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23rd IHP Regional Steering Committee meeting for Southeast Asia and the Pacific

Medan, Indonesia, 19-20 October 2015

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FINAL REPORT

Submitted 28 October 2015

**IHP-VIII Regional Steering Committee Meeting No. 23
Regional Steering Committee for Southeast Asia and the Pacific
UNESCO Jakarta Office, 2015**

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**The 23rd IHP Regional Steering Committee Meeting
for Southeast Asia and the Pacific
Medan, Indonesia
19 and 20 October 2015**

Chairman:	Mr. Kaoru Takara (Japan)
Secretary:	Mr. Yasuto Tachikawa (Japan)
Secretariat and UNESCO Representatives:	Mr. Shahbaz Khan (Jakarta Office) Ms. Ai Suguira (Jakarta Office) Mr. Alain Michel Tchadie (Jakarta Office) Ms. Dinanti Erawati (Jakarta Office) Ms. Vidyani Achmad (Jakarta Office)
Member Countries Represented:	Australia, China, Indonesia, Japan, Malaysia, Mongolia, New Zealand, Papua New Guinea, Philippines, Republic of Korea, Thailand, Vietnam. (See Annex A for the list of participants)
Observing Countries and Organizations:	Brunei Darussalam, Global Runoff Data Centre in Koblenz (GRDC), Asia Pacific Centre for Ecohydrology (APCE), Humid Tropics Centre Kuala Lumpur (HTC KL), International Centre for Water Hazard and Risk Management (ICHARM)

1 Welcome and Opening Remarks by UNESCO and local host

The meeting was opened at 9:05am on 19 October 2015 with opening remarks from RSC Secretariat (Mr. Shahbaz Khan) and introduction of the UNESCO representatives from Jakarta Office. Mr. Khan thanked the host country, Indonesia, and acknowledged the support from Indonesian Funds-In-Trust, Japan Funds-In-Trust, and Kyoto University. Mr. Khan explained the 23rd IHP RSC meeting was held in Medan even though announced to be organised in Myanmar during 22nd IHP RSC meeting. Due to general elections in Myanmar and consequent political unrest, local host requested the meeting to be held in another country as the security of foreign participants could not be guaranteed. Mr Khan stated the following points:

- 2015 was a special year as the year of executive board and the general conference (November 2015)
- 2015 is also the year of the launching of the SDGs
- Two new category 2 centres were endorsed in the AP region from the executive board in Iran and in Pakistan.
- Thanks to all members' contributions, a publication will be launched on 20 October compiling IHP achievements in the region over the past 50years.

Finally, Mr. Khan welcomed all participants and in particularly Brunei Darussalam which is represented for the first time in this committee. He also thanked and acknowledged Tirtanadi Water Company for hosting the meeting dinner on 19 October 2015 and University North Sumatra (USU) for co-organizing the International Symposium on "Integrated Actions for Global Water and Environmental Sustainability" in line with the Commemoration of the 70th Anniversary of UNESCO. Mr Khan also acknowledge the government of Medan.

Security briefing was given by UNDSS officer Mr Mark Benneth about Medan city.

Welcome address was given from Indonesian delegation by Mr Zainal Arifin (LIPI). Mr Arifin underlined the importance and pricelessness of water. He also gave some update on Haze problem in North Sumatera with more than 800 hotspots in fire in Sumatera.

2 Opening Comments On Behalf Of RSC and Introductions

The Chairperson, Mr. Takara cordially welcomed all participants, especially Brunei delegates for their first participation to IHP-RSC meeting. He further emphasized the importance of 2015 as the 70th anniversary of UNESCO and the 50th anniversary of IHP/IHD, thus this meeting has a particular importance particularly to establish regional cooperation in the region. He also mentioned that the year 2015 is also a very important year where the new SDGs were adopted and the 7th World Water Forum was held in the Republic of Korea.

Mr. Takara called for a self-introduction of all participants to the meeting including observers.

3 Adoption of the Agenda

The draft agenda was presented by the chairman, Mr. Takara, and adopted by the members. The agenda was adopted with five amendments, i.e.:

- item 9 will include Report on IHP World's Large Rivers Initiative, Working Group Meeting, Vienna, Austria, 25-26 June 2015
- item 12.A: presentation from GRDC

- item 14 will include a presentation on proposition on changes of terms length for Bureau

The revised agenda was then adopted.

The adopted agenda was further modified during the meeting and re-adopted by adding item 14 A: secretariat report on update from action point 3 (*“Form working group with identified leaders for project areas and submit proposal by the end of January (register interest including name and emails to Secretariat) by the end of January 2015”*) from 22nd IHP-RSC meeting and item 10bis: announcement of UNESCO-IHP-RSC SEAP award winners.

The final adopted agenda is presented in Annex B.

4 Secretariat Report

The RSC Secretariat, Mr. Shahbaz Khan presented his report (See Annex C).

He mentioned water has highest priority in Science programme however funds are limited. Moreover, he stated the challenges of Jakarta office was the reduction of JFIT funds by 50% and called for the need of innovative ways to support IHP successful activities.

Three comments were received from the members:

- Mr Ian White, ICG Vice-chair for Region IV commented on ADB sustainability indices on water which do not consider groundwater and stressed the importance of IHP work towards SDGs
- Mr Trevor Daniell, Australia, requested the report on post-Haiyan international symposium hold in Manila in February 2015
- Ms Yan Huang, China, reported on the communication and outreach report and recommendation developed by IHP China national committee including the launch of a logo and stressed out the impossibility to implement due to the lack of resources (human and financial) at IHP Secretariat. Ms Huang conveyed the call from IHP Secretariat for secondments options by China and other AP countries in order to support IHP Secretariat.
- Ms Huang also requested an update on the project areas (action point 3 from 22nd IHP-RSC meeting) which was decided to be given as item 13.A by the secretariat.

Mr Khan replied to the comments as follows:

- He acknowledged the resources constrains not only in IHP Secretariat with the departure of Bisher Imam to Cairo office and Siegfried Demuth retirement but also in Jakarta office.
- For communication, he offered JFIT funded CONNECT-Asia platform available in Jakarta.

5 Report of IGC Bureau

The IGC vice-chair for AP, Mr. Ian White presented his report (See Annex D and AnnexD_1). The main points of his presentations were:

- On the lack of human resource replacement procedure : how to replace vice-chair when they withdraw before the end of their mandate
- The lack of understanding of AP region at the global level

- The lack of human resources capacity at IHP Secretariat and UN lengthy recruitment and appointment process (including IHE rector)
- The difficulty on the category 2 centre process
- The financial committee report with the fact funds for IHP, category A, are lower than for some category C areas

Mr White proposed to send letter of appreciation on behalf of RSC committee to 7th WWF organizing committee for their success and importance for IHP and the region (Action point 1).

Mr Khan shared the following information as a response:

- Siegfried replacement is a matter of time and new appointment shall be shortly announced
- IHE rector appointment is delayed by Dutch government
- Category 2 centre process is usually delayed because of the legal requirements with national laws in the host country
- UNESCO recruitment process is a UN recruitment process and therefore lengthy.

6 Country Reports

Mr Takara opened the country report item by giving each country 4 minutes to report their activities since last RSC meeting in November 2014.

Country	Reports main points (Full country reports are available in Annex E)
Australia (Mr. Daniell) Trevor	<p>His presentation covered the following points (presentation in Annex E) :</p> <ul style="list-style-type: none"> - ACTIVITIES UNDERTAKEN IN THE PERIOD November 2014 to October 2015 - Status of IHP-VIII in Australia - National/local scientific and technical meetings 2014/2015 - Research/applied projects Pacific Islands (Information supplied by Ian White and Tony Falkland) <ul style="list-style-type: none"> o Water security and vulnerability to climate change and other impacts in Pacific Island countries and East Timor) o State of the Climate report - Conference Activities in 2015/16
China (Ms. Yan Huang)	<p>Her presentation covered the following points:</p> <ul style="list-style-type: none"> - 1. ACTIVITIES UNDERTAKEN IN THE PERIOD OF DEC 2014 – SEPT 2015 <ul style="list-style-type: none"> o 1.1 Meetings of the Chinese National Committee for IHP <ul style="list-style-type: none"> ▪ 1.1.1 Decision regarding the composition of the Chinese National Committee ▪ 1.1.2 Status of IHP-VIII activities ▪ 1.1.3 Decision regarding contribution to/participation in IHP-VIII o 1.2 Activities at national level in the framework of the IHP <ul style="list-style-type: none"> ▪ 1.2.1 National/local scientific and technical meetings ▪ 1.2.2 Participation IHP Steering Committees/Working Groups ▪ 1.2.3 Research/applied projects supported or sponsored

	<ul style="list-style-type: none"> ▪ 1.2.4 Collaboration with other national and international organization and/or programs ▪ 1.2.5 Other initiatives ○ 1.3 Education and training course <ul style="list-style-type: none"> ▪ 1.3.1 Contribution to IHP courses ▪ 1.3.2 Organization of specific training courses ▪ 1.3.3 Participation in IHP courses ○ 1.4 Publication ○ 1.5 Participation in meetings abroad ○ 1.6 Other activities at a regional or international level - 2 FUTURE ACTIVITIES <ul style="list-style-type: none"> ○ 2.1 Activities planned to until December 2015 ○ 2.2 Activities foreseen for 2015-2016 ○ 2.3 Activities envisaged for the long term
<p>Indonesia Mr. Hery Harjono</p>	<p>His presentation covered the following points (presentation in Annex E):</p> <ul style="list-style-type: none"> - Background - The purpose of the establishment of the IHP National Committee - Working group of Indonesian IHP National Committee - New Structure of IHP National Committee - Recent Activities - Future Activities
<p>Japan Mr. Yasuto Tachikawa</p>	<p>His presentation covered the following points (presentation in Annex E):</p> <ul style="list-style-type: none"> - Members of NatCom as of October 2015 - Special Note on : <ul style="list-style-type: none"> ○ Dr. Yutaka Takahashi received the Japan Prize in the field of Resources, Energy and Social Infrastructure, by his outstanding activities on “Contribution to development of innovative concept on river basin management and reduction of water-related disasters” on 23 April 2015. <p>Action point 2: Mr Daniell suggested a congratulation letter should be addressed from this committee by the chairperson to Prof Takahashi for being awarded the Japan price.</p> <ul style="list-style-type: none"> ○ a meeting on Cooperation with UNESCO on Water-Related Activities and Projects, with Madam Flavia Schlegel, Assistant Director-General for Natural Science, UNESCO, at the Graduate School of Advanced Integrated Studies, Kyoto University on 3 October 2015 at her occasion of visiting Kyoto to attend the 12th Science and Technology in Society (STS) Forum on 3-5 October 2015. - Status of IHP-VIII activities and funding to promote IHP activities - Participation in IHP Steering Committees/Working Groups - Participating in international meetings - International Meetings held in Japan - IHP Training Courses - Forthcoming meetings
<p>Malaysia</p>	<p>His presentation covered the following points :</p> <ul style="list-style-type: none"> - Information of IHP Malaysia

<p>(Mr. Hanapi Mohamad Noor)</p>	<ul style="list-style-type: none"> - Activities undertaken in the period October 2014 – October 2015 (outline) 1. Meetings of the IHP National Committee 2. Activities at national level in the framework of the IHP <ul style="list-style-type: none"> o 2.1 National/local scientific and technical meetings o 2.2 Participation in IHP Steering Committees/Working Groups o 2.3 Research/applied projects supported or sponsored 3. Educational and training courses <ul style="list-style-type: none"> o 3.1 Contribution to IHP courses o 3.2 Organization of specific courses o 3.3 Participation in IHP courses 4. Publications 5. Participation in international scientific meetings 6. Other activities at regional level - Future activities
<p>Mongolia Ms.</p>	<p>Her presentation covered the following points (presentation in Annex E):</p> <ul style="list-style-type: none"> - Brief information about Mongolia - Activities of Mongolian National IHP Committee <ul style="list-style-type: none"> o Renewal of the composition of Mongolian National IHP Committee o Mongolian National IHP Committee o Implemented activities in last 2 years
<p>Myanmar Mr Than Zaw</p>	<ul style="list-style-type: none"> - A report was submitted to the secretariat but Myanmar delegate could not reach Medan due to passport issue.
<p>New Zealand Mr. Dennis Jamieson</p>	<p>His presentation covered the following points (presentation in Annex E):</p> <ul style="list-style-type: none"> - IHP links to Government priorities <ul style="list-style-type: none"> o Access to data: APFRIEND o Link to infrastructure – a central government priority <ul style="list-style-type: none"> ▪ Catalogue of rivers ▪ National scale data access ▪ Water User Groups o Flood estimation: APFRIEND o Link to infrastructure – a central government priority o IHP-VIII o Link to infrastructure – a central government priority <ul style="list-style-type: none"> ▪ IWRM ▪ Ecohydrology - Status of IHP activities - Major items: <ul style="list-style-type: none"> o IHP –VIII <ul style="list-style-type: none"> ▪ Canterbury Water Management Strategy(CWMS) ▪ Infrastructure , government priorities and resilience (including Flood Design methods) ▪ FE²W (Food Energy Environment Water network) o Land and Water Forum o South Pacific Applied Geosciences Commission (SOPAC) o Korean Water Resources Association (KWRA) - Activities with Pacific Islands - Education/training – new technology - Publications

	- Activities for 2016
Papua New Guinea Mr. Joseph Jure	His presentation covered the following points (presentation in Annex E): <ul style="list-style-type: none"> - 1. Introduction - 2. Activities Organized by the National Committee - 3. Other Hydrological & Water Related Activities Conducted by Individual Water Agencies - 4. Participation in Regional Programs - 5. Future tasks
Philippines Mr. Guillermo III Quesada Tabios	His presentation covered the following points: <ul style="list-style-type: none"> - 1. Status of IHP-VII activities <ul style="list-style-type: none"> o 1.2 Activities at national level in the framework of the IHP <ul style="list-style-type: none"> ▪ 1.2.1 National/local scientific and technical meetings ▪ 1.2.2 Participation in IHP Steering Committees/Working Groups ▪ 1.2.3 Research/applied projects supported or sponsored ▪ 1.2.4 Collaboration with other national and international organizations and/or programmes ▪ 1.2.5 Other Initiatives o 1.3 Educational and training courses <ul style="list-style-type: none"> ▪ 1.3.1 Contribution to IHP Courses ▪ 1.3.2 Organization of specific courses ▪ 1.3.3 Participation in IHP courses o 1.4 Participation in international scientific meeting <ul style="list-style-type: none"> ▪ 1.4.1 Meetings hosted by the country ▪ 1.4.2 Participation in meetings abroad o 1.5 Other activities at regional level <ul style="list-style-type: none"> ▪ 1.5.1 Institutional relations /co-operation ▪ 1.5.2 Completed and ongoing scientific projects - 2. Future Activities <ul style="list-style-type: none"> o 2.1 Activities planned for 2015-2016 o 2.2 Activities in the long term
Republic of Korea Mr. Joong Hoon Kim	His presentation covered the following points: <ul style="list-style-type: none"> - 12th Hydroinformatics conference is organised in Incheon 21-25 August 2016, so far the number of abstracts submitted by the region is very low and Mr Kim encouraged members to submit abstract as the deadline was extended to 31 October 2015.
Thailand Ms Wandee Pattanasatianpong	Her presentation included the following points: <ul style="list-style-type: none"> - .1. Activities undertaken in the period of November 2014 – October 2015 <ul style="list-style-type: none"> o 1.1 Meetings of the National Committee for IHP <ul style="list-style-type: none"> ▪ 1.1.1 Decision regarding the composition of the National Committee ▪ 1.1.2 Status of IHP-VIII activities ▪ 1.1.3 Decision regarding contribution to/participation in IHP-VIII o 1.2 Activities at national level in the framework of the IHP <ul style="list-style-type: none"> ▪ 1.2.1 National/local scientific and technical meetings

	<ul style="list-style-type: none"> ▪ 1.2.2 Participation IHP Steering Committees/Working Groups ▪ 1.2.3 Research/applied projects supported or sponsored ▪ 1.2.4 Collaboration with other national and international organization and/or programs ▪ 1.2.5 Other initiatives ○ 1.3 Education and training course <ul style="list-style-type: none"> ▪ 1.3.1 Contribution to IHP courses ▪ 1.3.2 Organization of specific training courses ▪ 1.3.3 Participation in IHP courses ○ 1.4 Cooperation with UNESCO-IHE Institute for Water Education and / or international/ regional water center under the auspices of UNESCO ○ 1.5 Publications ○ 1.6 Participation in meetings abroad <ul style="list-style-type: none"> ▪ 1.6.1 Meetings hosted by the country ▪ 1.6.2 Participation in meetings abroad ○ 1.7 Other activities at a regional or international level <ul style="list-style-type: none"> ▪ 1.7.1 Institutional relations/co-operation ▪ 1.7.2 Completed and ongoing scientific projects - 2 Future activities <ul style="list-style-type: none"> ○ 2.1 Activities planned to until December 2016 ○ 2.2 Activities foreseen for 2015-2016 ○ 2.3 Activities envisaged for the long term
<p>Vietnam</p> <p>Mr. Hoang Minh Tuyen</p>	<p>His presentation included the following points:</p> <ul style="list-style-type: none"> - .1. Activities undertaken in the period of October 2014 – October 2015 <ul style="list-style-type: none"> ○ 1.1 Meetings of the National Committee for IHP <ul style="list-style-type: none"> ▪ 1.1.1 Decision regarding the composition of the National Committee ▪ 1.1.2 Status of IHP-VIII activities ▪ 1.1.3 Decision regarding contribution to/participation in IHP-VIII ○ 1.2 Activities at national level in the framework of the IHP <ul style="list-style-type: none"> ▪ 1.2.1 National/local scientific and technical meetings ▪ 1.2.2 Participation IHP Steering Committees/Working Groups ▪ 1.2.3 Research/applied projects supported or sponsored ▪ 1.2.4 Collaboration with other national and international organization and/or programs ▪ 1.2.5 Other initiatives ○ 1.3 Education and training course <ul style="list-style-type: none"> ▪ 1.3.1 Contribution to IHP courses ▪ 1.3.2 Organization of specific training courses ▪ 1.3.3 Participation in IHP courses ○ 1.4 Cooperation with UNESCO-IHE Institute for Water Education and / or international/ regional water center under the auspices of UNESCO ○ 1.5 Publications ○ 1.6 Participation in meetings abroad <ul style="list-style-type: none"> ▪ 1.6.1 Meetings hosted by the country ▪ 1.6.2 Participation in meetings abroad ○ 1.7 Other activities at a regional or international level <ul style="list-style-type: none"> ▪ 1.7.1 Institutional relations/co-operation ▪ 1.7.2 Completed and ongoing scientific projects

	<ul style="list-style-type: none"> - 2 Future activities <ul style="list-style-type: none"> o 2.1 Activities planned to until December 2016 o 2.2 Activities foreseen for 2015-2016 o 2.3 Activities envisaged for the long term
Pakistan (observer)	A country report (Annex E) was submitted to the Secretariat but no delegate could attend the meeting on the first day (19 October 2015).

7 Updates from category II centres under the auspices of UNESCO in the Asia-Pacific region present at the meeting

Narrative reports were received from APCE, HTC-KL and ICHARM (included in Japan report).

Centres present during the meeting.

Centres	Announcement
ICHARM Mr Masahiko Murase	ICHARM report is included in Japan country report (Annex E). In particular, Mr Murase presented the special IFI/IDI session at the International Symposium to take place on 21 October 2015 and during which practical implementation of water related DRR would be discussed.
HTC KL Ms Zainab Hashim	Ms Zaibin reported first that Mr. Mohamed Roseli Zainal Abidin had retired on 7 October 2015 and presented the updates on activities of HTC (Annex F). Her presentation included: <ul style="list-style-type: none"> - Heartiest gratitude to Dr Mohamed Roseli bin Zainal Abidin - About HTCKL - On-going research activities - Activities implemented and participated at local, regional and international level - Publications - Future programme 2016 - Finance and human resources
APCE Mr Ignasius Supata	Mr. Ignasius Sutapa presented the updates on activities of APCE (Annex F) with a special emphasis on the Yogyakarta Action Plan implementation activities. His presentation included: <ul style="list-style-type: none"> - Introduction - Recent activities of APCE - ICE 2014 and GoB of APCE Meeting - Promote joint research project in collaboration with Unesco Jakarta, and several Universities - Next activities

8 Report on the 7th World Water Forum 2015 on 12-17 April 2015 in Daegu and Gyeongbuk, Korea

Mr Soontak Lee is the co-chair of the international steering committee of the 7th World Water Forum (7th WWF) 2015 which took place in Daegu Gyeongbuk from 12-17 April 2015. Mr Lee extended with gratitude to RSC members for their participation and contribution to the 7th WWF. He then presented major outcomes and messages of the forum (See Annex G).

Mr Hanapi inquired about which platform had been developed as a monitoring system to ensure implementation and action plan are effectively taking place. Mr Lee replied the constitution of an action monitoring system for which the Korean government organised a workshop with former and future hosting country and the report of this workshop has been submitted to the UN general assembly as a recommendation for Goal 6.

After thanking RSC members for their participation, Mr Tachikawa also reported on the RSC Session in the Science and Technology Process on 13 April 2015 (See Annex H).

9 Report in the UNESCO International Scientific Symposium on Scientific, Technological and Policy Innovations for Improved Water Quality Monitoring in the Post-2015 SDGs Framework, Otsu and Kyoto, Japan, 15-18 July 2015 and Report on IHP World's Large Rivers Initiative, Working Group Meeting, Vienna, Austria, 25-26 June 2015

Mr White reported on the IHP international scientific symposium on water quality which took place in Japan on 15-18 July 2015. It was reported the symposium covered a very broad range of expertise and had a good geographical representation (See Annex D and AnnexD_2).

Mr White also reported on the World's Large Rivers Initiative (WLRI) working group meeting which took place Austria on 25-26 July 2015 (See Annex D and AnnexD_3).

Ms Yan asked what the definition of large rivers was and which AP rivers were already listed in the initiative. Mr White replied the definition of large rivers was still under consultation as the WMO definition was felt too restrictive and therefore the listing of large rivers was also still undefined. Indeed, according to WMO definition, there are at least 62 major large rivers but it is felt by the working group the definition of large river should be based on both discharge and river basin area.

Mr Lee presented some background to the WLRI. It was reported the WLRI was once rejected as the definition of the large river was not clear but due to the strong support from the Austrian government, IHP Secretariat finally decided to establish it.

10 Approval of the criteria for selecting individuals for the UNESCO-IHP RSC-SEAP Award and determination of the award winners

The Chairperson reported 10 years a similar awarding ceremony took place to celebrate the 40 years of IHP/IHD.

The Secretary reported back the historical and steps taken for the 50 years of IHP/IHD IHP-RSC SEAP awarding process. This was proposed at last RSC meeting and the process started a year ago (Annex I).

The Chairperson explained about the nomination process and explained about the selection criteria. A number of nominations were submitted within the process and according to the selection criteria. The floor was opened for comments.

Ms Yan commented the process has already been discussed during the year and it was now only time to amend or not the proposed criteria. It was suggested the second criteria could be 20 year or more of contribution.

Mr Lee commented every nomination should be respected but there is a need for a criteria as presented by the chairperson and the secretary. He suggested a committee should be now formed to go through all nomination with agreed criteria. Also, it was reported all RSC SEAP member countries should be acknowledge for their contribution as AP is an exemplary region in IHP.

Mr Tuyen suggested the nomination should come by at least 2 IHP national committee and not only one.

Mr Daniell commented the selection should be done by a small committee therefore for now the criteria proposed by the chairperson and the secretary are ok but in the future, Vietnam suggestion should be considered.

The chairperson noted this award is not an academic award but a mark of appreciation.

Mr Lee also inquired if deceased persons had been nominated and if so what was decided.

The chairperson reported it was decided to only award the “living” but the deceased would be mentioned.

The committee agreed to form a selection committee constituted by countries which did not nominate anyone (Malaysia, New Zealand, Papua New Guinea, and Thailand), the chairperson, the secretary and the secretariat. The selection committee will nominate “Water Hero for AP region” on day 2 after deliberation on day 1.

11 7th International Conference on Water Resources and Environment Research (ICWRER2016), 5-9 June 2016 in Kyoto, Japan

The secretary distributed hands out (see Annex J) on the 7th International Conference on Water Resources and Environment Research to take place in Kyoto from 5-9 June 2016 and the chairperson sought authorisation to use IHP-RSC logo for this event. The authorisation was granted.

UNESCO Office Jakarta announced it would like to propose a session about Regional delivery for SDGs to the conference and mobilise wider UN system.

Mr Lee proposed then Kyoto as the host for the next RSC meeting. The chairperson reported the next IGC will take place on 14-16 June 2016 which might be too close to the conference. Also the secretariat mentioned the need for the RSC meeting to be cost-effective and Japan is a very expensive and it might not be possible to fund both the RSC meeting and the conference.

The Chairperson actively called for participation from all members of the committee and will consider if it is feasible to host the next RSC meeting.

12 25th IHP Training Course: Risk Management of Water-Related Disasters under Changing Climate, Uji, Kyoto, Japan, 30 Nov. – 11 Dec., 2015

The secretary distributed hands out (see Annex K) on the 25th IHP Nagoya Kyoto Training course to take place in Kyoto from 30 November to 11 December 2015.

The secretariat explained the current funding situation with JFIT as this training is part of JFIT project. It was reported call for nomination from RSC members for participation has been circulated by the secretariat but this year findings to support participations were very limited and the secretariat called for members to consider supporting their participants.

12.A. Presentation from GRDC

Mr Looser from the Global Runoff Data Centre, WMO centre based in Koblenz reported about “Station Availability in the Asian Pacific region” (see Annex L). Mr Looser called for data sharing from the region especially but not limited to basins related to FRIEND. It was reported discharges available from GRDC are mean daily data and the call is not for real time data but rather quality controlled data.

The secretariat underlined the need to formalise the relation between RSC and GRDC by for example a memorandum of understanding. It was also reported UNESCO Office Jakarta would like to seek the possibility to form an agreement with GRDC for educational use of GRDC data.

Mr Lee inquired the state of the water archive. It was reported there was no update for the past 10 years in Kyoto. It was agreed by the committee to re-activate the water archive.

Mr Looser explained the process of assessment by GRDC which sometimes include seeking advice from WMO secretariat when they receive a request for data in order to identify if the use would be commercial or not.

Mr Murase underlined the need to reinforce the collaboration between IFI (International Flood Initiative), IDI (International Drought Initiative) and WMO especially on the data sharing as WMO is a member of IFI.

Mr Looser mentioned a resolution on the formalisation of RSC and GRDC collaboration was submitted and will be explained on day 2 item 19.

The chairperson closed day 1 at 16:58.

Day 2 was opened by the chairperson at 9:22 am on 20 October 2015.

10. Approval of the criteria for selecting individuals for the UNESCO-IHP RSC-SEAP Award and determination of the award winners - continued-

The Adhoc selection committee formed on day 1 and constituted of Malaysia, New Zealand, Papua New Guinea, and Thailand, the chairperson, the secretary and the secretariat reported:

- 10 individuals qualified the criteria of being nominated by one IHP national committee and having served at least 10years with IHP RSC.
- All 10 individuals are recognised for their outstanding contribution
- Additional criteria were considered to select “Water Hero in the region”, a) consideration of leadership quality, b) if the contribution of the individual was beyond

his/her country to implement IHP activities, c) the individual effort and capacity to mobilise funds .to implement IHP activities in the region.

- The chairperson and the secretary abstained from voting as two Japanese individuals are among the 10 nominated individuals.

Hence the following four individuals were selected by the ad hoc selection committee:

- Mr Trevor Daniell (Australia)
- Mr Soontak Lee (Republic of Korea)
- Mr Kaoru Takara (Japan)
- Ms XiaoYuan Zhu (China)

The four awarded individuals will be awarded at the opening ceremony of the international symposium to take place on 21 October 2015.

The 10 nominated individuals will be awarded at the award ceremony to take place on the afternoon of 20 October 2015.

13 Post- Catalogue of Rivers Initiative: Updates on Catalogue of Hydrologic Analysis modules

Mr Chikamori reported on the situation of the Catalogue of Hydrological analysis. Consultation on the format and level of target user was circulated to the committee members during January 2015 (see Annex M). Only two responses were received and it was reported the level of user should be beginner also a format was proposed and the floor opened for discussion.

Mr Tabios inquired about the difference between the catalogue of hydrologic analysis and the atlas that was developed 6years ago on the general status of water resources as well as AP_FIREND activities.

The chairperson explained this new catalogue is about using data collected in the six volumes of catalogue of rivers in an online format. It is a collection of analysis method including software and the discussion in this item point should be about the format of this new catalogue.

Mr Daniell commented on the high value of this new catalogue as a teaching tool and suggested it should:

- have a label system with several levels (Beginner, Advanced/Graduate and Practitioners),
- be open source software based or freely available
- Include a list of topics to be covered.

The secretariat reported the new proposed JFIT funded IHP project, WISER (Water Informatics for Sustainability and Enhanced Resilience in Asia and the Pacific) focuses on hydroinformatics and DRR and has received a positive response from the government of Japan.

It was reported there is a need for standardized method but this was very challenging. Also there is a need to give a clear identity to this new catalogue that shows why this new catalogue is developed, what are the differences of RSC hydrological methodology compared to already shared ones and the demarcation could be based on AP region geophysical characteristics including humid tropic region and snowmelt runoff countries.

Ms Yan called for action.

It was agreed to form a technical sub-committee (Action point 3) for which chair and members of the sub-committee should be selected.

14 Length of terms for Bureau Members and Establishment of an Intergovernmental Panel on Water (IPWater)

14.1 LENGTH OF TERMS FOR BUREAU MEMBERS

Mr Ian White explained the proposal from vice-chair Region I to amend IHP Statutes and Rules of Procedure of IHP Council so that the term of office of the Chair and Vice-chairs is increased from the current two years into four years. (See Annex D).

Mr Soontak Lee explained Mr Johannes Cullman had already proposed this extension in the past and the Bureau had rejected. The reason was it would extend the chance for any of the six regions to chair the council from every 12years now to every 24years.

The chairperson asked each member to state what their national committee had replied to the bureau on this matter and the answers were:

- Australia replied NO
- China replied NO
- Indonesia replied NO
- Japan replied YES but might change its reply as the reply deadline was extended
- Mongolia replied NO
- New Zealand had not replied yet as the deadline was extended to 28 October 2015
- PNG replied NO
- Philippines : the delegate has to check the reply from his commission
- Republic of Korea had not replied yet but will be NO
- Thailand replied NO
- Vietnam replied NO.

The chairperson noted IHP Secretariat is not as strong as it used to be and therefore national commissions could play a stronger role. However a 4years term would make the chair position very competitive.

The secretariat commented the 2years term was in line with the General Conference.

Mr Kuniyoshi Takeuchi stated the reasons behind this proposition:

- WMO CHy (Commission for Hydrology) chairpersonship is 8years
- Most of the international association like IAHS, IAHR chairmanship is 4years
- IHP Secretariat is weakened
- Therefore the need to propose a different kind of concept to make IHP more attractive as for instance CHy is much more active partly because of its very strong secretariat. A new concept is necessary and should be proposed from RSC to the bureau.

14.2 ESTABLISHMENT OF AN INTERGOVERNMENTAL PANEL ON WATER (IPWATER)

Mr Ian White reported about the proposal by IHP IGC Chair (Group III) to establish an Intergovernmental Panel on Water similar to IPCC – discussed at IHP Bureau Technical Meeting in Mexico. (See Annex D).

The chairperson opened the floor for discussion.

- New Zealand: this initiative needs to link with other existing initiative like OECD's and with Mr Quentin Grafton initiative (FE²W). Also there are numerous existing structures with which IHP could work with and UNESCO did not need another panel to run.
- Australia stated not in favour as this initiative would be a duplication of the world water council. Moreover, water is already under IPCC in chapter 4 therefore this panel would really be a duplication.
- China stated not in favour as could not see the added value to IHP as if inside IHP then it is a duplication and if it is outside IHP then it becomes a competitor of IHP.
- Malaysia stated not in favour that results regarding water should be included in the IPCC and not be separated from it
- Philippines stated it was a good idea however it needed more discussion on the logistics
 - - Mr Kuniyoshi Takeuchi noted "IP" is a keyword like for IPCC or IPBC (on biodiversity) and means a collection of journal papers with state of the art analysis which can be used for policy guidance. However water issues are not only scientific but much broader and therefore doubted IPWater could deliver the same as IPCC/IPBC.
 -
- Republic of Korea reported the World Water Council had been contacted by this IPWater initiative group. Also it was noted that IHP-IGC is the largest intergovernmental group with 36 member states therefore another intergovernmental panel on water was unnecessary.
- Indonesia replied not in favour as UNESCO has already IHP-VIII to deliver and should focus on this first.
- China replied rather than making IHP body larger, there was a need to make the existing structure more attractive and efficient by establishing a task force rather than a bureaucrat group.

The chairperson also added UN-Water has already published three reports but very limited impact compared to IPCC. Therefore even though it is important promoting a water report (by IHP or another UN body) for effective use by policy makers, and even though IHP needs to renew itself and become more attractive (IOC, MAB are much more active programs than IHP at the moment) this initiative is not as it appears to be very difficult to implement in terms of funds and logistics.

The chairperson summarised the opinion from RSC was not in favour for the establishment of IPWater but stressed out the need for IHP to become more attractive and there was definitely a need to raise water profile.

14.A Follow-up on four project areas proposals identified during 22nd RSC meeting

The secretariat presented the follow-up on action point four project areas proposals from 22nd RSC meeting (see Annex N).

In January 2015, the secretariat circulated a template for concept note with 31 Jan 2015 as deadline for their submission and two proposals were received. Only one was with a regional scope entitled "Training resources for preparing professionals to learn from and interact with the community" and it has been included in the new proposal for JFIT IHP project (WISER). In addition with another proposal from the water education group project on ."Leveraging knowledge through basic training for water professionals".

Ms Yan expressed the willingness to continue this process and continue gathering ideas.

The chairperson also encouraged the members to keep sending proposals to the secretariat which could be considered for implementation.

15 Organization of the 24th RSC meeting and associated conference

Mongolia offered to host the next RSC meeting as the last one was in 2008. The proposition was agreed by all members.

Action point 4: dates and places will be discussed between Mongolia and the secretariat.

16 Organization of the 25th RSC meeting and associated conference

Philippines offered to host the 25th RSC meeting since the last one hosted was in 2007. It was also agreed by all members.

17 Election of RSC Chairperson

The chairperson called for recommendation or nomination for the next chairperson. Republic of Korea proposed Mr Tabios as the next chairperson. It was seconded by Australia and China.

The chairperson proposed the next chairpersons to be Mr Guillermo III Quesada Tabios from the Philippines and it was agreed by all members.

18 Any other issues

No issue was brought.

19 Adoption of Resolutions

Three resolutions were submitted and agreed by all members however wording for each of them will be reviewed and circulated among members (Action point 5).

The three resolutions are:

- Resolution 1: Qualifications for filling vacant core staff positions in the secretariat of UNESCO's international hydrological programme (submitted by Vice Chair region AP)
- Resolution 2: Appreciation of the effort involved in the 7th World Water Forum (submitted by Vice Chair region AP)
- Resolution 3: Runoff data archives (submitted by GRDC).

20 Closure of the meeting

Mr Daniell proposed a round of thanks to Mr Takara for his effort and contribution during the past 2 years and was joined by all members.

A round of thanks was given to the secretary and the secretariat for the organisation of the meeting.

The new chairperson Mr Tabios was again congratulated.

The former chairperson, Mr Takara closed the session at 12:15 on 20 October 2015.

23rd RSC meeting action points are summarised below:

Action	Responsible person	Deadline
send letter of appreciation on behalf of RSC committee to 7th WWF organizing committee for their success and importance for IHP and the region (Action point 1).	Chairperson	asap
Action point 2: send a congratulation letter should be addressed from this committee by the chairperson to Prof Takahashi for being awarded the Japan price.	Chairperson	asap
Action point 3 in order to develop the catalogue of hydrological analysis, form a technical sub-committee for which chair and members of the sub-committee should be selected.	Mr Chikamori and all members	Not set
Action point 4: 24 th IHP-RSC meeting dates and places will be discussed between Mongolia and the secretariat.	secretariat	By end of 2015
Three resolutions were submitted and agreed by all members however wording for each of them will be reviewed and circulated among members (Action point 5)	Vice-Chair region AP and GDRC/Mr Takara	Not set

List of Annexes

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Annex B Final adopted agenda

Annex C RSC Secretariat report

Annex D Report on IHP Bureau Activities

Annex D_1 Important Issues from 52nd Session UNESCO IHP Bureau

Annex D_2 Brief Report UNESCO IHP International Water Quality Symposium

Annex D_3_Brief Report UNESCO IHP World Large Rivers Initiative Vienna June 2015

Annex E Country reports

Annex F Category II centre reports

AnnexG_item8_WWF7-Outcomes(presentation) - Prof. Soontak Lee

AnnexH_item8-7WWF2015

Annex I_item10-SEAPaward

Annex J_item11_ICWRER2016

Annex K_item12_IHP_LEAFLET25th

Annex L_item12A_AP FRIEND 2015

Annex M_ item 13_Post-Catalogue of Rivers Initiative

Annex N_item14A_followupWG22nrRSC

Final Report of the 23rd RSC meeting for Southeast Asia and the Pacific (Medan, Indonesia, 19-20 October 2015)

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Annex K_item12_IHP_LEAFLET25th

Annex L_item12A_GSDR

Annex M_ item 13_Post-Catalogue of Rivers Initiative

Annex N_item14A_followupWG22nrRSC

LIST OF PARTICIPANTS

23rd Meeting of the IHP Regional Steering Committee for Southeast Asia and the Pacific
JW Marriot Medan Hotel, Medan, Indonesia
19-20 October 2015

No	Country	Name	Institution
1	Australia	Trevor Daniel	Faculty of Engineering, Computer & Mathematical Sciences University of Adelaide
2	Australia	Ian White	Vice-Chair UNESCO IHP Asia - Pacific
3	Brunei Darussalam	Alice Lim Sui Kai	Department of Water Services Public Works Department, Brunei Darussalam
4	Brunei Darussalam	Norasilah Haji Nayan	Department of Water Services Public Works Department, Brunei Darussalam
5	China	Xiao Yuan Zhu	IHP National Committee of China
6	China	Liu Heng	IHP National Committee of China
7	China	Shanshan Xiong	IHP National Committee of China
8	China	Yan Huang	IHP National Committee of China
9	China	Xian Tian Yuan	IHP National Committee of China
10	Germany	Ulrich Looser	Global Runoff Data Centre (GRDC), Germany
11	Indonesia	Ignasius Sutapa	Asia Pacific Centre For Ecohydrology (APCE) – UNESCO, Indonesia
12	Indonesia	Zainal Arifin	Chairman of Indonesia National Committee of IHP
13	Indonesia	Hery Harjono	Asia Pacific Centre for Ecohydrology (APCE) – UNESCO, Indonesia
14	Indonesia	Tri Widiyanto	Research Centre for Limnology - LIPI, Cibinong, Indonesia
15	Japan	Kaoru Takara	The Chairperson, RSC for UNESCO-IHP in SEAP
16	Japan	Sono Inoue	Disaster Prevention Research Institute, Kyoto University
17	Japan	Yasuto Tachikawa	The Secretary, RSC for UNESCO-IHP in SEAP
18	Japan	Hidateka Chikamori	Okayama University, Japan
19	Japan	Masanori Inoue	Kobe University, Japan
20	Japan	Nishioka Seigo	Kobe University, Japan
21	Japan	Akira Kawamura	Tokyo Metropolitan University, Japan
22	Japan	Hidateka Chikamory	Okayama University, Japan
23	Japan	Kenichiro Kobayashi	Kobe University, Japan

24	Japan	Masahiko Murase	International Centre for Water Hazard and Risk Management (ICHARM), Japan
25	Japan	Hiroki Tsujikura	Osaka Main Office, Japan
26	Japan	Takahiro Sayama	Kyoto University, Japan
27	Japan	Kuniyoshi Takeuchi	International Centre for Water Hazard and Risk Management (ICHARM), Japan
28	Malaysia	Zainab Binti Hashim	Humid Tropics Centre Kuala Lumpur (HTCKL), Malaysia
29	Malaysia	Hanapi Moh Noor	Malaysian IHP National Committee
30	Malaysia	Nur Hareza Redzuan	Malaysian IHP National Committee
31	Malaysia	Dato Hanapi Mohamad N	Malaysian IHP National Committee
32	Mongolia	Chimeddulam Nergui	Mongolian IHP National Committee
33	Myanmar	Than Zaw	Department of Meteorology and Hydrology, Myanmar
34	New Zealand	Dennis Datema Jamieson	Project Leader Water Infrastructure Canterbury Water Management Service, New Zealand
35	Papua New Guinea	Joseph Jure	Papua New Guinea IHP National Committee
36	Philippines	Guillermo III Quesada Tal	Institute of Civil Engineering, University of Philippines
37	Republic of Korea	Soontak Lee	Republic of Korea IHP National Committee / Yeungnam University
38	Republic of Korea	Joong Hoon Kim	School of Civil, Environmental and Architectural Engineering, Korea University
39	Thailand	Wandee Pattanasantiang	Thailand IHP National Committee
40	Thailand	Thada Sukhapurnaphan	Royal Irrigation Department, Thailand
41	Thailand	Jaray Thongduang	Director of Hydrology Division, Thailand
42	Thailand	Karoon Premvuti	Hydrologist, Senior Professional Level, Thailand
43	Thailand	Lerdphan Sukyirun	Irrigation Engineer Professional Level, Thailand
44	Thailand	Kanokwan Yoowong	Plan and Policy Analyst Dept of Water Resources, Thailand
45	Vietnam	Hoang Minh Tuyen	Vietnam IHP National Committee

UNESCO Office Jakarta

47	Indonesia	Shahbaz Khan	Director & Representative, UNESCO Office, Jakarta
48	Indonesia	Vidyani Ahmad	UNESCO Office, Jakarta
49	Indonesia	Erawati Dinanti	UNESCO Office, Jakarta
50	Indonesia	Ai Sugiura	UNESCO Office, Jakarta
51	Indonesia	Alain Michel Tchadie	UNESCO Office, Jakarta

**23rd MEETING OF THE IHP REGIONAL STEERING COMMITTEE FOR
SOUTHEAST ASIA AND THE PACIFIC
TENTATIVE AGENDA**

JW Marriot Hotel, Medan Indonesia, 19 - 20 October 2015

No	Agenda Item	Responsible Person	Document/ Presentation
	Day 1 Morning– 19 October 2015 Start at 9 a.m.		
1	Welcome and opening remarks by UNESCO Myanmar and Indonesia IHP	Director of UNESCO Jakarta office, Myanmar and Indonesian delegates	Comments
2	Opening comments on behalf of RSC	Kaoru Takara, Chairperson	Comments
3	Adoption of the Agenda Presentation	Kaoru Takara, Chairperson	Draft agenda
4	Secretariat report	Secretariat	Presentation
5	Report of IGC Bureau	Ian White, IGC Vice-Chair	IGC report
6	Country Reports (4min max)	IHP delegates	
7	Updates from the centres under the auspices of UNESCO in the Asia Pacific Region	ICHARM, HTC Kuala Lumpur, APCE, etc.	Presentation/ Reports
8	Report on the 7 th World Water Forum 2015 on 12-17 April 2015 in Daegu and Gyeongbuk, Korea	Soontak Lee, Yasuto Tachikawa,	Presentation
	Day 1 Afternoon– 19 October 2015		
9	Report in the UNESCO International Scientific Symposium on Scientific, Technological and Policy Innovations for Improved Water Quality Monitoring in the Post-2015 SDGs Framework, Otsu and Kyoto, Japan, 15-18 July 2015 Report on IHP World's Large Rivers Initiative, Working Group Meeting, Vienna, Austria, 25-26 June 2015	Ian White and Kaoru Takara	Presentation/ report
10	Approval of the criteria for selecting individuals for the UNESCO-IHP RSC-SEAP Award and determination of the award winners	Kaoru Takara, Chairperson	
11	7 th International Conference on Water Resources and Environment Research (ICWRER2016), 5-9 June 2016 in Kyoto, Japan	Kaoru Takara and Yasuto Tachikawa	
12	25 th IHP Training Course: Risk Management of Water-Related Disasters under Changing Climate, Uji, Kyoto, Japan, 30 Nov. – 11 Dec., 2015	Yasuto Tachikawa	Announcement

12. A	Presentation from GRDC	Ulrich Looser	
	Day 2 Morning– 20 October 2015 Start at 9 a.m.		
13. A	Follow-up on four project areas proposals identified during 22 nd RSC meeting	Secretariat	Presentation
13	Post- Catalogue of Rivers Initiative: Updates on Catalogue of Hydrologic Analysis modules	Hidetaka Chikamori and Kenichiro Kobayashi	Presentation
14	Establishment of an Intergovernmental Panel on Water (IPWater) Changes of IHP system	Ian White	
15	Organization of the 24 th RSC meeting in xxxx and associated conference	RSC Secretariat	Need to be decided
16	Organization of the 25 th RSC meeting in xxxx and associated conference	IHP delegates, RSC Secretariat	Need to be decided
17	Election of RSC Chairperson	IHP delegates	
18	Any other issues	IHP delegates	
19	Adoption of Resolutions	IHP delegates	Draft Resolution
20	Closing of the Meeting	Kaoru Takara, RSC Chairperson	
	Day 2 Afternoon – 20 October 2015		
1	Opening address and introduction of the 50th Anniversary Booklet	Shahbaz Khan	Comments
2	Launching of Booklet on “Celebrating 50 years of Water Leadership in Asia and the Pacific” Success Story from the Field	IHP Delegates	
3	IHP RSC SEAP Award for Distinguished Contributors	Kaoru Takara, RSC Chairperson, IHP RSC Delegates	Ceremony
4	Special Appreciation to IHP National Committees	Kaoru Takara, RSC Chairperson, IHP RSC Delegates	
5	Speech by awardees (@15 minutes max)		Speech/Prese ntation
6	Commemorative Photo		
7	Closing		

Note: Possible draft resolutions should be submitted to the RSC Secretariat by 15 October 2015.



SECRETARIAT REPORT

UNESCO Science Bureau for Asia and the Pacific

(December 2014-October 2015)

23rd RSC meeting
19-20 October 2014
Medan

Shahbaz Khan
Director and Representative
UNESCO Regional Science Bureau for Asia and the Pacific

Regional Sciences Bureau for Asia and the Pacific - UNESCO Office, Jakarta



Action points from 22nd RSC

Action	Responsible person	Deadline	Status
1 RSC Chairman will send congratulations to Prof. Xia Jun for the International Hydrological Prize on behalf of this committee	Chairman	asap	Sent
2 To initiate the use of platform on which updates on projects and exchanges about major events among members would be possible between RSC meetings. This platform can be hosted on UNESCO JAK website (with coordination with Mr. Tachikawa)	RSC Secretariat and Secretary	to be confirmed by RSC Secretariat	Regular updates on JFIT and Prof Tachikawa's website
3 Form working group with identified leaders for project areas and submit proposal by the end of January (register interest including name and emails to Secretariat)	Leaders of project areas	end of January 2015	Was circulated by Secretariat
4 Chairman will make sure Iran cat 2 centre to be invited to next RSC meeting.	Chairman and RSC Secretariat	For next RSC meeting	Invitation was sent

Action points from 22nd RSC

Action	Responsible person	Deadline	Status
<p>5 Encourage IHP national committee of Member States of AP region to contribute to the work of communication and outreach of IHP by sharing:</p> <ul style="list-style-type: none"> o ideas on how to increase public recognition, strengthen the engagement of IHP and other stakeholders through collaborative communication, and how to enhance the outreach of IHP's messages and their relevance to actual and mounting global challenges. o examples of communication and outreach regarding increasing public recognition of IHP through means such as social media, website, documentation / reports etc. o Any ideas and examples / materials etc. are welcome and to please send to Ms. Yan HUANG (yhuang@cjwsjy.com.cn) before 10 December 2014. 	Ms. Yan Huang	10-Dec-14	Was circulated

Action points from 22nd RSC

Action	Responsible person	Deadline	Status
6 Action on Proposal of Catalogue for Hydrologic Analysis: Mr. Chikamori and Mr. Kobayashi to circulate template format to all members and members to send back comments by the end of November. Proposal/concept note for contribution to be send to Secretariat a.s.a.p. to try to launch first draft at 7 th WWF	Mr. Chikamori and Mr. Kobayashi	end of November 2014	Was circulated
7 Myanmar has to confirm to secretariat whether the meeting will be in Yangon or Mandalay for 23 rd RSC meeting.	Mr. Than Zaw	asap	Confirmed to Yangon
8 For 40 th anniversary, showcase RSC achievements as side event of 7 th WWF with the RSC medals to key contributors and each country to celebrate.	All members	30-Nov-14	Booklet and award ceremony
9 Mr. Takara will edit the draft RSC achievements to be circulated by the end of January, the editorial board will be the previous RSC chairmen and secretaries. Mr. Tachikawa will follow up the drafting for the IHP 40 years. Table of content will be circulated by end of December 2014.	Chairman	end of January 2015	Finalised as the Booklet
10 Volunteer country to be found for 24 th RSC meeting organization.	RSC Secretariat	asap	No country



Main Progress/Achievements on the Implementation of IHP in Asia and the Pacific



Selected Studies implemented and ongoing on water resources in Asia and the Pacific

Literature review on Ecohydrology Application in Asia Pacific

The study analyzed the Ecohydrology development and application in Asia-Pacific including the change of paradigm in water management and growth of Ecohydrology concept. The study covers the variety of settings in Asia-Pacific from tropical aquatic ecosystems to vast arid region, variety of problem to tackle in Ecohydrology application such as urbanization, industrialization, shrink of biodiversity, population growth, high water demand and transboundary water problem.

Literature review on Integrated Water Resources Management Application and HELP in Asia Pacific

This study provides the discussion on water related problem in Asia Pacific and UNESCO HELP Program along with IWRM implementation as solution to deal with those water challenges and the most recognizable drivers including rapid growth of population, economy, industrial and agricultural sectors. The challenges expand from water scarcity into water scarcity, water quality problems, environmental changing and deterioration, water conflict or water-related disaster problems. UNESCO HELP Program and IWRM application as tools are proposed as framework to manage more sustainable water resources in variety of problem and condition. The framework encourage the involvement of all level of stakeholders in whole river basin to address the problem from upstream to downstream and integration of Hydrology, Environment, Life and Policy (HELP) sectors.



Selected Studies implemented and ongoing on water resources in Asia and the Pacific



Customization of IWRM Guidelines for Flood and Drought Management: preliminary studies on guidelines framework

To address the interrelated water disaster such as flood and drought as frequent problem in many common settings, IWRM Guidelines need to be advanced by including drought scenario in the current IWRM guidelines for flood. The customization will be done in regards by taking measure from the whole catchment level in both wet and dry season. The risk assessment and the approach to deal with the two disasters shall be interrelated with the same input from basin's physical characteristic and same element at risk like local inhabitant, infrastructures, agricultural sectors, ecosystem, biodiversity and environmental resources.

Development of generic Watershed Sustainability Index framework for HELP River Basins in Asia Pacific and example on Watershed Sustainable Index study on Geumho RB (Korea), Langat RB (Malaysia), Citarum RB (Indonesia).

This study aims to propose Water Sustainability Index (WSI) as evaluation guideline in order to improve the application of Integrated Water Resources Management (IWRM) on policies, plans, designs and implementation processes in HELP River Basin in Asia Pacific. HELP indicators in WSI assessment shed light on what to be observed and collected in HELP demonstration basin for IWRM implementation. In addition to that, appropriate and proper IWRM framework and guidelines for HELP river basin will be provided as more practical approaches to implementation of IWRM.



Selected Studies implemented and ongoing on water resources in Asia and the Pacific

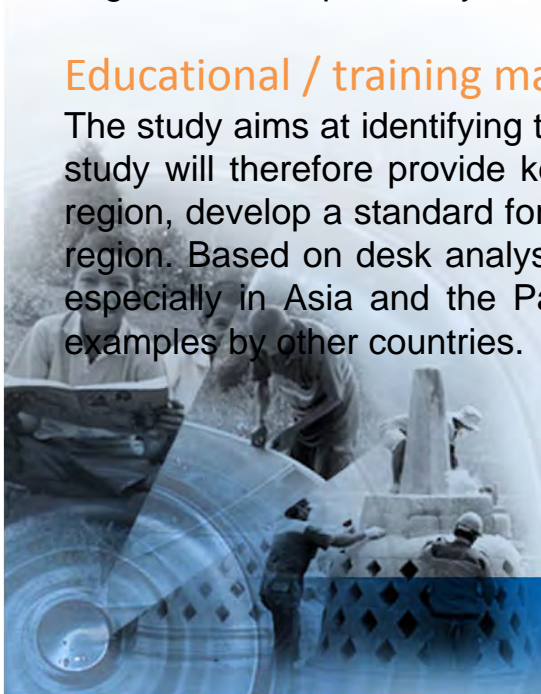


Preliminary study on Sustainable Water Management in Medan Study: conceptual model, water balance.

The preliminary study on Medan City water balance aims to project the future water balance in Deli River Basin, where Medan City is located. To support sustainable water management, the level of management should be in the river basin level that integrates from upper stream to downstream area. The study will cover the projection of water demand and supply in Deli River Basin influenced by changing parameter such as population changes and environmental changes. This study will give illustration on recent condition on water balance in Deli River Basin at general and specifically in Medan City.

Educational / training material on water resources management in Asia and the Pacific

The study aims at identifying the key challenges in delivering water education in Asia and the Pacific region. The study will therefore provide key scientific solutions to respond to the basic demand on water education in the region, develop a standard format to be produce as a workbook on recent on water education programme in the region. Based on desk analysis, the study will focus on the state of the art of water education and awareness, especially in Asia and the Pacific and will combine success story and best practices that could be used as examples by other countries.





Selected Studies implemented and ongoing on water resources in Asia and the Pacific



Ongoing studies

- Ecohydrology concept for the restoration and sound management of the Citarum River Basin, via control of pollution and sedimentation for water quality improvement through demonstration of innovative technologies and enhancing awareness and capacities at the community, river basin and national levels
- Ecohydrology approach applied to avoid deforestation in Peatland Rewetting and Conservation in Ex-Mega Rice Project location: Cases on food crops areas and on oil palm plantations areas.





Key Activities of IHP in Asia and the Pacific Region from December 2014 – October 2015



The 24th IHP Training Course



Held in Hydrospheric Atmospheric Research Center of Nagoya University, Japan on the theme "Forest Hydrology –Conservation of Forest, Soil, and Water Resources, from 23 November - 7 December, 2014.

This training course brought together participants from Asia-Pacific regions as a part of the Japanese contribution to the International Hydrological Program (IHP). The course is composed of a series of lectures and practice sessions.





Key Activities of IHP in Asia and the Pacific Region from December 2014 – October 2015



**“Enhancing Resilience against Multi-hazards through Effective Mitigation Systems and Adaptive Strategies”,
*UNESCO-PAGASA International seminar,
24-26 February 2015, Manila,
Philippines. In the post-Haiyan context***



ASEAN Water Footprint Course

24 - 26 February 2015, DID Training Centre, Kuala Lumpur

In collaboration with UNESCO IHP National Committee of Malaysia, this course help to expand the understanding of water footprint concept to a bigger number of water managers in ASEAN countries.



Key Activities of IHP in Asia and the Pacific Region from December 2014 – October 2015

- **“Sustainability Science for SDGs”,**
3-5 March 2015, Kuala Lumpur,
Malaysia

*Sustainability Science overarching IHP related
issues in Asia and the Pacific*

*This initiative also promote sustainability through
MAB and OIC in addition to IHP.*





Key Activities of IHP in Asia and the Pacific Region from December 2014 – October 2015



- “Strategic meeting of IHP-HELP, Ecohydrology and Water Security in Urban Settings Asia Pacific Pre-meeting to the 7th World Water Forum”
 - Strategic Meeting on Managing Water in Medan City, Indonesia, 10 March 2015, Jakarta, Indonesia
 - *“Recommendations for urban water management in Medan city” in the context of IFIT project with Government of Medan City, Indonesia on “Securing Medan Water Futures 2030”.*
 - Tools for Customizing IWRM Guidelines for Water Security in Asia and the Pacific: Challenges and Opportunities for HELP and Ecohydrology, 11-12 March 2015, Jakarta, Indonesia
 - *Link with IFI and IDI*
 - *Signatures of MOU between HTC-KL, RCUWM-Tehran and APCE.*

Key Activities of IHP in Asia and the Pacific Region from December 2014 – October 2015

- **Signature and start of “Strategic Strengthening of Flood Warning and Management Capacity of Pakistan Phase 2”**
 - Government of Japan and UNESCO signed an agreement of \$ 4.05 million for strengthening flood warning system in Pakistan (Islamabad, 10 March 2015)
 - **International Partners Technical and Capacity Building Meeting, Lahore, Pakistan 5-8 August 2015.**
 - *with the participation of Afghans officers*





Key Activities of IHP in Asia and the Pacific Region from December 2014 – October 2015

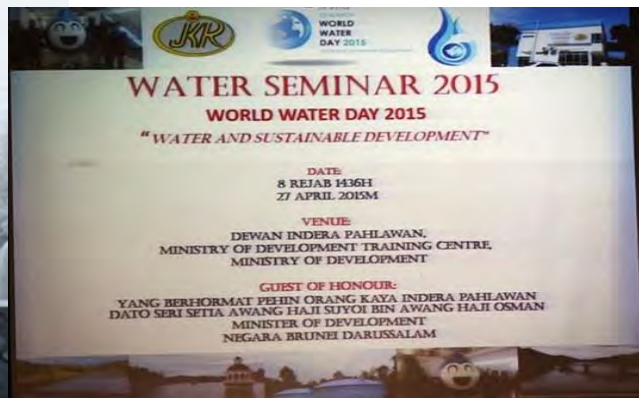


- April 7th WWF in Daegu



Activities of IHP from Asia and the Pacific during the 7th World Water Forum

As part of the IHP activities in the Asia and the Pacific region, UNESCO Office, Jakarta organized a series of sessions in Daegu and Gyeongju in Korea, Rep. of., during the 7th World Water Forum, from 14 and 17 April 2015.



Water Seminar 2015 in Bandar Seri Begawan, Brunei Darussalam

On 27 April 2015, UNESCO Office, Jakarta attended the “**Water Seminar 2015**” organized by the Department of Water Services of the Public Works Department, Ministry of Development of Brunei Darussalam, in Bandar Seri Begawan, the capital city of the country.



Key Activities of IHP in Asia and the Pacific Region from December 2014 – October 2015



Japan
Funds-in-Trust

“Masterclass Series on Community based Flood Management(Part 1)”

*with the National University of Sciences and Technology,
Islamabad, Pakistan, 7 May 2015.*

- “Regional DROUGHT workshop Asia Pacific Center for Ecohydrology (APCE), International Center for Interdisciplinary and Advanced Research (ICIAR), Indonesian Institute of Sciences (LIPI)”,
 - *Cibinong, Indonesia 3-5 August 2015*



Key Activities of IHP in Asia and the Pacific Region from December 2014 – October 2015

- “Strategic Strengthening for South-South Cooperation for Modelling and Managing Hydro-Hazards”, Jakarta Indonesia, 31 August-1 September 2015
 - *The creation of LinkedIn group: Modelling group in HydroHazards in Africa and Asia-Pacific region*
 - *Recommendations document written by the expert group on Hydro-Meteorology modelling for hydro hazards, Disaster Mitigation and Early Warning System .*

INTERNATIONAL WORKSHOP
SOUTH-SOUTH COOPERATION
FOR MODELLING AND MANAGING
HYDRO HAZARDS

JAKARTA, INDONESIA
31 August - 1 September 2015





Key Activities of IHP in Asia and the Pacific Region from December 2014 – October 2015



- **“Masterclass Series on Climate change and Pacific Islands”**
 - *with the University of the South Pacific, 4 sessions from 28August-18September 2015.*
- **23rd IHP RSC SEAP meeting and IHP 50th Anniversary celebration, Medan, Indonesia, 19-20 October 2015.**
- **International symposium “Integrated Actions for Global Water and Environmental Sustainability”**
 - *in line with the Commemoration of the 70th Anniversary of UNESCO, Medan, Indonesia, 21-22 October 2015.*

The Secretariat acknowledged the outstanding financial support from Member States through the Funds-in-Trust mechanism; particularly to:

- Indonesian Funds-in-Trust (IFIT)
- Japanese Funds-in-Trust (JFIT)
- Malaysian Funds-in-Trust (MFIT)

THANK YOU



Important Issues from 52nd Session UNESCO IHP Bureau, Paris, 1-2 June 2015

Dear Colleagues

Five important issues were raised at the 52nd IHP Bureau meeting in Paris on 1-2 June 2015.

1. Appointment of replacement staff at IHP Secretariat Headquarters/Appointment of IHE Rector Category 1 Centre.
2. Mexican proposal to establish an Intergovernmental Panel on Water
3. Changes to the term of appointment of IHP Bureau.
4. Procedures over the establishment of Category 2 Centres and UNESCO Water Chairs.
5. Appointment of a communication and co-ordination officer to IHP

The following is a brief summary of these issues. Full details can be found in the report of the meeting http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/IHP_bur_52_Final_Report.pdf

1. Appointment of Replacement Secretariat Staff

Currently the IHP Secretariat in Paris is reduced to a permanent staff of 5 with five or 6 vacant positions. By the end of 2015 one of these will retire and one is moving to a field office. The delays in appointment of staff will seriously affect the operation of IHP if not addressed. UNESCO are attempting to fill positions with underqualified staff from within the organisation with no particular expertise in water science. IHP Committees are urged to ask Permanent Country Representatives at UNESCO to request that UNESCO appoint suitably qualified (PhD level) candidates with the required expertise to fill vacant positions in the secretariat.

The important position of Rector UNESCO IHE, Category I Centre has been vacant since November 2014. UNESCO has unfortunately caused delays to the appointment process.

IHP Committees are urged to ask Permanent Country Representatives at UNESCO to request that UNESCO expedite the appointments of suitably qualified water staff.

2. Intergovernmental Panel on Water

The Mexican delegation has proposed the formation of extra budgetary Intergovernmental Panel on Water, with an international profile similar to the IPCC. It is proposed as a means to achieve the planned outcomes set in UNESCO's Programme and to address the recommendations of various evaluations of IHP, particularly to strengthen the science-policy nexus, and to acknowledge the highest priority given to water by UNESCO's General Conference. The Panel's objective is to propose, via the IHP Intergovernmental Council, pathways to enhance Water Security until 2100, at the global, regional and local scales. The main output will be a report with recommendations for the sustainable governance and management of the water until 2100, through best practices and options for equitable global, regional and local policies.

IHP Country Committees will be canvassed soon by IHP Secretariat on whether they agree with the Panel's creation and whether the Committee should be part of IHP, part of some other division of UNESCO or formed externally to UNESCO.

3. Term of Appointment of IHP Bureau Members

The current term of IHP Bureau members is currently 2 years, with the past chair serving an additional term in the Bureau as an ex-officio member. It is considered that a two year term is insufficient to

master the processes and procedures of UNESCO and IHP. It has therefore been proposed that the office of the chairperson and vice-chairpersons be increased from the current two years to four years. This proposal seeks to ensure greater continuity and improvement of the governance of IHP as recommended in reviews of IHP. In this proposal, the outgoing chairperson of IHP remains for an additional term as ex-officio Bureau member. If approved this change will apply to the next Bureau not the current.

IHP Country Committees will be canvassed soon by IHP Secretariat on whether they agree with this update of IHP Statutes and the Rules of Procedure of the IHP Council.

4. Procedures for establishment of IHP Category 2 Water Centres

The six Category 2 Water Centres approved by the 21st session of IHP Intergovernmental Council have yet to be approved by UNESCO. The Governing Council of UNESCO has changed the procedures for approving Category 2 Water Centres and UNESCO Water Chairs. The procedures are now so strict that country governments have not been able to agree to them. The amount of extra work involved in consuming a large amount of time of the secretariat.

IHP Committees are urged to contact their permanent country delegations to UNESCO to examine the procedures for approval of IHP Category 2 Water Centres and Water Chairs in an effort to make the procedures workable and timely.

5. Communication and Co-ordination Officer for IHP

The review of IHP Phase VII strongly recommended the improvement of communication in IHP and the strengthening of co-ordination of Category 2 Centres and Water related Chairs. IHP budget at present is too constrained to appoint someone to this essential position.

The Bureau called on Member State to consider providing funds for a communication and co-ordination officer for IHP, including the possibility of secondments, interns, and other support mechanisms and for Member States to mobilize their representatives at the Governing Bodies of UNESCO to support this endeavour.

Ian White

Vice-Chair (Asia-Pacific) UNESCO IHP

I am more than happy to answer any questions concerning the above issues or any others arising from the Bureau Meeting



Brief Report: UNESCO International Symposium: Scientific, Technological and Policy Innovations for Improved Water Quality Monitoring in the Post-2015 SDGs Framework, Kyoto-Otsu, Japan, 15-18 July 2015

This international symposium on water quality (WQ) was organised and supported by UNESCO-IHP International Initiative on Water Quality (IIWQ), Kyoto University and the Lake Biwa Environment Research Institute (LBERI) and was held from 15 to 18 July 2015, at Otsu, Shiga Province, Japan, on the shores of Lake Biwa, Japan's largest freshwater lake, and at the prestigious Kyoto University. The symposium is a response to Resolution XX.4 of UNESCO IHP's Intergovernmental Council and is a contribution to IHP Phase VIII Theme 3 "Addressing Water Scarcity and Quality" and to Theme 2 "Groundwater in a Changing Environment". The symposium follows on from the UNESCO Workshop on "Addressing Water Quality Challenges in Africa" held in Nairobi, Kenya in March 2011. It recognises that WQ is a key component of water security, the focus of IHP Phase VIII.

Symposium Goals

The twin goals of the Symposium were to promote the sharing and exchange of scientific-knowledge, technologies and policy approaches to water quality monitoring and to enhance scientific capacities of countries for improving water quality monitoring at the national and global levels. The latter was particularly directed at supporting the development and monitoring of the post 2015 framework sustainable development goal (SDG) targets on water quality and wastewater.

Participants

Over 60 Participants came from all UNESCO regions with particularly strong representation from Africa and Asia-Pacific. They were drawn from government organisations, and agencies, universities and research institutes and intergovernmental organisations and had a very broad range of expertise from policy, health, management, community participation through to a range of technical specialists with experiences in a very wide range of climatic and geographic zones. Delegates were welcomed by representatives of LBERI, Kyoto University and Kyoto University Graduate School of Advances Integrated Studies in Human Survivability and the Disaster Prevention Research Institute, UNESCO IHP, and the Japanese Committee for IHP.

Themes of the Symposium

Papers were presented over three days in a very broad range of themes covering:

- Ecological water quality monitoring of watersheds
- Ensuring safe drinking water for post-2015 sustainable development
- Monitoring groundwater quality and quantity
- New and innovative technologies and tools for water quality monitoring
- Water quality indicators, data and reporting
- Monitoring waste water and reuse
- Monitoring emerging pollutants and radionuclides
- Water quality monitoring using GIS and remote sensing
- Economic aspects of water quality monitoring
- Policy, institutional, capacity building and cultural aspects of water quality management

Two special events for the Symposium were the Field Trip by boat onto Lake Biwa followed by a visit to the Yanagasaki Drinking Water Treatment Plant, which treats water from Lake Biwa for use in Otsu

and the address to mark the 50th Anniversary of IHP by Mr Koichiro Matsuura, former Director General of UNESCO and now S.A. Professor at Kyoto University in Graduate School of Advances Integrated Studies in Human Survivability. In his address Mr Matsuura described the new initiatives and growth in water-related activities that occurred during his tenure at UNESCO and the special relationship he had with the Development Assistance and International Organisations of Japan which help support those initiatives.

The concluding session of the Symposium summarised the outcomes and key points raised during the meeting

Experts meeting on the UNESCO IHP IIWQ

Following the Symposium a one day international meeting of over 20 experts from 17 countries was held to discuss future directions and focus as well as potential concrete activities under IHP IIWQ. The meeting firstly reviewed UNESCO IHP's activities in past phases then focussed on the current phase, VIII and on water quality in the post-2015 SDGs. The UNESCO-Sida project on emerging pollutants in water and wastewater was also discussed. The meeting then broke into four working sessions:

1. Global water quality challenges & priorities – key water quality issues & challenges, knowledge gaps, research and capacity building needed.
2. Strengthening scientific knowledge and policy approaches-methods for strengthening research and innovation and policy development
3. Scientific cooperation and exchange on water quality-network of experts and institutions to promote sharing of knowledge, experience and best practice.
4. Long-term strategy, main goals and next steps – where to from here?

It was agreed without dissent that water quality data should be freely available as should data on the use of pollutants or potential pollutants within water sheds. The meeting led to the formation of an International Group on Water Quality with Professor Yosuke Yamashiki, Kyoto University Graduate School of Advances Integrated Studies in Human Survivability, as chair.

Next Meeting

The Chinese Academy of Sciences, Nanjing Institute of Hydrology and Limnology, kindly offered to hold the next symposium of WQ in Nanjing China in October 2016 (exact date to be determined).

Concluding Comments

Increasing development, growing populations, expanding mega-cities, the continuing shift of population from rural to urban areas, the drive for increased food production, and mining all impact on water quality. But not just water quality for drinking water, they impact on receiving waters in lakes, rivers, groundwater and our near coastal environments threatening the very ecosystems on which we depend and are made worse by climate change. The World Health Organisation's estimates that around 3.5 million people die each year from water-related diseases, more than half of these are children under the age of 5 underlines both the tragedy and the urgency of the issue

The Symposium covered a very broad range of most topics of central issue to the sustainability and safety of water supply systems and dependent ecosystems. The Symposium was a clear demonstration of UNESCO's great strength: it's UNESCO's ability to draw together experts from across the world to discuss our common problems, to exchange ideas, share experiences and seek solutions to global, regional and local challenges, such as those posed by water quality. The generosity and foresight of Kyoto University, LBERI and UNESCO IHP Secretariat in organizing and sponsoring the Symposium is greatly appreciated.

Ian White

Vice-Chair (Asia-Pacific) UNESCO IHP, Australian National University



Brief Report: UNESCO IHP World's Large Rivers Initiative, Working Group Meeting, Vienna, Austria, 25-26 June 2015

This Working Group Meeting on the World's Large Rivers Initiative international symposium on water quality (WQ), held on 25-26 June 2015, was organised and supported by Helmut Habersack, UNESCO Chair on Integrated River Research and Management, University of Natural Resources and Life Sciences (BOKU) Vienna, Austria, by the Austrian Ministry of Agriculture, Forestry, Environment and Water Management, and by the IHP Secretariat.

The meeting was a response to Resolution XXI.3 of IHP's Intergovernmental Council which requested the UNESCO Chair and IHP Secretariat to establish the WLRI and a working group of IHP Member States to elaborate the scope, activities and planned outputs of the initiative based on consensus and requests from countries. It followed on from the first working group meeting of the initiative during the 2nd World's Large Rivers Conference in Manaus, Amazon, Brazil in July, 2014.

The initiative is based on the recognition that the world's large rivers are major contributors to social, economic and culture well-being and are fundamental in providing transport routes, water supply, and food and energy production and in supporting dependent ecosystems. These functions, however, are under rising pressures due to land use and climate change, increasing development and growing populations. The Initiative is a contribution to the focus of IHP Phase VIII, water security and also underpins internationally agreed upon development goals and commitments, such as the UN's post-2015 Sustainable Development Goals.

Aim and Objectives of the WLRI

The overall proposed aim of the WLRI to create the knowledge base necessary for a holistic scientific assessment of the state of the WLRs and to promote their integrated and sustainable management. The suggested specific objectives are to:

1. Analyse the current state and the future development of the WLRs.
2. Establish a platform to build, facilitate, and harvest hydrological science synergies between countries and to provide education and training at technical and tertiary level.
3. Develop innovative strategies for the sustainable management of the WLRs for the benefit of both humans and nature, while recognising the individuality of rivers.
4. Assess future trends of river hydro-morpho-ecodynamics in order to develop and test adaptation and mitigation strategies.
5. Develop a good practices catalogue in integrated WLR management.

Participants

Over 42 participants came from all UNESCO regions with particularly strong representation from Africa, Europe and Asia-Pacific. Representatives were drawn from IHP Committees, government organisations, agencies, universities and research institutes and intergovernmental organisations. Delegates were welcomed by representatives of the Austrian Ministry of Europe, Integration and Foreign Affairs, the Austrian Ministry of Agriculture, Forestry, Environment and Water Management, UNESCO Natural Sciences Sector, the Austrian Commission for UNESCO, UNESCO International Hydrological Programme and University of Natural Resources and Life Sciences, Vienna.

During the meeting delegates were treated to a dinner hosted by the Austrian Ministry of Agriculture, Forestry, Environment and Water Management in the Ministry's magnificent Ceremonial Hall

Scope of the Meeting

This working group meeting was planned to contribute to the first planned outcome of the initiative “Global overview of the status and future of WLRs” particularly the definition of Large Rivers and the development of methodologies and identification of parameters in order to report back to IHP’s 23 Intergovernmental Council meeting.

Thematic Presentations

In order to catalyse discussion, a series of thematic presentations were given covering the management of Large River Basins, sediment trapping in river basins and the impact on coastal areas, climate and human impact or the morphology of Arctic Rivers, A World Bank perspective on transboundary river management, monitoring material fluxes in large rivers, and measuring and monitoring sediment and water quality in the Amazon.

In discussion the following points were raised:

- Need to clearly define the globally important question the WLRI seeks to answer (important for relevance and donor support)
- Need to link aim to the post-2015 SDGs
- Need to use worldwide experiences (for presenting and benchmarking) including historical and societal aspects.
- Linkage between inland surface waters and receiving seas (sediment, pollutants...).
- Balance of upstream – downstream interests and benefit sharing.
- Treat rivers and their catchments as a single entity.
- Must derive policy and management-relevant conclusions from scientific work.

Working Groups

The meeting split into four working groups concentrating on: Hydrology and Hydraulics; Sediment Transport and Morphodynamics; Water Quality and Ecohydrology; Socioeconomics and River Management. The working groups were asked to discuss two main topics: How to **define a large river** for the WLRI’s purposes from a thematic perception? Which **parameters / methodologies / data** are suitable for the creation of a global overview and an assessment of the status and future trajectory of the WLRs in each thematic area? The groups addressed four specific questions:

- I. What parameters are suitable to describe the status of the WLRs?
- II. What common methodologies are suggested to derive those parameters?
- III. What data are needed to quantify these parameters?
- IV. How can these parameters best be presented?

Working Definition of a Large River

The meeting decided in the first instance to adopt the World Meteorological definition of a large river as a river with a mean annual discharge at the mouth exceeding 2 000 m³/s or with a drainage basin exceeding 500 000 km². There are 62 rivers in the world which meet this definition, with basins covering over 64 million km³, discharging annually over 24,300 km³ of water (or 362 mm/year specific yield). This definition will be extended during the further development of the WLRI by additional quantitative and qualitative criteria including socioeconomic and cultural criteria.

Discussion of Outcomes of Working Groups

The list of parameters presented was very comprehensive. It might not be necessary for every river. Ecological / biological parameters need full integration regarding water quality / status. Establishment of reference conditions and baselines should be included in any assessment. The aim of this project

should be to give end users an integrated view about the status of the WLRs and should be linked to the post-2015 Sustainable Development Goals. It would also help recognition of the central importance of integrated monitoring and data sharing for management of the world's large rivers.

Next Steps

Preparation of a Concept Paper, a first draft of a common methodology and a set of parameters will be elaborated. A list of 10 rivers will be suggested to be studied for Phase I.

Phase I: Testing phase of the methodology on 10 rivers .The outcome of this phase will be a harmonized and commonly agreed method for assessing the status of large rivers and the status report of 10 rivers.

Phase II: Assessment of up to 300 rivers. The end product will be a status report of the WLRs in order to promote their integrated and sustainable management and to provide comparable baseline information for decision makers, funding bodies and river managers.

Participating countries will be asked to contribute with national expertise. The participation of the countries will be on a voluntary basis. For the pre-selected 10 rivers the WLRI will contact the relevant countries via UNESCO. The initiative could include exchange students. Additionally, it was suggested to present the WLRI as item for the next World Water Forum in Brazil in 2018.

It is planned that the Concept Paper should be finished and sent out to the Working Group as well as to the IHP Intergovernmental Council. The next Working Group Meeting in Vienna 14th / 15th of April 2016. And the UNESCO Char will report to IHP intergovernmental Council in June 2016.

Link to Working Documents

<https://bokubox.boku.ac.at/index.php/#f488dd539b9b6b4133260207541a5ac8>.

Ian White

Vice-Chair (Asia-Pacific) UNESCO IHP, Australian National University



Report on IHP IGC Bureau Activities

Ian White

Vice-Chair Region IV (Asia-Pacific)

IHP Australia

Outline

- Report on 52nd Session UNESCO IHP Bureau, Paris, 1-2 June 2015
- Items for Consideration
- IHP Perspective 7th World Water Forum – Daegu – Gyeongbuk Korea
- Report on IHP World's Large Rivers Initiative, Working Group Meeting, Vienna, Austria, 25-26 June 2015
- Report on IHP International Symposium: Scientific, Technological and Policy Innovations for Improved Water Quality Monitoring in the Post-2015 SDGs Framework, Kyoto-Otsu, Japan, 15-18 July 2015

References

- 52nd Session UNESCO IHP Bureau, Paris, 1-2 June 2015
http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/IHP_bur_52_Final_Report.pdf
- UNESCO International Symposium: Scientific, Technological and Policy Innovations for Improved Water Quality Monitoring in the Post-2015 SDGs Framework, Kyoto-Otsu, Japan, 15-18 July 2015, Program
www.unescokyotosympo2015.org/UNESCO2015-Program.pdf
- IHP World's Large Rivers Initiative, Working Group Meeting, Vienna, Austria, 25-26 June 2015
- <https://bokubox.boku.ac.at/index.php/#f488dd539b9b6b4133260207541a5ac8>.

52nd Session UNESCO IHP Bureau

Key Items:

1. Chair UNESCO IHP IGC
2. Vice-Chair Region I
3. Regional Presentations at IHP Bureau Meetings
4. Appointment of replacement staff at IHP Secretariat Headquarters/Appointment of IHE Rector Category 1 Centre.
5. Procedures for the establishment of Category 2 Centres
6. Appointment of a communication and co-ordination officer to IHP
7. Finance Committee Report
8. Date of 22nd Intergovernmental Council meeting
9. Bureau Response to 7WWF**
10. Mexican proposal to establish an Intergovernmental Panel on Water **
11. Changes to the term of appointment of IHP Bureau.**

Items 10 & 11 for Discussion and Resolution tomorrow



1. Chair UNESCO IHP IGC

Mr David Korenfeld Federman (Group III - Latin America and the Caribbean)
Chairperson, IHP National Committee of Mexico (CONAMEXPHI)

Mr Korenfeld Federman stood down as CEO CONAGUA because of corruption allegations.

IHP were requested by external agents to remove Mr Korenfeld Federman as Chair

The Mexican government assured IHP that the Chair has its full support and informed IHP privately that the allegations were political

The Bureau (minus GpIII) decided Mr Korenfeld Federman should continue as Chair



2. Vice-Chair Region 1

Dr Johannes Culman, Vice-Chair Region I, previous Chair IHP and Director of German National Commission's Secretariat for UNESCO IHP

Dr Culman has accepted a position with WMO and will no-longer be a member of the Bureau

** IHP does not have a clear procedure for the replacement of Chair/Vice-Chairs

3. Regional Presentations at Bureau Meetings

1. IHP Bureau Technical Meeting Merida, Mexico, 13-14 November 2014



2. 52nd IHP Bureau Meeting, Paris, France, 1-2 June 2015



3. Regional Presentations at Bureau Meetings



- Vast
- Diverse
- Complex
- Important
- Water Security
- Extreme Events
- Climate & Global Change Impacts
- Crucial Role of UNESCO IHP RSC- SEAP

Asia-Pacific under emphasised by IHP

4. Replacement of staff at IHP Secretariat

- IHP Secretariat in Paris reduced to 5 permanent staff of 5 with 5 or 6 vacant positions.
- At end of year one will retire & another move to the field
- UNESCO are attempting to fill positions with underqualified staff from within the organisation with no particularly expertise in water science.
- **ACTION:** IHP Committees are urged to ask Permanent Country Representatives at UNESCO to request that UNESCO appoint **suitably qualified (PhD level) candidates with the required expertise** to fill vacant positions in the secretariat – **Resolution from RSC?**

4. Replacement of Rector UNESCO IHE

- The important position of Rector UNESCO IHE, Institute for Water Education, Category I Centre has been vacant since November 2014.
- UNESCO has **unfortunately delayed** the appointment process.
- From 1 October 2015 the D-G UNESCO has appointed Mr Fritz Holzwarth (Germany) as Interim Rector UNESCO-IHE pending completion of the recruitment process for Rector of the Institute.
- Mr Holzwarth was Chair Gov Council IHE from Nov 2011 to Jun 2015.
- He studied Economics, Law and Political Science at the University of Freiburg/Breisgau has a Diploma (1977) and a Doctorate (1984) in Economics and a Diploma in Business Administration (1973) from the College of Economics, Pforzheim.
- **ACTION:** IHP Committees are urged to ask Permanent Country Representatives at UNESO to request that UNESCO fill this important position as soon as possible
- **Resolution from RSC??**

5. Category 2 Centres and UNESCO Water Chairs

- 6 Category 2 Water Centres approved by 21st session IHP Intergovernmental Council have yet to be approved by UNESCO.
- Governing Council of UNESCO has changed procedures for approving Category 2 Water Centres and UNESCO Water Chairs.
- Procedures are now so strict that country governments have not be able to agree to them. The amount of extra work involved in consuming a large amount of time of the secretariat.
- **ACTION:** IHP Committees are urged to contact their permanent country delegations to UNESCO to examine procedures for approval of IHP Category 2 Water Centres and Water Chairs to make procedures workable and timely. Resolution from RSC??

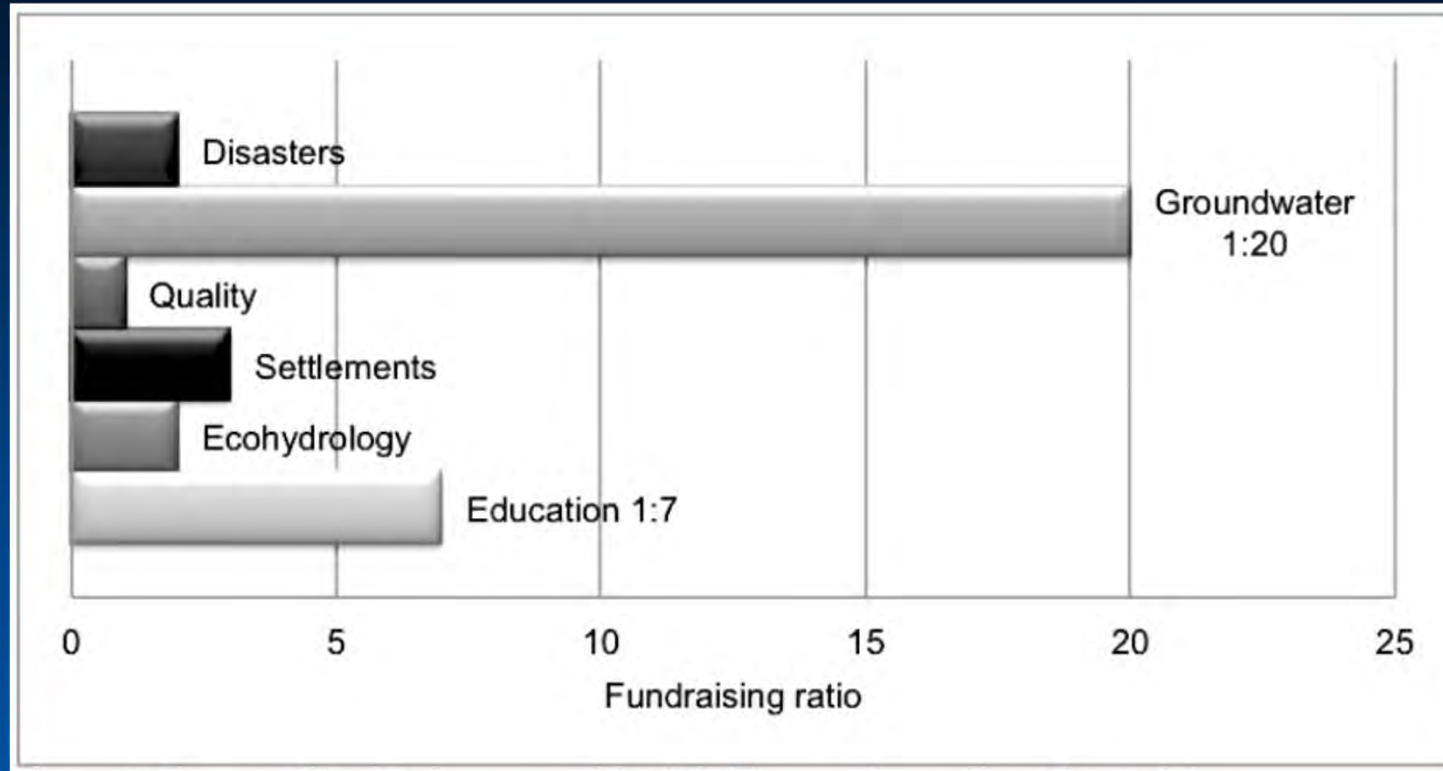
6. IHP communication and co-ordination officer

- Review of IHP Phase VII strongly recommended the improvement of communication in IHP and the strengthening of co-ordination of Category 2 Centres and Water related Chairs.
- IHP budget at present is too constrained to appoint someone to this essential position.
- **ACTION:** Member State to consider providing funds for a communication and co-ordination officer for IHP, including the possibility of secondments, interns, and other support mechanisms and for Member States to mobilize their representatives at the Governing Bodies of UNESCO to support this endeavour.

7. Finance Committee Report

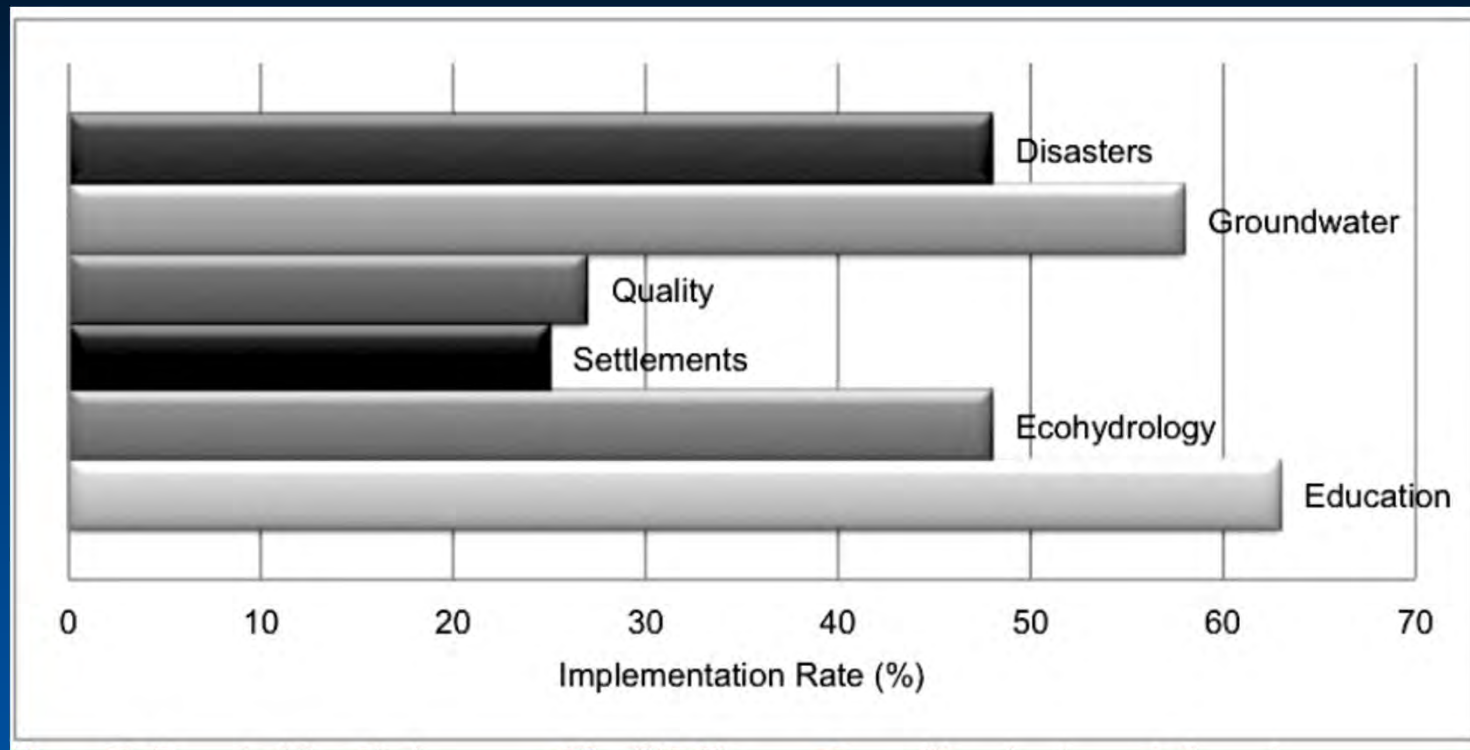
- IHP has been recognized as a top priority of UNESCO, with a corresponding "A rating" in the budget documents
- Actual funding allocated to its activities (about \$13.2M) was lower than that of programmes with "C ratings".
- **ACTION:** Chair of Finance Committee to follow up with Organisation
- Partly covered by Resolutions XX-1 & XXI-1 of IHP IGC
- **Resolution from RSC??**

7. Finance Committee Report



Fundraising Ratio of UNESCO IHP Programmes

7. Finance Committee Report



Implementation Rates of UNESCO IHP Programmes

7. Finance Committee Report

- Difficulties in the recruitment of a fundraiser, of a communication officer and of a coordinator of the UNESCO Water Network.
- **ACTION:** The Bureau decided to consult their region's Member States on providing funds for a communication officer for IHP, including the possibility of secondments, interns, and other support modalities and to report back on these proposals at the 22nd session of the IHP Council.
- The Chairperson of the Finance Committee further called **upon Member States** to mobilize their representatives at the Governing Bodies of UNESCO to support this endeavour in this process.
- Resolution from RSC???

8. Date 22nd Intergovernmental Council meeting

- Bureau agreed that the 22nd session of the IHP Council will take place over a four day period, from **14 to 17 June 2016**.
- **ACTION:** IHP Committees & RSC to note date



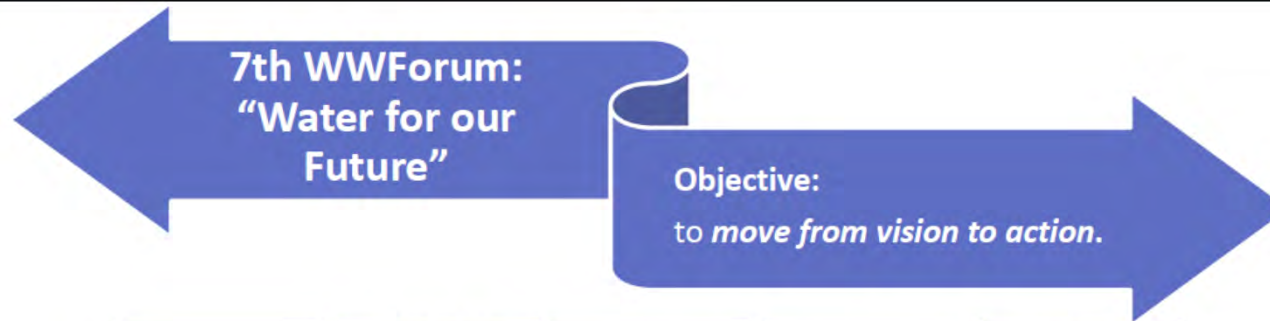
9. 7th World Water Forum- Daegu – Gyeongbuk Korea 12-17 April 2015



9. IHP's Role in 7th WWF

The Major International Water Event

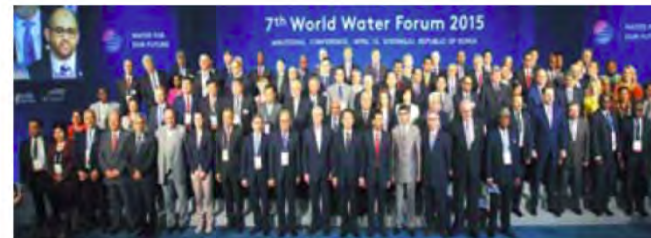
Organised and supported in SEAP Region



7 days	30,000 people from 168 countries.	9 heads of state	80 government ministers	100 official national government delegations
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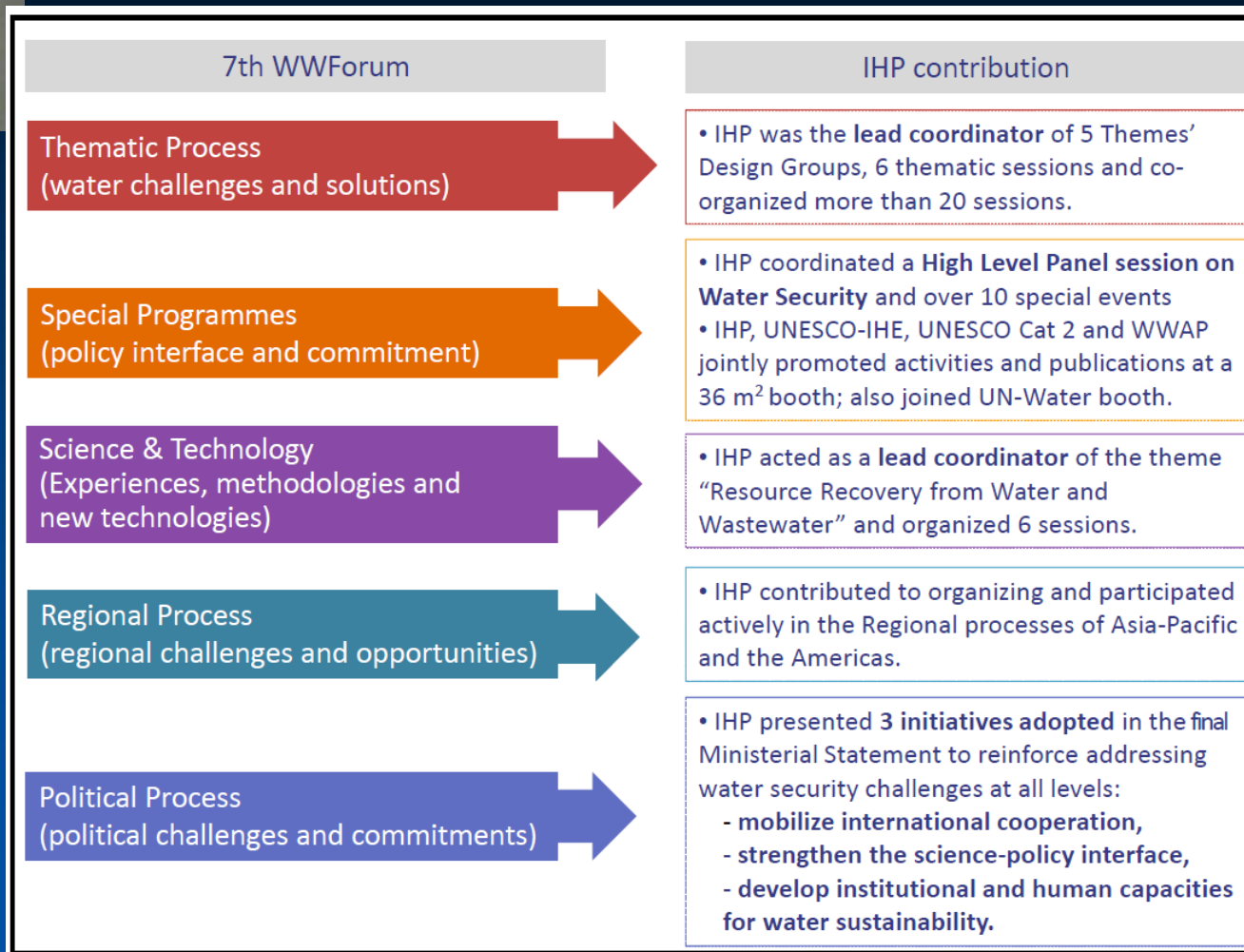
President Park Geun-hye and leaders of countries and international organizations



Ministerial Declaration presented

IHP's contribution to the 7th World Water Forum was significant

9. IHP's Role in 7th WWF



50th anniversary of UNESCO's water programmes

IHP organized the **High-Level Panel** on “Water Security and Sustainable Development: Co-operation among Disciplines and Stakeholders”.



Special event “**50 years of UNESCO water programmes**” (organized by CONAGUA)

“Youth Drawing the Future”: special programme and involvement in thematic sessions



Publications launched during the 7th WWForum (with partners)

Global Map of groundwater vulnerability to floods and droughts (BGR)



Transboundary aquifers of the world map (IGRAC)

50 years of Hydro(geo)logical mapping Activities



Book Water & Heritage (ICOMOS / Netherlands, UNESCO DG patronage)



9. IHP Bureau Acknowledgement

The Bureau expressed appreciation with the significant contributions of IHP and of other members of the UNESCO water network to the 7th World Water Forum

ACTION: RSC should similarly record its appreciation for a major regional initiative

10. Intergovernmental Panel on Water

- Proposal by IHP IGC Chair (Group III) to establish an Intergovernmental Panel on Water similar to IPCC – discussed at IHP Bureau Technical Meeting
- Bureau requested response from all IHP regions.

11. Changes to the term of appointment of IHP Bureau

- A proposal from vice-chair Region I to amend IHP Statutes and Rules of Procedure of IHP Council so that the term of office of the Chair and Vice-chairs is increased from the current **two years into four years**.
- Bureau requested response from all IHP regions.



Terima Kasih Banyak

IHP International Symposium Water Quality –Kyoto-Ostu Japan



IHP International Symposium Water Quality

- **SPONSORS:** UNESCO-IHP International Initiative on Water Quality (IIWQ), Kyoto University and the Lake Biwa Environment Research Institute (LBERI)
- **CONTRIBUTION TO:** Resolution XX.4 of UNESCO IHP's Intergovernmental Council and IHP Phase VIII Theme 3 "Addressing Water Scarcity and Quality" and to Theme 2 "Groundwater in a Changing Environment"
- **SYMPOSIUM GOALS**
 1. Promote the sharing and exchange of scientific-knowledge, technologies and policy approaches to water quality monitoring
 2. Enhance scientific capacities of countries for improving water quality monitoring at the national and global levels

IHP International Symposium Water Quality

- **PARTICIPANTS:** >60 Participants from all UNESCO regions particularly strong representation from Africa and Asia-Pacific.
- Drawn from government organisations, and agencies, universities and research institutes and intergovernmental organisations
- Very broad range of expertise from policy, health, management, community participation through to a range of technical specialists
- Experiences in a very wide range of climatic and geographic zones.

IHP International Symposium Water Quality

■ THEMES OF THE SYMPOSIUM

- Ecological water quality monitoring of watersheds
- Ensuring safe drinking water for post-2015 sustainable development
- Monitoring groundwater quality and quantity
- New and innovative technologies and tools for water quality monitoring
- Water quality indicators, data and reporting
- Monitoring waste water and reuse
- Monitoring emerging pollutants and radionuclides
- Water quality monitoring using GIS and remoting sensing
- Economic aspects of water quality monitoring
- Policy, institutional, capacity building and cultural aspects of water quality management

Experts meeting on UNESCO IHP IIWQ



Kyoto University

Experts meeting on UNESCO IHP IIWQ

AIM

- To discuss future directions and focus as well as potential concrete activities under IHP IIWQ.
- The meeting firstly reviewed UNESCO IHP's activities in past phases then focussed on the current phase, VIII and on water quality in the post-2015 SDG

Experts meeting on UNESCO IHP IIWQ

OUTCOMES

- Formation of an International Group on Water Quality with Professor Yosuke Yamashiki, Kyoto University Graduate School of Advances Integrated Studies in Human Survivability, as chair.
- The Chinese Academy of Sciences, Nanjing Institute of Hydrology and Limnology, kindly offered to hold the next symposium of WQ in Nanjing China in **October 2016** (exact date to be determined).



IHP World's Large Rivers Initiative, Working Group Meeting, Vienna, Austria, 25-26 June 2015



World's Large Rivers Initiative Working Group

- Response to Resolution XXI.3 of IHP's IGC. UNESCO Chair and IHP Secretariat to establish the WLRI and a working group of IHP Member States to elaborate the scope, activities and planned outputs of the initiative based on consensus and requests from countries
- World's large rivers are major contributors to social, economic and culture well-being.
- Provide transport routes, water supply, and food and energy production and in supporting dependent ecosystems.
- Rising pressures due to land use and climate change, increasing development and growing populations.
- Contribution to IHP Phase VIII, water security and UN's internationally agreed upon development goals and commitments

World's Large Rivers Initiative Working Group

- **AIM:** to create the knowledge base necessary for a holistic scientific assessment of the state of the WLRs and to promote their integrated and sustainable management.
- **OBJECTIVES**
 1. Analyse the current state and the future development of the WLRs.
 2. Establish a platform to facilitate hydrological science synergies between countries and to provide education and training.
 3. Develop strategies for the sustainable management of the WLRs
 4. Assess future trends in WLR to develop and test adaptation and mitigation strategies.
 5. Develop a good practices catalogue in integrated WLR management.

World's Large Rivers Initiative Working Group

- **Participants:** 42 from all UNESCO regions
- **Scope:** Global overview of the status and future of WLRs particularly the definition of Large Rivers and the development of methodologies and identification of parameters
- **Working Groups:**
 1. Hydrology and Hydraulics;
 2. Sediment Transport and Morphodynamics;
 3. Water Quality and Ecohydrology;
 4. Socioeconomics and River Management.

World's Large Rivers Initiative Working Group

Working Definition of a Large River

WMO definition

- mean annual discharge at the mouth exceeding 2 000 m³/s or with a drainage basin exceeding 500, 000 km².
- 62 rivers with basins covering over 64 million km², discharging annually over 24,300 km³ of water (or 362 mm/year specific yield).
- Definition **will be extended** by additional quantitative and qualitative criteria including socioeconomic and cultural criteria.

World's Large Rivers Initiative Working Group

Next Steps

- Request to participants to send a list of 10 large rivers (including brief reasons for this suggestion) which should be investigated in Phase I.
- End of 2015: Concept Paper (Pre-Feasibility-Study; 2-4 pages) should be finished and sent out to the Working Group as well as to the IHP Secretariat and the Bureau
- **14-15 April 2016**: Next Working Group Meeting in Vienna.
- June 2016: Report to IC.

9. Intergovernmental Panel on Water

- Mexican President proposed to UN an Intergovernmental Panel on Water similar to IPCC – discussed at IHP Bureau Technical Meeting
- Extra-budgetary Panel either within (or external to) IHP & UNESCO
- **Objective:** to provide **a report** proposing pathways for the sustainable governance and management of water until 2100, through best practices and recommendations at the global, regional and local scales, and grounded on a revision of the state of the art and current practices as well as on the current status and future plausible scenarios of water resources and societal interactions.
- Panel will conduct an in-depth consultation among its members, assisted by a wide range of contributing authors and peer-reviewers.

9. Intergovernmental Panel on Water

- Panel shall include policy-makers, scientists of social, human, economic and natural sciences, engineers and professionals with expertise on diverse water aspects, equality in terms of gender and sectors representation.
- **Number of members:** 34, with 30 regional reps (5 from each of 6 electoral groups), 2 representatives for indigenous peoples and for youth respectively, and 2 focal points, for gender-equality and human rights.
- **Initial Term:** 3 years depending on the availability of funds and the decisions of the IHP Council.
- **Meetings** 3. Panel can form sub-panels and a support unit will be established.

9. Intergovernmental Panel on Water

- **ACTION:** A regional response on the proposed Panel is required

1A. Do you agree with the establishment of the Intergovernmental Panel on Water?

- -YES, I AGREE WITH ITS CREATION
- -NO, I DO NOT AGREE WITH ITS CREATION

1B. If the Panel is established, shall it be created as a subsidiary body of the IHP Council?

- - YES, THE PANEL SHOULD BE PART OF IHP
- - NO, THE PANEL SHOULD BE ESTABLISHED IN OTHER PART OF UNESCO
- - NO, THE PANEL SHOULD BE ESTABLISHED IN OUTSIDE UNESCO

10. Changes to the term of appointment of IHP Bureau

- **PROPOSAL:** Amend IHP Statutes and Rules of Procedure of IHP Council so that the term of office of the Chair and Vice-chairs is increased from the current **two years into four years**.
- **REASON:** Ensure greater continuity of governance of IHP. Already discussed by members of previous Bureau.
- **NOTE:** Currently and in proposed change, outgoing Chair of IHP remains for an additional term as ex-officio Bureau member
- Will apply to the next Bureau
- Australian Permanent Delegation to UNESCO advises that two years is the norm throughout UNESCO including the Executive Board – may need to be put to General Conference>

10. Changes to the term of appointment of IHP Bureau

ACTION: A regional response on the proposed change is required

2.A Do you agree that the term of office of the chairperson and vice-chairpersons is increased from the current two years into four years?

-YES, I AGREE WITH THE INCREASE OF THE TERM OF OFFICE INTO FOUR YEARS

-NO, THE TERM OF OFFICE SHOULD REMAIN AS TWO YEARS

NATIONAL REPORT ON IHP RELATED ACTIVITIES AUSTRALIA

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2014 to October 2015

Australia was elected to the IHP Intergovernmental Council in Nov 2011. . Ian White was elected Vice President of the InterGovernmental Council of IHP in Paris in June 2014.

1.1 Meetings of the IHP National Committee

IHP activities in Australia are carried out under the guidance of the national UNESCO Science and Technology Network. In order to facilitate the implementation of UNESCO activities in Australia and the region, a national IHP Australian Network was established in 1995 and this network acts as the IHP National Committee for Australia. There are no formal meetings of the IHP Australian Network. Activities are conducted largely between the members by telecommunications (e-mail). The Australian National Commission (NATCOM) for UNESCO (www.dfat.gov.au/intorgs/unesco) has 12 members, two parliamentary representatives and four honorary members.

1.1.1 Decisions regarding the composition of the IHP National Committee

The IHP Australian Network includes the following members. Summary details of all current members are listed below. Dr Dasarath Jayasuriya is the principal focus point for the National committee.

Name	Expertise	Organization
Dasarath Jayasuriya	Flood and Seasonal Forecasting	Bureau of Meteorology
Tony Falkland	Island Hydrology	University of Adelaide
Trevor Daniell	Urban, Low and High Flow Hydrology	
Quentin Grafton	UNESCO Chair in Water Economics and Transboundary Water Governance	Australian National University
Tariq Rana	Hydrology, Water Policy and Planning	MDBA
Peter Martin	Public Relations	
Ian White	Hydrology/Water Quality	Australian National University
Jeff Camkin	Ecohydrology	University of Western Australia
	HELP Coordination	Centre for Excellence for Ecohydrology
Ian Cordery	Flood/Drought Hydrology	University of New South Wales
Peter Dillon	Groundwater	CSIRO Land and Water
Anne Jensen	Ecotones	Wetlands Care Australia
Ray Volker	Groundwater	University of Queensland

1.1.2 Status of IHP-VIII activities

The IHP Australian Network brings together many of the key hydrological research groups within Australia. As such, Australia is able to contribute towards IHP activities through the research programs currently existing in Australia. A description is provided below of some activities pertinent to IHP-VIII.

As yet all the activities being carried out in Australia have yet to be mapped against IHP VIII Themes.

The Australian Bureau of Meteorology and CSIRO Water Information Research and Development Alliance (WIRADA) undertakes research of direct relevance to the activities of the IHP.

Theme 1: Water-Related Disasters and Hydrological Change

Theme 2: Groundwater in a changing environment**Theme 3: Addressing Water Scarcity and Quality****Theme 4: Water and human settlements of the future****Theme 5: Ecohydrology, engineering harmony for a sustainable world****Theme 6: Water Education, key for Water Security**

Australia faces major challenges in ensuring sustainable water supply in the face of drying climate and rising demand for water. In response, the Australian Government's initiative, Water for the Future (<http://www.environment.gov.au/water/australia/index.html>) is built on four key priorities of taking action on climate change; using water wisely, securing water supplies and supporting healthy rivers.

Theme 1: Water-Related Disasters and Hydrological Change

Focal Area 1.1: Risk management as adaptation to global changes

Focal Area 1.2: Understanding coupled human and natural processes

Focal Area 1.3: Benefiting from global and local Earth observation systems

Focal Area 1.4: Addressing uncertainty and improving its communication

Focal Area 1.5: Improve scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events

A subset of the hydrological data collected by the State and Territory water agencies and the Bureau of Meteorology is contributed to international data centres for use in global and regional studies.

The Indian Ocean Climate Initiative (IOCI) (<http://www.ioci.org.au>), a partnership of research organisations, is researching the impact of climate variability and climate change on the water resources of the southwest region of Australia. CSIRO (<http://www.csiro.au/>), Australia's national research organisation, has research programs addressing global and regional climate change, climate change impacts on natural resources including water and climate change adaptation strategies.

Australian National University (ANU) together with Ecowise Environmental have been researching vulnerability and adaptation to global change in small island countries and have contributed to AusAID's Pacific vulnerability and adaptation project. The ANU, Ecowise Environmental and the University of Adelaide have been investigating the vulnerability of water supply catchments in the Australian Capital Territory to global change.

A number of major programmes will be highlighted in detail later.

The Water Information Research and Development Alliance (WIRADA) brings together CSIRO's research and development expertise in water and information sciences and the Bureau of Meteorology's operational role in hydrological analysis and prediction. The Alliance has covered fields of data interoperability, hydrologic modelling, water accounting and water resource assessment. The [Water data transfer standards](#) project is defining and developing transfer standards and procedures for supply of specified data from water information providers and has contributed significantly to the development of an international data exchange standard named WaterML. Among the other significant contributions has been in improving the seasonal streamflow forecasting area using the Bayesian Joint Probability method which has been operationalised using the Bureau operational systems and now well accepted in the industry. One further development is the Australian Hydrological Geospatial Fabric which is a specialised Geographic Information System (GIS). This identifies the spatial relationships of important hydrological features such as rivers, lakes, reservoirs, dams, canals and catchments and makes working with geodata in a hydrological context much easier.

Theme 2: Groundwater in a changing environment

Focal Area 2.1: Enhancing sustainable groundwater resources management

Focal Area 2.2: Addressing strategies for management of aquifers recharge

Focal Area 2.3: Adapting to the impacts of climate change on aquifer systems

Focal Area 2.4: Promoting groundwater quality protection

Focal Area 2.5: Promoting management of transboundary aquifers

The National Centre for Groundwater Research and Training (<http://www.groundwater.com.au>) has an extensive research program including research on groundwater/surface water interaction and is investigating how better to manage groundwater resources. CSIRO is researching use of aquifer storage and recovery with urban stormwater and recycled water to sustain depleted groundwater resources (www.clw.csiro.au/research/urban/reuse). The ANU is researching artesian groundwater processes and modelling of groundwater changes in the lower Great Artesian Basin and in south eastern Australia.

ANU, with Ecowise Environmental, are investigating shallow groundwater recharge, socio-cultural aspects of groundwater management and impacts of climate variability in low coral islands as a follow up to a UNESCO-IHP initiated project. Hydrological extremes in sensitive and stressed biomass and hydroclimatic zones are being researched in small island developing states.

Global change and feedback mechanisms of hydrological processes in stressed environments.

- The Murray Darling River Basin and GEWEX related research activities

Changing global dynamics in aquatic environments: degrading ecosystems, especially those susceptible to sea level change, coastal sediment balance and pollutant accumulation.

- *Crosscutting Program Components – FRIEND and HELP*

Collaboration in the Asian Pacific FRIEND project by provision of data, hosting a node of the Internet based Water Archive, and assisting in research activities. HELP basins include the Lower Murrumbidgee catchment in the Murray Darling River Basin (coordinated by Awadesh Prasad, Murray Darling Basin Authority), Tully Basin (coordinated by Jim Williams, CSIRO), Lower Burdekin River Basin (coordinated by Keith Bristow, CSIRO), Fitzroy River basin (coordinated by Chris Carroll, Queensland Department of Environment Resources and Mines) and the Ord River Basin (coordinated by Jeff Camkin University of Western Australia and Dick Pasfield). Overall coordination in Australia is through Prof. Jeff Camkin, University of Western Australia.

Theme 3: Addressing Water Scarcity and Quality

Focal Area 3.1: Improving governance, planning, management, allocation, and efficient use of water resources

Focal Area 3.2: Dealing with present water scarcity and developing foresight to prevent undesirable trends

Focal Area 3.3: Promoting tools for stakeholders involvement and awareness and conflict resolution

Focal Area 3.4: Addressing water quality and pollution issues within an IWRM framework - improving legal, policy, institutional, and human capacity

Focal Area 3.5: Promoting innovative tools for safety of water supplies and controlling pollution

An AusAID project has been approved to facilitate development of water quality guidance for managed aquifer in India. UNESCO Delhi office is assisting in project establishment.

An IAH Commission on MAR project has commenced to produce a monograph on clogging in MAR and the international publication is being led by an Australian editorial team from AGT and CSIRO. This addresses an important constraint on the effectiveness of recharge enhancement.

Non-conventional water resources: brackish water use and waste water re-use.

- A major new research project on storing wetland treated stormwater in a brackish aquifer for recovering potable water. This will be an icon project with much on HACCP that will be transferable to developing countries. This now has partners in China, India and Singapore.
- Free exchange of information from Australian Water Conservation Reuse Research Program and UNESCO (<http://www.clw.csiro.au/publications/awcrpp/>)

Access to water for food security in environmentally stressed zones.

The National Land and Water Resources Audit (<http://www.nlwra.gov.au/>) and http://audit.ea.gov.au/ANRA/atlas_home.cfm) and the Water and the Economy study have produced a considerable body of data and information about the value, use, distribution and quality of water within Australia.

Research on property rights of water and the structure, operations and social and economic impacts of water trading markets continues to receive a lot of attention in Australia and is a potential resource for similar projects in other countries. The ANU, the French agency CIRAD and Ecowise Environmental has undertaken research on the use of multi agent systems and companion modelling to support negotiations and reduce conflict over groundwater use in low atolls.

Theme 4: Water and human settlements of the future

Focal Area 4.1: Game changing approaches and technologies

Focal Area 4.2: System wide changes for integrated management approaches

Focal Area 4.3: Institution and leadership for beneficiation and integration

Focal Area 4.4: Opportunities in emerging cities in developing countries

Focal Area 4.5: Integrated development in rural human settlement

Culture, ethics and legislation for wise stewardship of water.

- Indigenous water knowledge and understanding
- Pacific Island countries culture and water issues
- A framework for integrating water policy for managed aquifer recharge into water resources management was developed and is being taken up by those states where the need is most pressing (<http://www.nwc.gov.au/publications/waterlines/robust-policy-design-for-managed-aquifer-recharge>)

Good Governance, capacity development and stakeholder participation. Empowerment of human resources.

- CSIRO with NCGRT and IceWARM are providing training on MAR (management of aquifer recharge) including technical aspects, management policies and guidelines for health and environment protection
 - Frameworks for determining sustainable yield of aquifers
- CSIRO and SKM are each developing a thematic paper on groundwater governance for GEF-FAO (on groundwater recharge/discharge and aquifer equilibrium and on surface water-groundwater interaction, respectively)

- French-Australian Initiative on Water and Land Management through the UNESCO Chair in Water Economics and Transboundary Water Governance at ANU conducted “Food and Water Security shaping Land-use Futures” 12-14th June 2013 which has developed a continuing program of research on relevant issues in this focal area.

Affordability, poverty alleviation and assured financing, for effective IWRM. Include ‘water’ in national PRSP’

- Implementation of IWRM in the Pacific Island Countries (assistance to SOPAC)
- Australian National Water Initiative

Shared Water resources and conflict

- Water markets and water trading approaches
- International exchange of data

As a result of a National Water Initiative (NWI) agreed by Australian federal and state governments all Australian water agencies are required to develop comprehensive water management plans. The plans are being developed through a process of extensive stakeholder consultation and watershed modelling. The process being employed and the resultant plans provide a valuable resource for similar projects elsewhere in the world.

The WIRADA [water resources assessment and water use accounting](#) project is developing methods and technologies, to enable the Bureau to provide integrated surface and groundwater

resource assessments, water accounts and water resource outlooks. The first 5 year agreement finished in 2012 and was extended for a period of 3 more years

Theme 5: Ecohydrology, engineering harmony for a sustainable world

Focal Area 5.1: Hydrological dimension of a catchment – identification of potential threats and opportunities for a sustainable development

Focal Area 5.2: Shaping of the catchment ecological structure for ecosystem potential enhancement – biological productivity and biodiversity

Focal Area 5.3: Ecohydrology system solution and ecological engineering for the enhancement of water and ecosystem resilience and ecosystem services

Focal Area 5.4: Urban Ecohydrology – storm water purification and retention in the city landscape, potential for improvement of health and quality of life

Focal Area 5.5: Ecohydrological regulation for sustaining and restoring continental to coastal connectivity and ecosystem functioning

Australia is developing policy and programs to support ecosystem enhancement through ecosystem service production

Australia has three UNESCO Ecohydrology Program Demonstration sites (Ord River, Western Sydney and water planning in Australia, with all three featured in the 2012 UNESCO document “Ecohydrology for Sustainability”).

The ANU and Ecwise Environmental have ongoing projects in conjunction with UNESCO-IHP investigating shallow groundwater recharge, water quality, impacts of land-use and extraction and socio-cultural aspects of groundwater management and impacts of drought in low coral islands. The ANU together with NSW Department of Primary Industry has been investigating estuary policy and management strategies to improve the health of estuaries. Research into hydrological process in and the sustainable management of wetlands is being undertaken in a number of universities and eWater Cooperative Research Centre and the ANU in conjunction with UNSW and the NSW Sugar Industry has been investigating the use of constructed wetlands to treat drainage from farm lands. The urban environment and water sensitive urban design are also areas of current research. The Bureau has been given a new responsibility under the *National Plan for Environmental Information*, which is the first step on a long-term commitment to reform Australia’s environmental information base and build this critical infrastructure for the future. It is initially a four-year program, and the first phase is a joint initiative between Commonwealth Department of Sustainability, Environment, Water, Population and Communities and the Bureau. The needs driving this initiative include looking at prioritising of investments in Natural Resource Management, identifying and predicting the impact of climate change, understanding environmental management decision impacts on the economy and society, activation of markets for environmental goods and services, improvement of the quality and transparency of environmental assessments for major projects and driving more sustainable resource management.

Theme 6: Water Education, key for Water Security

Focal Area 6.1 - Enhancing tertiary water education and professional capabilities in the water sector

Focal Area 6.2 - Addressing vocational education and training of water technicians

Focal Area 6.3 – Water education for children and youth

Focal Area 6.4 – Promoting awareness of water issues through informal water education

Focal Area 6.5 – Education for transboundary water cooperation and governance

Many universities and other research centres have educational and training programs. Some of the research centres are listed separately below.

National Centre for Groundwater Research and Training (<http://www.groundwater.com.au>)

The purpose of the centre is to provide research, education and specialist services for Australian and International land and water industries with the objective of improving the management of resources affected by groundwater processes.

Centre for Environmental Applied Hydrology (<http://www.civag.unimelb.edu.au/ceah>)

The Centre for Environmental Applied Hydrology is a research centre within the Departments of Civil and Environmental Engineering and Geography and Environmental Science at the University of Melbourne. Specific expertise covers all aspects of surface and groundwater hydrology, hydraulics and geomorphology.

Fenner School of Environment and Society, Australian National University (<http://cres.anu.edu.au>) conducts research and postgraduate training in spatial-temporal variability and characterisation of climate, integrated catchment management, groundwater modelling and hydrology, floods and droughts, coastal hydrology and land use, salinity, cultural and indigenous water issues, water and land policy and related socio-economic interactions, ecological economics.

The International Centre of Excellence in Water Resource Management (ICE WaRM) (<http://www.icewarm.com.au/>) is made up of a consortium of universities and has a strong focus on education and training. It promotes itself to international water resource management students to further their education in Australia and is also developing online courses for delivery in Australia and overseas.

International Water Centre (www.watercentre.org/) is a joint venture between University of Queensland, Griffith University, Monash University, University of Western Australia, International RiverFoundation, Moreton Bay and Catchments Partnership and the Queensland Government. The Centre aims to take Australia's expertise in whole of water cycle management to organizations in the rest of the World through Applied Research, Education and Training and Knowledge Services.

Professor David Waite, Director of the Centre for Water and Waste Technology & Dr Ashish Sharma, from School of Civil & Environmental Engineering at UNSW, are collaborating with Hohai University of Nanjing to develop joint research & Masters' level training programs in WATER MANAGEMENT through the Australia China Consortium for Water Research (ACCWR)

- The University of Western Australia has entered into a Memorandum of Understanding with the International Centre for Coastal Ecohydrology (under the auspices of UNESCO). Prof. Jeff Camkin, who coordinates HELP in Australia, has designed and delivered new components of the Erasmus Mundus MSc in Ecohydrology course in 2010, 2011, 2012. These courses have involved UNESCO HELP network participants from Australia, New Zealand, Malaysia, Philippines, France, Portugal, Spain, providing a bridge between UNESCO Ecohydrology and HELP programs and basins.

- *Crosscutting Program Components – FRIEND and HELP*

Collaboration in the Asian Pacific FRIEND project by provision of data, hosting a node of the Internet based Water Archive, and assisting in research activities. Australia currently has five UNESCO-IHP HELP basins (Ord, Murray Darling, Fitzroy (QLD), Burdekin and Tully). Further details are below.

1.2 Activities at a national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings 2014/2015

- 35th Hydrology and Water Resources Symposium 2014 (HWRS 2014)
Perth, Western Australia was held 17-23 February 2014 at the Pan Pacific Hotel. Website: <http://www.hwrs2014.com/>
- **WASH 2014 - Water, Sanitation and Hygiene for Everyone, Everywhere 24-28 March 2014, Brisbane, Australia** Web: www.wash2014.com.au
- FENNER CONFERENCE FOR 2013 Shine Dome, the Australian Academy of Science, Canberra 10, 11 October 2013 "Population, Resources And Climate Change – Implications For Australia's Near Future"
- Stormwater 2014 - National Conference on Urban Water Management Hosted by the Stormwater Industry Association 13th - 17th October 2014, Hilton Adelaide, South Australia
- OZWATER'14 Brisbane Jan, 2014
- Floodplain Management Association National Conference held in Brisbane on the 19 – 22 May 2015
- 2015 Stormwater Victoria Conference, 5 - 7 May 2015 • RACV Cape Schanck Resort
- 2015 Stormwater Queensland Conference, Hosted by Stormwater Queensland, Wednesday, 15th - Friday, 17th July, 2015, The Armitage Centre - Empire Theatre, Toowoomba, Queensland

- 2015 International Rivers *symposium* “Healthy Rivers – Healthy Economies”, Brisbane, Australia | 21-24 September 2015
- A number of meetings of the National Committee on Water Engineering, Institution of Engineer’s have been held during this period. Some of the key purposes of these meetings are to coordinate and organise hydrology and water resources symposia and conferences, to coordinate the ongoing revision to the national hydrological design guidelines Australian Rainfall and Runoff, prepare Position Papers on key hydrological issues and to manage the publication of Australian Journal of Water Resources. Position Papers are now all available on the Institution of Engineers, Australia web site: (<http://www.eng.newcastle.edu.au/~ncwe/ncwePosPaper/ppHome.htm>).

1.2.2 Research/applied projects Pacific Islands (Information supplied by Ian White and Tony Falkland) This was included in 2014 report but is still relevant.

The Pacific is a key element in the Earth’s water and energy cycles and supplies 75% of the world’s tuna stock. The red circles show the position of Kiritimati, Kiribati and Kosrae, Federated States of Micronesia

1.2.2.1 Context

The recent UN General Assembly Third International Conference on Small Island Developing States (SIDS) in Apia, Samoa held on 1-4 September 2014 concluded in the Outcomes that SIDS face numerous challenges to water resources:

- pollution
- overexploitation of surface & groundwater & saline intrusion,
- drought & water scarcity,
- Soil erosion & impacts on coral ecosystems & reefs,
- Lack of water & wastewater treatment, sanitation & hygiene.
- Changes in rainfall patterns related to climate change & impacts on water supply

In the Pacific (Figure 1), where many island states fall within the Least Developed Nations category, these challenges are exacerbated by limited resources and capacity. The SIDS are insignificant contributors to greenhouse gas emissions, yet will experience a disproportionate impact of climate change, especially the projected impacts of sea-level rise (Figure 2).

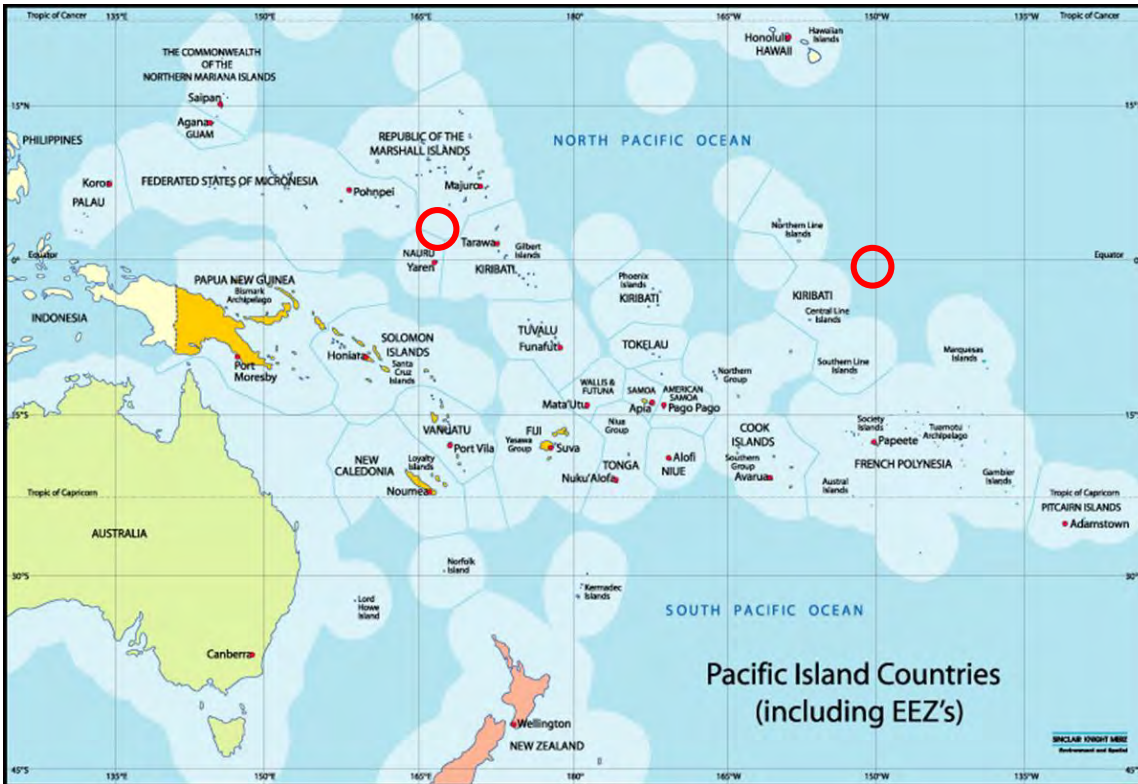


Figure 1. Pacific Island Countries (PICs) and their vast oceanic economic exclusion zones.

The above significant challenges coupled with resource and capacity limitations, mean that PICs as a whole will not meet the 2015 Millennium Development Targets for water and sanitation (Figure 3)

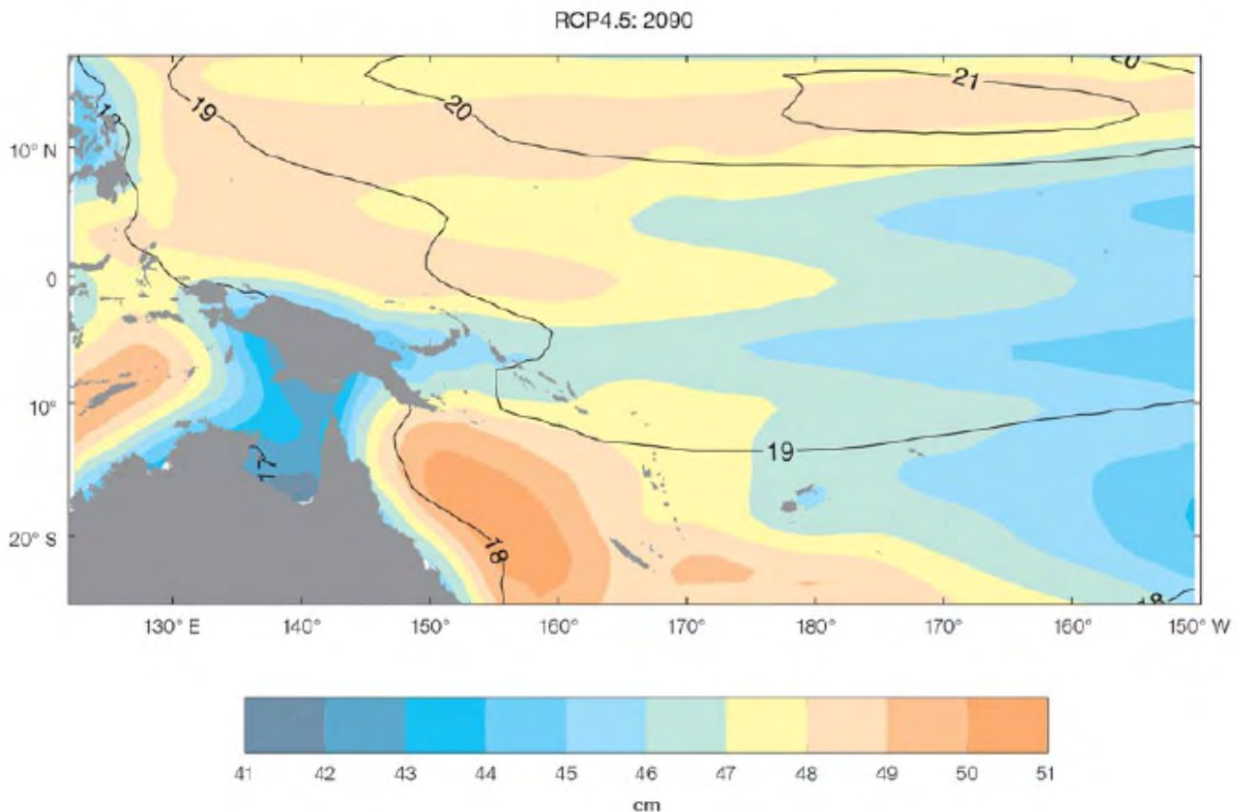


Figure 2. The regional distribution of projected sea-level rise for the period 2081–2100 relative to 1986–2005 from emissions scenario RCP4.5. The uncertainty is indicated by the contours (in centimetres). [BoM & CSIRO (2014). Climate Variability, Extremes and Change in the Western

Tropical Pacific: New Science and Updated Country Reports 2014, Pacific-Australia Climate Change Science and Adaptation Planning Program].

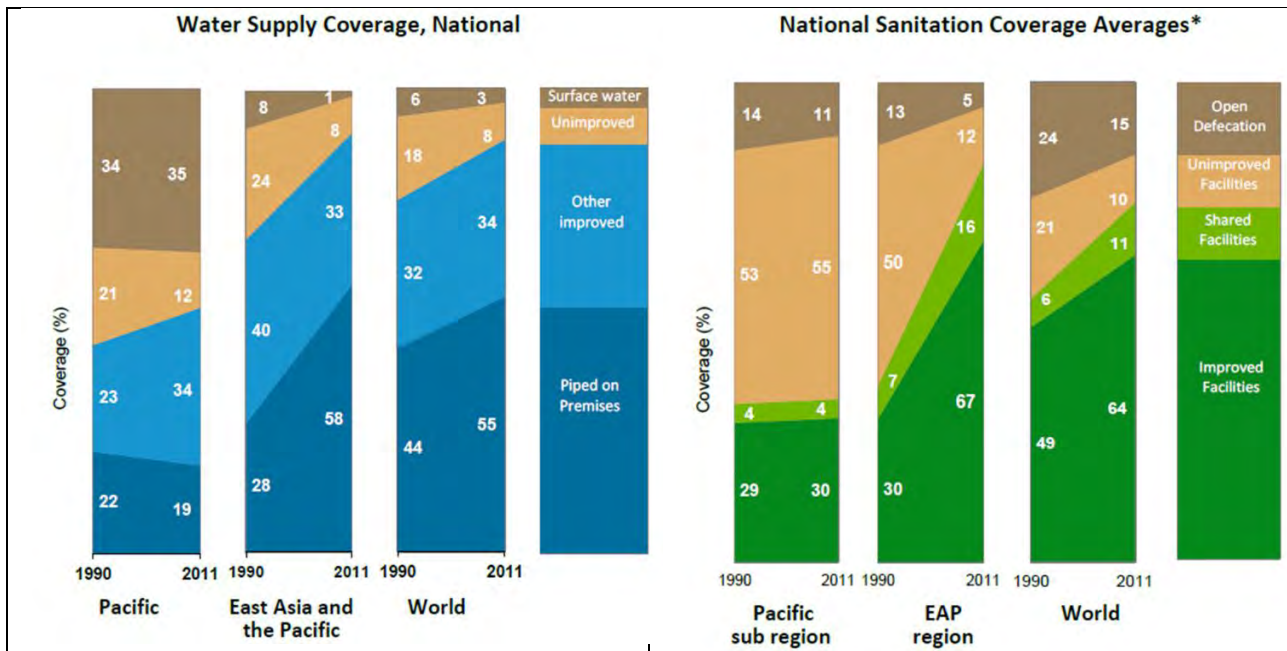


Figure 3. Progress towards meeting the 2015 Millennium Development Targets in water and sanitation in Pacific Island Countries, East Asia and the Pacific and the World (UNICEF). The failure to meet those targets is reflected in alarming health statistics, particularly amongst infants (Figure 4) and the elderly. These emphasise that water and sanitation are a vital issue in Pacific Island Countries.

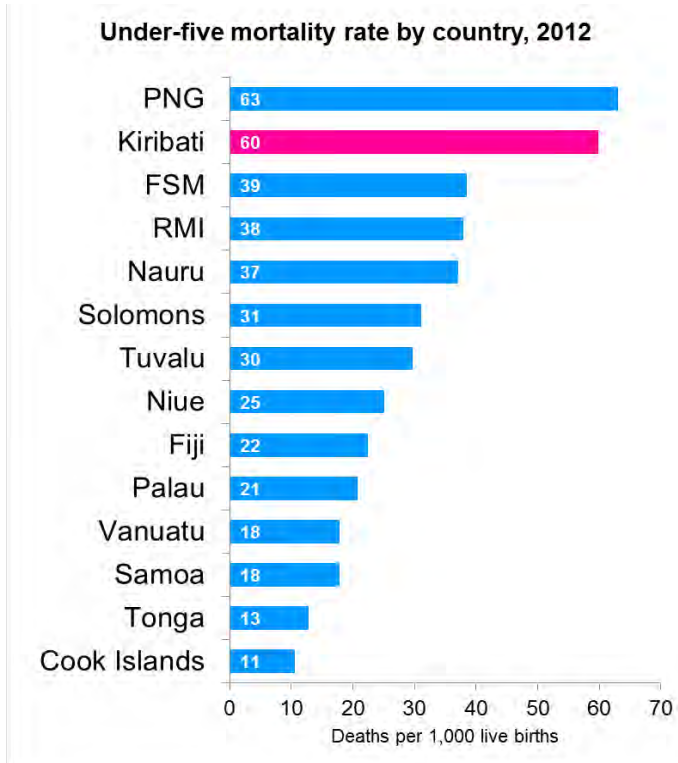


Figure 4. Under five infant mortality rates in Pacific Island Countries (UNICEF). For Australia, the infant death rate is around 4 deaths per 1,000 live births (UNICEF, year?).

**1.2.2.2 Australian Activities in Pacific Island Countries
Threats to Water Security**

An analysis was carried out by Tony Falkland for the Australian Government of the threats to water security in 14 diverse Pacific Island Nations, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Republic of the Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu (Figure 1) and included Timor Leste, to the year 2030. The analysis included projections of changes in future climates and sea-level out to the year 2030. The study (Falkland, A. 2011-14, Water security and vulnerability to climate change and other impacts in Pacific Island countries and East Timor) concluded that the highest risks to water security out to the year 2030 were;

- increasing water demands due to population growth and urbanisation,
- pollution of water resources,
- saline intrusion into fresh groundwater due to over extraction,
- leakage from urban pipe systems,
- impact of natural hazards,
- poor water governance, management and monitoring,
- inadequately resourced agencies with restricted capacity,
- financially unsustainable water supply systems,
- vandalism and conflicts arising from property rights disputes between land owners and governments.

Crowded urban and peri-urban locations, remote communities and low-lying areas were considered most at risk.

Strategies for reducing the above risks included:

- improved water governance,
- increased assessment and monitoring of water resources,
- designing appropriate water supply systems,
- improving demand management,
- improving drought and flood planning,
- capacity building and training, and
- improving community education, awareness and participation.
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1.2.2.4 Water Policy and Planning Development

Faced with the complexity and uncertainty of future climates in the Pacific Barnett (Barnett, J. (2001). Adapting to Climate Change in Pacific Island Countries: The Problem of Uncertainty, World Development, 29 (6): 977-993. Barnett, J. (2005). Titanic states? Impacts and responses to climate change in the Pacific Islands. Journal of International Affairs, 59 (1): 203–219) concluded that the only rational adaptation strategy in the Pacific is to:

- develop the general capacity of a society to cope with change by building up its institutional structures and human resources while
- maintaining and enhancing the integrity of ecosystems

The building up of institutional structures includes the development of national water and sanitation policy and implementation plans. Previously Australian IHP has assisted the governments of the Republic of Kiribati and the Republic of Nauru to develop national water, sanitation and hygiene policy and implementation plans.

In collaboration with the Applied Geoscience and Technology Division of the Secretariat of the Pacific Community, SPC, under the GEF Funded Pacific Islands Integrated Water Resource Management Program, Australian IHP Committee has assisted the government of Solomon Islands (Figure 1) through its National Intersectoral Water Coordination Committee to develop its 2014 National Water and Sanitation Policy and Implementation Plan.

1.2.2.5 Pacific Regional Program: Practical Climate Resilient Approaches for Food and Water Security and Coastal Zone Management

The overall aim of this program is to strengthen the national capacity of participating Pacific Island Countries to build their climate resilience and manage climate-related risks. The principal aims of the water sector contribution to Component 2, carried out by the Australia IHP Committee are to:

- carry out an initial risk assessment and analysis that identifies where gaps in water resources information represent a significant impediment to the management of current and emerging risks associated with climate variability and climate change; and
- to Identify practical opportunities in which participating countries can be assisted to strengthen their collection, management, analysis, communication and effective use of water resources information in order to achieve improved water security in the face of climate change

The project is supported by the World Bank and coordinated by SPC and examined pilot sites in Kiritimati Atoll in the Republic of Kiribati and Kosrae island in the Federated States of Micronesia.

Pilot sites

In terms of climate, geography and geomorphology, these islands are at opposite ends of the spectrum. Kiritimati, a low, limestone atoll, lying on the edge of the equatorial dry zone, with very poor soils, has the lowest mean, and most variable, annual rainfall of any permanently settled atoll in the Pacific. Kosrae, a high volcanic island on the northern edge of Pacific warm pool (PWP) and within the path of the intertropical convergence zone (ITCZ), with highly productive soils has one of the wettest coastal zones in the world with low rainfall variability.

Kiritimati relies heavily on scarce highly vulnerable groundwater lenses overlying seawater for its water sources. Kosrae has abundant rainfall and perennial streams as well as groundwater.

Paradoxically, the high island of Kosrae is much more vulnerable to sea level rise, because of the clustering of its settlements around the coastal fringe and its geographic position in the northwestern equatorial Pacific cyclone zone, than the low atoll of Kiritimati in the central eastern equatorial zone outside the cyclone zone. In Kiritimati the discrete freshwater lenses are at slightly higher elevation than in other atolls.

Issues in Common

Despite the vast differences in governance, geography, geology, cultures and climate, the study found that Kiritimati and Kosrae share common issues which increase risk in the water supply and sanitation sector.

1. Inadequate monitoring of water resources with major implications for management and planning
2. Inadequate storage of water resource data
3. Lack of capacity and resources to use data to improve management
4. Lack of capacity and resources to critically assess aid projects in the sector
5. Almost no connection with the local meteorology office
6. Poor communication and cooperation between water agencies.
7. Poor systematic communication between water agencies and island government
8. Decaying infrastructure with inadequate maintenance
9. Lack of resources to treat water
10. Lack of capacity and resources to plan or implement plans
11. Aid projects being implemented in the sector which are not whole island solutions and will not address future development needs.
12. Sub-optimal use of rainwater harvesting
13. Potential to increase the use of renewable energy in water supply systems.
14. Sanitation is scarcely mentioned.

Pilot projects were designed in each site to address these issues, particularly to enhance monitoring and analysis of climate and water parameters, to increase the use of seasonal forecasting, to enable development of safer locations and to engage local communities.

1. Rainfall Harvesting and Storage in Funafuti Tuvalu

Water resources in low-lying coral atolls are amongst the most vulnerable in the world due to the high permeability of the coral sands and the thin fresh groundwater lens, the main storage, which overlies seawater. In some atolls the coral sands are so permeable that no fresh groundwater exists. These atolls must rely on rainwater harvesting or desalination to supply their water needs.

Funafuti atoll (Figure 5), the capital atoll of Tuvalu has no fresh groundwater and rainfall harvesting is the principal source of fresh water.



Figure 5. Funafuti atoll, Tuvalu has no fresh groundwater and must rely on rainwater harvesting and desalination for water supply (NASA Shuttle Mission STS104, Jul 2001).

It is extremely vulnerable to drought. In an AusAID funded project through SPC, Australian IHP has carried out an analysis of the risk of failure of rainwater harvesting systems in Funafuti. The study identified that the three principal contributors to the failure of rainwater harvesting in Funafuti are the large demands in large family dwellings, the limited roof areas and rainwater tank storage volumes and inadequate guttering. It was found that there is a critical roof area to rainwater tank capacity ratio that needs to be supplied to reduce the risk of failure. The AusAID project is aimed at decreasing the risk of failure by improving rainwater harvesting infrastructure and its management.

Water Supply Improvements, Kiritimati (Christmas Island), Republic of Kiribati

Kiribati consists of 33 islands scattered across 5 million km² with a population of about 100,000 living in 20 low-lying coral atolls and islands. It is a least developed country with a GDP per capita of about US\$1,300.

Kiritimati is the largest coral atoll in the world with a total area of about 640 km². About 60% of this area is land while the remainder consists of lagoons. Kiritimati comprises 70% of the total land area of Kiribati and is the second most populated island in the nation with a growing population of about 6,000 (2010 Census). The Government of Kiribati has designated Kiritimati as the main potential growth island in Kiribati.. As a result of the government's strategy, Kiritimati population growth forecasts predict an annual growth rate of 8%.



Figure 6. Satellite image of Kiritimati atoll, Kiribati.

Kiritimati is located within the equatorial dry zone of the Pacific Ocean and its climate is dominated by long drought periods associated with La Niña periods and high rainfall periods associated with El Niño events. The mean annual rainfall is just less than 1,000 mm and the coefficient of variation, Cv, of annual rainfall is 0.72, which is very high. The average annual rainfall is lower and more variable than on other populated Pacific Island countries. Most other Pacific Island countries have average annual rainfalls between 1,500 mm and 3,000 mm and Cv's of annual rainfall between 0.15 and 0.25.

The freshwater resources of Kiritimati consist of groundwater and limited rainwater. The fresh groundwater occurs as 'freshwater lenses' which are fresh groundwater aquifers overlying seawater. These freshwater lenses have formed in favourable locations under the surface of the atoll. The soils are too permeable to support any fresh surface water resources.

The current Kiritimati Improved Water Supply Project, funded by the European Union and managed by the Water and Sanitation Programme of SPC, is focused on water supply improvements for the second largest village of London and a nearby settlement Tennessee. The overall objective of the Project is to improve livelihoods and enable human, social and economic development on Kiritimati Island.

Main activities of this project are:

- Install, rehabilitate and operate monitoring bores for the freshwater lenses used to supply London and Tennessee and revise assessments of sustainable yields.
- Undertake urgent improvement works to the existing water supply system, including rehabilitation of infiltration galleries and solar and wind powered pumps, install flow meters and refurbish water disinfection facilities.
- Undertake detail design work of the proposed water supply upgrade works and construct new facilities (including infiltration galleries, pipeline, storage tanks).
- Provide training to local water supply personnel in water supply system management, operation and maintenance and in vital water monitoring activities.
- Implement consumer education and awareness regarding the wise use of the limited available water resources.

1.2.3 Hydrology for Environment, Life and Policy (HELP)

Australia continues to contribute to the projects established under the HELP banner: the Lower Murrumbidgee catchment in the Murray Darling River Basin (coordinated by Awadesh Prasad, Murray Darling Basin Authority), Tully Basin (coordinated by Jim Williams, CSIRO), Lower Burdekin River Basin (coordinated by Keith Bristow, CSIRO), Fitzroy River basin (coordinated by Chris

Carroll, Queensland Department of Environment Resources and Mines) and the Ord River Basin (coordinated by Jeff Camkin University of Western Australia and Dick Pasfield). Overall coordination in Australia is through Prof. Jeff Camkin, University of Western Australia.

Prof. Jeff Camkin was an invited keynote presenter at the IHES/UNESCO Symposium Restoring Rivers for Future, South Korea (April 2011) and invited member of the Steering Committee for the UNESCO-IHP HELP 2nd International Symposium Building Knowledge Bridges for a Sustainable Water Future in Panama, November 2011.

The HELP Program, and HELP network participants from Australia and other countries, has featured in new modules developed for the Erasmus Mundus MSc in Ecohydrology delivered at the University of Algarve through a collaboration between the International Centre for Coastal Ecohydrology (under the auspices of UNESCO), the UWA and Technical University of Lisbon.

Activity in the Murray Darling HELP Basin has focussed on the development of a Basin plan, the largest ever water reform in the Murray Darling Basin.

1.2.4 Collaboration with other national and international organizations and/or programmes

As President of the WMO Commission for Hydrology Network, Mr Bruce Stewart provided a link between the UNESCO IHP and WMO's Operational Hydrology Programme. Mr Tony Falkland and Prof Ian White are members of the Water Working Group of the Science, Technology and Resources Network of the South Pacific Applied Geoscience Commission. Prof Ian White is a member of the Asian Pacific Association of Hydrology and Water Resources. Mr Trevor Daniell is the past Chairman of the FIGCC and was editor of the FRIEND 2014 Conference papers. Dr Peter Dillon chairs the IAH Commission on Managed Aquifer Recharge. University of Western Australia has entered into a Memorandum of Understanding with the International Centre for Coastal Ecohydrology (under the auspices of UNESCO). Prof. Jeff Camkin, who coordinates HELP in Australia, has designed and delivered new components of the Erasmus Mundus MSc in Ecohydrology course in 2010 to 2014 and further work is being developed under the MoU.

1.2.5 Major activities of BoM

The National Water Account is Australia's most comprehensive water information report and the report for 2014 was released in May 2015.

It provides a picture of water resources management for the previous financial year for ten nationally significant water regions: Adelaide, Burdekin, Canberra, Daly, Melbourne, Murray–Darling Basin, Ord, Perth, South East Queensland and Sydney.

The National Water Account discloses information about water stores and flows, water rights and water use. It also reports on the volumes of water traded, extracted and managed for economic, social, cultural and environmental benefit.

Ref <http://www.bom.gov.au/water/nwa/2014/overview/index.shtml>

Key findings

- Continued dry conditions across much of Australia through 2013–14 contributed to a second consecutive year of reduced inflows to storages and increased demand on the available resources in many regions.
- Surface water storage volumes in the nine National Water Account regions decreased during the year—from approximately 30,978,800 ML (or 75% capacity) at 1 July 2013, to approximately 29,922,900 ML (or 72% of capacity) at 30 June 2014.
- Water use was approximately 13,251,000 ML across the nine regions, a 21% decrease on use in 2012–13.
- Surface water, including inter-region transfers, accounted for 84% of water used, while groundwater accounted for almost 15%. Other sources, including desalinated water, contributed just over 1% of the volume of water used.

- The Murray–Darling Basin accounted for 80% of water used in National Water Account regions—primarily for irrigated agriculture, which is the major use of water in Australia.

Water security in urban areas has been improved through investment in desalination plants. Coastal urban regions can produce desalinated water to meet a portion of urban demand. In 2013–14, Adelaide and Perth relied on desalinated water for almost 40% of urban supply, an increase of more than 30% from 2012–13. In comparison, good surface water availability in Melbourne, South East Queensland and Sydney meant little or no desalinated water was produced in these regions.

To celebrate National Water Week in 2014, the Bureau of Meteorology [released the Australian Groundwater Explorer](#) at Australian Parliament House.

Parliamentary Secretary to the Minister for the Environment, Simon Birmingham, launched the valuable tool which provides a comprehensive picture of Australia’s groundwater resources.

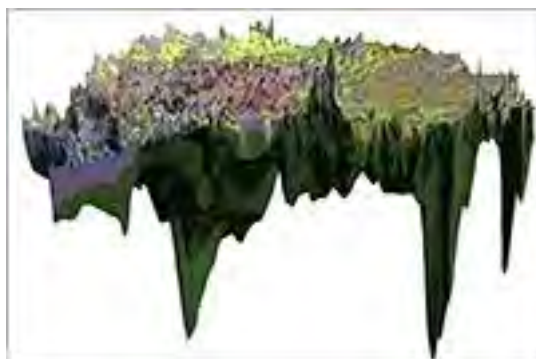
National Water Week is a great time to increase community awareness around water issues and how best to use our valuable water resources.

The Australian Government’s Improving Water Information Programme, led by the Bureau and supported by water agencies across the country, is helping to improve our national understanding of all water resources, including groundwater.

3D model of Murray Basin

A 3D hydrostratigraphy model has been developed for the Murray Basin in southeastern Australia. The model can be viewed as an interactive PDF in the new [Australian Groundwater Explorer](#), so you can view the data in 3D, including the ability to zoom in and out, pan and turn layers on and off.

The model has nine layers, which represent the aquifers and aquitards in the Murray Basin. Layers for the New South Wales section were produced by the Bureau of Meteorology using hydrostratigraphy logs interpreted by the NSW Office of Water. Victorian layers were provided by the Department of Environment and Primary Industries and South Australian layers by the Department of Environment, Water and Natural Resources.



The dataset, including ESRI georasters and geovolumes, is available by email request to groundwater@bom.gov.au

Water data at your fingertips

Water Data Online provides a single access point to nationally consistent, timely data from thousands of water monitoring stations across Australia.

As a water manager, policymaker, researcher or industry professional, you can better understand Australia’s water resources by viewing or downloading data and reports. You can now find standardised watercourse level and watercourse discharge data from approximately 3500 water monitoring stations around Australia.

Water Data Online displays information collected by the Bureau of Meteorology from lead State and Territory water agencies under the Water Regulations 2008. Over time, more stations and parameters will become available and linkages will be made from the Geofabric.

Every two years a major report on the State of the Climate, is published. Reference is CSIRO and Bureau of Meteorology (2014): *State of the Climate 2014*. 16 pp.

- www.csiro.au/State-of-the-Climate-2014 • www.bom.gov.au/state-of-the-climate/2014

Key Points made in this report (<http://www.bom.gov.au/state-of-the-climate/>)

- Australia's mean surface air temperature has warmed by 0.9°C since 1910.
- Seven of the ten warmest years on record have occurred since 1998.
- Over the past 15 years, the frequency of very warm months has increased five-fold and the frequency of very cool months has declined by around a third, compared to 1951–1980.
- Sea-surface temperatures in the Australian region have warmed by 0.9°C since 1900.



1.2.6 WIRADA

Water Information Research and Development Alliance (Source for information below: <http://www.bom.gov.au/water/about/waterResearch/wirada.shtml>)

The Water Information Research and Development Alliance (WIRADA) is a partnership between the Bureau of Meteorology and The Commonwealth Scientific and Industrial Research Organisation. WIRADA brings together CSIRO's leading expertise in water and information sciences and the Bureau's operational role in hydrological analysis and prediction to deliver value-added water information products and tools.

The initial \$50 million investment during 2008 to 2013 delivered significant scientific and research innovation required by the Bureau to fulfill its national water information mandate. A snapshot of the [outstanding achievements made by WIRADA previously](#) is available for download. Details on the achievements of WIRADA are also in annual reports under the Key Documents list below.

The Water Information Research and Development Alliance (WIRADA) 2014–15 annual report details the outcomes of a \$5 million dollar investment by the Bureau of Meteorology and CSIRO. The Alliance delivered 11 journal papers, 27 conference papers and 21 technical reports in 2014–15, for research in water informatics, water resource assessment modelling and streamflow forecasting.

Highlights and achievements include:

- A final standard (WaterML2.0 Part 2) for adoption by the Open Geospatial Consortium to describe, share, and access rating tables, stream gaugings and cross-sections.
- Work towards new standards for the exchange of groundwater features (aquifers, boreholes, wells, construction components, etc.) and observations.
- A new version (v5.0) of the Australian Water Resources Assessments (AWRA) modelling system that successfully couples landscape and river modelling components. The model incorporates improvements to the landscape modelling component, and an extended river model for catchment headwaters. The Bureau is currently implementing the models operationally into a unified system based on the Python language.
- A new staged error-modelling approach that corrects long-term biases, updates model forecasts using recent prediction errors, and describes the distribution of residual errors. The Bureau is adopting this error-modelling approach as it transitions the new 7-day streamflow forecasts service to produce ensemble forecasts.

An improved and simplified Forecast Guided Stochastic Scenarios (FoGSS) model for seasonal streamflow predictions, which now requires fewer parameters. Its performance has been successfully evaluated in 63 catchments including a number of intermittent systems. Computer code for the model is now with the Bureau for operational deployment.

1.2.7 Australian Rainfall and Runoff

Climate Change Guidelines

ARR launched its Interim Climate Change Guidelines at the Engineers Australia Convention 2014 in Melbourne in November. These guidelines were led by Dr Bryson Bates from CSIRO. This draft discussion paper draws on the most recent climate science, particularly the release of the IPCC Fifth Assessment Report on the Physical Science Basis in September 2013 (IPCC, 2013) as well as the new climate change projections for Australia (CSIRO and BoM, 2014), and outlines an approach to address the risks from climate change in projects and decisions that involve estimation of design flood characteristics. For consistency with the revised IFD design estimates for Australia, the Interim Guideline is intended to be applied to current-day rainfall intensities with a probability of one exceedance per year or annual exceedance probabilities (AEPs) from 50% to 1%.

Workshop at Conference 2015

ARR will be running a workshop on latest updates at the [Engineers Australia Hydrology and Water Resources Symposium Hobart in December 2015](#)

1.3 Educational and training courses

The National Centre for Groundwater Research and Training (a joint venture between 9 research/educational institutions, government water management organizations and private consultants) organises a wide range of groundwater related training courses. Details of courses can be found at the web site <http://www.groundwater.com.au/conf/content.asp>. The centre has established strong links with institutions in the region, particularly in Indonesia, Malaysia, Thailand and China.

1.4 Publications

There are numerous Publications from various conferences and Journals. Some of Particular interest are :

As a submission to the RSC history document, Australia IHP committee prepared a document entitled "International Hydrological Programme (IHP) History of Australia in Asia Pacific Region", August 2015.

Recent publications of National Water Commission

<http://www.nwc.gov.au/publications>

[Australia's water blueprint: national reform assessment 2014](#)

20 Oct 2014

[Urban water futures 2014](#)

14 Oct 2014

Over the past 10 years, the Australian urban water sector has weathered new extremes in drought and flood and, as a result, has changed significantly.

[Annual report 2013-14](#)

07 Oct 2014

This is the National Water Commission's report to parliament on our performance in 2013–14. It reports on our performance against our outcome, deliverables and key performance indicators as outlined in our Portfolio Budget Statement.

1.5 Participation in international scientific meetings

There have been numerous individuals participating in many meetings for IHP, APFRIEND, WMO, SOPAC, HELP.

The Groundwater Governance '[Shared Global Vision for 2030](#)', '[Global Framework for Action](#)' and '[Global Diagnostic](#)' involved participation from many Australian researchers at different consultation meetings and in the final expert panel meeting. These documents were presented and discussed at a special side event at the 7th World Water Forum in Daegu, Korea early in 2015.

1.6 Other activities at a regional level

A project titled: Enhanced Application of Climate Predictions in Pacific Island Countries is currently in progress to meet the general goals of improving weather and climate services and products. The AusAID funded project is developing a climate prediction capacity in participating countries, and in particular, is providing a framework for incorporating climate prediction information into planning across a broad range of agencies and industries. The climate prediction system being provided under the project is based upon the seasonal climate prediction system of the Australian Bureau of Meteorology, which has successfully issued climate predictions for some years. (www.bom.gov.au/climate/pi-cpp/)

Dr Peter Dillon of the CSIRO, Water Recycling and Diversified Supplies, Urban Water Theme, Water for a Healthy Country Flagship Program, CSIRO Land and Water, has been active in Managed Aquifer Recharge across the region and beyond.
www.clw.csiro.au/research/urban/reuse

1.6.1 Institutional relations/co-operation

No information available at this time.

1.6.2 Completed and ongoing scientific projects

Refer section 1.2.3 re ongoing Pacific Island projects.

2. Future Activities

2.1 Conference Activities in 2015/16

9th International Water Sensitive Urban Design Conference & 3rd International Erosion Control Conference (WSUD 2015) 19 - 23 October 2015, Sydney, NSW

Website: www.wsud2015.org

Australian Groundwater Conference in Canberra, 3-5 November 2015.

International Conference on Sustainable Water Management; 29 November to 3 December 2015 at Murdoch University, Western Australia

[36th Hydrology and Water Resources Symposium](#) in Hobart from 7-10 December 2015.

12th Conference on Hydraulics in Water Engineering on 9-11 Feb 2016, in Melbourne, Australia

International Water Reuse & Desalination Symposium, 4-5 November 2015, Brisbane Ozwater'16, 10-12 May 2016, Melbourne

Stormwater 2016, Hosted by Stormwater Australia, Monday, 29th August - Friday, 2nd September, 2016, Hilton Hotel, Brisbane, Queensland

2.2 Activities Planned for 2015/16

- Transference of the outcomes of update of ARR to the International Community.
- Continuation of assistance to Pacific Island Projects.
- Continuation of involvement in Asian Pacific FRIEND and Global FRIEND
- Continuation of involvement in HELP
- Participation in the IHP Intergovernmental Council of 2014/2016

2.3 Activities envisaged in the long term

No information available at this time.

CHINA

National Report on IHP Related Activities

for

23rd UNESCO IHP Regional Steering Committee (RSC) Meeting
for Southeast Asia and the Pacific (SEAP)

Contribution to IHP-VIII (2014-2021)

19-21 October 2015

Medan, Indonesia

Chinese National Committee for the IHP

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1. ACTIVITIES UNDERTAKEN IN THE PERIOD OF DEC 2014 – SEPT 2015

1.1 Meetings of the Chinese National Committee for IHP

1.1.1 Decision regarding the composition of the Chinese National Committee

The current IHP national committee consists of **29** distinguished water experts who are active in hydrology and water resources work in China. There was no particularly decision has been made during the past one year.

1.1.2 Status of IHP-VIII activities

Since 2014, IHP has been moved to its VIII-phase with focus of water security. Correspondingly, IHP China national committee has arranged projects and activities in all themes and almost all focal points of IHP-VIII through national committee members, focal points and working groups around the country. Some activities are provided in the following paragraphs.

(1) In November 2014, 4 Chinese expert from IHP participated the 22nd IHP Steering Committee meeting for Southeast Asia and Pacific in Yogyakarta, Indonesia.

Delegation of 4 participants including Ms. Xiaoyuan Zhu, Ms. Yan Huang, Ms. Shanshan Xiong and Mr. Xin Zhao participated in the meeting. During the meeting, delegate of China proposed 2 Chinese experts to participate the working group of Large River Initiative, information of the recommended Chinese was reported to the headquarter of UNESCO IHP after the RSC meeting.

In addition, with the strong support from Chinese and several other member countries, the meeting discussed possibility of joint research on water security, water disaster, IWRM and water education. Some ideas were discussed and possible activities were proposed during the meeting.

1.1.3 Decision regarding contribution to/participation in IHP-VIII

During October 2014 - October 2015, there were a couple of informal IHP national committee meetings or discussions. Through some focal points for certain projects, members of IHP and working groups desired to complete the on-going projects in their capacities. Meanwhile, the committee encourages IHP members to continue sharing knowledge and technology, and cooperate in various ways to promote hydrological development. Most activities are carried out among organizations of committee members.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings



(1) Video conference of the National flood management and drought relieve, Jan 20, 2015

On 20 January 2015, organized by the national headquarter of flood control and drought relief of China, a video conference of the national flood management and drought relief was held. The

objectives of the meeting is to review the work of 2014 and to make arrangement of work for 2015. According to the meeting, severe water disasters including floods, droughts and typhoon at coastal areas occurred in 2014, some places damages caused by flash floods and mudflows were serious, severe droughts happened in north China and south-west China in spring time, in summer droughts happened in east-north China and coastal areas near Yellow sea. Although there were severe floods and drought, few people died, and comparing with what happened in the past years, less property losses. For the arrangement of the work in 2015. Predictions showed that in north China there will be less rainfall in spring time, but for Changjiang river there might be big floods in the downstream area.

The general secretary of the national headquarter of flood control and drought relief, also the vice minister of the ministry of water resources, Mr. LiuNing chaired the meeting, presentations were given by the Bureau of Meteorology of China, headquarters of 6 provinces, and the Changjiang River Commission. All headquarters of flood control and drought relief at all levels including provincial level, river basin level and national level participated in the conference. Including the major conference rooms there were in total 44 conference rooms participated in the meeting.

(2) Yearly national working video meeting of hydrology, March 11, 2015

Organized by the bureau of hydrology, MWR, the annual working meeting was held to review the



work of 2014 and to make arrangement of 2015 for the hydrological work. The bureau of hydrology of MWR, bureau of hydrology at all levels of China including provincial level, river basin level, as well as the bureau of water resources protection took part in the meeting.

The vice minister, Mr. Liu Ning gave requirement for the work that require special attention in the coming new hydrological year. He analyzed the new challenges given by the new situation and require the hydrological work shall: 1) make good efforts on hydrometric work for the needs of flood management, drought relief and typhoon prevention; 2) developing innovations on the working and management mechanism; 3) enhance project management of hydrological work, and complete the development of monitoring system for small rivers before August, and make good preparation for groundwater monitoring projects; 4) explore services area for hydrological work, promote eco-hydrology monitoring work and urban hydrology work.

The meeting reported progress of basic construction of hydrology facilities and national groundwater monitoring project development. Presentations were given by hydrological offices from Hebei, Liaoning, Jiangsu, Shandong, Hunan, Qinghai and Changjiang Water Resources Commission etc.



(3) The 3rd forum of hydroinformatics and digital water of China were held on 3 April 2015 in Zhengzhou China.

Aiming to promote implementation and development of hydroinformatics and digital water, the forum was jointly organized by the center of technology

promotion of the ministry of water resources, north China water and hydropower university, Hehai university, Qinghua university etc. With the theme of “development of hydroinformatics at large amount of data”, the forum provided a platform for exchange and communication on hydroinformatics and use of large amount of data to serving the water management and social-economic development needs.

(4) International conference of Urban hydrology and environmental hydrology was held on May 16, 2015, in Beijing

The conference was jointly organized by Tsinghua university, Beijing University and several institutions. The conference aims to discuss topics about urban floods management and the needs of development of the so-called “Spunch city” given the high challenges in China where urbanization is in rapid development.



Focusing on urban flood management, and based on the new concept of “environmental hydrology”, the conferences wishes to promote integrated approach of considering multiple disciplines of hydrology, water conservancy, planning of urban and rural area and environment as well as civil engineering, together with architecture, view and parking etc.. More than 400 people participated in the conference, 37 presentations were given.

(5) High level forum on Water Security and Sustainable Strategic Development, 29 May 2015, Nanjing China.

The forum was jointly originated by Nanjing hydraulic research institute, China engineering academy etc. The forum lasted for 1.5 days, with 5 themes of: water utilization and allocation,



water disaster management, eco-hydrology, development of water engineering projects and security management, coastal zones and offshore projects. 13 presentations and 1 roundtable

discussion were given in the forum.

The minister of Water Resources Ministry Mr. Chen Lei presented in the forum and delivered keynote speech. According to Mr. Chen Lei, water security plays important role in the country security and sustainable development of China. It is important to implement the new strategy of water work, improve the insurances capacity of water security, to better facilitate the development of the country society and economy. Other participants include 50 experts from various Chinese academia of China engineering academy, academia from the Netherlands, Canada and USA, experts from world bank and international institutions.

(6) Workshop on development of prevention system of flash flood, 3 June 2015, Beijing.

The workshop aims to review work that have been made on flash flood prevention in the past,



conclude experiences and lessons, analyse weakness and difficulties existing in the current flash flood prevention work, and discuss objectives and tasks that shall be

made during the 13th 5-year planning on flash flood prevention.

The director general of the national headquarter of flood control and drought relief Mr. Qiu Ruiqian, officers and researchers from various water bureaus, provincial level headquarter of flood control and drought relief and the university of informatics in Nanjing, Changjiang institute of survey planning design and research, Chinese academy etc. participated in the workshop.

It has been determined that during the 13th 5-year planning period, financial support shall be increased at both the central governmental level and local provincial level. The tasks of the 13th 5-year planning shall be determined taking into consideration of the new requirements from local social-economic development, improving monitoring capacity and forecasting technology and ensurance capacity, expend the monitoring scope and improve capacity on service providing for social needs. In addition, it is required to promote education and practices on flood prevention evacuation program, increase the awareness of local people on flash flood, continue construction of engineering and non-engineering measures of prevention.

(7) Meeting of Reviewing on the “planning on national water supply and demand for middle and long terms”, July 17, 2015, Beijing

The meeting was held to review and discuss on the national planning of water supply-demand for mid-long terms of China. The vice minister of the ministry of water resources, Mr. Jiao Yong chaired the meeting.



According to the review from the experts participated the meeting, the Planning has applied the criteria of water saving, developed the water supply program for important areas and policies of water allocation and adjustment based on the water availability of river basins and regions and water demands of different function zones. The planning has taken

into consideration of eco-environmental protection, reduced unreasonable water usage for high pressure areas, and developed water security measures for ecologically fragile areas. It was concluded that the planning provided realistic programme for the future water supply of China.

Representatives from relevant departments of the National Development and Reform Commission, Ministry of Industry and Information Technology, the Ministry of Land, Housing and Urban Affairs, the Ministry of Agriculture, Forestry, Ministry of Water Resources, agencies

and organizations of the river basins, as well as invited experts attended the meeting.

(8) Meetings of flood risk mapping for important areas held by the national headquarter of flood control and drought relief, 22 July 2015, Beijing.

The meeting reported progress in the preparation of the flood risk mapping in key areas nationwide, and work plan for the near future.

According to the meeting, the next work plan is to: 1) urge local seize complete project construction tasks for the year of 2013 -2014, actively carry out projects of 2015 to ensure that by the end of this year the project work and payment shall be completed; 2) strengthen the results of quality management, surveys, model test and parallel computing using historical floods to carry out reliability verification of the risk mapping results; 2) provide technical support for the areas where progress is slow and with relatively poor work quality; 4) improve flood risk map web publishing and application management platform, and update flood risk map-related information; 5) promote the application of the risk mapping results based on flood risk management and combine with actual flood prevention practices.

(9) International Conference on Water Resources and Environment was held on July 25, 2015 in Beijing.

The conferences aims to exchange and discuss water resources management and related water environmental issues and to seek for proper solutions to those challenges. 11 keynote speaker were invited to deliver keynote speech. The speakers include the Fellow of IWA: Prof. Dr Miklas Scholz, Australian Prof. R. Quentin Grafton (FASSA), Prof. Shu-Qing Yang, Prof. Panagiotis Karanis from China program of thousands scholars, Govindasamy Agoram oorthy from Taiwan, etc. Technical Programm Committee consists of president Prof. Hwung-Hweng Hwung of Kung University in Taiwan, Prof. Jianmin Bian from Jilin University, Prof. Mohiuddin Md. Taimur Khan from Washington State University, etc. in total 28 international experts and scholars from different fields of water resources and the environment, water conservancy projects, water conservancy economics, hydrology and other fields.

(10) Seminar of Sciences and technology on Groundwater in HongKong, August 19-22, 2015

The Seminar was jointly organized by the City University of Hong Kong, the National Natural Science Foundation of China and the Beijing-Hong Kong Academic Exchange Centre in Hong Kong.



More than 150 scholars and young students from the Mainland and Hong Kong attended the seminar. The seminar aims to build cooperation between the Mainland and Hong Kong scholars and exchange platform to promote academic exchange and cooperation between the marine environmental science and technology, promoting the sustainable use of marine resources, improve scientific research and marine surveys and groundwater exploration ability.

Deputy Director of the Department of Earth Sciences, of the Ministry of National Natural addressed the opening ceremony. The Secretary-General - Professor Lin Qunsheng from City University of Hong Kong, also acts as UNESCO Deputy Inspector in the Central Government Liaison Office, Mr. Ji Jianjun speeches at the opening. Guests from department of Agriculture,

Fisheries and Conservation Department, Beijing-Hong Kong Academic Exchange Center, Shenzhen Municipal Science and Technology Innovation Council, Chinese Academy of Sciences Shenzhen Institute of Advanced Technology, etc. attended the opening ceremony of the Hong Kong SAR.

During the meeting, the scholars report, orally or in the form of poster presentation of their research ideas and achievements in the field of groundwater science and technology.

(11) National hydroinformatics work meeting, Sep 23, 2015, in Wuhan

The meeting comprehensively reviewed work progress of the development in hydroinformatics during the 12th 5-year plan phase, raised request on how to develop the 13th 5-year planning for the



development of hydroinformatics. The meeting invited researcher Mr. Luo Jianzhong from the National Computer Network and Information Security Management Center, Changjiang Water Resources Commission, provinces of Jiangsu, Shanghai, Zhejiang and Hubei, and other officers. The integration and

sharing of information resources were discussed; ideas and focus on information technology engineering and other aspects were shared and exchanged.

The meeting officially released the "One Map" as the result from the first national water resources investigation results. The map mainly include national basic geographic data, spatial data water infrastructure, water resource management and water thematic data and other remote sensing data. It plays important role in sharing and integration of water resources information and is the key to improve water resource management.

The meeting, the first attempt to "paperless" mode, open "water information" *Wechat* public number, through *Wechat* the participants to sign and obtained meeting materials published.

Departments from water ministry which is responsible for informatics, agencies in charge of informatics work in each river basin authorities, water authorities from provinces (autonomous regions and municipalities), as well as representatives of educational institutions participated in the meeting.

(12) Minister Chen Lei attended the opening ceremony of the 55th board meeting of world water council, July 16, 2015, Hangzhou, China

Minister of Water Resources Chen Lei stressed that the face of the global water security challenges, the Chinese Ministry of Water Resources is willing to work with the World Water Council with the plan of action advocated by the World Water Forum, to lead and promote the global water governance processes. Honorary President of the World Water Council Locke • Fu-hoon attended the meeting.

A total of more than 70 people from the national water management sector, international organizations, academic institutions and business representatives attended the meeting.

1.2.2 Participation IHP Steering Committees/Working Groups

(1) Participated in the 22nd IHP Regional Steering Committee meeting for Southeast Asia

and the Pacific Yogyakarta, Indonesia, 13 and 14 November 2014

55 participants from AP region participated in the meeting. Observation members such as Canada, Germany and Pakistan also took part in the meeting. The meeting discussed the work progress made during the past one year and discussed work plan for the next one year. Several resolutions were made as the results of the meeting including how to contribute to the IHP anniversary etc. The meeting encouraged joint research program on water disasters, water education etc. which were discussed and proposals on how to carry out it were also made.

1.2.3 Research/applied projects supported or sponsored

The website of the Chinese National Committee for IHP has been supported by UNESCO Beijing office and has been updated regularly. It was updated regularly for distributing messages to the public. Official home page is <http://www.chinaihp.org>. Announcement of web-based training courses and international conferences information are shared with hydrologist at national-wide on this website.

1.2.4 Collaboration with other national and international organization and/or programs

(1) China and Laos signed a memorandum of understanding on cooperation in the field of water resources, Nov. 7 2014.

To strengthen cooperation and exchange transactions in Mekong river, as well as to share China's successful experience and technology in water resources utilization planning, water resource development, on November 7, 2014, the Vice Minister of the Ministry of Water Resources, Mr. Jiao Yong, and the Deputy Minister of Environment and Natural Resources Miss Mo Manni, signed the MOU. With the signing of the MOU, it has provided opportunities and platform on exchanges and cooperation between Laos and China in the field of water focusing on the area of Mekong River.

(2) Delivery of the national water resources planning for Ecuador has been made in April 2015.

On 9 April 2015, with the submission of the last 3 reports on the water resources planning for 3 river basins of Ecuador, Changjiang Institute of Survey Planning Design and Research has made the final submission of the national water resources planning for Ecuador. The planning forms a solid foundation for water resources utilization and protection for the next 10-20 years in Ecuador. The planning studied water shortage issues and analyzed water demands for different water sectors of Ecuador, and provided various engineering measures and non-engineering measures to provide sufficient water to meet the development goals of the country.

(3) Cooperation on Hydropower Development in Pakistan, April 2015.

On April 20, 2015, witnessed by the preminister of Pakistan and Mr. Xi Jinping, the president of China during his visit to Pakistan, the Silk Road Fund, the Three Gorges Group and the Private Power Investment Board of Pakistan, jointly signed a "Memorandum of Understanding on joint development of hydropower projects in Pakistan".



Under the MOU, the Silk Road Fund will invest in shares of the Three Gorges Group in South Asia, to provide financial support to develop hydropower project including the very first one in Jhelum river, the Karot Hydropower Project. As the implementation of the "China-Pakistan economic corridor", the

Karot HPP is one of the priority energy projects. It plans to start construction in 2015.

(4) The fourth EU-China high-level dialogue platform Water were held on May 12-13, Copenhagen, Denmark.

Experts, scholars and business representatives, as well as Minister-level officials from China, the EU, the OECD as well as 16 EU countries including Denmark, Finland, the Netherlands, Ireland, Sweden, Switzerland and other EU countries, took part in the meeting. In total there were 200 participants. Topics about Water and sustainable development were discussed in-depth. The Conference also adopted "2015 EU-China high-level dialogue platform Water Joint Declaration" and the "Central Europe Water Platform 2015--2017 work plan." Minister of Water Resources Chen Lei attended the dialogue sessions and delivered a keynote speech.



During the meeting, 8 experts from different countries made presentations. The topics covers water management system, water pollution control action plan, allocation of water resources, flood mitigation, water rights and water market, watershed management, green hydropower, urban water system governance rule etc.

The dialog has provided excellent opportunities for the EU countries to learn about water management policies and technologies in China, and vice versa.

1.2.5 Other initiatives

NIL.

1.3 Education and training course

1.3.1 Contribution to IHP courses

NIL.

1.3.2 Organization of specific training courses

(1) 14th training on numerical simulation of groundwater, Nov 12, 2014, Beijing

The training program was jointly lunched by the North Water International, the National Environmental Protection Industry contaminated sites and groundwater restoration engineering technology centers, Peking University, China University of Geosciences.



The purpose of this training is to review groundwater science and engineering theory, learn in-depth numerical simulation techniques and practices on groundwater, to discuss difficulties and hot topics of groundwater.

The training provided courses on numerical modeling of groundwater flow, and use the latest Visual MODFLOW Classic interface and Chinese version of the interface of Flex, three examples of exercises has been carried out; the courses also include conceptual model of groundwater systems, groundwater flow simulation, solute transport simulation, and shared with the participants a numerical simulation with case-study and experience.

30 students from the Xinjiang Institute of Ecology and Geography, CAS, China Geological Environmental Monitoring Institute, Shanghai Academy of Environmental Sciences, Shandong Lunan Geological Engineering Investigation Institute, Gansu Hydrogeology and Engineering Geology Investigation Institute and so on attended the training course.

(2) The 4th training course on “Flood Management Decision Support System” (2014.11.23)

November 23 to 28, 2014, the 4th technical training course on "Flood Management Decision



Support System" was given in Nanjing. Technical staff engaged in water conservancy project management, design and research of China participated in the training course.

The training invitation NHRI dam flood risk management and dispatching experts in related fields, chief UK HR Wallingford's Shanghai office of Ms. Dou Qiuping to give lectures. Topics covers: flood risk assessment for dam break, framework for watershed flood management decision support system, and rapid flood damage assessment, urban storm-water integrated management system, real - time flood Content scheduling and forecasting applications, open development model interfaces OpenMI technology, hydraulics Urban Progress, earth dams anti-flood dam outburst process test and simulation as well as key areas of national flood hazard mapping projects.

(3) Training course on management of water planning work, December 17, 2014, Beijing

To implement the work arrangement of water of the country, as well as to regulate management of



planning, improve capacity of the staff on their work and management, The planning department of the ministry of water resources organized a training program on management of water planning work. The trainees include technical staff from water authorities of each province, river basin authorizes etc.

Experts from planning Department, the Safety Oversight Division, the China Institute of Water Resources and Hydropower delivered talks on speeding up work on major water conservancy Saving water requirements, the central water conservancy investment programs on the situation in recent years, water conservancy inspectors found problems related to the management and investment plans analysis, "water statistics management Measures" Interpretation, water conservancy projects and statistical management system, etc., made a presentation.\

(4) The 3rd national training program on application of new technology on hydrological monitoring. May 13, 2015, Nanjing.

The training course was organized by the Ministry of Water Resources and supported by Hohai

University, Nanjing MWR Hydrological Institute of Automation, Changjiang Water Resources Commission. In total 80 professionals of hydrological monitoring participated in the training.

The training combined classroom learning and laboratory experiments, supplemented with on-site training at hydrological station, as well as communication and discussions. The learning contents include: hydrological monitoring and emergency Hydrometry technological innovation, technical standards of hydrological monitoring, hydrological monitoring new technologies, hydrological Information compilation technology, automatic monitoring technology, application of aeronautical satellite remote sensing technology in hydrologic monitoring, etc.

1.3.3 Participation in IHP courses

No participation to IHP Courses during Nov 2014 to Oct 2015.

No observation of how many have actually participated in (or have received) the distance learning via web-courses. But the web-based distance learning notices received from UNESCO Jakarta office have been widely distributed through IHP China website and emails from IHP China secretariat.

1.4 Publication

To be included....

1.5 Participation in meetings abroad

(1) Chinese participated in the kick off meeting of the Water Security Project of UNESCO IHP, Feb 9, 2015, Paris.

In the VIII-IHP strategic development plan, water security is core. In order to discuss cooperation mechanism with potential cooperation partners, UNESCO-IHP held the workshop of project kickoff addressing Water Security: Climate Impacts and Adaptation responses in Africa, Asia and the Americas.



Professionals from UK, USA, Austria, Germany, UNEP, UNDP, IAEA, GEWEX and WGMS etc. attended the workshop. The meeting discussed the current research

network, technical innovations and management experiences regarding cooperation on water security, which shall benefit the implementation of planning on adaptation of climate change on water resources in Asia, Africa and America.

2 experts from China, namely Mr. Yao TanDong, and Mr. Zhang Fan participated the workshop representing the TPE. Mr. Yao delivered a presentation on Environment change over the Third Pole and impact on water resources, and chair the discussion session on the “vulnerability assessment” of water resources. After the meeting, Mr. Yao discussed with Siegfried Demuth on the research progress made on CC impact on water in Tibet plateau, and agreed to jointly publish the report on the Assessment of Climate and Water Changes under Global Warming on the Tibetan Plateau.

(2) Participated in the 36th IAHR World Congress, June 2015, Den Haag, The Netherlands

The congress was jointly organized by UNESCO-IHE, TU Delft, Deltares, Rijkswaterstaat and IAHR. 1400 experts from all over the world attended the congress. 14 professionals gave presentations. The Chinese representative Prof. Zhu Yonghu, from Changjiang River Commission presented his work on “2D Mathematical Modeling of Headcut Erosion during Breaching of Homogeneous Embankments” and discussed broadly with participants on relevant topics.

1.6 Other activities at a regional or international level

(1) The 4th International Conference on Water Resources Management and Engineering, December 2014, Zhengzhou

The conference was organized by the International Management Science and Engineering Technology Association (IAMSET). The conference theme was "groundwater pollution and environmental protection," focusing on the present situation of water pollution and water shortages, in-depth discussion and exchange have been made on the topics of China Water Resources and Environment and its development trends, water resources and environmental protection technology, regional water environmental governance and public health, sewage processing technology and other cutting-edge multi-disciplinary issues.

(2) International conference on Recycling Water, July 27, 2015, Haerbing

The meeting was co-sponsored by the International Water Association and the Harbin Institute of



Technology, State Key Laboratory of Urban Water Resource and Environment, Urban Water Resources (North) National Engineering Research Center etc. Topics include management of water recycling, applications and innovative technologies of water recycling. More than 150 water from 25 countries and regions

attended the meeting. 11 internationally renowned experts and scholars delivered talks and discussions to the meeting. Mr. Lee Guibai from Chinese Academy of Engineering was invited to the conference.

(3) IRTCES / ISI work can be viewed online: <http://www.irtces.org/isi/>.

2 FUTURE ACTIVITIES

2.1 Activities planned to until December 2015

For IHP China, the National Committee will:

- Continue paying high attention for regional (and international) cooperation under IHP framework and encourage cross-cutting cooperation with other international programme.
- Contribute to the implementation of IHP VIII strategic plan particularly on the integrated river basin management via case studies, however such activity require strong convener-ship from UNESCO-IHP at either global level or regional level.

- Hold the national hydrologic monitoring techniques application meetings in about December, 2015.

2.2 Activities foreseen for 2015-2016

Projects related to IHP-VIII themes will be continuously supported by the Ministry of Water Resources through IHP national Committee. IHP national committee will continue to encourage scientific and technical symposia and workshops. Cooperation among the Southeast Asia and the Pacific will be top priority. In summary, the activities will include (but not only) as below:

- Develop 13th 5-year plan for the coming 5 years at all levels and all aspects of hydrology, water resources and river basin management, flood control and drought relieve, improvements on capacity of hydroinformatics etc.
- Continue to implement collaborative researches project with IRTCES on erosion and sedimentation.
- Continue researching and collaboration on climate change impact on the hydrological cycle and water resources following the theme of IHP Phase VIII, with dedicated cooperation with Switzerland on upper Yangtze River basin.
- Encourage and initiate project following the new themes of IHP phase VIII, which will focus on water scarcity and environmental issues as well as integrated river basin management.
- Further continue colorations with international counterparties (e.g. Switzerland, the Netherlands, USA etc.) to promote and develop integrated water management concepts from different perspective such as risk management (Swiss), reservoir operation (USA) and environmental concerns.
- Continue collaboration with USA and UK on hydrometric technical development particularly on uncertainty quantification.
- Cooperate with regional IHP national committees to develop a development strategy on Small Hydropower.
- Participate in national planning on water resources management, hydrological professional development, promote basin-wide integrated water resources management at national scale.
- Participate in national rural drinking water planning and national drinking water sources area protection planning.
- Participate in national rural drinking water safety evaluation and planning, continue developing water quality protection technology.
- Providing training course for participates from developing countries on hydrological monitoring and flood forecasting technology
- Develop and promote integrated water resources management particularly on multiple reservoir operation and optimization.
- Other activities that will be organized at national/local (or basin-wide) levels by the committee members

2.3 Activities envisaged for the long term

China IHP National Committee will continue contributions to IHP actives, especially, may host RSC meeting/workshops/conferences, or join co-team for regional and international cooperation. Furthermore, working groups will be established for more cooperation activities. The committee will also promote and encourage young scientists to be actively involved in IHP work at national

and international level.

Moreover, it has to be noted that as UNESCO IHP China is a committee without **firm** management and organizational mechanism, it is difficult to gain driving forces to facilitate or promote IHP work. In addition, experienced committee members such as the general secretary Ms. Zhu Xiaoyuan will be soon retired; Mr. Liu Heng is giving less attention due to his tight schedule etc., the capacity of this committee needs new blood and energy. Thus, the secretariat will propose to the committee to promote IHP to gain more public attention and attract more participation from scientists and professionals from research institutions, in addition to the governmental organizations.

Annex I, Name list of the China national committee for UNESCO IHP

No.	Name	Position	Organization	Post in the organization
1	Deng Jian	Chairman	Bureau of Hydrology, Ministry of Water Resources (MWR)	Director
2	Liu ChangMing	Vice Chairman	Beijing Normal University	Academia
3	Liu ZhiGuang	Vice Chairman	Bureau of international cooperation and technology and Science, MWR	Deputy director
4	Jiang Jianjun	Vice Chairman	Bureau of geology and environment, Ministry of Land Natural Resources	Director
5	Liu Heng	Vice Chairman	Nanjing Hydraulic research institute of MWR	Deputy Director
6	Zhang Changkuan	Vice Chairman	Hohai University	Former chancellor
7	Wang Hao	Committee Member	China Institute of Water Resources and Hydropower Research	Department head, Academia
8	Wang Dianwu	Committee Member	Bureau of Hydrology of Liaoning province, MWR	Director
9	Hu HePing	Committee Member	Thinghua University	Vice chancellor
10	Guo Shenglian	Committee Member	Wuhan University	Deputy Provincial Governor
11	Wang Jun	Committee Member	Bureau of Hydrology, Changjiang Water Resources Commission, MWR	Director
12	Yang HanXia	Committee Member	Bureau of hydrology, Yellow River Commission, MWR	Director
13	Sheng Rong	Committee Member	China National commission for UNESCO	Department head
14	Lu Guihua	Committee Member	Water Authority of Jiansu province	Deputy director
15	Hu ChunHong	Committee Member	IRTCES under the auspices of UNESCO	Deputy director
16	Ni WeiXin	Committee Member	Nanjing Hydro-Automatic system research institute	Department head
17	Xia Jun	Committee Member	Department of Geology, China Institute of Water Resources and Hydropower Research	Director
18	Ren Liliang	Committee Member	Hehai University	Director
19	Yang ZhongShan	Committee Member	Hydrological center of Beijing city	Director
20	Ni GuangHeng	Committee Member	Thinhua university	Department head
21	Xu ZhongXue	Committee Member	Beijing Normal University	Deputy director
22	Cao ShengLei	Committee Member	Civil engineering department, ShanDong University	Director
23	Yu Zhijian	Committee Member	Bureau of Water diversion, Hubei province	Director
24	Tian TingShan	Committee Member	Chinese Institute of Geological Sciences Environmental Monitoring	Deputy director
25	Shi JianSheng	Committee Member	Department of Hydrology, Chinese Institute of Geology	Department head
26	Zhu Xiaoyuan	Secretary	Bureau of Hydrology, MWR	Department head
27	Jin Hai	Deputy Secretary	Bureau of international cooperation and technology and Science, MWR	Department head
28	Zou Ying	Deputy Secretary	Department of Hydrology, Nanjing Hydraulic research institute of MWR	Department head
29	Huang Yan	Deputy Secretary	Changjiang Institute of Survey, Planning, Design and Research	Deputy Chief Engineer

**INDONESIA NATIONAL COMMITTEE
INTERNATIONAL HYDROLOGICAL PROGRAM (IHP) UNESCO
23rd RSC Meeting of IHP, Medan 19 – 20 October 2015**

INTRODUCTION

Water is the source of all lives on the Earth and is a resource that is indispensable for our social and economic activities. Water is our most valuable natural resource. The availability and quality of fresh water not only affect human health and wellbeing, but also the functioning of essential ecosystems, including rivers, wetlands, lakes and coastal ecosystems. Without sound water resources management, human activities can upset the delicate balance between water resources and environmental sustainability. Climate change and anthropogenic activities are believed having a multitude of immediate and long-term impacts on water resources in Asia Pacific countries. These include flooding, drought, sea-level rise in estuaries, drying up of rivers, poor water quality in surface and groundwater systems, precipitation and evapotranspiration pattern distortions. These effects when compounded together have devastating impacts on ecosystems and communities, ranging from economic and social impacts to health and food insecurity, all of which threaten the continued existence of many regions in Asia Pacific.

Water-related disaster/problem vulnerability varies according to individual countries, geographical positioning and the capacity to mitigate or adapt to the changes. Coping, adapting and building the resilience capacities of Asia-Pacific countries towards the impacts of climate change and human activities on water resources requires a holistic approach involving systems thinking and risk management strategies. In addition, the solutions for the policy basis of water resources management should pivot on taking urgent action to utilize science, technology and innovation, local wisdom (culture) and policies relevant to water audit and management if a major crisis in water security sector to be averted.

Indonesia National Committee for IHP was established in the period of 1975 – 1980. Indonesia IHP supports activities related to : synthesizing information and knowledge gaps for addressing issues related to critical water environment systems; promoting the understanding of concepts and systems and enhancing knowledge regarding tools and technologies for the past experiences and on-going research projects related to terrestrial ecosystems processes, water issues in landscapes, rivers, floodplains, wetlands, reservoirs, coastal and urban areas.

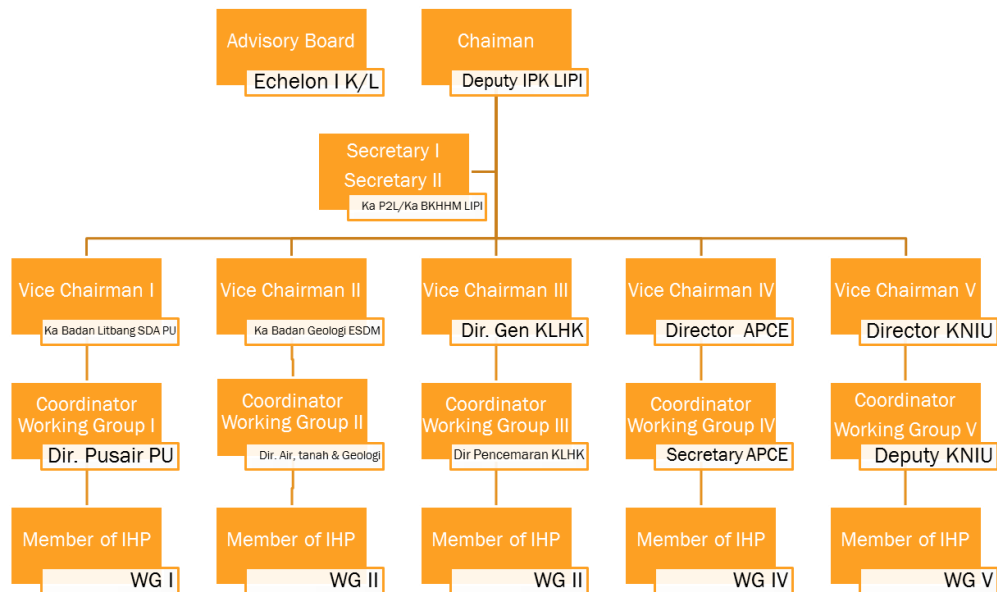
The purpose of the establishment of the IHP National Committee is reflected in the tasks as follows:

1. To foster, encourage and coordinate research activities concerning water issues conducted by various agencies.
2. Establish a national program in hydrology research to support national development inlining with UNESCO IHP
3. Acting as an advisory body to the Indonesian Institute of Sciences in matters related to research topics on water issues.
4. Acting as the National Committee in the relationship and cooperation with international agencies in the field of water issues, in particular with UNESCO IHP.
5. Acting as an information center for activities and research outcomes related to water issues in Indonesia

In order to support the IHP Phase VIII programs, Indonesian National Committee for IHP has revitalized the management structure. IHP Chairman will be assisted by five deputy chairman who oversees five main themes listed in the program of the IHP Phase VIII. New Indonesian National Committee structure for IHP shown in figure 1.

The 5 themes and working group are :

- o THEME 1/WORKING GROUP I : WATER-RELATED DISASTERS AND HYDROLOGICAL CHANGE : Ministry of Public Works and Housing
- o THEME 2/WORKING GROUP II : GROUNDWATER IN A CHANGING ENVIRONMENT : Ministry of Energy and Minerale Resources
- o THEME 3/WORKING GROUP III : ADDRESSING WATER SCARCITY AND QUALITY : Ministry of Environment and Forestry
- o THEME 4/WORKING GROUP II: WATER AND HUMAN SETTLEMENTS OF THE FUTURE : Ministry of Public Works and Housing
- o THEME 5/WORKING GROUP IV: ECOHYDROLOGY, ENGINEERING HARMONY FOR A SUSTAINABLE WORLD : APCE-UNESCO LIPI
- o THEME 6/WORKING GROUP V: WATER EDUCATION, KEY FOR WATER SECURITY : Ministry of Education and Culture (KNIU)



Chairman of Indonesia National Committee of IHP : Assoc. Prof. Dr. Ir. Zainal Arifin, MSc

RECENT ACTIVITIES

Many activities have already done during the last 5 years :

- 2011 : in this year, Indonesia IHP participated in the project of SWITCH in ASIA (Collaboration with UNESCO Jakarta Office and RC Limnology LIPI); World Water Day celebration (Collaboration with UNESCO Jakarta Office and RC Limnology LIPI); National Seminar on Ecohydrology (Collaboration with RC Limnology)
- 2012 : Indonesia IHP supported the Designing of APCE Building and attended to several meeting for : Public Communication related to Demosite in Saguling Reservoir area, West Java; preparing the WLC in Indonesia with ILEC in Kyoto; Public Awareness of water resources management in Islamic Boarding School in Ciamis, West Jawa; 20th RSC IHP AP in Langkawi, Malaysia
- 2013 : Indonesia IHP as co host with APCE-UNESCO for IFAS Training Course in collaboration with ICHARM and UNESCO Jakarta Office; Public Awareness of water resources management

in Islamic Boarding School in Ciamis, West Jawa; attended to 21th RSC IHP AP in Daegu, Korea; assisted to APCE Building construction; supported APCE-UNESCO in contributing article in UNESCO Free Flow Publication.

- 2014 : Indonesia IHP supported the Training Workshop on Lake Management hosted by APCE-UNESCO in Collaboration with ILEC Japan, Public Communication for Demosite in Saguling Reservoir, West Jawa); attended to IHP Council Meeting in UNESCO, Paris: invited as Kynote Speaker for Internasional Symposium on Landscape in Canberra; attended to WLC 15 in Perugia; as host for 22th RSC IHP AP and Ecohydrology Training Course, and International Conference cn Ecohydrology (ICE 2014), in Yogyakarta, Indonesia; attended to the Meeting for Water Diplomacy in Koblenz, Germany.
- 2015 : Indonesia IHP actively support for preparation of 16th World Lakes Conference hosted by Indonesia in 2016; as keynote speaker for National Celebration of World Water Day 23 March in Jakarta; attended to World Water Forum as key resource person, April 2015 in Gyonju, Korea; support research activities for APCE-UNESCO in collaboration with UNESCO Jakarta Office; attended to UNESCO Water Centre and Chairs Meeting in Kuala Lumpur – malaysia.

NEXT ACTIVITIES

In the new phase of IHP, Indonesia IHP National Committe will actively engage by planing, coordinating and collaborating related to International Hydrological Program :

- Getting more support from the Government (Relationship, Institutionally, Financially)
- Strengthening the networking with the center under UNESCO, Universities, other institutions
- Developing demosite in selected and specific purpose: Small Island Demosite, Karstic, Ecohydrology Demosite, Peatland ecohydrology Demosite....
- Promoting research and activities related to :
 - Sustainable water management for developing resilience cities
 - Ecohydrology for water security in urban and rural areas
 - Development of appropriate technologies for water security in marginal areas
 - Strengthening water management capacity for local communities

Recorded Activites



Figure 2.: Opening Ceremony of ICE2014, from the left to the right : Prof. Hubert Gijzen, Drs. Sulistyto, Prof. Iskandar Zulkarnain, Dr. Taufik Hanafi, Prof. Kaoru Takara



Figure 3.: Best practice enlightenment by Capacity building of community leaders



Figure 4.: IHP Training Course Lectures and Participants in November 2015, Yogyakarta – Indonesia



Figure 5.: 22th RSC Meeting of IHP Asia and The Pacific, in November 2014 Yogyakarta – Indonesia



Figure 6.: Side Meeting of IHP in World Water Forum in April 2015 Daegu - Korea



Figure 7.: Water Centres and Chairs Meeting in May 2015. Kuala Lumpur – Malaysia



Figure 8.: Attending for 2nd International Conference on Ecohydrology, September 21 - 23, 2015 in Lyon – France

NATIONAL REPORT ON IHP-RELATED ACTIVITIES

Japan

Various activities of UNESCO have been implemented under the support of the Japanese National Commission for UNESCO with financial contribution in the form of Fund-in-Trust (JFIT) for the Promotion of Science for the Sustainable Development. Japanese National Committee for IHP of UNESCO is expected to solve complex global challenges through following activities with a cross-cutting approach in collaboration with all the studies including social and human sciences, in addition to changing value. The following summary includes the activities of Japanese National Committee for IHP of UNESCO undertaken during April 2014 to October 2015.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD APRIL 2014 – OCTOBER 2015

1.1 Composition of the IHP National Committee

The composition of the Japanese IHP National Committee is as follows:

Members of the IHP National Committee as of October 2015.

	Name	Position	E-mail
Chair*	TAKARA Kaoru	Director and Prof., DPRI, Kyoto Univ.	takara.kaoru.7v@kyoto-u.ac.jp
*	UEMATSU Mitsuo	Director and Prof., CICAORI, Univ. of Tokyo.	uematsu@aori.u-tokyo.ac.jp
*	KURODA Reiko	Prof. Tokyo Univ. of Science	rkuroda@rs.tus.ac.jp
	ISHIZAKA Joji	Prof., ISEER, Nagoya Univ.	jishizak@hyarc.nagoya-u.ac.jp
	OKI Taikan	Prof., IIS, Univ. of Tokyo	taikan@iis.u-tokyo.ac.jp
	KAZAMA Futaba	Prof., Univ. of Yamanashi	futaba@yamanashi.ac.jp
	KAWAMURA Akira	Prof., Tokyo Metropolitan Univ.	kawamura@tmu.ac.jp
	TACHIKAWA Yasuto	Prof., Kyoto Univ.	tachikawa@hywr.kuciv.kyoto-u.ac.jp
	TANIGUCHI Makoto	Prof., RIHN	makoto@chikyu.ac.jp
	TSUJIMURA Maki	Prof., Univ. of Tsukuba	mktsuji@geoenv.tsukuba.ac.jp
	NAKAYAMA Mikiyasu	Prof., Univ. of Tokyo	nakayama@k.u-tokyo.ac.jp
	HARUYAMA Shigeko	Prof., Mie Univ.	haruyama@bio.mie-u.ac.jp
	HORI Tomoharu	Prof., WRRRC, DPRI, Kyoto Univ.	hori.tomoharu.3w@kyoto-u.ac.jp
	YOSHITANI Junichi	Deputy Director, ICHARM, PWRI	j-yoshitani@pwri.go.jp
	WATANABE Tsugihiko	Prof., Kyoto Univ.	nabe@kais.kyoto-u.ac.jp

Notes:

- * Member of the Japanese National Commission for UNESCO;
- CICAORI: Center for International Collaboration, Atmosphere and Ocean Research Institute;
- DPRI: Disaster Prevention Research Institute, Kyoto University;
- ICHARM: The International Centre for Water Hazard and Risk Management (UNESCO Category II Centre);
- IIS: Institute for Industrial Sciences, University of Tokyo;
- ISEER: Institute for Space-Earth Environmental Research, Nagoya University (formerly Hydrospheric Atmospheric Research Center (HyARC));
- PWRI: Public Works Research Institute;
- RIHN: Research Institute for Humanity and Nature; and
- WRRRC: Water Resources Research Center.

Secretariat of the Japanese National Committee for IHP, UNESCO:

c/o Mr. NODA Takao

Japanese National Commission for UNESCO,

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

3-2-2 Kasumigaseki, Chiyoda-ku, Tokyo 100-8959, Japan

E-mail: "Natcom Japan" <jpnatcom@mext.go.jp>

TEL: +81-(0)3-6734-2585 / FAX: +81-(0)3-6734-3679, <http://hywr.kuciv.kyoto-u.ac.jp/ihp/japan/>

Special Notes:

We would like to make special mention that Dr. Yutaka Takahasi received the Japan Prize in the field of Resources, Energy and Social Infrastructure, by his outstanding activities on “Contribution to development of innovative concept on river basin management and reduction of water-related disasters” on 23 April 2015. Dr. Takahasi served IHP as Vice-Chairperson (1990-1991) of Intergovernmental Council and the first Chairperson (1993-1996) of the IHP Regional Steering Committee for Southeast Asia and the Pacific. This is the first time for a hydrological scientist to receive such a big award. We are very proud of him and would like to share this great news with sincere congratulations. For further details of the prize, see http://www.japanprize.jp/en/prize_prof_2015_takahasi.html.

We are also very pleased to have a meeting on Cooperation with UNESCO on Water-Related Activities and Projects, with Madam Flavia Schlegel, Assistant Director-General for Natural Science, UNESCO, at the Graduate School of Advanced Integrated Studies, Kyoto University on 3 October 2015 at her occasion of visiting Kyoto to attend the 12th Science and Technology in Society (STS) Forum on 3-5 October 2015. Dr. Kaoru Takara (Chair, Japanese IHP National Committee), Dr. Toshio Koike (Director, ICHARM), Dr. Koichiro Oshima (Vice-President, Kyoto University), Dr. Yosuke Yamashiki (Chairperson, UNESCO-IHP International Initiative on Water Quality (IIWQ) International Experts Advisory Group) and other Kyoto University Professors welcomed her and had a mutually beneficial time to exchange various kinds of information on IHP activities at UNESCO Headquarters, regional and national levels, as well as ones of Kyoto University and ICHARM.

1.2 Status of IHP-VIII activities

Various activities relating to IHP-VIII (2014-2018) Themes have been implemented since 2014 as follows.

THEME 1: Water Related Disasters and Hydrological Changes

FA 1.1 – Risk management as adaptation to global changes

- Climate change research under the MEXT SOSEI program “Program for Risk Information on Climate Change” is intensively conducted from 2012 to 2016
- Development of a new flood management method utilizing paddies into river management against global warming [National Institute for Rural Engineering (NIRE), Univ. of Tsukuba, Univ. of Tokyo]

FA 1.2 – Understanding coupled human and natural processes

- Hydrogeological and sociological survey on development processes of East-Asian cities co-existing with floods [Kyoto Univ.]

FA 1.3 – Benefiting from global and local earth observation System

- Global water cycle assessment: IHP contribution to GEOSS [Univ. of Tokyo] There are number of activities led by Prof. Koike (Univ. of Tokyo) and others such as International Coordination Group (ICG) Meetings on the Global Earth Observation System of Systems (GEOSS) and Asian Water Cycle Initiative (AWCI) (GEOSS/AWCI/ICG) 10th GEOSS/AWCI/ICG Meeting, Tokyo, Japan, 26-30 May 2014
- Scientific sessions on interaction between hydrological cycle and physical/biochemical oceanography by cooperation between IHP and IOC held at annual meetings of JpGU in Pacifico Yokohama, Kanagawa, Japan, 28 April - 2 May 2014 and Makuhari Messe, Chiba, Japan, 24-28 May 2015 [JAMSTEC, Univ. of Tokyo, Kyoto Univ.]

FA 1.4 – Addressing uncertainty and improving its communication

- Climate change research under the MEXT SOSEI program “Program for Risk Information on Climate Change” is intensively conducted from 2012 to 2016

FA 1.5 – Improve scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events

- A Global Center of Excellence (GCOE) Program at Kyoto University “Sustainability/Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions” adopted for 2009-2014. Interdisciplinary research and education at Ph.D. level is implemented at Kyoto University for extreme weather and water conditions [Takara, Tachikawa and others].
- Collaborative joint research for hydrologic prediction between Yangon Technological University and Kyoto University has been launched in 2014. [Kyoto Univ.]
- Flood forecasting and management [ICHARM, PWRI, IFNet, JMA and universities] under the MEXT SOSEI Program from 2012 to 2017, changes of water-related disasters and water resources under global warming were investigated.

- Committee on Hydrosience and Hydraulic Engineering, JSCE, launched the subcommittee on flood risk management in 2013, which is in charge of field survey of actual flood cases (the subcommittee is chaired by Hori). The subcommittee conducted the field survey in five large flood and geo-hazard events which occurred in 2014 and 2015.
- Research Project on Disaster Prevention/Mitigation Measures against Floods and Storm Surges in Bangladesh [Prof. Nakagawa, DPRI, Kyoto Univ.] under SATREPS from 2013 to 2018.

THEME 2: Groundwater in a Changing Environment

FA 2.1 – Enhancing sustainable groundwater resource management

- GWES (Groundwater in Emergency Situations).
Great Eastern Japan Earthquake and Tsunami showed the importance of groundwater use in emergency situation during disasters.
- UNESCO Chair on Sustainable Groundwater Management in Mongolia at the Institute of Geography and Geoecology, Mongolian Academy of Sciences and the University of Tsukuba, Japan. UNESCO has decided to launch Phase 3 activity (for next 4 years) of this chair between Mongolian Academy of Sciences and the University of Tsukuba in August 2015. The new phase of the chair will focus on the monitoring of the groundwater and the surface water interaction and the consultant on the sustainable groundwater resources governance in Ulaanbaatar, capital city of Mongolia.
- Frontier of sustainable groundwater management systems based on groundwater flow process in arid/semi-arid region in cooperation with China and Mongolia [Univ. of Tsukuba, Hiroshima Univ., Kumamoto Univ.]
- A research project on the impact of the forest thinning on the groundwater recharge funded by CREST Program of the Japan Science and Technology Agency (JST). [Univ. Tsukuba, Kyoto Univ., Univ. Tokyo, Kyushu Univ.]
- IAEA (International Atomic Energy Agency) / UNESCO Technical Meeting on Groundwater Contamination Following the Fukushima Nuclear Accident was held at IAEA Headquarters, Vienna, 8 – 10 September 2014 to discuss the nature of groundwater and surface water contamination at the Fukushima NPS and its vicinity, and to share the experiences, particularly in terms of countermeasures and communication with stakeholders, at other areas, such as Chernobyl, Ukraine, Sellafield, UK, and Hanford and Brookhaven, USA [Tsujimura, Univ. Tsukuba]

FA 2.2 – Addressing strategies for management of aquifers recharge

- UNESCO Chair on Sustainable Groundwater Management in Mongolia at the Institute of Geo-ecology, Mongolian Academy of Sciences and the University of Tsukuba, Japan. The chair activity has been continued actively focusing on the monitoring of the groundwater and the surface water interaction and the consultant on the sustainable groundwater resources governance in Ulaanbaatar, capital city of Mongolia.

FA 2.3 – Adapting to the impacts of climate change on aquifer systems

- Groundwater resources assessment under the pressure of humanity and climate change (GRAPHIC) [Research Institute for Humanity and Nature (RIHN)]
UNESCO-GRAPHIC organized several international activities including symposiums and training courses to evaluate the effects of climate change and human activities on groundwater resources.

FA 2.4 – Promoting groundwater quality protection

UNESCO-IHP International Initiative on Water Quality (IIWQ) organized UNESCO International Scientific Symposium “Scientific, Technological and Policy Innovations for Improved Water Quality Monitoring in the Post-2015 SDGs Framework under the collaboration with Kyoto University and Lake Biwa Environmental Research Institute, 15th – 18th July, 2015 in Kyoto.

THEME 3: Addressing Water Scarcity and Quality

FA 3.1 – Improving governance, planning, management, allocation and efficient use of water resources

- DPRI initiated the Japan Egypt-Hydro Network (JF-HydroNet) with the coordination with three Egyptian Institutions under the umbrella of GCOE-ARS project at Kyoto Univ. for a joint research and education project on the water resources and environmental problems of the Nile Delta of Egypt [Prof. Tetsuya Sumi, WRRC, DPRI, Kyoto Univ.].
- Hydro-microbiological Approach for Water Security in Kathmandu Valley, Nepal [Prof. Kazama, Univ. of Yamanashi] under SATREPS from 2013-2018.
- Asian G-WADI (Global Network on Water and Development Information for Arid Lands) and International Draught Initiative (IDI) held 6th Asian G-WADI and 1st IDI Expert Group Meeting, 13th – 16th June 2015, Tehran, Iran. [Prof. Tsujimura, Univ. Tsukuba]

THEME 4: Water and Human Settlements of the Future

FA 4.2 – System wide changes for integrated management approaches

- Development of a Comprehensive Disaster Resilience System and Collaboration Platform in Myanmar [Prof. Meguro, IIS, Univ. of Tokyo] under SATREPS from 2014 to 2019.

THEME 5: Ecohydrology, Engineering Harmony for a Sustainable World

FA 5.1 – Hydrological dimension of a catchment - identification of potential threats and opportunities for a sustainable development

- Hydrological and ecological impact assessment of long-term global warming on river basins in the world [Kyoto Univ.]

FA 5.2 – Shaping of the catchment ecological structure for ecosystem potential enhancement - biological productivity and biodiversity

- Valorization of Bio-resources in Semi- arid and Arid Land for Regional Development [Univ. Tsukuba]
Univ. Tsukuba has performed an international collaboration research on the relationship between the bio-resources and surface water/ groundwater resources in semi-arid regions in Tunisia funded by SATREPS (Science and Technology Research Partnership for Sustainable Development) of the Japan International Cooperation Agency (JICA) and the Japan Science and Technology Agency (JST).

FA 5.3 – Ecohydrology system solution and ecological engineering for the enhancement of water and ecosystem resilience and ecosystem services

- Ecohydrology workshop and Steering Committee for IHP-VIII [Takemon]
A workshop on “Ecohydrology for Sustainable Development “ and Steering Committee Meeting for IHP-VIII were held at UNESCO Headquarters in Paris on 20-21 May 2014. Dr. Takemon (Water Resources Research Center, DPRI, Kyoto Univ.) attended the meeting and joined the discussion. As a result of discussion the committee proposed six target subjects in Ecohydrology for IHP-VIII: 1) Ecohydrologic technologies- green infrastructure, 2) Ecosystem services quantification and evaluation, 3) Ecohydrologic dynamics from basin scale to global scale, 4) Environmental flow regime science and management, 5) Hazards function and adaptation, and 6) Governance, morality and traditional knowledge.

THEME 6: Water Education, Key for Water Security

FA 6.2 –Addressing vocational education and training of water technicians

- To share the knowledge of hydrologic modeling techniques and enhance the understanding of hydrologic predictions, CommonMP (Common Modeling Platform for water-material circulation analysis) was developed at the National Institute for Land and Infrastructure Management [NILIM].
- Promoted UNESCO’s “IWRM Guidelines at river basin level (IWRM Guidelines)” by NARBO (Network of Asian River Basin Organizations)
- Implementation of NARBO IWRM training programme by using IWRM Guidelines as a main text book in November 2012, and November 2013 in Sri Lanka and May 2014 in Philippines
- Preparation for Educational material of IWRM guidelines for UNESCO by Japan Water Agency, secretariat of NARBO.
- International Environment Leaders Training Program funded by Ministry of Education, Culture, Sports, Science and Technology (MEXT) [Univ. Tsukuba, Kyoto Univ., Univ. Tokyo, Kumamoto Univ. et al.]

FA 6.3 – Water education for children and youth

- Kyoto University implemented Global COE Program “Sustainability/Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions” supported by MEXT and JSPS (2009-2014) [Takara].
- Kyoto University is implementing a Leading Graduate Schools Program “Inter-Graduate School Program for Sustainable Development and Survival Societies” (2011-2018) [Takara, Hori, Tachikawa].
- ICHARM Training Programmes and a one-year Master Degree Program on water-related risk management in cooperation with the National Graduate Institute for Policy Studies (GRIPS) supported by JICA.
- Six short-term training courses have been conducted about Early Warning System, June 2012-August 2014 [ICHARM].
- University of Tsukuba has performed an “Environmental Diplomatic Leader Education Program” to foster leaders having comprehensive capacity in the field of environment and sustainable development on graduate level from July 2009 - March 2014.
- University of Tsukuba has launched a new graduate level English course “SUSTEP (Sustainability Science, Technology and Policy) Program” to educate global leaders having comprehensive capacity of environment and sustainable development since April 2014.

1.3 Other regional and cross-cutting themes activities

(1) Post Catalogue of Rivers:

- Activities for post Catalogue of Rivers for Southeast Asia and the Pacific has been discussed. The information of the six volumes locates at: <http://hywr.kuciv.kyoto-u.ac.jp/ihp/japan/riverCatalogue.html>

(2) Asian Pacific FRIEND:

- With the dissemination of information from the SEAP region it is hoped that there will be better understanding and co-operation on matters related to water resources within each country as well as regionally. Of particular importance was the establishment of the Asian Pacific FRIEND, a UNESCO-IHP regional collaborative project, and the Asian Pacific Water Archive (APWA) that archives and makes available hydrometeorological and related data for Asian Pacific FRIEND projects and other IHP related activities in the region. Japan has been contributing to Asian Pacific FRIEND since its first Technical Sub-Committee (TSC) meeting in Kuala Lumpur in May 1997.

(3) International Flood Initiative (IFI), International Sediment Initiative (ISI) and International Programme on Landslides (IPL):

- Contribution to IFI as secretariat

ICHARM has been serving as the secretariat of the International Flood Initiative (IFI), a joint initiative with international organizations such as UNESCO (IHP), WMO, UN/ISDR, UNU, IAHS and IAHR. ICHARM manages the IFI website (<http://www.ifi-home.info/>) and compiles inputs, materials and tools provided by member agencies, while also providing its own outputs. With respectful contributions from participatory organizations, IFI has been making an effort to conceptualize, design and implement flood mitigation and protective actions and activities. Being intimately aware of the achievements that have been made in flood management in the last decade, IFI has also tried to foster the mobilization of resources and networks of the UN system, non-governmental organizations and so on in order to assist communities and governments in developing culturally sensitive flood management strategies and thereby addressing sustainable development, such as through IFI flagship project “to support benchmarking flood risk reduction at global, national and local levels” since 2013. ICHARM organized the IFI plenary session at the 6th International Conference on Flood Management (ICFM6), Sao Paulo, Brazil on 16 September 2014, and planned to organize the plenary session during the 23rd IHP RSC meeting to discuss how to step forward as the post-2015 and revitalize its activities aimed at the integrated flood management through monitoring, assessment and capacity building at regional levels.

(4) UNESCO Chair on Sustainable Groundwater Management in Mongolia (Phase 3):

- Phase 3 has been launched in August 2015 (for next 4 years) between Mongolian Academy of Sciences and the University of Tsukuba. The new phase of the chair will focus on the monitoring of the groundwater and the surface water interaction and the consultant on the sustainable groundwater resources governance in Ulaanbaatar, capital city of Mongolia.

(5) International Commission on Tracers (ICT), International Association of Hydrological Sciences (IAHS)

- The ICT commission has established the session: “Tracer methods for understanding the response of hydrological systems to transient contamination” (Hw15) by 26th IUGG (International Union of Geodesy and Geophysics) General Assembly to be held in Prague, in June 2015 [Tsujimura, M., Univ. Tsukuba as a Vice President of ICT].
- The ICT commission has establish the workshop “Tracer and isotope hydrology” (S8.4) by 42nd IAH (International Association of Hydrogeologists) Congress, to be held in Rome, Italy in September 2015 [Tsujimura, M., Univ. Tsukuba as a Vice President of ICT].

1.4 Activities at national level in the framework of the IHP

1.4.1 National/local scientific and technical meetings

- IHP Training Course Task Forth Meetings in Nagoya and Kyoto and Working Group Meetings in Tokyo (Prof. Uyeda, Prof. Nakamura, Prof. Takara, Prof. Ishizuka and Prof. Sumi) were held several times to discuss the organization of the Training Courses, the plan for the 23rd and 24th Training Courses, future direction, and the reviews.
- The 29th IHP National Committee meeting was held at MEXT on 4 June 2014 to discuss various issues relating to the 21st Session of IHP Intergovernmental Council (June 2014) and IHP-VIII (2014-2021).

1.4.2 Participation in IHP Steering Committees/Working Groups

- The 22nd RSC was held in Yogyakarta, Indonesia in conjunction with UNESCO-IHP and the International Conference on Ecohydrology, 10-14 November 2014. [Takara, Chikamori, Tachikawa, Kobayashi]

1.4.3 Research/applied projects supported or sponsored

- MEXT Sosei Program “Climate Change Risk Information” 2012-2016 [ICHARM, PWRI, IFNet, Kyoto Univ., Univ. Tokyo and others]

- Global COE Program “Sustainability/Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions” (GCOE-ARS) 2009-2014 sponsored by MEXT-JSPS [PL: Prof. Kaoru Takara, DPRI, Kyoto Univ.]
- JSPS-Asian Core Program, " Research and Education Center for the Risk Based Asian Oriented Integrated Watershed Management," 2011-2015 [PI: Prof. Yoshihisa Shimizu, Kyoto Univ.]
- Program for Leading Graduate Schools “Inter-Graduate School Program for Sustainable Development and Survivable Societies” (GSS) 2011-2018 sponsored by MEXT-JSPS [PC: Prof. Kaoru Takara, DPRI, Kyoto Univ.]
- Grant-in-Aid for ODA UNESCO activities, 2015 sponsored by MEXT [Kyoto University]
- “Precise Impact Assessments on Climate Change” supported by the SOUSEI Program of the Ministry of Education, Culture, Sports, Science, and Technology (MEXT). [T. Oki, Univ. of Tokyo]
- Research Project "Developing an Integrated Water Cycle Model for Sustainability Assessment of World Water Resources" supported by Grant-in-Aid for Scientific Research of The Japan Society for the Promotion of Science. [T. Oki, The Univ. of Tokyo]
- Research Project “Research and Development for Reducing Geo-Hazard Damage in Malaysia Caused by Landslide and Flood” supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2010-2015, JST-JICA [K. Tosaka, Univ. of Tokyo]
- Research Project “Development of Landslide Risk Assessment Technology along Transport Arteries in Viet Nam” supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2011-2016, JST-JICA [K. Sassa, International Consortium on Landslides (ICL)]
- Research Project “A tracer simulator of fallout radionuclides for safe and sustainable water use” Core Research for Evolutional Science and Technology (CREST), 2011-2015, the Japan Science and Technology Agency (JST). [T. Oki, University of Tokyo]
- Research Project “Hydro-microbiological Approach for Water Security in Kathmandu Valley, Nepal” supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2013-2018, JST-JICA [F. Kazama, Univ. of Yamanashi]
- Research Project “Disaster Prevention/Mitigation Measures against Floods and Storm Surges in Bangladesh” supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2013-2018, JST-JICA [H. Nakagawa, DPRI, Kyoto Univ.]
- Research Project “Development of a Comprehensive Disaster Resilience System and Collaboration Platform in Myanmar” supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2014-2019, JST-JICA [K. Meguro, IIS, Univ. of Tokyo]
- Research Project “Advancing of Co-Design of Integrated Strategies with Adaptation to Climate Change” supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2015-2020, JST-JICA [T. Oki, IIS, Univ. of Tokyo]
- Grant in Aid for Scientific Research (B) “Interaction between Groundwater and Surface Water in Semi-arid Regions” by Japan Society for the Promotion of Science (JSPS), April 2011 – March 2015 [Tsuji-mura, M., Univ. Tsukuba]
- Grant in Aid for Scientific Research (B) “Evaluation and Mapping of Residence Time and Storage Volume of Groundwater in Headwaters in Japan Using CFCs” by Japan Society for the Promotion of Science (JSPS), April 2011 – March 2015 [Tsuji-mura, M., Univ. Tsukuba]

1.4.4 Collaboration with other national and international organizations and/or programmes

The Japanese IHP National Committee has been closely collaborating with:

- Some committees in the Science Council of Japan (SCJ), including the Sub-Committee on IRDR (Integrated Research on Disaster Reduction) of ICSU (International Science Union), ISSC (International Social Science Council) and UNISDR (United Nations Office for Disaster Risk Reduction).
- The national government and its branches relating to hydrology and water resources administration,
- Nagoya University and Kyoto University for IHP Training Courses and Graduate School and other universities and research institutes,
- The Japan Water Forum (JWF),
- World Meteorological Organization (WMO), and
- International NGOs/NPOs such as the International Association of Hydrological Sciences (IAHS), the International Water Resources Association (IWRA), the International Association for Hydro-Environment Engineering and Research (IAHR), the Asia Pacific Association of Hydrology and Water Resources (APHW), Asia Oceania Geosciences Society (AOGS) and the International Consortium on Landslides (ICL).

1.4.5 Other initiatives

ICHARM: International Centre for Water Hazard and Risk Management under the auspices of UNESCO was established in Tsukuba, Japan in March 2006, after getting accreditation by the member states of UNESCO at the 33rd General Conference of UNESCO. Dr. Kuniyoshi Takeuchi, the former chairman of the Japanese National Committee for UNESCO-IHP, was assigned as the first Director of ICHARM. In its inception, ICHARM has been playing core roles in research, training, and information networking activities on water-related disasters at global levels. The activities are expected to contribute in the prevention and reduction of water-related disasters, focusing on flood disasters at the initial stage. On 1 October 2014, Dr. Toshio Koike, Professor of the University of Tokyo, was assigned as the second Director of ICHARM while the former director assigned as the Advisor at ICHARM.

On 23 July 2013, the Ambassador of Japan to UNESCO, H.E. Mr Isao Kiso and the Director-General of UNESCO, Irina Bokova, signed an agreement for the renewal of ICHARM at the UNESCO Headquarters in Paris. The agreement, which entered into force upon its signature, grants ICHARM the status of an international centre under the auspices of UNESCO (Category 2) for a second six-year term.

It is important to cooperate with existing UNESCO water Centers such as IHE in the Netherlands, HidroEX in Brazil, IRTCES in China, HTC in Malaysia and RCUWM in Iran, etc. The outline of ICHARM is as follows.

1) Mission: The mission of the Centre is to serve as the Global Centre of Excellence for Water Hazard and Risk Management by, inter alia, observing and analyzing natural and social phenomena, developing methodologies and tools, building capacities, creating knowledge networks, and disseminating lessons and information in order to help governments and all stakeholders manage risks of water-related hazards at global, national, and community levels. The hazards to be addressed include floods, droughts, landslides, debris flows, tsunamis, storm surges, water contamination, and snow and ice disasters. The Centre envisions a Center of Excellence housing a group of leading people, superior facilities, and a knowledge base which enables conducting i) innovative research, ii) effective capacity building, and iii) efficient information networking. Based on these three pillars, ICHARM will globally serve as a knowledge hub for best national/local practices and an advisor in policy making.

2) Functions:

- (i) to promote scientific research and to undertake effective capacity-building activities at the institutional and professional levels;
- (ii) to create and reinforce networks for the exchange of scientific, technical and policy information among institutions and individuals;
- (iii) to develop and coordinate cooperative research activities, taking advantage particularly of the installed scientific and professional capacity of the IHP networks, WWAP, the IFI/P and relevant programmes of non-governmental organizations, international institutions and networks;
- (iv) to conduct international training courses for practitioners and researchers on the global level; and
- (v) to organize knowledge and information transfer activities including international symposia or workshops, and to engage in appropriate awareness-raising activities;

3) Structure: The center is established as a part of the Public Works Research Institute (PWRI) and operated under the responsibility of its Chief Executive.

Based on the renewed agreement between the UNESCO and the Government of Japan on ICHARM, the Governing Board was established. The first Governing Board meeting was held on February 25, 2014, and examined and adopted the “Rule of Procedure”, “ICHARM Long-term (around 10 years) and Mid-term (around 5 years) Programmes” and the “ICHARM Work Plan (From April 2014 to March 2016)” that describes the detail of activity plan. Also reviewed is the “ICHARM Activity Report” dated from October 2010 to March 2014 (including the plan for February and March 2014). Following members are designated as the Governing Board Members from February 25, 2014 to the next board meeting;

Takashi Shiraishi, President, National Graduate Institute for Policy Studies (GRIPS)

Johannes Cullmann, former Chairperson, International Hydrological Programme Intergovernmental Council;
German Federal Institute of Hydrology (BfG)

Margareta Wahlström, Special Representative of the Secretary-General for Disaster Risk Reduction, United Nations Office for Disaster Risk Reduction (UNISDR)

Akihiko Tanaka, President, Japan International Cooperation Agency (JICA)

Toshiyuki Adachi, Vice Minister for Engineering Affairs, Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

Taketo Uomoto (Chairperson), Chief Executive, Public Works Research Institute (PWRI)

Irina Bokova, Director-General, United Nations Educational, Scientific and Cultural Organization (UNESCO)

See other information at: <http://www.icharm.pwri.go.jp/html/about/index.html>

The events related to the ICHARM are summarized as below:

- (1) The First United Nations Office for Disaster Risk Reduction (UNISDR) Asia Partnership Meeting on 22-24 April 2014 in Bangkok, Thailand

- (2) The third meeting for the High-Level Experts and Leaders Panel on Water and Disasters (HELP) on 27-28 May 2014 in Rotterdam, the Netherlands.
- (3) The Central Asia Climate Knowledge Forum: Moving towards Regional Climate Resilience on 13-15 May 2014 in Almaty, Kazakhstan
- (4) The 7th Global Earth Observation System of Systems (GEOSS) Asia-Pacific Symposium on 26-28 May 2014, in Tokyo, Japan
- (5) Introduction of Auto IFAS at the headquarter of Philippine Atmospheric Geophysical & Astronomical Services Administration (PAGASA) in the Philippines on 4-6 June 2014
- (6) Side Event of the 6th Asian Ministerial Conference on Disaster Risk Reduction on 23 June 2014 in Bangkok, Thailand
- (7) IFAS Workshop hosted by JICA and the Japan Science and technology Agency (JST) in University Tenaga nasional, Malaysia on 30 June -4 July 2014
- (8) ICHARM's acoustic Doppler current profiler (aDcp) was awarded the 16th Infrastructure Technology Development Award presented by Minister of Land, Infrastructure, Transport and Tourism (MLIT), Japan on 30 July 2014
- (9) Signing Memorandum of Understanding for potential research collaboration with Regional Centre on Urban Water Management (RCUWM) in Tehran, Iran in the presence of the ambassador of the Islamic Republic of Iran and Chief Executive of PWRI on 1 September 2014 in Tsukuba, Japan
- (10) WMO APFM Advisory Committee and Management Committee on 8-9 September 2014 in Geneva, Switzerland
- (11) ICHARM's IFI plenary session during at the 6th International Conference on Flood Management (ICFM6) on 16 September 2014 in Sao Paulo, Brazil
- (12) Field survey for research project on observation of large-scale inundation area on 11-18 September 2014 in the Jamuna River, Bangladesh
- (13) The second inception meeting of ADB (TA8456) Part II: The Capacity Development Technical Assistance Project initiated in 2014, convened on 16 September 2014 in Nay Pyi Taw, Myanmar
- (14) ICHARM international symposium "together with the people coping with increasing water-related disasters in the world" collaborated with the National Graduate Institute for Policy Studies (GRIPS) on 30 September 2014 in Tokyo, Japan
- (15) The World Bank seminar "Understanding risk in an Evolving World: Emerging Best practices in Natural Disaster Risk Assessment" on 1 October 2015 in Tokyo, Japan
- (16) IFAS Workshop hosted by JICA and the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) in Jakarta, Indonesia on 6-10 October 2014
- (17) Field Survey on housing on a river flow observation and Hearing Survey on housing on 9-14 October 2014 in the Lower Mekong Basin, Cambodia
- (18) The Coordinator Meeting of the 7th World Water Forum on 24 October 2014 in Marseille, France (participated as the coordinator of the design group of the theme 1.3, 'Adapting to Change: Managing Risk and Uncertainty for Resilience and Disaster Preparedness,' in the theme process and a design group member of the main focus 3, 'Water and Natural Disaster,' in the science and technology process and proposed a session of the UNESCO IHP RSC in the main focus 3).
- (19) The 23rd United Nations Secretary General's Advisory Board on Water and Sanitation (UNSGAB) on 29-31 October 2014 in Tokyo, Japan
- (20) The 16th Governing Council Meeting of Asia-Pacific Water Forum and second Asia-Pacific Regional Preparatory meeting for the 7th World Water Forum on 19 November 2014 in Seoul, South Korea
- (21) The second Joint project team meeting of Sentinel Asia, an initiative in which disaster management and space agencies in the Asian region, at the full-fledged implementation stage (Step 3) on 19-21 November 2014 in Yangon, Myanmar
- (22) The Workshop "River Basin Management using Science and Technology" co-hosted by the JICA-JST SATREPS Myanmar Project (University of Tokyo and Yangon Technical University), the Network of Asian River Basin Organization and the Ministry of Transportation, Myanmar on 24 November 2014, Nay Pyi Taw, Myanmar
- (23) The International Water Association (IWA) regional seminar "Challenges and Responses to Extreme Climate Events" on 25-26 November 2014 at the Asian Institute of Technology in Bangkok, Thailand
- (24) The UNESCO IHP second Category 2 Centres (C2C) meeting at German Federal Institute of Hydrology (BfG) on 15-17 December 2014 in Koblenz, Germany
- (25) The THA 2015 International Conference on "Climate Change and Water & Environment Management in Monsoon Asia" hosted by Thai Hydrologist Association on 28-30 January 2015 in Bangkok, Thailand
- (26) Courtesy visit and meeting with the Minister of Public Works and Housing on the "Program for Risk Information on Climate Change", called SOUSEI program by MEXT on 9-10 February 2015 in Jakarta, Indonesia

- (27) 47th Session of the UNESCAP/WMO Typhoon Committee session on 9-13 February 2015 in Bangkok, Thailand
- (28) ADB (TA8456) training on RRI Model and Storm Surge Model on 16-20 February 2015 at the Department of Meteorology and Hydrology (DMH) in Nay Pyi Taw, Myanmar
- (29) The Workshop on Flood Contingency Planning with Evidence-based Simulation on 24 February 2015 at the Calumpit Municipal Office in the Philippine
- (30) The International Seminar on Enhancing Resilience against Multi-Hazards through Effective Mitigation Systems and Adaptation Strategies jointly organized by UNESCO and the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) on 24-26 February 2015, Manila, the Philippine
- (31) Follow up seminar for ICHARM training on 3-4 March 2015 in Jakarta, Indonesia
- (32) The 3rd United Nations World Conference on Disaster Risk Reduction (UNWCDRR) on 14-18 March 2015 in Sendai, Japan
- (33) The 7th World Water Forum on 12-17 April 2015 in Daegu and Gyeongbuk, Korea
- (34) The workshops on sediment disasters and management on 25-26 May 2015 in Taipei, Taiwan
- (35) The 30th ISO/TC113 (the standardization of hydrometry, or measurement of liquid flow in open channels) meeting on 25-29 May 2015 at JSCE in Tokyo, Japan
- (36) The Integrated Research on Disaster Risk (IRDR) 13th Science Committee on 2-4 June 2015 in Qingdao, China
- (37) The 17th Governing Council Meeting of Asia-Pacific Water Forum on 10 June 2015 in Singapore
- (38) ADB (TA8456) “Training of Trainers (ToT) on RRI Model and Storm Surge Model on 15-17 June 2015 at the Department of Meteorology and Hydrology (DMH), followed by DMH Consultation Meeting for Risk Assessment on 18 June 2015 in Nay Pyi Taw, Myanmar
- (39) The 26th International Union of Geodesy and Geophysics (IUGG) General Assembly on 22-28 June 2015 in Prague, Czech
- (40) The 2015 International Workshop on Typhoon and Flood (IWTF) on 27-29 June 2015 in Taipei, Taiwan
- (41) WMO APFM Advisory Committee and Management Committee on 7-8 September 2015 in Geneva, Switzerland
- (42) The workshop for the UNESCO project “Enhancing natural Hazards resilience in South America (ENHANS)” on 21-22 September 2015 in Lima, Peru
- (43) IFAS Workshop hosted by JICA and the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) in Jakarta, Indonesia on 5-9 October 2015
- (44) The 11th APRU Research Symposium on Multi-Hazards around the Pacific Rim (APRU 2015) on 7-11 October 2015 in Tacloban, the Philippines
- (45) ADB (TA8456) Interim Meeting and workshop training on RRI Model and Storm Surge Model on 11-17 October 2015 in Nay Pyi Taw, Myanmar
- (46) 48th Session of the UNESCAP/WMO Typhoon Committee session on 25-31 October 2015 in Malaysia

1.5 Educational and Training Courses

1.5.1 Contribution to IHP courses

The UNESCO IHP Japan Training Course (TC) was initiated as UNESCO IHP Nagoya Training Course by Nagoya University in 1991 and has been held every year since then. Topics of the course are selected to fit the IHP themes. The host or convener body is the Hydrospheric Atmospheric Research Center (HyARC), Nagoya University (Note that the HyARC has been reorganized as the ISEER (Institute for Space-Earth Environmental Research, Nagoya University) since 1 October 2015). After the 19th TC, the Water Resources Research Center, Disaster Prevention Research Institute (DPRI), Kyoto University joined as a co-convener. Now both Nagoya University and Kyoto University are taking the convener role alternatively. This made the TC have wider scope including water resources and disaster prevention. About ten participants from East and Southeast Asian countries selected by UNESCO Jakarta Office take lectures and practices every year in the training course.

An important development of TC is information dissemination on website. The broadcasting of the lectures to universities in Asia via the Internet was successfully performed with help of Keio University and collaboration with EST (Engineering, Science, and Technology) programme. When the visiting participants and some graduate school students join the TC's, the number is limited as only 10-20. The lectures are now available via the Internet, and many participants at remote sites can join the TC. The lectures are also open to graduate school students staying at universities in Japan. Since the TC is a good opportunity for graduate school students to learn various kinds of hydrology, water resources and disaster-related issues with trainees from abroad, the conveners of TC encourage graduate students to join the TC.

1.5.2 Organization of specific courses

ICHARM also has been conducting a one-year master's program, “Water-related Disaster

Management Course of Disaster Management Policy Program,” since 2007 in collaboration with JICA and the National Graduate Research Institute for Policy Studies (GRIPS). 19 students in the class of 2011 graduated on 14 September 2012, 12 students in the class of 2012 graduate on 17 September 2013, 12 students in the class of 2013 graduate on 12 September 2014, and 13 students in the class of 2014 graduate on 16 September 2015 with a master’s degree in disaster management. The class of 2015 started the program on 6 October 2015 with 13 students. The doctoral program in disaster management started in October 2010 in collaboration with GRIPS. One student in the class of 2010 graduated on 17 September 2013, one student in the class of 2011 on 12 September 2014, and two students in the class of 2012 on 16 September 2015 with a doctoral degree. Three students in the class of 2013, two students in the class of 2014, and two students in the class of 2015 participated from four countries.

ICHARM has been providing a short-term training course with JICA as Capacity Development for Flood Risk Management.. This training program was launched in FY2012 and designed to provide opportunity for meteorologists, river administrators and disaster management officers in flood-vulnerable developing countries to learn the use of the Integrated Flood Analysis System (IFAS), developed and upgraded by ICHARM. The other important purposes are to learn about disaster management and evacuation plans and flood response cases in Japan, and to develop an action plan for local flood management of flood-vulnerable areas in the participants’ countries. These training activities aim to enhance individual flood-coping capacities and eventually to contribute to flood damage mitigation in the countries.

1.6 Cooperation with the UNESCO-IHE Institute for Water Education and/or international/regional water centres under the auspices of UNESCO

- 1) The 24th IHP Training course textbook, Forest Hydrology-Conservation of Forest, Soil, and Water Resources, HyARC, Nagoya Univ., December 2014.
- 2) Executive Summary of World Water Development Report 2014 in Japanese, MLIT (Ministry of Land, Infrastructure, Transport and Tourism) in support of UNESCO.
- 3) An IHE representative (Mr. Biswa Bhattacharya, Senior Lecturer in Hydroinformatics) was invited to Kyoto, Japan to attend: Global Alliance of Disaster Research Institutes (GADRI) Workshop on 13 October 2015 and The First International Symposium on Flash Floods in Wadi Systems (ISFF) on 14-15 October 2015, held in Uji Campus, Kyoto University.

1.7 Participation in International Scientific Meetings

1.7.1 Meetings hosted by the country

- IHDP committee meeting was held in Yokohama, Kanagawa, Japan on 2 May 2014 at the occasion of JpGU (Japan Geoscience Union) meetings on 28 April-2 May 2014 [Haruyama].
- 11th Annual Meeting of Asia Oceania Geosciences Society (AOGS2014) in Sapporo, Japan, 28 July – 2 August 2014.
- The 3rd UN World Conference on Disaster Risk Reduction in Sendai, 14-18 March 2015 [Takeuchi, Takara, Koike]
- The 2nd Global Summit of Research Institutes for Disaster Risk Reduction, Uji Campus, Kyoto University, 19-20 March 2015.
- UNESCO International Symposium: Scientific, Technological and Policy Innovations for Improved Water Quality Monitoring in the Post-2015 SDGs Framework, Kyoto-Otsu, Japan, 15-18 July 2015 [Yamashiki, Takara, Tsujimura]
- Global Alliance of Disaster Research Institutes (GADRI) Workshop “Round Table Discussion: Towards an Integrated Disaster Risk Research Platform for Hydro-Meteorological Hazards organized by DPRI, Kyoto University on 13 October 2015.
- The First International Symposium on Flash Floods in Wadi Systems (ISFF): Disaster Risk Reduction & Water Harvesting in the Arab Region, Uji Campus, Kyoto University, on 14-15 October 2015.

1.7.2 Participation in meetings abroad

- General Assembly of EGU (European Geosciences Union), Vienna, Austria, 27 April - 2 May 2014 [Sayama, Tsujimura]
- The 3rd Istanbul Water Forum was held by IWRA in Istanbul, Turkey, 27-29 May 2014 [Takara].
- IGU 2014 organized by IGU Commission Hazard and Risk, Jagiellonian University, Krakow, Poland, 18-23 August 2014 [Haruyama].
- IAEA/UNESCO Technical Meeting on Groundwater Contamination following the Fukushima Nuclear Accident, IAEA Headquarters, Vienna, 8-10 September 2014 [Tsujimura]
- The 7th World Water Forum in Daegu and Gyeongbuk, Korea, 12-17 April 2015 [Takeuchi, Koike, Oki, Tachikawa]

- The 15th IWRA World Water Congress "Global Water, a resource for development : opportunities, challenges and constraints" in Edinburgh, Scotland, UK, 25-29 May 2015 [Takara, Nakayama]
- The World's Large Rivers Initiative (WLRI) Meeting, Vienna, Austria, 25-26 June 2015 [Nakayama]
- The 26th IUGG General Assembly in Prague, Czech Republic, 22 June - 2 July 2015 [Taniguchi, Tsujimura]
- The 12th Annual Meeting of Asia Oceania Geosciences Society (AOGS2015) and the 7th APHW in Singapore, 1-7 August 2015 [Takara, Nakayama, Kawamura, Tsujimura, Sayama]
- The 42nd IAH (International Association of Hydrogeologists) Congress in Rome, Italy, 13th – 18th September 2015 [Taniguchi, Tsujimura]
- Asian G-WADI (Global Network on Water and Development Information for Arid Lands) and International Draught Initiative (IDI) held 6th Asian G-WADI and 1st IDI Expert Group Meeting, 13th – 16th June 2015, Tehran, Iran [Tsujimura]

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2015

- (1) The 25th IHP Training Course with the theme “Risk Management of Water Related Disasters under Changing Climate” will be held at Disaster Prevention Research Institute, Kyoto University, 30 Nov. to 11 Dec. 2015.
- (2) The 23rd Session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific will be held at Medan, Indonesia on 19-22 October 2015.

2.2 Activities foreseen for 2016 - 2017

- (1) ICWRER2016, International Conference on Water Resources and Environment Research 2016 will be held in Kyoto, Japan, 5-9 June 2016.
- (2) The 3rd Global Summit of Research Institutes for Disaster Risk Reduction will be held in Kyoto University, January 2017.

2.3 Activities envisaged in the long term

- (1) Participation in IHP-VIII projects and RSC activities.
- (2) Information dissemination through a web page of the National Committee.
<http://hywr.kuciv.kyoto-u.ac.jp/ihp/japan/index.html>
- (3) Activities relating to “Sustainability Science” that is a key promotion by the Japanese Commission for UNESCO.



MALAYSIA COUNTRY REPORT

of the
**NATIONAL COMMITTEE FOR
MALAYSIA INTERNATIONAL
HYDROLOGICAL PROGRAMME**

23rd MEETING OF IHP STEERING COMMITTEE
FOR SOUTH EAST ASIA AND THE PACIFIC

**by DATO' IR HJ. HANAPI MOHAMAD NOOR
SECRETARY IHP MALAYSIA**

MEDAN, INDONESIA | 19th - 22nd OCTOBER 2015

(ACTIVITIES UNDERTAKEN FOR THE PERIOD OF OCT 2014 - OCT 2015)

INFORMATION OF IHP MALAYSIA



- Name of the Centre : UNESCO - International Hydrological Programmes Malaysia
- Name of Chairman : Dato' Ir. Zainor Rahim bin Ibrahim
- Name and title of contact : Dato' Ir. Hj. Hanapi bin Mohamad Noor
(for cooperation)
- E-mail : ihp@water.gov.my/hanapi@water.gov.my
juhaimi@water.gov.my/shikin@water.gov.my
nasarudin@water.gov.my
- Address : Water Resource and Hydrology Division, Dept. of Irrigation and Drainage Malaysia, KM 7 Jalan Ampang, 68000 Kuala Lumpur.
- Location of centre : Kuala Lumpur, Malaysia

ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2014 – OCTOBER 2015 (OUTLINE)

1. Meetings of the IHP National Committee
2. Activities at national level in the framework of the IHP
 - 2.1 National/local scientific and technical meetings
 - 2.2 Participation in IHP Steering Committees/Working Groups
 - 2.3 Research/applied projects supported or sponsored
3. Educational and training courses
 - 3.1 Contribution to IHP courses
 - 3.2 Organization of specific courses
 - 3.3 Participation in IHP courses
4. Publications
5. Participation in international scientific meetings
6. Other activities at regional level



ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2014 – OCTOBER 2015



1. Meetings of the IHP National Committee

The present composition of the National Committee (2015-2017) :

Chairman : Dato' Ir. Zainor Rahim bin Ibrahim
Secretary : Dato' Ir. Hj Hanapi Mohamad Noor
Vice Secretary : Mrs. Ir. Nur Hareza Redzuan

EXCO Members

1. Dato' Ir. Hj. Abdul Nassir Bidin
- Department of Irrigation and Drainage Malaysia
2. Mr. En Mohd Khairul Adib bin Abd Rahman
- National Commission for UNESCO Malaysia
3. Prof. Nor Aieni Hj. Mokhtar
- Ministry of Science, Technology and Innovation
4. Dr Mohamed Roseli Zainal Abidin
- Humid Tropics Center Kuala Lumpur
5. Mr. Ahmad Zubir Sopian
- Putrajaya Cooperation
6. Mr. Mohamad Azam bin Toiman@ Saiman
- Ministry of Energy, Green Technology and Water
7. Mr. Suhaimi Mamat
- Ministry Natural Resources and Environmental
8. Tan Sri Dr. Madinah Mohamad
- Ministry of Education
9. Prof. Zulkifli Yusof
- Universiti Teknologi Malaysia



STANDING COMMITTEE



UNESCO-IHP Malaysia plans its activities through its Committee and they are carried out by the three standing committees which are:

1. Committee on Research under the chairmanship of the Director of Humid Tropics Centre, Kuala Lumpur (HTC KL)
2. Committee on Education, Training and Public Information headed by the University Science Malaysia (UTM)
3. Committee on Standardization of Hydrological Practices headed by the Department of Irrigation and Drainage Malaysia (DID)

Between Oct 2014 and Oct 2015 three meetings were held or to be held on 8th October 2014, 10th March 2015 and 27th Oct 2015



Meetings of the IHP National Committee

2. Activities at national level in the framework of the IHP



2.1 National/local scientific and technical meetings

Standing Committees of Science Meetings

(under Ministry of Science, Technology & Innovation)

2.2 Participation in IHP Steering Committees/Working Groups

- Participation of IHP Malaysia in the 22nd Regional Steering Committee Meeting for Southeast Asia and the Pacific - UNESCO IHP, which was held in Yogyakarta, Indonesia.

2.3 Research/applied projects supported or sponsored

2015: Overview study on Water, Energy and Food Nexus for Malaysia and special focus on nexus elements for Bernam, Perak and Kelantan River basin (expected to be completed in Dec 2015)

2014 : Data book Urban Eco Hydrology for Resilient Environment (UCOREN), Penchala River
R&D Component, Upscaling Water Security to meet local, regional and global challenges



2.4 Collaboration with other national and international organizations and/or programmes

- UNESCO Jakarta Office
- Malaysian National Commission for UNESCO
- Humid Tropics Center Malaysia
- University of Science Malaysia
- National Hydraulic Research Institute Malaysia
- UNITEN Malaysia
- University Institute Technology Malaysia
- National Oceanography Directives
- Putrajaya Corporation
- University of Technology Malaysia



3. Educational and training courses



3.1 Contribution to IHP courses

- Malaysia IHP Technical Talks (3 sessions in 2014, 2 sessions in 2015).
- The details of the technical talk session and training course sessions are as follows:-
 - i. Water Energy Food Nexus by Dr. Hezri Adnan Institute for Strategic & International Studies of Malaysia (ISIS)
 - ii. Water Management from the Islamic point of View
 - iii. Water Footprint by Dr. Ashok Chapagain of Water Footprint Network (WFN) Netherlands
 - iv. Drought Management and the onset of El-Nino phenomena by Dr. Mohd Hisham from Meteorology Department, Malaysia



3.2 Organization of specific courses

- National Water Watch Programme for Young Leaders (4 sessions yearly for each zone north, south, east and Malaysia Borneo) – **240 participants/year, average 60 participants/session**



- South East Asia Water Footprint Course from 24-26 February 2015 in Kuala Lumpur, Malaysia – **49 participants from Malaysia, ASEAN & Africa**



3.3 Participation in IHP courses (Courses attended by IHP Malaysia & members)



2015

Mrs. Nor Ashikin Abdullah

Course on Integrated Water Resources Management in Japan
From 30 August – 19 September 2015

Organizer : Japan International Cooperation Agency (JICA)

Objectives : to formulate a Master Plan for water resources management and to transfer technology on the integrated water resources management to the counterpart personnel.

2014

Mr. Alifnur Iskandar b Mohamad Sani

Course on Land and Water Management
From 1st Oct - 15 Dec 2014

Location : Cairo Egypt

Organizer: The Egyptian International Centre for Agriculture (EICA)



4. Publications

- Monthly Updates of IHP activities in DID Bulletin
- Comprehensive Module for National Water Watch Programme for Young Leader by Committee on Education, Training and Public Information, IHP Malaysia
- Databook Urban Ecohydrology for Resilient Environment (UCOREN), Sungai Penchala
- R&D Component, Upscaling Water Security to Meet Local, Regional and Global Challenges
- Guide to Hydrological Practices of Design Flood Discharges in Malaysia by Committee on Standardization of Hydrological Practices, IHP Malaysia.



5. Participation in international scientific meetings

5.1 Participation in meetings abroad

- Participation of IHP Malaysia in the 22nd Regional Steering Committee Meeting for Southeast Asia and the Pacific - UNESCO IHP, Yogyakarta, Indonesia.
- 13th IAHR/IWA International Conference on Urban Drainage (ICUD) in Borneo 2014
- International Conference on Ecohydrology in Yogyakarta 2014
- Participation in 7th World Water Forum in Daegu and Gyeongbuk, Republic of Korea (April 2014)
- UNESCO Symposium on Water Management in Transition Countries as Impacted by Climate and Other Global Changes, Lessons from Paleoclimate, and Regional Issues in Belgrade, Serbia 2014

6. Other activities at regional level

- National World Water Day 2015 celebration in Kuala Lumpur, Malaysia.
- Programme Dialogue with Universities Student in conjunction with World Water Day 2015, in Kuala Lumpur (27 April 2015)





- Malaysia UNESCO Day, Mei 2015
- International Putrajaya Lake and Wetland Explorace 2015 for international and local university students



International Putrajaya Lake and Wetland Explorace 2015, Putrajaya Malaysia



Celebration UNESCO Day 2015, Kuala Lumpur Malaysia



Other activities at regional level (continue)

- RCE Event Penang short presentation and act a panel embers
- Public Outreach Programme by National University Malaysia
- ASEAN Working Group on water Resources Management IWRM Country Strategy Guideline Workshop in Putrajaya, Malaysia (2-4 March 2015)
- Strategic Meeting and International Workshop on Tools for Customizing IWRM Guidelines for Water Security in Asia and the Pacific: Challenges and Opportunities for HELP and Ecohydrology 2015



FUTURE ACTIVITIES



1. Activities planned until December 2016

- National Water Watch Programme For Young Leaders
- IHP Technical Talks (yearly)
- Participation in the IHP Intergovernmental Council Meeting, UNESCO Paris
- Participation in IHP-RSC Meeting, Asian Pacific FRIEND and Catalogue of Rivers
- Participation in JICA's Overseas Technical Training Programme in Japan
- Participation in programme at the International Center for Water-related hazards and risk management (ICHARM)
- Workshop for National Water Resource Policy : Strategic Action Plan (in collaboration with DID)



2. Activities foreseen for 2016-2017

- Participation in IHP-RSC meeting Asian Pacific FRIEND and Catalogue of Rivers
- Cooperation between Regional Centre of Experts (RCE) Universiti Sains Malaysia and Universiti Kuala Lumpur (UNIKL) with IHP Malaysia on several matters for capacity building in hydrology and water resources fields
- Participation in IHP-Training course
- Implementation of projects related to IHP-VIII.
- Implementation of Malaysia-UNESCO Cooperative Programme funding by Government of Malaysia for South-South Country and Small Island.
- Collaboration with UNESCO-IOC activities.



3. Activities envisaged in the long term

- Long-term cooperation between The Regional Centre of Expertise on Education for Sustainable Development (RCEs) Penang and IHP Malaysia for Regional Sejahtera ESD Network (RSEN) and other activities
- Malaysia National committee for IHP will promote activities to public coordinate participations at national level to augment people's awareness through, educations and trainings on hazards caused by global warming, as well as hazards caused by geological events, These include sea level rise, flood and drought hazard, debris control, tsunamis, water and food security, and access to save water. Area of priorities is mega cities, and coastal areas.



3. Activities envisaged in the long term



- Participation in IHP-VIII projects and RSC activities.
- Information dissemination through a web page of the National Committee.
- Participation in IHP-RSC activities and IHP Inter-Governmental Council meetings in Paris.
- Malaysia IHP commitment to IHP Phase VIII (2014-2019)
- Scientific Researches by Malaysia IHP Standing Committee
- Collaboration with many other agencies for the purpose of scientific researches and public outreach programmes.

THANK YOU



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Malaysia



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Educational, Scientific and
Cultural Organization



MALAYSIA COUNTRY REPORT

of the
NATIONAL COMMITTEE FOR
MALAYSIA INTERNATIONAL HYDROLOGICAL PROGRAMME
23rd MEETING OF IHP REGIONAL STEERING COMMITTEE
FOR SOUTH EAST ASIA AND THE PACIFIC

by DATO' IR HJ. HANAPI MOHAMAD NOOR
SECRETARY IHP MALAYSIA

19 OCTOBER 2015
MEDAN, INDONESIA

[ACTIVITIES UNDERTAKEN FOR THE PERIOD OF OCT 2014 – OCT 2015]



Mongolian National IHP Committee

Country report

The 23rd IHP RSC meeting for Southeast Asia and the Pacific, MEDAN, Indonesia
19-22 October 2015

- 1. Brief information about Mongolia**
- 2. Activities of Mongolian National IHP Committee**

Basic information about Mongolia

Mongolia

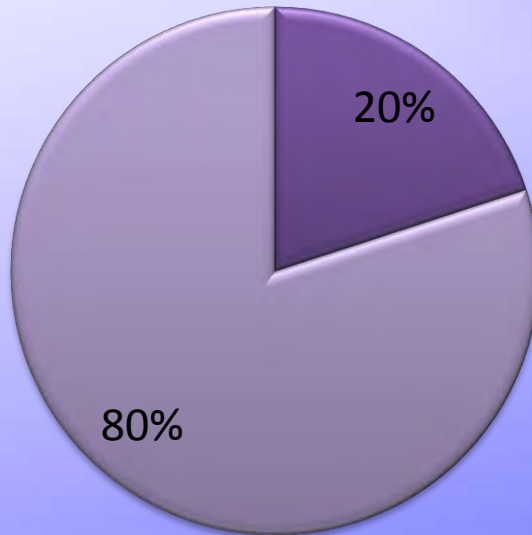
- **Landlocked** country between the Russian Federation and China
- **Total land area: 1,5 Mio. km².**
- **The total water area is 10,500 km².**



Water resources and water use of Mongolia

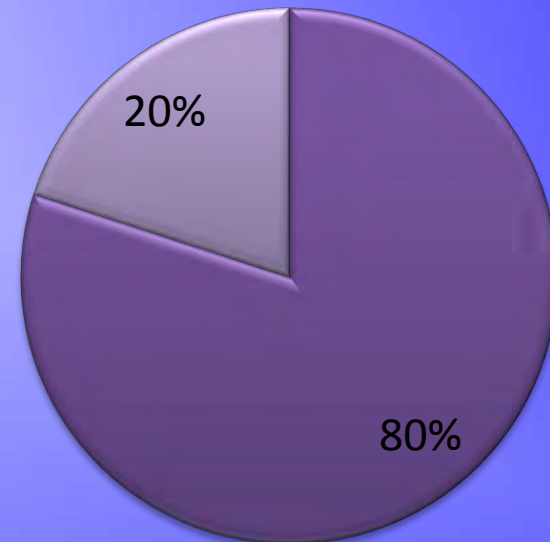
Water resources

■ Ground water ■ Surface water



Water use

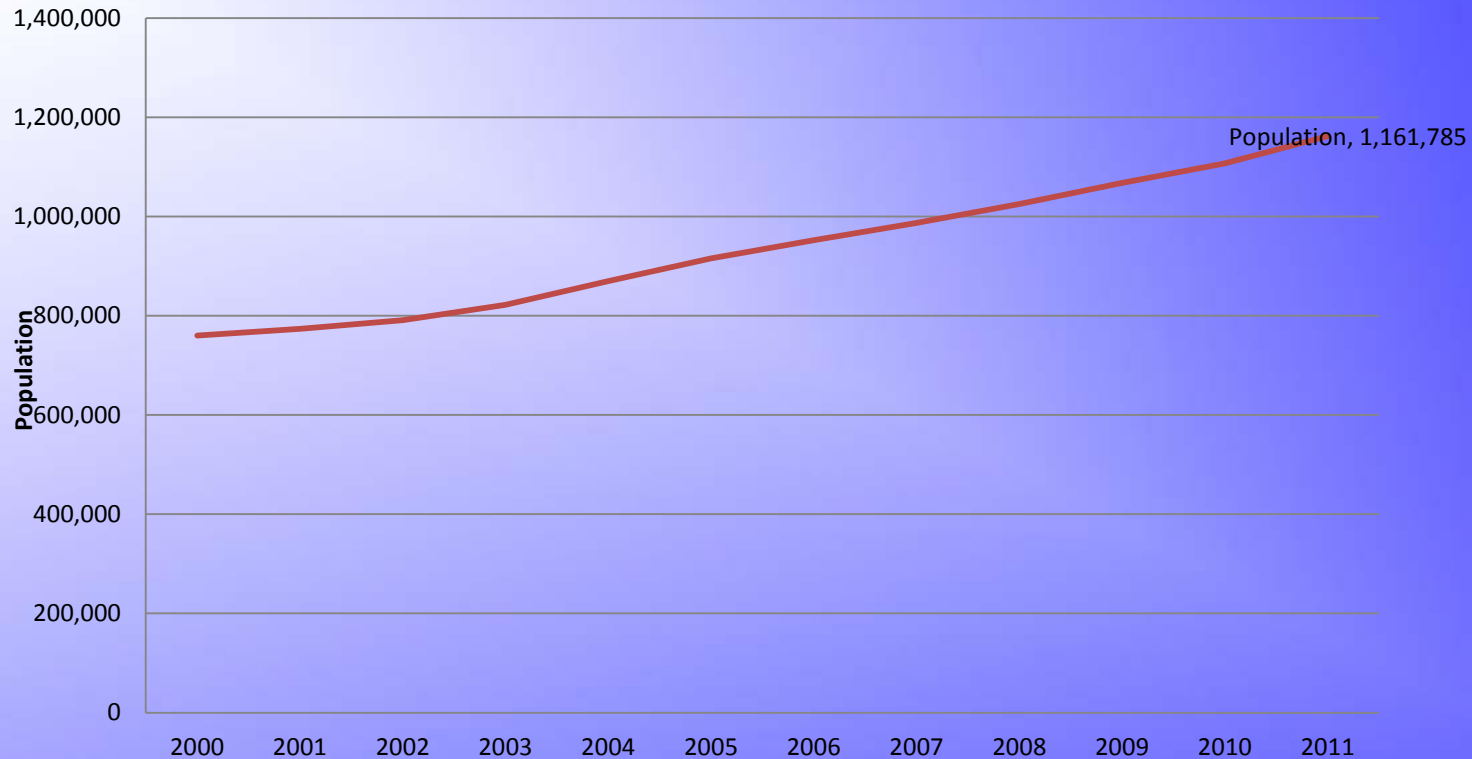
■ Ground water ■ Surface water



80% of Mongolian water resources is surface water and the rest 20% is ground water resource. But 80 of water supply comes from ground water and the rest 20% is used from surface water resource.

Urbanization and water pollution

Population of Ulaanbaatar city



The Urbanization in Mongolia is increasing rapidly. Today more than half of the total population live in Ulaanbaatar. Consequently Mongolia faces many challenges such as water pollution, air pollution and drought.

Number of rivers, lakes and springs dried out in the last few years



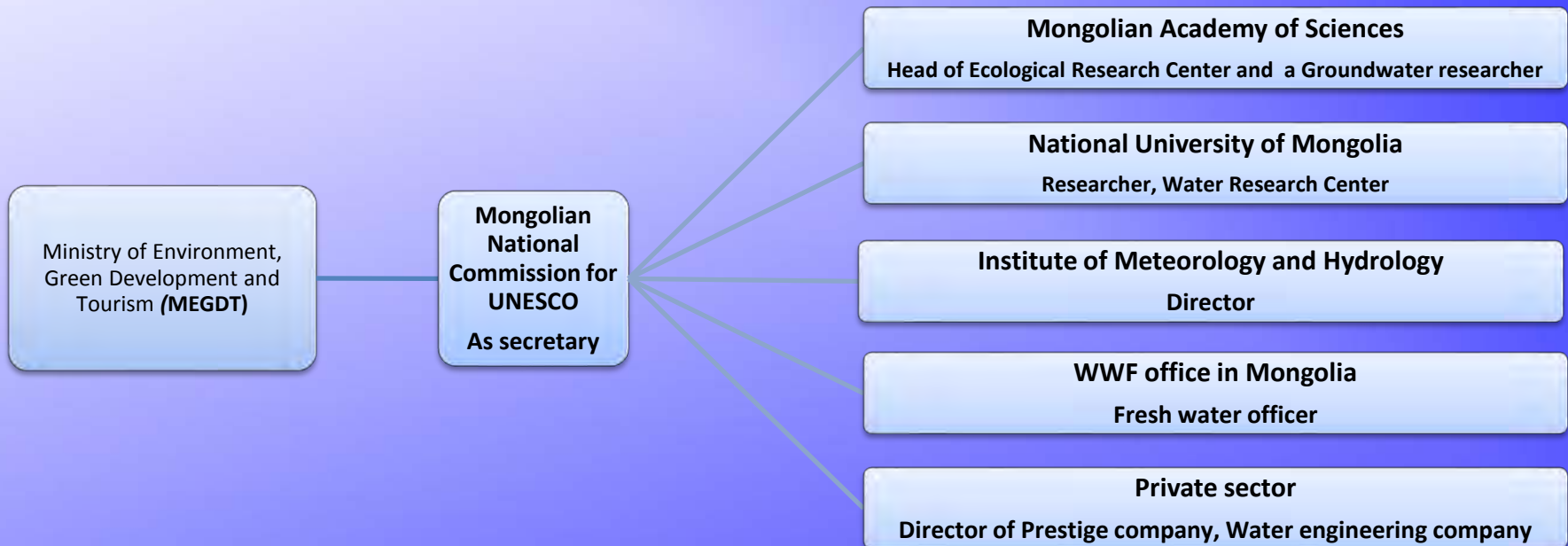
As result of drought in the last 15 years almost 1/3 of all rivers, lakes and springs of Mongolia have dried out.



Activities of the Mongolian National IHP Committee in last 2 years

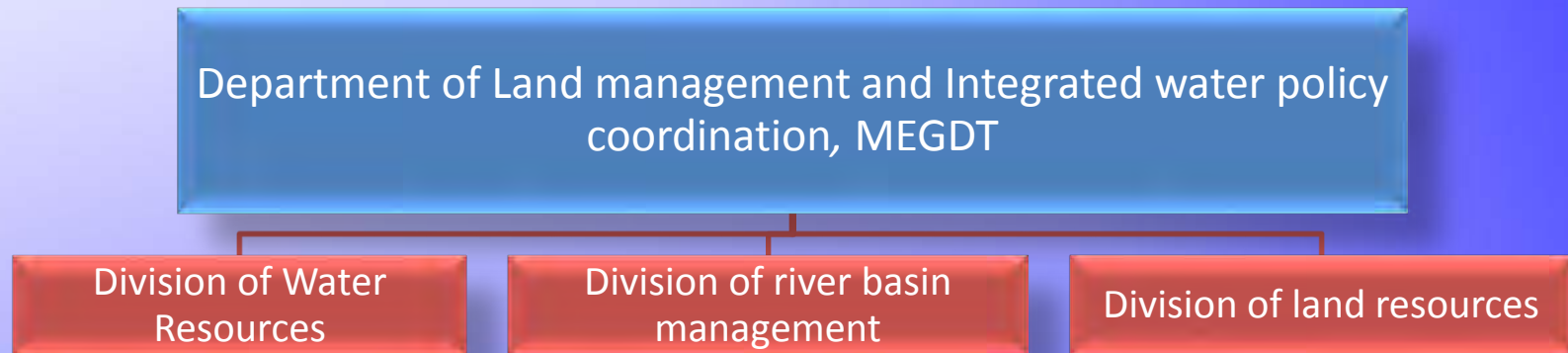
Renewal of the composition of Mongolian National IHP Committee

The composition of the Mongolian National IHP Committee **was renewed in 2013**. Now the Committee **consists of** researchers and specialists from the following organizations:



Mongolian National IHP Committee

The Head of the Committee is the Director of Department of Land management and Integrated water policy coordination of MEGDT.



- Water policy of Mongolia is leaded and ruled by this Ministry.

(MEGDT-Ministry of Environment, Green Development and Tourism)

Mongolian National IHP Committee

Advantages of the composition:

- A link between IHP Committee and Ministry in charge of water is ensured.
- And also a link between IHP Committee and Mongolian National Commission for UNESCO is ensured
- Academic institutions are involved in the activities of the Committee
- Private sector is also involved
- The chair of the Committee has influence on national policies concerning water related matters.

Implemented activities in last 2 years

- In the last 2 years the committee **organized several meetings and workshops** such as
 - “Decreasing the Water Pollution”
 - “Increasing the Water Price”
- Have been **involved in many water related projects**
- The head of the committee **participated in international events** such as Stockholm Water Week and 7th World Water Forum.
- This year we **developed a project proposal** and submitted to the UNESCO Participation Programme.

World Water Day Celebrations

Water and Sustainable
Development

March 20, 2015 | New Delhi, India

Implemented activities in last 2 years

- Every year we organize events on occasion to WWD on 22nd March. We translate Messages from DG of UNESCO dedicated to WWD and broadcast via different media.



Implemented activities in last 2 years

- This year we celebrated WWD and organized a **Parallel launch of the World Water Development Report** in Mongolia at same time with the main launching event in India
- We also made a press conference on this day involving different media
- And we organized a students' Scientific Conference under the topic "Water and sustainable development" involving students of 10 universities of Mongolia.



Parallel launch of the World Water Development Report in Mongolia on 20 March 2015.





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International
Hydrological
Programme

Thank you very much!

**23rd IHP REGIONAL STEERING COMMITTEE MEETING FOR
SOUTH EAST ASIA AND THE PACIFIC
MEDAN, INDONESIA
(19 October 2015 – 20 October 2015)**

NATIONAL REPORT OF NEW ZEALAND

1. Activities undertaken in the period October 2014– October 2015

1.1 Meetings of the IHP National Committee

1.1.1 Composition of the IHP National Committee

UNESCO New Zealand has been restructured and previous arrangements for sub commissioners (including IHP National Committee) remain unconfirmed. Mr. Dennis D Jamieson and MS Srinivasan have continued to maintain a watching brief of developments and act as ‘de facto’ Chairman and Secretary respectively as per their previous roles in the IHP National Committee during the reporting period. Discussions with UNESCO NZ indicate that the potential loss in continuity with IHP was not their intention.

1.1.2 Status of IHP activities

The following projects continue to be funded:

- Information on New Zealand’s Freshwaters: Water Resources Archive;
- Land Use Intensification: Sustainable Management of Water Quality and Quantity;
- Reducing the Impacts of Weather Related Hazards;
- Information on New Zealand’s Freshwaters: Climate and Water Resources Archives is a national programme of climate and hydrometric data collection. The data produced from this programme are of increasing importance to guide decision-making on development (especially proposed hydropower and expanded irrigation) and to contribute to the assessment of effects of human related activities on rivers and lakes. In addition there is wide interest in the effects of climate change on water resources and consequent effects on hydropower and agriculture.

As reported in previous years, the implementing agency (National Institute of Water and Atmospheric Research - NIWA) continues a policy of “free” data access for most users although budget pressures resulting from reviews of government science make this approach difficult to sustain

1.1.3 Decisions regarding contribution to participation in IHP-VIII

Components of the New Zealand hydrological research programme have increasingly good alignment with IHP-VIII themes in eco-hydrology and IWRM. This is fostered by collaborative processes that integrate social science and cultural perspectives into resource management with biophysical sciences. These approaches have been prominent in some regional councils regions in New Zealand (particularly Canterbury), but are of increasing relevance to Central Government work.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Core principles of IHP-VII and IHP-VIII align with emerging priorities for New Zealand.

Scientific and technical meetings are generally held within the context of professional societies (particularly the New Zealand Hydrological Society) and resource management affairs (e.g. workshops to brief groups established to guide government decisions on future land and water use).

1.2.2 Participation in IHP Steering Committees Working Groups

New Zealand attended the 2014 RSC meeting enabled by sponsorship through UNESCO – Jakarta..

1.2.3 Research/applied projects supported or sponsored

None directly sponsored by IHP.

1.2.4 Collaboration with other national and international organizations and/or programmes

Republic of Korea Water Resources Association (KWRA) – collaborative research strategy with NZ Hydrological Society (NZHS)

The KWRA and NZHS have had a Memorandum Of Understanding (MOU) in place since 2007. Regular exchanges between the organisations continue.

Links with other International and Regional organisations

Regular contact is maintained with Charles Pearson, the Regional Hydrological Advisor to the President of the WMO Region V (Asia Pacific). Contact is also maintained with SOPAC's Suva based Water & Sanitation Unit, through its role of representing the SW Pacific Island states on water related issues.

1.2.5 Other initiatives

Ecohydrology and NZ government priorities for infrastructure

Application of Ecohydrology principles is evident as water infrastructure options are advanced in New Zealand. Two examples are on the Opihi and Hurunui Rivers (Canterbury) where and existing and possible infrastructure concepts are being refined through field studies.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

None.

1.3.2 Organisation of specific courses

Courses and workshops run in New Zealand generally meet national needs. Because of the country's relative remoteness and distinctive resource management requirements, courses are not always suitable for participation by people from overseas.

National Institute of Water and Atmospheric Research (NIWA) Courses / workshops

Over the course of a year NIWA provides many courses for regional government agencies and their own staff. These cover many topics from general hydrological training to courses on specific topics of wide interest.

1.3.3 Participation in IHP courses

See 1.3.1.

1.4 Publications

Contributions to IHP publications have been principally through the Regional Steering Committee and the Asia-Pacific FRIEND. Other publications related to IHP activities include:

The "Climate Update" monthly bulletin

See <http://www.niwa.co.nz/climate/publications>

The "Island Climate Update" (ICU) monthly bulletin

The ICU, produced by NIWA's National Climate Centre in collaboration with SOPAC, is a multi-national project with important contributions from the meteorological services of countries around the region. The bulletin provides El Nino/Southern Oscillation and seasonal rainfall forecasts, discusses climate developments each month and provides a tropical rainfall outlook for the next three months and tropical cyclone outlooks during the cyclone season. It also includes an editorial on some topical aspect of relevance and interest to end-users.

<http://www.niwa.co.nz/climate/publications>

“Freshwater and estuaries update” bulletin

This is published to cover developments in the freshwater to estuaries zone. Estuaries are increasingly incorporated in joint programme given the direct connection to freshwater issues in NZ.

<http://www.niwa.co.nz/freshwater-and-estuaries/freshwater-and-estuaries-update>

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by the country

NZ Hydrological Society Annual Symposium

The annual conference of the New Zealand Hydrological Society 2014 was held as a joint Water Symposium of the New Zealand Hydrological Society, New Zealand Freshwater Sciences Society and the Institution of Professional Engineers New Zealand (IPENZ) Rivers Group in Blenheim NZ.

1.5.2 Participation in meetings abroad

A wide range of science conferences and events were attended. Alignment with IHP activities is a common theme of topics, given alignment with IHP-VIII.

1.6 Other activities at regional level

1.6.1 Institutional relations/co-operation

There is considerable contact between New Zealand and other UNESCO Member Countries in the Asia-Pacific region, especially with the Pacific Island countries. For example NIWA is working with agencies in many countries on updating hydrological information and database management systems. Many useful contacts have been enabled via the IHP, even though subsequent work has been in the context of bi-lateral arrangements and Pacific HYCOS.

1.6.2 Completed and ongoing scientific projects

In 2014 the Science system in NZ is focused on “National Science Challenges”. Additional changes are likely as a result of a recently released government review of the Science system. Changes are continuous and there have been high profile reorganisations and redundancies in science organizations.

2. Future Activities

2.1 Activities foreseen until December 2015

The annual conference of the NZ Hydrological Society is to be held at The University of Waikato in Hamilton. The theme this year is “From Data To Knowledge”.

2.2 Activities planned for 2016

Generally scientific activities planned at the national level are within the context of the research programme funded by NZ government. A significant proportion of this activity will be in areas that are included within the IHP, but are not explicitly implemented as a component of the IHP.

A significant opportunity for 2016 will be the 2016 Hydrological Society symposium with the topic of Infrastructure and Hydrology to be held in Queenstown NZ. IHP-VIII themes of Ecohydrology and IWRM are particularly relevant to NZX central Government aspirations with water hydrology and also align with the need to promote integrated science.

NIWA Courses

A range of training courses will be offered by NIWA. For a full list of courses refer to the NIWA web site. These courses are also open to overseas participants.

2.3 Activities envisaged in the long term

Continuation of the:

- NZAID funded Pacific Hydrological Training Programmes as required;
- NZAID funded monthly “Island Climate Update” publication with stronger links to end users.
- Monthly NZ “Climate Update” and “Climate Outlook” (web) publications.
- Quarterly “Fresh Water and estuaries Update” (web) publication.

**23rd Meeting of IHP and Regional Steering Committee
for the Southeast Asia and the Pacific**

**19-22 October, 2015
Medan, Indonesia**

**COUNTRY REPORT ON PAPUA NEW GUINEA INTERNATIONAL
HYDROLOGICAL PROGRAM ACTIVITIES: 2011-2015**

Prepared & presented by:

Joseph Jure

For

Papua New Guinea IHP National Committee

1.0 INTRODUCTION

The Conservation & Environment Protection Authority (CEPA) is a new statutory authority which has replaced the Department of Environment and Conservation (DEC). CEPA was established by an Act of Parliament in May 2014 and became officially effective in January 2015, has participated in the activities of the International Hydrological Program Decade (IHPD) from 1965-1974 under then DEC, the forerunner of the International Hydrological Program (IHP). With the launching of the latter in 1992, the Papua New Guinea (PNG) IHP National Committee was formed in January 1992 with a view to participating actively in IHP and regional programs such as the Asia Pacific FRIEND.

The current membership of the PNG IHP National Committee is maintained at eight (8), and drawn from various government agencies and institutions of higher learning, including now office of climate change and national disaster reduction agencies. Over the period 2011-2015, PNG experienced very little participation in IHP and UNESCO activities. This resulted from unexpected political developments leading to our physical displacement and change in the administrative structure.

The new government formed after 2012 general election has driven three (3) key policy initiatives; that is, free education, improved health services and infrastructure development. The latter is our main concern, which has impeded on the natural environment while driving this policy. The government also envisages economic growth on one hand but on the other hand expects integration of sound environment management principles so that the environment is not degraded. Furthermore, these principles are also consistent with the national development policies and United Nations Millennium Development Goals, particularly on environmental sustainability. The climate change adaptation uses water as the main influencing medium in preparing strategies for water related disasters and climate change, which consequently contributed to human livelihood.

This year alone we had experience extreme weather phenomena especially El Nino or long dry spell affecting the country and the region as a whole. Drought and frost caused hundreds of deaths: in some very remote communities, the death rate plumped. Crops failed; schools, jails and major mines were forced to close as water supplies ran dry; and there were outbreaks of diseases including diarrhea, malaria and typhoid.

As a result the government through Office of Natural Disaster Centre has allocated substantial amount of money to dispersed relief supplies to the affected areas. In line with this it has called on all line agencies to improve water and environment monitoring networks that has catered for development needs, climate change analysis and adaptation, promoting prudent environment management and monitoring food security.

2.0 ACTIVITIES ORGANIZED BY THE NATIONAL COMMITTEE

Significant water events organized at national levels were;

- World Water Day commemoration was held in March 2015,
- World Environment Day commemoration was held in June 2015,
- Regular Climate Change Adaptation Technical Working Group meetings,
- Ad hoc Early Warning System on coastal and inland floods sub-committee meetings.
- WASH Sanitation Committee Meetings
- Hydropower Project Steering Committee Meetings
- Eight Pacific Water & Wastewater Conference held in August/September 2015

3.0 OTHER HYDROLOGICAL AND WATER RELATED ACTIVITIES CONDUCTED BY INDIVIDUAL WATER AGENCIES

3.1 Flood Projection and Monitoring

In 2014 five provinces have been identified for basic flood projection and monitoring, which are in the northern part of PNG for climate change adaptation programs. This year another five have been added onto the list.

In addition, early warning systems were proposed especially for the locations mentioned above. Office of Climate Change & Development (OCCD) and CEPA are coordinating agencies for this program, while PNG National Weather Service will be the executing agency.

3.2 Hydropower Development for Clean and Green Energy

New hydropower schemes proposed have been encouraged to be climate compatible. This clean energy agenda will be driven by a policy shift, which will require proponents to abide by the legislations promoting clean energy through environment regulation and climate change policy.

New hydropower scheme being planned are;

- Small urban town electricity schemes - 5MW power supply for small urban town being funded by Asian Development Bank (ADB).
- Purari River hydro scheme (Gulf Province) –2500MW proposed electricity output has the potential to supply electricity in the southern part of Papua New Guinea and further south to North Queensland in Australia.
- Laloki River hydro scheme (Central Province) – the 10-20 MW of electricity supply is an additional power to be supplied to Port Moresby.

- Divune River hydro scheme (Oro Province) – 10 MW to supply electricity to Popodetta township and parts of Northern Province.
- Tagari River hydro scheme (Tari, Hela) – MoU established between Hela Provincial Government and Israeli firm to develop this. Will supply electricity to Liquefied Natural Gas (LNG) sites in Hela Province and Tari township.

3.3 Water Sanitation and Hygiene (WaSH) Policy

The National Parliament has just passed legislation on WASH Policy. Under this policy initiative, a WASH Authority will be established to oversee WASH activities. An entity that will be mandated to take on the WaSH roles and responsibilities in PNG. The core focus is to include hygiene and rural water supply & sanitation activities into the sector programs. The National Department of Health is the key stakeholder to this process.

3.4 Low Flow Studies for Water Supply

Two low flow studies were carried out in 2015. The first one was to establish the driest flow that could be used as a design for the proposed Pacific Maritime Industrial Zone project based in Madang province of PNG. The second study was to establish the most reliable flow rate that could be used for the Buka Township water supply in the Autonomous Region of Bougainville of PNG. Both reports will form the basis of developing reliable water supplies for the respective projects and communities.

3.5 Water Use Permits

CEPA operating under Environment Act 2000; monitor, enforce and set environmental standards. Water use for industrial purposes in particular is regulated under this legislation. Over the last decade there was an increase in volume of water permitted for extraction. Also, the volume of waste water discharged has raised prompting CEPA to tighten its enforcement and compliance measures. Funding and capacity have been a concern and this has hindered compliance monitoring activities.

3.6 Water Pollution

The country has uniquely fragile water resources due to his small size, lack of natural storage, competing land use and vulnerability to natural hazards.

Pollution of freshwater resources, unsafe drinking water supplies and inadequate sanitation can have a significant impact on public health, quality of life, the environment and economic development.

Urbanization, rural development, growing populations, climate change and increased demand from industry and agriculture is putting further pressure on the country's freshwater resources, threatening the long term viability of inhabitants.

Natural disasters exacerbate water issues. Excessive rainfall often linked to cyclones and typhoons, causes flooding and disruption of drinking water supplies. The country relies on groundwater and/or rainwater harvesting are highly vulnerable to droughts, often linked to El Nino or La Nina triggered climatic disruptions which is evident this year. Both situations – too much or too little water – compromise the safety of drinking water supplies and increase the risk to public health.

3.7 Waste management

The increase in the urban population growth has placed more pressure on inadequate infrastructure and facilities such as water supply, electricity, sewage and municipal solid waste (MSW) management. Most of the MSW produced in Port Moresby is dumped on land, in the ocean or waterways, fed to pets and animals, and small amount are incinerated, reused or recycled

JICA has supported PNG government in managing its municipal solid waste (MSW) under its project name Japanese Cooperation Project for Promotion of Regional Initiative on Solid Waste Management or J-PRISM in short. The project has been working in collaboration with the South Pacific Regional Environment Program office in Apia, Samoa. PNG being the largest partner in the project through NCD Solid Waste Management Programme which has five year term commencing in January 1, 2001 to December 31, 2015.

4.0 PARTICIPATION IN REGIONAL PROGRAMS

4.2 Trainings

Joseph Jure attended Water Resources Management Capacity Building seminar, Changsha, China from 6th -26th June 2014. This training program was conducted by Hydrochina Zhongnan Engineering Cooperation Limited and was supported by Department of Commerce of People's Republic of China and the Embassy of China (PNG). A certificate of participation was attained after 3 weeks intensive training.

4.3 Meetings

Joseph Jure attended the 22nd International Hydrological Program Regional Steering Committee Meeting and International Symposium on "Integrated Actions for Global Water and Environmental Sustainability", Yogyakarta, Indonesia from 10-14 November 2014.

4.4 JICA Support

JICA has teamed up with CEPA to revive and enhance Varirata National Park as a terrestrial Protected Area model. People living in Varirata and the surrounding areas of

Sogeri including Sirinumu Catchment and Laloki River of Central Province (PNG) will benefit from the project and earn income as park rangers and biodiversity conservation managers.

4.5 GEF Assistance

GEF also assisted the Biodiversity Conservation program being implemented in PNG under UNDP Ridge to Reefs Programme. The focus of the funding has been for effective management of PAs such as Varirata in Central province and other PAs throughout the country including Yus and Managlas in the Torricelli Mountain Ranges in Madang, East and West Sepik provinces.

5.0 FUTURE TASKS

- Attend the 23rd IHP RSC Meeting in Medan, Indonesia from 19-22 October 2015
- Anticipating a candidate from PNG to participate in the upcoming UNESCO IHP training courses.
- Conduct flow analysis for the various drought stricken areas.
- Continue engagement with stakeholders on climate change adaptation and disaster risk reduction - climate, El Nino, hydropower development, rural water supply & sanitation and hygiene.
- Continue providing hydrological and environmental assistance for development needs and environment management..
- Continue to promote sustainable land use practices and principles in areas of resource development. (permits and discharge waste water)
- Streamline palm oil processing industry. Principles of sustainable development & environment management.
- Contribute to regional activities as and when required.

6.0 CONCLUDING REMARKS

Finally, I take this opportunity to thank Kyoto University (Japan) in meeting all the costs to enable me participate in the 23rd Asia Pacific IHP RSC meeting and most importantly attend the international symposium.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

PHILIPPINES

**23rd Regional Steering Committee Meeting
UNESCO International Hydrological Programme
(UNESCO IHP)
for Southeast Asia and the Pacific
held at Medan, Indonesia
19-20 November 2015**

OCTOBER 2015

**Philippine National Committee
for the
UNESCO International Hydrological Programme
Republic of the Philippines**

1. ACTIVITIES UNDERTAKEN IN THE PERIOD NOVEMBER 2014- SEPTEMBER 2015

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The institutional members of the Philippine National Committee for the UNESCO-IHP are agencies and organizations (public and private) which are mandated with, and are engaged in research, development and management activities in the water sector:

Bureau of Soils and Water Management (BSWM), Department of Agriculture (DA)
Bureau of Research and Standards (BRS), Department of Public Works and Highways (DPWH)
Environmental Management Bureau (EMB), Department of the Environment and Natural Resources (DENR)
Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH)
Laguna Lake Development Authority (LLDA)
Local Water Utilities Administration (LWUA)
LPA & Associates (private sector)
Metropolitan Waterworks and Sewerage System (MWSS)
Mines and Geoscience Bureau (MGB), Department of the Environment and Natural Resources (DENR)
National Economic and Development Authority (NEDA)
National Hydraulic Research Center, University of the Philippines (UP-NHRC)
National Irrigation Administration (NIA)
National Mapping and Resource Information Authority (NAMRIA)
National Power Corporation (NPC)
National Water Resources Board (NWRB)
Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), Department of Science and Technology (DOST)
Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Department of Science and Technology (DOST)
Philippine Water Partnership (PWP)
Mapua Institute of Technology, School of Civil Engineering, Manila
University of Santo Tomas (UST), Department of Civil Engineering (UST), Manila
University of the Philippines at Los Baños (UPLB), College of Engineering and Agro-Industrial Technology (UPLB-CEAT), Los Baños, Laguna
Ateneo De Manila University (ADMU) - Manila Observatory, Quezon City
Central Luzon State University (CLSU), Muñoz, Nueva Ecija
De La Salle University (DLSU), Department of Civil Engineering (DLSU), Manila
University of San Carlos (USC), Department of Civil Engineering & Water Resources Research Center (USC), Cebu City

Officers of the Philippine National Committee for UNESCO-IHP:

Chairman: Leonardo Q. Liongson (UP Diliman)
Treasurer: Lino P. Aldovino (LPA & Associates)
Secretariat: NHRC and PWP staff (on secondment)

Agency Lead Representatives:

Leonor Cleofas, MWSS
Virgilio Basa, NAMRIA
Antonio Morano, DPWH-BRS
Resito David, DPWH-FCSEC
Virgilio Rivera, MWCI
Lennie Santos-Borja, LLDA
Rodora Gamboa, PWP

Finance Sub-Committee members:

Leonor Cleofas, MWSS
Dolores Hipolito, DPWH-FCSEC
Ms. Lyn Almario, MWCI
Francisco Arellano, MWSI
Romualdo Beltran, NPC
Lino P. Aldovino, PNC-UNESCO-IHP Treasurer

Technical Sub-Committee members::

Guillermo Q. Tabios III, UP-NHRC & I.C.E.
Roberto S. Soriano, UP I.C.E.
Romualdo Beltran, NPC
Samuel Contreras, BSWM
Emiterio Hernandez, LLDA
Milo Landicho, NIA
Rosa Perez, PAGASA

Program Sub-Committee members::

Peter Paul Castro, UP- NHRC & I.C.E. Dept.
Maria Antonia Tanchuling, UP- En.E. Program
Susan Abano, NWRB
Margarette Bautista, PAGASA
Isidora Camaya, NIA
Efren Carandang, NAMRIA
Maristel Espiritu, LLDA
George Estioko, NWRB
Myrna Lansangam, LWUA
Nicanor Mendoza, DENR-EMB
Jesusa Roque, NWRB
Teresita Sandoval, BSWM

Status of IHP-VII activities

In response to the questionnaire from the UNESCO-IHP Paris office, the following had been indicated in 2008 as the Philippines Country Priorities for IHP-VII Themes:

Theme 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS (General priority of the Philippines in all focal areas)

Focal area 1.1 - Global changes and feedback mechanisms of hydrological processes in stressed systems

Focal area 1.2 - Climate change impacts on the hydrological cycle and consequent impact on water resources

Focal area 1.3 - Hydro-hazards, hydrological extremes and water-related disasters

Focal area 1.4 - Managing groundwater systems' response to global changes

Focal area 1.5 - Global change and climate variability in arid and semi-arid regions

Theme 2: STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY (General priority of the Philippines in all focal areas)

Focal area 2.1 - Cultural, societal and scientific responses to the crises in water governance

Focal area 2.2 - Capacity development for improved governance; enhanced legislation for wise stewardship of water resources

Focal area 2.3 - Governance strategies that enhance affordability and assure financing

Focal area 2.4 - Managing water as a shared responsibility across geographical & social boundaries

Focal area 2.5 - Addressing the water-energy nexus in basin-wide water resources

Theme 3: ECOHYDROLOGY FOR SUSTAINABILITY (priority of the Philippines for focal area 3.1)

Focal area 3.1 - Ecological measures to protect and remediate catchments process

Focal area 3.2 - Improving ecosystem quality and services by combining structural solutions with ecological biotechnologies

Focal area 3.3 - Risk-based environmental management and accounting

Focal area 3.4 - Groundwater-dependent ecosystems identification, inventory and assessment

Theme 4: WATER AND LIFE SUPPORT SYSTEMS

(General priority of the Philippines in all focal areas)

Focal area 4.1 - Protecting water quality for sustainable livelihoods and poverty alleviation

Focal area 4.2 - Augmenting scarce water resources especially in SIDS

Focal area 4.3 - Achieving sustainable urban water management

Focal area 4.4 - Achieving sustainable rural water management

Theme 5: WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT

(General priority of the Philippines in all focal areas)

Focal area 5.1: Tertiary water education and professional development

Focal area 5.2: Vocational education and training of water technicians

Focal area 5.3: Water education in schools

Focal area 5.4: Water education for communities, stakeholders and mass-media professionals

Cross-cutting programmes: FRIEND (Asia Pacific FRIEND - priority of the Philippines)

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Philippine Water Partnership (PWP),

- Tracking of Progress on Water Security: Currently conducting preparatory activities on the conduct of a roundtable discussion (RTD) on water security framework during the 1st week of November 2015
- World Water Day 2015 Activities: Ms. Rosario Aurora “Rory” Villaluna was given a posthumous award for her contribution to the water sector during the Water & Sustainable Development Awards sponsored by Maynilad. Her daughter Loui, received the award on March 16, 2015 at UP Bahay ng Alumni.
- Lake Pandin Tour, San Pablo, Laguna: PWP representatives joined the Lake Tour on March 17, 2015 organized by the Laguna Lake Development Authority (LLDA), being the convenor of the formulation of the Development Management Plan (DMP) for Lake Pandin Creek / River Clean-up PWP participated in this simultaneous clean-up operation which was coordinated by DENR-NCR, EMB, RBCO, Manila Water and the Local Government Units (LGUs) in Malabon City.
- Ms. Jessica C. Salas through PWP has been contracted by STITCHTING DELTARES, a leading Dutch institute for integrated coastal studies and policy-related research and development to undertake the project entitled: “Philippines: Establishing Integrated Water Resources Management (IWRM) – planning tools and guidance and capacity building.” The project duration is from June to October 2015. PWP will provide assistance on the research work and administrative support during its implementation.
- PWP together with MWSS collaborated with the USAID-Be Secure Project in organizing the Water Demand Management: How to Cope with El Nino, a forum which is part of a series of engagements and field visits of the two international experts. This session intends to share practical and locally initiated water efficiency measures and global best practices that can be replicated particularly to water-stressed areas in the Philippines and to prepare for the ill-effects of El Niño and climate change. The said session also intends to gather inputs for policy development and identify actions on Water Demand Management.
- Updating of the 1976 Water Code of the Philippines and its Implementing Rules and Regulations (IRR). This program will support the National Government’s effort to update the Water Code, especially in the light of the major climate-induced calamities the country has been experiencing in more recent years. Series of discussions with the Project Team were held on the formulation of the Terms of Reference (TOR) for Consultant to review the existing Water Code. Environment Lawyer / Consultant was hired effective December 1, 2014 – April 30, 2015. The Consultant is expected to produce a final report containing all revisions to the submitted preliminary report, draft Water Code amendments bill and IRR amendments after taking into consideration all additional stakeholder inputs/reactions during the national consultations conducted.
- World Water Day celebration, PWP in collaboration with USAID Be Secure and NWRB organized a Roundtable Discussion (RTD) on March 19, 2015. This activity was the venue for the presentation of the output of the consultant. It was conducted in close coordination with the Philippine Water Partnership and the National Water Resources Board (NWRB). After more than three decades of adoption and implementation of the law, there is a need to amend the Code to be responsive to the changing needs of the country and its environment. There are current issues and challenges which need to be addressed such as climate change and operationalization of the IWRM, among others. Its provisions have to be flexible to be able to address future challenges as well. Participants were from various government offices, NGOs, LGUs, Water

Districts, the academe and the private sector. 2nd Roundtable Discussion (RTD)/ Experts' Review on the Amendments of the Water Code of the Philippines was held at the USAID Be Secure office in May 2015. The Public Consultation on the Proposed Amendments to the Water Code for Visayas was held in Iloilo City on May 29, 2015, while the Public Consultation for Mindanao was held in Cagayan de Oro City on June 19, 2015.

- The latest version of the Revised Water Code amending the 1976 Water Code has been submitted by the Consultant to PWP based on the RTDs and comments gathered from the public consultations conducted. There are some other "open" issues that need to be resolved and determined if the same should be included in the draft amendatory bill. PWP, together with the USAID-Be Secure Project will organize a writeshop tentatively scheduled during the last week of October 2015 to be attended by technical experts and legislative advisers to provide further comments and guidance.
- PWP together with GIZ organized the Orientation-Workshop on Mainstreaming Climate Change Adaptation and Resiliency in the Formulation of River Basin Master Plans: The Case of Central Cebu River Basin on March 4-6, 2015 held in Cebu City

1.2.2 Participation in IHP Steering Committees/Working Groups

Country Representative, 22nd Regional Steering Committee Meeting of the UNESCO International Hydrological Programme for Southeast Asia and Pacific (UNESCO-IHP SEAP) and the International Conference on Ecohydrology (ICE 2014) - "Ecohydrology Approaches Facing the Global water Environment Challenges", Yogyakarta, Indonesia, 10-14 November 2014.

1.2.3 Research/applied projects supported or sponsored

University of the Philippines - Diliman, Institute of Civil Engineering (UP-ICE) and National Hydraulic Research Center (NHRC)

Aquino, DH.M., Bartolome, C.T. and Tanchuling, 2014, Estimating Flood-induced Disaster Waste Generation in Philippine Residential Areas, 2nd ASEAN Environmental Engineering Conference, Puerto Prinsesa, Palawan, 11/21-22/2014, ASEAN Environmental Engineering

Aquino, DH.M., Tanchuling, 2014, Evaluating the perception on the adequacy and quality of water and sanitation services in public school buildings used as evacuation sites and benchmarking against established international standards, Philippine Institute of Civil Engineers 2014 National Midyear Convention, Baguio City, Philippines, 6/5-7/2014, PICE

Aquino, DH.M., Tanchuling and Bartolome, C.T., 2014, Correlation of Flood Depth and Disaster Waste Generation in Residential Buildings in Suburban Philippine Setting, 7th AUN-SEED Net Geological Engineering Conference (AGEC) & the 2nd AUN-SEED Net Natural Disaster Conference (ANDC), Yangon, Myanmar, 9/27/2014 to 10/01/14, AUN/SEED-Net.

Brasos, R.G. and Tanchuling, 2014, Water Quality Characterization of Tanay River System in Tanay, Rizal, Philippines, 2nd ASEAN Environmental Engineering Conference Puerto Prinsesa, Palawan, 11/21-22/2014, ASEAN Environmental Engineering

Clemente, E.D. and Tanchuling, 2014, Application of the Streeter Phelps Model on Estero de Paco, Manila, Philippines, 2nd ASEAN Environmental Engineering Conference, Puerto Prinsesa, Palawan, 11/21-22/2014 ASEAN Environmental Engineering

Cruz, E.C. 2014, Engineering analysis of tsunami incursion into coastal areas – theory and project applications, 12th Region III Technical Conference, Philippine Institute of Civil Engineers, Baler, Aurora, Philippines, 5/9-10/2014, PICE

Cruz, E.C., 2014, Hindcasting of storm surge and waves due to historical typhoons – applications to Philippine coasts, 12th Region III Technical Conference, Philippine Institute of Civil Engineers, Baler, Aurora, Philippines, 5/9-10/2014, PICE.

Herrera, E.C. 2014, Hydraulic Characterization of Estero de Paco, DOST National Science and Technology Week Workshop Tuguegarao City, Philippines, PCIEERD.

Herrera, E.C., 2014, Small fish, Big fish: A glimpse of the Integrated Decision Support System for Laguna Lake “Coastal Ecosystem Conservation & Adaptive Management”, 2nd National Conference/Workshop of the Philippines-Japan Collaborative Project, Quezon City, Philippines, JST-JICA.

Herrera, E.C., 2014, The IDSS Bolinao: Structure, Models, and Implementation for Supporting Decision-Making, “Coastal Ecosystem Conservation & Adaptive Management”, 2nd National Conference/Workshop of the Philippines-Japan Collaborative Project, Quezon City, Philippines, JST-JICA.

University of the Philippines - Diliman, Department of Geodetic Engineering (UP-GE Dept) and Remote Sensing & Image Processing Laboratory

The DREAM Program (2011-2016) - The DREAM Program is a research and development project supported by DOST. It uses state-of-the-art technology in particular LiDAR to create high resolution up-to-date detailed maps of 17 major river basins. The DREAM Program is geared towards the generation of information related to floods and disasters as well as other applications of this detailed information for various industry sectors, government agencies, academe, and other stakeholders. The Workshop was a venue to understand the acquisition strategy, the characteristics of the data and prospects for research and science applications.

University of the Philippines - Diliman (UPD), Office of the Vice-Chancellor for Research & Development (OVCRD):

Contact: UPD Vice Chancellor for Academic Affairs, Dr. Benito M. Pacheco, Professor of Civil Engineering

- Philippine recommended focal point for DRH program of UNESCO-MEXT-Kyoto University.

Department of Science and Technology (DOST) and University of the Philippines - Diliman (UPD).

Nationwide Operational Assessment of Hazards (Project NOAH)

Executive mission: to put in place a responsive program for:

- (a) Flood mitigation, specifically targeting a 6 hour flood early warning system for communities along 18 major river systems;
- (b) Improving communications for weather and other hazards

Activities:

- (a) Integrated Flood Early Warning System Rollout 2012
- (b) Airborne LIDAR survey: GPS, IMU, Laser Rangefinder
- (c) Precision watershed surveying for modeling of watersheds and flood zones
- (d) Accomplishments - Purchase, Inspection and Delivery of LiDAR Equipment,
Training Lease of Aircrafts
- (e) Advanced Works
 - Establishment/Relocation of GCPs for base stations
 - At least two base stations are needed for LiDAR Survey
 - Reconnaissance and Preparation for LiDAR survey
 - Flood Plain Extent Delineation
 - Development of tools for DEM correction
 - Mobile Lidar Processing
 - Integration of Satellite, Terrestrial and Bathymetric Data
 - Automated 6-Hour prediction of Water Level in Montalban
 - Marikina Watershed Modeling
 - Rapid Flood Simulation for Flood Events

Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA),

Continuing Priority Programs of the Flood Forecasting Branch

- Upgrading of *Flood Forecasting Operations*.
 - Establishment of *Communication Network Thru SMS Link* Between PAGASA Weather and Flood Forecasting Center (WFFC) Bldg. (Quezon City) and Magat Dam in Isabela.
 - Calibration of the following hydrologic models, to be applied operationally to the various flood forecasting points of the Pampanga, Agno, Bicol and Cagayan River Basins:
MLRegression, Storage Function and Sacramento Model.
- Establishment/Enhancement of *Community-based Early Warning System (CBEWS)* under the READY Project (UNDP), covering the following Provinces: Laguna, Ilocos Sur, Zambales, Cavite, Bohol
- Conduct of *flood hazard mapping* (READY Project) in the following provinces: Ilocos Sur, Laguna, Cavite, Pampanga, Iloilo.
- Improvement of the *Flood Forecasting and Warning System (FFWS)* of the Pampanga and Agno River Basins, to include the ff. activities:
- Construction of the Pampanga River Flood Forecasting Center.
 - Implementation of JICA project in the Pampanga and Agno river basins
- Strengthening of the *FFWS for Dam Operation*, including Magat Dam through the improvement of dam facilities and conduct of training.
- Establishment of *Early Warning System for disaster mitigation* in the south (Iloilo) under the Korean Government - project began March 2008.

1.2.4 Collaboration with other national and international organizations and/or programmes

No additional information is available.

1.2.5 Other Initiatives

National Water Resources Board (NWRB)

Reforms in the Water Sector - Philippine Development Plan (2011-2016)

- Strategy: Practice IWRM in the Water Sector,
- Whole Water Cycle Management and River Basin Approach

On-going Programs:

- Groundwater Resource Vulnerability
- Assessment using Isotope Techniques in Regions 2 and 10 (MGB/NWRB/PNRI- IAEA Funding)
- Inventory of water users in Region 2 -(IAEA)
- Groundwater Management Plan in Metro Iloilo including establishment of monitoring network (Government Funding)
- Preparation of Localized Customer Service Codes in CPC grantees
- Improvement of the water allocation system using Climate Change Impact Model intended for groundwater regulation that considers climate change scenarios
- Data collection and sampling of the groundwater data in Manila Bay Coastal Province (DENR-MBCO)
- Amendment of the Water Code (PD 1067) to be responsive to current issues and challenges and operationalize IWRM.

Proposed Programs:

- Establishment of an Integrated 3D GIS Based Water Resources Management Information System in the Provinces of Pampanga and Bulacan (KOICA funding, 2013-2014)
- Science-based Management Strategies for Sustainable Groundwater Resource Development in Metro Manila (Submitted to NEDA/JICA)

National Initiatives

- Legislative :Proposed Water Regulatory Commission and Water Reform Act
- Executive: Creation of a National Water Resources Management Office to address institutional fragmentation and improved science-based decision making.

Metropolitan Waterworks and Sewerage System (MWSS)

Water Supply Projects

- Angat Dam and Dyke Strengthening Project 2013 - 2016 National Government
Remediation and strengthening of the Angat Dam and Dyke in order to ensure its stability should the West Valley fault moves
- New Centennial Water Supply Project 2013 - 2017 PPP
Construction of a new water source in order to meet the increasing water demand. Also intended to provide a redundant dam for Metro Manila's domestic water supply.
- Bulacan Bulk Water Supply Project 2014 -2017 PPP
Construction of water distribution system that will provide bulk water supply to the water districts of the Province of Bulacan
- 15 CMS Water Source Development Project 2014 -2017 PPP /ODA
- Angat Water Utilization and Aqueduct Improvement Project Phase 3 2013 - 2015 ODA
Investigation and rehabilitation of the existing raw water conveyances (5 aqueducts and 3 tunnels) to Metro Manila.

Note: PPP = Public-Private Partnership; ODA = Official Development Assistance

Department of Interior and Local Government (DILG)

Current Initiatives & Programs

- MDGF-Enhancing Access to & Provision of Water Services with the Active Participation of the Poor
aims to enhance the provision of and access to water services in 36 waterless communities through a combination of improved policy environment and increases local capacities.

- (a Joint Program of the Government and the United Nations, with funding from the Spanish government under the MDG Achievement Fund Strategies works with local governments and communities empowers the vulnerable and disadvantaged inspires commitment, support and partnerships)
- Sound Practices and Knowledge Products
 - Human rights-based approach to WATSAN development planning.
 - Godparent schne for knowledge and skills transfer
 - Localized customer service code for Level II systems
 - Fact sheets, Publications, Brochures
 - Local Water Governance Toolbox - Physical and Web-based Knowledge Products
- Sagana at Ligtas na Tubig sa Lahat Program- 455 Waterless Municipalities 2011-2016
 - Bottom-Up Planning & Budgeting Program 609 Focus Areas 2013-2016
- Sagana at Ligtas na Tubig sa Lahat Program (SALINTUBIG)
 - A pro-poor initiative designed to provide water supply systems for waterless municipalities and intend to enhance/improve local capacities of LGUs and Water Service Providers in planning, implementation and operation and management of water supply facilities in a sustainable manner;
 - Target Beneficiaries - 455 waterless municipalities, waterless barangays, resettlement / relocation sites, lying-in clinics, RHUs and BEMONCs
- Program Components
 - Capacity Development
 - Training and Workshops
 - Studies
 - OJT
 - Mentoring and Coaching
 - Infrastructure Investment
 - Construction
 - Rehabilitation
 - Expansion
 - Upgrading

Department of Public Works and Highways (DPWH)

Short-listed Structural Mitigation Measures

- Pasig-Marikina River Improvement (RI) + Dam
- Meycauayan RI
- Malabon-Tullahan RI
- South Parañaque – Las Piñas RI
- East Mangahan Floodway (Cainta & Taytay RIs)
- West Laguna Lakeshore Land Raising
- Land Raising for Small Cities around Laguna Lakeshore
- Improvement of the Inflow Rivers to Laguna Lake
- Manila Core Area Drainage Improvement
- West Mangahan Area Drainage Improvement
- Valenzuela, Obando and Meycauayan (VOM) Improve.(to be studied further)

Proposed Non-Structural Measures

- Strengthening of the Flood Information and Warning System (FIWS)
- Effective Flood Control Operation and Warning System (EFCOS) improvement
- New telemetric rainfall and water level gauging stations

Capacity Building for Strengthening Community-based FRM

Update and implement Information and Education Campaign (IEC) programs
Rainfall and water level monitoring by Barangay Disaster Risk Reduction and Management Councils (BDRRMCs)
Construction of evacuation routes and temporary evacuation centers

Improvement of Management Information System (MIS) for Disaster Risk Management

Improvement and development of MIS
Capacity building

Reforestation and Watershed Management

Fort Bonifacio Retarding Tank - a model urban rainwater catchment system.

Estero de Paco Development - dredging, riprap, slope protection and phytoremediation, facelifting of residential homes, walkway/linear park

National Sewerage and Septage Management Program (NSSMP)

Project Description -

Increase number of sewerage and septage management projects (outside Metro Manila) by 2020

Septage Management Targets

All LGUs have septage management programs serving their urban barangays
Capital costs per project range from P4-71 M

Sewerage Targets

17 HUCs outside of MM serving 50% of urban barangays; to be done in 2 phases of 25% each (interceptor type systems)
Capital costs average P410 million/project/phase

National Strategy

Facilitate a bottom-up, demand-driven project development process by providing local implementers with training, tools and financial incentives, including NG cost share for sewerage.
DPWH (in coordination with DOH) – conduct a high-impact nationwide training and promotion campaign
Integral component of the Sanitation Roadmap and National Sustainable Sanitation Plan, broader, over-arching frameworks (needed water and sanitation sector reforms are being developed by other groups)

Local Strategy

LGUs, water districts, and small water service providers use the NSSMP Guide for Local Implementers to develop projects
Projects will include operational guidelines, ordinances, enforcement, user fees, promotion campaigns
LGUs encouraged to share capital costs with WDs and/or bid out contracts to the private sector for septage collection and treatment
DENR regional offices continue to lead the creation of WQMAs and Funds

Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH), *Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of the DPWH*, JICA.

Bureau of Soils and Water Management (BSWM)

Bureau of Soils and Water Management (BSWM), *Drought Mitigation Measures*.

Bureau of Soils and Water Management (BSWM), *Integrated Watershed Management for Sustainable Soil and Water Resources Management of the Inabanga Watershed, Bohol Island, Philippines*.

Bureau of Soils and Water Management (BSWM), *Rainwater Harvesting*.

Bureau of Soils and Water Management (BSWM), *Rehabilitation/Upgrading of Regional and Provincial Soil and Water Analyses*.

Bureau of Soils and Water Management (BSWM), *Small Water Impounding Projects (SWIP)*.

Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH), *Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of the DPWH, JICA*.

Laguna Lake Development Authority (LLDA), *Environmental User Fee Program* (as centerpiece of Environmental Management Program).

Laguna Lake Development Authority (LLDA), *River Rehabilitation Program* .

Laguna Lake Development Authority (LLDA), *Lake Fishery Management Program*.

Laguna Lake Development Authority (LLDA), *Laguna de Bay Shoreland Management*.

1.3 Educational and training courses

1.3.1 Contribution to IHP Courses

None

1.3.2 Organization of specific courses

None

1.3.3 Participation in IHP courses

Papers and Publications

None.

1.4 Participation in international scientific meeting

1.4.1 Meetings hosted by the country

2nd International River Summit, "Reviving Rivers, Rebuilding Civilization", hosted by the local government of Marikina City, Metro Manila, Philippines, 19-21 November 2014.

Plenary Sessions and Parallel Sessions:

Session 1: Water quality management

Session 2: Watershed, Water resources management and eco-system services

Session 3: Research & development and extension on river studies

Session 4: Corporate social responsibility

Session 5: Resilience building in river basin management

Session 6: Water partnerships, convergence and governance

Session 7: Biodiversity conservation in river revival

Session 8: Role of river in culture and heritage

Session 9: Flood risk management

Session 10: Resilience building in river basin management

1.4.2 Participation in meetings abroad

No additional information is available.

1.5 Other activities at regional level

Global Water Partnership - South East Asia (GWP-SEA), Steering Committee Meeting, 30 Sept-2 Oct 2015, Cambodia.

1.5.1 Institutional relations /co-operation

No complete information is available.

1.5.2 Completed and ongoing scientific projects

No additional information is available.

2.0 Future Activities

2.1 Activities planned for 2015-2016

Mapping of RSC Future Projects against IHP VIII "Water Security: Responses to Local, Regional and Global Challenges (2014-2021).

Participation in currently RSC-supported programs and activities such as APFRIEND, Catalogue of Rivers for SEAP, FFWS and the IHP training courses conducted by the Kyoto University.

Participation in the review of cross-cutting programs such as FRIEND, HELP and IWRM.

Evaluation by the national committee of the proposed IHP-VIII Themes, Focal Areas and Activities.

2.2 Activities in the long term

Concerted efforts and initiatives for research and extension activities in flood management, water-related multi-hazard risk assessment and mitigation, climate change mitigation and adaptation, and sustainable development in the context of integrated water resources management (IWRM).

Continued support of, and participation in the UNESCO-IHP in general and the RSC in particular, in all present and future: activities: APFRIEND (rainfall IDF and flood frequency studies), Catalogue of Rivers for SEAP, DRH, IHP training courses conducted by host countries, and joint hydrologic training courses and researches among member countries.



**NATIONAL REPORT ON IHP RELATED ACTIVITIES
IN REPUBLIC OF KOREA
In the period of Nov 2013 – Oct 2015**

**Korean National Committee
for
The International Hydrological Programme
Republic of Korea**

Abstract

Since the beginning of the eighth phase of IHP, the Korean National Committee for the IHP(IHP-KNC) has been and being paid its efforts to achieve the objectives set by UNESCO for this phase of IHP and the key focal area's projects have been and being executed in Korean river basins and in the field of hydrology and water resources in Korea. Research projects supported by the Government in the framework of the IHP in the period of Nov 2013 – Oct 2015 have been executed according to the implementation plan of IHP-VIII phase.

Particularly, during this period, the IHP-KNC has been preparing the establishment of a UNESCO Category II Water Centre, the International Centre for Water Security and Sustainable Management(i-WSSM) at the K-water Institute, Republic of Korea which was unanimously endorsed in the 20th Session of the Intergovernmental Council of the IHP and approved by the General Conference in 2013.

The IHP-KNC will actively continue and participate in the Asian Pacific FRIEND/HELP projects to complete with successful results and also will execute a HELP river basin project in collaboration with other Asia Pacific HELP projects and UNESCO international cooperative studies. Furthermore, a series of international symposiums and workshops have been and will be organized during this period as the IHP-VII and - VIII activities of IHP-KNC and contributed to the 7th World Water Forum held in Daegu-Gyeongbuk, Republic of Korea in 2015.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD Nov 2013 – Oct 2015

1.1 Meetings of the IHP National Committee

1.1.1 Decisions Regarding the Composition of the IHP National Committee

Korea as a participant in the program, then appointed within its Ministry of Construction a IHD National Committee(later, IHP National committee), which undertook pioneer hydrologic surveys of selected representative basins in three major river systems during the program period, and embarked in 1975 on a 6-year International Hydrological Programme (IHP) project as the first step toward an extension of surveys of domestic river basins in order to fulfill its responsibilities in the world's consolidated efforts to cope with the water problem.

After the completion of the first phase of IHP in 1980, the second phase of IHP project(1981~1983), the third phase of IHP project(1984~1989), the fourth phase of IHP project(1990~1995), the fifth phase of IHP project(1996~2001), the sixth phase of IHP project(2002~2007), the seventh phase of IHP project(2008-2013) and eighth phase of IHP project(2014-2021) followed for the continuation of representative basin studies, the adoption of new techniques of water resources development and water quality control, the hydrological evaluation of urbanization and variations of watershed including sustainable development in a changing environment, hydrology and water resources development in a vulnerable environment, water interactions of systems at risk and social challenges and water dependencies of systems under stress and societal responses, and education and water security with responses to local, regional and global challenges.

From the beginning of the New Millennium through the year of 2010, the Korean National Committee for the IHP was reorganized and strengthened to fulfill the IHP activities more effectively and actively. Particularly, the Korean National Committee for the IHP has been reorganized to include more members from various water organizations in Korea under the supplement of the legal background in the beginning of 2011.

All members of the Committee were from every part of water related organizations in the country and executive functions are carried out within the Water Resources Bureau, Ministry of Land, Infrastructure and Transport.

Decisions regarding most of IHP related activities are made by this committee which is held regularly and on request in special occasion.

1.1.2 Status of Contribution to / Participation in IHP-VII and IHP-VIII

As the completion of the seventh phase of IHP(2008-2013) the Korean National Committee for the IHP has executed most of the implementation plan of IHP-VII during the period(2008-2013), and initiated and undertook the core programme's Themes and Focal Areas from the beginning of the eighth phase of IHP(2014-2021) according to its implementation plan and projects.

During this period of the eighth phase of IHP, the Korean National Committee for the IHP has been paid its efforts to achieve the objectives set by UNESCO for this phase

of IHP and the following projects have been and being executed in Korean river basins and in the field of hydrology and water resources in Korea;

- (1) Water related disasters and hydrological change
- (2) Groundwater in a changing environment
- (3) Addressing water scarcity and quality
- (4) Water and human settlements of the future
- (5) Ecohydrology, engineering harmony for a sustainable world
- (6) Water education, key for water security
- (7) FRIEND and HELP basin studies

1.2 Activities at national level in the framework of the IHP

1.2.1 National / local scientific and technical meetings

Annual regular or many special scientific and technical meetings in the framework of the IHP were held in collaboration with International Hydrologic Environmental Society(IHES), Korea Water Resources Association(KWRA), Korean Society of Civil Engineers(KSCE), ICOLD Korean National Committee (KNCOLD), IWRA Korea Geographic Committee(IWRA-KGC), Korea Federation of Water Science and Engineering Societies(KFWSES), Korea Water Resources Corporation(The K-Water), and other water-related organizations in Korea. In those meetings, national/local hydrologic issues and water resources problems were dealt with special solution measures and their results were published in the form of scientific or technical reports and papers.

1.2.2 Participation in IHP Regional Steering Committees / Working Group

- Republic of Korea was one of most active member countries in IHP Regional Steering Committee's activities for Southeast Asia and the Pacific.
- Republic of Korean delegates actively participated in the IHP Regional Steering Committee, Workshop and Working Group meetings held in the period of 2013-2015.
- Republic of Korea IHP National Committee organized 21st IHP RSC Meeting of Southeast and the Pacific in Gyeongju, Republic of Korea.

1.2.3 Research / applied projects supported or sponsored

- Research projects supported by the Government in the framework of the IHP in the period of 2013~2015 have been executed according to the IHP Themes and Focal Areas.
- Some other research or applied projects were also supported or sponsored by the Government and other water-related organizations such as Korea Water Resources Corporation(The K-water) during this period.
- The following projects have been and are being implemented for the Asia Pacific

FRIEND in the representative river basins chosen as the Korean Asia Pacific FRIEND, and a Korean HELP basin(Kumho river) which is one of the International HELP basins;

- Basic hydrologic analyses and data collection
- Comparative regional flow regimes analyses
- Rainfall models and design storm
- Flood models and design flood
- FRIEND river basins studies
- Asia Pacific HELP(AP-HELP) river basin studies with UNESCO international joint cooperative studies

1.2.4 Collaboration with other national and international organizations / or programmes

The Korean National Committee for the IHP is functioning in the execution of IHP activities in collaboration with the following national and international organizations/or programmes; Korea Water Resources Corporation(The K-Water); Korea Water Resources Association(KWRA); Korean Society of Civil Engineers(KSCE); Korean Society of Agricultural Engineers(KSAE); Korean Meteorological Society(KMS); ICOLD Korean National Committee(KNCOLD); IWRA Korean Geographic Committee; International Hydrologic Environmental Society(IHES); Korea Federation of Water Science and Engineering Societies(KFWSES); Korea Institute of Construction Technology(KICT); Korean Universities Hydrology and Water Resources Programmes.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

The Korean National Committee for the IHP is contributing to the Korean Universities hydrology and water resources courses in the framework of the IHP in which graduate students and engineers are mostly involved with IHP projects and also educated or trained through the formal courses.

1.3.2 Organization of specific courses

Special workshops and seminars in the field of hydrology and water resources are annually organized by the Korean National Committee for the IHP in collaboration with above mentioned organizations in 1.2.4. In these specific courses, special topics are dealt with practical application in river basins.

1.3.3 Participation in IHP courses

The Korean National Committee for the IHP has actively been participating in IHP courses which were held in Asia-Pacific regions such as Japan, China and Malaysia by sending highly qualified hydrologists or proper candidates.

1.4 Cooperation with the international /regional water centres under auspices of UNESCO

- The Korean National Committee for the IHP has been preparing for the establishment of a UNESCO Category II Water Centre, the International Centre for Water Security and Sustainable Management(*i*-WSSM) at the K-water Institute, Republic of Korea which was unanimously endorsed by all member states in the 20th Session of the Intergovernmental Council of the IHP and approved by the General Conference in 2013.
- The Korean National Committee for the IHP has been collaborating very actively with other UNESCO Category II Centres such as ICHARM in Japan, Humid Tropic Centre in Malaysia and Regional Ecohydrology Centre in Indonesia.

1.5 Publications

- The Korean National Committee for the IHP is publishing IHP Annual Research Report in the form of Government Publication since 1975.
- These reports are distributed to all water-related organizations and IHP-KNC members and research results are published on the journals of academic societies or organizations.
- Some other technical reports, proceedings of scientific meetings and specific course's materials are also published by the IHP-KNC.

1.6 Participation in international scientific meetings

- Meetings hosted by the country
The following IHP meetings were hosted and organized by the IHP-KNC and IHES;
 - 2013 IHP RSC Meeting and 2013 Nakdong River Water Week/International Water Forum(Na-Ri IWW/IWF 2013) held between 30 September – 3 October 2013, Gyeongju, Republic of Korea.
 - 2014 Nakdong River Water Week/International Water Forum(Na-Ri IWW/IWF 2014) and Daegu International Water Forum(DIWF) held between 20 – 23 October 2014, Gyeongju and Daegu, Republic of Korea.
 - In the 7th World Water Forum, the IHP-KNC arranged and contributed to more involvement of the IHP communities in processes and activities of the 7th World Water Forum which was held in Daegu-Gyeongbuk, Republic of Korea on 12-17 April, 2015.
- Participation in meetings abroad
The Korean National Committee for the IHP actively participated in the IHP Inter-Governmental Council meeting as well as the regional IHP meetings such as Meetings of IHP Regional Steering Committee for Southeast Asia and the Pacific, Asia Pacific FRIEND Project and its workshops, Asia Pacific HELP project and its workshops, working Group meetings and etc.

2. FUTURE ACTIVITIES

- IHP-KNC will actively continue and participate in the Asian Pacific FRIEND/HELP projects to complete with successful results for the Southeast Asia and the Pacific and also will execute a HELP river basin project in collaboration with other Asia Pacific HELP projects and UNESCO international cooperative studies.
- The following international symposiums and workshops has been and will be organized during 2013-2015 as the IHP-VII and -VIII activities of IHP-KNC.
 - Korean Workshops of AP-HELP during 2013-2015
 - 7th WWF Related Meetings, Daegu Gyeongbuk in 2013 - 2014.
 - 2013 & 2014 International Water Forum(Na-Ri IWW/IWF 2013 & 2014) Gyeongju and Daegu, Republic of Korea

NATIONAL REPORT ON IHP RELATED ACTIVITIES
THAILAND

for

23rd UNESCO IHP Regional Steering Committee Meeting for
Southeast Asia and the Pacific: RSC for UNESCO-IHP

19-20 October 2015

Medan, Indonesia

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1 ACTIVITIES UNDERTAKEN IN THE PERIOD of November 2014 – October 2015

1.1 Meeting of the IHP National Committee

1.1.1 Decision regarding the composition of the IHP National Committee

The present composition of Thailand National Committee – IHP: TNC-IHP consists of 18 members as follows:

Chairman:	Director General of Department of Water Resources
Vice Chairmen:	Deputy Director General of Department of Water Resources Deputy Director General of Royal Irrigation Department
Secretary:	Director, Bureau of Research, Development and Hydrology Department of Water Resources
Members:	Representatives from concerned agencies and experts are as follows: <ol style="list-style-type: none">1. National Park, Wildlife and Plant Conservation Department2. Department of Groundwater Resources3. Royal Irrigation Department4. Thai Meteorological Department5. Marine Department6. Hydrographic Department, Royal Thai Navy7. National Research Council of Thailand8. Department of Royal Rainmaking and Agricultural Aviation9. Secretariat of the Thai National Commission for UNESCO10. Electricity Generating Authority of Thailand11. The Thailand Research Fund12. Thai Hydrologist Association13. Mr. Veeraphol Taesombat14. Director of Research and Hydrology Development Division, Department of Water Resources

The mailing address is as follows:

Thailand National Committee for the IHP
Department of Water Resources
180/3 Rama VI Rd., Soi 34, Samsennai,
Phayathai, Bangkok, 10400, Thailand
Tel : +66 2298 6604 Fax: +66 2298 6604
Email : wandee_pat@yahoo.com
kanokwan.yw@gmail.com

1.1.2 Status of IHP-VIII activities

The activities related to IHP-VIII on water resources are undertaken through the strategies and implementation plans on water resources management focused on public participation in 25 river basins in Thailand.

1.1.3 Decisions regarding contribution to/participation in IHP-VIII

During November 2014 – October 2015, there was not Thailand National Committee – IHP meeting or any discussions. However, the secretariat of TNC – IHP still encourages the members to continue on knowledge and technology sharing, and cooperate in various ways to promote hydrological improvement and water resources criteria.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Thai representatives attended in various meetings particularly on hydrology, meteorology, flood forecasting and warning system, water resources and environmental management.

1.2.2 Participation in IHP Steering Committees/Working Groups
Representatives from TNC – IHP and the Department of Water Resources participated in the 22nd Regional Steering Committee Meeting for Southeast Asia and the Pacific, RSC for UNESCO-IHP and the Conference, 13-14 November 2014, Yogyakarta, Indonesia.

1.2.3 Research/applied projects supported or sponsored
Research project implemented by concerned agencies of Thai government for the fiscal year of 2015 (B.E.2558) according to the IHP VIII are as following:

Theme 1 Water Related Disasters and Hydrological Changes

- Telemetry system installation for water monitoring on 1 October 2015 - 30 September 2016.
- Installation of simple water gauges with message boards for early warning.
- Water Management Strategy Review: To Tackle Climate Change on 1 October 2014 - 30 September 2015.
- Water Access and water use efficiency according to a green economy to support the climate change in Suan Phung District, Suan Phung, Ratchaburi Province on 1 October 2014 - 30 September 2015.
- The study on the protocol of magnifying an outcome of drinking water system in the two remote areas–Omkoï District and Mae Chaem District, Chiangmai Province on 1 October 2014 - 30 September 2015.
- Answer problem in success administration arithmetic manages original some water is sore the watermelon abundantly, district [teacher some] is sore , Phitsanulok Province and the line, the settlement receive the effect is damaged least on 1 October 2014 - 30 September 2015.
- The availability of local governments and involvement of the public in tackling water-related disasters (floods and landslides) in the south eastern part of the basin and canal basin became third, Nakhon Si Thammarat Province on 1 October 2014 - 30 September 2015.
- Developing of perception from flood - landslide disaster and community preparedness behavior for mitigating the impact of disaster: Case study of flood-landslide risk areas in Southern region on 1 October 2015 - 30 September 2016.
- Development of capacity building models on community’s adaptation for the rising risk of water resources from climate change and fluctuation on 1 October 2015 - 30 September 2016.
- Awareness of local community to impact of climate change and adaptation.
- Climate change and its impacts on water resources management of community (Multiple case studies: tributaries of Mun River basin)
- The effect of climate change on community based water management: Case study in the Mun River sub watershed area.
- Benefiting from global and local earth observation systems.

Theme 2 Groundwater in a Changing Environment

- Project Implementation on Groundwater and Hydro-Geological Map by the Department of Groundwater Resources with financial support of Groundwater Development Fund
- Telemetry system installation for water monitoring.
- Installation of simple water gauges with message boards for early warning to community
- Roles of Local Administration on Flood Management in Pathumthani Province.
- Selection of the Location for Disaster Victims Center and Assistance Route for Flood Mitigation.
- Study on Using Lateritic Soil mix with Cement for Road Restoration after Flood.
- Market Strategies of Hotel Business after Violent Flood in 2011, Case Study in Phra Nakorn Sri Ayutthaya Province.
- Addressing strategies for management of aquifers recharge.
- Promoting management of transboundary aquifers.

Theme 3 Addressing Water Scarcity and Quality

- Improvement of Electricity Generating Authority of Thailand or EGAT Reservoir Operation Rule Curve.
- Development of a Model for Optimal Reservoir Operation of Maeklong River Basin.

- Local Wisdom on Water Resources Management in Upper Northeastern Mekong River Basin.
- Study the Efficiency on Water Resources Management in paddy field due to the change of water storage in Mun River Basin, Part III, Samrong District, Ubonratchathane Province.
- Study on Sustainable Water Resources Management in Household according to Economic Efficiency.
- Strategy Review on Water Resources Management for Preparedness on Climate Change in Thailand.
- Water Access and Efficient Water Use according to Green Economic Concept to handle Climate Change, Suan Pheung District, Ratchaburi Province.
- Water user group strengthening.

Theme 4 Water and Human Settlements of the Future

- Study of Format on Expansion of Drinking Water Production with Slowly Sand Filtration System in Backcountry, Omkoi and Mae Chaem District, Chiang Mai Province
- System wide changes for integrated management approaches
- Institution and leadership for beneficiation and integration

Theme 5 Ecohydrology, Engineering Harmony for a Sustainable World

None

Theme 6 Water Education Key, for Water Security

- Enhancing tertiary water education and professional capabilities in the water sector
- Water education for children and youth
- Education for trans boundary water cooperation and governance

- 1.2.4 Collaboration with other national and international organizations and/or programmes
- Cooperate with Ministry of Natural Resources and Environment (MNRE) and other concerned agencies such as UNESCAP to organize a meeting/events/ exhibitions on the occasion of the World Water Day in March 2015
 - Collaborate with German Agency for International Cooperation: GIZ under the support by German Federal Ministry of Environment, Nature Conservation and Nuclear Safety (BMU) to contribute the project on Improved Flood and Drought Prevention through Ecosystem-Based Adaptation in Watershed for 3 years of implementation

1.2.5 Other initiatives

- The Department of Water Resources initiates the guidelines on Conjunctive Water Management with the Department of Groundwater Resources and Royal Irrigation Department, Thailand by using the SOURCE Model for decision support on water resources management with eWater Cooperative Research Center, Australia.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

None

1.3.2 Organization of specific courses

- National Training on Hydrology "Discharge Measurement and Analysis" on 3 - 5 November 2014, Nonthaburi Province, Thailand.
- Public Participation on-the-job Training of Operation and Maintenance of Early Warning System in the High Risk Areas of Flash Flood and Landslide for 2015, Regional Water Resources Office 1-11, Thailand.
- National Workshop on Operation and Maintenance of Mekong Hydrological Cycle Observation System : Mekong HYCOS on 19-21 May 2015, Udonthani, Thailand.
- National Workshop on Quality Assurance and Quality Control (QA/QC) of Mekong Hydrological Cycle Observation System : Mekong HYCOS on 28-29 July 2015, Loei, Thailand.
- Technical Workshop on Discharge and Sediment Data, Methodology and Activities on 30 March 2015, Vientiane, Lao PDR.

- Thailand Adaptation Pilot Project Tentative Plan for the Field Visit to Muaeng Chiang Rai District on 9-10 April 2015.
- Regional Water Quality Workshop on 2013 Regional Annual Water Quality Monitoring Report and Report Card on Water Quality. 14 November 2014, Phnom Penh, Cambodia (MRC).
- The International Workshop on 2nd International Workshop on On - site Domestic Wastewater Treatment in Asia on 1 to 2 December 2014, AIT Thani (Environmental Research and Training).
- Regional Workshop on Water Quality Data Analysis and Interpretation, on 8 - 9 December 2014, Hanoi, Viet Nam (MRC).
- Introductory Training Course on MRC/FMMP Flash Flood, 25-26 March 2015, Bangkok, Thailand.
- Activities for monitoring the integrity of ecosystems (Ecological Health Monitoring: EHM) of Thailand on the Mekong River's water quality monitoring stations 8 stations, on 8 to 10 April 2015.
- The National Workshop on MRC Web Portal (MRC-IS) Application, 22-23 June 2015, Bangkok, Thailand.
- Biochemical Oxygen Demand Analysis Training Workshop on 6 - 12 July 2015, UAE's Office in Bangkok, Thailand (MRC).
- 1st Workshop on Apply eWater Sources Model for Testing Procedure for Water Use Monitoring PWUM), on 20-23 July 2015, Nonthaburi, Thailand.
- Meetings Subcommittee fix lead contamination in Creek County Park, Kanchanaburi, on 5 to 7 August 2015, Kanchanaburi (PCD).
- Regional Technical Writing Workshop on Water Quality, on 7 - 9 September 2015, Hanoi, Viet Nam (MRC).
- Presentation of the project surveys and water quality monitoring Saen Saeb canal. The Conservation and Development of the canal, on 20 September 2015, floating morale - Miriam, Min Buri, Bangkok (Eddy., Department.).
- 2nd Workshop on Apply eWater Sources Model for Testing Procedure for Water Use Monitoring PWUM), on 20-23 July 2015, Bangkok, Thailand.

1.3.3 Participation in IHP courses

- Thai representative will attend the 25th IHP Nagoya Training Course "Risk Management of Water-related Disasters under Changing Climate" Kyoto University, Japan, 30 November- 11 December 2015.

1.4 Cooperation with UNECSCO-IHE Institute for Water Education and/or international/regional water center under the auspices of UNESCO

-

1.5 Publications

-

1.6 Participation in international scientific meeting

1.6.1 Meetings hosted by the country

-

1.6.2 Participation in meetings abroad

Representatives from Thailand participated in

- 7th World Water Forum on 12-17 April 2015, Daegu and Gyeonbuk, South Korea.
- Discharge Sediment Measurements and related Meeting, 2-3 July 2015, Hanoi, Vietnam.
- World Water Week on 23-28 August 2015, Stockholm, Sweden.
- 18th International River Symposium Excellence-Collaboration-Intergration:" Healthy River - Healthy Economics", 21-23 September 2015, Brisbane Convention & Exhibition Centre, Brisbane, Australia.
- Exchange Visit to Danube Riparian Countries, 20-25 September 2015, Austria, Slovakia and Hungary.

- Exchange Visit to PR China together with the Mekong Countries including Cambodia, Lao PDR and Myanmar hosted by ASEAN China Center, 20-27 September 2015.

1.7 Other activities at regional level

1.7.1 Institutional relations /co-operation

- TNC-IHP has remained coordination closely and contacts with UNESCO Jakarta Office and UNESCO Bangkok.

1.7.2 Completed and ongoing scientific projects

- Implementation of Joint-Discharge and Sediment Transport and Bedload Measurements in Mekong River in Thailand.

- Nam Pong project: Series of training for national modeler under IWRM principles.

- Lam Ta Kong project: Series on the job training/workshop for capacity building for the application of ArcSWAT.

2 FUTURE ACTIVITIES

2.1 Activities planned until December 2016

- Thai representatives will participate in the Training Course on International Training Program on Mountain Torrents and Geological Disasters Prevention Technology, November 2015, Wuhan, Hubei, Republic of China.

2.2 Activities foreseen for 2015-2016

- Continuation of Collaboration with RSC for Southeast Asia and the Pacific

- Enhancing activities contributed to IHP-VIII

- Enhancing activities on flood and drought management

- Continuation on promotion of integrated water resources management

- Expansion on implementation of integrated water resources management to the rest of the country

- Promotion on capacity building on water resources management for River Basin Committee

- Participate in the international forum/conference on water resources management or environmental aspects

- Project Implementation on Detailed Groundwater Map in the middle of north-eastern Thailand and overall area in Thailand by the Department of Groundwater Resources.

2.3 Activities envisaged in the long term

- Enhancing activities contributed to IHP-VIII

- Enhancing activities in Flood and Drought Management

- Highlight on Integrated Water Resources Management in 25 river basins

- Continuation of raising public awareness and education on water resources management

- Continuation of raising public participation on water resources management

*Thailand National Committee for IHP
Department of Water Resources
Ministry of Natural Resources and Environment
October 2015*

NATIONAL REPORT ON IHP RELATED ACTIVITIES

I. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2014 - OCTOBER 2015

1.1 Meetings in the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The Committee has remained unchanged during the period under review, with the Chairman being Prof. Tran Thuc, Vietnam Institute of Meteorology, Hydrology and Climate Change - Ministry of Natural Resources and Environment.

Assoc. Prof. Dr. Hoang Minh Tuyen, secretary of IHP National Committee.

The current IHP National Committee consists of 6 water experts working in hydrology and water resources in Viet Nam. Experts from Institutes, Departments and Committees concerned are as follows:

1. Vietnam Institute of Meteorology Hydrology and Environment
2. Department of Water Resources Management.
3. National Hydro-Meteorological Service
4. Ha Noi University for Natural Resources and Environment
5. Ha Noi Water Resources University
6. Center for Water Resources Planning and Investigation

1.1.2 Status of IHP-VIII activities

Prepare for the participation/contribution to IHP-VIII activities.

1.1.3 Decisions regarding contribution to/participation in IHP-VIII

1.2 Activities at a national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Scientific and technical meetings are generally held within the context of the Ministry of Natural Resources and Environment, Ministry of Science and Technology, and Professional Societies (particularly the Viet Nam Natural Resources and Environment, Viet Nam Fluid Mechanics, and Viet Nam Geography Societies).

The IHP National Committee has 3 meetings with the Vietnam National UNESCO Commission on the activities of the IHP National Committee. The Chairman and the Secretary of the IHP National Committee meet regularly to discuss IHP matters.

1.2.2 Participation in IHP Steering Committees/Working groups

The members of the Viet Nam National Committee for the IHP have attended and participated actively in all of the annual meetings of the Regional Steering Committee.

Participate in Asian Pacific FRIEND.

1.2.3 Research/applied projects supported or sponsored

- Participated in developing Flash flood potential maps and Flash flood Guidance system for Viet Nam, funded by VN Government
- Co-operated in developing Operation rule for reservoir system in dry season on Red river basin, funded by VN Government
- Participated in updating Climate change scenarios for Viet Nam, funded by VN Government

1.2.4 Collaboration with other national and international organizations

- Vietnamese-Mexican Peer-to-Peer Exchange: Sharing success factors for climate change policy, 15 March 2015



- In co-operation with CSIRO, Organized workshop “Consultation workshop on Downscaling Climate Projection”. May 2015
- Participated in high-level expert meeting in Tehran on Advances in Groundwater Management & New Tools and Strategies for Coping with Droughts. June 2015.

1.2.5 Other initiatives

1.3 Education and training courses

1.3.1 Contribution to IHP courses

None.

1.3.2 Organization of specific courses

- Training workshop “Climate change and sustainable development” for Lecturers of HaNoi University of Natural resources and Environment.



IMHEN and Yonsei University, Korea. Aug 2015

1.3.3 Participation in IHP courses

Several Vietnamese have participated in IHP courses and workshops during the reporting period, including IHP Training course on Numerical Prediction of High-Impact Weather systems, Urban Storm Water Management.

1.4 Publications

- Hoang Minh Tuyen, Tran Thanh Xuan, Luong Huu Dũng (2015): **River network, water resources of Viet Nam, changes and challenge.** Publishing House for Natural science and Technology.
- Hoang Minh Tuyen, Tran Thanh Xuan, Luong Huu Dũng (2015): **100 Questions & Answers about Hydrology and Water Resources.** Publishing House for Natural science and Technology.

1.5 Participation in international scientific meetings

1.6 Other activities at a regional level

1.6.1 Institutional relations/co-operation

None

1.6.2 Completed and ongoing scientific projects

None under the aegis of IHP-VIII

II. FUTURE ACTIVITIES

2.1 Activities planned for 2014-2015

- Attending meeting of 23rd IHP Regional Steering Committee for Southeast Asia and the Pacific.
- Participating in regional and national activities of IHP.

2.2 Activities envisaged in the long term

- Enhance activities contributed to IHP-VIII
- Focus on Water security and Scaring for Viet Nam
- Develop Flash flood warring system

THE REGIONAL HUMID TROPICS HYDROLOGY AND WATER RESOURCES CENTRE FOR SOUTHEAST ASIA AND THE PACIFIC (HTC KUALA LUMPUR)

FOREWORD



The Humid Tropics Centre Kuala Lumpur was inspired by increasing awareness of the importance of hydrology and water resources management in humid tropics region. It has become the prominent issue to the world organization.

The Regional Humid Tropics Hydrology and Water Resources Centre for Southeast Asia and the Pacific (HTC) is one of the UNESCO's Category II water centres. The HTC started operation in early 1997. An agreement between UNESCO and the Government of Malaysia was signed on 28 October 1999. The HTC aims to act as a catalyst in carrying out local, regional and international collaboration, consultation and partnership in water management. More specifically, the

objectives of the HTC are:

- To promote a conducive atmosphere for collaboration through technology and information exchange, education and science.
- To increase scientific and technological knowledge about the hydrological cycle.
- To promote and increase scientific and technological knowledge about urban stormwater management, ecohydrology, humid tropics and water education

The focal areas of HTC since 2009 are: Integrated Water Resources Management (IWRM), Urban Stormwater Management, Ecohydrology, River Waste Water Management, Humid Tropics and Water Education. The scope of activities includes applied research, services/advising/consulting, innovation product development, education, and software development.

HTC has been involved in the cross-cutting APFRIEND River Catalogue and some of the information can be access through <http://htckl.water.gov.my>. The Centre contributed to the SWITCH-in-Asia Urban Water Management through the construction of a demonstration integrated MSMA Stormwater Management Ecohydrology (SME) project at HTC and will continue to carry out the R&D&C for the benefits of UNESCO-IHP Strategic Plans. The SME demonstration project was officiated by H.E. Irina Bokova, the Director General of UNESCO on 21st May 2013.

Hopefully in the years to come, some of the component of the project can be successfully implemented through the Upscaling SME project at Langat river basin in Malaysia, in collaboration with one of the university that involve in UNESCO-HELP River Basin programme. The main target together with the implementation of other environmental projects at the river basin is to improve from the present stage E-Evolving to the next level stage O-Operating.

We wish very much to continue in the collaboration and networking and offer our services as a regional water centre under the auspices of UNESCO.

With Best Wishes,

Dr. Mohamed Roseli bin Zainal Abidin
Director
Humid Tropics Centre, Kuala Lumpur
Malaysia

INTRODUCTION

This report highlights events and activities that had taken place since the 22nd Regional Steering Committee Meeting for South East Asia and the Pacific UNESCO IHP held in Yogyakarta, Indonesia from 08th – 15th November, 2014 and throughout the year 2015 (till 30th September 2015). This report also highlights future programmes and activities for the year 2016 planned by the Centre. The report is categorized as follows;

1. Chapter 1: Activities Implemented and Participated at International and Regional Level.
2. Chapter 2: Activities Implemented and Participated at National Level.
3. Chapter 3: Quality Management System and Water Education Programme.
4. Chapter 4: Future Programme for 2016.
5. Chapter 5: Finance in 2014- 2015.
6. Chapter 6: Staffing in 2015.
7. Chapter 7: Publications in 2014/2015.
8. Chapter 8: Concluding Remarks.



CHAPTER 1**ACTIVITIES IMPLEMENTED AND PARTICIPATED AT INTERNATIONAL AND REGIONAL LEVEL****1.1. Seminar/Workshop/Training**

Attended the Training Course on Ecohydrology: A Tool for IWRM Implementation at the River Basin Level, on 09th – 09th November 2014 at Yogyakarta, Indonesia. This event was attended by Dr. Mohamed Roseli bin Zainal Abidin, Director of HTCKL. Dr. Mohamed Roseli bin Zainal Abidin gave a lecture on Ecohydrology for New Urban Design.

Attended the International UNESCO-PAGASA-IFI Workshop “Enhancing Resilience against Multi-Hazards through Effective Mitigation Systems and Adaptation Strategies on 24th – 26th February 2015 at La Breza Hotel, Quezon City, Philippines. This event was attended by Dr. Mohamed Roseli bin Zainal Abidin, Director of HTCKL. Dr. Mohamed Roseli bin Zainal Abidin presented a paper titled Flooding in Malaysia, Ecohydrology and Flood Mitigation Management Strategies

Dr. Mohamed Roseli bin Zainal Abidin, Director of HTCKL attended the Regional Dialogue on Sustainable Science Policy to Support the Post – 2015 Development Agenda on 4th -5th March 2015 at KLCC, Kuala Lumpur, Malaysia. Dr. Mohamed Roseli bin Zainal Abidin presented a paper titled ‘Sustainable Science: Linking Sustainable Development with Environmental Science with Examples on Water Security and Ecohydrology’ and involved in skype with UNESCO- Africa.

Dr. Mohamed Roseli bin Zainal Abidin also attended the 7th World Water Forum 2015 on 14th – 17th April 2015 at Daegu & Gyeongbuk, Rep. Of Korea. He presented a paper titled Eco-Biotechnology for Sustainable Urban Management: MBB, Phytoremediation. Alum Sludge. He also involved as a panelist for ‘Saemaul Undong: New Village Movement’. Talk on ‘Water Policy for New/Rural Villages (under insufficient financial resources) in Developing Countries.



Attended the Water Seminar 2015 in Brunei Darussalam World in conjunction of Brunei' Water Day 2015 which was held at Rizqun Hotel, Bandar Seri Begawan on 27th April 2015. The theme of this Seminar was Water and Sustainable Development. This seminar was attended by Dr. Mohamed Roseli bin Zainal Abidin, Director of HTCKL. He presented a paper titled Integrated Hydrological and Hydraulics River Basin Environmental Management.

The director of HTCKL, Dr. Mohamed Roseli bin Zainal Abidin Representing UNESCO Jakarta Office in delivering presentation on Water Management for Green Cities Development at the 15th International Convention on Melaka Twin Cities 2015: " Future Green Cities", on 29th -30th April 2015 at Equatorial Hotel Melaka, Malaysia

1.2. Meeting

Attended the "22nd Regional Steering Committee Meeting UNESCO-IHP Southeast Asia & the Pacific held in Yogyakarta, Indonesia from 08th – 15th November, 2014. The meeting was attended by Dr. Mohamed Roseli bin Zainal Abidin.

The Director of HTCKL, Dr. Mohamed Roseli bin Zainal Abidin attended a Meeting of Water Related UNESCO Category II Centres at Koblenz, Germany on 15th to 17th December 2014 and presented the HTCKL Activities Related to IHP.

The Director of HTCKL, Dr. Mohamed Roseli bin Zainal Abidin attendend a Strategic Meeting and a Workshop on Tools for Customizing IWRM Guidelines for Water Security in Asia and the Pacific: Challenges and Opportunities for HELP and Ecohydrology on 11th – 12th March, 2015 at Grand Kemang Hotel, Jakarta, Indonesia. He presented a paper title Implementing IWRM Guidelines and Ecohydrology Concept in a UNESCO Category 2 Centre.

1.4 Visit to HTCKL by the Director General of UNESCO Jakarta , Prof. Shahbaz Khan and Mr. Alain Mitchel Tchadie, Assistant Project Coordinator on 17th September 2015.

The main objective of the visit is to discuss about the implementation of project related to upscaling water security as follows;

- i. Review of the IPA contract on Comparative Studies Of Applying Ecohydrology And IWRM For Upscaling Water Security In Asia And Africa Through UNESCO Catergy 2 Water Centres



- a. Steps and progress of the research and activities
 - b. Production of a short video (2 to 5 min) on water resources management in Malaysia, emphasizing the case of Langat River and Putrajaya Lake.
 - c. MFIT visibility during the implementation of the IPA
- ii. Participation to the 3rd International Conference on Water Resources (ICWR-2015), from 24 to 25 November 2015 at Bayview Hotel in Langkawi, Malaysia
 - a. Possibility of organizing a side event on Water Planning

The side event will be the occasion to introduce the water books produced by UNESCO and related partners to the global community. The side event will bring together UNESCO, ADB, WWF-UK, and more than 60 international participants from Africa, Latin America, SIDS, etc.



CHAPTER 2

ACTIVITIES IMPLEMENTED AND PARTICIPATED AT NATIONAL LEVEL

2.1 Malaysia World Water Day 2015 (WWD2015)

With a theme “Water and Sustainable Development”, Malaysia celebrated the World Water Day (WWD) 2015 on 12th May 2015 at Auditorium DID, Ampang. This community programme was officiated by the Malaysian Minister of National Resources & Environment, the Honorable Datuk Seri G.Palanivel.

HTC Kuala Lumpur together with Malaysia International Hydrological Programme–UNESCO (MIHP-UNESCO) has conducted the MIHP-UNESCO best thesis award, an award to the best student’s thesis at undergraduate, post graduate and doctorate level in the field of hydrology and water resources. The objective was to promote Hydrology and Water Resources subjects at university level.

Malaysia UNESCO Day 2015

This year theme for Malaysia UNESCO Day is “Togetherness”. The occasion was held at Dataran Merdeka, Kuala Lumpur on 24th May 2015. The event was officiated by the Deputy Prime Minister of Malaysia, the Honorable Tan Sri Dato’ Hj. Muhyiddin Hj. Mohd Yassin and was witnessed by Her Excellency Madam Irina Bokova, Director General of UNESCO Paris. HTCKL participated in this event as one of the member under Science & Technology exhibition.

Workshop 1 :Comparative Studies of Applying Ecohydrology and IWRM for Upscaling Water Security in Asia and Africa Through UNESCO Category 2 Water Centres.

HTC KL carried out the first workshop at Sultan Idris Shah Forestry Education Centre (SISFEC), Air Hitam Forest Reserve, Selangor on 14th till 15th September 2015. A total of 11 papers were presented. Workshop also discussed on the format and report writing.



2.2 Research Activities

HTCKL carry out its R&D activities according to its first two functions under Article II (i.e.): (a) to coordinate the implementation of cooperative hydrological and water resources research projects and activities, and (b) to network with IHP National Committees and other similar centres for exchange of scientific and technical information on research results and the UNESCO-IHP cross-cutting programmes of SWITCH-in-Asia: Urban Water Management; as well as UNESCO-HELP River Basin (Langat River).

The R&D carried out is also in conjunction with UNESCO IHP-VIII STRATEGIC PLAN (2014-2021); “Water Security: Responses to Local and Global Challenges” and the themes and focal areas of Themes 1, 3, 4 and 5 in line with the UNESCO Strategic objectives (37C/4); strategic objective no. 4: Strengthening science, technology and innovation systems and policies-nationally, regionally and globally and strategic objective no. 5; Promoting international scientific cooperation on critical challenges to sustainable development. The main focuses are in stormwater management, ecohydrology, river management, waste water management and water education.

Most of the R&D are being carried out through collaboration and networking with local universities and under the R&D committee of Malaysian National IHP.

The R&D carried out for 2014 – 2015 is as per table follows:

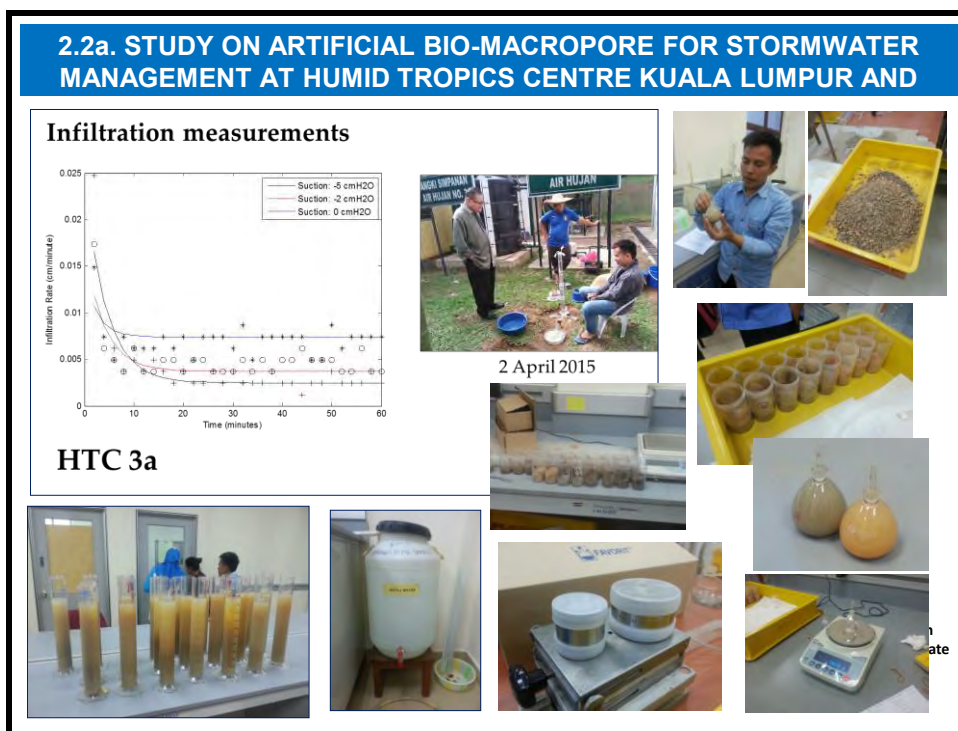


IHP VIII Themes	No.	Activities/Action Plan
THEME 1 : Water related Disasters and Hydrological Change	1.)	Artificial Bio-Macropore for Enhancing Soil Infiltrability for Urban catchment at HTCKL and Langat-HELP River Basin
	2.)	Debris and Mudflow Warning System for Cameron Highlands (DMFWS Phase 1)
THEME 3: Addressing Water Scarcity and Quality	1.)	Desalination of seawater for drinking and domestic water use in small islands such as using the step solar still system technique. Working with IOC.
	2.)	Study On River Water Quality Pasive River Water Quality Treatment Using Phytoremedation At Universiti Putra Malaysia (Upm)
	3.)	Study on Performance of Gross Pollutant Trapping Devices Vs. Life Cycle Cost And Gross Pollutant Management Strategies Knowledge Portal Case Study Putrajaya. Aims to collect performance data for selected device used to remove gross pollutants from within the urban drainage network.
THEME 4: Water and Human Settlements of the future	1.)	A water based recreational site to a rural community as well as to others through Rural River Rejuvenation (R3) which means of bringing aquatic life back to rural rivers and cleaning up their waters so as to be fit for recreation.
	2.)	A novel approach to reuse Alum Sludge for pottery manufacturing as well as to explore the possibility to be used as a building material in order to ensure better environmental sustainability as well as sound economical value. Alum Sludge is a potential environmental threat that is produced massively during the process of treating drinking water.
	3.)	Agricultural Non-Point Source Pollution and Impact on Reservoir Sedimentation and Water Quality. Non-point source (NPS) pollution occurs as water moves across the land or through the ground and picks up natural and human-made pollutants, which can then be deposited in lakes, rivers, wetlands, coastal waters, and even groundwater.
THEME 5: Ecohydrology, Engineering Harmony for a Sustainable World	1.)	Ecohydrology expert system of lake management using wireless sensor of real time monitoring (effectiveness of wireless sensor networks in real-time application, prototype system for real time monitoring and predicting several ecological parameter, expert system for ecological succession)
	2.)	Eco-Friendly Integrated Green Technology Expert System for Sustainable Green Infrastructure (GENIUS)
	3.)	Upscaling water security to meet local, regional and global challenges such as SME
THEME 6: Water Education, Key for Water Security	1.)	Promoting and enhancing Ecohydrology and HELP approaches, knowledge

2.2(a) Study on Artificial Bio-Macropore for Enhancing Soil Infiltrability for Urban catchment at HTCKL and Langat-HELP River Basin (on-going).

The objective of this study is to design & evaluate the performance of the artificial bio-macropore based on land use type during storm event. This study shall complete by end of this year (2015).





2.2(b) Desalination of seawater for drinking and domestic water use in small islands such as using the step solar still system technique (on-going).

The objective of this study is to develop and test the performance and productivity of a prototype stepped solar still for sea water desalination on Perhentian Island. This study shall completed by end of this year 2015.



2.2b. A Solar Still Stepped System for Domestic and Drinking Water

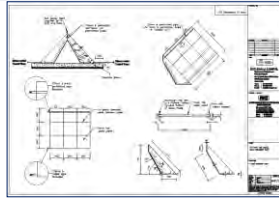
- The 1st prototype built in Perhentian Island, Terengganu, Malaysia for desalination of sea water into domestic and drinking water – monitoring the performance in progress until end of 2015.
- The 2nd small prototype constructed at HTCKL to improve river water quality.



The Solar Still Stepped System in Perhentian Island



The 2nd prototype model at HTCKL



Model of the Solar Still Stepped System

2.2b. A Solar Still Stepped System for Domestic and Drinking Water - small prototype constructed at HTCKL



2.2(c) Research on Performance of Gross Pollutant Trap (GPT) Trapping Devices versus Life Cycle Cost and Gross pollutant Management Strategies Knowledge Portal Case Study River of Life (on-going).

The objective of this research is to evaluate the performance of GPTs and develop the efficiencies and cost savings whilst maximising the environmental performance during the operational phase of existing GPTs. This study shall be completed by end of this year 2015.

2.2c. Study On Performance of Gross Pollutant Trapping Devices Vs. Life Cycle Cost and Gross Pollutant Management Strategies Knowledge Database



2.2(d) Water based recreational site to a rural community as well as to others through Rural River Rejuvenation (R3) which means bringing aquatic life back to rural rivers and cleaning up their waters so as to be fit for recreation (on-going). The objective of this R3 is to improve river water quality for recreation by using bio-filter techniques.



2.2d. River Rejuvenation for Social and Water Ecosystem Project at Jenderam River (tributary of Langat-HELP Basin)

- Demonstrate a project "living, clean and vibrant river" Applied R & D approach to increase the return of aquatic life in the river
- To use **Multimedia Bed Bio-filter (MBB)** and **Phytoremediation technique** in the stream so that the water is clean and the river can be used for recreational activities.



Location of the proposed project



Project site



Detention Pond

Creating Water-friendly Environment that coexists with Nature



The Idea

Construction Photos of 1st Phase



Direction of river flow

- MBB structure
- MBB structure
- Trash screen



MBB structure



2.2(e) A novel approach to reuse Alum Sludge for pottery manufacturing as well as to explore the possibility to be used as building material in order to ensure better environmental sustainability as well as sound economical value (on-going).

This research aims to create a new approach that help to reduce the effect of the ever increasing Alum Sludge produced by most water treatment plants in Malaysia and hence creating a safer and more sustainable environment. This study shall completed by end of this year 2015.






2.2e. Reused of Alum Sludge

- Alum sludge, the by-product from water treatment plant could contaminate water resources due to improper dumping.
- Alum sludge reused:
 - for brick manufacturing; (soil protection erosion bricks, building construction bricks, walking pavement)
 - for clay roof tiles manufacturing;
 - for pottery, etc.
 - HTCKL with a University partner is carrying out a novel approach to reuse alum sludge in manufacturing of soil protection bricks/blocks and building material using admixtures and the thermal curing

BENEFIT OF THE RESEARCH

This research will benefit in terms of providing a novel ingredient of raw material for soil protection bricks/blocks and building material manufacturers. As such, the research will contribute to the following:

- To reduce the pollution which cause by alum sludge
- To solve the problem of disposal of alum sludge which face by water treatment plant
- To contribute efforts towards green technology that can have direct positive impacts towards the environment, manufacturer as well as the consumer.
- To give the manufacturers an alternative choice for selecting raw material (clay or alum sludge).

2.2e. Reused of Alum Sludge : The product that we have made





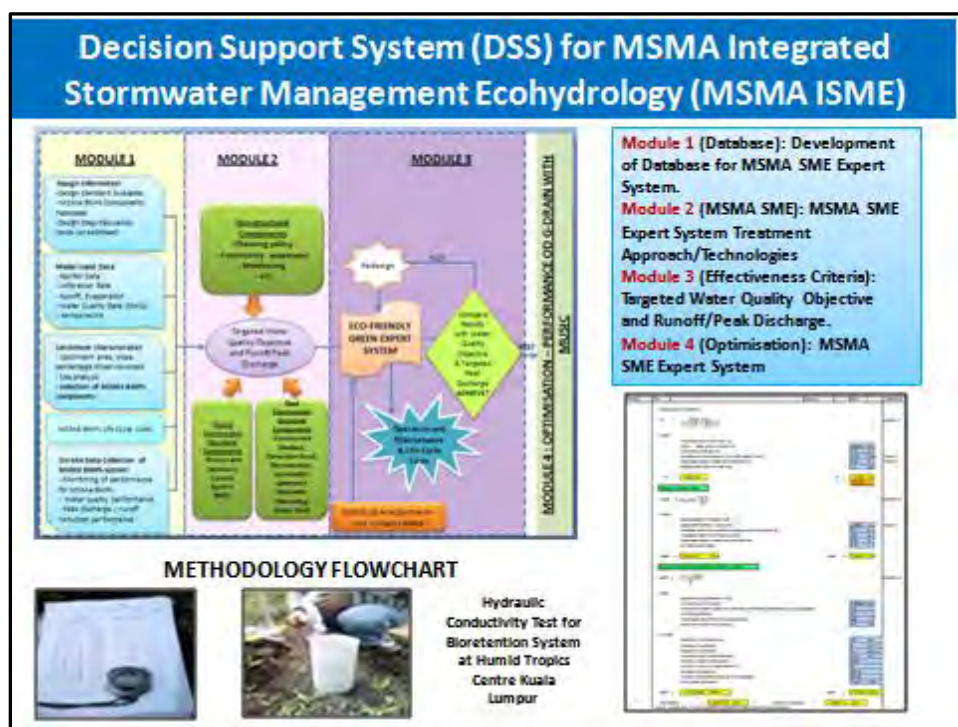


Description:					
Mix details	Cement Kg/m ³	AS kg/m ³	Sand kg/m ³	Gravel kg/m ³	Water L/m ³
SCC	500	-	894.6	745	180
SCC1AS20	400	100	894.6	745	180



2.2(f) Eco-Friendly Integrated Green Technology Expert System for Sustainable Green Infrastructure (GENIUS) or Decision Support System (DSS) for MSMA Integrated Stormwater Management Ecohydrology (MSMA ISME) (On-going).

The objective is to develop a Decision Support System for MSMA integrated Stormwater Management Ecohydrology based on expert data and user input. The performance of MSMA SME expert system will be compared with MUSIC software to analyze its reliability and outputs in terms of the urban stormwater systems. This study shall completed by end of this year 2015.



2.2(g) Study On River Water Quality Passive River Water Quality Treatment using Phytoremediation At Universiti Putra Malaysia (UPM).

Phytoremediation is the term that refers to the use of plants for cleaning up contaminants in soil, groundwater, surface water and air. The use of VG Phytoremediation can be a non-polluting and cost-effective way to remove or stabilise toxic chemicals that might otherwise be leached out of the soil by rain to contaminate nearby watercourses. It is also a way of concentrating and harvesting valuable metals that are thinly dispersed into the water and ground.



This research project is carried out with the following objectives:

- i. To derive at least 4 effective parameter(s) on river water quality improvement through running water.
- ii. To derive a formula on the improvement of river water quality to become Class IIB.

2.2g. Phytoremediation: A Green Technology to Remove Environmental Pollutants Using Vetiver Grass

- One of the phytoremediation measure to improved river water quality is to use vetiver grass as shown by the figures.
- HTCKL will carry out laboratory study and field study on the effectiveness of the vetiver grass





Field study sites





Flume experiment



2.2(h) Debris and Mudflow Warning System for Cameron Highlands (DMFWS Phase 1).

JPS is desirous to convert the successful spreadsheet-based debris and mudflow model for simulation into a mathematical computer-based model. Thus, the working computer model can be adopted for operational purposes.

The goal of the conversion is to have the ability to monitor and forecast debris and mudflows for Cameron Highlands using a computer model. This research will be coordinated by HTCKL and the Study Team will design and develop a web-based system for the debris and mudflow forecasting model. The model shall be confined to the parameters of a catchment in Cameron Highlands.



2.2h DEBRIS AND MUDFLOW WARNING SYSTEM (PHASE 1)

The Focus - to provide advanced warning to the public and relevant agencies for disaster relief on the possibility of occurrence of an impending debris and mudflow in high-risk and sensitive areas

- **Debris and mudflow is one of the major catastrophic problem** and became a history for the country especially Cameron Highlands in a state of Pahang, Ranau in Sabah, Kelantan River Basin in the state of Kelantan, and many rivers and area with steep slopes during heavy rainfall and flood events; from the perspective of population affected, frequency, areal extent and disruption to socio-economic activities.
- **This Research covers:** the development Debris and Mudflow Warning Model based on historical debris and mudflow disasters with the respective rainfall data in Cameron Highlands, Pahang
 - Started in 2002 under Typhoon Committee Hydrology Component, using guideline provided by MLIT, Japan. Data include the historical catastrophic rainfall event in Nov. 2014.
 - **Phase 1:** Currently, the Humid Tropics Centre Kuala Lumpur (HTCKL) is developing Debris and Mudflow Forecast Computer Model as part of the Debris and Mudflow Warning Model

Notes: Once the R&D projects and programmes completed, the output will be either or combinations in the form of technical reports, technical guidelines, papers, proceedings, posters, innovation products and demonstration projects.



CHAPTER 3

QUALITY MANAGEMENT SYSTEM AND WATER EDUCATION PROGRAMME
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Since HTC Kuala Lumpur was awarded the MS ISO 9001:2008 quality management certification, continual improvement has always being carried out. The UNESCO SWITCH-in-Asia Urban Water Management: MSMA Stormwater Management Eco-hydrology project in HTC compound is used as the quality management system. The external surveillance auditing for 2015 has been carried on 24th – 25th August 2015.

List of some of the Water Education Programmes carried out are as per table follows:

Water Education: Lecture and Talk Given

No.	Programme/Event	Remarks
1.	Training Course on Ecohydrology: A Tool for IWRM Implementation at the River Basin Level, 8 – 9 November 2014, Yogyakarta, Indonesia	Gave Lecture Topic on 'Ecohydrology for New Urban Design'
2.	Meeting of Water Related UNESCO Category II Centres Koblenz, Germany 15 to 17 December 2014	Presented 'HTCKL Activities Related to IHP' and involved in group discussion
3.	International UNESCO-PAGASA-IFI Workshop "Enhancing Resilience against Multi-Hazards through Effective Mitigation Systems and Adaptation Strategies, La Breza Hotel, Quezon City, Philippines, 24-26 February 2015	Gave presentation on 'Flooding in Malaysia, Ecohydrology and Flood Mitigation Management Strategies' and as Chairman for one of the session.
4.	Regional Dialogue on Sustainable Science Policy to Support The Post – 2015 Development Agenda, KLCC, Kuala Lumpur, Malaysia, 4-5 March 2015	Gave presentation on 'Sustainable Science: Linking Sustainable Development with Environmental Science with Examples on Water Security and Ecohydrology' and involved in skype with UNESCO- Africa.



No.	9.Programme/Event	Remarks
5.	Strategic Meeting and Workshop on Tools for Customizing IWRM Guidelines for Water Security in Asia and the Pacific: Challenges and Opportunities for HELP and Ecohydrology, 11 – 12 March, 2015, Grand Kemang Hotel, Jakarta, Indonesia.	Gave presentation on 'Implementing IWRM Guidelines and Ecohydrology Concept in a UNESCO Category 2 Centre'. Also, submit paper contribution 'Water Security and Sustainable Challenges Through Stormwater Management Ecohydrology' for the 7 th World Water Forum.
6.	7 th World Water Forum 2015, April, 14 – 17 2015, Daegu & Gyeongbuk, Rep. Of Korea	Gave presentation on 'Eco-Biotechnology for Sustainable Urban Management: MBB, Phytoremediation, Alum Sludge Also, involved as a panelist for 'Saemaul Undong: New Village Movement'. Talk on 'Water Policy for New/Rural Villages (under insufficient financial resources) in Developing Countries.
7.	Water Seminar 2015 in conjunction with World Water Day 2015, Theme: Water and Sustainable Development, 27 th April 2015, Rizqun Hotel, Bandar Seri Begawan, Bru	Gave presentation on 'Integrated Hydrological and Hydraulics River Basin Environmental Management'. Also, involved in panel discussion.
8.	15th International Convention on Melaka Twin Cities 2015: "Future Green Cities", 29-30 April 2015, Equatorial Hotel Melaka, Malaysia	Representing UNESCO Jakarta Office in delivering presentation on 'Water Management for Green Cities Development'.

Other than that, the contribution of HTCKL in education are as per table shown below;

Projects/ Programmes	IHP VIII/SDGs	Descriptions	Remarks
1. Sustainable Teacher Leadership for Education Sustainable Development (ESD) Competency	Theme 6 Sub-theme: 1, 2, 3 and 4 SDG No. 6	<ul style="list-style-type: none"> At planning stages to conduct the programme and workshop. HTCKL joint with Malaysia Science University (USM) 	Reviewing the state of the art and identifying collaborators programs that could be developed as professional development needs for teachers. Developing professional development resources on ESD.
2. Comparative Studies of Applying Ecohydrology and IWRM for Upscaling Water Security In Asia and Africa Through UNESCO Category 2 Water Centres	Theme 6 Sub-theme: 1, 2, 3 and 4 SDG No. 6	<ul style="list-style-type: none"> to develop modular curricula for water education in Asia-Pacific and Africa for watershed management including river basin, lake and wetland base on R&D, education activities such as from conferences, workshops, Regional Centre of Expertise on Education for Sustainable Development 	Two main components: 1. Comparative studies for customizing IWRM and ecohydrology for River Basin management 1.1. Conduct comparative studies for customizing IWRM for better water management at river basin level 1.2. Development of modular curricula for water education in Asia-Pacific and Africa, using Ecohydrology principles and IWRM guidelines.



CHAPTER 4

FUTURE PROGRAMME 2016

4.1 The future activities planned or to be participated as shown in the table below (If only the financial is approved by the Malaysia Economic Planning Unit (EPU) under the 11th Malaysia Plan (RMK-11) ;

NO	PROGRAMME /ACTIVITIES
1.	Pilot project Upscaling MSMA SME at Sg. Langat corridor - Implementation
2.	Forecasting Erosion Induced Landslide for Cameron Highlands
3.	In-Flow forecasting for Dam
4.	Rural River Rejuvenation (R3) Project at Jenderam River, Sepang - Landscaping Work
5.	Mobile wall (Barrier) for Flood Protection
6.	River Directory for problematic rivers in Malaysia.

- Funding/ Collaborator of the planned activities above either Government of Malaysia or UNESCO through UNESCO Jakarta.

4.2 Operational Plan

HTCKL will continue to perform and carry out its obligation under Article 2 of the Agreement related to;

- ✓ Coordinating the implementation of cooperative hydrological and water resources research projects and activities;
- ✓ Networking with IHP National Committees and other similar centre for exchange of scientific and technical information on research results;
- ✓ Organizing training courses, seminars, workshops and meetings for knowledge and technology transfer;
- ✓ Producing related hydrological and water resources publications and media for distributions.



4.3 Strategic Plan linked with IHP-VIII (Water Security: Responses to Local, Regional and Global Challenges)

- HTCKL Focus Area on R&D and water education based on UNESCO IHP VIII Themes (2014 - 2021) related to Sustainable Development and Science, and UN Post-2015 Water Agenda. HTCKL will continue to contribute in stormwater management, ecohydrology, river basin management, waste water management through its R&D programmes and through the three cross-cutting programmes i.e. UNESCO SWITCH (Sustainable Water Management Improves Tomorrow's Cities Health)-in-Asia: Urban Water Management; APFRIEND (Asia Pacific Flow Regimes from International Experimental and Network Data) and UNESCO-HELP (Hydrology for the Environment, Life and Policy) the Langat River Basin.
- The scope of activities will continue to include applied research, advising/consulting, continuing education and software development.



CHAPTER 5

FINANCE

5.1 Operation and Maintenance

The annual operating budget for the year 2014 and 2015 is shown in the table below.

No.	Component	Amount (USD \$)		Contributing Agency
		2014	2015	
1.	<u>Operation and Maintenance</u>			
	• Trust Account	29,063	24,270	Government of Malaysia
	• Operating allocation			
	➤ Current	67,804	44,812	Government of Malaysia
	➤ One Off	-		
	➤ Others	-		
	Subtotal	96,867	69,082	
2.	<u>Emolument</u>			
	• Staff salary	320,656	333,781	Government of Malaysia
	Subtotal	320,656	333,781	
3	<u>Sponsorship</u>			
	• Organizing Best Thesis Award	3,125	3,125	• UNESCO MIHP
	• Developing Modular Curricular Water Education		141,120	• Malaysia Funds-in-Trust
	Subtotal	3,125	144,245	
	TOTAL	420,648	547,108	

5.2 Development

Development Fund for 2014 and 2015 are as follows:

No.	Component	Amount (USD \$)		Contributing Agency
		2014	2015	
1.	Research and Development	273,437	351,562	Government of Malaysia (DID)
	TOTAL	273,437	351,562	



CHAPTER 6**STAFFING IN 2015****6.1 Outgoing**

- Mr. Hisham bin Hamzah the former Administrative Clerk of HTCKL has been transferred to Corporate Division of DID on 16th September 2015.

6.2 Incoming

- Mr. Mohd Fadzli Bin Ab Wahab, Assistant Engineer had reported his duty in HTCKL on 1st December 2014.
- Mrs. Farrah Zee Bt Mad Shah, Administrative Clerk had reported his duty in HTCKL on 16th September 2015.

Note: HTC Kuala Lumpur Organization Chart is as shown in Figure 1



CHAPTER 7

PUBLICATIONS

7.1 Publications by HTCKL in 2014/2015 are as listed below:

- Journal of Water Resource Management, Vol. 1, No. 3, December 2014.
- Technical Report: Rainwater Harvesting System, 2015
- Technical Report: Bioretention System , 2015
- Proceedings of Seminar on the first National Conferences on Non Point Source Pollution (NPS2014).



CHAPTER 8

CONCLUDING REMARKS

This report gives a brief account about activities carried out by the Centre during the reporting period. HTC Kuala Lumpur has been in existence and in operational for the past 16 years since October 1999 under the agreement between the Government of Malaysia and the United Nations Education, Scientific and Cultural Organization (UNESCO) and is expected to continue to be the UNESCO Water Centre i.e. The Regional Humid Tropics Hydrology and Water Resources for Southeast Asia and the Pacific.

HTC Kuala Lumpur plays a major role in conducting research in the field of hydrology and water resources and in contribution within framework of International Hydrological Programme (IHP) activities. The centre also provides research under the established Malaysian Hydrological Programme (MIHP) and in the lead of conducting a number of multidisciplinary collaborative researches in national and regional level.

Besides the research activities, HTC Kuala Lumpur also plays a very active role in the area of capacity building to increase scientific and technological knowledge about hydrological cycle, thus increasing the capacity to better manage and develop the water resources in a holistic manner.

Another major role of HTC Kuala Lumpur is to promote conducive atmosphere for collaboration among countries in the regions of Southeast Asia and the Pacific through technology and information exchange, education and science.



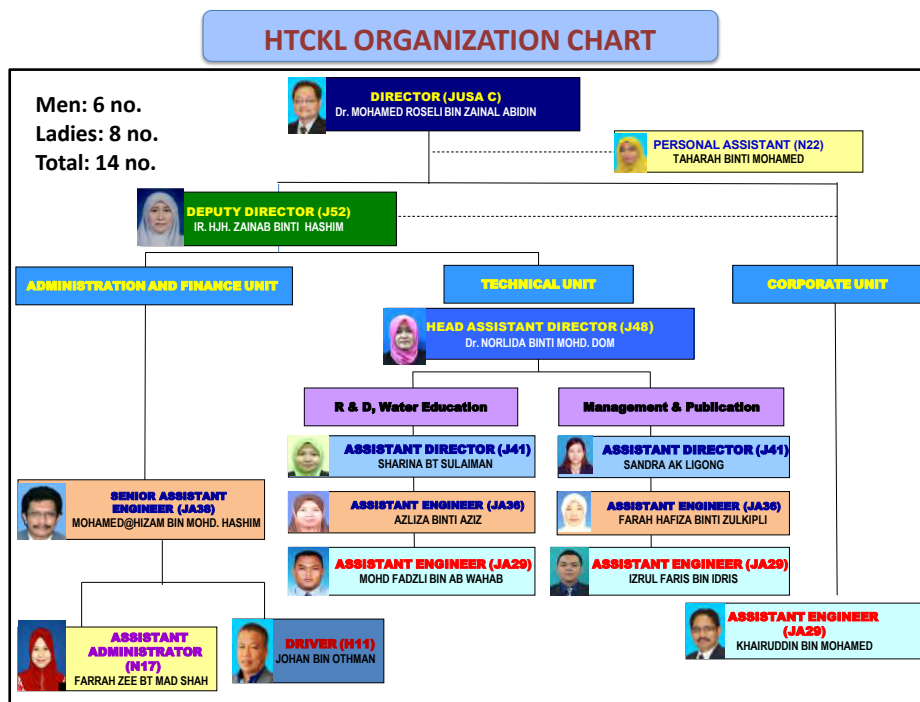


Figure 1: Organizational Chart of HTCKL



Report to RSC IHP AP
ASIA PACIFIC CENTRE FOR ECOHYDROLOGY (APCE)
UNESCO CATEGORY II CENTRE
23rd RSC Meeting of IHP, in Medan September 19 – 20 , 2015

INTRODUCTION

Global water environment has deteriorated and there has been significant lost of biodiversities worldwide, which severely impacts global ecosystems. Such trends provide ample evidence that conventional approaches to water resources management (based on the application of engineering techniques, sector interventions, and the elimination of such direct threats as point source pollution) are no longer sufficient to stem the tide of the water crisis. Ecohydrology aims to find solutions that, rather than focusing exclusively on technical issues, better respond to sustainable water resource policies and promote social development. Ecohydrology is a new integrative science that involves finding solutions to issues surrounding water, people, and the environment. One of the fundamental concepts involved in ecohydrology is that the timing and availability of freshwater is intimately linked to ecosystem processes, and the goods and services provided by freshwaters to societies. This means that emphasis is placed on the hydrological cycle and its effects on ecological processes and human well-being.

APCE is a center category II of UNESCO that focuses on ecological approach on the water resources management for providing a sustainable water for the people by harnessing science and technology, education and culture. APCE commits to contributing in overcoming current and important issues of national, regional and global interests, such as poverty, climate-change adaptation, and disaster risk reduction.

In achieving the objective, several activities have been planned. These activities benefit from results of past and current research activities conducted by Indonesian Institute of Science (LIPI) and their partners.

APCE has and develops excellent expertise and experience in the following fields:

- Relationships among ecological pattern and hydrological process;
- Disturbance and dynamics in natural and anthropogenic ecology and hydrology;
- Ecohydrological approaches to biodiversity conservation, environmental management, and ecological restoration;
- Integrating hydrology with ecological planning, design, and architecture, or reverse;
- Transdisciplinary studies of regional sustainability from scopes of ecohydrology, ecology, or both

RECENT ACTIVITIES

In the last 5 years, APCE has many activities :

1. As host for Integrated Flood Analysis System (IFAS) course in collaboration with ICHARM, Unesco Jakarta Office and LIPI. The Asia and Pacific region, with different climate characteristics are at risk to hydro-meteorological hazards that often associated with extreme events. Some countries of this region are vulnerable to floods, and the annual flood losses are too high for any government to bear. Based on the framework of the Flood Forecasting and Warning System (FFWS) that conducted in ten countries (Australia, Cambodia, China, Indonesia, Lao P.D.R, Malaysia, Philippines, Republic of Korea, Thailand and Vietnam, a technical course was organized. The objective is to enable government agencies to the use of appropriate software (IFAS) for flood forecasting and warning system that leads in increasing capacity of managing water resources under climatic variability and the related extremes phenomena. The course implies the provision of national digital GIS data for the model creation at the target river basin as well as local hydrological/hydraulic data for run-off analyses and model validation.

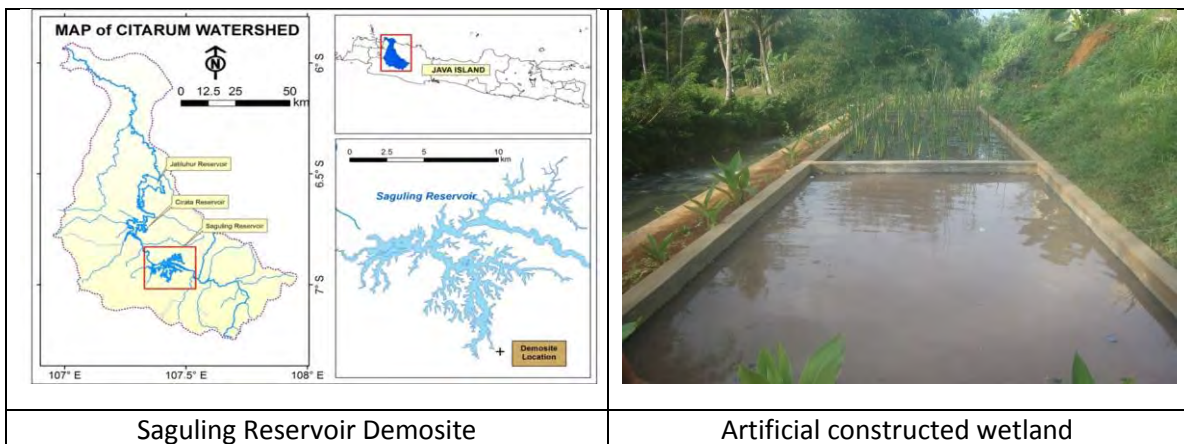


IFAS course activities



Flooding events in Indonesia

- Promote and develop Demosite for Community Base Development on Water Management in collaboration with UNESCO Jakarta Office, LIPI, University of Gajah Mada and Bogor Agriculture Institute. The objective of demosite for ecohydrology development is as a field station in relation to the implementation of ecohydrology concepts in the field. Demosite ecohydrology campaign is expected to be material to socializing sustainable management of water resources in accordance with the concept of ecohydrology as well as a natural laboratory for the future development of the concept of ecohydrology especially that represents ecohydrology tropical Indonesian concern. Ecohydrology demosite development in Indonesia will be directed to a location demosite representing the concept of sustainable management of water resources in several different groups, namely: ***“Demosite ecohydrology for the management of community-based on water resources”***.



- As Organizing Committee for Inauguration of APCE-UNESCO Secretariat building by Chairman of LIPI in March 25, 2014.
- As Host for International Conference on Ecohydrology (ICE) 2014 in Yogyakarta – Indonesia, in collaboration with UNESCO Jakarta Office, LIPI, UGM, Yogyakarta Special Region Province. This conference is in conjunction with the 22nd RSC Meeting of IHP. The objectives of the International Conference on Ecohydrology 2014 (ICE 2014) to synthesize information and knowledge gaps for addressing issues related to critical water environment systems. How the ecohydrology and ecotechnology could provide low cost environmentally sound technology for sustainable water management, especially in the Asia Pacific region.
- As Host for IHP Training Course in November 8-9, 2014 in Yogyakarta – Indonesia, in collaboration with UNESCO Jakarta Office and LIPI. This training course focused on three major objectives : to share and/or acquire the latest methods of water and nutrients cycles restoration in river basin scale by using ecosystem properties as a management tool; to provide the understanding of the main ecological and hydrological processes occurring at the river basin; to discuss how the

hydrological and ecological processes are affected by human activities and climate change, how they interact in time and space, and how Ecohydrology can help implement IWRM at the river basin level. Total participants were 29 participants coming from different countries, which consisted of 25 participants from Indonesia and Malaysia, Tokyo, Thailand, and Pakistan which were every country had a participant and from various affiliation.

6. As Host for the first meeting of APCE-UNESCO Governing Board in November 12, 2014 in Yogyakarta. The members of GB are : Prof. Dr. Iskandar Zulkarnain (Indonesia), Prof. Dr. Soontak Lee (Korea), Prof. Dr. Kaoru Takara (Japan), Prof. Dr. Quentin Grafton (Australia), Prof. Dr. Shahbaz Khan (UNESCO), Prof. Dr. Hidayat Pawitan (Observer, Indonesia).



International Conference on Ecohydrology (ICE) 2014, in Yogyakarta – Indonesia



First Governing Board Member Meeting of APCE

7. APCE Attended to Strategic Meeting and International Workshop of UNESCO, Jakarta 11-12 March 2015 as Keynote speaker.
8. APCE Contributed to World water day Workshop in March 24, in Jakarta as Keynote Speaker.
9. APCE attended to World Water Forum in Daegu Korea in April 2015
10. APCE attended to UNESCO Water Centres and Chairs Meeting in Malaysia in June 2015
11. Promote joint research project in collaboration with Unesco Jakarta, and several Universities :
 - a. Advanced Development of Ecohydrology Demonstration Site in the Saguling Reservoir, the Upper Citarum River basin, Indonesia
 - b. Study on the implementation of Ecohydrology approach and avoided deforestation in Peatland Rewetting and Conservation in Ex-Mega Rice Project location : Cases on food crops areas and on oil palm plantations areas
12. Promote and develop appropriate technology to provide clean water in marginal areas in collaboration with LIPI. IPAG60 : Alternative Technology to provide clean water in peatland area





Executive Director of APCE Presentation in Water Centres and Chairs Meeting in May 2015 Kuala Lumpur - Malaysia



National Workshop on Implementation of Ecohydrology Approach to Support Sustainable Management of Peatland Areas in Banjarbaru, Kalimantan-Indonesia, August 2015



Executive Secretary of APCE Presentation in 2nd International Conference on Ecohydrology
In September 2015, Lyon – France

NEXT ACTIVITIES

In order to support the IHP Phase VIII programs, APCE-UNESCO will focus to develop understanding and practices of ecohydrology through research, training and knowledge exchanges, information systems and public awareness, mainly on theme 5 related to ecohydrology, engineering harmony for a sustainable world by :

1. Promoting local resources base ecohydrological research
2. Strengthening local capacity to adopt ecohydrological concept and approach
3. Providing easy access to local resources based ecohydrological information and knowledge
4. Enhancing public awareness of local resources based ecohydrological practices

COLLABORATION

APCE – UNESCO promote and develop collaboration with different institutions :

- UNESCO Jakarta Office
- ICHARM, Japan
- HTC Kuala Lumpur, Malaysia
- ANU & University of Canberra, Australia
- University of Queensland Australia
- Kyoto University
- ILEC, Japan
- UGM, Yogyakarta – Indonesia
- IPB, Bogor – Indonesia
- UNLAM, Banjarmasin, Indonesia
- University of Palangkaraya, Indonesia
- University of Timor, Indonesia
- Ministry of Environment and Forestry
- Ministry of Public Work and Housing
- ICUWRM, Tehran – Iran

APCE GOVERNING BOARD MEMBER

Prof. Iskandar Zulkarnain (Indonesia)
Prof. Soontak Lee (Korea)
Prof. Kaoru Takara (Japan)
Prof. Quentin Grafton (Australia)
Prof. Shahbaz Khan (Unesco)
Prof. Hidayat Pawitan (Observer, Indonesia)

APCE BOARD OF DIRECTORS

Executive Director : Prof. Hery Harjono
Executive Secretary : Asc. Prof. Ignasius D.A. Sutapa
Director of Research Program: Prof. Hidayat Pawitan
Director of Cooperation & Training : Asc. Prof. M. Fakhruddin
Director of Data & Information System : Prof. Robert Delinom
Director of Social, Culture & Public Awareness : Dr. Munasri

CONTACT ADDRESS

ASIA PACIFIC CENTRE FOR ECOHYDROLOGY
(APCE) – UNESCO
Cibinong Sciences Centre – LIPI
Jl. Raya Bogor Km 46, Cibinong – BOGOR
WEST JAVA – INDONESIA
TEL./FAX.: 021-8757071/8757076
Website : www.apce-unesco.or.id
Email : ignas.sutapa@apce-unesco.or.id



7th World Water Forum
Daegu - Gyeongbuk, KOREA

7th World Water Forum(WWF7) Daegu Gyeongbuk, Korea 2015

Major Outcomes and Messages

Soontak LEE

Co-Chair, Intl' Steering Committee of the 7th WWF 2015
Distinguished Professor, Yeungnam University, Korea
President, Intl' Hydrologic Environmental Society(IHES)
Governor, World Water Council(WWC)



The Largest Intl.
Event in the field of
Water

- **Every 3 years**
- **Co-Organization** : Host Country + World Water Council<WWC>
- Forum Event(one week) + **Preparatory Process**(more than two years)

Mobilizing debate &
action for all water
issues

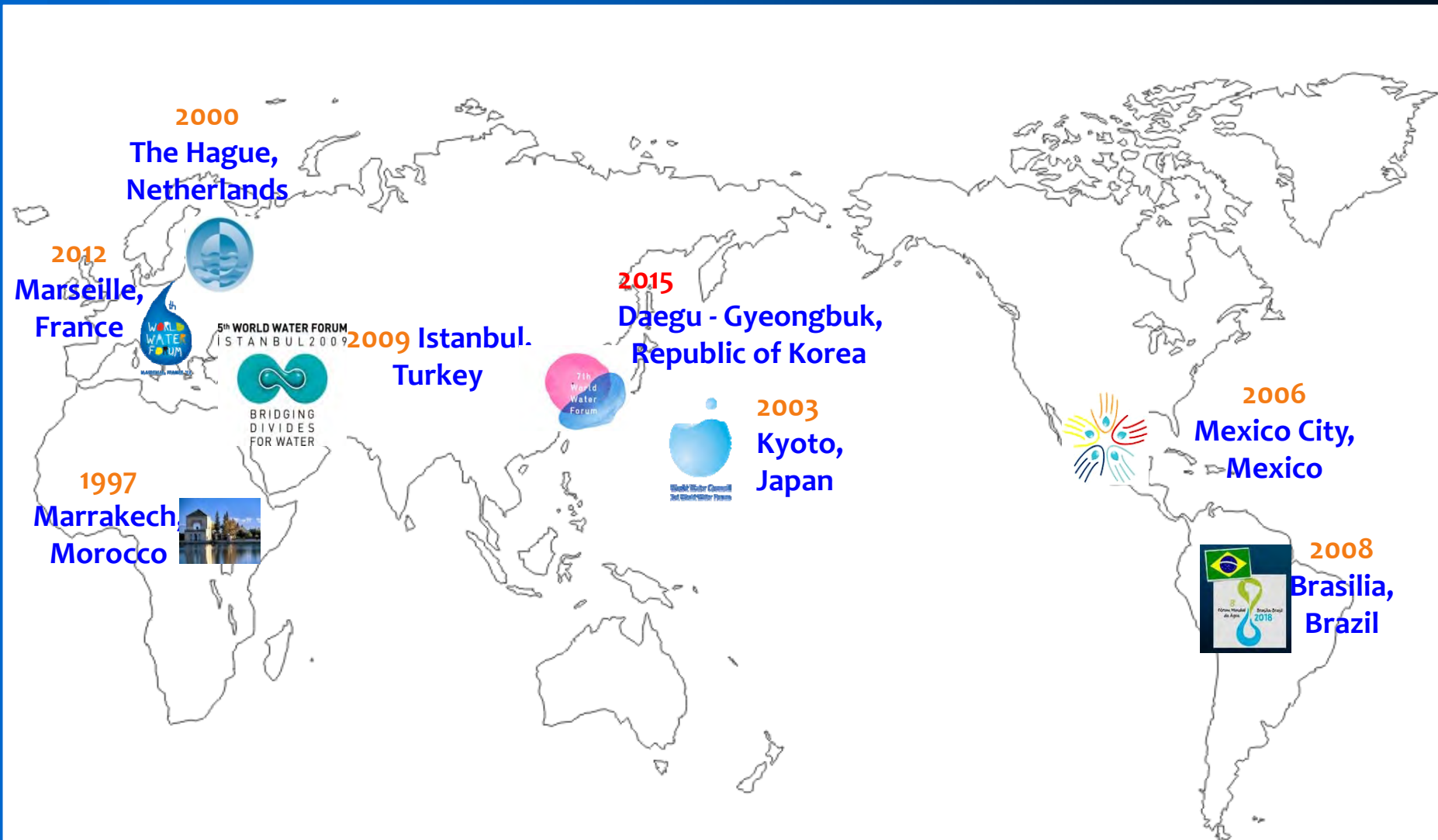
- **Provide a Platform** for all stakeholders to **exchange, learn together and catalyze concrete actions** for improved water resources & services development & management
- **Engage policy and decision-makers** in a dialogue to establish commitments

Ex. Ministerial Declaration, Water Expo from the business view

World Water Forum

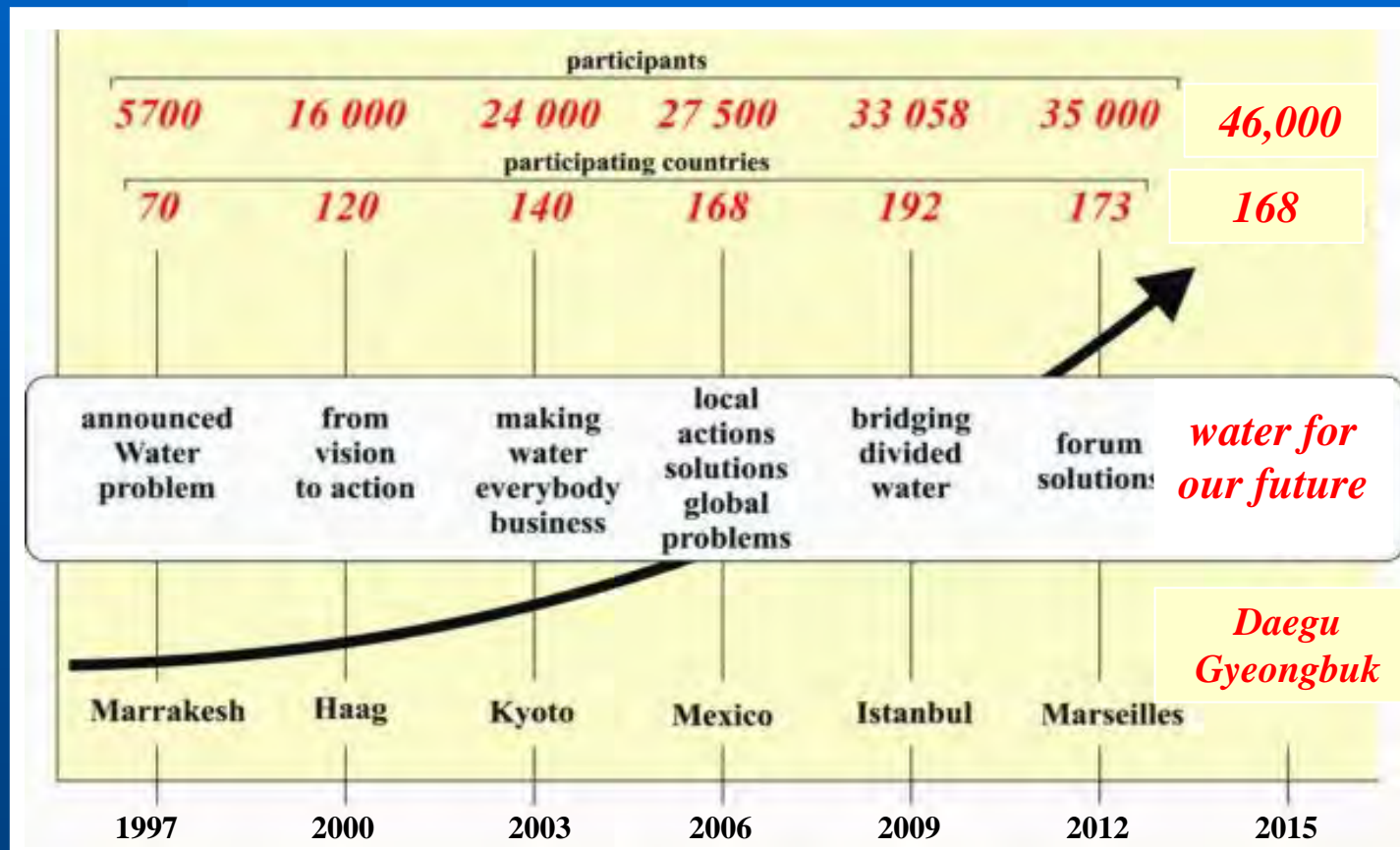


7th World Water Forum
Daegu - Gyeongbuk, KOREA





Participants and states in past WWF



- History of WWF has now long ways 1997-2015
- 6 Forums, Many thousands participants, impressive dynamic



Core Value

1st

Vision For Water, Life & Environment

2nd

From Vision to Action

3rd

A Forum with a Difference

4th

Local Actions for a Global Challenge

5th

Bridging Divides for Water

6th

Time for Solution

7th

Water for Our Future



WWF7 Slogan

“Water for Our Future”

우리 장래의 물을 위하여

“Stands for our will to move forward to the future by implementing solutions to water challenges of today”

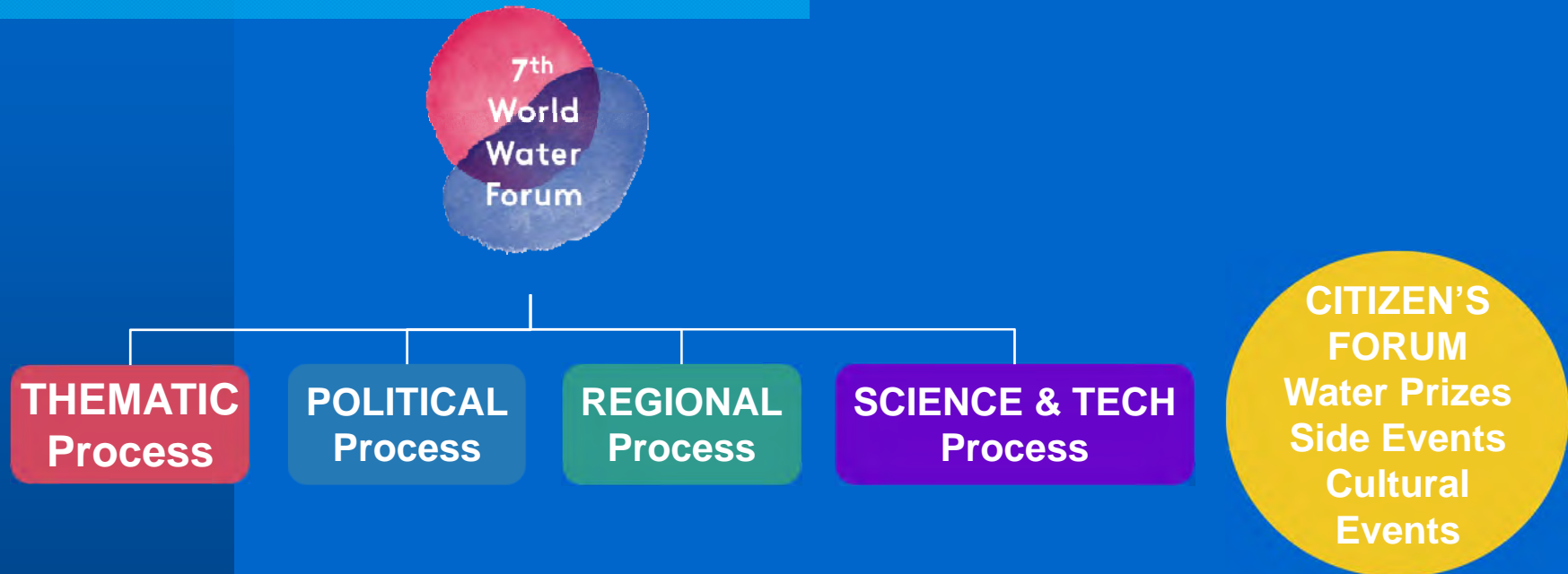
7th World Water Forum

Daegu Gyeongbuk, Republic of Korea

12-17 April, 2015



Process Framework

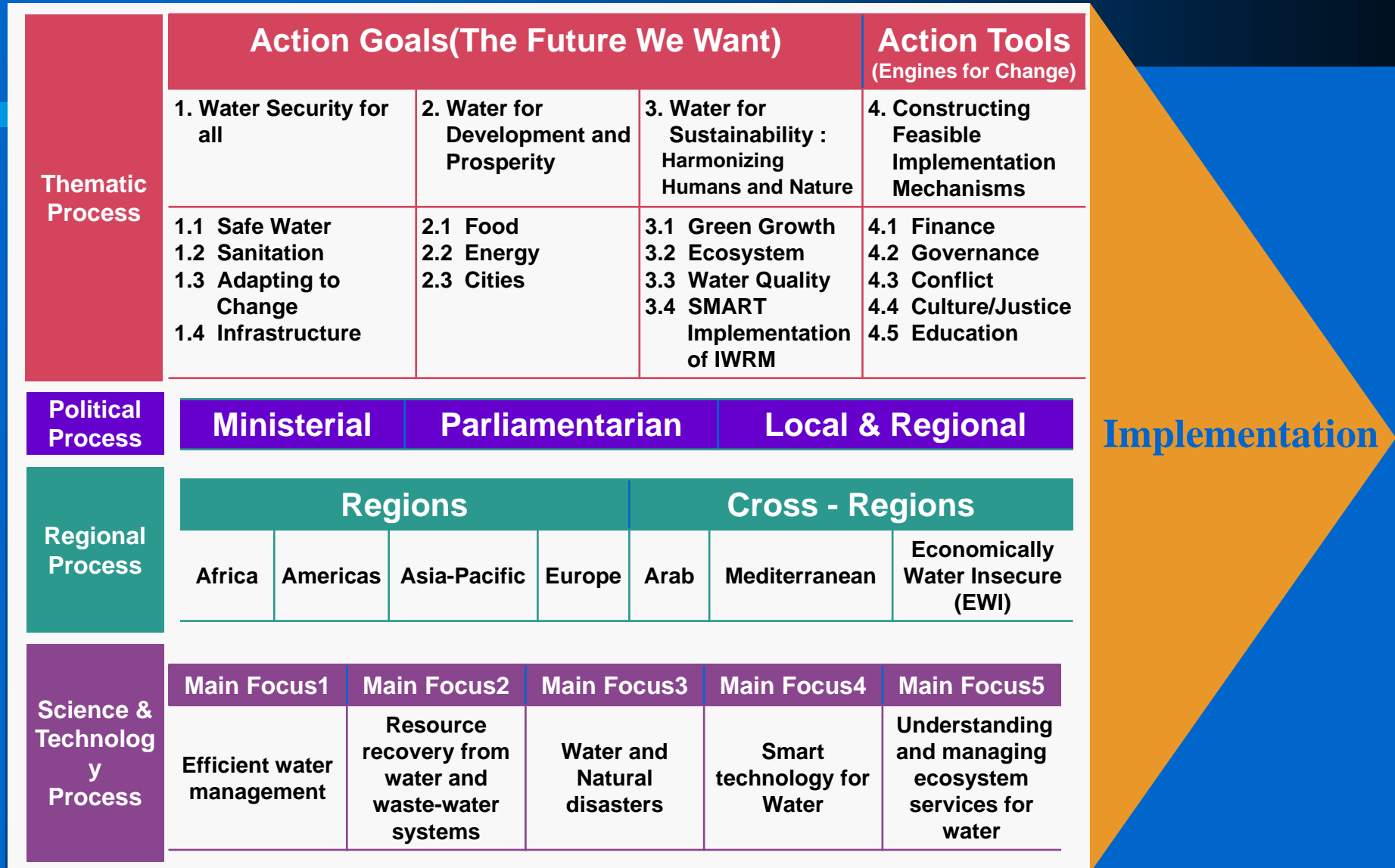


◆ Science & Technology Process

- Current and future water solutions are highly dependent on the use of scientific, research, new technologies and innovation processes.
- By focusing on the role of science, technology and innovation in the water sector, we could change the course of water services and sustainability.



Process Framework





7th World Water Forum

WWF7 Achievements

- Mechanisms were created to enhance support for continuous collective action on water.
 - Implementation Roadmaps(Irs), Action Monitoring System(AMS)
- Greater political commitment was generated for water within policy dialogues.
 - Ministerial Declaration, Parliamentarian Statement, Daegu-Gyeongbuk Water Action for Sustainable Cities and Regions
- The pivotal role of science and technology as a sustainable engine for implementation of water-related solutions was highlighted.
 - 5 Main Focus Areas, White Paper, CEO Innovation Panels
- Dialogue and exchange was enhanced among different regions.
 - Inter-Regional Sessions, Economically Water Insecure(EWI)
- Case studies demonstrating lessons on implementation were showcased.
 - Daegu Gyeongbuk Water Prize, Water Showcase, World Water Challenge

7th World Water Forum



7th World Water Forum
Daegu - Gyeongbuk, KOREA

WWF7 in Numbers

46,000 ENTRIES

FROM 168 COUNTRIES

10 WORLD LEADERS

81 GOVERNMENT MINISTERS at the Ministerial Conference

71 PARLIAMENTARIANS

95 LOCAL AND REGIONAL AUTHORITIES

403 SESSIONS & EVENTS

-128 for Thematic Process

-32 for Political Process

-51 for Regional Process

-40 for Sc & Tech Process

-61 for Citizen's Forum

-91 diverse additional sessions

-Expo:- from 39 countries(910 booths)

-294 water-related institutions(private corporations & organizations)

-21 water power countries hosted national pavilions

900 JOURNALISTS FROM FIVE CONTINENTS



7th World Water Forum
Daegu - Gyeongbuk, KOREA

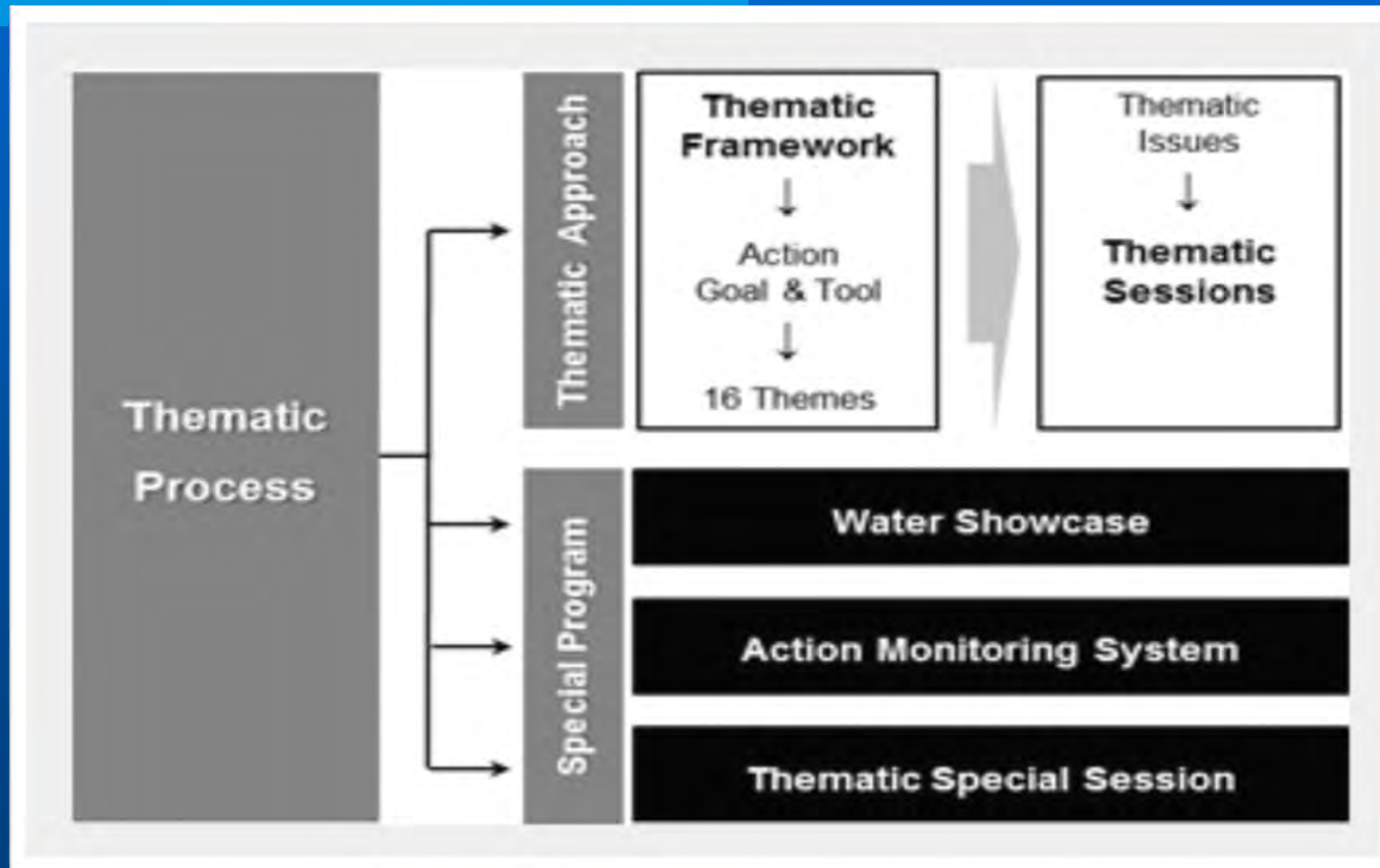
7th World Water Forum

World Leaders at the Grand Opening Ceremony





Thematic Process





Thematic Process

16 Champions for the Daegu & Gyeongbuk Implementation Commitment(DGIC)

- To assemble the major goals for action within each of the Forum's 16 thematic areas with the intention of supporting and monitoring progress in those areas over the next three years.

“Implementation Roadmaps” “Action Monitoring System”

Guide collective action and keep track of progress in a public arena.

“Water Showcase”

Exchange practical experiences, knowledge, information and policies through sharing actual cases with successful outcomes and instructive lessons



Thematic Process

Thematic Framework

Coordinators & Co-coordinators

ACTION GOAL 1 - The Future We Want

1. Water Security for All

- | | |
|--|--|
| 1.1 Enough Safe Water for All | : UNESCO International Hydrological Programme (UNESCO-IHP) |
| 1.2 Integrated Sanitation for All | : pS-Eau (Programme Solidarité Eau) AQUAFED |
| 1.3 Adapting to Change Managing Risk and Uncertainty
for Resilience and Disaster Preparedness | : International Centre for
Water Hazard and Risk
Management (ICHARM) |
| 1.4 Infrastructure for Sustainable Water Resource
Management and Services | : International Commission
on Large Dams (ICOLD) |

ACTION GOAL 2 - The Future We Want

2. Water for Development and Prosperity

- | | |
|----------------------|---|
| 2.1 Water for Food | : Food and Agriculture Organization of the United Nations (FAO) |
| 2.2 Water for Energy | : International Water Association (IWA) |
| 2.3 Water and Cities | : UN-Habitat
International Water Association (IWA) |



Thematic Process

Thematic Framework

ACTION GOAL 3 - The Future We Want

Coordinators & Co-coordinators

3. Water for Sustainability: Harmonizing Humans and Nature

- 3.1 Green Growth, Water Stewardship and Industry
- 3.2 Managing and Restoring Ecosystems for Water Services and Biodiversity
- 3.3 Ensuring Water Quality from Ridge to Reef
- 3.4 SMART Implementation of IWRM

- : K-water
- : Ramsar Convention Secretariat
- : Int'l Water Resources Association (IWRA)
- : UNESCO Regional Science Bureau
Global Water Partnership(GWP)

ACTION TOOL - Engines for Change

4. Constructing Feasible Implementation Mechanisms

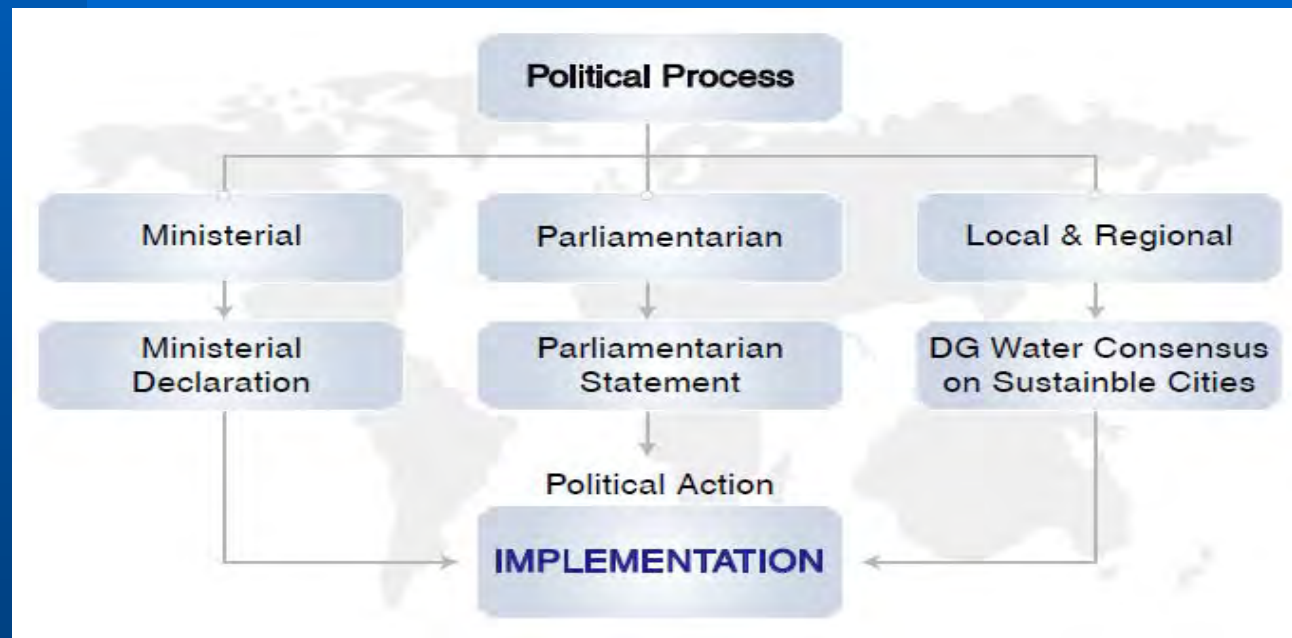
- 4.1 Economics and Financing for Innovative Investment
- 4.2 Effective Governance: Enhanced Political Decisions, Stakeholder Participation and Technical Information
- 4.3 Cooperation for Reducing Conflict and Improving Transboundary Water Management
- 4.4 Water Cultures, Justice and Equity
- 4.5 Enhancing Education and Capacity Building

- : Asian Development Bank (ADB)
- : OECD Water Governance Initiative
- : International Network of Basin Organizations (INBO)
- : UNESCO Women for Water Partnership (WfWP)
- : Int'l Network of Water Training Centers (INWTC)



Political Process

Political Process consists of three processes: Ministerial, Parliamentary, and Local and Regional Authorities (LRA) process.





Political Process

RECORDED ATTENDANCE FOR THE MINISTERIAL PROCESS

Ministerial Declaration, a full set of recommendations from the international water community

- More than **100 ministerial delegations** participated in the Forum
- **Dedicated water goal and water-related targets** in the **Post-2015 Development Agenda**
- 7th World Water Forum's contribution in **supporting their implementation**
- Importance of **science and technology's role** in moving from **the identification of solutions** for water-related challenges towards their **implementation**





Political Process

PARLIAMENTARIANS' COMMITMENTS TO ACT FOR IMPLEMENTATION

Parliamentarian Conference

Legislative solutions for sustainable water management
by gathering 71 parliamentarians from 27 countries

Parliamentarian Statement

Prioritizing **water security** in terms of **sustainable economic development**,
allocation of financial resources and streamlining **budget execution efficiency**



Political Process

NEW TOOLS FOR LOCAL AND REGIONAL AUTHORITIES

Local and Regional Authorities (LRAs) Process

95 Local & Regional Authorities from 26 countries

Daegu-Gyeongbuk Water Action for Sustainable Cities and Regions

➤ Concrete tools to guide LRAs in the implementation of sustainable water management strategies at the local level

Highlights

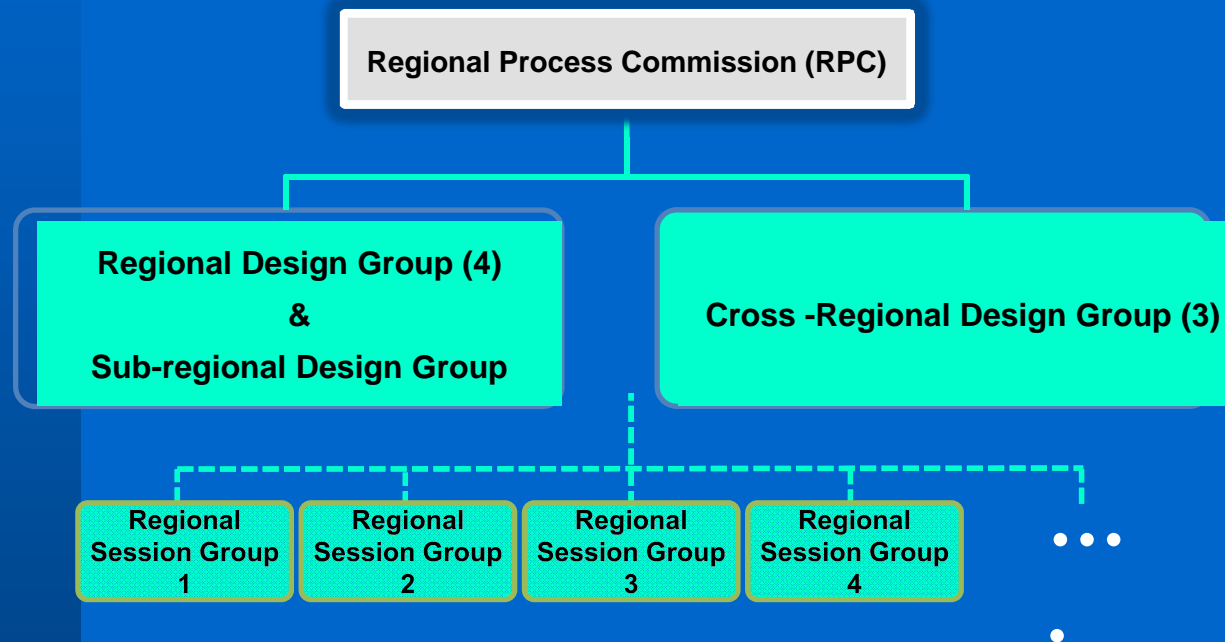
Importance of local authorities' roles in implementing and achieving the Sustainable Development Goals and how best to deliver their share of responsibilities in the most effective and efficient way





Regional Process

Structure



- **Regional / Cross-Regional Design Groups (led by Regional Coordinators)**
- **Sub-regional Design Groups (applicable to Regions that have Sub-regional division / led by Sub-regional Coordinators)**
- **Regional Session Groups (in charge of sessions)**

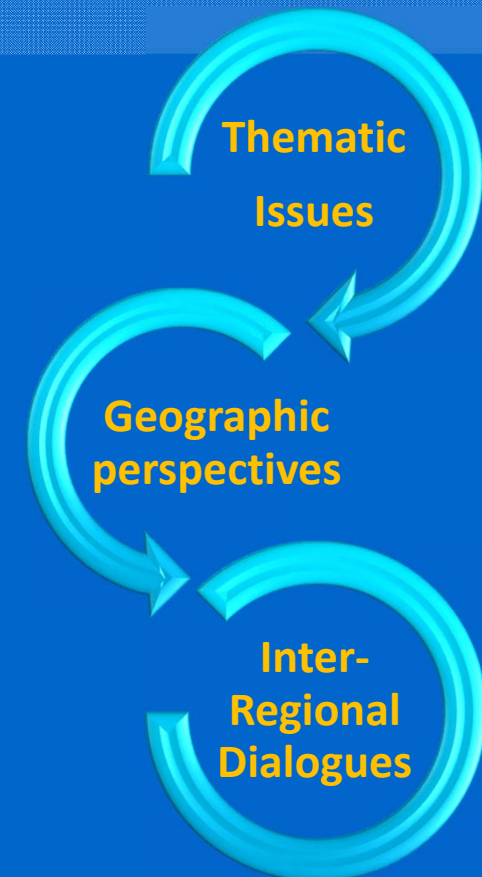


Regional Process

INTER-REGIONAL SESSIONS GENERATE DIALOGUE BETWEEN CONTINENTS AND PROCESSES

Successful new set of inter-regional dialogues

- Discussion on common **thematic issues** from **different geographic perspectives**
 - “Collaborative discussions”
 - “Cross-cutting concluding sessions”
- Participants gained a **broader understanding** of how to deal with **similar challenges** in **different contexts**.





7th World Water Forum

Science & Technology Process

The Science and Technology process aims toward the 'Implementation' of innovative and applicable technologies by building sound and effective linkages in the water sector between science, technology, policy and practice. In line with the goals of the STP, the process has the detail objectives on

- *improving the understanding of the roles of science and technology in solving the global water challenges based on practical cases and know-hows*
- *designing guidance on the use of science and technology to implement and innovate water policies and realities*
- *providing practical pathways to actors in business and policy makers to find the proper partners to make synergistic effects to implement solutions*

It consists of five Main Focuses with 25 Sub Focuses and three Special Programs (White Paper, CEO Innovation Panel, and World Water Challenges).

❖ **40 Sessions in total organized**



Science & Technology Process

✓ Focus Sessions

To share water-related innovative and applicable technologies and experiences worldwide, 31 Design Groups and more than 150 Sessions Groups are making the Process different from others in terms of providing technological solutions and implementation tools.

✓ White Papers – strategic insight and foresight

The White Paper, one of the core outcomes of the 7th World Water Forum, identifies the current status of water-related science and technology and provides future directions by composing 'science and technology innovation' in the sectors of each Main Focus of the Process.

✓ CEO Innovation Panel – Bringing together business leaders from water sector and beyond

- Gaining momentum behind science, technology and innovation

The CEO Innovation Panel aims at providing opportunities for communicating and interacting between CEOs of water-related enterprises, high-level government officials, water experts, and other stakeholders who have worked in the front-line for global water.

✓ World Water Challenges – linking problem owners with solution providers

It is a competition program for projects serving to bridge the problem owners and the solution providers. Judging committee has identified 15 water challenges around the globe, builds networks between problem owners and solution providers, and suggests and shares solutions for those challenges.



Science & Technology Process

Main Focus, Focus Session

- Main focus 1: Efficient Water Management
- Main focus 2: Resource Recovery from Water and Wastewater System
- Main focus 3: Water and Natural Disasters
- Main focus 4: Smart Technology for Water
- Main focus 5: Understanding and Managing Ecosystem Services for Water

***Primary Water Issues from Scientific and Technological Perspectives**



7th World Water Forum



7th World Water Forum
Daegu - Gyeongbuk, KOREA

Science & Technology Process

CONNECTING TECHNOLOGICAL INNOVATIONS WITH WATER CHALLENGES

Science and Technology Process(STP)

- Focused on the implementation of scientific and technological innovations in water management
- Aimed at bridging the scientific and technological gap between developed and developing countries

STP White Paper

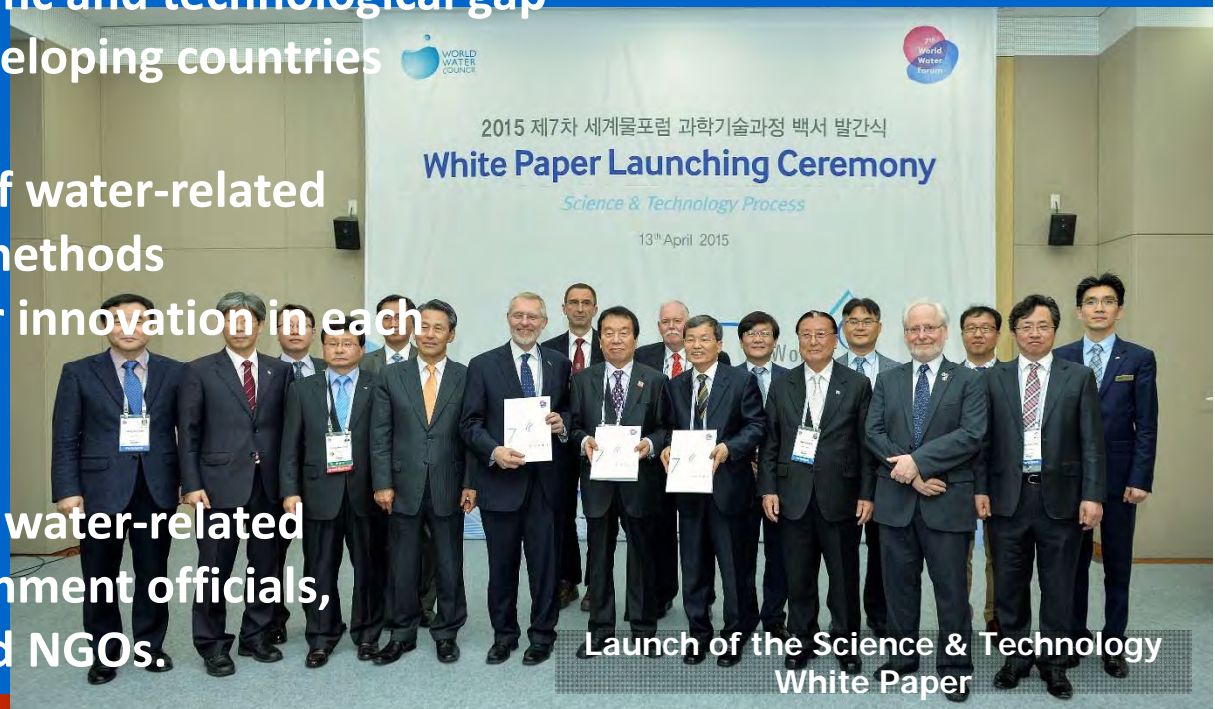
- Identify the current status of water-related scientific and technological methods
- Provide future directions for innovation in each of the five sectors

CEO Innovation Panels

Interaction between CEOs of water-related enterprises, high-level government officials, water experts, academia, and NGOs.



CEO Innovation Panel



Launch of the Science & Technology White Paper



Other Components

Citizen's Forum

The 7th World Water Forum aims to create an open platform where various stakeholders can exchange their views on water, find solutions and interact. Therefore, the Citizen's Forum is provided in order to reflect the voices of civil society to the 7th World Water Forum. With programs and activities led by civil society for raising awareness about water-related challenges, the Citizen's Forum facilitates and calls for practical actions by citizens.

List of some programs of the Citizen's Forum

- World Children Water Forum
- Youth Parliament for Water
- Launching of the Water Ethics Charter
- The 4th International Water and Film Event (IWFE)
- Sessions and exhibitions by indigenous peoples' groups
- 5-River Walk and Event
- Water education experience booths
- Successful cases of the community's participation to protect rivers and local streams
- Han River and Hallyu
- Korea's well culture showcase and dance performances

7th World Water Forum



7th World Water Forum
Daegu - Gyeongbuk, KOREA

Other Components

PRIZES RECOGNIZE DEVELOPMENT AND WATER SOLUTIONS



King Hassan II Great World Water Prize
by the Kingdom of Morocco, WWC



Kyoto World Water Grand Prize
by the Japan Water Forum, WWC

Mexico World Water Prize
by the Government of Mexico



Daegu Gyeongbuk Water Prize
by Gyeongsangbuk-do Province and
Dae-gu Metropolitan city
(Winners of the Water Showcase and
The World Water Challenge)



7th World Water Forum



7th World Water Forum
Daegu - Gyeongbuk, KOREA



Expo & Fair, Exhibition Hall EXCO Daegu



Goodbye until 2018 Brasilia



7th World Water Forum
Daegu - Gyeongbuk, KOREA

7th World Water Forum



CONCLUSION



7th World Water Forum
Daegu - Gyeongbuk, KOREA

Significance : Another legacy in the making...



7

Water for Our Future

Thank you!

<http://worldwaterforum7.org>

Item 8:

Report on the 7th World Water
Forum 2015 on 12-17 April 2015 in
Daegu and Gyeongbuk, Korea

RSC Session in the Science and Technology Process on April 13, 2015

Session title:

Scientific and educational collaborations in Asia and Pacific regions for robust and resilient water policy and management

--UNESCO-IHP RSC-SEAP activities and beyond for the coming decade of SDGs--

Main Focus:

Main Focus 1. Efficient water management

Main Focus 2. Resource recovery from water and wastewater systems

Main Focus 3. Water and natural disasters

Main Focus 4. Smart technology for water

Main Focus 5. Understanding and managing ecosystem services for water



KEI & IHP-RSC Joint session on April 13, 2015

1	Vulnerability assessment for climate change at regional scale	Jeong Ho Lee (KEI)
2	Enhancing climate change adaptation capacity for public institution and industries	Dong Hyun Kim (KACCC)
3	Urban floods management in karst environment, early warning system based on monitoring and modeling	Nathalie Dorfliger (BRGM)
4	UNESCO IHP RSC activities and collaboration to address extreme weather and water-related disasters	Prof. Kaoru Takara (Kyoto University)
5	Impact assessment of the risk of increased water-related disasters due to climate change	Prof. Trevor Daniell (University of Adelaide, Australia)
6	Ecohydrology approach for overcoming climate change impact on water resources sustainability by integrating local wisdom	Prof. Hery Harjono and Dr. Ignasius D.A. Sutapa (Asia Pacific Center for Ecohydrology, Indonesia)



**Prof. Hery Harjono and
Dr. Ignasius D.A. Sutapa**

UNESCO IHP RSC activities and collaboration to address extreme weather and water-related disasters



Kaoru TAKARA

Kyoto University

UNESCO IHP RSC-SEAP Chairperson



The International Hydrological Programme (IHP) is the UNESCO's Intergovernmental Scientific Cooperative Programme in Hydrology and Water Resources since 1975.

The **International Hydrological Programme** (IHP) is the only intergovernmental programme of the UN system devoted to water research, water resources management, and education and capacity building.

UNESCO-IHP RSC for Southeast Asia and the Pacific since 1993



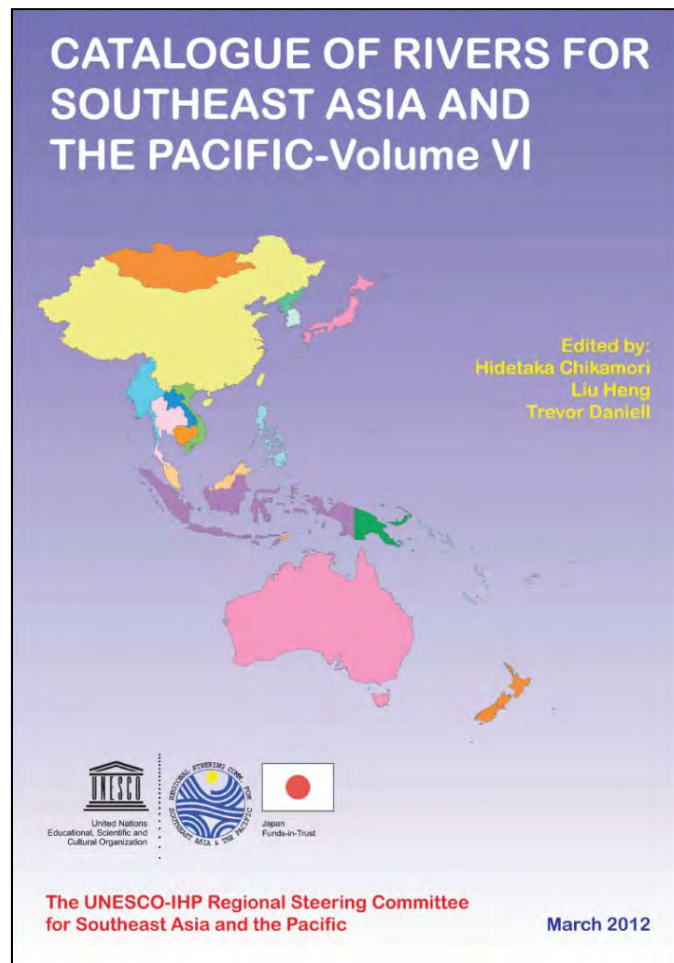
- In Southeast Asia and the Pacific region, regional cooperative activities have been made through the IHP Regional Steering Committee (RSC).
- In co-operation with UNESCO Office Jakarta and the participating member states, the RSC has coordinated a wide range of initiatives such as
 - ✓ AP-FRIEND (Asian Pacific Flow Regimes from International and Experimental Network Data) project,
 - ✓ Asian Pacific Water Archive,
 - ✓ Catalogue of Rivers, and
 - ✓ various activities in line with IHP 5, 6, and 7 phases.

History of RSC meetings since 1993

Year	RSC Meeting	Chairperson
Oct. 2015	23. Myanmar	Kaoru Takara (Japan)
Nov. 2014	22. Yogyakarta, Indonesia	Kaoru Takara
Oct. 2013	21. Gyeongju, Korea	Trevor Daniell (Australia)
Nov. 2012	20. Langkawi, Malaysia	Trevor Daniell
Oct. 2011	19. Kyoto, Japan	Liu Heng (China)
Nov. 2010	18. Hanoi, Viet Nam	Liu Heng
Nov. 2009	17. Wuhan, China	Leonardo Liongson (Philippines)
Oct. 2008	16. Ulaanbaatar, Mongolia	Leonardo Liongson
Nov. 2007	15. Manila, The Philippines	Eddy Djajadiredja (Indonesia)
Oct. 2006	14. Bangkok, Thailand	Eddy Djajadiredja
Nov. 2005	13. Bali, Indonesia	Tran Thuc (Viet Nam)
Sep. 2004	12. Adelaide, Australia	Tran Thuc
Oct. 2003	11. Sigatoka, Fiji	Keizrul Abdullah (Malaysia)
Oct. 2002	10. Port Dickson, Malaysia	Keizrul Abdullah
Nov. 2001	9. Halon Bay, Viet Nam	Richard Ibbitt (New Zealand)
Nov. 2000	8. Cristchurch, New Zealand	Richard Ibbitt
Oct. 1999	7. Nanjing, China	Soontak Lee (Republic of Korea)
Sep. 1998	6. Taegue, Republic of Korea	Soontak Lee
Dec. 1997	5. Nong Khai, Thailand	Badruddin Machbub (Indonesia)
Sep. 1996	4. Yogyakarta, Indonesia	Badruddin Machbub
Oct. 1995	3. Kofu, Japan	Yutaka Takahashi (Japan)
Nov. 1994	2. Phnom Penh, Cambodia	Yutaka Takahashi
Jan. 1993	1. Manila, The Philippines	Yutaka Takahashi

Catalogue of Rivers for Southeast Asia and the Pacific

<http://hywr.kuciv.kyoto-u.ac.jp/ihp/rsc/riverCatalogue.html>



Sixth volumes
including 121 rivers

UNESCO International Hydrological Program Eight Phase (2014-2021)

UNESCO-IHP-VIII: “WATER SECURITY
Responses to Local, Regional, and Global Challenges”



Session description:

To enhance the cooperative activities in RCS and to cope with **natural disasters induced by the changing hydrologic cycle and water resources**, various stakeholders including researchers, engineers and practitioners related to RSC-SEAP, UNESCO-IHP, APHW and other relevant organizations come together to discuss the following topics to define the direction of actions for SDGs, HFA-II and IHP-VIII:

Session description:

- Scientific and educational collaborations to address water-related disasters due to climate change;
- Planning a concrete collaborative research and education projects in line with IHP-VIII Programme “Water Security” 2014-2021;
- Enhancing earth observation data archiving system to reduce water-related disasters;
- Defining and planning collaboration between IHP National Committees and the category-two centers in RSC-SEAP to cope with water-related disasters;
- How to contribute to global decadal initiative such as SDGs and HFA-II; and
- Other issues.

Item 10:

Approval of the criteria for selecting
individuals for the UNESCO-IHP RSC-
SEAP Award
and
determination of the award winners

Processes of Nomination and Determination for IHP in SEAP Distinguished Contributors

May 26, 2015

Re: Call for nomination for IHP in SEAP distinguished contributors

Dear IHP National Committees in RSC SEAP,

As discussed at the RSC meeting Yogyakarta last year, IHP RSC in SEAP will make honorable recognition of distinguished contributors-to IHP activities in SEAP on the occasion of the 50 years anniversary of IHD and IHP. Please provide a nomination sheet according to the procedure indicated below. Looking forward to having your nomination.

Prof. Kaoru TAKARA,
Chairperson of the UNESCO IHP RSC in SEAP
takara.kaoru.7v@kyoto-u.ac.jp

The Name of Award for IHP in SEAP
Distinguished Contributors

UNESCO-IHP RSC-SEAP Award

Criteria for Selecting Individuals for the UNESCO-IHP RSC-SEAP Award

- Individuals from the SEAP region who are nominated by at least one IHP national committee of RSC in SEAP, and
- Individuals who made continuous outstanding contributions to UNESCO IHP RSC in SEAP for more than 10 years.

Selection Committee Members

Mr. Dato Hanapi Mohamad (Malaysia)

Mr. Dennis Datema Jamieson (New Zealand)

Mr. Joseph Jure (Papua New Guinea)

Ms. Wandee Pattanasatianpong (Thailand)

The selection committee approved the winners according to the criteria.

Award Winners (alphabetical order)

Mr. DANIELL, Trevor (Australia)

Mr. FALKLAND, Tony (Australia)

Mr. GOMBO, Davaa (Mongolia)

Mr. LEE, Soontak (Korea)

Mr. LIONGSON, Leonardo Quesada (Philippines)

Mr. PAWITAN, Hidayat (Indonesia)

Mr. TAKARA, Karou (Japan)

Mr. TAKEUCHI, Kuniyoshi (Japan)

Mr. TRAN, Thuc (Vietnam)

Ms. ZHU, XiaoYuan (China)

The 7th International Conference on Water Resources and Environment Research (ICWRER2016)



7th ICWRER

June 5-9, 2016 Kyoto, Japan

Web: wrrc.dpri.kyoto-u.ac.jp/icwrrer2016

Email: icwrrer2016@wrrc.dpri.kyoto-u.ac.jp



Kyoto University



Disaster Prevention
Research Institute



Water Resources
Research Center

Scope of the Conference

It's our great pleasure to invite you to join us for the 7th International Conference on Water Resources and Environment Research (ICWRER) which will take place in Kyoto, Japan, from June 5-9, 2016.

The International Conference on Water Resources and Environment Research (ICWRER) is a series of conferences dealing with hydrology and water resources. ICWRER-2016 is the 7th one of the series, and back to Kyoto since 1996 (1st one). One of the objectives of ICWRER conferences is to bring together physical, biological, chemical, statistical and technical expertise in order to better understand natural systems related to water resources from all around the world.

The main theme of ICWRER-2016 Symposium is 'Water Security in Geo, Eco and Socio-Systems'. Water security is defined as the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability. (UN-Water, 2013)

The topics of ICWRER conferences are wide encompassing climate change, hydrometeorological extremes, GIS and remote sensing, surface water and ground water interaction, real-time hydrometeorological forecasting, water-related disasters, integrated sediment and ecosystem management, water and environment management, eco-hydraulics and eco-hydrology, risk analysis and management, Legislation systems for water management, water diplomacy, social and economic aspects in water resources, and sustainable water resources management.

This conference is organized aiming to enhance the understanding of the natural and social phenomena associated with water resources issues through the discussion about whole water resources management system as integrated elements of geosystems, social systems and ecosystems.

Themes and Topics

- Theme 1: Climate change
- Theme 2: Hydrometeorological extreme events
- Theme 3: GIS and remote sensing in hydrology and water resources
- Theme 4: Surface water and ground water interaction
- Theme 5: Real-time hydrometeorological forecasting
- Theme 6: Water-related disasters
- Theme 7: Environmental management enhancing ecosystem services
- Theme 8: Integrated sediment and ecosystem management
- Theme 9: Water and environment management in urban areas
- Theme 10: Eco-hydraulics/ eco-hydrology for water sustainability
- Theme 11: Risk analysis and management
- Theme 12: Legislation systems for water management
- Theme 13: Water diplomacy
- Theme 14: Social and economic aspects in water resources
- Theme 15: Sustainable water resources management



Conference Venue

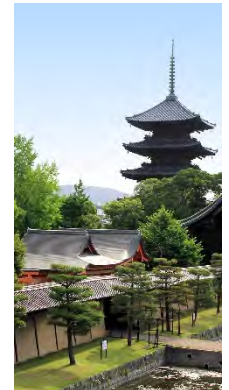
Kyoto TERRSA

(Kyoto Citizen's Amenity Plaza)

Address

Kyoto TERRSA Shinmachi Kujo Minami-ku, Kyoto, Japan

Tel: +81-(0)75-692-3400 Fax: +81-(0)75-692-3402



Key Dates

2015

- Mar 31 Deadline of Special Session Proposal
- Aug 31 Call for Abstract
- Oct 31 Deadline of Abstract Submission
- Nov 30 Notification of Abstract Acceptance

2016

- Feb 29 Deadline of Extended Abstract Submission
- Mar 5 Deadline of Early Bird Registration & Technical Tour Registrations
- Jun 5-9 ICWRER Conference

Conference Schedule

- Jun 5 AM Arrival
PM Registration, welcome party
- Jun 6 AM Opening, Keynote
PM Session
- Jun 7 AM Keynote, Session
PM Session
- Jun 8 AM Keynote, Session
PM Session, Banquet
- Jun 9 AM Excursion
PM Excursion

Contact

Chair: Kaoru Takara
Secretary General: Tomoharu Hori

Disaster Prevention Research Institute, Gokasho, Uji, 6110011, Japan
Email: icwrrer2016@wrrc.dpri.kyoto-u.ac.jp





Japan
Funds-in-Trust



MEXT

MINISTRY OF EDUCATION,
CULTURE, SPORTS,
SCIENCE AND TECHNOLOGY-JAPAN

International Hydrological Programme

Risk Management of Water-related Disasters under Changing Climate

The Twenty-fifth IHP Training Course (30 November - 11 December, 2015, Kyoto, Japan)

Water Resources Research Center, Disaster Prevention Research Institute, Kyoto University

Hydropheric Atmospheric Research Center (HyARC), Nagoya University

Supported by

Disaster Prevention Research Institute (DPRI), Kyoto University



Outline

A two-week training course on risk management of water-related disasters under changing climate is programmed for participants from Asian-Pacific regions as a part of Japanese contribution to the International Hydrological Program (IHP). The course composed of a series of lectures, practice sessions, and technical visits to the Yodo River Basin will be held mainly at the Disaster Prevention Research Institute (DPRI), Kyoto University during the two weeks from 30 November to 11 December 2015.

Objectives

The number of human losses and economic damages linked to human practices has been exacerbated by water-related extreme events. Water-related risk might further increase for a number of reasons. The probability of extreme events which cause high impacts to society is expected to increase because of human activities and/or as a result of climate variability and change. On the other hand, increasing population and economic growth lead to intensive urbanization, often in flood prone areas. Frequent disaster will prevent from developing or exhaust society. Poor water governance coupled with lack of adequate emergency management institutions and infrastructures reduces society's capacity to cope with extreme events and therefore increases the risk to life and property. In order to realize sustainable development, appropriate risk management of water-related disasters is indispensable.

In light of the Focal Area 1.1 “*Risk management as adaptation to global change*” under the Theme 1 “*Water related disasters under hydrological change*” of the IHP-VIII, the 25th IHP training course is focused on three major objectives: (1) to acquire the latest knowledge on hydrological assessment under changing climate at river basin scale, (2) to make practice on methodologies for assessing the impact of climate change on hydrological processes, and (3) to discuss alternatives of risk management at river basin scale.

Dates

30 November to 11 December, 2015

Venue

Disaster Prevention Research Institute, Kyoto University, Uji, Japan

Program (as of 15th October, 2015)

The latest version of the program will be available on our website at http://wrrc.dpri.kyoto-u.ac.jp/index_eng.html.

30 Nov. (Mon)	Exercise 1	Self-introduction and country report on risk management of water-related disasters	All participants
	Keynote 1	Role of data in flood modelling, flood management and Pakistan project S. Khan (Regional Science Bureau for Asia and the Pacific, UNESCO)	
1 Dec. (Tue)	Keynote 2	Water-related disaster risk, resilience and strategy K. Takeuchi (International Centre for Water Hazard and Risk Management)	
	Keynote 3	Resilience and flood management strategies P. Gourbesville (Polytech Nice-Sophia, University of Nice Sophia-Antipolis)	
	Exercise 2	Fundamentals of data processing	T. Hamaguchi (DPRI, Kyoto University)
2 Dec. (Wed)	Lecture 1	Projected future meteorological environment	E. Nakakita (DPRI, Kyoto University)
	Lecture 2	Fundamentals of basin-scale hydrological analysis Y. Tachikawa (Graduate School of Engineering, Kyoto University)	
3 Dec. (Thu)	Lecture 3	Fundamentals in rainfall-runoff-inundation modelling	T. Sayama (DPRI, Kyoto University)
	Lecture 4	Data Integration and Analysis System (DIAS) for water-related disasters A. Kawasaki (Graduate School of Engineering, The University of Tokyo)	
	Lecture 5	Fundamentals in flood frequency analysis	S. Tanaka (DPRI, Kyoto University)
4 Dec. (Fri)	Exercise 3	Data analysis of GCM and historical data	K. Tanaka (DPRI, Kyoto University)
	Lecture 6	Efforts to develop disaster statistics in the world Y. Ono (International Research Institute of Disaster Science, Tohoku University)	
	Exercise 4	Flood frequency analysis	S. Tanaka (DPRI, Kyoto University)
5 Dec. (Sat)		Technical visits to the Lake Biwa and the Yodo River	
6 Dec. (Sun)		Technical visits and cultural exchange with students at the Katsura river	
7 Dec. (Mon)	Exercise 5	Rainfall-runoff-inundation modelling	T. Sayama (DPRI, Kyoto University)
	Lecture 7	Fundamentals in river basin modelling	Y. Sato (Faculty of Agriculture, Ehime University)
8 Dec. (Tue)	Lecture 8	Fundamentals in optimum operation of reservoir systems	T. Hori (DPRI, Kyoto University)
	Exercise 6	Optimization of reservoir operation	D. Nohara (DPRI, Kyoto University)
9 Dec. (Wed)		Field workshop at the Katsura River and the Hiyoshi Dam	D. Nohara (DPRI, Kyoto University)
10 Dec. (Thu)	Lecture 9	Sustainable management of water resources in arid areas	S. Kantoush (DPRI, Kyoto University)
	Lecture 10	Flood risk assessment toward flood risk management	H. Tatano (DPRI, Kyoto University)
	Lecture 11	Integrated sediment and floating debris management	T. Sumi (DPRI, Kyoto University)
11 Dec. (Fri)		Report presentation by each participant and completion ceremony	

Downloading the Textbook for Participants from the Net

The textbook of “the 25th IHP Training Course”, which is converted in PDF style, will be prepared and be put on the IHP Nagoya/Kyoto forum website of “www.ihpnagoyaforum.org”. The participants are requested to download the PDF file from the website in advance as a preparation to the lectures of the training course. The textbook will include one page abstracts and presentation materials of the lectures.

Web Broadcasting the Lectures

The lectures except exercises and technical visits will be webcasted to some universities in Asia via the UNESCO Office Jakarta and with other technology through DPRI facilities. The slide materials will be distributed to the participants from the Net in advance. Some materials may be excluded from web broadcasting when copyrights apply.

Contact

Convener : TANAKA, Shigenobu (DPRI, Kyoto University) E-mail: tanaka.shigenobu.4m@kyoto-u.ac.jp

Chief assistant : NOHARA, Daisuke (DPRI, Kyoto University) E-mail: nohara.daisuke.2v@kyoto-u.ac.jp

Global Runoff Data Centre (GRDC)

Station Availability in the Asian Pacific Region

Ulrich Looser

Global Runoff Data Centre at the
Federal Institute of Hydrology (BfG) Koblenz, Germany



23rd Meeting of International Hydrological Programme (IHP)
Regional Steering Committee (RSC) for Southeast Asia and Pacific
19 – 20 October 2015 Medan, Indonesia



GRDC operational environment

Operates under the auspices of the
World Meteorological Organisation (WMO)



on the advice of an
International Steering Committee

with the financial support of the
Federal Republic of Germany



within the
Federal Institute of Hydrology



GRDC Main functions

- Acquisition and storage of global historical discharge data and associated metadata
- Dissemination of historical discharge data (385 000 station-years) and derived products from currently ~ 9200 stations in 160 countries (“One-stop shop”)
- Support to the water and climate related programmes and projects of the United Nations and their specialised agencies
- Service to the international research community on global change and climate services
- Cooperation and participation in international projects and programmes such as:
 - GCOS (Global Climate Observing System)
 - UNESCO IHP FRIEND-Water (Flow Regime from International Experimental and Network Data)
 - GEO (Group on Earth Observations)
 - GEWEX (Global Energy and Water Exchanges)
 - OGC (Open Geospatial Consortium) Hydrology Domain Working Group
 - etc.
- The GRDC is **not** substituting the functions of the National Hydrological Services
- Ownership of the data remains with the original Data Provider



GRDC Data Acquisition

Governed by WMO Resolutions on free and unrestricted exchange of hydro-meteorological data and support to the GRDC

- Opportunity driven
 - Maintenance of contacts with National Hydrological Services and especially with the people within the organisations
- No formalised processes
 - Cooperation and resolutions are not legally binding
 - Dependent on good will and voluntary cooperation



GRDC Data Policy

GRDC data are available to users free and unrestricted under specific conditions

Data requests must be in writing: e.g. E-mail, letter or facsimile

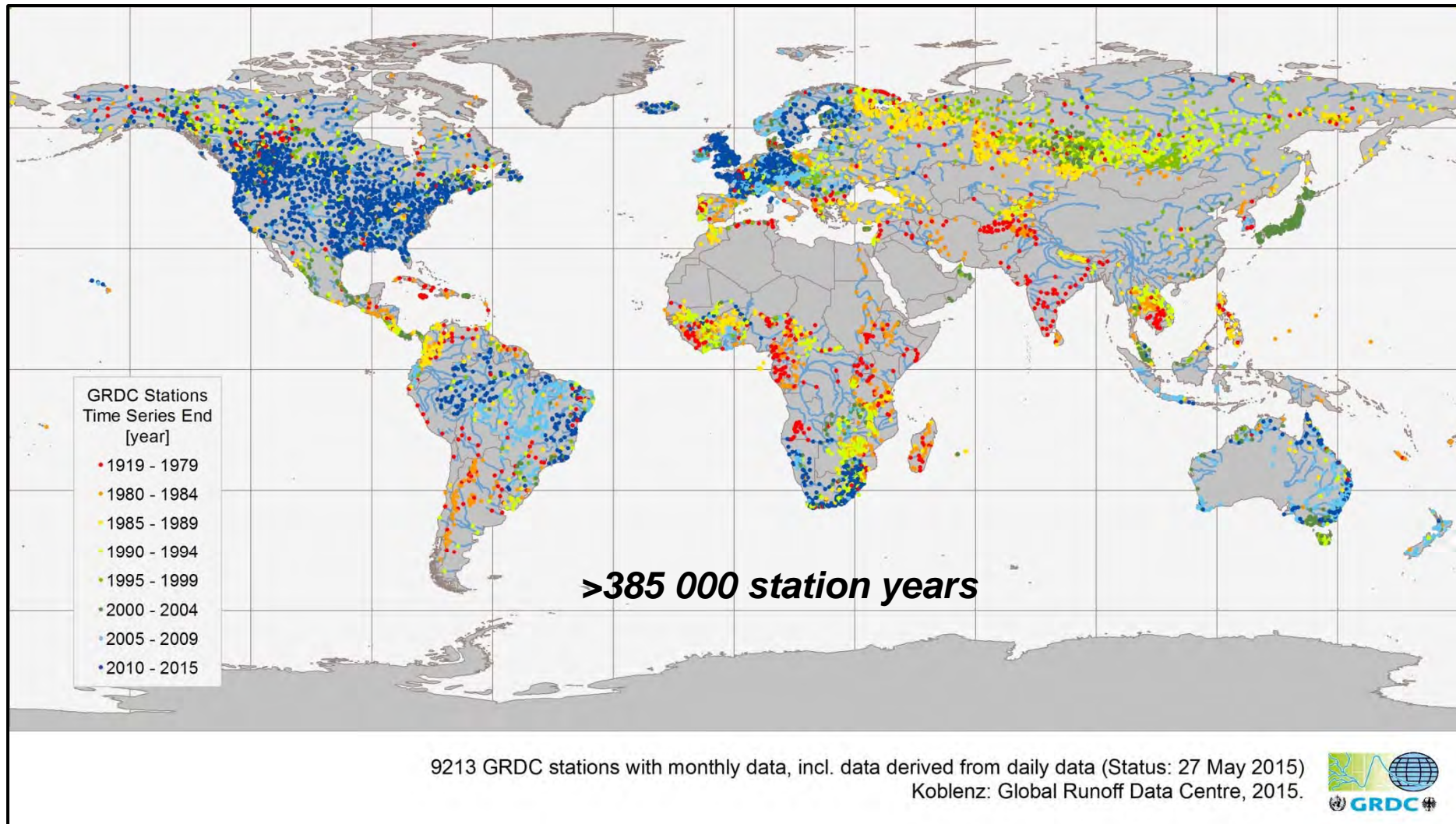
Data users must sign a user declaration stating that:

- Data may not be used for commercial purposes
- Data may not be transferred to third parties
- Data users agree that the GRDC may inform data providers about the use of their data
- After completion of the studies, two copies of the results will be provided to the GRDC
- The source of the data must be acknowledged in all publications



Status of the Global Runoff Database

Global Coverage of GRDC Stations indicated by time series end



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19 – 20 October 2015 Medan, Indonesia



Current FRIEND-Water Groups



23rd Meeting of International Hydrological Programme (IHP)
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19 – 20 October 2015 Medan, Indonesia

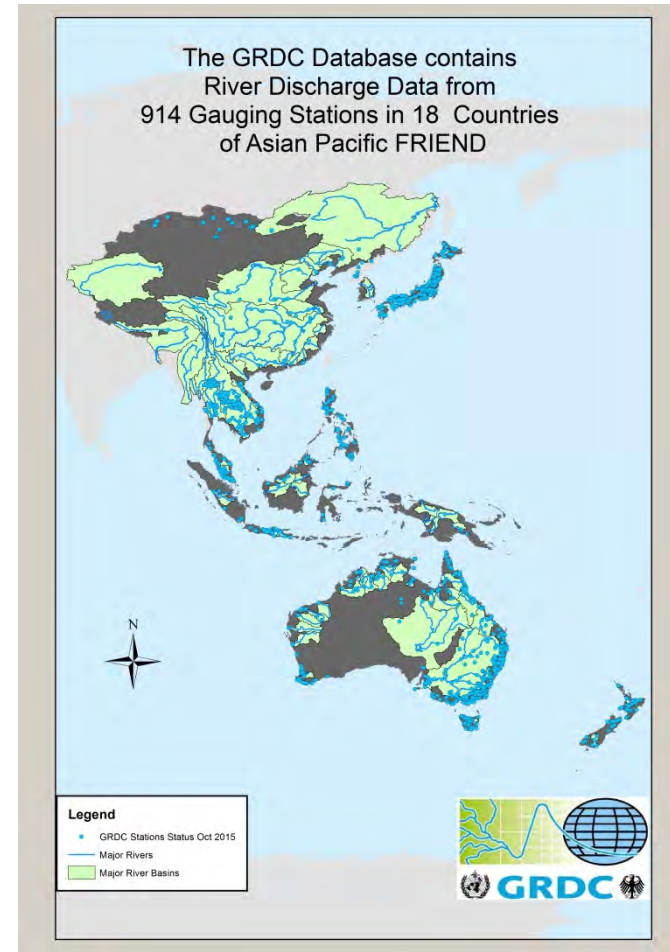
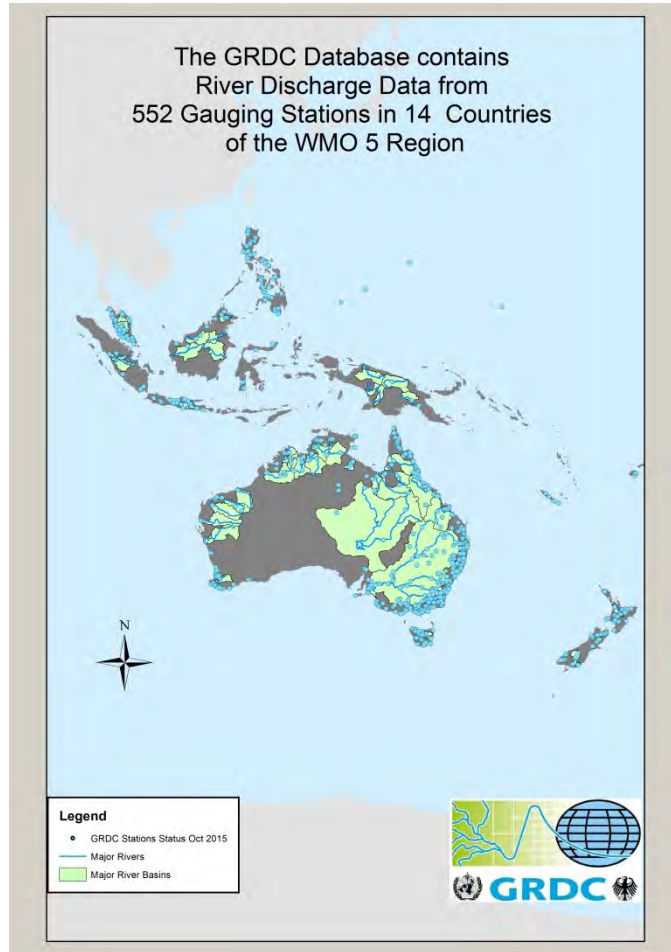


Future of FRIEND-Water Databases

- FIGCC (FRIEND-Water Intergroup Coordinating Committee) decision in Montpellier (Oct 2014) to integrate FRIEND-Water Databases into GRDC database
- Single data policy for all data
- GRDC as a service to multiple UN-Programmes demonstrating the cooperation between those programmes at WMO, UNESCO, UNEP...
- Successful integration of SA-FRIEND-Water database already achieved
- Busy with the integration of the EURO-FRIEND-Water database
- Negotiations to start with other FRIEND-Water groups



GRDC Stations in WMO Region V Countries vs. GRDC Stations in Asia Pacific FRIEND Countries



981 Asian Pacific Stations in the GRDC Database (not all visible)



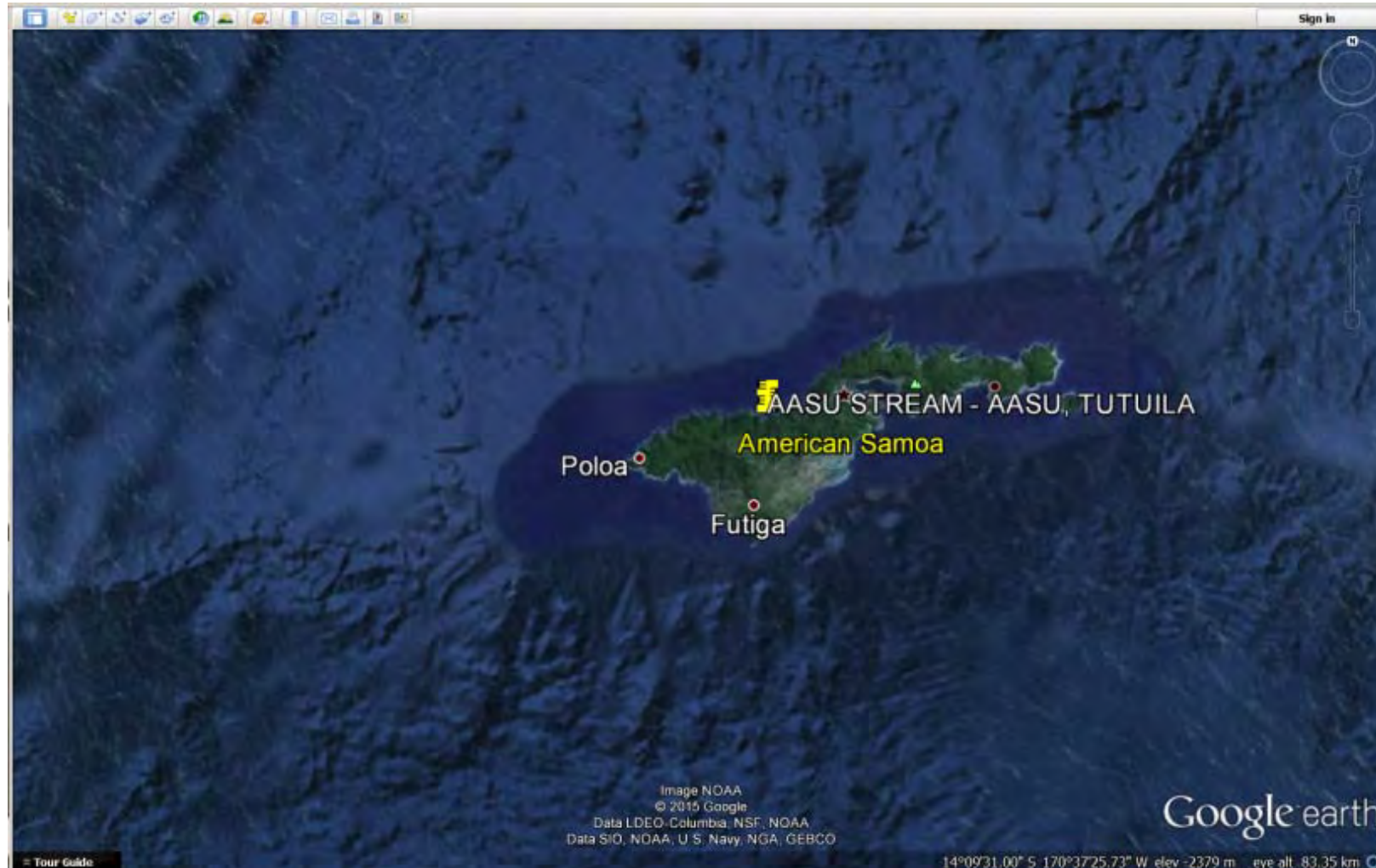
23rd Meeting of International Hydrological Programme (IHP)
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19 – 20 October 2015 Medan, Indonesia



AS American Samoa (WMO RA V)

Stations: 1

Data up to: 1983



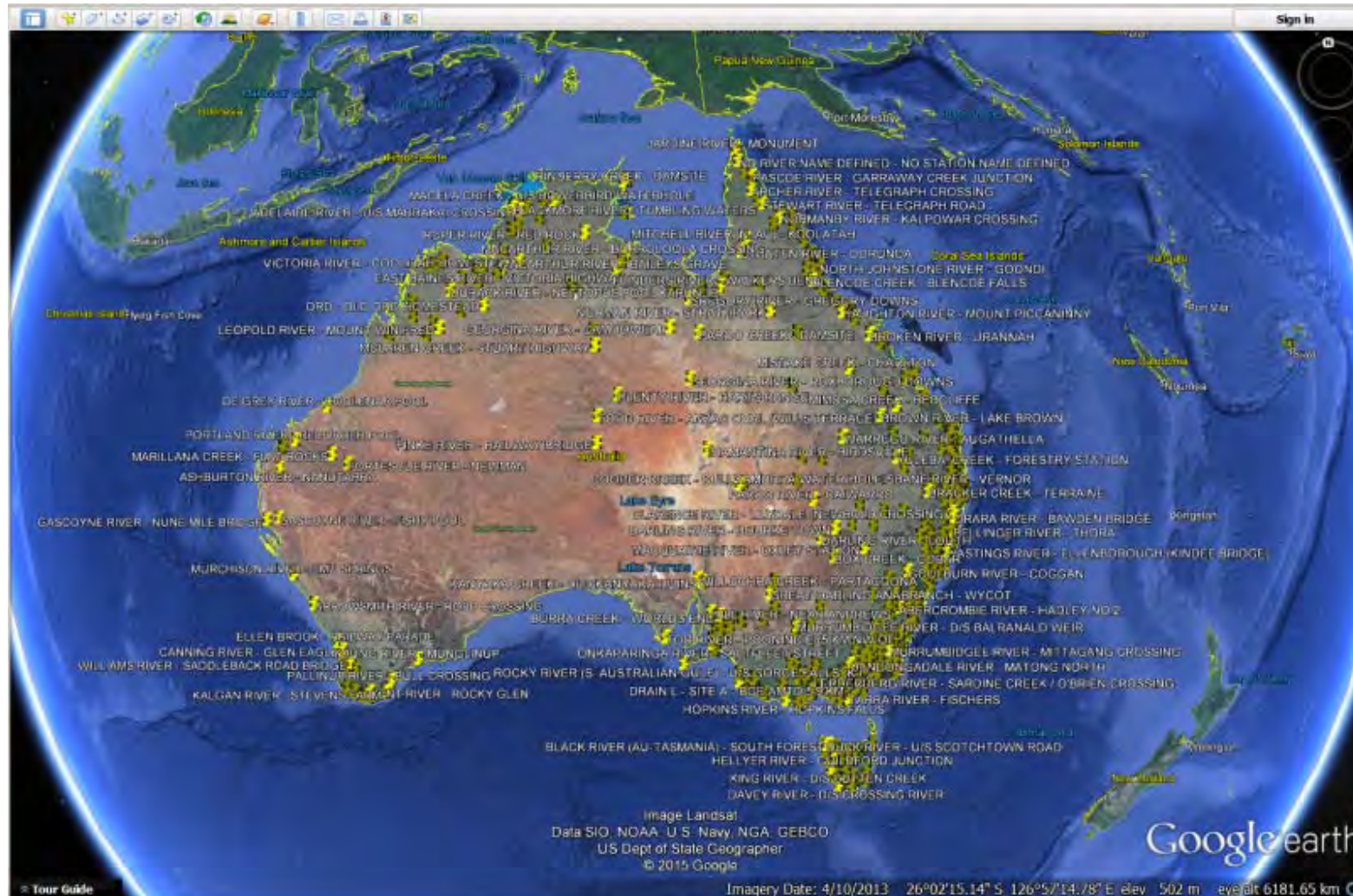
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AU Australia (AP-FRIEND & WMO RA V)

Stations: 373

Data up to:2012



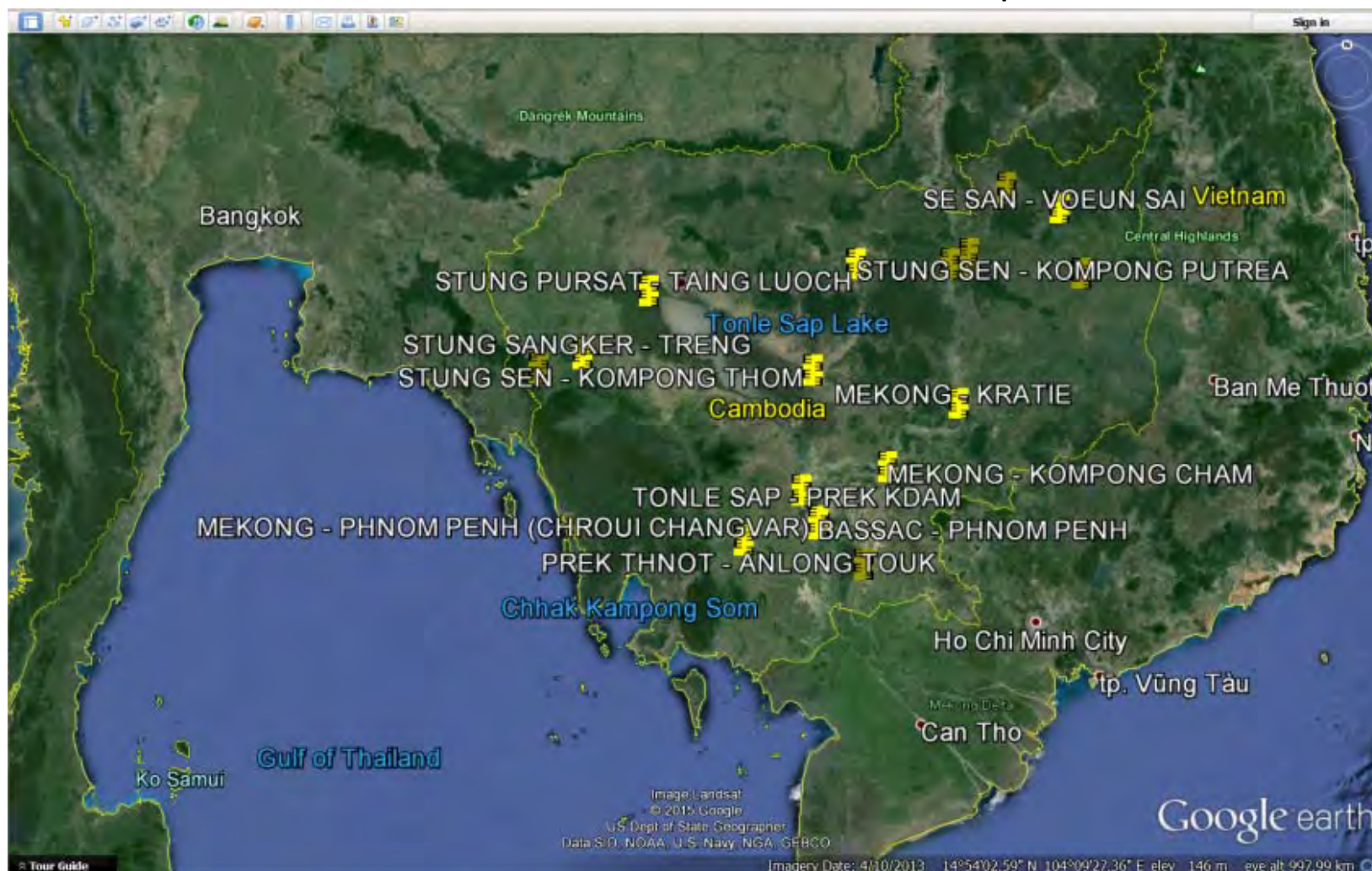
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KH Cambodia (AP-FRIEND & WMO RA II)

Stations: 18

Data up to: 1994



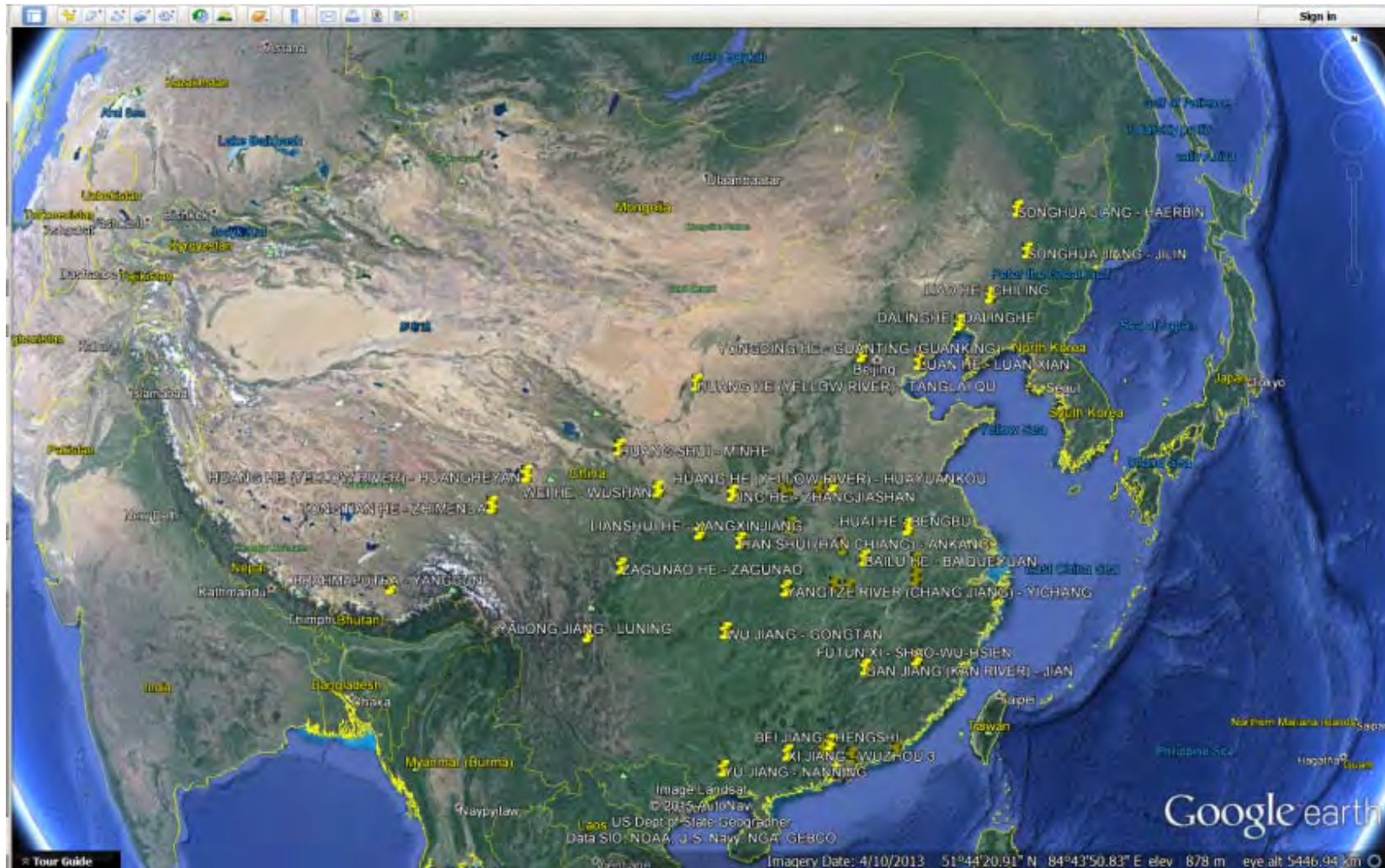
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CN China (AP-FRIEND & WMO RA II)

Stations: 39

Data up to: 2004



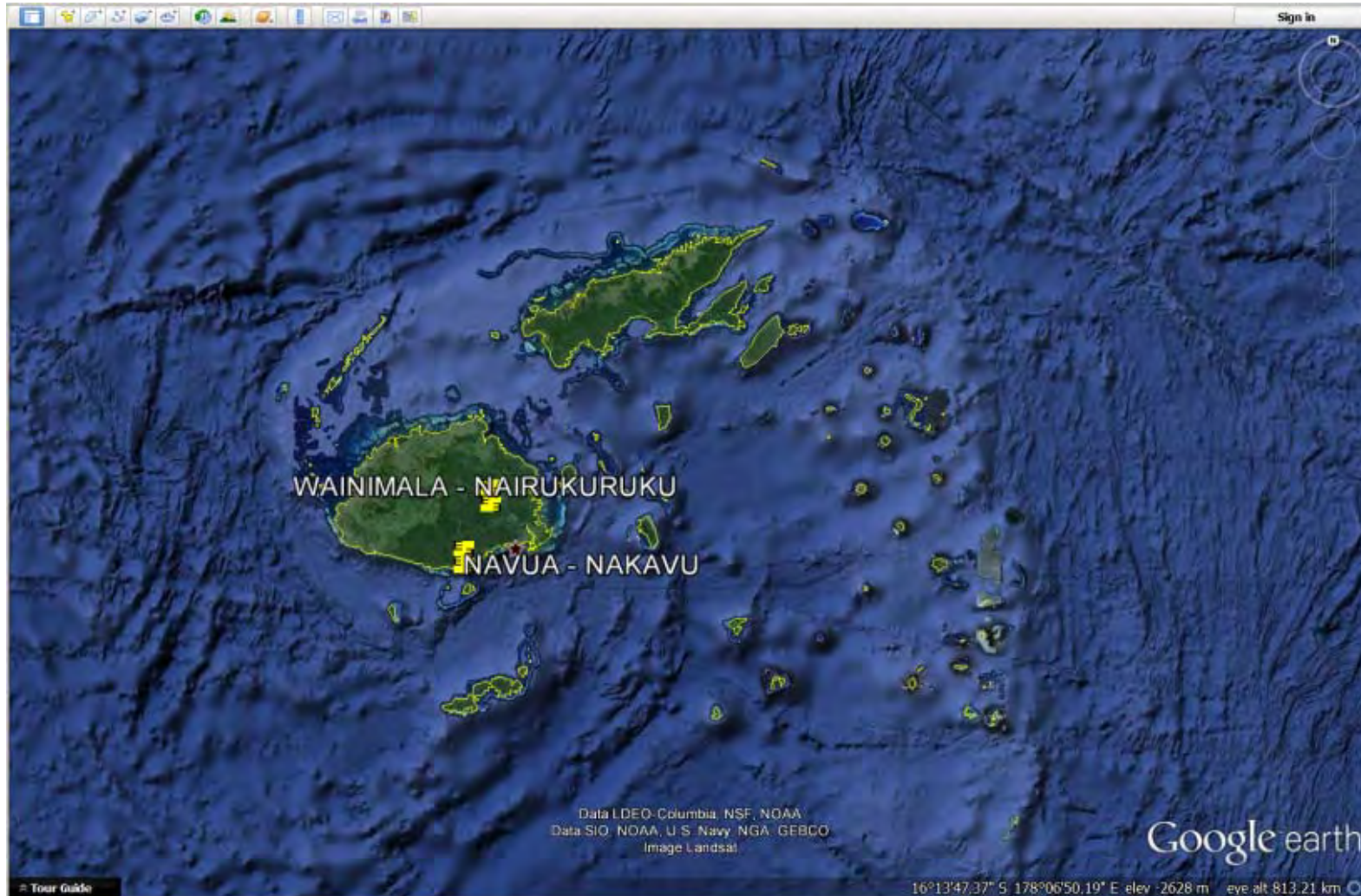
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Regional Steering Committee (RSC) for Southeast Asia and Pacific
19 – 20 October 2015 Medan, Indonesia



FJ Fiji (WMO RA V)

Stations: 2

Data up to: 1980



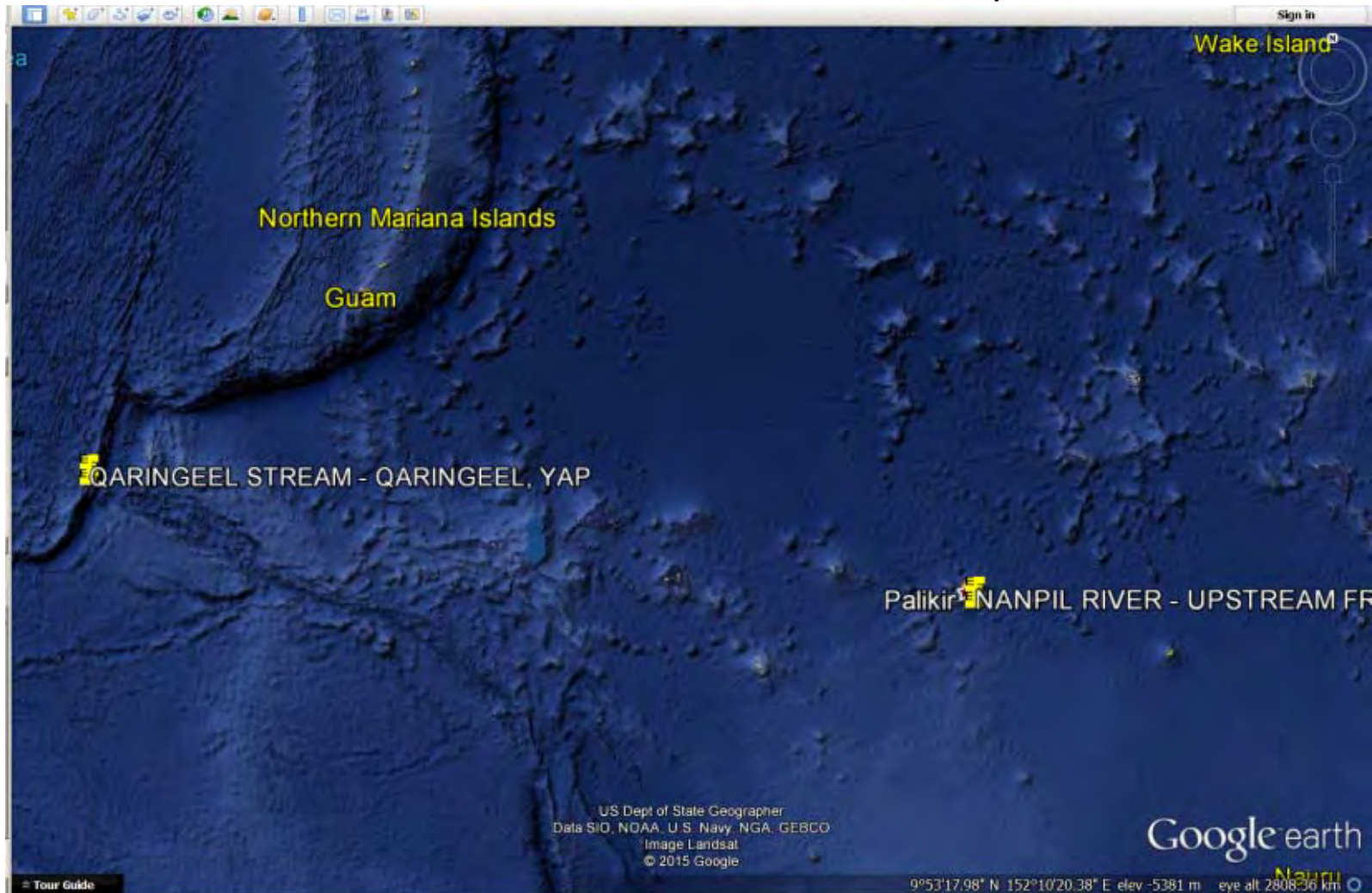
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Regional Steering Committee (RSC) for Southeast Asia and Pacific
19 – 20 October 2015 Medan, Indonesia



FM Federated States of Micronesia (WMO RA V)

Stations: 2

Data up to: 1983



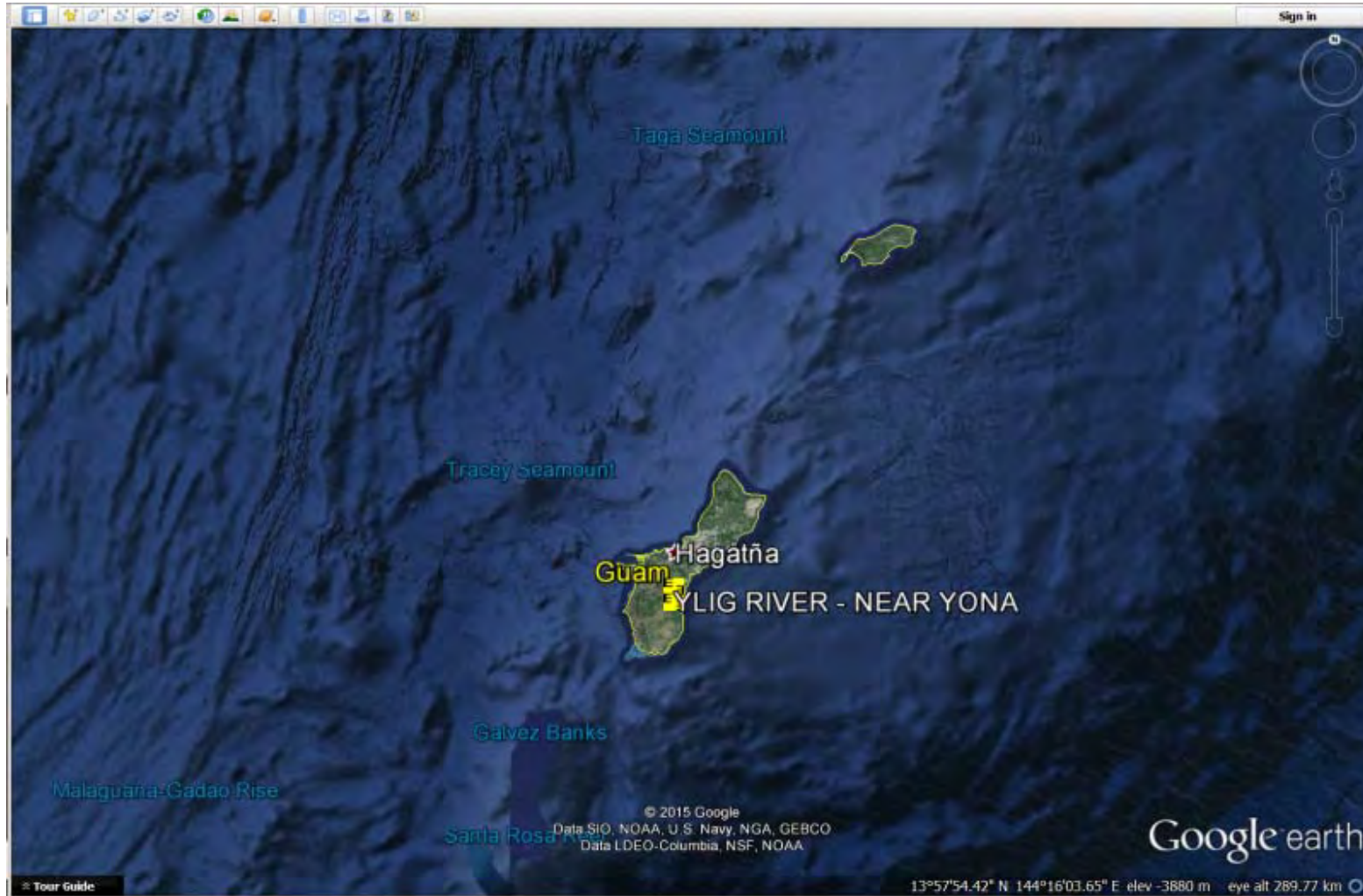
23rd Meeting of International Hydrological Programme (IHP)
Regional Steering Committee (RSC) for Southeast Asia and Pacific
19 – 20 October 2015 Medan, Indonesia



GU Guam (WMO RA V)

Stations: 1

Data up to: 1983



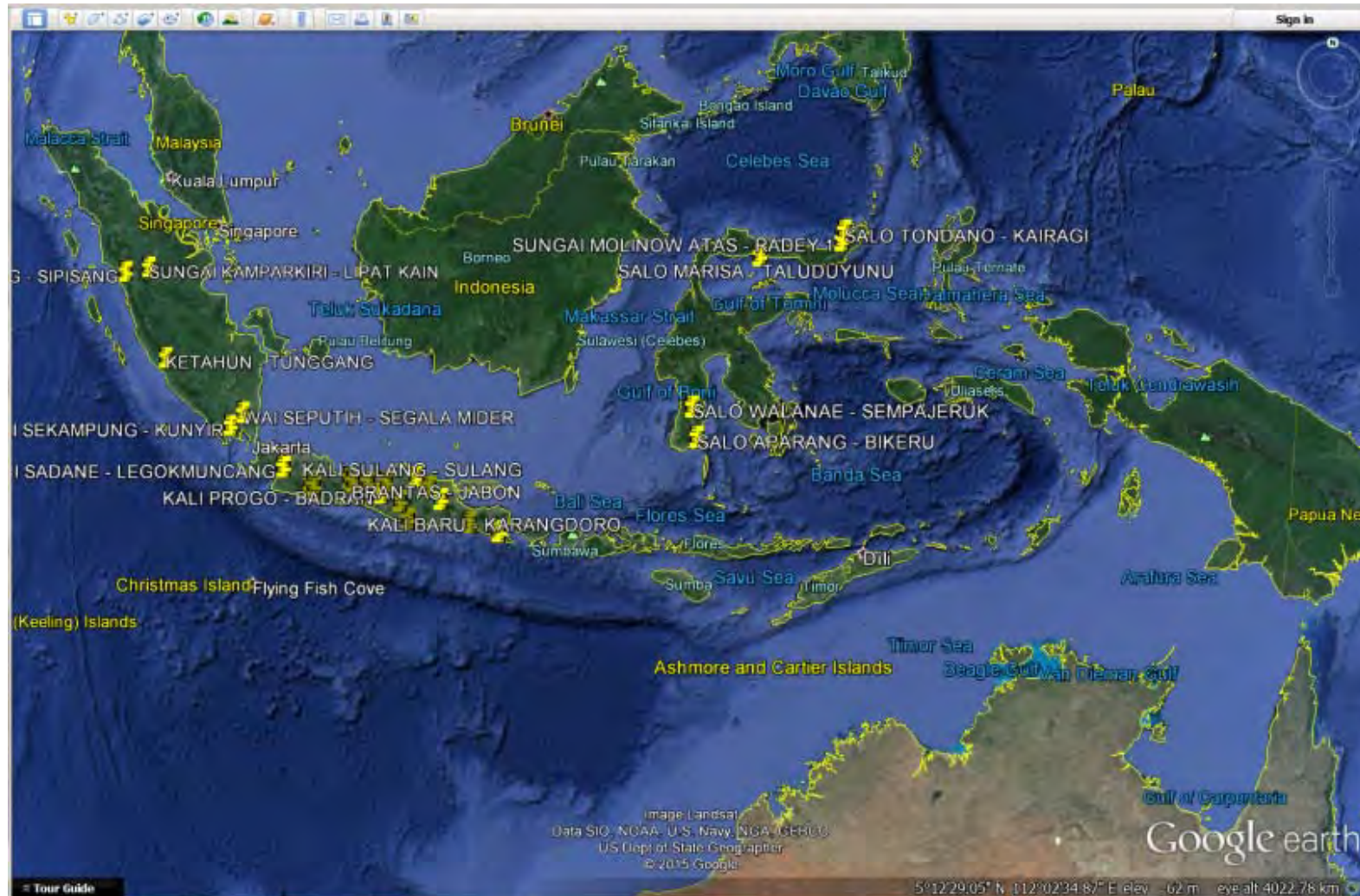
23rd Meeting of International Hydrological Programme (IHP)
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ID Indonesia (AP-FRIEND & WMO RA V)

Stations: 26

Data up to: 2010



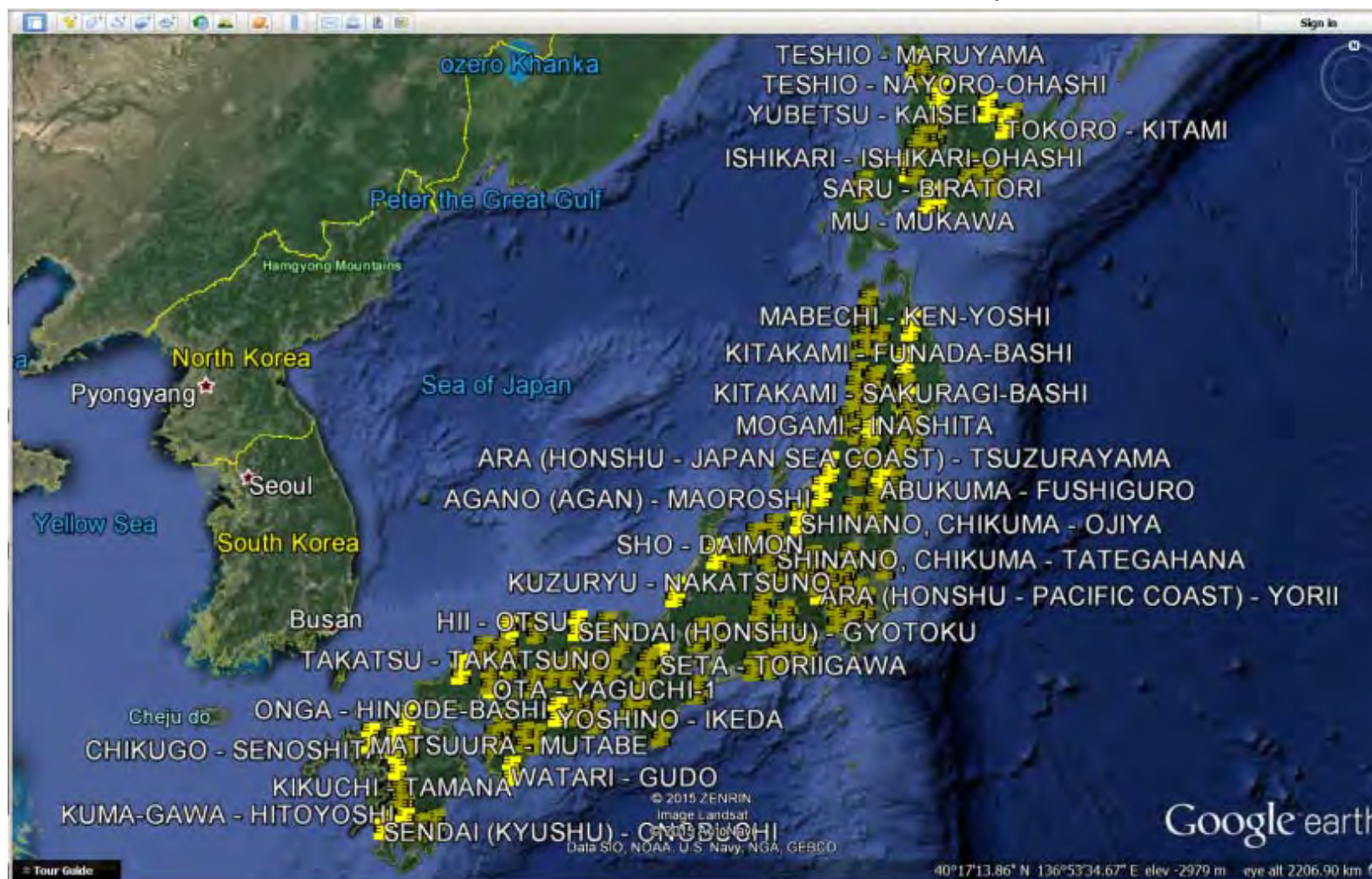
23rd Meeting of International Hydrological Programme (IHP)
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19 – 20 October 2015 Medan, Indonesia



JP Japan (AP-FRIEND & WMO RA II)

Stations: 152

Data up to: 2003



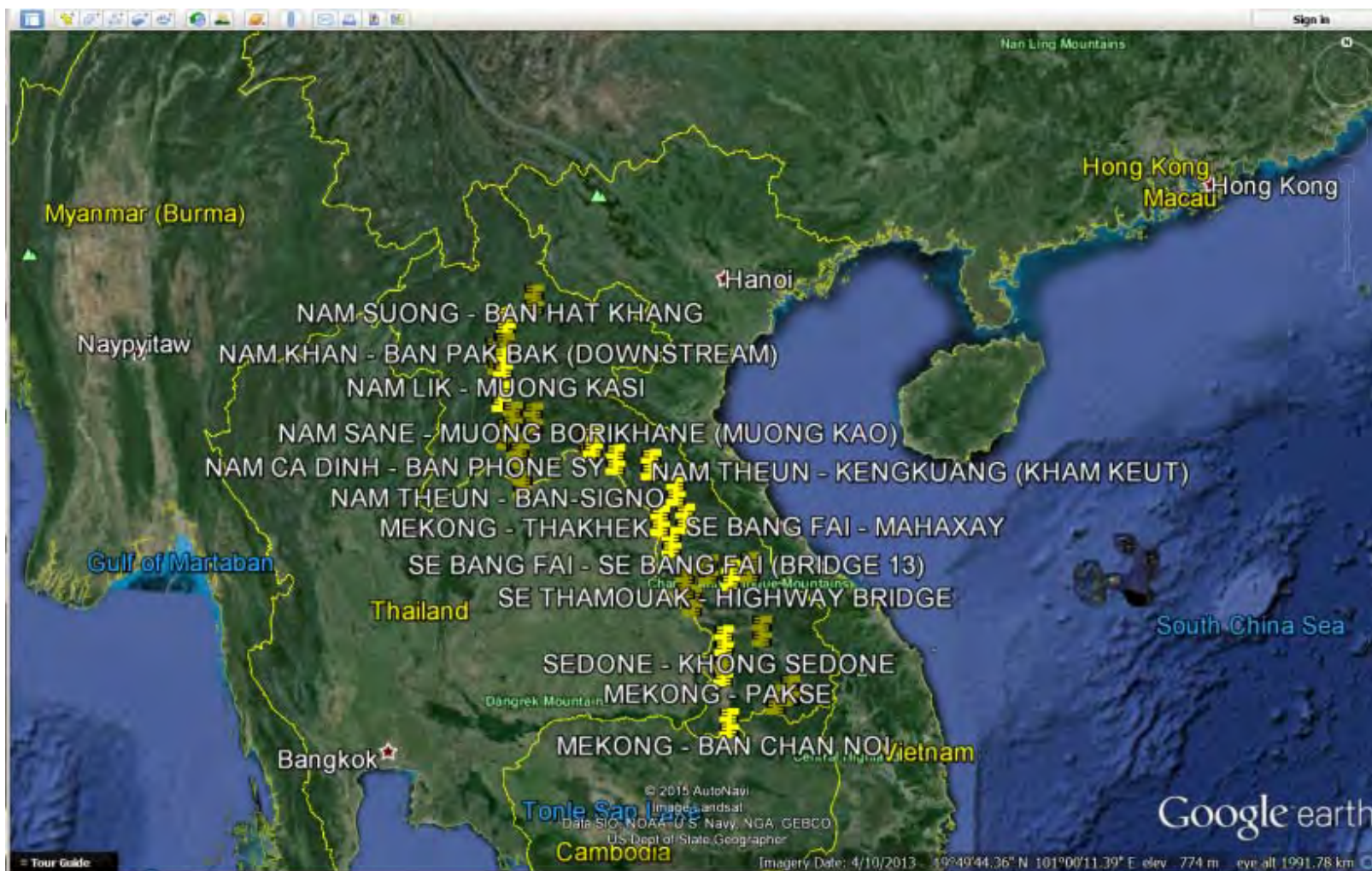
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LA Lao PDR (AP-FRIEND & WMO RA II)

Stations: 40

Data up to: 1994



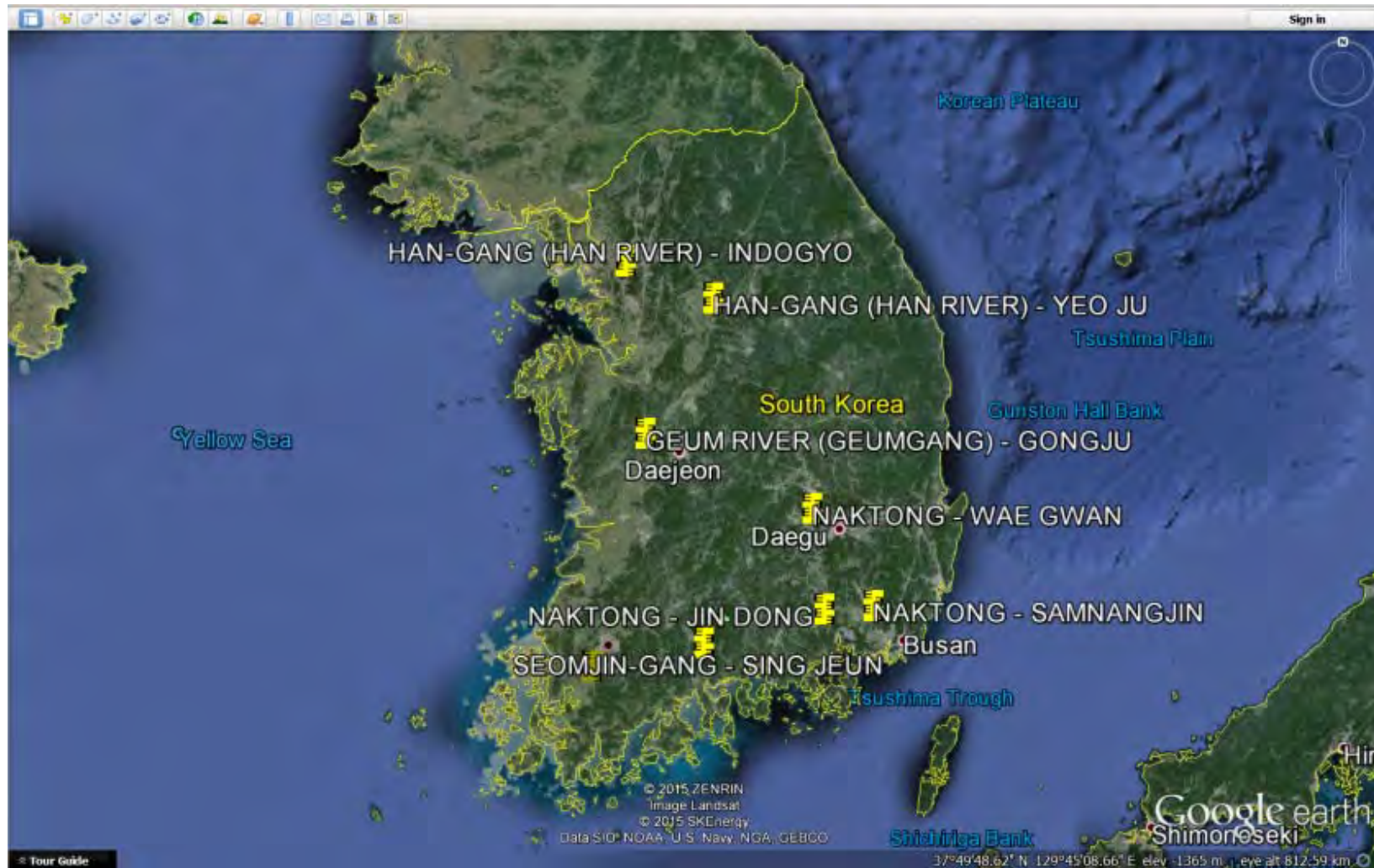
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Republic of Korea (AP-FRIEND & WMO RA II)

Stations: 8

Data up to: 2009



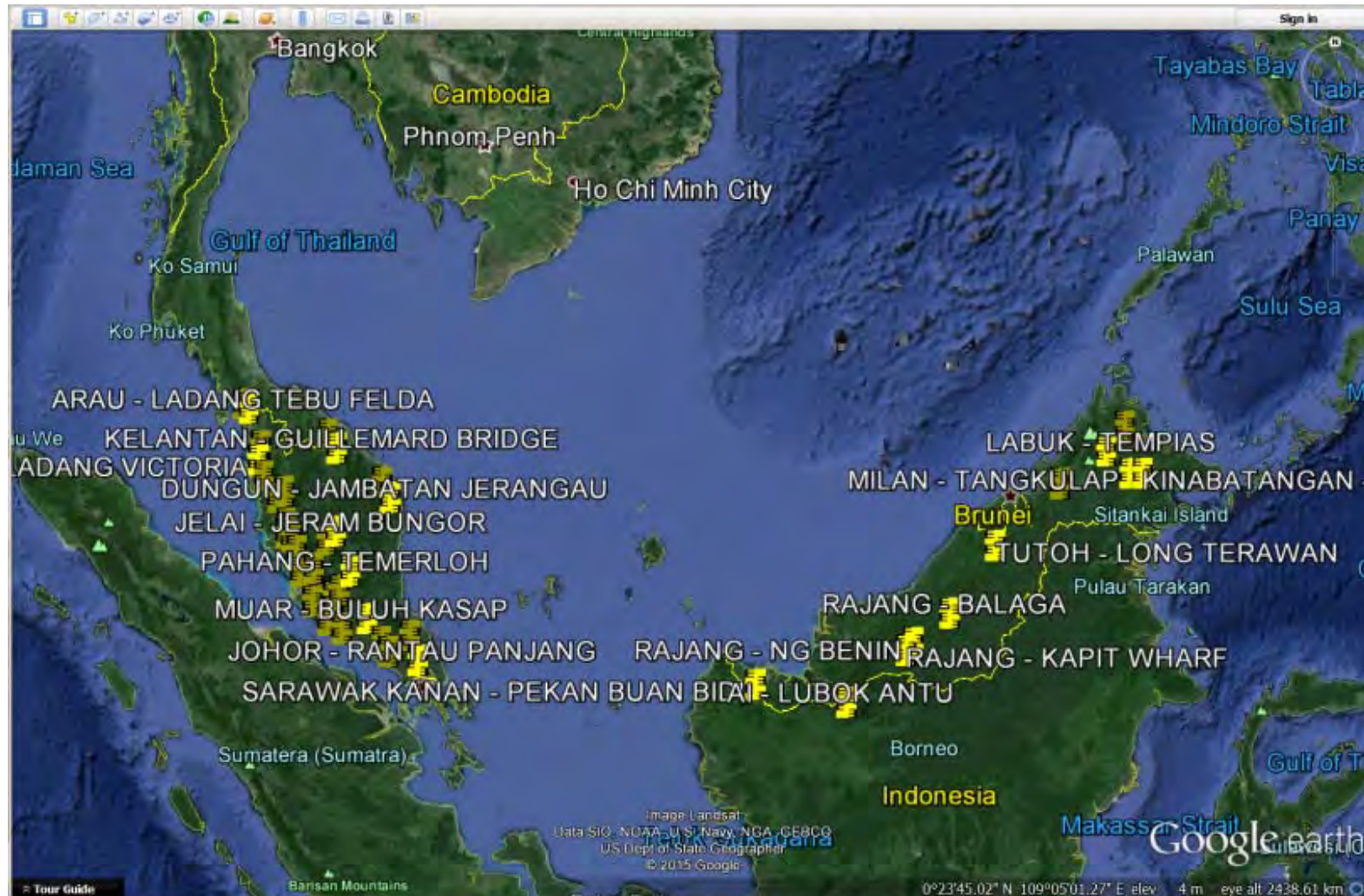
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MY Malaysia (AP-FRIEND & WMO RA V)

Stations: 41

Data up to: 2011



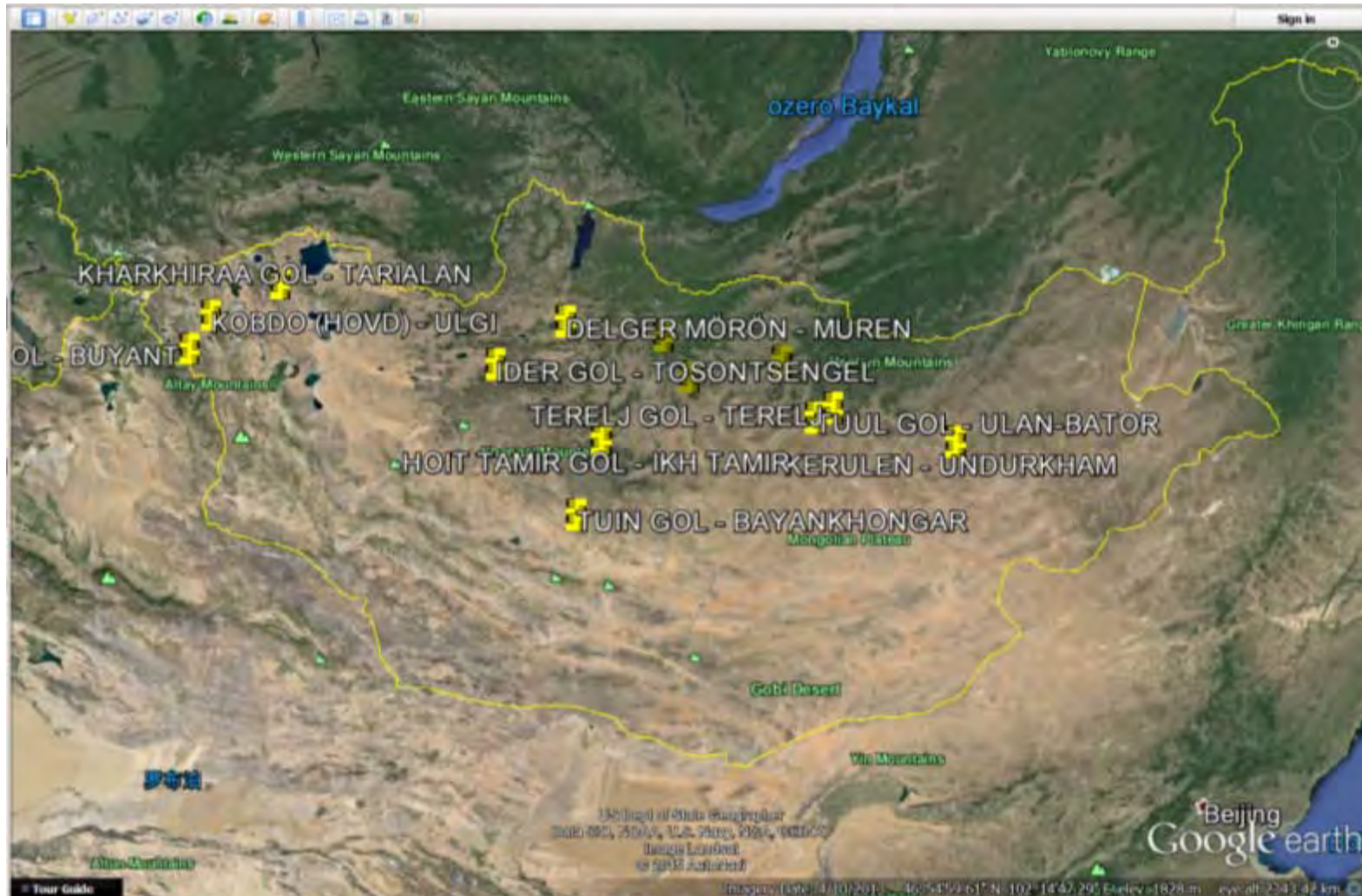
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19 – 20 October 2015 Medan, Indonesia



MN Mongolia (AP FRIEND & WMO RA II)

Stations: 13

Data up to: 1984



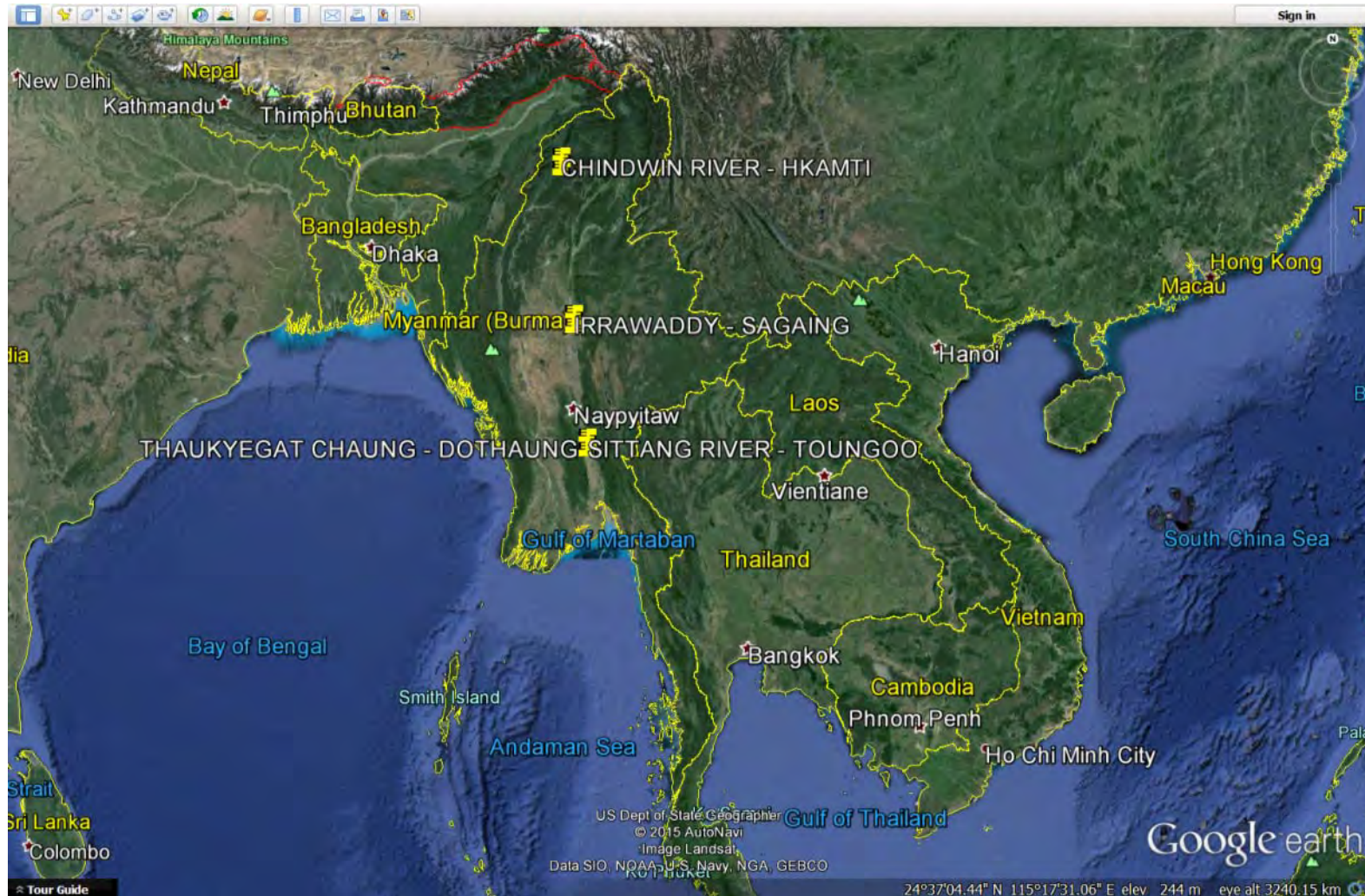
23rd Meeting of International Hydrological Programme (IHP)
Regional Steering Committee (RSC) for Southeast Asia and Pacific
19 – 20 October 2015 Medan, Indonesia



MM Myanmar (AP FRIEND & WMO RA II)

Stations: 4

Data up to: 1988



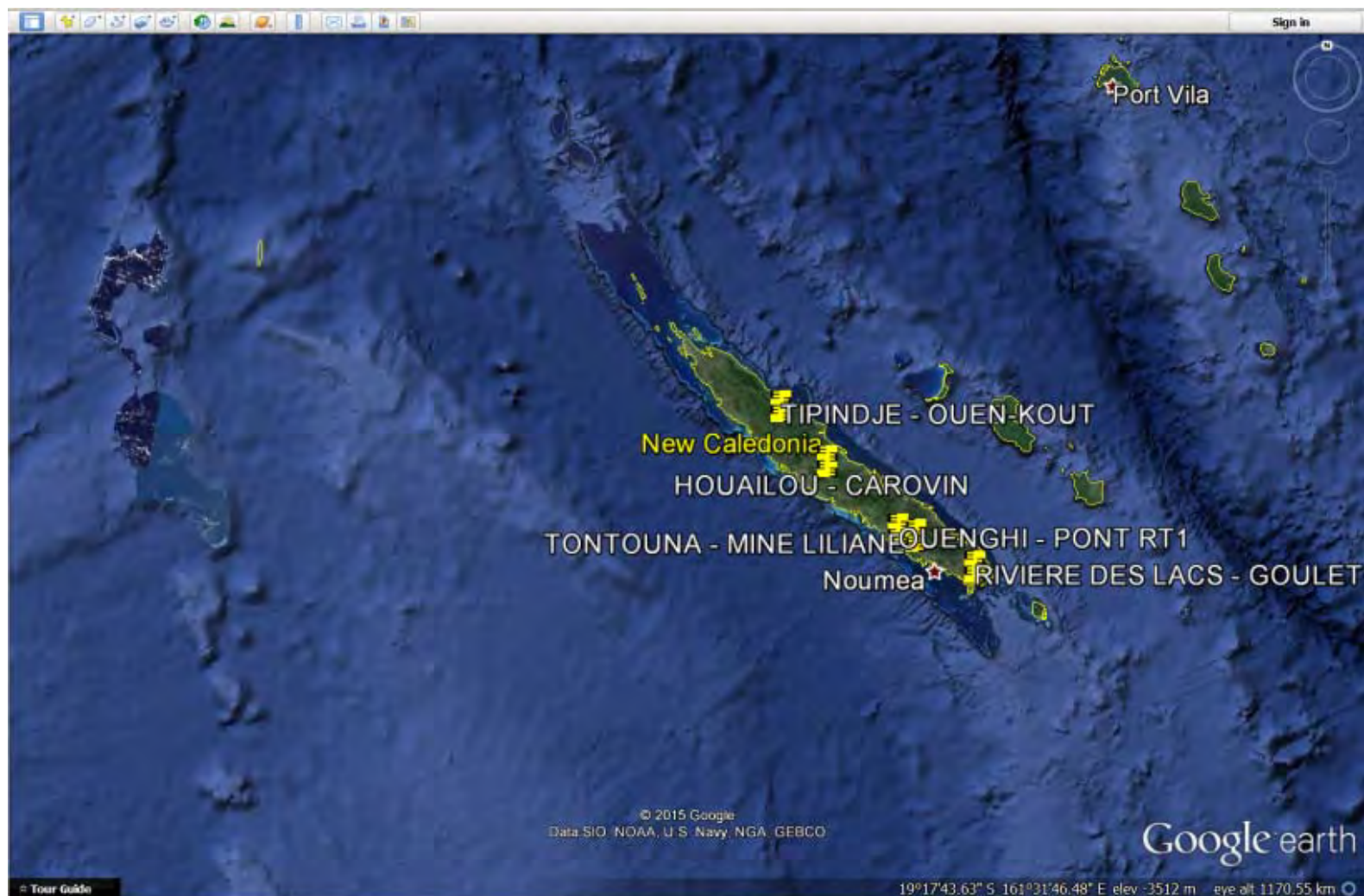
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NC New Caledonia (WMO RA V)

Stations: 5

Data up to: 1984



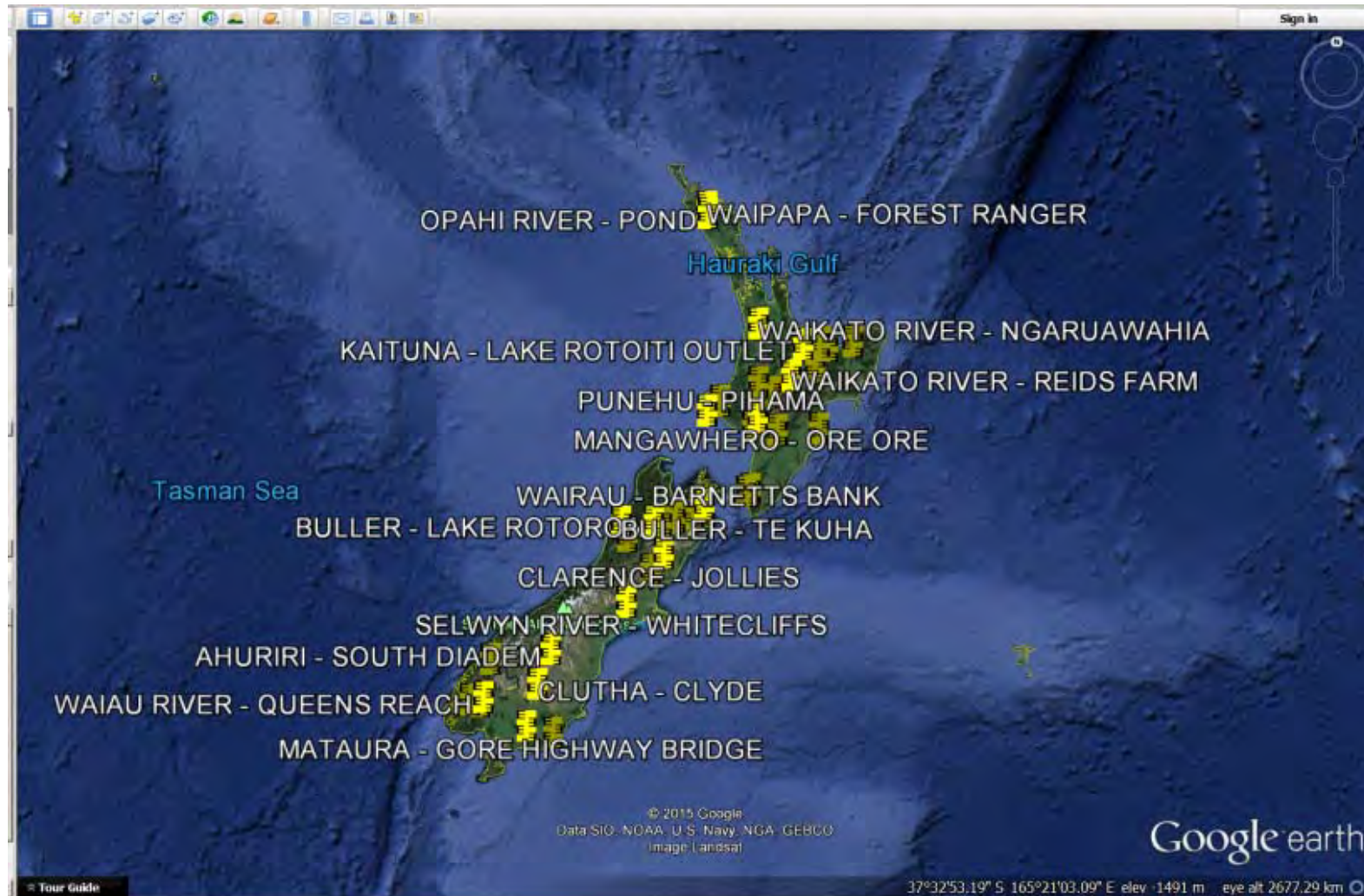
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NZ New Zealand (AP-FRIEND & WMO RA V)

Stations: 42

Data up to: 2010



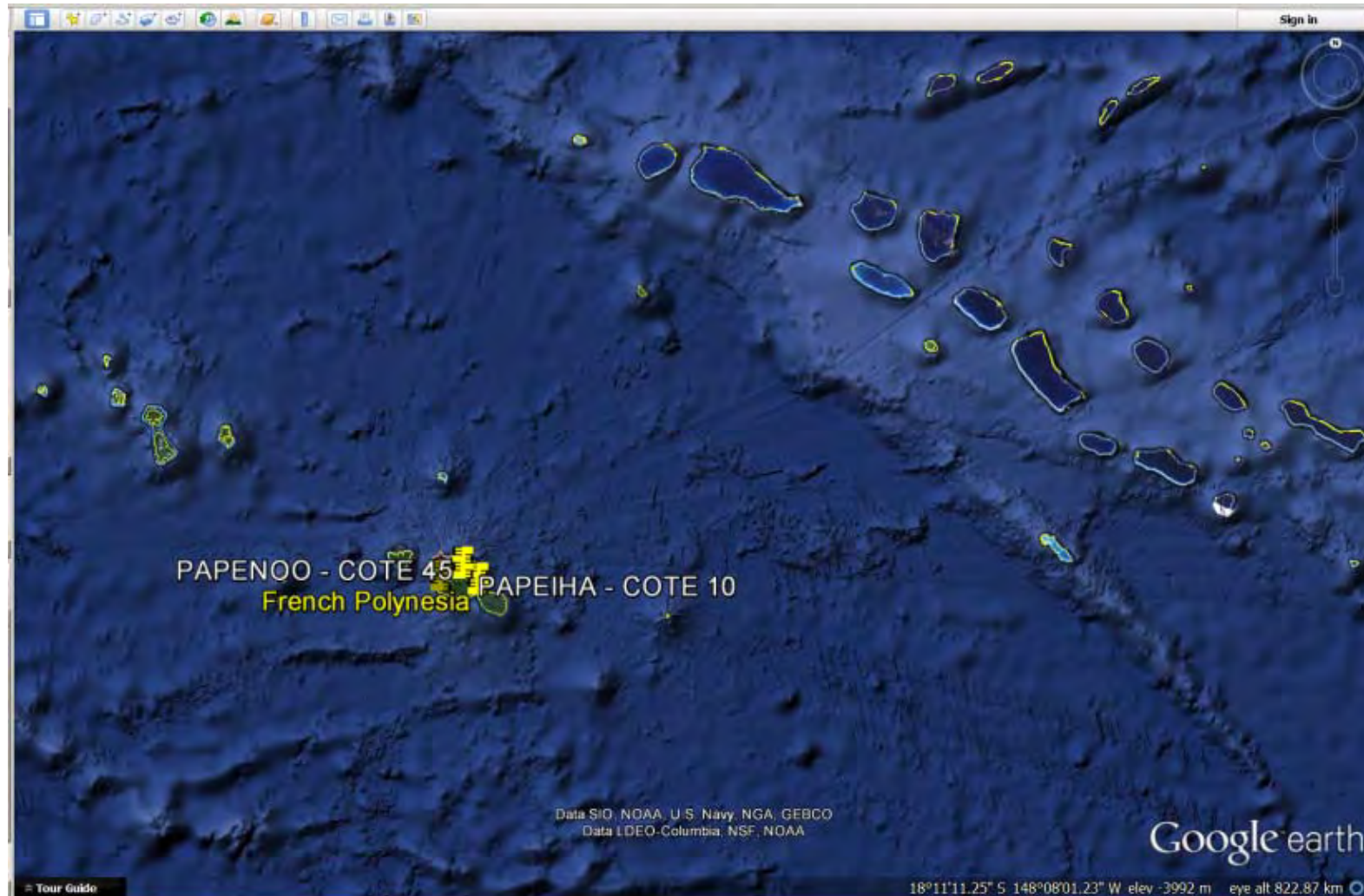
23rd Meeting of International Hydrological Programme (IHP)
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PF French Polynesia (WMO RA V)

Stations: 3

Data up to: 1986



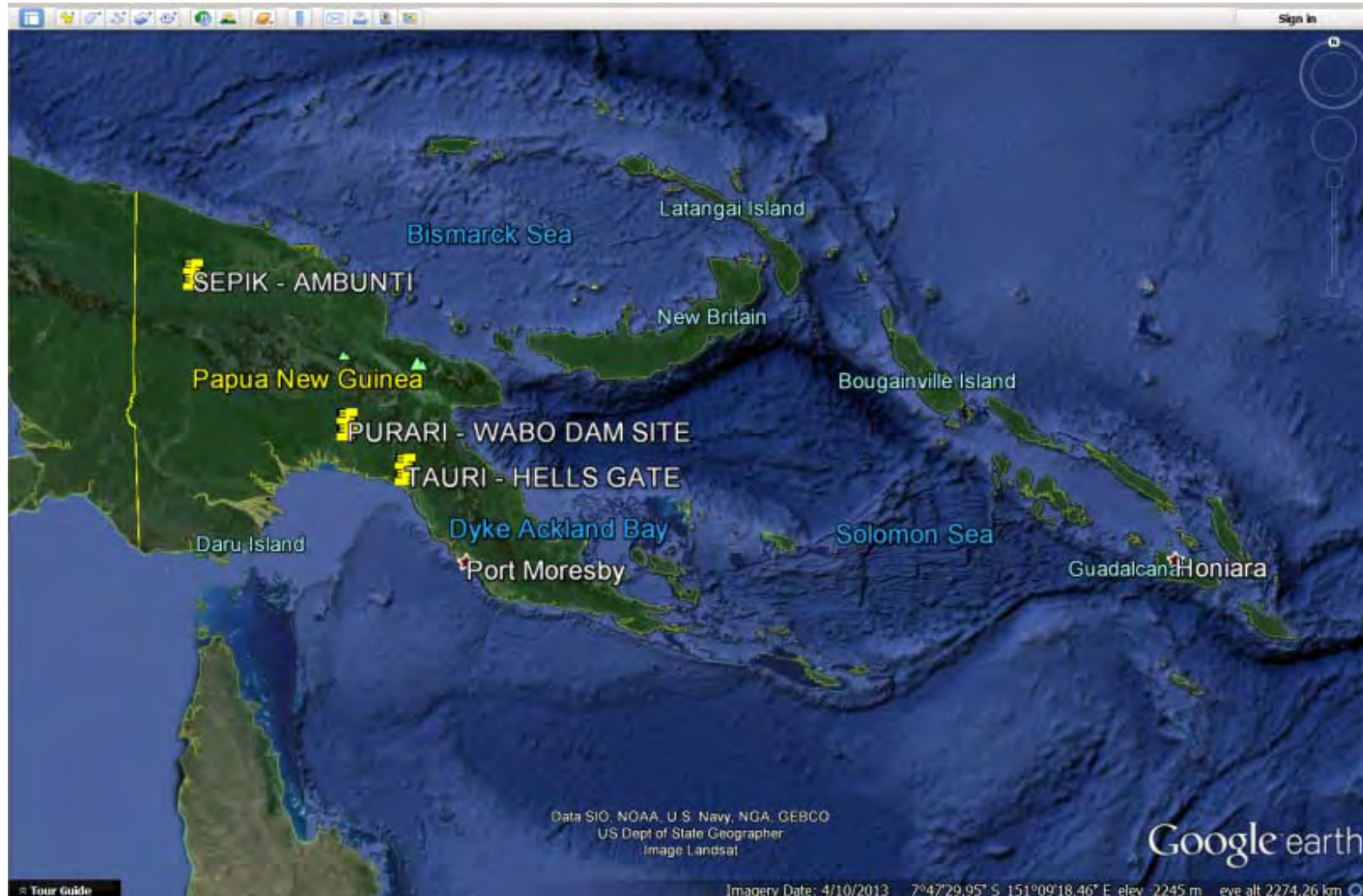
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PG Papua New Guinea (AP-FRIEND & WMO RA V)

Stations: 3

Data up to: 1984



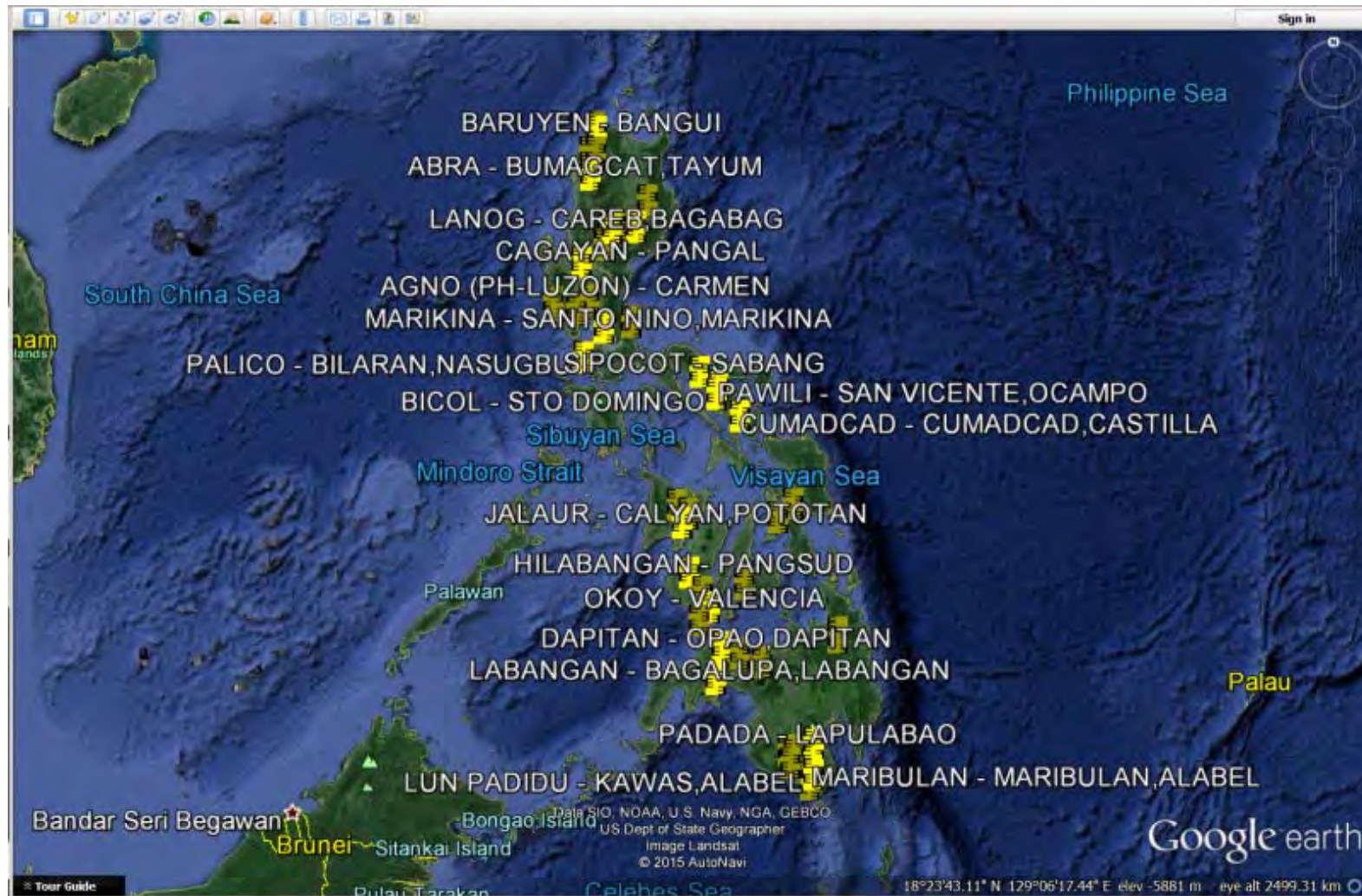
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PH Philippines (AP-FRIEND & WMO RA V)

Stations: 46

Data up to: 1988



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PW Palau (WMO RA V)

Stations: 1

Data up to: 1983



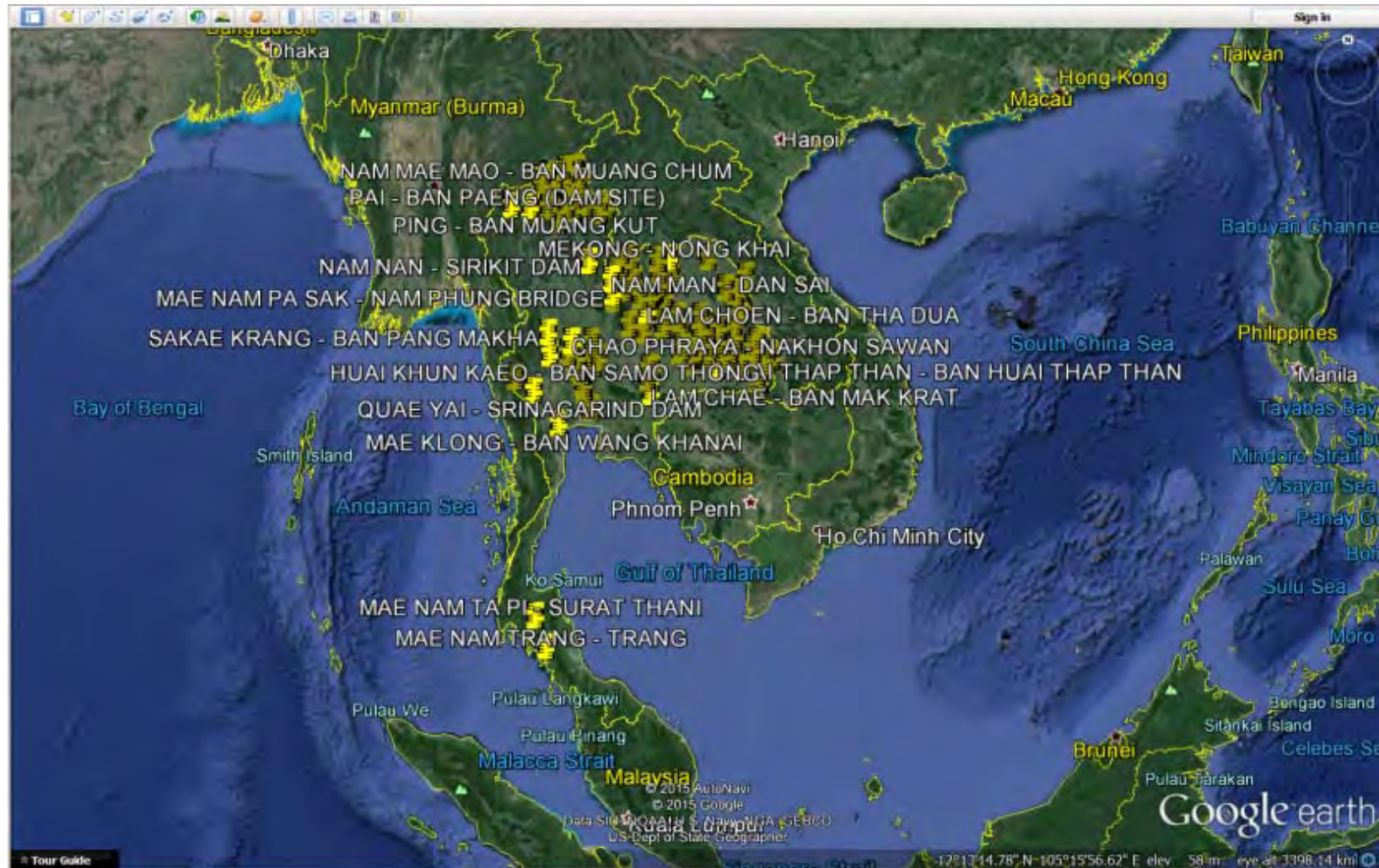
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TH Thailand (AP-FRIEND & WMO RA II)

Stations: 127

Data up to: 2000



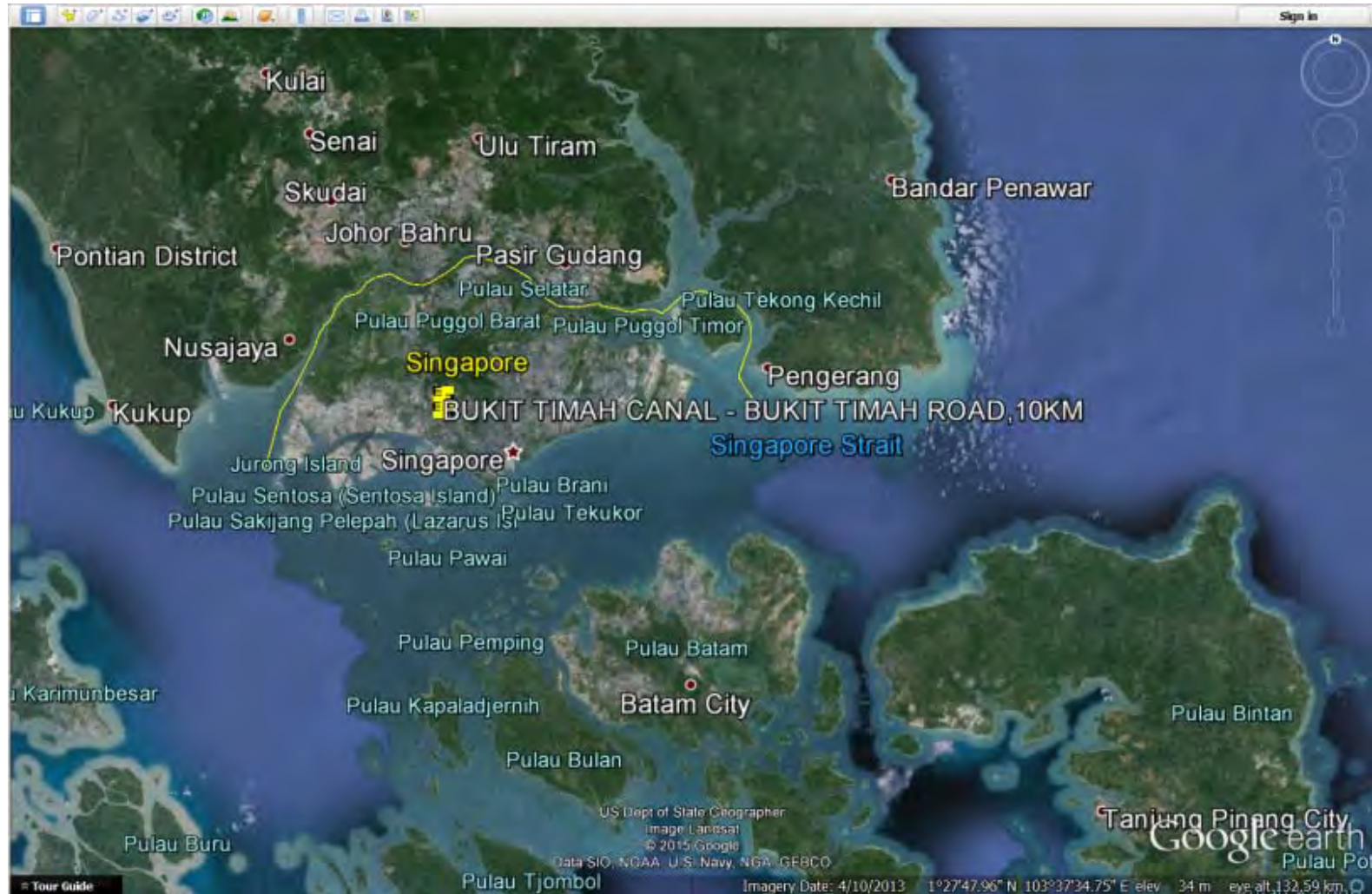
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Regional Steering Committee (RSC) for Southeast Asia and Pacific
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SG Singapore (WMO RA V)

Stations: 1

Data up to: 1988



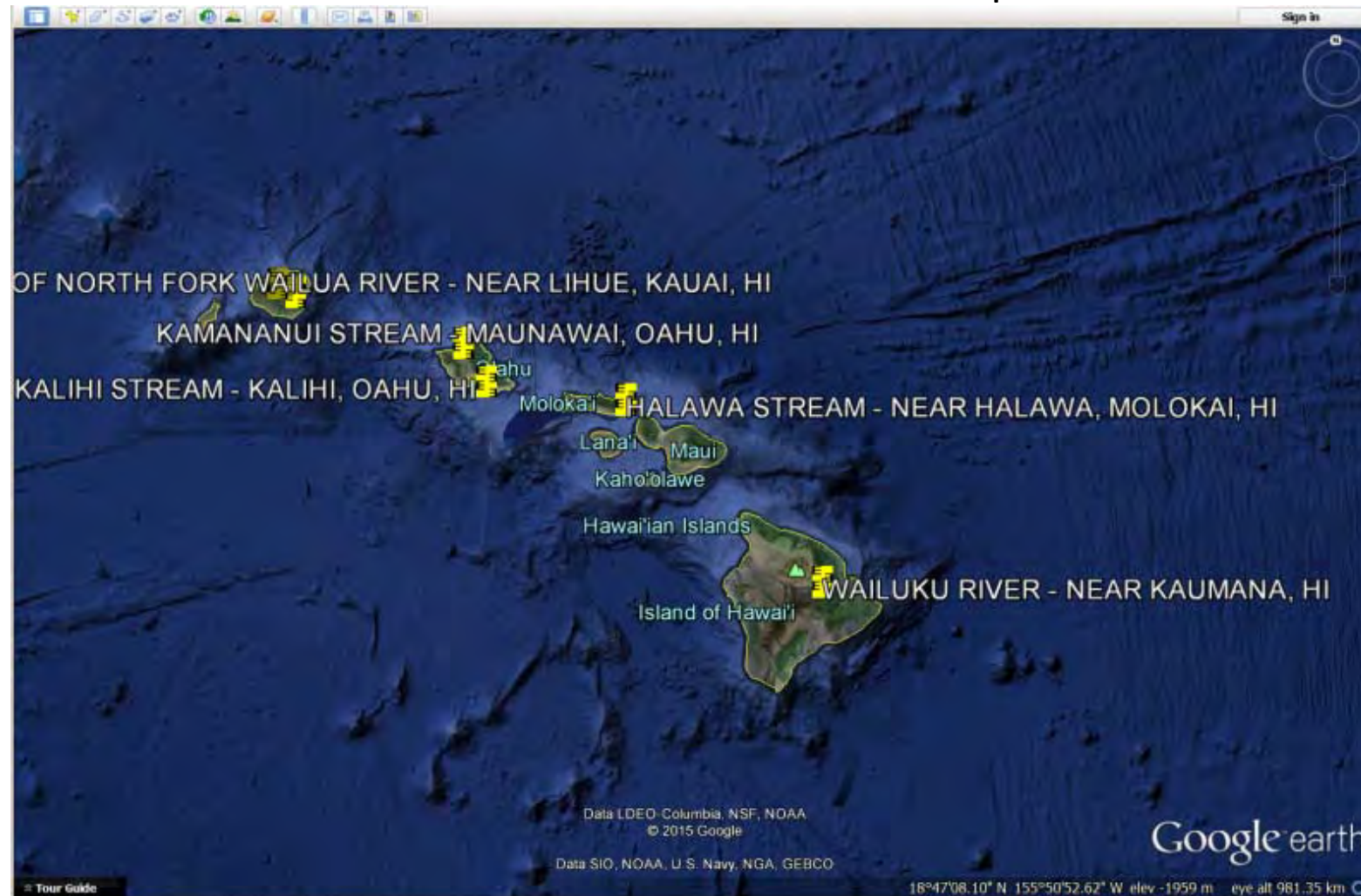
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Regional Steering Committee (RSC) for Southeast Asia and Pacific
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US United States of America (WMO RA V)

Stations: 6

Data up to: 2014



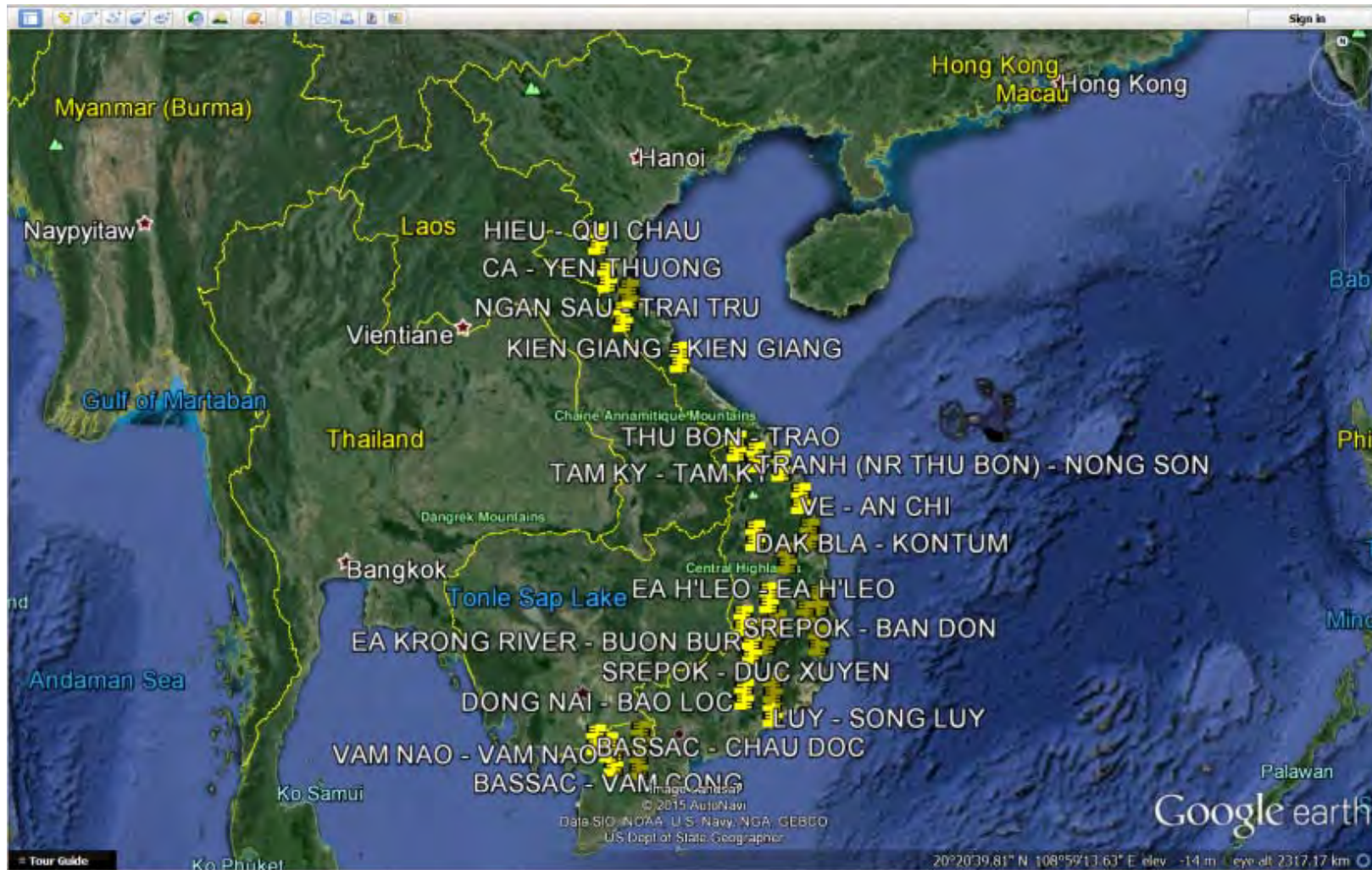
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VN Vietnam (AP-FRIEND & WMO RA II)

Stations: 27

Data up to: 1994



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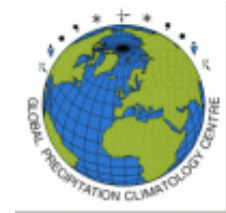


Partner Data Centres

Precipitation: GPCC

gpcc.dwd.de

Global Precipitation Climatology Centre
Offenbach, Germany



Water Quality: GEMS/Water GEMStat

<http://www.gemstat.org>

Global Environment Monitoring System of UNEP DEWA
Koblenz, Germany



Groundwater: IGRAC

<http://www.igrac.net>

International Groundwater Resources Assessment Centre
Delft, The Netherlands



Lakes and Reservoirs: HYDROLARE

www.hydrolare.ru

International Centre on the Hydrology of Lakes and Reservoirs
St. Petersburg, Russia



...more than 26 Years GRDC

Global Runoff Data Centre (GRDC)

Ulrich Looser (Head)

Irina Dornblut

Thomas de Couet

Johannes Pauler

e-mail: grdc@bafg.de, web: <http://grdc.bafg.de>

Thank you for your attention!



Presentation Catalogue of Hydrological Processes 2015

Prof Chikamori, Prof Kobayashi

Procedure for making the Catalogues of Hydrologic Analysis as the successive series of the Catalogues of Rivers proposal by IHP Japan team

Purpose

Publishing **Catalogues of Hydrologic Analysis by any media** was approved by 22nd IHP-RSC in Yogyakarta, Indonesia on 13-14th November 2014. **A reference book** for enhancing the understanding of hydrology and water resources in the **Southeast Asia and the Pacific region** through various examples using the information included in the **Catalogue of Rivers shall be made**. The reference book also contributes to water education in **IHP-VIII water security**. The examples include various hydrological topics with practical and also academic issues. The book would include a sample computer program to solve the example. In the reference book, it is expected to use the data shown in the catalogues of rivers. **Thus, the book is regarded as the successive series of the catalogues of rivers.**

Procedure for making the Catalogues of Hydrologic Analysis as the successive series of the Catalogues of Rivers

proposal by IHP Japan team

Target users

Practitioners and university students who study hydrology and water resources engineering.

This year we would like to propose a principle that the contents **should not be too specialized**. Rather it should be **more for the beginners of Hydrology** so that the catalogues can be used in the national/international lectures at universities.

For example, we corresponded with Dr. Trevor by e-mail after the last IHP-RSC about a paper “Estimating actual, potential, reference crop and pan evaporation using standard meteorological data: a pragmatic synthesis” of Hydrol. Earth Syst. Sci., 17, 1331–1363, 2013. **This level could be too high for the catalogue?? when we targeted undergraduate students of the universities.**

Welcome your opinion in this regards.

By referring to the mail from Dr. Mohamed Roseli bin Zainal Abidin, HTCKL, the format could be as follows:

- (1) Introduction
- (2) Objective(s)
- (3) Study Area
- (4) Methodology
- (5) Results (including data)
- (6) Conclusion
- (7) References

Table of Contents (for example)

Table of Contents

Theme 1: Water-Related Disasters and Hydrological Change

- Flood runoff
- Hydrologic frequency analysis
- Water and heat balance

Theme 2: Groundwater in a Changing Environment

- Groundwater
- Infiltration
- Subsurface runoff

Theme 3: Addressing Water Scarcity and Quality

- Water quality

Theme 4: Water and Human Settlements of the Future

Theme 5: Ecohydrology, Engineering Harmony for a Sustainable World

Presentation Catalogue of Hydrological Processes 2014

Prof Chikamori, Prof Kobayashi

Proposal for making the Catalogues of Hydrologic Analysis as the successive series of the Catalogues of rivers

Drafted by IHP Japan team

Purpose

To make a **reference book** for enhancing the understanding of hydrology and water resources in the **Southeast Asia and the Pacific region** through various examples using the information included in the **Catalogue of Rivers**. The reference book also contributes to water education in **IHP-VIII water security**. The examples include various hydrological topics with practical and also academic issues. The book would include a sample computer program to solve the example. In the reference book, it is expected to use the data shown in the catalogues of rivers. **Thus, the book is regarded as the successive series of the catalogues of rivers.**

Target users

Practitioners and university students who study hydrology and water resources engineering

What can be provided

In the text book, the basics of the hydrological theories and various applications are explained using examples with its solutions. In some cases, the sample programs are provided. The data of the catalogues of river is to be used.

Table of Contents (for example)

Table of Contents

Theme 1: Water-Related Disasters and Hydrological Change

- Flood runoff
- Hydrologic frequency analysis
- Water and heat balance

Theme 2: Groundwater in a Changing Environment

- Groundwater
- Infiltration
- Subsurface runoff

Theme 3: Addressing Water Scarcity and Quality

- Water quality

Theme 4: Water and Human Settlements of the Future

Theme 5: Ecohydrology, Engineering Harmony for a Sustainable World

Study area

Chapter 3: Evapotranspiration

Thornthwaite Method

Study Area



Figure 1: Study area. The red circle indicates Kobe city where the temperature data used in the example is measured.

Data

Table 1 shows mean monthly temperature of Kobe city for the year of 2013. Estimate the monthly potential evapotranspiration of Kobe city using Thornthwaite method.

Table 1. Mean monthly temperature of Kobe city for 2013

Mean monthly temperature (°C) for 2013	
Kobe city: lat. 34.7, lon. 135.2	
Jan.	1
Feb.	2
March	4.5
April	9.5
May	2.5
June	3.5
July	11.5
Aug.	16.5
Sep.	11
Oct.	6.5
Nov.	5
Dec.	6

Data

Result:

Thornthwaite (1948) derived a set of equations to estimate monthly potential evapotranspiration. The equations are expressed as follows:

$$E_p(i) = 0.533 D_0(i) \left(\frac{10t_i}{J}\right)^\alpha \quad (1)$$

where

$$\alpha = 6.75 \times 10^{-7} J^3 - 7.71 \times 10^{-5} J^2 + 1.79 \times 10^{-2} J + 0.492 \quad (2)$$

$$J = \sum_{i=1}^{12} \left(\frac{t_i}{5}\right)^{1.514} \quad (3)$$

where $E_p(i)$ is the potential evapotranspiration (mm/day) of the i th month, t_i the mean monthly temperature (°C), $D_0(i)$ the mean monthly sunshine hour (12hour/day).

From Table 1 and Equation (3), then Equation (2), J and α can be estimated:

$$J = \sum_{i=1}^{12} \left(\frac{t_i}{5}\right)^{1.514} = \left(\frac{1}{5}\right)^{1.514} + \left(\frac{2}{5}\right)^{1.514} + \left(\frac{4.5}{5}\right)^{1.514} + \left(\frac{9.5}{5}\right)^{1.514} + \left(\frac{2.5}{5}\right)^{1.514} + \left(\frac{3.5}{5}\right)^{1.514} + \left(\frac{11.5}{5}\right)^{1.514} + \left(\frac{16.5}{5}\right)^{1.514} + \left(\frac{11}{5}\right)^{1.514} + \left(\frac{6.5}{5}\right)^{1.514} + \left(\frac{5}{5}\right)^{1.514} + \left(\frac{6}{5}\right)^{1.514} = 21.50$$

$$\therefore \alpha = 6.75 \times 10^{-7} J^3 - 7.71 \times 10^{-5} J^2 + 1.79 \times 10^{-2} J + 0.492 = 0.85$$

$D_0(i)$ can be calculated using the following equations:

$$D_0(i) = \frac{2H}{0.2618} \quad (4)$$

$$\sin\left(\frac{H}{2}\right) = [A / \cos \theta \cos \delta]^{\frac{1}{2}} \quad (5)$$

$$A = \sin\left(\frac{\pi}{4} + \frac{(\theta - \delta + r)}{2}\right) \sin\left(\frac{\pi}{4} - \frac{(\theta - \delta + r)}{2}\right) \quad (6)$$

where θ is the latitude of the observation point (rad), δ the solar declination (rad), H hour angle (rad) from the sunrise to culmination considering horizontal refraction r ($=0.01$). The solar declination δ is expressed as:

$$\delta = 0.33281 - 22.984 \cos(w) - 0.34990 \cos(2w) - 0.13980 \cos(3w) + 3.7872 \sin(w) + 0.0325 \sin(2w) + 0.07187 \sin(3w) \quad (7)$$

where $w = \frac{2\pi}{365}$, in bissextile year $w = \frac{2\pi}{366}$ and J the number of the days from the New Year's Day.

As the result, the estimated monthly potential evapotranspiration is shown in the right

Format example (cont.)

Result (cont.)

where θ is the latitude of the observation point (rad), δ the solar declination angle (rad) from the sunrise to culmination considering horizon angle ($=0.01$). The solar declination δ is expressed as:⁴

$$\delta = 0.33281 - 22.984 \cos(wj) - 0.34990 \cos(2wj) - 0.13980 \cos(3wj) + 3.7872 \sin(wj) + 0.0325 \sin(2wj) + 0.07187 \sin(3wj)$$

(7)⁴

where $w = \frac{2\pi}{365}$, in bissextile year $w = \frac{2\pi}{366}$ and J the number of the days from the New Year's Day. ⁴

As the result, the estimated monthly potential evapotranspiration is shown in the right hand side column of Table 2. ⁴

Table 2. Mean monthly evapotranspiration of Kobe city estimated for 2013⁴

Month ⁴	Temperature ⁴ (°C) ⁴	Evaporation ⁴ (mm/day) ⁴
Jan. ⁴	1 ⁴	0.23 ⁴
Feb. ⁴	2 ⁴	0.45 ⁴
March ⁴	4.5 ⁴	0.99 ⁴
April ⁴	9.5 ⁴	2.04 ⁴
May ⁴	2.5 ⁴	0.70 ⁴
June ⁴	3.5 ⁴	0.97 ⁴
July ⁴	11.5 ⁴	2.61 ⁴
Aug. ⁴	16.5 ⁴	3.35 ⁴
Sep. ⁴	11 ⁴	2.19 ⁴
Oct. ⁴	6.5 ⁴	1.28 ⁴
Nov. ⁴	5 ⁴	0.94 ⁴
Dec. ⁴	6 ⁴	1.04 ⁴

References:⁴

Brutsaert, W.: Hydrology: An Introduction, Cambridge University Press, 2005⁴
 Ikebuchi, S., Shiiba, M., Takara, K., and Tachikawa, Y.: Ace Hydrology, Asakura Press, 2006⁴

The format of the reference book will be carefully discussed among member countries as it was so in the catalogues of rivers.

References



Item 13.A Four project areas



From final report 22nd RSC meeting:
Workshop summary on:

- Theme 1: Water Security (2proposals)
- Theme 2: IWRM including AP-Eco-hydrology, AP-HELP (1proposal)
- Theme 3: Water-related disasters (6 proposals)
- Theme 4: Water education (5proposals)

All members agreed on the proposal to form project areas of working groups and submit proposal by the end of January 2015.



Item 14.A Four project areas



-Secretariat circulated a template for concept note with 31 Jan 2015 as deadline for their submission.

-Response from members:

- Thailand proposal on **“Study on temporal changes in rainfall distribution in Thailand”**
- New Zealand proposal on **“Training resources for preparing professionals to learn from and interact with the community”**



Item 14.A Four project areas



- Proposal to JFIT (36month)

IHP-WISER in AP International Hydrological Programme Water Informatics for Sustainability and Enhanced Resilience in Asia and the Pacific

Focus on: Capacity building under policy recommendation for comprehensive risk management on water disasters in cooperation with ICHARM



Item 14.A Four project areas



- **Proposal to JFIT WISER:**
 - **Activity 1:** Dissemination and training on Catalogues of Hydrologic Analysis first module (including computer program and examples from the ASPAC region).
 - **In response to:**
 - Water Education group Project 3:
 - Title: **Leveraging knowledge through basic training for water professionals**
 - Prof. Chikamori, Prof. Kobayashi and Prof. Nguyen



Item 14.A Four project areas



- **Proposal to JFIT WISER:**
 - **Activity 2:** development of curriculum for water education on ecohydrology and IWRM for climate change water disaster impact resilience based on sustainability science in Asia and the Pacific (including a visioning workshop) linking science and policy.
 - **in response to:** New Zealand submitted concept note



Item 14.A Four project areas



- **Proposal to JFIT WISER:**
 - **Activity 3:** 25th IHP Nagoya training support
 - **Activity 4:** 24th and 25th IHP-RSC meetings organization