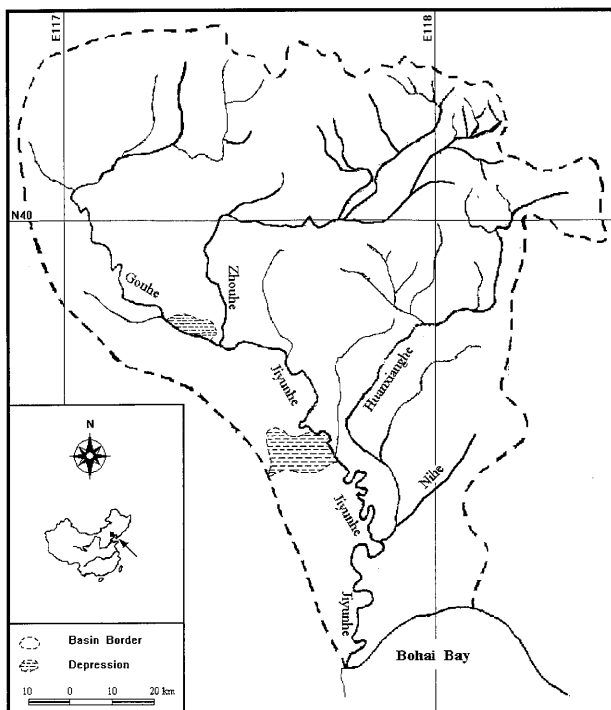


# Jiyun-He

## Map of River

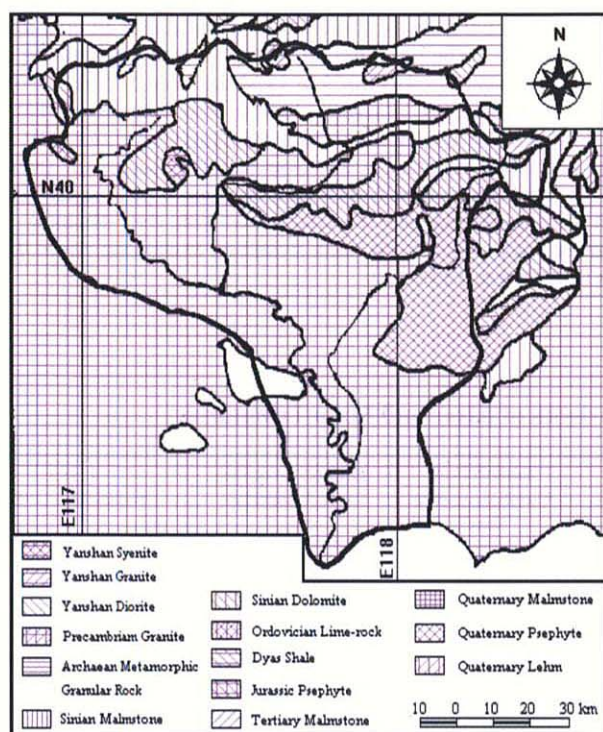


### Table of Basic Data

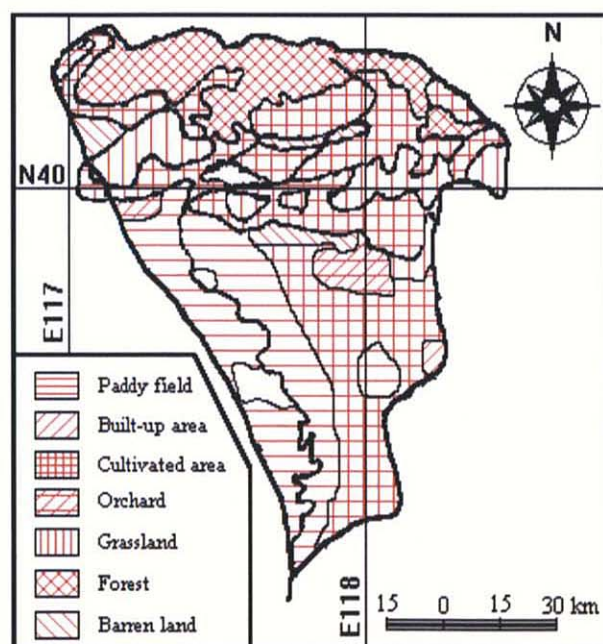
<b>Name:</b> Jiyun River		<b>Serial No.:</b> China-3
<b>Location:</b> Hebei Province, Northern China	N 39° 05' ~ 40° 21'	E 116° 48' ~ 118° 40'
<b>Area:</b> 10 288 km <sup>2</sup>	<b>Length of main stream:</b> 156.8 km	
<b>Origin:</b> Mt. Moashan (1 049 m)	<b>Highest point:</b> Mt. Maoshan (1 049 m)	
<b>Outlet:</b> The Bohai Sea	<b>Lowest point:</b> River mouth (-6.0 m)	
<b>Main geological features:</b> Clastic rock, marine deposit		
<b>Main tributaries:</b> Gou River (1 230 km <sup>2</sup> ), Zhou River (2 143 km <sup>2</sup> ), Huanxiang River (3 270 km <sup>2</sup> )		
<b>Main lakes:</b> None		
<b>Main reservoirs:</b> Haizi Reservoir (121 x 10 <sup>6</sup> m <sup>3</sup> ), Yuqiao Reservoir (1 559 x 10 <sup>6</sup> m <sup>3</sup> ), Qiuzhuang Reservoir (204 x 10 <sup>6</sup> m <sup>3</sup> )		
<b>Mean annual precipitation:</b> 594 mm (1956~1979)(basin average)		
<b>Mean annual runoff:</b> 1.91 m <sup>3</sup> /s (1971~1992)		
<b>Population:</b> 3 948 500 (1984)	<b>Main cities:</b> Tangshan	
<b>Land use:</b> Forest (27%), Rice paddy (14.6%), Other agriculture (52.9%), Urban (1.9%) (1984)		

## 2. Geographical Information

### 2.1 Geological Map



### 2.2 Land Use Map



## 1.1 General Description

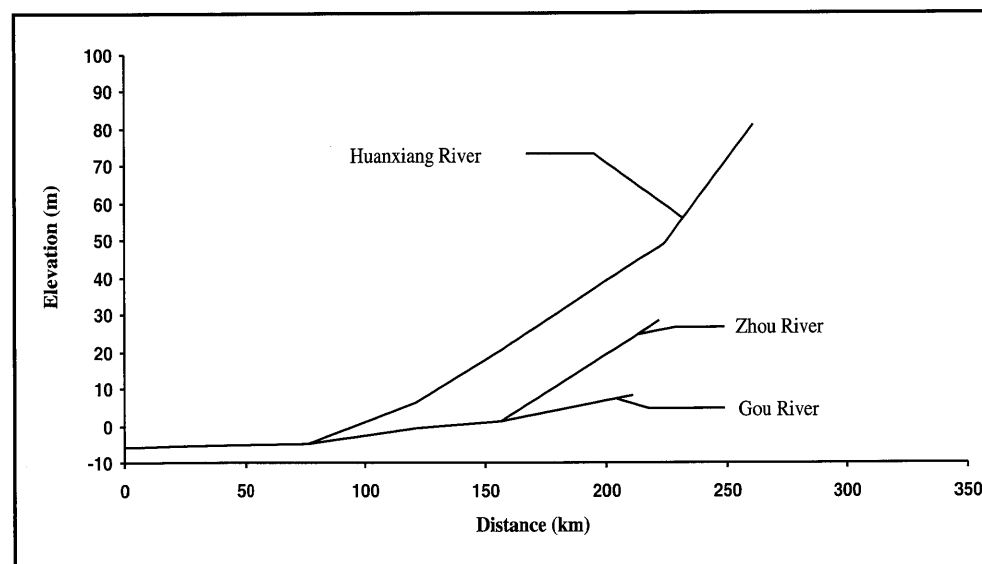
The Jiyun river flows through Hebei Province in the northern part of China. The river which originates from Mt. Maoshan (1 049 m) is 156.8 km long and drains an area of 10 288 km<sup>2</sup> before flowing out into the Bohai Sea. The basin has an average annual precipitation of 594 mm, and the annual discharge at Jiuwangzhuang (5 413 km<sup>2</sup>) in 1954 has been 51.5 m<sup>3</sup>/s. Two dams, the Haizi and the Yuquiao have been built across the river in 1960 to store respectively 121 x 10<sup>6</sup> m<sup>3</sup> and 1 559 x 10<sup>6</sup> m<sup>3</sup> of water. A third dam, the Qiuzhuang, which has a capacity to store 204 x 10<sup>6</sup> m<sup>3</sup> was built in 1962. The river has two main tributaries, the Gou and the Zhou. In the upper reach above Jiuwangzhuang, these two tributaries flow from mountain areas to plain areas with narrow rice fields. The section between Jiuwangzhuang and the confluence with river Huanxiang is considered the middle reach. The lower reach which is the main Jiyun and Huanxiang rivers flows into Bohai Sea. The basin population in 1984 was 3 948 500.

## 2.3 Characteristics of River and Main Tributaries

No.	Name of river	Length [km] Catchment area [km <sup>2</sup> ]	Highest peak [m] Lowest point [m]	Cities Population (1984)	Land use [%] (1984)
1	Gou	160 1 230	1 049 -----	-----	A (52.9) F (27)
2	Zhou	42 2 143	864 -----	-----	L (3) P (14.6)
3	Huanxiang	121 3 270	558 -----	Tangshan, etc. 111 800	U (1.9)

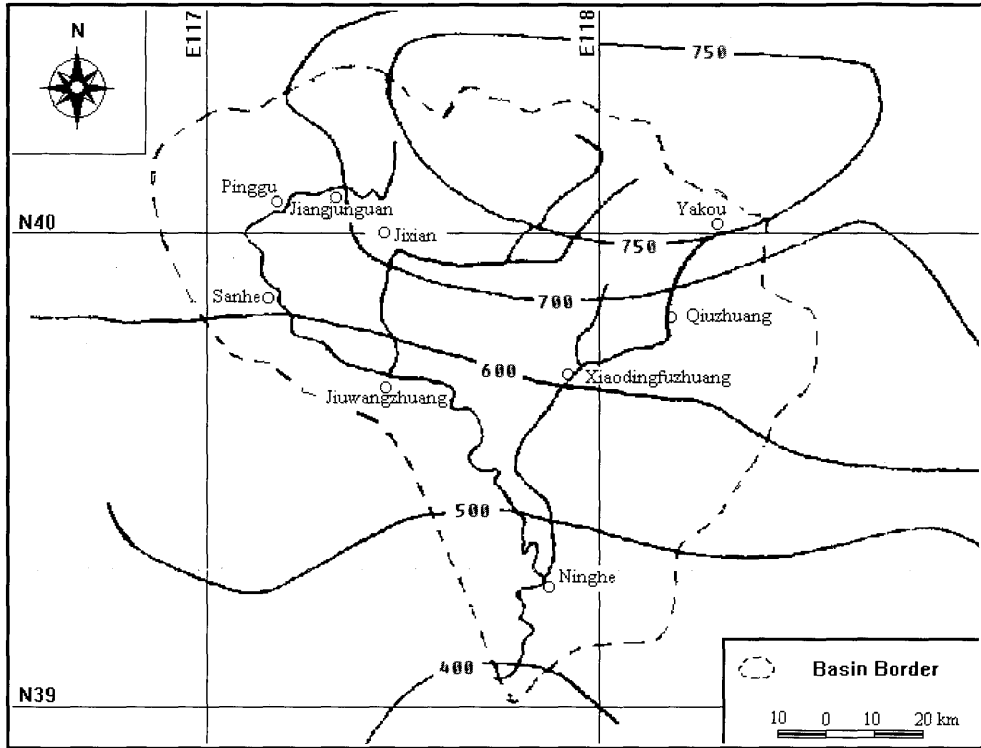
A: Other agricultural field F: Forest L: Lake, River, Marsh P: Paddy field U: Urban

## 2.4 Longitudinal Profiles



### 3. Climatological Information

#### 3.1 Annual Isohyetal Map and Observation Stations



#### 3.2 List of Meteorological Observation Stations

No.	Station	Elevation [m]	Location	Observation period	Mean annual precipitation <sup>1)</sup> [mm]	Mean annual evaporation <sup>1)</sup> [mm]	Observation items <sup>2)</sup>
	Yuqiao	22.72	N 40° 02' E 117° 31'	1960~present	728.7	1 409	P(TB),E
	Haizi	108	N 40° 10' E 117° 17'	1960~present	706	1 465	P(TB),E
	Pinggu	32	N 40° 08' E 117° 07'	1956~present	688	-----	P(TB)
	Jixian	105	N 40° 03' E 117° 20'	1956~present	705	1 895.4	P(TB),E
	Jiuwangzhuang	1	N 39° 46' E 117° 24'	1950~present	632	1 445	P(TB),E

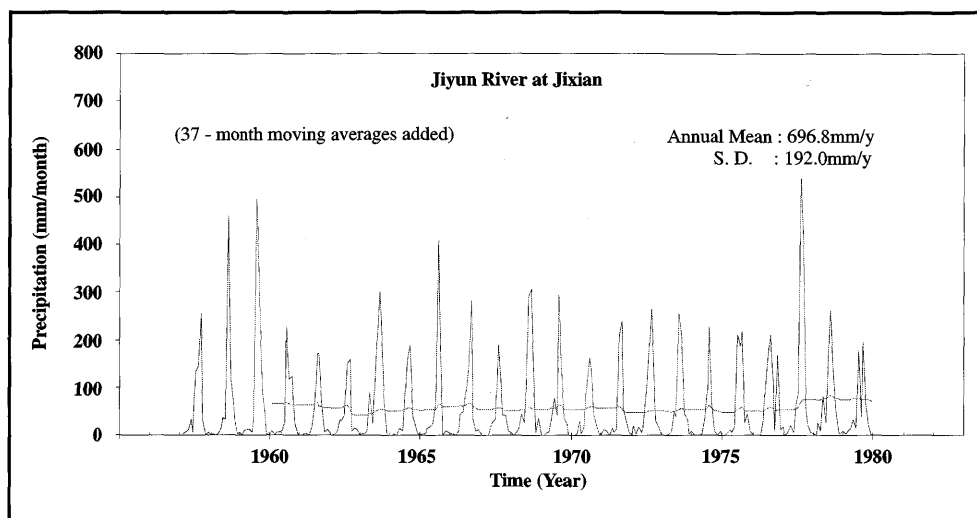
1) Period for the mean is from the beginning of the observation period to 1979

2) P: Precipitation, E: Evaporation with 20 cm Evaporation pan TB: Tipping bucket with recording chart

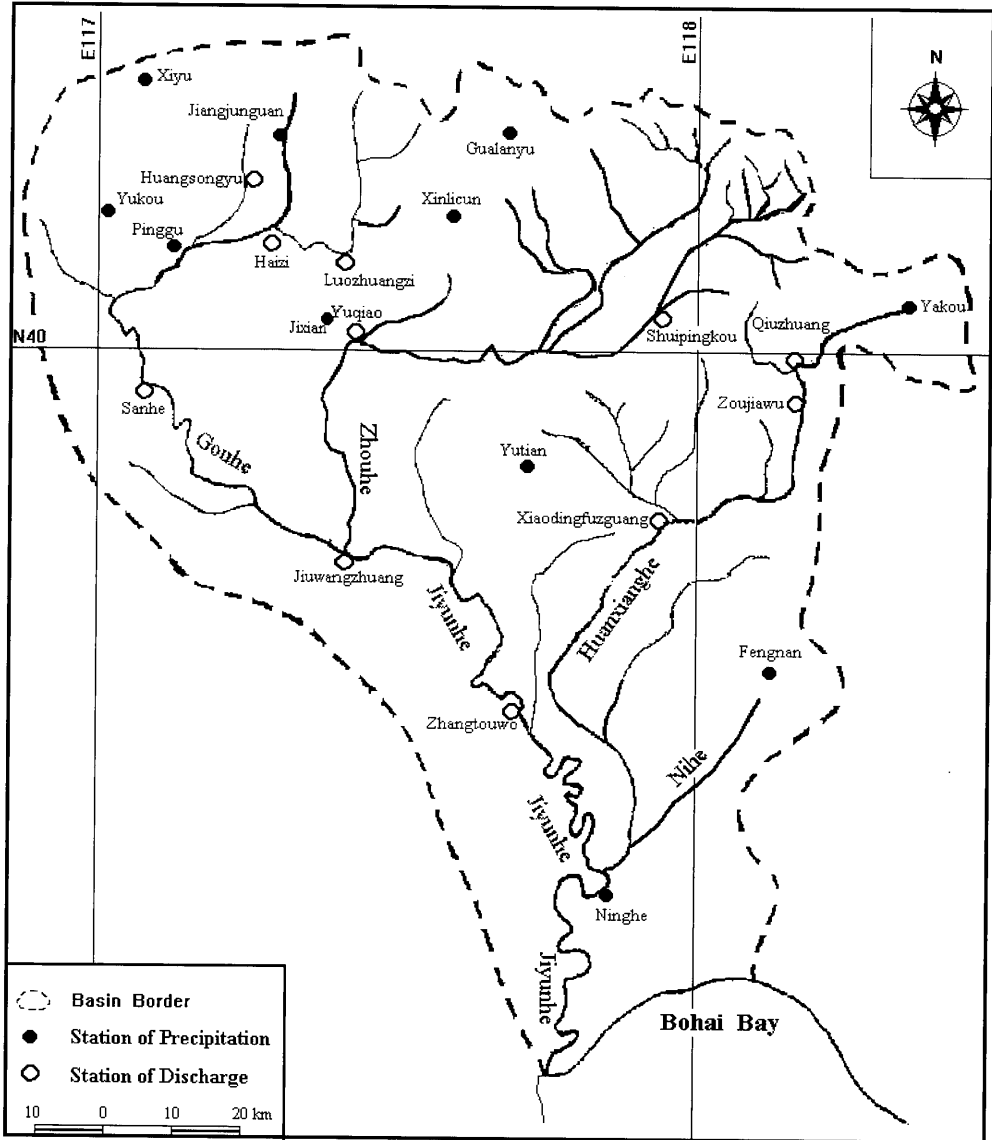
### 3.3 Monthly Climate Data

Observation item	Observation station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Period for the mean
Temperature[°C]	Jixian	-5.4	-2.8	4.4	13.0	19.9	24.1	25.9	24.7	19.7	12.7	4.1	-3.1	11.4	1957~1980
Precipitation [mm]	Jixian	2.9	4.8	8.6	24.9	29.6	87.0	243.6	200.6	54.4	29.8	8.0	2.6	696.8	1957~1980
Evaporation [mm]	Jixian	52.8	66.4	135.6	237.0	306.0	286.0	213.4	179.5	165.0	128.9	74.0	49.5	1 895.4	1957~1980
Solar radiation [MJ/m <sup>2</sup> /d]	Tianjin	7.31	9.37	13.2	15.6	16.2	18.2	16.1	14.0	12.0	10.1	7.21	6.45	12.1	1983~1985
Duration of sunshine [hr]	Jixian	203.1	201.3	237.3	244.0	289.9	272.0	225.7	227.2	244.0	231.0	193.6	190.0	2 760.3	1957~1980

### 3.4 Long-term Variation of Monthly Precipitation



4. Hydrological Information  
 4.1 Map of Streamflow Observation Stations



## 4.2 List of Hydrological Observation Stations

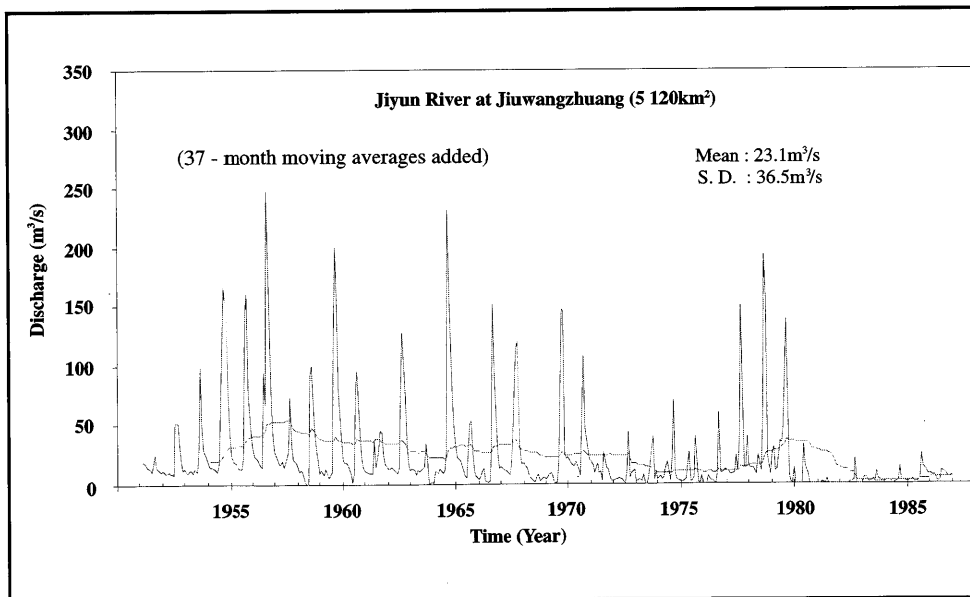
No.	Station	Location	Catchment area (A) [km <sup>2</sup> ]	Observation period	Observation items <sup>1)</sup> (frequency)
	Haizi	N 40° 10' E 117° 17'	443	1960~present	P, Q
	Sanhe	N 39° 59' E 117° 04'	2 230	1951~present	P, Q
	Jiuwangzhuang	N 39° 46' E 117° 24'	5 120	1930~present	P, Q, S

No.	$\bar{Q}$ <sup>2)</sup> [m <sup>3</sup> /s]	Q max <sup>3)</sup> [m <sup>3</sup> /s]	$\bar{Q}$ max <sup>4)</sup> [m <sup>3</sup> /s]	$\bar{Q}$ min <sup>5)</sup> [m <sup>3</sup> /s]	$\bar{Q} / A$ [m <sup>3</sup> /s/100km <sup>2</sup> ]	Q max / A [m <sup>3</sup> /s/100km <sup>2</sup> ]	Period of statistics
	2.09	350	72.6	0	0.47	79	1972~1987
	8.72	429	144	0.1	0.39	19	1972~1987
	28.2	572	225	0.1	0.55	11	1930~1980

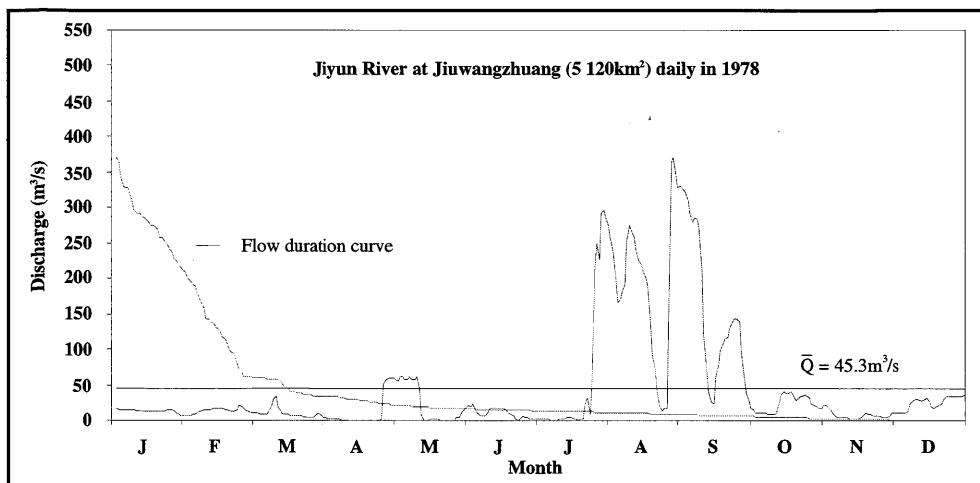
1) P: Precipitation  
Q: Discharge  
S: Sediment concentration

2) Mean annual discharge  
3) Maximum discharge  
4) Mean annual maximum discharge  
5) Mean annual minimum discharge

## 4.3 Long-term Variation of Monthly Discharge



### 4.4 Annual Pattern of Discharge



### 4.5 Annual Maximum and Minimum Discharges

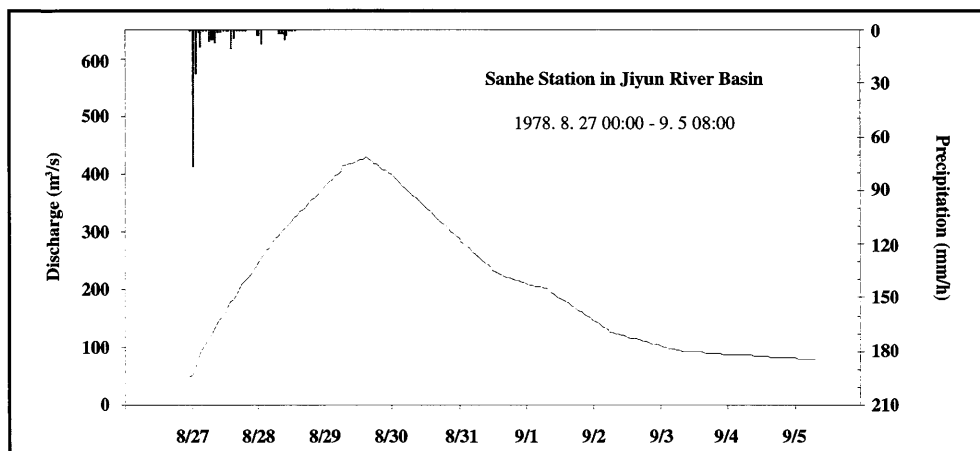
At Sanhe [2 810 km<sup>2</sup>]

Year	Maximum <sup>1)</sup>		Minimum <sup>2)</sup>		Year	Maximum <sup>1)</sup>		Minimum <sup>2)</sup>	
	Date	[m <sup>3</sup> /s]	Month	[m <sup>3</sup> /s]		Date	[m <sup>3</sup> /s]	Month	[m <sup>3</sup> /s]
1972	7.20	106.0	6	0	1980	6.06	19.50	5	0.75
1973	8.22	78.5	1	0	1981	7.08	5.11	5	0
1974	8.02	190.0	5	0	1982	7.26	158.00	4	0
1975	7.30	85.2	5	0.1	1983	8.06	91.60	12	0
1976	6.30	76.8	5	0	1984	8.11	150.00	9	0
1977	8.04	207.0	6	-2.87*	1985	8.19	131.00	5	0.51
1978	8.29	429.0	7	0.029	1986	7.19	54.70	5	0.25
1979	8.17	288.0	4	1.36	1987	8.28	234.00	5	1.42

1), 2) Instantaneous observation by recording chart

\* Instantaneous backwater flow influenced by downstream gate or dam

### 4.6 Hyetographs and Hydrographs of Major Floods





## 5. Water Resources

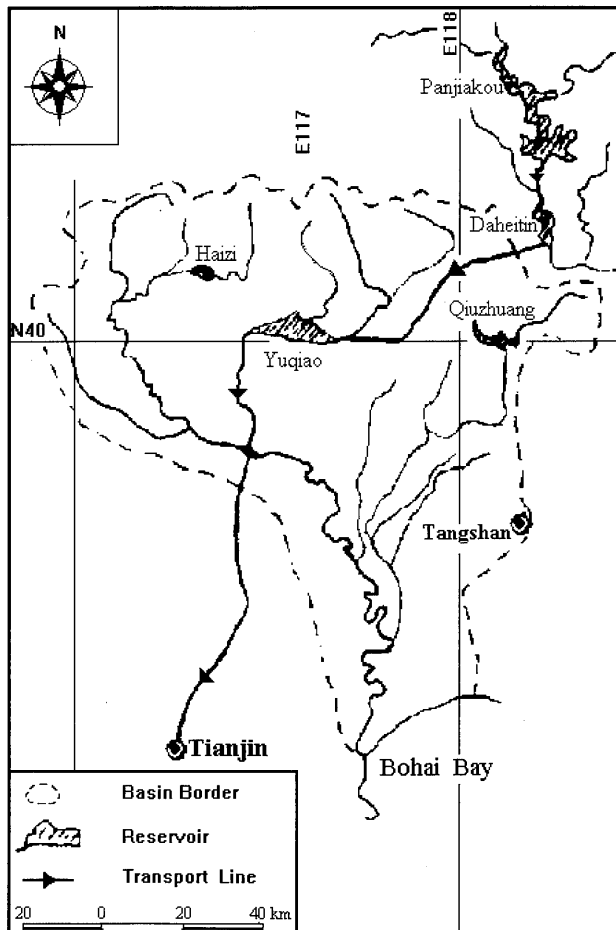
### 5.1 General Description

The Jiyun is an isolated river flowing into the sea in Northern China. Because of frequent flood disasters in the past, the river planning and management programmes in the 1960's were mainly focussed upon flood control.

During the 50 year period from 1930-1979, there were 16 occurrences of floods with annual maximum discharges greater than  $300 \text{ m}^3/\text{s}$  at Jiuwangzhuang which works out to approximately once in three years. Floods associated with typhoons and cyclones occur mostly during the period from late June to early September. Three large reservoirs have been built in the basin for flood-control and agriculture, the largest is the Yuqiao with a capacity of  $1\,559 \times 10^6 \text{ m}^3$  completed in 1960.

Due to the rapid increase of water demand in 1970's, water shortages in northern China were becoming more and more serious. Consequently, the Yuqiao reservoir was dedicated to provide municipal and industrial water to Tianjin city. The interbasin water transfer scheme from Panjiakou reservoir ( $2\,097 \times 10^6 \text{ m}^3$ ) to Tianjin via Yuqiao was completed in 1983. Even in recent times, water shortages in industry and agriculture pose as the main problems for local economic development.

### 5.2 Map of Water Resources Systems



### 5.3 List of Major Water Resources Facilities

#### Major Reservoirs

Name of river	Name of dam (reservoir)	Catchment area [km <sup>2</sup> ]	Gross capacity [10 <sup>6</sup> m <sup>3</sup> ]	Effective capacity [10 <sup>6</sup> m <sup>3</sup> ]	Purpose <sup>1)</sup>	Year of completion
Gou	Haizi	443	121	41	A	1960
Zhou	Yuqiao	2 060	1 559	1 262	A,I,N	1960
Huanxiang	Qiuzhuang	525	156	122	A	1962

#### Major Interbasin Transfer

Name of transfer line	Name of rivers and places connected		Length [km]	Maximum capacity [m <sup>3</sup> /s]	Purpose <sup>1)</sup>	Year of completion
	From	To				
Luanjin Water Transfer	Panjiakou	Tianjin	210	60	W,I	1983

1) A: Agricultural use, I: Industrial use, N: Maintenance of normal flows, W: Municipal water supply

### 5.4 Major Floods and Droughts

#### Major Floods at Jiuwangzhuang [5 120 km<sup>2</sup>]

Date	Peak discharge [m <sup>3</sup> /s]	Rainfall [mm] Duration	Meteorological cause	Dead and missing	Major damages (Districts affected)
1953. 8.10	274	85.7 (8.07~8.10)	Shear	-----	Yutian, etc.
1962. 7.27	391	225.9 (7.24~7.27)	Typhoon	-----	Tangshan, etc.

#### Major Droughts

Period	Affected area	Major damages and counteractions
1964.10~1965. 4	All area	Water supply cut ratio: 90%
1972	Tianjn, Tangshan	Water supply cut ratio: 80%

## 6. Socio-cultural Characteristics

The Jiyun means "famous people's country", because many famous artists and writers were born in towns within this basin. The Haizi reservoir is mainly used for recreational purposes. Many people enjoy swimming, barbecue and dancing in summer.

The Huanxiang means "return to home town". In the late August of each year, there is a temple fair at Fengrun county, which is near Huanxiang. The people who were born in this area often "return to hometown" to participate in this festival.

## 7. References, Databooks and Bibliography (In Chinese)

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