



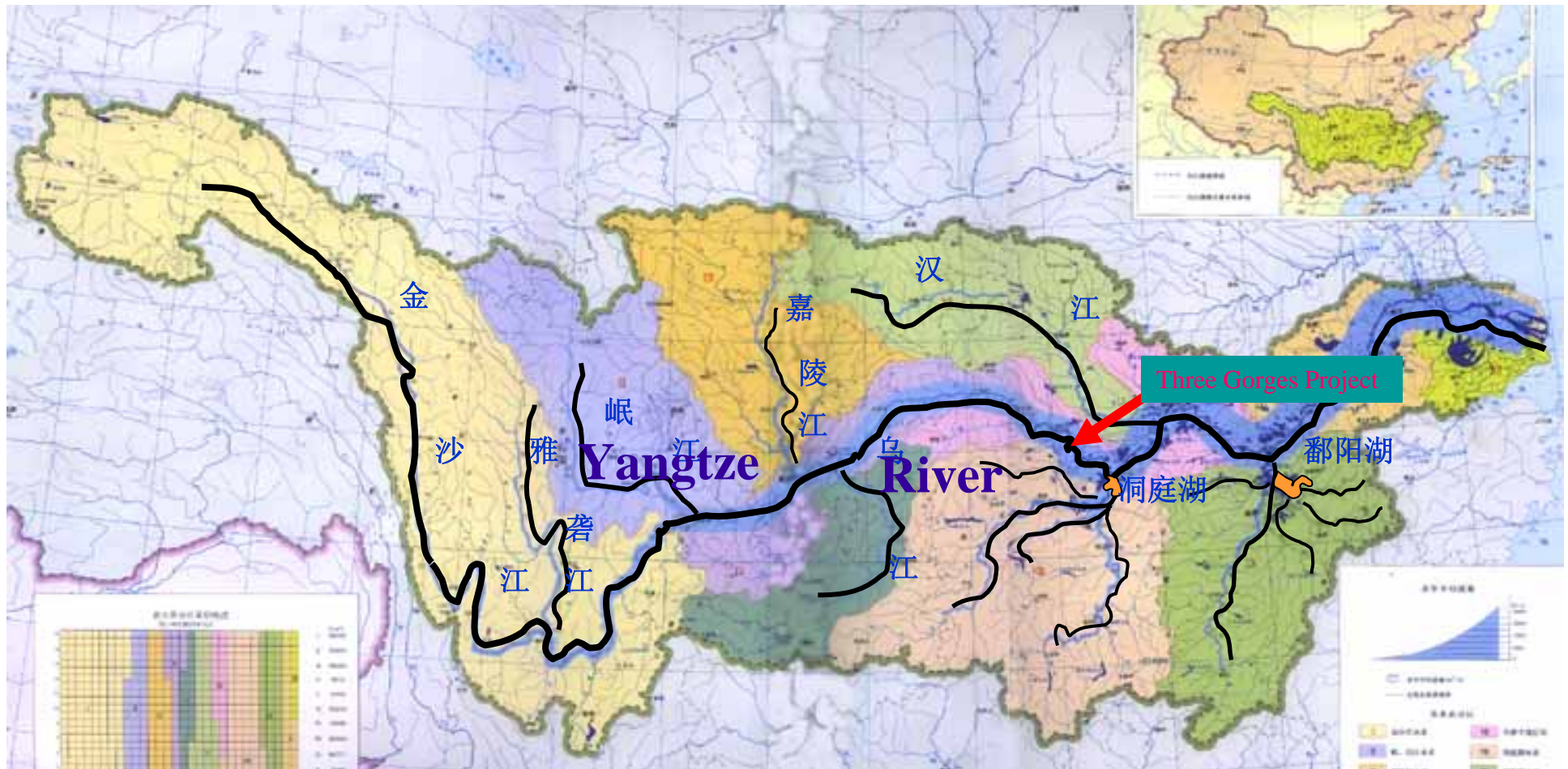
# **Water Resources Management in Yangtze River Basin**

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MWR, China**

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- ◆ **INSTITUTIONAL ARRANGEMENTS**
- ◆ **WATER RESOURCES MANAGEMENT**
- ◆ **CASE----THREE GORGES PROJECT**



- ◆ The river Yangtze is the largest river both in China and in Asia. It is 6,300 km long,
- ◆ catchment area of 1.8 million km<sup>2</sup>, about 19% of the nation's total land area.
- ◆ The gross industrial and agricultural output occupies about 40 percent of the whole nation.



- ◆ its mainstream running across 11 provinces and municipalities.
- ◆ The total population reaches 400 million.



## Water Resources

- ★ Its annual runoff into the sea amounts to nearly 1,000 billion m<sup>3</sup>
- ★ However, as low as 18% of the available water resources in the Basin has been developed.



The Yangtze Basin, particularly in the middle and lower reaches, is one of the most socially and economically developed regions in China.

# Water Challenges



**The 1998 Flood**



**The 2010 Drought**



**Water Pollution**



**soil erosion**

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# CHANGJIANG WATER RESOURCES COMMISSION

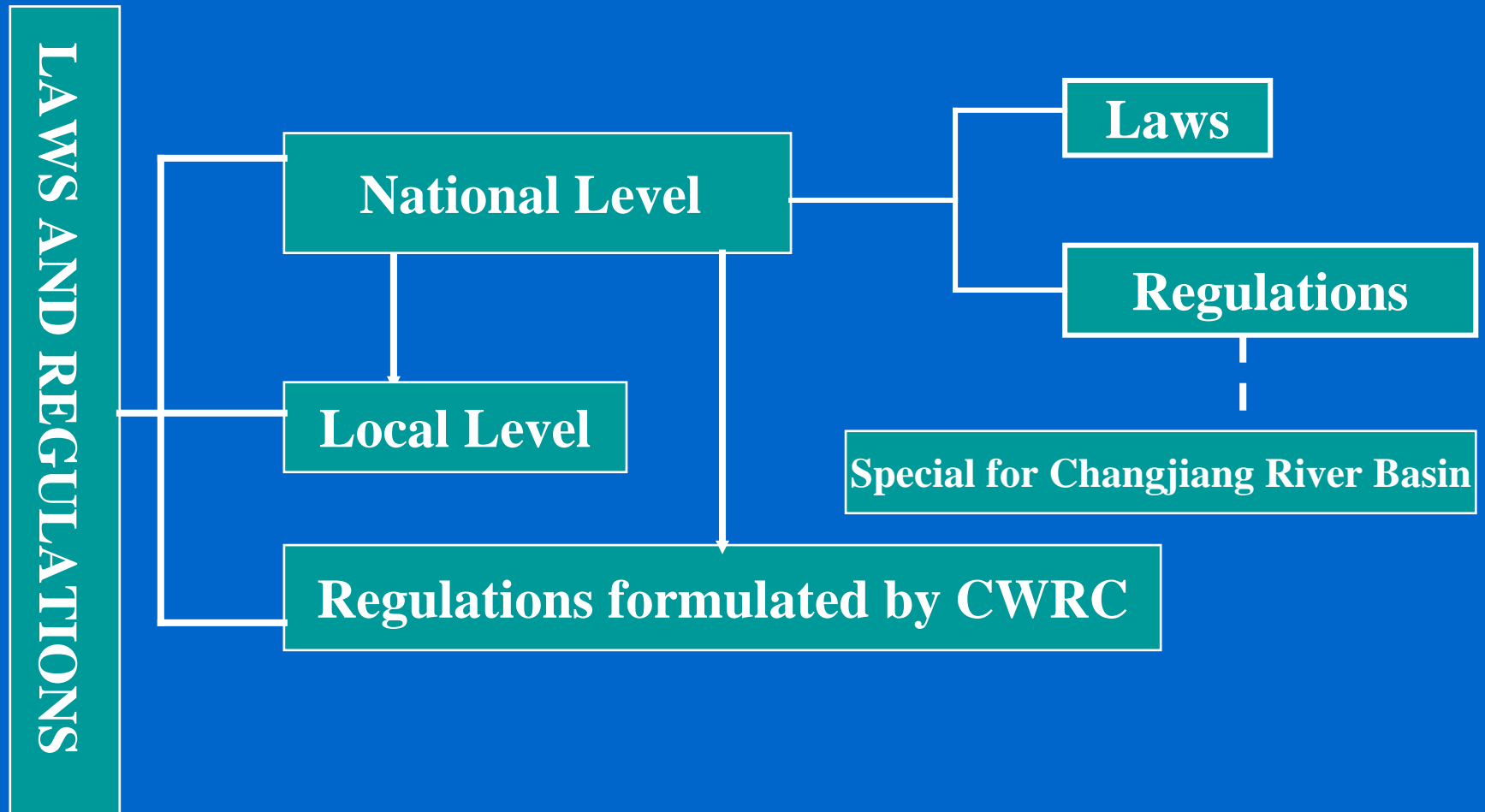
- ◆ CWRC was established in February, 1950
- ◆ 30,000 employees



## **Current status of Yangtze Basin Management**

- ◆ **Master plan formulated and being updated**
- ◆ **Water withdrawing permits management**
- ◆ **Flood control and Drought relief**
- ◆ **Water resources protection and soil conservation**
- ◆ **Optimizing operation of water use projects to generate multiple benefits, covering flood control, Drought relief, hydropower, irrigation, navigation, river ecology...**
- ◆ **Mediate and settle cross-provincial water disputes**
- ◆ **Promote the research and policy-making of Yangtze River**
- ◆ **Integrated water resources management being practiced**

# LAWS AND REGULATIONS



## National Level

- ◆ Water Law
- ◆ Water and Soil Conservation Law
- ◆ Water Pollution Control Law
- ◆ Flood Control Law



**Changjiang Flood Control and  
Drought relief Headquarter**

**Chongqing Flood Control and  
Drought relief Headquarter**

**Sichuang Flood Control and  
Drought relief Headquarter**

**Hubei Flood Control and  
Drought relief Headquarter**

**Hunan Flood Control and  
Drought relief Headquarter**

**Jiangxi Flood Control and  
Drought relief Headquarter**

**Anhui Flood Control and  
Drought relief Headquarter**

**Jiangsu Flood Control and  
Drought relief Headquarter**

**Shanghai Flood Control and  
Drought relief Headquarter**

**Members**

**comprised by CWRC chief and official heads,  
from local governments  
of Chongqing, Sichuang,  
Hubei, Hunan, Jiangxi, Anhui,  
Jiangsu, Shanghai provinces and municipalities.**



# Yangtze Forum

- ★ As a platform for consultation, dialogue and communication among stakeholders
- ★ it is to promote the resolution of disputes and conflicts of water related affairs
- ★ to enhance the combination of basin management and region management
- ★ **Organizer:** The Changjiang Water Resources Commission
- ★ **Co-organizer:** Local government of the rotational venue in the riparian provinces/municipalities





## Yangtze Forum

### ◆ Participants:

1. Water related ministries at central level
2. Riparian provincial governments at local level
3. Key stakeholders relying on Yangtze water resources
4. Public societies: Academic, NGOs, Financing Institutions, etc.
5. Specially invited international organizations

- ### ◆ **The Fourth Yangtze Forum** will be held from 18-19 April, 2011 in Nanjing, Jiangsu province.

**You are welcomed !!!**

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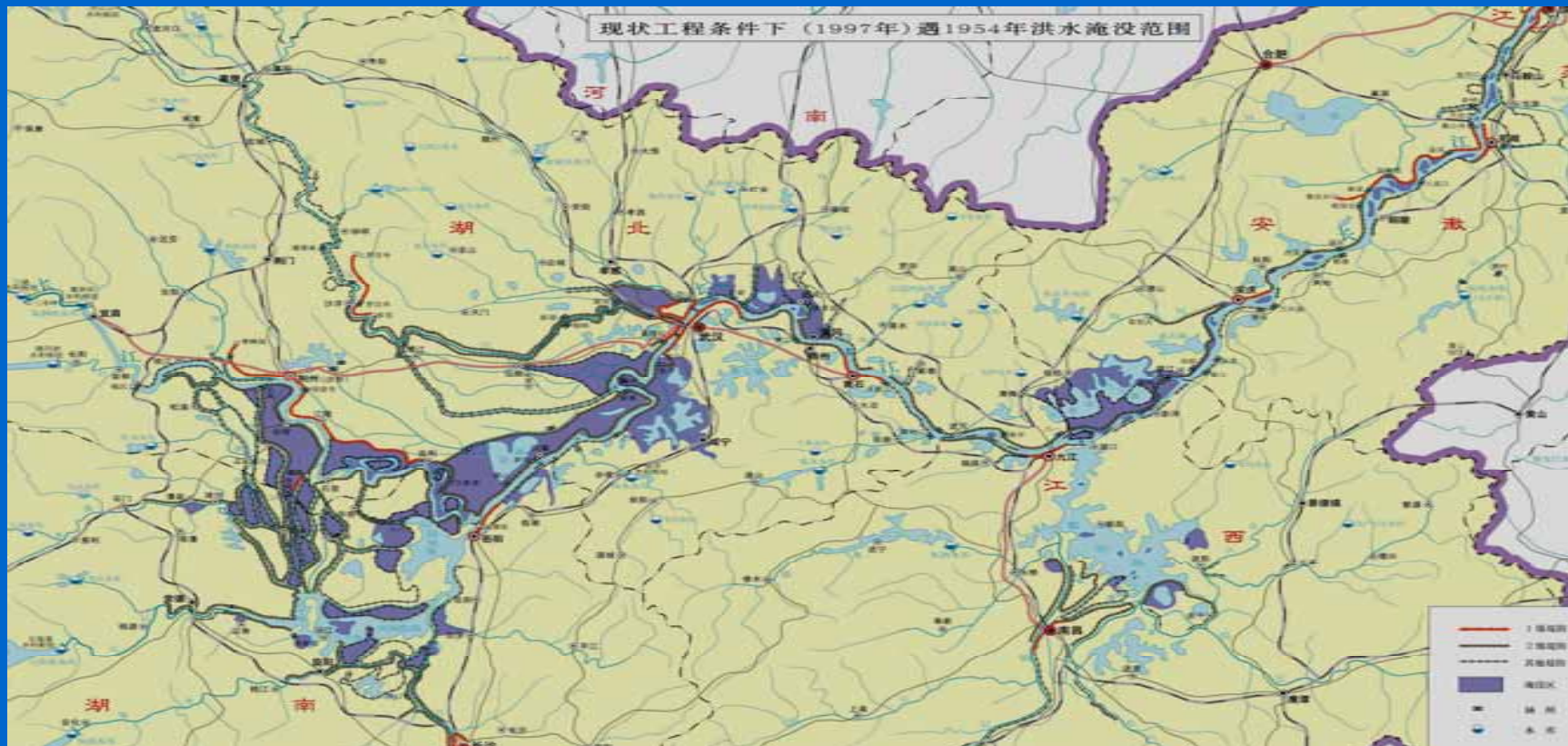
# Water Drawing Permit Management



**Water withdrawal permit management on a full scale has been carried out by water departments at each level within their authorized limits.**

# Flood Control System

- ◆ Comprised by river channels, reservoirs, and diversion area.
- ◆ 6400 hydrological, meteorological and rain gauge stations have been established by CWRC and provinces in the river basin.
- ◆ A flood warning and forecast system has been established and put into operation since 1998



## multi-reservoirs operation at basin-level

- CWRC has a responsibility for integrated operation of controlling reservoirs at upper Yangtze River Basin
- research on relationship between sustainable water resources development and ecosystem protection



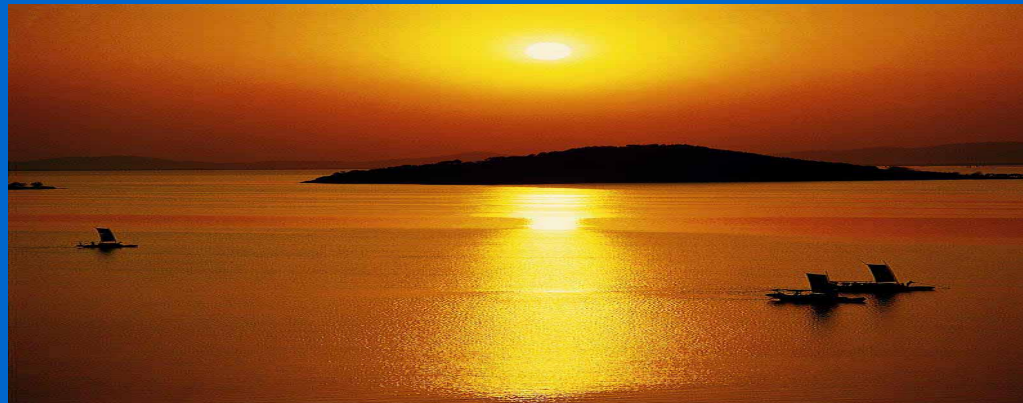
# Water Resources Protection

- ◆ Water quality monitoring, assessment, prediction, planning and management are carried out in mainstream and important tributaries
- ◆ Water quality monitoring network has been set up, more than 500 stations spread over the basin.



# Water Resources Planning

- The old vision of Comprehensive Plan focused on Flood control and the utilization of the water resources.
- The Current revised Comprehensive Plan pays more attention to water resources sustainable development, and focus on Water Quality, protection of wetlands, flood management , water allocation, and Considers the impact of water resource projects.



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The TGP is a multipurpose hydro-development project producing comprehensive benefits mainly in flood control, power generation and navigation improvement.

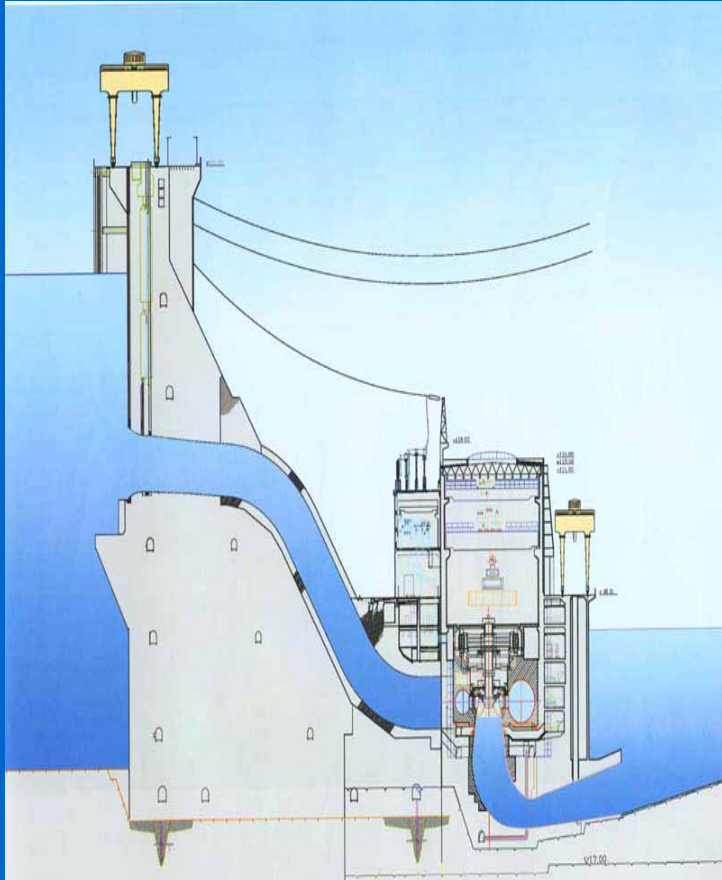


## *FLOOD CONTROL*



The flood control capability of the Jingjiang River section can be improved from the 10-year frequency flood to the 100-year.

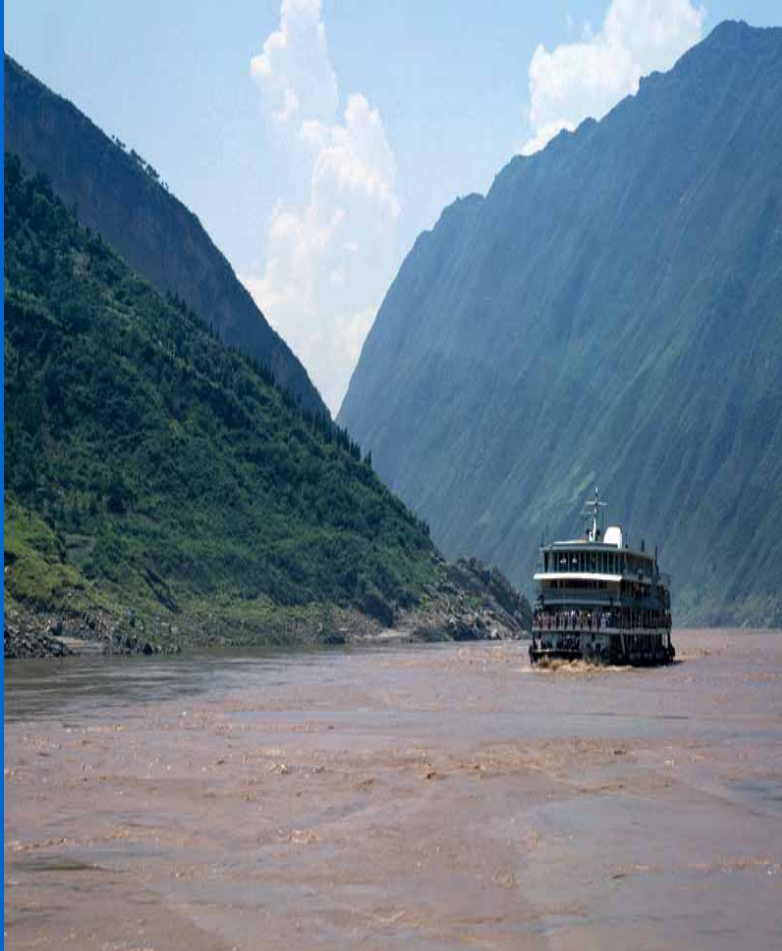
## Power Generation



★ TGP will provide with a total installation of generation capacity of 18,200MW

★ It will supply electricity to Eastern China, Central China .

## *NAVIGATION*



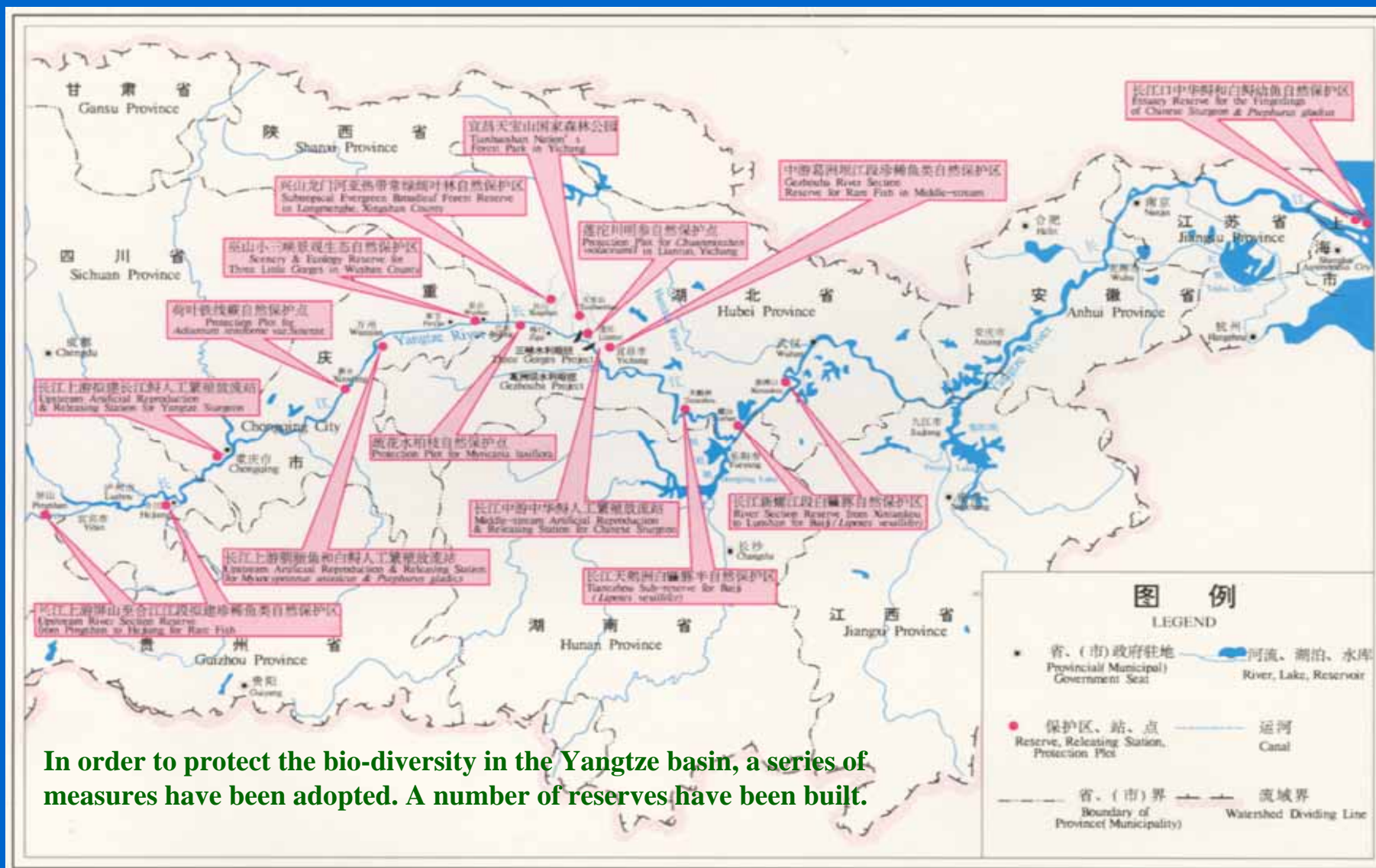
- ★ With the regulation of the reservoir, the minimum flow downstream of Yichang in the dry season can be increased from  $3,000\text{m}^3/\text{s}$  to over  $5,000\text{m}^3/\text{s}$
- ★ which can improve the navigation condition in the dry season in the middle reaches of the Yangtze River.

## Hydropower vs. water allocation

- Scientific operation is the key for rational utilization of water resources after the completion of TGP
- Develop multi-reservoirs operation scheme focusing flood management and water allocation
- Multi-reservoirs operation scheme is serving hydropower considering constraints of flood management, water supply and ecology needs



# Locations of species resource protection zones for TGP



In order to protect the bio-diversity in the Yangtze basin, a series of measures have been adopted. A number of reserves have been built.



Black carp



Grass carp



Bighead carp



Silver carp

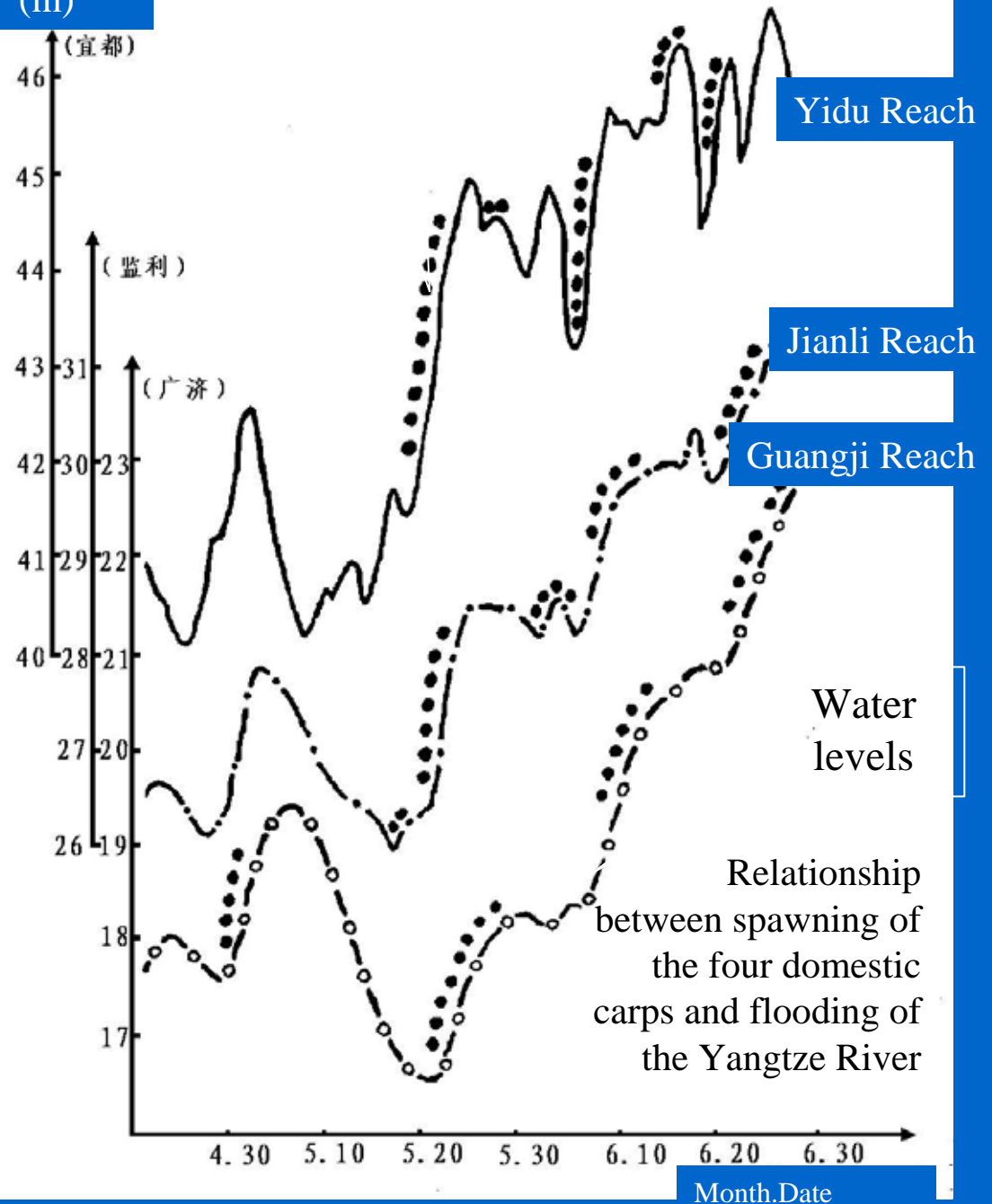
Four traditional commercially important fishes natively to the Yangtze River are black carp , grass carp , silver carp , and bighead carp

Impacts of TGP on fishes in the Yangtze River

## Reservoir ecological operation

- ◆ All the four carps spawn only when the water level rising.
- ◆ TGP will reduce the frequency and scale of the peak flood, a decrease in the spawning activities.
- ◆ Artificial peak flood can be made by reservoir ecological operation

Water level  
(m)





**Water and soil conservation forest**



**Terrace in reservoir region**

# *Artificial Reproducing and Releasing of Chinese Sturgeon*



**Raising young Sturgeon**

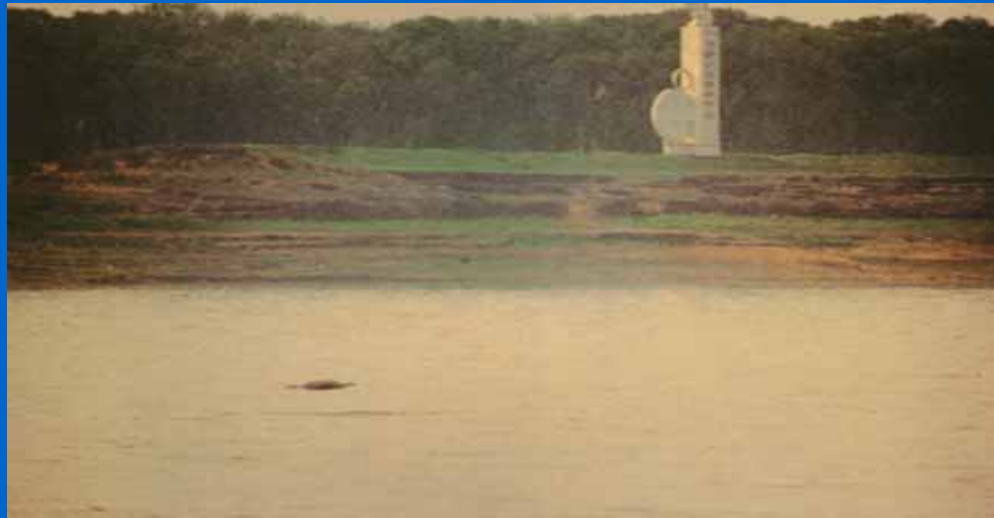


**One month old Chinese Sturgeon**



*Artificial Releasing of Chinese Sturgeon*

# Protection of Species Resources



Chinese river dolphin in reserve reach



Baiji--Chinese river dolphin

# Natural Reserves for Migrant Birds



Location of Poyang Lake Migrant Birds Reserve



Siberia Crane



Marabou

# Monitoring of Ecology and Environment

- A special monitoring system of ecology and environment for TGP has been established and put into operation since 1996
- It monitors the potential modification of ecological and environmental factors
- providing valuable information for management and decision making.



A large flock of birds is captured in flight against a warm, golden sunset sky. The birds are silhouetted against the bright light, creating a dense pattern of dark shapes. In the lower right, a bright sun is partially obscured by the horizon line, which appears to be over a body of water. The overall scene conveys a sense of natural harmony and movement.

**Ensuring health of the Yangtze and  
promoting harmony between human  
and nature**

**——Commissioner Cai Qihua**

**We are aiming to work out new strategy to protect sustainable  
development and promote harmonious coexistence between human and  
nature.**

An aerial photograph of a winding river flowing through a dense green forest. The river's path is highly irregular and meandering, creating a complex, zig-zagging pattern across the landscape. The water in the river appears light brown or tan, contrasting with the surrounding green. The word "Thanks" is overlaid in the center of the image in a large, bold, red serif font with a white outline.

**Thanks**