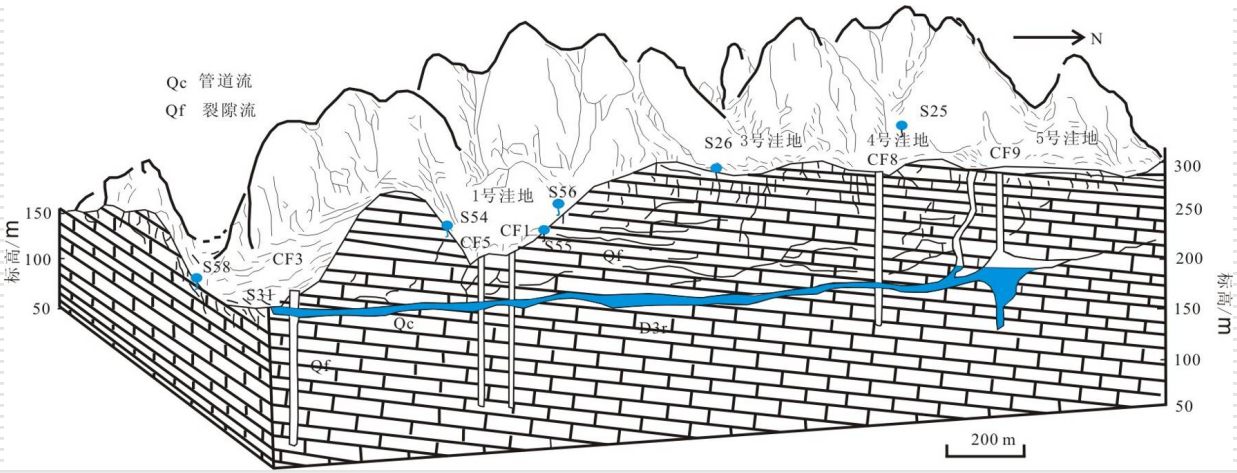
Approaches on the Karst Groundwater Governance



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Outline

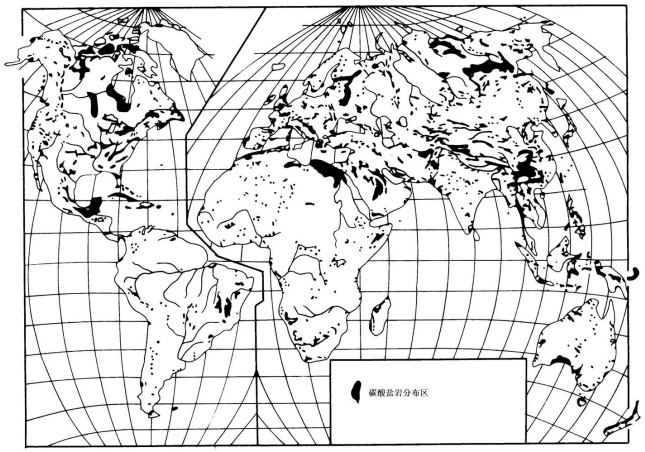
1. Karst: an important part of Earth Surface System

2. Karst hydrogeology: double-layer structure

3. Karst aquifer: sensitivity and fragility

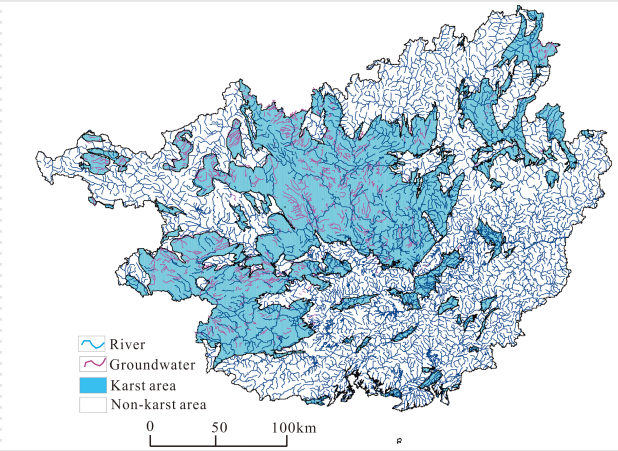
4. Karst groundwater governance: to be continued

1. Karst: an important part of Earth Surface System

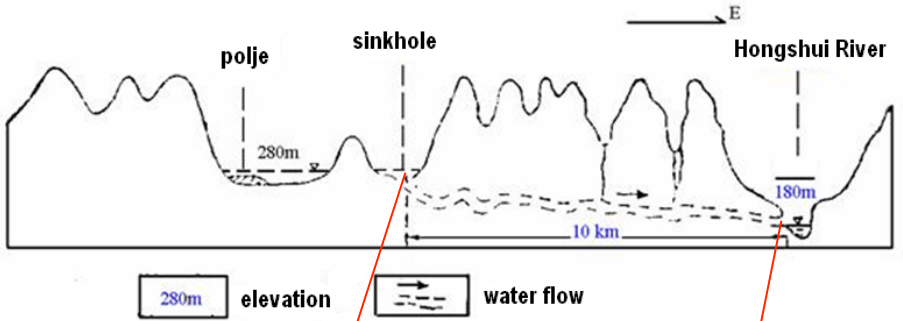


Carbonate rocks(karst) cover 9%–16% of the continental area, roughly 20-25% of the global population depends on the karst groundwater. It plays important role in fresh water supply.

2. Karst hydrogeology: double-layer structure



Distribution of the surface and ground water system, Guangxi Province

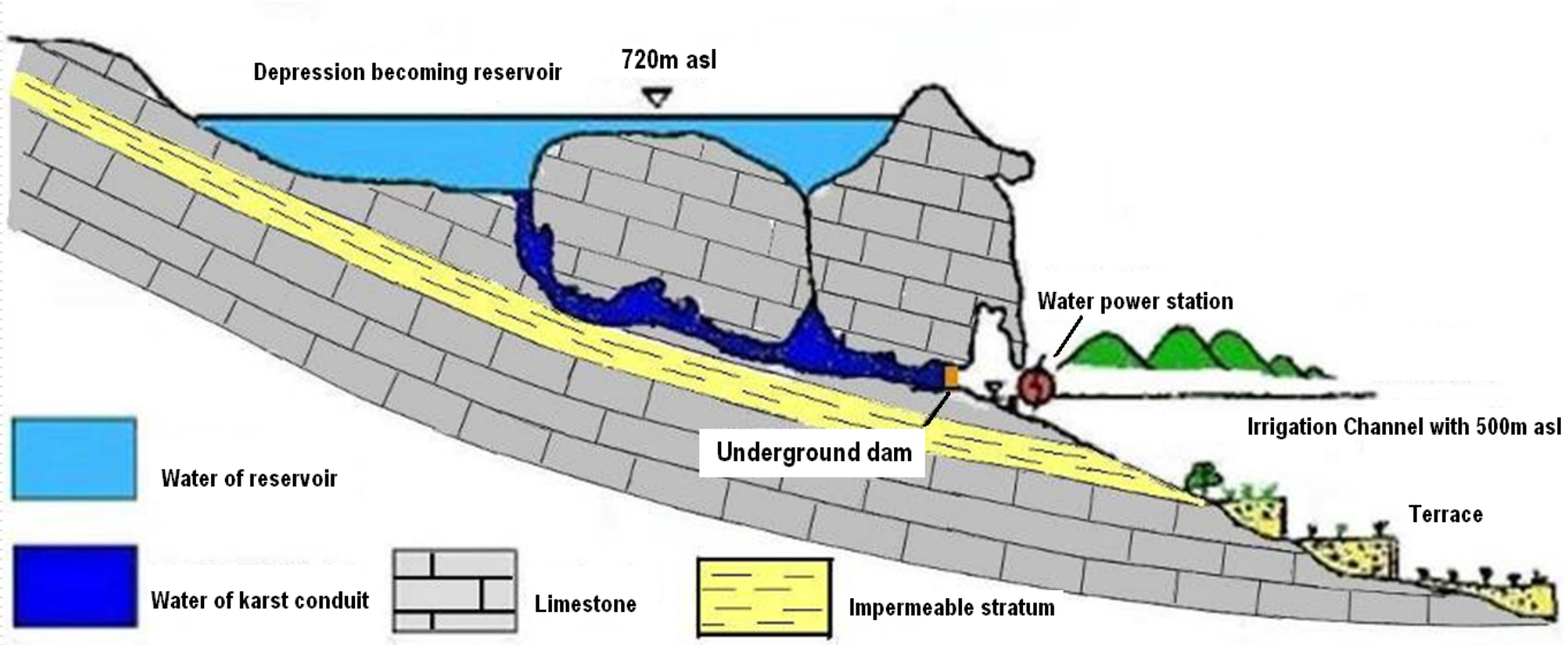


Sketch section of a typical underground river, Dongnan, Guangxi

Average water resource for the land in Karst region is 720,000.2m^3/km^2 ; Non Karst region is 950,000.2m^3/km^2

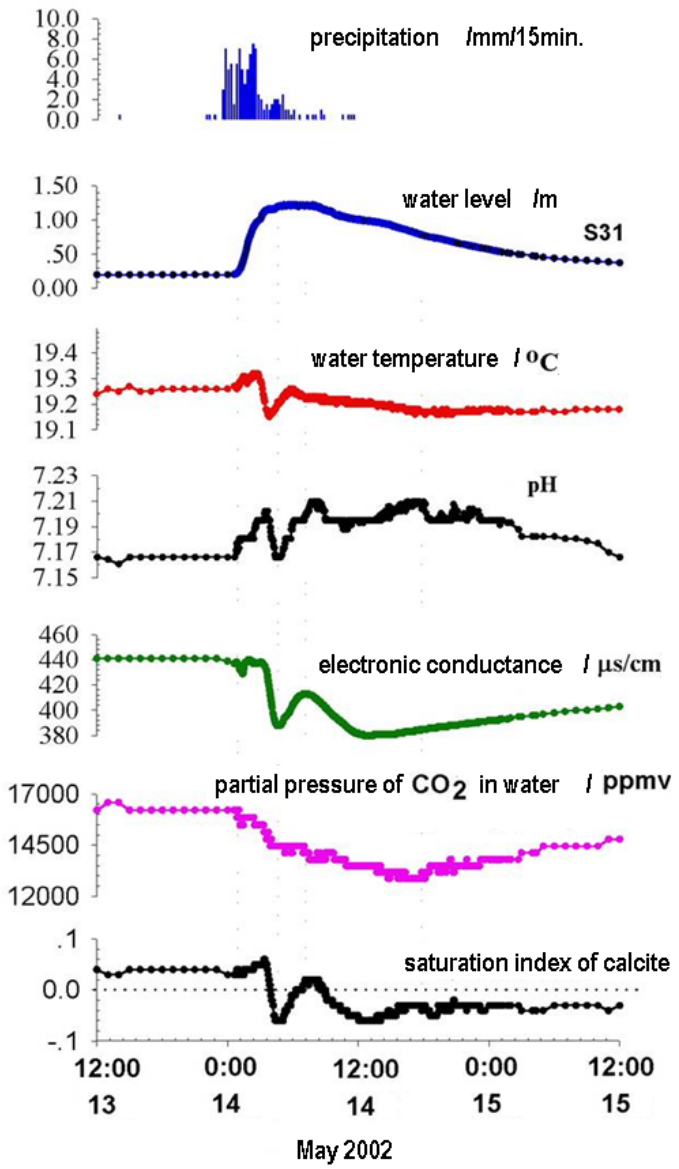
Average groundwater resource for the land in Karst region 500,000.34 m^3/km^2 ; Non Karst region is 220,000.35 m^3/km^2

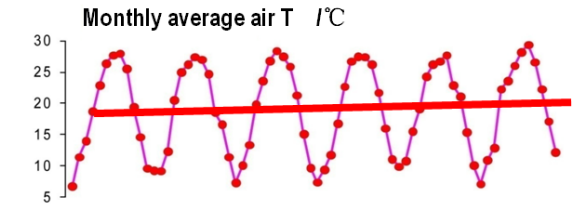
Investigation, exploration and utilization of karst groundwater impacted by geological setting

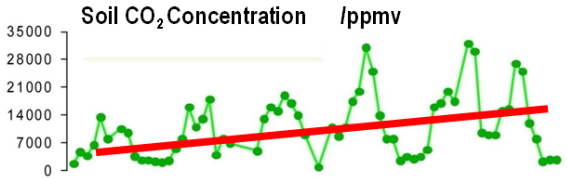


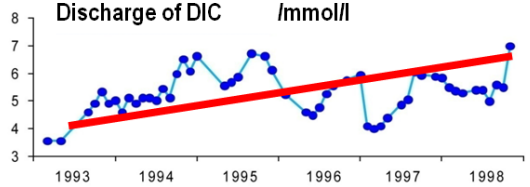
It finished the project that made the depression into a reservoir in Luota of Hunan so that the lack of water could be released and economic benefit increased, as well as ecological environment recovered.

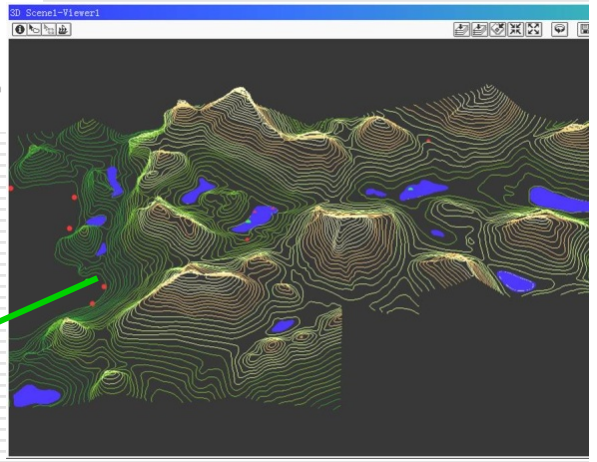
3. Karst aquifer: sensitivity and fragility









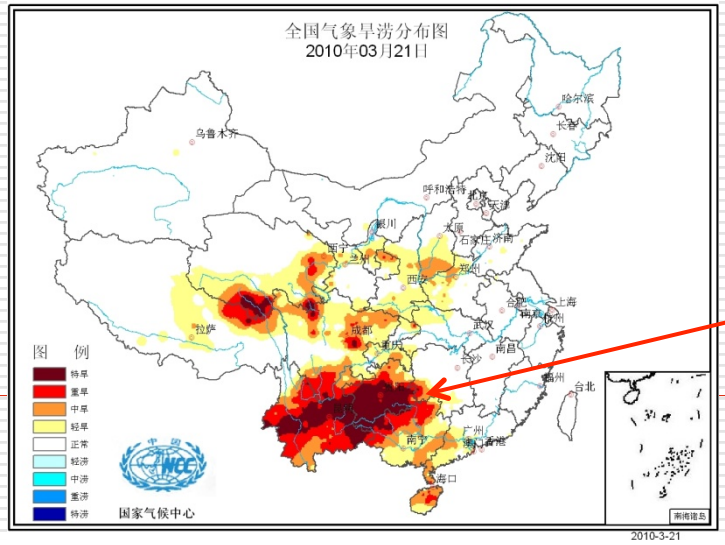


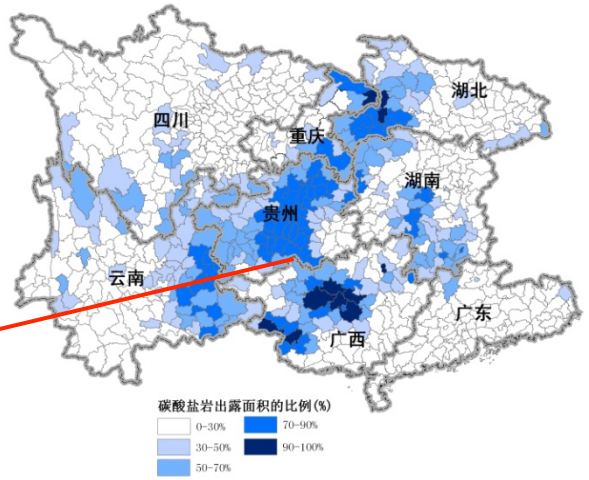
From the autumn of 2009 to the early summer of 2010, the southwest China suffered from autumn-winter-spring continuous drought.

Over 5,000,000 residents lacking of drinking water

Corp yield reduction 3,500,000ton

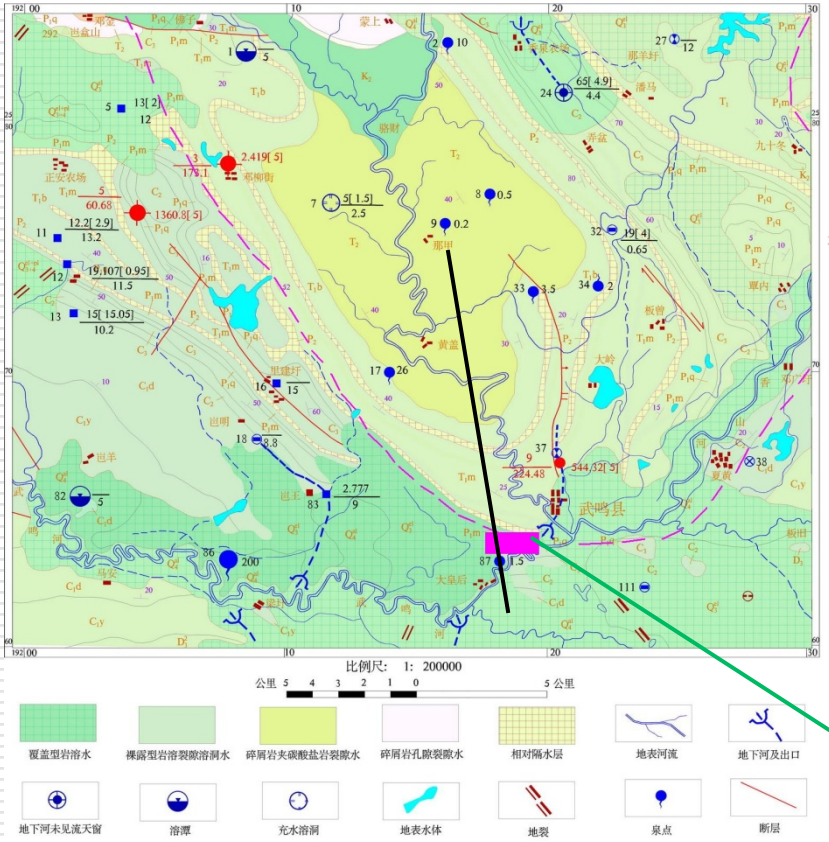
The serious drought area is located in karst region



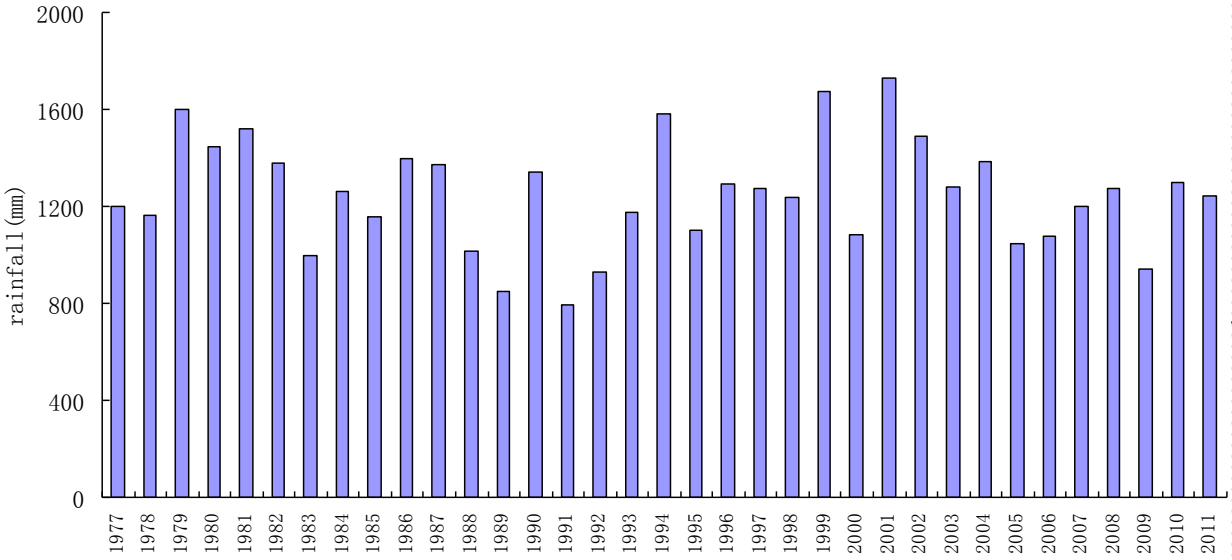


In order to fight against the drought , the Ministry of Land and Resources of China, organized nearly 10,000people, including 2600 geologists and hydrogeologists from 92 institutions and engineering companies in 14 provinces, to do field survey in drought areas and drill wells for water.

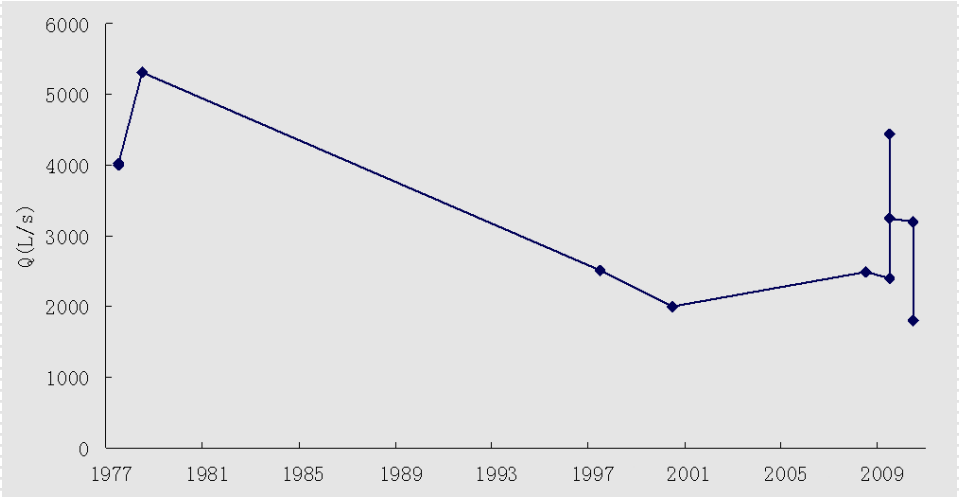
2348 successful drilled wells with total water outflow of 360,000m^3/day, it can be provided drinking water for 5,200,000people.

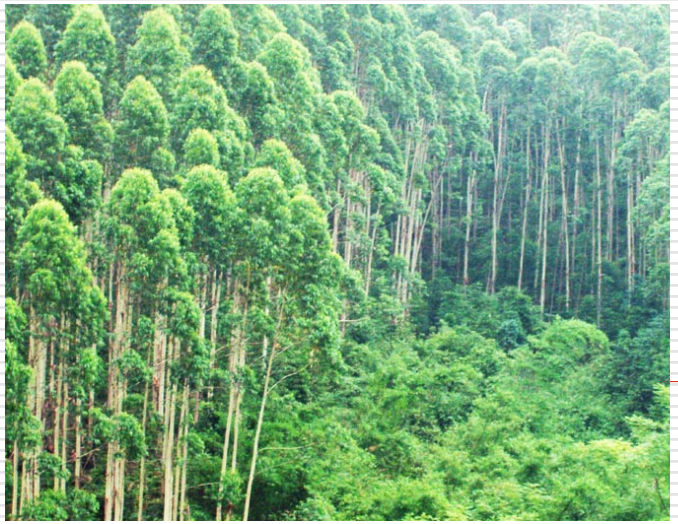


Lingshui spring is a covered karst ground basin with 697km^2 recharge area, is the water source for the Wuming Town(about 200,000people, and expected population 500,000 in future 10 years)



In past 30 years, the water flow of spring discharge continuously decreased from 4000L/s in 1977 to 2600L/s in 2001, although the annual precipitation maintained 1000-1500mm



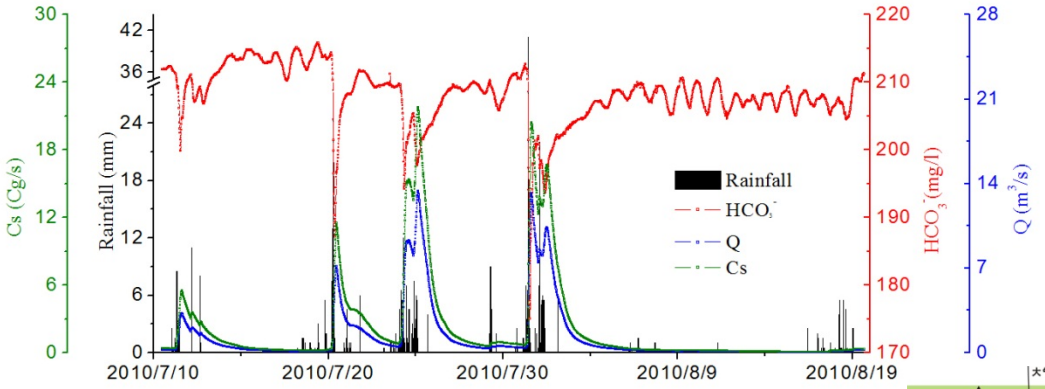


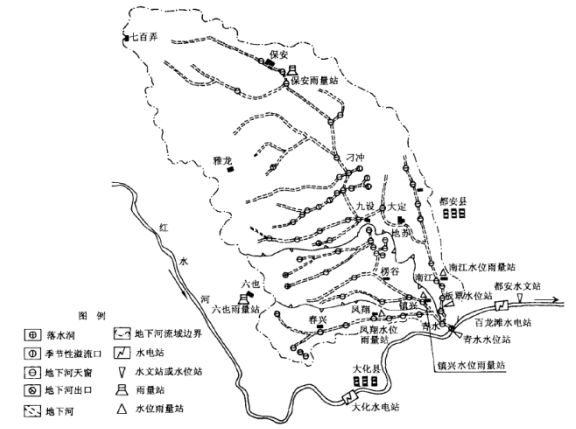
3 plots of eucalyptus forest in Guangdong province show that the annual total water use by eucalyptus forest were 443 mm, 402 mm and 363mm respectively, equivalent to 26.7 %, 24.5 % and 29.0 % of local annual rainfall

4. Karst groundwater governance: to be continued

The total karst water resource in China is 200 billion M3/year,which makes1/4 of the total groundwater resource of the country.

(1)Investigation

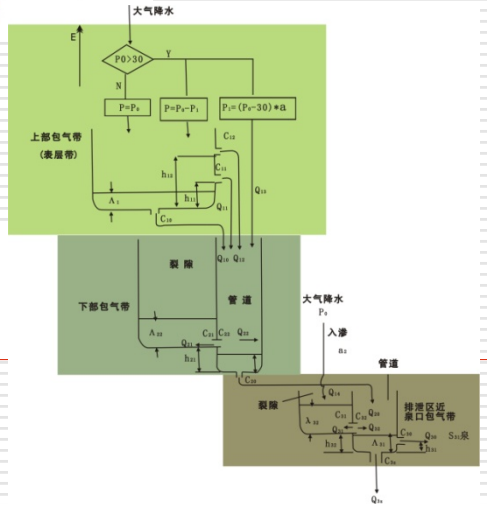




(2)Monitoring

(3)Modeling

Karst aquifer is a special pattern with heterogeneous media.



United Nations Educational,
Scientific and Cultural Organization

Welcome to Guilin!

Karst groundwater governance is the art of coordinating administrative actions and decision making, depending on the nature and processes of karst groundwater, and available water resources and requirement for socio-economy development.