

High-Efficient and Sustainable Use of Water Resources in Future Mega- City Urumqi

(未来乌鲁木齐特大城市水资源高效与可
持续利用)

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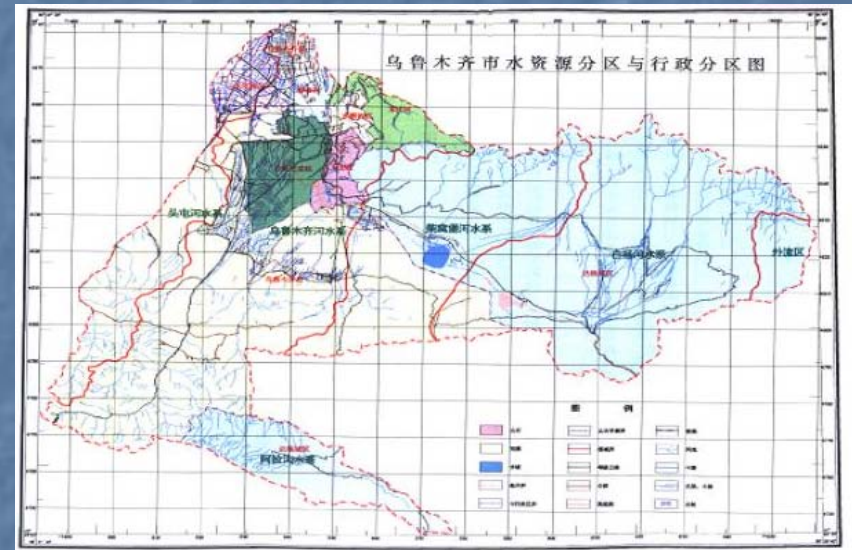
Water Researches and Present Use and Management

水资源及其利用与管理现状

Water Resources and Characteristics

(水资源及其特点)

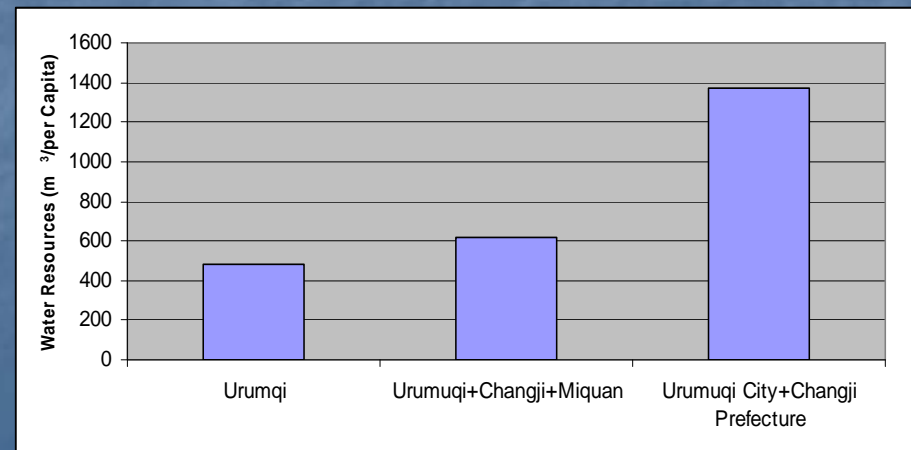
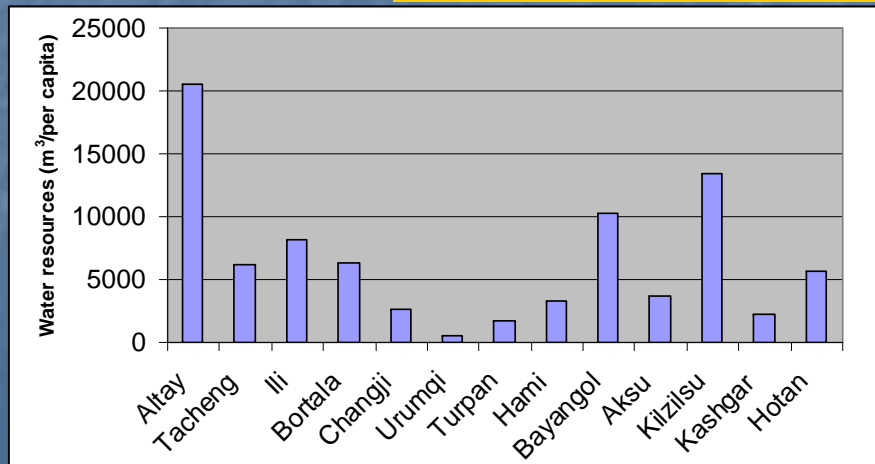
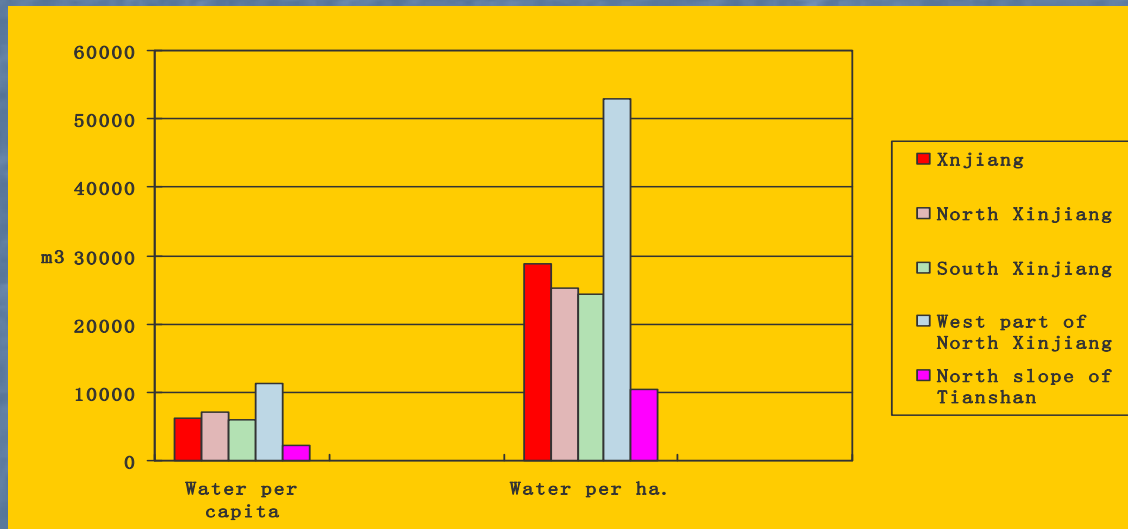
- Five catchment areas (Toutun, Urumqi, Chaiwopu, Baiyang and Alagou)
- Total water resources: 1.05 cubic km, including 1.02 cubic km surface water and 0.03 cubic km groundwater



I 级流域	II 级流域	III 级流域	IV 级流域	主要河流
西北诸河	天山北麓诸河	天山北麓中段	头屯河水系	头屯河
			乌鲁木齐河水系	乌鲁木齐河、板房沟河、芦草沟河
			柴窝铺湖水系	白杨沟
	吐哈盆地小河	吐哈盆地	白杨河水系	黑沟河、阿克苏河、高崖子河
			阿拉沟水系	艾维尔沟

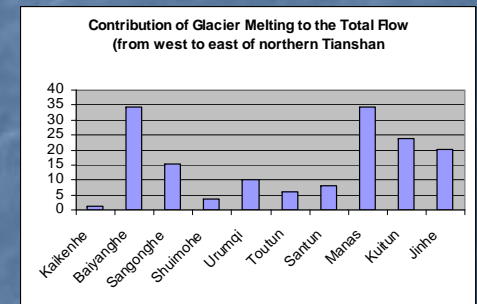
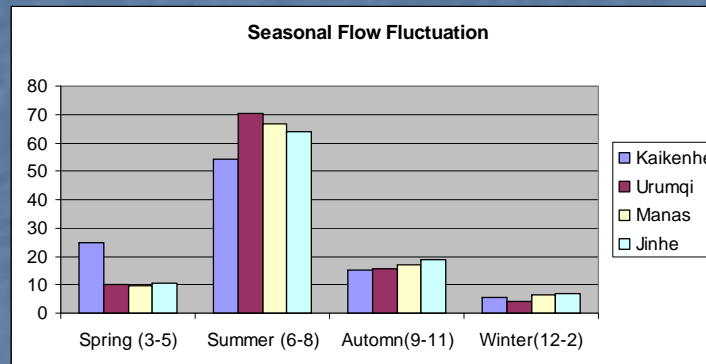
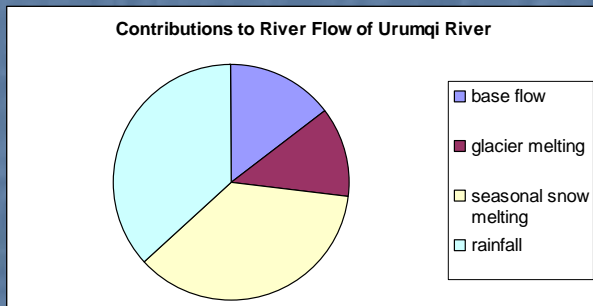
The scarcest water resources of first-level administrative districts of in Xinjiang

(新疆水资源最缺乏的一级行政区)

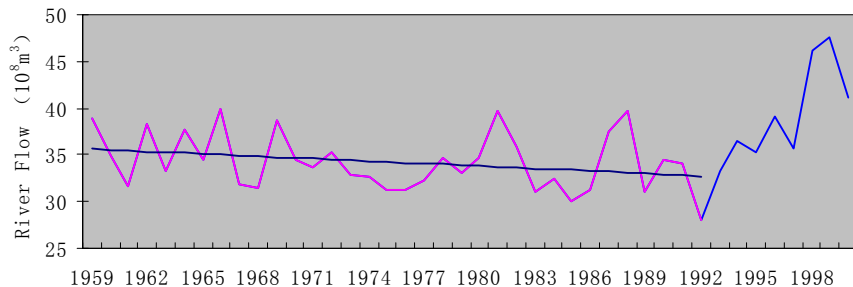


The major contributions to runoff are seasonal snow-melting water and rainfall and relatively strong yearly variation

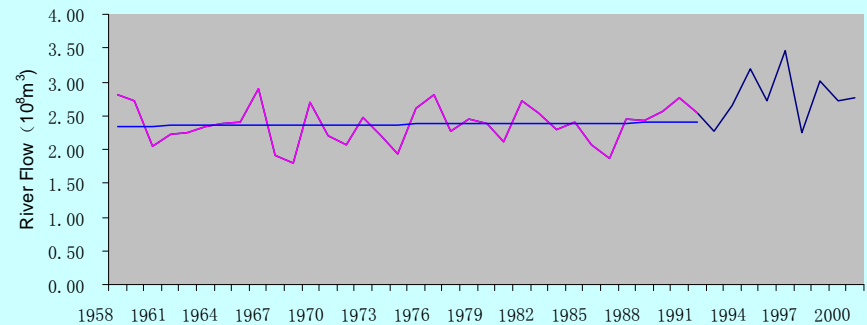
(地表水以季节性积雪融水与降雨补给为主且年际变化相对较大)



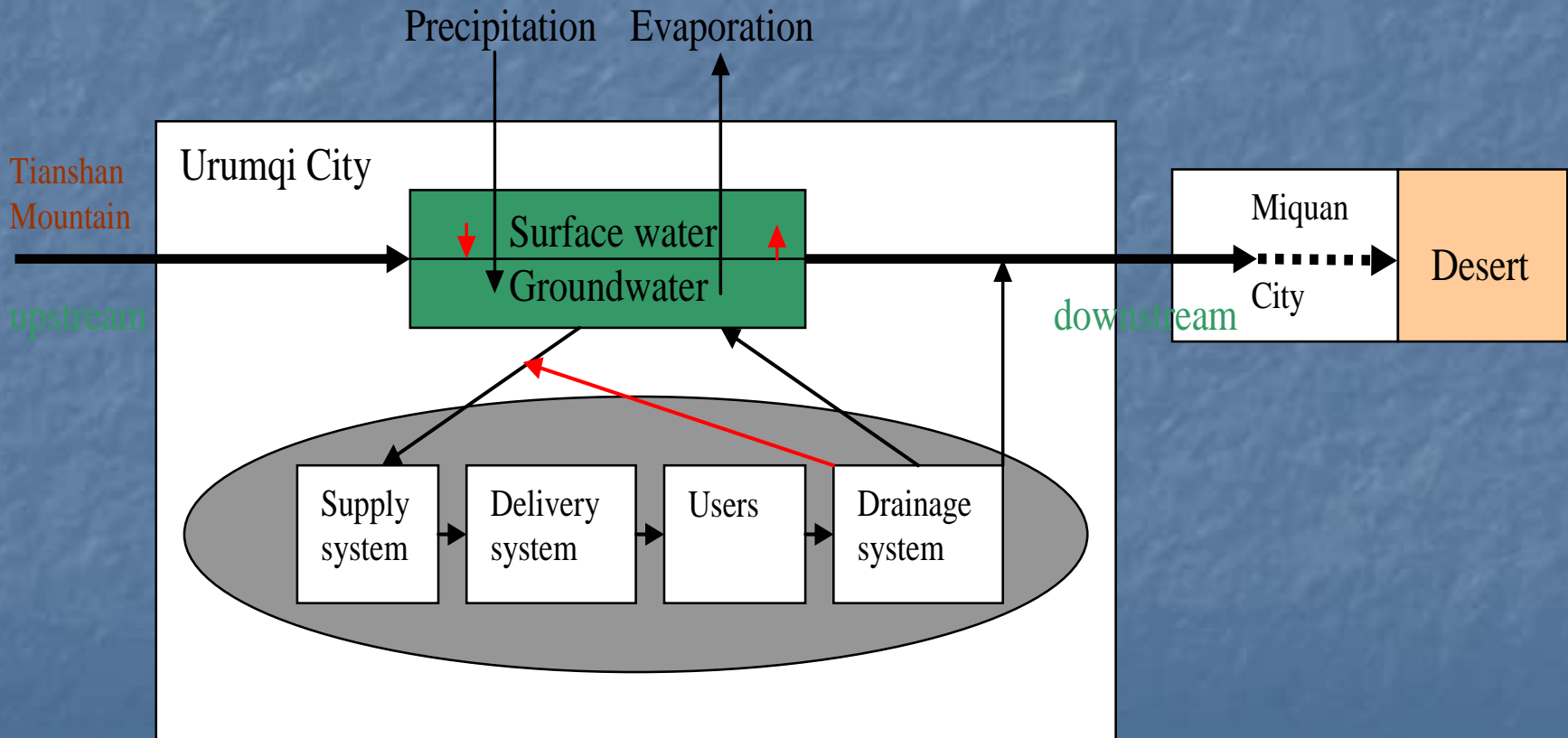
Flow Changes of Typical Rivers in Recent 50 Years in Northern Tianshan



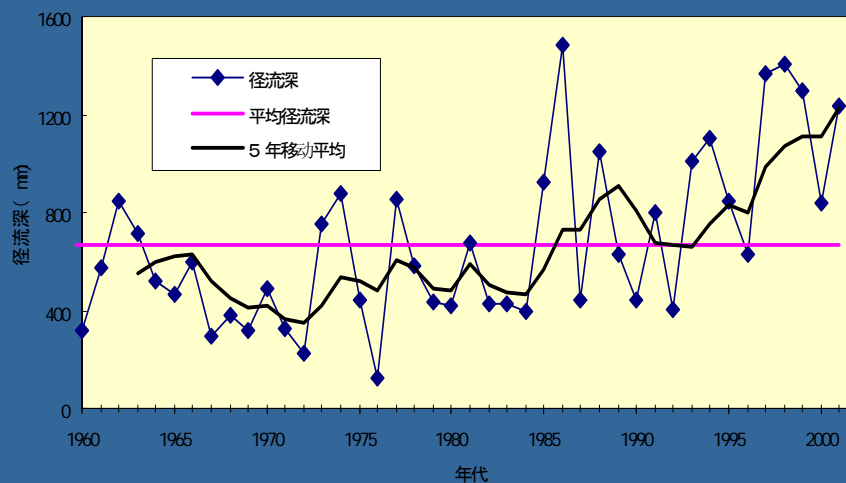
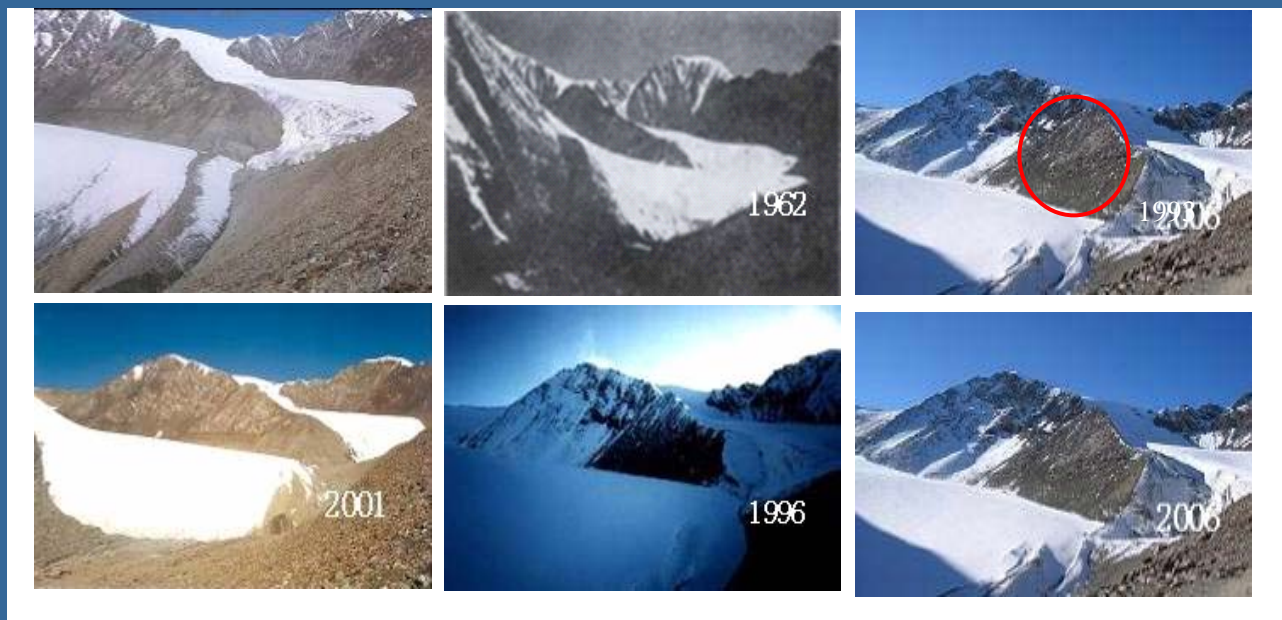
Flow Changes of Urumqi River in Revent 50 Years



The most affected hydrological cycle by urbanization (水循环受城市化影响最显著的区域)



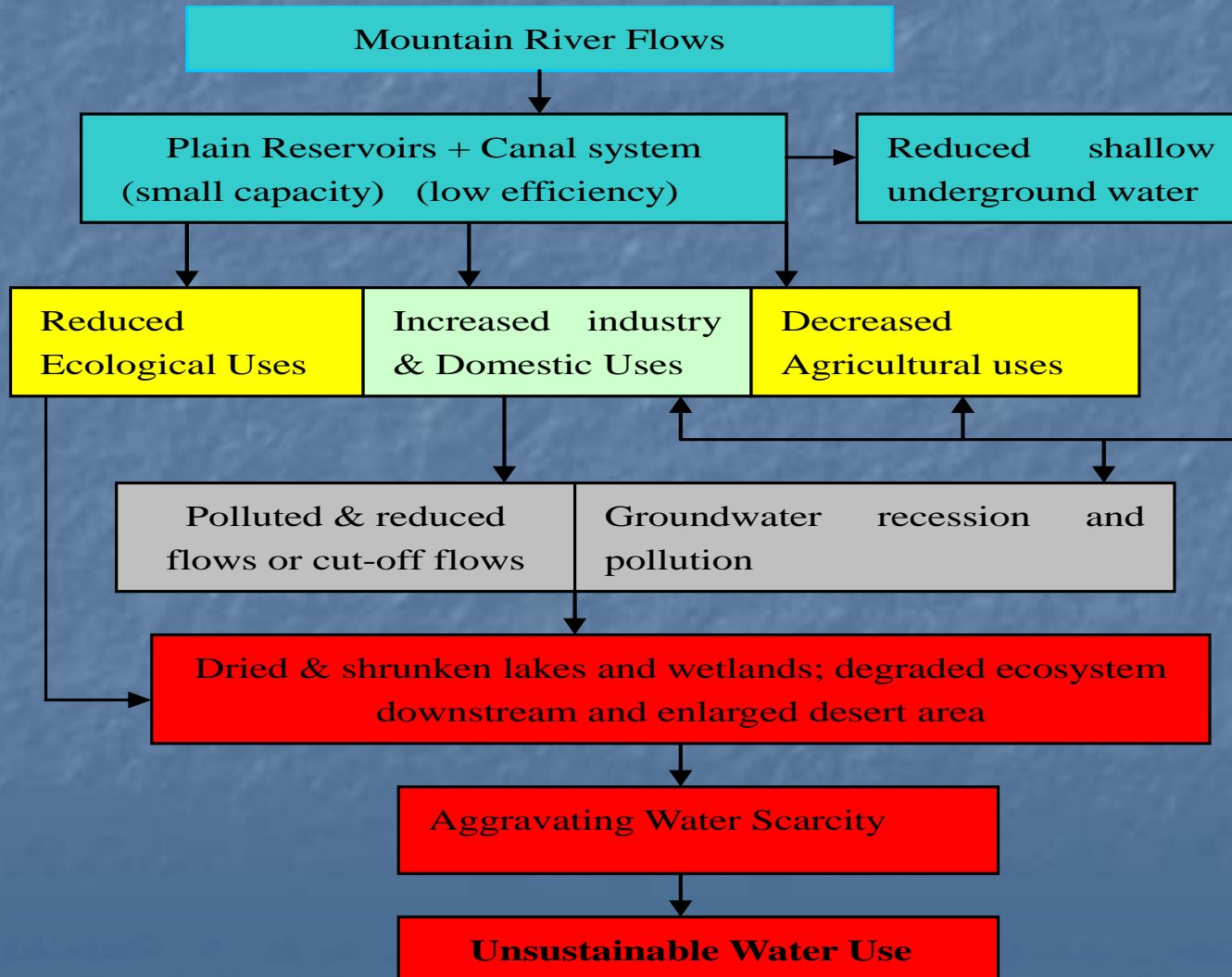
One of the most glacier-melting areas in Xinjiang (新疆冰川退缩最快的区域之一)



Water Major Issues in Water Uses (水资利用中的主要问题)

- Unbalanced water supply and demand
- Lack of **long-term research program** to determine the extent and depth of this problem
- Unclare interrelationship of surface and groundwater and no explicit account of return flows, water recycling and **environmental use**, the importance of which are often neglected in studies of water shortage
- Scenarios of water supply and demand are not properly presented, in particular **efficiency** in the all sectors.
- No available research on **climate change ---regional hydrological circle** and their impact on water availability
- What is **municipal healthy water circle**?
- Lack of plans for **water security** in extremes and emergency
- Lack of **risk assessment** and mitigation strategy and measures

Unsustainable Water Resources Use (水资源利用缺乏可持续性)



Seriously Polluted Waters (水污染问题严重)

Environmental Quality Communique of Urumqi City 2004

Waters	Quality
Urumqi River	Upstream: class II Mid-downstream: class III~over class V
Shuimohe River	Protected Area: over class II others: over class V
Wulabo Reservoir	Over class I
Caiwopu Lake	Over class V
Hongyanchi Reservoir	Class IV
Groundwater	Class IV resulted from 18 monitored wells. Quality in Southeast suburb and northwest suburb is better than that of south and north City

Note: Class I is mainly applicable to the water from sources, and the national nature reserves.

Class II is mainly applicable to first class of protected areas for centralized sources of drinking water, the protected areas for rare fishes, and the spawning fields of fishes and shrimps.

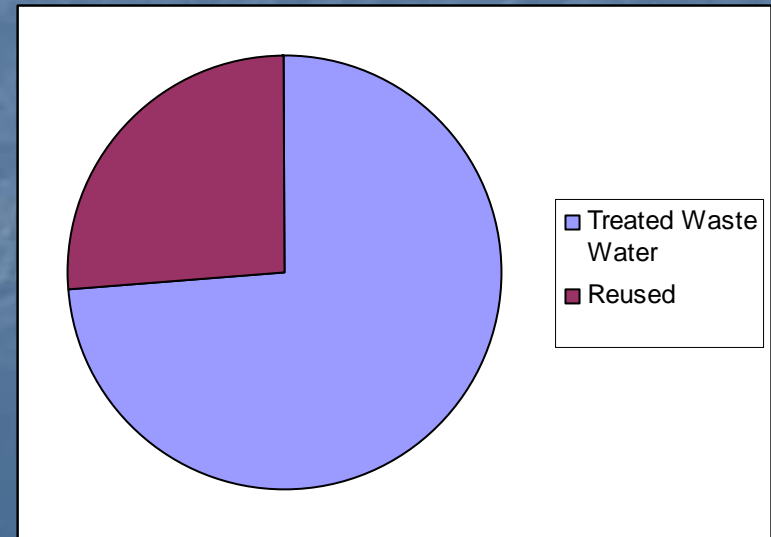
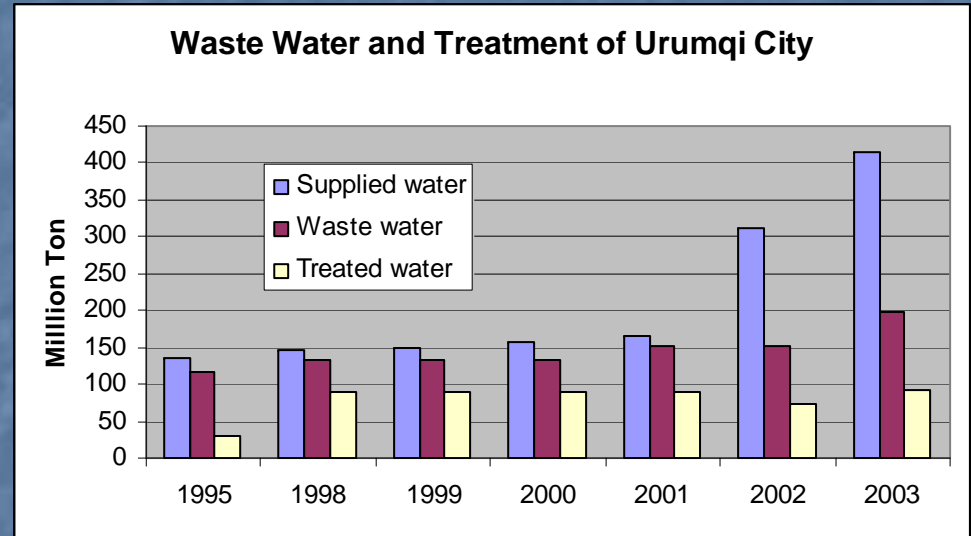
Class III is mainly applicable to second class of protected areas for centralized sources of drinking water, protected areas for the common fishes and swimming areas.

Class IV is mainly applicable to the water areas for industrial use and entertainment which is not directly touched by human bodies.

Class V is mainly applicable to the water bodies for agricultural use and landscape requirement

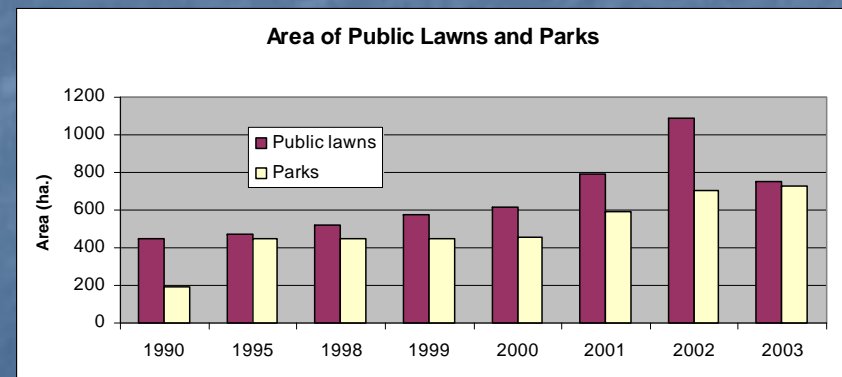
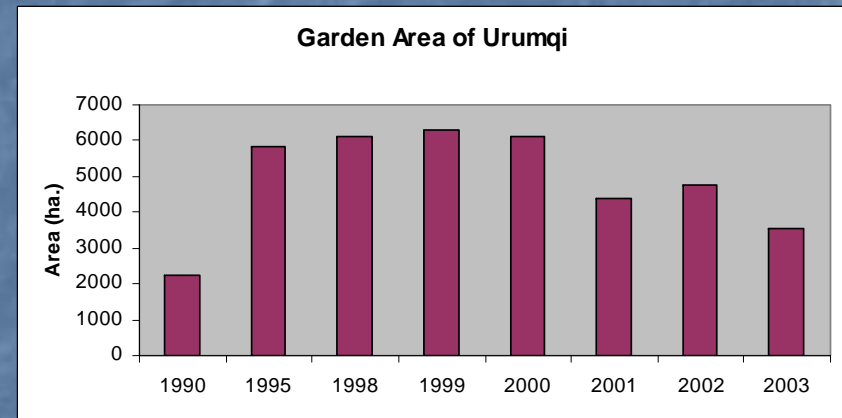
Low waste water reuse (污水回用率低)

- Water reuse plan being not properly incorporated into city master plan & water resource supply plan
- Users limited to near waste water treatment plants and costly distribution pipelines
- Unreasonable water tariff & incentive economic policy, cost recovery difficulty
- Water quality problem
- User development becomes a major task
- Needs joint efforts of suppliers and government
- Establish relevant regulations and policies and criteria/standard for guidance and enforcement



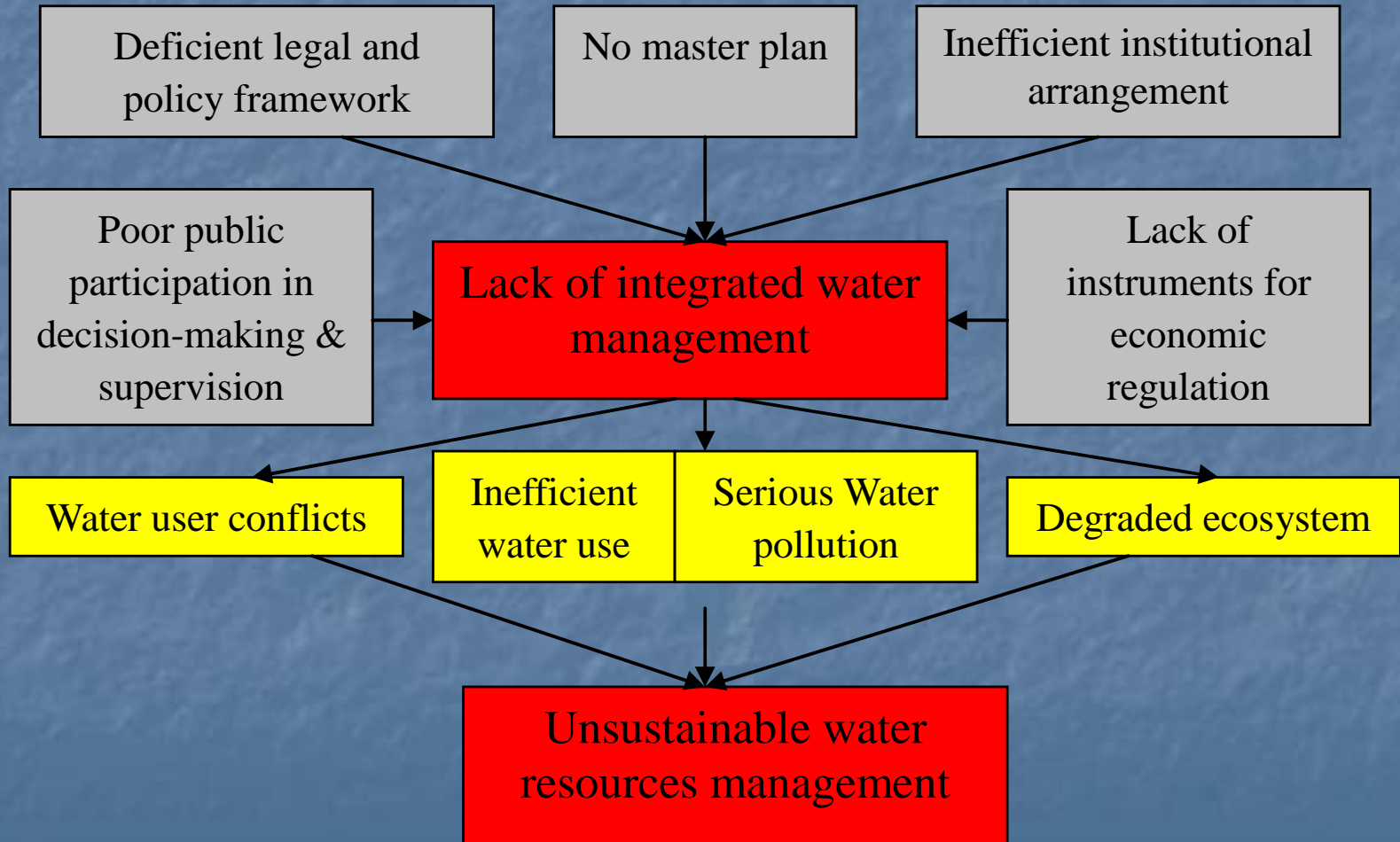
Lack of Environmental Water Uses (缺乏环境用水)

- Shrunk Lakes
- Reduced environmental flows for river ecosystem
- Lack of recreation area
- Reforestation only in inner cities and public gardens
- Lack of natural vegetation in the surroundings



Unsustainable Water Resources Management

(缺乏水资源的可持续性管理)



(RECAST Urumqi)

中德合作研究项目

干旱区特大城市资源高效利用研究—乌鲁木齐作为
中亚的示范城市

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**High-Efficient and Sustainable
Use of Water Resources**

水资源高效与可持续利用研究

Major Researches Contents

（项目主要研究内容）

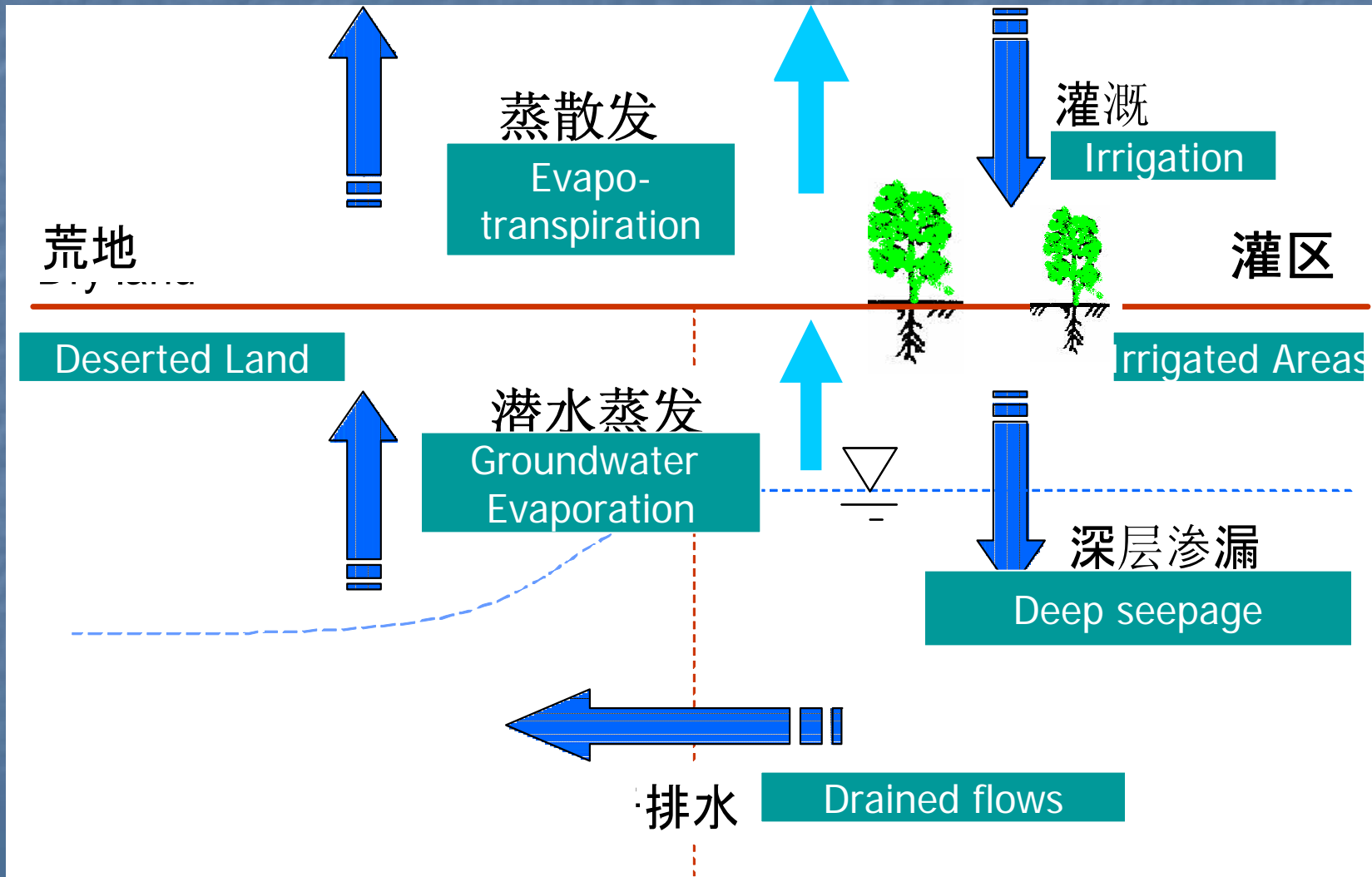
- Subproject 1 : Remote sensing of hydrological state。子项目一：水文状况的遥感分析
- Subproject 2: A descriptive water flux model子项目二：概念性水量模型
- Subproject 3: Establishment of a water information and control system for the Midong area and Development of a water conservation plan) 子项目3：建立米东区水信息与控制系统和制定水保护规划

Subproject 1: remote sensing of
hydrological state

(子项目一：水文状况的遥感分析)

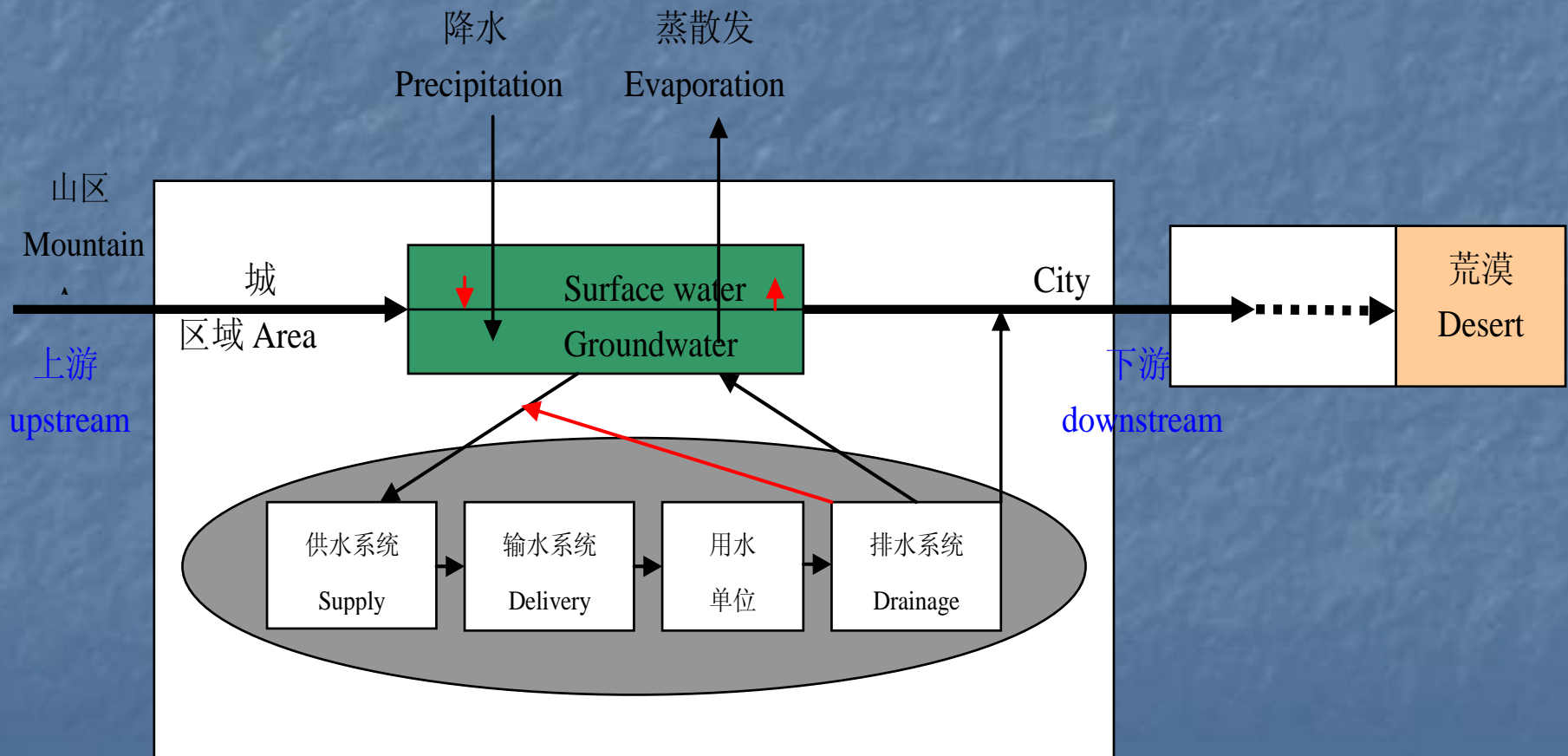
Research Focus 1: Water Transformation and Consumption in the plains

(研究内容之一：平原区水量转化与消耗)



Research Focus 2: Water Transformation and Consumption in the plains

(研究内容之二：城区水量转化与消耗)

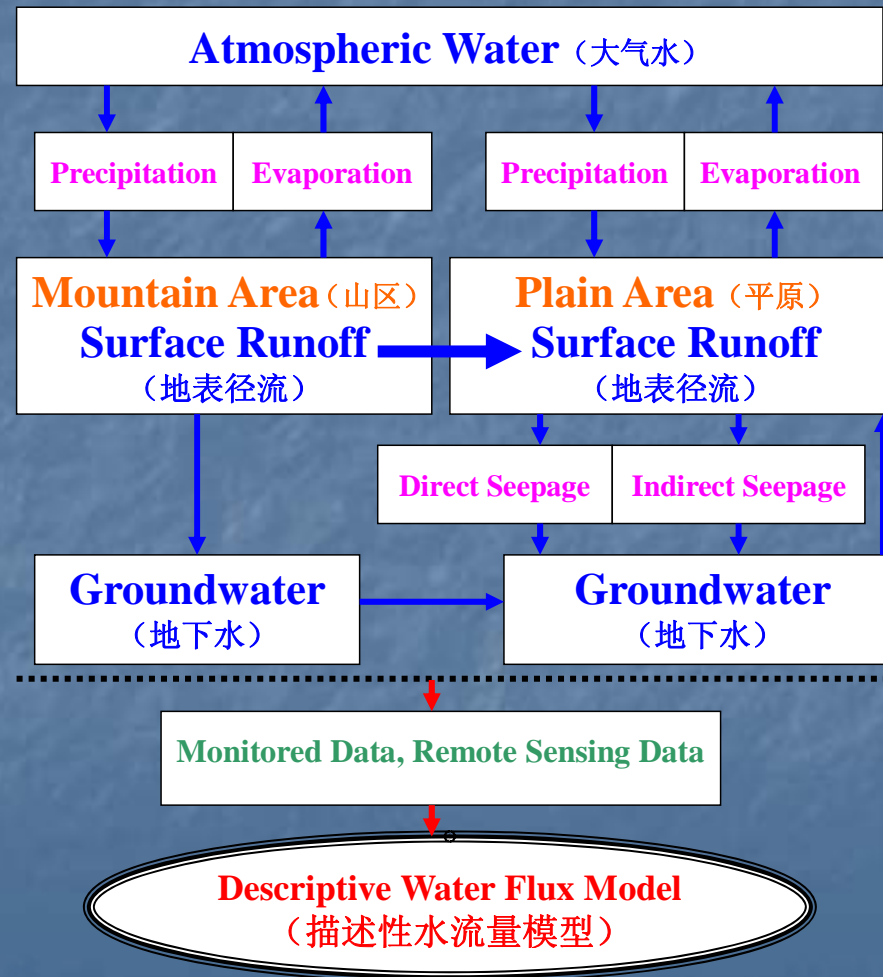


Descriptive Water Flux Model

(子项目二：水量模型)

Research focus: Integrated Mountain and Plain Water Flux Model

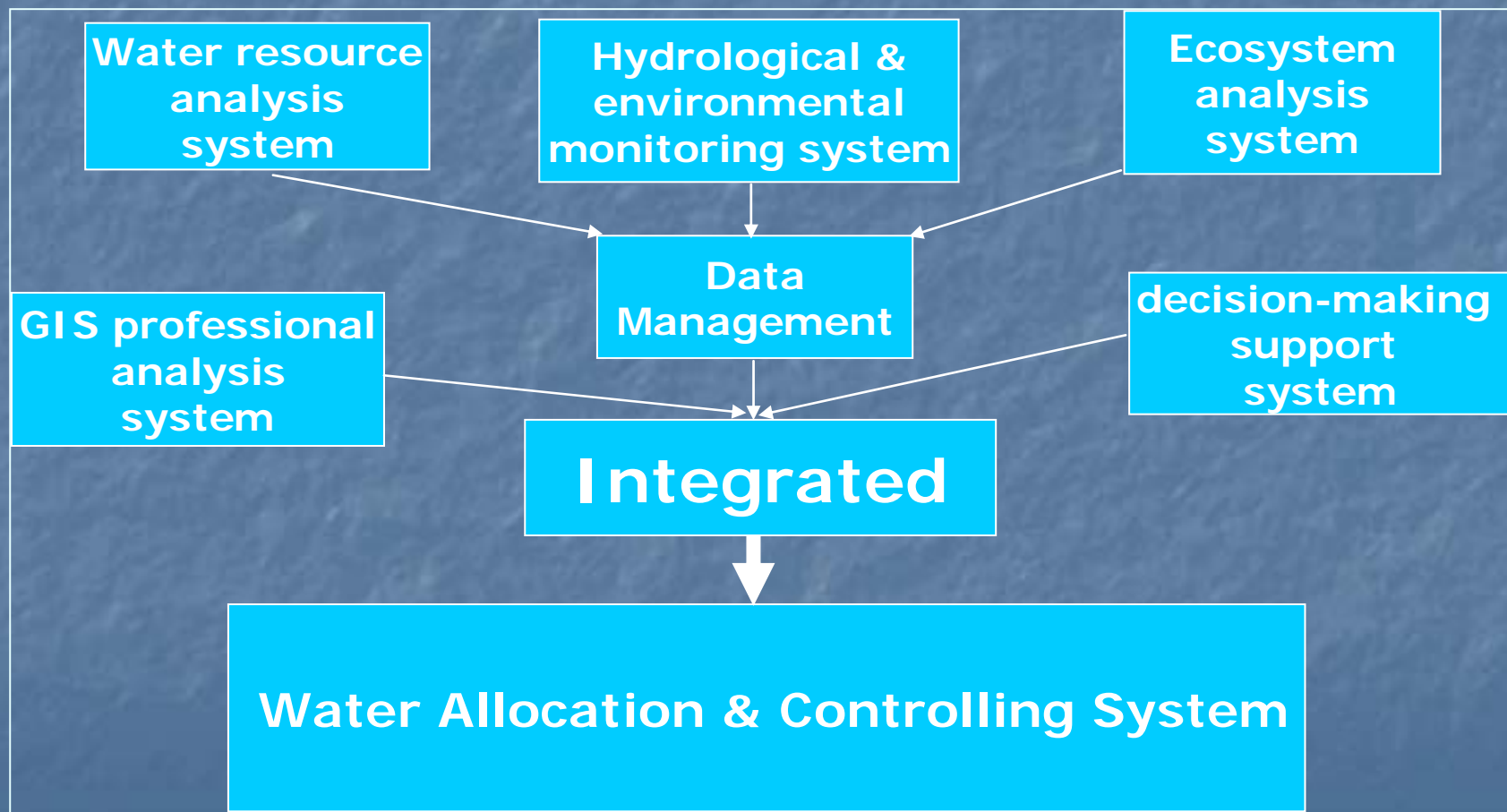
(研究重点: 山区-平原区综合水流量模型)



Subproject3: **Establishment** of a water information and control system for the Midong area and **Development** of a water conservation plan

(子项目3: 建立米东区水信息与控制系统和制定水保护规划)

Research focus: Establishment of a water information and control system for the Midong area
(研究重点: 建立米东区水信息与控制系统)



Thank you for your attention!

谢谢!