

Urban Catchments – Goals

Quality of surface waters is a severe problem worldwide but particularly important to China because of the exhausting exploitation of water resources by industry, agriculture and domestic purposes in urban areas. Lakes are important natural water resources and provide valuable ecosystem services to the public and therefore play a key role for the economic and social development in China. In recent decades, as a result of rapid economic and social development, fast urbanization and lack of pollution prevention or treatment, many lakes in China suffer from several sources of pollution (e.g. nutrients, heavy metals and organic pollutants). The problems of water pollution and eutrophication are therefore increasingly severe. A large number of lakes remains in a state of high ecological risk, with frequent toxic blue-green mass developments.



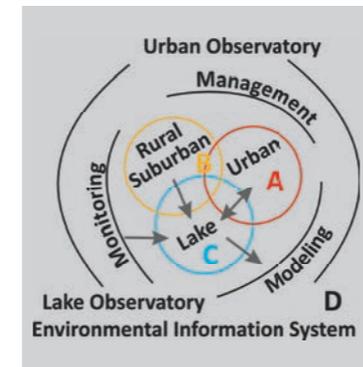
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The German project cluster within the German-Chinese cooperation initiative to the Mega-Water Program in China is focusing currently on the Lakes Chaohu, Dianchi and Taihu as well as the Liaohe River Basin.

Urban Catchments – Concept

Urban water management involves a comprehensive look at all urban resources: the lake as a source of drinking water and high priority for protection, restoration of the urban waters network, storm water management, and wastewater treatment. Due to rapid development rates in the demonstration region, suburban and rural areas and the effects of agriculture (non-point pollution sources) will be fully considered. The Urban-Water-Resources-Management (UWRM) concept is based on a regional implementation strategy with flexible decentralized cluster solutions for wastewater treatment.

An important basis for successful implementation of the UWRM concept is the establishment of extensive monitoring platforms (urban and lake observatories) for the



sources of water pollution as well as the recipient, Lake Chaohu. The observatories serve as an early warning system for operational water management. Long-term monitoring also enables a reliable assessment of measures and observations of emerging pollutants.

An environmental information system (EIS) will make data available for the UWRM concept, including necessary data infrastructures, interoperable simulation tools, and web services. The combination of monitoring and modeling platforms in EIS allows for the identification of contaminant sources and paths in the entire catchment, and, is an important tool for the operational water management and long-term water quality prognoses. The modeling platforms examine all levels of the coupled hydrologic system including soils and groundwater.

OpenGeoSys



Chaohu Lake

Environmental Information System (EIS)

Monitoring data from the lake and urban observatory as well as model results will be integrated in an EIS and provided to the local stakeholders and authorities for water management.



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Outlook

The Urban Catchments concept will be implemented as a pilot project at Chaohu. Several cities such as Hefei, Nanchang, Nanjing, Shanghai, and Wuhan have expressed their interest in this URWM concept.



1 Shanghai, 2 Nanjing, 3 Chaohu/ Heifei, 4 Nanchang, 5 Wuhan, 6 Three Gorges Dam, 7 Chongqing

Managing Water Resources for Urban Catchments - Chaohu

German Project Partners:



Chinese Project Partners:

- Chaohu Lake Management Authority (CLMA)
- City of Chaohu



The funding of the Urban Catchment project by the German Federal Ministry of Education and Research (BMBF) under grant 02WCL1337A is highly acknowledged. Partner of the Major-Water-Program in PR China.

Contact

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Urban Catchments Technology

Lake Observatory (TU Dresden / UFZ)



- Expertise in early warning systems for surface and raw water monitoring (e.g. buoy).
- Risk assessment of organic pollution in surface and raw water
- Risk management of contaminated sites

www.tu-dresden.de/hydrobiologie

Urban Observatory (TU Dresden)



Acquisition of matter and water fluxes in urban catchments:

- Monitoring of rainfall-runoff process, discharges and pollutant concentrations
- Evaluation for system dimensioning and environmental impact assessment

www.tu-dresden.de/hydro/siedlungswasserwirtschaft

Innovative Devices (bbe Moldaenke)



bbe will develop new sensitive methods to detect hazardous compounds in water. Biomonitors, UV fluorescence analysers and algae monitors incl. a new system for algae toxins and T&O early warning will be applied.

www.bbe-moldaenke.de

Data Station (AMC)



- Measurement and Testing Systems
- Monitoring and SCADA Systems
- Process Control and Automation Systems

www.amc-systeme.de

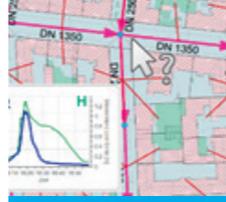
Environmental Monitoring Software (WISUTEC)



- Management, distribution and visualization of monitoring and time series data
- Integrated Sensor web
- Web-GIS interaction

www.alvis.software

Modeling and Planning Tools (itwh / UFZ / TUD)



- HYSTEM-EXTRAN for sewage system calculation, KOSIM for drainage system calculation, KOSTRA for precipitation analysis
- ADEWS Assessment of Decentralized Wastewater Solutions
- SWMM for urban stream modelling

www.itwh.de / www.ufz.de

Monitoring and Modeling (UFZ / TU Dresden)



- Three-dimensional lake modelling (e.g. hydrodynamics, resuspension)
- Water quality models
- Aquatic microbiology
- Ecotechnology design and optimization (GIS based methods)

www.ufz.de/cawr

Data Explorer + Visualization Software (UFZ)



- Integration and validation of heterogeneous and multi-faceted data
- Thermo-hydro-mechanical-chemical (THMC) numerical process simulation
- 3-D scientific visualization (VISLAB)
- Data synthesis using continuous workflows
- OpenGeoSys initiative

www.opengeosys.org



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