YANGTZE PROJECT

Forschungszentrum Jülich
in der Helmholtz-Gemeinschaft

Environmental Research at the Yangtze

4 research topics are being worked on by scientists from China and Germany:

Pollutants / Water / Sediment

Waste water, flooded abandoned industrial sites and intermittently flooded agricultural land lead to the input of pollutants and biomass into the Yangtze. Damming the river leads to a reduced groundwater velocity, which in turn leads to an extended residence time for pollutants in the reservoir. This means that the water contamination cannot be predicted in the long-term after the river has been dammed.

In terms of future-oriented water quality management, researchers want to analyze and monitor the processes in water and sediment so that they can estimate the danger potential. Model calculations and the use of new automatic monitoring systems will complement studies in the field and in the laboratory.

Vegetation / Biodiversity

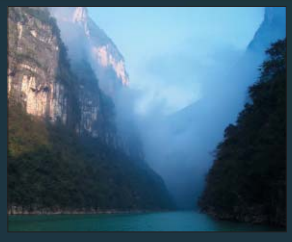
In years gone by, the Yangtze used to flood its banks with the change of seasons. Now that the river has been dammed, the highest water levels will appear upstream of the dam in winter, whereas up until now this occurred during the summer months. This change will have considerable effects on both flora and fauna and biodiversity.

Sediment deposits are expected to increase and considerably influence the growth of plants, their metabolism and the transport of nutrients. Since plants are to be introduced into the riparian zone for stabilization purposes, acquiring knowledge of their survival strategies under strongly changing environmental conditions is an important research goal.

Land use change / Mass movement

The damming of the Yangtze causes a large-scale change in land use and leads to an increase in landslips and soil erosion. Furthermore, the stress of the ground changes in elevated areas along the banks that have remained mostly dry until now. A rash drop in the water level can destabilize the river banks.

The use of higher areas of land on the banks of the river for agricultural purposes also contributes to an increase in the erosion potential. Therefore a risk evaluation should be conducted on the danger of landslips, soil erosion and diffuse substance inputs into the water. In order to monitor high-risk landslip areas, the installation of an early-warning system is planned.



Atmosphere

The development of Western China and its metropolis of Chongqing simultaneously causes an increase in emissions into the atmosphere as a result of expansion in the transport sector, the location of new industries and the influx of people.

This leads to an excessive input of pollutants, particularly nitrates and sulfates, into soil and water. Excess fertilization and acidification, even at some distance from the direct sources of emission, are the outcome. The aim of this research project is to investigate the impact of the input of atmospheric pollutants into soil and water and to incorporate the data into model calculations and to monitor the air quality.

It is also intended that further topics arising as a result of the rapid development of the city of Chongqing will be tackled in the medium term.

In Research Centre Jülich, scientists from a variety of disciplines work together on pressing environmental issues in the areas of soil, water, plants and the atmosphere (the Jülich ladder). This interdisciplinary approach means that Research Centre Jülich is in an optimal position to solve the unresolved issues that exist within the framework of this German-Chinese collaboration.

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