



# iWaGSS –Easing Water Stress with Real-Time Water Management

## Globale Ressource Wasser (GRoW)

According to UN figures, over 2 billion people around the world are currently affected by water stress. In future, due to population growth and burgeoning economic development, water extraction is expected to increase, particularly in sub-Saharan Africa. For the world-renowned Kruger National Park in South Africa, securing adequate water supply for people, animals and plants is already proving to be a challenge. In order to alleviate the water scarcity in the area, partners in the joint project iWaGSS are seeking to develop a computer-aided real-time water management system.

### Development of a Modular Water Management System

Within the Kruger National Park, a designated UNESCO Biosphere Reserve, a plethora of users, including the mining sector, industry, agriculture and (eco)tourism all compete for the scarce water resources. Further, the situation in the national park is steadily deteriorating due to the growth of the neighbouring town of Phalaborwa and the resultant increased demand for water. To ensure that existing water resources continue to be available for future use and improve the situation in the long term, the joint research project iWaGSS, comprising eight German and seven South African partners, plans to develop a computer-aided real-time water management system and pilot it in the region. The aim is for the system to support regional decision-makers and improve governance in the water sector.

The water management system comprises four modules combining risk assessment, new techniques for real-time water quality monitoring, hydrological modelling and socio-economic indicators.



A herd of elephants at the Olifants River in South Africa's Kruger National Park

More specifically, the project will first identify areas which are particularly susceptible to contamination. Based on a risk assessment potential mitigation measures will then be weighed up. The creation of a real-time monitoring network is intended to enable constant water quality monitoring both in the Kruger National Park and in the surrounding area as well as help ensure that countermeasures are taken promptly in the event of an emergency. Hydrologic models simulate the streamflow to predict the spatial and temporal distribution of pollutants in the water. With the analysis of socio-economic aspects, particularly in terms of water efficiency, ecosystem services and financial concepts, the project seeks to support the local and regional stakeholders responsible for water management and to improve water resource management sustainably.

### On-Site Testing in the Kruger National Park

Many years of practical experience have shown that it is often not the national legislation and regulations but rather the actual implementation on the ground which is the decisive factor for effective and efficient water management. The iWaGSS model region in north-east South Africa, on the Mozambique border, was selected in close cooperation with the South African project partners because the region's development makes it very susceptible to water problems.

The area is located along the lower reach of the Olifants River and covers rural regions with subsistence farms, predominantly agricultural zones, economically significant mining and industrial areas headquartered in Phalaborwa, as well as ecologically important nature reserves, such as parts of the Kruger National Park.

The Olifants is the most important source of water in the central part of the national park. However, the river is in a poor state in terms of both the quality and the quantity of water. Water use in the upper reach of the Olifants (for mining, agriculture, industry, energy generation and municipal water supply) reduces the amount of water that reaches the lower stretches of the river. Further, these types of water use lead to deterioration in water quality and an increase in sedimentation. The pilot region is one of the most challenging water management regions in southern Africa and is therefore particularly well suited for testing the iWaGSS concept in practice.

### Practical Experience Improves Concept Transferability

Using a modular real-time water management system, the project partners are seeking to improve information flow and facilitate forward-looking sustainable resource management. Their hope is to be able to shorten the reaction times of the authorities and water management institutions. Based on the four modules, the plan is also to develop a user-friendly decision-support system. The researchers are also working on the elaboration of environmentally sustainable recommendations for action and scenarios for tackling acute damage such as water pollution. The intention is for the practical experience gained through the project to serve as a basis for the future transfer of the concept to other regions with overstretched water resources, both in Africa and worldwide.



View over the mining area bordering the Kruger National Park

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