Contribution to Sustainable River Basin Management for a Coastal Zone of Southern Vietnam -Intermediate Results

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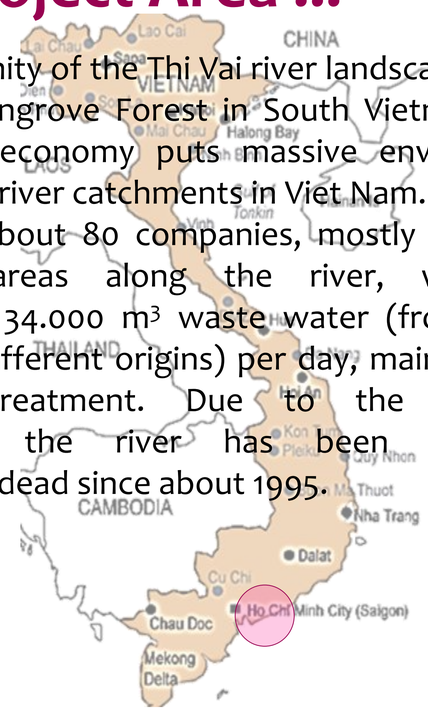
EWATEC COAST is about…

the development, supply and the use of water and environmental technologies and service tools in the framework of a management system.
The system offers the user the capability of sustainable improvement of the environmental and living conditions of the designated coastal zone in South Vietnam. The project takes into account the anthropogenic influences, as well as the natural climate variability and future climate change on water quantities and water quality. In addition, the project aims to transfer the EWATEC COAST concept to other countries.
EWATEC COAST consists of 9 interacting subprojects, results of each subproject are implemented into a water management system. The project runs for 3 years and will end in August 2015.

The Project Area …



is in the vicinity of the Thi Vai river landscape and the Can Gio Mangrove Forest in South Vietnam. Rapid growth of economy puts massive environmental pressure on river catchments in Viet Nam.
There are about 80 companies, mostly situated in industrial areas along the river, which are discharging 34.000 m^3 waste water (from various areas and different origins) per day, mainly without effective treatment. Due to the numerous discharges, the river has been considered ecologically dead since about 1995.

Expected Results

With relevance to the water management of the region the following results are expected from the subprojects:

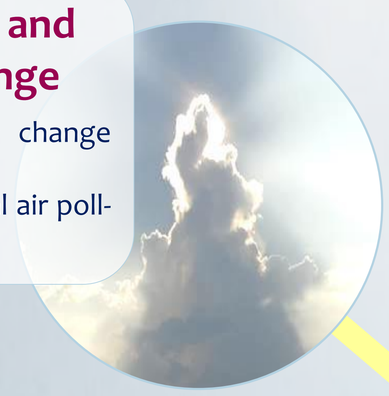
- ► forecast on climate change
- ► integrated model system for surface runoff, river and groundwater flow
- ► bio-reactor model for mangroves
- ► integrated risk analysis in the coastal area
- ► optimized plant concept for tannery wastewater
- ► customized regional air pollution model
- ► model-based management system
- ► forecasts of the effects of anthropogenic influences and climate change

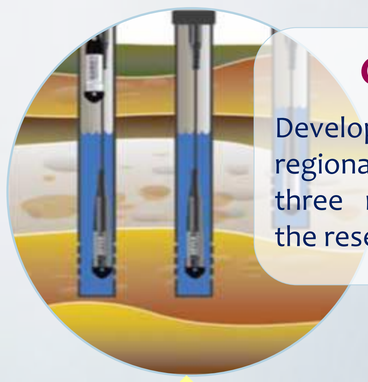
Decision makers need both, technology to increase water quality by optimising treated water discharge and proper management tools to preserve water quality in the river networks.

Work in Progress

Meteorology and Climate Change

Forecast on climate change for the project areas.
Provision of a regional air pollution model.





Groundwater

Development and application of regional groundwater models in three representative zones in the research area.

Mangrove Ecosystem

Bio-reactor model for mangroves at landscape scale with focus on the removal of pollutants in the water body.

Aquatic Organisms

Derivation of long time information about water quality and water balance by the analysis of aquatic organisms.

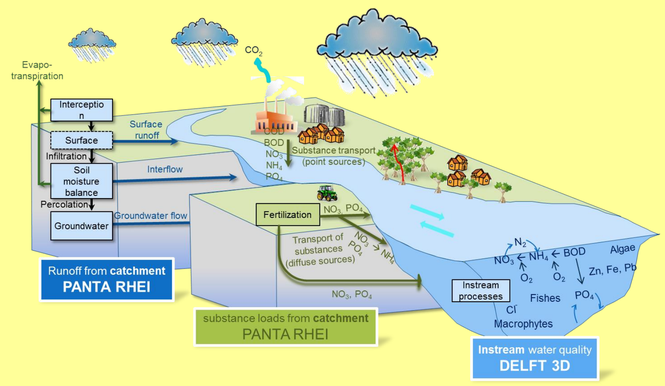
Management System

Panta Rhei
Ecohydrological model

Water balance and nutrient transport

Delft3D
Ecohydraulic model

Hydrodynamics and instream water quality



Wastewater Management

Implementation and optimization of an experimental pilot plant for the purification of tannery wastewater

Coastal Protection

Modelling of the coastal waters, determination of the loss potential due to onshore storm floods.
Risk analysis for the coastal zone.

First Results

Figure 1 shows the results of a preliminary tracer simulation modelled with Delft3D. By simulating a tracer it is possible to reproduce a potential transport of a pollutant discharged into the river. The tracer was put at a certain point in the upper reaches of the model area at 6:00 AM on 15 April. For 2 minutes a discharge of 3 m^3/s with a tracer concentration of 100 kg/m^3 was given into the river.

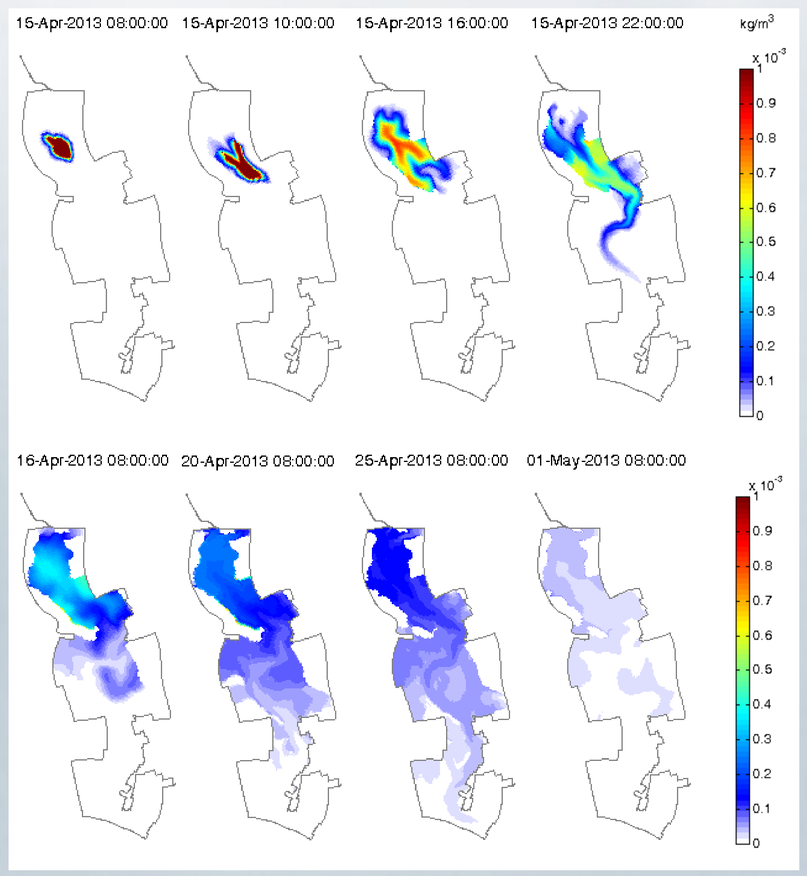


Figure 1: Spreading of a tracer modelled with Delft3D after a tracer input in the upper reaches of the Thi Vai river on 15 April 06:00.

The tracer is transported up- and downstream according to the tide and remains mainly in the upper reaches for several days. Due to the tide and the constant change of flow direction it takes a long time until the tracer leaves the river. Even after 2 weeks there are still traces of it in the upper reaches. It can be followed that nondegradable pollutants, which are discharged into the river, could remain in the river over a longer period and may display a serious health issue for humans as well as for aquatic organisms.

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