



Impact of Climate Change on the Quality of Urban and Coastal Waters

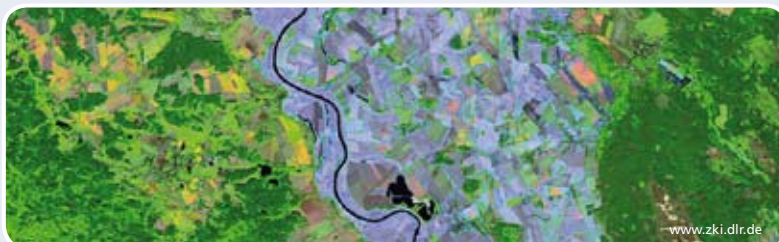
Diffuse Pollution (diPol)



Foto: Thomas Panzau

CLIMATE CHANGE AND CONTAMINANTS

Projected climate changes for Northern Europe comprise increased seawater level and more extensive rainfalls in the watershed, followed by extreme discharges of rivers. Along with the effect on water quantity, these developments will have consequences for the water **quality**: high precipitation flushes nutrients and contaminants from streets, agricultural areas, and combined sewer overflows into rivers; high discharges remobilize polluted sediments and transport them to the coastal areas impacting bordering countries.



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BEING PREPARED ...

The Water Framework Directive (WFD) and the Marine Strategy Directive (MSD) demand activities from member states to prevent deterioration of coastal waters. In order to achieve a "good ecological status" of all surface waters, member states are obliged to suggest a "program of measures" in the river basins to be ultimately implemented by 2027.

Currently planned programs do not address climate-induced changes of contaminant transport due to the complexity of processes and variability of regional specifications. But unless climate change impacts are integrated in management concepts – and **diPol** will help in doing this – they will potentially fail in the attempt to reach the objectives of the Frameworks and to sustain a healthy environment.



Foto: Heinrich Reincke



Foto: René Schwartz



Foto: Gabi Schönemann, pixelio

THE DIPOL VISION

The quality of life is linked to the quality of water in our environment. Climate change will probably affect the quality of rivers and coasts. Counteracting measures need to be planned as soon as possible. BUT for that, a thorough understanding of the complex interactions in the triangle river – urban – sea is necessary. Using 4 case sites for demonstration, **diPol** will offer tools to

- simulate the impact of climate change on water quality
- demonstrate how environmental parameters are interconnected
- foster communication among stakeholders
- draw attention of local citizens to their changing environment

Within **diPol**, scientists and school children work together to maintain our environment for the future and therewith a good quality of life.

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European Union



The European Regional Development Fund

**The Interreg IVB
North Sea Region
Programme**

Investing in the future by working together
for a sustainable and competitive region

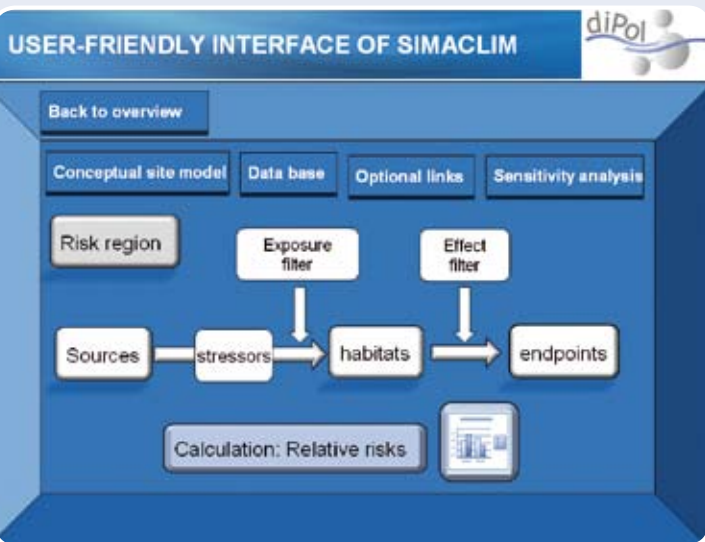


THE PROJECT

Within this Interreg IV B – project, 19 partners from 5 countries in the North Sea Region have come together in a joined effort to exchange information and prepare for climate change impact on the quality of the coastal environment within the next 50 years.

Decision makers from environmental and urban planning offices are invited to implement the simulation tool SIMACLIM as a communication and decision support tool in order to visualize the impact of different measures on the overall aims of a region while at the same time becoming aware of their transnational impact, e.g. on the quality of the coastal area.

A short term goal is hence the implementation of SIMACLIM in the development of a regional management plan under consideration of societal goals and transnational impacts. Exemplarily for the different kinds of sites that are encountered in the urban-river-sea triangle, 4 sites have been chosen which are to a different extent influenced by the freshwater and the marine regime.



SIMACLIM – A COMMUNICATION AND SIMULATION TOOL

Decision makers need to address complex, partly conflicting interests and to balance legislation, societal, environmental and economic concerns. The communication and simulation tool SIMACLIM will illustrate these complex environmental processes and simulate different scenarios. SIMACLIM is set up in three steps:

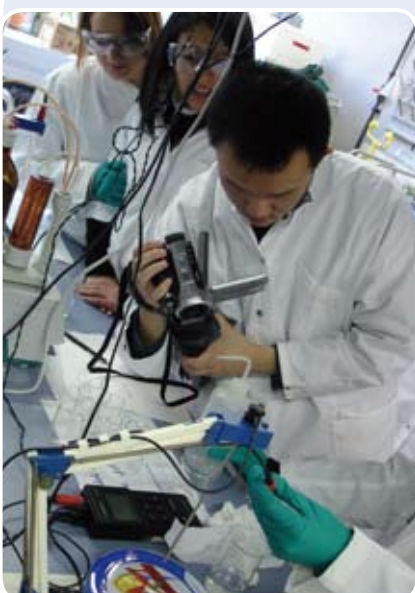
- Stakeholder objectives and societal goals need to be identified for a specific region.
- A conceptual site model is created showing the connectivity of stakeholder objectives and environmental parameters.
- An easily usable risk model, that is developed within diPol, is adapted to specific site conditions and used to demonstrate relative risks e.g. from environmental stressors to stakeholder objectives.

RISK ANALYSIS AND THE WEB BASED KNOWLEDGE PLATFORM

In order to develop SIMACLIM, 4 case sites have been selected reflecting a variety of different site characteristics and impacts of freshwater and marine processes (Inner Oslo-Fjord, Norway; Göta älv river, Gothenburg, Sweden; Wilhelmsburg in Hamburg, Germany; Harrestrup River and Kalveboderne Lagoon near Copenhagen, Denmark).

Tools to assess (toxicity profiling) and model (Scremotox) the impact of climate change on the coastal zone due the loads of rivers with toxic contaminants and mixtures are also applied and tested for the Rhine-Meuse estuary.

The data and experiences of these case sites are collected and visualized in a WEB BASED KNOWLEDGE PLATFORM which is supported by the Open Earth Initiative (www.openearth.eu).



EDUTAINMENT

The combination of EDUcation and enterTAINMENT has become a major pillar of the project.

School children representing our next generation play an important role in the communication of climate change impacts on water quality.

In diPol, they accompany the scientists during sampling surveys, get to know methods to analyse climate change impacts, and document the whole project by producing a documentary film from their perspective. This documentary will be widely distributed among schools and NGOs throughout the North Sea Region at the end of the project in order to raise awareness and commitment and to inform other communities of the importance of the issue.

