



DELTA IN TIMES OF CLIMATE CHANGE II

INTERNATIONAL CONFERENCE

OPPORTUNITIES FOR PEOPLE, SCIENCE, CITIES AND BUSINESS
 ROTTERDAM THE NETHERLANDS, 24-26 SEPTEMBER 2014

Deltas in Practice, policy-practice sessions	
Deltas in Practice Theme 2. Adaptation strategies	
DP 2.6 Towards an integrated estuarine management: Examples of innovative approaches	
Chair	Prof. Dr. Patrick Meire, University of Antwerp, Belgium
Organised by	Prof. Dr. Patrick Meire, University of Antwerp, Belgium
Presentations	<ul style="list-style-type: none"> ● MSc Tom Maris, University of Antwerp, Belgium ● MSc Yves Plancke, Antwerp Port Authority, Belgium ● MSc Stefaan Ides, Flanders Hydraulic Research, Belgium ● Prof. dr. Patrick Meire, University of Antwerp, Belgium ● MSc Wim Dauwe, Flemish Waterway Administration, Belgium ● MSc Youri Meersschaut, Maritime Access, Belgium ● MSc Lieven Nachtergaele, Nature and Forest administration, Belgium ● MSc Wim Dauwe, Flemish Waterway Administration, Belgium ● Prof.dr. Stijn Temmerman, University of Antwerp, Belgium ● Prof.dr. Mike Elliot, Hull University, United Kingdom ● Dr. Kirsten Wolfstein, Hamburg Port Authority, Germany ● MSc Manfred Meine, Hamburg Port Authority, Germany ● D r. Jean-Paul Ducrotoy, Seine Aval, France and University of Hull, IECS, United Kingdom ● Prof.dr. Tom Ysebaert, NIOZ and IMARES, the Netherlands ● Dr. Zhengbing Wang, Deltares and SKLEC, the Netherlands/China ● Prof.dr. M. Shahadat Hossain, University of Chittagong, Bangladesh
Session topic	<ul style="list-style-type: none"> ● The session consists of very short presentations delivering key messages estuarine managements. The messages consist of crucial scientific insights, management options, practical experiences and lessons learnt.
Objective of the session	<ul style="list-style-type: none"> ● The objective of this session is to discuss large scale management options to adapt towards increasing flood risks (rising sea levels, increased storm intensity, etc.) and human pressures (deepening, shipping, pollution, etc.), while maintaining a good ecological status. Experiences from the Scheldt estuary will be compared in an international context with approaches from Germany, France, United Kingdom, China and Bangladesh, where several estuaries face similar problems.
Main conclusions and lessons learnt from the presentations	
<p>Changes in fresh water inflow and nutrient influx due to climate change result in changes in primary production. When the balance between respiration and production gets disturbed, a regime shift can occur from a heterotrophic to autotrophic system.</p> <p>In the Scheldt Estuary the sigma plan aims at improving "blue and green". The plan developed from a plan to reduce flood risk to its present form in aiming adaptation to climate change and multi functional use of space combined with flood safety. A important part of the plan is the stakeholder management and participation. Some of the key elements mentioned are local ownership and taking into account emotional involvement of people.</p> <p>In the western Scheldt, tidal range has increased due to changes in morphology. Opposing factors are de-poldering and reduced flow resistance due to dredging. Management should aim at</p>	





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maintaining tidal range. To reduce an increasing tidal range, the entrance to estuaries can be modified by constructing islands to give increased flow resistance.

An ecosystem (ES) approach provides a framework for the services the system delivers and functions as a communication tool. The demand in a system is often clear, where as the supply is not. The ES approach can demonstrate how loss of one habitat can result in the loss of a bundle of ecosystem services. ES based adaptation focuses on a longer term than traditional engineering. Key methods are creating wetland and relocating the sea defence. There is a lot of potential for the ES approach for cities more than 50 km from the coastline.

Approaches in the UK. Challenges in Deltas are the same everywhere: to protect the natural system, and to meet the demands of people. Problems usually have one of three causes: too much is taken away, too much is being put in or the system itself changes due to climate change. A holistic approach is preferred. This means there has to be dealt with a lot of legislation on different levels.

The Elbe estuary typically has problems with the sediment transport. Tidal pumping occurs bringing sediment upstream. Solutions to reduce dredging and improve water quality involve a holistic plan incorporating state managed stretches as well as harbour controlled stretches. To minimise conflicts stakeholder management and public involvement are integral part of the approach.

Approach of the Seine. The measures to improve the Seine estuary are local. Some 'lessons learnt' are given:

- Put research into practice. Work on time scales from 100s to 1000s of years. Involve discharge and surface area, but also tide, wave and river characteristics and sediment fluxes.
- There is an ecological and sociological continuum from local to global. A reference situation might be hard to define. Rather focus on trends than on thresholds.
- A patrimonial view of the estuarine ecosystem. Focus on the ecosystem, not species to reduce the risk of 'fossilised' habitats. EU legislation sometimes conflicts by protecting habitats. We should allow species to adapt.

Comparisons between the Yangtze and Western Scheldt show in both cases a large interaction between human influences and ecology and changing morphology. Both estuaries are pushed out of their natural equilibrium by human interventions. The results are not always the same, e.g. in the Western Scheldt marshes are increasing in height, whereas in the Yangtze marshes are eroding. Strategies need to be reviewed in the light of climate change.

The case of Bangladesh shows ICZM on a local scale. Recovering from regular occurring cyclones involves increasing the resilience among local fishing villages because of their importance for the local economy. Villages are classified based on the presence of mangrove forests and embankments. Improvements focus on cyclone proof housing and infrastructure, making and repairing embankments, reforestation and local support to the community by providing fishing tools. Adaptation measures involve local training both on-farm and off- farm.

Main conclusions of the discussion

Conservational legislation is not well adapted to the expected (climate) changes in the future. The situation of the past is not coming back. Estuaries are not the primary target of nature





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conservation laws, and they do not work well here because of the dynamic character of estuaries.

The approach to improve estuarine quality depends largely on the resources available to the authorities. Along with legislation, there should also be modern technique to make new developments possible. The integration of knowledge and new insights into policy requires leadership and involvement of local communities.

Measures are related to economic momentum, population pressure and land use. A changing economic situation, such as the rise of bio fuels, increases the demand for land and makes land unavailable for estuarine development.

The occurring 'problems' in estuaries are often problems for humans, not for the estuary.

Main result or conclusion of the session

The occurring 'problems' in estuaries are often problems for humans, not for the estuary. The challenges are often the same. The approach depends on, among others, the availability of resources. New insights lead to a more holistic approach in estuarine management incorporating long term effects and local stakeholder involvement.

The integration of knowledge and new insights into policy requires leadership and involvement of local communities.

Most exciting insights or outcomes

- What works now, might not work in the future. Measures are related to economic momentum, population pressure and land use
- It is not always clear if a measure is good for ecology or the ecologist
- It does not work to forbid someone to catch shrimp if he is hungry

