2022 United Nations Ocean Conference Side Event

Reducing the ecosystem-based carbon footprint of coastal engineering

30 June, 9AM WEST, virtual side event

Organized by: Wetlands International, Witteveen+Bos, Deltares

Background on the event (one paragraph)

In its virtual side event Wetlands International, Witteveen+Bos and Deltares presented a new report 'Reducing the ecosystem-based carbon footprint of coastal engineering' in which we outline a simplified methodology for quantifying the ecosystem-based carbon footprint of coastal engineering projects. We also present potential options to reduce the carbon footprint, including through Nature-based Solutions. In the side event we facilitated a discussion among those that commission, finance, design or implement projects towards more climate and ecosystem friendly coastal engineering.

Key Issues discussed (5- 8 bullet points)

- Coastal ecosystems such as mangroves, sea grass meadows, salt marshes and unvegetated intertidal wetlands contain sediments that are often rich in organic carbon. Mangroves for example, typically hold five times as much carbon as a similar area of rainforest, with most of the carbon stored within the sediment.

- Coastal engineering projects like land reclamation, port development and coastal protection involve activities that interfere with the carbon cycle of sediments and coastal ecosystems, which can result in significant emissions, both on or off-site. This includes dredging and displacement of sediment, or activities that change the hydrological or sedimentation dynamics. Under some circumstances such disturbance causes previously sequestered carbon to be emitted as greenhouse gases.

- The new methodology presented in the new report that was presented simplifies the complexity of organic carbon cycling in coastal systems. It distils the most relevant information that needs to be assessed in the form of a 'sediment passport', based on which one can zoom in on those engineering activities that influence key carbon stocks and processes. This in turn helps to identify potential ways to reduce emissions or sequester carbon.

- The ecosystem-based footprint of coastal engineering projects can be reduced with the right adjustments. These include the more carbon-benign handling of sediments during dredging, the beneficial use of dredging sludge; for instance for wetland creation and restoration, or land

reclamation, and the careful release of dredged materials into the seascape. There are also opportunities to enhance blue carbon sequestration by applying the so-called Building with Nature approach that integrates Nature-based Solutions into water and marine engineering practice.

- Current efforts to reduce the carbon footprint from coastal engineering focus mostly on the emissions related to the deployment of construction vessels and the use of materials such as concrete and steel. However, the impact of these projects on the carbon balance of coastal wetlands may be far greater. Bringing these down is an important step for the sector to reduce emissions and enhance carbon sequestration in line with the Paris Agreement.

- Although the emissions arising from the burning of fossil fuels can be very thoroughly quantified, emissions from ecosystem and sediment disturbance have not, until now, been sufficiently accounted for. This study is a first step to address this discrepancy.

Key recommendations for action (5 - 6 bullet points)

- The ecosystem-based carbon footprint of coastal engineering is not yet accounted for – while it may be highly relevant in specific circumstances. In the report 'Reducing the ecosystem-based carbon footprint of coastal engineering' we identify existing legislation and policies that enable climate- and ecosystem-friendly hydraulic engineering, along with recommendations to further strengthen the policy environment and associated financial incentive mechanisms.

- There is a need to better understand this ecosystem-based carbon footprint, and while it would be useful to go through a selection of cases in depth, there is also a need to distill practical guidance from that, with rules of thumb and a decision tree to help identify when carbon foot printing is relevant, i.e. which interventions and areas are high risk and which are not.

- We need to embrace a holistic approach, that also clarifies (and values) synergies between adaptation and mitigation, biodiversity and people benefits. Scale in space and time is also relevant: ideally landscape scale (ICZM) and long-time scales.

- Such understanding opens the way for development of financial and policy incentives that would enable more climate and eco-friendly engineering. But all actors need to collaborate and take responsibility – including clients (public/private), development banks, scientists and NGOs.

- We encourage stakeholders to use this methodology, share data and findings, in order to enable its continued improvement and global uptake.

Voluntary Commitments (one paragraph)

Wetlands International, Witteveen+Bos and Deltares will continue to work with those that commission, finance, design or implement projects towards more climate and ecosystem friendly coastal engineering. With those players, we will identify case studies to test the new methodology presented in the report 'Reducing the ecosystem-based carbon footprint of coastal engineering' to increase understanding and to distill practical guidance to enable actions already now. We will also encourage development of financial and policy incentives that will enable more climate and eco-friendly engineering.