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The Lippensbroek polder as a case study for the innerdike restoration of ecosystem structures and functions.

D. Jaminé[1,2] & P. Meire[1]
[1] *Ecosystem Management Research group, University of Antwerp*
[2] *Ministry of the Flemish community, AMINAL Nature Division*

In the framework of the SIGMA plan, Flemish authorities (Waterways and Maritime Affairs Administration, division Sea Scheldt) plan a large controlled inundation area (CIA) in polders (Kruibeke-Bazel-Rupelmonde, 578 ha) along the freshwater - oligohaline border of the Scheldt estuary. Beside fulfilling an important role in enhancing safety against flooding, a CIA could contribute to the restoration of degraded ecosystem functions and habitats by implementing specific management options. However, as the outcome of some management types on ecosystem structures and functions are still uncertain, preliminary projects on a smaller scale must yield adequate information to allow, if necessary, appropriate adaptations. In the pilot project 'Lippensbroek', a management scenario for the northern part of the future Kruibeke-Bazel-Rupelmonde CIA will therefore be tested beforehand on an innerdike area of 10 ha. Carefully designed sluices will allow the exchange of limited amounts of Scheldt water, causing a semidiurnal submersion of ca. 0.5 m. Additionnaly, submersions with larger water quantities will occur on a less regular base during storm floods. We discuss the present and future hydrologic regime of the Lippensbroek polder, together with the necessity of a multidisciplinary program to monitor the restoration of ecosystem structures (fresh water tidal marshes, mudflats, creeks, etc.) and functions (nutrient cycling, storage capacity enhancement, sediment retention, biodiversity and habitat support, etc.).