SUSTAINABLE MANAGEMENT OF THE BALTIC SEA AND FRESHWATER RESOURCES

Case study Gulf of Finland

Impacts of Vuosaari harbor construction works on the coastal ecological status

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SYKE

Baltic BOOST

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Construction: 2003-08

Activities

- Land fill: 19 ha
- Dredging: 5.86 mill. m^3
- Dumping: 5.86 mill. m^3
- Sand extraction: 6.32 mill. m^3

Pressures

- Sealing
- Extraction

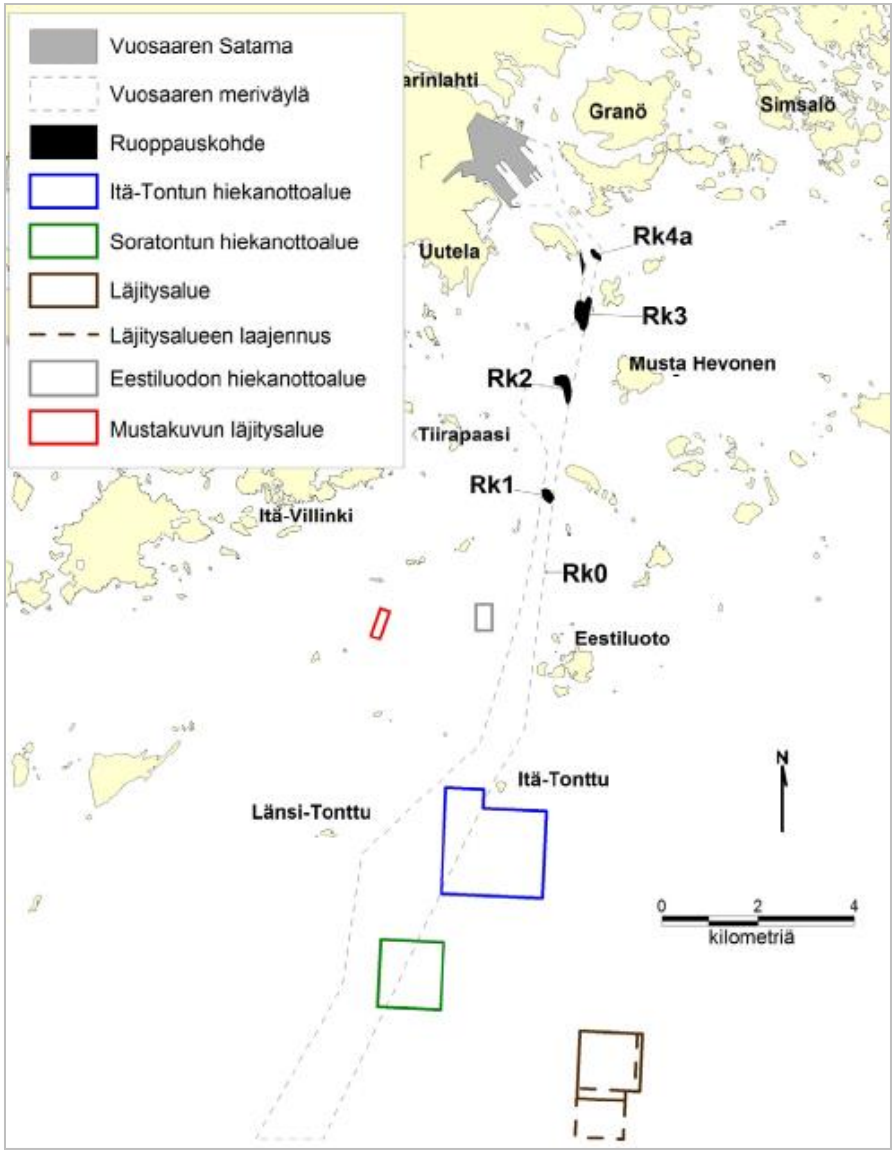
} Physical loss

- Siltation
- Smothering

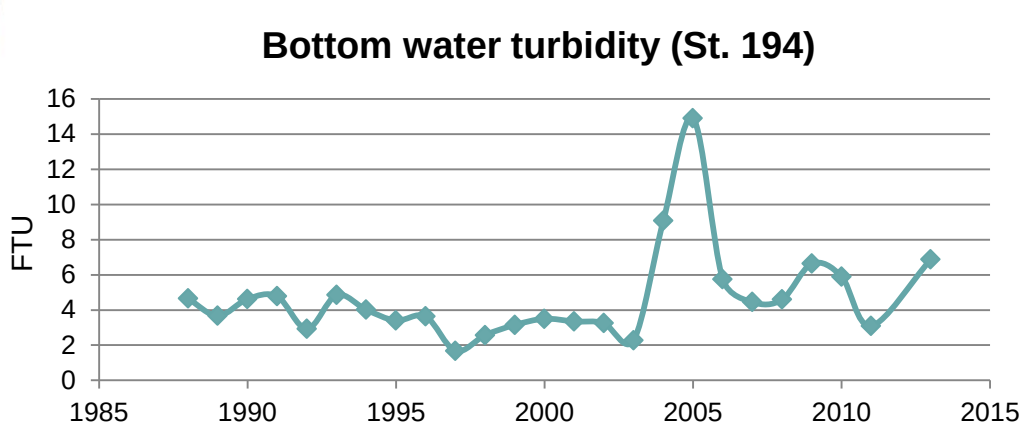
} Physical damage

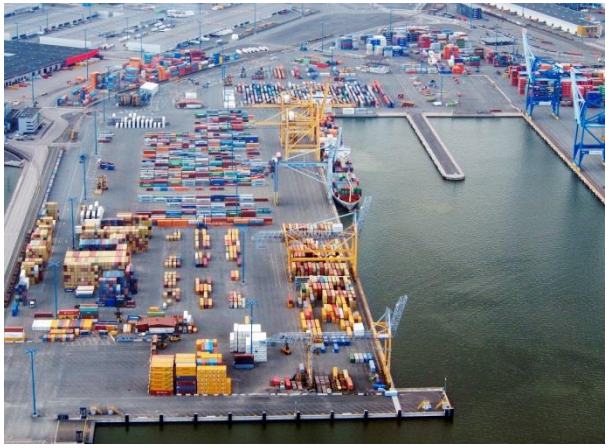
Impacts & States

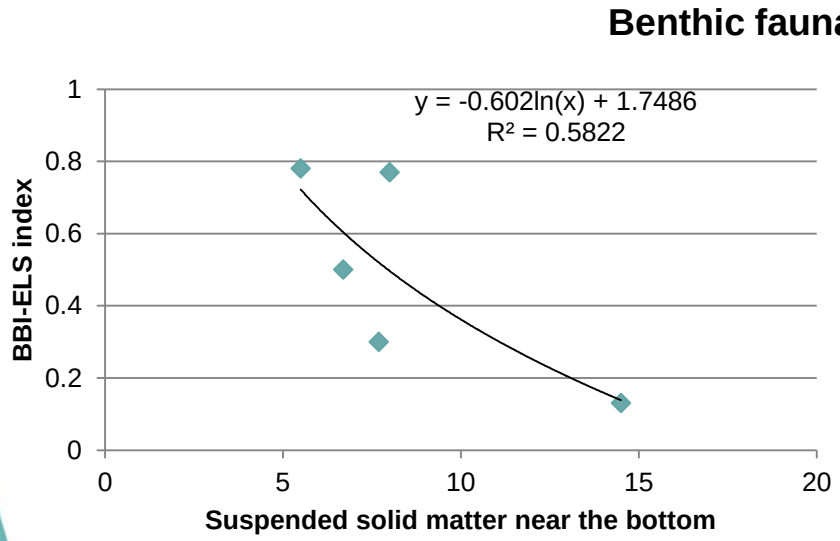
- Brackish water Benthic Index
- Depth limit of *Fucus vesiculosus*
- Turbidity and suspended solids

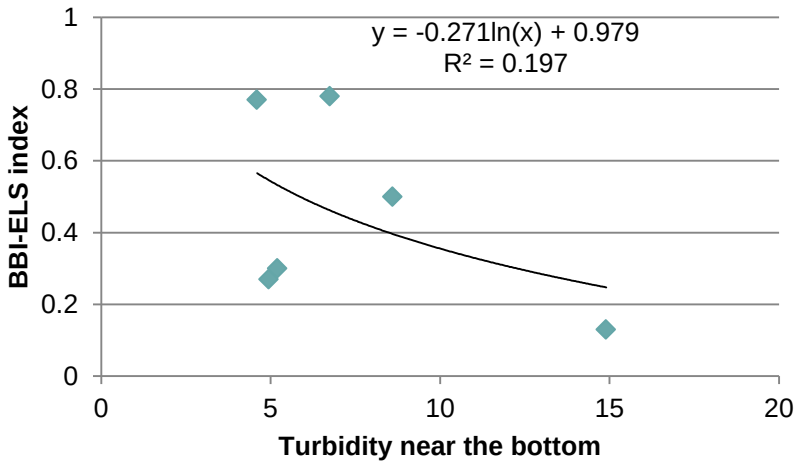


Results









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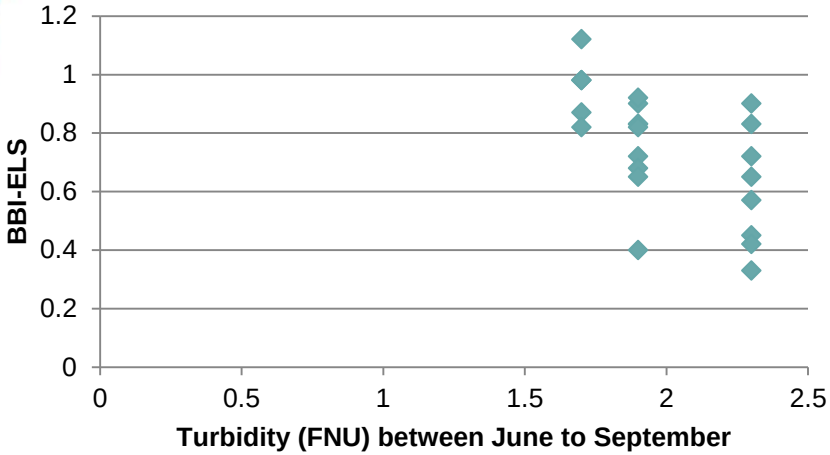
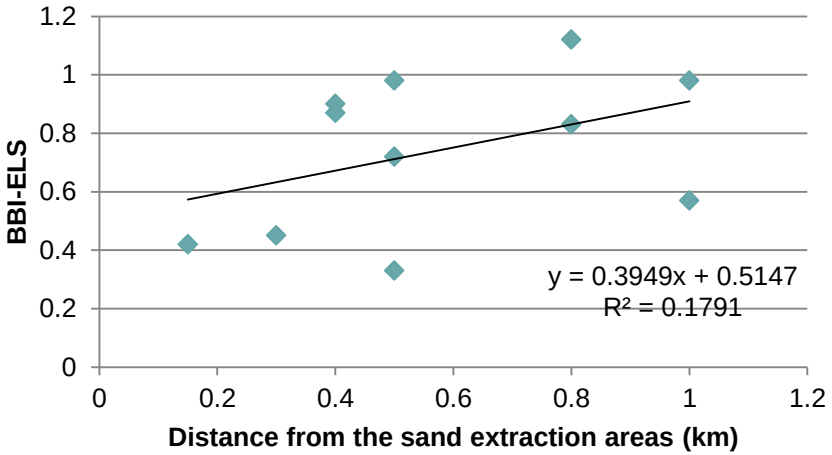
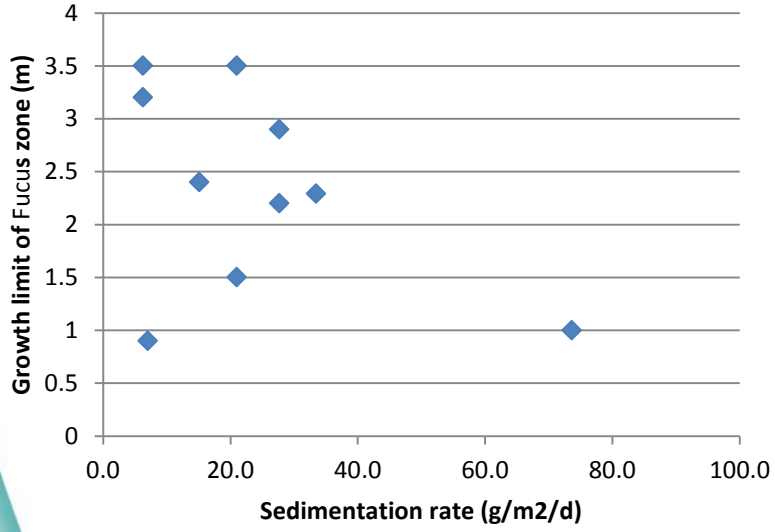
Results

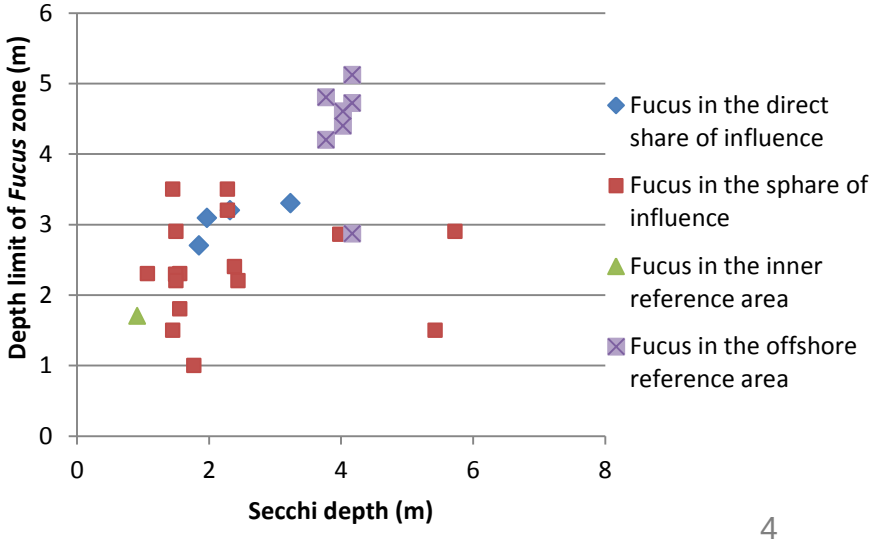
Benthic fauna in sand extraction areas





Bladderwrack distribution





Summary

- Data availabilty to calculate ’state indicators’ restricted
- Indicators not designed for physical pressures

  → hard to find pressure-impact relationships in ecological status indicators

- Physical loss in the core activity areas
- Other effects maily casued by increased suspended solids and turbidity, leading to increased sedimentation rates
- After dumping activity turbidity levels return to background levels within 2 hours – 2 days
- High background turbidity especially in inner archipelago

Summary

- Benthic fauna recovery in core areas:
  - Disposal: density fully recovered but species richness only to 50% within 4 years
  - Dredging: density recovered in 4-6 years (0.5 km distance)
  - Sand extraction: no recovery after 6 years
- Impacts on benthic fauna in adjacent areas:
  - 0.15 km: 92 % reduction in density
  - 0.5 km: 64-87% reduction in density, 45 reduction in biomass,
  - 1 km: 67-74% reduction in density
- Impacts on bladderwrack coverage
  - 0.5 km: 65-86% reduction in coverage
  - 1 km: 50-95% reduction in coverage
- Other impacts:
  - Change in population structure of *Macoma balthica*
  - 50% reduced herring spawning success