Challenges of marine accounting

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Brief introduction of marine accounting projects in SYKE

- ESTAT projects (2018, 2019, 2021-2023): One of the focuses is accounting on fish resources, considering food web interactions and including reactional fishing (pilot supply and use accounts, asset accounts)
- MERIAVAIN project (2018-2021): Developing valuation framework for marine ecosystem services (ES) from different key marine habitat types, following SEEA EA
  - Evaluation of valuation methods and existing data sources for a pilot case area, according to the requirement for marine accounting (SEEA EA)
  - Common reed for bioenergy, ferromanganese (abiotic services), climate regulation (carbon storage and sequestration), water quality control (nutrient removal), oil waste decomposing, recreational services
- MAREA project (2020-2022): Embed ecosystem services mapping, environmental accounting and sustainability assessment into integrated governance for sustainable planning on marine and coastal areas
  - Continue work of MERIVAIN, focusing on trade-offs of services and feedbacks
- MAIA project: More in the next presentation

SYKE MAREA EUROPEAN UNION European Regional Development Fund Interreg Central Baltic EUROOPAN MERI- JA KALATALOUSRAHASTO SUOMEN TOIMINTAOHJELMA 2014-2020 Elinkeino-, liikenne- ja ympäristökeskus MAIA Mapping and Assessment for Integrated ecosystem Accounting

Challenges of marine accounting

- The challenges introduced in this presentation mainly based on the experiences from our projects
- Mainly related to data: lack of data, mismatch of data (e.g., different units used in bio-physical ES assessments and valuation studies), not all valuation methods applicable for accounting, spatial scaling
- Challenges of marine accounting
  - Provisioning services
  - Regulating services
  - Cultural services
  - Other general challenges for marine accounting

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Provisioning services

- Accounting for fish resources
  - The linkage to habitat (extent) and ecosystem condition account
    - Migration of fish, different age groups live in different habitats

    →how assess the contributions of nursing, feeding and other function from specific habitats and their condition to fish stocks and their services.
  - Monetary asset account
    - Requires proper bio-economic models that can consider the food web interactions, and both catch from commercial and recreational fishing, to predict the expected ES flows in the future
      - Lack of proper models to predict expected ES likely happen for some of other ESs, especially when multiple ESs from an ecosystem asset has trade-off among each other
    - Policies and future ecosystem service use

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Regulating services

- Map types of ecosystem extent
  - Unlike terrestrial ecosystem that can be easily identified
  - Map types of ecosystem extent are different in marine ecosystem types, overlap issues
- Mismatch of the data (e.g., unit) from extent, condition, services to valuation
  - Require well planning in advance when collecting the data for the accounting
- Data availability for the physical unit of ES at the ecosystem type level
  - E.g., Water quality control: estimating net nutrient sink/year at the Baltic Sea level is possible, base on the nutrient status in the water and nutrient input, but estimation on net nutrient sink rate at the ecosystem type level is lacking

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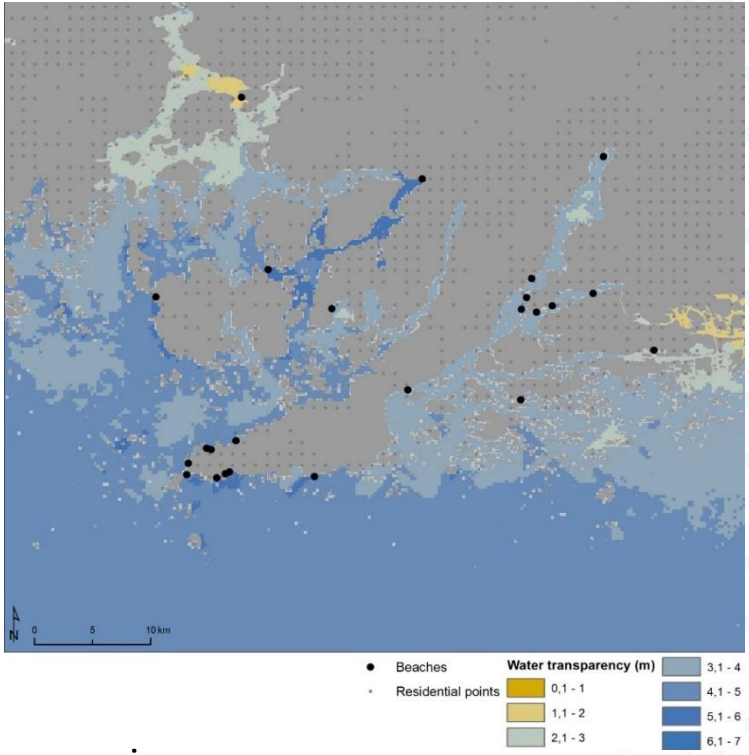
Cultural services

- Recreational fishing
  - Require regular statistic
  - How to link different habitats
- Other Recreational services (e.g., swimming)
  - The linkage from habitat → function/condition→ services are hard to establish
    - Only a few travel cost models include the effect of ecosystem condition (water quality, biodiversity) on behavior change



- Partly due to some important recreational services happen in coastal areas
- Mismatch of the condition indicators used in the survey for travel cost methods and the condition indicators estimate in the ecological studies

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Other challenges in general

- Scope: ecosystem scope vs. national scope (exclusive economic zone (EEZ))
  - Fish migration across EEZ, and the estimation of the stock should base on ecosystem scope
  - Some condition indicators e.g., levels of nutrients and hazardous substances, also do not have boundary → the ES that controls these substances could also have an effect across the boundary
- 3-Dimension characteristics of the marine environment
  - Some condition indicators (e.g., levels of nutrients, species) may vary in deepness
- How to link pressure or feedback of specific use of ES to ecosystem extent, condition (ecosystem degradation) → original or other ESs
  - An assumption case of common reed for bioenergy and mining potential on ferromanganese concretion

Some of the issues may be mentioned or partly solved in the next presentation

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END

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