Natural Capital Accounting in the North-East Atlantic

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The values included in this presentation are just first estimates and should be treated with caution.
The Convention for the Protection of the Marine Environment of the North-East Atlantic:

- Region I: Arctic Waters
- Region II: Greater North Sea
- Region III: Celtic Seas
- Region IV: The Bay of Biscay and Iberian Coast
- Region V: Wider Atlantic

*This initial attempt of NCA for the OSPAR area has been prepared by the Netherlands in its capacity as a Contracting Party of the OSPAR Convention*
The **elements of nature** that directly and indirectly produce value or benefits to people, including ecosystems, species, freshwater, land, minerals, the air and oceans, as well as natural processes and functions.

### Natural Capital

#### Ecosystem capital:

<table>
<thead>
<tr>
<th>Ecosystems as assets:</th>
<th>Ecosystem service flows:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent, structure and condition of:</td>
<td>Provisioning services, e.g. food, fibre, and energy</td>
</tr>
<tr>
<td>e.g. forests, woodlands, rivers, lakes, oceans, coasts, wetlands, grasslands, croplands, heathlands and urban parks</td>
<td>Regulation and maintenance, e.g. of climate, river flow and pollination</td>
</tr>
<tr>
<td></td>
<td>Cultural services, e.g. recreation in nature and spiritual use of nature</td>
</tr>
</tbody>
</table>

#### Abiotic assets:

- **Solar radiation**
- **Renewable energy**, e.g. solar, wind and hydro
- **Minerals, fossil fuels, ozone layer, gravel, etc.**

#### Abiotic flows:

- **Phosphate fertiliser**, radiation protection, etc.

#### Depletable

- Non-depletable

**Note:** Global solar radiation is constant above the atmosphere and hence considered a stable asset.

Source: (European Commission, 2013; European Environment Agency, 2019)
The System of Environmental- Economic Accounting (SEEA) integrates economic and environmental data to measure interrelationships between the environment and the economy.

SEEA Ecosystem Accounting (2021) extends accounting to the spatial domain, per ecosystem.

However, neither the SNA nor the SEEA CF were designed for accounting for ES or ecological capital.
SEEA Ecosystem Accounting

- **Extent Account**
  - e.g. forest area

- **Ecosystem Condition**
  - e.g. biomass

- **Physical Ecosystem Services**
  - e.g. timber (m³)

- **Monetary Ecosystem Services**
  - e.g. timber (€)

- **Monetary Ecosystem Asset**
  - e.g. stock (€)

Source: https://www.ted.com/talks/lars_hein_natural_capital_accounting
OSPAR interest in SEEA EA

Good ecosystem status ➔ Quality Status Report ➔ DAPSIR

Overcome silos

North-East Atlantic Environment Strategy

Ecosystem and Natural capital accounting **OSPAR Operational objective 7.03**

Overlaps or synergies between DAPSIR and NCA
1. Extent account

“Organize data about the extent or area of the various ecosystem types, differentiating between the different Ecosystem Assets present in the Ecosystem Accounting Area”

- Recommendations agreed to consider the IUCN Global Ecosystem Typology (GET) as a “reference classification” but not available at the OSPAR level

→ the EMODnet broad-scale seabed habitat map for Europe (EUSeaMap 2019) used
Good starting point, ~70% of the OSPAR area identified.

Baseline for future accounts

<table>
<thead>
<tr>
<th>Ecosystem type</th>
<th>Extent area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2: Littoral sedimentary habitats*</td>
<td>14,989</td>
</tr>
<tr>
<td>A3: Infra-littoral rock and other hard substrata</td>
<td>2,430</td>
</tr>
<tr>
<td>A4: Circalittoral rock and other hard substrata</td>
<td>2,851</td>
</tr>
<tr>
<td>A5: Sublittoral sediment</td>
<td>6,785</td>
</tr>
<tr>
<td>A6: Deep-sea sediment</td>
<td>4,200,113</td>
</tr>
<tr>
<td>Total Area</td>
<td>9,237,542</td>
</tr>
</tbody>
</table>
2. Condition account

“Records the condition of ecosystem assets in terms of selected characteristics at specific points in time. Over time, they record the changes to their state and provide valuable information on the health of ecosystems.”

Indicators

Marine ecosystems

Coastal ecosystems

Status

Pressures

Biodiversity status

- Marine Birds
- Marine Mammals
- Fish
- Food webs
- Benthic habitats
- Pelagic habitats
- Food webs
- Oil and gas extraction
- Underwater noise
- Marine litter
- Non-indigenous species
- Bycatch

- Climate Change
- Eutrophication
- Atmospheric and riverine inputs
- Radioactive substances
3. Physical supply and use accounts

“The supply and use tables intend to record the flows of final ES supplied by ecosystem assets, and used by economic units during an accounting period”

- The marine natural capital accounts published by the Netherlands and UK are used as main guidance.

- The ES flow accounts in physical terms include the supply of final ES by ecosystem type and the use of the services selected by economic units.

- The economic units distinguish between households, enterprises and government, and constitute one of the central features of ecosystem accounting.

### Ecosystem services

<table>
<thead>
<tr>
<th>Provisioning services</th>
<th>Fish Provisioning Aquaculture Provisioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulating services</td>
<td>Carbon sequestration</td>
</tr>
<tr>
<td>Cultural services</td>
<td>Outdoor recreation</td>
</tr>
</tbody>
</table>

### Abiotic flows

- Renewable electrical energy from wind power
- Extraction of oil and gas
- Extraction of minerals (sand & gravel)
4. Monetary supply and use accounts

ES in monetary terms are based on multiplying estimated prices for individual ES with physical quantities.

- The estimations used are calculated by benefit transfer from other studies conducted within the OSPAR area.
- Benefit transfer is the projection of benefits from one place and time to another time at the same place or to a new place. Thus, benefit transfer includes the adaptation of an original study to a new policy application at the same location or the adaptation to a different location.
5. Monetary asset account

- Information on stocks and changes (additions and reductions) of ecosystem assets.
- This includes accounting for ecosystem enhancement and degradation.
- Beyond GDP value
Asset value of 125.75 EUR billion, wherein more than 40% value comes from carbon sequestration and outdoor recreation (which are underestimated).
Some first lessons learned and final remarks

- **Ecosystem extent account:**
  - 2d maps are available, but the sea is 3d. Additional challenge!
  - Lack of timeseries to record changes

- **Condition account:**
  - Lots of data available. What to choose?
  - Most OSPAR condition indicators not focus on water column or compiled by ecosystem type (too weighted towards animal/species indicators)

- **Ecosystem services:**
  - Include more ecosystem services in the next version of accounts
  - Links with other accounts (ecosystem types, condition)

- **Monetary accounts:**
  - Valuation still controversial, methodology substantial impact on results
“This is a historic step forward towards transforming how we view and value nature. We will no longer be heedlessly allowing environmental destruction and degradation to be considered economic progress.”

UN Secretary-General António Guterres