Ocean Accounts
Plans and Priorities

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Overview

1. Background
2. SEEA: A reminder
3. Oceans
   - Why are they different?
   - How can SEEA help?
4. Implementing ocean accounts
   - Partnerships
   - Capacity needs assessment
   - Case studies & pilots
   - Regional expert workshop (Bangkok, 1-3 August, 2018)
5. Discussion
1. Background

• Member States have asked ESCAP for support for
  • Regional cooperation
    • On the conservation and sustainable use of the ocean
  • Regional partnerships
    • For enhancing data and statistical capacities for Goal 14

• This requires
  • Assessing governance, institutions and data needs
  • Building and applying evidence
  • Providing guidance on data and statistics
  • Engaging in international, regional and national partnerships
Three solitudes...

I don’t have data on that.

Why is the ocean so important?

We need a “killer” indicator.
...or convergence?

- Ask the right questions
- Official Statistics
- Policy
- Evidence based policy
- Work together
- Common priorities
- Efficient data collection
- Science
- Data collectives

We can help decide what to measure and how!

You should know this!

How can we sustain benefits from the ocean?

ESCAP - Environment Statistics Overview
Governing the ocean needs “Big Statistics”

+ Big Science
+ Big Policy

• A common language:
  • Standards: Concepts, Classifications, Methods

• To:
  • Integrate what we already know and identify gaps
  • Collaborate on solving and avoiding problems ➔ evidence
  • Put it into context ➔ messaging ➔ “killer” indicators
  • Ensure quality, coherence and relevance

• Environmental-economic accounting is “Big Statistics”
  • A integrated framework ➔ standards
  • Combine data from different sources ➔ coherent
  • Link to economic accounts ➔ relevance
2. SEEA: A reminder

Stocks (P & Q)
- Minerals & energy
- Land, Soil
- Timber
- Aquatic
- Other biological
- Water
- Ecosystems + conditions

Flows (P & Q)
- Materials
- Energy
- Water
- Ecosystem services

Residuals (Q)
- Solid waste
- Air emissions
- Effluents
- Ecosystem impacts

Environment

Economy
- Production
- Consumption
- Accumulation
- Imports
- Exports

Mitigate & Manage (P)
- Protection $
- Goods & Services
- Taxes & subsidies

Benefits/Costs
- SNA: Contribution of natural inputs to economy (rent)
- Depletion, degradation adjusted net savings
- Non-SNA: Contribution of natural inputs to well being
- Externalities (health, poverty)

National wealth
- National Balance Sheet
- Resource life
- “Critical” Natural Capital

P = Price (monetary value)
Q = Quantity (physical)
SEEA-Ecosystems (spatially detailed)

**Physical**

- **Thematic**: Land, Water, Carbon, Biodiversity
- **Extent**
- **Condition**

**Monetary**

- **Asset**

**Services Supply**

**Services Use**

**Tools**: Valuation techniques, Classifications, Spatial units, scaling & aggregation, Biophysical modelling

**Supporting**: SNA, I-O tables, economic production functions

**Augmented I-O Table**

**Integrated Sector Accounts and Balance Sheets**
A note on valuation of ecosystem services

<table>
<thead>
<tr>
<th>Section</th>
<th>Division</th>
<th>Group</th>
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</thead>
<tbody>
<tr>
<td>01. Provisioning</td>
<td>01.01 Nutrition</td>
<td>01.01.01 Biomass</td>
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<td>01.01.02 Water</td>
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<td>01.02 Materials</td>
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<td>01.02.02 Water</td>
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<td></td>
<td>01.03 Energy</td>
<td>01.03.01 Biomass-based energy sources</td>
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<td></td>
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<td>01.03.02 Mechanical energy</td>
</tr>
<tr>
<td>02. Regulation &amp; Maintenance</td>
<td>02.01 Mediation of waste, toxics and other nuisances</td>
<td>02.01.01 Mediation by biota</td>
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<td>02.01.02 Mediation by ecosystems</td>
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<td>02.02 Mediation of flows</td>
<td>02.02.01 Mass flows</td>
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<td></td>
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<td>02.02.02 Liquid flows</td>
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<td>02.02.03 Gaseous / air flows</td>
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<td></td>
<td>02.03 Maintenance of physical, chemical, biological conditions</td>
<td>02.03.01 Lifecycle maintenance, habitat and gene pool protection</td>
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<td>02.03.02 Pest and disease control</td>
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<td>02.03.03 Soil formation and composition</td>
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<td></td>
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<td>02.03.04 Water conditions</td>
</tr>
<tr>
<td></td>
<td>03. Cultural</td>
<td>02.03.05 Atmospheric composition and climate regulation</td>
</tr>
<tr>
<td></td>
<td>03.01 Physical and intellectual interactions with biota, ecosystems, and land-/seascapes [environmental settings]</td>
<td>03.01.01 Physical and experiential interactions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>03.01.02 Intellectual and representative interactions</td>
</tr>
<tr>
<td></td>
<td>03.02 Spiritual, symbolic and other interactions with biota, ecosystems, and land-/seascapes [environmental settings]</td>
<td>03.02.01 Spiritual and/or emblematic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>03.02.02 Other cultural outputs</td>
</tr>
</tbody>
</table>

**SNA Benefits**
- Should be in SNA
- Benefits produced by economic units
- Potential to be marketed
- If require capital, labour…(e.g., timber)
  - Value ecosystem’s contribution (rent)
- If no capital, labour…(e.g., wild food)
  - Value at market price
  → Correct undercounting in SNA

**Non-SNA Benefits**
- Should NOT be in SNA
- Produced by ecosystems (e.g., water regulation, pollination, air purification)
- NO potential to be marketed (but have carbon markets and PES)
- Better to have reliable physical measures
- View as part of national wealth
  → Demonstrate “importance” to well-being

Source: CICES, 2013. [www.cices.eu](http://www.cices.eu)
## Services Supply in physical units

<table>
<thead>
<tr>
<th>Ecosystem service</th>
<th>Units</th>
<th>Urban</th>
<th>Pasture</th>
<th>Cropland</th>
<th>Forest</th>
<th>Heath</th>
<th>Peat</th>
<th>Surface Water</th>
<th>Other nature</th>
<th>Provincial total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunting</td>
<td>kg meat</td>
<td></td>
<td></td>
<td>14,732</td>
<td>8,100</td>
<td>678</td>
<td>70</td>
<td>1,513</td>
<td></td>
<td>34,193</td>
</tr>
<tr>
<td>Drinking water</td>
<td>$10^3$ m$^3$ water</td>
<td>4,071</td>
<td>7,026</td>
<td>11,227</td>
<td>3,117</td>
<td>214</td>
<td>-</td>
<td>478</td>
<td>862</td>
<td>26,995</td>
</tr>
<tr>
<td>Provisioning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop production</td>
<td>$10^6$ kg produce</td>
<td></td>
<td></td>
<td>1,868</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,868</td>
</tr>
<tr>
<td>Fodder production</td>
<td>$10^6$ kg dry matter</td>
<td></td>
<td></td>
<td>533</td>
<td>251</td>
<td>784</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air quality regulation</td>
<td>$10^3$ kg PM$_{10}$</td>
<td>272</td>
<td>404</td>
<td>717</td>
<td>700</td>
<td>45</td>
<td>7</td>
<td>40</td>
<td>69</td>
<td>2,254</td>
</tr>
<tr>
<td>Carbon sequestration</td>
<td>$10^6$ kg carbon</td>
<td>875</td>
<td>8,019</td>
<td>273</td>
<td>50,664</td>
<td>393</td>
<td>149</td>
<td>-</td>
<td>1,056</td>
<td>61,429</td>
</tr>
<tr>
<td>Cultural</td>
<td>$10^3$ trips</td>
<td>2,690</td>
<td>1,863</td>
<td>2,611</td>
<td>1,565</td>
<td>30</td>
<td>3</td>
<td>139</td>
<td>220</td>
<td>9,121</td>
</tr>
</tbody>
</table>

**Source:** Remme et al., 2014 (Limburg, the Netherlands)
3. The Ocean
Different kind of “land cover” and “ecosystems”

- They’re very large
- Water keeps moving (currents, upwelling)
- Multi-layer (pelagic, benthic)
- All looks the same from a satellite (water or ice)
- Trans-boundary / shared / Most outside of national jurisdictions
- Less studied / known / measured
- SEEA not tested

- ESCAP YouTube Video; UN Environment: Ocean Pollution
Many SEEA accounts $\rightarrow$ many related SDGs

SEEA: Central Framework + Ecosystems
We have the technology!

**National Spatial Data Infrastructure (NSDI)**
- SEEA Ecosystem extent
  - Terrestrial and Freshwater ecosystem types (Land Accounts)
  - Coastal communities
  - Coastal infrastructure
  - Pollution sources

**Oceans spatial units**
- Ocean ecosystem types
- Marine protected areas
- Fishery, tourism, mining areas
- Water quality / temperature

**National statistics**
- Emissions, effluents, wastes
- Assets: fish stock
- Supply/use: catch, beneficiaries

**Analyses**
- Main sources of land-based pollution (by whom)
- Value of natural inputs (to whom)
- Cost/benefit of rehabilitation and protection
- Policy options → values at risk
- Capture of “rent” (returns on investment)
### Figure 1 A stylized set of ocean accounts

#### Ocean Assets:

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Ocean Extent</th>
<th>Ocean Services Supply (physical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific units</td>
<td>Industry</td>
<td>% to ocean</td>
</tr>
<tr>
<td>SEEA Air emissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEEA Effluents¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEEA Solid wastes¹</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ would benefit from spatial disaggregation

#### Ocean governance

<table>
<thead>
<tr>
<th>Ocean governance</th>
<th>Ocean Conditions</th>
<th>Ocean Services Use (physical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific units</td>
<td>Industry</td>
<td>Specific units</td>
</tr>
<tr>
<td>Policies, plans and regulations</td>
<td></td>
<td>Acidification (pH)</td>
</tr>
<tr>
<td>Institutions</td>
<td></td>
<td>Eutrophication (BOD)</td>
</tr>
<tr>
<td>Management practices</td>
<td></td>
<td>Plastics (T)</td>
</tr>
<tr>
<td>Technologies</td>
<td></td>
<td>Temperature (°C)</td>
</tr>
<tr>
<td>SEEA LPE</td>
<td></td>
<td>Accessibility/quality</td>
</tr>
</tbody>
</table>

² Including critical natural capital areas, settlements, coastal infrastructure, protected areas, fishing zones, designated tourist areas, coral reefs, mangroves, coastal beaches.

#### Note:

This is a stylistic representation of the SEEA-EEA with additional components required for including sources of land-based pollution, abiotic services (such as minerals, energy and medium for transport), expenditures and governance. This is not as comprehensive as described in the text. Much of the data on flows of land-based pollution, ecosystem types, and condition would be derived from detailed maps and aggregated as shown in the tables for reporting.

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**SEEA Mineral and Energy Assets; SEEA AFF**

**Ocean Services Supply (physical)**

<table>
<thead>
<tr>
<th>Service</th>
<th>Ecosystem Types (ha)</th>
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<tbody>
<tr>
<td>Provisioning</td>
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<td>Regulating and maintenance</td>
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<tr>
<td>Cultural</td>
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<tr>
<td>Abiotic: Minerals, energy, medium for transport</td>
<td></td>
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</tbody>
</table>

**Ocean Services Use (physical)**

<table>
<thead>
<tr>
<th>Service</th>
<th>Beneficiary type³</th>
</tr>
</thead>
<tbody>
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<td>Provisioning</td>
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**Ocean Services Supply (Monetary⁴)**

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**Ocean Services Use (Monetary⁴)**

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</tbody>
</table>

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**SNA for some services⁵**

⁵. Would benefit from disaggregation by large/small enterprise and linkage to employment by beneficiary type.

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**Ocean Accounts: Plans and Priorities**

http://www.unescap.org/our-work/statistics
Implementing ocean accounts

• Partnerships
  • International, regional and national
  • UNSC: ESCAP & UNEP lead SEEA ecosystems revision on ocean

• Capacity needs assessment
  • Review national ocean priorities, policies, institutions, data

• Case studies & pilots (Indonesia, Fiji, others?)
  • Assessment, establish working group, compile priority accounts

• Regional expert workshop (1-3 August, 2018)
  • Draft guidance on data and statistics (10 issue briefs)

• Future
  • Coordinated implementation
    • e.g., neighbouring countries to address transboundary issues
  • Regional & national “centres”: data hubs and research
Many stakeholders → many partnerships

Plus other UN inter-agency and supported
• GESAMP: Joint Group of Experts on the Scientific Aspects of Marine Environment Protection
• GEF: Global Environment Facility
• IPCC: Intergovernmental Panel on Climate Change
• OneSharedOcean
• UNEP: Global Programme of Action for the Protection of the Marine Environment from Land-Bases Activities (GPA)
• DOALOS: The Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects
• UN Environment: Coordinating Body on the Seas of East Asia (COBSEA); International Coral Reef Initiative (ICRI)
• World Bank: the Pacific Islands Regional Oceanscape Program (PROP)

International
• OECD: Ocean Economy
• GEO: Blue Planet

Regional
• APEC (Asia-Pacific Economic Forum): Ocean and Fisheries Working Group
• ASEAN: Southeast Asian Fisheries Development Centre (SEAFDC)
• CROP: Council of the Regional Organisations in the Pacific
• FAO: Asia-Pacific Fisheries Commission (APFIC)
• PEMSEA: Partnerships in Environmental Management of the Seas in East Asia

Academic
• ICSU: International Council for Science
• Journal of Ocean and Coastal Economics

See the concept note for a more complete list
A partner mapping (to be continued)
Capacity needs assessment

• **Currently via online questionnaire and interviews:**
  • National priorities for the ocean?
  • Capacity to address SDG14
  • Policies, regulations, frameworks, institutional mechanisms
  • Obstacles, challenges; priorities for development
  • Priority SDG14 targets
  • Stakeholder engagement

• **Overview of regional needs → ESCAP strategy**
Case studies and pilots (in progress)

• **Scoping study (more detailed than capacity needs)**
  - National vision, policies, regulations, institutions, plans
  - Policy gaps, incoherence, good practices
  - Data providers, users and stakeholders

• **National working group (some already exist)**
  - Integrate data for priority subset of ocean accounts
  - Release pilot accounts, publish selected data
Regional expert workshop: Bangkok, 1-3 Aug. 2018

• 60+ national, regional and international experts

• Coordinate contributions now
  • Groups of 3-4 experts develop: issue, options, recommendations
  • Plenary discussions of preferred options

• Keynote lectures: Statistics, Science, Governance

• Result in guidance document for SEEA revision and implementation of case studies
Regional expert workshop: Bangkok, 1-3 Aug. 2018

• The issues (so far):
  1. Spatial units and ecosystem classification: delineating units
  2. Ecosystem services: expand on existing classifications
  3. Disaster risk and climate change: establish linkages
  4. Links to social concerns: communities, artisanal, target groups
  5. Links to economic concerns: valuation and links to SNA
  6. Global data: What’s available and how to use it
  7. Progress on measuring SDG14: indicator metadata
  8. Ocean governance: international, regional and national
  9. Modelling the ocean: experience and opportunities
 10. Others?
Good news!

- Accounts don’t need to be complete to be useful
- There is international interest and support
  - Oceans Conference; United Nations Statistical Commission
  - Partnerships
  - Focus on governance
- ESCAP to support partnerships for governance, data and statistics
  - Horizontal (topic, country) and vertical (international, regional)
- Other countries have already done parts
  - European Environment Agency workshop (Mar. 2016)
  - Some national data online: Thailand
  - Australia, NZ, NOAA, OECD: marine economy
Take home points

• SEEA is a good starting point for statistical guidance for addressing SDG 14 (and ocean links to others)

• Ecosystem accounting is a spatially-detailed extension of the SEEA
  • It includes guidance on measuring ecosystem types, their condition, the services they provide
  • Especially SDG 15.9 (ecosystem and biodiversity values)

• Ocean data and statistics are a new challenge since the SEEA has not been applied to oceans
  • There are many organizations working on different aspects of oceans and there are opportunities for harmonization of approaches to measuring SDG 14 and related indicators
Group discussion: Ocean Accounts

- Specific interests or perspectives to include?
- Interest in contributing?
  - To expert workshop papers? (even if not attending)
  - Using resulting guidance for upcoming work
  - Advising on spatial or other data products
- Who should be engaged?
References: Ecosystems


CICES (Common International Classification of Ecosystem Services). http://Cices.eu

Dickson, B., Blaney, et al., 2014. Towards a global map of natural capital: Key ecosystem assets. DEW/1824/NA. Nairobi, Kenya: UNEP.


FEGS-CS (Final Ecosystem Goods and Services Classification System. https://www.epa.gov/eco-research/final-ecosystem-goods-and-services-classification-system


SCBD Quick Start Package
SEEA Central Framework, SEEA-EEA, Applications and Extensions


World Bank WAVES: Designing Pilots for Ecosystem Accounting
References: Oceans


http://dx.doi.org/10.1890/110004


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      bordt@un.org

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  • https://unstats.un.org/unsd/envaccounting/eea_project/default.asp
  • Contact: seea@un.org