Services Generation Account
(Levels 0, 1 and 2)

Project: Advancing the SEEA
Experimental Ecosystem Accounting
Overview: Services Generation

1. Learning objectives
2. Review of Level 0 (5m)
   - What is it?
   - Why do we need it?
   - What does it look like?
   - Expertise & data required
   - Links to related training materials
3. Level 1 (Compilers)
   - Concepts (15m)
   - Group exercise & Discussion (30m)
4. Level 2 (Data providers)
   - Data options, examples & issues (15m)
   - Group exercise & Discussion (15m)
5. Closing Discussion (10m)
SEEA-EEA Training Levels 1 and 2

• **Learning objectives**
  • Level 1: To understand:
    • Why accounting for Ecosystem Services is important
    • The basics of the “ecosystem services cascade” and the difference between its components
    • How Services Generation is treated in the SEEA, including basic concepts and the structure of the accounts that include services
    • How to start to build a Services Generation account
  • Level 2
    • Understand the data options and sources
    • Be aware of how other countries have approached Ecosystem Services Generation
Account 6: Services Generation

SEEA-EEA accounts and linkages

Physical Accounts (by spatial unit):
- Ecosystem Extent Account
- Ecosystem Condition Account
- Ecosystem Services Generation Account
- Ecosystem Services Use Account
- Ecosystem Capacity Account

Ecosystem component accounts: Land, Carbon, Water, Biodiversity
Supporting information: Socio-economic conditions and activities, ecological production functions
Tools: Classifications, spatial units, scaling, aggregation, biophysical modelling

Monetary Accounts (by spatial unit):
- Ecosystem Services Supply Account
- Ecosystem Services Use Account
- Ecosystem Asset Account
- Augmented I-O Table
- Integrated Sector Accounts and Balance Sheets

Supporting information: SNA accounts, I-O tables
Tools: Valuation techniques
Level 0: Account 6: Services Generation

- **What?**
  - Physical and monetary flows of “final” ecosystem services from ecosystems to beneficiaries
  - Directly used by (or affect) people

- **Why?**
  - Inform policies of contribution of ecosystems to human well-being
  - Assess trade-offs between development and conservation
  - Links to standard economic production measures in SNA
  - Links to other SEEA-EEA accounts (*Condition, Supply and Use*) and tools (*Valuation*)
  - Indicators:
    - Flows of individual services (physical and monetary) \(\Rightarrow\) change
    - Indices of aggregated services by ecosystem type \(\Rightarrow\) change
**System of Environmental-Economic Accounting**

**Level 0: Account 6: Services Generation**

- **What does a Services Generation Account look like?**

### Maps
- Land cover
- Cultural
- Regulating
- Provisioning

### Tables
<table>
<thead>
<tr>
<th>Type of service</th>
<th>Ecosystem type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban and associated</td>
<td>Forest tree cover</td>
</tr>
<tr>
<td>Provisioning</td>
<td>e.g., tonnes of timber</td>
</tr>
<tr>
<td>Regulating</td>
<td>e.g., tonnes of CO₂ stored / released</td>
</tr>
<tr>
<td>Cultural</td>
<td>e.g., hectares of parkland</td>
</tr>
</tbody>
</table>

**Lookup tables**
- Biophysical modelling
# System of Environmental-Economic Accounting

## Level 0: Account 6: Services Generation

### Example (services in physical units)

<table>
<thead>
<tr>
<th>Ecosystem service</th>
<th>Units</th>
<th>Land cover type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Pasture</td>
</tr>
<tr>
<td>Hunting</td>
<td>kg meat</td>
<td></td>
</tr>
<tr>
<td>Drinking water extraction</td>
<td>$10^3$ m$^3$ water</td>
<td>4,071</td>
</tr>
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<td>Crop production</td>
<td>$10^6$ kg produce</td>
<td>1,868</td>
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<td>Fodder production</td>
<td>$10^6$ kg dry matter</td>
<td>533</td>
</tr>
<tr>
<td>Air quality regulation</td>
<td>$10^3$ kg PM$_{10}$</td>
<td>272</td>
</tr>
<tr>
<td>Carbon sequestration</td>
<td>$10^6$ kg carbon</td>
<td>875</td>
</tr>
<tr>
<td>Cultural</td>
<td>$10^3$ trips</td>
<td>2,690</td>
</tr>
</tbody>
</table>

**Source:** Remme et al., 2014 (Limburg, the Netherlands)
Level 0: Account 6: Services Generation

What does a Services Generation Account look like?

- Spatially-detailed physical measures of “final” services according to common classification:
  - Provisioning
  - Regulating
  - Cultural
- Physical measures (crops, flood control, clean drinking water, carbon sequestration, recreation, …)
- Monetary measures where appropriate and available

→ Ecosystem Services Supply Account
Level 0: Account 6: Services Generation

What do you need to create a Services Generation Account?

- Ecosystem Extent Account, Ecosystem Condition Account
- Common spatial infrastructure (spatial units)
- Common classification of services

Data:

- Field studies
- Transfer from other locations (benefits transfer, valuation)
- Economic production (agriculture, forestry, fisheries, water)
- Biophysical modelling

Expertise: ecologists, geographers (GIS), economists, policy analysts, statisticians
Level 1: Account 6: Services Generation

- Why Services Generation Accounts?
  - Ecosystems provide services that are essential to the economy and human activities:
    - Food supply
    - Clean water
    - Flood protection
    - Carbon sequestration
    - Recreation, cultural and religious importance

- Ecosystems are being converted and degraded
  - Which ones are most important to conserve?
  - How can they best be managed to maintain services?
  - Link with national planning and accounting to ensure ecosystems are included in decisions
Level 1: Account 6: Services Generation

- The Ecosystem Services Cascade

- Services are the contribution of ecosystems to a benefit for people...

Source: Nottingham School of Geography
Ecosystem services (versus benefit)

An ecosystem service is the contribution (by the ecosystem) to a benefit (for people)
Level 1: Account 6: Services Generation

- Services are the contribution of ecosystem to the benefits for people…
  - They are **not** the benefits; benefits require capital and labour to use
  - We need to calculate the contribution of ecosystems, for example:

  \[ \text{Crops} = f(\text{nature, equipment, inputs, labour, energy}...) \]

  To grow crops, nature provides biomass growth, nutrients, water, flood control, pollination…

  Without these, there would be no crops. In the Services Generation Account, we measure the physical services (e.g., the crop).
Types of Ecosystem Services

Provisioning Services
= goods that can be harvested from, or extracted from ecosystems
Example: providing fish for fisheries, or providing wood for timber harvest

Regulating Services
= the regulation of climate, hydrological, ecological and soil processes
Example: pollination, carbon sequestration, flood control

Cultural Services
= the non-material benefits provided by ecosystems
Example: recreation, tourism, providing a setting for cultural or religious practices
Ecosystem services and maps

- Wood production
- Hydrological function
- Carbon sequestration
- Crops
- Carbon sequestration
- Livestock production
- Carbon sequestration
- Recreation and tourism
Level 1: Account 6: Services Generation

- The SEEA-EEA focuses on “final services”
  - The point **before** human involvement transforms the services to benefits
    - e.g., biomass → harvesting; fish → capture…
  - Ecosystem processes and functions are **not** services
    - e.g., reproduction, predation, food web, nutrient cycle…
  - **Biodiversity** itself is not a “final” service
    - It is an aspect of *Ecosystem Condition* and is recorded in the *Biodiversity Account.*
## Level 1: Account 6: Services Generation

- **Services**
  - Based on *Common International Classification of Ecosystem Services (CICES)*
  - Not mutually exclusive
  - A list of “final” services
  - More detail (4-digit)
  - Does **not** include “supporting services” (= ecosystem functions)

<table>
<thead>
<tr>
<th>Section</th>
<th>Division</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>01. Provisioning</strong></td>
<td>01.01 Nutrition</td>
<td>01.01.01 Biomass</td>
</tr>
<tr>
<td></td>
<td>01.02 Materials</td>
<td>01.02.01 Biomass</td>
</tr>
<tr>
<td></td>
<td>01.03 Energy</td>
<td>01.03.01 Biomass-based energy sources</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01.03.02 Mechanical energy</td>
</tr>
<tr>
<td><strong>02. Regulation &amp; Maintenance</strong></td>
<td>02.01 Mediation of waste, toxics and other nuisances</td>
<td>02.01.01 Mediation by biota</td>
</tr>
<tr>
<td></td>
<td>02.02 Mediation of flows</td>
<td>02.01.02 Mediation by ecosystems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02.02.01 Mass flows</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02.02.02 Liquid flows</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02.02.03 Gaseous / air flows</td>
</tr>
<tr>
<td></td>
<td>02.03 Maintenance of physical, chemical, biological conditions</td>
<td>02.03.01 Lifecycle maintenance, habitat and gene pool protection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02.03.02 Pest and disease control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02.03.03 Soil formation and composition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02.03.04 Water conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02.03.05 Atmospheric composition and climate regulation</td>
</tr>
<tr>
<td><strong>03. Cultural</strong></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>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>

Source: CICES, 2013. [www.cices.eu](http://www.cices.eu)
Level 1: Account 6: Services Generation

- How?
  - Direct measure (e.g., socio-economic survey on recreational use, field survey of available fish…)

- Remember Level 0 – Biophysical modelling?
  - **Lookup tables:** Take values from another location
  - **Statistical approaches:** Estimate based on known explanatory variables
  - **Geostatistical interpolation:** Estimate from nearby known locations
  - **Process-based modelling:** Use models of processes (e.g., land cover change, demand for services…)

- The group exercise will use only **Lookup Tables**…
Level 1: Account 6: Services Generation

• Compilation Group Exercise (30m)
  • Situation:
    • Know total services for some LCEUs
    • Need to calculate:
      • Missing services for based on known data and lookup table

• Objective (Groups of 3-5):
  1. Calculate missing services
  2. Calculate totals
  3. Report and discuss results
### Level 1: Account 6: Services Generation

**Group Exercise: Step 1 – Calculate unknown services**

- e.g., Crop for LCEU04 = \((18,700 / 500) \times 281.3\)
- e.g., Carbon for LCEU04 = \((500 \times 20)\)

<table>
<thead>
<tr>
<th>LCEU</th>
<th>Extent (ha)</th>
<th>(C) Crop</th>
<th>(R) Recreation</th>
<th>(W) Water</th>
<th>(S) Carbon Sequestration</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCEU01 - Rainfed herbaceous cropland</td>
<td>500.0</td>
<td>18,700.0</td>
<td>500.0</td>
<td>600.0</td>
<td>20</td>
</tr>
<tr>
<td>LCEU02 - Forest tree cover</td>
<td>262.5</td>
<td>0.0</td>
<td>1,500.0</td>
<td>500.0</td>
<td>30</td>
</tr>
<tr>
<td>LCEU03 - Inland water bodies</td>
<td>68.8</td>
<td>0.0</td>
<td>1,600.0</td>
<td>15,000.0</td>
<td>5</td>
</tr>
<tr>
<td>LCEU04 - Rainfed herbaceous cropland</td>
<td>281.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCEU05 - Forest tree cover</td>
<td>75.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCEU06 - Urban and associated developed</td>
<td>56.3</td>
<td>0.0</td>
<td>500.0</td>
<td>500.0</td>
<td>0</td>
</tr>
<tr>
<td>LCEU07 - Urban and associated developed</td>
<td>68.8</td>
<td>0.0</td>
<td>700.0</td>
<td>400.0</td>
<td>0</td>
</tr>
<tr>
<td>LCEU08 - Open wetlands</td>
<td>37.5</td>
<td>700.0</td>
<td>5,000.0</td>
<td>10,000.0</td>
<td>40</td>
</tr>
<tr>
<td>LCEU09 - Inland water bodies</td>
<td>50.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCEU10 - Forest tree cover</td>
<td>225.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCEU11 - Rainfed herbaceous cropland</td>
<td>175.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,800.0</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Level 1: Account 6: Services Generation

- Is everyone clear on the objectives?
- 30 minutes group work
- Please ask questions!

Results:
- Each group report:
  - Totals for each service
  - Which LCEU generates the most of each service?
  - Were there any surprises?

<table>
<thead>
<tr>
<th>LCEU</th>
<th>Extent (ha)</th>
<th>(C) Crop tonnes/year</th>
<th>(R) Recreation trips/year</th>
<th>(W) Water m³/year</th>
<th>(S) Carbon Sequestration tonnes/ha/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfed herbaceous cropland</td>
<td>500.0</td>
<td>18,700.0</td>
<td>500.0</td>
<td>600.0</td>
<td>20</td>
</tr>
<tr>
<td>Forest tree cover</td>
<td>262.5</td>
<td>0.0</td>
<td>1,500.0</td>
<td>500.0</td>
<td>20</td>
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<td>68.8</td>
<td>0.0</td>
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<td>15,000.0</td>
<td>5</td>
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<td>0.0</td>
<td>1,000.0</td>
<td>15,000.0</td>
<td>30</td>
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<tr>
<td>Forest tree cover</td>
<td>75.0</td>
<td>0.0</td>
<td>1,000.0</td>
<td>15,000.0</td>
<td>30</td>
</tr>
<tr>
<td>Urban and associated developed</td>
<td>56.3</td>
<td>0.0</td>
<td>500.0</td>
<td>500.0</td>
<td>0</td>
</tr>
<tr>
<td>Urban and associated developed</td>
<td>88.8</td>
<td>0.0</td>
<td>700.0</td>
<td>400.0</td>
<td>0</td>
</tr>
<tr>
<td>Open wetlands</td>
<td>37.5</td>
<td>700.0</td>
<td>5,000.0</td>
<td>10,000.0</td>
<td>40</td>
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<tr>
<td>Inland water bodies</td>
<td>50.0</td>
<td>0.0</td>
<td>5,000.0</td>
<td>10,000.0</td>
<td>5</td>
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<td>0.0</td>
<td>5,000.0</td>
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<td>0.0</td>
<td>5,000.0</td>
<td>10,000.0</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,800.0</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>85</strong></td>
</tr>
</tbody>
</table>
Level 2: Account 6: Services Generation

- Learning objectives (Level 2)
  - Understand the data options and sources
  - Be aware of how other countries have approached Services Generation Accounting
Level 2: Account 6: Services Generation

- A full Services Generation Account is more complex than the exercise:
  - More services (48 “final” services in CICES)
  - More types of data (tonnes, risks, visitors, air quality, cultural significance…)
  - Less measured data → need models to estimate
  - High variability among ecosystem types and region (e.g., salt marsh carbon = 650 to 1750 tCO$_2$/ha/year)

- **Do not** need to include all services:
  - High priority services → measure or estimate
  - Get started with available data
Ecosystem services in an account

- Ecosystem service account developed for Limburg Province, the Netherlands
- 2200 km², 1.1 million inhabitants
- Analysis of 7 ecosystem services

Source: Remme et al., 2014
# Level 2: Account 6: Services Generation

## Example (services 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>Water</th>
<th>Other nature</th>
<th>Pro vincial total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunting</td>
<td>kg meat</td>
<td>-</td>
<td>9,100</td>
<td>14,732</td>
<td>8,100</td>
<td>678</td>
<td>70</td>
<td></td>
<td>1,513</td>
<td>34,193</td>
</tr>
<tr>
<td>Drinking water extraction</td>
<td>$10^3$ m³ 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>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>533</td>
<td>251</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>784</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>

**Note:** Units of measure are very different

**Source:** Remme et al., 2014 (Limburg, the Netherlands)
Level 2: Account 6: Services Generation

- Data options and sources
  - Field studies
    - Literature on similar sites or specific research
  - Transfer from other locations (benefits transfer, valuation)
    - Ecosystem valuation research databases (e.g., www.evri.ca)
  - Economic production (agriculture, forestry, fisheries, water)
    - Socio-economic statistics already available with spatial detail
  - Biophysical modelling
    - Know conditions, can estimate some services using production functions (e.g., hydrography → flood control)
Level 2: Account 6: Services Generation

Canada Example:

Water purification potential and change by drainage area for boreal wetlands

Index based on:
- % forest cover
- % agricultural land
- % riparian forest
- % wetlands
- % anthropogenic disturbance
- % burn area
- Edge & linear density (fragmentation)
- Human footprint
- Slope
- Nitrogen & Sulphur exceedance (from atmospheric deposition)

Source: Statistics Canada, 2013
Level 2: Account 6: Services Generation

Canada example

Net biomass extraction for human use

Includes:
- Agricultural crops
- Livestock and poultry
- Milk
- Maple products and honey
- Forestry
- Fisheries (inland and marine)

Source: Statistics Canada, 2013
Level 2: Account 6: Services Generation

Canada example

Weight of commercial fish landings by marine statistical area

Includes:
- Groundfish
- Pelagic fish
- Shellfish

Also done for west coast

Statistical area defined by Ministry of Fisheries and Oceans

Source: Statistics Canada, 2013
Level 2: Account 6: Services Generation

- Services flow data commonly available

<table>
<thead>
<tr>
<th>Service</th>
<th>Flow measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisioning services</td>
<td></td>
</tr>
<tr>
<td>Timber services</td>
<td>timber increment</td>
</tr>
<tr>
<td>Crops</td>
<td>crop production</td>
</tr>
<tr>
<td>Livestock</td>
<td>livestock production</td>
</tr>
<tr>
<td>Water provision</td>
<td>annual freshwater supply</td>
</tr>
<tr>
<td>Regulating services</td>
<td></td>
</tr>
<tr>
<td>Water quantity regulation</td>
<td>total amount of water stored</td>
</tr>
<tr>
<td></td>
<td>total amounts of pollutants removed annually</td>
</tr>
<tr>
<td>Climate regulation</td>
<td>annual carbon fixation</td>
</tr>
<tr>
<td>Storm protection</td>
<td>total number of storms mitigated</td>
</tr>
<tr>
<td>Air quality regulation</td>
<td>total amount of pollutants removed via dry deposition on leaves</td>
</tr>
<tr>
<td>Erosion control</td>
<td>total amount of soil retained</td>
</tr>
<tr>
<td>Pollination</td>
<td>increased yield of crops due to pollination</td>
</tr>
<tr>
<td>Soil quality regulation</td>
<td>increased yield of crops attributable to soil quality</td>
</tr>
<tr>
<td>Cultural services</td>
<td></td>
</tr>
<tr>
<td>Recreation</td>
<td>number of visitors</td>
</tr>
</tbody>
</table>

Source: (Maes, Parachini et al. 2011)
Level 2: Account 6: Services Generation

- **Data sources: Socio-economic statistics**
  - Agricultural statistics: crop, livestock production
  - Energy statistics: biomass for fuel
  - Fisheries statistics: catch, stock
  - Forestry statistics: timber stock, harvest
  - Park surveys: visitors, use
  - Water statistics: withdrawals, consumption
  - Natural disasters: incidence of floods, erosion, storms
  - Soil inventories: erosion potential
  - Health statistics: regulation of biotic environment

- Are these spatially-detailed national data?
- Do we know the methods and classifications?
Level 2: Account 6: Services Generation

- **Data sources: Environmental statistics**
  - Iconic species & habitats
  - Land cover → carbon sequestration, air filtration
  - Hydrology & weather data: Flow rates, variability → flood risk
  - Topography, land cover, soil & weather data → erosion and landslide risk
  - Carbon storage and sequestration (see *Carbon Accounts*)
  - Remote sensing → primary production

- Are these spatially-detailed national data?
- Do we know the methods and classifications?
Level 2: Account 6: Services Generation

- **Data sources: Ecosystem valuation databases**
  - Based on codifying scientific studies
  - Include data for many countries, ecosystem type, physical services measures
    - Environmental Valuation Reference Inventory ([www.evri.ca](http://www.evri.ca))
    - TEEB Ecosystem Service Valuation Database ([ESVD](http://www.esvd.org))
    - Gulf of Mexico Ecosystem Services Valuation Database ([www.gecoserv.org](http://www.gecoserv.org))
  - Need to understand location, definitions and methods used
Level 2: Account 6: Services Generation

- **Data sources: Specific studies & models**
  - These may not be included in databases
  - Specific studies:
    - National or regional ecosystem assessments (Millennium Ecosystem Assessment, UK National Ecosystem Assessment)
    - Small-area studies (e.g., one park, one region)
    - TEEB studies and country studies (multiple ecosystems and services)
  - Decision-support models
    - There are landscape-scale and site-scale models that can help estimate service flows (AIRES, InVEST, LUCI…)
    - See Biophysical Modelling
Level 2: Account 6: Services Generation

Data sources: Special surveys and case studies

- High-priority data gaps may also be addressed by collecting new data
  - Ecological field studies to determine “production functions”
  - Socio-economic surveys to determine use of services (e.g., water, food, recreation)
  - Case-studies for specific locations or social groups (e.g., dependence on nature of low-income residents)

- Possible to add questions to existing surveys, for example,
  - Households use of water, source of food, incidence of hazards (flooding, erosion, drought, disease), source of biomass for fuel
Level 2: Account 6: Services Generation

- Group exercise (15m) (Groups of 3-5)

1. In your country, what are three important ecosystem services that should be included in a Services Generation Account?
2. Which land cover types generate them?
3. What national data are available in your country on the generation of these services?
4. Report your results
Level 2: Account 6: Services Generation

- Concepts Group exercise (15m)

- Group reports
  - The *ecosystem services* you selected
  - The main land cover types for each
  - Are *national data* available in your country on the generation of these services?

- Discussion
  - What other ecosystem services would be important to measure?
  - On what topic might a special survey be used to fill priority data gaps?
Level 2: Account 6: Services Generation

- Discussion and questions
- Take home points
  - Services Generation in biophysical terms is one of the most important aspects of Ecosystem Accounting
  - Data on Services Generation are available from many sources
  - There are some simple methods available to start to integrate these data
  - Start by focussing on available data and priority services
Level 2: Account 4: Carbon

- Further Information
  - SEEA Experimental Ecosystem Accounting (2012)
  - SEEA-EEA Technical Guidance (forthcoming)
    - Detailed supporting documents
    - “Linking Flow and Asset Accounts” and
    - “Biophysical Modelling” by Lars Hein
References

- CICES, 2013. [www.cices.eu](http://www.cices.eu)
- Nottingham School of Geography, nd, Nature’s services in decision making. [http://www.nottingham.ac.uk/geography/research/research-that-makes-a-difference/natures-services-and-decision-making.aspx](http://www.nottingham.ac.uk/geography/research/research-that-makes-a-difference/natures-services-and-decision-making.aspx)
Evaluation of the training module

- Please complete the evaluation form for this module
- For this module
  - What did you learn that you could apply in your work?
  - Was the presentation clear and informative?
  - Was it too simple? Too complex?
  - Was there anything you did not understand?
  - What additions or deletions would you suggest (recognizing that the unit is intended for a general audience)?
  - Do you have any suggestions as to how the SEEA-EEA may be improved (concepts, principles) in this area?
Acknowledgements

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