Measuring Ecosystem Services in Canada

Regional Training Workshop on the System of Environmental-Economic Accounting with a Focus on Water Accounting

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Many demands from resource departments:

1. Monetary values of ecosystems and their services to support discussions of protection, conservation, climate change, sustainability, pollution prevention, land cover / use change...

2. Opportunity to raise argument beyond “environment” versus “economy” to understand the real contribution of ecosystems to human well being, sustainability and “green growth”
M.E.G.S. Overview and objectives

- Two-year project involving five federal departments
  - 60 (a dozen) experts in various domains involved
  - Statistics Canada co-leading with Environment Canada

Objective: Develop the statistical infrastructure for ecosystem accounting

1. Identify and acquire data sources
   - E.g. remotely sensed data, raw and interpreted
2. Refine concepts, standards and classifications
   - E.g. Natural patches, biomass, land cover ecosystem unit, land cover classification
3. Investigate methods for valuation of ecosystem goods and services
   - Test non monetary, and market and non-market monetary approaches
4. Develop community of practice
   - Agree on results and next step
M.E.G.S. – Project governance

In-kind participation from:

- Environment Canada
- Agriculture and Agri-Food Canada
- Fisheries and Oceans Canada
- Natural Resources Canada
- Parks Canada
- Policy Horizons Canada (funding)
M.E.G.S. – The Outcome

1. Developed or adapted E.G.S. concepts
2. Created* a M.E.G.S. geobatabase
3. Produced E.G.S. analysis
   1. Provisioning – Marine, biomass
   2. Regulation – Wetlands, fragmentation
   3. Cultural – Park study
4. Explored valuation
   • Monetary and contextual variables
5. Community of practice
6. Identified a (ever growing) research agenda
7. Produced a “Teachers Kit”
Progress on valuation

Produced data on

1. Market value of selected provisioning service

2. Non-monetary values of wetlands and other contextual values

3. Impact of source data on non-market monetary valuation
Ecosystem productivity: national biomass extraction
Value of commercial fisheries landings

Ranked by value
- Highest tercile
- Middle tercile
- Lowest tercile
- No data

Source(s): Fisheries and Oceans Canada, Economic Analysis and Statistics, Strategic Policy Forces, 2017; Statistics Canada, Environment Accounts and...
Marine coastal fisheries ecumene

Note(s): 1 Fishing Industries include: the Fishing Industry (NAICS 1141), the Seafood Product Preparation and Packaging industry (NAICS 3117) and the Aquaculture Industry (NAICS 1125).
Distribution of freshwater wetlands, southern Canada

- Waste assimilation
- Flood attenuation
- Habitat
- Biodiversity
- ...
Thousand Islands National Park case study – results of monetary valuation studies

- This study explores the use of “benefits transfer”, a monetary valuation method to estimate the annual value of EGS flows

- The annual value of EGS flows assessed for the park is estimated to be between $12.5 million and $14.7 million (2012 dollars).

- The annual value of recreational services is estimated at $3.9 million (2012 dollars)
Map 3.29 Built-up area, Toronto census metropolitan area (CMA) and census metropolitan area-ecosystem (CMA-E), 1971, 1991, 2001 and 2011
## Ecosystem asset account, Toronto census metropolitan area-ecosystem, 1971 to 2011

<table>
<thead>
<tr>
<th></th>
<th>Total built-up area(^1)</th>
<th>Arable(^2)</th>
<th>Natural and semi-natural(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Settled</td>
<td>Roads</td>
<td></td>
</tr>
<tr>
<td><strong>Opening stock 1971</strong></td>
<td>850</td>
<td>418</td>
<td>4 930</td>
</tr>
<tr>
<td><strong>Land lost to settled area</strong></td>
<td>...</td>
<td>...</td>
<td>-961</td>
</tr>
<tr>
<td><strong>Balance of change(^4)</strong></td>
<td>1 409</td>
<td>403</td>
<td>-102</td>
</tr>
<tr>
<td><strong>Closing stock 2011</strong></td>
<td>2 260</td>
<td>821</td>
<td>3 867</td>
</tr>
</tbody>
</table>
Human activity and the environment 2015: The atlas


square kilometres

- Built-up area
- Arable land
- Natural and semi-natural land
- Forest
- Water
- Other
Conclusion: Ecosystem accounting in Canada

1. Ecosystem accounting is a process as well as an objective
   • Requires multidisciplinary, multi-departmental cooperation

2. Small successes lead to further funding:
   • We received funds to further investigate
     ▪ freshwater ecosystems
     ▪ Produce an annual land cover change matrix
     ▪ Produce annual water yield

3. Making the data available is a challenge
   • Large data sets
   • Complex subject-matter
Measuring Ecosystem Services in Canada

Thank you for your attention

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