

Issue 3

Land cover mapping, land cover
classifications, and accounting units

Issue papers

- Canada
Land Cover Mapping in Canada with Respect to Ecosystem Accounting by Patric Adams, Michael Bordt, Giuseppe Filoso and Gapriel Gagnon
- Australia
Ecosystem statistical and accounting units, land cover, remote sensing and adjustments by Richard Mount, Belinda Allison, Phil Tickle and Viv Bordas
- EEA
Issue paper on Definition Classification of Socio-Ecological Landscape Unit (SELU) by Jean Louis Weber, EEA
- UNSD
Accounting Units for Ecosystem Accounts by Alessandra Alfieri, Daniel Clarke and Ivo Havinga, UNSD
- FAO
Land cover classification for ecosystem accounting by Antonio di Gregorio (FAO), Gabriel Jaffrain (IGN-FI) and Jean Louis Weber (EEA)
- Quebec
Point of View on Policy Applications, Accounting Units and Principles of Monetary Valuation, and Québec's Experience by Stephanie Uhde

Statistical unit



EEA

- Is based on Socio-Ecological Landscape unit (SELU)
- operationally is based on land cover units
- analogies with SNA
- links to SEEA asset accounts and flow accounts
- SELUs will be classified according to topology and land cover types

Australia

- Statistical (observational) unit vs. accounting (and reporting) unit
- No single spatial unit can be relevant to all ecosystem phenomena
- Statistical unit = ecosystem production unit
- Starting point: Ecosystem goods and services
- Problems:
 - Spatial unstability of the statistical unit
 - Changes in the relevant classification schemes

An ecosystem goods and services pathway

- Define the statistical unit by **simple rule set**
- Derive statistical measures via the statistical units
- Transform from statistical units to accounting units for reporting of ecosystem goods and services. Output accounting unit can be e.g.:
 - Ecosystem type/entity
 - Ecological regions
 - Physical units
 - Administrative units ..

Accounting unit

Australia

- Accounting units must be build from basic statistical units
- Statistical units can for spatial analysis be represented in vector (e.g. cadastral parcel) or grid (1 km x 1 km or 0,1 x 0,1 km) form.
- Both the grid format and land parcels can be use as statistical accounting unit for spatially linking economic activity to land, but the grid format is preferred for statistical units from the perspective of efficient transformation of large data sets to multiple reporting units.

UNSD

- "The accounting unit is a conceptual and operational structure for the compilation of national accounts of the environment using a system's approach".
- As an analogy to SNA a functional unit in ecosystem accounts can be defined according to its capacity to perform:
 - *production* of ecosystem services that represent a flow of value to humanity
 - *consumption* of energy and other inputs for the supporting functions that allow ecosystems to sustain themselves and ultimately provide ecosystem services
 - *accumulation* of the holding of structure or material components of ecosystems.

- "It is recommended that the statistical criteria in identifying accounting units in the environment are simple and are based on biophysical features that could reasonably approximate the definition of ecosystems as functional units.."
- Dominant land cover classes + slope, altitude etc. as additional dimensions

Canada

- "Ideally, the accounting unit is homogenous over the accounting period. This also implies that the unit is as small as possible to increase its homogeneity."
- How much information is required to delineate the ecosystems and how much is simply an attribute of the ecosystem?
- One criterion: accounting unit is subset of the Soil Landscape Unit (SLU), which is the basis for Ecological Classification in Canada.
- It would be desirable for the accounting unit not to cross provincial, ecodistrict or drainage area since these are used in reporting.

Classifications



Classifications found in the papers

- SEEA Land cover types (14)
- Dominant Land Cover Classes used in EEA SECA (UNSD p. 4)
 - 5 classes and No dominance
- FAO p. 9: First sketch of aggregated LCFU classification
 - LCFU = Land Cover Functional Units

Also: Provisional Land-cover Flow classification

Canada: Different classification in the various data sources

Dominant Land Cover Classes used in EEA SECA

- 1 Artificial surfaces
- 2A Arable land and permanent crops
- 2B Pastures and mosaic farmland
- 3A Forests and transitional woodland
- 3B Natural grassland, heathland, sclerophyllous vegetation
- 3C Open space with little or no vegetation
- 4 Wetlands
- 5 Water bodies
- No dominance

Ecological classification of Canada

- 1 021 Ecodistricts
- 194 Ecoregions
- 53 Ecoprovinces
- 15 Ecozones
- This framework is used for reporting of general environmental trends

Other issues

- Remote sensing technology and other data sources (Canada)
- Dimensions of land classification:
 - Land cover
 - Land use
 - Land management practices
 - Tenure (Australia)

European Forum for Geostatistics

- www.efgs.info
- EFGS call for action to establish a Global Forum for GeoStatistics (GFGS)

My questions for discussion

- Should the difference between statistical and accounting unit be clarified?
- What is the right scale of classifications for national level analysis?
- What is the essential information for definition of an ecosystem: land cover and latitude, slope, length of growth period, aridity?
- Grid or vector data?