Virtual Expert Forum on SEEA Experimental Ecosystem Accounting 2020

Session 1 on ecosystem extent and condition

COMPILATION OF ECOSYSTEM EXTENT ACCOUNT AND TESTING THE IUCN GET CROSSWALK

ESTONIA

June 23, 2020

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Our experience on compilation of ecosystem exctent and developing national ecosystem typology

Work under Eurostat grant on ecosystem accounts

Year 1

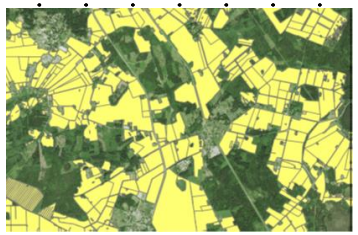
- 3,8 million polygons
- 140 mapping units (ecosystem types and land use/ cover types)
- Crosswalk to EUNIS
- Crosswalk to LULUCF
- Link to Business register and Land Cadastre

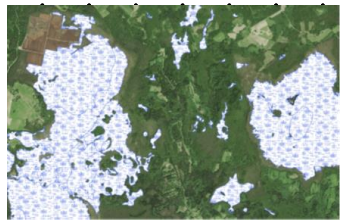
Year 2

- Ecosystem typology, in progress
- Linking mapping units to national ET-s
- Testing crosswalk to IUCN GET
- Suggestions for new IUCN GET groups
- …

Would you have done something differently?

Merging different data layers into one layer





Decision tree and priorities to overlay the map layers:

1. Agricultural land and semi-natural habitats (Support bases)
2. Forests
3. Wetlands
4. Semi-natural habitats (eligible for support)
5. Natura 2000 habitats inventory
6. Meadows database
7. Estonian Topographic Database

After merging and simplification of different data layers and overlying with Estonian topographic database, we were able to get more detailed information for 85% of EAA. For the remaining 15% of the area, Estonian Topographic Database was the only source of information we could use.

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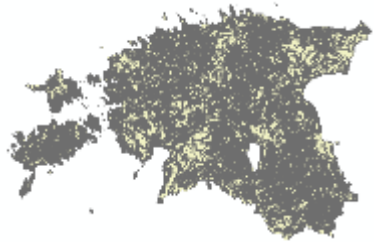
Establishing the ownership dimension of Estonian ecosystem extent account

Ecosystem base map



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Land Cadaster

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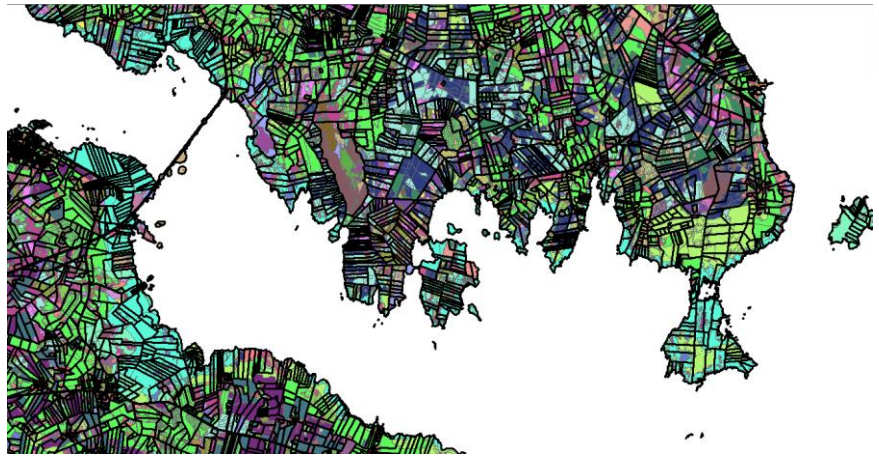


Monitoring of the ecological tax reform in Estonia; Kaia Oras

Ecosystem base map and Land Cadaster data provided a basis for the creation of the ownership dimension in a merged dataset.

Example of the deliverable: Opening extent account and land owners, 2019 (ha)

Institutional sector/(UNFCCC/IPCC land use classes (LULUCF)	Cropland	Forest land	Grassland	Other land	Settlements	Shrubbery*	Wetland	TOTAL
General government	71 033	113 178	63 176	1 705	62 581	3 083	46 600	**361 356**
Non-financial corporations	262 487	476 303	91 933	1 104	42 595	3 126	11 181	**888 730**
Financial corporations	266	624	263	7	173	13	31	**1 377**
Households	494 158	680 055	291 147	2 456	101 418	9 646	24 497	**1 603 376**
NPISH	1 344	2 780	1 576	26	1 664	68	277	**7 735**
Rest of the world	5 920	15 654	7 780	209	3 340	309	742	**33 954**
State Forest Management Centre	2 864	1 049 105	39 262	2 468	18 002	1 761	221 258	**1 334 720**
Unknown	4 502	81 392	3 369	121	4 683	162	21 003	**115 232**
TOTAL	**842 574**	**2 419 091**	**498 506**	**8 096**	**234 456**	**18 168**	**325 589**	**4 346 480**
Percentage	19	56	11	0	5	0	7	**100**

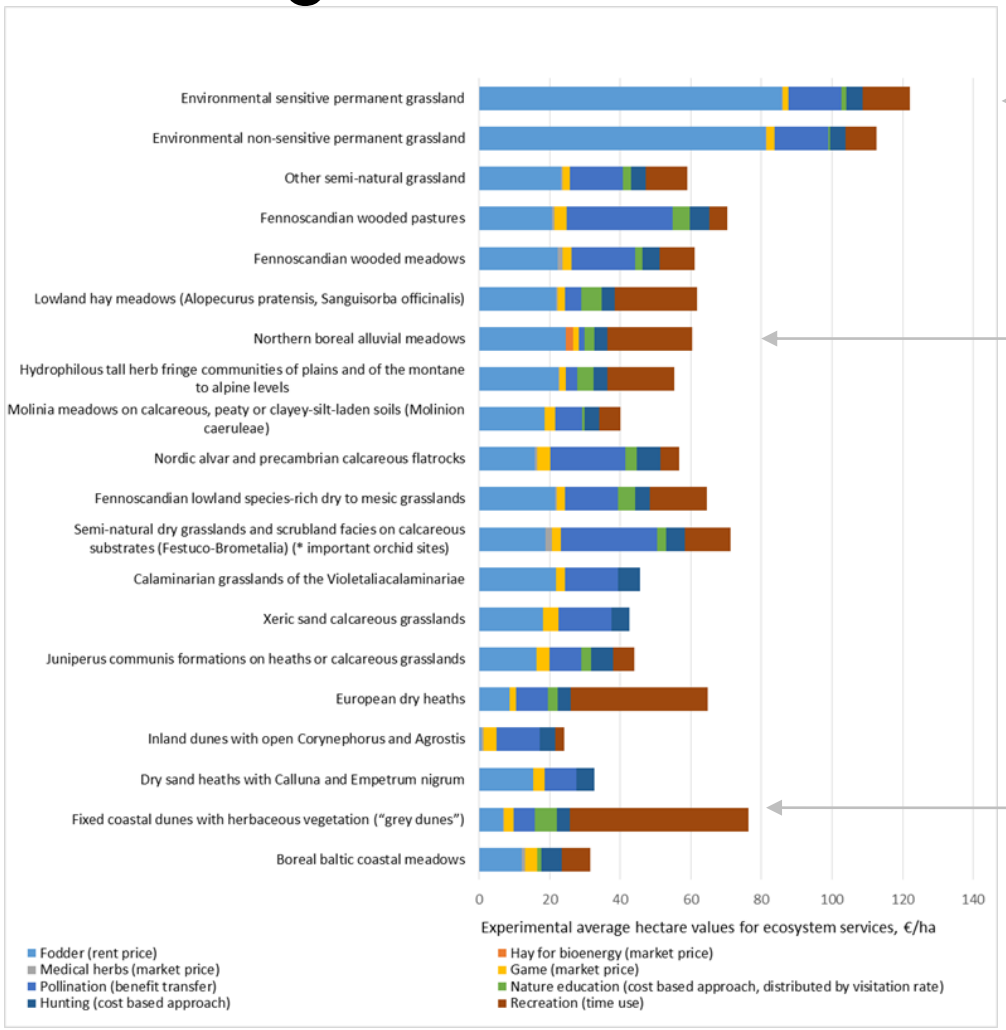
*-Shrubbery class is separated from grassland in this table / project, although classified as Grassland in the LULUCF classification

Example of the deliverable: opening extent account (2019, EUNIS Habitat type classes and institutional sectors, ha)

SECTOR_ACTIVITY	NACE	NACE ACTIVITY	Total	Coastal	Constructed, industrial and other artificial habitats	Grasslands and lands dominated by forbs, mosses or lichens	Habitat complexes	Heathland, scrub and tundra	Inland surface waters	...
General government_TOTAL			361 356	632	55 190	29 224	5 739	3 333	11 354	
General government_H	H	Transporting and storage	32	0	31	0	0	0	0	
General government_J	J	Information and communication	6	0	2	0	0	0	0	
General government_L	L	Real estate activities	610	2	24	2	9	2	6	
General government_M	M	Professional, scientific and technical activities	3	0	2	0	2	0	0	
General government_N	N	Administrative and support service activities	1	0	0	0	0	0	0	
General government_O	O	Public administration and defence; compulsory social security	249 874	84	3	3	46	806	1 823	
General government_OTHER			98 781	545	16 789	10 556	4 286	1 516	9 464	
...										

More detailed levels available

Ecological detail matters.
Average ha-values of services by types of grasslands



Cultivated grasslands

Northern boreal alluvial meadows (6450)

Fixed coastal dunes with herbaceousvegetation ("grey dunes") (2130)

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Testing of the IUCN GET EFG in Estonia

The IUCN Global Ecosystem Typology

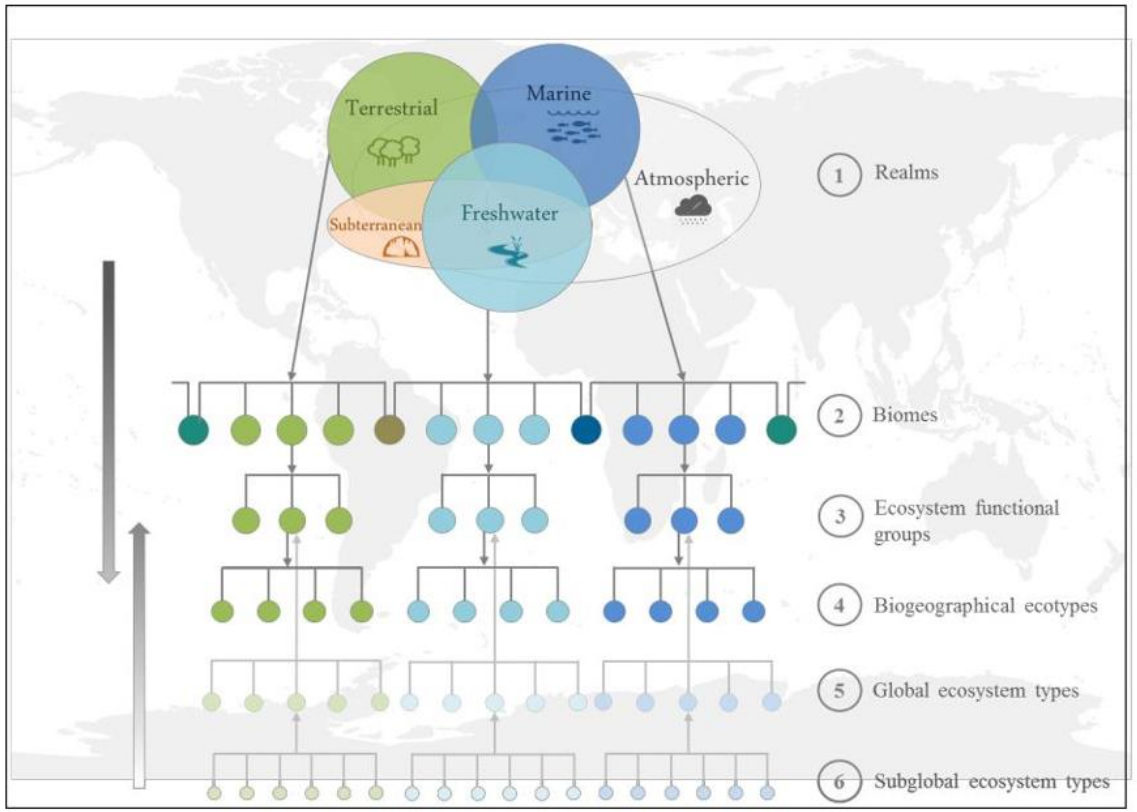


Figure 1. Hierarchical structure of Global Ecosystem Typology. Top cluster shows thematic

- standardised, globally consistent, spatially explicit typology and terminology for managing the world's ecosystems and their services.

- reference classification for UN System of Environmental-Economic Accounting – Experimental Ecosystem Accounting (SEEA EEA) for the ecosystem extent, services and assets.

- foresees structural integration of established national classifications, which would form the lowest level of the hierarchy.

Testing IUCN GET: From mapping units to ecosystem types

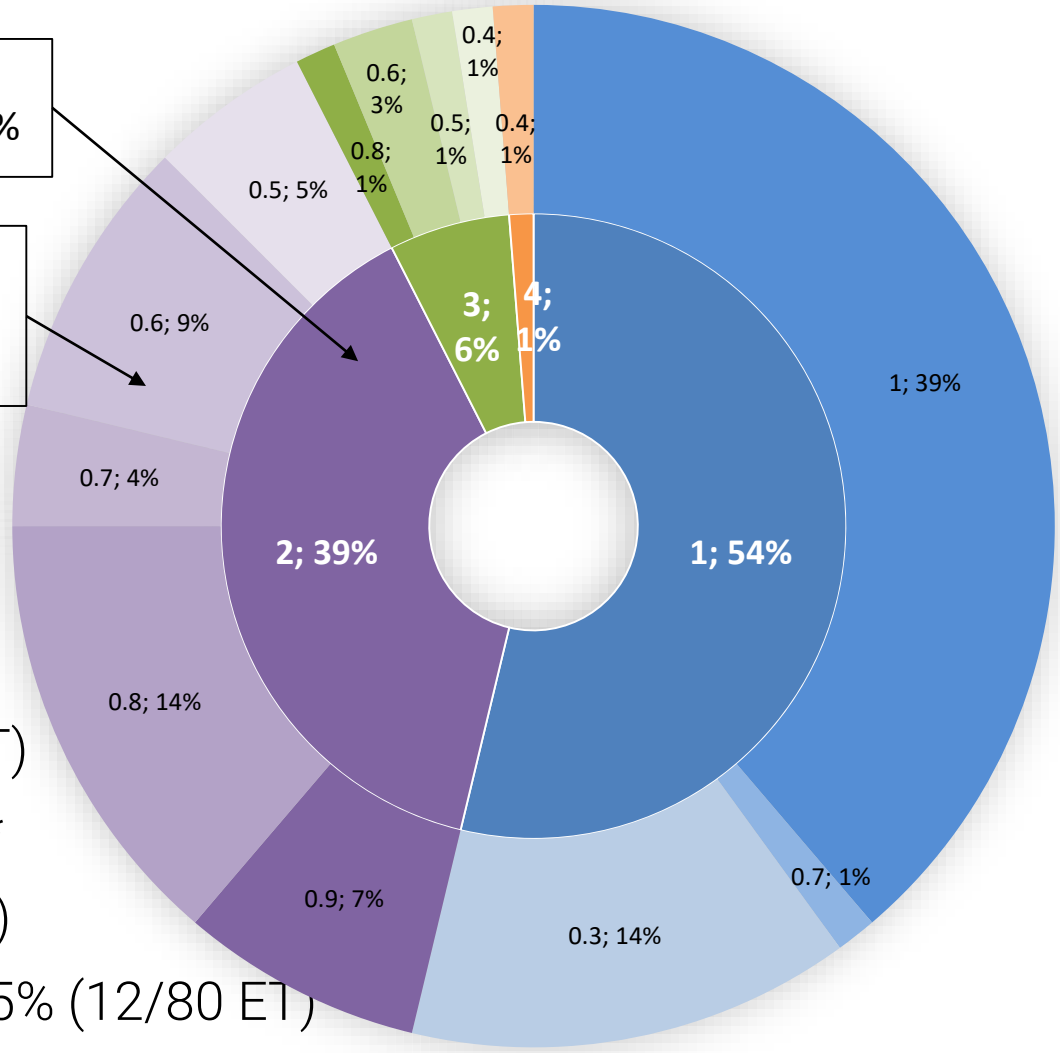
- Identifying ecosystem types (ET) from mapping units based on expert analysis
- 80 different ecosystem types in Estonian National Ecosystem Typology

Ecosystem class (level 1)	Number of ecosystem types (level 3)
Coasts	15
Grasslands	15
Water bodies	12
Forests	11
Wetlands	11
Crops	6
Heathlands	3
Outcrops	3
Urban	2
Artificial areas	1
Unidentified open area	1

Testing IUCN GET: Results

Inner circle:
Number of candidate EFG-s; %

Outer circle:
Maximum membership value by the number of EFG; %



- 29 EFG-s represented in Estonia

- Testing with 80 ecosystem types:
- 1:1 crosswalk 39% (31 cases of 80 ET)
- Preferred EFG found 78% (61/80 ET)*
- Preferred EFG not found 6% (5/80 ET)
- Ecosystem type not fully described 15% (12/80 ET)

*Preferred EFG found when maximum membership value ≥ 0.6

Testing IUCN GET: Problems 1

- Difficulties grouping Estonian forest types.
- The division between T2.1 and T2.2* is mainly based on canopy composition but the classification in Estonian system is based on soil (*i.e.* site types).
- Boreal needle-leaved or decidous forests can grow on the same soil type. Also forests with mixed canopy occur.

Mixed forest. Photo: Arvi Kriis / Ekspress Meedia

*T2.1 Boreal and temperate montane forests and woodlands; T2.2 Temperate deciduous forests and shrublands

Testing IUCN GET: Problems 2

- There are groups for temperate forests (EFG T2.2) and subtropical/temperate forested wetlands (EFG TF1.2) but there is no equivalent for boreal forests (EFG T2.1) in wetlands biome.

- Estonian grasslands are semi-natural. Low-intensity anthropogenic maintenance, such as grazing or mowing is necessary for their existence. Fitting these under EFG T4.5 Temperate grasslands according to the EFG description will not be entirely correct.

- Estonian heathlands do not fit entirely under EFG T3.3 Cool temperate heathlands because they are not in coastal areas in Estonia.

Testing IUCN GET: Problems 3

- Many Estonian peatlands have been drained or influenced by draining. These wetlands do not fit the description of natural fens or peat bogs very well as ecological key drivers have changed because of lowered water table.

- Type „artificial areas“ includes different site types such as excavation sites, airports, landfills, roads, production yards etc. Some of these sites may be single objects surrounded by natural ecosystems in which case fitting these under T7.4 Urban Ecosystems is questionable.

- Estonian lakes had to be fitted under EFG F2.4, EFG F2.1 and F2.2* because lakes are covered with ice but it does not happen constantly every year for 40% or more time of the year.

* EFG F2.4 Freeze-thaw freshwater lakes, EFG F2.1 Large permanent freshwater lakes and F2.2 Small permanent freshwater lakes

Testing IUCN GET: Suggestions

- Adding new EFG groups
  - Temperate mixed forests
  - Boreal forested wetlands
  - Semi-natural pastures and old fields (T7.5 has been created as of this moment)
  - Category „Other(s)“ for unidentified areas

- Modifying EFG descriptions
  - The description of T3.3 should be broadened to include inland heathlands.
  - The description of EFG T7.4 should be broadened regarding single large scale technogenic objects/landscapes where human activity is not present continuously

Summary of our experience

- We created Estonian ecosystem extent map using mapping units from diferent sources.
- We had to start developing our national ecosystem typology.
- The direct match (1 to 1 crosswalk) with IUCN Global Ecosystem Typology is moderate.
- We still need to specify the links between mapping units and ecosystem types (which were used to test the fit with IUCN GET) in our national classification.

Bottlenecks

- No well-established uniform ecosystem typology on national level.
- Too good/detailed data could be a problem as well.
- Not enough coherence between global and national classifications (types are grouped based on different characteristics).

Questions to the audience

- Did you have or do you foresee similar problems as we had?
- Is it better to make the EFG descriptions more general or is it better to add additional groups to the typology?
- How the decision should be made when one-to-one crosswalk is needed, for example when the extent of ecosystem types is required to be compiled based on IUCN GET level three?
- What could be the minimum number of ecosystem functional groups (IUCN GET level 3) that is still ecologically meaningfull from the viewpoint of accounting of extent and services? What is the maximum number of groups?
- What do you see as the main bottlenecks?

Thank you!

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UN SEEA EEA revision clarification of terms

KEY topics as outlined :

- Definition of EA and EAA
- Use of IUCN GET as a reference classification

- Ecosystem assets (EA): the focus – conceptually 3D objects, link CBD definition

- Ecosystem accounting area (EAA) provides a boundary around a set of ecosystem accounts, ususally country

- EA classified by ecosystem type (ET) – IUCN Global Ecosystem Typology as a reference classification (concenptual bases e.g focal points for countries who use their own conceptual classifications)

- Delineation of EA should focus on ecological aspects – limited link to ecosystem use, recommend to go beyond land cover

- Basic spatial unit (BSU) is an operational choice (in a GIS format)

DEVELOPED ESTONIAN ECOSYSTEM MAP*