GEOSPATIAL DATA FOR ECOSYSTEM ACCOUNTING

EARTH OBSERVATION FOR ECOSYSTEM ACCOUNTING (EO4EA) GEO INITIATIVE

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GEO | EARTH OBSERVATIONS FOR ECOSYSTEM ACCOUNTING

OUTLINE

- Introduction to GEO and EO4EA
- Earth observation data supporting ecosystem accounts
- Application of global datasets for ecosystem accounting
- Opportunities for capacity building and amplification

THE GROUP ON EARTH OBSERVATION (GEO)

- GEO is a partnership of more than 100 national governments and in excess of 100 Participating Organizations that envisions a future where decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations

- GEO promotes open, coordinated and sustained data sharing and infrastructure for better research, policy making, decisions and action across many disciplines

- Activities are implemented under GEO through Flagships and Initiatives which are incorporated in the work programme; one of which is EO4EA

GEO GROUP ON EARTH OBSERVATIONS

EARTH OBSERVATION FOR ECOSYSTEM ACCOUNTING (EO4EA)

- EO4EA is a GEO Initiative that seeks to enable and enhance the application of earth observation data in support of ecosystem accounting

- The initiative is comprised of 4 work streams;
    - Case studies and synthesis
    - Ecosystem extent and condition
    - Ecosystem services
    - Implementation and capacity building

- The goal of the initiative is to develop data and methods that can be applied to support ecosystem accounting and to facilitate its widespread adoption

EARTH OBSERVATIONS FOR ECOSYSTEM ACCOUNTING

LINKING EARTH OBSERVATION DATA TO THE ACCOUNTS

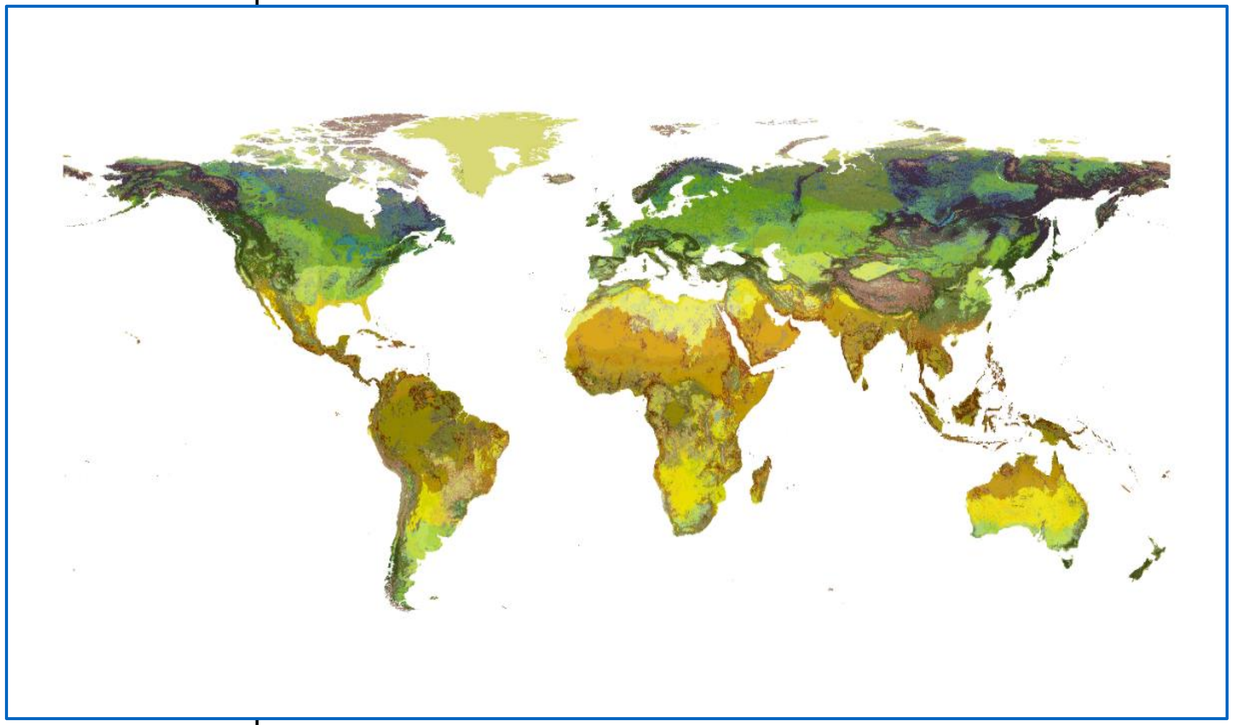
- Earth Observation data, and particularly satellite data, is uniquely suited for ecosystem accounting because it is temporally and spatially consistent

- Methods and algorithms for processing and analyzing EO data are readily transferable and scalable

- Developing standard geospatial data products to support accounting will facilitate the adoption, foster development, and allow for comparability

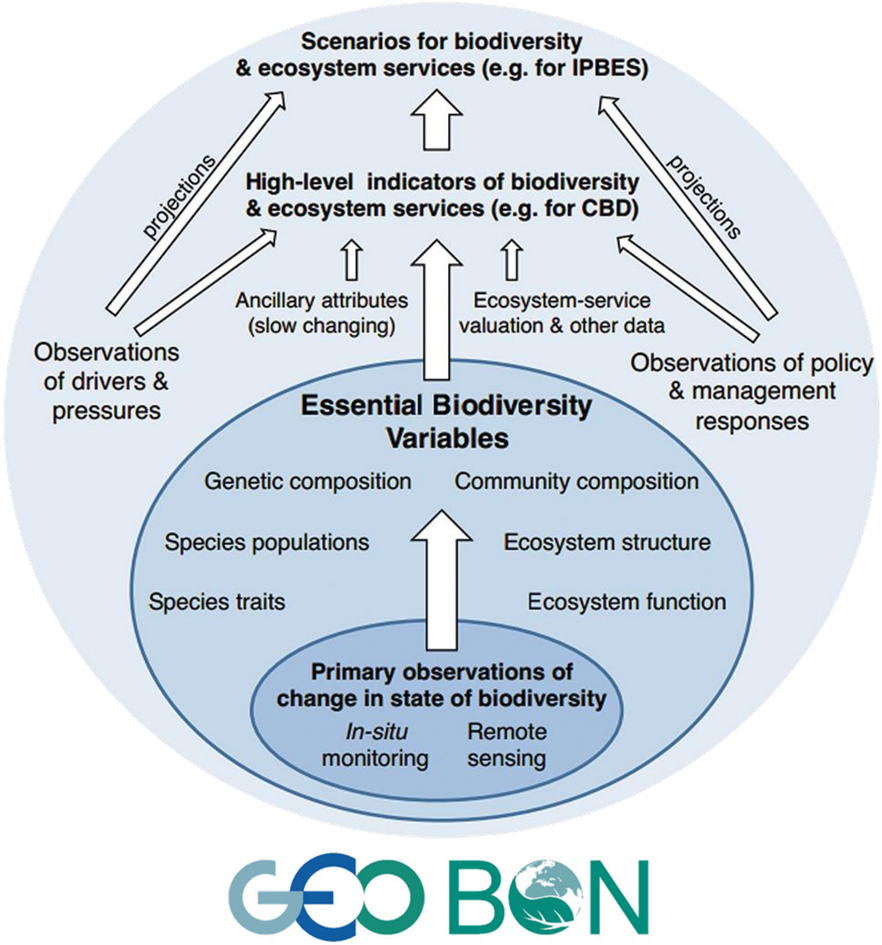
EXAMPLE: GLOBAL MAPS OF ECOSYSTEM EXTENT

Environmental domain	USGS/ESRI Major Ecosystem Type
Terrestrial	1 Forestlands
	2 Shrublands
	3 Grasslands
	4 Woodlands and Savannas
	5 Barren Lands
	6 Croplands
Freshwater	7 Rivers and Streams
	8 Lakes and Ponds
	9 Freshwater Wetlands
Marine waters	10 Estuaries
	11 Sunlit Ocean Waters
	12 Twilight Ocean Waters
	13 Deep Ocean Waters
Marine seabed	14 Intertidal Seabed
	15 Sunlit Shelf
	16 Twilight Shelf
	17 Continental Slope
	18 Deep Ocean Floor
	19 Trench Floor
Any	20 Built Environment



Sayre et al., in Review

EXAMPLE: KEY INDICATORS FOR ECOSYSTEM CONDITION



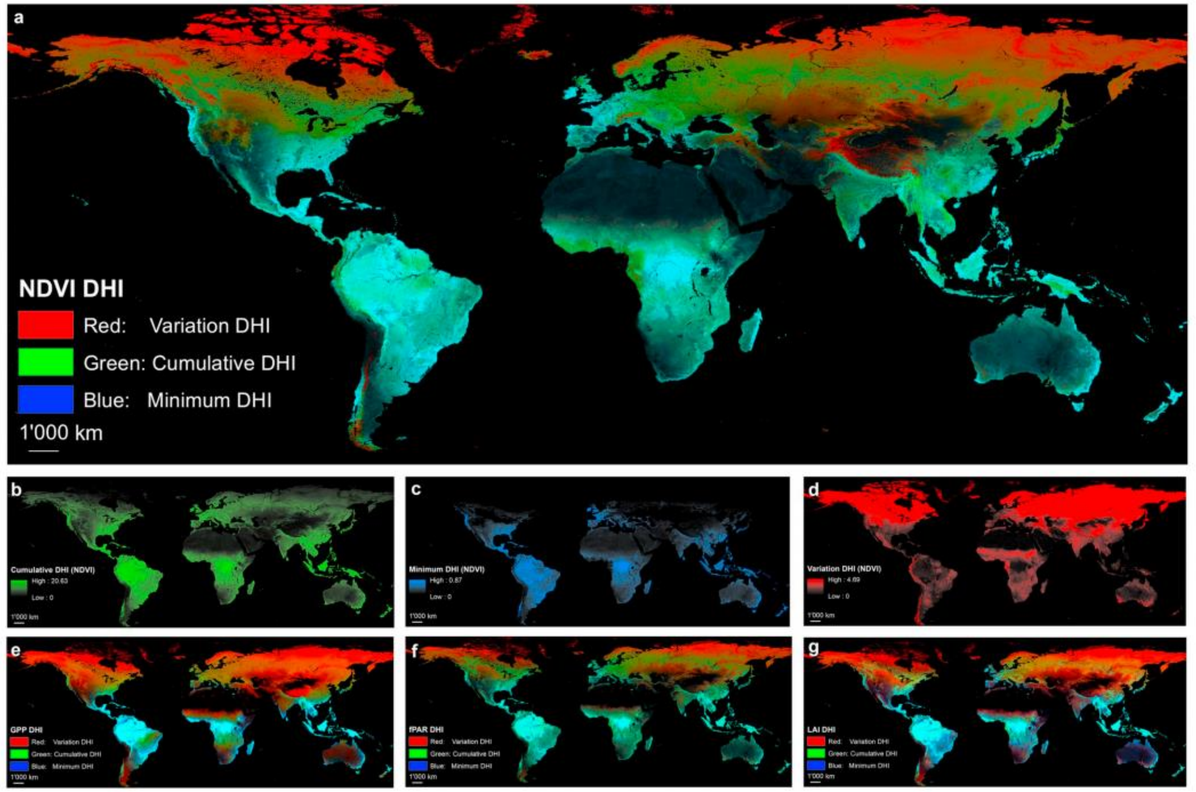
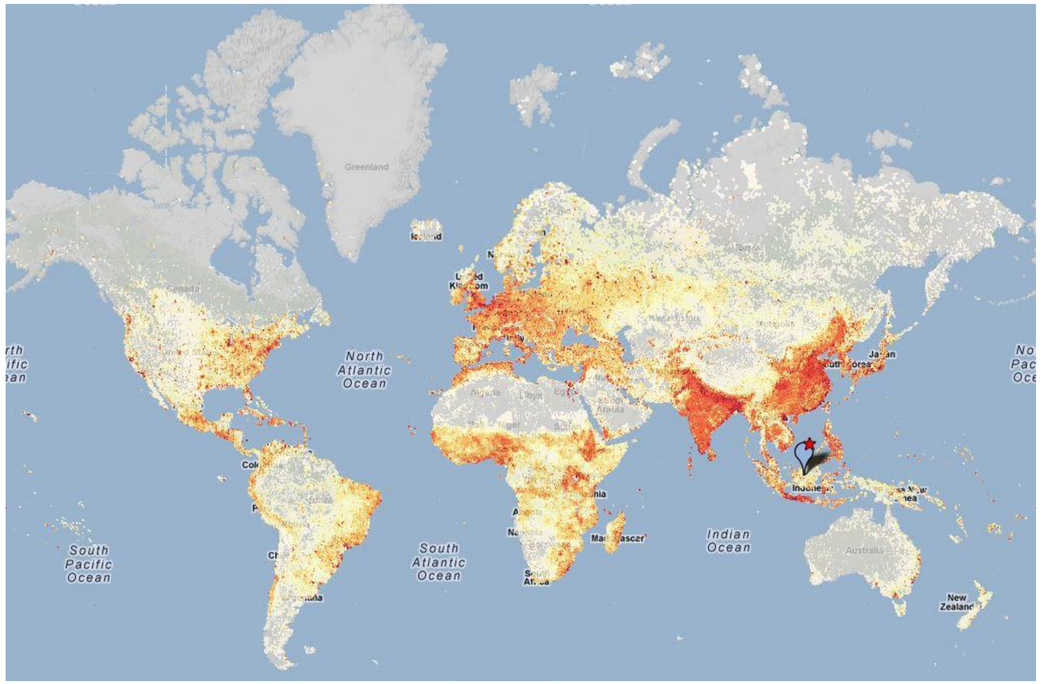


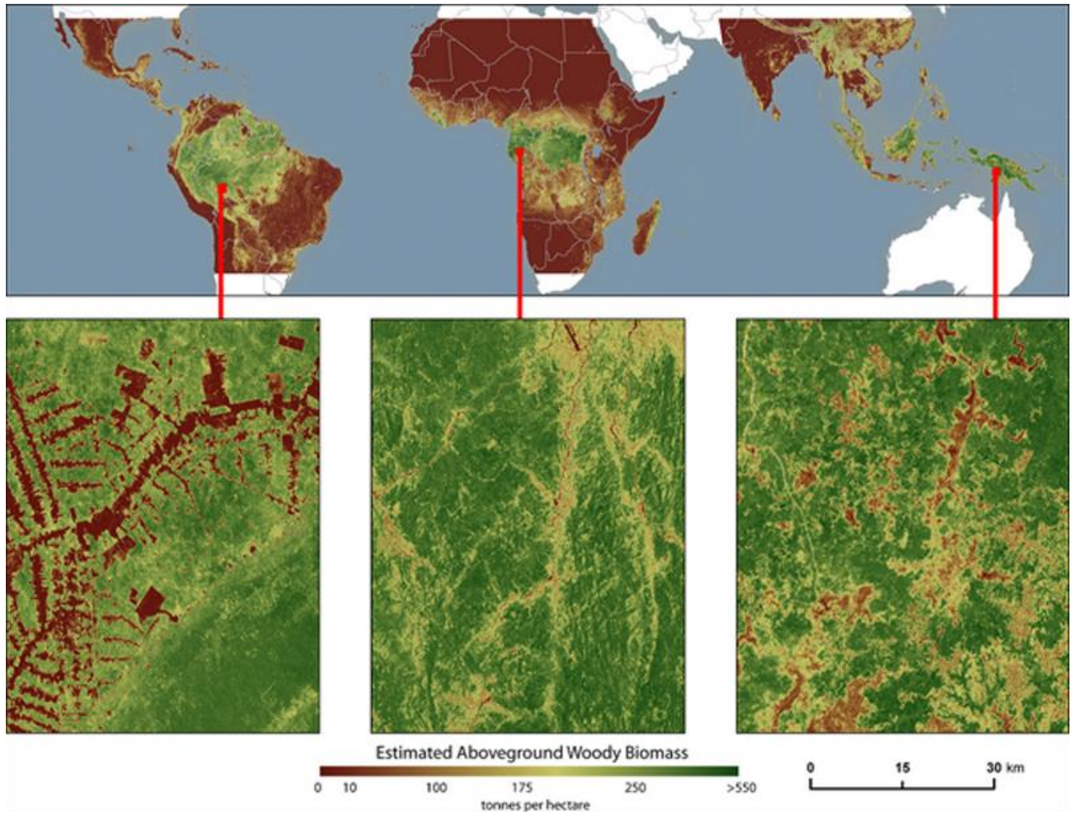
Fig. 1. The global patterns of the DHIs, a) a color composite of the three DHIs based on median MODIS NDVI data from 2003 to 2014 with cumulative DHI in green, minimum DHI in blue, and variation DHI in red, b) cumulative DHI by itself, c) minimum DHI by itself, d) variation DHI by itself, e) fPAR-based DHIs, f) LAI-based DHIs, and g) GPP-based DHIs. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Radeloff et al. 2019

EXAMPLE: ECOSYSTEM SERVICES INDICATORS



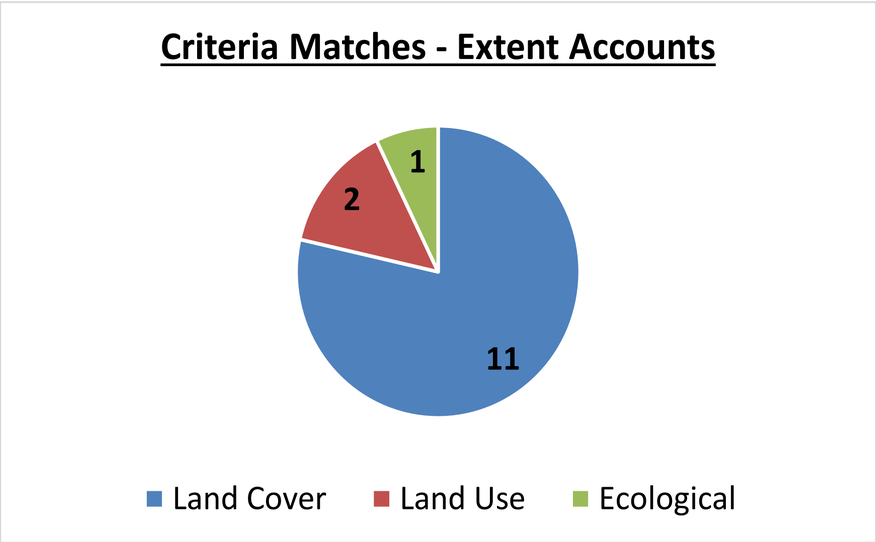
Landscan Population data, 2007

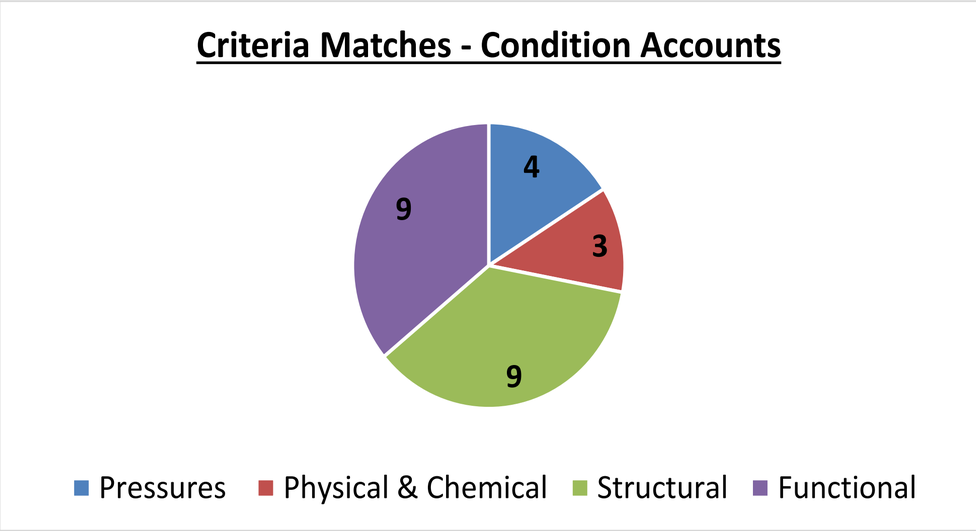


Baccini et al., 2019

COPERNICUS AND ECOSYSTEM ACCOUNTS

- 14 out of 45 products have a match for ecosystem extent
- 25 out of 45 products have a match for ecosystem condition
- Only 2 out of 45 products have a match for ecosystem services
- Review table and interactive database can be found here: https://projects.eionet.europa.eu/ecosystem-capital-accounting/library





Review of Copernicus land services products for ecosystem accounting produced by WCMC, 2018

NEXT STEPS

- Creating a platform to bring together global datasets for ecosystem accounting
- Providing guidelines and input to data producers to improve data quality and make datasets account-ready
- Developing a library of algorithms to support data analysis and the generation of accounts

CONCLUSIONS

- GEO is a uniquely positioned as an international coalition to support the geospatial need of ecosystem accounting through the development of standards and open access of spatial data

- EO4EA plays a specific role to liaison between GEO and the SEEA to ensure technical transfer and to support the implementation of accounts

- Globally consistent geospatial dataset provide a starting place for countries to develop accounts, especially in data-poor regions

- There is a need for platforms which can bring together account-ready data and facilitate the analysis required to create ecosystem accounts.


THANK YOU
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