I talk

25th meeting of the London group
Melbourne, Australia
2019

Julie

Update on USA's SEEA-related Activities

Julie L. Hass, Ph.D.

25th London Group Meeting
Speed Information - USA
Melbourne, Australia
7-10 October 2019

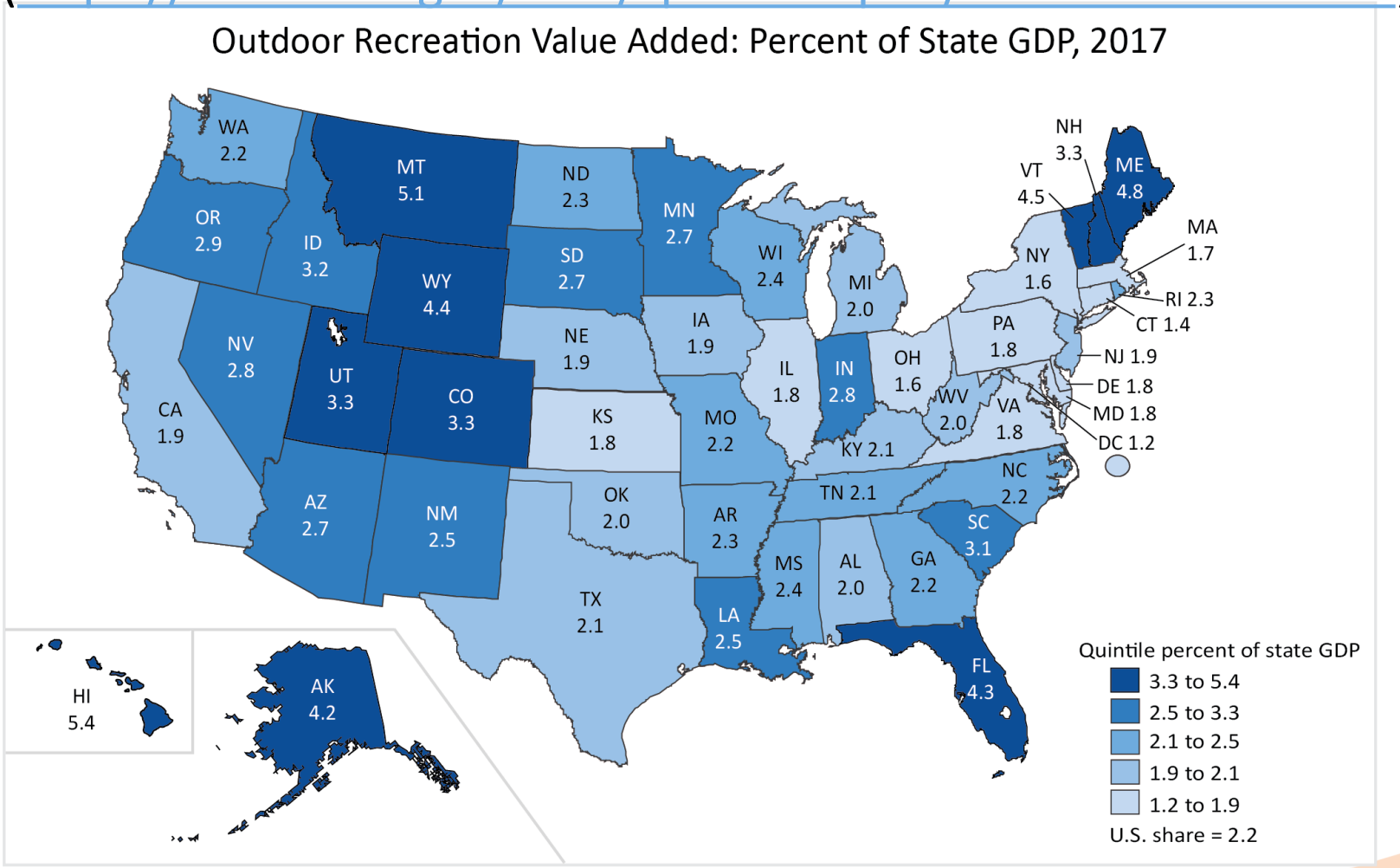
Disclaimer: Any views expressed here are those of the authors and not necessarily those of the Bureau of Economic Analysis or the U.S. Department of Commerce.

NCA Inter-Agency Working Group

- Natural Capital Accounts US Inter-Agency Working Group
  USGS, BEA, NOAA, USFS, EPA, World Bank, + academics
- Important since US has a decentralized statistical system
- Outputs – papers – from the 3 years:
  - The Natural Capital Accounting Opportunity: Let's Really Do the Numbers, *BioScience*, Volume 68, Issue 12, December 2018, Pages 940–943, https://doi.org/10.1093/biosci/biy135
  - Ecosystem accounts for Southeast USA
  - US Water accounts for the 48 conterminous states
  - Land valuation
  - Urban ecosystem accounts
- Papers will be forthcoming in Ecosystem Services Special Issue 2020
- NOAA and BEA working on Ocean satellite accounts (monetary) – built in similar fashion as Tourism Accounts and US's Outdoor Recreation Satellite Accounts (ORSA)

Satellite Accounts - Economic

- Outdoor Recreation – ORSA
  (https://www.bea.gov/data/special-topics/outdoor-recreation)



U.S. Bureau of Economic Analysis

BEA Research Unit

- Evaluating data sources and methodologies for a number of SEEA-CF accounts including:
  - various asset accounts – for different minerals, timber, oil and natural gas, coal;
  - monetary environmental accounts: government expenditure on the environment, environmental taxes, and environmental goods and services.
- The focus has been to investigate existing data sources to determine the suitability of the data and to develop implementation plans for management to use if the opportunity for developing new statistics related to SEEA-CF should arise.

Thank you for your attention!

Contact information:

Julie L. Hass JLHASS@gmail.com

Scott Wentland Scott.Wentland@bea.gov

François

London Group on Environmental-Economic Accounting
October 7-10, 2019
Melbourne, Australia

New data streams for environmental accounting? The use of satellite earth observations to measure the Anthropocene

François Soulard, Marcelle Grenier

Environmental Accounts and Statistics Program

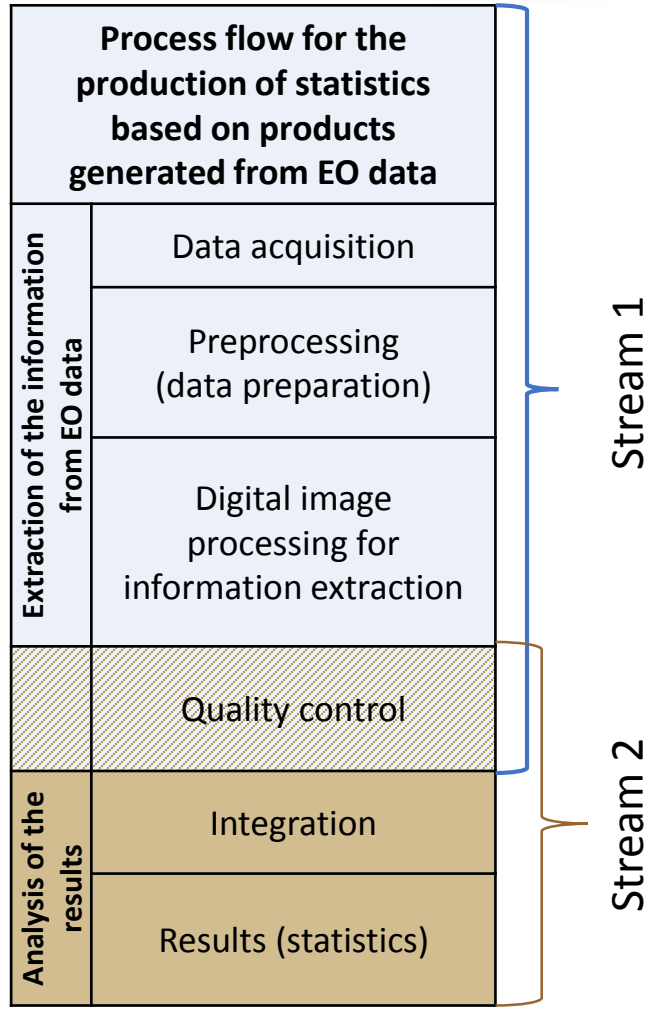
Statistics Canada

francois.soulard@canada.ca

Earth observation data

The number of earth observation satellites increased significantly over the last 5 years (250%). This phenomenal growth is a good indicator of the increasing use of earth observation data. Their characteristics cover a variety of applications for multiple users.

	Technical characteristics
Sensors	> 700 EO satellites around the earth
	Spatial resolution from 0.25 m to 1 km
	Temporal resolution is near real time, historical from 1970
	Open access continues to expand
Processing	Data cubes
	Artificial intelligence (machine learning, deep learning)
	Cloud computing
	Platforms (e.g. GEE) and open source software



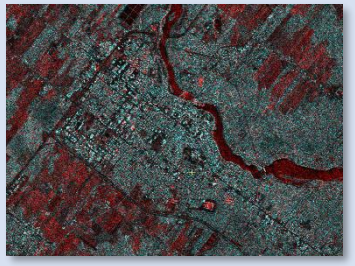
	Stream 1 – Extraction of the information from earth observation data	Stream 2 – Use of products generated from earth observation data
Input	• Governmental (USGS, Sentinelle hub, Open Data -Radarsat) • Vendors (Digital Globe, Planet, BING) • International: UN Global Platform	• Global products (Global Water Explorer, Global Urban Footprint, Global Human Settlement, Global Tree Cover) • National products (land cover and land use)
Requirements	• Identify the accounting needs • Typology • National/Regional variability • Scale (spatial resolution) • Timeliness (historical and current)	
Quality control	• Accuracy assessment • Peer review of the methodology • Ground-truthing	• Authority • Relevance • Accuracy • Timeliness • Accessibility • Interpretability • Coherence
Results	Calculate statistics	Adjust statistics according to the limitations of the products
Effort	High	Low

An operational and a practical approach is a balance between the effort needed to extract the information and the level of detail required to produce statistics

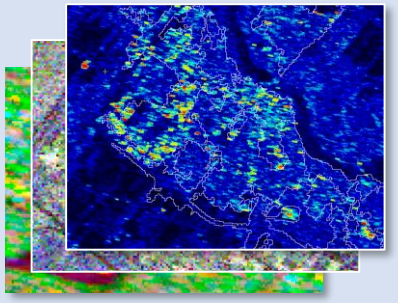
1. Pre-processing Earth Observation Data

Landsat-8, 2016-08-05

Spectral bands and indices (e.g. NDVI)

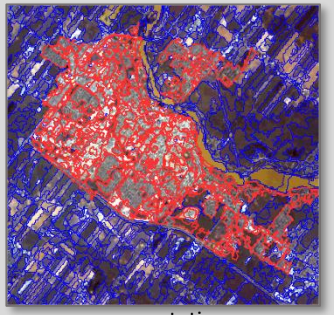


Radarsat-2, 2016-04-28, FQ1W

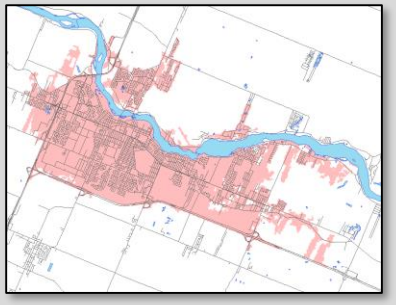


Polarimetric Decompositions

2. Classifying urban land cover using Geographic Object Based image analysis (GEOBIA)



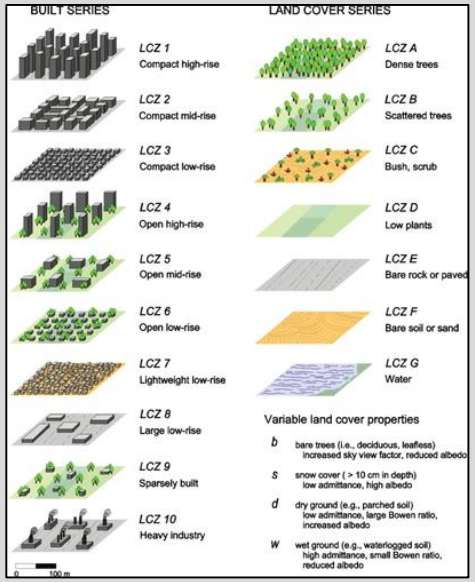
segmentation



Level 1: Urban vs Rural delineation

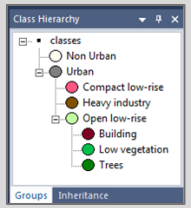
Simulated results

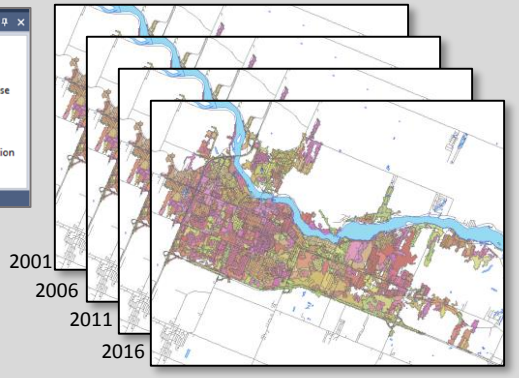
Urban land cover categories



Source: International Journal of Climatology, Volume: 34, Issue: 4, Pages: 1062-1080, First published: 18 June 2013, DOI: (10.1002/joc.3746)

Production of an urban land cover map
Involves classifying image objects (polygons) using rule sets based on radar decomposition layers, optical spectral and contextual information

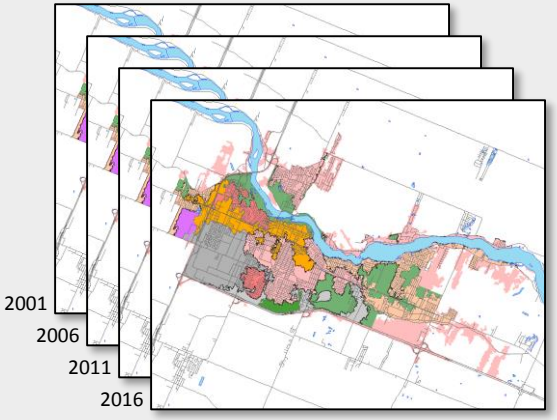




Urban Land Cover maps

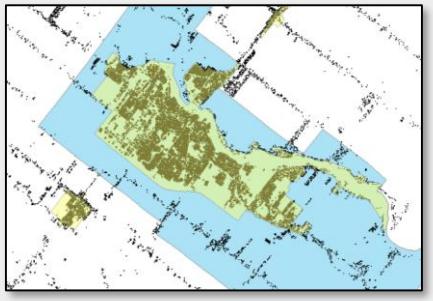
3. Defining urban land use categories using socio-economic data

Urban land use categories:
residential, commercial, industrial, institutional, parks, etc

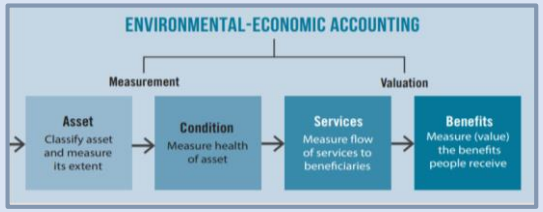


Bridging urban land cover and land use categories: Integrating socio-economic data (census data) and geospatial data such as the building footprint (Microsoft)

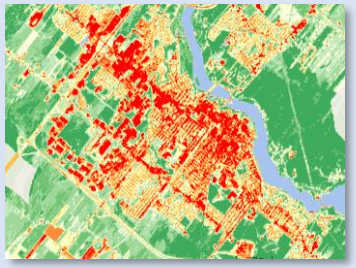
Simulated results



4. Accounting for ecosystem assets in urban areas

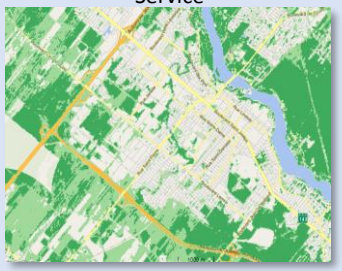


Condition



Heat islands

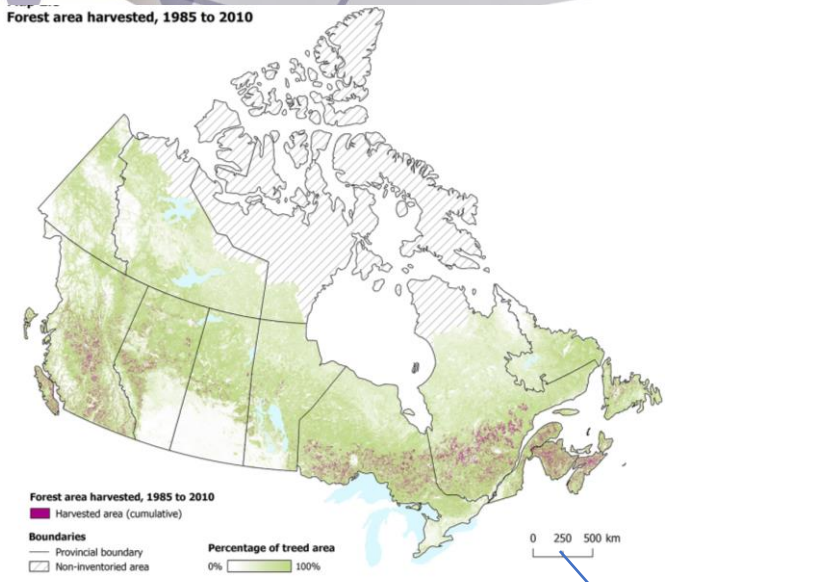
Service

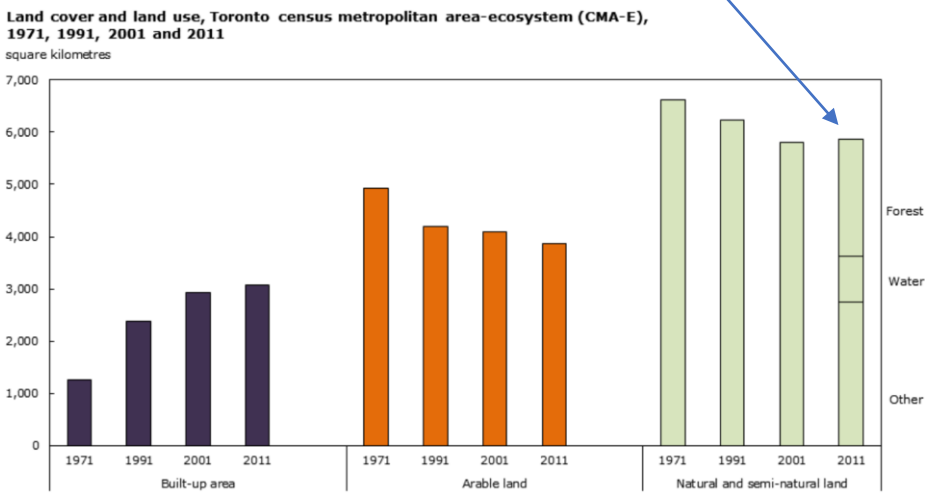


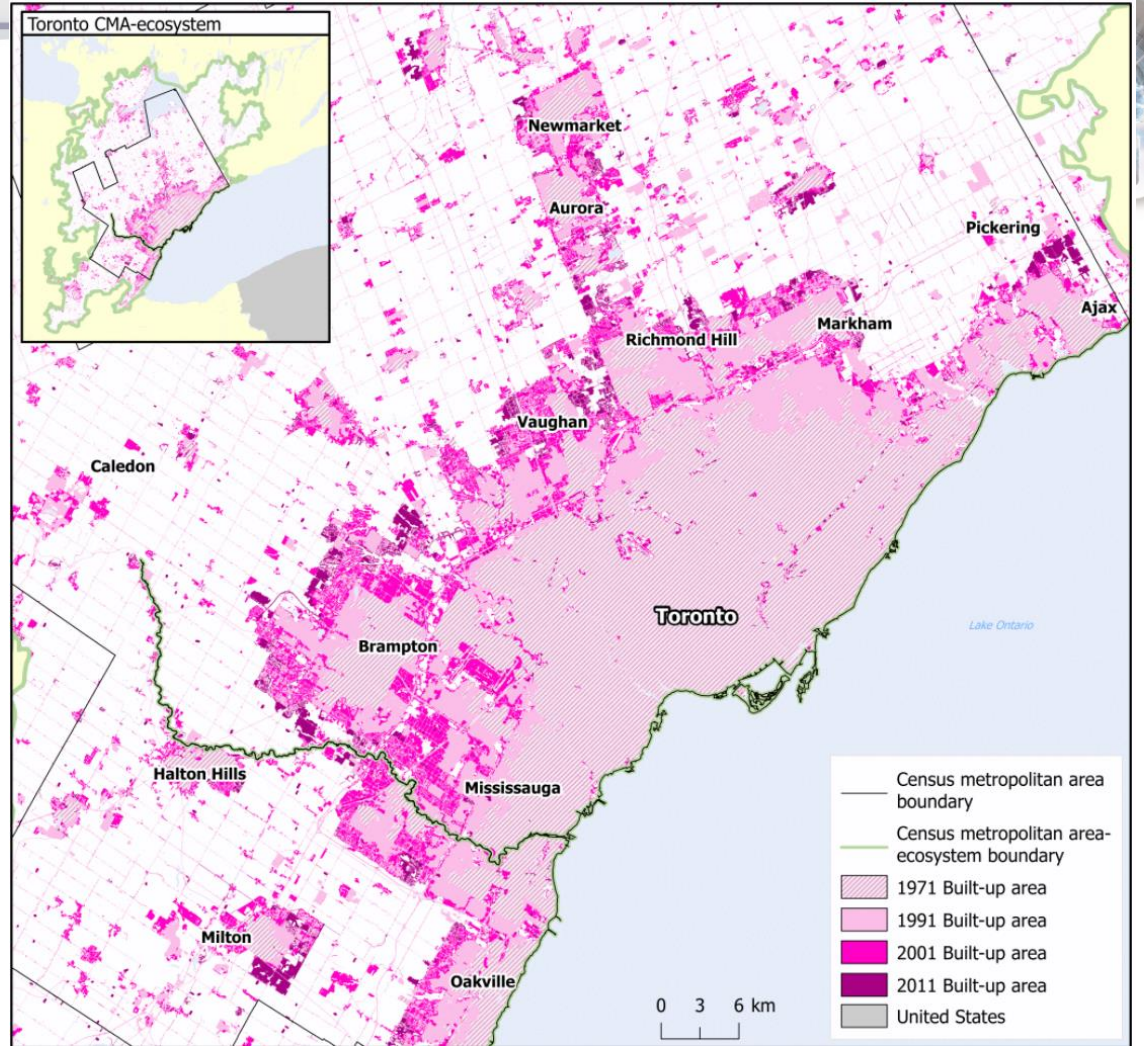
Cool islands – heat mitigation

https://www.donneesquebec.ca/recherche/fr/dataset/ilots-de-chaleur-fraicheur-urbains-et-temperature-de-surface/resource/82a3e8be-45d2-407e-8803-fcc994830fcc

Stream 2







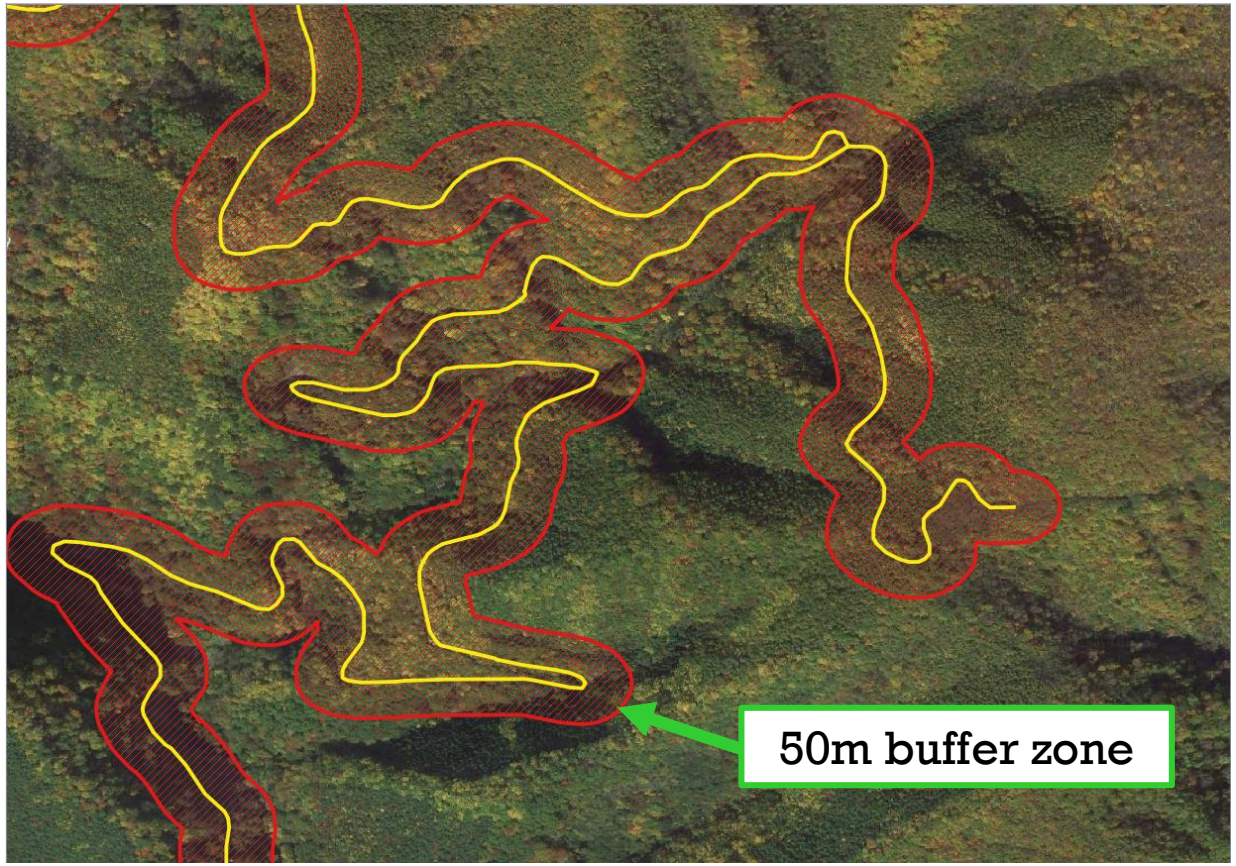
	Total built-up area [1]		Arable [2]	Natural and semi-natural [3]
	Settled	Roads		
	square kilometres			
Opening stock 1971	850	418	4,930	6,615
Land lost to settled area	...	...	-961	-448
Balance of change [4]	1,409	403	-102	-300
Closing stock 2011	2,260	821	3,867	5,866

... not applicable

Takashi

Spatial analysis of forest accessibility and ES in Japan

Takashi Hayashi
PRIMAFF, Japan



Study site: Iwate Prefecture

Distance from roads	Provisional services	Regulating services	Cultural services
Accessible d≦50m	✓	✓	✓
Non-accessible d > 50m	-	✓	-

Spatial analysis of forest accessibility and ES in Japan

Iwate Prefecture	Natural forest		Manmade forest		Total
	Coniferous	Broadleaf	Coniferous	Broadleaf	
Accessible forest area (ha)	11,917	64,196	81,430	2,597	160,140
Total forest area (ha)	95,694	516,676	479,927	18,995	1,111,291
Share of accessible forest (%)	12.5	12.4	17.0	13.7	14.4

Spatial analysis of forest accessibility and ES in Japan

Possibility of extension: Estimation and pricing by road type

	Distance from roads	Provisional services	Regulating services	Cultural services	Price of forest (JPY/ha)
Trail	Accessible (d≦50m)	-	✓	✓	P_1
	Non-accessible (d > 50m)	-	✓	-	P_2
Logging road	Accessible (d≦50m)	✓	✓	-	P_3
	Non-accessible (d > 50m)	-	✓	-	P_4
Community road	Accessible (d≦50m)	✓	✓	✓	P_5
	Non-accessible (d > 50m)	-	✓	-	P_6
Intercity & Highway	Accessible (d≦50m)	-	✓	-	P_7
	Non-accessible (d > 50m)	-	✓	-	P_8

John

GROUP ON EARTH OBSERVATIONS

Earth Observation for Ecosystem Accounting (EO4EA)

John Matuszak, NCSE

Daniel Juhn & Max Wright, Conservation International
secretariat@EO4EA.org

October 2019 / Melbourne, Australia

EARTH OBSERVATIONS FOR ECOSYSTEM ACCOUNTING

#GEOdatatech

GEO Data Technology Workshop

Ecosystem accounting is a standardized system that is, by design of its use of spatial data, reliant on earth observation to achieve its goals at scale.

- There is a significant global demand for ecosystem accounting with the UN Statistical Commission identifying over 80 countries that have indicated their desire to develop these accounts.

- There is a significant global demand for ecosystem accounting with the UN Statistical Commission identifying over 80 countries that have indicated their desire to develop these accounts

- Our mission is to document, pioneer, develop, and test the methods and tools that will allow earth observation technology to more effectively enable the widespread adoption of ecosystem accounting.

EARTH OBSERVATIONS FOR
ECOSYSTEM ACCOUNTING

Common attributes between EO and EA

- Standardization
- Regularity
- Geospatial formats

EARTH OBSERVATIONS FOR
ECOSYSTEM ACCOUNTING

EO4EA work program and key deliverables -

To assess the use and potential of Earth Observations to:

- Four Workstreams: 1)case studies and synthesis, 2)ecosystem extent and condition, 3)ecosystem service assessment, and 4)capacity building.
- Headline Deliverables:1) review and contribute to the development of methods and standards, 2) test and apply EO data and algorithms for the purpose of ecosystem accounting, and 3) develop data platforms and resources to amplify our result and facilitate ecosystem accounting at scale.

EARTH OBSERVATIONS FOR ECOSYSTEM ACCOUNTING

Key Milestones and/or Deliverables for 2020-2022

- Develop an online library, hosted on the EO4EA website, of case study and synthesis reports to support the application of EO for ecosystem accounting
- Contribute to the development of the UN-SEEA revision of the Ecosystem Accounts in 2020 and highlight the use of EO for operationalizing accounting
- Compile a list of key ecosystem services for accounting and identify EO datasets to support the assessment of those services, especially in data-poor regions
- Create capacity building material to facilitate the adoption of ecosystem accounting, including base products, workflows, and educational materials

Thank You

Contact

Daniel Juhn & Max Wright
Conservation International
secretariat@eo4ea.org

EARTH OBSERVATIONS FOR
ECOSYSTEM ACCOUNTING

Viveka

Agenda 2030 and the SEEA

Viveka Palm, vice director regions and environment, SCB
Adjungerad Professor KTH
Co-chair of the IAEG-SDG group
viveka.palm@scb.se

SCB

THE GLOBAL GOALS
For Sustainable Development

The 17 SDG goals

1. Poverty
2. **Agriculture**, food security
3. Health
4. Education
5. Gender
6. **Water**
7. **Energy**
8. Growth and employment
9. Infrastructure and innovation
10. Inequality
11. Cities
12. **Sustainable production and consumption**
13. **Climate change**
14. **Marine areas**
15. **Land degradation and biodiversity loss**
16. Peace, justice
17. Governance – including statistical capacity

Basic human needs

Economy

Environment

Society

Statistiska centralbyrån Statistics Sweden

IAEG-SDG

- 28 representatives from NSI:s over the world.
- Co-chaired by Sweden and Tanzania.
- UNSD secretariat
- Work endorsed in UNSC 2017. Around 230 indicators. Working on making them measurable and giving advice to the UN custodians for the global follow up
- A working group for interlinkages between goals.

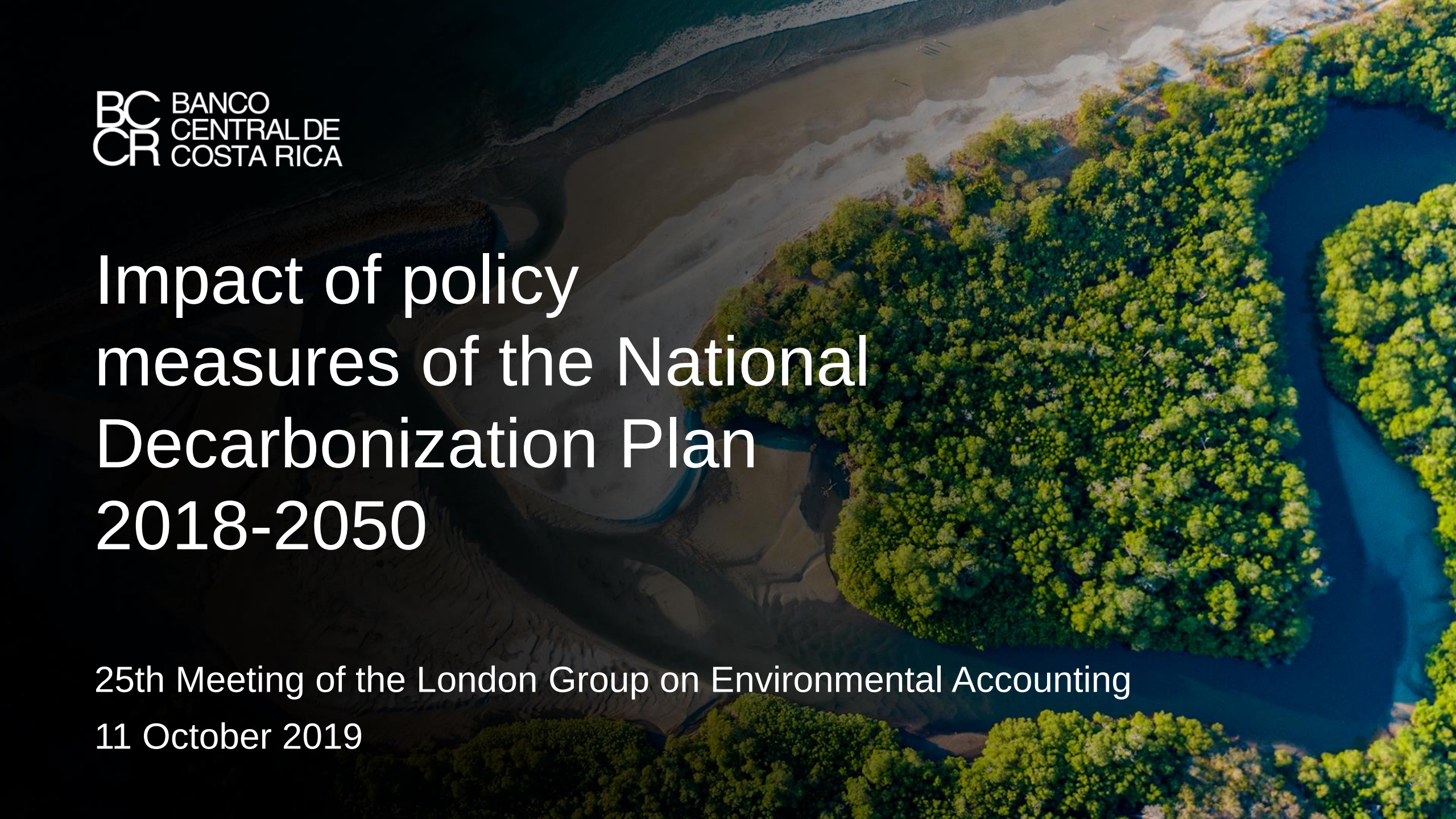
Using SEEA for the SDGs

- Promoting the use of SEEA in the Working Group for interlinkages between the goals.
- Working Group report is underway - deadline in November to be presented at next UNSC meeting in 2020.
- SEEA is planned as one chapter, co-written by Canada, Germany and Sweden.

Chapter content

1. SEEA data for specific indicators already in the system: e.g. water, land, fossil fuel subsidies.
2. Using a harmonised datasystems for sustainability analysis - a need for the Agenda 2030 process.
3. Bringing together resource use, environmental pressure, economic facts on production and consumption (industries and products) into one system. Input-output analysis, industrial profiles.

Irene



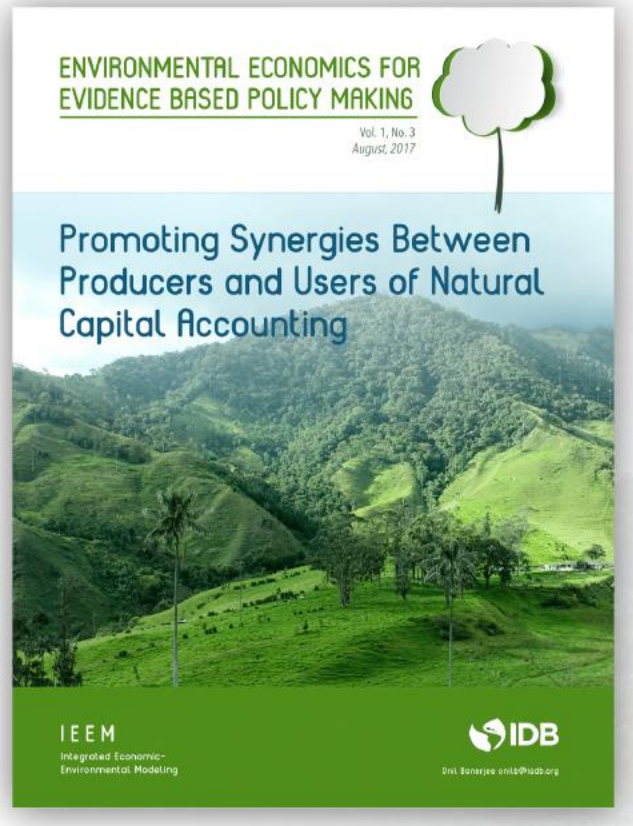
BANCO CENTRAL DE COSTA RICA

Impact of policy measures of the National Decarbonization Plan 2018-2050

25th Meeting of the London Group on Environmental Accounting

11 October 2019

Integrated Environmental Economic Modeling for Costa Rica (IEEM-CR)



- Recursive, dynamic GEM that incorporates the environmental accounts.
- Forward-looking analysis of public policies and understanding of the impact of decisions before their implementation.
- Risk scenarios that consider environmental factors for macroeconomic projections.
- Use of the platform to link national and environmental accounts to analyze feasibility of achiving environmental commitments.
- Main inputs: Social Accounting Matrix 2012 and Energy Accounts.

DESCARBONIZE
COSTA RICA
COUNTRY COMMITMENT 2018-2050

Decarbonization Plan

10 Focus Areas in total

Our scope: actions related to “Transport and sustainable mobility” ➔ first 3 focus areas:

- Public transport system
- Light vehicle fleet
- Freight transport

Potential shocks to address

Replacement of the use of private vehicles with public transportation.

Increase in non-polluting public transport fleet.

Impact over variables such as:

- **GDP**
- **Employment**
- **CO_2 emissions**
- **Public finances**