

Establishing classes for
ecosystem types – is there a
minimum number of classes to
support measurement and
decision support?

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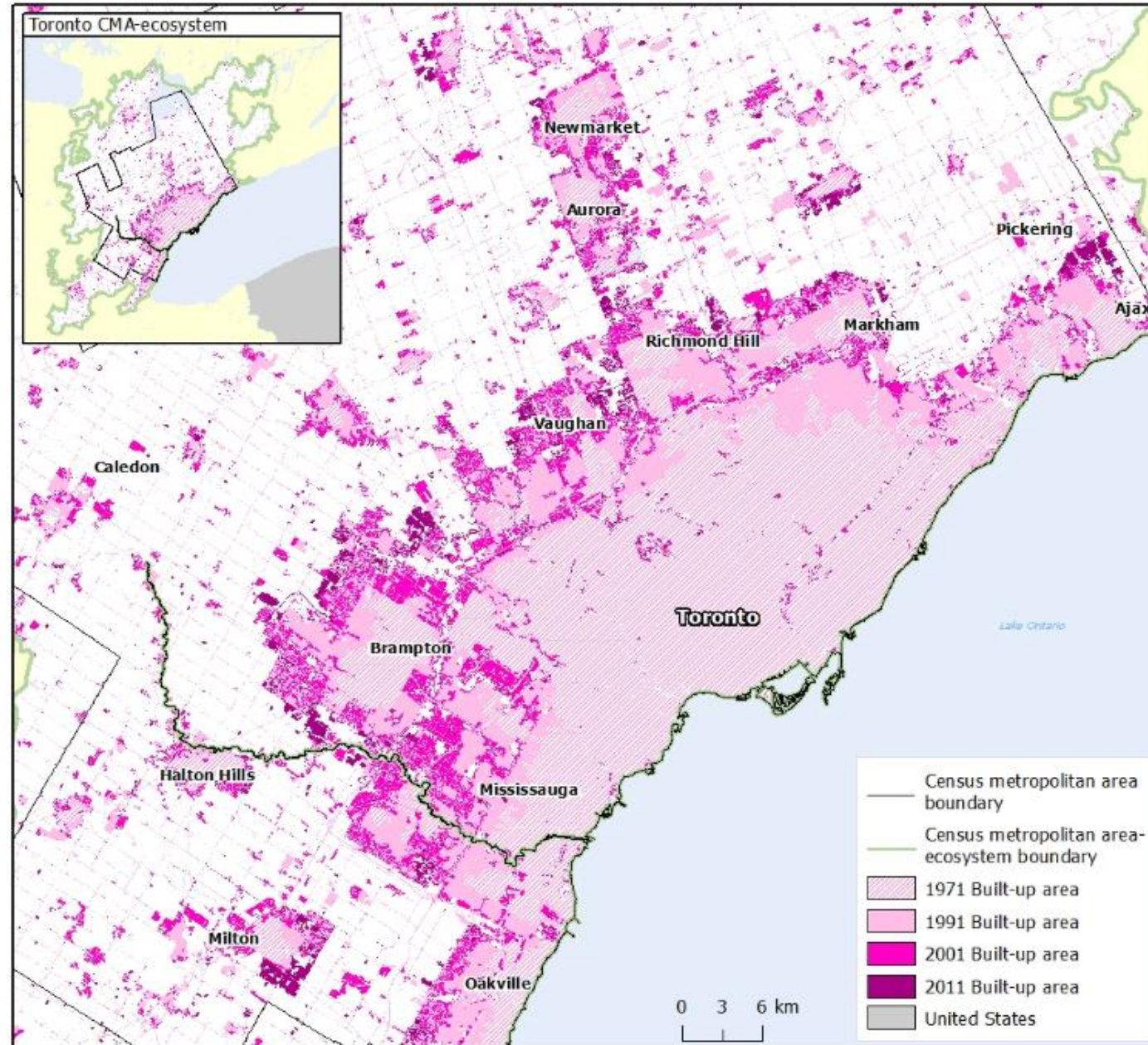
Ecosystem accounts in Canada

POLICY USES

- Informs public policy issues, for instance, the loss of the best agricultural land for urban land uses.
- Helps provide answers to local issues, such as urban sprawl.
- Contributes to the development of laws and policies aiming to frame spatial planning, namely metropolitan areas.



Urban ecosystem assets accounts



HAE 2015 : The changing landscape of CMAs

Ecosystem asset account, Toronto census metropolitan area-ecosystem , 1971 to 2011

	Total built-up area ¹		Arable ²	Natural and
	Settled	Roads		semi-natural ³
	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

HAE 2015 : The changing landscape of CMAs

Land cover and land use, Toronto census metropolitan area-ecosystem (CMA-E), 1971, 1991, 2001 and 2011

square kilometres

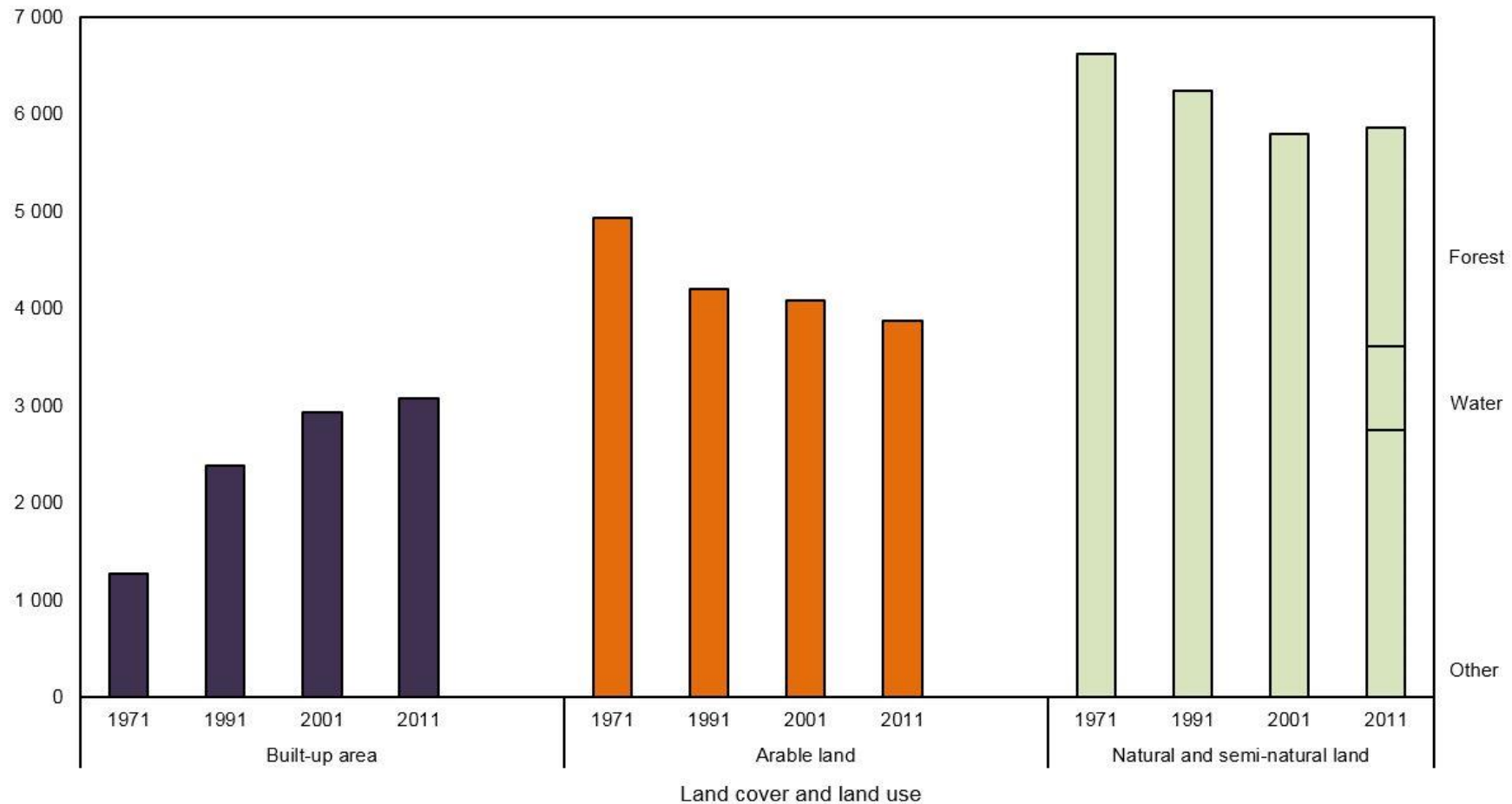
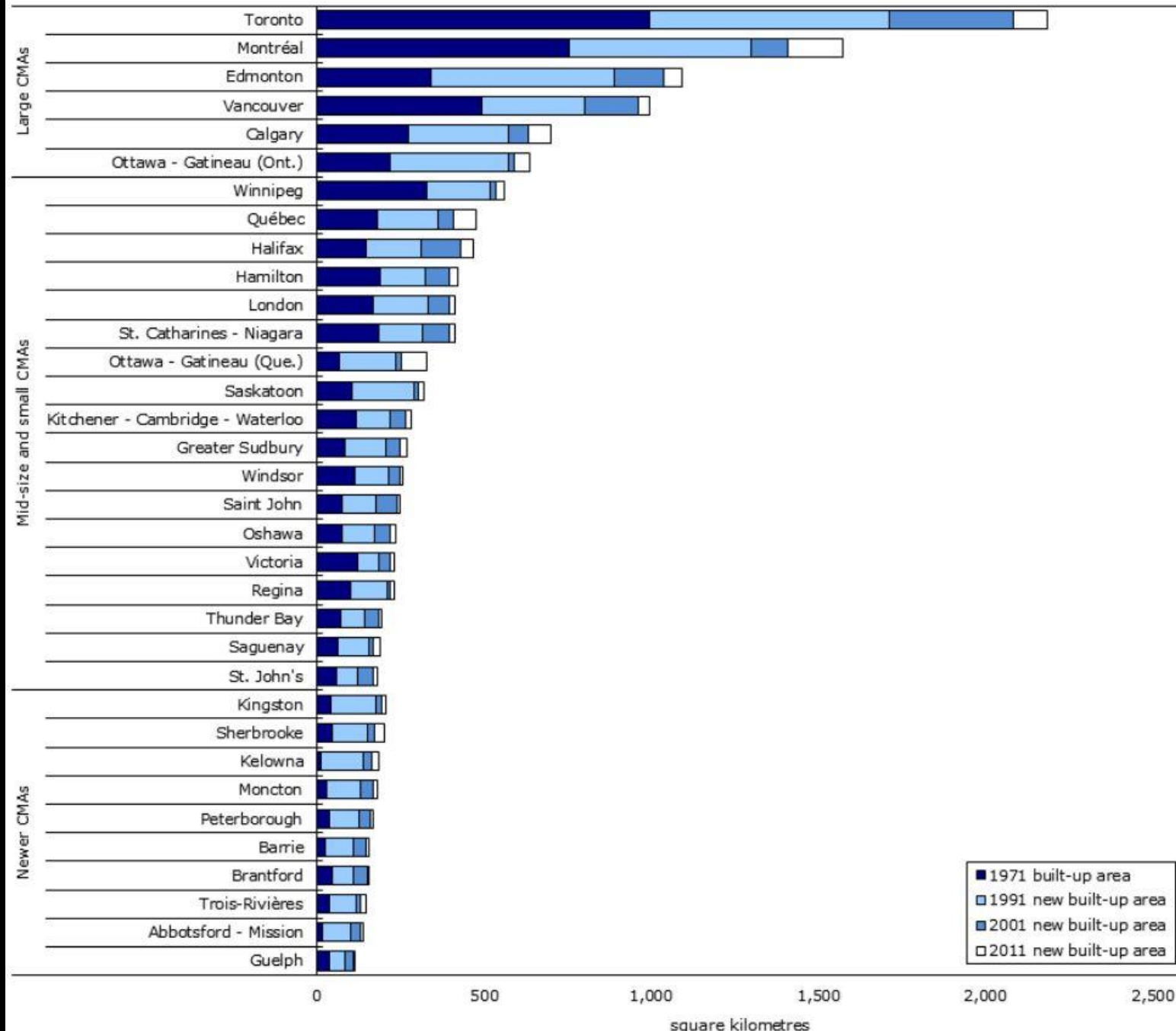


Chart 2.4
Built-up area by census metropolitan area, 1971, 1991, 2001 and 2011

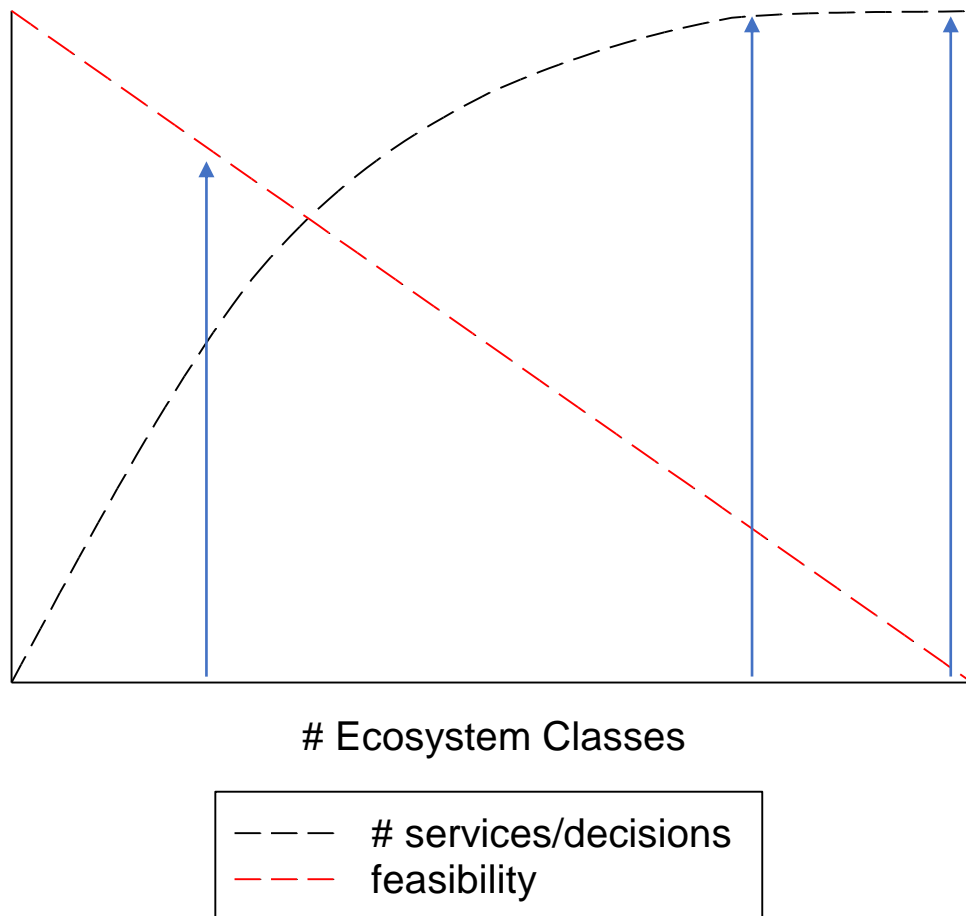


Hierarchical classification

Forest	Land cover
Tropical Forest	Biome
Cloud Forest	Ecosystem
Elfin Forest	Distinct structure, fx and composition, provides specific services, e.g. carbon, fog interception

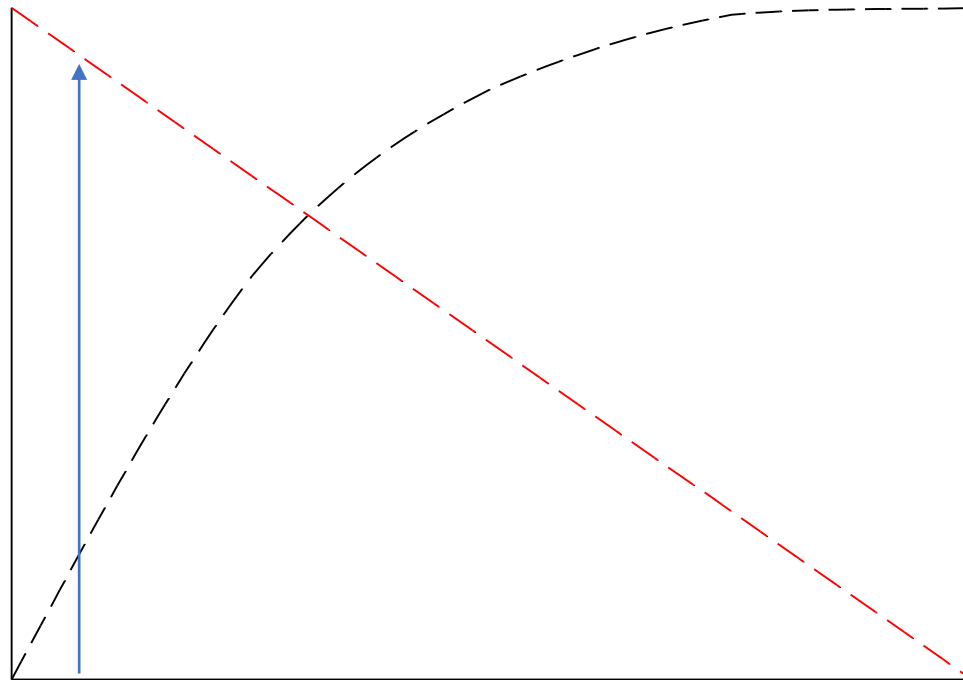
Forest	Land cover
Tropical Forest	Biome
Moist Lowland Forest	Ecosystem
Riparian Forest	Distinct structure, fx and composition, provides erosion and flood control, regulates water quality, etc.

Selecting # Ecosystem Classes



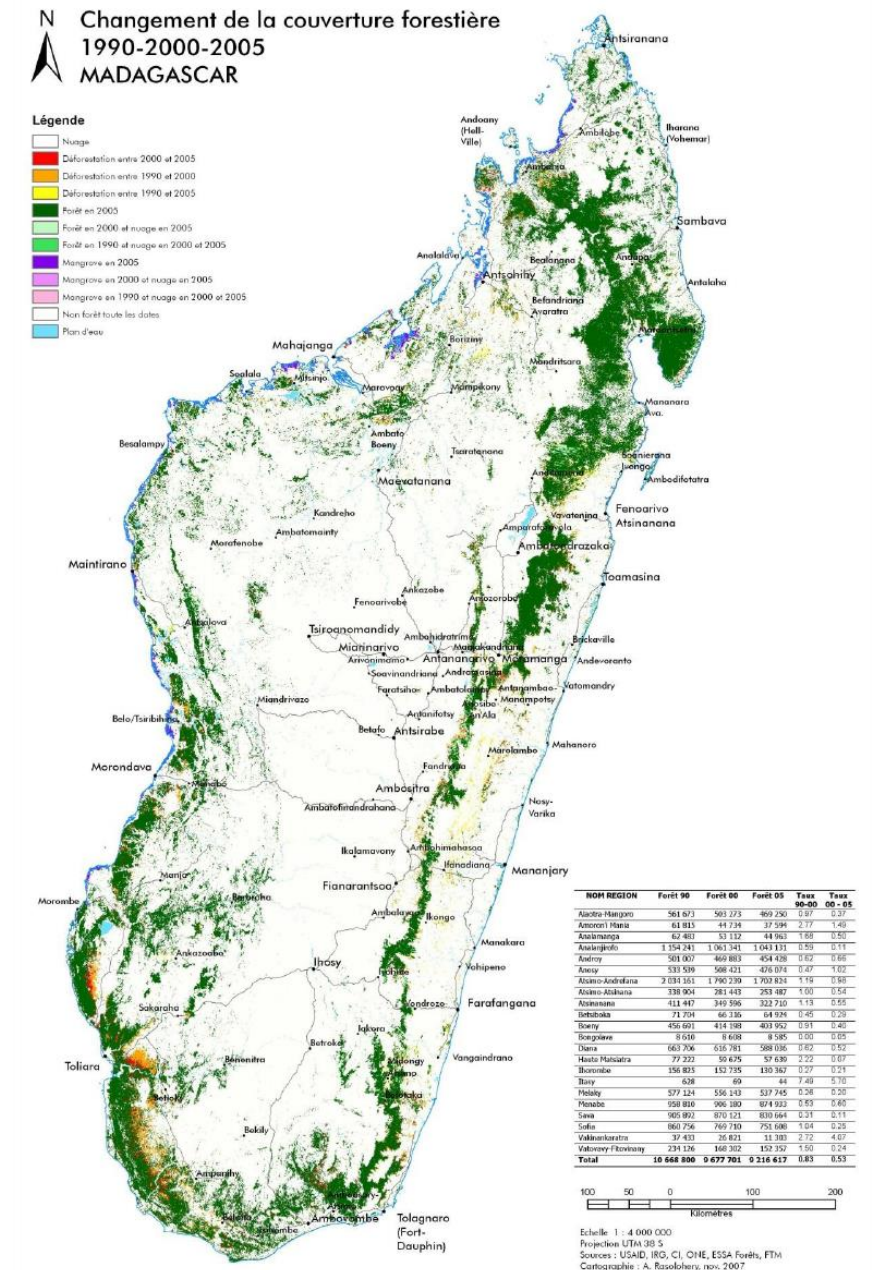
- Ecosystem classes distinguish sources of benefits and can determine management approaches
- Trade-off between feasibility/effort and applicability to a wider range of benefits, decision-making and policies
- Is # classes determined by ecological/biophysical differences or by services/decisions/policies? If latter not considered or not known, measure as many as possible
 - Ecosystem classes are foundation for all future accounts – desired outcomes/policies change

Forest (land cover) mapping led to tripling of protected areas in Madagascar

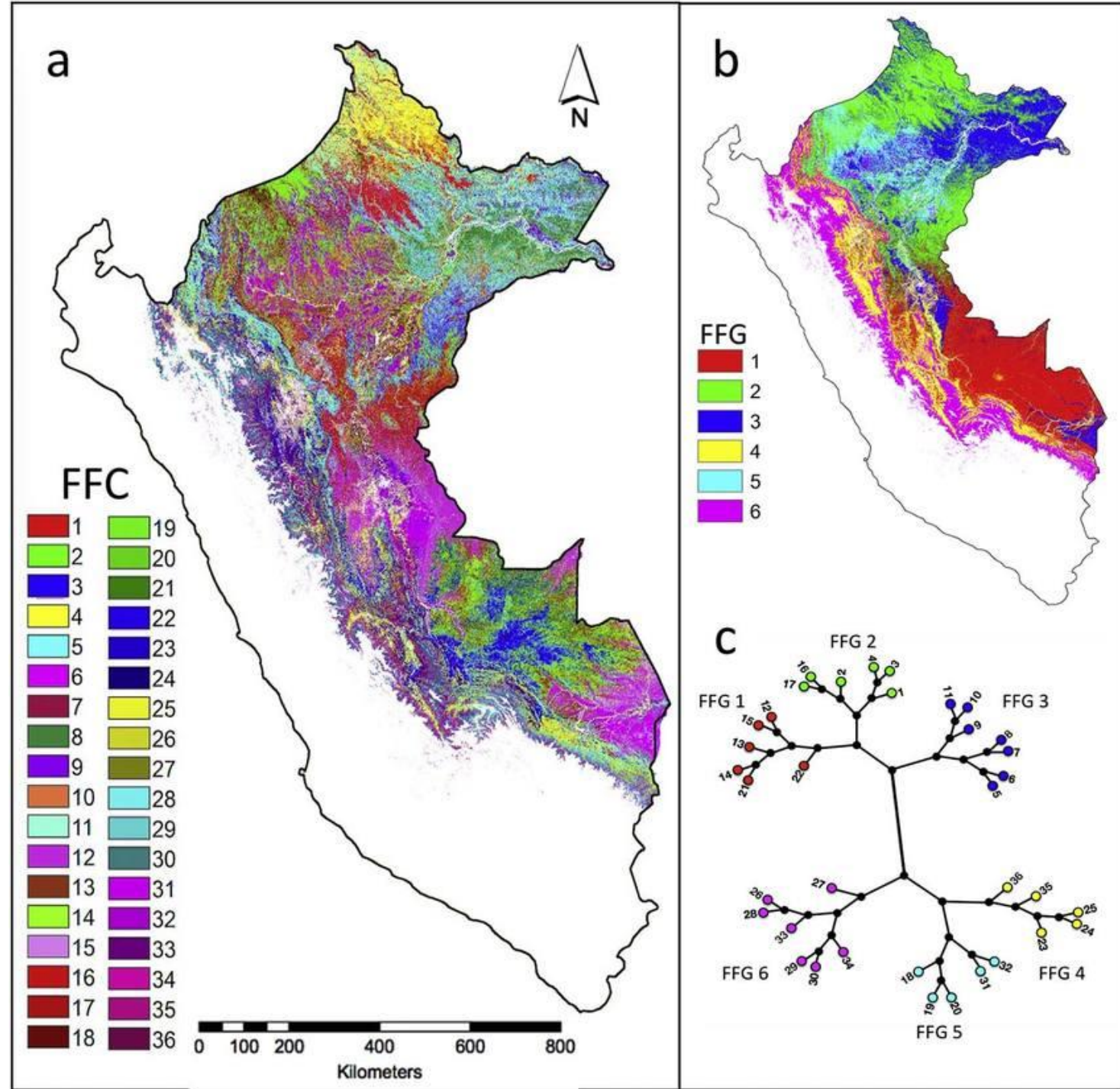


Ecosystem Classes

— — — # services/decisions
- - - feasibility



Hyperspectral ecosystem classification for Peru

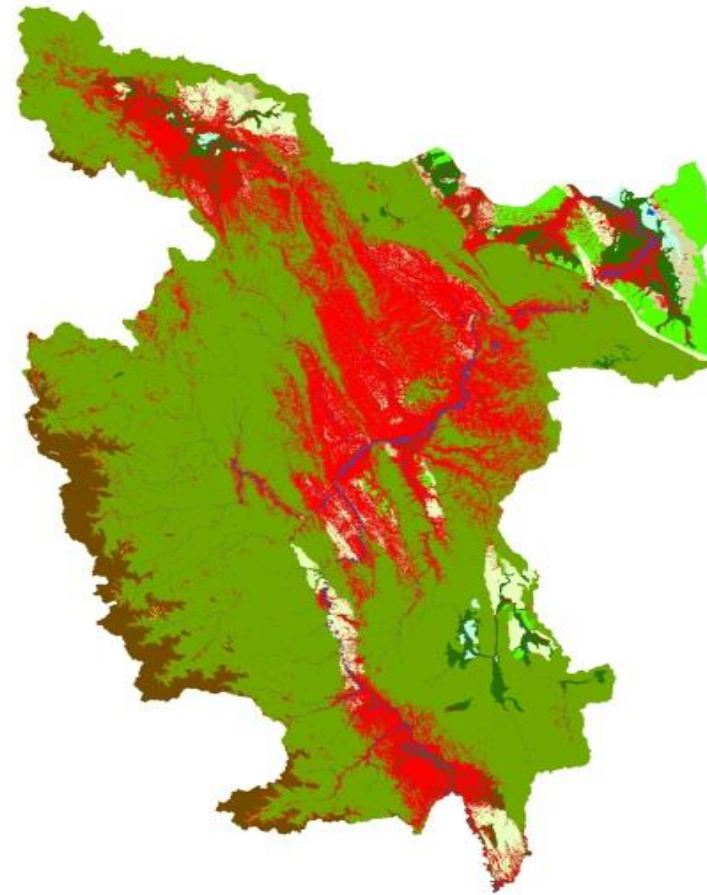


Ecosystem classification for San Martin, Peru

Pre-colonization



Current



Boques

- Bosque Humedo de Colina Alta
- Bosque Humedo de Colina Baja y Lomada
- Bosque Humedo de Montana
- Bosque Humedo de Terraza Alta
- Bosque Humedo de Terraza Baja y Media

Herbazal

- Matorral Arbustivo
- Herbazal Hidrofitico

Pastizal

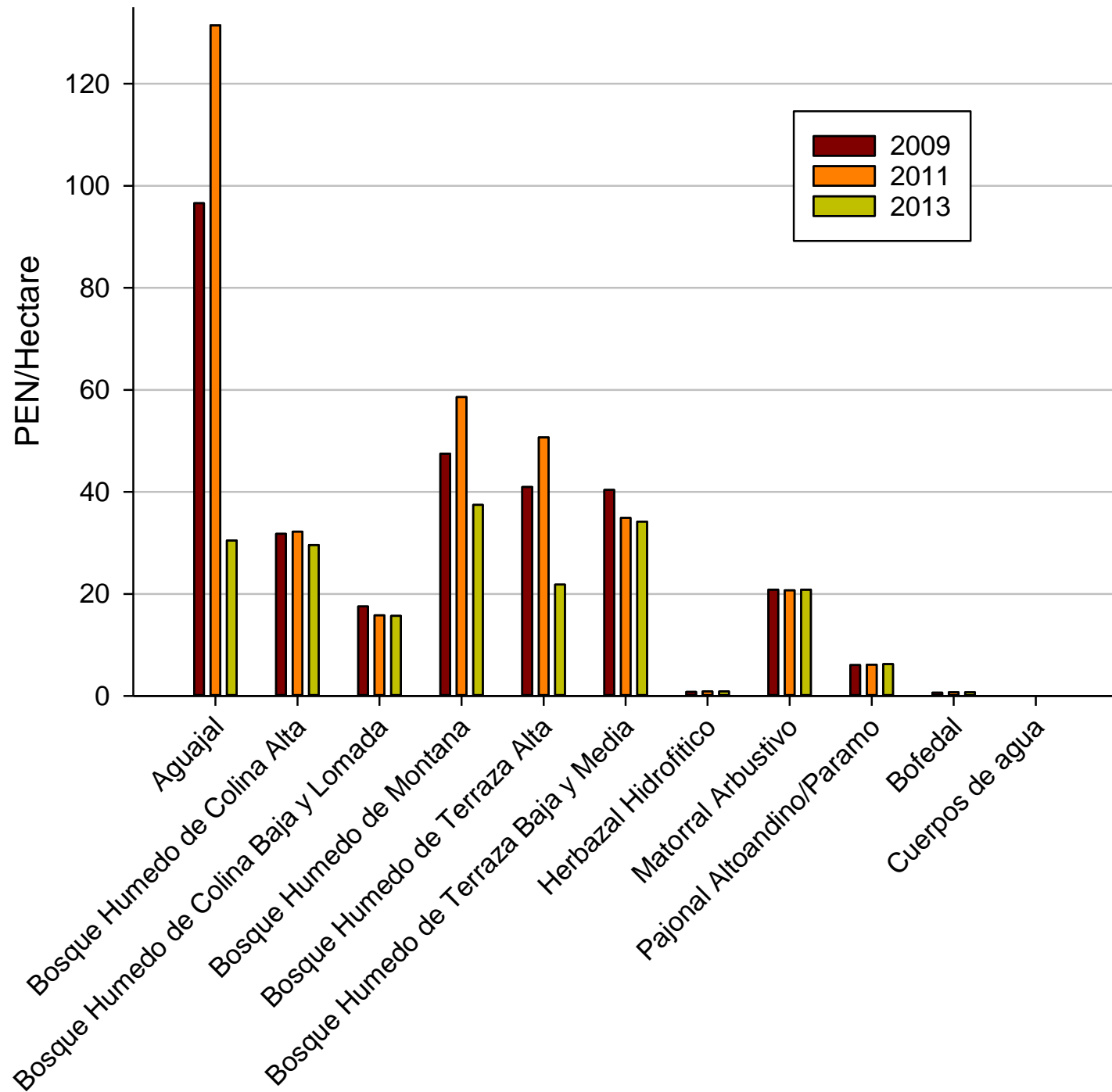
- Paramo y Pajonal Altoandino

Bosques Inundables y Cuerpos del Agua

- Bofedal
- Aguajale
- Cuerpos del Agua

Ecosistemas Modificados

- Ecosistemas Modificados



Economic values of palm swamp

- Water provisioning
- Bushmeat
- Firewood
- Fruits
- Biodiversity

Questions

- How does # classes influence applicability to high level policies, e.g., SDGs?
- How does # classes affect ability to monitor change in classes over time?
- Which variables are most important for classification? Vegetation?
- Bottom up vs top down? Should biology or ecosystem services determine classification?
- How does spatial scale affect # classes? More classes at smaller spatial scales?
- How does # classes affect aggregation for condition and services? After accounts completed, can always aggregate classes and services later, but to disaggregate, have to redo spatial analyses of services