

Addressing Divergence in Ecosystem Accounting

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Highlights

- First comprehensive survey of the ecosystem accounting community of practice
- Agreement on the need for broadening scope, addressing multiple decision contexts and mainstreaming implementation
- Divergence on ethical positions regarding monetization of ecosystem services and interpretation of key concepts, such as biodiversity, ecosystem services and the role of spatial analysis
- Convergence between the 4 distinct sub-communities (discourses) could be fostered by addressing their specific positions.



Methods (1)

- Select questions of interest to community (areas of possible disagreement)
- Organize by stages of ecosystem accounting:
 - Concepts: Statements addressing confusion about language,
 - Scope: Statements addressing what should be included in an ecosystem account,
 - Feasibility: Statements addressing issues of implementation, and
 - Need: Statements addressing application to decision making



Methods (2)

- Identify expected discourses:
 - Economics/Well-being: Focus on **economic** aspects or incorporate a broader focus on **well-being**,
 - Idealism/Pragmatism: Focus on what **should** be done or focus on what **can** be done,
 - Precision/Generalism: Focus on **detail** or focus on **general principles**, and
 - Uncertainty/Certainty: Focus on better understanding what we **don't know** or focus on implementing what we **do know**.



Methods (3)

- Conduct online survey
- Agreement/disagreement with statements
- 131 responses (50.6% completion rate)
- Measure consensus index for each question (variance from even distribution;)
- Cluster respondents into “discourses” (hierarchical clustering)

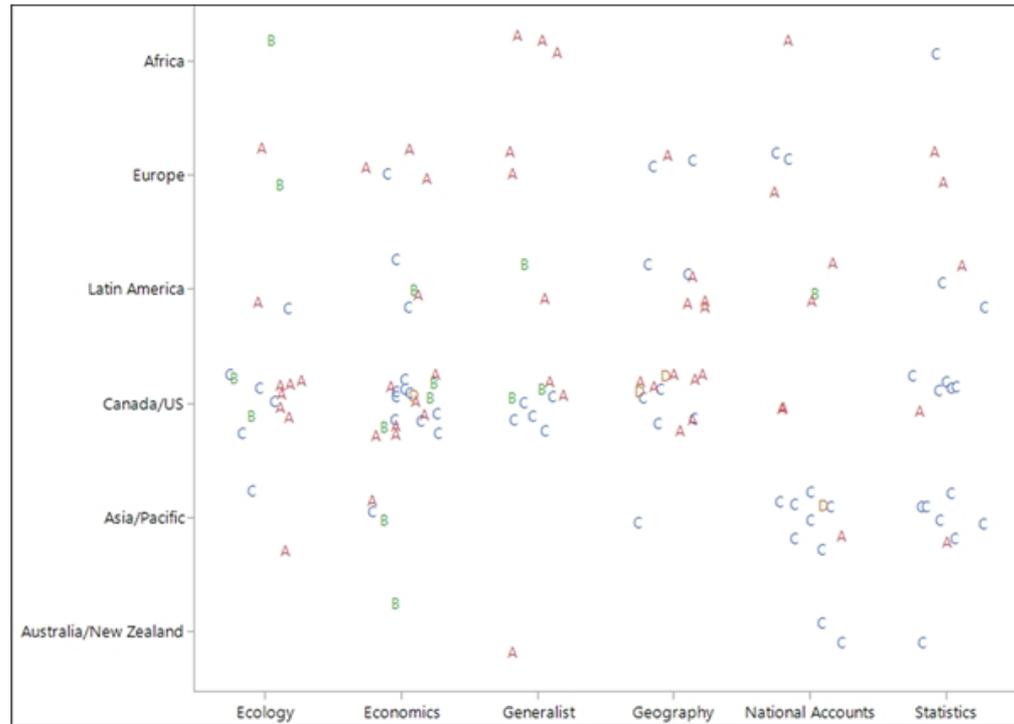


Results: The community of practice

Uneven:

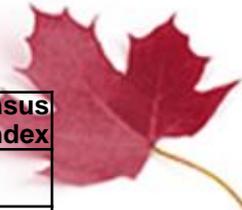
- 47% from Canada/US
- 24% economists
- 11% users
- Most from Asia/Pacific self-identified as national accountants and statisticians

Figure 2 Demographics of the community of practice: Location (Y), Field of work (X) and Role (A=Create evidence, B=Analyse evidence, C=Use evidence, D=Student)



Note: Latin America includes Mexico and Caribbean. Points are “jittered” to illustrate several respondents in the same cell.

Results: Main **consensus** statements



Stage/Statement	Agree/ Disagree	Consensus Index
Concepts		
C04: Ecosystem Accounting can incorporate principles used in economic accounting (e.g., stock/flow, accounting periods, coherent classifications).	Agree	871
C05: There are general ecological equalities that can be included in Ecosystem Accounts.	Agree	619
C06: Businesses will need to ensure benefits for society, not only to their shareholders.	Agree	661
Scope		
S02: Land cover is the best starting point for delineating spatial units for Ecosystem Accounting.	Agree	780
S06: Ecosystem Accounts should measure the capacity of ecosystems to generate services in the future.	Agree	675
S09: It is important to include measures of resilience and thresholds in Ecosystem Accounting to avoid irreversible changes.	Agree	641
S11: There is no role for national statistical offices in the assessment of ecosystems and biodiversity.	Disagree	679
Feasibility		
F01: Ecosystem Accounts need to have data on local ecosystems to understand changes in Ecosystem Services at the national level.	Agree	703
F04: Ecosystem Accounting and derived indicators will be useful, even if they are not precise.	Agree	805
F11: A variety of spatial units (e.g., landscapes, service producing units) are necessary for compiling Ecosystem Accounts.	Agree	925
Need		
N03: International classifications, concepts and methods for ecosystems are not needed to inform local problems.	Disagree	683
N06: Ecosystem Accounting only needs to inform environmental and natural resource decisions.	Disagree	719
N07: An Ecosystem Account must be complete (all ecosystems, all conditions, all services) to be useful.	Disagree	779
N09: A single indicator is better than a "dashboard" to make decisions about ecosystems.	Disagree	645
N11: For Ecosystem Accounts to be useful, they should be relevant to different decision contexts (e.g., economic, conservation, resource management).	Agree	881
N12: There is no need for an international framework to help all countries understand the trade-offs between development and conservation.	Disagree	733
N13: Ecosystem Accounting will identify opportunities for technological innovation.	Agree	607
N15: Ecosystem accounting can inform fiscal and trade policy by valuing ecosystems.	Agree	1067

*Higher = greater consensus



Results: Main dissensus statements

Stage/Statement	Consensus Index*
Concepts	
C01: Market forces will determine the most beneficial uses of ecosystems.	318
C02: Ecosystem "quality", "state", "health" and "condition" are not equivalent terms.	284
C07: Ecosystem "capacity", "potential" and "capability" are equivalent terms.	293
C09: If the world loses one species, this will have a negative impact on human well-being.	327
C10: Technology will find ways to offset the negative impacts of habitat and species loss.	273
C11: Some benefits of ecosystems are too fundamental to human well-being to be included in a composite index.	162
C13: Habitat and biodiversity loss will have a greater impact on humans than climate change.	284
C14: Biodiversity should be considered a final ecosystem services.	132
Scope	
S01: National-level Ecosystem Services indicators obscure detail at the local level.	296
S04: "Cultural services" are too vague to be included in an Ecosystem Accounting framework.	363
S10: Ecosystem Accounting needs to estimate future Ecosystem Services.	387
Feasibility	
F02: To link Ecosystem Services to human well-being, it is necessary to have a production function for human well-being.	348
F03: There is too much uncertainty in linking Ecosystem Services to human well-being for Ecosystem Accounting to be useful.	385
F05: It is possible to calculate a single indicator of ecosystem condition for all ecosystem types.	304
F08: There is not enough data to produce useful Ecosystem Accounts.	331
F09: All compilation and analysis of Ecosystem Accounts can be performed within Geographic Information Systems (GIS) and spatial models.	170
Need	
N01: The main purpose of Ecosystem Accounting is to inform economic decisions.	394
N02: Ecosystem Accounts need only be compiled once every 5 to 10 years to track major trends.	271
N04: Management of ecosystems and species should not focus on those that generate the most Ecosystem Services.	248
N05: If you don't put a dollar value on nature, economic decisions will assume its value is zero.	83
N08: It is not necessary to monetize Ecosystem Services for meaningful decisions.	261
N14: Decision makers do not require more science to illustrate that ecosystems are important to human well-being.	279

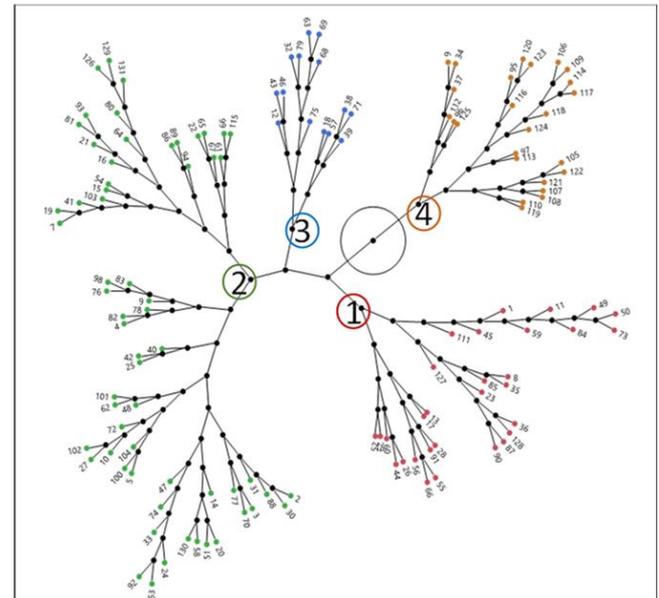
* Lower = Greater Dissensus



Results: Four discourses (clusters)

- Discourse 1 (n=30): Market agnostic / more science
 - Canada/US Economists and Geographers who create evidence
- Discourse 2 (n=62): Market agnostic / idealist
 - Analysts
- Discourse 3 (n=14): Ecological certainty / pragmatic
 - Canada/US Economists who analyse evidence
- Discourse 4 (n=25): Market optimist/certainty
 - Asia/Pacific national accountants and statisticians who analyse evidence

Constellation plot





Results: Sources of Divergence

Top 10 Dissensus statements (in decreasing order of dissensus)	Discourse				Source of Divergence (Discourse)
	1 Market agnostic/ More science n=30	2 Market agnostic/ Idealist n=62	3 Ecological certainty/ Pragmatic n=14	4 Market optimist/ Certainty n=25	
N05: If you don't put a dollar value on nature, economic decisions will assume its value is zero.	Neutral	Neutral	Neutral	Agree	4
C11: Some benefits of ecosystems are too fundamental to human well-being to be included in a composite index.	Agree	Neutral	Neutral	Agree	(1 and 4) vs (2 and 3)
C14: Biodiversity should be considered a final ecosystem services.	Neutral	Neutral	Disagree	Agree	3 vs 4
F09: All compilation and analysis of Ecosystem Accounts can be performed within Geographic Information Systems (GIS) and spatial models.	Neutral	Disagree	Disagree	Agree	(2 and 3) vs 1 vs 4
N04: Management of ecosystems and species should not focus on those that generate the most Ecosystem Services.	Neutral	Neutral	Neutral	Neutral	Within discourse
N08: It is not necessary to monetize Ecosystem Services for meaningful decisions."	Agree	Agree	Strongly Agree	Disagree	4
N02: Ecosystem Accounts need only be compiled once every 5 to 10 years to track major trends.	Neutral	Disagree	Neutral	Neutral	2
C10: Technology will find ways to offset the negative impacts of habitat and species loss.	Disagree	Disagree	Disagree	Neutral	4
N14: Decision makers do not require more science to illustrate that ecosystems are important to human well-being.	Strongly disagree	Disagree	Disagree	Disagree	Within discourse
C13: Habitat and biodiversity loss will have a greater impact on humans than climate change.	Neutral	Neutral	Neutral	Agree	4



Conclusions

- Community of practice is unevenly distributed by location, field of work and role
- Four discourses not well characterized by demographics
- Strong convergence on scope, feasibility and need
- Divergence on concepts possibly due to different ethical positions and interpretation of concepts
 - Requires clarification of concepts, agreement on approaches



Recommendations

- Leverage the divergence among clusters to advance ecosystem accounting:
 - Discourse 1 (market agnostic/more science) → develop the science and linkages to well-being in collaboration with international science/policy platforms
 - Discourse 2 (market agnostic/idealist) → focus on codifying that knowledge with general principles, concepts and classifications
 - Discourse 3 (ecological certainty/pragmatic) → support testing and operationalization of concepts
 - Discourse 4 (market optimist/certainty) → develop accounting and statistical principles



- The full paper is under review

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