The Natural Capital Accounting Opportunity: Let's Really Do the Numbers*

Kenneth Bagstad – *U.S. Geological Survey*
James Boyd – *Resources for the Future*
Carl D Shapiro – *U.S. Geological Survey*
Carter Ingram – *Ernst & Young*
Jeffery Adkins – *U.S. Nat. Oceanic and Atmos. Admin.*
Clyde F Casey – *U.S. Geological Survey*
Cliff Duke – *Ecological Society of America*
Glynn, Pierre – *U.S. Geological Survey*
Monica Grasso – *U.S. Nat. Oceanic and Atmos. Admin.*
Julie Hass – *U.S. Bureau of Economic Analysis*
Justin Johnson – *University of Minnesota*
Glenn-Marie Lange – *World Bank*
John Matuszak – *U.S. State Department*
Ann Miller – *U.S. Department of Interior*
Kirsten L.L. Oleson – *University of Hawaii*
Charles Rhodes – *U.S. Env. Protection Agency*
François Soulard – *Statistics Canada*
Michael Vardon – *Australian National University*
Ferdinando Villa – *Basque Centre for Climate Change*
Brian Voigt – *University of Vermont*
Scott Wentland – *U.S. Bureau of Economic Analysis*

Abstract

The nation's economic accounts provide objective, regular, and standardized information routinely relied upon by public and private decision makers. But there is a huge gap in these accounts. The U.S. and many other nations currently do not account for the natural capital — such as the forests, grasslands, animals, soils, and water bodies—upon which all other economic activity rests. It is time to create formal natural capital accounts (NCAs) for the United States. NCAs would standardize, regularly repeat, and aggregate diverse environmental data and link it to economic activity—just like GDP and jobs reports do for other aspects of the economy. NCAs would help guide hundreds of billions of investment dollars every year by helping businesses and governments peer into the future, innovate, and plan for shocks.

To this end, in October 2016, with support from the National Socio-Environmental Synthesis Center (SESYNC) and the USGS Powell Center, we convened a working group that by 2019 seeks to demonstrate the feasibility and added value of natural capital accounting (NCA) for public and private sector decision making in the U.S. The group includes experts in economics, accounting, and the natural sciences from federal agencies and universities, plus international experts who have previously applied NCA in their countries. Our group's roadmap is to first develop proof-of-concept land and water accounts using the SEEA framework at national and subnational scales by late 2017. The land and water accounts will draw on (1) existing land cover and land use datasets generated by USGS and others, (2) property value data from Zillow provided to the Bureau of Economic Analysis (BEA) through a public-private partnership, (3) USGS water use data, (4) USGS and U.S. EPA water quality data, and (5) BEA water infrastructure asset value data. Land and water accounts provide the basis for interpreting change in other ecosystem services measured within NCA (SEEA CF and SEEA EEA 2012), and are typically the first accounts compiled in countries as they develop a NCA system.

* Disclaimer: Any views expressed here are those of the authors and not necessarily those of the U.S. Department of Commerce, U.S State Department, U.S. Environmental Protection Agency, Statistics Canada, World Bank, or any agencies/organizations therein.

The Natural Capital Accounting Opportunity: Let's Really Do the Numbers

One morning each month, thousands of business people, journalists, and financial analysts sit at their computers waiting to devour the U.S. government's latest Gross Domestic Product (GDP) estimates. Based on what they see, markets move, politicians react, and businesses change their plans. Why all the rapt attention?

Because our national accounts—which also include employment, trade, and other widely used tallies—serve as a trusted "truth-telling" machine. They give decision-makers critical insight into what is happening nationally, but also into specific regions, industries, and supply chains. Regrettably, there is a gaping hole at the center of these accounts. The U.S. and many other nations currently do not account for the natural capital — such as the forests, grasslands, animals, soils, and water bodies—upon which all other economic activity rests *(1, 2)*. So, while car manufacturers can routinely track the steel, glass, rubber, and electronics they use to build cars, farmers have no routine access to data on the supply of irrigation water or pollinator populations they need to grow their crops. The tourism and recreation sectors cannot track the state of natural resources—such as forests, beaches, parks, or water quantity and quality—that are essential to their financial survival. And voters have no accounting yardstick to use when evaluating whether politicians are following through on promises to protect the nation's environmental wealth, in the way we hold them accountable for jobs and trade numbers.

As the saying goes: you can't manage what you don't measure. But that is not quite right. If you don't measure, you don't manage *well*. Indeed, currently we "manage" natural capital all the time: every time we convert a forest to agriculture or housing, allow polluted runoff to enter a stream, create a new park, or use water to cool electric power plants. And often there is no lack of environmental data documenting the results; in fact, we are awash in it. The problem is that all of those data are disorganized. Managers cannot easily see, track, share, and use them *(3, 4)*. So we are often flying blind as we make long-lasting—and sometimes irreversible— natural resource decisions that affect our economy, our environment and our health. It is time to change that by creating formal natural capital accounts (NCAs) for the United States. NCAs would allow all of those environmental data to be transformed into standardized, regularly repeated, and useful reports—much like the eagerly awaited GDP and jobs reports *(5)*. Robust NCAs would help guide hundreds of billions of investment dollars every year in a way that makes our country more innovative, richer, and healthier *(6)*. They would enable managers to evaluate their investments and policies. And they would make it easier to identify trends that help businesses and governments peer into the future, innovate, and plan for shocks *(7)*. But we will reap none of these benefits unless leaders in the public and private sector commit now to establishing and unleashing the power of NCAs. NCAs are not a new idea *(8)*. For decades, many economists and national accountants have viewed the desirability of NCAs as beyond debate *(9, 10)*. To economists, natural capital is a significant and self-evident factor of production— just like steel, energy, and crops—and thus worthy of their own analysis and tracking.

So why have NCAs not yet been created in the United States? One hurdle has been scientific. Creating NCAs requires extensive collaboration between a trio of disciplines—natural science, economics, and accounting—that see the world in very different ways. Another long-standing hurdle has been a lack of strong coordination between the government and the private sector, which must collaborate on data collection and setting accounting standards, both complicated tasks.

Now, however, we see reasons for optimism. First, collaboration on environmental matters between the public and private sectors has generally improved. One example is the Natural Capital Coalition, a consortium of 250 businesses, financial firms, non-governmental organizations, and universities, which generates, shares, and evaluates information on natural capital. Second, relations between the disciplinary trio (natural science, economics, and accounting) have become far more harmonious. Natural and social scientists have coalesced around ideas such as "ecosystem services," "ecosystem-based management," and other research movements in academia and government. There has also been an explosion of cheaper, spatially explicit, and more abundant biological, physical, and social data. Finally, the UN's System of Environmental-Economic Accounting has fostered and produced internationally agreed-upon environmental accounting definitions, rules, and classifications (*11*). Accountants have been drawn in via specific international NCA initiatives, for example, in Australia, Canada, the United Kingdom, and many other countries *(12, 13, 14).*

We represent one, but not the only, multidisciplinary collaboration that is working to take advantage of these new opportunities to advance NCAs. Still, more work is needed to, for example, harvest useful environmental data from numerous federal and state agencies and natural-resource dependent businesses. Such coordination will be a challenge. But we already observe (and are ourselves an example of) accounting collaborations between the Department of Commerce (BEA and NOAA),

Department of the Interior (USGS, BLM, and NPS), Department of Agriculture (Forest Service), State Department, EPA, and NASA. Private-sector collaborations to produce natural capital reporting standards are underway *(15).* There is a small, but solid, foundation on which to build.

We ask that others join in this endeavor: to build a systematic, coordinated information system that delivers regular information on the status, economic uses, and financial implications of our nation's natural and environmental resources. Several concrete steps would help support the faster development of trusted, high quality information for use in NCAs. We ask that:

- National statistical agencies (like BEA and Census) expand data-sharing collaborations with other federal agencies be expanded, particularly with those responsible for natural resource and environmental data.

- Federal agencies (A) identify existing Federal data applicable to NCAs and (B) coordinate environmental data collection with the BEA, Department of Labor, Office of Management and Budget (OMB), and other statistical agencies.
- A state government lead the way and to act as a test bed for state, regional, and national data coordination.
- The business community—particularly those in the manufacturing, agriculture, service, and utilities sectors—collaborate and support this effort by identifying the NCA information most important to informed business planning.
- Natural scientists and environmental economists think differently about their work and how it can contribute to NCAs. Natural capital accounting requires data standardization (related to biological, physical, and economic factors) that may feel uncomfortable to some researchers. It requires thinking about data at larger scales than is typical of most environmental research. Finally, the data synthesis required for NCAs will inevitably require compromise between the perfect and the pragmatic.

With these requests fulfilled, we can imagine a different kind of morning in the year 2025. This time, thousands of business people, journalists, and financial analysts wait to devour numbers that more fully reflect the status of our linked economic and environmental performance. And the decisions they make based on those numbers create an even more prosperous, healthy, and innovative nation.

Challenges Ahead

One of the challenges common to the SEEA CF research agenda and the U.S. research effort toward NCAs is the classification of land and linkages to industry uses. We have spent time over the last year working on a methodology to link our National Land Use Database to NAICS codes, which we would also like to share with the London Group. The presentation at the 2017 London Group will include tables (not included here in this short summary paper) that exemplify some of the research group's efforts thus far, along with a discussion of methodological challenges in both the near term and longer term.

Acknowledgments

This work was conducted as a part of the "Accounting for U.S. Ecosystem Services at National and Subnational Scales" working group supported by the National Socio-Environmental Synthesis Center (SESYNC) under funding received from the National Science Foundation (grant DBI-1052875) and the U.S. Geological Survey John Wesley Powell Center for Analysis and Synthesis (grant GX16EW00ECSV00).

References

1. Jorgenson, D.W., J.S. Landefeld, and W.D. Nordhaus. 2006. A New Architecture for the U.S. National Accounts. National Bureau of Economic Research: Chicago.

2. Helm, D., 2015. Natural Capital: Valuing Our Planet. Yale University Press, 296 pp. 3. Polasky, S., H. Tallis, and B. Reyers. 2015. Setting the bar: Standards for ecosystem services. Proceedings of the National Academy of Sciences 112(24): 7356-7361.

4. Boyd, J. and S. Banzhaf. 2007. What Are Ecosystem Services? Ecological Economics: 63: 616-626.

5. United Nations, European Commission, Food and Agricultural Organisation of the United Nations, International Monetary Fund, Organisation for Economic Co-operation and Development and The World Bank. 2014. System of Environment-Economic Accounting 2012 Central Framework: New York.

6. Whitworth, J.. 2015. Quantified: Redefining Conservation for the Next Economy. Island Press, 256pp.

7. International Bank for Reconstruction and Development/The World Bank. 2017. Better Policy through Natural Capital Accounting: Stocktaking and Ways Forward. 7th WAVES Annual Partnership Meeting Edition.

8. Hecht, J.. 2005. National Environmental Accounting: Bridging the Gap Between Ecology and Economy. Washington DC: Resources for the Future.

9. National Research Council. 1999. Nature's Numbers: Expanding the National Economic Accounts to Include the Environment. Washington, DC: The National Academies Press. doi:https://doi.org/10.17226/6374.

10. Vardon, M., P. Burnett, and S. Dovers. 2016. The Accounting Push and the Policy Pull: Balancing Environment and Economic Decisions. Ecological Economics. 124: 145-152.

11. European Commission, Organization for Economic Co-operation and Development, United Nations, and The World Bank. 2013. System of Experimental Environmental Accounting 2012: Experimental Ecosystem Acct.. https://unstats.un.org/unsd/envaccounting/eea_white_cover.pdf

12. Office for National Statistics. 2017. U.K. Environmental Accounts: 2017.. London: Office for National Statistics. Available at

https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/ukenvironmentalaccounts/2017

13. Sustainable Prosperity. 2014. “The Importance of Natural Capital to Canada’s Economy” http://www.sustainableprosperity.ca

14. Australian Bureau of Statistics. 2017. Australian Environmental-Economic Accounts 2017. Available at http://www.ausstats.abs.gov.au/

15. Natural Capital Coalition. 2016. “Natural Capital Protocol.” (Online) Available at:

www.naturalcapitalcoalition.org/protocol