

**Recommended Reading from the desk of Mary Ruckelshaus**



Introduction to the Natural Capital Project Approach

REGISTER FOR NCP-101

[How the human condition limits the power of technology](#), *The Seattle Times*, June 11, 2015

[Why Do Many Reasonable People Doubt Science?](#) Joel Achenbach *National Geographic*, June 2015

*"It's their very detachment, what you might call the cold-bloodedness of science, that makes science the killer app. It's the way science tells us the truth rather than what we'd like the truth to be. Scientists can be as dogmatic as anyone else--but their dogma is always wilting in the hot glare of new research. In science it's not a sin to change your mind when the evidence demands it. For some people, the tribe is more important than the truth; for the best scientists, the truth is more important than the tribe."*

[A World Without End](#), *New Yorker*, May 15 Innovation Issue.

An amazing story about a video game called No Man's Sky and the power of software to paint a picture of the world and allow exploration.

**Gretchen Daily: Taking Our Work to Scale**  
DISPATCH FROM STOCKHOLM

The Natural Capital Project turns ten years old this October. It's breathtaking to reflect on the change over the past decade, with so many innovative efforts underway to integrate values of nature into decision-making.



Caption here

In May, we worked together with many partners to create a landmark event - the Stockholm Summit on Natural Capital - to help accelerate the uptake and magnify the impact of these efforts. Leaders came from around the world to learn about the tremendous innovation in the pipeline and to develop a shared action plan.

The setting was a secluded castle and grounds called Steningevik, on a beautiful lakeshore just outside Stockholm. In an atmosphere of intimacy and trust, top representatives from across the public and private sectors, multilateral and financial institutions, academia, and civil society weighed in on the path forward. How could we best work together, to achieve much more than any could alone, to scale models of success for achieving better outcomes for people and nature?

We aimed first to shine a spotlight on the best practices for valuing natural capital, and the use of technology in doing so. A decade ago, the poster children for valuing nature were New York City and Costa Rica - with remarkable programs for investing in nature to secure drinking water (to NYC) and hydropower, tourism, climate stability and biodiversity (for Costa Rica and the world). Then there seemed to be a pause, and people began to doubt ... **[Click here to read the full essay]**

**[THE REST OF THIS TO GO ON OUR WEBSITE PAGE]**...whether other iconic models would emerge.

Yet today we see many cities and nations adopting and innovating upon these approaches. And we see new actors--corporations, multi-laterals, private investors and others--making nature a core part of business strategy to reduce risk and generate economic opportunity. The Inter-American Development Bank (IDB) is an inspiring example, piloting and scaling an array of new approaches for integrating biodiversity and ecosystem services into infrastructure planning and loan decisions, amounting to \$1.8 billion annually.

[Valuing Nature: Q&A With Gretchen Daily](#), June 15, 2015. Check out the great Q&A between Gretchen and Mark Tercek on Mark's blog.

### Another short story!



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(Short description here) Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam et aliquet ante, id placerat felis.

### Software Tools



[InVEST](#) is a free and open-source software suite developed by the Natural Capital Project. You can download the latest version of InVEST [here](#).



[OPAL](#) is NatCap's latest free and open-source

At the Summit, we examined some of today's pioneering models, led by such diverse institutions as IDB, the Council on Ethics for the Norwegian Government Pension Fund, the International Union for Conservation of Nature, Dow Chemical, Unilever, and the Government of China. We probed current barriers to scaling these successes, from lack of readily available data and practical methods through to institutional divides and "too many who care too little." We identified promising, near-term ways in which we could work together to lift some of these. With core NatCap partners and our Stockholm partners - the Royal Swedish Academy of Sciences and the Stockholm Resilience Centre - we opened ambitious new pathways for sparking innovation and catalyzing investments in nature-based solutions.

Our action plan has three main thrusts. First, we began designing and will soon launch next-generation "use cases" to demonstrate how data-driven, scientifically credible, and technology-enabled approaches can improve major policy and management decisions across key sectors and regions. Focal contexts include resilient cities, the finance sector, and development planning. Second, partners leading these use cases are co-developing the Natural Capital Science & Technology Platform to accelerate innovation and learning for a growing array of other individuals and institutions. Finally, key participants are joining forces to bring visibility to the advances underway and to engage other leaders.

It was especially meaningful to convene the Summit in Stockholm. The Royal Swedish Academy of Sciences is driving the integration of ecology, economics, and other disciplines necessary for transforming our ways of thinking about value. Sweden's leadership in this arena traces back to an early founder of the Academy, with key lessons for us today.

In the 18th Century, Carl Linnaeus revolutionized the way people thought about nature. Moving from local descriptions of organisms that could not readily be shared or made sense of at a higher level, he took a global view. He invented the system that we use today for characterizing and inter-relating all organisms. And he developed a way of communicating universally about life, so that people could talk about it all over the world.

Today, we're all driving this revolution further. Looking through "use cases", we can see how different regions, sectors, and actors are beginning to value nature. From there, we are reaching together for ways of scaling successful (but typically partial and local) approaches, harmonizing innovations so that they are compatible and systematic, without losing essential adaptations to particular contexts. And we're reaching out, developing ways of communicating about the many intimate human connections with nature, and the values of nature, all over the world.

### Lynn Scarlett: Better, greener, cheaper, smarter

*Lynn Scarlett, now at The Nature Conservancy, has previously served as Deputy Secretary and Chief Operating Officer at the U.S. Department of the Interior, and, among many other leadership roles, also served on the Executive Committee of the President's Management Council.*

*Lynn Scarlett is also giving the opening remarks at a panel event, "Integrating Natural Capital Into Decisions" in Washington, D.C., June 30, hosted by The Natural Capital Project. To register, click [here](#).*

**As the Managing Director of**

software for mitigating development impacts. You can download the latest version of OPAL [here](#).



[RIOS](#) is a software tool that helps design cost-effective investments in watershed services. You can download the latest version of RIOS [here](#).



[PyGeoprocessing](#) was developed at the Natural Capital Project to create a programmable, open source, and free GIS processing library to support the ecosystem service software InVEST. The latest version 0.2.1 fixes several bugs.

Users can pip install pygeoprocessing, upgrade or download the package [here](#).

### **NatCap Forums**

For help using InVEST, OPAL and RIOS, visit the [NatCap Forums](#), our online user community.

### **Newsletter Archive**

Check out NatCap's previous newsletters in our [Newsletter Archive](#).

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## **Public Policy at The Nature Conservancy, you probably go to a lot of meetings. Was there anything about the Stockholm Summit that stood out to you?**

The Stockholm Summit was a fairly intimate group, and that was deliberate so that there could be real conversation. What was especially unique was the mix of people that were there. Often what we see with natural capital and natural infrastructure and ecosystem services discussions are a lot of scientists, and sometimes groups of policy makers. But there were a lot of private sector folks. People from various companies, but then also people with backgrounds in investment banking and finance.

That made it enriching because you had people bringing that business lens to the discussion.

## **At the summit, participants broke out into three discussion groups. One focused on cities, one on finance and investment and you ended up in the one on sustainable development. Why did you pick that group?**

I was really torn, I have to say, between the cities group and the sustainable development one. Torn because not only personally, but at The Nature Conservancy, we're quite focused on cities and nature in cities, nature solutions, natural capital and that context. But I ended up going to the sustainable development one because, we have, at TNC, a global interest in the nexus between people and nature. On the people side of the equation, we have a significant interest in how nature and economic development opportunities and personal livelihoods and social well being go together.

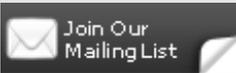
## **These are such broad topics, how did you narrow down the discussion?**

We tried to not so much narrow it as give it specificity. We focused on the upcoming release of the global sustainable development goals through the United Nations Development Program- and the U.N. Environment Program. There will be, in September, the next iteration of sustainable development goals, with 17 different goal categories. We focused on - how could we try to very deliberately introduce natural capital contexts into specific countries as they strive to think about implementation of the sustainable development goals?

## **When did you, personally, first start hearing about natural capital as a concept?**

It goes waaaaay back. It goes back to the very first publication that Gretchen Daily published on the subject, maybe 20 years ago. That was before I was at the Interior Department. The concept really sang to me. I had always been among those who thought we rather artificially divided the world of conservation ... **[To read the full interview, click here]**

Lynn Scarlett, Director of Public Policy,  
The Nature Conservancy



... from the world of working landscapes and people and economies.

So the concept of natural capital and the role that ecosystems play, whether it's in purifying water, or providing buffers against coastal storms, or any of the other attributes of ecosystems intrigued me. Way back then, I also started to read about some of the actual examples playing out even if people didn't put that label on it.

My interest in the concept really ratcheted up a notch right after I left the Interior Department. That was in January of 2009. When I left, there was the economic slowdown, the big recession. And in turn, a big political focus on budget deficits. That played out at the state level in the US but also elsewhere across the globe. That caused me to re-examine natural capital concepts, and ask what role might those ideas play, thinking about conservation in a time of scarcity?

### **What role does conservation play in a time of scarcity?**

If you can use green infrastructure in a city to address stormwater needs and do so at a third or a quarter of the cost of building pipes and tunnels, well there you have it: better, greener, cheaper, smarter. That's a message that resonates with cities, struggling to invest in infrastructure and meet their environmental goals. It's a message that resonates where they're trying to make every last dollar count, and stretch each dollar to its maximum potential.

And then they get multiple benefits, because they not only get that infrastructure, but also opportunities for recreation, urban migratory bird protection and even the social benefits, such as research that shows the relationship between the expanded tree canopy and reduced crime.

### **How does thinking about natural capital change the conservation game?**

If you're thinking about natural capital and the role it plays in, let's say, coastal community protection or natural capital and the role it plays in managing storm water, then instead of just dipping into the age old public conservation funding bucket, you can now dip into the storm water infrastructure bucket, or you can dip into the coastal disaster preparedness bucket, or other sources that had not typically been thought of as a way of investing in nature. One of the messages that we're driving at TNC is the idea that nature is not just nice, it's essential. And that makes it have traction, not simply with those devotees of conservation, but virtually with everyone. Potentially.

**It does seem like preserving trees, for example, would be an idea most people could get behind, but so often that's been painted as a pursuit at odds with human wellbeing.**

That's just a symbol of a larger, longstanding narrative in environmental philosophy and political economy. We have tended to pursue the notion of conservation as something separate from the broader walks of life. That's rooted in Teddy Roosevelt and the era of great investment in preserves. The first wildlife refuge of 1903, national parks dating to the late 1800s, where nature was a place you go visit, a place to set aside, a place special for wildlife. Those places are incredibly important--don't get me wrong--but, they tended to reinforce in peoples' minds the idea that nature was "other," nature was something else, nature wasn't us, nature wasn't people, nature wasn't communities, and that it was a place we visited; nature was places we protected as opposed to seeing their intimate interconnection with the

wellbeing of all life, including our own.

### **Can you talk about your work promoting urban greening?**

When I left the Department of the Interior I was recused from working on all the stuff I'd been working on while I was there. Cities were not among them, so that was a place I could put my focus. So I wrote a paper on urban greening; it wasn't new research, but a synthesis on greening and natural capital in the concept of cities. That also really heightened my interest, because it seemed like incredibly untapped potential for all cities, but especially for cities that are old and have aging infrastructure, and face exorbitant expenditures to address that. This is a good moment in time to say: How do we build ourselves into the 21st century rather than back into the 19th century?

### **You were at the Natural Capital Symposium at Stanford in March. What did you take away from that event?**

I gave an opening set of remarks on the intersection of natural capital and policy, and what are some of the key policy challenges. What strikes me in that conversation is the degree to which the policy momentum still lags. So, we have tremendous advances over the last two decades. Tremendous advances in science, our scientific comprehension of ecosystems and the corollary services they provide, tremendous advances in thinking about metrics and indicators and how one scientifically can look at the characteristics of natural capital. And we have ongoing advances in the world of economics: how it is that one can quantify those benefits, not only in functional units but also even in monetary units in some cases. I want to underscore that virtually everybody in the ecosystem services and natural capital world comprehend that natural capital is not about monetizing everything. However, it can certainly be useful to be able to monetize, whether one is trying to compare different options or depict a suite of benefits that a particular investment might make.

So, big advances in science, big advances in economics, and yet the policy traction remains spotty.

### **Why is it, do you think, that the policies to support incorporation of natural capital in decisions is lagging?**

There are many reasons. For one, there are so many regulatory silos that one must tackle change almost on a one-by-one basis-- for example, changing storm water regulations to accommodate natural solutions or road system regulations to revise how we build culverts. But there are other reasons like inertia or lack of familiarity with how ecosystem solutions actually perform in a way that would reduce regulatory risk.

### **You served on the board of the National Parks Conservation Association. Do you have a favorite national park?**

When I was at the Interior Department, we were always advised not to pick favorites. I love many, but I do love Grand Teton National Park. It's absolutely glorious. The jagged mountains that rise up, and then the lakes below them so they reflect the mountains. It's a balm to the soul. Great hiking. Just the visual ambiance is absolutely stunning. I also am a birder, so I have to put a plug in for wildlife refuges. There are some spectacular wildlife refuges, and one of my favorites is Bosque del Apache, in New Mexico. It's just awesome. And I just visited Klamath Marsh National Wildlife Refuge. What a spectacular setting-- and I saw 114 species of birds there and in the surrounding area. I should mention other public lands, too, like Canyon of the Ancients, managed

by the Bureau of Land Management. The cultural artifacts there are a testament to human creativity and enterprise.

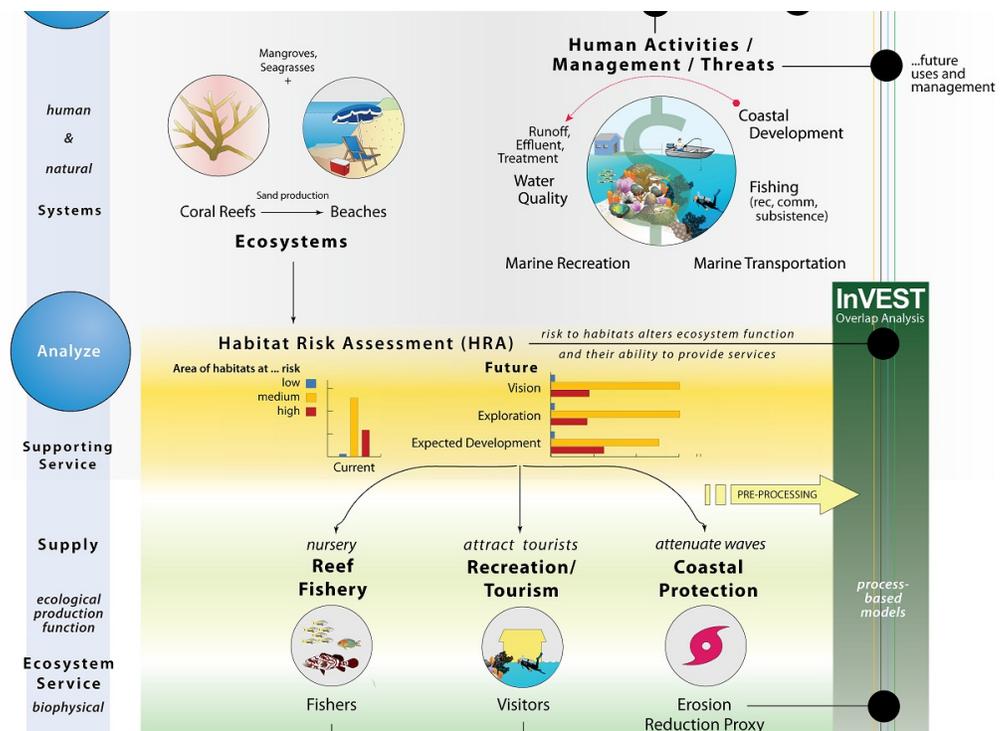
## Map of the Month

### ENHANCING CAPACITY FOR COASTAL MANAGEMENT IN BARBADOS

In July 2014, NatCap, Downstream Strategies, TNC, and WWF began assisting the Barbados Coastal Zone Management Unit (CZMU) integrate nature's values into coastal management. Over the past year, CZMU has lead a stakeholder-driven process to identify, prioritize, map, and estimate the value of present and potential future ecosystem services in Barbados. The specific project tasks include:

- Integrate ecosystem services into coastal planning and risk decisions
- Develop a custom spatial analysis tool (InVEST) and database to inform coastal management in Barbados
- Enhance the capacity of the Coastal Zone Management Unit in Barbados to conduct resilient coastal planning using ecosystem services analyses

**Click on our infographic to learn more about NatCap's approach to ecosystem services assessment as well the specific methodology that was developed for and applied in Barbados.**



Credit: Gregg Verutes, Jess Silver, Katherine Wyatt & Katie Arkema

## Introducing: The Marine Concierge

A GUIDE TO MAKE MARINE SPATIAL PLANNING EASIER FOR EVERYONE

As 50 million people are born each year and similar numbers seek to raise their standard of living, the Earth's marine ecosystems face expanding pressures from fisheries, aquaculture, energy production,

runoff from land, shipping, climate change and much more. Marine spatial planning (MSP) has been proposed as a way for more strategic and streamlined management of our oceans and coasts.

But marine spatial planning is complex, and often the people tasked with doing it run into problems. In our experience at The Natural Capital Project, many of the same barriers to marine spatial planning come up time and time again.

To help address common questions and planning dilemmas, we've designed a "concierge" to make it easier to learn about, get inspired by and implement MSP. [The Marine Spatial Planning Concierge](#) is in its beta testing stage now, and we would love your feedback on it. [Gregg-should people contact you?]

With the Concierge, we aim to provide clear, modular advice for any stage of the planning process, and to offer a curated library of the best resources out there. The Concierge also describes and links to examples of how other engaging in marine planning processes around the world have gotten over common hurdles, such as how to move forward when data is scarce, how to harmonize data from different sources, or where to go for help when the tools you're using are beyond your technical expertise.

With help from the MSP community, we hope to iteratively improve this concierge and to continue to amass a library of interactive guidance to support a variety of decisions that lead to better outcomes for people and nature. We are collating feedback and are excited to hear what the NatCap community thinks of it, hear suggestions on how to make it more useful.

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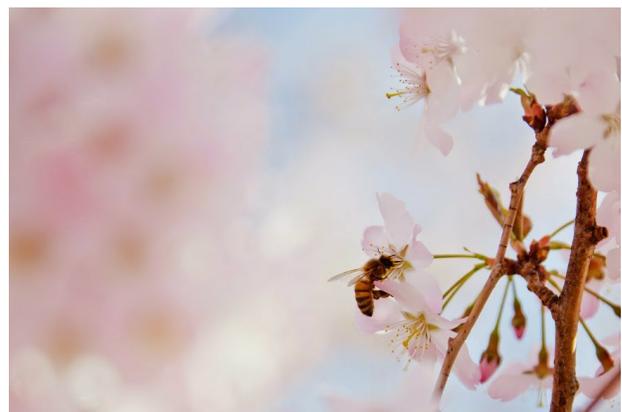
## Recent Press and Publications

Ten years ago, the U.N. Millennium Ecosystem Assessment showed that the earth's ecosystems were widely degraded, and would keep deteriorating, making conditions worse for future generations if people now continued to develop land and extract resources along the same trajectory.

Galvanized by these findings, environmental scientists knew they couldn't solve these problems in a silo, and were spurred to more

aggressively collaborate across sectors. They aimed to find ways to describe the values of nature in ways that are meaningful for decision-makers, so that clean water, clean air, fisheries and other nature-derived benefits humans depend upon can be preserved and sustained.

Several leading ecosystems services experts, including all of NatCap's founders - Gretchen Daily, Steve Polasky, Peter Kareiva and Taylor Ricketts, along with many other leaders in the field, published new research and case studies this month, which have been collected into a series of papers in the Proceedings of the National



Caption here

Academy of Sciences. The special feature, "Nature As Capital," highlights the accomplishments of these collaborations between field ecology and computer science, non-profits and economists, businesses and governments, and showcases how through working together, our understanding of ecosystem services has matured and our ability as a society to use this information has grown exponentially.

"Ten years ago, this stuff was kind of a glimmer in a few people's eyes," said NatCap lead scientist Anne Guerry, quoted in an article for PBS's NOVA. Guerry was the lead author on the Introduction to the series, [with 22 co-authors] which focused on taking the ideas behind ecosystem services into the real world where the information can be used to make better decisions.

"Ecosystem services and natural capital are still in the Wild West phase," added Steve Polasky.

But now after a decade of hard work, we can now point to China's massive reforestation, to Belize's coastal planning - which has inspired a new effort in Barbados (See Map of the Month), to the water funds throughout Latin America and now spreading to Africa, and to our tools ability to show that "where matters" and also "how you do it" matters.

To read more about the new research, click on the links below.

[Natural capital and ecosystem services informing decisions: From promise to practice](#)

Guerry, Anne D.; Stephen Polasky; Jane Lubchenco; Rebecca Chaplin-Kramer; Gretchen C. Daily; Robert Griffin; Mary Ruckelshaus; Ian J. Bateman; Anantha Duraipappah; Thomas Elmqvist; Marcus W. Feldman; Carl Folke; Jon Hoekstra; Peter M. Kareiva; Bonnie L. Keeler; Shuzhuo Li; Emily McKenzie; Zhiyun Ouyang; Belinda Reyers; Taylor H. Ricketts; Johan Rockström; Heather Tallis; Bhaskar Vira.  
*PNAS. June 16, 2015, Vol. 112 (24), 7348-7355. doi:10.1073/pnas.1503751112*

[Setting the bar: Standards for ecosystem services](#)

Polasky, Stephen; Heather Tallis; Belinda Reyers.  
*PNAS. June 16, 2015, Vol. 112 (24), 7356-7361. doi:10.1073/pnas.1406490112*

[Improving global environmental management with standard corporate reporting](#)

Kareiva, Peter M.; Brynn W. McNally; Steve McCormick; Tom Miller; Mary Ruckelshaus.  
*PNAS. June 16, 2015, Vol. 112 (24), 7375-7382. doi:10.1073/pnas.1408120111*

[Embedding ecosystem services in coastal planning leads to better outcomes for people and nature](#)

Arkema, Katie K.; Gregory M. Verutes; Spencer A. Wood; Chantalle Clarke-Samuels; Samir Rosado; Maritza Canto; Amy Rosenthal; Mary Ruckelshaus; Gregory Guannel; Jodie Toft; Joe Faries; Jessica M. Silver; Robert Griffin; Anne D. Guerry.  
*PNAS. June 16, 2015, Vol. 112 (24), 7390-7395. doi:10.1073/pnas.1406483112*

[Impacts of conservation and human development policy across stakeholders and scales](#)

Li, Cong; Hua Zheng; Shuzhuo Li; Xiaoshu Chen; Jie Li; Weihong Zeng; Yicheng Liang; Stephen Polasky; Marcus W. Feldman; Mary Ruckelshaus; Zhiyun Ouyang; Gretchen C. Daily.  
*PNAS. June 16, 2015, Vol. 112 (24), 7396-7401. doi:10.1073/pnas.1406486112*

[Spatial patterns of agricultural expansion determine impacts on biodiversity and carbon storage](#)

Chaplin-Kramer, Rebecca; Richard P. Sharp; Lisa Mandle; Sarah Sim; Justin Johnson; Isabela Butnar; Llorenç Milà i Canals; Bradley A. Eichelberger; Ivan Ramler; Carina Mueller; Nikolaus McLachlan; Anahita Yousefi; Henry King; Peter M. Kareiva.  
*PNAS. June 16, 2015, Vol. 112 (24), 7402-7407. doi:10.1073/pnas.1406485112*

[Estimating the impacts of conservation on ecosystem services and poverty by integrating modeling and evaluation](#)

Ferraro, Paul J.; Merlin M. Hanauer; Daniela A. Miteva; Joanna L. Nelson; Subhrendu K. Pattanayak; Christoph Nolte; Katharine R. E. Sims.  
*PNAS. June 16, 2015, Vol. 112 (24), 7420-7425. doi:10.1073/pnas.1406487112*

## Other Press and Publications:

### [Delivery of crop pollination services is an insufficient argument for wild pollinator conservation](#)

Kleijn, David; Rachael Winfree; Ignasi Bartomeus; Luísa G Carvalheiro; Mickaël Henry; Rufus Isaacs; Alexandra-Maria Klein; Claire Kremen; Leithen K M'Gonigle; Romina Rader; Taylor H Ricketts; Neal M Williams; Nancy Lee Adamson; John S Ascher; András Báldi; Péter Batáry; Faye Benjamin; Jacobus C Biesmeijer; Eleanor J Blitzer; Riccardo Bommarco; Mariëtte R Brand; Vincent Bretagnolle; Lindsey Button; Daniel P Cariveau; Rémy Chifflet; Jonathan F Colville; Bryan N Danforth; Elizabeth Elle; Michael P.D. Garratt; Felix Herzog; Andrea Holzschuh; Brad G Howlett; Frank Jauker; Shalene Jha; Eva Knop; Kristin M Krewenka; Violette Le Féon; Yael Mandelik; Emily A May; Mia G Park; Gideon Pisanty; Menno Reemer; Verena Riedinger; Orianne Rollin; Maj Rundlöf; Hillary S Sardiñas; Jeroen Scheper; Amber R Sciligo; Henrik G Smith; Ingolf Steffan-Dewenter; Robbin Thorp; Teja Tscharntke; Jort Verhulst; Blandina F Viana; Bernard E Vaissière; Ruan Veldtman; Catrin Westphal; Simon G Potts.  
*Nature Communications*. June 16, 2015. doi: 10.1038/ncomms8414

### [Valuing Nature: Q & A With Gretchen Daily](#)

by Mark Tercek, *Huff Post Green*, June 15, 2016

### [Moderate land use changes plant functional composition without loss of functional diversity in India's Western Ghats](#)

Mandle, L.; T. Ticktin.

*Ecological Applications*. 2015. doi: 10.1890/15-0068.1

### [Energy as a driver of change in the Great Lakes-St. Lawrence River Basin](#)

Kelly, B.; B. Keeler; G. Helm; G. Krantzberg; T. Lyon; W. Mabee.

*Journal of Great Lakes Research*. 2015, Vol. 41, 59-68. doi:10.1016/j.jglr.2014.11.019

### [Marine Protected Areas: Smart investments in ocean health](#)

Reuchlin-Hugenholtz, E.; E. McKenzie.

WWF, Gland, Switzerland. 2015.

A full list of [news stories](#) and [publications](#) are available on our website. Access to full articles may require library access.

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Thank you for your continued interest in the Natural Capital Project. If you have any questions, please feel free to contact us at [invest@naturalcapitalproject.org](mailto:invest@naturalcapitalproject.org).

