

# SCIENCECHRONICLES

November 2011

Image:  
Windward  
Cemetery,  
Grenada.  
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Steve Schill.  
See page 7 to  
learn what's  
happening in  
this image.



## Making a Bigger Impact

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## Editor's Note

By **Bob Lalasz**

Jump to page 19 — it has information that could save your life, or at least the liveliness of your next presentation. (Same thing, really: Who wants to “die” in front of an audience?) There, I’ve reprinted the handbook Dan Majka and Tara Schnaible passed out with their “Conservation by DESIGN” presentation at last month’s TNC All-Science meeting — and it’s essential reading for all our scientists. None of us have the academic luxury of reciting our talks directly from reams of projected bullet points (rendered in hard-to-read Comic Sans font). If design is the secret weapon in effective communications, we are too often laying down arms with our first PowerPoint slide, my scientist friends. Dan and Tara have done a gorgeous job with this primer (print it out if you wish); if you’re interested, I hear they’d be open to doing a WebEx of their talk for your science crew.

Elsewhere in this issue, Jonathan Higgins discovers where the cutting-edge science at TNC is hanging out;



**“If design is the secret weapon in effective communications, we are too often laying down arms with our first PowerPoint slide, my scientist friends.”**

**Bob Lalasz**

Sheila Walsh wraps up her two-part takeout on what it’ll take to overcome the obstacles to scaling up ecosystem markets; and Mike Beck dives into an ecosystem service so huge that it’s basically hidden in plain sight: the wave attenuation by fringing coral reefs, which keeps our shorelines from simply washing away (see cover photo). The value in protection that such reefs provide to hundreds of millions of people present resource-

strapped marine conservationists with a difficult choice: Save them, or save those reefs that yield maximum biodiversity. I suspect this dilemma won’t be the last of its kind to surface as the Conservancy wrestles with the full implications of protecting nature’s value for people. **SC**

*Bob Lalasz ([rlalasz@tnc.org](mailto:rlalasz@tnc.org)) is director of science communications for the Conservancy.*

### The Mission(s) of *Science Chronicles*:

1. To bring you the latest and best thinking and debates in conservation and conservation science;
2. To keep you up to date on Conservancy science — announcements, publications, issues, arguments;
3. To have a bit of fun doing #1 and #2.

Editor & Submissions [Bob Lalasz](#)

Wild Turkey [Peter Kareiva](#)

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# Announcement

## The Science Impact Project

By [Peter Kareiva](#) and [Bob Lalasz](#), The Nature Conservancy

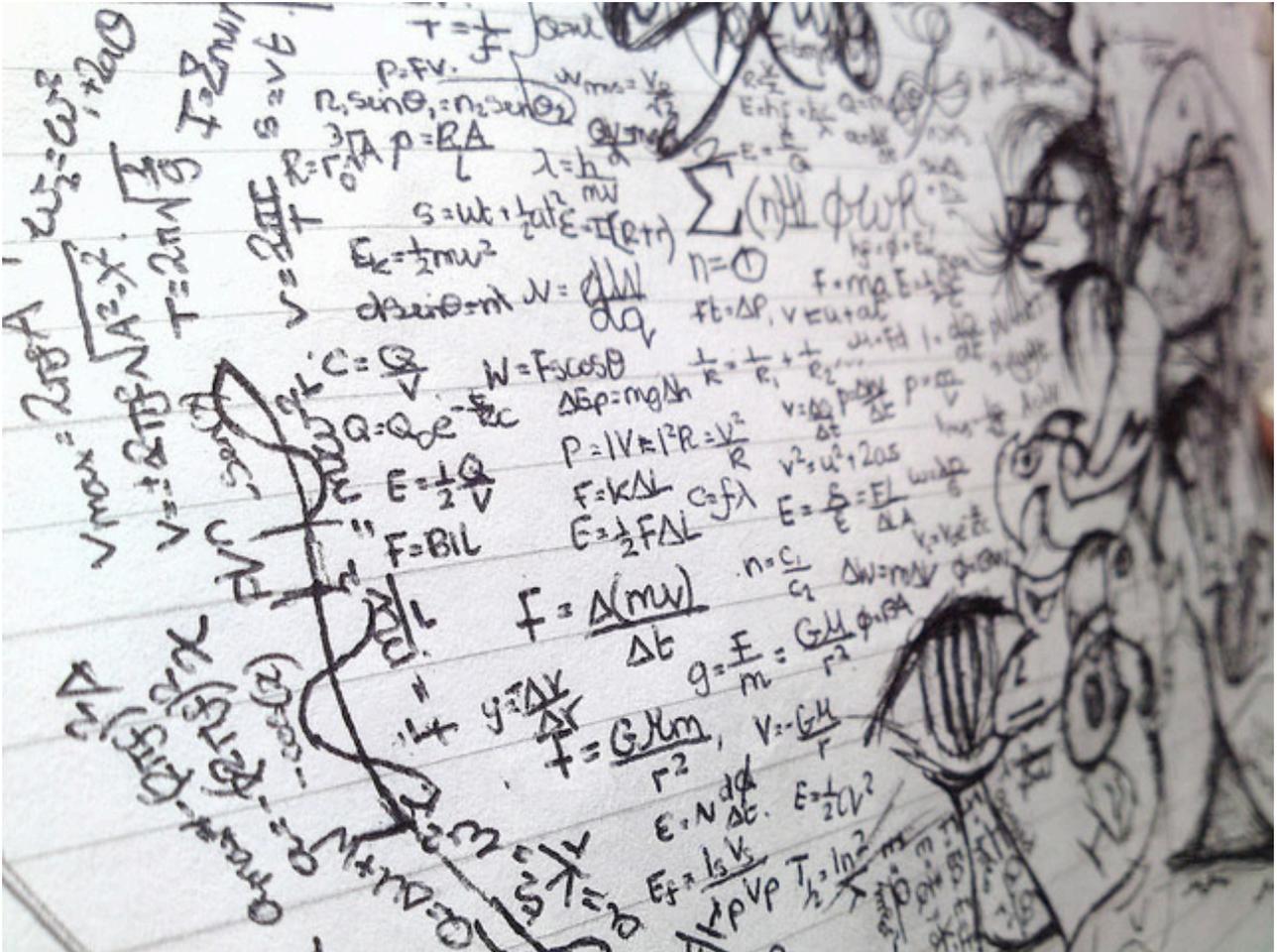


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[Discuss this project on the Conservation Gateway](#).

With the world's population exceeding 7 billion — and demands for food, water, energy and minerals growing even faster — it is clear conservation has to step up its game. If we are smart, there is no reason we cannot meet our resource needs; but if we thoughtlessly exploit our natural capital without regard to impacts, we will squander any chance at insuring better lives for our children.

Science has a big role to play in this campaign to win. And that means the Conservancy's scientists need help learning how to have even greater impact. So Science at The Nature Conservancy is pleased to announce the Science Impact Project, a program to train a new cadre of scientific thought leaders at TNC — scientists who regularly think, write and speak in high profile venues about global conservation issues, and who will help the Conservancy formulate scaled and innovative solutions to those issues.

## The Science Impact Project: What is It?

The Science Impact Project (previously known informally as the “X-Men and Women Project”) is a systematic, three-year effort to enable select TNC scientists to maximize their and the impact of the Conservancy’s work in a world in which conservation is too often an afterthought. The program includes:

- Developing a “big idea” that has considerable impact on conservation paradigms, perception and/or practice;
- Developing a strategic research agenda pegged to the big idea;
- Presentation training;
- Donor and policy communications training;
- Media and social media training.

At the end of the training, participants will have:

- A TED-style talk that they can customize for a variety of audiences;
- The tools and poise to fundraise from high-level donors and to communicate with a wide variety of policymakers;
- The tools and confidence to give effective interviews to the media;
- A research plan around the big idea;
- A book proposal, article/essay for general audiences, or fundraising proposal based on the big idea.

In addition, participants will be asked to address tasks pegged to the Global Challenges-Global Solutions framework — particularly around External Affairs priorities.

As we experiment with this program and develop its curriculum, we will look for ways to bring a scaled-down version to regional and field programs that seek to similarly enhance the impact of their scientists. If the program is as effective as we hope it will be, we will be calling for nominations and suggestions for a third cohort (see below for the first two).

### Why This Program?

The Nature Conservancy is the world's premier applied conservation science organization — but very few people recognize that, in large part because we lack scientific thought leaders who can write, speak and lead on globally significant questions beyond their fields. Developing such thought leaders will advance the Conservancy’s mission by:

- Increasing our ability to raise money from potential donors who are interested in funding science but who are looking for signs of our scientific credibility.

**“The Nature Conservancy is the world’s premier applied conservation science organization — but very few people recognize that, in part because we lack scientific thought leaders who can write, speak and lead on globally significant questions beyond their fields.”**

- Making clear and public some of the Conservancy's competitive advantages — namely, our scientific heft, vision and credibility.
- Positioning the Conservancy to better drive public conversation in media and elsewhere.
  - Increasing our visibility and access to venues with key policymaker and opinion-shaper audiences — from Davos to Aspen Ideas.
  - Making it easier to achieve the robust ambitions of our Global Challenges-Global Solutions framework.

### Details

Participants will be chosen from across the organization with the support of their supervisors. Participants will be selected to span the Global Challenges-Global Solutions framework that is guiding TNC's work going forward. Project participants are selected for the content and gravitas they bring to the table. Participants must already have a substantial body of published research that shows great promise.

Each cohort will undergo two intensive training sessions per fiscal year, building skills essential to thought leaders through development of particular research projects. Participants will then be expected to refine these projects between sessions and to commit to an enhanced role in fundraising for the Conservancy that also respects the time they need to implement their work plans.

Science Communications and selected science staff will support participants throughout the process. We will develop customized goals and skill-building plans for each participant. We will mentor participants through regular, frequent check-ins. We will also generate opportunities for participants to write, speak, blog and communicate with donors. In addition, we will create a philanthropy resource pack about each participant, to be hosted on the philanthropy intranet site and which will include their bios, CVs, key messages, innovations and specialties, target audiences, and potential for fundraising trips and other philanthropic engagement.

### Participants

Participants have already been chosen for the first two of three cohorts. They are:

**Team 1:** Vera Agostini; Silvia Benitez; Joe Fargione; Evan Girvetz; Judy Haner; Jon Hoekstra; Rob McDonald; Lizzie Mcleod; Jen Molnar; Jeff Opperman; Stephanie Wear.

**Team 2:** Mike Beck; James Fitzsimons; Eddie Game; Joe Kiesecker; Jensen Montambault; Scott Morrison; Mark Spalding; Sheila Walsh; Joni Ward; Supin Wongbusarakum.

If you have questions about the Science Impact Project, please contact Peter Kareiva at [pkareiva@tnc.org](mailto:pkareiva@tnc.org) or Bob Lalasz at [rlalasz@tnc.org](mailto:rlalasz@tnc.org). **SC**

“Each cohort will undergo two intensive training sessions per fiscal year, building skills essential to thought leaders through development of particular research projects.”

# Viewpoint

## Reefs Break Waves, Every Day

By [Mike Beck](#), senior marine scientist, The Nature Conservancy



**Above, Figure 1: Map of the coast of Grenville, the second-largest city in Grenada. This is just a typical day of wind waves. The arrows highlight some of the reef breaks.**

I know you're thinking that "reefs break waves every day" is obvious (or, more likely, "errr derrr, you bonehead"). But there's more to that statement than meets the eye; it says a lot about reef science, conservation, climate adaptation, hazard mitigation and the Conservancy's priorities.

Here's why: Most coral reef science and conservation (particularly regarding the impacts of climate change on corals) is focused on (i) the loss of the stunning diversity and productivity of corals and fishes and (ii) what that loss means for the future of coral reefs and the people that rely on their fisheries. But despite the obviousness of my title, there is extraordinarily little science that focuses on the role of reefs as *barriers* (even on the Great Barrier Reef).

**Mind Surfing.** I'd like to bring a different perspective to reef conservation and science. I argue that wave attenuation by coral reefs is *the single most obvious ecosystem service globally* — these reefs sit in front of hundreds of millions of people around the world and trillions of dollars in coastal development.

The importance of reefs as barriers really hit home for me as I gazed on the Windward Isles from seat 10A on my return home to the States from Grenada recently. But you can make these observations right at your desk. Use Google Earth to look first at the eastern edges of the Windward Isles — look for towns and small cities, and then look for the crescent of what may at first seem like clouds ringing those communities (Figure 1). These are the waves breaking on the fore-reefs that protect these communities. I know because, as a surfer, I have mind-surfed waves all around the globe this way.

But this is not just about wet dreams on Google Earth; it's about people's everyday lives. While in Grenada, I met Dexter Miller on Petit Martinique (one of that country's islands). We met on one of the few flat pieces of land on the island. Almost all his town's livelihoods and lives happen on that one piece of land. Fishing is their main income, and the ports and docks are right there; boat-building is the second biggest income generator, and they make the boats right on this one strip of land, which also contains the town's store and gas station; and this area also doubles as the soccer field.

**The Daily Disaster.** But the shores of his town — this one flat piece of land — have begun to erode rapidly. And even more rapidly in the past few years. This land loss is not about the future of intensifying storms and sea-level rise; nor is it even about past storms like 1999's Hurricane Lenny ("Wrong Way Lenny"), which everyone on the island still remembers vividly. The erosion is happening now with no storm in sight — we watched it biting in and taking away part of their shore every day. This is the daily disaster.

What's behind this increasing erosion? Past sand mining certainly contributed to it — but they stopped that mining. What the erosion is likely most about is that the fringing reefs of Petit Martinique are dying.

What few are recognizing — even in the conservation community — is how drastically that fringing-reef breakdown increases the wave energy hitting shores every day. Mere inches of lost fore-reef depth (either because reefs are not growing or sea levels are rising) means substantially greater wave energy transmitted over the reefs and hitting shorelines (Field et al. 2011). This increase in wave energy is an engineering fact, well worked out for artificial breakwaters around the world.

Indeed, just look at Petit Martinique in Figure 2 (below). What's telling is what you don't see on the southern side of the fringing reef. You can see the reef below water, but you don't see the waves breaking there as you do in front of St. Vincent. While the reef of Petit Martinique is still getting protection from bigger storm waves (waves break ~ when

“What few are recognizing — even in the conservation community — is how drastically that fringing-reef breakdown increases the wave energy hitting shores every day.”

Wave Height = Depth of Reef Tops), their fringing reefs are not protecting it from the daily disaster.



**Figure 2: Petit Martinique (below) and Petit Saint Vincent. Look at what you don't see on the south side of the fringing reef just east of the Petit Martinique: waves.**

**A Global Breakdown.** Now consider that this daily disaster is playing out just behind Dexter's town in the village of Windward (see this issue's cover photo), where their fathers' graves are being washed into the sea. It's also happening in coastal towns and villages throughout Grenada and the Grenadines; the windward isles of the eastern Caribbean ecoregion; throughout the Caribbean; throughout the tropical Atlantic; throughout the tropics globally.

**Rebuilding Blue Infrastructure.** Conservationists often say that we are going to have to be proactive and smart about how we respond to climate change, because it will

be impossible and too expensive to build a wall around whole towns, cities or islands (except, of course, places like New York City). But consider for a moment that in fact these fringing coral reefs *are* the wall — the natural infrastructure, sometimes 30, 60 or even hundreds of feet high — that rings villages, cities and whole islands. Think for one moment about the cost of erecting such a wall; and the benefits lost without it.

To save them, we are going to have to act fast and be much more proactive. On Petit Martinique, they are already heavily defending their shores — often house by house — with hastily erected breakwaters and gabions. Each small gray shore defense that goes in increases erosion just a little downshore and requires another gray solution in that spot. In Dexter’s town, they are pushing to get a whole breakwater wall — a project that will cost EC\$3.5M at a minimum.

I can appreciate why they need to act now, but all of these fixes will be temporary. As sea levels rise and (far more importantly) if the barrier reefs continue to break down, then ever more wave energy will make their temporary solutions ineffective. These likelihoods are not currently accounted for in the engineering and design models for breakwaters (or it would become clear how unviable they might be).

A significant part of the solution is going to have to be revitalizing and rebuilding those reefs. Those tasks will be challenging, but we do have the knowledge to implement them — specifically, how to better manage reefs to reduce sedimentation, pollution and overfishing so that the reefs can grow. Such knowledge is the core of the Conservancy’s Reef Resilience program. Increasing temperatures and acidification will add to the challenge and (some would say) make the endeavor hopeless; I think these predictions are overly dire and do not account for resilience or evolution.

To succeed in revitalization will also require us to be more proactive in reef restoration to spur that growth. The Conservancy has already pioneered approaches to reef restoration in Florida and the U.S. Virgin Islands — approaches that are rapidly being taken up by partners. You might say these approaches are expensive, but compare the costs against the cost of all of the individual grey infrastructure projects such as those being erected on Petit Martinique. And remember that new climate adaptation funds are already starting to flow in the billions of dollars; these small island developing states are primary recipients of those funds, and right now the gray engineers and businesses are selling just one approach.

In many ways, the work that we must do with coral reefs parallels the work in oyster reef restoration. Indeed, the engineering and economic principles that we work on with the Natural Capital Project for oyster reefs in the Gulf of Mexico need to be applied to coral reefs in the Caribbean. And we will need to apply the visionary thinking behind such projects such as the Alabama 100/1,000 project — which is moving to restore 100 miles of oyster reef and the 1,000 acres of marsh that can grow behind those reefs — to combining successful coral reef and mangrove restoration in order to hold shorelines

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together and make hard infrastructure investments more viable in the medium to long term.

The recognition that wave attenuation is a globally critical ecosystem service — one that we have not yet fully embraced— will challenge the Conservancy’s priorities as well. These fringing reefs are rarely the most scenic, beautiful, remote or diverse coral ecosystems. Indeed, it’s that they are directly in front of villages, towns and cities that makes their revitalization such a high priority. We will also likely have to get comfortable with added hardened structures like reef blocks, as they provide substrate for oysters and corals; add quickly to some of the attenuation benefits; and include the industries and engineers who would otherwise promote only sea walls.

This is not exactly the work I signed up for some years back, but personally I am excited to be part of work that jointly meets conservation and hazard mitigation goals; that’s fulfilling to me. **SC**

*Author’s Note: For more information on the At Waters Edge (AWE)-Coastal Resilience project in Grenada, contact Conservancy co-leads Ruth Blyther and Vera Agostini. For more information on oyster and coral reef restoration, contact the Conservancy’s Rob Brumbaugh, Amanda Wrona, Judy Haner and Meaghan E. Johnson.*

[Discuss this article](#)  
on the Conservation  
Gateway.

#### **Further Reading**

M. Field, A. Ogston, and C. Storlazzi. 2011. Rising sea level may cause decline of fringing coral reefs. EOS 92:273-274.

M. Johnson et al. 2011. Caribbean Acropora restoration guide. Best practices for propagation and population enhancement. Arlington, VA: The Nature Conservancy.

# Straight, No Chaser

## As I Walked Down Beale Street

By [Jonathan Higgins](#), senior freshwater ecologist, The Nature Conservancy

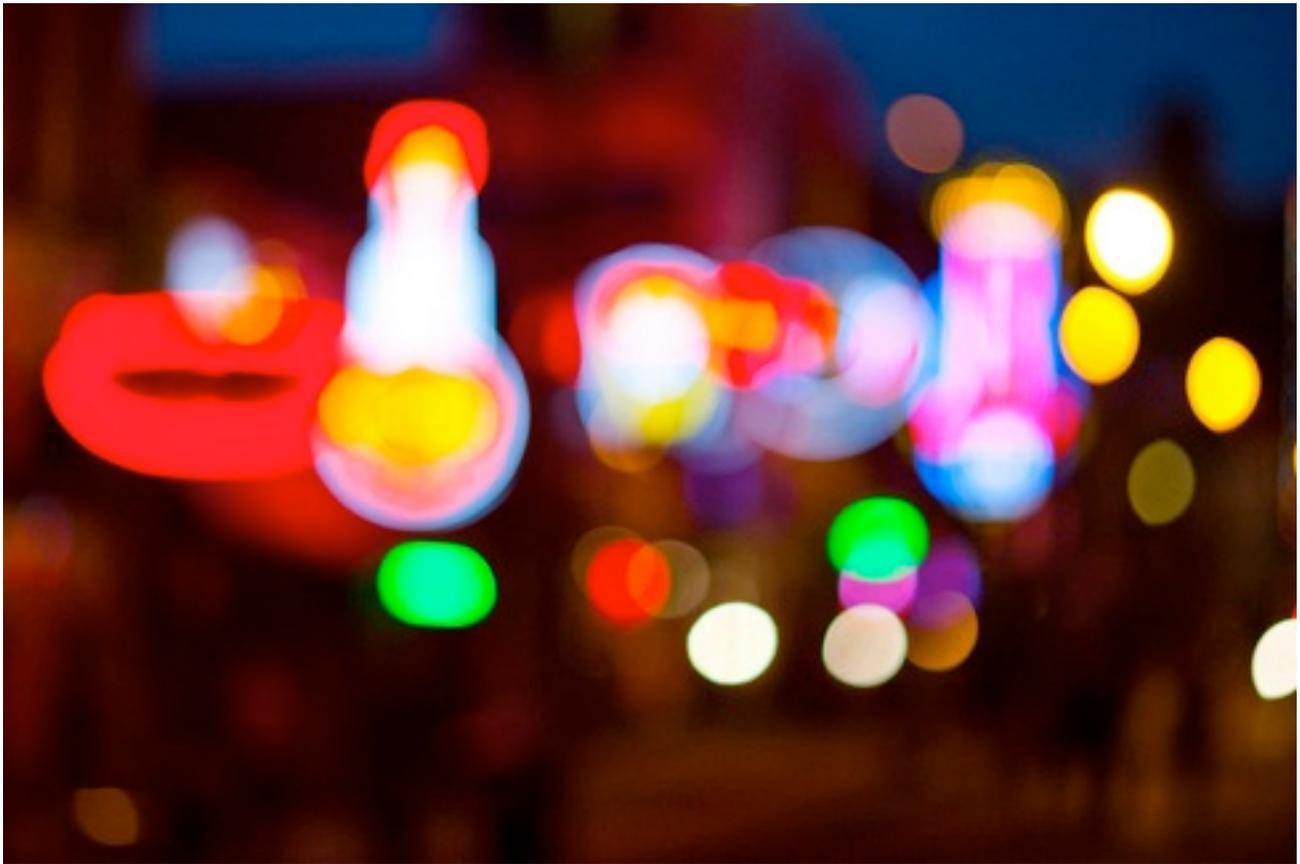


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**‘Straight, No Chaser’ is an irregular (if not downright odd) column exclusive to *Chronicles* by Jonathan Higgins.**

**[Discuss this article](#) on the Conservation Gateway.**

As I walked down Beale Street in Memphis during last month’s All-Science Conference (held in sort-of-nearby Olive Branch, Mississippi), I passed the larger clubs, where I would have heard familiar, often solid but generally overworked tunes played to audiences who are easily pleased or don’t care and wanted to drink and talk with their friends. I instead went to smaller, funkier clubs, where non-headliners and bands that looked like nothing you would see on a main stage pumped out soul music genius and tore off some new and exciting riffs to small appreciative audiences that shook their stuff. The floors trembled and the walls shook. These musicians provided the Memphis sounds that grew out of Stax Records, soul music that captured a new audience and changed how people moved.

To me, the different rewards between main-stage Beale Street and small-club Beale Street mirrored the conference. The plenary and symposia sessions addressed a range of topics from the familiar to some developing aspects of our work. Some were thought-provoking. They were important and generally well done; we all need to be part of the conversations around what was presented. There were the occasional brilliant lines

thrown in, mostly from outsiders who were brought in to bend the chords, so to speak — to get a different sound moving in the room, to change the conversation a bit, to show new perspectives. The 90-second iMovie on Development by Design produced by Bruce McKenny's young daughter is a must-see. Such things caught my ear. I've been at the Conservancy long enough to be tired of the same drumbeats.

Then came the late hours of Wednesday afternoon, which held close to 40 short talks and dozens of posters that presented the conference's non-headliners in small and hard-to-find venues — and provided many of the gems that should have been heard by a wider audience. Exciting ideas and actual data were shown by individuals, representing everything from projects to global programs. Just some of the things I loved: Evaluations of costs and potential outcomes from alternative interventions; adaptive management decisions based on innovative data-driven risk models; a variety of measures needs and frameworks and ways to communicate them; and of course, all of the freshwater work which is dear to my heart. And these were the few things I was able to see from the many venues active at once in a period of time that added up to less than one morning plenary session.

Many of these presentations offered new beats, chords and orchestration...and got the dance floor started. I saw people engaged, enlightened and enthralled.

There is a lot of great music being made in the world — and at The Nature Conservancy, especially off the main stage. The question is: Are we listening, or do we just want to talk with our friends? **SC**

## Article

# Bringing Efficient and Effective Ecosystem Markets to Scale 2: Challenges & Solutions

By [Sheila Walsh](#), ecosystem services analyst, The Nature Conservancy



In [Part I of this piece](#) (published in last month's *Chronicles*), I reviewed the challenges and issues around generating efficient and effective markets for ecosystem service payments. The excitement around the promise of such markets is justified — but only if we can help such efforts overcome and address these challenges and issues. The good news is that the Conservancy and others can and are addressing these challenges. I summarize these initiatives below and sketch out some ways forward.

Image credit: [Joost J. Bakker IJmuiden/ Flickr](#).

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### Avoid Maslow's Hammer

Although markets promise an efficient solution to resource-use problems, there is no guarantee that the result will be consistent with conservation goals. Knowing when markets might *not* be the appropriate tool is important for avoiding Maslow's Hammer — the tendency to use a familiar tool as a solution to every problem. "If people value competing uses [e.g., such as resource extraction] more highly [than uses that are compatible with conservation]...then market-based solutions will not protect the

resource in question," says Timm Kroeger, an environmental economist for the Conservancy's Central Science team. People may value extractive uses of ecosystems — such as timber — more than conservation because these people 1) lack information about the benefits they get from a conserved ecosystem, 2) do not bear the full costs of the resource extraction, or 3) simply care more about the things that resource extraction provides. "Issues #1 and #2 are a problem, because society as a whole loses," says Kroeger.

The Conservancy can play an important role in reducing these classic market failures by providing information on the benefits people get from conservation and by advocating for policies that force users to bear full costs through regulatory markets. For example, our science has helped ensure that conservation easements serve a valid "conservation purpose," which is one requirement for landowners to receive tax deductions. However, to engage new stakeholders in ecosystem markets, we may need to increasingly provide information on the economic value of ecosystem services, especially services that are not currently valued in the marketplace. In contrast, in cases in which users care more about resource extraction than conservation, payments may not be sufficient to avoid resource extraction — and the Conservancy may be better off buying land outright or using other traditional conservation strategies to achieve a conservation goal.

### **Don't Just Hit Repeat: Design and Evaluate Markets for Different Contexts**

Just as market-based solutions will not be the best strategy for all problems, different types of market structures and payment schemes will be more successful in certain contexts (Jack et al. 2008). Basic science and project evaluation are key to the Conservancy's ability to verify the effectiveness of market-solutions and replicate successful designs. The recent development of a protocol for monitoring and evaluating water funds is a critical step for the Conservancy, as we are involved in the planning of many new water funds around the world. Evaluations will determine whether 1) the funds are delivering freshwater services to payers, 2) recipients of payments see welfare improvements, and 3) there are significant improvements in the ecosystem. According to the Conservancy's Tim Boucher, who helped evaluate the effects of the Quito water fund on the Andean Páramo, demonstrating this triple bottom-line is the "biggest thing with scaling up water funds."

In addition, it is important to know that payments for ecosystem services and other market strategies are delivering better results at a lower cost than non-market alternatives. Our science can help us identify when socioeconomic<sup>1</sup> and ecological factors may increase costs. For example, payment schemes need to be more complex and potentially more costly when the benefits from the next unit of conservation are not constant due to differences across ecosystem states or places. If the Conservancy wanted to apply a water funds model to shallow lakes, such as those in the Midwestern United States, the payment scheme would need to account for the fact the lake ecosystem has threshold effects. Payments would not yield positive benefits until a critical level of

**<sup>1</sup>The cost of a PES program may be lower if payments are made to some of the poorest landholders because less money is needed to compensate these landowners; however, higher payments may be needed to significantly reduce poverty (Jack et al. 2008). Also, the poorest people may own some of the lowest quality lands, which may result in low ecosystem service delivery or conservation benefit. These potential trade-offs of cost-effectiveness, poverty alleviation, service provision and conservation in different contexts underscore the Conservancy's need to articulate how we want to prioritize these various outcomes.**

pollution reduction has occurred that would flip the lake to a state characterized by clear waters, piscivorous fish and benthic algae (Hein 2006).

### Set the Standard

Science and evaluation can also be a means to scaling up markets by helping define the rules and set the standards for new regulatory markets or by helping encourage voluntary engagement in emerging markets. For instance, the Clean Development Mechanism under the Kyoto Protocol doesn't currently allow for forest carbon credits because of unresolved concerns about their effectiveness, especially at the project level.

To help resolve these issues, the Conservancy's Forest Carbon Team is working on "domestic and international flagship projects that demonstrate scalability of emissions reductions," says Bronson Griscom, a scientist on that team. One such TNC flagship project in Brazil covers an area the size of Panama. By using subnational scale projects, "TNC is trying to be a thought leader for these standards that nations can use," adds Griscom.

Although forest carbon credits have already been sold on voluntary markets to companies and individuals, the Conservancy will play a role in getting countries to become buyers of such credits by providing the science to help establish standards for an international system under the next iteration of the Kyoto Protocol. Similarly, the Conservancy's Louisiana program is setting the bar for voluntary forest carbon markets by recently sponsoring the first third-party-validated forest carbon offset projects in the United States. Such validation is key to showing investors that the credits meet science-based standards.

### Engage New Actors and Generate Demand

Even if everyone agrees on the rules of the game, it has to be worth it to play. The Conservancy can engage new actors and help generate demand for these markets by using science to demonstrate the value of ecosystem services. That's the aim of TNC's collaboration with the Dow Chemical Company, for which the Conservancy is developing new methods that use biophysical modeling and economic valuation to help businesses consider the value of ecosystem services in their decision-making. When businesses understand how ecosystems (a) contribute to their increased production by providing key inputs like water or (b) help reduce costs by mitigating natural hazards or pollution, they might become more involved in ecosystem markets and make greater investments in conservation.

Dollars and cents might not be the main motivation for some stakeholders, but it might be critical to making conservation feasible. According to Josh Parrish of the Conservancy's Working Woodlands program in Pennsylvania, economic value is about 10th on the list of reasons why people want to conserve their forests. The first? Commonly, it's that they care about spiritual or recreational values associated with

**“The Conservancy can play an important role in reducing these classic market failures by providing information on the benefits people get from conservation and by advocating for policies that force users to bear full costs through regulatory markets.”**

biodiversity. But the problem with capitalizing on that motivation is that there is not a lot of demand for biodiversity credits.

So the Working Woodlands program uses revenue generated from carbon credits to finance the cost of improved forest management and long-term conservation agreements. This program suggests that we should look for more opportunities to use demand for one ecosystem service to help sustain other services or biodiversity that either have less demand or are not amenable to markets. Improving our understanding of trade-offs or synergies between ecosystem services and mapping this understanding against market demand could help us identify new conservation financing options. However, when new opportunities arise to sell credits for other services or biodiversity, landowners and Conservancy staff need to be aware of the benefits and problems associated with "stacking" multiple credits from a single piece of land, as well as the various changing policies surrounding this practice (see Cooley and Olander 2011).

### **Build the Infrastructure**

The Conservancy can also help build the infrastructure that supports markets and market transactions. In Oregon, the Conservancy has acted as a science advisor and experienced practitioner to help design both an integrated ecosystem service marketplace as well as new laws to support ecosystem markets along with other partners. According to Cathy MacDonald, director of conservation programs for the Conservancy's Oregon program, TNC's greatest contribution to establishing the marketplace has been in scientific input for an ecosystem credit accounting system that establishes metrics for credit types, market rules and a trading platform for the Willamette Basin. Now, the Willamette Partnership is working toward scaling this market infrastructure to the regional level in a way that reduces overhead costs for market building.

Another key concern about scaling up to the regional level is matching the market to the scale of the ecosystem and institutions. One challenge: Making the scale of the market big enough that there is enough competition to result in efficient outcomes, but making sure that trading of credits maintains ecological and institutional integrity. The Conservancy should leverage our partnerships with local organizations and landscape-level expertise to meet these challenges.

### **Take Action to Mainstream Ecosystem Markets as One of Many Conservation Strategies**

The Conservancy has made significant progress with ecosystem markets, but markets and other incentive-based strategies are still not a regular part of our conservation toolbox and are not operating at scale. Drawing on the examples and lessons from our own work and that of others, we should take the following actions to mainstream ecosystem markets:

**“We should look for more opportunities to use demand for one ecosystem service to help sustain other services or biodiversity that either have less demand or are not amenable to markets.”**

- Consider ecosystem markets and other incentive-based strategies<sup>2</sup> alongside non-market conservation strategies in the conservation business planning process (see Question 4 in the Roadmap for PET Recommendations: “What range of strategies was considered?”).

- Increase our capacity in economics, finance, policy and law through trainings and new hires.

- Enhance collaboration between scientists, conservation practitioners, and experts in finance, law and policy to research, develop, implement and evaluate market strategies, starting with the conservation business planning process.

- Create communities of practice for ecosystem markets on connect.tnc.org.

- Evaluate key market strategies — by comparing them with non-market strategies or to having done nothing — before replicating

- Generate demand for ecosystem services and support for ecosystem market policies through a set of strategic collaborations that researches and broadly communicates the value of ecosystem services to key actors (e.g. private resource owners, community groups, businesses and governments). Advocate for policy to create markets when appropriate and provide infrastructure for markets to function at appropriate scales given the ecology, economics and institutions relevant to the ecosystem service and potential buyers and sellers. (Think “whole systems.” )

- Review and identify gaps and opportunities for scientific research and policy advocacy across key ecosystem services, and invest in a set of projects and policy initiatives to meet these needs.

Many of these actions could become a part of existing or new planning processes (as recommended by the Planning Evolution Team) and support the new Global Framework. Fundamentally, however, mainstreaming ecosystem markets to meet new conservation challenges is about evolving and expanding the type of pragmatic market and incentive-based solutions (such as buying land and setting-up easements) that have been a cornerstone of the Conservancy’s work to include a range of ecosystem services as well as private and public actors. **SC**

<sup>2</sup>For a description of various types of ecosystem markets and payment for ecosystem service schemes see Ecosystemmarketplace ([http://www.ecosystemmarketplace.com/pages/dynamic/web.page.php?page\\_name=e\\_markets\\_intro&section=about\\_us](http://www.ecosystemmarketplace.com/pages/dynamic/web.page.php?page_name=e_markets_intro&section=about_us)). For a taxonomy of incentive-based strategies (including markets) see Jack et al. 2008 (free online access: <http://www.pnas.org/content/105/28/9465.full>).

### References

Cooley, D., and L. Olander. 2011. Stacking Ecosystem Services Payments Risks and Solutions. Nicholas Institute for Environmental Policy Solutions Working Paper NI WP 11-04. <http://nicholasinstitute.duke.edu/ecosystem/land/stacking-ecosystem-services-payments>

Hein, L. 2006. Cost-efficient eutrophication control in a shallow lake ecosystem subject to two steady states. *Ecological Economics* 59:429-439. [http://upi-yptk.ac.id/Ekonomi/Hein\\_Cost.pdf](http://upi-yptk.ac.id/Ekonomi/Hein_Cost.pdf)

Jack, B.K., C. Kousky, and K. Sims. 2008. Designing payments for ecosystem services: Lessons from previous experience with incentive-based mechanisms. *PNAS* 105(28): 9465-9470. <http://www.pnas.org/content/105/28/9465.full>

## Article

# Design for Scientists: Simple Tips to Improve Science Communication

By [Dan Majka](#), conservation science GIS manager, The Nature Conservancy

About five years ago, I stumbled across a book on software development called *Getting Real*, written by the company 37signals. 37signals is known for the extreme customer-centered focus of its products. They create easy-to-use software that people love. As I was flipping through their book, I came across a chapter about designing user interfaces which stated that you should always design the interface first, before you started programming. The authors stated: “The interface is your product. What people see is what you're selling.”

This concept was a game-changer for me. I began to wonder what could happen if we at the Conservancy put more consideration into the interfaces we create — things such as tools, reports, websites, graphs and presentations. It seemed every scientist I knew would spend 99% of their time collecting and analyzing data, and then quickly throw together their report or presentation at the last minute. And what was the result? A whole lot of barely usable tools, boring presentations, and impenetrable websites and reports.

If you attended the session at the TNC All-Science conference by Bob Lalasz and Evan Girvetz on science communication, you know that difficulties can arise when science, policy and marketing get in the ring together. The great thing about design is that it's a non-controversial way to greatly improve the effectiveness of your science. Nobody is ever going to argue that your graph should be *more* cluttered or your report *more* difficult to read.

Can design really make that much of an impact? Take a look around. Design can — and often does — make the difference between a raging success and a miserable failure. The recent redesign of the nature.org homepage resulted in [a 229% increase in email signups](#). A small fly etched into Amsterdam airport urinals resulted in 80% less spillage. How often have you heard others rave about their iPhone or iPad? Can you say the same for PeopleSoft?

Ultimately, everything around us is designed, and we have the choice to design products that work for our audience or against them. Tara Schnaible and I gave out the following as a pamphlet to accompany our presentation at the All-Science conference. We hope it will be a useful starting point for thinking about how to design more effective products for your audience. **SC**

“Design can — and often does — make the difference between a raging success and a miserable failure...How often have you heard others rave about their iPhone or iPad? Can you say the same for PeopleSoft?”

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# Design for Scientists

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Simple tips to improve science communication

Dan Majka  
Tara Schnaible

The Nature  
Conservancy   
Protecting nature. Preserving life.™

# On Design

Design is neither magic, nor is it about making things pretty. Good design captures attention, conveys information, and helps others get things done.

## On your audience

**Get to know your audience.** You will accomplish much more when your audience can relate to what you're saying.

**Your audience deserves your attention.** Any report, graph, tool, presentation, or website is meant to communicate with *people* and inspire them to *do something*. Make it easy for them to understand your message and take specific action.

## Motivation

**Make your tool or message relevant for your audience.** Ask your audience questions about what has motivated them in the past. Do not ask about forward-looking motivational ideas, because people always think an idea *might* work. Look at what *has* worked.

“If you're only looking at the problem from your own point of view, you're only going to be, at best, half right.”

–Jesse James Garrett

## Context

**Understand your audience's situation** by observing them in their environment. Imagine the constraints that might impact how they use your tool, understand your presentation, or process your report. Context *can* impact outcomes.

## Emotion

**Emotional people take action.** Tell stories that relate your work to experiences they can identify with. Tell them what actions they can take, and make it easy for them to do it.

# 1. Simplify

Focus on your core message, and remove or hide details which compete for your audience's attention.

## Presentations

**PowerPoint is not a teleprompter.** Put a word or two up to emphasize your points, not full sentences. If you'd rather have your audience read, just send them an email instead of reading your slides to them – this saves time for both parties.

**Use the animation function to introduce bulleted points one-at-a-time.** If you introduce all your points at once, your audience will not listen to you; instead, they will read your slides.

**Build out graphs or diagrams piece-by-piece.** Help your audience understand what the axes means and the story the data are telling.

“It's all about removing the unnecessary.”

–Jonathan Ive, Apple

**Only display a logo on the first and last slide** of your presentation; anything else distracts from your message. If someone walks into the room halfway through your talk, and you bore them so much that they leave before you're finished, do you really want them to remember your organization anyway? *Your story is the “TNC brand,”* not the logo.

**Don't use those silly TNC PowerPoint templates.** Yes, this will get me in trouble, but it will also make your presentation more effective. Does your audience really need to see small photographs of nature on every slide to be reminded that you work for The Nature Conservancy? No.

## Writing

**When writing reports, move as much of the non-story to appendices.** Nerds love to study methods sections and revel in the details. These are important, but don't let them impede your core message. Hide 'em in the back of the report.

**Provide a one- or two-sentence summary** at the beginning of every chapter of a report or webpage. Don't make the reader work so hard to figure out your core message.

## Graphs

**Remove every element of a graph that does not help you tell a story.** This includes gradients, 3D fills, dark backgrounds, and unnecessary gridlines.

# 2. Contrast

If something is different, make it *really* different. Help your audience distinguish what's important.

## Typeface

Use **two different typefaces to distinguish the headings from the body text** of a report, presentation, or article written for the web.

When choosing two typefaces, **make sure the two don't look too similar**. The easiest way to avoid this is to choose one serif and one sans-serif font. *Serif fonts* include such favorites as Times New Roman, Georgia, Cambria, Californian, and Palatino. TNC's official serif is Oakleaf. *Sans-serif fonts* include Calibri, Arial, Consolas, Verdana, and Tahoma. TNC's official sans-serif is Imago.

**Do not use TNC's Oakleaf and Imago fonts for presentations** or other on-screen use. While they look nice in print, they were not made to be easy-to-read on digital screens. Instead, try pairing Georgia & Verdana or Cambria & Calibri.

**Make your headings and body text significantly different in size** to create a sense of hierarchy. When in doubt, hold your report or presentation at arms length and squint. Can you tell what stands out? It should be the headings.

**Highlight no more than 10% of a text** using bold, italics, underlining, or color. If you need to highlight an extremely important point, consider incorporating the point in a heading instead.

## Color

**Choose a couple complementary colors** to use throughout a presentation or report. A good source for these is the TNC color guide, which can be downloaded at <http://home.tnc/identity/standards/color.html>.

**Try using a monochromatic color scheme** that varies the lightness or darkness of a single color when displaying trends in a numerical dataset. This has two advantages: 1) It prints in black-and-white better, and 2) it is easier for those with color blindness to see.

**Use an achromatic + 1 color scheme** to highlight a single category within a numerical color scheme by using shades of black & grey along with one extra color.



Monochromatic



Achromatic + 1

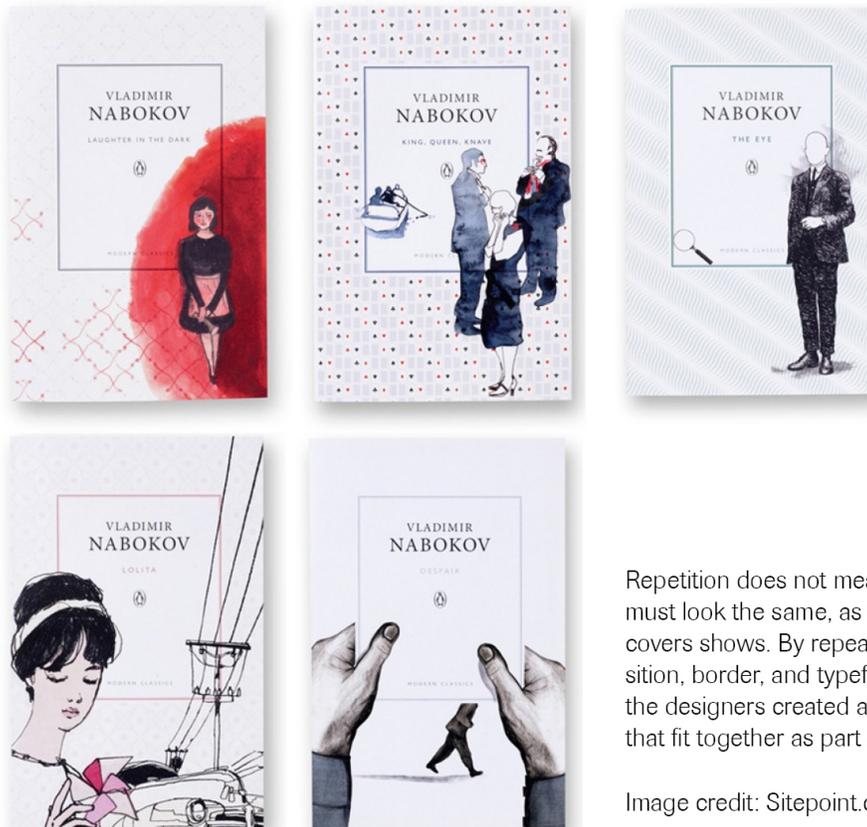
# 3. Repetition

Repeat elements of a design throughout — consistency helps people learn and adapt to new information quicker.

**Choose a couple key typefaces and use them consistently** throughout a report or presentation. Choose three at most – one for titles or headings, one for body text, and another for labeling captions or graphs. To create differentiation between levels of headings, use size, color, or variants such as small caps, italics, or bold. Be sparing in color use – one or two colors might make your headings pop out, but a rainbow will confuse your readers.

**Find repetitive items and design them consistently.** Look for items such as pull-quotes, graphs, borders, icons, and images, and format them in a similar way to create a rhythm throughout your report or presentation.

**Turn off the option to shrink text on overflow** when giving a presentation in PowerPoint. This option resizes your text to fit in a text box, which will create inconsistency in text sizes throughout your presentation. To turn off the option, right-click a textbox, go to Format Shape > Text Box, and change the Autofit option to Do not Autofit.



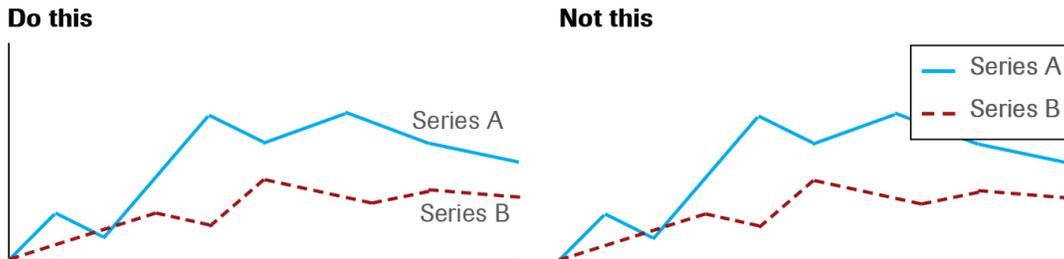
Repetition does not mean that everything must look the same, as this series of book covers shows. By repeating the same position, border, and typeface of the title box, the designers created a series of books that fit together as part of a larger family.

Image credit: Sitepoint.com



# 5. Proximity

Group similar items together to indicate relatedness, reduce clutter, and organize information.



**Directly label data series on graphs when possible.** Placing labels in close proximity to data limits confusion and also makes it easier for those with color blindness to understand your data.

**Break up writing into headings,** especially when writing for the web. The brain naturally looks for groups, and readers don't usually read on the web, they scan.

**When displaying lists, combine them into groups of 3-4 items, and create space between the sub-lists.** There is a reason phone numbers look like this: (520) 545-0188 and not this: 5205450188. Bite-sized chunks are easier to digest.

BAD	GOOD	
Scrub shrubland	<b>Scrub shrub</b>	<b>Forest</b>
Steppe	Scrub shrubland	Conifer forest
Chaparral	Steppe	Deciduous forest
Montane grassland	Chaparral	Mixed forest
Alpine grassland	<b>Grassland</b>	<b>Human land use</b>
Lowland grassland	Montane grassland	Developed
Conifer forest	Alpine grassland	Agriculture
Deciduous forest	Lowland grassland	
Mixed forest		
Developed		
Agriculture		

# Resources

Interested in design? Want to make your science more effective? Here are some resources we've found useful.

## Design principles

William Lidwell. 2010. Universal principles of design, revised and updated: 125 ways to enhance usability, influence perception, increase appeal, make better design decisions, and teach through design.

Jan White. 2003. Editing by design: For designers, art directors, and editors —the classic guide to winning readers.

Robin Williams. 2008. The non-designer's design book.

50 free lessons in graphic design.  
<http://bit.ly/p2VD7m>

## Making things usable

Steve Krug. 2005. Don't make me think: A common sense approach to web usability.

Steve Krug. 2009. Rocket surgery made easy: The do-it-yourself guide to finding and fixing usability problems.

Susan Weinschenk. 2011. 100 things every designer needs to know about people.

Usability.gov/methods - Gives a step-by-step guide for testing the usability of a website or process.

Software Usability Research Lab - Definitive site for user-behavior research. <http://bit.ly/qDZYen>

## Color

Colorbrewer2.org – a tool for designing map & data color schemes.

Kuler.adobe.com – a tool for exploring attractive color schemes.

TNC color guide – <http://home.tnc/identity/standards/color.html>

## Typography

Robert Bringhurst. 2004. The elements of typographic style.

Ellen Lupton. 2010. Thinking with type: A critical guide for designers, writers, editors, and students.

Typography for lawyers - A ton of free tips for making your text look better.  
<http://typographyforlawyers.com/>

## Presentations

Nancy Duarte. 2008. Slide:ology: The art and science of creating great presentations.

Nancy Duarte. 2010. Resonate: Present visual stories that transform audiences.

Garr Reynolds. 2009. Presentation Zen design: Simple design principles and techniques to enhance your presentations.

Cliff Atkinson. 2011. Beyond bullet points: Using Microsoft PowerPoint to create presentations that inform, motivate, and inspire.

Carmine Gallo. 2009. The presentation secrets of Steve Jobs: How to be insanely great in front of any audience.

## Data visualization

Stephen Few. 2009. Now you see it:

Simple visualization techniques for quantitative analysis.

Edward Tufte. 2001. The visual display of quantitative information.

Nathan Yau. 2011. Visualize this: The FlowingData guide to design, visualization, and statistics.

Dona Wong. 2010. The Wall Street Journal guide to information graphics: The Dos and Don'ts of presenting data, facts, and figures.

## Writing

Strunk & White. 1999. The elements of style.

William Zinsser. 2006. On writing well: The classic guide to writing nonfiction.

Ginny Redish. 2007. Letting go of the words: writing web content that works.

Yahoo. 2010. The Yahoo! style guide: The ultimate sourcebook for writing, editing, and creating content for the digital world.

Writing complexity analysis - tests a website for how difficult it is to read. <http://juicystudio.com/services/readability.php>

## Messaging & influence

Robert Cialdini. 2006. Influence: The psychology of persuasion.

Frank Luntz. 2006. Words that work: It's not what you say, it's what people hear.

Chip and Dan Heath. 2007. Made to stick: Why some ideas survive and others die.

Guy Kawasaki. 2011. Enchantment: The art of changing hearts, minds, and actions.

Richard Thaler. 2009. Nudge: Improving decisions about health, wealth, and happiness.

## Science communication

Randy Olson. 2009. Don't be such a scientist: Talking substance in the age of style.

Cornelia Dean. 2009. Am I making myself clear? A scientist's guide to talking to the public.

Nancy Baron. 2010. Escape from the ivory tower: A guide to making your science matter.

## Interaction design

Alan Cooper. 2007. About face 3: The essentials of interaction design.

37signals. 2009. Getting real: The smarter, faster, easier way to build a successful web application.

Giles Colborne. 2010. Simple and usable web, mobile, and interaction design.

Kim Goodwin. 2009. Designing for the digital age: How to create human-centered products and services.

## Design thinking

Daniel Pink. 2006. A whole new mind: Why right-brainers will rule the future.

Roger Martin. 2009. The design of business: Why design thinking is the next competitive advantage.

Jeanne Liedtka. 2011. Designing for growth: A design thinking toolkit for managers.

# About us

## **Dan Majka**

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520-545-0188

Dan conducts spatial analyses for Arizona's Conservation Science program, manages GIS and information resources, and designed and maintains the [azconservation.org](http://azconservation.org) website. He also designed and manages [corridordesign.org](http://corridordesign.org), a website dedicated to providing tools and information on wildlife corridors, and recently redesigned the [maps.tnc.org](http://maps.tnc.org) site for Conservation Data & Information Systems.

## **Tara Schnaible**

[tschnaible@tnc.org](mailto:tschnaible@tnc.org)

312-580-2359

Tara is a Usability Analyst who loves talking with users and creating better software for TIS. She has been a usability junkie for years and has 15 years of experience listening to people talk about what they hate about their computers. She would love to help you with your problems – call or email her!

## Science Shorts

# Phantom Portfolios and How to Make Them Visible

**Knight, A.T., H.S. Grantham, R.J. Smith, G.K. McGregor, H.P. Possingham, and R.M. Cowling. 2011. Land managers' willingness-to-sell defines conservation opportunity for protected area expansion. Biological Conservation 144:2623-2630.**

Could we fundraise smarter and do conservation faster and cheaper if we treated the likelihood of placing lands and waters under conservation the same as the likelihood of an invasive spreading or an endangered species winking out? In this study, a sizable chunk (up to 95%) of proposed conservation portfolios can simply never happen when the reality of willingness-to-sell and practical-ability-to-fundraise are popped into the equation. This approach supports the first recommendation of the Planning Evolution Team (P.E.T.): "Enhance selection and development of strategies."

*But wait! It gets better...*

**Halperin, E., A.G. Russell, K.H. Trzesniewski, J.J. Gross, and C.S. Dweck. 2011. Promoting the Middle East peace process by changing beliefs about group malleability. Science 333: 1767-1769.**

The science of conflict resolution is deeply knit in the day-to-day work of the Conservancy. As we "broaden support for conservation," we will need to build, more than ever before, on this legacy. This study shows that even very hostile groups can be made more amendable to coexistence and cooperation when taught, not about each other, but about how human attitudes in general are shaped by current situation and immediate needs, not some innate quality. Plug that into your willingness-to-sell model!

— [Jensen Montambault](#), applied conservation scientist, The Nature Conservancy

## TNC: Let's Help Solve the Bee Crisis

**Levy, S. 2011. What's best for the bees. Nature 479:164-166.**

**Garibaldi L. et al. 2011. Global growth and stability of agriculture yield decrease with pollinator abundance. PNAS 108:5909-5914.**

**The Great Sunflower Project** (see <http://www.yourgardenshow.com/citizen-science/great-sunflower-project>)

It is hard to imagine a more important group of animals than bees — over 70% of the world's crops benefit from bee pollination, as well as most of the flowering plants in our neighborhoods and gardens. But bees are under siege due to habitat loss, pollution and disease. Statistical analysis of global FAO data suggest that crops that depend on bee pollination have not enjoyed the same degree of yield increases as crops that do not need bees. The real story is murky, and there is a lot of science that needs to get done before

we get this figured out. One of the intriguing findings is that, in some regions of the United States, highly disturbed ecosystems and even invasive plants can be important resources for sustaining otherwise declining bee populations. Now add to the mix a terrifically ingenious citizen science project, whereby backyard gardeners plant sunflowers (and other flowers) and then count pollination visits for 15 minutes every month. Over 100,000 households in the United States have signed up to collect these data, and are helping to produce a map of where the bees really are in short supply. All this is to say that the hypothesized bee crisis represents a conservation threat that backyard, urban and simple landscape modifications (hedgerows with wild flowers around farms) can play a major role in addressing. My suggestion is that TNC should partner with The Great Sunflower project as a way of engaging people — bees really are essential to our planet, and it is hard to find situations where individual actions can make such a tangible difference — and help out the science.

— [Peter Kareiva](#), chief scientist, The Nature Conservancy

## The Challenge of Prosecuting Anthropogenic Emissions for the Crime of Severe Weather Events

**Evam, A. T. 2011. Arabian sea tropical cyclones intensified by emissions of black carbon and other aerosols. *Nature* 479: 94-97.**

Climate policy wonks wish they could blame severe weather on emissions — and they often do on NGO blogs and media interviews. But scientifically establishing this link is not so easy. The paper by Evam and colleagues about Arabian sea cyclones is one of the better studies I have seen. The evidence is circumstantial, but persuasive: cyclones in the Arabian Sea have gotten increasingly severe and damaging since 1979, while at the same time black carbon and sulphate emissions have been on the rise in the region. Moreover, there is a clear physical mechanism by which these emissions can create conditions more favorable to cyclone formation. So maybe we should convict? But it is really only five storms over a 30-year period that drive the results. Also: In the past, natural variation has produced conditions every bit as favorable to cyclones as human emissions. We all know weather and storms are unpredictable and variable — are we ready to convict on the basis of five storms? I do not know. So I will use the scientific weasel phrase “consistent with” and remind everyone that it does not really matter if there is enough evidence to convict emissions for the crime of severe weather — severe weather is a problem humans must deal with regardless of the criminal, and intact ecosystems can play a role in protecting us against these threats. The degree to which intact ecosystems might buffer human populations against the ravages of cyclones is the question we conservationists need to be addressing (while we let our atmospheric science colleagues worry about the cause of the storms). **SC**

— [Peter Kareiva](#), chief scientist, The Nature Conservancy

## The Coda Files

### Alison Greenberg

**Think being or hosting a Coda Global Fellow is mysterious and unattainable? Think again! The Coda Global Fellows program enables staff to apply their talents beyond their regular job to forward the Conservancy's global priorities. Coda Fellows can be anyone. They can be anywhere. They could even be...you. So take a step with us into...The Coda Files.**

"Philanthropy staff are practicing anthropologists at heart," says Craig Leisher, TNC social scientist, TNC Poverty Alleviation team lead and one of Alison Greenberg's Coda Fellowship advisors. "They know how to study people, they are great listeners and can quickly relate to almost anyone even if cultural similarities are close to zero."

Alison exemplified these abilities in her first social science field experience with Craig. "During our study of the socioeconomic impacts of TNC's Niobrara Preserve [Nebraska], we noticed a trend in local ranchers' responses to our question, 'why won't you burn on your property?'" said Alison. "The answer was consistently, 'TNC hasn't shown me the benefit to my bottom line — in terms of the almighty dollar — of burning! I couldn't care less about habitat for Sandhill Cranes!'"

"Well, no one from the preserve had examined and quantified the economics of burning," adds Alison, "even though it's pretty clear that burning would make the grasses stronger and more nutritious for grazing, as well as manage the spread of the Eastern Red Cedar, which is causing significant economic and environmental harm to the grasslands. But it was never the preserve's goal to be a multiplier, to change ranchers' practices. Niobrara never had social or economic objectives; its role was to be a land-protection and research demonstration site. So the program hadn't invested in an economist to demonstrate the value of burning to our rancher neighbors...that was a huge wake-up call for me."

#### Coda Fellow: Alison Greenberg

**Day Job:** Senior principal gifts officer, The Nature Conservancy

**Assignment:** Social Science Integration Project

**Duration:** July 2011-December 2011

**Take-Home Lesson:** "It's become totally clear to me that, at the end of the day, human behavior and decisions will make or break TNC's goals."



The Niobrara field experience inspired Alison to undertake a Coda Fellowship to integrate social science into the Conservancy's robust biological scientific capacity because, as she put it, "we owe it to our staff, our partners and our donors to demonstrate the impact our work has on people, and to design our priority projects with people in mind." Alison has created a Social Science Task Force with Craig and her other advisor, TNC's senior social scientist Supin Wongbusarakum, to receive critical input and guidance from key Conservancy staff on how best to achieve this integration. Alison puts the likelihood of success at an all-time high.

"It's an exciting time to be doing this at TNC," she says. "Mark Tercek and our executive team are keenly aware that our conservation strategies must improve human well-being, and are enormously supportive of this effort to show how this can be done effectively."

Supin is thrilled and delighted with the experience, innovation and dedication Alison brings to her Coda Fellowship. "I had a dream that the Conservancy would strategically integrate human well-being into conservation. The dream that I had thought would take 10 years to bring to fruition is now beginning to blossom." **SC**

— [Jensen Montambault](#), applied conservation scientist, Central Science, The Nature Conservancy

*The Coda Global Fellows program enables staff to apply their talents beyond their regular job to forward the Conservancy's global priorities. Burning science needs? Want to share your skills with a global priority? Contact [Jolie Sibert](#), director of the Coda Global Fellows program!*

## Announcements

### Call for Citations: Nature Conservation's Impact on People

WO-Strategic Communications wants to know about existing reports and papers that in some way make the case that nature conservation provides benefits in terms of drinking water, food, local livelihoods and/or human health. These connections don't have to be the primary theme of the paper or report, but the benefit does have to be in the terms above. In other words, the term "drinking water" (for example) doesn't have to appear in the title or appear extensively in the text, but drinking water as a benefit of nature conservation must be addressed explicitly in the text.

Please send citations and the paper (if you have a copy) to Misty Herrin at [mherrin@tnc.org](mailto:mherrin@tnc.org) by 12 December. Many thanks in advance.  
SC

### Let's Talk: TNC-Science and New York Academy of Science to Hold Discussion Series

Science at The Nature Conservancy and The New York Academy of Sciences are partnering to present a series of public fora in 2012 on conservation and conservation science issues of moment. The events, to be held at the Academy's 300-seat auditorium and videotaped for webcast later, offer the Conservancy an unprecedented opportunity to spotlight its scientific expertise and ability to convene world-class thinkers for discussions on many of the global challenges conservation faces. The

fora also offer the possibility of significant media and donor cultivation opportunities. TNC members will receive discounted admission to the events. The lineup for the first season of fora is below:

#### **Energy for the Next 20 Years: Protecting the Environment and Meeting Our Demands (January 12)**

Global energy consumption is projected to grow more than 50 percent by 2035, with much of that increase coming from countries outside the United States and Europe. Meanwhile, the world's total carbon emissions continue to grow, and dams—the planet's leading source of renewable energy—are often devastating for river ecosystems and people who depend on them. How can Earth possibly meet its growing energy demands without destroying the environment? Experts on wind, nuclear, hydropower and other energy forms debate the most promising paths forward.

##### ***Confirmed Participants***

- Joe Fargione, The Nature Conservancy
- Stewart Brand, Long Now Foundation
- Jesse Jenkins, Breakthrough Institute
- Arne Jungiohann, Heinrich Boell Institute
- David Roberts, Grist (moderator)

#### **Creating the Next Conservation Movement -- Or Do We Even Need One? (February 23)**

"Conservation" and "environmentalism" are in danger of becoming our grandfathers' words. The environment ranks close to the

bottom when Americans are polled about their top concerns, and the percentage of those who identify themselves as conservationists has slipped substantially in the last five years. How can we build a new U.S. conservation and environmental movement to meet the challenges of the new century...or is the desire to mainstream environmentalism just a symptom of the problem?

##### ***Confirmed Participants***

- Michael Shellenberger, Breakthrough Institute
- Ted Nordhaus, Breakthrough Institute
- Sanjayan, The Nature Conservancy
- Gernot Wagner, Columbia University and Environmental Defense Fund

#### **Nature and the City: What Good is Urban Conservation? (April 16)**

From New York's High Line to the Los Angeles River, there's a new energy across the United States about recapturing nature in cities. But can these efforts be about more than building quality of life for urban residents? Cities are dependent on the natural world for clean water, air, food, fiber, and a host of other things, yet many times these linkages are not appreciated or valued. New scientific research is showing how important this "green infrastructure" is for cities, and helping create new conservation opportunities. Leading scientists, authors and urban conservationists discuss the science behind and promise for today's urban conservation efforts.

##### ***Confirmed Participants***

- Rob McDonald, The Nature Conservancy

- Phil Stevens, Urban Creeks Council

### **Beyond Ideology: How Should We Feed Ourselves if We Care About Nature? (May 8)**

Agriculture already uses almost 40 percent of the Earth's land mass—and with world population expected to add another 2-3 billion people by century's end, that figure seems destined to increase...putting more pressure on natural systems that are already stressed by water scarcity, nutrient runoff, and other agricultural byproducts. Meanwhile, fishing stocks are widely reported to be on the verge of collapse globally. So what's the answer—genetically modified organisms? A new Green Revolution? A widespread change in diets? Five scientists discuss the challenges and potential solutions that could feed the people and protect nature.

#### ***Confirmed Participants***

- Jonathan Foley, University of Minnesota
- Pam Ronald, UC-Davis
- Doug Gurian-Sherman, Union of Concerned Scientists
- Phil Levin, NOAA

For more information on the series, please contact Bob Lalasz at [rlalasz@tnc.org](mailto:rlalasz@tnc.org). **SC**

## **AAAS Science & Technology Policy Fellowships: Applications Due**

Online application is open for the 2012-2013 AAAS Science & Technology Policy Fellowships. The deadline to apply is December 5, 2011, 5:00p EST.

Placement opportunities are available in congressional offices and 15 executive branch agencies for all scientific fields, including the social sciences. The five fellowship areas being offered for September 2012 through August 2013 are:

- Congressional
- Diplomacy, Security & Development
- Energy, Environment & Agriculture
- Health, Education & Human Services
- Roger Revelle Fellowship in Global Stewardship

To learn more about the AAAS Science & Technology Policy Fellowships, visit <http://fellowships.aaas.org>. Please contact the Fellowships staff at [fellowships@aaas.org](mailto:fellowships@aaas.org) or 202-326-6700 with questions. **SC**

# New Conservancy Publications

Conservancy-affiliated authors highlighted in bold.

Please send new citations and the PDF (when possible) to: [pkareiva@tnc.org](mailto:pkareiva@tnc.org) and [rlalasz@tnc.org](mailto:rlalasz@tnc.org). Please include "Chronicles Citation" in your subject line so we don't miss it.

Some references also contain a link to the paper's abstract and a downloadable PDF of the paper. When open source or permitted by journal publisher, these PDFs are being stored on the Conservation Gateway, which also is keeping a running list of Conservancy authored science publications since 2009.

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Ban, N.C., V.M. Adams, G.R. Almany, S. Ban, J.E. Cinner, L.J. McCook, M. Mills, R.L. Pressey, and **A. White**. 2011. Designing, implementing and managing marine protected areas: Emerging trends and opportunities for coral reef nations. Journal of Experimental Marine Biology and Ecology. doi:10.1016/j.jembe.2011.07.023.

Green, S.J., **A.T. White**, P. Christie, S. Kilarski, A.B.T. Meneses, G. Samonte-Tan, L.B. Karrer, H. Fox, S. Campbell, and J.D. Claussen. 2011. Emerging marine protected area networks in the Coral Triangle: Lessons and way forward. Conservation and Society 9(3):173-188.

Hang-gi Wong, M., C.Q. Duan, **Y.C. Long**, **Y. Luo**, and G.Q. Xie. 2010. How will the distribution and size of subalpine *abies georgei* forest respond to climate change? A study in Northwest Yunnan, China. Physical Geography 31:319-335. DOI: 10.2747/0272-3646.31.4.319.

Johnson, T. N., P. L. Kennedy, T. DelCurto, and **R.V. Taylor**. 2011. Bird community responses to cattle stocking rates in a Pacific Northwest bunchgrass prairie. Agriculture, Ecosystems & Environment 144:338-346. <http://www.sciencedirect.com/science/article/pii/S0167880911003379>

King, D.I., C.C. Chandler, J.H. Rappole, R.B. Chandler, and **D.W. Mehlman**. 2011. Establishing quantitative habitat targets for a "critical endangered" neotropical migrant (Golden-cheeked warbler *dendroica chrysoparia*) during the non-breeding season. Bird Conservation International doi:10.1017/S095927091100027X.

Li L., S. Yu, B.P. Ren, Ming L., **R. Wu**, and **Y.C. Long**. 2009. A study on the carrying capacity of the available habitat for the *Rhinopithecus bieti* population at Mt. Laojun in Yunnan, China. Environ Sci Pollut Res DOI 10.1007/s11356-009-0130-8.

Lindenmayer, D.B., P. Gibbons, M. Bourke, M. Burgman, C.R. Dickman, S. Ferrier, **J. Fitzsimons**, D. Freudenberger, S. T. Garnett, **C. Groves**, R.J. Hobbs, R.T. Kingsford, C. Krebs, S. Legge, A.J. Lowe, R. McLean, **J. Montambault**, H. Possingham, J. Radford, D. Robinson, L. Smallbone, D. Thomas, T. Varcoe, M. Vardon, G. Wardle, J. Woinarski, and A. Zerger. 2011. Improving biodiversity monitoring. Austral Ecology. doi:10.1111/j.1442-9993.2011.02314.x.

**Opperman, J.J.**, **C. Apse**, F. Ayer, J. Banks, L. Rose Day, J. Royte, and J. Seebach. 2011. Hydropower, salmon and the Penobscot River (Maine, USA): Pursuing improved environmental and energy outcomes through participatory decision-making and basin-scale decision context. Chapter 13 in Burger, J. (ed.) 2011.

*Stakeholders and Scientists: Achieving Implementable Solutions to Energy and Environmental Issues*. Springer, New York, New York.

**Opperman, J.J.**, J. Royte, J. Banks, L. Rose Day, and **C.D. Apse**. 2011. The Penobscot River (Maine, USA): A basin-scale approach to balancing power generation and ecosystem restoration. *Ecology and Society* 16(3):7. <http://dx.doi.org/10.5751/ES-04117-160307>

**Opperman, J.J.**, **A. Warner**, **E. Girvetz**, **D. Harrison** and **T. Fry**. 2011. Integrated reservoir-floodplain management as an ecosystem-based adaptation strategy to climate change. Proceedings to American Water Resources Association 2011 Spring Specialty Conference on Climate Change and Water Resources, Baltimore, MD. April 2011.

Price, J., J. Silbernagel, **N. Miller**, **R. Swaty**, **M. White**, and K. Nixon. 2011. Eliciting expert knowledge to inform landscape modeling of conservation scenarios. *Ecological Modeling* doi:10.1016/j.ecolmodel.2011.09.010.

Ren, B.P., Li M. **Long Y.C.**, and Wei F.W.. 2009. Influence of day length, ambient temperature, and seasonality on daily travel distance in the Yunnan snub-nosed monkey at Jinsichang, Yunnan, China. *American Journal of Primatology* 71:233-241.

Ren, B.P., Li M., **Long Y.C.**, C.C. Gruter, and Wei F.W. 2008. Measuring daily ranging distances of *Rhinopithecus bieti* via a global positioning system collar at Jinsichang, China: A methodological consideration. *Int. J. Primatol* 29:783-794. DOI 10.1007/s10764-008-9251-z.

**Warner, A.**, **J.J. Opperman**, and R. Pietrowsky. 2011. A call to enhance the resiliency of the nation's water-management infrastructure. *Journal of Water Resources Management and Planning* 137:305-308.

Watts, R.J., **B.D. Richter**, **J.J. Opperman**, and K.H. Bowmer. 2011. Dam re-operation in an era of climate change. *Marine and Freshwater Research* 62:321-327.

Wu, R., S. Zhang, D.W. Yu, P. Zhao, X. Li, L. Wang, Q. Yu, J. Ma, A. Chen, and **Y.C. Long**. 2011. Effectiveness of China's nature reserves in representing ecological diversity. *Frontiers in Ecology and Environment* 9(7):383-389. doi:10.1890/100093.