Translational Ecology
Short Course

Tucson, AZ
April 4-5, 2018
Mission of the Southwest Climate Science Center

The mission of the SW CSC is to work with natural and cultural resource managers to develop and deliver scientific information and techniques to anticipate, monitor, and adapt to climate change in the southwestern United States.
Vision for the Southwest Climate Science Center

• Foster effective collaboration between scientists and resource managers in anticipating, monitoring, and adapting to climate variability and change in the Southwest

• Identify and apply best practices for translational climate and environmental sciences
Guiding principles:

• Focus on management outcomes and solutions
• Co-production of knowledge by practitioners and scientists
  • Actionable Science
Guiding principles:

• Focus on management outcomes and solutions
• Co-production of knowledge by practitioners and scientists
  • Actionable Science
• Coordination of cultures and calendars of decision-making and research
• Clear communication of scientific capacities and uncertainties
• Utilization of experiential and local knowledge
• Commitment to span professional and disciplinary boundaries
SW CSC Expertise and Institutional Connectivity

University of Arizona
- Gregg Garfin: climate impacts and climate adaptation
- Alison Meadow: anthropology, evaluating use of climate information
- NOAA RISA - CLIMAS • Coop Extension • USGS AZ WSC • USGS AZ CFWRU • USGS NPN • USGS SDRS

University of California, Davis
- Mark Schwartz: conservation biology and ecosystem management
- Beth Rose Middleton: Native studies, environmental law and policy
- CDFW • CA LCC • Delta Science Program • USDA California Climate Hub • USDAFS PSRS • USGS WERC • Coop Extension

University of California, Los Angeles
- Glen MacDonald: long-term climate and environment dynamics
- Rich Ambrose: restoration, environmental health, and conservation biology
- NOAA Sea Grant • NPS Santa Monica NRA • Santa Monica Bay Restoration Commission

Desert Research Institute
- Tamara Wall: wildfire social science, evaluating use of climate information
- Tim Brown: wildland fire science and management
- BLM • Nevada Division of Forestry • NIFC Predictive Services • NOAA RISA - CNAP • NOAA WRCC • USFWS • USGS WGSC

Colorado State University
- Erica Fleishman: ecology and conservation biology
- Brad Udall: water policy, climate adaptation
- Colorado NHP • Colorado FS • Coop Extension • DOI NC CSC • USDAFS RMRS • USFWS NRP • USGS CO CFWRU • USGS FCSC

Utah State University
- Nancy Hunty: ecology, human ecology, and climate adaptation
- Michelle Baker: aquatic and ecosystem ecology
- BLM • USDAFS RMRS • USDA NWRC • USGS UT CFWRU • Utah Climate Center • UDWR • Coop Extension

Scripps Institution of Oceanography
- Alexander Gershunov: extreme weather and climate variability
- Dan Cayan: meteorology, oceanography, and hydrology
- NOAA RISA • CNAP • USGS CA WSC • NOAA SFSC • NWS San Diego • CDFW
Cycle 2 - Science

• Coastal Ecosystems
• Terrestrial and Aquatic Ecosystems
• Water
• Climate Extremes
• Actionable Science Practice
Cycle 2 – Capacity Building

- Regional Partner Dialogues and Summits
- Academic Fellows
- Practitioner Fellows
- Engagement with Tribes
- Community of Practice
Translational Ecology

ECOLOGY IS WELL INTO IT’S SECOND CENTURY AS AN ORGANIZED SCIENTIFIC DISCIPLINE, RICH WITH OBSERVATIONS, EXPERIMENTS, AND A GRUNDMANNING OF HOW THE NATURAL WORLD WORKS. TODAY’S ENVIRONMENTAL SCIENTISTS HAVE A POWERFUL ARAY OF TOOLS AND TECHNIQUES TO MEASURE AND RECORD THE ENVIRONMENT AND TO INTERPRET VAST AND DIVERSE DATA. WE DESPITE PRODUCING AN ENORMOUS AMOUNT OF NEW INFORMATION, ECOLOGISTS ARE OFTEN UNABLE TO CONVEY KNOWLEDGE EFFECTIVELY TO THE PUBLIC AND POLICY-MAKERS. UNLESS THE DISCOVERIES OF ECOSCIENCE ARE RAPIDLY TRANSLATED INTO USEFUL ACTIONS, THEY WILL REMAIN QUITE ACHIEVED WHILE THE THREATENING DEGRADATION PROGRESSES.

GLOBAL WARMING, THE GULF OF MEXICO OIL SPILL, INVASIVE SPECIES—THOSE ARE A FEW OF THE ISSUES CONCERNING ENVIRONMENTAL SCIENTISTS AND, INCREASINGLY, THE PUBLIC. WHAT IS NEEDED IS A NEW PARTNERSHIP BETWEEN SCIENTISTS AND ADVOCACY GROUPS THAT CONVEYS ECOCLOGICAL INFORMATION ACCURATELY AND IN WAYS THAT WILL ENSURE THAT THE SCIENCE IS INFORMATIVE AND THAT ITョ WILL BE HEARD BY POLICY-MAKERS AND THE PUBLIC.

SUSTAINABLE DEVELOPMENT AND THE SUSTAINABILITY OF LIFE ON EARTH ARE DEPENDENT ON OUR ABILITY TO UNDERSTAND THE ENVIRONMENT AND THE WAY IN WHICH IT AFFECTS OUR LIVES. WE NEED A SCIENTIFIC REVOLUTION TO TRANSFORM THE WAY WE THINK ABOUT THE ENVIRONMENT, THE WAY WE MANAGE IT, AND THE WAY WE LIVE WITH IT.

Good examples of translational ecology involve interdisciplinary teams of scientists, engineers, public health experts, and members of the broader community. A recent study of the environmental impacts of mountaintop-removal mining involved a collaboration between ecologists and public health experts. Earthjustice and other nonprofit groups used this material to convince the U.S. Environmental Protection Agency (EPA) to issue new guidelines that will severely limit such mining practices. In another example, research by natural ecologists helped the EPA outline how to recognize and delineate wetlands, based on soil characteristics. Other scientists are now working with advocacy groups to help policy-makers understand the implications of human perturbations of the global nitrogen cycle. And we can be sure that scientific analyses of the impacts of deep-water petroleum extraction will also be forthcoming—in this case, unfortunately, as a retrospection.

Translational medicine grew from the recognition that basic research findings were not moving effectively into the development of drugs and treatments. To overcome this problem, in 2006 the U.S. National Institutes of Health established a Consortium for Translational Clinical and Translational Research, which grants Clinical and Translational Science Awards. These awards have recently been increased to over $200,000 per year for the next 5 years, expanding the consortium to 55 institutions nationwide. Translational ecologists should similarly connect the end-users of environmental science with the major funders of environmental research.

This week, the Ecological Society of America concludes its annual meeting in Pittsburgh. The world’s largest international organization of ecologists can play a crucial role in promoting translational ecology. It has drawn together more than 3000 scientists, policy-makers, and citizens to explore the causes and consequences of this year’s theme: global warming. Many of the sessions call for ecologists to take charge and improve science education and literacy, so that issues related to global warming are not misunderstood. Connecting ecology to stakeholders in these and other ways should enhance the understanding and appreciation of ecological concepts, ensuring that scientific rigor is brought to bear on the world’s many environmental challenges.

—William H. Schlesinger

A Paleosol, Science, 320: 1451-1453

www.sciencemag.org

S C I E N C E

V O L 3 2 0 . 6 A U G U S T 2 0 1 0

607
2015: Translational Ecology Working Group

- Ecologists
- Climate adaptation scientists
- Social scientists
- Resource managers

- Special issue of *Frontiers in Ecology and the Environment*
- ESA Symposium & special sessions
## Translational Ecology

### Research
- Colleges and universities · Science agencies · Think tanks
- Basic science and theory · Applied science · Environmental education
- Raw data and analysis · Scientific papers · Derived data products
- Empirical and theoretical models · Predictions · Forecasts

### Institutions
- Knowledge-action boundary
- Process-oriented tools and techniques*

### Practice
- Adaptive management · Ecosystem management · Advocacy and policy
- Web-based portals · Mapping tools · Reports and expert opinion
- Regulatory and management planning · Conservation planning · Decision support

### Collaboration
- Trust
- Actionable science
- Robust decision making
Collaboration, teamwork facilitation

Communication

Sci-Pol

Interpersonal

Co-production

STRONG SCIENCE FOUNDATION
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• Maggie Pitts
• Erica Fleishman
• Larry Fisher
• Kiyomi Morino
• Scott Stonum
• Ralph Marra, Jr.
• Brad Udall
What’s In the Folders?

• Agenda
• Participant list
• Speaker bios
• Co-production exercise
• Meeting facilitation scenario
• Message Box
• COMPASS Message Box Guidebook
<table>
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<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>830-900</td>
<td>Registration</td>
</tr>
<tr>
<td>900-945</td>
<td>Welcome, Overview, Introductions</td>
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<tr>
<td>945-1045</td>
<td>Science Policy</td>
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<tr>
<td>1045-1100</td>
<td>Break</td>
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<tr>
<td>1100-1200</td>
<td>Translation and Co-production 1</td>
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<tr>
<td>1200-100</td>
<td>Lunch</td>
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<tr>
<td>100-245</td>
<td>Translation and Co-production 2</td>
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<tr>
<td>245-300</td>
<td>Break</td>
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<tr>
<td>300-415</td>
<td>Interpersonal skills</td>
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<td>415-430</td>
<td>Break</td>
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<td>430-500</td>
<td>Recap</td>
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<td>Time</td>
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<td>830-900</td>
<td>Group activity</td>
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<td>900-930</td>
<td>Translational Ecology Perspectives</td>
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<td>930-1030</td>
<td>Meeting facilitation 1</td>
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<td>1030-1045</td>
<td>Break</td>
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<tr>
<td>1045-1145</td>
<td>Meeting facilitation 2</td>
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<td>1145-1245</td>
<td>Lunch</td>
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<tr>
<td>1245-215</td>
<td>Science communication</td>
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<td>215-230</td>
<td>Break</td>
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<tr>
<td>230-415</td>
<td>Translational Ecology Exercise</td>
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<tr>
<td>415-430</td>
<td>Break</td>
</tr>
<tr>
<td>430-500</td>
<td>Recap and Meeting Evaluation</td>
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Bathrooms
INTRODUCTIONS

• Gather by date of birth
• With the person to your left
  • Who
  • Where
  • What
  • Why
  • Favorite food
• Introduce your partner to the group
Navigating translational ecology: creating opportunities for scientist participation


Interest in translational ecology (TE) – a research approach that yields useful scientific outcomes and fosters collaboration between scientists and stakeholders – is growing among ecologists. Translational ecology brings together participants from different cultures and with diverse incentives. We address ways to cultivate a culture of TE, such as investing time and money in articulating the value of translational research, and outline common entry points to translate research into meaningful solutions. This panel will discuss strategies for increasing the uptake of TE in current institutional frameworks, but also highlight common institutional constraints that hinder progress. We also highlight the benefits of building and maintaining relationships with researchers and institutions that are engaged in translational research.

Panel 1. Overcoming barriers to translational research

Translational ecology is a “cross-cultural” enterprise between scientists and stakeholders. Diverse cultures and perspectives can enhance the quality and impact of science, but can also create barriers to scientist and stakeholder engagement. However, scientists and stakeholders also have different levels of flexibility and this may allow them to help each other to tackle challenges (green arrows in Figure 4; Tables 1 and 2).

Table 1. Constraints on scientists (and how stakeholders can help overcome them; Figure 4a)

<table>
<thead>
<tr>
<th>Scientist constraint</th>
<th>Stakeholder flexibility</th>
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</thead>
<tbody>
<tr>
<td>Pressure to publish (academics)</td>
<td>Involve scientists in project design and implementation; include controls</td>
</tr>
<tr>
<td>Rigid timelines, such as academic calendar, degree length, and tenure (academics)</td>
<td>Adjust hiring to match academic calendar; be open to publishable sub-projects</td>
</tr>
<tr>
<td>Need for grants and funding (academics)</td>
<td>Strengthen broader impacts for traditional funding (eg NSF); expand funding options via boundary organizations</td>
</tr>
<tr>
<td>Mandated to avoid making direct policy recommendations (government funding)</td>
<td>Shift from “should” requests to “if, then” statements</td>
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</tbody>
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Table 2. Constraints on stakeholders (and how scientists can help overcome them; Figure 4a)

<table>
<thead>
<tr>
<th>Stakeholder constraint</th>
<th>Scientist flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure to act and move forward with available information</td>
<td>Provide iterative “one-pagers” as work progresses; ongoing experimentation</td>
</tr>
<tr>
<td>Penalized for unsuccessful trials; risk averse</td>
<td>Take responsibility and provide land or funding for higher-risk treatments</td>
</tr>
</tbody>
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In a nutshell:
- Translational ecology brings together scientists and stakeholders to develop research that addresses environmental challenges.
- Engaging participants with different perspectives can enhance the quality and applicability of science, but also presents challenges to collaboration.
- Such relationships, when positively supported by boundary organizations, can help to address each other's perspectives, constraints, and facilitators.

Panel 2. Overcoming barriers to translational research

Translational ecology is a “cross-cultural” enterprise between scientists and stakeholders. Diverse cultures and perspectives can enhance the quality and impact of science, but can also create barriers to scientist and stakeholder engagement. However, scientists and stakeholders also have different levels of flexibility and this may allow them to help each other to tackle challenges (green arrows in Figure 4; Tables 1 and 2).

Figure 4. Conceptual figure in which (a) stakeholders can overcome scientist-related barriers to engagement and (b) scientists can overcome stakeholder-related barriers to engagement.
TRANSLATIONAL ECOLOGY

Building translational ecology communities of practice: insights from the field

Dawn M. Lawson*, Kimberly R. Hall†, Laurie Young‡, and Carolyn AF. Egri*‡

Translational ecology (TE) prioritizes the understanding of social systems and decision contexts in order to address complex environmental problems (Egri et al. 2015, Wall et al. 2017). Egri et al. (2017) define TE as “an approach in which early stakeholders, and decision makers work together to develop research that addresses the sociological, ecological, and political contexts of an environmental issue.” However, and that TE is distinct from conventional ecological research in that it seeks “to link science and practice by integrating ecological science with the full complement of social dimensions that underlie today’s complex environmental issues” (Egri et al. 2017). To succeed in helping society address the many challenges that require an understanding and applications of ecological knowledge, TE-based projects must build communities of practice.

Communities of practice have a common sense of purpose and shared methods for learning and innovation (Wenger 1998). These communities are more likely to be successful over time if they develop and communicate clear mechanisms for engagement, resolution of differences, and knowledge exchange. The field of TE brings together two types of critical components of practice, as identified by Amoiridis and Roberts (2003): epistemic communities (researchers), which focus on the creation of new knowledge, and professional communities, which focus on land and natural resource management, typically in partnership with stakeholders. In the context of improving the use of sound scientific and technical information in decision making, these two communities share a common sense of purpose, yet they work, learn, teach, and innovate differently. To foster groups of scientists in diverse contexts of practice, we need to share detailed stories about TE processes, which can inform and provide evidence of positive outcomes (Probst and Bottrill 2008). Furthermore, the methods and goals of translation must be tailored to the specific geographical and scientific context, and valued by community members (Probst and Bottrill 2008). In other words, the diverse applications and processes of TE are a must. However, benefiting from lessons learned by others can be challenging due to the paucity of outreach for describing the goals, methods, challenges, and collaborative agreements that can be used to build a body of shared knowledge and practice. We seek to fill this gap by examining a series of case studies.

*Space and Nautical Weather Systems Center, Pacific, CA, USA; †Geosystems, Inc., Westminster, CO, USA; ‡US Department of the Interior, US Geological Survey, Tucson, AZ.

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TRANSLATIONAL ECOLOGY

Linking knowledge to action: the role of boundary spanners in translating ecology

Hugh D. Salfoot*, Sarah C. Sawyer†, Susan D. Kercher‡, J Kevin Haas‡, and Molly Crenn

One of the most effective ways to foster the co-production of ecological knowledge by producers and users, as well as to engender dialogues between them, is to cultivate individuals or organizations that can bridge the understanding gap between the two groups. These “boundary spanners” are critical to ensuring scientific salience, credibility, and legitimacy, yet they remain relatively underresearched in ecology. We summarize some of the major roles of boundary spanners in translational ecology and suggest that effectiveness in translating ecological knowledge into actionable scientific results, more informed policy making, increased investment in science-driven solutions, and inspiration for partnerships. We aim to facilitate future TE-based projects and build momentum for this community of practice.

*Front Ecol Environ 2013, 1(MS): 590-596, doi: 10.1890/11-1718

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Developing a translational ecology workforce

We define a translational ecologist as a professional ecologist with diverse disciplinary expertise and skill sets, as well as a suitable personal disposition, who engages across social, professional, and disciplinary boundaries to partner with decision makers to achieve practical environmental solutions. Becoming a translational ecologist requires specific attention to obtaining and skills that are not typically gained through graduate school, including interdisciplinary skills. Among the types of interdisciplinary skills that would prove valuable to interested ecologists may include the ability to tailor ecological concepts to be more easily understood by people who may not have a strong background in the field. Additionally, a translational ecologist may be learned through personal experience, graduate programs, and other training opportunities.

Front Ecol Environ 2013; 1:405-409. DOI: 10.1890/13-0041.1 (a)
Front Ecol Environ 2013; 1:405-409. DOI: 10.1890/13-0041.1 (b)

A. The severity of global environmental challenges and the increasing need to engage with decision makers to identify solutions that are socially acceptable. Such solutions must be valence, credible, and legitimate in order to be effective (Cash et al. 2003).

In a nutshell:
1. Translational ecologists are professional ecologists who engage across social, professional, and disciplinary boundaries to partner with decision makers in order to achieve practical environmental solutions to primary challenges.
2. To be effective, translational ecologists must have an interdisciplinary skill set (e.g., skills in negotiation, conflict resolution, and communication) as well as a strong understanding of the ecosystems they work in.
3. Individuals should be encouraged to develop these skills through training and experience.
4. Agencies, universities, and non-governmental organizations that require translational ecologists must support professional development of these skills.
5. Training of translational ecologists is a responsibility shared among individuals, employees, educators, and academic administrators.

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(a) Ecology
- Genetics
- Statistics
- Evolution
- Epidemiology
- Physiology
- Botany
- Plant development

(b) Ecology
- Economics
- Psychology
- Sociology
- Law
- Project Management
- Conflict Resolution
- Communications

The National Academy of Sciences has noted that while many programs provide training for scientists in the research and development phase of knowledge, they are often not designed to address the needs of scientists who are required to communicate their results to decision makers. This disconnect is a significant problem for policy makers who must make decisions based on scientific evidence. In order to bridge this gap, it is essential that ecologists are trained in the skills necessary to communicate their findings effectively.
Use-inspired science: making science usable by and useful to decision makers

Tommas U-Wall,1* Elizabeth McNie,2 and Gregg M. Gerber3

A growing body of research in translational science provides a foundation for translational ecologists to consider strategies that show the most promise, as well as the potential pitfalls of the practice. These research approaches (e.g., use-inspired climate science) require deliberate engagement with end users, and an understanding of the social and cultural contexts in which a research project functions. We examine the climate science translation literature (looking at how research can inform decision-making) to identify key issues related to how social scientists have helped guide researchers engaged in use-inspired science. We focus on understanding the more intangible inputs to research projects, including the social and cultural contexts, stakeholder engagement, the role of social capital, and evaluating the outputs, outcomes, and impacts of these social science projects and initiatives. Research on socio-ecological systems and translational science is increasingly pointing to the conclusion that intentional, structured processes, such as those found in translational sciences, boost the likelihood of science being successfully incorporated into environmental decision making and policy.

As defined earlier in this Special Issue, translational ecology (TE) is an approach that embeds intentional processes by which ecologists, stakeholders, and decision makers work collaboratively to develop and deliver ecological research that, ideally, results in improved environmental-related decision making" (Enquilt et al. 2017). TE seeks to link ecological knowledge to decision making by integrating science with the social dimensions that underlie today’s complex environmental issues. Most notably, TE facilitates this linkage via interactions between decision makers, practitioners, and the public. Distinct from both basic and applied ecologies, TE deliberately extends research beyond theory or conceptual applications, and is motivated by a search for outcomes that directly serve the needs of natural resource managers and decision makers. TE is at a broader movement that aims to update and reenergize the social science to bridge science and society, to make science more relevant and usable in the face of rapidly changing and increasing environmental challenges (Laliberte et al. 2016). National Research Council (1999) and a series of approaches (end-to-end science, boundary work, co-production of science and policy, production of usable or actionable science) that embeds and puts into practice the integration of science and decision makers, through a variety of means. The purpose of this special issue is to facilitate the integration and awareness of usable climate science for regional ecologists engaged in environmental decision making. The purpose of this special issue is to share these lessons learned and to facilitate the integration of science and decision makers, through a variety of means.

In a nutshell:

- Benefits to the use of scientific information in decision making by potential users of social capital among researchers, such as scientists, practitioners, and the public.
- The benefits of a well-aligned framework for managing environmental information, practitioners, and stakeholders include an increased ability to catalyze mutually reinforcing social processes to understand and manage environmental systems.
- Ecologists can assist policy and improve the chances of meaningful outcomes by developing a project strategy that considers the following factors: useful information, successful use of information, effective communication, public health, and public services.

1Division of Atmospheric Sciences, Desert Research Institute, Reno, NV. 2*Virtually the same, Water Assistance Cooperative Institute for Research in Environmental Sciences, University of Colorado at Boulder, Boulder, CO. 3School of Natural Resources and the Environment, University of Arizona, Tucson, AZ.

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Figure 4. Overlooking the Hapi and Naipo Native Reserves in Amazon.

Figure 5. Pastoral created and used to all alleviated pastoral numbers for project outreach.
Translational ecology in my own backyard: an opportunity for innovative graduate training

Jennifer L. Tank

It all started a decade ago with a simple “yes.” I’d been asked by a senior colleague to take a call from The Nature Conservancy (TNC), they needed someone to “put numbers to an emerging conservation practice” in agricultural systems and catchments. Since I was a specialist in agricultural ecology, they wanted to know if I could help. I admit that my knee-jerk reaction was to slam the door on the request and tell my colleague that I didn’t do those kinds of contracts. But he encouraged me to take the call, and to be open to the opportunities that could develop by partnering with a large conservation organization. “You never know what might happen”, he said. So I got off my high horse, heeded his advice, and began my journey into translational ecology, which has led to some of the most challenging and rewarding science of my career.

Midwestern croplands play a crucial role in feeding the country and the world, but resultant of excess nitrogen, phosphorus, and sediments can compromise both local and downstream water quality, resulting in algal blooms and subsequent hypoxia. “Dead zones” often occur far from the nutrient source. TNC helped quantify the effects of two-stage ditches, which reduce floods and reduce agricultural ditches in order to promote nutrient retention and removal before they are exported to sensitive downstream ecosystems like the Gulf of Mexico. At the time TNC called, implementation of two-stage ditches had not been quantitatively linked to improved water quality, and the task of my lab (and my graduate students) was to determine whether floodplain restoration could reduce stream nutrient export from agricultural watersheds.

Ten years later, our small partnership has grown into the Indiana Watershed Initiative (IWI), which involves not only university graduate students and faculty but also a diverse group of partners including the Soil and Water Conservation Districts (SWCD) from multiple counties, 50 or more local farmers in two demonstration watersheds, staff from the USDA Natural Resources Conservation Service, and TNC scientists and managers. Our ongoing studies of conservation practices implemented in the streams and surrounding watersheds have revealed complex and unexpected ecological and biogeochemical processes at the interactions between terrestrial and aquatic ecosystems. The shared goal of the interdisciplinary team which includes the graduate students conducting the dissertation research in this setting, is that results from our translational research will lead to novel management solutions that benefit both farmers and the environment.

A further goal is that the successful outcomes highlight through demonstration projects, which are really watershed-scale experiments, will facilitate widespread adoption of conservation practices to improve water quality in agricultural lands. Translational ecology a fundamental shaping the research experience of the students involved is in my lab. They have honing skills that allow them to think critically, communicate effectively, build collaborations, and place their research in a broader context, all of which supports their professional development and future academic achievements.

My students have learned that the results from their research must reach partners and stakeholders on a faster timeline than that of a post-reviewed publication. They are now keenly aware of the challenges faced by resource managers, who are pressed to implement environmental solutions on the shorter time frames required by policy and budgets. Most of us have experienced the anxiety of sharing preliminary data, with worries about being scooped (or more likely) that research conclusions will change after additional data collection and analyses. While this concern is warranted, students often discover that the iterative sharing and open discussion of preliminary data lead to unanticipated opportunities and new research directions. Moreover, feedback from partners with critical on the-ground knowledge has improved the research questions we ask.

Now, for my students presenting preliminary data to our partners is considered an opportunity rather than a cost. Nevertheless, those interactions and the non-traditional research products (e.g., posters, videos, even tweets) are not always valued in less traditional metrics of training success, and the time commitment required of the students can be viewed as time away from “real research.” Yet the effective communication skills honed and practiced in this translational setting are serving graduate students in the same way as they move forward in their careers. Among those benefits are better presentations, more compelling grant proposals, mastery of job interviews, and improved teaching skills.

Listening creates challenges and opportunities. Our translational research has been guided by the principles of OPV (“other points of view”), a communication tool that I