Improving Environmental Decision-Making Through Integrated Governance, Public Engagement, and Translational Approaches

Nicole K. Ward1, Kathleen A. Torso2, Craig Anthony (Tony) Arnold3, Liza Mitchell4, and Marja H. Bakermans5

1Department of Biological Sciences, Virginia Tech, 926 West Campus Drive, Blacksburg, Virginia 24061 USA
2Water Resources Program, University of Idaho, 875 Perimeter Drive MS 3002, Moscow, Idaho 83844 USA
3Brandeis School of Law and Department of Urban & Public Affairs, University of Louisville, 2301 S 3rd Street, Louisville, Kentucky 40208 USA
4Pitkin County, Open Space and Trails, 530 E Main Street, Aspen, Colorado 81611 USA
5Department of Biology and Biotechnology, Worcester Polytechnic Institute, 60 Prescott Street, Worcester, Massachusetts 01605 USA

Symposium Motivation and Goals

As reflected by the 2019 ESA meeting theme “Bridging communities and ecosystems: inclusion as an ecological imperative,” it is clear that ecology is increasingly recognizing the importance of effective community engagement. Community engagement is not a recent approach, particularly from the disciplinary perspectives of urban and regional planning, public policy, and law (Arnstein 1969). Within the discipline of ecology, there are a wide range of approaches when it comes to community engagement (Whitmer et al. 2010, Pandya 2012, Enquist et al. 2017). Community engagement in and of itself does not necessarily result in improved decision-making and policy nor does it necessarily make the process inclusive (Quick and Feldman 2011). Therefore, the specific approaches used in community engagement is a point of debate (Day 1997), causing a push to focus on collaborative, mutually beneficial engagement approaches (Innes and Booher 2005, Norström et al. 2020).
With a multitude of community engagement initiatives within and across disciplines, our symposium aimed to bring together academics and practitioners, each working from a unique perspective in environmental decision-making, to improve community engagement initiatives. Prior to the symposium, we generated a shared list of definitions (Box 1) to facilitate cross-disciplinary communication. At the symposium, panelists shared perspectives on (1) the role of law (Barb Cosens) and nonprofits (Liza Mitchell) in environmental governance; (2) methods and lessons learned from inclusive environmental decision-making, including Joint Fact-Finding (Todd Schenk), Resilience Justice (Tony Arnold), and Co-Production (Kirsten Schwarz and Steven Mathisen) approaches; and (3) training the next generation of translational ecologists (Marja Bakermans). During the synthesis discussion, panelists identified the first steps they take in initiating a new community engagement program: observe, design process, build relationships, and develop partnerships, and five key ingredients for inclusive community engagement are as follows: listen, show up, follow up, connect to the issue, and trust (Fig. 1).

### Presentation Summaries

**Resilience justice: the intersection of resilience science, social justice, policy analysis, and community capacities (Tony Arnold, University of Louisville)**

Resilience science describes how complex adaptive systems change through time, but Resilience Justice moves beyond that idea to facilitate more inclusive community engagement. For example, social justice and injustice need to be brought to the forefront of adaptive governance and resilience assessments (Arnold et al. 2017). Resilience Justice focuses on capacity building, empowerment, and systemic change through co-production and co-governance of green and blue infrastructure. Co-production and

| Box 1. Shared Definitions |
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| **Environmental Governance** | The process or action of influencing the rule of law, customs, or traditional norms by private actors, a government agency, network, market, or interaction between government and society in a social (e.g., family, tribe, organization)—ecological system (e.g., territory, river basin, ocean) (Lee 2003, Bevir 2012, Cosens and Gunderson 2018) |
| **Inclusion** | Recognizing, respecting, and integrating all relevant perspectives with equal consideration and dignity in decision-making; central to inclusion is shared power, shared decision-making, and shared responsibility for implementation, management, capacity building, and governance (Quick and Feldman 2011) |
| **Translational Ecology** | A multidisciplinary, cross-sector, and iterative environmental science approach that promotes actionable research to support the resilience of social–ecological systems through the use of accessible tools and frameworks to encourage knowledge exchange and mutual learning (Brunson and Baker 2016) |
| **Integration** | “A process by which ideas, data and information, methods, tools, concepts, and/or theories from two or more disciplines are synthesized, connected, or blended” (Repko 2012, p. 466) |
| **Collaboration** | The action of working with a particular person, or community of people (Repko 2012) |
co-governance are achieved through neighborhood inclusion, power, and fostering social and political capital. Resilience Justice is (1) a concept of justice, (2) an analytical framework, and (3) a diagnostic tool.

Resilience Justice aims to overcome structural inequalities that contribute to injustices in blue-green infrastructure projects that focus on distribution and governance processes alone. The old model for green and blue infrastructure development focused on equitable distribution and access, participatory
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decision-making, and prioritization of green and blue infrastructure. This model does not overcome vulnerabilities such as public underinvestment in marginalized and oppressed communities, systemic inequalities, gentrification, and green gentrification. Resilience Justice focuses initiatives to improve green and blue infrastructure on inclusion, systematic investment in marginalized communities’ infrastructure, empowerment, capacity building, co-production, and co-governance.

Adaptive water governance: reconciling development and ecosystem resilience (Barb Cosens, University of Idaho and Lance Gunderson, Emory University)

Freshwater is an exemplary common-pool resource with complex socio-environmental dynamics, providing a template to examine how governance may affect adaptive capacity. Adaptive governance, which includes formal political institutions and informal social norms, emerges in many cases to improve environmental management (Dietz et al. 2003). However, when approaches to governance increase the role of private actors, concerns with accountability and corruption rise. Importantly, in these governance structures, only those with ample resources can participate (i.e., likely not inclusive). The resilience literature lacks consideration of the problem with collaborative governance that political scientists identified: the increased threat of corruption with an imbalance of power among private actors. This research presentation, based on work from a Socio-Environmental Synthesis Center team (SESYNC 2013), aimed to identify the legal mechanisms that would enable adaptive governance to overcome issues with corruption in water management (Cosens and Gunderson 2018).

The SESYNC team identified four key legal mechanisms to ensure legitimacy of adaptive governance in addition to two previously identified mechanisms: clear and enforced rules and institutionalized solutions. The first key legal mechanism is for the structure of the government to balance stability by setting high-level goals and standards with flexibility and innovation through local experimentation (Craig et al. 2017, for Panarchy concept context, see Chaffin et al. 2016). Second, the government should delegate authority to agencies to promote networked decision-making and collaboration (e.g., Gosnell et al. 2017). Third, foster participatory (through capacity building for marginalized populations and facilitation of inclusive collaborative processes) and adaptive capacity (through adaptive planning, adaptive management, market regulatory mechanisms, and networked governance). Fourth, government structure and process must provide legitimacy, accountability, equity, and justice (through oversight, standard setting, administrative process, and judicial review). Moving forward, it is necessary to consider that with the inherent scientific uncertainty in complex systems, decisions are ultimately based on values. Therefore, good governance comprised of openness, transparency, integrity, effective collaboration, and performance-orientated review works to identify appropriate points for finding solutions to environmental issues.

The role of nonprofits in building community partnerships to improve watershed management (Liza R.J. Mitchell, Natural Resource Planner and Ecologist, Pitkin County, CO)

The Colorado River Basin has a highly complex history of water use and shifting climate regimes are complicating the already overburdened supply and demand of water. In response, Governor Hickenlooper signed an executive order in 2013 to draft a Water Plan. The Water Plan was based on regional watershed boundaries, not political boundaries, which made the process multi-jurisdictional and community-oriented from the beginning.
Nonprofits have played a large role as liaisons in environmental decision-making in the Colorado River Basin. Nonprofits are well poised to contribute if they are science-driven, consensus- and solution-oriented, scaled locally, involved in community outreach, credible, and multi-jurisdictional. Importantly, nonprofits committed to stakeholder relationships are poised for success. This includes listening to the concerns of the people before drafting project or research objectives. Nonprofits embedded in the community for a long time may have credibility and unique trust relationships with people in the area that benefit collaborative efforts. Further, nonprofits have access to funding that local government or universities do not, and can leverage partnerships to accomplish objectives. Challenges to the process include different mental models of the system, which can make the process slow, lack of funding to support the entire process, and loss of participation at various stages in the project.

As a case study, this presentation outlined the Crystal River Management Plan (Roaring Fork Conservancy 2016). The plan had four goals: (1) verify that water depletion is a problem, (2) quantify how much water is needed, (3) locate where the water is needed most, and (4) evaluate potential solutions with stakeholders. Importantly, the management plan focused on communicating results in accessible, color-coded figures based on the level of impairment and social feasibility to identify priority areas.

**Lessons from a translational undergraduate program (Marja H. Bakermans, Worcester Polytechnic Institute)**

The Great Problems Seminar at Worcester Polytechnic Institute trains undergraduates to be active problem-solvers, engage with stakeholders, address complex open-ended problems, and work on teams, all of which are key for translational ecology work (Bakermans and Pfeifer 2018). An involved course like this requires support from community partners, faculty, student mentors, and library staff. The structure of the course is divided into two parts: The first half is spent understanding the problem, and the second half is spent addressing the problem. During the course, students engage with stakeholders in various ways (e.g., conduct interviews, attend public meetings). Additionally, students practice multiple forms of communication: presentations, discussions, posters, and displays. Student also built team and self-awareness through the course by conducting a visual inventory of student strengths and skills, identify areas for growth through the project, and divide work among group members according to identified assets and areas for growth. Student success beyond course requirements has been tremendous. Some students have been awarded grants to further develop their project after the course, and many students have turned their projects into ongoing clubs. All final posters are published on the WPI Library website and have been downloaded from all over the globe, with >20,000 downloads in the past year. The Great Problems Seminar is a model course for teaching translational ecology principles through experiential learning.

**Building shared understanding and advancing governance through multi-stakeholder joint fact-finding (Todd Schenk, Virginia Tech)**

We often think more science facts will improve policy and decision-making; however, science can be mistrusted, misconstrued, and misunderstood. Further, science embedded within “wicked problems” (Rittel and Webber 1973) adds to difficulty in applying science knowledge. Joint Fact-Finding (Schenk et al. 2016) works to overcome these issues by generating science information that is salient (relevant), credible (trustworthy), and legitimate (fair; Cash et al. 2002), and bridge the science–policy divide by building collaborative partnerships between scientists and policy-makers and other stakeholders.
Joint Fact-Finding is an engagement strategy for experts (e.g., scientists), decision-makers, and key stakeholders to “resolve or narrow factual disputes” in policy issues. Joint Fact-Finding is successful when those affected are involved in development of the research question, selection of experts, and finding, analyzing, and interpreting the science/technical information. The process also requires skillful facilitation. For process specifics, see Schenk and Matsuura (2017). The presentation also presented a case study of the Joint Fact-Finding process in regard to the Poseidon Desalination Plant in Huntington Beach, CA, which is also outlined in Schenk and Matsuura (2017).

Community engagement in green infrastructure design as a means to build urban water resilience (Kirsten Schwarz, University of California, Los Angeles and Steve Mathisen, Community Organizer and Activist, ReNewport)

The Strategic Depaving project is a collaborative project between academic and community partners working to transform vacant lots in Newport, KY, into public green space that is designed by the community. The project is built around the idea of community-engaged scholarship where work (1) addresses societal needs, (2) generates mutual benefits for partners, (3) integrates community and academic needs, and (4) challenges structures of inequality and uneven power dynamics. The project aims to communicate to the public that scientists need and value community input and community input can effect change. It aims to communicate to scientists that community engagement can improve our work. Further, well-executed community engagement can improve environmental decision-making (Dean et al. 2016).

The broad goal of Strategic Depaving is to promote resilience through engagement that centers the needs of a community by prioritizing amenities and then designing those amenities to realize ecosystem services. By focusing on the process of co-production, the project hopes to build agency that may further create and maintain desired ecosystem states. Strategic Depaving is a partnership between ReNewport, Westside Citizens Coalition, and academic partners from the disciplines of Journalism, Biology, History, Environmental Science, Arts, Nursing, and Civic Engagement. Their engagement process included visioning workshops with interactive activities including asking participants to use LEGO® to prioritize and spatially arrange park amenities, a brainstorming board for people to contribute words that describe what they like about their neighborhood and what their vision is of the future of their neighborhood. Importantly, the engagement process was iterative: They focused on listening to what people said, coming back and telling them what they heard, and then eliciting additional feedback and ideas. Big lessons learned from the project include (1) transparent goals facilitate trust, (2) engage with many different and overlapping groups, (3) find key leaders within each group, (4) expect engagement to evolve over time, (5) be flexible, (6) build agency for work to continue beyond project, (7) welcome divergent ideas, and (8) focus on equity and process.

Symposium Outlook

During our synthesis discussion, panelists collectively generated a list of the most important things to do in an inclusive community engagement initiative as well as the first steps in starting a new project.

What are the most important things to do in an inclusive community engagement initiative?

• Listen. Pay attention to the words, values, and ways people describe themselves as well as the way they relate to others and their environment. Conduct open-ended interviews.
• Show up. Attend and organize informal and formal gatherings and show interest in the community.

• Follow up. Go back to the community, see whether what you thought you heard is what they tried to communicate. Follow through on promises. Respond in a timely fashion.

• Connect to the issue. Use active listening skills to foster valuable conversation with and among community members. Uncover the variable ways that the issue is connected to people and their daily lives, their concerns, and their values. Internalize that you cannot impose your view on other people, and strive to understand their view and their connection to the issue.

• Trust. Many ways to build a trusting relationship. Focus on building trust however you can. Do all of the above to foster trust.

*What are the first steps you take when starting a new inclusive, community engagement initiative?*

• Consciously step back from how you understand the problem. Observe.

• Focus on process design. Be clear, flexible in time and resources, and transparent.

• Build relationships.

• Develop partnerships.

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