A *Superior* Research Reader

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Greetings and welcome to A *Superio*r Research Reader, a monthly reader on what we believe is current and relevant research to science and resource management on the Superior.

This Month's Edition: Human and Social Dimensions of Natural Resources Management

This month we want to emphasize the qualitative side of natural resource management because the human and social dimensions are equally as important as the quantitative sciences influencing our work. In this issue you'll find articles exploring institutional capacities to adapt to climate change, *Futures Research* examining impacts on social-ecological systems, an introduction to *Trust Ecology*, and utilizing *Traditional Ecological Knowledge* for targeted forest inventories. For those of you out there who get as giddy and excited about these qualitative aspects of the environment as we do, check out The Human-side of Restoration Webinar Series for more social science insight on ecological restoration, human communities, individual values, public opinions, and social structures.

Happy reading,

Pooja and Katie

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1. Armsworth and colleagues discuss the capacity of conservation organizations, primarily public agencies and non profits, to adapt to changing environmental conditions.

2. Our friend David Bengston at the Northern Research Station and his team propose that futures research, a transdisciplinary field of inquiry, can help anticipate growing impacts of change on social-ecological systems.

3. Stern and Baird describe `Trust Ecology', and examine how different types of trust may interact to drive institutional resilience in natural resource management contexts.

4. Emery et al. discuss how `Traditional Ecological Knowledge' contributes to targeted birch bark inventories, a cooperative effort between the Great Lakes Indian Fish and Wildlife Commission and Forest Inventory and Analysis Program.

Are conservation organizations configured for effective adaptation to global change?
Armsworth et al. 2015. Frontiers in Ecology and the Environment

ABSTRACT: Conservation organizations must adapt to respond to the ecological impacts of global change. Numerous changes to conservation actions (e.g. facilitated ecological transitions, managed relocations, or increased corridor development) have been recommended, but some institutional restructuring within organizations may also be needed. Here we discuss the capacity of conservation organizations to adapt to changing environmental conditions, focusing primarily on public agencies and nonprofits active in land protection and management in the US. After first reviewing how these organizations anticipate and detect impacts affecting target species and ecosystems, we then discuss whether they are sufficiently flexible to prepare and respond by reallocating funding, staff, or other resources. We raise new hypotheses about how the configuration of different organizations enables them to protect particular conservation targets and manage for particular biophysical changes that require coordinated management actions over different spatial and temporal scales. Finally, we provide a discussion resource to help conservation organizations assess their capacity to adapt.

Strengthening Environmental Foresight: Potential Contributions of Futures Research
Bengston et al. 2012. Ecology and Society

ABSTRACT: The need for environmental foresight has increased in recent decades as the pace of change has accelerated and the frequency of surprise has increased. Successfully dealing with the growing impacts of change on social-ecological systems depends on our ability to anticipate change. But traditional scientific tools are blunt instruments for studying a future that does not exist. We propose that futures research, a transdisciplinary field of inquiry that has been developing for more than 50 years, offers an underused but fruitful set of approaches to address this important challenge. A few futures research methods—notably several forms of scenario analysis—have been applied to environmental issues and problems in recent years. But futurists have developed an array of other useful methods for exploring possible, plausible, and preferable futures, important insights into the nature of change, and perspectives for thinking creatively and deeply about the future. We present an overview of futures research and its potential to enrich environmental planning and policy by offering a cross-fertilization of new ideas and approaches, providing a more complete view of emerging environmental problems, and facilitating the development of strategies to increase adaptive capacity and deal more effectively with surprises.

Trust ecology and the resilience of natural resource management institutions
Stern and Baird. 2015. Ecology and Society

ABSTRACT: The resilience of natural resource management (NRM) institutions are largely contingent on the capacities of the people and organizations within those institutions to learn, innovate, and adapt, both individually and collectively. These capacities may be powerfully constrained or catalyzed by the nature of the relationships between the various entities involved. Trust, in particular, has been identified repeatedly as a key component of institutional relationships that supports adaptive governance and successful NRM outcomes. We apply an ecological lens to a pre-existing framework to examine how different types of trust may interact to drive institutional resilience in NRM contexts. We present the broad contours of what we term “trust ecology,” describing a conceptual framework in which higher degrees of diversity of trust, as conceptualized through richness and evenness of four types of trust (dispositional, rational, affinitive, and systems based), enhance both the efficacy and resilience of NRM institutions. We describe the usefulness and some limitations of this framework based on several case studies from our own research and discuss the framework’s implications for both future research and designing more resilient governance arrangements.

Using Traditional Ecological Knowledge as a Basis for Targeted Forest Inventories: Paper Birch (Betula papyrifera) in the US Great Lakes Region
Emery et al. 2014. Journal of Forestry

ABSTRACT: Traditional ecological knowledge (TEK) has been proposed as a basis for enhanced understanding of ecological systems and their management. TEK also can contribute to targeted inventories of resources not included in standard mensuration. We discuss the results of a cooperative effort between the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) and USDA Forest Service's Forest Inventory and Analysis Program (FIA). At the urging of member tribes, GLIFWC staff worked with tribal gatherers to document TEK regarding desired characteristics of birch bark for traditional uses and translated this into an inventory field guide. The guide was provided to FIA, which incorporated the methods into its field manual and trained inventory crews in implementation of the protocol. Birch bark data were collected during three field seasons from 2004 to 2006. Results show birch bark supply has declined. Lessons learned from this multiyear, multistage project provide a model for future targeted inventory efforts.