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# Transdisciplinary research on environmental governance: A view from the inside☆

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ABSTRACT

Working effectively across boundaries is a critical skill for researchers focused on environmental governance in complex social–ecological systems, but challenges remain in the acquisition of such skills given the current structure of traditional disciplinary training. In an effort to contribute to improved coordination of research across disciplinary boundaries, we provide an insiders' view based on our experience participating in a two-year transdisciplinary research initiative designed to address the changing nature of environmental governance in the Intermountain West region of the United States. We discuss transdisciplinary research as a promising approach for addressing complex, real-world problems and identify several challenges. We analyze our transdisciplinary research process using the ideas of boundary setting, boundary concepts, and boundary objects. We conclude with reflections and lessons learned, emphasizing the importance of our external boundary setting, the role of funding, and the inexorable link between individual commitment and project success.



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## 1. Introduction

In the past decade, scholars and practitioners have come to recognize that the quest for global environmental sustainability requires innovative research approaches to address the complexity of social–ecological systems and better connect academic studies to decision-making. Transdisciplinary research is a way of organizing academic inquiry to address complex, real-world problems (Hadorn et al., 2008; Pohl et al., 2008). In this article, we reflect upon our experience participating in a two-year research initiative to develop a transdisciplinary framework for analyzing the changing nature of environmental governance in the intermountain west (IMW) region of the United States. We situate our approach as transdisciplinary, as it required a common articulation of the research problem and the joint development of a research framework across multiple disciplines to create a new analytical approach for addressing complex social–ecological problems. Each of us joined the initiative while engaged in individual research studying different cases of emerging environmental governance efforts across the IMW region, varying in geographic scope and scale, drivers, and stakeholder constituencies. Although rewarding, we found working across disciplines and integrating knowledge to be far more challenging than anticipated. Our goal is to contribute to a small but growing body of literature on how to organize and carry out transdisciplinary research to address these challenges and to provide helpful insights for others interested in using this approach.

We begin with a discussion of transdisciplinary research and its challenges before moving to a brief introduction to the IMW Initiative. In the remainder of the article, the boundaries literature is used to reflect on our transdisciplinary research experience. We discuss the importance of our *boundary setting*, which provided a neutral and enabling environment for our work as well as logistical support for our day-to-day activities. Our *boundary concepts* gave us a common language for discussing the challenge of environmental governance in the IMW region. Finally, in developing a shared research framework, we created a *boundary object* that allowed us to conceptualize the dynamics of environmental governance in the IMW region and guided our individual research projects. Through our insiders' view, we contribute to a better understanding of conducting transdisciplinary research, which has been widely acknowledged to be time-intensive and frustrating (Wiesmann et al., 2008; Winowiecki et al., 2011). We also illustrate its benefits through reflections on how this approach enhanced our analysis of environmental governance, a research area that demands the incorporation of diverse perspectives and knowledge domains. We conclude with a discussion of lessons learned.

## 2. Transdisciplinary research

There is variation in the definition of "transdisciplinary research" within the current literature (Hochtl et al., 2006; Wesselink, 2009). For this paper we apply the definition used by Jakobsen et al. (2004), who define transdisciplinary research as "coordinated interaction and integration across multiple disciplines resulting in the restructuring of disciplinary knowledge and the creation of new shared knowledge" (Jakobsen et al., 2004, p. 17). This definition broadly encompasses three defining features emphasized in current discussions of transdisciplinary research. First, transdisciplinary research spans disciplinary boundaries in order to overcome the problem of compartmentalization in academia and develop more holistic comprehension of complex societal problems (Pohl et al., 2008; Max-Neef, 2005). While interdisciplinary work retains disciplinary boundaries (Harris et al., 2008; Petts et al., 2008), transdisciplinary work "literally transcends traditional disciplinary boundaries, challenging and renegotiating them" (Petts et al., 2008, p. 597). Lang et al. (2012) and Hadorn et al. (2008) highlight the importance of a collaborative, reflexive, and integrative research process where participants move past disciplinary boundaries by jointly defining the problem, establishing and implementing a research design, and creating collective products through transdisciplinary research.

Second, transdisciplinary research integrates knowledge through mutual learning to create new analytical frameworks and approaches for conducting research and improving society's ability to address complex problems (Hadorn et al., 2008; Lang et al., 2012). This differs from an interdisciplinary approach which is less collaborative in that it does not necessarily involve group-based problem identification, working through a process of shared goal setting, methodological selection, or agreed-upon modes of analyzing data along the way (Harris et al., 2008). In contrast, transdisciplinary research participants jointly develop approaches that develop mutual understanding and respect for diverse theories, epistemologies, and methods (Morse et al., 2007; Pohl et al., 2008; Tacconi, 2011; Wickson et al., 2006). Transdisciplinary research focuses on temporality, with integration as an ongoing endeavor, and emphasizes the importance of creating a process that stimulates mutual learning from diverse values, goals, and resources that individuals contribute (Lang et al., 2012; Pohl et al., 2008; Wiesmann et al., 2008).

Finally, transdisciplinary research is problem-focused (Hadorn et al., 2008; Lang et al., 2012; Max-Neef, 2005; Pohl, 2005; Wesselink, 2009; Wickson et al., 2006). The goal is to identify "science-based solutions for problems in the life-world with a high degree of complexity in terms of factual uncertainties, value loads, and societal stakes" (Wiesmann et al., 2008, p. 435). In contrast to interdisciplinary efforts, transdisciplinary research is centrally focused on addressing societal issues (Hochtl et al., 2006; Wesselink, 2009; Wiesmann et al., 2008). It presents an opportunity to address the governance of complex social–ecological problems by integrating an array of theoretical and methodological approaches across the ecological and social sciences (Evely et al., 2010; Folke, 2007; Hadorn et al., 2008; Lang et al., 2012; Ostrom, 2009; Tacconi, 2011; Wickson et al., 2006). Transdisciplinary research stitches together a panorama through negotiations across disciplinary boundaries. It therefore catalyzes the development of innovative strategies to amend human–environment interactions and increase the resilience of social-ecological systems (ACERE, 2009; Chapin et al., 2009;