



## Co-productive governance: A relational framework for adaptive governance



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### ABSTRACT

Adaptive governance focuses our attention on the relationships between science and management, whereby the so-called 'gaps' between these groups are seen to hinder effective adaptive responses to biophysical change. Yet the relationships between science and governance, knowledge and action, remain under theorized in discussions of adaptive governance, which largely focuses on abstract design principles or preferred institutional arrangements. In contrast, the metaphor of co-production highlights the social and political processes through which science, policy, and practice co-evolve. Co-production is invoked as a normative goal (Mitchell et al., 2004) and analytical lens (Jasanoff, 2004a,b), both of which provide useful insight into the processes underpinning adaptive governance. This paper builds on and integrates these disparate views to reconceptualize adaptive governance as a process of co-production. I outline an alternative conceptual framing, 'co-productive governance', that articulates the context, knowledge, process, and vision of governance. I explore these ideas through two cases of connectivity conservation, which draws on conservation science to promote collaborative cross-scale governance. This analysis highlights the ways in which the different contexts of these cases produced very different framings and responses to the same propositions of science and governance. Drawing on theoretical and empirical material, co-productive governance moves beyond long standing debates that institutions can be rationally crafted or must emerge from context resituate adaptive governance in a more critical and contextualized space. This reframing focuses on the process of governance through an explicit consideration of how normative considerations shape the interactions between knowledge and power, science and governance.

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### 1. Introduction

Building effective relationships between science, policy, and practice, knowledge and action requires attention to governance. Governance concerns the various processes and structures shaping individual or collective action (Young, 1992), solidified through formal or informal norms or rules (Lebel et al., 2006). More specifically, environmental governance concerns environmental-related incentives, knowledge, institutions, and decision-making behaviors (Lemos and Agrawal, 2006). Environmental sciences are central to environmental governance, as new understandings of environmental systems often inspire new rules, regulations, or institutions (Miller, 2004; Forsyth, 2003). However, increasingly

the knowledge base for environmental governance extends beyond science to include local, traditional, holistic, and experiential knowledge (Folke et al., 2005; Brown, 2010). Thus the relationship between different types of knowledge is central to environmental governance (Rist et al., 2007). Environmental governance also brings questions of morals, values and societal commitment to the fore (Hajer, 1995; Pielke, 2004; Bocking, 2006), as normative dimensions of governance convey assumptions about how society should be organized, how problems should be addressed and by whom (Glasbergson, 1998). In this way, environmental governance can be viewed as a constant negotiation of what we know about the world, how we choose to act, and how collective action is mobilized.

In a world of constant change and incomplete knowledge, environmental governance must respond to changes in social, institutional, and ecological systems (Folke, et al. 2005; Lemos and Agrawal, 2006). 'Adaptive governance' provides a conceptual umbrella for approaches seeking to integrate knowledge of social

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and ecological systems into inclusive decision-making that anticipates, learns from, and responds to change (Wyborn and Dovers, 2014). Adaptive and ecosystem-based management, precursors to adaptive governance, directed significant attention to the role of science in addressing uncertainty and non-linearity in ecological systems (Armitage et al., 2009). Adaptive governance expanded the focus of adaptive management to consider the broader contextual social and institutional processes influencing environmental management, with a particular emphasis on social learning, collaboration and co-management (Armitage et al., 2007; Folke et al., 2005). However, in the shift from ‘adaptive management’ to ‘adaptive governance’ the interplay between science and governance remains largely unexamined.

Co-production focuses attention on this interplay to conceptualize the complex interconnections between knowledge and decision-making (Jasanoff, 2004a,b; Vogel et al., 2007). Co-production has a long lineage as an analytical lens in science and technology studies (STS) and more recently has become an instrumental goal of science and policy (van Kerkhoff and Lebel, 2014). As an analytical lens, co-production highlights the myriad social, cultural, and political influences shaping relationships between science, policy, and practice (Jasanoff, 2004a,b). As an instrumental goal, co-production refers to innovative approaches where the producers and users of research collectively identify problems and produce knowledge intended for a specific context (Mitchell et al., 2004). This second invocation of knowledge co-production is now emerging in discussions of adaptive co-management as an effort to draw on diverse knowledge in environmental governance (Berkes, 2009; Armitage et al., 2011; Robinson and Berkes, 2011; Watson, 2013).

This paper unites these different theoretical approaches to present a new conceptual framing ‘co-productive governance’ that focuses attention on the dynamic interplay between the context, knowledge, process, and vision of governance (after Jasanoff, 2004a,b). This framework was developed to support empirical research that examined the potential for Jasanoff’s “idiom of co-production” (2004) to provide an alternative theoretical basis to adaptive governance from the dominant neoinstitutional approaches. The research focused on two case studies of connectivity conservation as examples of both adaptive governance and co-production. The paper uses the co-productive governance framework to highlight the contextual influences shaping the co-production of science and governance in these cases. These cases highlight the inability to separate considerations of science from governance, while also demonstrating the varied ways that co-productive processes shape how governance unfolds. These insights highlight the value of a framework that focuses attention on the co-evolutionary relationships between science and governance. Unlike the design principles and diagnostics central to adaptive governance scholarship, the co-productive governance framework focuses analytical attention on how existing knowledge, aspirations, and institutions can be harnessed to support governance that is adaptive to change.

## 2. Literature review

### 2.1. Adaptive governance

Adaptive governance links social, political, economic, and ecological domains, framing flexible, collaborative decision-making as an alternative to top-down, bureaucratic governance (Gunderson and Light, 2006; Armitage et al., 2007; Folke et al., 2005; Lebel et al., 2006). Adopting the iterative learning of adaptive management, adaptive governance grew from the realization that challenges to co-management and adaptive management predominantly emerge from the arenas of governance (Armitage et al.,

2007). Centralized or overly bureaucratic governance structures struggle with management practices that plan for failure, learn from experimentation, and adapt to change (Allen and Curtis, 2005). Collaborative institutional mechanisms, networks, and cross-scale linkages are a principal focus of adaptive governance scholarship.

Social learning and collaborative co-management are foundational to adaptive governance (Folke et al., 2005). Social learning entails collective learning, reflexive practice, and action (Keen et al., 2005; Rist et al., 2007; Pahl-wostl et al., 2007). Collaborative co-management involves power-sharing between local communities and government to provide community benefits through decentralized decision-making (Armitage et al., 2007; Carlsson and Berkes, 2005; Olsson et al., 2004). Adaptive governance focuses on networks connecting people, ideas, and knowledge (Innes and Booher, 2010), to address environmental challenges that cross local to regional to global scales (Berkes, 2002; Ostrom, 2010; Biermann et al., 2009).

Collaborative planning and deliberative public policy scholarship parallels these intellectual developments, drawing on the intellectual lineage of critical social and political theory (Innes and Booher, 2010; Fischer, 2000; Hager and Wagennar, 2003). Another response to the perceived failings of bureaucratic, expert led decision-making, collaborative planning emphasizes the importance of bringing non-traditional voices and more diverse knowledge into planning. Innes and Booher (2010) outline three key features of adaptive governance: diversity in agents and components; ample opportunity for interaction among agents; and effective modes for selecting appropriate methods. Collaborative dialogs have profoundly changed decision-making structures on the ground (Connick and Innes, 2003), providing fruitful insight into the challenges of balancing diverse interests in adaptive governance. However, these critical insights play less attention to the normative influences shaping the interplay between science and governance.

Developing and refining design principles and diagnostics is a central focus of adaptive governance scholarship. Design principles are conditions attributed to successful institutions that facilitate compliance with the rules in use (Ostrom, 1990). This approach identifies and examines the underlying principles or broad structural similarities common to robust governance systems (see Table 1). Design principles provide a heuristic, not a blue print, to examine governance (Ostrom, 2005). However, these insights were largely derived in small scale, well-defined resource systems within relatively homogeneous communities with a direct stake in resource management; characteristics not commonly found across the world (Dietz et al., 2003). Unlike design principles, Young's diagnostic approach disaggregates environmental conditions on a case-by-case basis to analyze and identify the implications of these conditions for institutional design (2002). The approaches are complementary: both identify generic rules or principles for institutional design, the principal distinction being the ability for diagnostics to be used across a larger diversity of cases (Cox et al., 2010). While acknowledging the substantial contribution of this work, lists of idealized conditions divorced from their context only presents half of the picture. Theory and practice must also attend to the ways in which actors can work within or transform existing structures and processes to facilitate effective environmental governance.

The view that institutions can be rationally crafted conflicts with contextual understandings of institutional change. Focusing on formal and informal rules typically neglects the relationships and processes central to practice of governance (Steins and Edwards, 1999; Cleaver, 2000; Nightingale, 2011), while imparting the notion that governance can be developed by recipe (Armitage et al., 2007). Moreover, institutions exist in a constant state of flux,

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