The U.S. Fire Learning Network: Transforming Natural Resource Management Agencies and Institutions through Collaboration (Book proposal in review)

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The U.S. Fire Learning Network: Transforming Natural Resource Management Agencies and Institutions through Collaboration

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Summary of Proposed Book

An unusual coalition of fire professionals, scientists and activists gathered in 2001 to discuss a new experiment in conservation that would address their shared frustration over the stubborn persistence of fire suppression as the top fire management priority. Acting on the opportunities created by a record-breaking fire season and the unveiling of the National Fire Plan, they founded the U.S. Fire Learning Network (FLN) to accelerate efforts to restore fire adapted ecosystems. Unlike previous collaborative efforts, this multi-scalar network was intended not only to get more prescribed fire on the ground in specific landscapes, but also to redirect fire management away from fire suppression and toward ecological restoration. In its initial phase, the network enlisted 25 sites from across the U.S. in a two-year collaborative planning process.

By 2010, this conservation experiment was thriving. The FLN had engaged over 650 organizations in planning efforts that had returned fire to many of the 150 participating landscapes. The network was credited with generating and disseminating innovative approaches in fire planning and management as well as for influencing plans and policies at state and federal levels. As Jim Hubbard, the USFS Director of State and Private Forestry put it, the FLN had begun to “change behavior, change thinking, and change approaches in fire management over time”.

Based on five years of extensive fieldwork, this book describes the founding of the network, its operation, how it generates and disseminates innovation, and the ways it has grown and changed over time. Our close examination of the FLN provides guidance on how to structure multi-scalar collaborative processes in ways that enable learning and innovation across organizational, jurisdictional, and professional boundaries. We also engage with the critical question of how the FLN promotes the elusive goal of transformative change within wildland fire management.

We suggest that multi-scalar collaborative learning networks may offer a new approach to effectively address obstacles that perpetuate rigidity in natural resources management. Many have advocated and theorized about constructive ways to overcome resources management agencies’ resistance to fundamental change, but few have offered solutions based in practice (Diamond, 2005; Gunderson & Holling, 2002; Walker, Holling, Carpenter, & Kinzig, 2004). The goal of this volume is to close this gap by describing the design and implementation of a multi-scalar collaborative learning network. We seek to describe what learning networks are, what they have the potential to accomplish, and how they might be improved to achieve the broader goal of transformative change.
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**Schedule:** We will draw on 6 peer-reviewed journal articles, 1 book chapter, and Dr. Butler’s dissertation to develop the text. Draft chapters will be available for review during the summer of 2010 for at least 3 chapters. We anticipate completing the book by May 2011.  

**Length:** Total Text will be approximately 300-350 pages of typed, double spaced, one-inch margins, which will contain between 82,500 and 96,250 words, based on an estimate of 275 words per page.  

**Illustrations:** The book will include approximately 8-12 maps (color tone would be most effective) and 6-10 black and white line figures. We expect to use side bars and text boxes for more in-depth case vignettes. We will also have a bank of photographs from which to draw to provide visual depictions of network interaction. We expect that printing 8-10 of these photographs would enhance the text. We have received permissions for all copyrighted material.
Annotated Chapter Synopses

Chapter 1: Introduction

Can collaborative processes catalyze transformative change in environmental management? This book examines this question through a detailed case study of the US Fire Learning Network, a multi-scalar collaborative learning network that aims to accelerate ecological restoration. The task before this learning network is considerable, because fire management in the US is caught in a frustrated transition. As fire historian Stephen Pyne noted, fire agencies called an end to the war against fire on the wildlands four decades ago, abandoning a 70 year old commitment to wildfire suppression and announcing a new era of ecologically informed management (Pyne, 2004). Yet, fire suppression continues to dominate (Arno & Allison-Bunnell, 2002). As Pyne (2004, p. 52) plainly states, “the issue is not that we have failed to cross the divide, but that we have so little to show for having breached it decades ago.”

This book examines the reasons for this frustrated transition and the potential to overcome it through an innovative approach to collaboration. In particular, we explore how the FLN simultaneously alters practices on the ground and informs policies and plans at higher institutional levels within fire management. We suggest that this can both promote operational goals that have proven difficult to achieve through other means as well as lay the foundation for more transformative change.

The implications of this work extend beyond fire management to a range of other environmental challenges, such as fisheries decline, water scarcity, and climate change. Like the growing threat of wildfire, this range of challenges are both social and ecological, cross temporal, spatial, and organizational scales, and require transformative change within multiple organizations, institutions, and disciplines. Our in-depth study of the FLN will provide insights into how multi-scalar collaboration can address a wide range of pressing concerns that have frustrated conventional top-down or bottom-up solutions.

Chapter 2: Collaboration and Transformation

While natural resource professionals and organizations must adapt to new challenges, they have struggled to overcome a legacy of optimizing resource outputs without concern for ecological complexity (Allison & Hobbs, 2004; Carpenter & Brock, 2008; Gunderson & Holling, 2002). A revolution in thinking about collaborative learning over the past twenty years holds out the potential to alter these longstanding and destructive institutions by changing individual and collective attitudes, behaviors, actions and practices. However, until recently, collaboration in environmental management primarily has addressed disagreements that inhibit particular actions in specific locations. Collaboration’s potential to foster broader social change was muted. Drawing on recent research within collaborative planning (Innes, Connick, & Booher, 2007; Margerum, 2008; Scholz & Stiftel, 2005), we describe how ambitious cross-scalar efforts linking multiple sites in a network of collaboratives may foster broader institutional transformation. Yet this new pulse of research has stopped short of examining how
collaborative transformation plays out in practice. Our study of the FLN is this next step, considering not only if a network can foster transformative change, but also how it can do so.

Chapter 3: The Frustrated Transition in Fire Management

As suggested in earlier chapters, increasingly catastrophic wildfires are not only an acute social and ecological challenge for natural resource managers, they are the result of a rigid institution that has struggled to develop effective responses to ecological imperatives. In this chapter, we trace this deadlock back to its origins at the dawn of natural resource management in the U.S. in the nineteenth century, and follow how wildland firefighting became the central purpose of the US Forest Service (USFS) and associated state forestry agencies. We then describe how biodiversity decline and increasingly destructive wildfire over the past century have combined with new ecological ideas to lead scientists, public managers, activists, and policymakers to agree that fire suppression has devastated formerly healthy forests. Yet political advocacy and top-down regulatory reform over the past forty years largely have failed to shift fire management practice from fire suppression to ecological restoration. Despite changes in policy, understanding and rhetoric at the highest level, fire suppression is continually reinforced through incentive structures, agency budgets, and professional practice (Arno & Allison-Bunnell, 2002) as well as competing priorities within land management agencies. Instead of making ecological restoration the core of fire management practice, increasing resources are devoted to suppressing fires which continue to grow in extent and intensity. This chapter describes why fire managers understand the problem and yet continue to perpetuate the focus on fire suppression at the expense of ecologically informed management.

Chapter 4: The US Fire Learning Network

A rare window of opportunity opened in the late 1990s when a string of catastrophic wildfires led the agencies to formulate a National Fire Plan that called for collaborative innovation to restore fire adapted ecosystems. TNC and the federal land management agencies responded by creating the US Fire Learning Network (FLN) in 2002. Since then, the FLN has become a widely acclaimed example of collaboration in fire management. Based on five years of extensive fieldwork, we trace the story of the FLN from its germination within TNC through its development as a wide-ranging and multi-scalar inter-organizational collaborative. In this chapter, we describe the creation, purpose, design, processes, and outcomes of the FLN. We begin by describing how FLN organizers reached agreement on the core objective to both shape wildland fire management and encourage landscape-scale restoration of fire-adapted ecosystems. We then describe how they created the first FLN design, and then adapted their approach over time to better generate and spread innovative approaches to ecological fire restoration. We characterize each level of the evolving network by comparison to established approaches to collaboration (see figure 1), with landscape collaboratives operating similarly to traditional multi-stakeholder collaboratives, regional networks to communities of practice, and the national network to inter-organizational public-private partnerships.
Figure 1: Cross-scalar circulation of participants, planning products and information throughout the fire learning network

We describe how different levels in the network were linked to enable cross-scalar circulation of people, planning products, information, and ideas. Finally, we assess the extent to which the FLN has been able to accomplish the goal of accelerating the pace of stand-level prescribed burning projects as well as other less-obvious outcomes, such as disseminating innovative fire management practices and promoting landscape-scale planning. Side bars and text boxes will be used to illustrate network dynamics and provide rich descriptions of how various landscape and regional collaboratives achieved these outcomes.

Chapter 5: Ecological Restoration Narratives and Imaginaries

In this chapter, we describe how FLN participants adopted ecologically informed fire management practices. During the first two years, network leaders led participants through a four-step planning process that produced compelling stories of each landscape’s relationship to fire, describing an ecologically healthy pre-colonial past, a degraded present day, and the prospect of a future return to
health. As the network expanded and regional networks were established, people, planning products, and information circulated across all levels of the network. This circulation reinforced participants’ common ties and shared purpose while providing them with freedom to experiment with innovative approaches to the particular challenges of their landscape. Over time, FLN participants developed collective expertise, engaged in cross-jurisdictional and inter-organizational collaboration, and acquired a common imaginary (Taylor, 2004) grounded in hands-on restoration ecology. We conclude that balancing creative experimentation on each landscape and conceptual coherence across the network enabled FLN participants to be autonomous while speaking with a unified voice.

Chapter 6: Inspiring Ecological Fire Restoration beyond the Network

The FLN not only guided participants toward new approaches to fire management, it also influenced individuals and organizations outside the network. Participants extended the reach of the network by bringing a new “fire culture” back into their host organizations and attracting other professionals to the FLN. Through these connections, the FLN operated across organizational, temporal, and spatial scales in ways that external advocacy or internal reform could not, fostering ground-level change as well as guidance for national policy reform. We provide examples of their accomplishments, such as increasing the number of fire professionals versed in ecological fire restoration, enhancing collaborative capacity to enable landscape-scale planning and management, and infusing new policies and plans with the principles of ecological restoration. We suggest that the FLN has laid the groundwork for more substantive change in fire management by influencing policy and planning and by increasing the number and proficiency of practitioners engaged in this work.

Chapter 7: Transformative Potential of Multi-scalar Learning Networks

In this chapter, we chart the arc of change in fire management since the 1970s and plot the impact of the FLN along this arc. We argue that while the FLN was initiated during a time of building momentum toward transformation, it plays a critical role in catalyzing change by enabling fire managers to transition to a new community and competence. The power of the FLN is not in the plans that it produces, but in the way it disrupts old habits and fosters new routines and collaborative relationships. The FLN builds solidarity around a collective capacity to embark on new, potentially risky, management approaches; skills; knowledge; and a professional identity grounded in restoration ecology. While the network is still evolving and experimenting, its impact extends beyond particular landscapes to national plans and policies. In this way, the network offers the potential to transform entire institutions, reshaping both the policy environment and the entrenched culture of fire suppression by combining the autonomous and creative work of landscape collaboratives.

Although the FLN has fostered the adoption of ecological fire restoration principles and practices, we note that gaps remain before broader transformation can be achieved, and we outline limitations of the network approach in bridging those gaps. The FLN cannot reach all fire practitioners and organizations, and resistance to change remains. The high costs of managing and supporting network activities limits access, as the network can only grow so large before overextending available staff and budgets. Moreover, as participants are almost exclusively fire professionals, the FLN has been able to affect only
minimal change on the broader public. We suggest that these and other limitations inhibit the ability of the FLN to achieve the ultimate goal of transforming fire management agencies and institutions.

Chapter 8: Challenges of Network Design, Management, and Growth

This chapter explores the numerous challenges that must be met in order to design, manage, and grow a learning network, and uses detailed examples from the FLN to provide specific guidance to potential network designers and practitioners. We begin by describing how the network’s multiscalar structure was designed and implemented and we revisit how participants, planning products, information and ideas circulate within and across levels. Then, we explore network membership, accountability, guidelines, and staffing. We focus on how network leaders and managers distributed responsibility rather than assumed formal hierarchical leadership (Brafman & Beckstrom, 2006), while creating common behavioral norms and procedures and establishing accountability among network participants. We introduce the concept of “netweaving” as a metaphorical depiction of network leadership. Finally, we turn to the question of growing a network by describing how the FLN has been able to sustain individual collaboratives as well as increase their number over time, both through deliberate organizing and by creating the conditions for growth.

Chapter 9: Conclusion

In our conclusion, we revisit the theme that multi-scalar collaborative learning networks could foster critically needed changed in environmental management. We summarize the changes that the network promotes, while also describing the limits of a network approach. We also note how the FLN navigated certain tensions that arise within multi-scalar networks, and we outline implications for planning practice. Moreover, we specify how FLN leaders utilized different approaches to keep network participants and sponsors accountable to one another, how they established certain criteria for membership, and how a distributed team of staff and volunteers managed the network. Finally, we clarify the contribution of this volume to scholarship on collaborative planning and network governance, and outline how a multi-scalar collaborative learning network model can be applied to address other cross scalar environmental challenges, such as climate change, fisheries decline, and fresh water supply, that are also frustrated by the resilience of outmoded institutions.
Audience and Target Market

Given the burgeoning interest in collaboration, networks, and disaster as well as the continuing interest in environmental sustainability, the book will be a resource for scholars, a text for students, and a guide for practitioners. The primary audience for this book includes researchers, educators, and students in natural resources and environmental planning-related fields, particularly those focused on environmental conservation, ecological restoration, or fire management and who have a particular interest in collaboration and networks. Secondary audiences include natural resources and environmental managers who have an interest in inter-organizational collaboration and networks in general and as applied to natural resources and environmental governance in particular. Some typical job titles the book would be appropriate for include:

- University educators, researchers, and students in forestry, natural resources management, urban and regional planning, public administration, environmental studies, and various environmental subdisciplines of traditional social sciences fields (e.g., political science, sociology, geography)
- Forestry and Fire Management professionals working in public and non-profit organizations
- Planners and public administrators whose jobs in part or whole deal with environmental management and who seek to engage in inter-organizational collaboration
- Conservation Advocates and Professionals working in public and non-profit organizations

Scholars

Among academic disciplines, scholars in urban and regional planning, natural resources, and public administration would find the volume particularly applicable to their work. Also, researchers engaged in resilience studies would find the volume pertinent. The sections below describe how this volume would be attractive to these fields and identify related professional associations where it could be marketed.

Scholars in the field of urban and regional planning will be attracted to the book, especially those connected to the study of collaborative planning which has become a central focus of planning research and practice over the last two decades. Collaborative planners have traditionally focused on examining place-based, multi-stakeholder, consensus building processes. Over the past decade, collaborative planning scholars have begun to examine collaborative endeavors that take place at multiple sites and scales and have begun to develop a framework for cross-scalar collaborative governance (Innes, et al., 2007; Margerum & Whitall, 2004; Weber & Hayward, 2009). This volume is on the leading edge of clarifying how such cross-scalar collaborative arrangements might be organized and the extent of their impact.

Professional and academic planning associations would be excellent venues for marketing the work. The leading academic association is the American Collegiate Schools of Planning (www.acsp.org) which publishes quarterly newsletters, the Journal of Planning Education and Research, and hosts an annual
conference. The American Planning Association (www.apa.org) is the leading professional association in the field. Its flagship publication is the Journal of the American Planning Association, which recently published Goldstein and Butler’s (2010) article describing what planners could learn from our study of the FLN. The association also publishes newsletters and the practitioner-oriented Planning Magazine, and hosts an annual conference. Finally, the planning community is actively connected through the online network Planetizen (www.planetizen.org), which could provide a venue for publicizing the proposed book.

The scholarly fields associated with natural resource management will be interested in this book, since collaborative adaptive management is a central paradigm within these fields. The book is relevant to those interested in forestry, fire management, and collaborative resource management in general. The book builds on existing scholarship in this area by expanding the extent to which such processes can be applied across multiple scales and locations. We have contributed earlier analyses of the FLN to Society and Natural Resources, the journal of the International Association for Society and Natural Resources (IASNR) (http://www.iasnr.org/), a predominantly U.S.-based organization that holds an annual conference and hosts it outside the US every three years. We have also published in the Journal of Forestry, the leading journal of the Society of American Foresters (www.safnet.org). These articles will increase awareness and interest in the proposed book among natural resources management scholars and practitioners.

In the field of public administration, network governance has recently become a very active area of research. Some of these scholars map relationships within policy or administrative networks, while others examine the outcomes of network interaction. This book focuses on outcomes and, unlike most previous studies of network governance, provides a robust empirical approach to examine how learning and change can extend beyond the network. Most public administration scholars and professionals are associated with the American Society of Public Administrators (www.aspanet.org) which hosts an annual conference, regional conferences, and publishes Public Administration Review.

Finally, there is a large network of natural and social scientists who focus on social-ecological resilience. Many of them are associated with the Resilience Alliance (RA) (www.resilience.org), an international network of twenty member institutions founded in 1999 that includes universities, government, and non-governmental organizations, and which is intertwined with many other organizations, such as The Beijer International Institute for Ecological Economics, The Millennium Ecosystem Assessment, The Santa Fe Institute’s program on Robustness, and The Stockholm Environment Institute. The RA publishes the on-line journal Ecology and Society (http://www.ecologyandsociety.org/) and convened a 4-day international conference in Sweden, with over 600 attendees. Goldstein presented at this conference. He is also special editor in a recent issue of Ecology and Society on multi-scalar collaborative approaches to social-ecological resilience which includes an article by Butler and Goldstein that draws on this research (Butler & Goldstein, Forthcoming 2010). This should raise awareness of the book in the resilience community.

Reflecting their convergence on common theme of collaborative social-ecological governance, many scholars in public administration, urban and regional planning, political science, natural resources
management, and resilience studies share ideas and participate in joint research initiatives. For example, the Community-based Collaborative Research Consortium hosts a website (www.cbcrc.org), a repository of case studies, and a journal, and the Collaborative Democracy Network (www.csus.edu/ccp/CDN/index.stm) focuses on ways to “build capable institutions of governance for network society”. The authors of this book are engaged in both of these networks, and recently organized a symposium on resilience to catastrophic events through collaborative planning (http://www.ipg.vt.edu/resilience/) that engaged scholars from all four fields, which produced a special issue of the journal Ecology and Society and an edited volume, currently in review at MIT Press.

Students

The book will be applicable to graduate and upper level undergraduate courses in three major fields: Urban and Regional Planning, Natural Resources Management (including Forestry) and Public Administration. Each of these fields either focuses on or has subfields in environmental planning and management and offers coursework in collaboration, conflict resolution, and network governance.

Graduate and undergraduate courses in Urban and Regional Planning that focus on collaborative and communicative planning will be a primary target for the volume. Nearly every major planning program teaches a Masters-level class in collaborative and communicative planning approaches. Some also teach relevant courses in collaborative planning at the undergraduate level for upper-level majors. This book would be suitable for these courses because it considers new approaches to collaboration to address critical emerging problems.

Examples of these courses include:

- University of Virginia, PLAC 5240, Collaborative Planning
- Florida State University, DURP 5123, Collective Governance
- University of Oregon, PPPM 643, Collaborative Planning and Management
- University of Hawaii, PLAN 661, Collaborative Planning for Environmental Solutions

Planning programs have a growing interest in ecological planning, sustainability, and natural hazards planning. For example, an MIT course that covered this terrain was entitled Disaster, Vulnerability, and Resilience: http://ocw.mit.edu/OcwWeb/Urb/Urban-Studies-and-Planning/11-941Spring-2005/CourseHome/index.htm. While this book does not directly concern responses to natural hazards, it does examine an effort to reduce the potential of catastrophic fire through ecological planning. This linkage will make the book a valuable addition to such courses, given that efforts to build collaborative capacity to reduce disaster incidence and impact is a growing area of interest.

The book may also be adopted in graduate and upper level undergraduate courses in Public Policy, Public Administration, and Natural Resources programs with a focus on collaborative processes and network governance. The book draws on an innovative multi-scalar collaborative learning network to provide guidance for design, management, and sustainability of networks. It also provides a deeper understanding of how multi-scalar networks might achieve transformative change. These practical and
theoretical insights will be welcome additions to educators seeking to enhance student exposure to core concepts and challenges in collaborative and network governance.

Examples of these courses include:

- Virginia Tech, GIA 5164, Collaborative Governance and Civil Society
- University of Arizona, Networks and Public Management
- Tilburg University, Interorganizational Relationships
- Virginia Tech, PAPA 6114, Complex Public Organizations
- University of Southern California, SPPD, Networks
- Indiana University, Networks and Public Management

Finally, the book would also be applicable in graduate and upper level undergraduate courses in environmental studies and natural resources management. Many such courses highlight the role of collaborative and adaptive management to overcome conflict, address uncertainty, and build ecological resilience to achieve sustainability. This book not only contextualizes collaborative and adaptive management, but introduces an innovative approach to address complex, multi-scalar environmental challenges.

Examples of courses that take up these topics include:

- MIT, 11.363, Civil Society and the Environment
- Harvard University, SOC 175b, Civic Environmentalism
- Virginia Tech, UAP 5414, Natural Resources Planning
- Florida State University, DURP 5421, Environmental Planning and Natural Resources Management

**Professionals**

There are many professions whose practices are the subject of chapters of the proposed book. The professions that will have the greatest interest in this book are:

- **Mediators and Facilitators.** A concentration of members of this field with an interest in the book’s themes can be reached through the Association for Conflict Resolution, Environment and Public Policy section’s annual meeting (2008 meeting website at: [http://www.mediate.com/acrepp/](http://www.mediate.com/acrepp/)). Some are also associated with community-based conservation efforts, and attend meetings like the Western Stewardship Summit ([http://www.sustainablenorthwest.org/wss/](http://www.sustainablenorthwest.org/wss/))

- **Network leaders.** There is a robust community of organizers and consultants who create and sustain learning networks and communities of practice, many of whom are involved in CPSquare ([http://cpsquare.org/](http://cpsquare.org/)). This book relates to their growing interest in examining ways to develop multi-level networks.
• **Environmental Planners** who engage in collaborative planning efforts and who aim to address pressing problems by working across organizational, professional, and administrative boundaries. Most such planners are associated with the American Planning Association or natural resources professional associations like the Society of American Foresters or the International Association for Society and Natural Resources.

• **Fire management professionals**, particularly those who seek to engage in collaborative ecological fire management. With the National Fire Plan, Healthy Forests Restoration Act, and a growing movement for ecologically responsible fire management, this audience is growing. The practitioner journal *Fire Management Today* would reach many of these professionals. The broader fire community coalesces under the International Association of Wildland Fire (IAWF) which hosts an annual conference and publishes the *International Journal of Wildland Fire*. Butler and Goldstein have each presented aspects of this work at IAWF conferences. High concern about the fire crisis in other countries such as Australia, Portugal, Greece, and South Africa will make the book attractive to an audience beyond US fire management professionals.

• **Forest Service and Conservation professionals** and their associates. The USFS’s Research Branch has funded this research, and the authors have presented their work to USFS audiences. Moreover, the U.S. Fire Learning Network is part of the Nature Conservancy’s broader international effort to promote ecological fire restoration. The close relationship the authors have forged with TNC and USFS staff over the past five years will likely lead each organization to promote the book among its staff and partner organizations.
Market Competition

This is the first book that brings together collaborative environmental management, collaborative planning, network governance and social-ecological resilience to examine the transformative potential of multi-scalar collaborative networks. This book situates the crisis of wildland fire management in the broader crisis that characterizes natural resources management—the inability to respond to critical challenges that threaten sustainability. We draw on collaborative environmental management and expanding opportunities for collaborative planning and network governance to propose a way forward to address this crisis. There are numerous volumes that touch on these component parts, which testifies to the scholarly, professional, and public interest in these topics. Our book is unique in that it brings these ideas together to identify new approaches to collaboration and describe beneficial synergies that emerge from combining collaborative processes across multiple organizational and spatial scales.

Wildland Fire Management

There is wide recognition of the crisis in fire management. Recent volumes that outline aspects of the crisis include the following:


Our text draws insights from these books to contextualize the fire crisis. However, we go a step further by exploring social and institutional changes necessary to address the crisis and a mechanism to implement those changes. Arno and Allison Bunnell, Pyne and Wuerthner provide scientific evidence of the value of fire, lament the lack of ecological fire management, identify the social and institutional limitations that exacerbate the problem, and suggest technical solutions and responses. While they all suggest that policy and social changes are necessary to avert the crisis, these authors only address needed changes in abstract terms and do not propose mechanisms for implementing those changes. Our text specifically identifies what is required to foster institutional change and describes a collaborative model that can catalyze those changes.

Crises in Natural Resources Management

The cycle of crisis and renewal that characterizes ecological systems has been applied to social-ecological systems by social scientists studying resilience. Several volumes have applied this approach to identify a crisis among natural resources management institutions that suffer from rigid and stable structures. Without innovation and adaptation, a system can get caught in a “rigidity trap” (Gunderson & Holling, 2002), unable to break free from the status quo. Rigidity traps were first described in natural
resource management bureaucracies that perpetuate themselves at the expense of the productivity and vitality of the ecosystems that they manage. Resource managers reduce natural variation because dependent industries require predictability and desire productivity maximization of certain resources. This enables the bureaucracy to persist, but negative ecological and social feedbacks increase the likelihood of catastrophic events and dramatic, unanticipated change (Holling, Gunderson, & Ludwig, 2002).

Key volumes that explore this crisis and potential ways forward include:


Like the proposed book, these volumes identify the existence and sources of a rigidity trap and propose collaborative approaches at multiple scales to address complexity and foster innovation and learning. However, they provide few examples of effective collaborative approaches to address rigidity traps. Our volume does both, providing an in-depth analysis about the sources of the crisis, the design and function of a multi-scalar network, and the resulting outcomes that catalyze overcoming the crisis.

Other books in this area include:


These books are timely additions to resilience thinking as they provide practitioners with concrete guidance on planning for resilience in highly vulnerable and dynamic ecological contexts. However, Beatley’s examination of planning for resilience is almost exclusively tied to local issues and particular built design solutions rather than addressing the complex and cross-scalar aspects of resilience. Meanwhile, Walker and Salt’s work provides a robust explanation of resilience thinking and gives examples of ecological and social cycles of crisis, growth, reorganization, and renewal. However, the
book doesn’t consider how cross‐scalar or multi‐level governance approaches can foster resilience. Our volume builds on the concept of resilience that thinking to describe how an entire system can be reorganized and transformed through multi‐level collaboration.

**Collaborative Environmental Management**

Collaborative engagement promotes the social learning required for adaptive management (Gooch & Warburton, 2009; Pahl‐Wostl et al., 2007). Until recently, these collaborative efforts have not addressed institutional issues that cross jurisdictions and range across temporal and spatial scales (Healey, 1997; Koontz et al., 2004; Weber, 2003; Wondolleck & Yaffee, 2000). Leading scholars in the field are now expanding beyond these limits to address fundamental that relationships between social institutions and ecological systems (Berkes, 2004; Berkes & Folke, 1998; Ostrom et al., 2002). Nonetheless, few books that discuss collaborative environmental management extend their analysis to these challenges.

Some of these volumes examine how collaboration can generate learning and integrate science and politics. Such texts include:


Others aim to describe collaborative processes, barriers to collaboration, and associated outcomes of effective collaborative approaches. Examples include:


These texts focus on multi‐stakeholder consensus building processes as the primary approach to collaborative environmental management. In contrast, our proposed book will chart new directions in the study of collaborative environmental management by describing how collaborative learning can be woven into a multi‐scalar network to achieve fundamental social and ecological changes, and by providing ideas on how to design effective networks.
Collaborative Planning and Network Governance

Finally, this volume will contribute to the growing interest in collaborative or network governance. The scope of collaborative endeavors has been expanding since the turn of the century, operating both at larger scales (Innes, et al., 2007; Margerum, 2008; Scholz & Stiftel, 2005) and across multiple scales (Fung & Wright, 2003; Margerum & Whitall, 2004; Ostrom, et al., 2002). Scholars began examining the extent to which a broader understanding of collaborative planning could be associated with and informed by the concept of the Network Society\(^1\), a global shift in social and political relations through heightened interconnectedness and interdependence of firms, groups, populations, governments, and nations.

Some books in the planning and policy fields aim to address this growing area of scholarship. Recent volumes include:


Hajer and Wagenaar’s volume broke new ground by bringing together leading scholars from planning and policy sciences to examine emergent network approaches to governance for complex public policy challenges. However, as an edited volume, the text lacks a coherent message and guiding framework to theorize about the potential of transformative change. Scholz and Stiftel’s edited book took a different approach as they focused on one topic of study, water systems management in Florida, and had empirical chapters followed by commentary and analysis from leading collaborative planning scholars. The volume falls short in proposing design and management principles of “new institutions for collaborative planning” as scholars evaluate collaborative efforts against multi-stakeholder consensus building criteria. Sabatier, et al. examine collaborative approaches to watershed management, an

\(^1\) The call for papers for the Third Joint Congress of the Association of Collegiate Schools in Planning and the Association of European Schools of Planning in 2003 specifically asked scholars to examine whether the notion of a “network society” had implications for planning. In this forum, it became clear that the implications of the network society are both far reaching and quite variable as the term can be applied to physical infrastructure networks, social connections (both virtual and face to face), information flows (particularly via communication technologies), and governance forms (Albrechts and Mandelbaum, 2005).
inherently cross‐scalar challenge. However, like the Scholz and Stiftel volume, contributors tend to rely on multi‐stakeholder consensus building frameworks for analyzing the watershed collaboratives, and it only obliquely proposes ways that the burgeoning interest in collaborative watershed management can promote transformative change in environmental management. Finally, Innes and Booher’s work builds on three decades of research and practice in collaborative planning to develop a theory of collaborative rationality and synthesize the state of the field. However, it does not address collaborative planning through multi‐scalar networks, the focus of our book. Our volume stands apart from these works by examining the potential of a multi‐level collaborative governance approach and describing how such endeavors can lead to more far‐reaching change than place‐based multi‐stakeholder collaboration.

Others go a step further and more explicitly aim to address the need for multi‐level governance arrangements to respond to complex and cross‐scalar environmental challenges. Examples include:


Bridging Scales focuses on the importance of cross‐scalar boundary work to engage in ecosystem management. While it offers useful concepts for how to integrate local and scientific knowledge in conducting assessments, the text lacks robust links to management and proposals for overcoming institutional barriers for multi‐level governance. The authors in Changing Climates describe how multi‐level governance is necessary to respond to the effects of climate change at local, regional, national, and international levels, and conclude that no system exists for coordinating across levels, inhibiting the effectiveness of climate change governance. This argument resonates with multiple scholars who suggest that multi‐level governance is necessary to resolve complex and cross‐scalar environmental problems. Our proposed volume goes a step further by empirically examining a multi‐level governance approach, and by building new theory for network governance based in practice.

Summary

The interest is high in collaborative planning, network governance, and collaborative environmental management, and it continues to grow. With recent large‐scale natural disasters such as the Asian tsunami, Hurricane Katrina, and Haitian earthquake, the relevance of building social‐ecological resilience and more nimble and adaptive management institutions is urgent and palpable. Our book provides practical and theoretical insights into how to effectively design multi‐level collaborative networks that not only respond to complex cross‐scalar environmental challenges by building adaptive capacity, but also catalyze the potential for broader social change to create greater resilience across large‐scale social‐ecological systems. These core aspirations make the proposed volume a worthwhile addition to the growing literatures in social‐ecological resilience studies, collaborative planning and governance, and collaborative environmental and natural resources management.
References


ACADEMIC CREDENTIALS

Associate Professor, Department of Planning and Design, University of Colorado, Denver, 2009 - Present

Assistant Professor, School of Public and International Affairs, Program in Urban Affairs and Planning, Virginia Tech, 2004 - 2009

Ph.D. in Environmental Planning, Department of City and Regional Planning, University of California, Berkeley, 2004

Doctoral Program, Environmental Studies, University of California, Santa Cruz, 1993-95

MS in Forest Ecology, School of Forestry & Environmental Studies, Yale University, New Haven, CT, 1990

BA in Biology and English Literature, Wesleyan University, Middletown, CT, 1986

RESEARCH & PROFESSIONAL EXPERIENCE

2008-Present Organizer, Virginia Tech Symposium On Enhancing Resilience To Catastrophic Events Through Communicative Planning, 11/16-11/18

2008-Present Program Director For Collaborative Learning, Institute For Policy and Governance, Virginia Tech, Blacksburg, VA

2007 Organizer, USFS/TNC Network Leadership Training, New Castle, VA

2003 - 2004 Science Manager, Scientific Advisory Panel, Santa Cruz, CA

1999 - 2004 Science Director, Biodiversity Sciences Center, Natural Heritage Institute (NHI), Berkeley, CA.

1994 - 1997 GIS Analyst, Center for Biodiversity Analysis and Management, University of California, Santa Cruz

1990 - 1992 Research Analyst, World Resources Institute, Washington DC

1989 - 1991 Research Biologist, Copper River Delta Ecosystem Study, Cordova, AK and Corvallis, OR

1987 - 1988 Research Assistant, Worldwatch Institute, Washington DC

1986 Policy Intern, The Conservancy, Naples, FL
EXTRAMURAL SUPPORT

Principal Investigator (100%) of $75,000 award from the U.S. Forest Service (USFS) Northern Research Station for continuation of study entitled “Improving Collaborative Decision-making and Community Capacity Through Fire Learning Networks.” 2009-2011.

Training grant of $9,997 to support network leadership training, awarded by the U.S. Forest Service Northern Research Station, with $15,000 in funding for travel and facilities provided by the Nature Conservancy. 2007.

Principal Investigator (95%) of $161,501 award from the U.S. Forest Service (USFS) Northern Research Station for study entitled “Improving Collaborative Decision-making and Community Capacity Through Fire Learning Networks.” 2006-2009.

Two-year Agreement with the Nature Conservancy to provide $30,000 to support the Fire Learning Network research project, 2006-2007.

Co-Principal investigator (49%) with Bruce Hull in the Virginia Tech Department of Forestry on $129,890 U.S. Forest Service (USFS) Northern Research Station study examining community involvement in wildfire response and recovery. 2004-2006.

AWARDS AND FELLOWSHIPS

Morris K. Udall Environmental Policy and Conflict Resolution Dissertation Fellowship, 2001
Departmental Fellowship, Department of City and Regional Planning, University of California Berkeley, 1997
Aldo Leopold Fellowship, Yale School of Forestry and Environmental Studies, 1990

PUBLICATIONS

Books


Peer-reviewed Articles

Goldstein, Bruce Evan and Butler, William. The U.S. Fire Learning Network:

Providing a Narrative Framework for Restoring Ecosystems, Professions, and Institutions. In press for Society and Natural Resources


Goldstein, Bruce Evan and Butler, William Hale. The Network Imaginary: Coherence and Creativity within a Multiscalar Collaborative Effort to Reform U.S. Fire Management. Journal of Environmental Planning and Management, 52(8), 1013-1033, 2009


Peer-reviewed Articles In Review (with status)

Goldstein, Bruce. The Weakness of Strong Ties: Why Scientists Almost Destroyed the Coachella Valley Multispecies Habitat Conservation Plan In Order To Save It. In revision for Environmental Management


Goldstein, Bruce Evan. Boundary Objects and Double Binds: Opening the Black Box Of Collaborative Planning Expertise. In revision for Planning Theory and Practice

Book Chapters


**Edited Collections Under Review (with status)**


**Other Publications**

"Mediated Modeling". Book Review for the Journal of the American Planning Association; Summer 2005; 71, 3; 340


“Science, Participation, and Assurances: A Review of the Literature on Habitat Conservation Plans”. A report to the National Center for Environmental Decisionmaking Research, Knoxville TN. 23pp, 1998

“UNI-GIS”. InfoText 53(Fall): 3-4, 1997


“Sewage Treatment – Naturally”. Renewable Resources Journal. 7(2): 5-11, 1989

“Natural Sewage Treatment”. World Watch 1(3): 10-11, 1988


"Indonesia Considers Resettlement". World Watch 1(2): 6-7, 1988
"High and Dry: Ground-water Mining in the United States". World Watch 1(1): 41-4, 1988
"Canada Proposes Nuclear Subs". World Watch 1(1): 8-9, 1988

PRESENTATIONS AND INVITED TALKS

**Resilience To Surprises Through Communicative Planning.** Association of Collegiate Schools of Planning, Crystal City, VA, (Also organized three sessions and served as moderator and discussant). October 1-3, 2009.


**The Network Imaginary: How to Change Course After a Century of Ecologically Destructive Fire Suppression.** Invited Lecture to the Department of Geography and Planning, Appalachian State University, Boone, NC. April 16, 2009.


**Holding the Reins on Collaborative Planning: Narrative in the Fire Learning Network.** With Will Butler, Association of Collegiate Schools of Planning, Milwaukee, WI, October 18-21, 2007

**Planning For Resilience: Innovations in Social Learning.** With Jana Carp, Association of Collegiate Schools of Planning, Milwaukee, WI, October 18-21, 2007

**Restoring Fire-Adapted Ecosystems and Institutions Through Learning Networks.** With Will Butler. Workshop on Networks and the Environment at the Maxwell Workshop on Organizations and the Natural Environment, Sponsored by the Center for Environmental
Policy and Administration (CEPA), Maxwell School of Citizenship & Public Affairs, Syracuse University, NY. May 22-24, 2007

**Improving Collaborative Decision-making and Community Capacity Through Fire Learning Networks.** International Symposium on Society and Resource Management (ISSRM), Park City, Utah. June 17-21, 2007

**Conservation Learning Networks and Ecological Planning: The Art of Creating Resilient Biocultures.** Association of Collegiate Schools of Planning, Fort Worth, TX (also organized panel and served as discussant). November 9-12, 2006

**Skunkworks In the Embers of the Cedar Fire: Enhancing Societal Resilience in the Aftermath of Disaster.** Annual Meeting of the Science and Democracy Network. Harvard University, Cambridge, MA. (also organized panel and served as panelist). June 25-27, 2006.


**Democracy, public participation and equity in setting science agendas.** Invited speaker at decision-support workshop organized by the Science Policy Assessment and Research on Climate (SPARC) program at the Center for Science and Technology Policy Research, University of Colorado, Boulder, CO. June 13-14, 2005.


**Scientific advice as social engineering: The co-production of science and society within a deadlocked habitat conservation plan.** Association of Collegiate Schools of

Barriers to Collaboration Among Experts: Lessons From a Crisis Within a Habitat Conservation Plan. Association of Collegiate Schools of Planning, Baltimore, MD, November 19-24, 2002

When Experts Attack! Obstacles to Technical Collaboration During the Preparation of a Habitat Conservation Plan. University of California, Berkeley - Department of City and Regional Planning, Colloquium Series, Berkeley CA, October 28, 2002

The Sonoran Desert Conservation Plan: Lessons From an Effort to Place Science at the Center of Habitat Conservation Planning. Organizer, presenter, and moderator of evening session. Ecological Society of America, Tucson, AZ, August 4-9, 2002.

Barriers to Cooperation Among Ecologists: Lessons From Crises Within Two Habitat Conservation Plans. Ecological Society of America, Tucson, AZ, August 4-9, 2002


Environment and Culture Seminar, Guest lecture on scientists role in resolving policy disputes. University of California, 2001

Can Technical Agreements on Endangered Species Protection that Evolved by Consensus Survive Scientific Scrutiny? Society for Social Studies of Science and European Association for the Study of Science and Technology Annual Meeting, Vienna, Austria, September 27-30, 2000


Planning Theory Seminar, Guest lecture on planning and expertise. Department of City and Regional Planning, University of California, Berkeley, Fall 1998

Place-based Knowledge and Science: A Practical Guide to Combining Bioregional Epistemologies. Association of Collegiate Schools of Planning, Fort Lauderdale, FL, November 6-9 1997

Place-based Knowledge and Science: A Practical Guide to Combining Bioregional Epistemologies. UC-Stanford Workshop in the History of Science. Santa Barbara, CA. October 4-5, 1997


PROFESSIONAL SERVICE AND AFFILIATIONS

International Association for Society and Natural Resources
Association of Collegiate Schools of Planning
American Planning Association: Vice-chair, Information Technology Division 1997-2001

SPECIAL TRAINING

American Collegiate Schools of Planning (ACSP) Catalina Island Ph.D. Workshop, 2001
Dutch Summer School in Science and Technology Studies, University of Twente, Enschede, Holland. Theme of Science, Politics and the Law, 1998
Beginning and Advanced Training in Geographic Information Systems, Environmental Systems Research Institute, Redlands, CA, 1994
Training in Environmental Mediation, RESOLVE Program, Washington DC, 1992
William H. Butler

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EDUCATION

Doctor of Philosophy, Environmental Design and Planning
August 2009
School of Public and International Affairs, Virginia Tech, Blacksburg, VA
Focus Areas: Environmental Planning and Policy, Collaborative Governance, Planning Theory
Graduate Certificate: Future Professoriate

Dissertation: Learning to Burn, Burning to Learn: Transforming Fire Management through the US Fire Learning Network
Committee: Bruce E. Goldstein and John Randolph, Co-chairs; R. Bruce Hull, Max Stephenson
Award: Richard Zody Award for Outstanding Dissertation in Planning, Governance, & Globalization

Masters of Urban and Regional Planning
May 2003
Urban Affairs and Planning Department, Virginia Tech, Blacksburg, VA
Focus Areas: Growth Management, Ecosystem and Watershed Planning, Land Use Planning
Major Paper: Planning for Water: Statewide Approaches to Watershed Management

Certificate, Community Solutions Multi-party Mediation and Facilitation
January 2003
Institute for Environmental Negotiation, University of Virginia

Bachelor of Arts with High Honors, Economics and French
May 1996
Guilford College, Greensboro, NC
Focus Areas: International Development, Latin American Economic and Social Development
Honor’s Thesis: Martinique, France and the Paradox of Colonialism

PROFESSIONAL EXPERIENCE

Assistant Professor
Starting August 2010
Urban and Regional Planning Department, Florida State University, Tallahassee, FL

Visiting Assistant Professor
August 2009-present
Urban Affairs and Planning Program, Virginia Tech, Blacksburg, VA

Research Assistant
2006-2009
Urban Affairs and Planning Program, Virginia Tech, Blacksburg, VA

Graduate Teaching Assistant
2003-2006
Urban Affairs and Planning Department, Virginia Tech, Blacksburg, VA

Environmental Planning Consultant
2002-2004


**CONFERENCE PRESENTATIONS**


Restoring Fire Adapted Ecosystems and Institutions through Learning Networks. With Bruce E. Goldstein. Workshop on Organizations and the Natural Environment, Maxwell School of Public Affairs, Syracuse University, Syracuse, NY, 2007


Planning to Win: Institutionalized Barriers to Collaboration in the Creation of a State Park. 46th Annual Association of Collegiate Schools of Planning Conference, Kansas City, MO, 2005

Institutionalizing Watershed Planning and Management: Analysis of Statewide Approaches to Planning for Water Quality. 45th Annual Association of Collegiate Schools of Planning Conference, Portland, OR, 2004

Institutionalizing Coordination for Sustainability: Learning from Statewide Approaches to Watershed Management. Sustainable Communities Conference, Burlington, VT, 2004

GRANTS AND FELLOWSHIPS

USDA Forest Service, Northern Research Station. Improving Collaborative Decision-making and Community Capacity through Fire Learning Networks: Phase II. Co-authored the renewal of a research grant in the amount of $75,000 to study the US Fire Learning Network, 2008

WPI Fellowship for Graduate Research in Environmental Studies, $2,500 to conduct research on watershed planning efforts, 2005-2006

Dan River Basin Association, $5,250 for developing a Master Plan for the Mayo River State Park, 2005

TEACHING EXPERIENCE

Virginia Tech, Blacksburg, VA
Instructor, UAP 3354: Environmental Policy and Planning Fall 2005
Instructor, UAP 4354: Environmental Problem Solving Studio Fall 2004
Instructor, UAP 5794: Graduate Environmental Studio Fall 2004
Co-instructor, UAP 5484: Research Design and Qualitative Methods Spring 2004
Graduate Teaching Assistant, UAP 5224: Quantitative Research Methods Fall 2003

Guilford College, Greensboro, NC
Co-instructor, Community and Economic Development, Study Abroad, Guadalajara, MX Fall 1999
Instructor, Quaker Leadership Scholars Senior Capstone Course 1998-1999
Teacher’s Assistant, Quakerism and French Conversation 1995

Universidad Peruana Los Andes, Huancayo, Peru
Instructor, English as a Foreign Language 1997

SERVICE & OUTREACH

University
Diversity Committee, Urban Affairs and Planning, Virginia Tech, 2009-present
Undergraduate Curriculum Committee, Urban Affairs and Planning, Virginia Tech, 2009-present
Honors Committee, College of Architecture and Urban Studies, Virginia Tech, 2003-2005
Faculty Search Committee Student Representative, Urban Affairs and Planning, Virginia Tech, 2003
Quaker Life & Heritage Committee Staff Representative, Board of Trustees, Guilford College, 1998-99
Quaker Life & Heritage Committee Student Representative, Board of Trustees, Guilford College, 1995-96

Community
Leadership Team, Network Leader Training, Virginia Tech, Fall 2007
Grants Committee, Dan River Basin Association, 2005-2006
Environmental Planning and Organizational Consultant, Dan River Basin Association, 2002-2006

SELECTED HONORS AND AWARDS

Richard Zody Award, Outstanding Dissertation, Planning, Governance & Globalization, Virginia Tech, 2010
Ph. D. Jamboree, School of Community and Regional Planning, University of British Columbia, 2004
National American Institution of Certified Planners Certificate for Academic Achievement, 2002
Virginia Citizens Planning Association Fellowship for Outstanding First Year Graduate Student, 2001
Honors Scholar, Guilford College, 1992-1996