Catalyst Grant Final Project Report
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Project title

Improving Frameworks for Assessing Social Vulnerability to Climate Change in Temperate Forest Regions: New Indicators of Adaptive Capacity

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Summary

Climate change is a critical issue in natural resource management, and the ability to adapt to its impacts varies significantly. This project aimed to enhance our understanding of a concept that scholars refer to as "adaptive capacity" – the capacity for a given entity (an individual, organization, or community) to alter their behavior and practices in the face of environmental change to ensure their long-term existence. Specifically, this project was focused on the adaptive capacity of the networks of entities engaged in the governance of natural resources in rural regions of the Pacific Northwest.

The Pacific Northwest is vulnerable to a range of climate impacts, namely, increasingly frequent and severe wildfires, along with drought and decreased snowpack. This project aimed to complement prior research on climate impacts in the region by producing detailed, qualitative case studies to better understand adaptive capacity in this context. The research team decided on three case study regions for this work: the Nisqually Watershed, WA; the Rogue Basin, OR; and Siskiyou County, CA. The data collection was conducted by Matt Sehrsweeney, a master's student; this project also serves as his master's thesis. He spent several weeks in each case study region, interviewing a diverse array of stakeholders engaged in resource management. The findings, centered on the importance of understanding the underlying socio-political conditions that produce adaptive capacity, provide useful insights on the nature of adaptive capacity in these regions.

There are two key outputs, both in progress. The first is a written, policy-oriented report for the Forest Service, which will also be distributed to all stakeholders interviewed, as it should provide insight on strategies for enhancing adaptive capacity through collaborative governance. The second output is Matt Sehrsweeney's master's thesis. The first outcome, emergent from Sehrsweeney's master's thesis, is an enhanced understanding of the importance of underlying socio-political conditions in determining adaptive capacity at the governance network level; important insight for the field of social vulnerability. And second, in a more pragmatic dimension, the report written will provide the researcher-practitioners at the Pacific Northwest Research Station (this project's external partner) with a set of tools to improve their ability to understand and respond to the needs of communities facing climate impacts. Academically, an important next step in this research is conducting more detailed, long term case studies that provide more insight on the historical power dynamics that produce and govern the underlying conditions of adaptive capacity. Practically, important next steps might include facilitating skill and idea sharing between local networks engaged in resource management in the region.

Project background and approach

Literature Review

Climate change is the defining issue of the modern era, and assessing vulnerability to its impacts is an urgent task for scholars and practitioners. Its effects will be profound, and they will be unevenly distributed – because of a confluence of biophysical and socioeconomic factors, some communities will be particularly vulnerable to these impacts. Critical to understanding the impacts of climate change is understanding adaptive capacity, a community's ability to alter policies, practices and relationships with the natural world in ways that ensure their long-term sustainable existence (McCarthy et al., 2001).

Scholars of social vulnerability have produced a great number of frameworks and measures to quantify adaptive capacity (reviewed by Engle, 2011). However, these assessments too often focus on superficial indicators of adaptive capacity, failing to investigate the conditions and processes that produce these indicators, and the attendant power dynamics that govern them (Watts, 2015; Tayler, 2014). Improving our understanding of and ability to adequately assess adaptive capacity in a given region requires a more thorough analysis of the underlying socio-political conditions of the region.

This is particularly relevant at the level of the environmental governance network – the network of entities and institutions, including multiple levels of government, non-profits, and businesses, that are implicated in the management of natural resources in a given region (Lemos and Agrawal, 2006). Although some frameworks for assessing adaptive capacity have particular utility in the context of a governance network (e.g. Engle and Lemos, 2010; Gupta et al, 2010), similarly to assessments in other contexts, these frameworks generally do not analyze underlying socio-political conditions.

In rural, mixed land ownership contexts in geographies such as the US West, governance network analysis is especially salient as an approach to assessing resource management. Nearly half of all land in the west is federally owned, and it often interdigitates with private, state, and locally managed public land (Congressional Research Service, 2020). This is also a particularly unique context in which to examine adaptive capacity in natural resource management – to match the scale of climate impacts in these regions, landscape-scale adaptation will be necessary.

However, currently, adaptive capacity at the governance network level in a rural, mixed land ownership context has received scant attention.

Research Question: In rural, mixed ownership contexts, what are the key underlying socio-political conditions that contribute to adaptive capacity at the governance network level?

Methods
To investigate these questions, we used a comparative, case study approach (described in Yin, 2009). We chose three case study regions in the rural Pacific Northwest that had conducted adaptation planning processes in collaboration with the Model Forest Policy Program between 2013 and 2014: the Nisqually River Watershed, WA; the Rogue River Basin, OR, and Siskiyou County, CA. My primary data source was a series of interviews conducted with key stakeholders involved in natural resource management in each case study region. I used the adaptation plans to identify an initial set of key stakeholders, and then used the snowball sampling method to identify other important stakeholders, conducting between 14 and 16 interviews in each region. Analysis of interview data entailed both a deductive framework to assess measures of adaptive capacity at the governance network level, paired with an inductive analysis of the underlying socio-political conditions contributing to this adaptive capacity. To supplement this core data set, I reviewed the adaptation plans along with key legislation, court decisions, and other natural resource management plans that the interviews revealed to be particularly relevant.

Findings
This study produced several key findings about the important socio-political conditions underlying measures of adaptive capacity at the governance network level in this context. We found evidence to support conclusions drawn by many studies examining adaptive capacity, that resources, internal capacity, and social capital are particularly salient measures of adaptive capacity in this context. Furthermore, this study identified several underlying socio-political conditions that contribute to the production of adaptive capacity at the governance network level in this context.

These chiefly important conditions are as follows:
1. Legal authority of entities engaged in conservation and adaptation activities
2. Proximity/connection to political power of entities engaged in conservation and adaptation activities
3. Percentage of land in case study region that is undeveloped/in protected status
4. Institutional support of collaborative governance efforts from larger governing entities

Outputs
Output 1: *Practitioner-oriented report for Forest Service and other stakeholders*
The practical, practitioner-oriented output of this project is a report on the findings that will be delivered to the USFS Pacific Northwest Research Station, the project's external partner. This report will summarize the key findings that are particularly useful to stakeholders engaged in collaborative, networked, natural resource management in the Pacific Northwest. This will take the form of a research memo: several pages outlining the background, research question and key findings. This combines several of the originally conceived outputs: community profiles for each of the case study regions, along with a framework of adaptive capacity indicators. The

community profiles will be included in this report, and the adaptive capacity indicator framework has shifted slightly to better match the findings – it will now center not on traditional indicators of adaptive capacity, but on the important underlying socio-political conditions. Furthermore, this information was also going to be communicated in the form of a webinar. However, during the course of the research, it became apparent that many of the stakeholders interviewed would benefit from the findings. Thus, because it was unlikely that all interested stakeholders would be available to watch the webinar at the same time, we elected to put together a written report instead. This report, which will be complete by the end of April, will be emailed to the stakeholders and made available on the web.

Output 2: *Master's thesis and academic publication*
This project served as Matt Sehrsweeney's master's thesis, a masters student in SEAS and the Ford School of Public Policy. The thesis captures the scholarly significance of this project; chiefly, the new model for assessments of adaptive capacity at the governance network level in rural, mixed ownership contexts. The model this thesis presents focuses on analyzing the socio-political dynamics that underly and thus produce the measures of adaptive capacity that vulnerability scholars generally use. The thesis is in progress, and will be completed at the end of April 2020. Upon completion, the key findings will be transitioned into a manuscript, which will be submitted to a journal this summer.

Outcomes
Outcome 1: This project enhances practitioners' understanding of the critical underlying features that features of a community that determine adaptive capacity. It serves fundamentally the same function as that laid out in the proposal—improving local stakeholders' understanding of adaptive capacity in the region—but does so in a slightly different manner, focused on underlying conditions instead of higher-level indicators.

Outcome 2: Though not initially intended, this project should also serve to facilitate communication and sharing of useful ideas and strategies for collaborative climate adaptation work across the three case study regions.

Outcome 3: Finally, the outcomes of this project will serve to strengthen research relationships between the project partners, and contribute significantly to the academic study of adaptive capacity.

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