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Beyond the black box: Forest sector vulnerability assessments and adaptation to climate change in North America

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ABSTRACT

In the wake of the failures to date of well-publicized multilateral and multi-sectoral mitigation efforts to control greenhouse gases, attention is now increasingly focused on the effectiveness and capacity of national and sub-national level sectoral plans, including forestry, to usher in a new era of adaptation efforts. In Canada, the government of British Columbia spent several years developing its Future Forest Ecosystems Initiative as part of a larger climate change response strategy in the forest sector. Similarly, in the United States, wildfire related events have led to climate change inspired efforts by individual states (e.g., Alaska, California) and the US Forest Service has recently undertaken plans to incorporate climate change considerations in national forest planning beginning with the National Road Map for Responding to Climate Change. This paper highlights a number of shortcomings with both these national and sub-national strategies with respect to the relationships existing between governance, forestry and climate change. It proposes incorporating considerations of governance mechanisms directly into forest sector planning and the need to assess not only natural system level changes but also the extent to which new problems can be dealt with by 'old' or 'new' governance arrangements.

1. Introduction

In the wake of the disappointing outcomes of multilateral and multi-sectoral climate change mitigation efforts such as the Kyoto Protocol and the Copenhagen Accord, attention is now increasingly focused on the effectiveness and capacity of national and sub-national level sector plans to address adaptation related issues (Ottinger, 2010). On both sides of the Canada–US border forest sector climate change policy adaptation frameworks have proliferated as government

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agencies attempt to scope new ways to incorporate climate change vulnerabilities into daily decision-making. From these assessments, adaptation plans and frameworks at both the national and sub-national levels are being developed in order to facilitate and ''mainstream'' a new round of policies and programmes. According to Brooks and Adger (2004), ''mainstreaming'' refers to ''the integration of adaptation objectives, strategies, policies, measures or operations such that they become part of the national and regional development policies, processes and budgets at all levels and stages'' (p. 211).

There are three major uncertainties about the precise impacts of climate change on existing policy regimes in the US and Canada which are highlighted in many forest climate change assessments as driving government adaptation efforts. First, changes in growing conditions may threaten the ongoing efforts of forest managers to match tree species and subspecies to appropriate sites when replanting after harvest, with a significant real and potential loss of forest productivity (Johnston et al., 2009). Second, the prediction of hotter and drier conditions throughout much of western North America may pose additional challenges for forest managers. In Canada, for example, temperatures are expected to continue to increase and conditions become significantly dryer for the southern edge of the boreal forest from northern Ontario, through Manitoba, Saskatchewan and into northern Alberta (and even BC and Alaska in some models). A warmer and dryer climate suggests an increase in the frequency, extent and severity of forest fires in these regions (Wotton et al., 2010) as well as changes in existing patterns of forest insects and diseases. Similarly, in the US, dry conditions led to catastrophic forest wildfires as early as 2003 in the southern Californian counties of San Bernardino, Riverside and San Diego (Grulke et al., 2009) and are expected to increase. Third, the network of protected forest areas that has been laboriously created to address biodiversity conservation goals (notably the efforts to combine the 12% minimum protection promoted after Rio with conservation biologists' recommendations for the protection of a network of ''representative ecosystems'') may not now be able to meet these goals. As a recent Ontario climate change assessment notes: ''current protected areas may no longer contain the ''best'' representative examples of features, ecosystems and species. As species migrate and ecological boundaries change in response to climate change, ecological communities will change and some may be lost from within the fixed boundaries of protected areas'' (Government of Ontario, 2011; p. 10). Can American and Canadian forestry adaptation to climate change planning efforts develop effective and implementable strategies for forest sector adaptation in light of these major challenges?

This article presents two cases of forest adaptation frameworks developed in the US and Canada and highlights two key weaknesses in the way that these and other national and sub-national strategies have operationalized the relationships between governance, forestry and climate change policy-making. These are (1) a disjuncture between the desires of governments and affected stakeholders to mainstream climate change adaptation concerns with the incomplete and misleading conception of governance presented in the climate change vulnerability and assessment literature, and (2) the role of ''micro'' level factors, such as policy capacity or on-the-ground implementation resources which affect both a government's ability to plan and societal actors abilities to take part in those plans and planning efforts.

Existing forest sector adaptation planning frameworks generally seek to consider climate change vulnerabilities using macro-level systems-based vulnerability assessments currently in vogue amongst geographers and natural resource managers and, on this basis, to develop ''mainstream'' adaptation plans that can be integrated into public policy decision-making (Burton, 2010; Keskitalo, 2011). When addressing the feasibility of proposed climate change policy solutions, the impact of the policy and governance systems is rarely considered. Wellstead et al.'s (2012) critique of the vulnerability assessment literature found that it is often informed by a latent structural-functional logic. While vulnerability assessment frameworks can provide a useful heuristic, the functionalist assumptions inherent in these approaches leave much to be desired in terms of understanding political phenomena, including activities such as public policy-making. For example, as the renowned Norwegian social and political theorist Jon Elster (1986) noted, functionalism is a ''puzzling and controversial'' mode of explanation in general because, unlike other scientific modes such as causal or intentional explanations (where the intended consequences occur earlier in time), early events are explained by another event later in time (p. 31). Thus, in a functional explanation, ''we cite the actual consequences of the phenomenon in order to account for it'' (p. 31). Feedbacks loops are the essential mechanism in functional reasoning because they provide ''a causal connection from the consequences of one event of the kind we are trying to explain to another, later event of the same kind'' (p. 32). However, in social and political situations, as Elster further argued, such explanations are ''only applicable when a pattern of behaviour maintains itself through the consequences that benefit some group, which may or may not be the same group of people displaying the behaviour'' (p. 32). Thus, most climate change vulnerability assessments simply assume that governance and policy activities will be performed in specific ways due to system-level prerequisites based on natural resource characteristics, ignoring the possibility of non-performance and the role played in it by meso and micro level institutional and governance-related variables. Following a discussion of the cases, the paper sets out these problems and suggests ways they can be addressed in future studies and planning processes.

2. The characteristics and problems of existing forest sector vulnerability assessments: ''black-boxing'' governance and downplaying political factors

Canadian and American federal, provincial, and state governments have recently undertaken several well-publicized vulnerability assessments linked to climate change adaptation in