A Spatially Explicit Vulnerability Assessment of Maine’s Forest Industry to Climate Change

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Vulnerability

“the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change... [and] is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity” (IPCC, 2007)

- **Exposure**: “the nature and degree to which a system is exposed to significant climatic variations” (IPCC, 2007)

- **Sensitivity**: “the degree to which a species or habitat is likely to be affected or responsive to climate change” (Staudinger, et al., 2015)

- **Adaptive capacity**: “the ability or capacity of a system to modify or change its characteristics or behavior so as to cope better with existing or anticipated external stresses” (Adger, 2004)

Source: Fellman (2015)
The goal of this study is to present a spatially explicit assessment of vulnerability to climate change in the forestry sector in Maine, USA.

- Identify regions in Maine with highest vulnerability
- Develop appropriate adaptation strategies (Galicia, Gómez-Mendoza, & Magaña, 2015)
- Novel research for Maine
Methods

Indicator selection

Exposure score

Sensitivity score

Adaptive capacity score

Combine to determine overall vulnerability

Exposure
1. Extreme precipitation events
2. Change in winter conditions
3. Change in mud season
4. Pest and insect related tree mortality
5. Deer browsing
6. Changes in forest composition

Sensitivity
1. Market accessibility
2. Density of transportation networks
3. Ability to meet employment needs
4. Dependency on forestry
5. Proportion of county land forested
6. Employee health

Adaptive Capacity
1. Cultural capital
2. Human capital
3. Social capital
4. Political capital
5. Agency
6. Management Flexibility

Fischer & Frazier (2018)
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Overall Vulnerability

Exposure + Sensitivity = Adaptive Capacity

Counties with high exposure and sensitivity and low adaptive capacity:
- Aroostook
- Somerset
- Franklin
- Oxford
Limitations

• Spatial coverage
• Data availability

Next Steps

• Refine adaptive capacity
• Participatory workshops
Thank you

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Citations


