

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

Alyssa Soucy

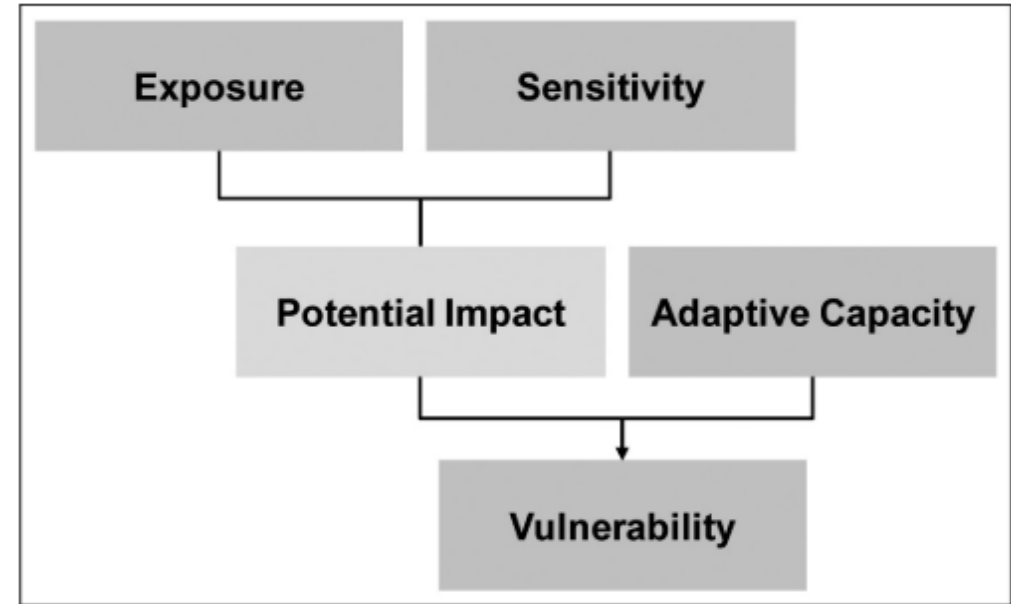
Parinaz Rahimzadeh-Bajgiran

Sandra De Urioste-Stone

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)

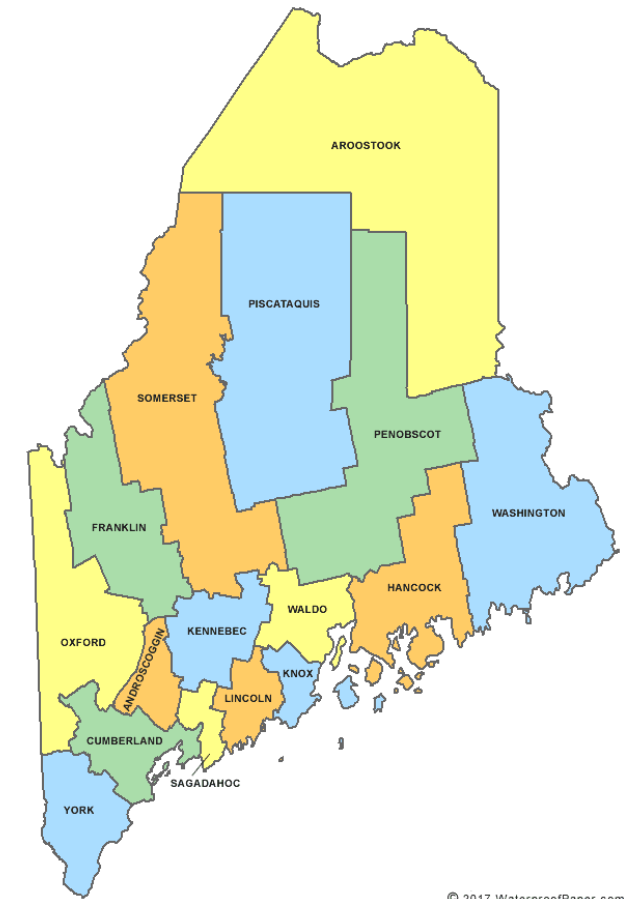


Source: Fellman (2015)

Project goal

The goal of this study is to present a spatially explicit assessment of vulnerability to climate change in the forestry sector in Maine, USA

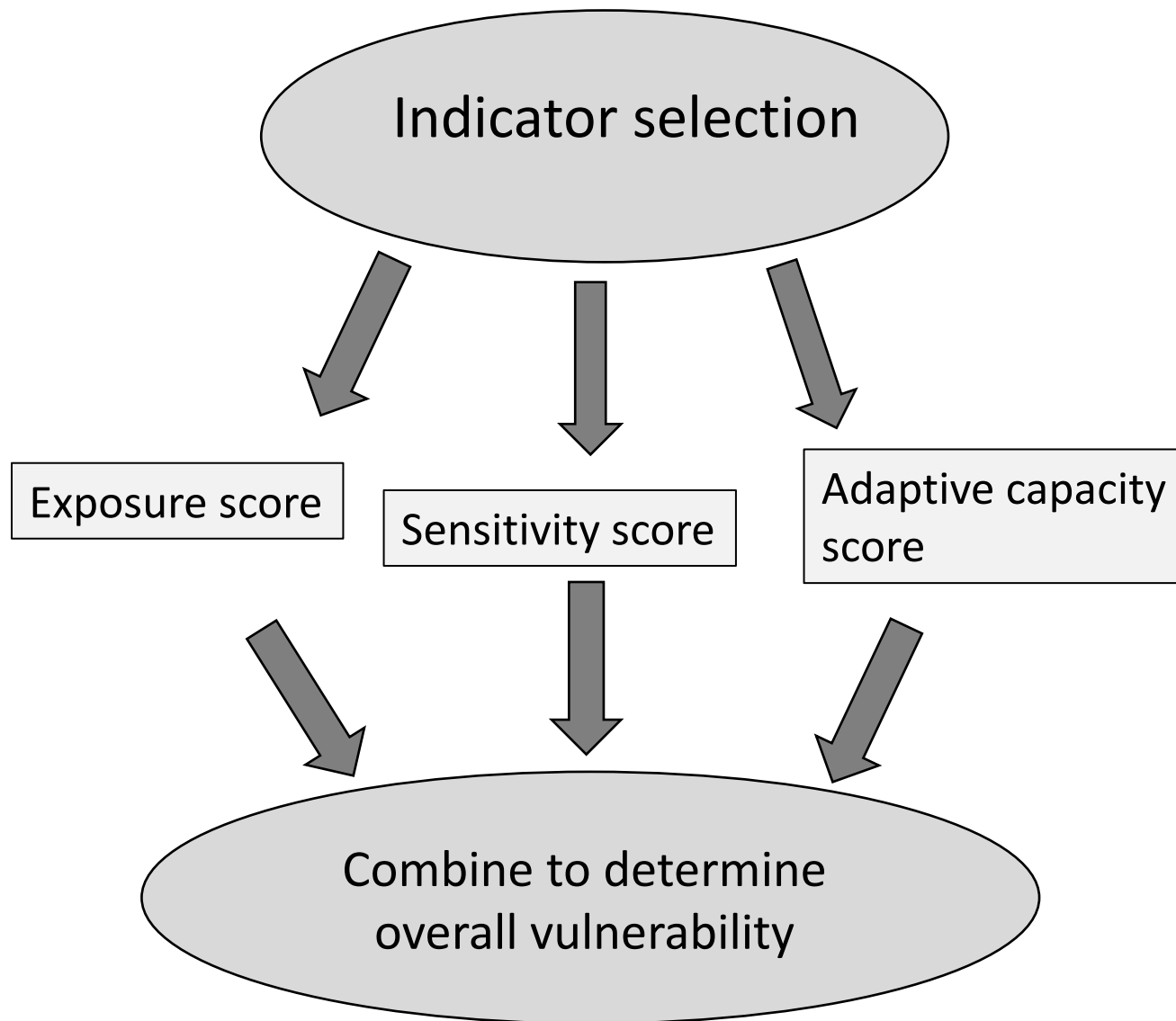
- Identify regions in Maine with highest vulnerability
- Develop appropriate adaptation strategies (Galicia, Gómez-Mendoza, & Magaña, 2015)
- Novel research for Maine



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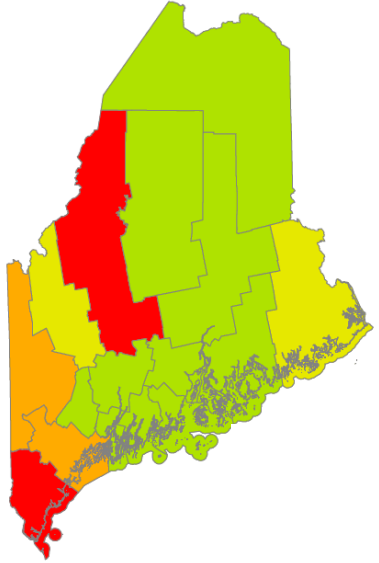
Methods



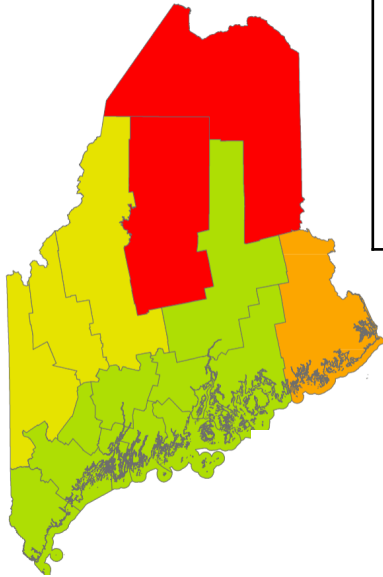
Component	Indicators
Exposure	<ol style="list-style-type: none"> 1. Extreme precipitation events 2. Change in winter conditions 3. Change in mud season 4. Pest and insect related tree mortality 5. Deer browsing 6. Changes in forest composition
Sensitivity	<ol style="list-style-type: none"> 1. Market 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	<ol style="list-style-type: none"> 1. Cultural capital 2. Human capital 3. Social capital 4. Political capital 5. Agency 6. Management Flexibility

Exposure

Extreme precipitation



Mud season



1. Extreme precipitation events

2. Change in winter conditions

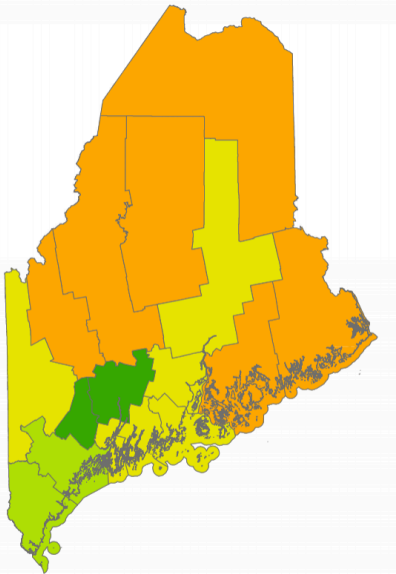
3. Change in mud season

4. Pest and insect related tree mortality

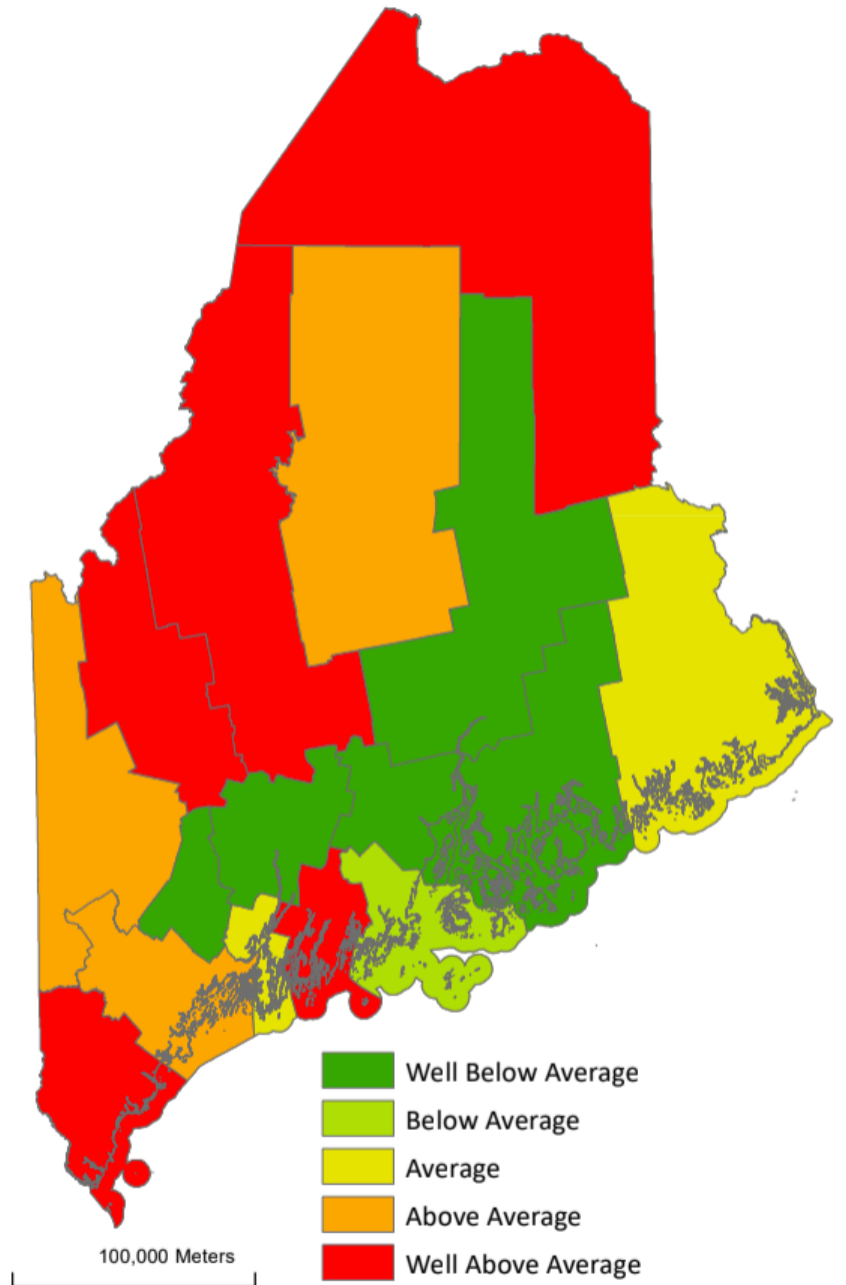
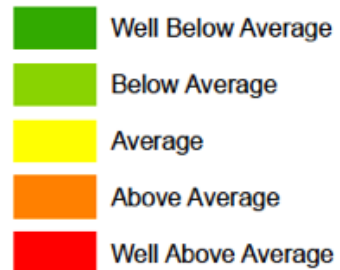
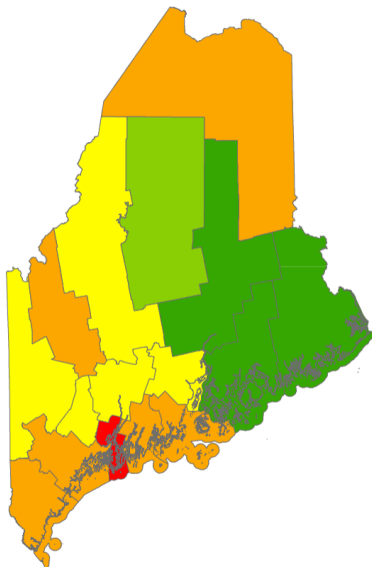
5. Deer browsing

6. Changes in forest composition

Pest and insect

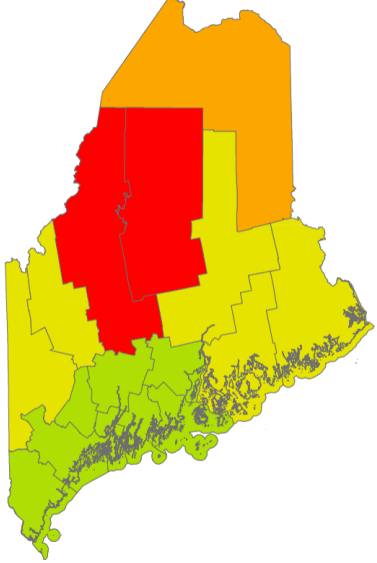


Forest composition

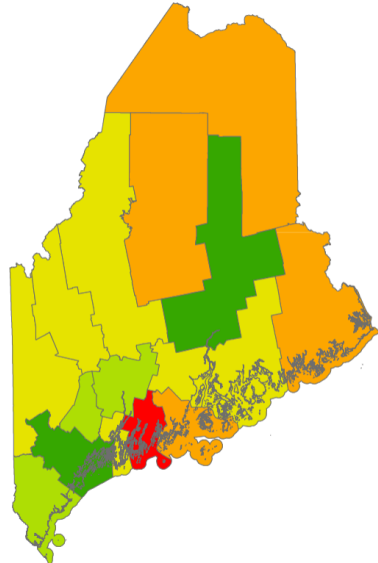


Sensitivity

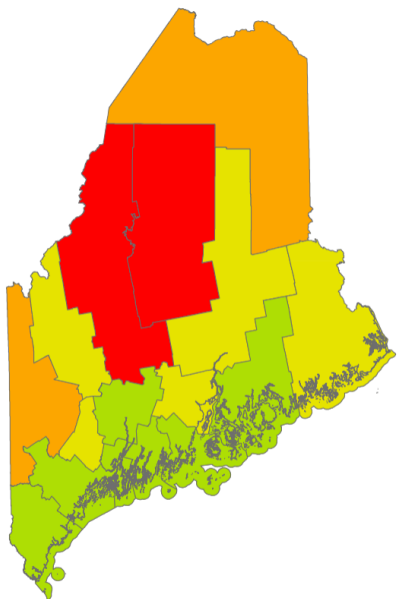
Market Accessibility



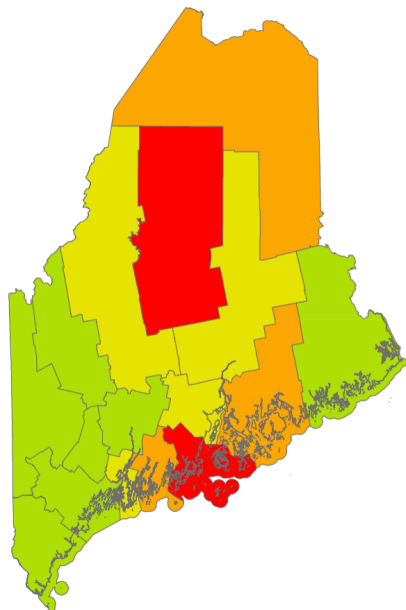
Employment Needs



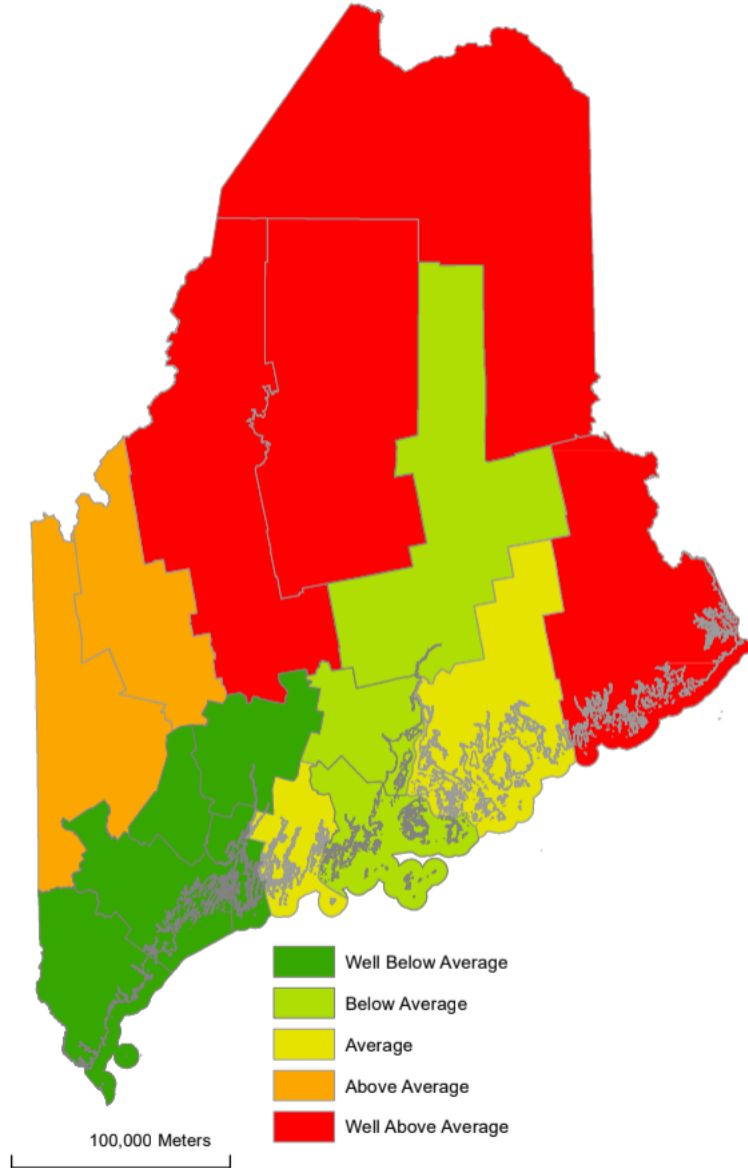
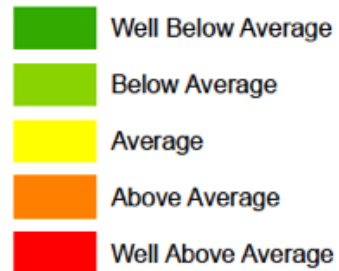
Forest Dependency



Employee Health

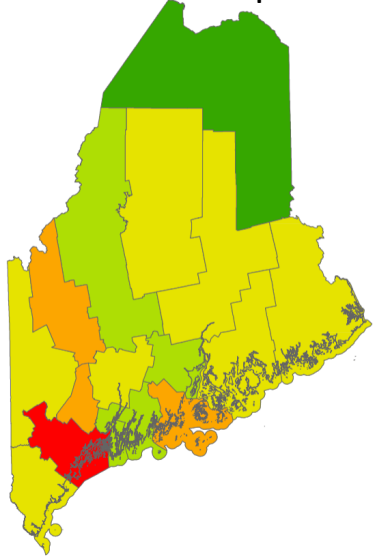


1. Market accessibility
2. Density of transportation networks
3. Ability to meet employment needs
4. Dependency on forestry
5. Proportion of county land forested
6. Employee health

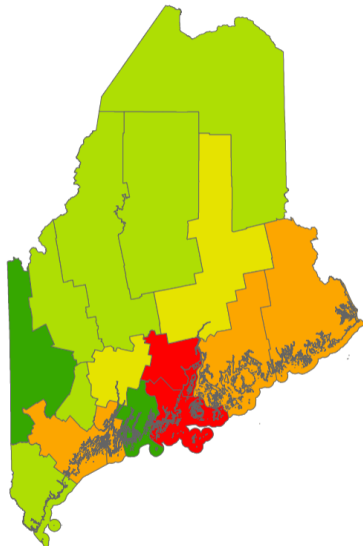


Adaptive Capacity

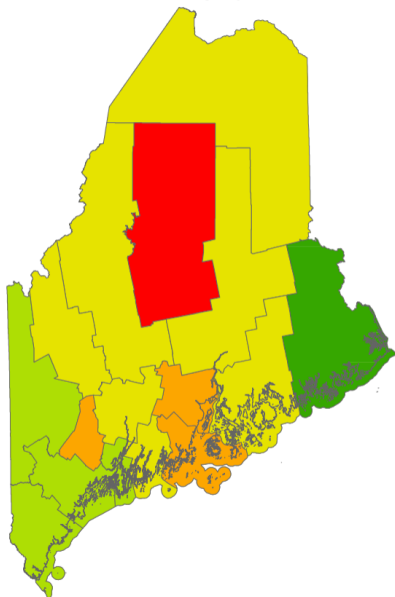
Human Capital



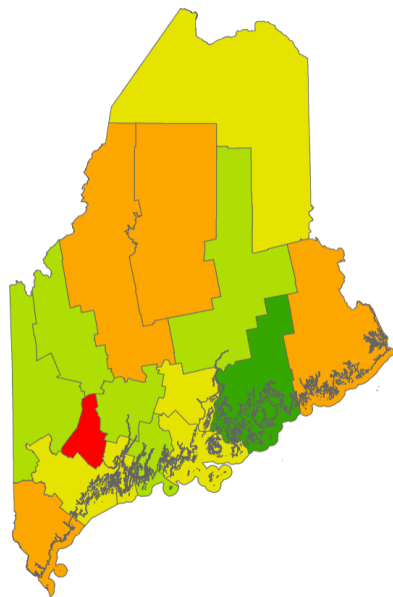
Social Capital



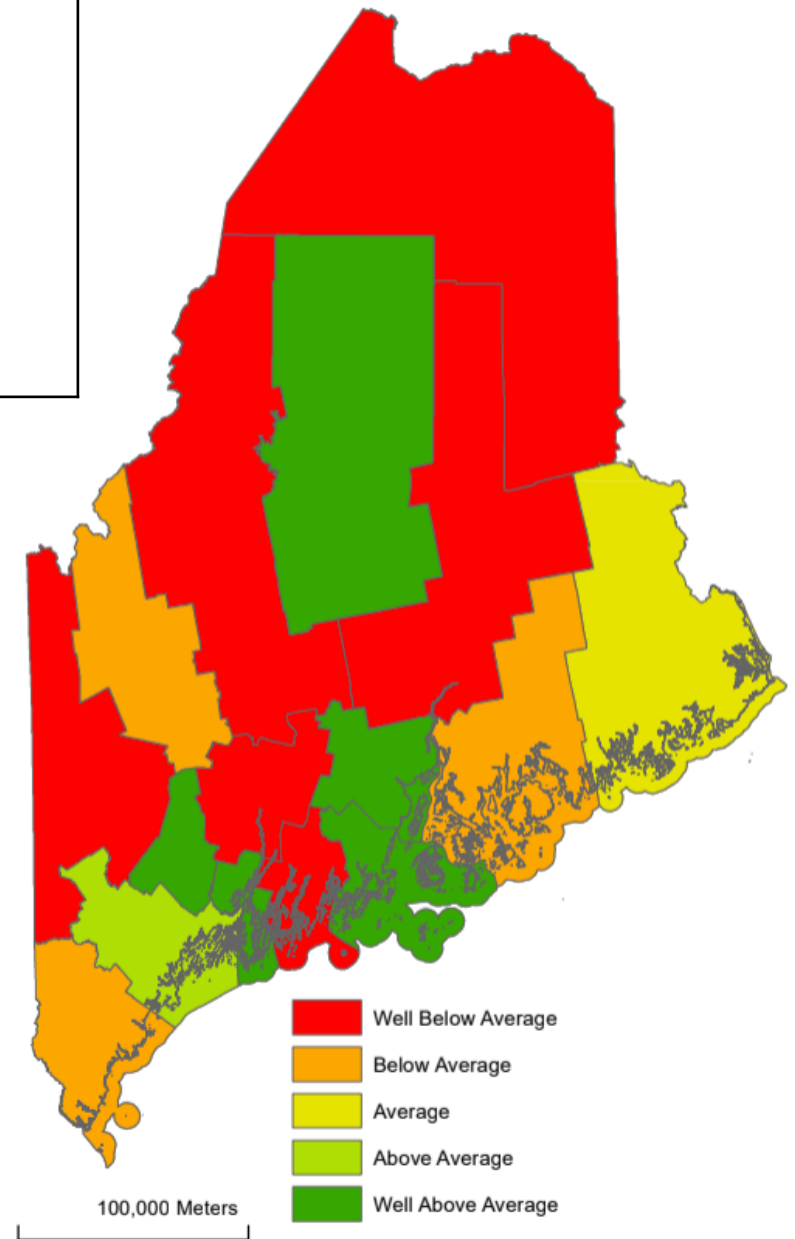
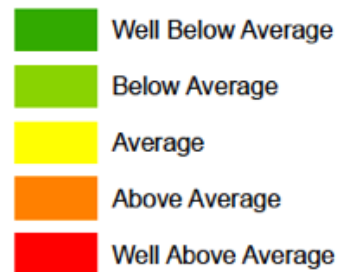
Agency



Management Flexibility



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



Overall Vulnerability

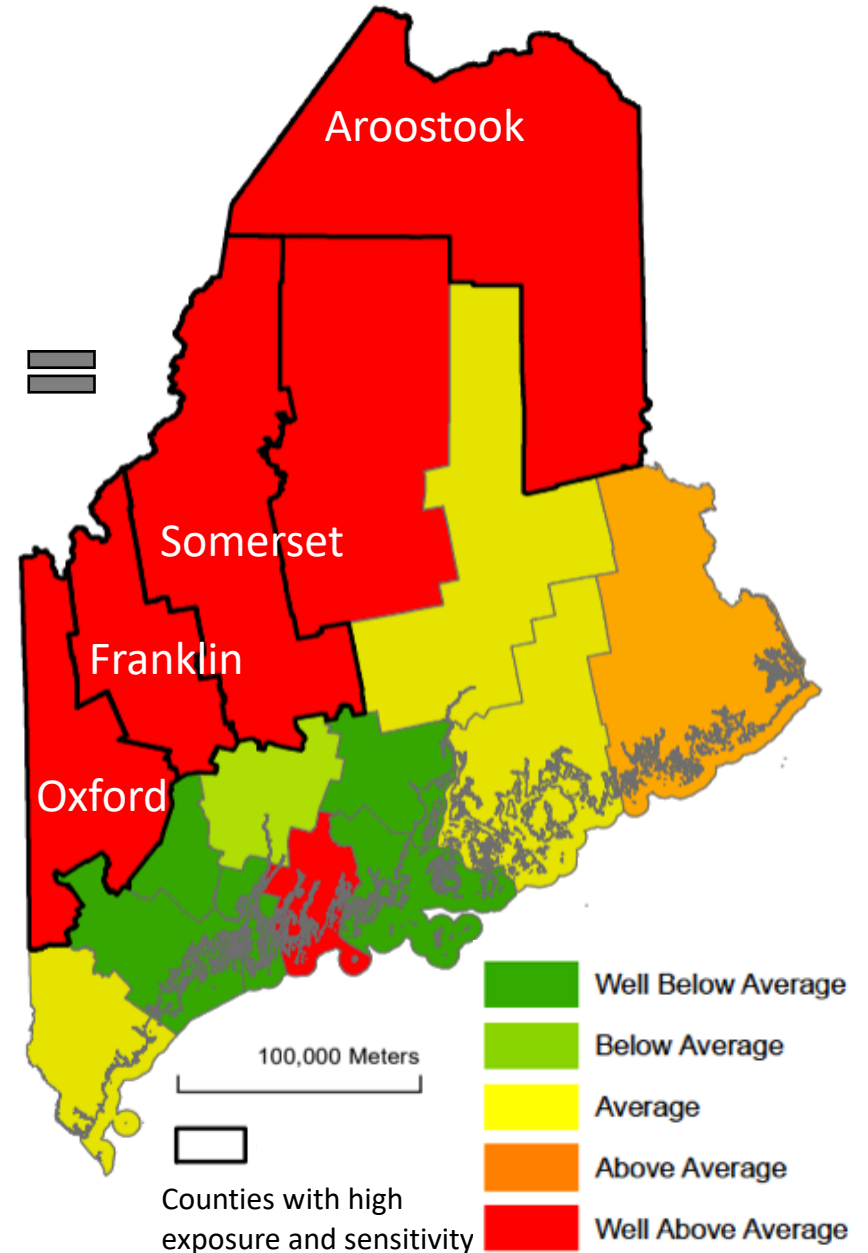
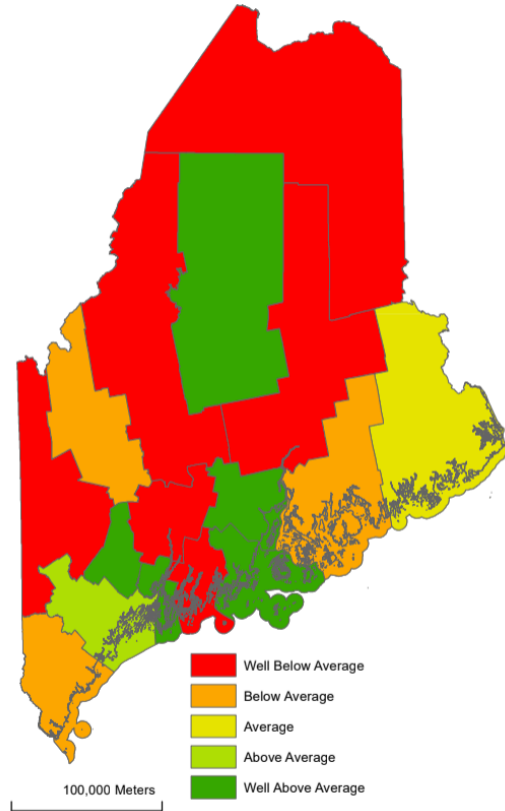
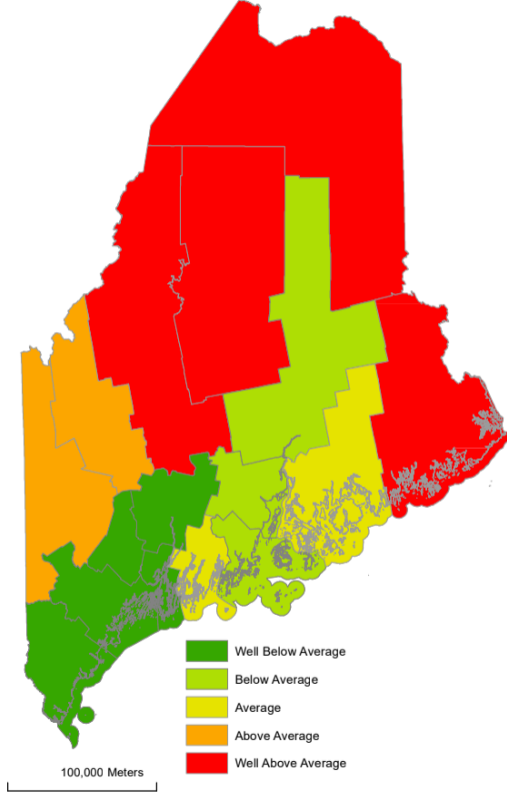
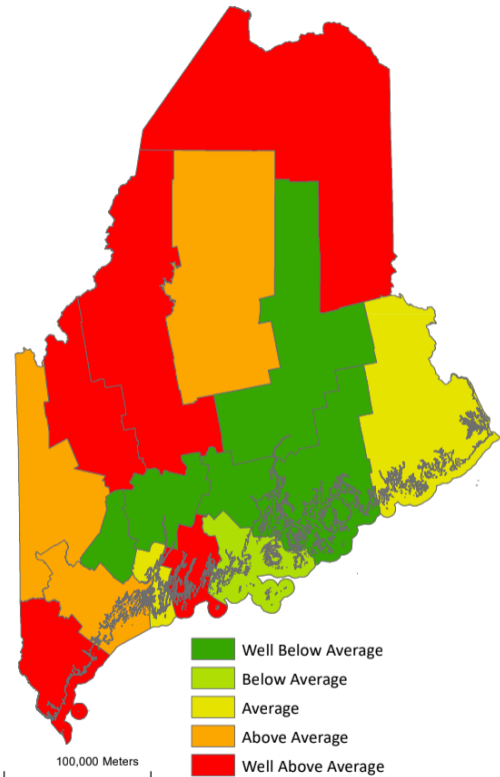
Exposure



Sensitivity



Adaptive Capacity



Counties with high exposure and sensitivity and low adaptive capacity

Limitations

- Spatial coverage
- Data availability

Next Steps

- Refine adaptive capacity
- Participatory workshops



Thank you

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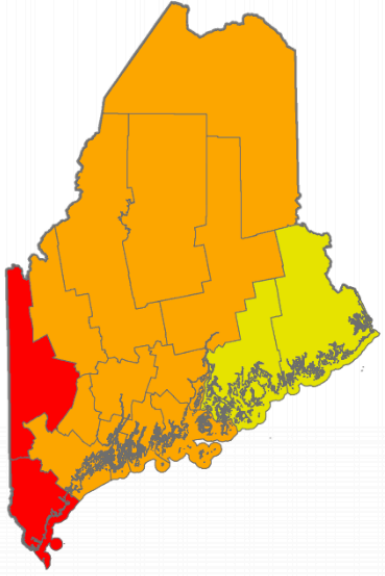
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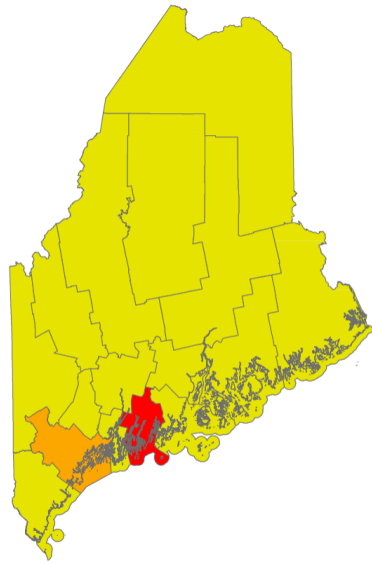
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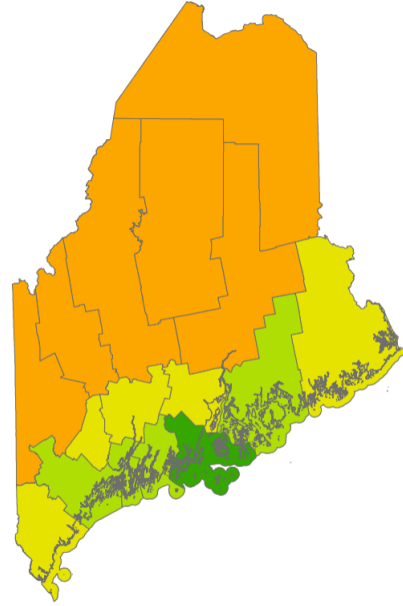
Deer browsing



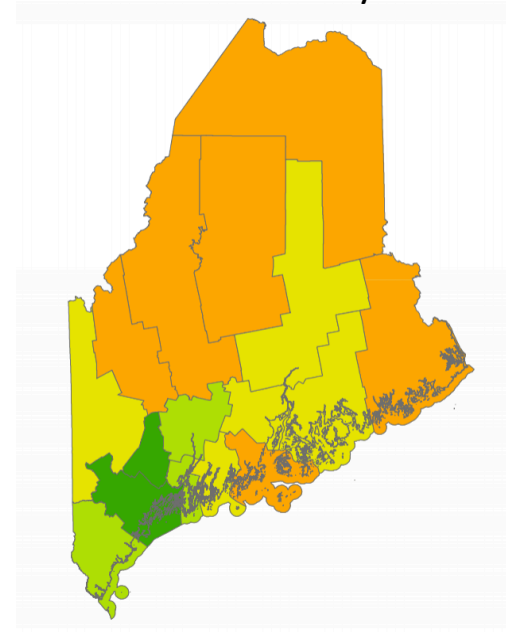
Winter conditions



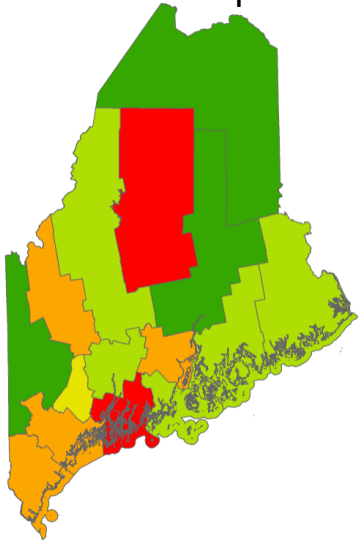
Forested Land



Road Density



Cultural Capital



Political Capital

