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Upstate Rural New York Residents' Perceptions of Climate Change

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What is the Issue? Climate Change Impacts in Upstate NY

Rural landowners may disproportionately affect and be affected by 21st century climate change. Rural communities play a role in carbon cycling through land use patterns, modes of rural transportation, growth of biofuels, and the development of alternate sources of renewable energy. Changes in climate may directly impact rural occupations such as agricultural work via changing growing seasons and precipitation patterns that require adaptations in farming techniques. Rural areas may also see new economic opportunities in alternative energy, including a growth in wind generated power. Despite the potential of significant impact, rural audiences tend—on the whole—to be more skeptical about climate change than urban audiences (Davidson et al., 2003). Audiences that don't accept the validity and seriousness of climate change are less likely to change behaviors or support policies that may help to mitigate effects.

Access to information alone is not sufficient to change behavior. Moreover, fostering actions that would mitigate or help adapt to climate change is only possible if those actions are consistent with personal values. Such values themselves may vary among rural people and communities, depending on local context factors such as community well-being, occupations, and key resident characteristics. For example, concern about climate change tends to be higher for people who are urban, female, and with higher levels of education (Leiserowitz, 2005, O'Connor et al., 1999). Public opinion also differs on the importance of taking action—personally or politically—on the issue of climate change (e.g., Nisbet and Myers, 2007). Research suggests that different audiences may also react differently to climate change information depending on the approach (e.g., National Research Council, 2011). Science educators must understand how these perspectives vary within and among rural communities to be effective in climate change education. In order to improve outreach and education efforts to rural audiences, we examined how these perspectives vary in upstate New York (NY).

Examining perspectives on climate change

In the spring of 2011 we conducted a mail survey of 1,800 upstate NY property owners to better understand their climate change attitudes and beliefs, and how these vary across and within communities. To examine rural landowner views we sampled two separate strata (900 participants drawn from each): one region comprised of seven counties in Central/Western NY, intended to represent a relatively agriculturally dependent region; the other from a five county region in the Adirondacks, as a more tourism-intensive region. A three step mailing procedure yielded a 30% response rate, or 497 responses (246 from Central/Western NY and 251 from the Adirondack region).

We compared perceived risk, impacts, and knowledge about climate change across several key characteristics: gender, political ideology, age, region, and land-ownership/land use. *Overall perceived risk of climate change* was measured via a composite scale created based on responses

to four items (each scored on a four point-scale from “not at all serious” (1) to “very serious” (4)): “How serious of a threat is climate change to people in: (a) other countries, (b) people in the United States, (c) you or your family, and (d) your local community. Because response patterns to these items did not differ (though climate change was seen as slightly more serious in places farther from home), a summed scale of these items was created. Mean scores for this scale averaged 2.97, or “somewhat serious.” To measure *beliefs about climate change impacts*, we investigated suites of impacts that included potential weather changes, negative effects on agriculture and the environment, and positive effects such as increased biological productivity. These were scored on a five point scale from “strongly disagree” (1) to “strongly agree” (5). The impacts separated into two primary domains, positive and negative. Agreement was higher for the negative impacts scale (mean = 3.76, or nearly ‘agree’ on average) than the positive, or increased productivity scale (mean = 3.09 or ‘neutral’ on average) (see Table 1). *Self-assessed knowledge* about potential climate change impacts in NYS was also examined. Although the most common response was “moderately well informed” (43.3%), responses were skewed towards relatively little knowledge (15.7% said they “don't know much”, and 34.7% said they “know a little bit” or less, compared to only 6.3% who said they were “very knowledgeable”).

Table 1: Agreement with statements about occurrence of climate change impacts (5=strongly agree, 1=strongly disagree).

Negative Effects	Mean	% SA*
<i>Weather Changes</i>		
Increased frequency and severity of extreme weather events	3.75	26.0%
Increased stream/river flooding	3.47	13.7%
Increased summer droughts	3.47	14.6%
<i>Agriculture</i>		
Increased food prices	3.81	33.2%
Varying crop yields because of unpredictable weather	3.70	15.4%
More farmers going out of business	3.53	22.9%
More pesticides required to combat pest species	3.21	10.4%
<i>Ecological</i>		
Increases in new invasive species	3.60	21.8%
Declines in important fish species	3.54	19.9%
Declines in important wildlife species	3.50	19.2%
Loss of native tree species, such as maple, beech, birch	3.37	15.9%
Increased problems with forest fires	3.37	13.7%
Loss of wetlands	3.22	11.1%
Positive Effects: Productivity		
Increased productivity of some timber tree species	3.19	6.8%
Increased crop yields due to longer growing seasons	2.98	5.0%

*% SA = percentage of respondents that strongly agree.

The impact of gender, political ideology, and age

In our analysis, some key differences emerge by gender. For example, women were significantly more likely to perceive negative impacts than were men. This is consistent with past research that shows males exhibit lower levels of environmental concern than women (Davidson and Freudenburg, 1996). Also with respect to overall perceived threat of climate change, women were more concerned than men. Self-reported knowledge, however, was higher for men than for women. While this difference was not as stark as for perceived negative impacts and overall risk assessment, it indicates a greater gender gap in perceived risk than perceived knowledge.

When asked to report their political ideology on a five point scale ranging from conservative to liberal, almost 43% of respondents self-identified as liberal, about 42% placed themselves in the middle, and just over 31% identified as conservative. Consistent with past research (e.g., Stedman, Davidson, Wellstead, 2004), there were strong, significant differences in overall perceived risk by political ideology: those identifying as liberal were more concerned than conservatives. Interestingly, moderates were more akin to liberals in their expressed concern. Similar relationships were observed for perception of negative impacts, although the differences were not as stark, suggesting that overall perceived threat of climate change is more strongly driven by ideology than is agreement about specific impacts. Finally, there was no significant relationship between perceived knowledge and political ideology.

While age is traditionally negatively related to concerns about climate change, our analysis revealed no relationship between overall perceived threat, nor specific beliefs about outcomes. However, there was a robust relationship between respondent age and perceived knowledge; younger respondents felt more knowledgeable than older respondents.

Differences across region, landownership, and land use

To help us develop a targeted outreach program that will vary by region and type of audience, we also compared beliefs, attitudes, and knowledge by respondent region, land ownership status, and farming status. There were significant regional differences in overall perceived risk and beliefs about impacts. Adirondack respondents were more likely to agree with the potential negative impacts of climate change than were Central/Western NY respondents. Adirondack residents also perceived a greater risk of climate change. There were no significant regional differences in perceived knowledge, however.

To examine differences by landownership and land use, respondents were divided into three categories: those who owned no land associated with their primary residence (17.7% of respondents), those who owned land but were not farmers (71.7%), and those who farmed their land (10.6%). There were no differences in landownership/use for specific outcome beliefs of climate change, nor for overall perceived risk. However, the results suggest that landownership is associated with greater perceived knowledge: farmers had the highest self-assessed knowledge, followed by landowners who did not farm and non-land owners.

Summary

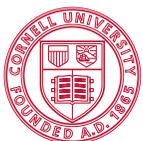
Rural landowners may disproportionately be affected by the impacts of climate change, and may in turn play a large role in mitigation and adaptation. These preliminary analyses present us with several useful guidelines for designing climate change-related outreach in rural areas of New York State. First, considerable variation exists within rural communities of NYS, which are home to a mixture of political ideologies; perceptions of climate change vary with these political ideologies, and by gender and age. Outreach efforts must take this variation into account, rather than assuming that any one outreach vehicle will be appropriate across an entire community.

Second, we can selectively address impacts that are of greatest concern to specific rural audiences. For example, increased food prices, extreme weather events, and farmers being driven out of business are among the items that respondents are most likely to agree will result from climate change. These would be logical topics to address first in reaching out to rural audiences. Finally, modest but measurable variations exist between central/western NY and Adirondack communities. These variations are not large enough to suggest a need for entirely different approaches to outreach, but do warrant careful analysis for selection of topics of greatest concern in each geographic area.

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