

CLIMATE ADAPTATION BARRIERS AND OPPORTUNITIES IN THE UNITED STATES:

CENTER FOR
SCIENCE & TECHNOLOGY
POLICY RESEARCH



A Focus on Policy and Decision Making at the Sub-National Scale

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SUMMARY

Recent studies have highlighted the role of decision making within communities and sectors in fostering or hindering successful adaptation. Additionally, it is clear that adaptation is not uniform across localities, even for areas with the same exposure. Finally, adaptation or actions taken in response to risk may even be maladaptive across time scales. We ask the overarching questions of “What drives communities and agencies to act pro-actively in the face of risk?”, and “How do decisions made about risk condition the future vulnerability of systems?” Preliminary results are reported here for three sectors in the U.S.: federal public lands, municipal hazard response, and urban water systems.

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1 ADAPTATION AND FEDERAL PUBLIC LANDS

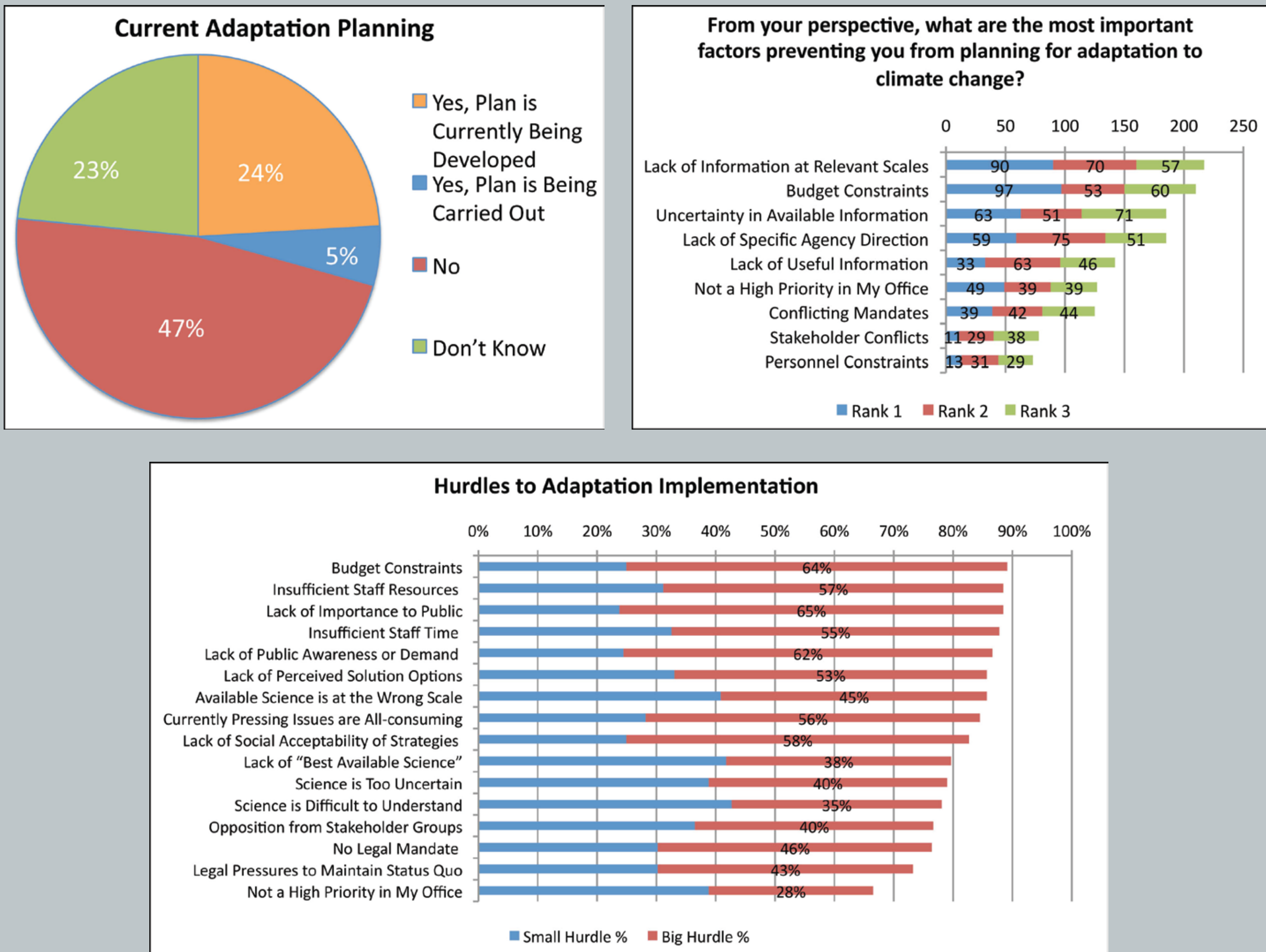
QUESTIONS: Are U.S. federal public land managers incorporating considerations of adaptation into their decision making at the local level on the ground? What is the role of information in adaptation, and what are the perceived barriers to implementing adaptive decisions?

METHODS: We administered an online survey to over 3000 public lands decision makers (either direct decision makers or providing input to decisions) in 4 agencies (Bureau of Land Management, Forest Service, Fish and Wildlife Service, and National Park Service) in three western U.S states (Colorado, Wyoming and Utah). We asked questions on their management challenges, adaptation and planning for climate change, perceptions of barriers and attitudes about climate change. We obtained a 21% response rate which is typical of current online surveys of this nature. We followed up this survey with interviews with key informants from each agency to illuminate various responses.



RESULTS

- Land managers face multiple challenges
- Over 70% of respondents believe climate change is real and already happening
- 65% believe it is a serious or very serious problem
- Climate change is not the top challenge
- Only 6% of agencies are implementing adaptation actions
- Lack of information at relevant scales and funding limitations were top constraints
- Lack of public awareness or concern also seen as a key hurdle



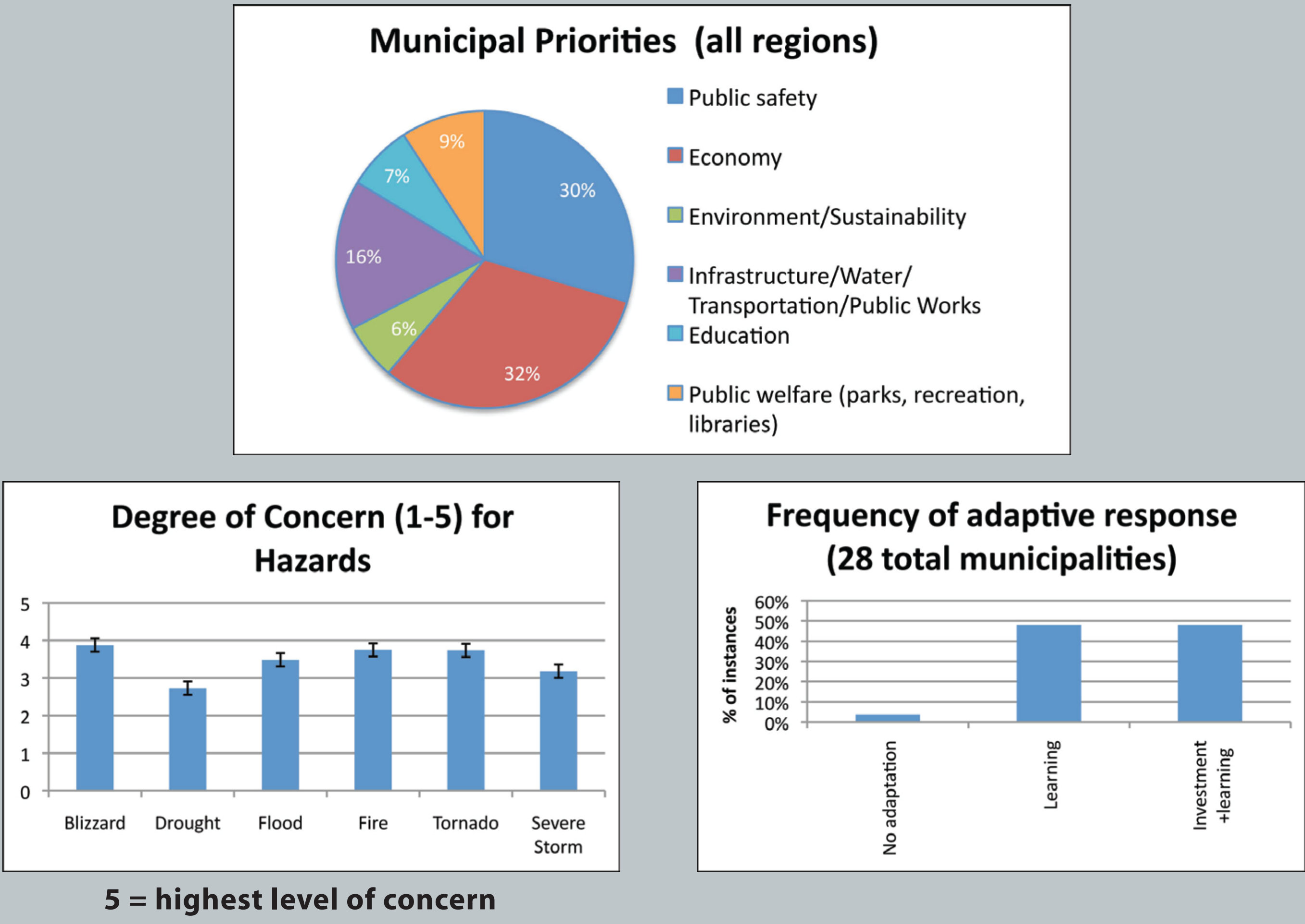
2 ADAPTATION TO CLIMATE-RELATED HAZARDS AT THE MUNICIPAL LEVEL

QUESTIONS: Are there differences in adaptation and adaptive capacity among municipalities in the same region and with the same exposure level to hazards? What might account for those differences?

METHODS: Given that most municipalities in our region have not begun to plan for climate change, we examined planning and response for climate-related hazards as an initial proxy. We administered a survey to over 140 city managers, elected officials and planners in 60 cities in Colorado, Wyoming and Utah. We asked about top priority areas, what natural hazards were seen as important, how municipalities have allocated resources to a given hazard, what types of plans exist and how they relate to implementation, impressions of memorable extreme events, where communities obtain information, how collaborations occur, how citizen groups are involved, and beliefs about climate change. We grouped data into 8 indicators of adaptation, from expanding departments and acquiring equipment to training and statements about learning.

RESULTS

- Perceptions of risk differ between states
- Strong adaptive capacity to hazards can emerge for unrelated reasons
- Belief in climate change is variable among respondents but does not appear to correlate with adaptation
- Virtually all communities in the sample experienced disasters recently, and yet their responses vary
- Relationships with state government vary and influence municipal level preparedness

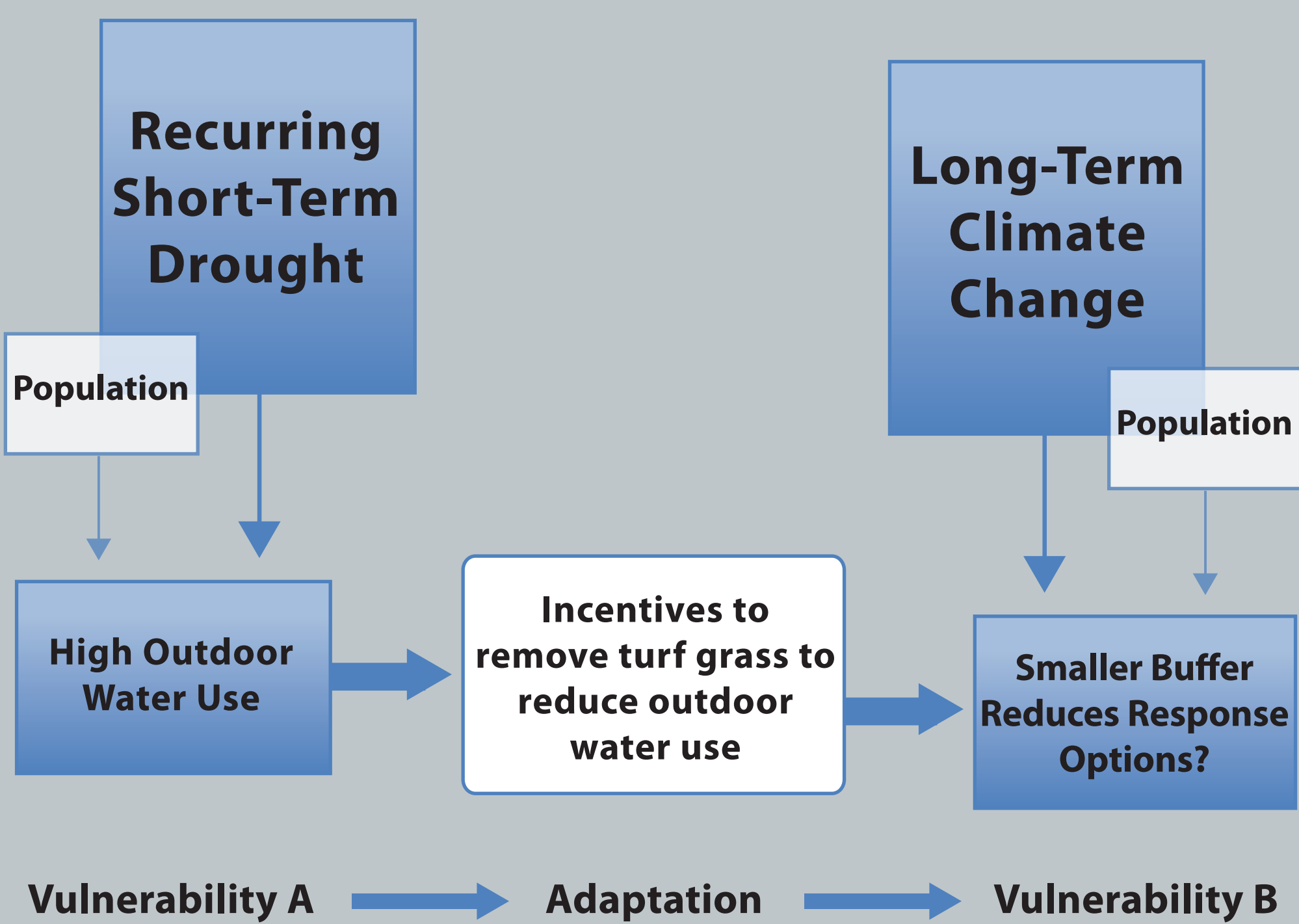


3 ADAPTATION AND MUNICIPAL WATER SYSTEMS

QUESTION: Do policies put in place to reduce short-term vulnerabilities to drought increase vulnerability to longer-term climate change (and vice versa)?

METHODS: Conceptually, we are examining previous drought and current perceptions of vulnerability as a way of understanding how actions taken in the past may condition vulnerability in the present and future. We have completed the first phase of the study which included an extensive literature review on adaptation, vulnerability and urban water systems and a semi-structured survey of water managers at 20 urban systems, around the U.S. We asked questions about past drought events, measures taken, what limits the ability to respond to drought, and what triggers a decision to implement measures. Our next phase will focus on in depth case studies of 3 larger urban systems to understand the dynamics of vulnerability and how elements may shift depending on changes in exposure, sensitivity and adaptive capacity.

Dynamic Nature of Exposure*



Geographical and Climatological Context



RESULTS

- Vulnerability is not captured adequately by changes in an aggregated indicator
- Shifts in vulnerability can occur through unintended consequences of adaptive actions
- Over 82 potential sources of vulnerability identified across the 20 cities, grouped into exposure, sensitivity and adaptive capacity
- Drought responses may produce new "limits" to future adaptive capacity
- Lack of “political will” and public support were common mentions in the area of deficits in adaptive capacity
- We hypothesize that vulnerability is a dynamic concept and that adaptive measures do not always work to lower vulnerability