The background of the slide is a photograph of a rural landscape, likely in North Dakota, featuring rolling hills and fields of tall grass. The entire image has a blue color cast. The title text is centered in the upper half of the image.

Planning for Potential Climate Change Impacts in North Dakota: Attitudes, Policy, and Barriers

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University of North Dakota

The logo for Scientific American, featuring the words "SCIENTIFIC" and "AMERICAN" in a bold, white, sans-serif font stacked vertically within a black rectangular box. The background of the entire page is a blue-tinted photograph of rolling hills and a field of tall grass under a cloudy sky.

**SCIENTIFIC
AMERICAN**

February 8, 2007

Climate Change Verdict: Science Debate Ends, Solution Debate Begins

The IPCC summary for policymakers definitively proclaimed the globe to be warming as a result of human activity, now the science shifts to impacts and solutions

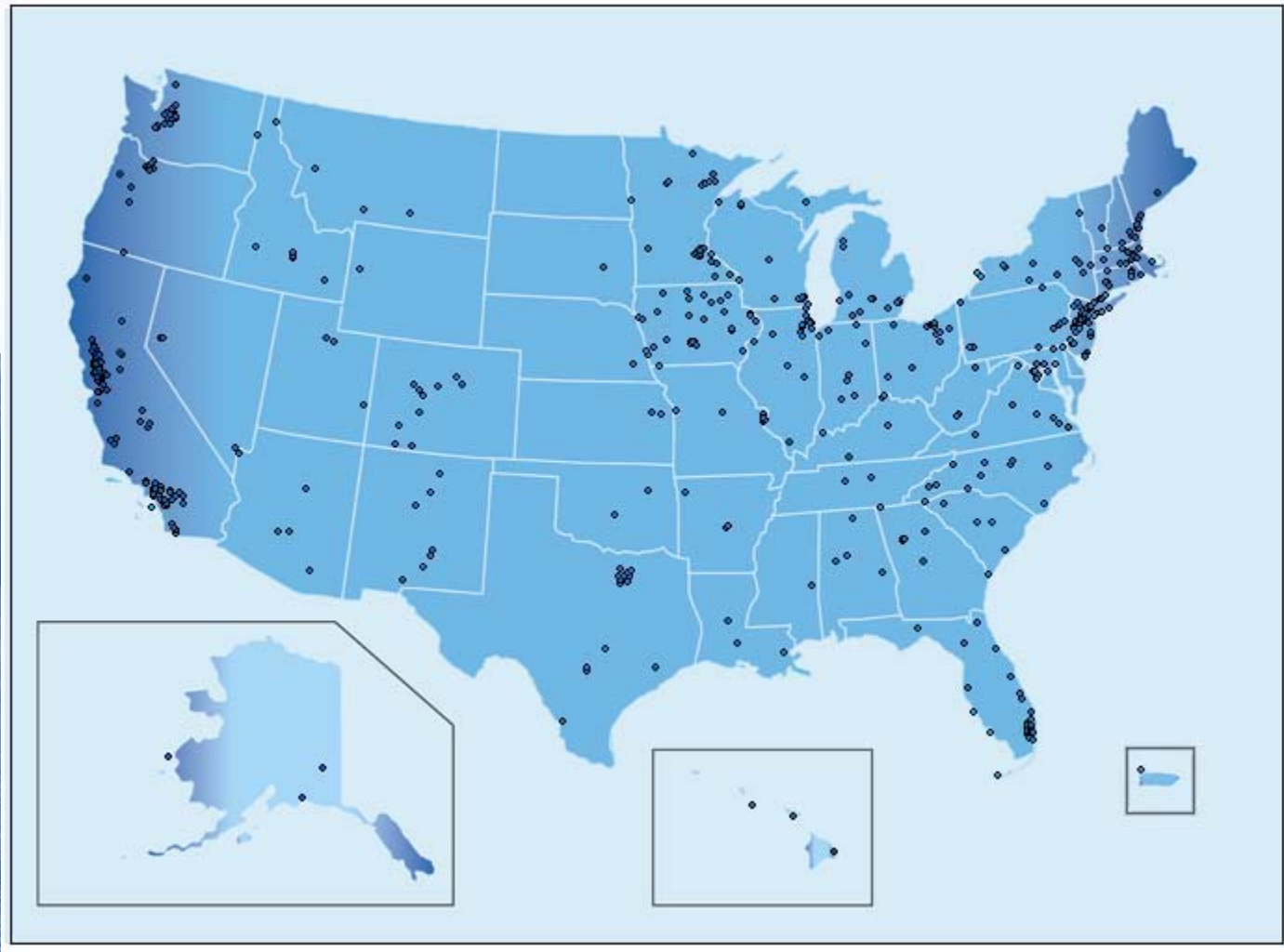
By David Biello

US Cities Respond: Call to Action

- US Mayors form Climate Agreement-
 - Promotes adopting Kyoto Protocol at local scale, February 2005
 - Nearly 800 cities- every state represented

Cities That Have Signed On to the US Mayors Climate Agreement

794 as of 2/14/2008



Source: <http://usmayors.org/climateprotection/ClimateChange.asp>

What are we doing locally?

- GF Mayor signed US Mayors Climate Agreement, July 2007
 - Green3 Grand Forks Resource Committee
 - 3 Goals: Cleaning our Environment, Increasing Efficiency, and Saving Money
 - Committee, 9-subcommittees formed Nov. 2007
 - Preparing a report of recommended actions for City Council review in March
 - Prompting community dialogue

Citizen Dialogue

- Letter to editor:
- These policies all are aimed at controlling what people do, where they do it and how they do it. Members of the Green Grand Forks committee have admitted as much.

Regulations that increase the costs of building and growing a business hurt the middle class. Policies that increase the building costs for critical city infrastructure lead to higher property taxes. Enacting policies that manipulate human behavior is un-American and runs contrary to the example set by the Founding Fathers.

[Mayor] Brown would be better off adhering to Thomas Jefferson and the Constitutional Convention than Al Gore and the U.S. Conference of Mayors.

GF Herald, 1/25/2008

Citizen Dialogue, cont.

- Citizen #1 Response:

- Narloch sees a conspiracy and lists all the things he thinks the committee might do. The reality is that none of the things he lists have happened and most probably never will. They certainly won't happen without a great deal of public debate and approval by Grand Forks citizens.

The committee's goals are to come up with ideas that'll increase efficiency and save taxpayers money while helping the environment.

Of course, part of the reason for the initiative is climate change. It is imperative that our community prepare for life in a carbon-constrained world. But instead of looking at climate change as an unsolvable problem, the committee is rolling up its sleeves to deal with this reality while also looking for opportunities.

Citizen Dialogue, cont.

- Citizen #2 Response:
- Narloch doesn't think we should do anything in Grand Forks that will help the environment. He doesn't like city planning, compact fluorescent light bulbs, promoting bicycle trails, commute-reduction programs or incentives for car pooling and public transit. Those all sound like positive actions to me, especially when I think about how much money and energy they can save.

Narloch's article has, in fact, encouraged me to support [the] Green Grand Forks [Committee].

We all have a choice in everything that we do. My choice is to own up to the fact that climate change is a problem and to do something about it for my own sake as well as my neighbor's.

What are we doing state-wide?



Empower North Dakota-
supply energy to the nation

- Renewable Energy:
 - Agriculture & Energy
 - Ethanol: from about 30 million gallons a year (2001) to more than 440 million gallons
 - Biodiesel: aiming for production of 85 million gallons
 - Using our Transmission Authority, we can build the transmission necessary - even if we have to build it ourselves - to develop both more large-scale wind farms and power plants.
 - 600 megawatts of wind power online in the near future
 - We are working to link new electrical generation to CAPX 2020 to take North Dakota energy to Minnesota and beyond.

Statewide, cont.

- Traditional energy:

- Coal:

- >4,000 megawatts of electricity a year
 - Lignite Vision 21, developing new clean-coal power plant projects, coal gasification, and coal-to-liquids, including carbon sequestration.

- Oil & Natural Gas:

- >113,000 barrels a day on a smaller footprint through directional drilling
 - New technology opportunities to sequester carbon

What about planning for natural resources & public health impacts across the state?

- 4.1 million breeding ducks nesting in ND
(ND Ducks Unlimited, 2005)
- Search for “climate change” on ND state government website: 211 hits
 - Compare to neighboring Minnesota: 2800 hits

Survey of ND Decision-makers

- Mixed format questionnaire, adapted from survey of California coastal managers
(Moser and Tribbia 2006)
- Representatives in government offices for natural resources & public health management
- 27% response rate: survey population of 495, 143 responses

Survey of Decision-makers, cont.

- Primary Question:

- Are these decision-makers considering climate change impacts; and if so, are they taking any steps to adapt their management of natural resources and public health?

Survey of Decision-makers, cont.

■ Secondary Questions:

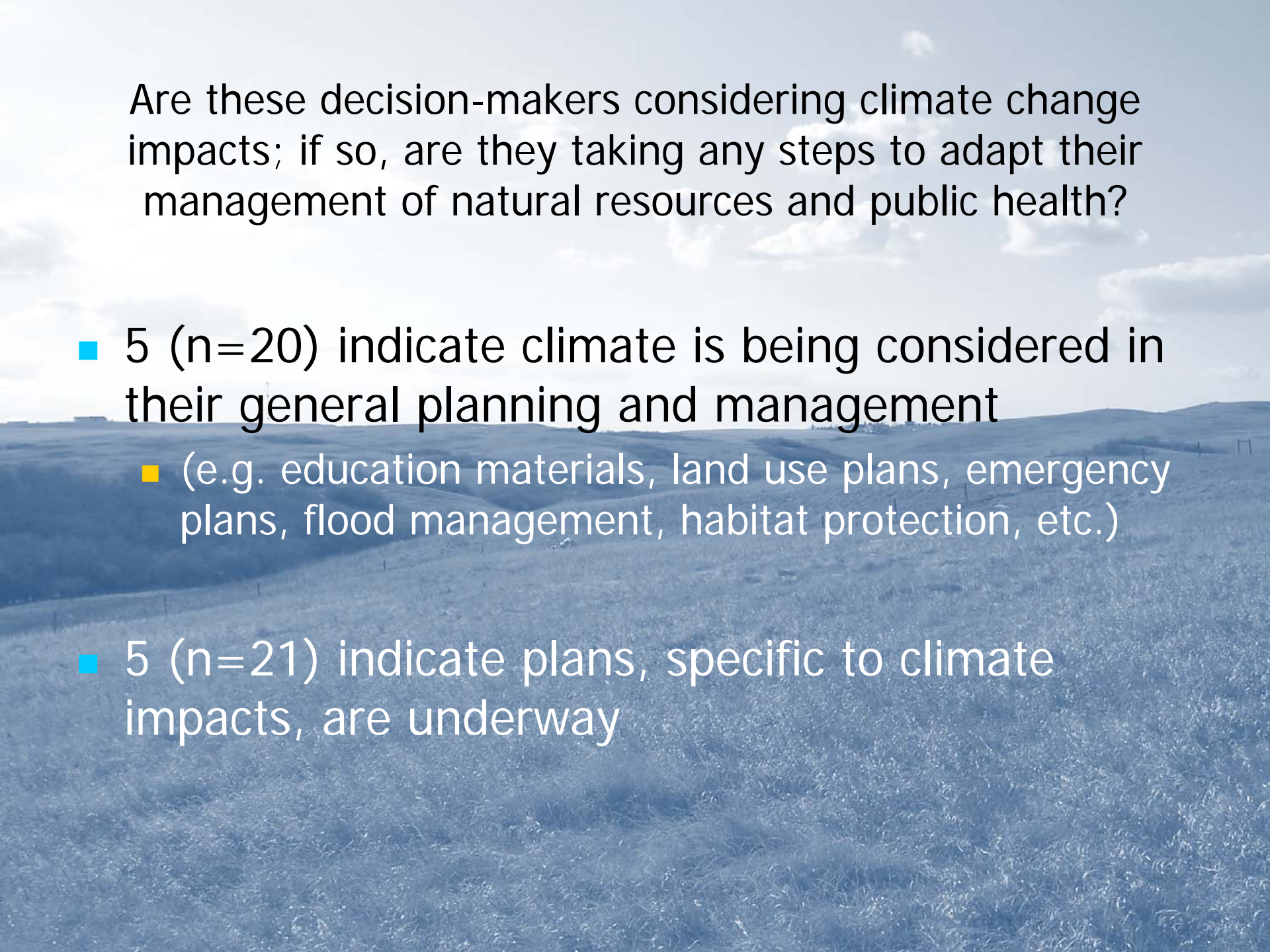
- Where do these decision-makers obtain their climate-relevant information?
- What are the barriers to climate science informing government decision-making in North Dakota; how can these be overcome?

Survey Results

- Respondents represent 10 categories of government decision-makers
 - Disaster/Emergency Services (n = 12)
 - Elected Officials, i.e. County Commissioner, Tribal Chair (n = 21)
 - Environmental Specialists, i.e. within Agriculture Extension (n = 21)
 - Infrastructure Supervisors, i.e. Highway Engineers (n = 11)
 - State Parks and Recreation Managers (n = 7)
 - Public Health Officials (n = 10)
 - Regional Planners (n = 4)
 - Soil Conservation Managers (n = 25)
 - Water Resource Managers (n = 17)
 - Weed Control Managers (n = 8)

Survey Results, cont.

- Average 18 yrs employment in government
- 41% hold a bachelors degree (n = 120)
- 71% male, 29% female (n = 118)
- 62% are 45-64 years of age,
 - 15% are older than 64,
 - 23% are younger than 45 (n = 118)



Are these decision-makers considering climate change impacts; if so, are they taking any steps to adapt their management of natural resources and public health?

- 5 (n=20) indicate climate is being considered in their general planning and management
 - (e.g. education materials, land use plans, emergency plans, flood management, habitat protection, etc.)
- 5 (n=21) indicate plans, specific to climate impacts, are underway



What are the common barriers to addressing potential climate change impacts in planning?

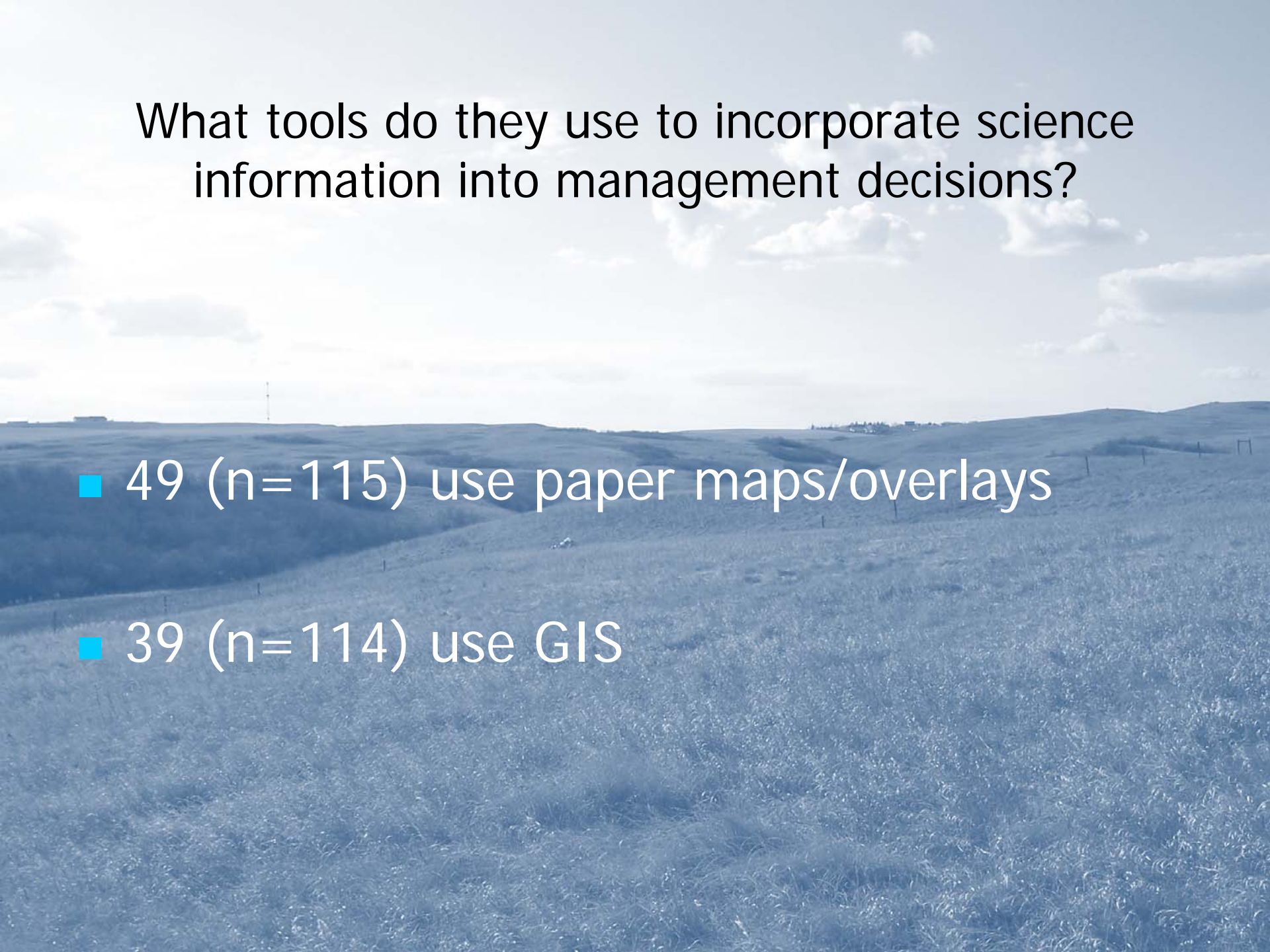
- 12 (n = 39) of respondents feel their office does not need to plan for potential climate impacts
- 38 (n=83) believe the science is still too uncertain to incorporate into planning
- 46 (n=84) see lack of public awareness/demand for action as barrier

What are the common barriers to addressing potential climate change impacts in planning? cont.

- 37 (n=81) indicate they lack a legal mandate to take action
- 30 (n=55) indicate lack of state/federal resources (e.g. funding, leadership, information)
- 40 (n = 82) indicate there are no perceived solutions; lack of decision options is a barrier

Where do these decision-makers obtain their climate-relevant information?

- 52 (n=99) most often consult colleagues in the office
- 50 (n=107) also rely on experts at state/local research institutions

The background of the slide is a photograph of a vast, rolling landscape under a bright, cloudy sky. The terrain consists of gentle hills and valleys covered in dense, tall grass. The entire image has a monochromatic blue tint. In the distance, a few small structures and a tall tower are visible on the horizon.

What tools do they use to incorporate science information into management decisions?

- 49 (n=115) use paper maps/overlays
- 39 (n=114) use GIS

What types of decision support do they believe would help overcome some of the barriers to addressing potential climate change impacts?

- 58 (n=89) indicate a great need for Hands-on Training of decision support tools/information in real-life settings
- 30 (n=89) indicate need for easy-to-access Internet resources (e.g. database of case studies that illustrate use of decision support information/tools)
- Collaboration through translators/boundary organizations (i.e. extension agents)

Building Collaborative Relationships


ForestPARC



The Forestry Remote Sensing Outreach Program



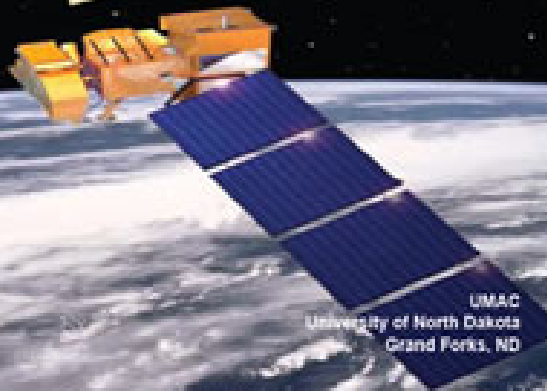
Source: <http://www.cnrhome.uidaho.edu/default.aspx?pid=68956>



Using Remote Sensing for Farming

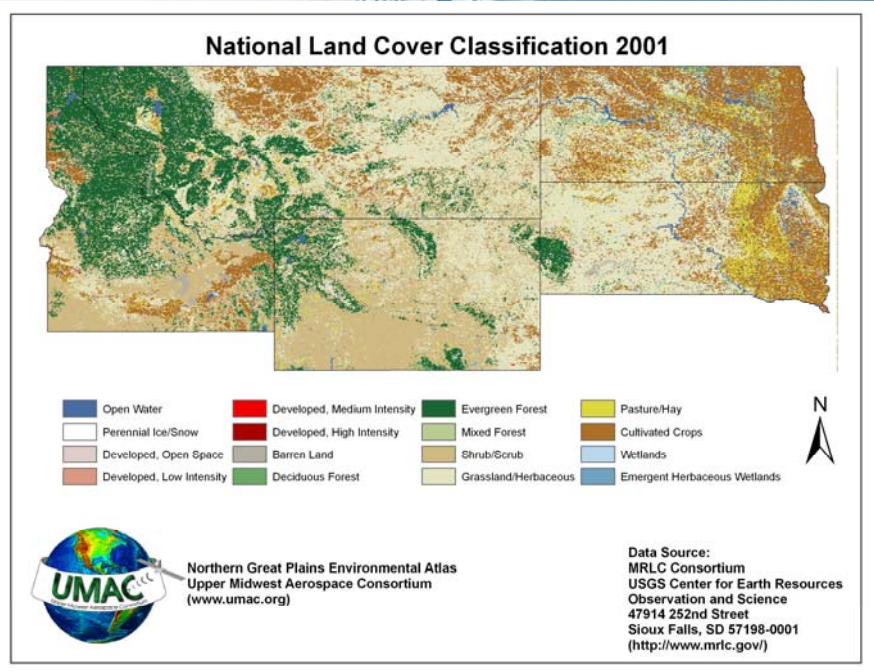
TRAINING SEMINAR

INTENDED FOR:
Farmers
Crop Consultants
Extension Agents
Crop Insurance Agents



UMAC
University of North Dakota
Grand Forks, ND

call for more information **701-777-2490**
or go to our website www.umac.org/agtraining



Source: <http://www.umac.org/atlas/themes.html>

Useful Resources

- Center for Research on Environmental Decisions, Columbia University:
 - <http://www.cred.columbia.edu/decisionpolicymakers/publications/>
- Climate Decision Making Center, Carnegie Mellon University:
 - <http://cdmc.epp.cmu.edu/>
- Center for Science & Technology Policy Research, University of Colorado, Boulder:
 - Communicating urgency, facilitating social change: new strategies for climate change: <http://www.isse.ucar.edu/communication/index.html>
 - Science policy assessment and research on climate: <http://sciencepolicy.colorado.edu/sparc/>
- ICLEI Local Governments for Sustainability:
 - <http://www.iclei.org/>