Some people say:
“I have personally experienced the effects of global warming.”
What does that mean, and does it matter?

Behavior, Energy & Climate Change Conference
November 30th, 2011
Washington, DC

Edward Maibach, MPH, PhD, Karen Akerlof, MS,
Neil Stenhouse, MA, Teresa Myers, PhD,
Connie Roser-Renouf, PhD
Our story has a timeline:

1. Fall 2008: We noticed something interesting in the first *Climate Change in the American Mind* survey – 1/3rd of all Americans believe they “have personally experience global warming.”

1. Winter 2010: We surveyed Americas TV weathercasters and found that ¼ of them said they “have seen evidence of climate change in their local weather patterns.”

1. Summer 2010: Karen Akerlof took a trip to northern Michigan to take a closer look at the folks in Alger County.

1. Winter 2011: We surveyed America’s weathercasters again to take a closer look – 35% said they “have personally observed the impacts of climate change.”

1. Spring 2011: We re-surveyed folks who took our Fall 2008 survey to see what, if anything, had changed.
Abstraction is an anathema to effective communication
Abstract
Where higher concepts are derived from literal ("real" or "concrete") concepts, first principles, or other methods.
Concrete

Experiences that can be processed directly with one or more of our five senses
Our brains process risk information in two ways:

- **Experiential system**
  - “experiencing is believing”

- **Analytic system**
  - requires logic and evidence

**Processing of risk**

Source: Slovic, Finucane, Peters, & McGregor, 2004
Experiential system
“experiencing is believing”

Processing of risk

Source: Slovic, Finucane, Peters, & McGregor, 2004
CLIMATE CHANGE
IN THE AMERICAN MIND

Americans’ climate change beliefs, attitudes, policy preferences, and actions
Do you think that global warming is happening? How sure are you that global warming is happening?

“I have personally experienced the effects of global warming.”

- Very sure global warming is happening: 4%
- Extremely sure global warming is happening: 29%
- Somewhat sure global warming is happening: 43%
- Not at all sure global warming is happening: 24%

Yale/George Mason (2008) unpublished data
**Experiencing global warming on Lake Superior’s shores**

Akerlof, K., Maibach, E., Fitzgerald, D., Cedeno, A. Y., & Neuman, A.

**The Great Lakes**
- largest freshwater system in the world

**Lake Superior**
- largest freshwater lake in the world by surface area

**Rapid climatic changes occurring:**
- **Air temperatures** increasing: 2.7°F (‘00-’10 vs. 20th century)
- **Water temperatures** of Lake Superior increasing almost double rate of air: 4.5°F (‘79-’06)
- **Winter ice** covering Lake Superior for shorter periods
- **Heavier downpours**
- **More lake effect snow** in winter
- **Increased extreme weather events**
- **Changing seasons**
Do Alger County residents believe they are experiencing changes from global warming?

Do you agree or disagree with the statement: "I have personally experienced the effects of global warming"?

- Strongly disagree: 25%
- Somewhat disagree: 11%
- Don't know: 37%
- Somewhat agree: 21%
- Strongly agree: 6%

n=732
Where do Alger County residents believe they are experiencing changes from global warming?

If you have experienced global warming, where have you personally experienced it?

(multiple responses allowed)

- Alger County: 67%
- Elsewhere in Upper Michigan: 23%
- Elsewhere in the United States: 40%
- Other: 6%

n=198
What changes do respondents identify?

In what ways have you personally experienced global warming? *(Open-ended response, coded)*

- Seasons: 36%
- Weather/weather patterns: 25%
- Lake levels changing: 24%
- Changes to animals/plants: 20%
- Snowfall: 19%
- General temperature changes: 16%
- Rainfall: 15%
- Human health impacts: 11%
- Drought/getting drier: 9%
- Climate/climate change: 8%
- Extreme weather/storms: 7%
- Economic impacts: 6%
- Loss of ice, ice sheets, or glaciers: 6%
- Fires: 3%
- Lake temperatures changing: 3%

n=143
Do respondent perceptions match climatic data?

Yes ....

In what ways have you personally experienced global warming? 
(Open-ended response, coded)

Dates of last frost with linear trend line

Dates of first frost with linear trend line

NCDC data
And no ...

Almost all respondents said they had noticed LESS snow – only 1 respondent said MORE snow

Total monthly snowfall (decadal averages)

NCDC data
Weathercasters as climate educators
TV Weathercasters:
What evidence of climate change have you seen in your local weather patterns? (2010)
What climate change impacts have you personally observed? (2011)

<table>
<thead>
<tr>
<th>Category</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seasons (general term)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature changes not related to seasons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extreme weather (storms etc)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snowfall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rainfall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drought</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes to plant and animal species</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature records</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climate change (general term)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of ice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in timing of freezing, frost etc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precipitation (specific term)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weather extremes (e.g. more extreme range)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes in water body temperatures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes in weather patterns (not specified)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes in water body levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TV Weathercasters:

Where did you personally observe the impacts of climate change? (2011)

Relationship of weathercasters’ personal experience of climate change to the “Big Five” key beliefs about climate change

- % "very" or "extremely" certain GW is happening
- % believe GW is mainly human-caused
- % believe at least one type of significant harm from climate change will occur.
- % believe humans could, in theory, reduce GW
- % said most scientists think global warming is happening
Belief certainty that global warming is happening by belief in having experienced it

- Strongly agree have personally experienced global warming
- Somewhat agree
- Somewhat disagree
- Strongly disagree have personally experienced global warming
[Liberals vs. Conservatives] Belief certainty that global warming is happening by belief in having experienced it

- Liberals - Strongly/somewhat agree have personally experienced global warming
- Liberals - Strongly/somewhat disagree have personally experienced global warming
- Conservatives - Strongly/somewhat agree have personally experienced global warming
- Conservatives - Strongly/somewhat disagree have personally experienced global warming
or

?
Model #1: Reciprocal Lagged

and
In summary:

1. Personal experience with climate change appears to deepen understanding and engagement with the issue. This is so regardless of one’s politics.

1. Like politics, however, the climate change impacts that tend to get noticed tend are local.

1. Showing these local manifestations – such as changes in seasonal events, weather patterns, and local changes in plants and animals – may be one of the best available means of making the global local, and the abstract concrete.
All 4C reports can be downloaded at:

Climatechangecommunication.org