NARST Annual Conference, Puerto Rico, 2013

Symposium on Climate Change Education:
Policies and Implications

Symposium sponsored by the NARST Policy and External Relations Committee with Charles W. Anderson and Nancy Brickhouse as discussants.

CLIMATE CHANGE EDUCATION RESEARCH

POLICIES AND IMPLICATIONS

J. Randy McGinnis, Emily Hestness, Wayne Breslyn, Chris McDonald
University of Maryland, College Park

CLIMATE CHANGE EDUCATION RESEARCH
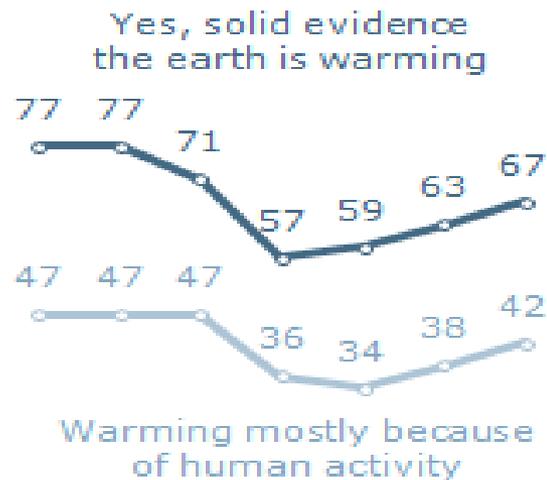
POLICIES AND IMPLICATIONS

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PUBLIC THINKING ABOUT CLIMATE CHANGE IN USA

- Recent Pew Center data:

Two-Thirds Say the Earth Is Warming

Yes, solid evidence the earth is warming

77 77 71 57 59 63 67
47 47 47 36 34 38 42

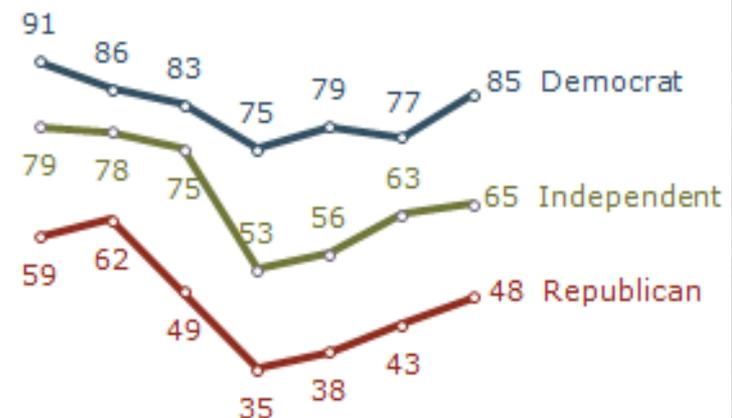Warming mostly because of human activity

2006 2009 2012

PEW RESEARCH CENTER Oct. 4-7, 2012.

Across Party Lines, More Say There Is Evidence of Warming
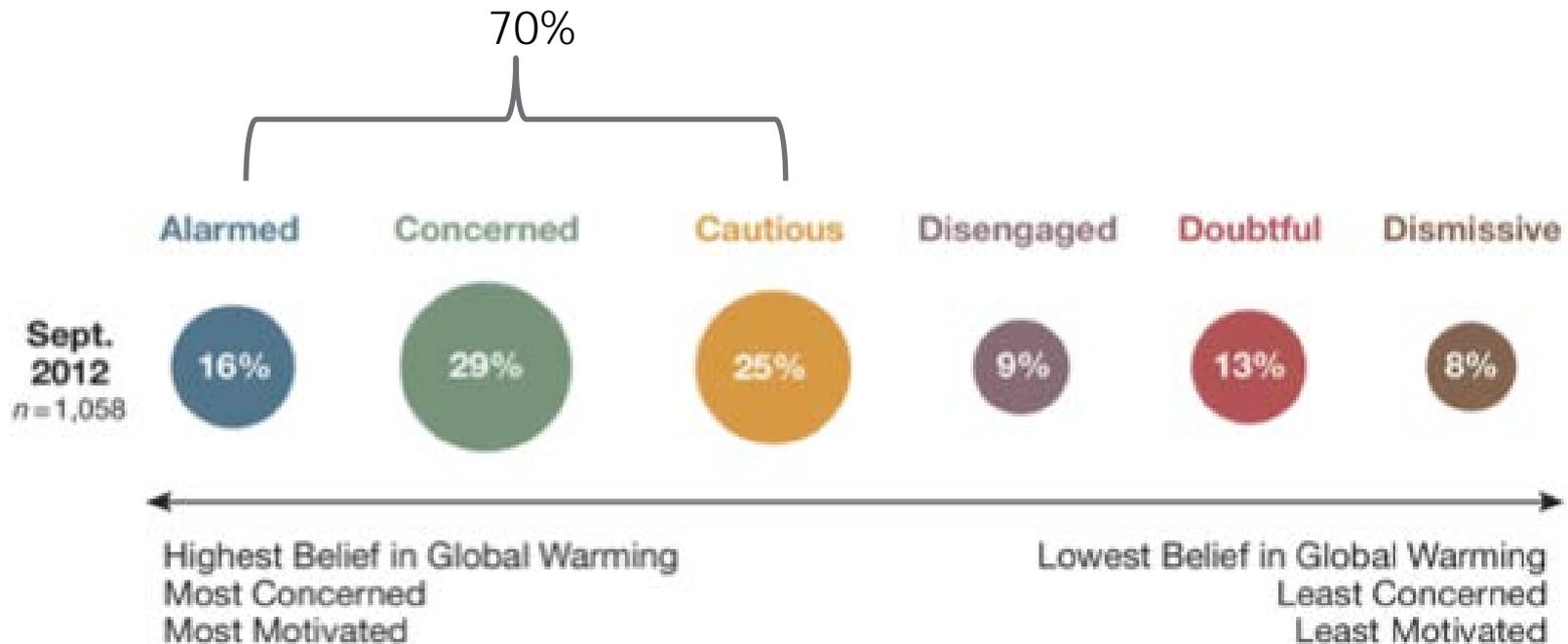
% saying there is solid evidence of warming

91 86 83 75 79 77 85 Democrat
79 78 75 53 56 63 65 Independent
59 62 49 35 38 43 48 Republican

2006 2009 2012

PEW RESEARCH CENTER Oct. 4-7, 2012.

GLOBAL WARMING'S SIX AMERICAS

The Six Americas Audience Segments

70%

Alarmed	Concerned	Cautious	Disengaged	Doubtful	Dismissive

Sept. 2012
n = 1,058

16%   29%   25%   9%   13%   8%

Highest Belief in Global Warming
Most Concerned
Most Motivated

Lowest Belief in Global Warming
Least Concerned
Least Motivated

Proportion represented by area

Source: Yale / George Mason University

NATIONAL PUBLIC RADIO STORY (USA)

December 26, 2012

NATIONAL PUBLIC RADIO STORY (USA)

n p r news   arts & life   music   listen

news ▸ u.s. ▸ education

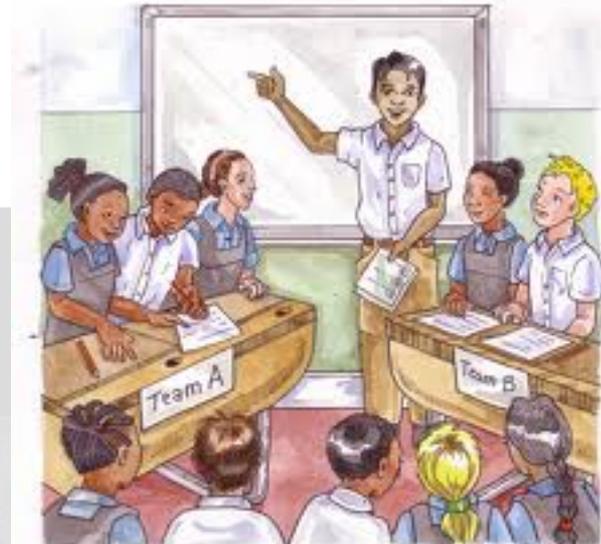## A Hot Topic: Climate Change Coming To Classrooms

Classroom debate?

by JENNIFER LUDDEN

March 27, 2013   3:31 AM

▶ **Listen to the Story**

Morning Edition

NEXT GENERATION SCIENCE STANDARDS

"ESS3.D: Global Climate Change

- If Earth's global mean temperature continues to rise, the lives of humans and other organisms will be affected in many different ways.

- Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature…"

STATUS OF STATE ENVIRONMENTAL LITERACY PLANS IN USA

Source: North American Association for Environmental Education (NAAEE, 2013)

Plans include specifics about:

-Graduation requirements

-Standards

-Professional development

-Measurement

-Implementation and funding

(47 states + D.C. surveyed)

MADE-CLEAR

Maryland and Delaware Climate Change
Education Assessment and Research

- Maryland (MD) and Delaware (DE) Climate Change Education, Assessment, and Research

- 5-year project supported by NSF Phase II Climate Change Education Partnership (CCEP) grant

- Build climate change education partnerships among two states' (MD & DE, USA):
  - research and teaching universities
  - public schools
  - federal agencies
  - public and private sectors

MARYLAND (MD), USA

- MD first state in USA to pass environmental literacy graduation requirement (2010)

- Environmental Literacy Standards

Example:

STANDARD 5   HUMANS AND NATURAL RESOURCES
The student will use concepts from chemistry, physics, biology, and ecology to analyze and interpret both positive and negative impacts of human activities on earth's natural systems and resources.

Topic A: Human Impact on Natural Processes
    Indicator 1:   Analyze the effects of human activities on earth's natural processes.
    Indicator 2:   Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.

Topic B: Human Impact on Natural Resources
    Indicator 1:   Analyze, from local to global levels, the relationship between human activities and the earth's resources.

DELAWARE, USA

- All public schools teach same statewide curriculum

- Climate (change) not in current curriculum

- Revising state curriculum based on NGSS

- Climate change is in NGSS
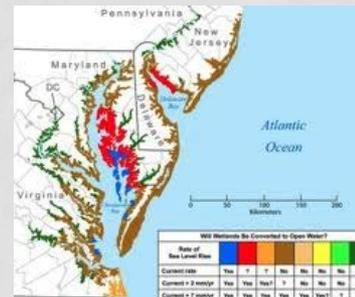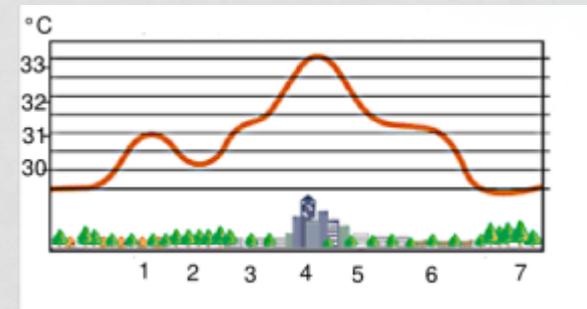
CULTURALLY RELEVANT LEARNING PROGRESSIONS

1. Extreme Weather

2. Sea Level Rise

3. Urban Heat Island Effect

DEVELOPMENT OF OUR DRAFT HYPOTHESIZED LEARNING PROGRESSIONS*

- Based on NGSS draft

- Built on prior research (e.g. Jin & Anderson, 2012)

- Tapped "misconceptions" literature base

- Focus on student thinking

* Based on our review of the NGSS. Still needs to be empirically validated.

RESEARCH GOALS WITH LEARNING PROGRESSIONS

To investigate:

1. how teaching a particular climate change impact helps students in a particular geographic region to learn about climate change science.

2. how teachers can use these learning progressions to teach about climate change science.

3. growth over time of students' knowledge of climate change.

J. Randy McGinnis
Wayne Breslyn
Chris McDonald
Emily Hestness

www.ClimateEdResearch.org