MADE-CLEAR (MC) CCEP Grant

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PEW Survey on Public Attitudes in USA (1/11-16/2012)

Public's Agenda for President and Congress 2001-2012

% considering each as a "top priority"	Jan 2001 %	Jan 2002 %	Jan 2003 %	Jan 2004 %	Jan 2005 %	Jan 2006 %	Jan 2007 %	Jan 2008 %	Jan 2009 %	Jan 2010 %	Jan 2011 %	Jan 2012 %	
Strengthening nation's economy	81	71	73	79	75	66	68	75	85	83	87	86	+18
Improving job situation	60	67	62	67	68	65	57	61	82	81	84	82	+25
Protecting environment	63	44	39	49	49	57	57	56	41	44	40	43	-14
Reducing influence of lobbyists	--	--	--	--	--	--	35	39	36	36	37	40	
Dealing with illegal immigration	--	--	--	--	--	--	55	51	41	40	46	39	
Strengthening the military	48	52	48	48	52	42	46	42	44	49	43	39	
Dealing with global trade	37	25	--	32	32	30	34	37	31	32	34	38	
Improving roads, bridges, and public transportation	--	--	--	--	--	--	--	--	--	--	33	30	
Reducing military spending	--	--	--	--	--	--	--	--	--	--	--	29	
Reforming campaign finance	37	23	--	24	--	--	--	--	--	--	--	28	
Dealing with global warming	--	--	--	--	--	--	38	35	30	28	26	25	-13

PEW Survey on Public Attitudes USA (1/11-16/2012)

Wide Partisan Gaps Over Environment, Education, Poverty, Budget Deficit

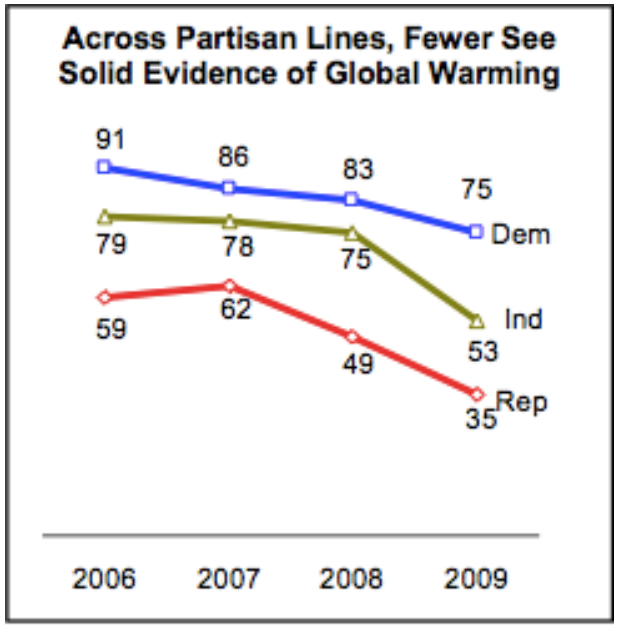
% considering each as a "top priority"	Rep %	Dem %	Ind %	R-D diff
Protecting the environment	27	58	40	-31
Improving educational system	51	79	60	-28
Dealing with problems of the poor	39	66	46	-27
Dealing with global warming	11	38	21	-27

Was ~30% 5 years ago

PEW Survey on Public Attitudes USA (11/9-14/2011)

Opinions About Global Warming: 2006-2011

Is there solid evidence the earth is warming?	2006 %	2007 %	2008 %	2009 %	2010 %	2011 %
Yes	77	77	71	57	59	63
Because of human activity	47	47	47	36	34	38
Because of natural patterns	20	20	18	16	18	18
Don't know	10	10	6	6	6	6
No	17	16	21	33	32	28
Mixed evidence/Don't know	6	7	8	10	9	9
	100	100	100	100	100	100
How serious a problem is global warming?						
Very serious	43	45	44	35	32	38
Somewhat serious	36	32	29	30	31	27
Not too serious	11	12	13	15	16	16
Not a problem	9	8	11	17	18	17
Don't know	1	3	3	3	3	2
	100	100	100	100	100	100



PEW Survey on Public Attitudes USA

Summary of Results:

- Concerns over environment/global warming have fallen over past five years
- Republicans more than three times less likely to identify "dealing with global warming" as a top priority
- Democrats almost twice as likely to believe there is consensus among scientists about global warming

Policy Impact for Delaware, USA

- Increase rigor of STEM courses
- Create clearer pathways for students to excel in STEM
- Expand science literacy of all students
- Provide pipeline of science professionals as part of state-wide economic development strategy
- Prepare individuals to implement green technologies—keys to CC mitigation and strong economy

Policy Impact for Maryland, USA

- Align P-12 STEM curriculum with college requirements and workplace expectations
- Triple number of STEM teachers in shortage areas
- Enhance STEM preparation for elementary teachers
- Improve knowledge/skills of all P-20 math/science teachers
- Provide STEM internships, co-ops, or lab experiences for all interested HS and college students
- Increase number of STEM college grads by 40% by 2015
- Create MD's STEM Innovation Network to make STEM resources widely available to public

MADE-CLEAR Project Research Prospectus

Maryland and Delaware Climate Change Education Assessment and Research

- Socioscientific issues (SSI) initiative provides a framework for Climate Change Educaiton that is both personally and socially relevant
- SSIs motivate students and encourage social activism
- Students struggle to understand Climate Change because it involves complex systems, which interacts with various alternative conceptions
- Learning progressions (LPs) provide a rich framework for understanding when and how students can learn about climate change at various levels
- Smith, Wiser, Anderson, Krajcik, and Coppola (2004) describe LP pedagogy as where "big ideas can be understood in progressively more sophisticated ways as students gain in cognitive abilities and experiences with phenomena and representations" (p. 5)

MC Research Prospectus

Maryland and Delaware Climate Change Education Assessment and Research

Goal: Embed climate change science into formal and informal education in the region.

Objective #1: Use new and emerging technologies to support climate change learning while simultaneously enhancing appreciation of science and technology.

- Technological resources include visualizations, interactive games, simulations, digital probes, on-line electronic data, and virtual experimentation (see Swarat, Ortony, & Revell, 2012; Svihla and Linn, 2011)

MC Research Prospectus

Maryland and Delaware Climate Change Education Assessment and Research

Goal: Embed climate change science into formal and informal education in the region.

Objective #2: Advance learning sciences research in the areas of conceptual change and learning progressions to create new understandings of how students from diverse backgrounds engage in learning about climate change.

- Assessments will draw on students experience and make student thinking visible, which will improve instructional interventions (see Smith et al., 2004) .

MADE-CLEAR Project Research Prospectus

Maryland and Delaware Climate Change Education Assessment and Research

Goal: Embed climate change science into formal and informal education in the region.

Objective #3: Assess new approaches to professional development (PD) that foster changes in teacher knowledge, skills, and dispositions through inquiry and the exploration of the relationships of science and technology to society.

- Assess outcomes of PD activities that incorporate learning sciences principles and climate change science through quasi-experimental design and survey research.

Potentially Fruitful RQs

Maryland and Delaware Climate Change Education Assessment and Research

- How does an instructional intervention help students advance through a learning progression for understanding carbon cycles (Anderson, Chen, & Mohan, 2009)?
- What is a possible learning progression for evaluating conflicting evidence about the climate change SSI?
- What is the relationship between how students respond to evidence about the climate change SSI and their views on the Nature of Science (NOS) (Zeidler et al., 2005)?
- What effect does an instructional intervention have on student conceptions about climate change science?
- What factors influence teachers' decisions to teach about the climate change SSI (Klosterman & Sadler, 2010)?

MC Phase II Plans

Maryland and Delaware Climate Change Education Assessment and Research

- 5 year project
- Focus on PD and pre-service ed. for teachers (grades 8-12) in climate change ed. in Delaware and Maryland
- Focus on bridging formal and informal science education for teachers
- Involvement of higher education content and education faculty in teacher PD and in instructional module development and delivery
- Research extends to investigation of student learning

Dissemination of CC Resources

- Used Google Keyword Tool to learn about CC-related searches
- Provides insight into how people seek CC info
- Informs dissemination efforts both online and offline

Keyword or Phrase[1]	Average U.S. Monthly Searches
global warming	165,000
climate change	33,000
greenhouse effect	22,000
global warming facts	22,200
what is global warming	14,800
greenhouse gasses	14,800
effects of global warming	5,400
causes of global warming	1,300
global warming effects	5,400
global warming causes	5,400

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