

Final Report: Climate Change Awareness for all Educators

Award Number: 0807590

Submitted by Steve Ackerman and Margaret Mooney
Cooperative Institute for Meteorological Satellite Studies
University of Wisconsin-Madison

Overview.....	1
Summary of Findings.....	2
Recommendations.....	2
Appendices (I –XIII).....	4

Overview

The Cooperative Institute for Meteorological Satellite Studies (CIMSS) conducted two separate Climate Education Summits for language arts and social studies teachers in 2009, one in Wisconsin and another in Maryland. Not surprisingly, the geographically distinct meetings produced similar findings. Prevailing themes include:

- Climate is more tangible for students when focusing on local impacts of climate change.
- Climate change lessons should include solutions and age appropriate mitigation activities.
- Teachers want climate change resources specifically geared to grade levels, elementary educators teaching multiple subjects request simplified graphs and charts and material at lower reading levels.
- Non-science teachers experience a dearth of climate related resources at all grade levels.
- Teachers want guidance on how to address naysayers, hype and fake science.
- Teachers want more climate related professional development opportunities.

Both events were held on a Saturday and followed similar agendas with time and travel stipends for participants. The Wisconsin summit was conducted in February at CIMSS with 11 teachers from Madison and Milwaukee Wisconsin. The Maryland summit was held in November at the NOAA Science Center with 14 participants from DC, Virginia and Maryland. Both summits started with a short survey followed by presentations on climate change, group discussions and break-out sessions. NOAA provided the venue and logistical support for the November event.

Feedback was collected from pre-summit questionnaires, on-site surveys, break-out sessions, and final evaluations. Prior to each meeting, the following two questions were distributed electronically to participants:

- 1) What is the top (1 or 2) questions you have about Climate Change?
- 2) Do your colleagues or students ever mention or ask questions about the 2007 IPCC Summary for Policy Makers?

Responses to the first question were addressed at the respective summits. For the 2nd question, a majority of participants (>90%) indicated that the IPCC report was never discussed at their schools and many had no idea what it was. Prior to the February summit held at CIMSS, a PDF

of the 18-page Summary for Policy Makers was distributed as recommended reading. For the second summit held later in the year, the 14-page chapter on Global Climate Change from the 2008 USGCR Impacts report was distributed as recommended reading. In spite of pre-summit questionnaires and recommended readings, when asked to write out what the IPCC acronym stood for, only 1 participant got this correct. Even more enlightening, both groups thought that the recommended readings were too dense and too complicated for educators who do not teach middle or high school science, which was especially interesting since the 2008 USGCR report is significantly easier to read than the actual IPCC summary yet still considered too difficult for G6-12 language arts and social study teachers and elementary educators who teach all subjects.

Summit agendas, attendee lists, answers to pre-summit questionnaires, surveys and evaluations follow this summary report. The evaluations indicated a high degree of satisfaction with the summits. Nineteen participants rated the experience as excellent; the most favorable score possible, the others checked the next best box of very good. Resources from the Wisconsin summit were sent directly to participants electronically; resources from the Maryland event were placed on-line for download and can be viewed at <http://cimss.ssec.wisc.edu/teacherworkshop/DC/>.

Summary of Findings

The salient findings identifying the need for regional connections to climate change and the repeated request for age-appropriate resources and mitigation activities were listed at the beginning of this report. This feedback underscores the need to continue the current trend of making climate connections to local ecosystems. The most striking information gathered was the lack of awareness around the IPCC report. The greatest need identified was the scarcity of climate related classroom resources for non-science classes and the request for climate related professional development opportunities which was underscored by the high number of incorrect survey responses to basic questions concerning melting ice scenarios and greenhouse gases.

Recommendations

Most of the classroom resources requested by language arts and social study teachers could be developed by modifying existing resources for science classes. This endeavor could be accomplished systematically and efficiently by CIMSS, NSF, NOAA and/or NASA in collaboration with non-science teachers at the high school, middle school and elementary grade levels who could review the revisions. Once developed, these resources would need to be widely advertised.

Concerning the issue of professional development opportunities, teachers clearly indicate a preference for workshops where they can interact with the presenters, however, the time, cost and carbon footprint required to conduct workshops combined with the urgency of the climate problem makes face-to-face educational events fairly impractical. An exception to this could be large scale trainings or teacher in-services conducted in collaboration with school districts.

The cost-and-carbon-efficient solution involves web-based delivery of classroom resources and professional development curriculum incorporating recommendations gathered at these summits, such as podcast demonstrations of classroom activities and visuals that demonstrate numerical

concepts. This option presents a practical and potentially expedient way to address the need for classroom resources and professional development opportunities.

The combination of face-to-face trainings explaining the science of climate change coordinated with school districts followed by web-based delivery of non-science resources and professional development curriculum would be optimal. As one teacher wrote in the evaluation *“Today was great, but I’d like to see the learning continue. An ongoing experience is much more valuable than a one-shot deal.”* One model to achieve this could involve the following steps:

- 1) developing classroom resources for non-science teachers by modifying existing resources,
- 2) developing web-based climate curriculum for non-science teachers,
- 3) identifying regional partners to work with school districts or state departments of education,
- 4) providing large scale workshops or teacher in-services followed by on-line professional development curriculum culminating in an on-going technology-supported virtual community of climate literate social studies and language arts teachers.

Taking a project to this level and galvanizing nation-wide dissemination would involve many partners but even this is achievable due to partnerships already in place through the Climate Literacy Network.

Appendices

I. February Summit Agenda

	<h2 style="text-align: center;">Climate Education Summit</h2> <p style="text-align: center;">Atmospheric Oceanic and Space Science Building University of Wisconsin-Madison</p> <p style="text-align: center;">1411 AOSS, 1225 W. Dayton, February 2009</p>	
---	---	---

Saturday, February 28th

- | | |
|-------|--|
| 9:00 | Welcome & Summit Overview
Dr. Steve Ackerman, CIMSS/SSEC, UW-Madison |
| 9:10 | Climate Change Questionnaire |
| 9:20 | Introductions and Discussion |
| 9:50 | Climate Mechanisms Overview Presentation |
| 10:30 | Break |
| 10:50 | Identifying challenges & misconceptions brainstorming session |
| Noon | Lunch (View weather and climate on a 3D globe in 148) |
| 12:45 | Climate Change Overview Presentation |
| 1:30 | Identifying approaches to explain climate system science (break-out session) |
| 2:15 | Report-back from break-out sessions and discussions |
| 2:30 | Break |
| 2:45 | On-line resources and activities for weather and climate |
| 3:15 | Summary Discussions, Conclusions, Next Steps |
| 4:00 | Climate Change Questionnaire & Evaluations |
| 4:30 | Adjourn |

		
---	---	---

<http://cimss.ssec.wisc.edu/education/>

II. February Summit Participants

Name /email	School	Grade(s)
Daniel Beaman <dbeaman@madison.k12.wi.us>	Emerson Elementary Madison	4th/5th
Jacquelyn C. Kendall kendaljc@milwaukee.k12.wi.us	Craig Montessori School Milwaukee	4/5/6 All subjects
Julie Fitzpatrick <jfitzpatrick@madison.k12.wi.us>	Frank Allis Elementary Madison	1st grade
Madeleine Para <mpara@madison.k12.wi.us>	Chavez Madison	first grade
Laurie Solchenberger <lrsochenber@madison.k12.wi.us>	Lincoln Elementary Madison	Cross-Categorical (grades 3/4/5)
Ann Velden <avelden@madison.k12.wi.us>	Chavez Madison	4th/5th
Kathy Huncosky <khuncosky@madison.k12.wi.us>	MMSD Elementary Science Instructional Resource Teacher	
Bridget Ciurlik <bciurlik@mtsd.k12.wi.us>	Lake Shore Middle School, Mequon.	sixth grade reading, english and mathematics
Joseph Ciurlik <jciurlik@mtsd.k12.wi.us>	Homestead High School in Mequon	government and American studies at at 10, 11, and 12
Resha Wyman <rwyman@dsd.k12.wi.us>	Dodgeville Middle School Dodgeville	Speech and Language Pathologist
Jill Newton <jillnew@aol.com>	Milwaukee high school	Math & science



III. February Summit Applications

Hi Margaret,

This is just a check-in. I wanted to let you know that I extended an invitation to about 35 MMSD elementary science teachers to apply for the teacher summit quite some time ago. I hope that you have received some applications from these teacher leaders in the district. Hope all is going well.

Kathy

Kathy Huncosky

Teaching & Learning-Science Rm 125

MMSD Elementary Science Instructional Resource Teacher

545 West Dayton Street

Madison, WI 53703

608-663-5205

Hi Margaret and Kathy,

I am a fourth/fifth grade teacher at Emerson Elementary and am interested in the climate change workshop. I will fill out the application and send it to you this afternoon.

Thanks,

Dan

My address is:

Dan Beaman

2463 Thatcher Lane

McFarland, WI 53558

I may already be in the UW system because I worked for UW-La Crosse until Jan 1 2008.

Thanks,

Dan

Hello,

I received an e-mail about the climate change program for teachers in February. I would be interested in participating. I teach first grade, and would like to figure out how to talk about this with my students. I think it is one of the most important issues for us to face, in order for the children I teach (and everyone else) to have a decent future. I have attended the Midwest Renewable Energy Fair for the last two years, including once for credit, but still find it difficult to teach about in a first grade classroom.

Sincerely,

Madeleine Para

Chavez, first grade

1123 Erin St.

Madison, WI 53715

Hi Margaret,

Today we received information on the Teacher Summit on Climate Education that will take place in February. I am a 4/5 teacher at Chavez in Madison, and I am very interested in this topic! Because my husband is Chris Velden, climate change has been a topic of interest and discussion for many years. I was excited to hear about this opportunity to look at ways to educate children on climate change. I would love to join this workshop! Please let me know if you need any further information.

Thanks,

Ann Velden

Ms Mooney,

I would like to register for the Climate Control Conference at UW on Feb 28. I am a Speech and Language Pathologist based at Dodgeville Middle School and actually will be teaching some min-courses here about the Green and Healthy Schools initiative and on individual actions that help the environment.

Thank you.

M. Resha Wyman

Hi Margaret,

Please consider this an application for the Teacher Summit on Climate Education. I am an elementary education Cross-Categorical teacher (grades 3/4/5) at Lincoln Elementary who has a passion for science and environmental studies, and who loves to share that passion with others!

I try to integrate science into as many lessons as possible, and to stay active and current in teaching and learning about science-related issues.

- Master's degree and license in special education (pre-K through 12)
- Regular education licensure (grades K-8) in the states of Wisconsin and Alaska

- Prior to teaching, I earned degrees in Wildlife Ecology, Rural Sociology, and Conservation Biology from the UW-Madison. With those degrees, I worked for the following agencies: Forestry Sciences Lab in Juneau, AK; UWGS in Anchorage, AK; & USFWS environmental education in Anchorage, AK. (Please see the website for Shorebirds Sister Schools Program: http://shorebirds.pwnet.org/migration/resource_center_sister.htm) This program encourages teachers to be actively engaged in teaching science. I was one of its educators who worked with teachers in the classroom and organized/led field trips.
 - Most recently, I participated in a class offered to Madison teachers through the UW: "Environmental and Water Issues Around the World".
 - During the summer of 2007, I worked for "Global Explorers", a non-profit based in Colorado (please see their website: <http://www.globalexplorers.org/>). I led two trips of middle and high school students from Winnipeg to Churchill (on Hudson Bay in Canada), to explore the Arctic region and learn about climate change. We stayed for part of the time at the Churchill Northern Studies Centre where we had the opportunity to talk with scientists about their research, eventually working with one of them to do some of our own.
 - During the 2007-2008 school year, I had the opportunity to lead-teach the FOSS science program for a 2nd grade teacher with whom I was co-teaching. She said she did not feel comfortable teaching science, and this has been my experience when working with elementary school teachers. I wanted to not only teach the students about science, but to make the "kit" simplified for my teammate's future use.
 - I have also had experience working with the Cook Inlet Tribal Council (Anchorage, Alaska) at a remote field site. Here, I led camps of youth ages 13-21 in tree-planting, and worked with Elders to coordinate culturally-related activities. Thank you for your consideration. What an exciting opportunity!
- Laurie Solchenberger
201 Kings Row #4
Monona, WI 53716

Hi Margaret,

I teach first grade and would be interested in attending the Teacher Summit on Climate Change. I have no experience in the area of meteorology, however, I did some science writing for software development with Professor Mina Johnson-Glenberg as part of a grant was the coordinator for Frank Allis Elementary School's involvement with the U. W. - Madison Arboretum's Earth Partnership for Schools, working with Elizabeth McCann have written and implemented two grants related to outdoor education have attended the Midwest Conference for Renewable Energy and Sustainable Living have taken Sustain Dane courses on simple living and energy conservation have taken three KEEP classes related to energy conservation have watched Al Gore's movie, An Inconvenient Truth, and have found the truth to be more than just inconvenient. My passion is gardening, especially with children. I am a Master Gardener and belong to a few garden related organizations.

Julie Fitzpatrick
5013 Pebblebrook Drive, Madison, WI 53716-2333

IV. February Pre-Summit Electronic Questionnaires

Name / Grade(s)	Question 1 <i>What is the top (1 or 2) questions you have about Climate Change?</i>	Question 2 <i>Does mention of or questions concerning the 2007 IPCC Summary for Policy Makers ever come up between you and your colleagues or between you and your students?</i>
Dan Beaman 4 th /5h	My top question about climate change is what can I advocate for kids to do that will collectively make the biggest difference for climate change?	The IPCC summary is not mentioned at the elementary level.
Bridget Ciurlik 6 th grade reading, English & math	Rather than the top two questions I have about climate change--I guess I'd like to have a brief overview of what it is and the major causes and misconceptions of climate change. I don't know if there is a top 10 list of misconceptions people have about climate change but that would be an interesting topic as well. I'd also like to know about new technology being used in measuring climate change and how effective this technology is. Lastly, I'd like to know what the pros and cons are to different solutions to climate change and how expensive these measures may be.	The topic of the 2007 IPCC Summary for Policy Makers never comes up in class nor have I discussed it with my colleagues. To be quite honest I'm not even positive about what is in this summary.
Joseph Ciurlik Governments & American studies to 10,11, 12	I have no specific questions...maybe where the scientific community is on the issue of climate change.	I do discuss the topic with my students occasionally.
Julie Fitzpatrick First Grade	What are the best and worst case scenarios for the timeline of change, and what its effects will be on weather extremes, ocean level, food supply and species extinction, including our own?	Since I teach first grade, the issue of climate change is touched on only at a very superficial level, although only slightly less superficial than the level of attention it receives from my peers, who are far more interested in the latest episode of Lost! and American Idol. The prevailing attitude seems to be that it is such a complicated, frightening, and widespread issue, why depress ourselves by dwelling on it when there is nothing we can do about it anyway. Let the governments do what they can, since that is the only way to force corporations to change.
Jacquelyn C. Kendall 4/5/6/ All Subjects		
Madeleine Para First Grade	My top personal questions: 1) Is it too late? 2) What is the most important thing individuals can do and the most important thing government can do? As a first grade teacher my top questions: 1) Can you make it easy for me to integrate the study of weather into other first grade activities, given that	Item 2: Huh? No, never, not sure I know what it is.

	<p>the science curriculum is already dictated to me.</p> <p>2) How can young children investigate climate change?</p>	
<p>Laurie Solchenberger Cross-Categorical (grades 3/4/5)</p>	<p>1) One of the questions I am most interested in regarding climate change involves geo-political & sociological issues surrounding natural resource/land "discovery"/"ownership"/use. I saw a very interesting documentary while in Winnipeg, exploring the Arctic and potential conflicts over land "ownership" and Native/Indigenous Peoples' interests. Of course I've forgotten the name of the program!</p>	<p>2) No, the topic of the 2007 IPCC Summary for Policy Makers never comes up, but I teach in an elementary school.</p>
<p>Ann Velden 4th/5th</p>	<p>1. What data can we share with students to prove/explain climate change? (I just heard a student today say, "Global warming is a myth." His companion asked me if it was a myth and I said, "No!!" I just read a good article in the paper which gave specific data which I thought would be meaningful to kids and will bring it along on Saturday but I am definitely looking for ways to share that climate change is real and that are on a child's level if possible.</p>	<p>2. I don't know what the IPCC summary is and it has never come up between colleagues at my school that I am aware of.</p>
<p>Resha Wyman Speech and Language Pathologist</p>	<p>I would like to know a tactful and constructive way to respond to people who claim they do not "believe in climate change".</p> <p>I'd also like to know about Obama's priorities in this area, the people he has chosen to lead the way, what changes we hope to see, and how we and our students can help.</p> <p>Any way to relate this to the Green and Healthy Schools initiative would be helpful.</p>	<p>I really don't know anything about the 2007 IPCC summary and doubt that anyone around here does either.</p>
<p>Kathy Huncosky</p>	<p>My top questions about climate change are:</p> <ol style="list-style-type: none"> 1. Does climate change mean the same thing as global warming? Is it more encompassing? 2. What has been happening in the field of education concerning climate change so far? 	
<p>Jill Newton Math & science</p>	<p>Are the recent extreme weather events due to global warming? How is the rise in the average global temperature causing the extreme weather?</p>	<p>The 2007 IPCC Summary for Policy Makers has never come up with students or colleagues.</p>

	<p>As a science teacher I have been receiving, books, CDs and DVDs presenting materials supporting global warming as a result of human activity and materials stating the rise in the average temperature is natural and humans are not responsible. All the presenter seem to be credible and if they have an agenda it isn't immediately obvious. How do you form an intelligent, informed opinion on climate change given all the conflicting viewpoints?</p>	
<p>Charles Tennesen</p>	<p>I 'm very pleased to see the increased exposure that concerns about climate change has had in general in the media and by politicians at all levels. Nevertheless, after two relatively "normal" (snowy & cold) winters I continue to be amazed and concerned about the number of people who raise questions of doubt about the reality of the climate change threat. My central concern is that many "average" folks aren't convinced enough of climate change to support both measures in their own lives and through legislation to actually take action to reduce human impact on the climate. So I think a useful topic to cover would be any serious scientifically based evidence that refutes the evidence of the IPCC report. If teachers were aware of this evidence (if there is any), then they would be better prepared to address them and not potentially be blind-sided.</p>	<p>As to your 2nd question, this topic does not often come up. I think one main reason for this is because of the issue I raised above. Folks aren't sure if a colleague may think climate change is a bunch of bunk, so they don't discuss it casually so as to avoid a potential conflict. Generally speaking, in our area, I think most teachers understand the reality of climate change. But there is a certain percentage who do not, and so the topic isn't brought up.</p>

V. February Summit Survey

- 1) Have you heard about the **IPCC Summary for Policy Makers**? If so, What is it?
 - No. A document
 - No
 - No, not until learning about this summit
 - No, only through your email
 - No
 - No, guess international policy on climate change?
 - I've heard about it, but I don't know what it is
 - No
 - International Policy for climate change
 - No
 - No, International Protocol on climate change

- 2) Define greenhouse gas:
 - A gas (CO₂, Methane) that traps sunlight in the atmosphere
 - CO₂ (and others) that collects in the atmosphere to block and reflect light and heat
 - Gases that amplify the heat absorbed by the Earth from the sun
 - A gas that helps create? Ozone, that blocks the earth's ability too let heat escape the atmosphere
 - CO₂ trapped by the atmosphere forming ozone
 - Gases that are trapped in the earth's atmosphere that increase the earth's atmospheric temperature
 - A gas that builds up in the atmosphere and gets trapped?
 - Gases trapped within whichever sphere it is, increasing the temperature of the earth's surface?
 - Gasses (by products of our activities) that stay in the atmosphere and prevent heat from escaping
 - Greenhouse gas is a gas such as CO₂ that traps infrared light back into the atmosphere warming the planet
 - Gas trapped in the atmosphere that raises global temperatures

- 3) What is the most abundant greenhouse gas?
 - CO₂
 - CO₂
 - Carbon Dioxide or Methane
 - CO₂
 - CO₂
 - CO₂
 - Carbon dioxide
 - CO₂
 - Carbo Florides? CO₂?
 - CO₂
 - CO₂

- 4) Which greenhouse gas is of most concern to climate scientist studying warming?
 - I know Methane has a bigger impact per molecule
 - CO₂
 - CO₂
 - CO₂
 - Ozone
 - CO₂
 - Ozone
 - CO₂
 - CO₂
 - CO₂
 - Hydrocarbons

- 5) What element constitutes the bulk of the mass in any single tree?
 - Carbon

- Carbon
- Water or Carbon
- Carbon
- H2O
- Carbon
- H2O
- Water
- Carbon
- Nitrogen or Carbon

- 6) What was the first creature added to the endangered species list because of human-induced global warming?
- Polar Bears?
 - Plankton
 - Polar Bear
 - Polar bear
 - Polar bears
 - Us?
 - Penguin
 - Too bad is wasn't humans
 - Polar Bears
 - Don't know
 - No Clue

TRUE or FALSE

- 7) The Ozone Hole contributes to global warming.
- False – 7 responses (1 person added “I think its an effect”)
 - True – 4 responses
- 8) Global Warming is accelerated by the melting of snow and ice cover surfaces.
- False – 3 responses
 - True - 8 responses
- 9) Melting of Arctic snow and ice will likely result in rising sea levels.
- True – 11 responses (1 added “ (Greenland, other land mass glaciers/snow pack)
- 10) Melting of snow and ice in Antarctica will likely result in rising sea levels.
- True – 10 responses
 - False – 1 response

MULTIPLE CHOICE

- 11) How long does it take for atmospheric CO2 to disperse & quit trapping out-going thermal energy?
<20, 50, 75, or 100 yrs>
- 100 – 3 responses
- 75 – 1 response
 - 50 – 3 responses
 - 20 – 3 responses
 - ? – 1 response
- 12) According to the IPCC report, how many inches could sea levels rise by 2100?
<1-4 inches, 4-7inches, 7-24inches >
- 1-4 – 1 responses
 - 4-7 – 3 responses
 - 7-24 – 7 responses

VI. February Summit Evaluations

Evaluation of Climate Summit

Please rate each of the following aspects of the teaching-learning experience on a 5-point scale by checking the box that best describes your opinion.

	Not at all 1	Very little 2	Somewhat 3	A fair amount 4	A great deal 5
<u>BENEFITS</u>					
To what extent did the experience:					
Increase your knowledge of Climate System Science	0	0	0	5	6
Increase your understanding of Climate System Science	0	0	0	4	7
Increase your understanding of Global Climate Change	0	0	0	5	6
Help you recognize the potential applications of on-line resources technologies to study and teach Climate	0	0	0	3	8
Increase you level of interest and appreciation about climate literacy	0	0	0	3	8
<u>CONTENT</u>					
To what extent was the content covered:					
Easily understandable –	0	0	0	2	9
Relevant to your needs –	0	0	1	2	8
Suitable to your current knowledge of Weather and Climate –	0	0	0	1	10
Suitable to your current knowledge of Global Climate Change –	0	0	0	1	10
In accordance with your expectations –	0	0	0	1	10
<u>AUDIENCE</u>					
To what extent did you:					
Feel comfortable	0	0	0	1	10
Feel free to ask questions	0	0	0	1	10
Feel encouraged to learn	0	0	0	1	10
Feel there was a good overall climate for learning	0	0	0	1	10

DELIVERY

To what extent was information:

	1	2	3	4	5
Well organized	0	0	0	1	10
Presented at the right pace	0	0	0	2	9
Provide enough time for discussion	0	0	0	1	10

To what extent did the presenters:

Speak clearly	0	0	0	0	11
Answer questions adequately	0	0	0	0	11
Use visual aids effectively	0	0	0	0	11
Emphasize important points	0	0	0	1	10
Allow for sharing of ideas and experiences	0	0	0	0	11

OVERALL RATING

	Poor	Fair	Good	Very good	Excellent
Overall, how do you rate this teaching-learning experience	0	0	0	1	10

IPCC Summary for Policy Makers

Please comment on whether you think the document will be useful to you	0	1	1	5	4
--	---	---	---	---	---

ADDITIONAL COMMENTS

Please provide any additional comments, suggestions, or observations about your experience.

- I hope there will be follow-up opportunities. I appreciated seeing the websites and the humor, also
- I feel motivated to try to find ways to incorporate learning about climate into our curriculum. The globe was awesome!
- All three presenters were great. Worked well together. Loved going to the roof.
- It was great! Thanks
- Today was great, but I'd like to see the learning continue. An ongoing experience is much more valuable than a one-shot deal.
- To effect system change, participants need resources and admin. Cooperation to change other teachers
- Thanks so much!
- Thanks for a great day!

VII. November Summit Agenda



Climate Education Summit for G4-12 Social Studies and Language Arts teachers

Saturday, November 7th
NOAA Science Center



9:00	Welcome & Summit Overview Dr. Steve Ackerman, CIMSS/SSEC, UW-Madison
9:10	Climate Change Questionnaire
9:20	Introductions and Discussion
9:50	Climate Change Mechanisms Overview Dr. Steve Ackerman, CIMSS/SSEC, UW-Madison
10:40	Break
11:00	Identifying challenges unique to non-science teachers (discussion)
Noon	Lunch
12:45	Regional Climate Change Impacts and Response Dr. Steve Ackerman, CIMSS/SSEC, UW-Madison
1:30	Identifying ways to incorporate climate change topics into non-science classes (break-out discussion sessions)
2:10	Report-back from break-out sessions and discussion
2:40	Break
3:00	Climate Literacy Essential Principles LuAnn Dahlman, NOAA Climate Office
3:15	On-line resources and activities for weather and climate Margaret Mooney, CIMSS/SSEC/UW-Madison
3:45	Summary Discussions, Conclusions, Next Steps
4:15	Climate Change Questionnaire(2), Evaluations & paper-work
5:00	Adjourn



<http://cimss.ssec.wisc.edu/education/>

VIII. November Summit Participants

G4-12 Language Arts and Social Studies Climate Education Summit NOAA Science Center Saturday November 7th 2009

Participant	School	City	State
Judy Fitzpatrick	Short Pump Elementary	Henrico	VA
Eric Trink	Montevideo Middle School	Penn Laird	VA
Laura Dorn	E.W. Stokes school	Washington	DC
Doug Heishman	Cub Run Elementary	Penn Laird	VA
Anita Shepard	Matula Elementary	La Plata	MD
Gloria Allen	Plummer Elementary Schhol	Washington	DC
Dave West	Blair High School	Silver Spring	MD
Jeff Greiner	Woodrow Wilson HS	Washington	DC
Amanda Huowitz	Thomas Jefferson High School	Alexandria	VA
Judy Miller	Springbrook High School	Rockville	MD
Deyon Johnson	Lincoln Middle School	Washington	DC
Deb Dornemann	Poe Middle School	Annandale	VA
Alicia Hall	JFK High School	Rockville	MD
Sharon McBride	Houston ISD	Houston	TX

Instructors

Steve Ackerman CIMSS/SSEC/University of Wisconsin-Madison
Margaret Mooney CIMSS/SSEC/University of Wisconsin-Madison

NOAA Partners

Nina Jackson NOAA NESDIS
Dan Pisut NOAA NESDIS
LuAnn Dahlman NOAA Climate Office



VIII. November Summit Applications (*non-eligible science teachers are italicized*)

August 22, 2009

I am currently a fourth grade teacher in a self-contained classroom outside of Richmond, Virginia. I have limited natural science background, but I have an intense personal interest in the current state of our environment and the need to make changes in order to prevent further damage.

Because of my interest and passion for science I have been the science contact for my school for a number of years. This position as liaison with the county school district administration involves transmitting information back and forth and also allows me to give input.

The Virginia state science standards for fourth grade include weather, ecosystems, watersheds and space. There are so many opportunities to introduce climate education and the students are at a perfect age to begin to understand the implications of their behaviors. I also teach Virginia history, geography, civics, and economics. The students are introduced to the process of making laws and changes that have occurred in our state's waters and land over time. Since I am in a self-contained classroom and teach all subjects there is opportunity to include reading and writing on climate.

I would very much like to participate in the Teacher Summit on Climate Education on November 7, 2009, in Silver Spring, MD in order to become more knowledgeable on the science behind the Climate Change study. It is my desire that I will learn how to teach about climate education and to find ways to share that information with other teachers and students in my school and district.

Thank you very much for your consideration

Judy Fitzpatrick
Teacher, grade 4
Short Pump Elementary
3425 Pump Road
Henrico, VA 23233
804 360 0812 (w) 804 360 2617 (h) 804 240 0940 (c)

Hello,

My name is Kelly Garner. I teach world geography and sociology to grades ranging from 9th to 12th. I am interested in this workshop because climate change is a part of our curriculum and one of my areas of interest. For geography, I plan to have my students write predictions about how the world will change as part of their end of the year activity. The way that climate change affects the human geography of Earth is, or should be, one of the essential elements in their predictions. For sociology, I have an article from SEED magazine titled "The Last Experiment" about the increasing role of social scientists in affecting public attitudes and consumer decisions related to climate change. I think that the social sciences play an important role in helping to contextualize scientific data and provide a means for people to understand the ramifications of human contributions to natural processes.

Kind regards, Kelly Edward Garner M.S. Ed WFR

P.s. The article that I mentioned above is available online at http://seedmagazine.com/content/article/the_last_experiment/P1/ You are likely already familiar with its content but in case you are not, please enjoy.

I teach earth science at Pacifica high school in oxnard. I teach grades 9,11 and 12 (all earth science). My major is geophysics and I hope to bring new insights, information and activities back to my classroom.

Thank You, Kirk fitzmorris

I am interested in registering for the NOAA climate seminar. I am currently an 8th Grade World Geography Teacher at Montevideo Middle School in Penn Laird, Va. Please respond with any further information that I may need to know. Thanks so much!

Eric M. Trinka
World Geography/Social Studies Dept.
Montevideo Middle School
Penn Laird, VA 22846
www.mmsworldgeography.co

Remy Luerssen,
Today, I received notice of the Teacher Summit on Climate Education and read with interest. This is an issue that I care deeply about and would love to participate. Please let me know if it would be possible for me to do so.

Thanks for your consideration,
Doug Heishman
4th grade teacher (Social Studies, Language Arts)
Cub Run Elementary

Hello,

I am interested in attending the Climate Summit on November 7th. I teach 6th grade geography and world cultures. I'm interesting in attending because climate is part of my geography curriculum and I would like ways to teach my kids about it as it relates to the real world.

Mrs. Joanna Tanner
6th Grade Geography & World Cultures
Wilde Lake Middle School
<http://teacherweb.com/MD/WildeLakeMiddleSchool/Tanner/index.html>

Good morning, Ms. Mooney

My name is Laura Dorn, and I teach 4th grade social studies and language arts at the E.W. Stokes school in DC. I live in Silver Spring, and have family and friends who work for NOAA in Maryland, and in South Dakota. I am interested in attending the summit because I am responsible for instructing students in a nature theme during our third trimester (approximately April-June), and our school emphasizes "taking care of our community" and thinking globally.

Please let me know if you require other information!

Thank you,
Ms. Laura

Hello Margaret:

I am interested in attending The Summit on Climate Education. I am a seventh grade social studies teacher at Crittenden Middle School in Newport News, Virginia. I believe the information that I will obtain will enhance my ability to enrich my students with the concept of cross curriculum content.

Sincerely,
Beatrice Toombs

Dear Margret,

Dayna Dember, and Donna Battle Jackson are interested in attending the workshop on November 7, 2009 in Silver Spring MD. We are teachers from Stanton Elementary in DC. We would like to know more information about climate education so we can pass it on to other colleagues at our school. Hope to hear from you soon. My e-mail address is daynadember1@yahoo.com Thank you and have a great day.

Margaret,
Regarding your Nov. 7 Teacher Submit on Climate Ed. I see your flyer inviting English and Social Studies teachers. There isn't a similar request for Earth Science Teachers?
Fran
Dr. Fran Hess
Presidential Awardee for Excellence in Science Teaching
Cooperstown High School
Cooperstown, NY 13326

Margaret,
I understand your focus. I just wanted to note that I feel a collaboration of both actively teaching Earth Science teachers as well as those from the other disciplines would be a good forum to develop collaborative techniques. This would include Earth Science Teachers who do incorporate literacy skills as well as those who do not along with English, Social Studies and even teachers from other disciplines. I have previously been involved with presenting science literacy techniques workshops to Earth Science teachers.
Perhaps I will be able to join you along the way some day depending on time and resources. I would like to be kept abreast of developing plans and opportunities to be able to perhaps participate in the future.
Thank you for taking the time to answer my email.
Fran

Dr. Fran Hess
1191 County Highway 10
Laurens, NY 13796
fhess@stny.rr.com

Cooperstown High School
39 Linden Ave
Cooperstown NY 13326
fhess@cooperstowncs.org
607-547-8181

On 9/1/09 10:45 AM, "Margaret Mooney" <Margaret.Mooney@ssec.wisc.edu> wrote:

> > Hi Fran,
> > You're more than welcome to join us on Nov. 7th but the discussion will
> > be focused on discerning how to share climate change information with
> > non-science teachers. The motivation for this comes directly from
> > science teachers concerned about their colleagues' access to climate
> > change information. During a meeting in July 2007 to design a University
> > of Wisconsin on-line climate change course,
> > (<http://cimss.ssec.wisc.edu/climatechange/>) five middle and high school
> > science teachers temporarily abandoned the discussion on probability and
> > modeling to advocate for the creation of free on-line lessons that
> > explain the IPCC report on a level that social study and language art
> > teachers could easily comprehend. We wrote a proposal to NSF expressing
> > this goal and NSF funded these summits so we could ask social study and
> > language art teachers what they think.
> >
> > Please let me know if you plan to join us for some or all of the day.
> > You wouldn't be eligible for an NSF stipend but we'd be happy to buy you
> > lunch. And there will be one or two NOAA folks there who you could lobby
> > for a similar Earth science teacher workshop in your area, we conduct
> > them annually in Wisconsin.

> > (<http://cimss.ssec.wisc.edu/teacherworkshop/2008/index.html> &
> > http://www.aos.wisc.edu/~galen/edu_teacher.html) ... maybe you could
> > visit us next summer?
> > Meanwhile, please consider coming on the 7th.
> > Sincerely,
> > Margaret

Hi Ms. Mooney,

We are Sara Suiter and Claudia Rosas. We are a 3rd grade Teachers at Elsie Whitlow Stokes school. We are interested in attending the summit. We teach Science and we think this would be very interesting and helpful for our class.

Please let us know if there is anything else we should do.
Thank you,
Ms. Claudia & Ms. Suiter

claudiar@ews.org

saras@ews.org

Hello Ms. Mooney,

I am a Spanish teacher at Warwick High School in Newport News, Virginia and I would like to apply to attend the 2009 Teacher Summit on Climate Education being held this November. I currently instruct Spanish I, Spanish II Pre-International Baccalaureate and Spanish 3 at Warwick High. I would like to attend the summit to gain additional knowledge regarding a phenomenon that affects much of Latin America.

I am also the club sponsor for Warwick High School's Interact Club which is an international community service organization. I would love to be able to spread the information I gain at this summit with my students in the Interact Club.

Thank you for your time and I look forward to a wonderful learning experience!

Respectfully,

Katherine P. Kinsey

Warwick High School

Spanish 1, 2 Pre-IB, 3

katherine.kinsey@nn.k12.va.us

I would love to attend the Teacher Summit on Climate Education on Sat, Nov 7 in Silver Spring. I am the science coordinator for National Presbyterian School in Washington DC and teach 3rd - 6th graders. I am very interested in best practices for teaching about climate change. I used the NSAS/NSF Sprintt (Student Polar Research with IPY National and International Teacher Training) curriculum with the 5th graders last year and was pleased with some of the results, but feel that there is a lot of room for further integration across disciplines and refinement of the science lessons. Additionally, my school participates in GLOBE (particularly with Kevin Czajkowski's surface temperature studies). I feel like we're on the tip of the iceberg as far as teaching/studying this topic and would love to participate in this summit to further develop my curriculum, help inform other educators about the best practices and strategies for improving science literacy on this important topic.

I have attached a brief resume FYI.

Thank you for considering me,

-Dale Glass

Dale S. Glass, MS
Science Coordinator
National Presbyterian School

4121 Nebraska Ave., NW
Washington, DC 20016
dglass@nps-dc.org 202-552-4233

Aloha Margaret,

My name is Sara Kammerer-Cox, and I teach 4th grade in Fairfax County. I am interested in attending the Nov. 7th Summit on Climate Education at NOAA. My interest is driven by my desire to grow professionally through collaboration with peer professionals, as well as adding to my own content knowledge to help in the classroom.

Thanks for your consideration,
Sara

I am a 4th grade teacher in Fairfax County and teach science, in addition to the other core subjects, for both general and special education students. My teammate Sara Kammerer-Cox shared information about the teacher Summit on Climate Education and I would love to take part in event. My hopes are that information gained can be brought back and shared with my class.

Please let me know if there are any opening still available.

Diane Kopecky
4th Grade
Woodlawn ES

Dear Ms. Mooney,

I teach grades 10-12 in the subject areas of geology and astronomy. I'd be very interested in attending this summit in order to learn about the latest information on climate change. I don't teach language arts directly, but they are incorporated into my classes. If this disqualifies me, I'll understand, but it sounds interesting nonetheless. Just so you know, I would also be happy to go back to my school to share what I learn at the summit with teachers in those subject areas in some fashion.

Thanks!

*Russ Kohrs
Broadway High School
Broadway,*

Dear Ms. Mooney,

I am very interested in attending the "Teacher Summit on Climate Education" on Nov.7th. Currently, I am enrolled in the Johns Hopkins "Earth and Space Education" Graduate Certificate Program. Last semester, I took a weather class where we talked about climate change. I am very interested in this subject and learning how to effectively teach my K-6 Montessori science students.

Also, this summer I hope to do my internship at NOAA so this would be a great introduction.

Thank you for your serious consideration.

Very Truly Yours,

Jaimie D. Galbreath, M. Ed

Sent from my Verizon Wireless BlackBerry

Dear Ms. Mooney,

My name is Darryl Richards and I want to apply to attend the Teacher Summit on Climate Education Application on November 7, 2009. I currently teach 10th grade biology and 12th grade AP Biology, though I have taught Environmental Science before. Even though I am not a social studies or language arts teacher, I would like to attend this professional development because I find weather and meteorology fascinating and interesting. Whatever materials and strategies that are provided at the meeting I would be willing to share with our History and English teachers. I recently attended a NOAA

meeting back on July 29 and would like to continue to attend as many professional developments as possible. Thank you.

--

Darryl Richards
Biology/AP Biology Teacher
New Era Academy
2700 Seamon Avenue
Baltimore, MD 21225
443-984-2415

Dear Ms. Mooney-

My name is Susan Twidle. I am an Earth Science Teacher (gr 10-11-12) at Howell High School in Farmingdale N.J. I am interested in attending your climate change workshop. I am part of a six high school district in central New Jersey. I would be able to share this information with dozens of teachers in my district.

I am intersted in attending for the very reason you put forth in the flier- I want to be able to answer student inquiries about climate change accurately and present meaningful lessons on the topic in my classes.

I can be reached at the following addresses:

Howell High School	Home: 145 Stockton Ave
405 Squankum Yellowbrook Rd	Ocean Grove NJ 07756
Farmingdale NJ 07727	732-775-4510
732-919-2131	suetwi7@optonline.net
stwidle@frhsd.com	

Please let me know if you need further information or if there are spots still remaining. Thank you so much-
Susan Twidle

Dear Ms. Mooney,

I am very interested in participating in the Teacher Summit on Climate Education. I believe that it is a very important to stay as informed as possible about our environment and learn more about our climate. I am a preschool teacher for three year olds at the Goddard School and was wondering if this Summit would be available for someone in my position as well as the public school system?

Thank you for your time.

Sincerely,
Melissa Scobell

Dear Ms Mooney

I am a high school special education science teacher. I understand that the 11/7/2009 Summit is for social studies and language arts teachers. If one for math and science teachers is held, please inform me. Thank you.

Marc Sheinb

Hi there..I am a 4th grade reading/writing teacher at Plains Elem. In Timberville. I am curious about the Teacher Summit on Climate Ed. on Nov. 7. I may be interested in attending. Would this be a suitable program for me to attend? Can you give me more info.?

Thanks so much

Tammy

Tammy Shearer wrote:

Hi there...I am not going to be able to make it ...thanks for inquiring.

Hi Margaret,

I am a third grade, special education teacher. I teach all subjects and thought this would be beneficial information in our Science curriculum.

My name is Alicia Hall. This year, I will teach Modern World History, NSL (National, State, & Local Government), African American History, and Latin American History at John F. Kennedy High School.

I am interested in the Climate Education Summit because I actually teach about environmental concerns in all four courses. I would appreciate the opportunity to learn best practices and improve my own background knowledge so that I can be a more effective educator and advocate.

Thank you for considering my application.

Alicia M-B. Hall
Modern World History and African American History
Social Studies Department
John F. Kennedy High School

Dear Ms. Mooney,

I am interested in the Climate Summit. I am a Social Studies teacher at Woodrow Wilson SHS in DC. I currently teach World Geography and U S History. I also take students on field trips to places like Ecuador and The Galapagos Islands and Peru. I teach mostly 11th and 12th graders. Climate concerns, such as global warming, etc. are areas I address in my classes and I would like to learn more to bring newer information to my students. To help them learn more about our planet's climate and how we are affecting it.

Sincerely,
Jeff Greiner

jeffrey.greiner@dc.gov

Please accept my name: Gloria Allen to attend the Teacher Summit on Climate on Nov.7.
I wrestle to teach weather vs climate, climate impact, and related concepts at the 5th grade level with few resources and even less time.

I need more depth of information to be a better facilitator of the concepts for these testable and teachable standards in DCPS.

Hello-

My name is Ross White. I am the U.S.History team leader for the social studies department at Springbrook High School. in Silver Spring, Md. We are in the midst of implimenting an IB MYP program at our school, and this type of class will help me to bring back some interdisciplinary ideas for the History curriculum as well as connecting it to real world issues of importance. I would greatly appreciate your consideration for a slot in this upcoming summit.

Sincerely,

Ross White
Springbrook High School
Social Studies

. Mooney...I teach US Govt.-12 th grade and US History-11th grade in Chesterfield County, Virginia at Matoaca High School....I have always firmly believed that geography dictates economy and economy dictates history and government....I would be very interested in attending your Nov. 7 teacher summit on Climate Education.

Hello,

I am very interested in attending this conference. I teach grade 7 College Education and grade 6 English Language Arts. I want students to learn that Science is not an isolated subject and integrate Science topics in my English classes. I want to immerse myself in the language of this topic and introduce Science careers in this field to my College Ed classes. I also LOVE Science and am curious about education for professional growth in this area.

Thank you
Denise Cherry

Hi Ms. Mooney:

I am interested in attending that Nov. 7 event.
I teach grades 9 - 12 in social studies.
I am passionate about global warming and already include it in my teaching about government.
I can easily ride my bike to NOAA.

Cheers,

Dave West
Blair High School
Silver Spring MD

-----Original Message-----

From: Margaret Mooney [mailto:margaret.mooney@ssec.wisc.edu]
Sent: Monday, September 21, 2009 8:37 AM
To: Greenawalt, Morgan L.
Subject: Re: Teacher Summit on Climate Education

Morgan,

Thank-you for your interest & willingness to attend the climate education summit on November 7th. Please plan on joining us. I will reserve a stipend for your time and efforts. (we'll do the paperwork for this at the workshop).

We'll meet from 9am to 5pm on Saturday November 7th at the NOAA Science Center and we will provide lunch. I'll send an update and parking details in mid-October.

Meanwhile, just one request - could you please send me the names of the two schools you work at:
Thanks,

Margaret

Margaret Mooney
CIMSS/SSEC/UW-Madison
608-265-2123

Greenawalt, Morgan L. wrote:

> > Hi Margaret,
> > I am interested in participating in your teacher summit on climate
> > education on November 7th.
> > I am a Gifted and Talented Resource teacher in Fairfax County. I am a
> > full time teacher however I split my time between two schools.
> > I teach all grades, K-6 at both of my schools.
> > I work with over 600 kids at my one school and over 800 at my other
> > school. I go into classrooms to teach critical thinking and problem
> > solving lessons with these students.
> > I also pull identified groups of high ability students in K-6. I teach
> > interdisciplinary lessons with these students.
> > Please let me know if I am still able to register for the summit! I
> > would love to opportunity to attend and use this knowledge to develop
> > lessons which I can use with my students.
> >
> > ~Morgan Greenawalt

Hello,

I am very interested in attending this conference. I teach grade 7 College Education and grade 6 English Language Arts. I want students to learn that Science is not an isolated subject and integrate Science topics in my English classes. I want to immerse myself in the language of this topic and introduce Science careers in this field to my College Ed classes. I also LOVE Science and am curious about education for professional growth in this area.

Thank you
Denise Cherry

Hi Margaret,

That is great! I am excited to attend.

My two schools are Terra Centre Elementary School in Burke, VA and Sangster Elementary School in Springfield, VA. I look forward to meeting you and let me know if you have any other questions.

Hi! I'm interested in attending your teacher summit on climate education.

I teach at Thomas Jefferson High School for Science and Technology in Alexandria, VA. I teach AP US History (11th grade) and an Anthropology elective (10th, 11th and 12th grade).

I'm interested in the summit for three basic reasons:

At a comprehensive science and technology school we're always looking at the intersection of the sciences and humanities.

While I am a humanities teacher, I also sponsor our school's Environmental Impact Club. We have worked on a number of projects to address climate change including raising over \$50,000 to put solar panels on our roof and meeting with our three Congressman's offices and two Senator's offices to deliver letters and discuss climate legislation.

Personally, I care deeply about doing something to stop global warming. I understand many of the possible consequences of doing nothing. I understand many of the policy prescriptions to achieve emissions reductions. But I don't really understand the science behind all of this.

Thanks!

Amanda Huowitz

Hello,

My name is Ms. Greer, a 5th grade teacher at Thompson Elementary. I have a self-contained classroom. I am a first year teacher and eager to learn as much as I can. Also, Thompson Elementary has a new Science Academy. My principle recommended this summit to the 5th grade team. I had a few questions before I commit. Is all airfare and travel expenses covered along with lunch and teh \$100.00 stipend?

I look forward to hearing from you.

Thank you,

Ms. Greer

Margaret Mooney,

Greetings!

I am extremely interested in attending your class on Climate Education. I am a first year teacher at Meadowbrook High School in Chesterfield County, Virginia. I teach 9th grade World History 1 and 11th grade United States and Virginia History. I want to learn more about climate because I recognize that a better understanding of climate on my behalf would allow to to encourage students to better realize the effect that they have on the world both as individuals and also as member of the American society.

I appreciate your consideration.

Sincerely,

-Josh Greeson

Ms. Mooney,

I would very much like to participate in the "Teacher Summit on Climate Education" which will be held on November 7, 2009. Below is my registration information. Please confirm as soon as possible.

Judy Miller

Name: Judy Miller, Springbrook H.S. (Silver Spring, MD) (301) 989-5700

Subject: NSL Government (regular/honors) Grade 10

Reason for Attending:

As a government teacher in Montgomery County Public Schools (Rockville, Maryland), I would like to attend your workshop on Climate Change. Included in the MCPS curriculum is a unit focused on public policy. It requires teachers to teach a variety of contemporary issues such a smart group, civil rights, and social security. Recently, environmental policy has been added to this list. This school year I would like my students to research and complete an extensive class project on climate change. Such a project will allow them to be aware of environmental policy and hopefully motivate them to join the "go green" movement. Your workshop will provide me with strategies to present this topic.

Greetings,

I am interested in teaching a wholistic approach to education. The topic and the issues that cause and effect it would greatly enhance my lessons in regards to US Policy and economics.

Thanks.

Tony Payne

9th Grade U.S. History

Mrs. Mooney,

I am interested in attending the summit on Saturday, November 7, 2009. I am a 7th Grade English teacher at Lincoln Middle School. Please let me know if spots are still available.

Thanks,

Deyon Johnson

7th Grade English Teacher

Lincoln Middle School

Ms. Mooney

What a wonderful thing you are doing to help continue the knowledge base of global warming!!! I teach 8th grade civics in Fairfax County and would love to participate in the Teacher Summit for Climate Change. I do not believe that our students are too aware of the impact of global warming. I believe they have a little bit of knowledge but could have that strengthened. I also believe that the students are VERY receptive to learning and trying to do their part with this issue.

I would love to learn more so that I can talk in greater detail at times about the issue. Please allow me this fantastic opportunity on the 7th of November.

I look forward to hearing back from you that I may participate.

Hope you have a wonderful long weekend.

Warm regards,

Deb Dornemann

X. November Summit Pre-Summit Electronic Questionnaires

Name	Top Climate Change Questions:	IPCC Questions
Judy Fitzpatrick	1. There are so many factors which contribute to climate change. How do I present them to my fourth graders without being too simplistic? 2. Once my students understand the issue, do you have suggestions for actions they can take? I would like to have	I have no idea what the 2007 IPCC Summary for Policy Makers is? Am I in the wrong place? I checked it out and it looks very technical.
Eric Trinka	1. Where do I find classroom friendly data that we can use to teach climate change?	2.. No one has ever asked me questions about IPCC.
Beatrice Toombs	1. Is there any upcoming legislation about climate change? 2. What roll did climate change play in G-8 summit? 1) What are the websites that are sponsored by special interests that claim to be based on science but are really fronts for disinformation? I see stories like the following http://www.telegraph.co.uk/comment/columnists/christopherbooker/6143587/Arctic-ice-proves-to-be-slippery-stuff.html http://www.examiner.com/x-2304-DC-Republican-Examiner~y2009m10d25-ABC-all-upset-at-poll-showing-huge-drop-global-warming-believers and they claim sites like http://arctic.atmos.uiuc.edu/cryosphere/ as sources but the information found there actually seems to support claims about climate change. Maybe they thought no one would check. How do we wade through all of the hype and fake science?	Colleagues have asked about the Summary for Policy Makers, but no students.
Kelly Garner	What was this conference in Warsaw where they claim 650 of the top climate scientists said climate change is a media hoax? (Mentioned in one of the above stories.)	2) No, no one here mentions it.
Laura Dorn	How do we as educators respond to and present differing viewpoints about global warming?	I have never heard of the IPCC Summary- so I've got a lot to learn!
Doug Heishman	What are the top things that students could do to make a difference? What are some great ways to teach students about climate change?	
Katherine Kinsey	What are the major changes we can expect in the next ten years?	My students/colleagues never mention the 2007 IPCC Summary for Policy Makers.
Sara Kammerer-Cox	What controls are being placed on industry to keep toxic emmissions down? Is global warming a real threat?	No
Diane Kopecky	cancelled	
Anita Shepard	I would like to know more about the CO2 issue surrounding climate change. Also, what are the current theories about how much "being green" effects climate change in the near future as well as the far future.	No one I have talked to has mentioned the 2007 IPCC Summary for Policy Makers.
Gloria Allen	1. How does climate change impact habitats and life cycles?	2. My students and colleagues do not mention 2007 IPCC Summary for Policy Makers
Ross White	cancelled	

Richard Stegemerton	what is the length of time for changes to actually occur and be considered true changes?	The IPCC 2007 Summary is not mentioned at great length in our discussions, but should be.
Dave West		
Morgan Greenawalt	I am most interested in how climate change is affecting our local area...NOVA... and how I can demonstrate this to students and parents (hands on lessons and resources to use with the kids).	My parents and local community do not ask questions about the 2007 IPCC Summary for Policy Makers
Jeff Greiner	What are future scenarios predicting about the impact of Global Warming on the seaboards of the USA	no
Denise Cherry	cancelled	

Amanda Huowitz

My questions maybe more policy oriented than science, but here they go: To forestall the worst effects of climate change, we obviously need to reduce world wide carbon emissions significantly. 1) What is the scientific consensus (if one exists) on this target and by when do we need to get there? 2) Nuclear energy. Is it necessary to build more nuclear plants to reach specified target? What are the upside/downsides of doing so? 3) Clean coal. From a scientific standpoint is this a real possibility?

I don't think so specifically. We do teach a course on geosystems that looks at climate modeling that I'm guessing references the report.

Josh Greeson

The top question I have about climate change regards intention. The reality is that there are many different ideas, beliefs and findings regarding climate change. That being said, regardless as to opinions & understandings, it is fair to say that climate change is a major issue, pressing on the collective conscience of all citizens. Why in this climate, do these groups & individuals not make it a point to present their understandings & findings in ways that are not accusative, judgemental or overly aggressive?

No my colleagues and/or students have not asked questions about the 2007 IPCC summary for policy makers.

Judy Miller

How can I fit "climate change" in the government public policy unit? Please provide me with suggestions and/or lesson plans. If a student is interest in a career dealing with climate change, what courses should he/she consider taking while in high school or college? What is the future job market for students interested in climate change?

Tony Payne cancelled

Deyon Johnson

How can we teach students so that they may teach others?

We never ask questions.

Deb Dornemann

How the U.S. can lead the change with what is needed to control climate change, while also helping developing countries find better and affordable ways to do the same. Another question, what are the U.S. and other countries doing to make a change and is what they are doing making a difference?

No one that I am aware of, in my school knows what the IPCC Summary is? I am looking forward to sharing this with my colleagues :)

Alicia Hall

XI. November Summit Surveys

Climate Education Survey Questions

1. What does the acronym IPCC stand for?
 - International Policy Climate Commission
 - International Panel on Climate Change
 - International Climate Council
 - Blank
 - International Project on Climate Change
 - Do not know
 - Intergovernmental Panel on Climate Change
 - International Protocol for Climate Change
 - Blank
 - International Panel on Climate Change
 - International Panel on Climate Change
 - Blank
 - Intergovernmental __ Climate Change
 - Blank
2. Define greenhouse gas
 - Any gas that contributes to the overall warming of the Earth's atmosphere
 - heat trapping gas in atmosphere, keeps planet from getting too cold, regulates
 - Gas which is heat holding
 - methane Carbon Monoxide blockig the ozone and depleting it
 - gasses that break through the ozone layer, destroying it
 - Do not know
 - heat-trapping gases absorb heat radiated from surface of atmosphere and go back to
 - gases are released into the air form a blanket in the atmosphere then they provide heat back to the earth too much of the gas puts too much heat back
 - something that is in our atmosphere that allows sunlight to pass but traps the earth's heat
 - Blank
 - a gas that contributes to global warming
 - carbon dioxide accumulation in the atmosphere- it traps heats and effects climate
 - gasses which emit from cars, manufacturing companies, ect
 - gasses emitted
3. What is the most abundant greenhouse gas?
 - CO₂ – 8 responses
 - Methane – 2 responses
 - Do not know – 1 response
 - water vapor – 1 response
 - Don't know – 1 response
 - Blank – 1 response
4. Which greenhouse gas is of most concern to climate scientist studying warming?
 - CO₂ – 8 responses
 - CO₂ and methane - response
 - Nitrogen – 1 response
 - Do not know – 1 response
 - water vapor – 1 response
 - carbon, water hydrogen? – 1 response
5. What element constitutes the bulk of the mass in any single tree?

Carbon
CO2
CO2
nitrogen
polar bear
roots
Trunk
Blank
Blank
carbon
carbon
carbon
Blank

6. What was the first creature added to the endangered species list because of human-induced global warming?

Polar Bear
Good question, not polar bear
Blank
polar bear
polar bear
Polar Bear?
Blank
polar bears, my only guess, but as I recall it never happened!
polar bear
?
Blank
Blank
Blank
Polar Bear

TRUE or FALSE

7. The Ozone Hole contributes to global warming
• True – 9 • False -2 • Blank – 3
8. Global warming is accelerated by the melting of snow and ice cover surfaces
• True – 11 • False – 1 • Blank - 2
9. Melting of arctic snow and ice will likely result in rising sea levels
• True – 11 • False – 2 • Blank - 1
10. Melting of snow and ice in Antarctica will likely result in rising sea levels.
• True – 11 • False – 1 • Blank - 2

MULTIPLE CHOICE

10. How long does it take for atmospheric CO2 to disperse and quit trapping out-going thermal energy? (20, 50, 75 or 100 years)
• 20 - • 50 - 1 • 75 - 1 • 100 – 9 • Blank - 2
11. According to the IPCC report, how many inches could sea levels rise by 2100?
• 1-4 inches - 2 • 4-7 inches - 4 • 7-24 inches – 6 • Blank - 1

XII. November Summit Break-out sessions Notes

Identifying ways to incorporate climate change topics into non-science classes

Grades 4-8 breakout session notes from 11/7/09 DC Area Climate Summit

“Elementary teachers use everything” but they need material on their grade levels. They suggested that NOAA (or NASA or...) creates content first then teacher could re-write at elementary level, possibly with a “character” or maybe as a board game. They also like short videos like www.brainpop.com – they all agreed that they would like to be pilot sites for new education projects.

Math & science teachers need access to graphs and charts that are simpler.
They also want to know where to get data for regional/local sites – easy data access.

Writing teachers suggest brief corrective responses activities and/or writing prompts where the student creates the story and NOAA (or ...) provides possible answers/examples at different levels of proficiency. They would like these activities by grade and linked to standards, both national standards and core standards, possibly state standards.

Teachers would also like inquiry based activities with podcast demonstrating the correct way to perform the activity (like the GLOBE protocols & Steves example of using a hotplate to demonstrate how short & long radiation travels through the atmosphere – any hands-on activities that don't create misconceptions with videos like those on www.teacher.tube.com

Add facts to all topics – simple direct facts.

The concept of climate regions is introduced in the third grade in DC so this would be a good time to show impacts.

Regional /local opportunities and mitigation activities should accompany all impact lessons, i.e service activities and/or virtual field trips.

There was a general request for lesson plans or units that feature local eco-systems Some teachers said they wanted climate change info for kids similar to IMF resources for students and/or the World Bank student resources at which point one teacher recommended (and others conferred) the book “How do we know what we know about Global Climate Change” by Lynne Cherry and Gary Braasch (<http://www.howweknowclimatechange.com/>)

Someone brought up the fact that the Chesapeake Bay is newly included in DC standards and a short discussion ensued about what might be done to get results & suggestions from the workshop into National education standards

Such as

The creation of a list for history classes showing where to plug in climate change lessons, i.e. a chronological paring of human history with appropriate climate related conditions and/or events

Several teachers want elementary grade-level lesson plans that demonstrates how to differentiate weather from climate (don't just explain the difference to teachers)

Someone else expressed a desire for a lesson plan that teaches the impact of oceans on weather (and oceans on climate)

Several teachers requested an elementary level (grades 3-5) lesson plan that outlines a guided climate change web quest

Or – have students be the experts and report back to classmates (jigsaw model)

- Ecosystem expert
- Ocean acidification expert
- Precipitation pattern expert (drought)
- Temperature expert

Everyone agreed that they'd like information on the science behind the solutions in order to discern which recommended solutions actually make sense to pursue

There was also a request for simple graphs – if there is more than one thing plotted there should be more than one graph – for example, a graph showing a comparison of two values on the should be accompanied by two additional graphs with separate plots of the individual values (3 graphs total)

Taking Action

- Have students write letters to congress and fax them for effectiveness
- Raise awareness so people will want to mitigate
- Have students create and follow an action plan

All climate change lessons should include solutions / options / kid-centered options

Examples: non-meat recipes, shorter showers etc...

Include visuals that demonstrate some of the concepts such as the benefit of one person doing something times 100 or a million or a billion – or a school district

There was a request for simple power point presentations with detailed note pages (they cited LuAnn Dalhmans Essential Principles ppt presentation)

There was also a request for smart board/white board resources and activities

More workshops!

There was a request for more face-to-face workshops on climate change with take-away activities that teachers can use with their students and a suggestion for projects that involve buddy schools (like the GLOBE model)

Grades 9-12 breakout session notes from 11/7/09 DC Area Climate Summit

The non-science educators agreed that their goal would be for students to get the global level **science** information in **science** class. They advocated for including climate in national science teaching standards to assure that students would get the climate science information in science classes. This would allow Social Studies and Language Arts teachers to address issues involving climate impacts in their classes without having to go over the science.

Educators mentioned and reiterated the necessity for their students to see climate change as here and now rather than far away and a long time off. They need to be aware of the regional impacts for their own region and how it might affect them personally. Fifty years from now sounds like way too long to matter.

Economics:

Connection to distribution of wealth

Tie climate change impacts to economic stability

If the fisheries fail, those folks won't pay taxes, they'll be out of jobs, looking for work in your community.

What activism opportunities can students take part in?

How do your activities affect the folks who are "downstream" from you.

Case studies and role playing where students take on roles and try to come to consensus decisions.

Examples:

Georgia and Florida fighting over water from the Chatahochee River.

Farmers and fishermen need to work together instead of blaming each other.

Teachers voiced desire for “tiered” lessons where kids could do analysis-level learning if they had time and skills (advanced science courses), but they would also want background information that teachers could cover in a shorter time period.

Educators felt strongly: Don’t just ask students to find their own information on a topic. Instead, point them toward very specific information, written at an appropriate reading level. They expressed general agreement that most classes (especially those with English-language learners) need more material at a lower reading level and with attractive visuals (NOT clip art or “kid” graphics).

Participants saw a lot of promise in using the history and policy issues of the Montreal Protocol as a model of an international problem that has been solved.

Put young people at the center: feature people that kids can identify with.

Provide different viewpoints and let folks make their own decisions. For example: show a farmer talking about why they need fertilizer, and someone in bay talking about its effect on blue crabs.

Have students examine the role of corporations and large businesses in climate. Examine claims of “greenwashing” by analyzing ads and comparing how much money companies spend on ads versus action.

Develop a lesson that shows how policy develops from science.

Topics that teachers teach every year in which climate change might fit:

Federalism: six principles for states and the national government.

SmartGrowth: [\(This is a DC-focused deal that led to a lot of conversation, but I couldn't really follow it.\)](#)

Desire for long-term projects for kids to engage in:

Get them to have a deep focus for an extended period.

Games:

“Clim” City

Chevron’s Website: a game

Carbon Footprint Calculators

Policy Areas:

(some essay/report ideas)

What would society be like if gas cost \$10 per gallon.

What would life in America be like if the Federal Highway act of 1957 hadn’t passed?

World History:

Competition and Cooperation among nations

Depleted resources and ecological transitions

Animals and cultures in the tropical forests----

What are the real costs of products? Ecological

Language needs to be less scientific. Focus on impacts.

Ten-minute videos on what’s going on: “Here’s the physical basis of global warming.”

Concrete examples of each of the seven principles.

Application of science:

Need examples of here and now.

Not just examples like Darfur, where drought has led to conflict, but other disasters that are closer to home.

In English:

What novels and short stories have a setting that would help us understand climate?

Example: Grapes of Wrath

How does setting impact the plot?

Language Arts teachers thought it would be great to have a solid list of “standard” high school reading selections in which climate plays a role.

In history:

When studying industrialization: How has industrialization affected the planet?

When the pilgrims showed up: What was the climate like?

Great moments in history that were affected by climate/weather.

Go to LOC, use primary sources to learn something:

Parallel effort for using data sources to document.

Geography: Human migration patterns related to climate.

Emissions testing: What if you had to pay for how much your car emits?

The Scarlet Letter (C instead of A)

Rationing Carbon Use: once you’ve used your limit, you can’t drive for the rest of the month.

Consider the history of nuclear energy and how it’s popularity/acceptance has waxed & waned.

Social science research projects (i.e. testing the efficacy of various conservation messages) would need to be well-scaffolded. Some thought this method of teaching would be too time consuming for the outcomes. A couple teachers voiced the same objections as science teachers often use to tell why they don’t use more inquiry in science.

Folks thought that a lesson that builds on and draws parallels to the environmental movement of the 1960s could be interesting and useful.

To be widely used, stuff has got to be prepackaged and comprehensive. Again, visuals that bring climate change to here and now (like the river on fire in the 60s) were seen as important.

What were the attitudes of early settlers to the environment? Were native American attitudes and practices any different?

Teachers agreed that more training for teachers is important.

Consider working with NCSS- National Council for Social Studies (Teachers)

A book recommended by Amanda Hurowitz: “Down to Earth: the role of nature in U.S. History”

Recommendation: Add voiceovers to videos.

A few things held up as models of good curriculum to consider following:

Brown University: Choices Curriculum

Landmark Supreme Court Cases (one- two- or three-day activities with various reading levels)

Facing the Future: Sustainability curriculum.

Discovery videos with teacher resources. United streaming.

Some teachers would like to receive a PPT and notes that would allow them to prepare themselves to present a one-hour professional development seminar for other teachers at their school and/or district.

XIII. November Summit Evaluations

Climate Education Summit Evaluation - 11/7/09 (14 participants)

What worked well:

1. I loved hearing/listening to the others perspectives on the global warming impact, along with resolutions
2. Very comfortable tone for sharing. This would not have been possible without this face-to face-meeting.
3. PowerPoint presentation with speaker was great. Very resourceful and insightful. The discussion was good too, but not enough equity in voices heard.
4. Difficult to choose one. Ackerman's presentation was very helpful. I liked that it was interactive allowing us to ask questions and discuss while he went through the presentations. It's so nice to feel like I understand these graphs.
5. Format great, level or presentation great, physical comfort good, the flow of events/activities were just right! Ackerman spoke at a level that was understandable felt comfortable asking questions.
6. Clarification of many scientific global warming terms. You provided me with an array of resources/ideas. A well organized workshop.
7. Presentation with immediate discussion. Breaks-opportunities for networking. Small group brainstorming.
8. Being able to ask questions during the presentations rather than at the end.
9. I enjoyed the breakout groups and the casual discussion style of the conference. It really allowed for the free flow of ideas.
10. Raise awareness of climate change- exposure to different resources (people and print/internet, other teachers)
11. The earlier presentation from Steve Ackerman and the grade level break-out
12. Brainstorm session of ideas to take back. Info on climate change
13. Group discussions
14. Discussion during Steve's PowerPoint (not lecture, then discuss)

Recommendation for Improvement:

1. I would recommend the PP slides not be so scientific, but more teacher friendly. You audience is an advanced group, but not to the point of being scientists.
2. Less talking at us. I felt as though much of the slide show was a repeat of "An Inconvenient Truth"
3. Internet incorporation. I really wanted to see sites. Also, maybe equity cards. Just a thought.
4. Bring in a policy person to add another dimension to the workshop. Some one from Unimof Concerned Scientists could be great or NRDC. Sierra Club or any of the other environmental groups.
5. Somehow amplifying spoken words. It was hard to hear with a fan of some type making noise
6. none
7. Project -have teams come up with one lesson or a product to take home and use in the classroom. Assignment-make a product or lesson to share with participants
8. have a printout or ppts so that we can take notes on the slides
9. I would recommend ensuring that you have internet connectivity for participants as it boosts productivity and access to information
10. the website was very broad-I need information broken down/simplified- give each teacher or small group a topic-demonstrate how we would teach it and share with each other
11. Please be certain to have the follow up of presentation info sent to allow further closer study of the wealth of info shared.
12. Can't think of one-learned a lot
13. blank
14. working wifi, more take-away materials(to share with colleagues)

Overall Rating on a scale of 1 to 5 (1=low, 5=high)

4 = 4, 1 = 4.5 9 = 5

Overall Rating on a scale of 1 to 5 (1=low, 5=high) paired with additional comments

- 1) 5
- 2) 4
- 3) 4, I came in with very little knowledge. I feel I've learned a ton! I'm really confident in returning to school with information for other teachers.
- 4) 4.5
- 5) 5, thank you for this valuable opportunity
- 6) 5
- 7) 5
- 8) 5, I was very captivated and am excited about future uses of materials and data
- 9) 5
- 10) 4
- 11) 5
- 12) 5
- 13) 4
- 14) 5, informative, engaging, relevant, good pace, comfortable environment and food, hosts seemed genuinely engaged and interested in our input