CMMAP Winter Education and Diversity Retreat
February 28, 2012
Damon Room, NCAR Mesa Lab

Agenda

CMMAP Winter Education and Diversity Retreat
Damon Room, NCAR Mesa Lab

Tuesday, February 28, 2012		
8:00	Coffee and Pastries	
8:30	Melissa Burt	Welcome, Introductions, and LSOP Activity
8:45	Brian Jones	LSOP Open House
9:15	Claire Fleming	CGCC
9:45	Brian Jones Scott Denning	Evolution of Summer Teacher Course and CSU Continuing Ed Distance Learning Course
10:30	Break	
10:45	Rodger Ames Scott Denning	Climate App for the iPad
11:30	David MacPhee Silvia Canetto	Women and Ethnic Minorities in the Academic ATS: Has their Representation Changed?
12:00	Lunch	
1:00	Susan Hassol	Improving Communication of Climate Change
	Take breaks as needed	
2:30	SueEllen Campbell John Calderazzo	Climate Change Reader Proposal
3:15	Everyone	Brainstorming and ideas for collaboration on Education and Diversity Proposals (DR-K12 and OEDG)
4:30	Raj Pandya	Participatory Research in Indigenous Communities
5:15	Adjourn	

Attendees:

Len Albright, Rodger Ames, Matt Aronson, John Calderazzo, SueEllen Campbell, Silvia Canetto, Scott Denning, Marcia Donnelson, Howard Drossman, Claire Fleming, Susan Hassol, Brian Jones, Mike Lacy, David MacPhee, Raj Pandya, Dave Randall, Stephanie Rivale, Randy Russell, Dave Swartz, and Tom Windham.

8:45 - LSOP Open House - Brian Jones

Brian Jones gave a report on the Little Shop of Physics Open House which was held on Saturday, February 25th.

He estimated that the open house drew 8000 Visitors. The event used the entire 2nd floor of the CSU Lory Student Center. They had150 volunteers, 300 + experiments/

This year, the theme for LSOP and the open house is, "How big is your world?" The experiments where placed in all three ballrooms. The rooms where split between, the dark room (go), the light room (flow) and twilight (glow).

CMMAP and other partners made presentations in separate rooms.
Slow Motion Commotion – high-speed camera set up with experiments
Journey of a Rain Drop – Water Cycle, cloud in the bottle, rain drop bottles.
NCAR - Simply Shocking - Lightning and lightning safety
CIRA - Viewing the Earth from Space

There is always room for more partners. Brian asked for suggestions.

John Calderazzo suggested a Poetry Station as a quiet corner for parents and kids. John would help organize a group of teachers. The purpose of the poetry station would be to use language and metaphor which teaches across people's experience.

Sarah Hepburn was mentioned as a possible presenter regarding geology and climate change.

Brian has received a Google Grant to assist in developing a franchise for LSOP.
Folks from the Pine Ridge came down this year to learn more about how to do their own version of LSOP and several teachers attended the Summer Teacher Course.

Brian is promoting LSOP more as a science field trip for schools. It was suggested that he could talk to Tom Milligan about CSU promotional activities.

9:15 - Colorado Global Climate Conference - Claire Fleming
Claire Fleming discussed the Climate Global Climate Conference, an annual event for high school students and their teachers. Last year the event was held on October 17th at CSU and was filled to capacity.

Claire was interested in receiving ideas on the core concepts of the event just as: who can present, a theme, what it is that everyone needs to know about the science, alternative energy, ecology?

How do we know what we know? Ice Cores, Tree Rings, etc. How do you get this information in the first place? It was suggest there might be a breakdown called "Skype a scientist," discuss climate and weather related events that are local, including significant weather events in the last three years. Could also include topics like water shortages and water rights. The event has evolved and should be designed as a structure that has a purpose.

If we have a theme, this would help determine who to invite as speakers. Themes could be developed around all the different ways of knowing; introducing one or two ways of knowing per year. How do we know? What do we know? What do we do about it?

What would we like to see for next year's event? A specific breakout for teachers was added last year, it was agreed that this worked well and perhaps that could be expanded in some way.

It was also agreed that more active participation during the day was needed. There seems to be a lot of talking – we need more doing. We need to ask the presenters to make their presentation more interactive. Talk about the core concept, how does the topic relate to the state standards?

It was also suggested that there could be an interactive workshop with graduate students. Tom Windham suggested that a native elder could be invited to do a talking circle.

Next year the times for the event will be different, starting at 9:30 and ending at 3:00. The event would start with Scott and end with the keynote speaker

Claire also asked for suggestions on a possible keynote speaker. Possible suggestions for speakers included Bill Ritter, Former Governor of Colorado and Nalini Nadkarni who is at the University of Utah. Dr. Nadkarni is a canopy scientist/biologist who works with climate change in forests and she has started a new science education center at Utah.

There was discussion about alternate ways to prepare the evaluations. It was suggested that we might try interviewing the attendees and/or by ask for the evaluations after each session.

David MacPhee said it was important to minimize open-ended questions for this age group.

9:45 - Evolution of Summer Teacher Course and CSU Continuing Ed Distance Learning Course

Brian Jones discussed changes that will be made to the Summer Teacher Course starting this summer. It will now be called the CMMAP Summer Institute and be broken down into two sections. Part I will still include the five e's: engage, explore, explain, extend and evaluate.

Part II will be for teachers who had taken the course before or an advance section for people who will be taking Part I this summer. As an example, advanced topics can include buoyancy and stability.

There was discussion about follow up with the teachers and continued support throughout the year. More support for the teachers after they have put the ideas to work in the classroom. It was suggested that we might consider cutting down one day of content and spend this time on how the teachers will deliver this information in the classroom.

Raj briefly mentioned the Research Experience for Teachers (RET) through UCAR/SPARK. The program is four weeks long and deals with chemistry concepts and climate change. Teachers meet with the scientists and then develop their research projects. The teachers

are treating like experts. Spark is working in conjunction with the University of Northern Colorado on this project.

Both Brian and Scott Denning are currently working on developing on-line courses both for CSU college credit and for Continuing Education (C.E.) requirements. C.E. courses are being designed to extend the information to the teachers. Teachers will help develop the information.

Scott is currently teaching an OSHR class. There are 15 people in class – very experienced individuals. CSU's On Line Plus with the assistance of Carl Melle is digitally capturing the material and will market the class after it has been packaged.

The class is in two parts which are: Climate 101 How the climate works and Climate 201 How the climate is changing? Scott feels the "taping" of the class is above average in technical quality. Very enthusiastic.

Brian is also working with Carl Melle on a course for teachers based on his television show. This package will include behind the scenes piece. They are working on how to make the class more interactive.

Randy Russell suggested adding an on-line discussion component; include on-line blogs, live chats, etc. Brian said they are also working on kits that can be sent to each participant.

10:45 - Climate App - Scott Denning and Rodger Ames

Scott Denning and Rodger Ames discussed the EARTH carbon App that they are developing.

The learning objectives for the app are:

- Comprehensible and predictable
- Observations limit choice of parameters
- Future climate determined by CO_2 (integral) rather than emissions (derivative)
- Very long time scale response!
- Modeling can be fun!

Experiential Learning includes:

- **Calibration** (predict the past)
- Prescribe initial CO_2 and emissions(t)
- Adjust land-use to get CO_2 history (compared to firn and flasks)
- Adjust climate sensitivity & heat capacity

- (compare to proxy & GISStemp)
- **21st Century** (AR4 Scenarios)

The question is whether we can take the LSOP success done with one hands and translate it into the virtual world?

Rodger did a demo of the app to show the types of input a user could make along with the steps they could take to advance to higher levels. The app is intended for use by middle and high school teachers and includes standards mapping, lesson planning and hands on learning. The app will be tested as part of the Summer Teacher Course and be available as a demo for teachers and students at the CGCC.

It is planned to have one of the summer intern work on helping to develop the app.

11:30 - Women and Ethnic Minorities in the Academic Geosciences: Has their Representation Changed - David MacPhee and Silvia Canetto

David MacPhee and Silvia Canetto discussed women and minorities representation in ATS?

They pointed out that with a very small number to draw from undergraduate majors it is important to focus on how we can change the pipeline?

About 39% of 1135 students are women. 7% minority.

ATS has a very low number of minority students. Perhaps we could look at undergraduate degrees. One way to increase participation on the graduate level would be to draw from different undergraduate degrees. For example 43% of undergraduate students majoring in math are women while only 4.5 % of graduate students in ATS have math background.

1:00 - Improving Communication of Climate Change - Susan Hassol

Susan Hassol, ClimateCommunication, LLC NCAR Visitor, National Climate Assessment Senior Writer
This presentation focused on how scientists communicate to the public.

What do Americans think?
63% - believe in global warming
50% - mostly due to human activity
39% - Think scientists think it is warming
38% - say that scientists do not agree

Common misconceptions are that the ozone hole, toxic wastes and aerosol sprays are causes.

It is important for scientists to use their words carefully. For example when we say aerosols….climate deniers can twist this by referencing aerosol spray cans, etc.

She pointed out a study done by Yale University, "Global Warming Six Americas", http://environment.yale.edu/climate/publications/SixAmericasMay2011.

In 1997 – Climate change became a policy issue.

She recommended two books by Chip and Dan Heath: Made to Stick
Switch – how to create change when change is hard. She also recommended: http://climateinteractive.org/simulations as a good source for a simple climate model.

In dealing with policy makers and the public it is all about the conversation. Answer questions; focus on engagement – not lecturing. Connect on values. Concentrate on message crafting

The public wants to hear good news – put a positive spin on your message. For example: Reduced emissions will make people healthier, communities more livable. Be careful with numbers, don't expect people to do math in their heads. Use analogies, for example, "Greenland's annual melt is 225 times the annual water usage in Los Angeles. Scientists need to work on crafting their message, their language use, less is more.

2:30 - Climate Change Reader Proposal- SueEllen Campbell and John Calderazzo

SueEllen Campbell and John Calderazzo are considering developing a climate change reader for use by university faculty in the classroom. One concept is to structure the book much like the Changing Climates@CSU website. They questioned:

Is it worth doing a book at all?
Or, just distribute on the web for free?

A second concept would a series of essays with 20-25 pages per author. Possible topics could be oceans, policy, carbon, rain and floods climate refugees and national security. What are the impacts on people?

Several faculty members at CSU are interesting in providing essays for this project. The proposal is due to the editor in April or May the editor at the University of California Press.

It was suggested that this book should include ethnically diverse and Spanish speaking writers. And that the book might have greater impact if information was given about possible career paths for the various academic areas included in the essay. An attempt should be made to reach out to minority institutions to find contributors.

3:15 - Brainstorming and ideas for collaboration on Education and Diversity Proposals (OEDG) - Marcia Donnelson and Scott Denning

Marcia Donnelson gave us a status update on the planning process for the OEDG (Opportunities for Enhancing Diversity in the Geosciences) Track 1 proposal that CMMAP is coordinating. Scott Denning added some background on the proposal in general as well as CMMAP's submission last year for the same RFP. The current idea is to apply for the Track 1 proposal this fall with the intent of involving a few select Alliance School communities in the planning process to create programming that meets needs identified by these communities. The ultimate goal, upon successful completion of Track 1, is to later

apply for Track 2 and build upon the foundation established through Track 1, increasing and bolstering programming and outputs. The group provided input and posed questions about next steps.

4:30 - Participatory Research in Indigenous Communities – Raj Pandya

Raj Pandya gave a presentation about science and communication and and ideas as to how our science can become more inclusive.

The main points were that science is becoming more participatory, inclusive, and computational. To prepare students for this new type of science (science 2.0) it requires a rethinking of science education and its goals. Think about the process behind science over content, prepare students for multiple career paths, emphasize the solutions and not just the disciplines, and to be inclusive. The new framework can be based on the following: aligning research and education with community priorities, plan for co-management of the project (between scientists/community), engage the community at every step, and incorporate multiple kinds of knowledge.

Raj also discussed some work that a few SOARS proteges will be partaking in this summer. In Pointe aux Chene, LA they will be responding to the needs of this community. Two proteges will work with the community on issues associated with salt water intrusion, vulnerability to flooding, and plant ecology.