

**Berkeley Team Meeting - CITRIS Center  
Education & Diversity Retreat  
January 10, 2011**

In Attendance:

Colorado State University: Len Albright, Michelle Betsill, Melissa Burt, John Calderazzo, SueEllen Campbell, Silvia Canetto, Scott Denning, Marcia Donnelson, Claire Fleming, Brian Jones, Mike Lacy, Nisse Lee, Dave Randall and Andrea Weinberg

UCAR: Susan Foster, Rebecca Haacker-Santos and Randy Russell

Colorado College: Barbara Whitten

NSF: Jay Fein

UC-Davis: Marco Molinaro

University of Washington: Tom Ackerman

**Welcome & Introductions**

Melissa Burt welcomed everyone to the meeting and asked for those individuals present to introduce themselves and explain their role as part of CMMAP.

**Brian Jones and Nisse Lee – Ideas about Scales: LSOP’s next video**

We kicked off the meeting with a few icebreakers from LSOP. There 2010 theme, It’s about time, covers time in a variety of ways, from timescales to slowing down time. Brian requested brainstorming ideas of ways to represent scale for the 2011 Theme of Scale (“Size matters”). LSOP hopes to assemble the ideas into three groupings, and follow up with schools to see how these groupings will cover their science requirements. As part of his presentation, Brian showed a clip from Everyday Science a TV show that airs on Rocky Mountain PBS and Poudre School District Channel 10. He also showed a video clip from Science it UP which takes basic principals of Physics and demonstrates them in a very easy to understand and entertaining format.

**Mike Lacy: Results from an Observational Study of Kids Engaging in LSOP Activities**

Mike’s study involved watching kids participating in LSOP activities, specifically looking for patterns, to see how much engagement there is, and if they are using the project/exhibit correctly.

- One interesting finding was that 43.6% of kids become more interested in the exhibit through spending time with it; they get “sucked in” and want to explore more. This is the type of outcome we are trying to achieve.
  - Boys and girls interact with exhibits quite similarly. Latino/a kids seemed a bit less interactive with exhibits, a bit less likely to read signage.
- 6th-7th graders spent a little more time than 3rd-5th graders. 8th-9th graders tend to seem somewhat bored and spend less time on exhibits. This is good if the target audience is middle-school students.
- A simulated tornado is one exhibit that tends to draw kids in and they spend more time there.
- The overall trend is that time spent per exhibit is small.

LSOP is trying to take this data and identify how to keep kids at a single exhibit longer. Different levels of challenge, like the simulated tornado? Nisse described using pictorial signage, with further explanation in English and Spanish.

- Scott Denning suggested making exhibits entirely hands-on in order to draw kids into the exhibit and get something out of it even without reading the signage.
- It was suggested to have fewer exhibits that are organized by theme so that a single exhibit adds clearer understanding of a general theme.
- It was further suggested to have handouts for teachers to take with them containing explanations of exhibits.
- Less is more” came up again and again.
- Marco Molinaro suggested having a “cheat sheet” for parents and teachers that is keyed to each exhibit with two or three points or Q/A for the person in an authority position to be able to answer kids questions and help with learning. He got this idea from the Tokyo Science Museum.
- Marco also pointed out that greater learning could potentially take place if kids not only interact with the exhibits, but engage in discussion with a peer or group; supporting kids talking to kids. And, structuring the flow through the exhibits could be more deliberate.

### **Randy Russell and Susan Foster: Next Steps for UCAR Educational Outreach**

Rebecca Haacker-Santos, SOARS Deputy Director, attended the meeting since Raj Pandya was unable to. She reported an 85% success rate for retaining

interns in the Significant Opportunities in Atmospheric Research and Science (SOARS) program and for them to enter into graduate school pursuing advanced degrees in the Atmospheric Sciences.

- New ideas for the next few years of SOARS were discussed.
  - Offer protégés' an opportunity to get involved with hands-on science education and outreach.
  - Reach out to Native American communities and other underrepresented populations to find potential protégés' and stewards who can relate to their communities.
  - Seek out more grant funding.

SOARS has started a new summer research program for high school students (HIRO). HIRO is a 3 week program that allows high school students to get research experience with NCAR scientists.

- High school outreach – possibly recruit at the CMMAP's Colorado Global Climate Conference?

UCAR is looking forward to the furthering connections and supporting education and outreach with CMMAP, through SEE-ME resources that are geared towards Atmospheric Science. Windows to the Universe is now with NESTA - National Earth Science Teachers Association. Starting in year 6, CMMAP will work with Windows to the Universe (NESTA) directly.

- UCAR's focus moving forward with educational outreach, they want to work with LSOP and CMMAP better, and go into more depth than Windows has historically.
- Randy demonstrated his rough draft of "Cloud Zoom". He is looking for input from scientists regarding the different components and crystals, etc. at different layers of the scale. Different layers to cloud zoom, grid scales, etc. to help tell part of the CMMAP story of why we are trying to improve climate modeling. Interesting in helping, contact Randy ([rrussell@ucar.edu](mailto:rrussell@ucar.edu)). He wants input on where to focus, now that he has shared the various model ideas. New focus areas:
  - How about having different target areas - rain cloud, volcanic eruption, fire, etc.?
  - Interactive animations & game ideas: "Factories": Cloud, raindrop, snow, etc. Virtual ballooning. Parcels of air. Cloud morphology.
  - Radiation model/demonstration as being at the cloud level. "Smaller

drops make brighter clouds”, rather than global radiation budget.

Susan: moving into the next five years, focusing on these interactive tools, wanting to get CMMAP input, and looking at webinars - National Science Teachers Association. What kind of web seminars would we want to do next summer or fall? Topic ideas from the summer teacher workshop?

### **Melissa Burt: Goals & Strategies for recruiting diverse students for CMMAP**

This presentation discussed the goals and strategies that have been developed for CMMAP in consultation with Tom Windham. Ideas for this, what does diverse mean in this context, how does SOARS deal with it, etc. Need to think about who would fit in the internship and in our graduate students based on our diversity goals. Need to target recruiting based on this. Potential strategies are to network with physics, chemistry, and math departments to have faculty share atmospheric sciences as a potential field or career path as applied physics and applied chemistry options. The specific details for 2012 internship recruitment will be laid out during Summer 2011.

### **Brian Jones & Nisse Lee: LSOP Activity**

Be the model (we did greenhouse gasses). What else could you do this way? Clouds. Phase changes. Velcro.

### **John Calderazzo: New Initiatives in Science Communication**

John gave an overview of a couple pertinent articles on science communication. There is a missing platform for disseminating climate change information. Scientists shouldn't be the only people trying to get the word out, it is harder or them to do it on their own. If they do, it isn't heard loud enough. We need more airtime and more money, like news/media have, in order to really get the message across and compete with misinformation. John led us in a thought-provoking and somewhat passionate discussion about science's 'obligation' to communicate more effectively and to a broader audience about climate change. Interesting points were raised and a lively discussion ensued. Michele Betsill brought up an important point, stating that we should stay focused on our ultimate goal to move forward with asking the more difficult questions of what to do about climate change, regardless of who agrees or doesn't agree with the science behind it all.

### **Michelle Betsill: Policy Outreach**

Due to time constraints, this discussion item was not covered.

### **Leonard Albright and Andrea Weinberg: Building an Education and Diversity - CMMAP Evaluation Plan for the next five years**

The Education Evaluation plan covers components of LSOP, Windows, Teacher Workshop, Summer Internship and Diversity initiatives. In designing an education evaluation program, it should have “payoff”, to benefit CMMAP. This way we can improve in targeted ways as we move towards the future. Outcomes of Interest slides were reviewed for each of the four areas under review. Currently looking at short term with an eye on longer-term, and longitudinal strategies. Goal is to bring a final draft of a new evaluation plan to the August Team Meeting in Fort Collins 8/2011.

### **Marco Molinaro: Lessons Learned from the Education and Diversity Programs at the Center for Biophotonics in Davis, CA**

Marco showed several videos capturing cloud and weather movement, and the apparent movement of the sun on the horizon depending on the time of year. This was very fitting for CMMAP. He then went through some lessons learned from the Education Programs at his STC. The didn't want to differentiate and separate the diversity initiatives from the rest of the STC and just stick it in with education. Strived to have diversity run throughout the undergraduate pool. By not having a 50% or greater group, nobody is the majority, and everyone belongs. Helps things run even better. Found Socioeconomic status (SES) - to be across the board, but the majority also overlapped with NSF defined diverse groups. Help students feel like they are part of a community and have something to really contribute. They found most undergrads in their field wanted to take a year off before entering grad school, mainly to have the time to take entrance exams. They worked hard to keep those students involved in science in the transition time. Learned they were taking advantage of their diverse students... for photo opportunities, outreach, visiting dignitaries, etc. Keep the group really diverse! But that its important to not take advantage of minorities.

K to grey... lifelong learning. They ended up focusing on high school, undergraduate and graduate students because NSF said don't do K-12 because you would not have enough time to be able to see those students become scientists in the life of the STC. They did do a bit of work with grade school students, but spent most of the efforts on middle and high school students that could be followed through to graduate school. Started a undergraduate internship program for community college students. This was a 2 week program during winter break that introduced students to the world of research. Students would then be able to apply for the CBST internship or other programs for the following summer. Partnered with another department which was also interested in the program and outcomes. They share funding responsibilities. Historically, provided programs for low SES students and turned away students from higher income families. Now that the STC is ending, thinking about how to be sustainable and bring in more funding from these students who can pay. Program sustainability. For years, focused specifically on how to make NSF happy. Now that the STC is ending, this does not matter as much. In pleasing NSF only, perhaps they neglected the needs of their own campus. Needed to

keep more focus on how to keep it really going into the future. Focus on the institution and partners, and make sure to not neglect the local environment. In looking to alternative resources to sustain the Center, it is important to be mindful of how much work it takes to sustain reporting for each project. Often times small foundation funding requires as much effort for reporting, if you want to be grant and foundation funded. Each grant may have as much reporting work as the NSF grant.

A couple of specific questions were asked of Marco to wrap up the day:

Q: What would you do differently in year six, knowing what you know now?

A: 1) Focus more on publications. It is not good enough to just let our information exist in our annual reports. We need to get it into professional journals in each field. Step it up and take it to the next level. 2) Court foundations. Establish relationships so that when the STC ends the non-profit can continue.

Q: Are there any resources or publications established by STCs on how they have done things?

A: Not really at this point. However, there are STCs who have been through this before and would probably be willing to collaborate or share.

Other thoughts:

- Stay open minded and see how things can relate or overlap... evolve.
- Mix and blend... continue to think of innovative methods to moving forward.

### **Scott Denning on a grant opportunity: Transforming Undergraduate Research in STEM**

Three project types are addressed in the solicitation. Howard Drossman will be the PI for this proposal. Howard is proposing the Type 3 project that is the largest dollar amount and presents the largest challenge. Idea for creating a program to educate undergraduate faculty in climate change, to then disseminate this information to undergrad students. Make this a package to market and sell.

Howard has sent an email detailing his thoughts regarding this proposal. The email will be forwarded to several of the participants at the retreat. The proposal is due early January 2012.

### **Adjourn**

The meeting adjourned at 4:00pm.