

Title of Session: Science K-20+ Resources - CReSIS

Moderator: Jeff Cooper

Guest Speaker: Stephen Ingalls

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JeffC: OK Stephen, well... I think we should probably start with the CReSIS homepage.

JeffC: and what's happening with your project.

StephenI: Let me give you all a quick overview and then we'll go there.

StephenI: Just as a short introduction...

StephenI: The Center for Remote Sensing of Ice Sheets (CReSIS) was established in 2005 by the National Science Foundation as a designated Science and Technology Center (STC).

StephenI: The program establishes large, multi-university, multidisciplinary organizations to study a specific scientific problem that probably can't be adequately addressed with a smaller research team. The initial grant is for five years, renewable for another five years after review in the fourth year (for us, that's 2009).

StephenI: Our partners include: University of Maine, Penn State, Ohio State, Elizabeth City State, and Haskell Indian Nations University. The University of Kansas is the lead institution and is where the headquarters resides. Approximately 162 participants, around 70% of them students, are involved with the Center's research.

StephenI: We also partner with the University of Copenhagen, the Danish Technical University, a research center in the UK, and another research center in Tasmania, Australia, as well as with two NASA labs (Goddard and JPL).

StephenI: Our mission is to study the response of the world's ice sheets (Greenland and Antarctica) to climate change and the potential impact on sea level rise.

StephenI: Approximately 7 meters of sea level is locked in Greenland's ice sheet and another 60-70+ meters in Antarctica.

StephenI: I'll take a few questions and then propose we nose around our website.

DavidW: Big project!

StephenI: And introductions seems like a great idea for me.

BJB2: everyone please share where you are located and what interests you in this topic

BJB2: I'm in Pennsylvania (Penn State territory!)

DavidW is in New Jersey, near New York City (might still be Penn State territory)

StephenI: Karina?

KarinaM: I'm in Edinburg Texas

StephenI: Ok...let's go to the CReSIS website...(www.cresis.ku.edu)

StephenI: We have three large program areas...Research, Education, and Knowledge Transfer

StephenI: News = Knowledge Transfer (kind of)

StephenI: The Center keeps two journalism undergrads on the staff to maintain a kind of climate change newspaper.

StephenI: This is updated daily with headlines from major news outlets on climate change.

StephenI: The Icebreaker (orange hyperlink at the bottom of the news section) is our quarterly newsletter.

StephenI: How are we doing so far?

BJB2 smiles...pretty cool, Stephen!

BJB2 . o O (no pun intended)

StephenI: The center section on the home page provides a high-level outline of our research efforts.

StephenI: We build radar that penetrates ice - up to 2 miles, to determine the internal structure of the ice sheet.

StephenI: We also use seismics (Penn State) to assess what's going on at the base of the ice sheet (water, rock, smooth, rough, etc.)

StephenI: You can drag radar and instruments around on the surface, but those conditions are sometimes too rough to traverse, so aircraft are often used for the radar.

KarinaM: interesting

StephenI: A highlight of our first five years is the construction of a UAV (uncrewed aerial vehicle) that will be used in both Antarctica and Greenland.

StephenI: To give you some sense of size, it's about 26' wingtip to wingtip and is being built by aerospace engineering students, staff, and faculty here at Kansas.

JeffC: cool

BJB2 hope they're considering how to get the plane through the classroom door!

StephenI: Field work - we have a team that's in Antarctica right now and have taken along a middle school high school teacher from Olathe, Kansas.

JeffC: one thing I found particularly interesting at the site are the links that are found on the K-12 Education page: <https://www.cresis.ku.edu/education/k-12.html>

StephenI: I'm headed toward the education section...

JeffC: cool Stephen... sorry for jumping ahead!

StephenI: The educator, Brandon Gillette, will be blogging his experiences and posting them via another website belonging to an organization called PolarTREC.

StephenI: Lastly, and equally important as the research, is our education outreach effort.

MaureenB: I would love to do that but some place warm :)

StephenI: We have one PhD education graduate student, three MS students, and assorted staff here that work with our K-12 outreach coordinator to do outreach in our region around Lawrence.

StephenI: Since January 2007, we've visited nearly 60 classrooms and seen around 9,000 kids.

StephenI: Focus is to middle school and our efforts are really aimed at trying to attract a greater, more diverse pool of kids to STEM careers.

KarinaM: Have you visited Texas?

StephenI: No visits to Texas yet...but online, virtual visits like we're exploring now is probably in the near future.

StephenI: The stuff at the top of this section is just some random cool stuff that students might like.

KarinaM: Cool!

StephenI: The CReSIS IPY posters were done here by KU sophomores to celebrate the International Polar Year (2007-2009).

StephenI: We posted all of them because they were truly very good. I got the idea from the 1957-58 posters done to commemorate the International Geophysical Year.

StephenI: Cheri (our Outreach coordinator) has done a web survey to find cool, interesting climate change websites for students to explore in the Links to Polar Fun.

KarinaM: This sounds like fun and interesting to explore

StephenI: Anthropolis (at the top) is one of my favorites.

StephenI: We update these all the time and if you find one you'd recommend to us, we're all ears.

StephenI: Looks like we misspelled Athropolis.

StephenI: I'm back to the home page now.

StephenI: Jeff - should I stop for a few minutes and give folks a chance to shoot some questions?

BJB2 wonders if anyone has any questions?

BJB2 . o O (the posters are wonderful)

StephenI: The posters by Carolina Medeiros and Ivan Aguirre were our "winners" for this year. Carolina's was the designated K-12 outreach poster for AY 07-08.

BJB2: excellent design

StephenI: Let's walk through the "For Educators" section...

StephenI: Ice, Ice Baby is a series of hands-on lessons Cheri Hamilton developed and that work really well at K-5/6.

KarinaM: How would you encourage high school students to join you guys?

StephenI: High schoolers are a tough audience for us.

KarinaM: why?

StephenI: They have either developed the math skills in middle school necessary to

function at a high level in STEM efforts or they haven't.

StephenI: We focus our outreach at the middle school level for that very reason.

StephenI: One mechanism, however, that we've tried to use with high schoolers is First Robotics.

BJB2: cool!

StephenI: It's even nicer when the district in question has a First Lego League program to feed the high school effort.

BJB2: there is a first robotics K-12 group in the [TI] student campus

StephenI: I'm still on the Ice, Ice Baby page...

KarinaM: Thanks for answering my ?

StephenI: We tried to build these lesson plans so that they were self-contained. Everything you should need is here. Click on 10 - Glacial Movement.

StephenI: All of these were developed in this format and show linkages to national science standards at the bottom.

StephenI: I'm going back to the Ice, Ice Baby page now.

MaureenB: good ideas for kids Science Fair projects

StephenI: We will add to these over time as Cheri finds things that she's tried (and that work).

StephenI: We post nothing here that Cheri finds troublesome.

StephenI: back to the home page...

StephenI: any questions on Ice, Ice baby?

StephenI: The TRIO curriculum section is still a bit troublesome on this page.

MaureenB: lessons seem very straight forward

StephenI: It was developed in another format about two years ago for use in an 8-10 week summer program.

StephenI: We're proofing this area now and will be developing more high-school web-based products in a CD/DVD format.

StephenI: Each year over the past two years, our partner at Ohio State has hosted a K-12 teacher workshop (the coming soon link).

StephenI: Kansas will host a similar event this coming summer.

StephenI: We are converting the presentations given during that workshop and will host them here when that effort is complete.

StephenI: I should probably talk a little bit about the International Polar Year.

StephenI: click on the IPY link and it should take you to www.us-ipy.gov

KarinaM: Do teachers enjoy this type of workshops? What kind of questions do teachers ask?

StephenI: Teachers seem to enjoy these workshops...many are a bit "science-phobic" and get to explore some things hands on that they can take back to their classrooms.

KarinaM: cool

StephenI: The "take-away" from these workshops is that teachers must develop some curricular tool to share, but that relates to climate change.

StephenI: IPY - I'm on the IPY website.

StephenI: the first IPY was 1882-83 and organized by an Austro-Hungarian naval officer frustrated that he couldn't do enough science by himself to explore the poles

DavidW smiles

DavidW: Probably a bit more challenging in the 19th century

StephenI: he didn't live to see the first effort, 15 nations, 12 expeditions (true - no airplanes or skidoos)

StephenI: the second IPY was organized by a researcher who was experimenting with high altitude balloons and ran into some strange wind phenomena at 10-15 KM up he couldn't explain (and wanted some help)

StephenI: the third was planned as the result of a dinner party where three researchers thought it would be neat to organize some worldwide scientific effort on the 50th anniversary of the 1st IPY

StephenI: it grew from an originally envisioned polar year focus to a larger global geophysical effort

StephenI: fueling an entire generation of scientists and engineers, we have high hopes for this IPY - that it could do the same at a time when the world is focusing more to the challenges of climate change

StephenI: back to the CReSIS home page

StephenI: Polar Links are a collection of resources related to our research that we thought teachers could incorporate into lessons on climate change.

DavidW: Stephen, have there been any efforts to have students around the US (around the world) collect and share data?

DavidW: . o O (days of snow cover, thickness of pond ice, etc.)

StephenI: good question, but not the kind of data we're dealing with - I'm going to talk a little about an international student organization we want to found

StephenI: David - everything you suggested has an analogous relationship to Greenland or Antarctica and could easily be integrated into lessons on climate change - just beware the difference between climate and weather

StephenI: I'm going to stop for a few minutes and see if there's more discussion threads out there to entertain.

StephenI: Too fast, too slow? Anyone want me to back up?

DavidW: Thinking about how to differentiate climate and weather

JeffC: I'm interested to see how K-12 Science teachers could incorporate your research into global project based learning.

JeffC: I mean... students are incredibly bored in school... getting them involved somehow with this project... thinking about their future, etc.... and yet... a lot (everybody?) feels rather powerless to do anything.

StephenI: Good question - weather vs. climate, and I'm not a meteorologist. Think of it like data points. Weather is a data point. A single data point might represent weather, but a curve drawn through hundreds of data points would be climate.

StephenI: Global learning...we have a budding initiative with the objective of arming 1,000,000 K-12 kids with a baseline of climate change knowledge, then connecting them via the Internet to let them explore the challenge and propose potential solutions.

StephenI: The challenge I personally face with climate change is knowing where to start given the magnitude of the issue...

JeffC: exactly

DavidW: and how to make it real for students who may not see much change

DavidW: Connect them up with students, for example, in Alaska, who may be witness to much more rapid changes

JeffC: but it's *their* future when the change may really have the impact. we (us old people) will be dead by 2050.

StephenI: right...that's why it really isn't "inconvenient" enough for the older generation to take on

StephenI: Our connections with Native American and Alaska Native peoples has proven valuable in understanding the impact of climate change today.

JeffC: and as Stephen says... it's of such enormous magnitude, how do you apply the "think globally act locally" framework? What kinds of projects could students do that they'd feel were relevant and would have an impact?

DavidW: greener technology (buildings, transportation, food production)

StephenI: Good example in the newspaper recently...Girl Scouts who sponsored "no idle zones" near their schools

MaureenB: recycling

JeffC: I definitely like the idea of connecting with native American and Alaskan native students, if for nothing more than increasing cultural awareness and connections.

DavidW nods to Jeff

StephenI: Jeff - true...plus, they're seeing the impact now.

DavidW: or any group living near glaciers or any environment that seems to have accelerating environmental changes

StephenI: NPR had a spot this morning about the glaciology club that goes out to measure the glaciers every year

StephenI: in Iceland

StephenI: What else might I entertain the group with?

DavidW smiles

JeffC: Stephen, our time is up for today. I really want to thank you (and the others at CReSIS) for spending an hour with us tonight. Well... do you tapdance?

StephenI: Nope, but we promise to post another joke to the website next month.

BJB2: Stephen, this has been a fascinating presentation! Thanks.

JeffC: excellent!

JeffC: Like you said, the magnitude of this issue is overwhelming.

JeffC: I'm really glad you have a presence here at Tapped In.

StephenI: Keep checking the website...more to come. My e-mail is singalls@crisis.ku.edu if you have anything to share later.

KarinaM: Thank you Stephen, your information was very interesting

JeffC: And of course, if there's anything we can do here to help you, just let us know.

StephenI: will do

BJB2 waves goodnight

KarinaM: goodnight!

DavidW: Great presentation, Stephen. Good luck with your work

StephenI: thanks...lots to do

DavidW agrees