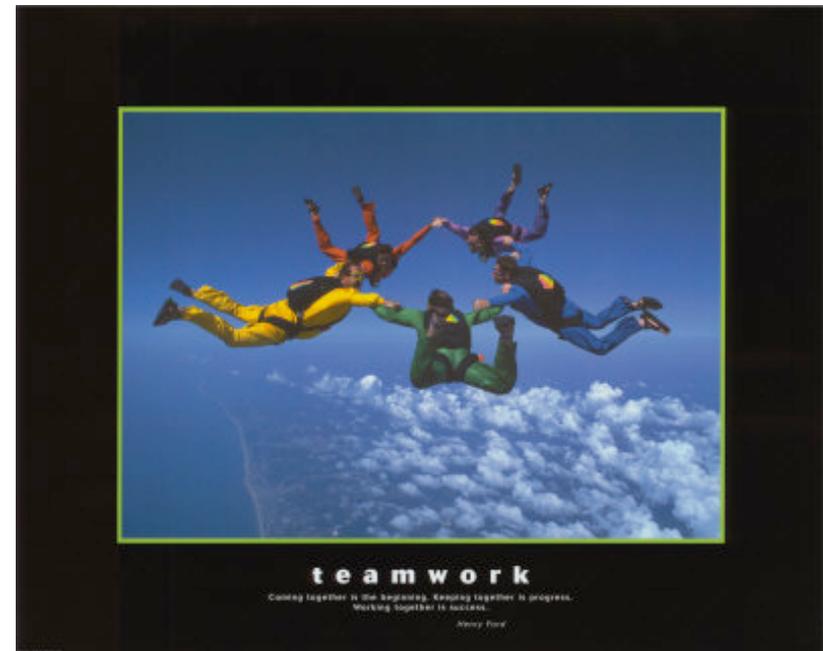


Education and Diversity

The Team

- Scott Denning, Director, Education and Diversity
- Christine Aguilar, Manager, K-12 Science Education and Diversity Manager
- Melissa Burt, Manager, Diversity and Higher Education



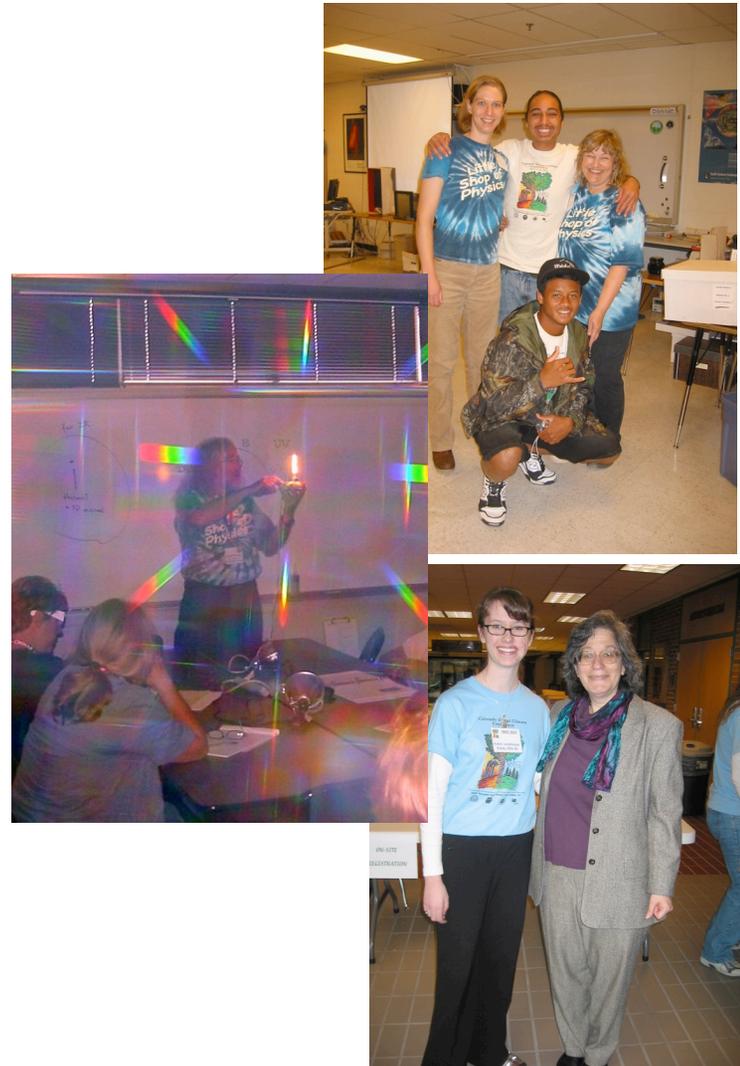
Diversity and Higher Education Manager

- Position created as result of NSF Site Review Panel recommendations
- M.S. Atmospheric Science
B.S. Meteorology
- CMMAP Graduate Student
- SOARS protege
- Focus on increasing diversity and building partnerships in Atmospheric Science



K-12 Education

- Enhance learning of Earth System Science at all levels.
- Improve participation in science and engineering by women and minorities.



K-12 Education

- Teacher training
- Weather Kits
- Online resources
- Mentoring
- Little Shop of Physics
- Middle School Camp
- Colorado Global Climate Conference





- HOME
- SCIENCE-ED HOME
- FOR STUDENTS
 - Current
 - Prospective
 - Internships
- FOR TEACHERS
- EVENTS PAGE
- CALENDAR
- DIVERSITY
- LINKS



Teachers

Program Helps & Classroom Ideas

Also look at our [Links and Resources](#) pages in the CMMAP [Learn About](#) pages.

Ten Things You Should Know About the Atmosphere

Hands-on investigations from CMMAP and Colorado State University's [Little Shop of Physics](#).

Here is the [Website containing Materials](#) from the 2006-2007 teacher workshops.

Support and Resources for Teachers

PDF brochure containing information to help teachers and students *reach for the sky*.

[CMMAP_ED_WebBrochure.pdf](#)

Teaching Weather and Climate

This yearly course is offered in the summer. Registration for the next course will happen in early spring 2009.

Resources from past courses [can be found here](#)

Art and Culture in Clouds, Weather and Climate

[A great site](#) brought to us by the folks at [Windows to the Universe](#) for teachers and parents.

Teacher Links from the Community Learning Network

[These pages](#) provide links to global warming/climate change information including curricular resources, hands on experiments, instructional materials and lesson plans for elementary through high school levels.

Environmental Protection Agency's Climate Change Pages

[This excellent web site](#) provides information on climate change, wildlife, and wildlands. It includes downloadable and free, interpretive kits which include a video, trail cards, global warming wheel card, and a CD-ROM, which contains fact sheets, brochures that can be ordered, case studies, sample trail talk outlines, visual aids, and a number of interactive activities. The tools are geared toward people of all ages to serve the needs of the diverse groups that visit parks and refuges.

[Here's their site](#) for kids.



Educator Support & Resources

- Program Helps
- Classroom Ideas
- Workshops
- Conferences
- Student Opportunities



Activity**Description**

[Does air weigh anything?](#)

Indeed! But most simple experiments that purport to show this don't work. This one does.

[How does the atmosphere keep the earth warmer?](#)

The earth cools by infrared. And the atmosphere is somewhat opaque to the infrared, so it keeps the earth warmer. A simple investigation.

[How can clouds help keep the air warmer?](#)

When water vapor condenses, it gives up heat. This is an important process of energy transfer in the atmosphere.

[Do cities affect the weather?](#)

Cold water vapor won't necessarily condense to form water droplets... nucleation sites are needed as well.

[If hot air rises, why is it cold in the mountains?](#)

When air expands, it cools. And when it rises, it expands. A nice exercise on adiabatic heating and cooling.

[Can it really rain fish and frogs?](#)

A bit about extreme weather. A very zesty demonstration.

[Can you "see" thermal radiation?](#)

Sort of. You can certainly feel it, probably better than you expected!

[What is the "greenhouse effect"?](#)

The earth is warmer than the moon, and it's because of our atmosphere. An investigation with an infrared thermometer.

[How does the earth cool itself off?](#)

The earth can only cool itself off by radiating energy to space. A simple exercise with a placemat and an infrared thermometer.

[Why does it get colder on clear nights than on cloudy nights?](#)

The earth gives up energy to space by radiation. If it's cold up above, it cools off more at night.

Lecture Notes

Download as PDF or PPT - PPT are larger

Follow the Energy (Overview)	PDF (3 MB)	PPT (31 MB)
Radiation and Energy Balance	PDF (1 MB)	PPT (6 MB)
Pressure, Density, and Vertical Motion	PDF (1 MB)	PPT (3 MB)
Moist Convection, Clouds, and Precipitation	PDF (2 MB)	PPT (12 MB)
Weather vs Climate	PDF (1MB)	PPT (1 MB)
What Makes the Wind Blow?	PDF (1MB)	PPT (20 MB)
Global Circulation Systems	PDF (1 MB)	PPT (40 MB)
Oceans and Climate Variability	PDF (1 MB)	PPT (54 MB)
Climates of the Past	PDF (1 MB)	PPT (38 MB)
Climates of the Future?	PDF (1 MB)	PPT (16 MB)

Course Activities

For all the course activities, and more, [take a look here!](#)

Short QuickTime movies

Courtesy of Dave Swartz - large files

- [Adiabatic warming and cooling](#)
- [Coriolis effect part 1](#)
- [Coriolis effect part 2](#)
- [Earth's energy balance](#)
- [Latent heat and phase changes](#)

Readings

- IPCC Working Group 1 (2007) : [Technical Summary](#)
- IPCC WG1 (2007) : [Summary for PolicyMakers](#)
- Broecker and Denton (1990) : [Thermohaline Circulation and Ice Ages](#)
- Pacala and Socolow (2004) : [CO2 Stabilization: A Menu of Feasible Choices](#)



Higher Education

- Enhance the climate science workforce of the future.
- Increase the number of underrepresented groups who are pursuing graduate degrees in Atmospheric Science.



Higher Education

- Summer Internships
- Graduate Student Colloquium
- Climate Policy
- Changing Climates
- Recruiting
- Mentoring

CLIMATE CHANGE: WHAT WE ALL NEED TO KNOW
A Public Lecture Series

Fall 2008 & 5
Colorado State
Lory Student Center North
Thursday evenings • 7

September 11
Climate Change: Past, Present and Future
Dr. David Randall, CSU, Atmospheric Science, CMMAP

October 9
The Biological and Ecological Effects of Climate Change
Dr. Alan Knapp, CSU, Biology

November 6
The Economics of Climate Change
Dr. Charles Kolstad, University of California, Santa Barbara, Economics

November 13
Climate Change and the Literary Imagination
Linda Brads, University of Washington, English
Marybeth Holleman, University of Alaska, Anchorage, English

Solutions to the Climate
Dr. Scott Denning, CSU, Atmospheric Science
Dr. Mark A. M. Meier, CSU, Atmospheric Science
two-day teacher about global warm
February 4 and 5, Lory Stu

The Effects of Climate Chan
Dr. Lori Pyle, CSU

Climate Change: Politics and Policy Making
Dr. Michelle Betsill, CSU, Political Science

This series is sponsored by CMMAP (The Center for Multiscale Modeling of Atmospheric Problems), a National Science Foundation Science and Technology Center and by the Office of the President, of Colorado State University. The Department of Economics and the Department of Agricultural and Resource Economics are helping support Dr. Robert A. Howarth, The Lisa B. Morgan Fund and Civil Creative Writing Series are helping support Linda Brads and Marybeth Holleman. For more information, visit <http://changingclimates.colostate.edu> or contact sarah.colleazette@colostate.edu or jeffrey.campbell@colostate.edu.

Presented by Rick and Alvin
Colorado State University



Higher Education

Immediate Impact

- 2007 and 2008
 - 2 successful summers
 - 9 summer interns
(2/3 female)
-
- Parker
 - CSU ATS grad student
 - Tyler and Alice
 - want to apply CSU
ATS
 - Claudette
 - pursue M.S. Atmos



Higher Education

Future Impact (Recruiting)

- Build partnerships with MSIs
- Hampton University
- Spelman College
- Morehouse College
- Tour Southern CO Colleges/Universities
- Future Tech - STEM Diversity Initiative
- American Geophysical Union



Education and Diversity

- Changing Climates @ CSU
- Diversity in Science
- K-12 Education
- Closing

