

Recruitment of Diverse Students: Goals, Strategies, and Plans



**Education and Diversity Retreat
August 2012**



CMMAP Diversity Goal:

Increase the number of diverse students pursuing graduate degrees in atmospheric science

Strategy:

Recruit, retain, and mentor students from underrepresented groups

What are we doing?

Targeted recruitment at minority serving institutions

Network with programs with like interests and goals

Focus on multiple academic disciplines

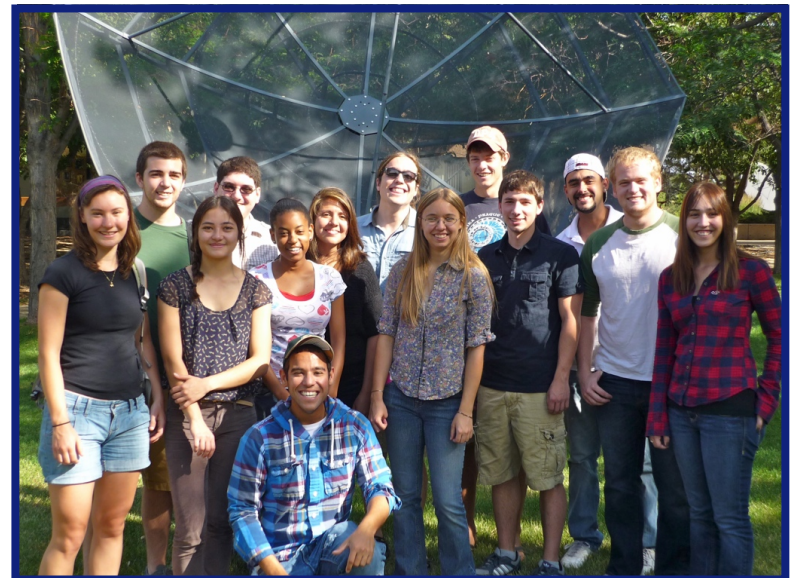
Attend professional societies annual meetings

CMMAP Summer Internship

- **Research experience**
- **Multidimensional mentoring**
- **A supportive, inclusive community**
- **Professional development**
- **Financial support**

Summer 2012

**13 undergraduate interns
38% from underrepresented groups**



Where do we come from?



2007

CMMAP welcomed three interns in our first year.



One of our first summer interns, Beth Beckel explored cloud and precipitation chemistry. She learned the basics of gas-phase atmospheric chemical sampling techniques and spent most of the summer learning about the mist chamber.



Claudette Ojo worked on the Tropical Ozone Sonde Dataset for Satellite Validation Processing and Modeling looking at spatial and temporal relationships between ozone and temperature as a function of height.

Parker Kraus investigated land-atmosphere interactions in the West African country of Mali, looking at evaporation and photosynthesis rates.



2008

CMMAP enjoyed six interns in 2008.

Claudette Ojo, a business major, interviewed companies for the organization Climate Wise to learn the progress they were making in reducing greenhouse gas emissions.



Alice Duvivier and Jette Petersen worked together on a numerical approximation for mathematical operators used in climate modeling.



Tyler Ruggles, interested in environmental science and policy, helped a city become part of the Mayors for Climate Change organization.

David Sullivan studied carbon pricing and taxation for the National Conference of State Legislators finding advantages and disadvantages of different methods and creating a booklet.



Zoe Keve has a strong interest in helping people and improving our world. She worked at the National Conference of State Legislators constructing a booklet on biofuels.

Summer Internship Program

Find out more about us here:
www.cmmap.org/scienceEd/internships.html



2011

2011 brought us eleven summer interns.



The moisture cycle of the Madden-Julian Oscillation (MJO) was the focus of Jennifer's research this summer.

Brittany compared and analyzed total precipitable water from ground-based GPS and SSM/I Satellite Remote Sensing.



Julie investigated approaches to local Climate Action Programs and model practices in Colorado.



Molly studied the sources and trends of free tropospheric aerosols measured at Mauna Loa.



Jason looked at the seasonal variability of the width of the tropical belt from GPS radio occultations and reanalyses.



Dustin performed an error analysis of SSM/I F08 antenna temperatures to produce an extended record of observations for climate applications.



Evaluating the response of the terrestrial biosphere to significant drought was the focus of Ian's summer research.



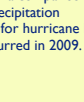
Moises performed studies of variability in fire count in Indonesia: Effects of ENSO and MJO phase.



Keri's research modeled the West African Monsoon and looked at the formation of African easterly waves.



David looked at the diurnal cycles characteristics of disturbed and undisturbed periods during TIMREX.



Jessica did a comparison model precipitation forecasts for hurricane Ida which occurred in 2009.

2009

Ten interns spent a summer at CMMAP in 2009.

Laura Witte worked with the Ft Collins Sustainability Group estimating how much CO₂ would be conserved by implementation of policies.



Lance Vanden Boogart worked with the land-surface modeling group comparing a chemistry transport model with observed CO₂ concentrations in the midwest.



Katie Riley researched and summarized trends in the carbon offset market. She also created a hypothetical model of offset design.



Katherine Heal learned to use an aerosol mass spectrometer to analyze aerosol emissions from types of biodiesel and later, perform sampling in Rocky Mountain Nat'l Park.

Liz Huddle spent the summer determining parameters for a mist chamber to try to increase its efficiency.



Having a strong passion for disaster research, Heather Morgan tried to find a connection between the MJO and Atlantic hurricanes.



Samantha McGraw conducted interviews and researched New Jersey city climate action plans.



JoBeth Minniear came to CMMAP to research how water vapor, temperature, and vertical velocity relate to one another in a very high resolution simulation of a tropical convection system.

Terreka Hart focused her research on how concentric eyewalls and mesovortices influence the intensity of hurricanes in the Atlantic basin.



Cara Tabor performed research with a spin tank to compare mathematical models of a balanced vortex and what she observed in ice-generated vortices in the spin tank.



2010

Watch us grow, indeed! We hosted 12 interns this year!



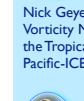
Idamis Del Valle came from Puerto Rico to study the effects of enhanced moisture triggers on precipitation and winds.



Kyle Hemes researched the spatiotemporal influence of vegetation on global surface-atmosphere exchange.



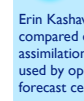
Ariana Marrero, from Puerto Rico, studied the variability of the seasonal cycle in the Tropical Eastern Pacific and Caribbean.



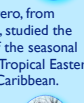
Nick Geyer used the Vector Vorticity Model to simulate the Tropical Western Pacific-ICE case.



Tina Laboy spent her summer researching the propagation of the Madden-Julian Oscillation.



Erin Kashawic compared data assimilation schemes used by operational forecast centers.



Stormy Stevens looked at the impact of tropical cyclone rainfall on drought in Alabama.



Chris Alston researched hurricane activity along the US northeast coast.



Daniel Rothenberg got into the nuts and bolts of a climate model dynamical core.



Christina McCluskey researched nitrogen samples collected from Rocky Mountain National Park.



Marie-Christine Razaire examined the responses of the ocean carbon cycle to climate change.



Watch us grow!

6 summers - 55 interns



After the internship... where do our interns go?

Bachelors programs: 24

Masters programs: 16

PhD programs: 9

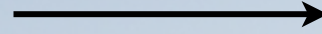
Scientific workforce: 16

almost half of our interns are now graduate students

one third are at CMMAP!!

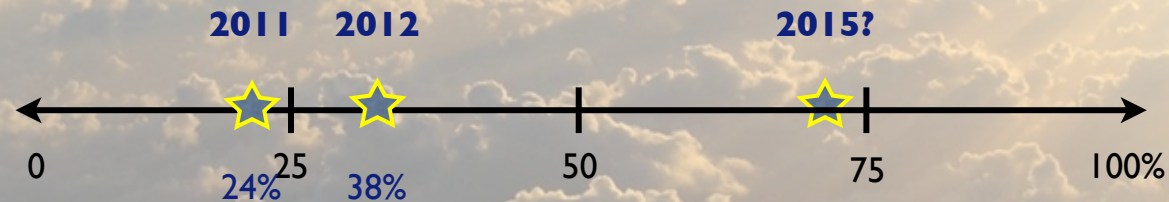
CMMAP Diversity Goal:

Increase the number of diverse students pursuing graduate degrees in atmospheric science



CMMAP Internship and our undergraduate Interns

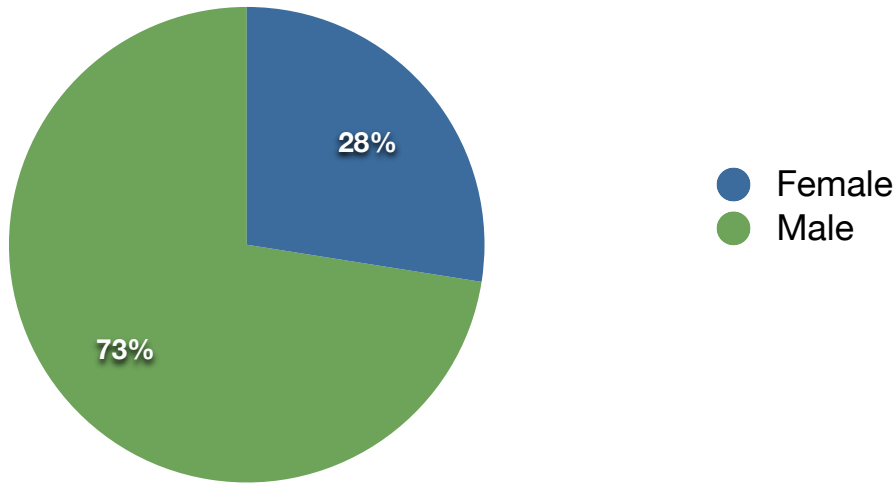
Internship Diversity Goals



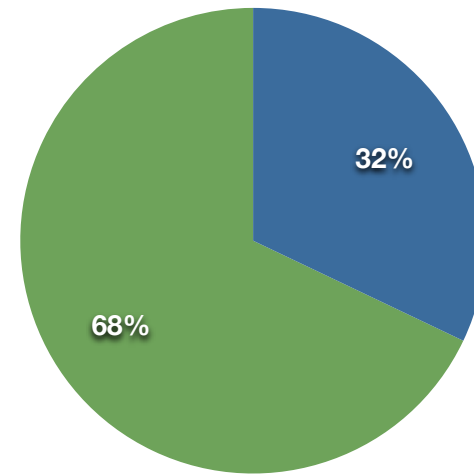
The more diverse are interns are... the more likely we are to reach our CMMAP diversity goal

How is CMMAP contributing to broadening participation in the Atmospheric Sciences?

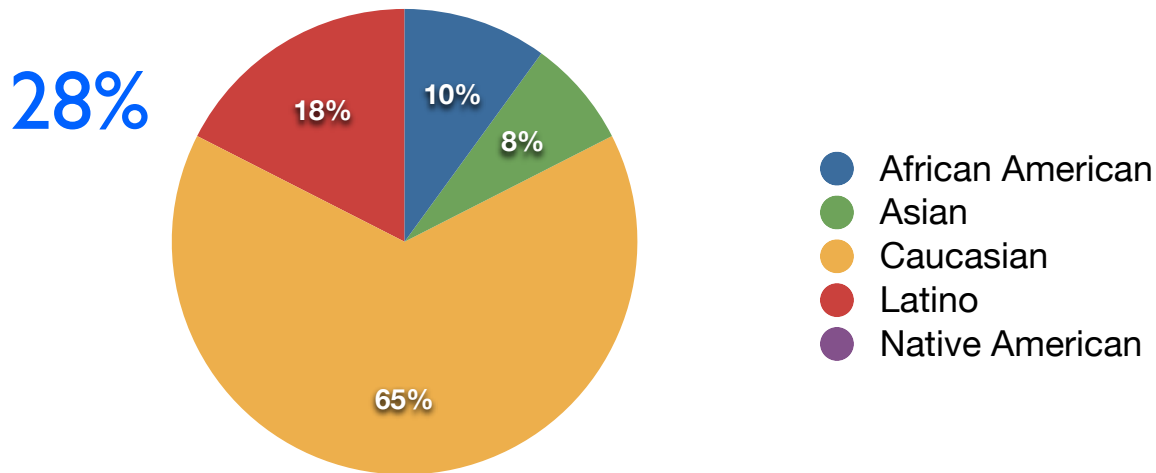
CMMAP ATS Graduate Students*



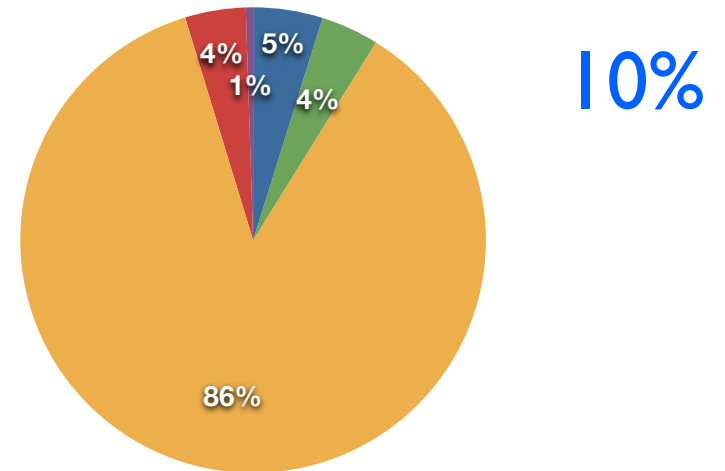
NSF Data - Graduate Enrollment - 2012**



CMMAP ATS Graduate Students



NSF Data - Graduate Enrollment - 2012



*CMMAP Graduate Students funded over Years 1-6, includes CMMAP ATS and CMMAP related project NSF IGERT

**nsf.gov - Women, Minorities, and Persons with Disabilities in Science and Engineering

Recruiting Plans

What's worked so far

Word of mouth

Talking with faculty from universities

Holding informal sessions

Past interns telling peers about their experiences

What we'll continue to do

Targeted recruitment at MSIs

Target a small number of geographic areas

**Network with programs with like interests, goals,
and successful histories**

Recruiting Plans

What's new

Current interns act as “intern ambassadors”

Hold recruiting sessions at past interns universities

Market the “types” of projects available based on past projects

Potential visits for 2012-2013

**Elizabeth City State University
Norfolk State University**

CUNY and SUNY schools

Florida International University

New Mexico State, Tech, and Highlands

University of Texas El Paso

Feedback from Mentors

What did you learn as a Faculty Mentor?

“It’s key to find a project that the student wants to do ... I’m also routinely amazed about what the students can do with relatively little guidance from me so I’m learning to not micro-manage... Oh yeah, and weekly meetings/regular communication are key.”

What did your interns gain from the CMMAP experience? (mentor POV)

“My interns refined their research skills, particularly their ability to think about how to approach a research question. I think they also learned about how their research can be used in the “real” world and learned about working in a team environment to achieve mutual goals. One of my interns told me that his experience was very helpful in thinking about his future direction or at least what he doesn’t want to do!”

What did you learn as a Faculty Mentor?

“I really encouraged them both to have clearly defined goals. This was a good exercise for myself and my graduate students. I also "preached" my elevator speech approach to talks and posters and we had at least two weeks of working on this. This really helps students focus on the goal of their research, as well as the prime result arising from their research. All 4 of them showed tremendous improvement in this over the two weeks. I only hope that it translated to their talks and to their posters this week.”

What did your students learn who were the Grad Student Mentors?

“This has been quite an eye opening experience for my graduate student. He told me that he cannot believe how I advise 10 students – he has found it incredibly busy mentoring just one student. My grad student has also had to learn to become more hands on in assisting students dealing with the details. Overall I feel that he has done a very good job with his intern, has been very encouraging and has tried to steer him down the path of thinking more of the physics behind the results.”

What did your interns gain from the CMMAP experience? (mentor POV)

“I feel that both of my interns have learned a little more about setting well-defined goals, elevator speeches, planning properly in order to conduct effective research, and to become a little more independent. “

Feedback from Interns

**What did our interns gain from the
CMMAP experience?**



Andrea and Len

Questions?

