Diversity Update

UCAR Board of Trustees
Personnel Committee Meeting
15 May 2007
Washington, DC
Presentation Objectives

- Background
- Explore roles for a UCAR diversity effort
- Update on SOARS program and directions for the future
Progress

PhDs in the Geosciences awarded to students who are Hispanic or African American

1973-1978
1.32%
Total # of PhDs: 2956

1997-2002
2.78%
Total # of PhDs: 3606

Assuming exponential growth, we reach parity (~31% Latino and Black) in 2109
Roles for UCAR

1. Contribute to NCAR’s efforts to diversify its own workforce
2. Serve as an intellectual commons for diversity in the atmospheric and related sciences
3. Support capacity building, particularly in communities those who have historically been underserved by geosciences
4. Share successful practices learned in SOARS
Balances to navigate

• Commitment to developing NCAR’s own workforce vs. partnership the university community
• Overarching strategic planning vs. “Free-market” style competition of projects
• Focus on individuals vs. systemic change
• Visible near-term success vs. long-term investment
A sample of NCAR activities

1. UCAR Supporting NCAR

- Maura Hagan (ASP) hosted a preparing for the post-doc workshop for AGEP post-docs
- Al Kellie (CISL) and Brant Foote (RAL) leading NCAR planning efforts – initial focus on diversifying Computer scientists
- Tim Killeen strategic initiative funds to support efforts to place a CO2 instrument at Dine College, Africa Initiative, and post-docs
- Roger Wakimoto (EOL) recruited interns from diverse groups
More NCAR Activities

1. UCAR Supporting NCAR
   - Roberta Johnson (E&O) and NCAR scientists in a rapidly growing suite of activities for Spanish speaking educators
   - Catherine Shea (DIR) in conversations with tribal college leaders - NCAR hosting a symposium on Climate Change and Native Lands at NCAR
   - Africa Initiative supported by NCAR and UCAR, involves collaboration between UOP (Globe, COMET) and NCAR (RAL and ISSE).
2. UCAR as an Intellectual Commons for Diversity

- Oct 2006 UCAR members meeting included a well-attended breakout session to discuss diversity.
- The members made preliminary recommendations and requested a follow up summit (with their university leaders?)
Diversity Breakout Session

Recommendations

• Facilitate a community developed plan
• Become a forum for identifying and sharing best practices
• Broker partnerships between NCAR and among community (e.g. minority/majority colleges)
• Exploit observation facilities, etc. to excite and attract students
• Strengthen and diversify NCAR career pathways
• SOARS*10 – reproduce SOARS at other institution
• Provide junior faculty support, address service burden on women on minorities
• Include an International element – especially nearby cross-boarder partnerships
3. Supporting Capacity Building

Sahel Conference 2007

2-6 April 2007
Ouagadougou, Burkina Faso

Co-hosted by CILLS, Programme SAAGA
Participants

- Over 80 Participants from 18 countries
- Several regional alliances
- 10 participants from UOP, NCAR, and UCAR
- Unique mix of operational meteorologists, researchers, university faculty, military personnel, and program leaders
Conference Consensus

- Fundamental importance of training and education
- Long-term investment in Infrastructure (telecom)
- Development of NWP research and operations capability
- Free and open data exchange
- Regional approaches are fundamental to success
Weather Modification

- Controversial – A tentative consensus
  - Weather Modification should be accompanied by scientific research and optimization
  - Investment in rainfall enhancement capability produces other benefits
4. Expanding SOARS

- SOARS Mission
  - To broaden participation in the atmospheric and related sciences by engaging students from groups historically underrepresented in science and preparing them to succeed in graduate school. These groups include Black or African-American, American Indian or Alaska Native, Hispanic or Latino, female, first-generation college students, and students with disabilities. SOARS welcomes lesbian, gay, bisexual, and transgender students.
SOARS Values

• Authentic science experience
• Extensive, multidimensional mentoring
• Supportive community
• Professional development
• Competitive, flexible financial support
• Multi-year experiences
Protégé Success

SOARS Success

These figures include protégés entering the program in 2007

Protégé Degrees

Protégé Career Track

A Diverse Learning Community

Number of protégés who are:
- American Indian or Alaska Native
- Black or African American
- Hispanic or Latino
- Asian
- White

Protégé Success
Persistent Challenges

• Many URM students are in institutions (including two year colleges) without geoscience courses and research
• Some students face obstacles to traveling to participate in REU experiences
• Students expend lots energy to investigate and apply to multiple programs
• Intern programs compete for students, instead of cooperating to create more qualified students
• Difficult to build community in many small programs
• Students alone have to combine opportunities to meet their needs
A geoscience research alliance

• What if individual REU programs pooled their resources in a nationwide partnership – or alliance?
Shared Recruitment Strategy and Resources

- Students apply to all opportunities with one application
- Access to a national pool of students for individual researchers
- Multiple, distributed relationships
- An ability to focus on recruiting students from other STEM fields

>> Introducing geosciences to more students

In 2004:
- 85,000 BS’s in Math, Computer Science, & Physical Science
- 3,903 BS’s in Geoscience

Research Sites

The Leadership Alliance has 19 institutions with participating summer research programs:

- Brown University
- Columbia University
- Cornell University
- Dartmouth University
- Harvard University
- Howard University
- Hunter College
- Johns Hopkins University
- Montana State University
- New York University
- Princeton University
- Stanford University
- Tufts University
- University of Colorado at Boulder
- University of Maryland, Baltimore County
- University of Miami
- University of Pennsylvania
- Vanderbilt University
- Yale University
2. Wider Scope of Research Opportunities

- Students matched to interests within geographic constraints
- Research opportunities that address local needs
- Students get a chance to preview graduate schools
3. Extended Learning Community and Support

• Increased peer support for students in small/single student REUs
• Shared orientation conference for students and mentors to initiate community
• Online tools to maintain community (writing workshop)
• End of summer colloquium, opportunity for review & feedback
• Travel to national conferences
• Multi-year component
Thank You
Extra Slides
Ethnicity of Atmospheric Science PhDs (1973 to 2004)

- 3,166 Total PhDs
- 2,140 Total earned by US Citizens
- 30 Hispanic American PhDs
- 21 African American PhDs

Data from Roman Czujko, AIP Statistical Research Center
Emergent Partnerships

- UCAR, EUMETSAT and African NMHS’s collaborate to share and distribute products (e.g. composite rainfall from radar)
- Discussions with US ambassador about regional approaches to training, maintenance of radar
- Co-Development of Numerical Weather Prediction with regional centers and NMHS’s
- UCAR participation in evaluation of Seeding
- CO₂ Monitoring in Ghana
- Collaborations with ECMWF, MeteoFrance
Acceptance to SOARS

Doesn’t Include RESESS
About this Year’s Protégés

• Experience
  – 12 Returning Protégés
  – 13 New Protégés

• Academics
  – 1 Graduate Student
  – 6 Graduating Seniors
  – 6 Continuing Seniors
  – 9 Juniors
  – 3 Sophomores

• Program
  – 19 SOARS
  – 6 RESESS*

* RESESS is Research Experience in Solid Earth Science for Students, a SOARS Partner focused on geophysics, managed by UNAVCO
SOARS Funding

- 12 protégés and a program administration supported by NSF-ATM (2006-2010)
  - Includes $4000 in undergraduate need-based tuition a semester
- 2 protégés supported by NOAA Climate Program Office (ongoing)
- 2 proteges supported by NOAA Oceans and Human Health Initiative (til 2005-2009)
- 2 proteges supported by Center for Multiscale Modeling of Atmospheric Processes (CMMAP) (2006-2010)
- 1 Protégé supported by CIRES (last year, planning to continue this year)
- 6 proteges supported in partner program RESESS (2006-2008)

GOAL: 6 protégé positions by 2008
## Research Alliance cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel Support</td>
<td>For students/advisors/MSI faculty members</td>
<td>$0.9M</td>
</tr>
<tr>
<td>Support for added value</td>
<td>2 staff (coordination and website)</td>
<td>$225K</td>
</tr>
<tr>
<td>Selection committee and advisory committee travel</td>
<td></td>
<td>$30K</td>
</tr>
<tr>
<td>Online writing workshop leadership</td>
<td></td>
<td>$30K</td>
</tr>
<tr>
<td>Recruitment: booths, publications, and travel</td>
<td></td>
<td>$100K</td>
</tr>
<tr>
<td>External Evaluation</td>
<td></td>
<td>$50K</td>
</tr>
<tr>
<td><strong>Total funding needed</strong></td>
<td></td>
<td><strong>$1.36 M</strong></td>
</tr>
<tr>
<td>Base investment that can be leveraged from existing REU funds already used to support students</td>
<td></td>
<td><strong>$1.6M</strong></td>
</tr>
</tbody>
</table>
## Ethnicity of SOARS Protégés

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>18-24 Year Olds(^1)</th>
<th>In Atmos. grad school(^2)</th>
<th>Protégés</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black or African-American</td>
<td>14%</td>
<td>1.8%</td>
<td>42%</td>
</tr>
<tr>
<td>Latino or Hispanic</td>
<td>17%</td>
<td>1.6%</td>
<td>34.5%</td>
</tr>
<tr>
<td>American Indian or Alaskan Native</td>
<td>0.9%</td>
<td>0.4%</td>
<td>11.5%</td>
</tr>
<tr>
<td>Asian-American</td>
<td>4.3%</td>
<td>7.1%</td>
<td>5%</td>
</tr>
<tr>
<td>White</td>
<td>62%</td>
<td>85%</td>
<td>7%</td>
</tr>
</tbody>
</table>
# Gender of SOARS Protégés

<table>
<thead>
<tr>
<th></th>
<th>18-24 Year Olds¹</th>
<th>In Atmos. grad school³</th>
<th>Protégés</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>48.8%</td>
<td>33.6%</td>
<td>62%</td>
</tr>
<tr>
<td>Male</td>
<td>51.2%</td>
<td>66.4%</td>
<td>38%</td>
</tr>
</tbody>
</table>

## Data:
3. National Science Foundation, Division of Science Resources Statistics, Survey of Graduate Students and Post doctorates in Science and Engineering, 2001