NCAR Diversity Report: Hispanic Serving Institutions

Outcomes
The NCAR diversity money was used to reach out to faculty who teach atmospheric or related sciences at Hispanic Serving Institutions (HSIs) and welcome them and their institutions to the UCAR community. The goal was to increase the use of UCAR and NCAR facilities and resources by HSI students and seed research and teaching collaborations between NCAR scientists and faculty from HSIs.

We used the funds to support two visits to UCAR from Luis F. Bejarano, a faculty member in the Department of Meteorology and Physics at the University of Puerto Rico at Mayaguez. During these visits, he participated in the Unidata’s User’s Workshop, the WRF modeling workshop, and had one-on-one meetings with representatives from COMET and researchers in ACD.

Measures of Progress and Success
A summary of the highlights is provided here, and a detailed account, prepared by Dr. Bejarano, is provided as an appendix.

- Dr. Bejarano developed a course on tropical meteorology using COMET’s online tropical meteorology textbook, and 5 students are expected to enroll in this new course in Fall of 2013.
- Dr. Bejarano redesigned the universities synoptic meteorology course to include a significant lab component that used Unidata data and visualization tools. Ten students participated in the redesigned course in 2012 and rated the course 4.8 on 5 point scale.
- Many UPRM students are now using Unidata tools, including the IDV, as part of the department’s daily weather briefing. Some of those students are teaching their fellow students to use IDV.
- Dr. Bejarano plans to run WRF semi-operationally over the Caribbean. Not only will this provide an opportunity for his students to learn to run and interpret numerical models in a locally relevant context, it would be the first real-time mesoscale model run in the Caribbean islands and likely prove to be a useful tool for meteorologists in the region.
- Dr. Bejarano decided to collaborate with Mary Barth and Andy Heymsfeld of ACD in support of ACD’s diversity proposal “Building Long-Term Partnerships with Targeted U.S. University Programs Serving Underrepresented Student Populations in the Atmospheric Sciences Field.” Dr. Bejarano will serve as liaison to help arrange visits between NCAR and UPRM and help integrate ACD tools into the UPRM curriculum. The three of them are also exploring potential research collaborations.

Internal collaborations or university interactions
Covered in the previous bullets.
Recommended changes and next steps

The original intent was to invite faculty from two different Hispanic Serving Institutions, but scheduling constraints made it impossible for the other faculty member to visit UCAR. On the other hand, the repeat visit helped Dr. Bejarano meet more potential collaborators and gave him the chance to get additional support for activities he initiated after the first summer. For example, he was able to follow up with Unidata and COMET with specific questions that came up when using their resources with his students.

Although Dr. Bejarano still intends to use WRF locally, he is having considerable difficulty installing it at Mayaguez, in part because of the difference between WRF and the systems the university's computer support personnel are familiar with. Similarly, a colleague in Ghana has been unable to get WRF running there because of the challenges working without dedicated system support. It makes me wonder if there is some way to better assess an institution's capability to support WRF as part of the workshop registration, or offer additional training and support aimed at addressing some of the challenges related to installation without dedicated expertise, or even further simplify the installation of WRF.
April 18th, 2013

To: Spark – Science Education Program  
University Corporation for Atmospheric Research (UCAR)  
P.O Box 3000  
Boulder, Colorado 80307-3000

Re: Educational and research activities between UCAR and UPRM.

I am writing as an Assistant Professor of Physics and Meteorology of the Physics Department at the University of Puerto Rico at Mayaguez (UPRM). Besides my teaching and research responsibilities, I have been an active member of the Curriculum Committee since July 2008 when I joined the faculty. The Curriculum Committee deals with the creation of new courses and curricular sequences.

Our Department has offered B.Sc. and M.Sc. degrees in Physics since the 1950’s, and we are currently developing academic programs in Atmospheric Sciences and Meteorology. Currently, we offer a minor in Meteorology, which has very high student demand and is the only program of its kind in Puerto Rico. We are also developing graduate courses that will enable students in our Physics M.Sc. program to pursue an Atmospheric Physics option. This would also become the first of its kind in the Commonwealth.

For the past 5 years I have been in charge of teaching several Meteorology courses, including Introduction to Meteorology, Physical Meteorology, Dynamical Meteorology 1 & 2, Synoptic Meteorology, Undergraduate Research (in Atmospheric Sciences and Meteorology), and Tropical Meteorology which I offer under Special Topics course.

In addition to the course offering in Meteorology, the Department also sponsors two kinds of weather forecasting instructional activities, both conducted and mentored by me. One of them gathers volunteer students to design and discuss the daily forecast. For the second kind, I supervise undergraduate students, in a special Student Mentoring Program between UPRM and a Community Radio Station in the Central Mountains of Puerto Rico, for regional twice-weekly meteorological forecasts. These activities provide the students an opportunity for practicing their newly acquired skills and enhance their future job opportunities.

During the current academic year (August 2012 to May 2013) our Meteorology offerings and the weather forecasting activities have experienced an additional growth. It has been possible because of the new educational and research collaboration UCAR started with UPRM in summer 2012. To date, I have been a visiting scientist to UCAR on two occasions. During my first visit, in July 2012, I attended the 2012 Unidata Users Workshop. Then, in February 2013, I attended the Weather Research and Forecasting
(WRF) Model Tutorial. This initiative between UCAR and UPRM has benefited us tremendously. Specific results include: 1) the creation of the Tropical Meteorology course, which I will offer next fall under Special Topics course. I created this course based on the teaching and training resources provided by UCAR through its MetEd program. I am expecting at least 5 students to be registered in the class; 2) the re-design and offering of the Synoptic Meteorology course in fall 2012. The Unidata Workshop provided me the tools to incorporate the Integrated Data Viewer (IDV) into the class. I used IDV to design new lab-assignments, including Surface Weather Analysis, Sounding Analysis, Upper Level Maps, Cloud and Satellite Imagery, Height and Thickness Analysis, Vorticity Analysis, Quasi-Geostrophic Theory, and Cyclogenesis. According to the student evaluations, the re-designed class was a success. I obtained excellent evaluations (4.8/5.0) from the 10 students who took the course; 3) the improvement of the weather forecasting instructional activities. Some of the students who took the Synoptic course in fall 2012 are currently mentoring other undergraduate students about the capabilities of IDV to perform the weather briefings. There are about 10 to 15 students involved in these briefings.

On the other hand, the benefits of my attendance to the WRF Model Tutorial are still to be seen, since we are still struggling with the computer facilities to install and run the model. However, after overcoming this problem we hope to run the ARW Idealized Cases to include these results in both the Synoptic and Tropical Meteorology courses.

In short, this new educational and research initiative between UCAR and UPRM has resulted in additional growth and prestige to our Program. Our students will benefit as well, since we have instituted summer research internships as an integral part of the meteorology curriculum and this will open additional research opportunities for them.

If I may be of further assistance, I will be available at luis.bejarano@upr.edu by email, or at (787) 832-4040 ext 3603 by telephone.

Sincerely yours,

Luis F. Bejarano, Ph.D.
Assistant Professor of Physics and Meteorology
Physics Department
University of Puerto Rico at Mayaguez
# Account Budget Summary

## Current account information as of March 31, 2013

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## Financial & staffing data as of March 31, 2013

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## Field Information Report

Printed on 4/18/2013

Account Budget Summary.rpt

Month & Fiscal Year selected: March 2013