# **COMET Partners Project Final Report**

University: University of Arizona

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Type of Project (Partners or Cooperative): Partners

**Project Title:** A COMET Partners Proposal for the Fourth Symposium on Southwest Hydrometeorology

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## Section 1: Summary of Project Objectives

On September 20-21, 2007, over 100 scientists in the academic, private sector, and public sector participated in the Fourth Hydrometeorology Symposium held at the Tucson Hilton East Hotel in Tucson, Arizona. The two-day meeting served as a critical forum to discuss and present research issues associated with mid-latitude, subtropical, and tropical weather systems that affect the Southwest United States, and discuss the resulting impact on hydrologic systems. Major topic sessions included hydrometeorology integration, climate science and annual prediction, monsoon forecasting, extreme water and weather events, ensemble and probabilistic forecasting, and issues surrounding accurate quantitative precipitation estimation (QPE).

The COMET grant funded two key costs of the conference. Four non-NOAA researchers were supported with the Partners grant – all of whom are subject matter experts in the major topic sessions of the symposium. The grant also helped to fund venue costs and allowed us to keep conference fees extraordinarily low (\$25). This increased attendance from not only the research and government communities, but also students from the University of Arizona who were not charged any fees.

### Section 2: Project Accomplishments and Findings

Our agenda included 34 oral presentations and 14 posters over a very busy two-day symposium. The breath and depth of the conference exceeded our expectations, and has resulted in several post-conference collaborations, including enhanced collaboration on a COMET Coop Project between SUNY Albany, NWS Storm Prediction Center, and NWS WFO Tucson. A copy of our Conference Preprint is attached to this final report.

The final attendee count of 111 people exceeded our expectations, including 18 who came at the last minute. Although the vast majority of participants came from Arizona

and other states in the Southwest U.S., several attendees came from as far away as Washington, DC, New York, New Jersey, Mississippi, Georgia, and Louisiana. In addition, there were several attendees from Mexico. The large number of attendees increased our conference fee collections and allowed us to completely wave the fees for the eleven students who attended.

The session chairs and presenters kept each talk to their 15 minute allotted times (20 minutes for our five invited speakers). This allowed at least 5 minutes of discussion after each talk, and stimulated new ideas on how to tackle some of the more complex science issues presented.

Like the past three previous symposia sponsored by COMET in the southwest U.S., a feedback survey was provided in each participant packet (attached). Twenty-eight surveys were returned, and virtually all of them were positive about the symposium as a whole and in the two-day length. Several comments included:

"This was the best symposium yet..." "Thank you for including so many student papers..." "Great discussions..." "It was diverse enough so as to maintain interest among the broad spectrum of topics, yet with full academic and technical rigor..." "Good balance..." "Great symposium! Well organized and conducted."

The one notable deficiency was that on our first day of the conference, laptop and especially microphone problems degraded some of the presentation quality. Those were fixed by the second day.

The overarching theme which emerged from the symposium is that both precipitation estimation and forecasting science is advancing rapidly, and is becoming increasingly integrated with hydrologic forecasting science. It is also apparent that increasing concerns about long-term drought, water supply in this rapidly growing region of the country, and conflicting climate change signals and forecasts are being researched on several fronts, and that even closer interaction between hydrologic and atmospheric sciences will be required in the years ahead.

#### Section 3: Benefits and Lessons Learned: Operational Partner Perspective

The National Weather Service in Tucson greatly benefited from the interaction with the university and private sector communities. Eighteen NWS forecasters from five WFOs, one River Forecast Center, Western Region Headquarters, and the Hydrometeorolgical Prediction Center shared their current research and attended the sessions. Since the meeting, several of these NWS forecasters have interacted with other attendees to set up new collaborations or reinforce old ones. One example involves the recently-awarded COMET Coop Project between SUNY Albany, SPC, and NWS Tucson. The initial organizing meeting for this new project was held in between sessions at this symposium.

The work on this symposium also strengthened our ties with three departments at the University of Arizona, and with two key meteorology partners in Tucson. The National

Weather Association (NWA) has since received word about the success of our symposium, and the close working relationships between the university, private sector, military, and NOAA/NWS hydrometeorology communities. Because of the strong interaction, and our experience with this conference, the NWA is now working to hold their 2010 annual meeting in Tucson.

The success of this symposium reinforced the notion that small, inexpensive regionallevel meetings such as this greatly encourage research and interaction on the "grassroots" level. Scientists and students working on small yet critical research projects need a venue to present their findings, and interact with scientists who can use these studies as springboards for larger collaborative work between the academic, private sector, and government researchers.

#### Section 4: Benefits and Lessons Learned: University Partner Perspective

Describe the benefits to the University resulting from the collaboration and any significant lessons learned during the study. Identify any major problems encountered and describe their resolution.

The University of Arizona (UA) benefited from co-sponsoring and participating in the symposium. The Department of Atmospheric Sciences gained visibility within the University of Arizona and among the various private and public stakeholders that attended the meeting. This visibility is very important given that the Department of Atmospheric Sciences needs to attract students, increase external funding, and become more integrated with other research units on campus, as identified in a recent departmental review. Within the university, the symposium steering committee brought together members from the Department of Atmospheric Sciences, Department of Hydrology, and Institute for the Study of Planet Earth (ISPE). These university steering committee members are currently collaborating to establish a new graduate program in hydrometeorology, one of the first of its kind in the country, and to establish a new cooperative research institute with NOAA. These efforts were facilitated by the attendance of NOAA personnel at the symposium, such as from National Weather Service Offices and the Climate Prediction Center. The Department of Atmospheric Sciences is now currently pursuing collaborative relationships, in the form of research proposals and joint projects, involving stakeholders and research units from other Arizona universities that participated in the symposium. These include the National Weather Service (as mentioned in Section 3), the Salt River Project, Davis Monthan Air Force Base, and the Institute for Global Sustainability at Arizona State University. These research proposals have been submitted or will be submitted to federal agencies (NOAA and NSF) and state agencies, such as the Arizona Water Institute and Science Foundation Arizona.

The symposium also had strong participation by University of Arizona personnel, including many graduate students. This reflects a wide array of research being conducted at the University of Arizona in the area of hydrometeorology. Graduate students from several different departments presented oral and poster presentations relating to all of the symposium topics. Though it was the first experience attending a professional meeting for many of them, most of their presentations were well received by symposium attendees as evidenced by several of the attendee comments (see Section 2). Many more students attended the symposium as participants, facilitated by the fact that the registration fee for students was waived. Symposium presentations reinforced concepts in courses taught in the Departments of Atmospheric Sciences and Hydrology. For example, much of the climate-related research presented at the meeting used statistical concepts such as time series analysis and empirical orthogonal function analysis, which directly related to material in the course Objective Analysis in the Atmospheric and Related Sciences taught that same fall semester.

## **Section 5: Publications and Presentations**

A complete list of attendees, our conference agenda, and abstracts is attached. All of the presentations and posters have also been posted on the symposium website: http://www.atmo.arizona.edu/swhs/FINALAGENDA\_SWHS2007.html

## Section 6: Summary of University/Operational Partner Interactions and Roles

The SW Hydromet Symposium Organizing Committee met for the first time on November 29, 2006. Over the next ten months, the following agencies and people in the Tucson area collaborated on funding sources, grant writing and application, conference organizing, agenda formation, speaker arrangements, and logistics:

University of Arizona Department of Atmospheric Sciences: Dr. Christopher Castro, Dr, Xubin Xeng, Sandy Holford

University of Arizona Department of Hydrology: Dr. Hoshin Gupta

University of Arizona Institute for the Study of Planet Earth: Dr. Gregg Garfin

NOAA/National Weather Service Forecast Office, Tucson, AZ: Erik Pytlak, Glen Sampson, Craig Shoemaker, Glenn Lader, Krist'l Palacio

Vaisala, Inc,: Ron Holle, Theresa Fischer

25<sup>th</sup> Operational Weather Squadron, Davis-Monthan AFB, Tucson (USAF): Maj. Steven Dickerson, Capt. William Ryerson, MSgt. Paul Walker

As the event approached, two subteams were formed to handle conference abstracts and programming (Castro, Gupta, Garfin) and Logistics and Budgeting (Pytlak, Holford, Holle, Palacio). Planning meets were held on February 5, April 9, June 11, August 15 and September 5 at the NWS Forecast Office, although e-mail contact between the team members was conducted almost continuously from January through early October.

Through careful coordination and sharing of resources, and a brief but fortuitous drop in airfares a month before the symposium, the conference budget ended with a solid surplus, despite the loss of an expected University of Arizona grant and an additional non-NOAA speaker. The final budget summary, and a comparison with our original budget submitted in our initial COMET grant request, is attached.

### Attachments:

- I: Preprint for the Southwest Hydrometeorology Symposium
- **II:** Copy of the feedback survey

III: Final budget summary, and comparison with original grant request submission