George Mason University

UCAR Membership Report on 2009 Application for Membership

On May 18, 2009 the UCAR membership site team (Rick Anthes, UCAR; Amy Clement, University of Miami; and John Merrill, University of Rhode Island) visited George Mason University (GMU) in connection with the university’s application for full membership in UCAR. At GMU the atmospheric and related science programs are offered primarily through the Department of Atmospheric, Oceanic and Earth Sciences (AOES) in the College of Science; both undergraduate and graduate degrees are awarded through the Department. In addition, undergraduate and graduate degrees are awarded through the Department of Geography and Geoinformation Sciences. We visited these activities at both the main campus (Fairfax, VA) and, in the afternoon, the Center for Ocean, Land Atmosphere studies (COLA, Calverton, MD).

We were welcomed by the Chief of Staff of the University and by College of Science officials, and introductory remarks were added by J. Shukla, acting chair of AOES. Faculty and staff from AOES and other departments were introduced. UCAR President Anthes introduced the site team and provided a brief overview of UCAR and its activities. Following a break, representatives of the following departments and centers presented informative summaries of their programs, student bodies and research in the context of UCAR interests.

1. **Atmospheric, Oceanic and Earth Sciences (AOES) (Barry Klinger, Graduate Coordinator and Randy McBride, Undergraduate Coordinator).** The Department offers the BS in Earth Science, currently including an emphasis in coastal oceanography and estuarine science. Over 1300 students enroll in geoscience courses; there are 85 majors, and 35 with a minor; 20 majors have graduated. The Department is considering adding an emphasis in Atmospheric Science within the program. AOES also offers the PhD in Climate Dynamics. In 2008 there were 19 enrolled in this program, and ten PhDs have graduated since 2004. Additional information on the PhD program is discussed below.

2. **Computational and Data Sciences (Bob Weigel).** The CDS Department emphasizes the central role of computational methodologies in the physical, mathematical and data sciences. The academic and research programs integrate mathematics, computer science skills and scientific modeling. It was interesting to hear that students in AOES are usually in the minority when enrolled in CDS courses in numerical modeling techniques, for example.

3. **Physics (Mike Summers).** The Department of Physics and Astronomy teaching and research portfolio covers a wide range of specializations. Prof. Summers’s presentation emphasized planetary science research, ranging from the upper atmosphere of earth to remote sensing and proposals for in situ observations on distant planets.
4. **Geography and Geoinformation Sciences (Peggy Agouris).** The Department of Geography and Geoinformation Sciences offers degrees which include course work in atmospheric science and remote sensing. These range from the BS in Global Environmental Change, through the MS in Earth System Science to the PhD in Earth Systems and Geoinformation Sciences. Some of these programs are offered jointly with other departments, including Environmental Science and Policy.

After these presentations and discussion we were joined by the University Provost, Peter Sterns, and were served lunch in the Showcase, a multimedia presentation facility adjacent to the offices of the AOES staff. In the afternoon we moved to the COLA offices for more detailed presentations on the Climate Dynamics program.

5. **Climate Dynamics (at COLA) (Welcome and overview by Jim Kinter, Director).**

Dr. Kinter’s overview included information on the history of COLA. He also outlined the omnibus funding structure, in which a research proposal covering up to five years of work by the staff is supported jointly by federal agencies (NSF, NASA and NOAA), and those with faculty appointments receive 50% support from GMU. The research staff at COLA numbers 28, and of these 9 have appointments at GMU; there are also four postdoctorals. Two students who recently defended their PhD theses made brief presentations on their work: Deepthi Achuthavarier, on ocean impacts on variability of the Indian summer monsoon, and Xiaohua Pan on mean climate impacts on ENSO simulation and prediction. After a break there were presentations on climate dynamics topics by COLA researchers: Jian Lu talked about his work on rainfall distributions in a warming climate; David Straus talked about the role of model studies in understanding atmospheric circulation regimes; and Tim DelSole introduced a new framework for diagnosis of predictability on multiple time scales. It became clear that there is a pervasive collegiality among the researchers, extending from the students to the most senior investigators. COLA investigators make use of multiple state of the art climate models, including those from NASA, NOAA (GFDL) and NSF (NCAR CCSM). All of the students make use of models or model products (including Reanalysis fields) in their work.

GMU’s membership application is based on the desire to participate as a full member of the community of institutions engaged in education and research in atmospheric and related sciences. GMU researchers are active users of climate models, and in particular make use of the NCAR computer facilities and models. They serve or have served on Advisory boards for Divisions and Laboratories at NCAR.

**Recommendation:** The Membership Committee concludes that George Mason University meets the UCAR membership criteria, and accordingly recommends that the Members’ Representatives elect George Mason University a UCAR member.