University of Connecticut

On 7-8 April 2008, the UCAR membership site team (Jack Fellows, UCAR; John Merrill, University of Rhode Island; and Jim Miller, Rutgers) visited the University of Connecticut (UCONN) in connection with UCONN’s application for full membership in UCAR. At UCONN, the atmospheric and related sciences are distributed across four departments and integrated together in several centers, groups, and programs. We visited these activities at both the UCONN main campus (Storrs, CT) and Avery Point campus (Groton, CT).

We were welcomed and provided a brief overview of UCONN by Provost Dr. Peter Nicholls and Vice Provost Dr. Joe Compronie. The UCAR site visit team provided a brief overview of UCAR and there was extensive discussion with the faculty and students throughout the visit on how UCAR membership could benefit UCONN and how UCONN could contribute to the UCAR community. Representatives of the following departments and centers provided thorough presentations on the various activities in relation to UCAR, including (presenters):

1. **Center for Environmental Science & Engineering (CESE - Dr. Mike Willig).** This center was created in 1987 to promote multi-disciplinary research and education in environmental sciences, engineering, environmental policy, and sustainability. It has over ~20,000 ft² of research labs and collaboration space; 10 lab and business development staff; and ~90 faculty members from over a dozen relevant UCONN departments. CESE provides both office space, lab, financial, and computational support to both faculty and graduate students to work on interdisciplinary environmental projects, including: sampling and analysis of atmospheric compounds in gaseous and particulate phases (e.g., mercury, nitrogen, and air toxics) and have been involved in many large scale projects like the International Global Precipitation Measurement program, predicting summer rainfall in the Mississippi River basin, ecological effects of rainfall changes in tall grass prairies, NSF's Long-term Ecological Research program, and a founding member in the National Ecological Observatory Network (NEON). This lab also supports the State of Connecticut water quality monitoring, and these activities pay for much of the center. The CESE also houses the Atmospheric Sciences Group which was the grass roots effort that came together to develop the UCAR application and promote atmospheric and related research and education collaboration across the various UCONN departments. The CESE hosts extensive lab facilities for atmospheric monitoring and sampling, including atmospheric mercury auto-analyzer, isokinetic source sampling system, a trace metals lab, nitrogen blow down units, and equipment for extraction and analysis of atmospheric air toxics.

2. **College of Agriculture & Natural Resources (Dean Kirklyn Kerr and Dr. Mark Rudnicki).** The Natural Resources Management and Engineering (NRME) department includes a broad range of research programs, groups, and centers, including:
   a. **Atmospheric Resources Program.** Primary focus is on biosphere-atmosphere interactions related to forests and agriculture, including atmospheric, vegetation, land, and water exchange processes; biometeorology studies of microclimates; and model development of energy, pollutants, and organism exchanges with local environments.
   b. **Agriculture and Forest Meteorology Research Program.** Most of these projects focus on research and education efforts relevant to ag and forest environmental problems facing Connecticut. This program has a broad range of facilities, including
an environmental wind tunnel, LIDAR-laser and sensor development lab, and a mobile micrometeorology profile measurement and data logging system.

c. **Center for Land Use Education and Research (CLEAR).** CLEAR uses remote sensing and geographic information systems technologies to create cutting edge information on changing landscapes. CLEAR includes the Laboratory for Earth Resources Information Systems which is a NASA Regional Earth Resources Application Center named the Northeast Access to Usable Technology in Land Planning for Urban Sprawl.

d. **Connecticut Institute of Water Resources.** CIWR is a partnership between UCONN, Connecticut, and the USGS focused on water resource research and resolving state and regional water problems. The CIWR has a water resources field station (well field for research and teaching) and water quality and soil labs.

3. **Department of Marine Sciences (Dr. Ann Bucklin and Dr. Jim Edson).** The DMS focuses on marine sciences and coastal oceanography, in particular air-sea interactions, climate studies, and the cycling of carbon between the atmosphere and oceans. DMS faculty and students have been involved in several large field campaigns with NCAR scientists like Ocean Horizontal Array Turbulence Study (OHATS) and the CLlvar MOde Water Dynamics Experiment (CLIMODE). Their marine meteorology and physical oceanography groups are actively involved in NOAA IOOS and NSF ORION programs. The DMS is also a world leader in mercury biogeochemistry and understanding the movement of mercury through the atmosphere, hydrosphere, cryosphere, and surface sediments. The DMS supports the Coastal Ocean Laboratory for Optics and Remote Sensing (COLORS). COLORS is developing algorithms to use remote sensing to quantify phytoplankton and CDOM in optically complex waters. The DMS includes a fleet of coastal research vessels and buoys, wet and dry labs, a seawater research facility, and an extensive machine and electronic shop. During our visit we toured the R/V Connecticut, which is a 76’ fully outfitted research vessel. The DMS also operates the MYSound Buoy Array as part of the Long Island Sound Integrated Coastal Observing System. This system measures both physical and biogeochemical properties within the Sound (e.g., currents, winds, oxygen content, salinity).

4. **College of Liberal Arts & Science (Dean Ross MacKinnon and Dr. Anji Seth).** The Department of Geography has an emphasis on climate change science and the human-climate interface. Researchers and students use climate models and observations to characterize regional climate change and explore adaptation and policy options. They have a state-of-the-art GIS lab and a broad range of collaborations, including the North American Regional Climate Change Assessment Program.

5. **College of Engineering (Associate Dean Mehdi Anwar and Dr. Guiling Wang).** Atmospheric research in the Environmental Engineering Program includes: (1) land-atmosphere interactions (vegetation-climate feedback, land surface models, etc) and (2) hydrological remote sensing and its application to land and atmospheric modeling. Many of NCAR’s climate models are primary tools in this research.
6. **UCONN Health Center (Dr. Paula Schenck).** The Center for Public Health and Health Policy supports research that examines the health consequences related to dispersion of contaminants and atmospheric phenomena.

UCONN’s membership application is based on the desire of the faculty for more active participation in UCAR programs and peer institutions. The site visit team was impressed by the enthusiasm of the faculty, staff, and students for their research and by the level of institutional support for their activities. Because of the integrative and center orientation at UCONN, it was a little difficult to fully count the number of Ph.D. students and their associated degree programs during the visit. However, it was clear that there were dozens of Ph.D. students working on very interesting interdisciplinary and UCAR-relevant research. Based on the DMS scholarship and Ph.D. student production alone, UCONN would qualify for UCAR membership. When you consider all the other activities, it was clear to the site visit team that UCONN is a good addition to the UCAR family. UCONN has several areas of research that will be an exciting addition to the UCAR community, in particular their very interesting mercury and other trace metals, hydrology, geography, marine sciences, and the climate-public health connections research.

**Recommendation:** The Membership Committee concludes that the University of Connecticut meets the UCAR membership criteria, and accordingly recommends that the Member Representatives elect the University of Connecticut a UCAR member.