Date: 18 May 2015

Memorandum
To: the UCAR Membership Committee
From: Tom Bogdan (UCAR), Len Pietrafesa (NCSU)
Subject: The University Of British Columbia, Vancouver British Columbia, Canada
Application for Membership to UCAR

Tom Bogdan and Len Pietrafesa visited UBC, met with UBC administrators, faculty, students and technical staff on May 5, 2015. The Visit - Agenda is attached.

We would like to submit for your consideration the University of British Columbia’s (UBC’s) application for membership to the University Corporation for Atmospheric Research (UCAR). UBC is co-located in both Vancouver and in the Okanagan Valley in British Columbia in Canada. UBC has nearly 60,000 students, including 12,000 international students from 139 countries. In 2014 UBC awarded 12,421 degrees, had an annual operating budget of $2.1B, conducted $563M in sponsored research funding on 8,442 projects, was estimated to have had a $12.5 B economic impact in Canada and spun off 161 companies. UBC is consistently rated within the Top 40 Universities in the World. Of note, this UCAR membership application focuses on the Atmospheric Sciences Program (ATSC) academic “program”, The ATSC program is administered by the Earth, Ocean & Atmospheric Sciences (EOAS) Department.

There are 13 core ATSC faculty consisting of 7 tenured full professors (Allen, Balmforth, Bertram, Black, McKendry, Parlange, Stull), 4 tenured associate professors (Austin, Christen, Donner, Pawlowicz), and 2 tenure-track assistant professors (Radic, Waterman). All ATSC faculty are involved in undergraduate and graduate classroom instruction and research and in graduate research education. Hsieh, Steyn and Stull are CMOS Fellows, Parlange is an AGU fellow, Stull is an AMS Fellow, and McKendry is a fellow of the Royal Canadian Geographic Society. Steyn is a Certified Meteorologist with CMOS, and Stull is a Certified Consulting Meteorologist with the AMS. There are 14 additional colleagues located across UBC and these closely aligned faculty are designated Associated Faculty. There are also a cadre of colleagues in industry and in government labs who have been appointed as Adjunct Professors to the “program”. There are also 4 emeritus core faculties, and 3 of the 4 are still active in sponsored research (Hsieh, Oke, Stern). There are also 8 postdoctoral scholars, 5.5 research associates and 5.5 IT and Lab Tech Staff.

The UBC ATSC program is highly interdisciplinary, and while it seemingly consists of but 13 core faculty (CV's are attached), it actually spans four colleges and eight departments. ATSC researchers have been collaborating for over 50 years, and currently the core faculty are responsible for $3.1M in research grants annually; or ~$240K/faculty member/yr. The core faculty is highly productive with ~ 5 peer reviewed publications/faculty member/yr in the highest rated scientific journals in the world. In addition, seven books have been published by these faculty and several are considered “classics in the field”. The faculties are involved in 35 major research programs globally, pole to pole, thus ~ 3 research programs/faculty member.

The ATSC academic program was created in the early 1980s, and offers BS, MS and PhD degrees. The programs involved in UCAR areas are located on the Vancouver campus. Programs of study in the Atmospheric and related sciences are distributed throughout ASU including the College of Arts and Sciences, the College of Fine and Applied Arts and the Walker College of Business with departments within these colleges including: atmospheric
chemistry, atmospheric physics, climatology, physical geography, climate patterns, impacts of pollutants and greenhouse gases on ecological systems, aerosol loading and properties, climate change and extreme events, renewable clean energy including solar, wind, hydrogen and water, climate and sustainable organizations, new hybrid automobile power source strategies and funding sources (e.g., cities, industries and businesses, such as Ford, Daimler, Mercedes, etc), and the economic and social impacts of climate change. Within the Department of Technology and Environmental Design there is a focus on instrumentation, where students learn not only how instruments work but how to service, design and build them as well. The precipitation (rain, sleet, snow, hail, grapple) and nucleation laboratory is delving into fundamental thermodynamics revealing visualized representations. Customized weather forecasts are provided 24/7 to paying customers via the on-campus UBC high performance computing systems which total 616 cores in three clusters; providing back-up as needed.

ATSC currently has an enrollment of 24 undergraduate, 14 M.S. and 13 Ph.D. students. In the past 5 years ATSC has granted 54 BS and combined majors degrees (~11/yr), 10 Diplomas (2/yr) in Meteorology, 9 MS and 7 PhD degrees (3.2/yr). Over the period 2010-2014, ATSC graduate students have won 16 AMS and/or CMOS awards (3.2/yr) and participated in 88 conferences (17.6/yr). Also, 53 ATSC grad students have participated in observational field programs, and 23 students were involved in summer schools, workshops, training programs, extended visits to national labs (including NCAR ASP grad-student visitors), as science-fair judges, and as museum guides. ATSC undergraduate students are required to take 44 credit hours in the physical and mathematical sciences and 62 credit hours in the environmental sciences; with many elective opportunities based on interests. Graduate student programs of study are based upon the areas of interest and pursuit of the individual student. The enthusiasm of the UBC students and their faculty advisors was infectious. The UCAR review team was deeply impressed with the commitment of the students to their research projects and challenges as they conduct their research in modern, well equipped laboratories. There was clear evidence of a great deal of pride in the student experience in this intellectually stimulating UBC campus environment.

Our assessment is that UBC faculty and students will greatly benefit from UCAR membership by broadening research opportunities for faculty and students and providing access to educational materials in the atmospheric and related sciences that are core to the modern mission of the National Center for Atmospheric Research (NCAR). Likewise we believe that UBC brings a strong history, legacy and proven commitment to multi-disciplinary and inter-disciplinary atmospheric, environmental research into the UCAR family and moreover will further broaden UCAR’s constellation of outstanding earth systems science universities across greater North America. In summary we believe that UCAR and NCAR will benefit from UBC’s broad portfolio of atmospheric and related science programs, its commitment of service to society, its range of modern environmental sustainability programs, such as clean energy, and its incredible international academic reputation and ranking, along with the sustained legacy of exceptional scholarly productivity of its faculty and students.