

In Memoriam
Dr. Harold "Harry" Orville
(1932 - 2011)



Dr. Harold "Harry" Orville, 79, Distinguished Professor Emeritus of Atmospheric Sciences at the South Dakota School of Mines and Technology, died 6 June 2011 at a Rapid City nursing home. Over a long and distinguished career he contributed much to the science of weather modification and the use of numerical cloud models in support of weather modification research. Harry was a long-time member of the WMA and received its Schaefer, Thunderbird and International awards (the only WMA member to hold all three).

Harry was born 23 January 1932 in Baltimore, MD to Capt. Howard and Lillian Orville. He grew up in Arlington, VA, graduating from high school in 1950. He received a degree in political science from the University of Virginia in 1954, along with a commission in the U.S. Army, and married Laura Milster the same year. In his senior year he gave a speech in speech class on the newly developing field of weather modification by cloud seeding. In those days Harry's father chaired President Eisenhower's Committee on Weather Control. Harry, now following in his father's footsteps, served as a Signal Corps meteorologist at Ft. Huachuca, AZ, and was honorably discharged in 1956 as a 1st Lieutenant. He subsequently received his M.S. degree in meteorology from Florida State

University and his PhD from the University of Arizona in 1965.

In February 1965 Dr. Orville came with his family to the Black Hills to join Dr. Richard Schlessener, Dr. Arnett Dennis and other colleagues at the Institute of Atmospheric Sciences at the South Dakota School of Mines and Technology. His main activity was developing numerical cloud models as a major component of the Institute's weather modification research program, being carried out under what came to be known as the Bureau of Reclamation "Skywater" program. His PhD research involving cloud photogrammetry led him into cloud physics, and Harry and his students and colleagues were careful to include cloud microphysics as well as dynamics in their models. They developed microphysical parameterization schemes to represent the generation, growth and interactions of different classes of cloud and precipitation particles. As computer capabilities advanced, these schemes became more complicated and sophisticated and the models moved from clouds containing only liquid particles (cloud droplets and raindrops) to incorporate various forms of ice including cloud ice crystals, snow, graupel and hail. Furthermore, Harry always paid close attention to comparisons between the model simulations and corresponding observations.

Often the focus of the modeling work was on understanding and properly simulating basic physical processes, but as the capabilities improved it became possible to simulate effects of cloud seeding in the models as well. The first journal publication dealing with glaciogenic cloud seeding appeared in 1980, and many followed. Harry understood that models offer a unique capability to compare the behavior of the same cloud with and without the application of seeding treatments. He thus became an international leader in the application of numerical cloud modeling to the simulation of cloud seeding processes. Work expanded to cover

seeding for precipitation enhancement from both summer convection and winter orographic storms, for hail suppression, and even for trying to enhance convection through widespread dispersal of carbon black dust. More recent years saw the addition of hygroscopic- seeding simulations (though some simulations of salt seeding had been carried out in the 1970s). In 1990 and 1996 he published important surveys of the role of numerical cloud modeling in weather modification research and operations.

Harry helped set up the Department of Meteorology (now the Department of Atmospheric Sciences) – the academic arm of the Institute – in 1966, became department head in 1974, and served for over twenty years in that position. He also served as interim vice president at SDSM&T in 1987 and 1993, and as acting director of IAS. Upon retiring from fulltime teaching in 1996, Orville was named a distinguished professor emeritus.

He successfully advocated for cloud seeding trials, sponsored by the West Dakota Water Development District and the City of Rapid City, to enhance reservoir levels in the Black Hills during 1989. He organized a local workshop with invited national speakers, spoke at council meetings, and participated in on-air call-in shows on the topic. In the early 1990's he conducted local research involving microwave radiometer measurements of the vapor flux over the Black Hills region and, in collaboration with Richard Farley and several students, simulated Black Hills spring storm cases to explore the potential enhancement due to seeding of these storms.

Dr. Orville and Nancy Knight collaborated on two NSF-sponsored Research Experiences for Undergraduates projects associated with major convective-storm field projects conducted in Bismarck, ND, in 1989 and 1993 to study potential for hail damage mitigation using cloud seeding.

He helped organize a program development workshop for the Board on Atmospheric Sciences and Climate of the National Academies of Science in November 2000, to assess whether a new study of the scientific underpinnings of weather modification was needed. It led to a study that resulted in the National Research Council report on ***Critical Issues in Weather Modification Research***, issued in 2003.

Dr. Orville was a Fellow of the American Meteorological Society and in 1993 was awarded the Charles Franklin Brooks Award, the highest AMS award for service. He served the AMS in many capacities, including AMS councilor and member of the Executive Committee from 1983-1986, and Scientific and Technical Activities Commissioner from 1989-1996. In addition, he chaired the AMS Committee on Weather Modification on two different occasions and also served on the Committees on Cloud Physics and on Severe Local Storms. He was a member of the International Commission on Cloud Physics from 1971 to 1980, spent the academic year 1972-73 working with the NOAA Office of Environmental Modification (dealing with their weather modification programs), and spent a 1982 sabbatical in the Weather Modification Office at the World Meteorological Organization headquarters in Geneva. He later chaired the WMO Executive Council Panel of Experts/Committee on Atmospheric Sciences Working Group on the Physics and Chemistry of Clouds and Weather Modification Research from 1991-1997. He chaired the organizing committees for WMO scientific conferences on weather modification in Italy (1994) and Thailand (1999), and was instrumental in initiating the series of International Cloud Modeling Workshops conducted under WMO auspices.

Harry had a lifelong interest in sports and athletics, including being a boxer in college. In 1965 he became the manager of Harney Little League teams, and was also active in the Boy

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Scouts of America and served as PTA President. He was an avid golfer, becoming a member of the Hole in One Club in 1998, and initiated the annual South Dakota School of Mines and Community Golf Tournament (which has raised tens of thousands of dollars for scholarships). The seventh annual event took place on the day that Dr. Orville passed away. Survivors include his wife, Laura Orville, Rapid City; their golden retriever, "Breezy;" four children,

six grandchildren, and three great grandchildren; and two brothers, of whom Richard Orville of Texas A&M University will be familiar to many WMA members. Memorials will be placed towards the Harold and Laura Orville Graduate Fellowship or to the South Dakota School of Mines and Community Golf Tournament through the SDSM&T Foundation.