UND Receives \$1M Atmospheric Research Contract from U.S. Navy, Strengthens New Public-Private Partnership

Cape Experiment 2019 combines strengths of UND, Weather Modification International to advance cloud modeling, forecasting on global scale

GRAND FORKS, N.D. — The University of North Dakota has received a contract of just over \$1 million to conduct research on behalf of the Naval Surface Warfare Center in an effort to improve the understanding of thunderstorms. The research combines aircraft measurements and observations with the United States Navy's Mid-Course Doppler Radar (MCR) to develop better cloud models.

David Delene, professor of atmospheric sciences at UND, says Cape Experiment 2019 (CapeEx19) is a historic opportunity both in the project's sophisticated level of research and the partnerships it creates. UND will be subcontracting with Fargo, N.D.-based Weather Modification International (WMI) in the use of its Cessna Citation II Research Aircraft – a modified jet previously owned by the University, until 2016.

"This is a great example of a public-private partnership," Delene said, "We both take the strengths of what we can do to conduct a project that's difficult to do individually. UND provides the scientific understanding, and WMI provides the ability to operate the aircraft safely and effectively while utilizing state of the art aircraft probes."

For two weeks in July 2019, WMI and UND will conduct between 20 and 30 hours of flying in thunderstorm anvils near Cape Canaveral, Florida. The Citation II aircraft can reach heights allowing a variety of cutting-edge probes to take measurements at the tops and centers of storms.

Probes in use during this mission will measure essential atmospheric state parameters (temperature, humidity, wind and pressure), but Delene highlights cloud size, concentration, habits and total water content as key measurements. These probes include the Cloud Droplet Probe, Cloud Imaging Probe, Precipitation Imaging Probe and the Particle Habit and Imaging and Polar Scattering Probe to measure the number and size of cloud particles. The Nevzorov Probe and Hot Wire Probe will measure cloud liquid and total water content.

Delene says the U.S. Navy has a keen interest in modeling clouds on a global scale. Its MCR system is one of the most advanced radars on the planet. UND's research using data collected during the July flights will help the Navy understand the system's abilities and limitations as they pertain to weather monitoring and forecasting.

The project expands the work of UND/WMI/Navy research projects from 2010 and 2015, though this is the first time the flights combine WMI's operational prowess and UND's scientific expertise. It's also a great opportunity for UND students to work at a high level, utilizing a combination of the best observational equipment in the field of atmospheric sciences.

"We'll have several graduate students involved that will fly on the plane, run the data systems and make sure instruments are performing correctly during flights," Delene said. "They'll also process the data right after the flights and examine them. After the field work for the project is over, it's going to form the basis of multiple thesis projects." WMI has a strong history in the modification and operation of special mission aircraft in the fields of cloud seeding and atmospheric research. WMI provides world-class capabilities, professional staff and state of the art equipment when it comes to research aircraft, having worked with clients around the globe.

President of WMI, Neil Brackin, spoke highly of UND as a partner as his company becomes more proactive in the world of weather research. In addition to Cape Experiment 2019, WMI involves UND students and faculty in a variety of projects that provide training and opportunities in the field of atmospheric science.

"CapeEx19 is one example of how we can leverage the strengths of UND and the Atmospheric Sciences department in deploying industry leading equipment on domestic and international projects; in this case a fully instrumented Cessna Citation II Research Aircraft to Cape Canaveral, Florida" Brackin said. "When we have an open collaboration and leverage our combined strengths, WMI and UND offer unparalleled history and capability in this industry. For us, it's a great channel for developing operational programs within the government, military and commercial sectors, helping us build our brand as the leading commercial operator within the field of atmospheric sciences."

"This is a significant project with a lot of measurements, and a lot of top-notch scientists, that highlights what we can do at the University of North Dakota, in terms of airborne research," Delene said. "This public-private partnership is the start of a new era, which is already leading to multiple joint projects, and hopefully many more significant opportunities in the future."

About UND: The University of North Dakota is the chief opportunity engine for North Dakota and UND students. Founded in 1883, six years before North Dakota was granted statehood, UND is among the nation's premier regional public research universities and is at an exciting point in its 136-year history. Classified as a "Doctoral University: Higher Research Activity" institution by the Carnegie Foundation for the Advancement of Teaching, UND is characterized by a solid foundation of the liberal arts, high quality students and faculty, a diverse curriculum, a widely recognized program of graduate education and research, law and medical schools praised for quality and innovation, rich cultural resources, and an outstanding record of alumni support. Its major academic divisions include Arts and Sciences, Aerospace Sciences, Business and Public Administration, Education and Human Development, Engineering and Mines, Nursing and Professional Disciplines, Medicine and Health Sciences, Law, Extended Learning and the School of Graduate Studies. Long a provider of distance education, UND is developing a robust online presence. Learn more at <u>www.und.edu</u>.

About WMI: Weather Modification International is the world-leader in atmospheric chemistry, pollution and weather research, weather forecasting and modeling, and weather modification programs. The company is best known for its successful cloud modification projects worldwide to suppress hail and enhance precipitation. WMI also sets the standard in providing sophisticated ground-based weather radar systems and has been active since the early 1960's. WMI has conducted research and implemented weather programs in North America, South America, Europe, Asia, the Middle East and Africa, totaling more than 35 countries. WMI is a sister company to Fargo Jet Center and is based at their headquarters in Fargo, N.D.

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