



## Geography Department Speaker Series

# Dana Veron

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### Local to regional forcing of sea ice coverage along the East Antarctic Coast



**Friday, January 26**  
**Tillet -264,**  
**Livingston Campus**  
**3PM**

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In the Adelie Sea region of East Antarctica, summer sea ice coverage demonstrates strong temporal variability that is frequently out of phase with larger regional patterns. While numerous atmospheric and oceanographic forcings are known to influence sea ice concentration and distribution, the cause(s) of this variation have not been fully explored. We use in situ data from the CALVA and GLACIOCLIM field campaigns, along with MeteoFrance station data to explore the strength and timing of various atmospheric forcing such as surface temperature, cloud cover, net longwave and local winds in comparison to sea ice concentration both locally at the permanently occupied Dumont d'Urville Station and in the larger Dumont d'Urville Sea region (139 to 146 °E, called the Smith Region Sea ice gridded and polygon data come from the National Ice Center for the summers from 2005-2019. This period is of interest because of the large calving event of the Mertz glacier tongue in 2010, which changed regional ocean circulation patterns. ERA5 climate reanalysis data (2003-2022, gridded 0.25°x0.25° hourly) from the European Centre for Medium-Range Weather Forecasts (ECMWF) are then used to construct a summertime (NDJF) climatology of the surface, atmospheric and oceanographic conditions at DDU, in the Smith region, and in the surrounding area (area in a box bounded by 120°E -54°S and 160°E -70°S). ). At the local scale near DDU, katabatic winds have a strong influence on sea ice coverage and local climate. However, on a larger scale, the impact of katabatic winds is less apparent, and the influence of cloud cover and the related net infrared radiative flux is more strongly correlated with changes in sea ice. Further study with several supervised machine learning regression models indicates the importance of these forcings in sea ice feature detection.

Dr. Veron is a Professor in the Department of Geography at the University of Delaware and Co-Director of the Gerard J. Mangone Climate Change Science and Policy Hub. The themes of her research include climate change impacts; cloud-radiation interactions; surface radiative properties; Arctic energy balance; Antarctic boundary layer meteorology; sea breeze circulation; land/ocean surface-atmospheric interactions; offshore wind resource assessment.