

Environmental controls on temporal and spatial patterns in pteropod (*Limacina helicina*) abundance along the Western Antarctic Peninsula

Patricia S. Thibodeau¹, Deborah K. Steinberg¹, Claudine Hauri², and Hugh W. Ducklow³

¹Virginia Institute of Marine Science, The College of William and Mary, Gloucester Point, Virginia USA

²International Arctic Research Center, University of Alaska Fairbanks, Fairbanks, Alaska USA

³Lamont-Doherty Earth Observatory, Columbia University, Palisades, New York USA

Pteropods are one of the most abundant macrozooplankton taxa in the Western Antarctic Peninsula (WAP) and are important grazers of phytoplankton and prey for higher trophic levels. Currently, little is known about long-term and regional environmental controls on WAP pteropods. As part of the Palmer, Antarctica Long-Term Ecological Research Program (PAL LTER) we are examining long-term (1993 to present) trends in the biogeography of the thecosome pteropod, *Limacina helicina*, in relation to environmental controls. These include dissolved inorganic carbon (DIC), aragonite saturation, ice cover, sea surface temperature (SST), and presence of Upper Circumpolar Deep Water (UCDW)—a water mass characterized by warm temperature and high nutrients that floods onto the WAP continental shelf. Preliminary analyses indicate no significant relationship between DIC concentration or aragonite saturation and *L. helicina* abundance. We found a significant negative correlation with sea ice, and positive correlations between both SST and UCDW vs. summer *L. helicina* abundance, indicating warmer, ice free waters are preferred, possibly due to timing and propagation of the spring bloom as ice melts through the season. Our results suggest that changes in environmental patterns on different temporal (i.e., sub-decadal and longer-term) and spatial (i.e., latitudinal and cross-shelf) scales influence pteropod abundance and biogeography in the WAP, which can impact energy transfer to higher trophic levels and alter biogeochemical cycling in this ecosystem.

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Contact author: Patricia S. Thibodeau, Virginia Institute of Marine Science, The College of William and Mary, Gloucester Point, Virginia 23062, USA
psthibodeau@vims.edu