Oceanography Seminar

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"Time-lapse camera analyses indicate intense seafloor pulses and rapid processing of phytodetritus in a productive, glaciomarine fjord, Andvord Bay (Antarctica)"

Glaciomarine fjords along the West Antarctic Peninsula (WAP) are highly productive ecosystems in which seasonal pulses of phytodetritus deliver food to the seafloor and sustain rich benthic communities. However, the timing and intensity of phytodetritus pulses, and benthic community response, remain unevaluated in WAP fjords. We used a calibrated seafloor camera to study the arrival and utilization of phytodetritus over a 9-month period (Dec 2015 – Sept 2016) in the middle basin of Andvord Bay, a typical northern WAP fjord. The amount of phytodetritus on the seafloor was analyzed through development of automated color-recognition methods. Processing of phytodetritus by Ampharetid polychaetes, a dominant deposit feeder, was determined through measurement of fecal casts produced over time. Comparisons between "pre-bloom", "bloom", and "winter" periods indicated a rapid increase in deposit-feeding of almost five times background rates during an intense pulse of phytodetritus. Nonetheless, the bulk of phytodetritus was not consumed by large deposit feeders but appeared to degrade quickly (i.e. within weeks), presumably by microbial processes. This contrasts with similar depths (500-600 m) on the open shelf where most phytodetritus is consumed rapidly by mobile deposit-feeders such as holothurians (Sumida et al. 2014). Our work highlights the substantial differences in pelagic-benthic coupling and organic-carbon cycling within WAP fjords compared to the much less productive open Antarctic shelf ecosystem.

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