

# CGD SEMINAR



**DATE:** Tuesday, 15 November 2016  
**TIME:** 11 a.m.  
**LOCATION:** NCAR, 1850 Table Mesa Drive  
Mesa Lab, Main Seminar Room  
**TITLE:** Gelatinous zooplankton in marine ecosystems: a neglected but critical link in the ocean carbon cycle  
**SPEAKER:** Jessica Luo, NCAR/CGD

## ABSTRACT:

The net transfer of organic matter from the surface oceans to depth, controlled by a set of processes collectively referred to as the biological pump, is a key function of marine ecosystems. Estimates of the magnitude (6-13 Pg C yr<sup>-1</sup>) and efficiency (5-20%) of the biological pump typically fails to include cryptic organisms such as gelatinous zooplankton (i.e. jellies), which have fast sinking fecal pellets and carcasses. Here we demonstrate, with a combination of modeling and high-resolution observations, the multiple ecological roles of gelatinous zooplankton and their contribution to the global carbon cycle. Using a high-throughput underwater imaging system, the *In Situ* Ichthyoplankton Imaging System (ISIIS), we investigated the fine-scale community dynamics of gelatinous zooplankton at a meso-scale front, which provided insights on their abundance, diversity, and aggregation dynamics. In addition, we developed an off-line, coarse resolution global model for three gelatinous zooplankton groups (cnidarians, ctenophores, and pelagic tunicates), which suggested that their inclusion in global models could increase estimates of export flux by 3.5 Pg C yr<sup>-1</sup>, and the transfer efficiency of the biological pump by over 4-fold. This work highlights areas in which increasing ecological understanding of cryptic organisms like gelatinous zooplankton can improve our estimates of ocean carbon cycle dynamics.

**Live webcast:** <http://www.fin.ucar.edu/it/mms/ml-live.htm>

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