Motivation:
Identify biologically-driven mechanisms of carbon flux variability across an ocean basin.

Methods
Automated Image Processing
Phytoplankton community in surface waters and trap samples
Microscopy & DNA sequencing

Somewhat automated particle ID from processed images

Motivating Image

Phytoplankton community aggregates

Sampling locations of surface communities and sinking particles

Surface cell abundance

Fluxes of individual cells

Similar size distribution at boundary as offshore, but higher total fluxes, larger particle size classes (largely fecal pellets)

Preliminary Results

Particle fluxes near the boundary were ~10x higher than offshore

Offshore particle and plankton characteristics were also found near the boundary (e.g. PSD slope, plankton functional groups), but with higher magnitudes, relatively more diatoms in the surface and sinking, and larger size classes of sinking particles composed primarily of fecal pellets.

Diatom abundance and fluxes increase near the boundary, while others groups maintain similar levels

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