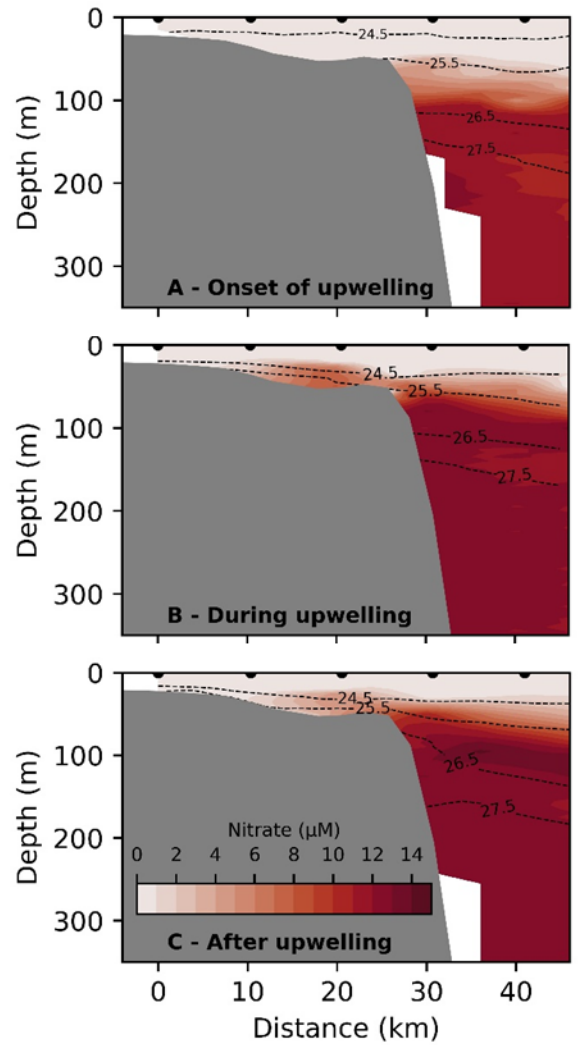
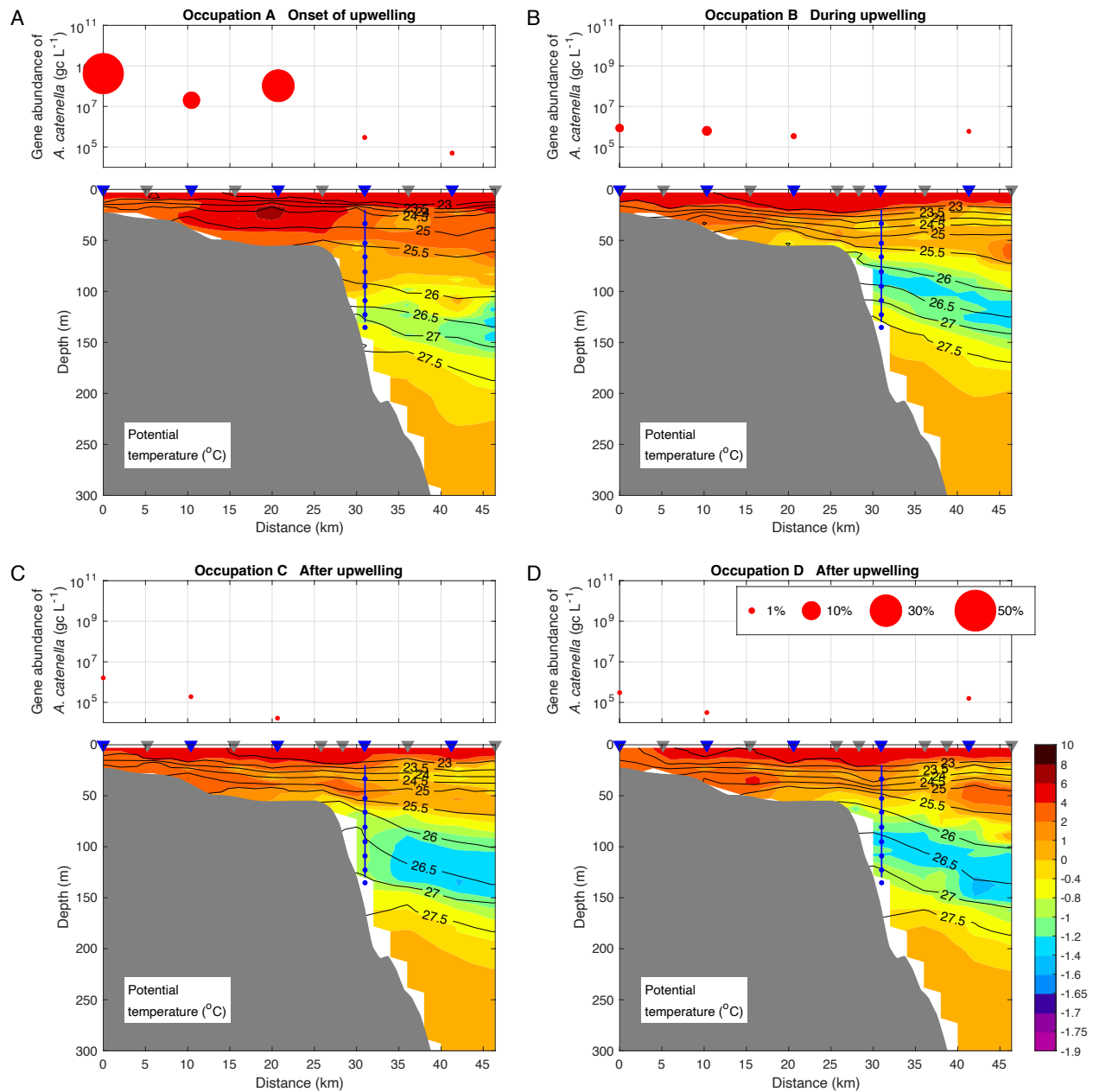


Supplemental Figure 1. 10-m winds and sea-level pressure for the period before the upwelling (29-30 Aug), during the upwelling (31 Aug – 1 Sep), and after the upwelling (3 Sep). The top row shows the wind vectors and speed (color) in the western Beaufort / eastern Chukchi Seas. The blue dots are the stations of the repeat transect. The bottom row shows the sea-level pressure over a larger domain. The black dashed box is the domain shown in the top row. The center of the Beaufort High (BH) is indicated.

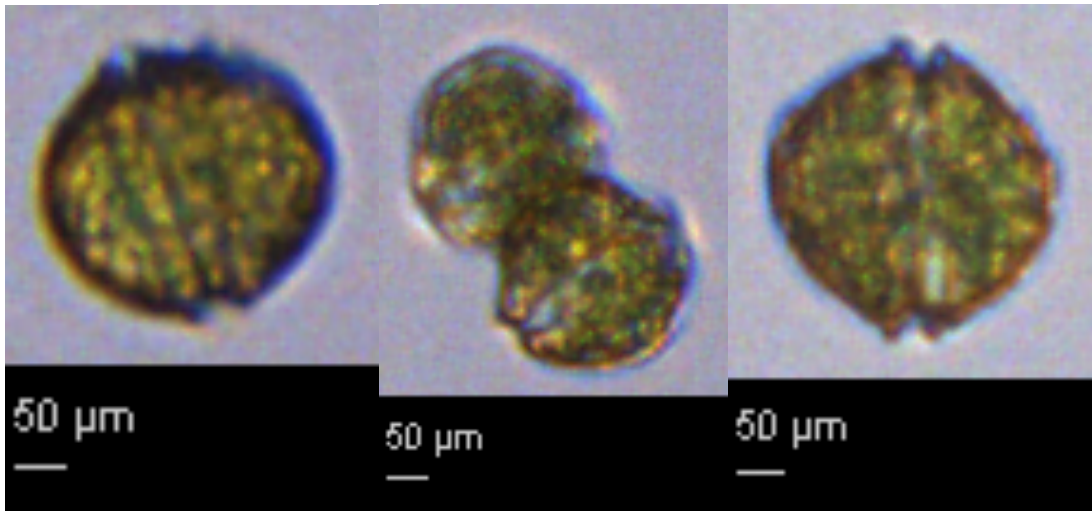


Supplemental Figure 2. Vertical sections of nitrate (color, μM) measured by the SUNA V2 sensor, with potential density contours overlain (kg m^{-3}). (A) onset of upwelling, (B) during upwelling, and (C) after upwelling. Transect occupation D is not shown due to fewer casts with the SUNA sensor.



Supplemental Figure 3. Vertical sections of potential temperature (color) overlain by potential density (contours, kg m⁻³) for (A) onset of upwelling, (B) during upwelling, and (C, D) after upwelling. Station locations indicated by triangles across the top of the section with blue triangles indicating those at which surface water was collected. While the AON mooring is not on the transect, the location of the mooring with respect to the shelf on the sampled transect is plotted as a blue line for reference with dots indicating the locations of MicroCATs along the

mooring profile. The corresponding concentrations of absolute *A. catenella* 28S rRNA gene abundance collected from the chl-*a* max depth are plotted above the sections, with the relative fraction of *A. catenella* 18S rRNA of total eukaryotic phytoplankton (dinoflagellates, diatoms, haptophytes) 18S rRNA indicated by the symbol size.



Supplemental Figure 4. *Alexandrium spp.* images taken during FlowCAM analysis.