Nearfield sampling of plankton, marine snow, oil droplets in the vicinity of the BP DWH oil spill in the Gulf of Mexico using the holographic plankton camera

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Efforts are underway to model the transport and spread of the oil plume that has formed from the leaking MC252 BOP site. Dispersants have been used to emulsify a portion of the oil in the plume. Presently there is limited data on the distribution of plankton and marine snow and oil droplet sizes in relation to the oil plume. Such information is critical to accurate modeling of the plume transport and the impact on the pelagic ecosystem of the gulf.

As part of the overall assessment effort, an underwater digital holographic imaging camera (Holocam) is being used to observe, quantify, and measure plankton, marine snow, and oil droplets within the nearfield region of the well head. The Holocam (Fig 1) images objects in a size range of 20 microns to cm and is autonomous, battery-powered with holograms recorded internally on a compact flash card. The holocam image volume was 166 ml, with 9-14 micron resolution in x,y and 200 micron axial resolution. During the M/V *Ocean Veritas* cruise (July 14-16, 2010), we mounted the Holocam on the CTD frame on 6 casts and collected over 3000 holograms. Plankton and marine snow (but no oil droplets) were observed on this cruise, based on initial processing of the data; further processing is underway.

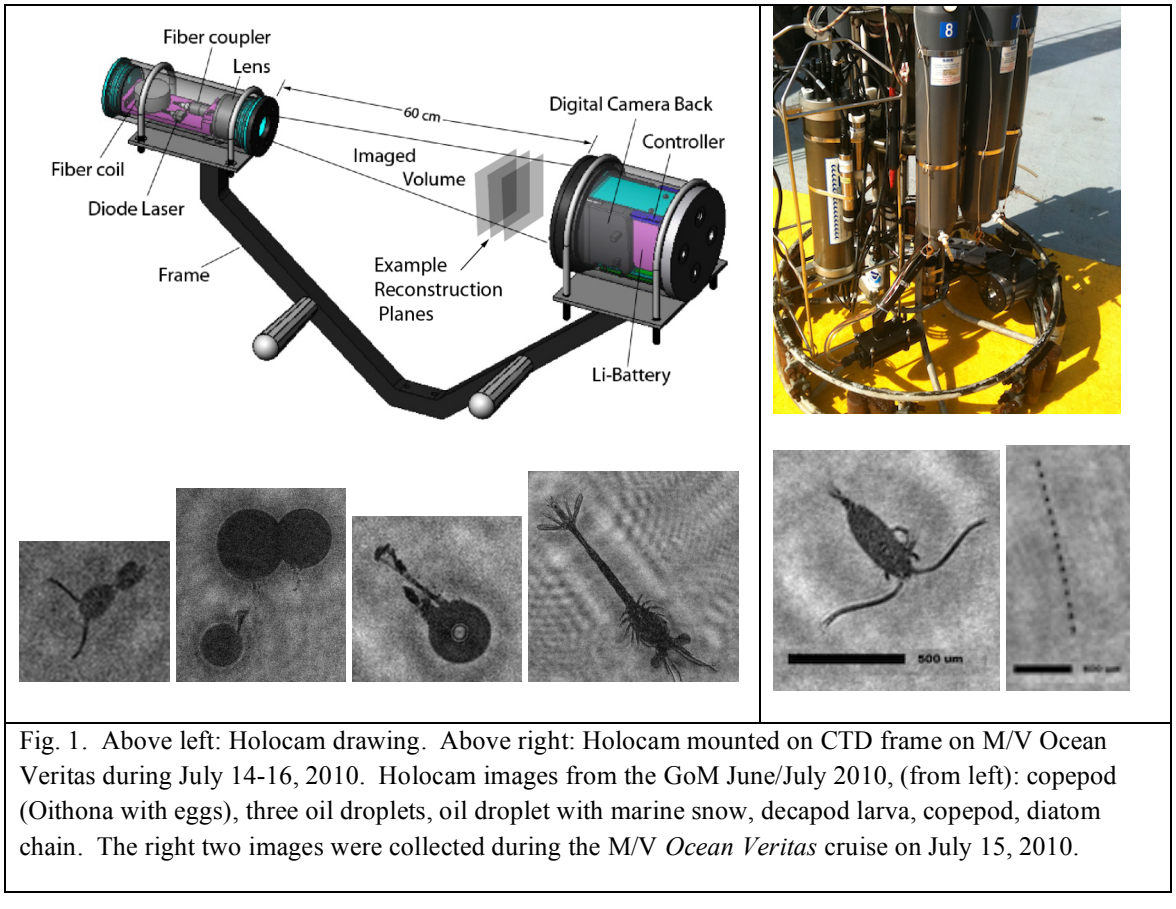

Fig. 1. Above left: Holocam drawing. Above right: Holocam mounted on CTD frame on M/V Ocean Veritas during July 14-16, 2010. Holocam images from the GoM June/July 2010, (from left): copepod (Oithona with eggs), three oil droplets, oil droplet with marine snow, decapod larva, copepod, diatom chain. The right two images were collected during the M/V *Ocean Veritas* cruise on July 15, 2010.