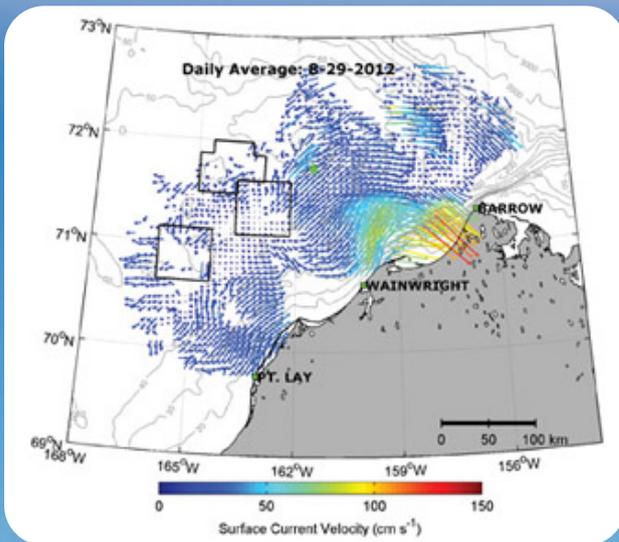


September 2012

University of Alaska Fairbanks Summer 2012 Roundup: “We threw everything at the ocean this year, including the kitchen sink!”

Contributed by Hank Statscewich & Peter Winsor, University of Alaska Fairbanks

Summer 2012: Researchers at the University of Alaska Fairbanks (UAF) have kicked off an exciting field season with a massive sampling exercise to measure ocean currents and stratification in the Chukchi Sea, a marginal sea of the Arctic Ocean. The season started off with the installation of CODAR Extended Long-Range SeaSondes in the villages of Barrow, Wainwright and Point Lay. These specially-configured units feature a second transmitter and transmit antenna to a traditional 5 MHz installation to maximize the amount of energy transmitted from the antennas towards ocean. Heavy ice cover lingered throughout the study area through most of June and into mid-July, but by mid-August the ice started to break apart and improvements in range from each of the three systems due to the hardware augmentation started to become evident. Some preliminary analysis show ~25% improvement in range, from 180 km to 240 km!



Current map with a strongly sheared current field and huge front in the vertical sections (transition between greens and blue colors between Barrow and Wainwright). Black boxes are areas being considered for offshore drilling.

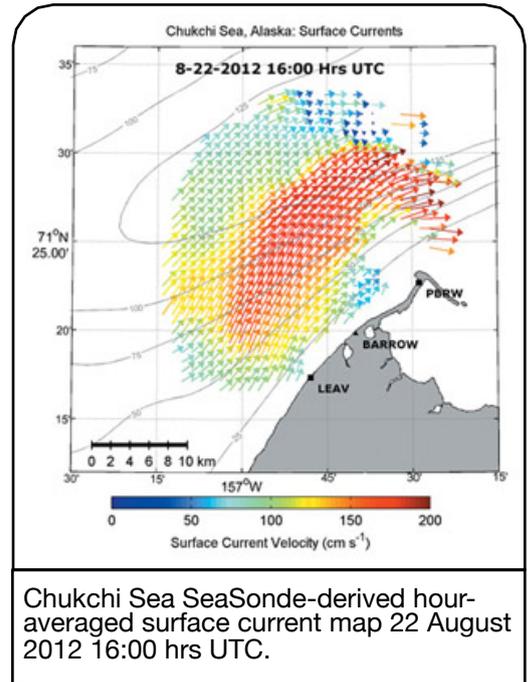
In addition to the Long-Range SeaSondes, two higher resolution 25 MHz systems are running in the village of Barrow to investigate the near shore current fields around Point Barrow, the northernmost point in the United States. The energetic currents of the region represent the oceanographic link between the Pacific and Arctic Oceans via Barrow Canyon, a deep submarine canyon that is located just 20 km from shore.

In August, principal investigator (PI) Tom Weingartner joined a multi-disciplinary science crew on board the US Coast Guard Cutter icebreaker Healy. The group departed Dutch Harbor on August 4 en route to the Chukchi. A dispatch from Tom relays the ice conditions, “Right now we are at 71° 37’N, 160° 30’W and ice edge is no more than 5 miles away to the south. Ice edge is very diffuse and easily navigable. Hanna Shoal was an impressive mess with unbelievably large masses of grounded ice.” During the cruise, Tom deployed 28 drifters in the study area and collected a mountain of hydrographic and ocean current data.

Follow That Front! Adaptive Sampling Using SeaSonde Data

The day that Tom stepped off the Healy and onto dry land, PI Peter Winsor and crew stepped onto the Norseman II for a two week survey of the frontal structures on the Chukchi Shelf. Winsor and crew towed an undulating CTD-optics instrument through the water almost continuously for 12 days, collecting >4,000 casts through a 1,300 swath of ocean. The science party made extensive use of the surface current maps produced by the SeaSondes to adaptively sample fronts, convergence zones and coastal jets in the region. Winsor also deployed 20 drifters, two gliders and a short-term current meter mooring. The drifters were initially separated by 10 km but were placed on either side of a front, identified by the CODAR and towed instrument, with a temperature difference of >6 °C. Two Webb Slocum gliders were deployed alongside the drifter clusters to gain a Lagrangian perspective of the frontal physics. For these glider deployments, the UAF team relied on the glider piloting expertise of the Rutgers University Coastal Ocean Observation Lab. While the UAF researchers were at sea in the Chukchi, the glider pilots were comfortably situated in New Jersey.

A total of ~100 drifters were deployed in the Chukchi Sea this summer. Apart from giving the science team insights into the circulation patterns of the area, the drifters will also be used for detailed comparisons with the CODAR-derived surface currents. Project data, including real-time surface current vectors can be viewed on the project website: <http://dm.sfos.uaf.edu/chukchi-beaufort/index.php>.



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