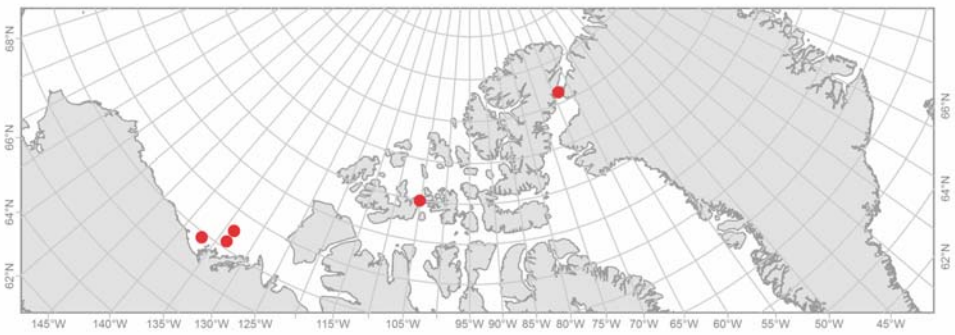
ASL Environmental Sciences

Solutions Newsletter

Summer 2014

Nares Strait Ice Study for Institute of Ocean Sciences, Canada

Dr. Humfrey Melling at the Institute of Ocean Sciences (IOS/Fisheries and Oceans Canada) has operated multiple ice measurement stations in the Beaufort Sea and Canadian Arctic Archipelago since 1991. In 1997 ASL began a long history of processing and analysis of data from these stations, under contract to IOS, and this work continues with processing of the 2012-2013 deployments. The stations employ subsurface moorings equipped with upward looking sonar instruments: an ASL Ice Profiler (IPS) for ice draft measurements and an ADCP for observations of ice velocity. Fusion of these datasets produces a high-resolution two-dimensional spatial profile of the overhead ice draft with vertical accuracies of 5 cm and horizontal resolution of 1 m. Typical one-year records observe several hundreds or thousands of kilometres of ice as it drifts over the moorings.



DFO/IOS ice measurement station locations in the Canadian Arctic

ASL recently began processing a three-year time-series of ice draft and velocity acquired by IOS between 2003 and 2006 in Kennedy Channel within the remote Nares Strait, the largest sea ice pathway from the Arctic Ocean through the Canadian Arctic Archipelago.

Ice Profiler™

An upward-looking sonar device, mounted on the ocean floor to accurately measure ice draft.

Recent Ice Profiler™ Sales:

Link to Ice Profiler brochure

10 IPS for deployment in the Russian Arctic
3 IPS to ASL project for ConnocoPhillips
2 IPS to NOAA-PMEL for deployment in the Arctic
1 IPS to KORDI, Korea for deployment in Antarctica
1 IPS to the Norwegian Polar Institute

And they are off!

10 ASL's Ice Profilers with internal batteries and 10 cages for the taut line mooring mounting were prepared for shipment to Russia. The equipment will be moored in ice infested waters in the Russian arctic to gather data for the oil and gas industry.

Cambridge Bay Observatory: Two years of Arctic Sea Ice

Ocean Networks Canada mini-observatory in Cambridge Bay has been monitoring seasonal changes since its installation in the fall 2012. The objective of the observatory is to provide science-based knowledge for greater understanding and protection of sensitive Arctic marine ecosystems.

Since the ASL Shallow Water Ice Profiler (SWIP) was deployed in October 2012, it has provided continuous real-time measurements of underwater sea ice thickness, as well as water levels, including tides and waves and ocean temperatures. The nearly two years of data successfully aquired are accessible through the University of Victoria Plotting Utility.

An Ocean Networks Canada mini-observatory on the dock ready for deployment in Cambridge Bay, Nunavut.

ASL to Build an Ocean Data Geoportal for Greenland Oil & Gas

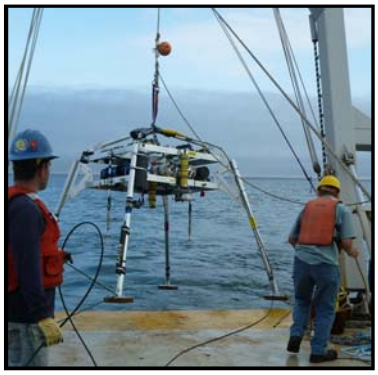
The Mineral Licence and Safety Authority of the Government of Greenland (MLSA) has contracted ASL to build and maintain a web-based marine geoportal from which sea ice, iceberg, metocean, and seafloor data from the east and west coasts of Greenland can be accessed by authorized parties. It will be a collaborative tool that will allow multiple users to interact with the system. ASL started the design and assemblage of the database in January 2014. This first phase also includes data quality control and database system integration. The marine geoportal will be launched online in 2015. Geoportal maintenance and database updates will be carried out by ASL's highly qualified team of ice, metocean, and GIS specialists.

ASL's decades of experience carrying out ice and metocean projects along with our cutting-edge software engineering team, and our familiarity with the end user (engineers and operational planners of oil and gas companies) enable us to provide innovative solutions to global environmental challenges.

IRIS™- Image Recorder for Imagenex Sonar

Sediment transport studies at Martha's Vineyard Coastal Observatory using ASL's Image Recorder for Imagenex Sonar (IRIS)

Christopher R. Sherwood of the Woods Hole Coastal and Marine Science Center, U.S. Geological Survey (USGS) and Malcolm E. Scully and John Trowbridge of the Woods Hole Oceanographic Institution (WHOI) are co-principal investigators of a project to measure the effect of spatially varying bottom stress on inner-shelf circulation conducted near the Martha's Vineyard Coastal Observatory (MVCO, www.whoi.edu/mvco) and funded by the National Science Foundation and USGS. As part of this study, two platforms were deployed with sensors to measure near bottom currents and bedforms, including ASL's IRIS battery-powered data logger connected to Imagenex 881A sonars. The equipment was deployed in July, 2014. At the end of September, the platforms will be serviced and redeployed with new batteries.



Each platform is equipped with an Imagenex 881A pencil beam sonar with Azimuth drive, and an Imagenex 881A imaging (fan beam) sonar. An ASL IRIS controls each sonar, providing power, control commands, and recording the acoustic data over the duration of the ongoing deployment. The pencil beam sonar provides elevation measurements of bottom features while the imaging sonar records views of a larger area of the bottom. Fan images are recorded hourly, and the azimuth data is collected every 9 hours. The data from both types of sonar instruments will be used to describe and quantify the movement of the bed forms and sand ripples.

One of the instrumented platforms being deployed from the R/V Connecticut at the MVCO site, July, 2014.

Link to IRIS brochure

Acoustic Zooplankton Fish Profiler™ news:

The AZFP provides continuous high-resolution time series of acoustic scattering strength throughout the water column. The data can be used to monitor the presence and behavior of zooplankton and fish, as well as physical processes such as internal waves, sediment suspension and scattering from bubbles.

Recent AZFP™ Sales:

Link to AZFP brochure

1 four-frequency AZFP to University of Alaska Fairbanks
2 four-channel AZFPs to our agent Sanko Tsusho Co, Japan
2 single channel 769 kHz AZFPs to our agent Shanghai Generule Commercial and Trade CO, China
1 single frequency 125 kHz AZFP to the Korean Institute of Ocean Science and Technology (KIOST)
15 four-frequency AZFPs to WHOI Ocean Observatories Initiative
1 two-channel, 200 kHz AZFP for aquaculture deployments on the East Coast of Canada

An AZFP for Echosystem and fish monitoring to be deployed by UAF

Dr. Seth Danielson is a physical oceanographer with the University of Alaska Fairbanks School of Fisheries and Ocean Sciences. Dr. Danielson purchased an AZFP 38/125/200/455 kHz, internally-powered and internally-recording with 32 GB of flash and a standard battery pack for a one-year deployment for observations of Arctic Cod and to monitor the ecosystem to within 30cm below the ice. The instrument will be deployed on the shallow arctic shelf in 30m below the water surface on taut line mooring for 12 months. The mooring site is between the Chukchi and Beaufort Seas.

The AZFP will be co-deployed with 600 KHz TRDI workhorse ADCP equipped with the Waves array package. Dr. Danielson and his Mooring Technician, Mr. David Leech, took part in ASL's hands-on training program in March to become familiar with the instrument.

AZFP instrument in the mooring cage with Mooring Technician David Leech, Claudine Hauri, SFOS carbon chemist, and Jessie Turner, SFOS graduate student at the Seward Marine Center Courtesy of Dr. Seth Danielson

ASL to provide Un-Cabled Bio-acoustic Sonar Instruments for The Ocean Observatories Initiative (OOI)!!

The Consortium for Ocean Leadership (OL) and the Woods Hole Oceanographic Institution (WHOI) announced ASL Environmental Sciences will provide Un-Cabled Bio-acoustic Sonar Instruments for the Ocean Observatories Initiative (OOI) Coastal and Global Scale Nodes (CGSN). A 2.5 year Indefinite Quantity Contract was awarded to ASL with a maximum value of $1.6M.

Under the terms of the contract, ASL will supply up to 16 instruments for the Coastal Scale Nodes and up to 10 instruments for the Global Scale Nodes. ASL will supply its off-the-shelf Acoustic Zooplankton Fish Profiler instruments to meet the CGSN specific requirements. Four-frequency internally-powered, internally-recording AZFP echosounders with 38, 125, 200 and 455 kHz channels will be supplied for use on the Coastal Scale Node and operate for 7 months or longer on their own power. On the Global Scale nodes, each will have a dual set of AZFPs, each with 38, 70, 125 and 200 kHz channels (one will point up and the other will point down) to operate for up to 13 months without recovery. The first units are scheduled to be delivered in latter half of 2014.

ASL is excited to be part of OOI. The project funded by the National Science Foundation is planned as a networked infrastructure of science-driven sensor systems to measure the physical, chemical, geological and biological variables in the ocean and seafloor. For more information on the AZFP instrument go to: http://www.aslenv.com/AZFP.html and on OOI go to: http://oceanobservatories.org/.

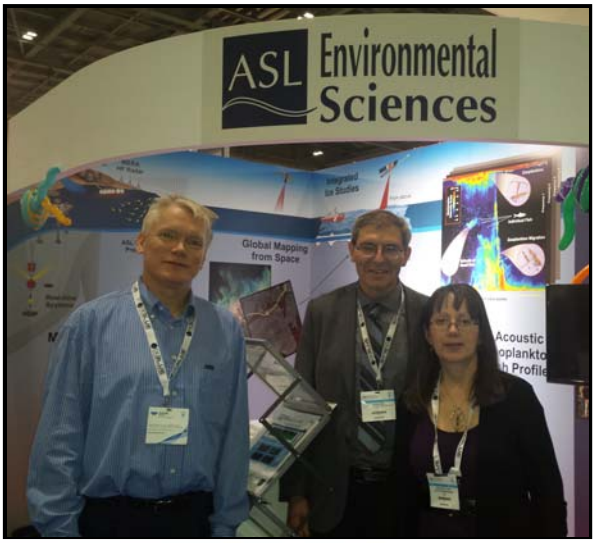
Satellite-based Study of Water Quality of Chilko Lake

ASL Environmental Sciences Inc. has successfully completed the Lake View Project, which was funded by the Canadian Space Agency (CSA) Earth Observation Application Development Program (EOADP) between 2011 and 2014. Lakeview's objective was to apply advanced remote sensing technologies to improve our understanding of factors that control freshwater survival of Sockeye salmon.

The project team led by ASL also included scientists from Fisheries and Oceans Canada, University of Victoria, and C-CORE. Historical archived environmental and satellite data were used in conjunction with in situ data to understand the present and historical water quality of Chilko Lake. Chilko Lake sockeye constitute one of the largest salmon stocks in the Pacific Northwest, for which Fisheries and Oceans Canada (DFO) has maintained a 55-year record, including partitioned freshwater and marine survival. The lake was also the site of fertilization experiments in the 1970s-1990s. ASL examined the use of spaceborne data from MERIS and LANDSAT satellites collected over Chilko Lake for the purpose of generating long time series of lake chlorophyll and water temperature, including testing and validating standard chlorophyll algorithms against in situ measurements. ASL also assessed the state of glaciers in the watershed using LANDSAT and RADARSAT data and performed comparisons of Sockeye survival with lake variables.

The end product of Lake View is a valuable collection of new spatial data products useful for a wide range of scientists and managers. The project also demonstrated the use of historical satellite time series data for limnology and salmon biology. The methods and data products developed during the project will continue to support ongoing research.

ASL presented this work at the recent symposium: IGARSS 2014 & 35th Canadian Symposium on Remote Sensing in Québec City, July 13-18. **(Link to paper)**
ASL carries out similar studies in marine and coastal waters for scientific research and as input to environmental assessment programs.
For more information please contact remotesensing@aslenv.com



Upcoming Conferences

Oceanology Int'l China	Sept 3-5
Oceans 2014, St John's Nfld.	Sept 14-19
BC-TRCR Prince George, Mine Reclamation Symposium	Sept 22-25
Canada-US Oil & Gas Forum, NWT	Nov 4-6
Yellowknife Geoscience Forum	Nov 25-27
ArcticNet Arctic Change, Ottawa	Dec 8-12
ATC 2015, Copenhagen	Mar 23-25

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