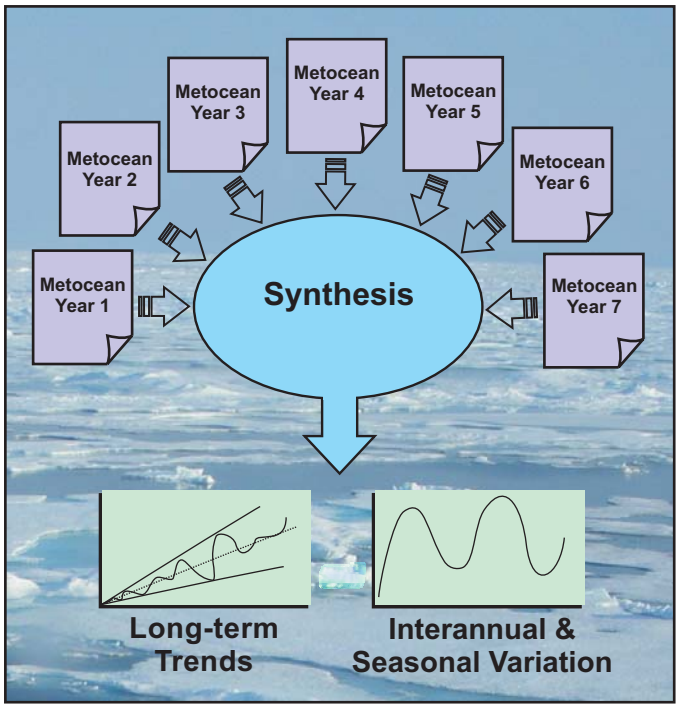
ASL Environmental Sciences

Solutions Newsletter

Spring 2013

Long-term metocean time series analysis for offshore oil & gas client

Long term trends and interannual and seasonal variation of environmental parameters is important to the design and operation of offshore structures and can only be derived by examining long time-series of several years. ASL has completed a synthesis analysis of seven years of measurements of ice draft, ice velocity, ocean currents, and ocean waves. Data was collected from 2005 to 2012 at two sites in Camden Bay in the Beaufort Sea, using Ice Profiler™/ADCP instruments deployed in 30m and 45m water depth. Data processing was supplemented with meteorological data from nearby stations and ice charts of the region. ASL engineered new MATLAB tools to study a large number of time-series datasets arising from multiple historical projects. These tools allow ASL data analysts to ensure data quality consistency, compute statistics on a variety of time scales, and visualize the analysis results.



Shallow Water Ice Profiler™ as part of undersea observatory in Arctic

Ocean Networks Canada, based at the University of Victoria, completed the installation of a cabled undersea observatory in Cambridge Bay, Nunavut, in September 2012. This is the first location in Canada's Arctic for year-round monitoring of the marine environment.

The observatory consists of an underwater instrument platform at 6.3 m water depth, connected by power and communications cables to a shore station on the wharf in the town of Cambridge Bay. The seafloor platform hosts instruments that measure CTD, O2, florescence, turbidity, and sound, take HD video images, and an ASL Shallow Water Ice Profiler (SWIP) measuring sea ice thickness. On the wharf are a weather station and video camera. All data and imagery are transmitted by satellite link to the NEPTUNE Canada data centre at University of Victoria. Data have been flowing over this link since early October 2012. ASL's SWIP is the first near real-time, continuous system in the Arctic specifically monitoring sea ice thickness.

This mini-observatory will operate in Cambridge Bay for 5 years. ONC will work with the research community to develop shore-based scientific programs that will take advantage of the continuous, year-round data stream from the undersea platforms. Equally important, this project also involves working with the local secondary school to enable students to discover marine science through access to live video, underwater sounds and data from the observatory.

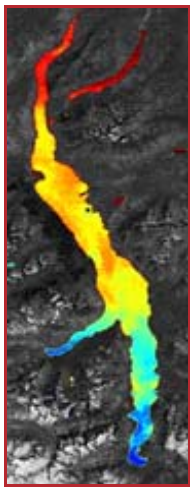
Link to the Arctic Observatory:
http://www.neptunecanada.ca/data-collaboration/

LakeView: Remote Sensing of BC Salmon Lakes


Photo credit: Dan Selbie

ASL is using satellite remote sensing to develop improved maps of water quality for some of the most remote salmon lakes in British Columbia, Canada. The LakeView project, funded by the Canadian Space Agency, aims to apply advanced remote sensing technology to improve our understanding of factors that control freshwater survival of Sockeye salmon.

Fraser River Sockeye salmon are a culturally and economically important species for all British Columbians, but returns have been declining steadily for nearly 3 decades. In 2010, 30 times more fish returned than in 2009, making that year's run one of the largest returns in the past 100 years. Neither the low nor the high return was predicted, and significant economic and other disruption ensued. This is not understood and it is impossible to collect biological samples for the past, but remote sensing data archives can be used to make some inferences.



ASL is leading a team of experts from Fisheries and Oceans Canada, University of Victoria, ASL and C-CORE. Historical archived environmental and satellite data in conjunction with in situ data are used to understand the present and historical water quality of Chilko Lake. Satellites with optical, infrared and radar sensors (i.e., ENVISAT-MERIS, LANDSAT and RADARSAT) are used to estimate chlorophyll concentration, surface temperature (see image), and the extent of lake ice and glaciers within the watershed. These products will be distributed to scientists and the public via the ASL/GRIP GeoPortal, a user friendly browser and online data analysis tool. The project includes a Case Study of the linkages between historical water quality as observed via satellite and metrics of freshwater survival of Chilko Lake Sockeye salmon.

The end product of LakeView will be a valuable collection of improved spatial data products useful for a wide range of scientists and managers. The project will also demonstrate the use of historical satellite Earth Observation time series data for limnology and salmon biology.

For more information, contact Dr. Eduardo Loos: eloos@aslenv.com

ASL's Super Computer for Numerical Modelling

ASL has recently developed super computing capabilities using MPICH (Message Passing Interface). This is a leading edge parallel processing system. The system has multiple nodes, each with multiple CPUs. It is being used to improve ASL's existing current, sediment transport, ice tracking, and plume models to work faster and in more detail. The system distributes large groups of calculations to a number of computers to generate results faster. It greatly reduces the run-time of our high resolution 3D circulation models.

Arctic Special Interest Group

ASL and Maritime Way Scientific have led in the creation of an Arctic Special Interest Group (SIG) within the Canadian Meteorological and Oceanographic Society (CMOS). The first meeting of the Arctic-SIG was held on Sunday May 26 in Saskatoon SK as part of the CMOS Joint Annual Congress. The meeting featured presentations from Canadian University speakers and from Canadian Government and International Climate modelers, as well as a talk by David Fissel of ASL on applied ocean-ice applications in the Arctic. The Arctic SIG is presently formulating a Work Plan for the coming year to focus on a few collaborative initiatives in which members of the Arctic SIG group can facilitate and contribute to.

Upcoming Conferences

CMOS 2013	Saskatoon	May 26-30
POAC 2013	Finland	Jun 9-13
CoastGIS	Victoria	Jun 19-21
ISOPE 2013	Alaska	Jun 30-Jul 5
CRIPE 2013	Edmonton	Jul 21-24
Cdn Symposium Remote Sensing	Victoria	Aug 26-29
38th CLRA & NLMRW	Whitehorse	Sept 9-12
Oceans 2013 /ADCPs in Action	San Diego	Sept 23-27
ECM13	San Diego	Nov 4-6
ATC 2014	Houston	Feb 10-12
Oceanology International 2014	UK	Mar 11-13

ASL Environmental Sciences

ASL Environmental Sciences Inc.
#1-6703 Rajpur Place, Victoria, BC, Canada V8M 1Z5
Phone: 1-250-656-0177 **Fax:** 1-250-656-2162 **Email:** asl@aslenv.com
www.aslenv.com