ASL Environmental Sciences

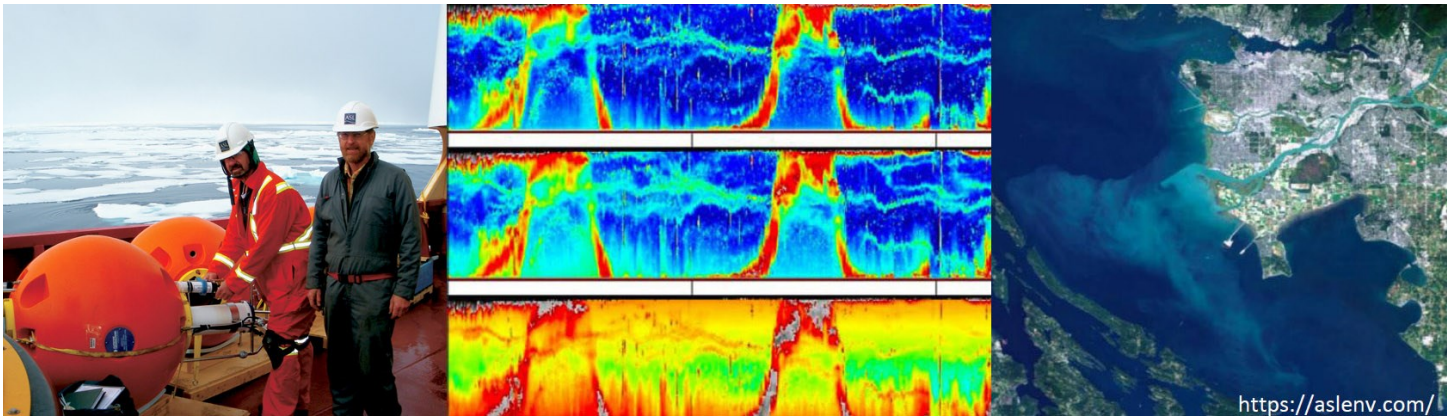
Newsletter
Spring 2023

Spring 2023 ASL Newsletter. This issue:

From Academia to Industry

ASL Environmental Sciences Inc. recently paid a visit to the Centre for Earth Observation Science (CEOS) at the University of Manitoba in Winnipeg, Manitoba where Dr. Matthew Asplin of ASL, also an alumnus of CEOS, gave a talk in the CEOS Seminar Series entitled "From Academia to Industry – How to Transition to a Successful Career in the Marine Sciences Consulting Sector Through Strategic Networking and Agile Business Development." Dr. Asplin outlined the variety of skillsets obtained during graduate studies, ranging from project management, proposal writing, fieldwork, and networking at conferences and linked them to skill sets that employers desire. Dynamic individuals with a breadth of adaptable skill sets are highly valuable to companies like ASL, and are in high demand to support Canada's blue economy.

Dr. Asplin also outlined his ongoing collaborations between ASL, Indigenous communities, and universities across Canada and the United States. Dr. Asplin recently was also appointed as an Adjunct Professor with the University of Victoria, Department of Geography. He will use this appointment to continue to pass knowledge to the younger generation through teaching, mentorship, and co-supervision of graduate students, as well as exploring research of mutual interest to ASL and its collaborators abroad.



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ASL Conducts Field Trials of Split-Beam Sonar Prototype

ASL Environmental Sciences is pleased to announce the successful field trials of a new prototype split-beam sonar. The trials were conducted in the Saanich Inlet near the Institute of Ocean Sciences (IOS), Sidney, BC. This milestone marks the first such deployment of the prototype instrument, as part of a collaboration between researchers at Memorial University, the Department of Fisheries and Oceans Canada (DFO), and ASL. The field testing was done from a small IOS launch with Dr. Stéphane Gauthier, Fisheries and Oceans research scientist; Dr. Len Zedel, Professor and Department Head of Physics and Physical Oceanography at Memorial University; and graduate student Axel Belgarde, also of Memorial University. ASL staff members Dr. Steve Pearce and Graeme Thompson participated in the study.

Split-beam echosounders use multiple receiver channels to determine target location within the acoustical beam. Unlike ordinary single-beam echosounders, split-beam echosounders may determine not only the range but also the direction of arrival of incoming signals. This facilitates accurate measurements of target strength. When detecting fish over multiple pings, a split-beam sonar may track the fish and estimate their swimming speed and direction.

ASL has extensive experience developing calibrated scientific hydroacoustic profilers. ASL instruments are known for their unmatched ability to collect long time series data, with typical deployments lasting 12 months. This new split-beam echosounder prototype is designed to run autonomously for months at a time, allowing researchers to collect long time series data at the study site. Many researchers find such tools useful when studying fish behavior throughout changing seasons, or when deploying in remote environments.

The field trial for this new design was carried out February 1, 2023 (Figure 1) and the results are promising. As part of the system testing, two small spheres were lowered and raised through the water column to a maximum depth of 220 m. The sample echogram of Figure 2 shows these spheres over one of the trial casts.

Figure 1. Dr. Len Zedel preparing to lower the target spheres (left). Dr. Stéphane Gauthier and Axel Belgarde on the bridge (right).

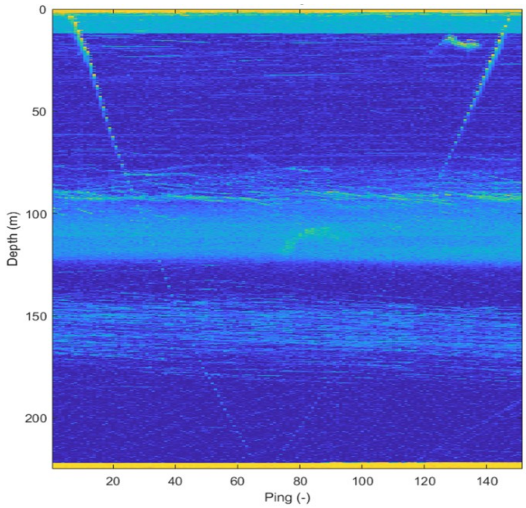

Figure 2. Echogram of target spheres being lowered and raised through the water column.

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Using WERA Ocean Radar for Surveillance Applications of Off-shore Infrastructure

The topic of surveillance of civil off-shore infrastructure is increasingly becoming a significant issue globally. In response to this, WERA has provided an upgrade to its High Frequency ocean radar system to monitor ship activities far behind the horizon. Several "WERA" ocean radar systems are located on the European coastline as well as the east and west Coasts of North America. The systems located at the German Bight, the Dutch North Sea coast, and the French and Italian Coasts are particularly well suited for this technical application of ship detection. The WERA ocean radar, represented in Canada by ASL Environmental Sciences, is classified as a "dual-use" system because it is suited for oceanographic applications as well as over-the-horizon ship detection and tracking. It can be used for the surveillance of very large areas of the coastal ocean to identify suspicious ship manoeuvres. This technology should be of interest to all countries with infrastructure on their coast. About 10 years ago, HELZEL developed a specific product for surveillance applications: the HELZEL OTHR. This OTHR system provides ship tracking for ranges of up to 200 nautical miles and is already in use in Asia and Africa. The main application is the surveillance of the exclusive economic zone (EEZ) to detect illegal fishing activities or other suspicious activities, e.g. smuggling or piracy and, of course, threats to off-shore infrastructure. To extend an existing ocean radar WERA for ship-tracking applications, the systems may need to be refurbished and extended to 16 receiver channels. For new installations, the OTHR systems are best suited for these surveillance applications. It is worth mentioning, that such a "military" OTHR system can be used for civil applications as well. These dual-use applications include wave measurement, tsunami detection and ocean current monitoring for environmental protection and search and rescue. Figure 1 shows the existing WERA system at Tofino, BC.

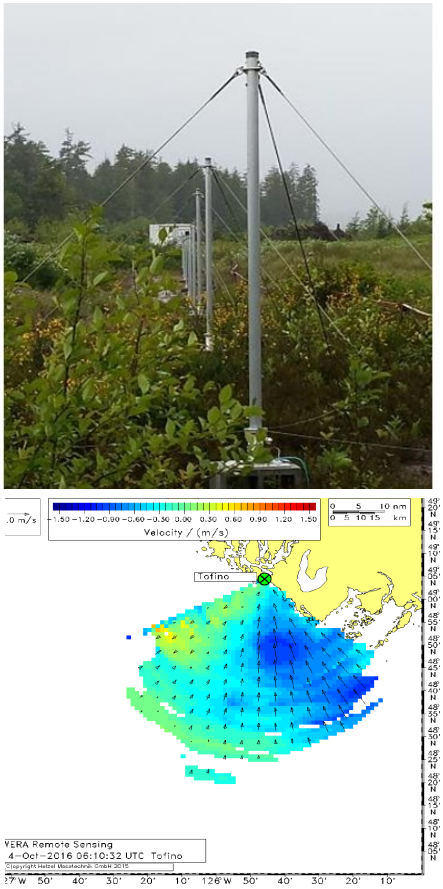

Figure 1. WERA Antenna Array near Tofino, Canada, the map shows the ocean currents monitored by the ocean radar system. Within this area it would be possible to track ships as well.

The data of the WERA system on Wangerooge, Germany are used to demonstrate this feature. Figure 2 shows ship tracks generated by this WERA system. The range is 70 km in this case.

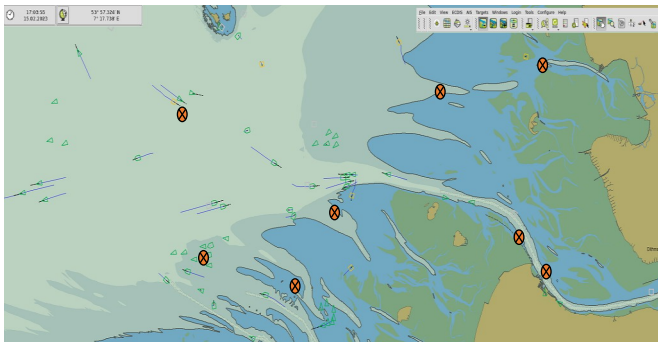

Figure 2. Map with ship tracks generated by WERA on Wangerooge Island. The green marked targets are identified by means of AIS. The orange marked targets don't have any identification or have turned off their AIS and thus these targets are visible on the radar monitor only. The multi-sensor tracker software, used in the analysis, was developed and provided for these tests by Innovative Navigation GmbH.

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Acoustic Scintillation Flow Meter Installed at Beaucaire Hydropower Plant, France

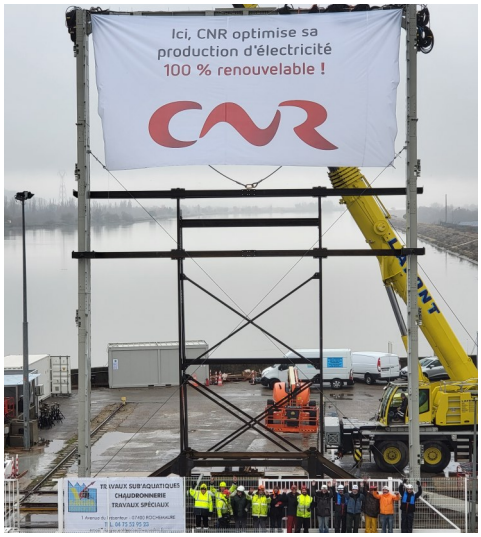

Figure 1. ASFM frame at the Beaucaire Hydropower Plant, Rhône River, France.

ASL AQFlow is pleased to announce that our Acoustic Scintillation Flow Meter (ASFM) is being used by the Compagnie Nationale du Rhône (CNR) to conduct flow measurements at the Beaucaire Hydropower Plant on the Rhône River in France as part of an electrical production optimization program. This site generates approximately 210 MW of hydroelectricity from six bulb turbines. Figure 1 shows the instrumented frame that is lowered into the hydroelectric plant intake to the turbine and is equipped with an ASFM array that measures flow across 30 paths. Prior to this installation, the ASFM was successfully deployed at the Châteauneuf-du-Rhône, Montélimar-Henri-Poincaré hydroelectric plant, another of CNR's facilities on the Rhône River. The quality of the data collected at this site was considered very high and results were repeatable with an average uncertainty of roughly 0.4%.

The scintillation technique measures the velocity of the water flowing through an intake by sending and receiving acoustic pulses that detect small-scale turbulences in the flow (Figure 2). If the spacing between transducers is sufficiently small, then the pattern of the variations of the embedded turbulence in the flow at the upstream transducer will be nearly identical to the pattern of the variations of the embedded turbulence at the downstream transducer with a measurable time delay. By measuring the highest correlation between these two signals over time, an average flow velocity can be determined by dividing the spacings of the transducers by the change in time at the point of highest correlation. As the ASFM uses an array of three closely spaced transmitter/receiver pairs, both flow magnitude and inclination can be resolved.

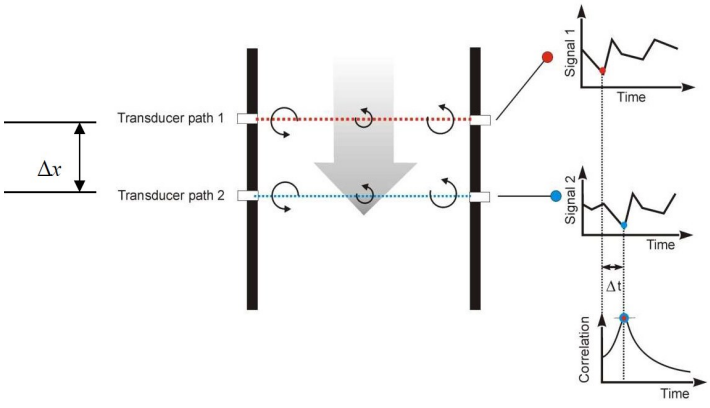

Figure 2. Schematic of the Acoustic Scintillation Flow Meter.

In January of 2022, the ASFM was included in an appendix to the American Society of Mechanical Engineers Performance Test Code under Hydraulic Turbines and Pump-Turbines (ASME PTC 18-2020). The ASFM is non-intrusive, has no moving parts and does not require intake or unit dewatering. It has been used in a variety of hydroelectric plants around the world and continues to offer real-time, accurate and cost-effective flow measurements.

For more details on the ASFM technology and a list of papers and installations, visit our website: www.aqflow.com

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Sofar Spotter Metocean Buoys for Real-time Oceanographic Data

ASL is pleased to announce the addition of the Sofar Spotter metocean buoy to its oceanographic equipment product sales lineup. This complements the already growing broad range of innovative equipment offered by the ASL–DASCO Equipment Inc. partnership.

The Sofar Spotter metocean buoy (Figure 1) provides real-time wave, wind, sea surface temperature and barometric pressure from a compact, solar powered, rugged designed buoy built to withstand the harshest conditions of the open ocean. With 24/7 satellite and cellular connectivity, real-time data can be collected from anywhere in the world and displayed via Sofar Spotter's dashboard and API. The buoy is affordable, compact and portable weighing only 7.45 kg and is about the size of a basketball.

In addition to offering these buoys for purchase, ASL currently has three units in our lease pool. We have had continuous successful deployments of Spotter buoys in the coastal waters off British Columbia for about a year.

The Sofar Spotter buoy has an optional Smart Mooring (Figure 2) that expands the platform to acquire up to three underwater sensors to collect data such as pressure for water levels and tides as well as water temperature. These data are passed to the Sofar Spotter buoy where they become accessible via the Sofar dashboard providing both real-time surface and subsurface data.

Figure 1. The Sofar Spotter is a compact, solar powered, rugged surface buoy with real-time capabilities that can transmit data from anywhere in the world.

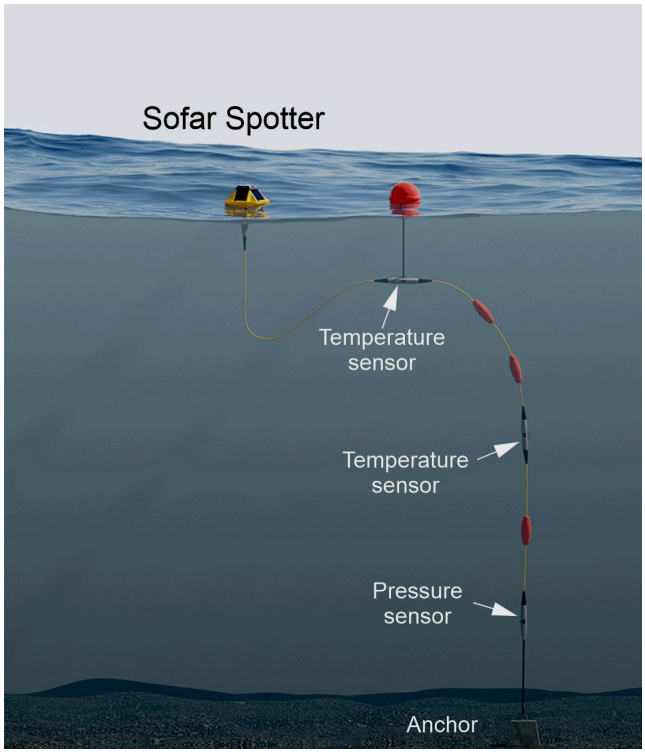

Figure 2. Sofar Spotter buoy showing optional Smart Mooring with underwater sensors.

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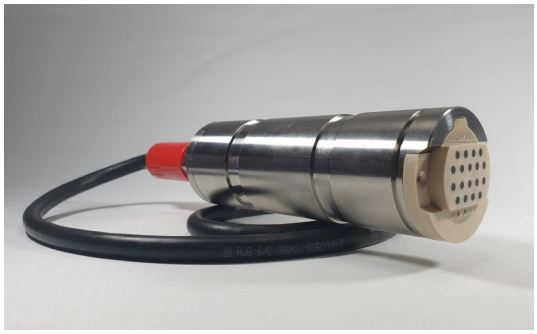
ASL is Now a Region Representative for ANB Sensors



ANB Sensors. Model OC300 rated to 300 m (top) and model OC1250 m rated to 1250 m (bottom).

ASL is pleased to announce that we have entered into a product sales agreement with ANB Sensors of Cambridge United Kingdom. ANB Sensors have developed a next generation **calibration-free**, solid-state, multi-parameter pH, conductivity and temperature sensor. Unlike other pH sensors that require frequent re-calibration, the ANB sensors uses a patented technology that automatically carries out in-situ calibrations throughout the deployment. These sensors can be deployed individually or integrated into underwater vehicles, sondes or monitoring platforms using the optional dedicated integration kit. There are four available options for operating at 5 m, 50 m, 300 m or 1250 m depths. They are suitable for both freshwater and saltwater environments and are designed to electrochemically inhibit the formation of biofilms. The specifications of the sensors are as follows.

Ph range: 2 – 10
Resolution: 0.01 pH
Accuracy: +/- 0.05 pH
Response: Instantaneous
Salinity: 0 – 40 ppt

Temperature Resolution: 0.1C
Operational Temperature: -5 to 40°C
Communications: RS232 / RS485 / USB
Power: 5 – 42 VDC
Power Consumption: 90 mA

For more information on these sensors or other products and services partnerships, please contact James Bartlett (jbartlett@aslenv.com).

ASL continues to add to its international ocean technology equipment and service partnerships. These include Teledyne Marine, DeepWater Buoyancy, Hemisphere, Trimble, Valeport, Sofar, ANB Sensors and WERA.

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ASL Job Postings - Oceanographer

ASL Environmental Sciences, Inc., is a world-class company with more than 40 years' experience in oceanographic, acoustic, remote sensing, and ice research services. We provide clients with scientific consulting services in flow measurement, numerical modeling, wave measurement and analysis, airborne and spaceborne optical and SAR remote sensing, sediment transport, acoustics, and ice studies. Based out of Victoria, British Columbia, Canada, ASL provides products and services to national and international clients from industry, government, and academic sectors. ASL owns an extensive pool of metocean equipment, and we also manufacture a line of underwater acoustic measurement instruments, such as the AZFP Acoustic Zooplankton & Fish Profiler.

ASL is an employee-owned company and presently employs 30 highly qualified scientific and engineering personnel. We have an immediate opening for an oceanographer.

Job Description:

The oceanographer position involves all aspects of solving client problems as part of a larger team. The ideal candidate will be self-driven and comfortable working independently as well as working in a team environment, with senior oceanographers, computer programmers, data analysts, technicians and others. An aptitude for analytical thinking in the oceanographic realm with strengths in computer programming, especially in Matlab, will be essential for the oceanographer position. Some of the key tasks in the daily activities of the oceanographer will include the following:

- Basic examination of oceanographic time-series for QA/QC purposes.
- Identifying any potential issues encountered in the measurements which need to be considered prior to starting the routine analyses.
- Running of existing programs using tools from ASL's Matlab library.
- Maintaining and extending our existing library to meet client needs.
- Writing up the methods used to analyze client data.
- Summarizing the results of the analysis in language that is clear for the client to understand.

Our software libraries include routines to process many types of oceanographic data, such as ADCP current-wave data, water properties (temperature, salinity, dissolved oxygen, etc.), and ice profiling sonar data. We are currently developing new methodologies to support our Acoustic Zooplankton Fish Profiler. Candidates who possess experience in interpreting acoustic backscatter and coding in Python, in addition to Matlab, will be of interest to support this growing part of our data analysis offerings.

The oceanographer position will primarily involve the processing and interpretation of oceanographic data; however, there will also be opportunities to be involved in field programs. The following skills will be useful to engage in these tasks:

- Experience operating common oceanographic equipment including ADCP's, CTD's, DO and Tu.
- Experience maintaining oceanographic equipment.
- Experience working at sea.
- Experience assembling, deploying/recovering/ and maintaining oceanographic moorings.

ASL is a federal government contractor. For this reason, the successful candidate is required to complete a background check to get reliability confirmation from Public Works Canada.

Please e-mail your application to HR-Oceanographer@aslenv.com with subject line: Oceanographer Position.

Compensation will be commensurate with skills and experience. ASL offers profit sharing and dividends on shares. We thank all those who apply to ASL, but only those candidates selected for an interview will be contacted. No phone calls please.

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ASL Job Postings - Oceanographic Technician

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ASL is employee-owned and presently employs 30 highly qualified scientific and engineering personnel. We have an immediate opening for an oceanographic technician.

Job Description:

The Oceanographic Technician position involves:

- Maintenance and operation of common oceanographic equipment including ADCP's, acoustic releases, CTD's, DO and Tu, including mobilization for field projects and leases, bench testing, and calibrations.
- Shipping and receiving equipment worldwide.
- Maintenance of the equipment database, WASP.
- Participation in boat-based field work.
- Processing of oceanographic data, such as ADCP, and CTD.

The ideal candidate will be self-driven and enjoy working independently, as well as with other members of the group. Applicants need to be detail oriented as small mistakes, such as in O-ring assembly, can result in expensive failures and loss of data. The ability to self-schedule and work to deadlines is important as often work comes up on short notice. Some electronics experience is advantageous for testing and troubleshooting equipment. Basic computer skills are needed and knowledge of MatLab would be helpful. Experience working at sea is welcome but not necessary, as long as the applicant is willing and able to participate in boat-based field work.

ASL is a federal government contractor. For this reason, the successful candidate is required to complete a background check to get reliability confirmation from Public Works Canada.

Please e-mail your application to HR_OceanTech@aslenv.com with subject line: Oceanographic Technician Position.

Compensation will be commensurate with skills and experience. ASL offers profit sharing and dividends on shares. We thank all those who apply, but only those candidates selected for an interview will be contacted. No phone calls please.

To view all current ASL job posting, visit our careers page by clicking on the link below.

https://www.aslenv.com/careers.html

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Equipment Leasing, New Equipment, Used Equipment Sale

ASL Environmental Sciences operates the largest private pool of metocean equipment in Canada, all of which are available for lease. Included are approximately 50 ADCPs, 30-odd acoustic releases, various CTDs, DO and Turbidity loggers, 40 temperature-loggers, sediment traps, and ponar grabs, as well as mooring flotation, cages, and bottom frames. We can also provide instruments plus mooring, ready to deploy. If you need assistance in the field, we do that too.

Can't wait several months for a new instrument? We can provide leased equipment within days, and we ship worldwide.

New Equipment

ASL has recently placed an order for a new **AML-6 multi-parameter CTD** to be available to the equipment pool this summer.

The AML-6-Lgr can hold up to 6 X2-Series sensors on the endcap. The X2 sensors can be swapped in the field and configured specific to the users needs. Initially we will have conductivity (salinity), temperature, turbidity, chlorophyll, and dissolved oxygen. The AML-6 is the logger version, primarily for profile/casts. It is self-powered via a rechargeable internal battery and has a mechanical on/off switch on the bulkhead. Data transfer is easy using either Wi-Fi, or USB.

Other recent additions to the lease pool include three **SOFAR Spotter buoys**, These are small easily deployed wave buoys with real time wave data available via Iridium satellite.

Used Equipment Sale

Are you on a limited budget, or just looking for deals? ASL is selling off various used metocean equipment on an as is, where is basis, including:

- Brooke Ocean Technology Botwing 970
- TRDI 600 kHz BroadBand ADCP, DVS6000
- FTS Weather Station
- ARGOS satellite beacons
- RBR CTD logger, T-loggers, Tide/pressure gauges
- Aluminum bottom frames

Visit the ASL website for more details (Click here). All reasonable offers will be considered.

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ASL Celebrates Our Carol Stewart as United Way Outstanding Employee Campaign Chair 2022

ASL employees have been making strong contributions to United Way year after year. And while this requires a team effort, it also requires a special person to organize and motivate all our staff to make donations in fun and interesting ways.

Our very own Carol Stewart was honoured with the United Way 2022 Outstanding Employee Campaign Chair (1–100 Employees) Award. We are very proud and congratulate Carol for her incredible efforts!

Conferences

Upcoming Conferences

Offshore Technology Conference OTC 2023
May 1–4, 2023
Houston, TX

Aquaculture Canada
May 7–11, 2023
Victoria, BC

Canadian Meteorological and Oceanographic Society (CMOS 2023)
May 28–June 1, 2023
St. John's Newfoundland

Coastal Zone Canada Conference 2023
June 11–15, 2023
Victoria, BC

44th Canadian Symposium on Remote Sensing
June 19–22, 2023
Yellowknife, NWT

Recent Past Conferences

Annual Meeting of Asian Fisheries Acoustics AFAS 2022
November 4–16, 2022
Busan, Korea

Marine Renewable Canada
November 22–24, 2022
Halifax, Nova Scotia

ArcticNet ASM 2022
December 6–9, 2022
Toronto, Ontario

Alaska Marine Science Symposium (AMSS 2023)
January 23–27, 2023
Anchorage, Alaska

ICES Fisheries and Plankton Acoustics Symposium
March 27–30, 2023
Portland, Maine

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