

# Environmental Sciences

# Equipment Leasing and Field Services

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We also have experienced personnel to support you in the field and with data processing as required. Our field technicians have over 50 years of combined experience, while our Field Services Manager has over 40 years' experience. This wealth of experience has enabled us to develop innovative solutions to past challenges that your project can benefit from.

Many of our clients are repeat customers and look to us first for their equipment and mooring requirements. In addition to equipment leasing, we provide comprehensive advice on equipment selection, rigging, etc. We regularly use a wide range of equipment for our projects and know these instruments well.

Reliable Rentals at Reasonable Rates. Check out our inventory at <u>www.aslenv.com/lease.html</u>.

#### ASL's Equipment Leasing and Field Services

ASL Environmental Sciences has the largest lease pool of metocean equipment in Canada. We offer ADCPs (75kHz to 2 MHz), CTDs, acoustic releases, acoustic profilers including the ASL Ice Profiling Sonar (IPS) and the ASL Acoustic Zooplankton Fish Profiler (AZFP), wave and tide gauges, pingers and transponders, mooring cages and frames, flotation, drogued drifters, sediment grab samplers, and water guality profilers (Dissolved loggers and Oxygen, Turbidity, Chlorophyll, pH). You can depend on us to help you choose the best instruments for your application and advise you on how to deploy them effectively. We are proud of our ongoing commitment to quality field performance, prompt delivery, and dedicated oceanographers and technicians on staff.







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#### **Client Endorsements**

Here's what some of our clients are saying about ASL.

"We appreciate all the help that Rick and the ASL team have provided over the years. Their support has been incredibly helpful and knowledgeable, offering well-maintained and reliable equipment to help our projects run smoothly. We have never encountered any issues with the equipment, allowing us to consistently collect sound scientific data. Thank you for your help and support. We look forward to continuing to work with ASL in the future!"

Alexis Marti, M.Sc. Aquatic and Marine Biologist, ERM Consultants Canada Ltd.

"ASL was instrumental in the success of our current measurement campaign. They provided timely, efficient, and friendly support with regards to instrument selection, leasing, shipping, and technical advice while in the field. Thank you very much for everything!" Thank you truly!

Victoria Venturini, Coastal Lead, North America, HATCH

"ASL rented CSR an ADCP and acoustic release for a current monitoring project in the fall of 2024. The equipment was well maintained and worked without issue during a 30-day bottom deployment and hull mounted transects. The support we received from Rick and his team was excellent. ASL provided prompt technical support when needed and was keen to ensure the success of our project."

Colin Toole - CSR GeoSurveys Ltd.

"As a company that provides equipment leasing, ASL Environmental stood out from the beginning with their efficient communication and specific expertise. Regardless of where we were at in the busy field season, they offered quick, thoughtful responses and guidance. Their input helped us select the appropriate ADCP for our project and allowed us to collect accurate data with ease, all while saving us from having to make a large investment in equipment we may only need for a couple field seasons. I'd happily recommend ASL to anyone considering leasing any equipment they have to offer."

Ryan Gardener, MSc, Aquatic Biologist, Ktunaxa Nation Council

"I had the opportunity to test an ASL multi-frequency Acoustic Zooplankton Fish Profiler (AZFP) in a freshwater lake to examine the diurnal migration of a cyanobacteria bloom. This novel approach was successful at detecting the movement of the species Aphanizomenon flos-aquae, a key species that impacts large fluctuations of dissolved oxygen and has the potential to create lake-wide hypoxia and fish kills."

Rob Bowen, Principal, Diversified Scientific Solutions





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#### Acoustic Zooplankton Fish Profiler (AZFP)

The lease pool now includes several four-frequency 67.5-125-200-455 kHz AZFPs. The AZFP can monitor the presence and abundance of zooplankton and fish within the water column by measuring acoustic backscatter returns at multiple ultrasonic frequencies. Other sonar targets realized from the acoustic backscatter data may include bubbles, jellyfish, and suspended sediments. The multi-frequency data can help with the classification of fish species.

#### **AZFP** Nano

ASL recently introduced the Acoustic Zooplankton Fish Profiler (AZFP)-nano to its family of advanced acoustic instruments for aquatic environments. This compact, lightweight, single frequency scientific echosounder is a miniaturized version of the AZFP and is well-suited for applications in challenging environments where size and weight are important considerations. This advanced profiler was developed to measure a wide range of physical and biological parameters within the water column including zooplankton, fish, algae, bubbles and suspended sediments. The AZFP-nano has useful applications for fisheries sciences, oceanography and environmental monitoring and due to its compact design, the AZFP-nano can easily fit on AUVs, CTD rosette samplers, and other instrument packages.

The Nano uses common D-sized batteries with enough power for multi-week deployments. The instrument comes factory calibrated with a 200 kHz transducer with other frequency transducers soon to be added. In the summer of 2024, the AZFP-nano was part of an international climate research expedition off the southeast coast of Greenland where it was used to collect a combined 14 kilometers of water column data in a study focused on glacial-ocean interactions.

ASL is working with SOFAR Ocean and the Bristlemouth initiative to provide researchers with a compact system delivering acoustic backscatter data in near real-time via cellular or iridium communication. Using a Bristlemouth hardware interface, acoustic data acquired from the AZFP-nano and other oceanographic instruments can now be viewed and downloaded remotely, bringing acoustic data from the field directly to the researcher.



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#### ANB pH Logger

ASL is a sales representative for ANB Sensors of Cambridge, UK. ANB has developed a next-generation solid-state pH sensor. Unlike other pH sensors that require frequent calibration, the ANB pH sensor uses a patented technology that automatically performs in-situ reference checks throughout the deployment. Power can be supplied from any sensing platform, or the sensors can be equipped with a Li-lon rechargeable battery unit and will log data to internal memory for periods up to a year.



(•)) ANB Sensors

The specifications of the ANB sensors are as follows.

| <b>Ph range:</b> 2 – 10      | Temperature Resolution: 0.1C               |
|------------------------------|--------------------------------------------|
| Resolution: 0.01 pH          | <b>Operational Temperature:</b> -5 to 40°C |
| <b>Accuracy:</b> +/- 0.05 pH | Communications: RS232 / RS485 / USB        |
| Response: Instantaneous      | Power: 5 – 42 VDC/ Li-lon battery          |
| <b>Salinity:</b> 0 – 40 ppt  | Power Consumption: 90 mA                   |
|                              |                                            |

ASL, in collaboration with the Nunatsiavut Government, is conducting a multi -year oceanographic study near Nain, Labrador, using subsea moorings with advanced instruments including ASL's Ice Profiling Sonar (IPS), an ADCP, and sensors for chlorophyll, turbidity, temperature, salinity, and dissolved oxygen. A recent key addition is the ANB 0C300 pH sensor, offering calibration-free monitoring of marine pH.

#### AML-6 CTD with Temperature, Salinity, Turbidity, Dissolved Oxygen, Chl A+B

ASL recently added an AML-6 multi-parameter CTD to the equipment lease pool. The AML-6-Lgr can hold up to six X2-Series sensors on the endcap. The X2 sensors can be swapped in the field and configured specifically to the user's needs. At present, the CTD has conductivity (salinity), temperature, turbidity, chlorophyll, and dissolved oxygen, and other sensors can be added as needed. The AML-6 is the logger version, primarily for profile/casts. It is 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.





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#### **Mesemar Buoys**

ASL recently acquired three Mesemar PBM-15, 1.5 m diameter. Polyethylene buoys. They are made from high-quality rotomolded polyethylene, filled with closed cell expanded polyurethane foam and are capable of withstanding extreme conditions often encountered at deepwater sites. They are typically fitted with directional wave instrumentation but other sensors can be added. These buoys expand our existing shallow water wave monitoring services to include deep water. Additional information on these buoys can be found at



https://cdn.mesemar.com/wp-content/uploads/PBM-15-25\_Polyethylene-Buoys.pdf

#### Sofar Spotter Buoys

ASL's lease pool includes several Sofar Spotter wave buoys. The Sofar Spotter buoy provides real-time wave, wind, sea surface temperature and barometric pressure from a compact, solar powered, ruggedly 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 7.5 kg and is about the size of a basketball. We have had continuous deployments of Spotter buoys in the coastal waters off British Columbia for about a year and more recently they are being used in Newfoundland.





The Sofar Spotter buoy has an optional Smart Mooring that enables the platform to acquire data from up to three underwater sensors such as temperature, pressure and turbidity. 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. ASL has recently interfaced the AZFP-nano to the Spotter Smart Mooring.





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### **Custom Moorings and System Integration**

ASL oceanographers have extensive experience in the design of metocean moorings. We know what the threats are to a successful deployment: corrosion, abrasion, entanglement and load/depth rating failures. ASL uses numerical modelling software to help account for current drag and buoyancy, and to calculate the load on each component as well as anchor weight requirements. Mooring components should all be load rated and capable of handling the mooring loads expected, including shock loading. Moorings deployed in strong tidal flows need to be low-drag to limit depression. Alternately, we use bottom frames to provide a stable platform that can also withstand fishing activity, debris and high suspended/mobile sediment.

Deepwater moorings must be rated for extreme depths, and buoyancy is generally provided with syntactic foam or glass sphere flotation. Taut line moorings can be thousands of meters long and require special vessel deck gear and positioning capabilities.

Working in rivers and lakes can present different challenges, such as high river flows and limited accessibility to remote areas. Clear water can drastically reduce the range of the Acoustic Doppler Current Profilers often used for flow measurement, and extremely low current speeds in many lakes can require custom sampling configurations.

Recovery can be even more challenging. ASL recently achieved a 100 % recovery rate over a three-year project in the harsh conditions of Cook Inlet, Alaska. Our moorings often have backup recovery/relocation features.





Whether you are doing CTD, water quality or ADCP transect work, or wish to deploy taut-line moorings or bottom frames, ASL has the knowledge and experience to help you. We made some mistakes early on (yes, we deployed a bottom frame or two upside down) and you don't have to. We helped develop and now use "tilt-pingers" to monitor the frame orientation during deployment.

We can supply you with a custom mooring that meets your requirements and is designed according to your instrumentation and measurement needs and the oceanographic conditions expected.



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# **Custom Moorings and System Integration**

One of our clients requested a lightweight bottom frame for deployment from a small inflatable boat in an area only accessible by helicopter. We designed and built a small plastic frame that could be easily assembled on site. It housed an Ice Profiling Sonar (IPS) and a SeaBird CTD logger.





Another unusual request was for a deepwater acoustic releaseactivated pop-up recovery system. This included three barrels of rope and lots of zap straps. The client reported that it performed as planned.







Of course, we can also provide more traditional taut-line moorings, bottom frames, and surface buoys. Either lease or custom built. Give us a call to discuss your needs.

# **Did You Know?**

- We recommend you do not rely on the delayed start feature of most instruments. Start the instrument up before deployment and confirm it is running (an AM radio can often be used to help confirm operation). This reassurance is well worth trading off a few days of battery power.
- The backup ring on an O-ring seal should be on the inner, low pressure, side of the O-ring. It helps the O-ring resist deformation and extrusion.



ADCP battery packs can be the largest contributor to magnetic effect on the instrument compass. ASL tests all manufacturers battery packs for their magnetic signature. Anomalous battery packs are degaussed and re-tested. This is particularly important at higher latitudes where the horizontal component of the earth's magnetic field is weaker.



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