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**Current and Wave Measurements for MOWI Canada East**

ASL is helping MOWI Canada East with current and wave measurements to support their fin fish aquaculture operations in southern Newfoundland. The current measurements are used as input to a deposition model as well as for engineering design of pens and anchoring systems. The wave data are also used for engineering. The current data is collected using subsurface moorings with doppler current profilers, while the wave data is obtained in real-time using SOFAR Spotter buoys. Measurements at each site typically last three months. Water quality data is collected using CTDs.



Deployment of current meter mooring at a prospective aquaculture site.



SOFAR Spotter wave buoy deployment.



## ASL's Dr. Matthew Asplin Joins the Marine Renewables Canada Board of Directors

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ASL Environmental Sciences Inc. congratulates its own Dr. Matthew Asplin on his recent election to the Marine Renewables Canada Board of Directors to a three-year term (2023-2026). We also wish to extend our sincere congratulations to the other newly elected members and wish them all the best in working together to push Marine Renewable Energy projects forward in Canada!

*"I bring my professional, technical, academic, and strategic knowledge to the Marine Renewables Canada board of directors with a cross-generational perspective. As a "Xennial" working in both senior management and academic roles, I feel strongly connected to older and younger generations alike, and I hope to leverage my extensive interdisciplinary field-based research experience in the Arctic, to provide perspective on extreme environments found in Canada's coastal areas."*

--Dr. Matthew Asplin



Marine Renewables Canada is the national association for tidal, offshore wind, wave and river current energy, representing a membership of technology and project developers, suppliers, utilities, Indigenous organizations, researchers, and communities. Marine Renewables Canada's mission is "to champion Canada's growing marine renewable energy sector through advocacy, engagement, and education and expand market opportunities across the country and globally."

Learn more about Marine Renewables Canada here: <https://marinerenewables.ca/>



For those that are members of Marine Renewables Canada, consider joining in on a members roundtable discussion taking place in British Columbia, Newfoundland and Labrador and Nova Scotia. See details for these events [here](#).



ASL Environmental Sciences  
#1-6703 Rajpur Place  
Saanichton, BC  
V8M1Z5 Canada

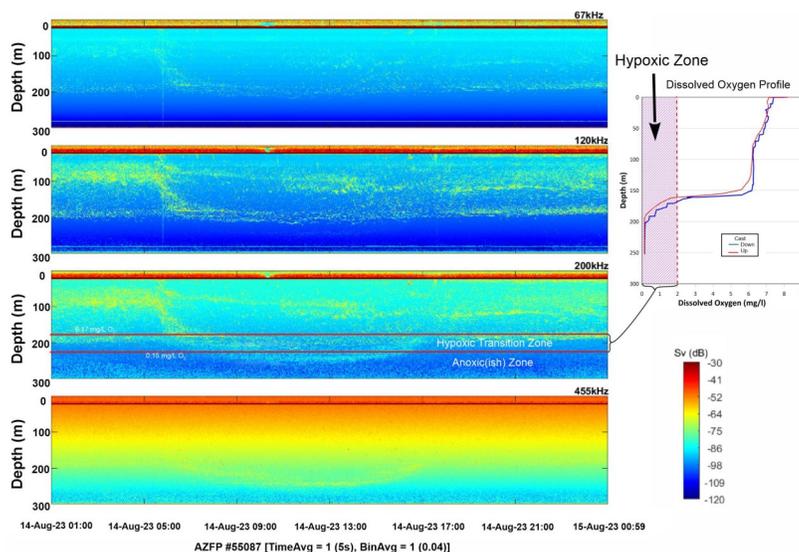
Phone: +1 250 656-0177  
Email: [asl@aslenv.com](mailto:asl@aslenv.com)  
Website: [aslenv.com](http://aslenv.com)



## Acoustic Zooplankton Fish Profiler (AZFP) Used to Monitor Diving Insects in Lake Malawi, East Africa

Dr. Philip Matthews, Associate Professor in the Department of Zoology at the University of British Columbia and winner of the 2023 annual Acoustic Zooplankton Fish Profiler (AZFP) award, and Dr. Maxon Ngochera, Chief Fisheries Research Officer, Malawi, have now completed their field work. This work centered on examining the unmatched diel migration of the aquatic larvae of the *Chaoborus edulis*, a midge fly that is abundant in Lake Malawi, East Africa. For more details on his winning proposal see this link here: (<https://aslenv.com/assets/files/Press-release-Philip-Matthews-AZFP-contest-winner-2022.pdf>).

The goal of this research was to use ASL's multifrequency AZFP to better understand the physiology and ecology of *Chaoborus edulis* larvae, the deepest free-diving insects in the world. The AZFP revealed that these aquatic midge larvae dive 200 m into the hypoxic zone of the lake during the day to avoid fish predation. Fish avoid this zone as the concentration of oxygen drops to values below their tolerance for survival ( $\leq 2.0$  mg/l). Dr. Matthews and his team were instrumental in discovering how this organism regulates its buoyancy to achieve vertical ballasting over such a large range. Coupled with the AZFP mooring were a series of water quality monitoring instruments that measured dissolved oxygen (DO), pH, and oxygen reduction potential. Figure 1 shows echograms of the vertical migration of the *Chaoborus edulis* along with a DO profile illustrating the hypoxic and anoxic zones on the 200 kHz panel. Note the steep dive of this species at about 6 am as they move deeper into the water column to avoid predator fish. Figure 2 depicts the emergence of the adult phase of the midge fly as they rise out of the water to form dense clouds.



**Figure 1.** AZFP echograms showing the diel vertical migration of the *Chaoborus edulis* and the depth of the hypoxic zone.



**Figure 2.** Emergence of the adult *Chaoborus edulis* forming dense clouds above the lake.

## ASL Team Members Invited to Support UBC's PRODIGY Program

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Launched September 1<sup>st</sup>, 2021, the University of British Columbia Pacific Rim Ocean Data Mobilization and Technology (PRODIGY) program hosts graduate students and post-doctoral fellows to bridge the fields of oceanography, geophysics, computer science and statistics. Through this program, participants are training in deployment and testing of ocean sensors, data analysis, forecasting, and working with decision makers and policy stakeholders.

ASL's Matthew Asplin, PhD was invited to sit on the program's advisory committee to help connect students with co-op work opportunities across B.C. marine industries. Matthew's experience as an educator and metocean researcher gives him a unique perspective on the value of such programs.

"As a 'Xennial' in senior management, governance board, and academic roles, I feel equally connected to older and younger generations alike. I want to bridge academic training with industry opportunities that lead to exciting and fulfilling careers in Canada's rapidly evolving blue economy." – Matthew Asplin, PhD., ASL's Director, Metocean and Arctic Strategic Partnerships.

ASL's Biological Oceanographer, Julek Chawarski, PhD, has also been invited to teach students about acoustical oceanography and autonomous monitoring of fish and plankton. Through his work, which is based at Bamfield Marine Science Centre, Julek has access to an ocean playground boasting biodiverse and dynamic ecosystem of migratory fish, invertebrates, and marine mammals. During their week long visit to BMSC in April, students will learn about instrumentation and learn applied skills in deployment, recovery, data processing, and advanced analytical techniques.

"These training programs are so vital to the long-term understanding of our oceans. We need bright leaders to lead innovation in instrumentation and analytics to keep pace with the massive data generation in recent and coming decades" – Julek Chawarski, PhD. ASL's Biological Oceanographer.

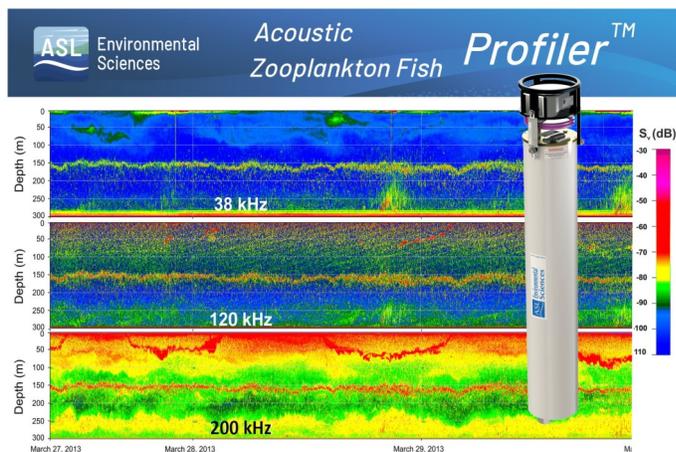
The PRODIGY program will visit Bamfield in early May for a week long intensive course where students will have the opportunity to deploy one of ASL's Acoustic Zooplankton Fish Profilers and learn some of the fundamentals of acoustic data processing.

## ASL Developing Real-time Data Transfer Capabilities for Coastal Monitoring

ASL has joined the developer community at Bristlemouth, an initiative aimed at democratizing marine data access and connectivity through a full-stack physical connectivity standard. The Bristlemouth open standard is a new design of a two-wire connector that is akin to an ocean USB. This connector, which is designed to withstand rugged deep ocean and coastal environments, enables high power and low latency data transfer among cabled underwater instruments. As members of the Bristlemouth Pioneer program, we are working on integrating our AZFP with SOFAR's spotter buoy, enabling real-time data transfer from a single-frequency echosounder over cellular/iridium networks.

*"Traditionally, hydroacoustic instruments have been treated as power and data hungry, often dismissed for applications in real-time data logging. Our new approach, which leverages customized data condensing protocols and expanding data transfer capacities over cellular, will make acoustic data available for real-time monitoring and decision-making"* - says Julek Chawarski, PhD, ASL's Biological Oceanographer.

Importantly, the plug-and-play nature of this connector will allow simple integration of the AZFP with other important oceanographic sensors for a more holistic picture of the marine environment. Hosting our data on a flexible web portal will enable the application of real-time analytics including statistical measures of backscatter and newly developed deep-learning tools for the detection of anomalies, targets, and boundaries. We view this advancement as a critical step toward increased data access and broader integration of acoustic data in marine monitoring and decision making.



## ASL's Latest Metrocean Surface Buoy Solution

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ASL is pleased to announce that it has recently acquired three Mesemar PBM-15 Polyethylene buoys for a major metrocean study we are undertaking for a client project. These buoys are designed to the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) recommendations and are made from high-quality rotomoulded virgin polyethylene, filled with closed-cell expanded polyurethane foam. These are very suitable for deep-water sites where extreme weather requires a more robust buoy for metrocean data collection. They feature the ability to add an internal ballast weight for greater stability and high shock resistance.

Following their successful recovery in the spring of 2024, we plan to add these to our lease pool to offer to future clients, especially for measuring directional waves in offshore environments to support the development of offshore wind farms and other marine renewable energy projects where stable, reliable data collection over extended periods is required.

The PBM-15 provides a robust platform suited to harsh conditions offshore or a stable platform in more protected waterways. This platform can easily be configured to meet client monitoring needs and client-customized instrument packages. These buoys are intended to expand our existing shallow-water wave monitoring services to include deep-water directional wave studies for site assessment, numerical modeling studies, engineering design criteria and extremal analysis, and other applications. Examples of data collection include, but are not limited to, directional waves, wind, barometric pressure, and custom solutions. *More information on these buoys is available here:* [https://cdn.mesemar.com/wp-content/uploads/PBM-15-25\\_Polyethylene-Buoys.pdf](https://cdn.mesemar.com/wp-content/uploads/PBM-15-25_Polyethylene-Buoys.pdf)



**Figure 1.** Mesemar PBM-15 Polyethylene buoy in red.



**Figure 2.** ASL has received three yellow buoys (the standard cautionary buoy colour) and are instrumented with a yellow flashing light to conform to the standards and guidelines in the Canadian Aids to Navigation System (TP 968).

## ASL Hires Matus Hodul for the Position of Remote Sensing Scientist



ASL is pleased to announce the appointment of Matus Hodul to the position of Remote Sensing Scientist as part of our remote sensing team. Prior to joining ASL, Matus attended the University of Ottawa, where he developed automated methods for the detection of North Atlantic right whales using satellite imagery while working towards his doctorate degree. As part of a team working on Canada's smartWhales initiative, Matus published the first ever example of an individual animal being identified using satellite imagery: the right whale "Ruffian", whose distinct markings could be seen from space. Before that, Matus worked with the Canadian Hydrographic Service to map navigational hazards in Arctic waterways. He also brings experience in the acquisition and use of UAV and aerial photography.

Matus's research interests center around the application of high- and moderate-resolution optical satellite imagery to map a wide variety of environmental variables, as well as to detect and monitor objects of interest, especially in marine environments. As part of the ASL team, Matus will participate in research and development of earth observation methods for a variety of projects and clients. He will develop and apply automated tools for image processing, classification, target and anomaly detection, change detection, and time-series analysis. He is excited to be part of the team.

## Careers in Meteorology and Oceanography – Virtual Panel Discussion

**CMOS Virtual Career Panel**

The CMOS Student Committee is holding an open discussion on careers in meteorology and oceanography on **Thursday, March 14th from 1-2 pm ET**, we hope to see you there!

Go to the link below or scan the QR code to Join: <https://bit.ly/3wrhez2>



**Shannon Nudds**  
Shannon is the vice-president of CMOS and works for DFO at the Bedford Institute of Oceanography where she is a project coordinator for the Barrow Strait Monitoring Program.

**Dr. Matthew Asplin**  
Dr. Matthew Asplin is Director, Metrocean and Arctic Strategic Partnerships at ASL Environmental Sciences Inc. in Victoria, B.C. where he handles marketing for consulting services, business development, and senior management duties. Matthew is also the Chair of the Vancouver Island CMOS Center.

**Dominique Paquin**  
Dominique works for Ouranos, a consortium on regional climatology and adaptation to climate change. She contributed to the development of the Canadian Regional Climate Model (CRCM) and studied the impacts of climate change on numerous phenomena such as freezing rain or snowstorms.

**Nikolay Damyanov**  
Nikolay has spent 12 years working for WSP, becoming a lead in 2017 and the Weather Operations Manager in 2020, overseeing a team of approximately 20 operational meteorologists.

If you have any questions let us know:  
[students@cmos.ca](mailto:students@cmos.ca)

ASL recently participated in the CMOS Virtual Career Panel held on March 14th. Discussions centered on opportunities for those seeking career paths in meteorology and oceanography. The panel was comprised of several professionals in these fields who shared their experiences in government and private sector.



ASL Environmental Sciences  
#1-6703 Rajpur Place  
Saanichton, BC  
V8M1Z5 Canada

Phone: +1 250 656-0177  
Email: [asl@aslenv.com](mailto:asl@aslenv.com)  
Website: [aslenv.com](http://aslenv.com)



## Conferences

### Upcoming Conferences

#### [Working Group on Fisheries Acoustics Science and Technology](#)

(WGFASST 2024)  
April 9-12, 2024  
Brest, France

#### [Offshore Technology Conference](#)

(OTC 2024)  
May 6-9  
Houston, Texas

#### [Canadian Meteorological and Oceanographic Society](#)

(CMOS 2024)  
June 3-6, 2024  
Virtual

### Recent Conferences

#### [Advanced Sar workshop for Remote Sensing Radar](#)

November 27-30, 2023  
Canadian Space Agency Headquarters,  
Longueuil, Quebec

#### [Marine Renewables Canada](#)

December 4-6  
Ottawa, ON

#### [Alaska Marine Science Symposium 2024](#)

January 29-February 2, 2024  
Anchorage, Alaska

#### [9th World Fisheries Congress](#)

March 3-9, 2024  
Seattle, Washington

