

THE CURRENT

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Newsletter of the Society of Canadian Limnologists

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Right: Diluted bitumen forms a slick on the surface of a contained mesocosm in a burned and controlled area at the IISD-ELA. Photo credit: IISD-ELA

Message from the president

Jérôme Marty, President



In a few weeks, my mandate as President of the SCL will come to an end, and I am feeling generally optimistic as I write my last contribution to the newsletter. The science landscape in Canada has changed remarkably over the last three years with a new government that seeks to restore the role and value of science as a source of evidence supporting policy and decision making. Within the federal

government, scientists are able to once again speak publicly about their research. For freshwater sciences, the efforts to preserve ELA organized by the several organizations, including the SCL, contributed to the successful transfer of ELA to IISD. At a larger scale, consultation on the state of science in Canada resulted in the release of the Naylor report, which calls for investment in fundamental science to support (and retain) innovation in Canada. A few weeks ago, Dr. Mona

Nemer was nominated Chief Scientist for Canada, a position that will play a critical role in promoting science based decision making.

This is all good news, but the on the ground reality for freshwater scientists is slow to change. Funding via the Research Councils remained unchanged in the 2017 budget. It is my impression that Canada is not headed in the right direction when recognizing the importance of water, although, the public faces an increasing number of water-related issues in their daily lives, from cultural eutrophication to flooding. This fall, water levels in Eastern Canada are at spring peak levels, while western Canada is recovering from a major drought. I recently learned that the total number of hydrometric stations in Canada is similar to that of Belgium. Given the size of our country, our ability to predict large scales changes in the future remains limited. Canada's freshwater deserves a vision or a strategy to help defining priorities, a message that is being shared by many organizations. Good governance and policy include good science and the renewed interest in evidence-base decision making is now a great

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opportunity for members of SCL to contribute to this important dialogue.

As President of the SCL, I had the great pleasure to meet many limnologists over the last 3 years, announcing awards to students and outstanding researchers (congratulations this year to Matthew Guzzo and Tony Ricciardi for the 2018 Peters and Rigler Awards). I promoted the SCL in the media and participated in various discussions on water priorities and governance as president. We are now finalizing the

incorporation process for the Society, with a re-draft of the by-laws to be considered at our next meeting in Edmonton. At this meeting, we will also need to renew the Executive with a new President, new VPs and Student members. We look forward to nominating our colleagues during this renewal phase, and we look forward to seeing some new faces from our membership getting involved in SCL.

Cheers,
Jérôme Marty ☺

The SCL wants YOU!

Mike Rennie

The SCL Executive will be recruiting from the membership for a number of positions on our executive. Terms are currently three years. Members who are interested in nominating themselves or someone else from the membership can contact anyone on the executive, or e-mail us (comms@socanlimol.ca).

The positions we are recruiting for are as follows:

- President
- Vice-president anglophone*
- Vice-president francophone*

(*According to the current by-laws, nominations for the presidency of the society in the next term will come from one of the two Vice-Presidents unless either VP is unable to be nominated; this process may change with the revision of the bylaws currently underway).

- Student representative, anglophone
- Student representative, francophone

We look forward to receiving your nominations! ☺



Uncle Secchi wants YOU to join the SCL Executive!!! Send your nominations to comms@socanlimol.ca!

2018 SIL Student Competition Update

Josh Thienpont

The second International Society of Limnology (SIL) Student Competition, which began over the summer, has proceeded to the second phase. The Canadian applicants for the award, of which we are allowed two based on the number of Canadian SIL members, are Matt Guzzo, for his 2018 Peters Award winning article (read more on that in this edition of the Current), and Clay Prater for the 2017 publication he lead entitled “Interactive effects of genotype and food quality on consumer growth rate and elemental content. Ecology 98: 1399–1408.”

In total SIL received 40 applications from 22 countries; a strong indication of the healthy state of global limnological research by students and early career scientists! The competition now shifts to the international phase, from which the winner will be invited to present a plenary lecture at the [2018 SIL Congress in Nanjing, China, occurring from August 19-24, 2018](#). The winner will be announced in the spring. Good luck to Matt and Clay from SCL! ☺

Research Highlight Exploring What Oil Spills Do To Freshwater

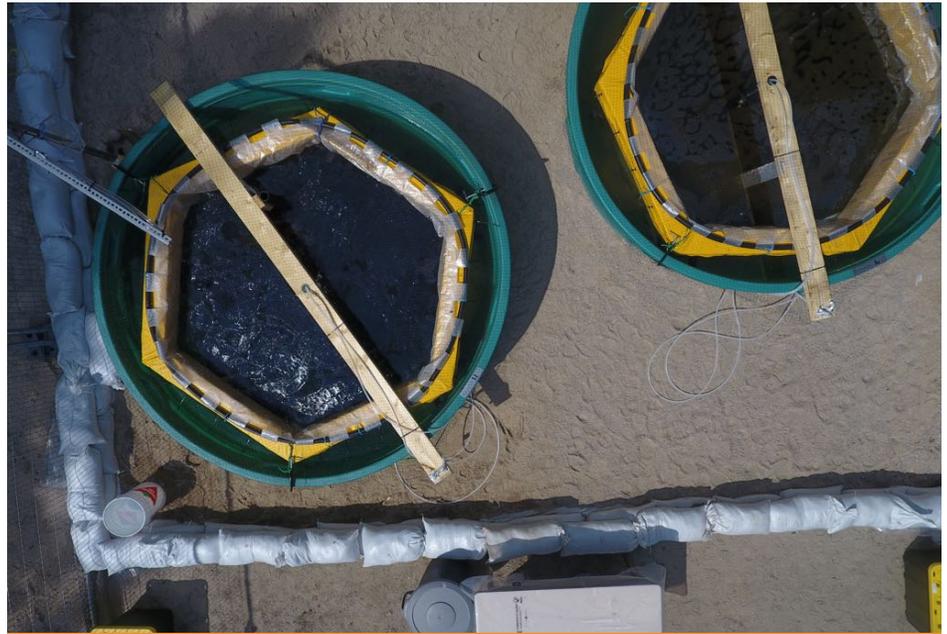
Vince Palace, Head Research Scientist

IISD-Experimental Lakes Area

North America has the largest network of energy pipelines in the world, and unfortunately periodic oil spills from pipelines do occur. Even so, you may be surprised to learn that we actually know very little about what happens to fresh water systems when an oil spill occurs. Moreover, we know very little about how best to clean those oil spills up. That's why IISD Experimental Lakes Area is planning a large project, in three stages, to answer those very questions.

There are many types of oil and, by volume, one of the largest types of oil transported in North America is bitumen, which is extracted from the Alberta Oil Sands. Bitumen is too thick to be transported in pipelines and so it is diluted with other lighter oils so that it flows more easily. The diluted bitumen is called 'dilbit'. It is the form of oil transported through many pipelines in North America and the primary form of oil that IISD-ELA will study.

Our research will consist of three stages, all within carefully contained environments. First, a pilot study, using three small (2m diameter) land-based microcosms has already been completed to examine the chemical and physical behaviour of dilbit in freshwater. This pilot study will be used to guide a second study, proposed for 2018. The second study will examine oil behaviour in large



Slick, man: Shot from above via drone of the high (left) and low (right) diluted bitumen additions (photo credit: IISD-ELA)

10m diameter enclosures in a lake. Finally, a third study will compare methods of cleaning spilled oil from enclosed areas of shoreline to determine the most effective method.

As always, the research planning has a significant safety component and model oil spills will always be limited in volume and only within contained environments within the lake. Our studies always include recovery plans to return the lake to pre-study conditions. For these studies, we are committed to removing oil from the model spill sites once the research is complete.

made every attempt to collaborate with parties who might be interested in the research. IISD-ELA has sought input from First Nations and government departments, the oil production and transportation industries, regulators, universities and local community members. 🌱

FAST FACTS:

WHO? The IISD-ELA, Environment and Climate Change Canada, Fisheries and Oceans Canada, Natural Resources Canada, University of Manitoba, Queen's University and many other collaborating universities across Canada

WHERE? The IISD-ELA, a set of 58 lakes in Northwestern Ontario set aside by the Province of Ontario for whole-lake experiments

WHAT? Shoreline enclosures to study the impacts of diluted bitumen spills on freshwater ecosystems and an evaluation of remediation technologies.

WHY? To inform industry around best practices and government organizations around the threats of overland spills of diluted bitumen to aquatic systems.



Left: Test run of shoreline mesocosms that will be used in the diluted bitumen spill experiments at the IISD-ELA in 2018. **Right:** IISD-ELA and Environment Canada researchers donning PPE to study the mesocosm experiments in 2017. Photo credit: IISD-ELA

As always, our approach to the topic of oil spills is neutral. We aim to provide reliable results which can be used to inform decisions regarding pipeline development and to develop more effective methods for remediating oil spill sites. Throughout the project development stages, we have

Do YOU have a story to share in the next issue of The Current? Have an idea for a blog? Send ideas, photos or contributions to: comms@socanlimnol.ca.



Left: 2018 Rigler Award recipient, Dr. Anthony Ricciardi Professor, McGill University

Right: 2018 Peters Award recipient, Matthew Guzzo, University of Manitoba

2018 Award Winners

Michael Rennie, Hugh MacIassac

It is with great pleasure that the SCL executive announces that the 2018 Frank Rigler Award will be presented to **Dr. Anthony Ricciardi**. This award is SCL's highest honour, and recognizes Dr. Blais' outstanding research and its impact on people and policymakers.

Tony is a world leader in aquatic invasion biology, conducting research into how invasive species transform ecosystems. Using lakes and rivers as model systems, he was the first to demonstrate that the impacts of an invasion can be predicted using quantitative models based on environmental conditions. His current research boldly employs globally-distributed experiments aimed at capturing variation in the impact of invasive freshwater fishes and invertebrates across biogeographical, regional, and local scales. His research has documented rates of species invasion that revealed the Great Lakes to be the most invaded freshwater ecosystem in the world, and further showed that previous ballast water management schemes were not effective; this research provided impetus for the implementation of new ballast water regulations in 2008. He also published the first extinction rate estimates for freshwater fauna in a landmark study that showed North American lakes and rivers are losing their rich endemic biodiversity at a rate proportional to that recorded in tropical rainforests, thereby providing striking evidence of the need to protect species in our own backyard. This study (Ricciardi & Rasmussen 1999, cited 1,103 times; Google Scholar) has influenced freshwater conservation for nearly two decades. Tony will be

presenting his work in a plenary session at the upcoming meeting in Edmonton, so be sure not to miss it!

This year, the honour of the Rob Peters Award for best student paper in *Limnology* published in the last year goes to **Matthew Guzzo** for his 2017 paper "[Behavioural responses to annual temperature variation alter the dominant energy pathway, growth, and condition of a cold-water predator](#)" published in the *Proceedings of the National Academy of Sciences of the USA*. This work demonstrates the nuanced relationship between Lake Trout life histories and annual variation in weather, and most importantly how behaviour explicitly mediates this relationship. Specifically, Matt showed clearly that Lake Trout in small boreal lakes can respond to high nearshore temperatures in warm years by retreating earlier to deep water, whereas in cool years they stay in the nearshore to feed on littoral minnows. Matt is a PhD student at the University of Manitoba and will be presenting his research at the conference in Edmonton.

Congratulations to both our award winners! 🎉

Upcoming SCL Meetings

The 2018 CCFFR / SCL meeting is quickly approaching. The meeting is being held at the Westin Edmonton, in the heart of the downtown region. Abstracts and early registration closed on November 7, 2017. The meeting is sure to have a vibrant scientific program, with 13 diverse special sessions, as well as a general session theme. The social program looks to be equally engaging, with entrance to the Saturday evening banquet included in the registration, not to mention the many excellent restaurants and pubs in Edmonton's city centre, in which to continue conversations and catch up with colleagues and friends.

Special rates on accommodations at the Westin Edmonton are available for conference attendees until December 11, 2017, and can only be booked through the link on the [CCFFR / SCL meeting website](#).

Please also take special note that the SCL Business Meeting will be held January 6 from 12:00 – 1:20 pm. We hope to see you in Edmonton.

Make sure to follow along for all the developments on the meeting as they arise [on our website](#), which also has links to the [conference website](#). 🎉

Member Recognition

Karen Kidd was this year announced as the [Stephen A. Jarislawsky Chair in Environment and Health](#) at McMaster University.

John Smol was awarded an honorary Doctor of Sciences at Western University, and by all accounts, [gave a barn-burner of a convocation address](#).

Congratulations to all of our members successes! Be sure to let us know about your achievements or those of your colleagues for our next newsletter! 🎉



SIL is looking for a new webmaster



Gord Goldsborough, long-time SIL webmaster. Image credit: University of Manitoba

After more than two decades of dedicated service to SIL (the parent organization of SCL), our webmaster Gordon Goldsborough, is stepping down. SIL needs an enthusiastic member that would volunteer to take over. This means mostly being in charge of the every-day upkeep of SIL's website (with initial training by Gordon).

The requirements from potential applicants are:
(1) some experience with

WordPress, the system our website runs on.
(2) enthusiasm and a will to make a difference for the International Limnological Community.

While this task requires some time investment, it places the webmaster at the heart of SIL activities, provides experience in running a scientific society, and constitutes an outstanding and much respected service to fellow Limnologists.

Interested individuals should send a letter of interest to Tamar Zohary.

Sincerely,

Tamar Zohary - SIL General Secretary-Treasurer
Yves Prairie - SIL President

Student Spotlight:

Dan Gregoire, PhD student with Dr. Alexandre Poulain, University of Ottawa

What inspired you to become a scientist/limnologist?

I was inspired to pursue research after taking my first environmental microbiology and limnology classes. I was fascinated by the diversity of microbes and how they can shape our environment. I became interested in how microbes in aquatic systems can teach us about environmental health and help develop new strategies for managing environmental pollution.

What is one of your fondest memories performing research in limnology?

One of my fondest memories was starting a company inspired by my graduate research called Microbright. My goal with this company was to take my research on potential bioremediation strategies for water from the laboratory scale and apply it to meet industry needs. This provided me with an opportunity to network with people outside of my field and communicate my science to a broader audience. While it proved very challenging at times, this experience taught me a lot about what it takes to scale up an idea and the practical hurdles that come with applying research in an industrial setting.

Do you have any advice for students thinking about starting a master or a PhD?

First and foremost, make sure you are passionate about the topic you are working on. It's possible that the initial project discussed will not be the project you finish with but if it is still a subject you are passionate about that will come through in your work. Be open to learning new techniques or pursuing side projects that can complement your main research. This will make for much

stronger research papers that cater to a broader audience and can expand your skillset immensely. Take advantage of any opportunities to network with professionals from different fields and challenge yourself to present your research to as many different audiences as possible. Finally, take some time to celebrate the victories (big and small) that you achieve as part of grad school. This is essential for recharging your batteries before taking on the next challenge.



Daniel Gregoire showing us how it's done (with style) in his lab at the University of Ottawa. Image credit: University of Ottawa

Do YOU want to be in the next student spotlight? Let us know!
comms@socanlimnol.ca

Upcoming meetings

(meeting websites hyperlinked where available)

2018

SCL meetings

- **2018 with CCFRR** (Edmonton, Jan. 4-7) #CCFFR2018

SIL meetings

- **34th congress** 19-24 August in Nanjing, China

Other meetings

2017

- **North American Lake Management Society**, 6-9 November, Denver, CO
- **SETAC North America**, 12-16 November, Minneapolis, MN
- **American Geophysical Union**, Dec 11-15, New Orleans #AGU17

2018

- **Ontario Chapter of the American Fisheries Society**, 22-24 February, Geneva Park, ON
- **Canadian Society for Zoology**, 7-11 May, St. John's, NL
- **Canadian Geophysical Union Meeting**, June 10-14, Niagra Falls, ON
- **Association for the Sciences of Limnology and Oceanography**, summer meeting, 10-15 June, Victoria, BC
- **Ecology, Ethology and Evolution of Fishes**, 17-20 June, Montreal, QC
- **9th International Charr Symposium**, 18-21 June, Duluth, MN
- **International Association for Great Lakes Research** 18-22 June, Toronto, ON

- **International Statistical Ecology Conference**, July 2-6 2018, St. Andrews, Scotland
- **American Society for Ichthyologists and Herpetologists**, 8-15 July, Rochester, NY
- **Canadian Society for Ecology and Evolution**, 18-21 July, Guelph ON
- **Animal Behaviour Society Conference**, 2-6 August, Milwaukee, WI
- **Ecological Society of America**, 5-10 August, New Orleans, LA
- **American Fisheries Society**, 19-23 August, Atlantic City, NJ
- **ELLS-IAGLR 2018**, September 23-28, 2018, Evian, France
- **Geological Society of America**, 4-7 November, 2018

Recent Citings

Do you have recent publications from the last 6 to 12 months that you'd like highlighted in the the next issue? Send it to comms@socanlimnol.ca.

Bouchard F, MacDonald LA, Turner KW, Thienpont JR, Medeiros AS, Biskaborn BK, Korosi JB, Hall RI, Pienitz R, Wolfe BB. 2017.

Paleolimnology of thermokarst lakes: a window into permafrost landscape evolution. *Arctic Science* 3: 91-117. <https://doi.org/10.1139/as-2016-0022>

Campeau A, Wallin MB, Giesler R, Löfgren S, Mörth C-R, Schiff SL, Venkiteswaran JJ, Bishop K. 2017. **Multiple sources and sinks of dissolved inorganic carbon across Swedish streams, refocusing the lens of stable C isotopes.** *Scientific Reports* 7: 9158, doi: [10.1038/s41598-017-09049-9](https://doi.org/10.1038/s41598-017-09049-9).

Costa, D., J. Roste, J. Pomeroy, H. Baulch, J. Elliott, H. Wheatler, C. Westbrooke. 2017. **A modelling framework to simulate field-scale nitrate release and transport during snowmelt: the WINTRA model.** *Hydrological Processes*. doi: [10.1002/hyp.11346](https://doi.org/10.1002/hyp.11346)

Fera, S.A., Rennie, M.D. and Dunlop, E.S. 2017. **Broad shifts in the resource use of a commercially harvested fish following the invasion of dreissenid mussels.** *Ecology* 98: 1681-1692. doi: [10.1002/ecy.1836](https://doi.org/10.1002/ecy.1836)

Korosi JB, Thienpont JR, Smol JP, Blais JM. 2017. **Paleo-ecotoxicology: what can lake sediments tell us about ecosystem responses to environmental pollutants?** *Environmental Science & Technology* 51: 9446-9457. doi: [10.1021/acs.est.7b02375](https://doi.org/10.1021/acs.est.7b02375)

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Dispatches from the Field:

Scenes from the 2017 IISD-ELA field course. Left: Misty morning on Lake 239, Molly the dog at the ready.

Right: *Mysis diluviana* captured and successfully identified during the field course.

Image Credit: Emma Lehmborg



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Korosi JB, Thienpont JR, Pisaric MFJ, deMontigny P, Perreault JT, McDonald J, Simpson MJ, Armstrong T, Kokelj SV, Smol JP, Blais JM. 2017. **Broad-scale lake expansion and flooding inundates essential wood bison habitat.** Nature Communications, doi: [10.1038/ncomms14510](https://doi.org/10.1038/ncomms14510).

Liu, F., Fortin, C., Campbell, P.G.C., 2017. **Can freshwater phytoplankton access cadmium bound to low-molecular-weight thiols?** Limnol. Oceanogr. 62, (in press). DOI [10.1002/lno.10593](https://doi.org/10.1002/lno.10593)

Luek, A., Rowan, D.J. and Rasmussen, J.B. **N-P Fertilization Stimulates Anaerobic Selenium Reduction in an End-Pit Lake** Scientific Reports 7, Article number: 10502 (2017) doi:[10.1038/s41598-017-11095-2](https://doi.org/10.1038/s41598-017-11095-2)

MacKay, M., Verseghy, D., Fortin, V and Rennie, M.D. 2017. **Wintertime Simulations of a Boreal Lake with the Canadian Small Lake Model.** Journal of Hydrometeorology. 18: 2143–2160. doi: <https://doi.org/10.1175/JHM-D-16-0268.1>

Murray, L., Rennie, M.D., Svendsen, J.C. and Enders, E.C. 2017. **Effect of nanosilver on metabolism in Rainbow Trout (*Oncorhynchus mykiss*): An investigation using different respirometric approaches.** Environmental Toxicology and Chemistry. 36(10): 2722–2729. doi: [10.1002/etc.3827](https://doi.org/10.1002/etc.3827)

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Nürnberg GK. 2017. **Attempted management of cyanobacteria by Phoslock (lanthanum-modified clay) in Canadian lakes, water quality results and predictions.** Lake Reserv Manage. 33:163–170. <http://dx.doi.org/10.1080/10402381.2016.1265618>

Orihel, D.M., Baulch, H.M., Casson, N.J., North, R.L., Parsons, C.T., Seckar, D.C.M. and Venkiteswaran, J.J. **Internal phosphorus loading in Canadian freshwaters: A critical review and data analysis.** Canadian Journal of Fisheries and Aquatic Sciences pp. 1-25 <https://doi.org/10.1139/cjfas-2016-0500>

Powers, S.M., H.M. Baulch, S.G. Labou, S.E Hampton, N.R. Lottig, and E.H. Stanley. 2017. **Nitrification contributes to winter oxygen depletion in seasonally frozen forested lakes.** Biogeochemistry. doi: [10.1007/s10533-017-0382-1](https://doi.org/10.1007/s10533-017-0382-1)

Powers, S.M., S.G. Labou, H.M. Baulch, R.J. Hunt, N.R. Lottig, S.E Hampton and E.H. Stanley. 2017. **Ice duration drives winter nitrate accumulation in north temperate lakes.** Limnology and Oceanography Letters. doi: [10.1002/lol2.10048](https://doi.org/10.1002/lol2.10048)

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Carrie, S. Bowman, M.F. and Kirkwood, A.E. 2017. **Assessing landscape and contaminant point-sources as spatial determinants of water quality in the Vermilion River System, Ontario, Canada.** Environmental Science and Pollution Research 24: 22587-22601. doi: <https://doi.org/10.1007/s11356-017-9933-1>

Thienpont J.R., Desjardins C.M., Kimpe L.E., Korosi J.B., Kokelj S.V., Palmer M.J., Muir D.C.G., Kirk J.L., Smol J.P., Blais J.M. 2017. **Comparative histories of polycyclic aromatic compound accumulation in lake sediments near petroleum operations in western Canada.** Environmental Pollution 231: 13-21. doi: <https://doi.org/10.1016/j.envpol.2017.07.064>

Zastepa, A., Taranu, Z.E., Kimpe, L.E., Blais, J.M., Gregory-Eaves, I., Zurawell, R.W., Pick, F.R. 2017.

Reconstructing a long-term record of microcystins from the analysis of lake sediments. Science of the Total Environment, 579, pp. 893-901. doi: [10.1016/j.scitotenv.2016.10.211](https://doi.org/10.1016/j.scitotenv.2016.10.211)

Watson, S.B., Zastepa, A., Boyer, G.L., Matthews, E. 2017.

Algal bloom response and risk management: On-site response tools. Toxicon, 129, pp. 144-152. doi: [10.1016/j.toxicon.2017.02.005](https://doi.org/10.1016/j.toxicon.2017.02.005)

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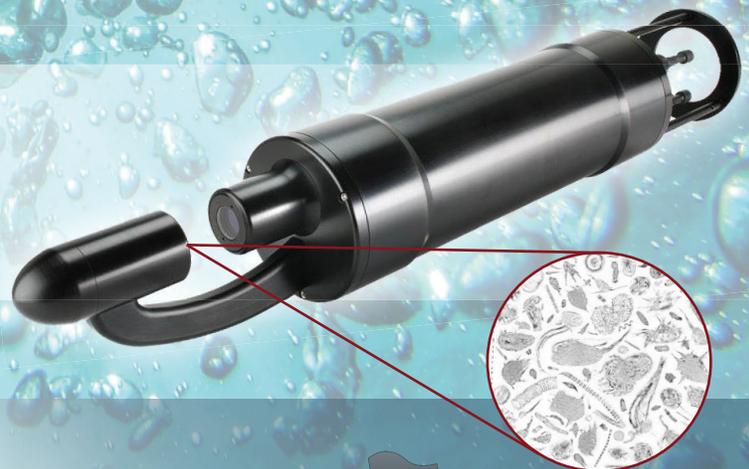
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