In August 2013, Université Laval welcomed a new professor, Alexander Culley, to the Biochemistry, Microbiology and Bioinformatics Department. His research interests are in the area of microbial oceanography, particularly the viral marine ecology of the Arctic. Dr. Culley has diplomas in biology from the University of Oregon (U.S.), biological oceanography from Moss Landing Marine Laboratories and botany from the University of British Columbia, where he obtained a doctorate under the supervision of Prof. Curtis Suttle. According to Dr. Culley, “Université Laval is the ideal place to study environmental virology, because Laval’s strengths in microbiology and oceanography provide unique opportunities for work in the Arctic and the St. Lawrence River system.” The marine bacterial community is made up of protista, procaryotes and viruses that catalyze chemical transformations affecting marine nutrients. The latter influence, in turn, the composition of marine organism communities, in both coastal and pelagic zones. Growth in the field of viral ecology is, therefore, useful for understanding the oceans and the planet as a whole, in the current context of climate change.

Dr. Culley is currently working to equip his laboratory so that he will soon be able to characterize the diversity and dynamics of Nordic ecosystem viruses. Initially, he intends to study the microbial mats in three regions: Hudson Bay, Ellesmere Island and Victoria Island. “I am enthusiastic,” he said, “about joining a diversified and stimulating group like Québec-Océan, and I am anxious to develop new collaborations.”

Hypoxia in the St. Lawrence estuary

The lack of oxygen (hypoxia) in the deep waters of the St. Lawrence estuary is one of the most interesting problems to study currently, because of the complexity and worrisome impacts that the phenomenon may have on sediment chemistry and organisms living in the estuary. Acquiring knowledge on this subject has recently taken an unforeseen turn as a result of the sometimes-contradictory results obtained by the teams of Dr. Alfonso Mucci and Dr. Daniel Bourgault. In the past year, exchanges between the two teams have made it possible to determine certain errors and to make progress in identifying the causes of hypoxia.

We are publishing here Dr. Bourgault’s response to the comments made by Dr. Mucci and reported in the Québec-Océan Newsletter of February 2013.

Alfonso Mucci stated that the rate of benthic and pelagic respiration determined using our model (Bourgault et al., 2012) contradicted published measures. We agree with that statement, but with an important subtlety. Our results run counter to previous hypotheses, models and interpretations mainly with respect to the relative roles of benthos and pelagos in regard to hypoxia. That is our main conclusion and the originality of our discovery. However, contrary to what Alfonso Mucci suggests, there is currently no usable robust measure for pelagic respiration in the estuary or the gulf’s deep waters. There are only some inferences based on debatable hypotheses and very uncertain coefficients (ETS, rate of pelagic respiration estimated from bacterial activity, isotopic fragmentation of dissolved oxygen). In fact, there
is a glaring lack of knowledge on microbial pelagic respiration.

Alfonso Mucci added that “a model reproducing almost exactly the vertical and horizontal gradients of dissolved oxygen concentration” was published in Lefort et al. (2012). However, we recently found a major error in the code used in the model developed by Lefort et al. That finding confirmed the doubt that we expressed in the spring of 2012. The results and conclusions of Lefort et al. need to be revised, and the authors are now working to correct the situation.

**Takuvik gets new, high-performance equipment**

In November 2013, the Takuvik Joint International Laboratory, associated with Dr. Marcel Babin’s Canada Excellence Research Chair (CERC), obtained two grants awarded by the Canada Foundation for Innovation (CFI), from the Leaders Opportunity Fund (LOF) and the Infrastructure Operating Fund (IOF). That funding will make it possible for the research team to acquire four pieces of equipment: a laser in situ scattering and transmissometry probe (LISST), a volume scattering function meter (VSF), a membrane inlet mass spectrometer (MIMS) and a submersible flow cytometer (flow cytobot). Those instruments will make it possible to carry out a precise and fine characterization of the optical and physiological properties of phytoplankton, particularly during Arctic Ocean blooms. They are state-of-the-art tools for acquiring a better understanding of arctic ecosystems.

**AWARDS AND RECOGNITION**

**Gouvernor General’s Academic Medal to Heike Link**

Heike Link (UQAR-ISMER) is a recipient of a Governor General’s Academic Medal, which is awarded in recognition of high achievement by a student. Her gold medal is the most prestigious award that can be given to a graduate level student at a Canadian university. Congratulations to Dr. Link, whose doctoral dissertation was on the diversity of the benthic ecosystem in the Canadian Arctic. She is now pursuing postgraduate work at the University of Kiel, in Germany.

**http://www.uqar.ca/uqar-info/pres-de-42-000-diplomes-remis-par-luqar/**

**The Réal Décoste Scholarship to Line Bourdages**

Line Bourdages, a PhD student under the supervision of Bruno Tremblay (McGill U.), was awarded the Réal Décoste Scholarship from the Ouranos Consortium for her project on “The role of cryosphere and boundary layer stability in the Arctic amplification phenomenon”. In the context of a diminishing snow and ice cover, a reduction of
atmospheric stability is expected, with numerous potential repercussions on the Arctic climate. In this project, the different feedbacks related to changes in atmospheric stability will be studied. Emphasis will be placed on Hudson Bay, Labrador Sea, and Northeastern North American land regions, where cryospheric and atmospheric changes have great potential of affecting precipitation patterns and timing, storm tracks, river run-off, and the general hydrology. To do so, the newly-released Arctic System Reanalysis [Byrd Polar Research Center, Ohio State University] will be used to correlate boundary layer stability to snow and sea ice characteristics, and to quantify the impact of the stability on the radiative environment and the Arctic amplification of climate change.

Three awards to Québec-Océan members at the 2013 Annual Scientific Meeting of ArcticNet

Posters presented by Jordan Grigor (left) “Seasonal life history strategies of the chaetognath *Parasagitta elegans* in the Canadian Arctic” and Mathieu Ardyna (middle) “Physical control of subsurface chlorophyll maximum in the Arctic Ocean”, both PhD students from U. Laval, were recognized at the 2013 ArcticNet meeting. Cyril Aubry (right), also from U. Laval, was recognized twice for his talent as a photographer in the best photo contest. Congratulations!

A Phénix award to Sud-de-l’Estuaire ZIP Committee

The Phénix de l’environnement is the highest environmental competition award in Québec. The competition is intended to make known and promote the excellence and know-how of Québec organizations in the field of environmental protection and sustainable development. The Sud-de-l’Estuaire ZIP Committee won the Phénix in the category for the enhancement, protection or responsible management of ecosystems. This ZIP committee’s project proposes solutions that will result in better adaptation of coastal communities faced with the problem of shoreline erosion. It deals with the restoration of the Lower St. Lawrence coast and ecologically and economically beneficial techniques, such as revegetation. It includes the production of a guide and the restoration of two coastal sites.

http://zipsud.org/notre-equipe-a-lhonneur/

SHORT TRAININGS AND CONFERENCES AROUND THE WORLD

ANNE-MARIE DION-CÔTÉ

Anne-Marie Dion-Côté is a doctoral student in biology at U. Laval, under the supervision of Prof. Louis Bernatchez. She is working on the identification of genomic and epigenomic barriers to hybridization among the lake whitefish. With support from the international fellowship program of the Fonds de recherche du Québec – Nature et technologies (FRQNT), she travelled to Dr. Petr Rab’s
fish genetics laboratory, at the Czech Academy of Sciences (Libechov). From August 20 to December 20, 2013, she honed her skills in cytogenetic divergence between glacial breeding lines among lake whitefish and chromosomal instability among their hybrids. She has returned to Québec with new skills that will be useful to Québec- Océan members who work in genomics and bioconservation. “I have been able to develop an expertise in the classical and molecular cytogenetics of fish unique to Canada,” she said, “that I am eager to share with interested Québec- Océan members.”

Blandine Gaillard

Blandine Gaillard is a doctoral candidate in oceanography at UQAR- ISMER, under the co-supervision of Prof. Philippe Archambault. She is working on the use of bivalves as a biological archive of the effects of climate change on the arctic food web. From September 16 to December 21, 2013, with the support of an international fellowship grant from the Fonds de recherche du Québec – Nature et technologies (FRQNT), she worked with Dr. Tarik Meziane at the UMR BOREA (Biologie des Organismes et Écosystèmes Aquatiques) laboratory of the Muséum National d’Histoire Naturelle (Paris, France). She acquired skills in the analysis of the food sources of arctic bivalves. “This fellowship gave me the opportunity to learn about a multi-marker approach (fatty acids, pigments and stable isotopes) to describe trophic relations, from laboratory work to statistical analyses,” said Blandine. Interested members of Québec-Océan will be able to profit from the new expertise that Blandine Gaillard has brought to Québec.

IN THE MEDIA

The Arctic: a cloud factory

Prof. Simon Bélanger (UQAR) is interested in how pack ice melting affects the amount of light that reaches the Arctic Ocean. The reduction in pack ice, in synergy with the increase in water temperature, facilitates evaporation and cloud production. It is quite possible that light reaching the ocean’s surface is reduced by the increasing cloud cover. The melting of the ice and increased cloudiness may, therefore, affect the productivity of the arctic marine ecosystem, which is tied to the amount of light that penetrates the water. To test this hypothesis, Simon Bélanger and two other Québec- Océan researchers have analyzed light and primary production from 1998 to 2010, using NASA data. They have concluded that the amount of light has increased locally, but at the overall arctic scale, there has not been much change. Consequently, it is important to take into account spatial variations in cloud cover to properly estimate the amount of light reaching the ocean and correctly deduce primary production. To better understand these early results, Julien Laliberté (UQAR) has begun a master’s project, under the supervision of Prof. Bélanger, to evaluate the satellite methods used to estimate the amount of light reaching the surface of the Arctic Ocean. Furthermore, the relationships between climate and the seasonality of primary production in the north of Baffin Bay and the Labrador Sea will be studied by Christian Marchese (UQAR), a doctoral student under the supervision of Prof. Bélanger and Prof. Jean-Éric Tremblay (U. Laval).

Using maritime gardening to study the functioning of marine coastal flora and fauna

Prof. Mathieu Cusson (UQAC) is studying coastal marine communities that are threatened by anthropic disturbances (e.g., pollution) and climate change. The latter factor will change ice dynamics in the St. Lawrence. The researcher is, therefore, interested in the impact of several disturbances. What are the consequences of the reduction of algal cover on benthic organisms? What would happen if several species of molluscs were affected? What would be the repercussions of a change in nutrient concentration? Mathieu Cusson’s laboratory has recreated those disturbances in vivo in order to study the impacts, both in isolation and in combination. The results could well be of use to managers of
natural environments who are looking for good assessment tools.  
http://www.frqnt.gouv.qc.ca/medias/bulletin/genial/2013/genial_45.html#nouveauchercheur

From the St. Lawrence to La Baie: a 100 km path through the estuary’s waters

Mélany Belzile, Dr. Daniel Bourgault (UQAR-ISMER) and Dr. Pascal Sirois (UQAC) are working to explain how waters in the St. Lawrence estuary feed the Saguenay River Fjord. The physical phenomena that allow those waters to go up the St. Lawrence to Saint-Fulgence and La Baie have an influence on the fjord’s flora and fauna, by bringing species from the St. Lawrence estuary and gulf. A study of marine currents, both in summer and winter, is also under study to measure the effects of climate change on the Saguenay River Fjord system.  
http://www.radio-canada.ca/regions/saguenay-lac/2013/12/02/004-courant-saguenay-st-laurent-uqar.shtml

Canada needs a global vision of ocean sciences

Prof. Louis Fortier (U. Laval) has cosigned the report made by the Council of Canadian Academies on oceanographic research in Canada. The report finds that Canadian funding for research in the ocean sciences is inadequate because it does not promote ocean access. Canada is not lacking in talent, ideas or problems related to its three oceans, but is lacking in research vessels, state-of-the-art instruments and the highly qualified personnel needed for their proper operation. According to Prof. Fortier, “Research must be carried out so that we can better manage, in 25, 50 or 100 years, the services provided by the ecosystems of our three oceans.”  
http://www.lefil.ulaval.ca/articles/trois-questions-louis-fortier-35329.html

Lack of political coordination for reacting to petroleum spills in the Gulf of St. Lawrence

According to Prof. Émilien Pelletier (UQAR-ISMER), the absence of coordination between the provinces and the federal government concerning petroleum spills in the Gulf of St. Lawrence has led to a flawed or inexistent emergency plan. The lack of coordination has also led to gaps in scientific knowledge about the area, which is vulnerable because it is a semi-closed, small sea (compared with other gulfs where there is resource exploitation, for example, the Gulf of Mexico) and its icy waters several months of the year. The researcher reminds us that it is of utmost importance to invest more in research to have better knowledge of the Gulf of St. Lawrence and to better control the impacts of any eventual petroleum spills.  

Beluga population dropping in the St. Lawrence

Until recently, the beluga population in the St. Lawrence seemed to have stabilized at around 1,000 head. A new study has shown that the number has dropped 20% since 2000 and the current number of individuals is now around 900. According to Dr. Véronique Lesage (Maurice Lamontagne Institute, MFO), the decline can be explained by several factors. Climate change and water warming are detrimental to the deepwater fish on which belugas depend. Major toxic algae blooms have resulted in large numbers of deaths among St. Lawrence fauna. In addition, contaminants and maritime traffic are causing deterioration of beluga habitats.  

Science superstar

Prof. Louis Bernatchez (U. Laval) has received many honours, including the 2012 Prix Marie-Victorin. According to Prof. Bernatchez, the recognition that comes with an award is striking. Receiving a prestigious award gives the recipient more weight when he or she speaks publicly or defends a cause, such as, for example, the petition to maintain without reduction the budget of the Fonds de recherche du Québec, which he launched in 2012.  
http://www.sciencepresse.qc.ca/actualite/2013/10/22/scientifique-superstar

EVENTS

...UPCOMING

A Web site for oceanographic conferences

Conference-Service.com publishes a calendar of upcoming scientific conferences in the marine sciences field. The calendar is available to all participants and organizers who want to announce their event.  
http://www.conference-service.com/conferences/oceanography.html
2014 AGM

Mark your calendar! Québec-Océan’s next annual general meeting will be held from November 17 to 19, 2014. More information will be sent to the group’s members in the coming months.

Annual Congress of the Canadian Meteorological and Oceanographic Society

“Northern Exposure: the Implications of Changes in Cold Environments” is the theme of the 48th CMOS Congress, which will be held from June 1 to 5, 2014. “The theme is ideally suited to Rimouski, the host city for the congress, because it is already home for a large community of scientists and citizens who are interested in nordinicity,” notes the chair of the local organizing committee, Prof. Simon Bélanger. This international congress is organized by a dozen members of Québec-Océan. “Researchers and students from Canada, the United States and Europe will share the results of their most recent discoveries that are related to the North,” said Dr. Michael Scarratt, chair of the scientific committee.

In addition to scientific papers and posters, a round table on the exploitation of natural resources in and around the Gulf of St. Lawrence will be presented during the congress. This activity, open to the general public, will bring together Steven Guilbeault, cofounder and senior director of Equiterre, Jean-Thomas Bernard, professor at the University of Ottawa and specialist in economic issues related to non-renewable natural resources, and Daniel Bourgault, professor at UQAR-ISMER, specialist in the coastal physical oceanography of arctic environments and the St. Lawrence in particular.

Finally, a third activity will take place on June 6. A Teachers’ Day will give teachers at the primary, secondary and college levels the opportunity to attend conferences given by internationally renowned researchers and participate in interactive educational activities related to the themes of the congress.

2014 AGM

24 hours of science : ART AND SCIENCE

The 9th edition of “24 Hours of Science” will be held on May 9 and 10, 2014, under the theme “Art and Science”. Recognized by UNESCO and organized by the group Science pour tous, the event will involve more than 300 scientific activities throughout Québec. The event’s objectives are to facilitate meetings between researchers and the general public, promote science careers among youth and stimulate an interest in science and technology.

Québec-Océan members are invited to propose activities for the general public or for students to their coordinators before the end of February or to sign up for activities already organized by the group.


Nature in All Its Forms

The scientific popularization symposium “Nature in All Its Forms” will return to UQAR from March 13 to 15, 2014. Several Québec-Océan students are involved in the symposium’s organization and program. The meeting will have conferences, posters, stands and debate on hydrocarbon issues in Eastern Québec.

https://sites.google.com/site/lanaturedanstoussetats/Home

Planning session for the CCGS Amundsen’s 2014 expeditions

Amundsen users will meet in Montréal on February 25, 2014, at the Fairmont The Queen Elizabeth Hotel, to finalize the 2014 scientific expedition plan. The preliminary plan includes an expedition of around 90 days, from the beginning of July to October. Sampling will begin in Baffin Bay, will continue in the Northwest Passage and then extend to the Beaufort Sea and Chukchi Sea. On the return voyage, some supplementary sampling will be carried out. The expedition will provide services for the ArcticNet, BREA and NETCARE research programs and for a Canada-Japan collaboration.
A LOOK BACK...

Evening of film and discussion at the Musée de la civilisation

On January 10, 2014, the general public in the Québec city area came in large numbers to see Sur le grand océan blanc, the French version of the film Children of the Cold, which tells the story of Éric Brossier, France Pinçzon du Sel and their two children, whose sailing vessel Vagabond was trapped in the ice near Grise Fjord (Nunavut). The unconventional family provides access to the Arctic for research teams by way of their vessel or by measurements that they can make. Marcel Babin’s Canada Excellence Research Chair and the Takuvik group have begun collaboration with the family in Baffin Bay. The film was shown at the Musée de la civilisation, in collaboration with Québec-Océan and Takuvik, and was followed by a discussion period.

2013 ArcticNet ASM

Five hundred fifty scientists participated in ArcticNet’s ninth annual scientific meeting, from December 9 to 13, 2013, in Halifax (Nova Scotia). The event was an opportunity for several dozen Québec-Océan members to have exchanges with scientists whose specialty is the North, government partners, Inuit organizations and private sector representatives to share the most recent arctic research results.

http://www.arcticnetmeetings.ca/asm2013/docs/full_program.pdf

2013 AGM

From November 13 to 15, with 125 participants, high-quality conferences and posters, and time to network, the 2013 edition of Québec-Océan’s Annual general meeting was a great success!

The communication and popularization workshop was also well attended. «Very useful, very clear, very stimulating» were the comments received after the training, resulting from a quick survey of a dozen students and professors. Thank you to Mrs Sophie Malavoy who gave such an informative presentation and answered many questions.

The prizes for best oral presentations were awarded to Frédéric Cyr, Virginie Roy (UQAR-ISMER) and Maxime Geoffroy (U. Laval). Mathieu Ardyna, Robin Bénard (U. Laval) and Annie Séguin (UQAR-ISMER) won the prizes for best posters.

ON THE BULLETIN BOARD

New members

Regular Member: Dr Jannette Frandsen (INRS-ETE).

A well-deserved retirement for Suzanne Roy and Julian Dodson

Québec-Océan wishes a happy retirement to Professors Suzanne Roy (UQAR-ISMER) and Julian Dodson (U. Laval), who made important contributions to our understanding of marine ecosystems. Hired as research professors at the end of the 1980s, these two members of Québec-Océan continued their careers at UQAR-ISMER (Dr. Roy) and at U. Laval (Dr. Dodson), where they trained dozens of master’s and doctoral students. The research interests of these two renowned scientists were very different. Suzanne Roy is a specialist in phytoplankton and algal pigments, while Julian Dodson is interested in the ecological control of the life strategies of river and estuary fish.

Stay “connected” on the St. Lawrence and its environment

Credit: Sébastien AUGER

Dawn at Baie-Saint-Paul.

In addition to its Facebook and Twitter pages and its bulletin, Stratégies Saint-Laurent offers a daily press review service. For all the news about the St. Lawrence and its environment, sign up by sending an email to info@strategiessl.qc.ca.
The Sud-de-l’Estuaire ZIP Committee is leading an initiative for the restoration of eel-grass (Zostera marina) in Baie Mitis

Baie Mitis has exceptional ecological characteristics and a diversity of natural habitats, including a seagrass bed for eel-grass that serves as a nursery, food locker and shelter for a large number of aquatic species. The bed regenerates slowly, and for the last ten years, it has regressed significantly. Therefore, regeneration must be accelerated by replanting. The objective for the experimental restoration planned for 2014 is to strengthen the seagrass bed and evaluate the capacity of this natural environment to regenerate itself. In the spring, a call for volunteers will be made to enlist help for the project.

http://zipsud.org/restauration-de-la-zosteraie-dans-la-baie-de-mitis/

Organizations closely concerned by this issue – like the Réseau d’observation de mammifères marins, Stratégies Saint-Laurent and the Conseil régional de l’environnement du Bas-Saint-Laurent – also support the CPAWS’ call to action.

Let’s make snow belugas to help our St. Lawrence belugas!

Did you know that currently there remain only about 900 belugas in the St. Lawrence? According to the Canadian Parks and Wilderness Society (CPAWS) – Québec section, “Between the oil port project inside the Cacouna’ beluga nursery and the government’s call for tenders to evaluate the petroleum and gaz potential of the American Bank, the survival chances for threatened marine species in Québec are melting like snow on a warm day.” To respond to the urgency of the situation, an initiative was started several weeks ago in Québec: instead of making snowmen, several people are making snow belugas! They have turned a recreational activity into an expression of support for the call to action made by CPAWS – Québec: “The time has come to create marine protected areas in Québec so that the iconic beluga and our other marine species can breathe a little easier.”

As long as there is snow around, make your own snow beluga and show your support for the movement to protect our Québec marine species!

http://monbeluga.ca

1 See the article by Patrick Nadeau published on the Huffington Post blog on November 28, 2013, and entitled “Port pétrolier à Cacouna: les conséquences de l’indifférence du Québec”.

http://quebec.huffingtonpost.ca/patrick-nadeau/port-petrolier-cacouna-consequence-indifference-quebec_b_4349528.html
Québec-Océan pools together the scientific activities of Québec’s main universities active in oceanography, and those of their partners in government and the private sector. Funded by the Fonds de recherche du Québec – Nature et technologies, some universities and research grants, Quebec-Ocean’s mission is to support Québec researchers and the training of students to promote excellence in oceanographic research and dissemination of knowledge.

2013 Annual general meeting participants.