

LE SOUFFLEUR

GROUP FOR RESEARCH
AND EDUCATION
ON MARINE MAMMALS



*Better understand these animals, raise awareness about them
and better protect them*



SUMMARY

FOREWORD

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ABOUT GREMM

The fate of whales is linked to the value that we place on them. Getting to know them is the best guarantee for their future. This is the essence of the mission of the Group for Research and Education on Marine Mammals (GREMM).

Founded in 1985 and based in the village of Tadoussac, GREMM is a non-profit organization dedicated to scientific whale research and marine conservation education. It carries out long-term research programs on St. Lawrence belugas and the large rorqual species that frequent the estuary. The organization also manages the Marine Mammal Interpretation Centre and edits the *Whales Online* magazine and encyclopedia. Lastly, GREMM coordinates the Quebec Marine Mammal Emergency Response Network.

TELLING STORIES

Creative. Resilient. Agile. This is how I would describe today's "GREMMlins." Through the darkest days of the pandemic, what our teams managed to accomplish over the last two long years has been nothing short of a miracle.

FROM THE BOTTOM OF MY HEART, I THANK YOU ALL.

Patience, we continued to compile "whale tales." Passionately, we continued to share them.

CIMM, which since 2020 has hosted the most impressive and most complete collection of whale skeletons in Canada, enjoyed record attendance in 2021. In fact, a little over 37,000 visitors were charmed by the skeleton display nicknamed "Ballet of the Whales." The *Whales Online* website (baleinesendirect.org/en/) also established a new record number of visitors: 930,000! At the same time, *Whale Portraits* quietly celebrated its 20th anniversary. That's twenty seasons of weekly bulletins bridging the gap between research teams, conservationists and captains/naturalists from the fleet of whale-watching boats that take 300,000 passengers every summer to admire cetaceans in the Saguenay-St. Lawrence Marine Park. With every issue of *Whale Portraits*, there's a story of a whale.

Our insatiably curious research teams and students rely on a multitude of sources to chronicle these stories. On board our research vessels the *Bleuvet* and *BpJAM*, from the capes and cliffs of the Saguenay and the St. Lawrence, in our labs and those of our partners, through photo-identification, molecular biology, remote sensing, acoustic or aerial (drones) monitoring and, most recently, simulations and artificial intelligence, no stone is left unturned to uncover, little by little, the fascinating lives of the giants with whom we share the St. Lawrence.

In the early 2000s, we adopted the motto "**Greater understanding for better protection.**" Over the past year, our mission has been repackaged.

The mission of the Group for Research and Education on Marine Mammals (GREMM) is to increase the collective awareness of marine mammals and the scientific study of these animals in order to safeguard their future in the St. Lawrence for future generations.

GREMM creates, collects, preserves, promotes, interprets and shares marine mammal knowledge in order to **better understand these animals, raise awareness about them and better protect them.**

But let's not kid ourselves... In reality, we collect and tell whale stories to change the world.

Robert Michaud
President and Scientific Director
Group for Research and Education on Marine Mammals

FEATURE STORY



THE REASONS BEHIND AN EXCEPTIONAL YEAR FOR HUMPBACKS

"First time ever," "extraordinary," "record..." After a while, observers describing the 2021 whale-watching season in the estuary began to run out of superlatives. Researchers and cruise-goers alike were surprised by the number of animals present in and around the Saguenay-St. Lawrence Marine Park. Observers were particularly excited by the humpbacks and their highly dynamic and acrobatic displays. But should we be celebrating the sudden overabundance of this species in the estuary? When researchers are questioned about the reasons for the strong showing of humpbacks in 2021, the theories retained raise concerns over the long term.

RECORD NUMBERS

Over the course of Summer 2021, GREMM's research teams, together with Parks Canada, photographed and identified approximately 70 different humpback whales in the St. Lawrence Estuary. Contributions from captains and naturalists aboard whale-watching boats participating in the program added a further thirty individuals to the list. Thus, over one hundred different humpbacks visited the Saguenay-St. Lawrence Marine Park between June and October 2021!

A few historical data to put this figure into perspective: Until 1999, a single humpback whale entered the Marine Park (some readers may remember Siam, who still visits our waters today); between 1999 and 2017, they numbered fewer than 10; in 2019, 28 were tallied, and in 2020, 29. The same peak of 70 individuals was noted for fin whales in 2021, i.e. more than twice the number of the previous year, which was more typical. Conversely, blue whales were conspicuous by their near total absence, with just 2 individuals identified.

Regardless, summer 2021 was undoubtedly exceptional, and not just because of these statistics. "What's even more remarkable than these numbers," points out GREMM's

scientific director Robert Michaud, "is the sustained presence of individuals throughout the season with particularly long stays, as well as the arrival of new individuals in the sector." In fact, a number of older humpbacks, despite being well known in the gulf, had never before ventured as far upriver as the estuary. Even more surprising, researchers photographed hitherto unknown adults that had never been observed anywhere in the St. Lawrence.

ON A QUEST FOR FOOD

What might explain the presence of so many humpbacks in the estuary in the summer of 2021? Researchers are rather unanimous: What makes whales move the way they do is food! "There are two possibilities..." points out Robert Michaud, "Either prey was exceptionally abundant in the estuary, or it was extraordinarily lacking elsewhere, which could have driven the whales to fall back on the 'last restaurant' open."

Cristiane C. de Albuquerque Martins, an ecosystem scientist with Parks Canada in the Saguenay-St. Lawrence Marine Park, echoes this view: "The St. Lawrence Estuary is a dead-end alley. If whales came this far, it is probably because they were unable to find

enough food elsewhere. They wouldn't have made the journey for nothing.

"This hypothesis is substantiated by observations made by Richard Sears, founder of the Mingan Island Cetacean Study (MICS), who has been studying whales in the Gulf of St. Lawrence for 45 years: "In 2021, we encountered very few humpbacks, the animals didn't linger too long in the area and they moved around quite a bit. The same holds true for fin whales. Clearly, the animals scoured the waters but did not find what they were looking for."

The extended stays of humpback and fin whales in the estuary suggests that the animals found what they were looking for in the Marine Park: a well-stocked pantry! This is also what acoustic surveys carried out in the Marine Park by Parks Canada indicate. Project lead Samuel Turgeon explains, "Unfortunately, our data set this season is insufficient, but the handful of trips we made out to sea did reveal a significant concentration of schooling fish, possibly sand lance. Rarely had I ever seen schools of such scale in any of my previous monitoring work."

CHANGING ECOSYSTEM

How might we explain the sudden appearance of such exceptional prey density in the estuary? The question remains unanswered. "It's a large-scale phenomenon that involves a considerable number of oceanographic parameters," points out Samuel Turgeon, "but it is widely known that pelagic species undergo cycles in their population trends." It is also known that prey distribution has been affected by global climate change in recent years. In the St. Lawrence, water temperatures are rising, oxygen levels are declining, and currents are changing, reaching new records nearly annually. These profound changes have a ripple effect on prey... and their predators, including whales!

Moreover, Robert Michaud notes that "Up until the 2000s, the estuary was a rather stable system where one could predict the presence of whales from year to year without too much trouble. For the last 20 years, these patterns have been changing and in the past few years, the magnitude of annual variations has been truly spectacular."

ADAPTING TO SURVIVE

"The consequences of climate change will likely be catastrophic for all living beings, predicts Christian Ramp, whale researcher at University of St Andrews, but I believe that whales fall into that category of species that are capable of adapting. We humans have to contend with borders, whereas they have the ability to move around in the immense ocean and adapt their diet to the availability of prey." The problem? The presence of whales and how they might behave will be increasingly difficult to anticipate, which is a real challenge for conservation. For Robert Michaud, "We saw it with the North Atlantic right whale... No longer can we afford to spend years improving our knowledge before we decide to implement conservation strategies. We need to be quicker and more reactive when adopting new measures and amending existing ones to protect whales more adequately."

SCIENCE IN ACTION



ST. LAWRENCE BELUGA PROJECT – Coordinated by GREMM, the St. Lawrence Beluga Project is carried out by a broad network of NGO and academic partners and in close collaboration with Fisheries and Oceans Canada's Maurice Lamontagne Institute, Environment Canada's St. Lawrence Centre, and Parks Canada. Discover here an overview of the project's scientific breakthroughs for 2021.

FAMILY ALBUM

Beluga monitoring through photo-identification is the cornerstone of the St. Lawrence Beluga Project. Each encounter with these white whales is an opportunity to photograph their flanks in an effort to identify individuals based on their distinctive markings and scars. During these encounters – or “contacts” as they are known in our lingo – pod size and composition, observed behaviour and ambient conditions are all systematically documented. Recognizing individual belugas across time and space provides insight into the species' social organization and habitat use. With these data, researchers can determine how the distribution of individuals influences their exposure to anthropogenic threats.

Painstaking analysis of over 25,000 photos from the beluga catalogue allowed Rozenn Le Net, resident in pathology at Université de Montréal's Faculty of Veterinary Medicine, to establish an atlas of lesions most frequently observed on beluga skin. Published in the scientific journal *Marine Mammal Science* in Winter 2021, these results are notably highly useful for evaluating the persistence of the various marks and scars used to identify belugas.

Between June 6 and October 5, 2021, GREMM's research team spent 48 days on the water on board the *Bleuvet* and *BpJam*. This effort yielded 81 contacts with beluga herds and over 11,000 photos that would later be used to identify individuals. A further 29 days of observations were made from land-based observation sites in Cacouna and Kamouraska, resulting in 50 contacts and roughly 11,000 photos. Preliminary analysis of the photos has led to the identification of 101 individuals already featured in GREMM's “family album,” as the St. Lawrence beluga catalogue is sometimes called.

A FAMILY ALBUM COMPILED USING ARTIFICIAL INTELLIGENCE!

Artificial intelligence has already helped create powerful tools to identify humpback whales. There are even online citizen platforms such as *Flukebook* and *Happy Whale*. Belugas, on the other hand, represent a major challenge. Throughout the year, we submitted a total of roughly 10,000 photos of over 600 belugas for a Kaggle challenge that invites programmers to find a solution to identify some of the “more difficult” cetacean species to pre-identify. Results are expected by 2023!

With the support of RQM's St. Lawrence Odyssey Program, our partner at Université du Québec en Outaouais (UQO) Clément Chion put two post-doctoral fellows to the task: Marcelo de Araújo and Ankita Shukla, who will be supported by Sébastien Gambs, professor at UQAM's Department of Computer Science and Canada Research Chair in Privacy-Preserving and Ethical Analysis of Big Data. To be continued!

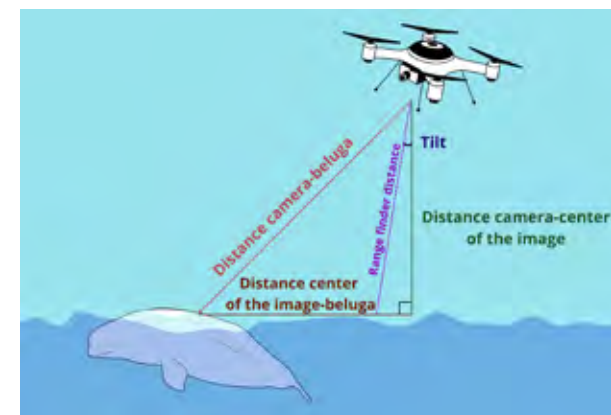


The different markings and scars present on belugas are used to identify them.

BEHAVIOURAL ECOLOGY

The summer of 2021 was marked by a return to La Grande Île de Kamouraska (GIK). Located in the Upper Estuary, GIK is an island that offers an exceptional observation site for studying belugas. Virginie Chadenet spent several weeks here in 1991 as part of her master's project (Université Laval). Antoine Godefroid followed in her footsteps in the summer of 2000, also in the context of his master's project (UQAR).

This time it was Jaclyn Aubin and a team from Ocean Wise that set up their gear here to study the beluga's vocal repertoire. As part of her PhD project (University of Windsor), Jaclyn aims to determine whether dialects exist in St. Lawrence belugas. Drawing on the research of Valeria Vergara, according to which each beluga has its own unique contact call, Jaclyn is attempting to determine whether the vocalizations recorded at three different sites (Kamouraska, Cacouna and Baie Sainte-Marguerite) are distinct. Images are captured simultaneously to confirm through photo-identification the existence of different beluga communities, each favouring a particular sector in the estuary. Matching sound recordings with images taken for photo-ID purposes will perhaps one day add an acoustic dimension to the beluga catalogue. This way, the communities might eventually be characterized and recognized both by sight and by sound!



The drone hovers over a beluga. Distances and angles are obtained between the animal and a camera mounted on the device, which are subsequently used to evaluate the individual's girth. © Alexandre Bernier-Graveline

Emmanuelle Barreau, PhD candidate at UQO, joined the crew on board the *Bleuvet* for the summer of 2021 to study the fusion-fission dynamics of beluga herds. Emmanuelle will use data from beluga photo-identification surveys and more specifically from GREMM's herd monitoring efforts in an attempt to categorize areas heavily used by the species and verify which sectors are important for feeding, socializing, calving, mating, resting and other essential activities.

These same data sets were used by our partners at the Maurice Lamontagne Institute (Fisheries and Oceans Canada), Jean-François Ouellet and Véronique Lesage, to identify summer transit corridors used by belugas in the St. Lawrence Estuary. In fact, Jean-François published the results of this study in the scientific journal *Ecosphere* in Spring 2021. The study notably shows a correlation between the tidal current and beluga movements. It also demonstrates segregation in the species by sex and age group, but suggests that certain sectors, notably the waters around Île Rouge, are used by roughly half the beluga population. By better understanding beluga distribution, we can better assess how human activities affect each segment of their population.



Observation site on La Grande Île de Kamouraska © ROMM

SCIENCE IN ACTION

ACOUSTIC UNIVERSE

Studies on beluga distribution and their use of habitat also contribute to our understanding of the consequences of underwater noise on the species. For the past few years, Clément Chion, head of UQO's interdisciplinary socio-ecological simulation laboratory (LISSÉ), has been overseeing the development of a simulator called 3MTSim. This simulator aims to model the interactions between belugas and maritime traffic to identify solutions to minimize noise impacts in this sector. In 2021, four hydrophones were used to collect approximately 5,000 hours of sound recordings to better understand the beluga's underwater soundscape. Each of these four hydrophones was deployed to a different site: Kamouraska, Cacouna, Baie Sainte-Marguerite and Anse Saint-Étienne. In fact, this was the first time that autonomous hydrophones were installed at the last two sites.

The season also marked the start of data collection for Camille Kowalski, PhD candidate at UQO. Posted at Anse Saint-Étienne, Camille documented the interactions between pleasure boats and belugas. Her observations, combined with a boater survey, will enable her to paint a clearer picture of recreational boating, which will serve as input to the 3MTSim modelling.

These hydrophones also collect precious data for projects being carried out by Jaclyn Aubin (see "Behavioural Ecology" section) and Valeria Vergara. Analysis of data from previous years led to the publication of a new scientific article in Spring 2021. In her text, Valeria demonstrates that contact calls are severely masked by ship noise. It is believed that noise pollution reduces the range of an adult's call by about 57%, i.e. 2.9 km rather than 6.7 km. As for calls made by newborns, which are considerably softer to begin with, it would appear that they are audible for only about 170 m in the presence of boats, i.e. 53% lower than their usual range of roughly 360 m. Underwater noise could therefore have significant consequences on the ability of mothers and calves to maintain contact with each other. Lastly, in late 2021 Valeria ended her collaboration with Ocean Wise and began working for the Raincoast Conservation Foundation.

MORTALITY MONITORING

Since 2017, GREMM has added an aerial dimension to its beluga encounters. When conditions allow, the research team launches a drone during its "contacts" to capture images of the individuals from above. Doing so adds another angle that makes it easier to photo-ID individuals in the catalogue while allowing important data to be gathered on the physical fitness of a given individual. Thanks to photogrammetry, a method that relies on trigonometry to estimate distances by analyzing a photo, an individual's girth can be measured.

In order to better evaluate how this morphological marker corresponds to a beluga's health, Meredith Sherrill, PhD candidate at Université du Québec à Montréal's (UQAM) TOXEN laboratory, is currently working to establish a correlation between the girth of an individual and the composition of its blubber. To do so, biopsy samples of individuals filmed by drone and photo-identified are taken and sent to the lab for analysis. Last summer, 50 biopsies were performed and 265 minutes of drone footage was recorded. Over the winter, our team carried out the arduous task of identifying individuals captured in the drone images. Following initial analysis of these data, preliminary results were obtained on the length, body mass index and lipid profile of individual belugas according to their age and sex. The project will resume next year.

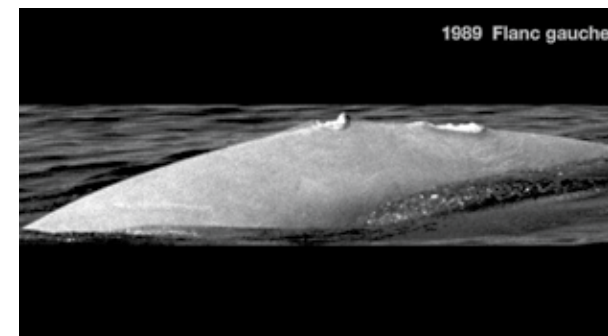


Drone images can also be used to determine whether or not a female is pregnant, distinguish males from females and gain insight into the belugas' rich social lives.

MORTALITY MONITORING

Analysis of beluga carcasses found along the shores of the St. Lawrence provides important information on factors affecting the survival of the species. The majority of fatalities are never documented, but analysis of those individuals that are discovered contributes to a better understanding of the causes of mortality in this species. In 2004, the Quebec Marine Mammal Emergency Response Network (QMMERN) assumed the lead role in managing the Beluga Carcass Recovery Program, which was first launched in 1983. Last year, the QMMERN once again received a number of reports of dead belugas. A total of 19 beached carcasses were located and sampled between March and December 2021, which is higher than the median figure of 14 carcasses over the past 39 years. Of these, 8 were able to be transported to Université de Montréal's Faculty of Veterinary Medicine to be examined by veterinarian Stéphane Lair and his team.

Once again, the mortality rate of newborns and pregnant females was abnormally high: 6 of the recovered carcasses were those of newborns and 2 were females that had just given birth. First noted in 2008, this worrying trend remains unexplained. Notably, contamination by flame retardants (PBDEs and other bromine-based compounds), access to prey of sufficient quality and quantity, and noise and physical disturbance may all contribute to complications during gestation.



Mortalities documented in 2021 included DL0105, a.k.a. Chérubin. This 30-something-year-old male had been known by GREMM since 1989 and was adopted by listeners of Radio CIEL FM in 1990.

SCIENCE IN ACTION

HEALTH AND TOXICOLOGY

To minimize disturbance and maximize effectiveness, biopsy samples taken by scientists to compile beluga “health charts” are shared between a number of partners. Each collected biopsy is immediately divided into sub-samples designated for different analyses. Part of the biopsies is used to answer questions related to genetics such as determining the sex of individuals, studying genetic diversity within the population and examining the influence of genetic characteristics on individual health. The other part is used to obtain the fine composition of beluga blubber as well as the concentration of contaminants. In this context, for her PhD, Meredith Sherrill is also interested in the impact of contaminants on belugas’ physical condition, notably how flame retardants affect the animals’ ability to metabolize fats. The results of her study are forthcoming. Another master’s student at UQAM’s TOXEN laboratory, Laura Zeppetelli-Bédard, is studying the correlations between the beluga’s diet, contamination rates and lipid composition of its fat tissue and those of its prey. With chemical contaminants having been identified as one of the chief factors limiting the recovery of the population, it is critical that further research be conducted to better understand the mechanisms behind the toxicity of these contaminants. Lastly, Valerie Jolicoeur, who is also pursuing her master’s at UQAM’s TOXEN laboratory, is conducting analyses to verify the effects of organohalogen contaminants on thyroid functions by measuring the concentrations of various contaminants and thyroid hormones in fat samples taken by biopsy.



Biopsies can reveal genetic secrets, accumulated pollutants and what the sampled belugas have been eating.

NARWHAL

For the 6th consecutive year, a narwhal was observed accompanying belugas in the St. Lawrence estuary. This young male is now approaching sexual maturity, and scientists are beginning to wonder about the possibility that it might mate with a beluga. In fact, in 2019, researchers from the University of Copenhagen and the Natural History Museum of Denmark confirmed the existence of a beluga-narwhal hybrid*. Genetic analysis of an unusual skull discovered in Greenland some 30 years earlier led them to conclude that the skull was that of a hybrid born to a female narwhal and a male beluga. Hybridization between a male narwhal and a female beluga has never been recorded, but it is not implausible. In this context, the St. Lawrence narwhal will perhaps father the very first documentation of a living “narluga”!

The social integration of the narwhal into the beluga population is an exceptional phenomenon. In January 2021, Radio-Canada aired a feature on its TV series Découverte entitled “Un intrus dans le Saint-Laurent” (Intruder in the St. Lawrence). Featuring footage shot by GREMM and an interview with our president and scientific director Robert Michaud, the documentary takes an in-depth look at how the narwhal was “adopted” by St. Lawrence belugas. In 2020, GREMM decided to offer humans the possibility to adopt (symbolically, of course) our resident narwhal. The collective adoption campaign successfully continued in 2021 and is still open!

Chip in for the collective adoption of the narwhal:

<https://baleinesendirect.org/en/observer/qui/portraits-de-baleines/narval-monodon-monceros/>

¹Skovrind, M., Castruita, J.A.S., Haile, J. *et coll.* Hybridization between two high Arctic cetaceans confirmed by genomic analysis. *Sci Rep* 9, 7729 (2019). <https://doi.org/10.1038/s41598-019-44038-0>



This narwhal has been swimming with belugas since 2016.

GREMM’S PUBLICATIONS

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(2021) Ouellet J-F, Michaud R, Moisan M, & Lesage V. Estimating the proportion of a beluga population using specific areas from connectivity patterns and abundance indices. *Ecosphere* 12(6):e03560 <https://doi.org/10.1002/ecs2.3560>

(2021) Le Net R, Larrat S, Michaud R, & Lair S. Pathological and epidemiological investigation of skin lesions in belugas (*Delphinapterus leucas*) from the St. Lawrence Estuary, Quebec, Canada. *Marine mammal science* 38(2). <https://doi.org/10.1111/mms.12888>

(2021) Aubin J. A., Michaud R. & VanderWal E. Prospective evolutionary drivers of allocare in wild belugas. *Behaviour* 158(8-9). <https://doi.org/10.1163/1568539X-bja10094>



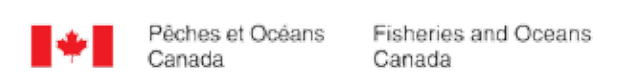
Beluga family

THANKS

ACKNOWLEDGEMENTS TO OUR KEY FINANCIAL PARTNERS



THE SPONSORS OF THE CAMPAIGN



SCIENCE IN ACTION



WITH THE LARGE RORQUALS

2021 SEASON IN STATISTICS

- **19 systematic censuses** using photo-identification from on board the BpJAM and a further 192 from opportunity platforms
- **2 blue whales** identified this season
- **Approximately 70 fin whales** identified this season, including Ti-Croche (Bp955), Oméga (Bp929) and Zipper (Bp097)
- **Approximately 70 humpback whales** identified this season based on the catalogue maintained by the **Mingan Island Cetacean Study (MICS)**, including Irisept (H492), Chewbacca (H824) and Gaspar (H626), as well as over thirty additional IDs made by our collaborators, captains and naturalists from the Marine Park's fleet of whale-watching boats

The 2021 season was noteworthy for the abundance of large rorquals that visited the St. Lawrence. Preliminary data are testimony to an exceptional season during which approximately 70 fin whales and as many humpbacks were identified, compared to 29 and 21 in 2020, respectively. Several fin whales that had not been seen in years were photographed by the team. Unexpected visits by humpbacks that normally frequent the Mingan Archipelago area also surprised our team. Lastly, we would be remiss not to mention an occurrence rarely observed by the team: a breaching fin whale. Imagine, Orion (Bp17), an animal measuring some 20 metres long, hurling itself out of the water!

Our research team continued systematic censuses using traditional photo-ID techniques from the boat. However, we also launched a pilot project to photo-identify large rorquals from above using a lightweight drone. The preliminary results are encouraging. This technique has proven highly effective for fin whales and blue whales. For humpbacks, however, we remain doubtful, considering that the colour pattern of the underside of the caudal fin (tail) cannot be photographed from a drone. We are currently evaluating whether the jagged outline of the species' tail would be sufficient to make reliable identifications. If so, drone imagery would have the advantage of enabling us to identify humpbacks regardless of whether or not they raise their tails.

Employing a drone to obtain images from above also makes it easier to monitor the physical condition of these whales using photogrammetry. Images that clearly show the entire animal – from the tip of the mouth to the tip of the tail – will also be particularly useful for documenting the scars left on their bodies by ship strikes or entanglements in fishing gear. Indeed, drones can be used to detect markings that would not otherwise be visible when making “horizontal” observations. This makes it possible to determine the proportion of large rorquals having suffered these types of injuries with greater accuracy.

EXCEPTIONAL VISITS

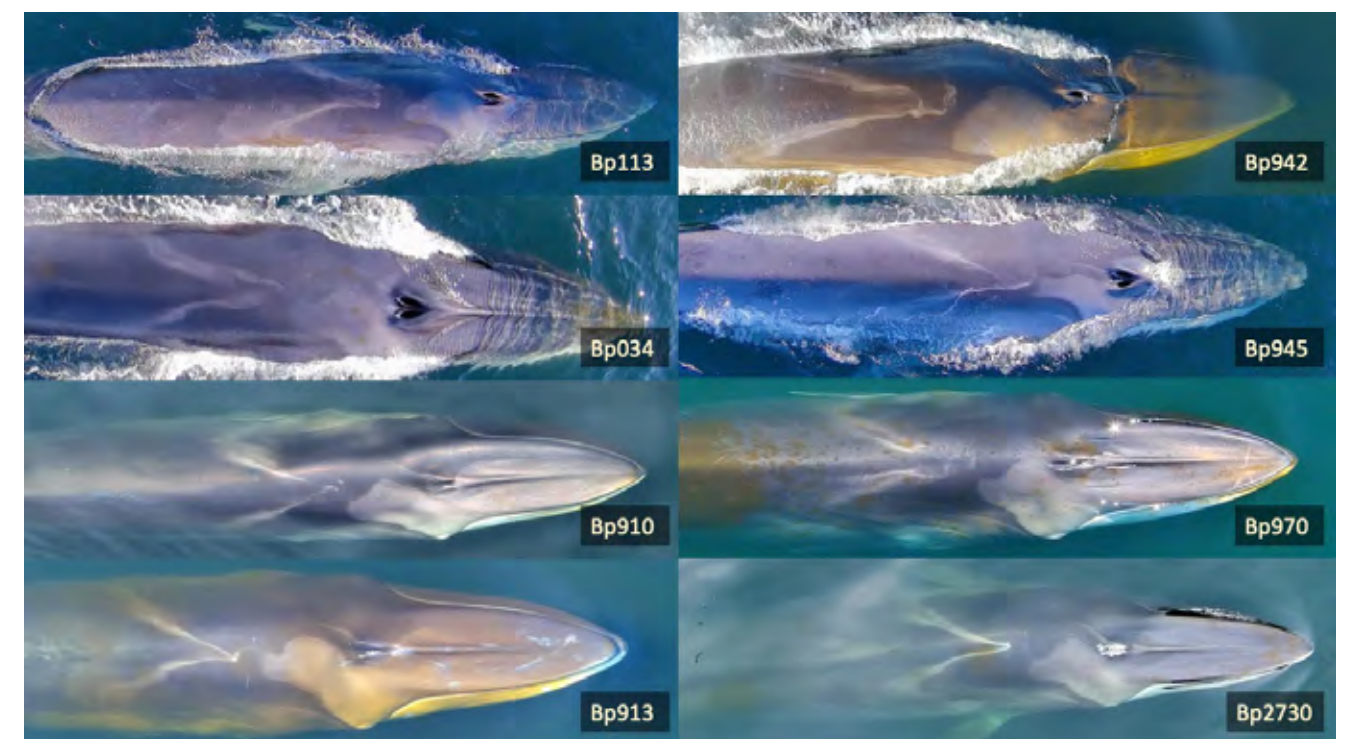
RETURN OF OLD ACQUAINTANCES

For our team, the return of several fin whales that had not been seen in years was cause for excitement! Indeed, Bp2356 was spotted passing through the sector, whereas this individual had only ever been identified in 1987 and 2018! Same thing for Bp2730, a.k.a. Inusité, which had previously been observed in 2000 and 2001. Given that we only rarely cross paths with these individuals, their life histories remain an enigma!

BEYOND MINGAN

Our team was also astonished by visits from humpbacks that are well known to the Mingan Island Cetacean Study (MICS), but which had never before been identified in our sector. Individuals that decided to explore the St. Lawrence upstream of the Mingan Archipelago include Fleuret (H009), Cédille (H144), Helmet (H166), Gronier (H228), Leprechaun (H379) and Fat Bee (H456). Females Fleuret and Cédille have been in the MICS catalogue since 1982 and 1988, respectively. For what we believe to be her first visit to the estuary, Cédille did us the honour of showing up with her sixth calf!

PILOT PROJECT FOR USING DRONES TO STUDY LARGE RORQUALS



The results of the pilot project for photo-identifying fin whales from above are encouraging.



Humpback whale Leprechaun (H379)



Fin whale Bp2356

FASCINATING AND EDUCATING

EDUCATION AT GREMM

MARINE MAMMAL INTERPRETATION CENTRE

May 2021 – Once again this year, the Marine Mammal Interpretation Centre (CIMM) is no exception to the numerous uncertainties and concerns generated by the pandemic. Notable measures include a maximum capacity of 40 visitors at a time at the CIMM, social distancing, mandatory mask requirements and occasionally vague criteria regarding interpretation activities. The season is shaping up to be an exceptional one, but the team is ready to rise to the challenge and innovate once again! The naturalists have already arrived, training is progressing well, we have highly skilled communicators, and we will be able to develop new outdoor interpretation and outreach activities at those places where cetaceans are observed on a daily basis. Will there be a good turnout amongst the tourists this year?

November 2021 – In what turned out to be a remarkable year, the CIMM saw no fewer than 37,000 visitors walk through its doors throughout the season. In fact, visitors were not the only ones to show up in droves. Summer 2021 was an exceptional year for whale-watching, too, not only offshore, but also from the giant boulders in front of the CIMM. Belugas and minke whales regularly foraged near the shoreline, much to everyone's delight. Visitors who had the chance to observe these giants in their natural environment were all the more enthralled when they entered the CIMM and discovered the collection of skeletons on display. Inaugurated last year, "Ballet of the Whales" was a big hit once again this season, wowing children and adults alike.



Marine Mammal Interpretation Centre (CIMM)

Despite a rocky year, GREMM was able to pursue its educational mission thanks to financial assistance from the federal and provincial governments, especially the support from Quebec's Ministry of Culture and Communications as well as Canadian Heritage. The CIMM, which has been recognized by Quebec's Ministry of Culture and Communications as a scientific museum institution since 2000, now receives recurrent financial support.

WHALE PORTRAITS CELEBRATES ITS 20TH ANNIVERSARY!

This year marked the 20th anniversary of *Whale Portraits*, a GREMM publication intended for captains and naturalists working with the whales of the St. Lawrence. The newsletter was first published in 2001 to facilitate exchanges between researchers and teams working with the public in the Saguenay-St. Lawrence Marine Park. Over time, the style, format and team of *Whale Portraits* has changed. However, the purpose of the publication has remained the same: to inform and raise awareness within the whale-watching industry by offering short, educational and entertaining articles to encourage its members to adopt more environmentally-responsible practices.

For the 20th anniversary of the publication, *Whale Portraits* set out to expand its reach to cover the entire St. Lawrence. The aim is to facilitate exchanges between researchers and observers throughout the St. Lawrence in a bid to encourage whale-watching companies across Quebec to adopt higher ecotourism standards. The fact that whales are not confined to borders of any sort makes it all the more important to collaborate with captains, naturalists and researchers working beyond the boundaries of the Marine Park to better understand how these giants use these waters and better protect them.

Efforts to expand the distribution of *Whale Portraits* commenced in Spring 2021 when project manager Laure Marandet travelled to the Gaspé Peninsula to meet with regional players in the whale-watching industry.

The publication was very well received, with approximately twenty new contacts being added to our mailing list. The season also brought a special edition intended for stakeholders throughout the St. Lawrence (including those in the Gaspé and Mingan sectors) that highlighted observations, activities and industry players in these regions. A total of 16 editions of *Whale Portraits* were published over the course of the summer and distributed in person, by post or by email to some 300 contacts, including a hundred or so members of the whale-watching industry.



— 2002



— 2009



— 2021

EDUCATING BOATERS HOW TO NAVIGATE WHALE HABITAT

GREMM also carries out a variety of outreach activities. In a partnership with the Marine Mammal Observation Network (MMON), Parks Canada and Fisheries and Oceans Canada, GREMM is participating in the campaign "Show your care, keep your distance" to educate the public on rules to follow in the presence of belugas. The cornerstone of this campaign is the Navigating Whale Habitat training program. Specifically developed for recreational boaters, this training is offered at no cost in both French and English. Using simple, playful language, it provides an overview of the marine mammals of the St. Lawrence and their environment and presents the rules to follow on board any type of watercraft, be it a sailboat, motorboat, kayak or paddleboard. Once again this year, GREMM undertook to promote this tool on all our platforms and to keep the training program up to date. In the summer of 2021, a little over 2,200 people consulted the site and 303 users completed the training, making them new allies in protecting belugas while they're out on the water.



FASCINATING AND EDUCATING

BETTER PROTECTION

GREMM IN THE MEDIA

Once again, the cases handled by the Quebec Marine Mammal Emergency Response Network, articles published on *Whales Online*, activities of the Marine Mammal Interpretation Centre and the research work conducted by GREMM, not to mention the whales themselves, made headlines in the media. No fewer than 131 interviews were given to the print, radio, and TV media.

As part of a feature on *La semaine verte*, Robert Michaud answers a journalist's questions on the unusual visit of a humpback whale to Montréal in 2020. Produced by James Cameron and presented by Disney+ in collaboration with National Geographic, the documentary series *Les secrets des baleines* chronicles the story of the narwhal that has been observed in the St. Lawrence since 2016. Radio-Canada's *Découverte* also picked up the story of the narwhal and its beluga companions, this time with a more forward-looking perspective.

Such a considerable presence in the media enables us to carry out our education and conservation mission: talking about whales and their precarious situation helps place the environment at the forefront of public concern.



With some 930,000 visitors in 2021, the Whales Online website and its French-language version Baleines en direct continue to garner a strong following. The articles, columns, field notes and encyclopedic pages dedicated to cetaceans make science more accessible while creating a bridge between the general public and marine mammals. On the social networks, the creation of an Instagram page has been instrumental in reaching a younger audience, while our Facebook and Twitter pages continue to attract new subscribers. The most popular column remains the observations of the week. A special thanks to all of our contributors who share their marine mammal sightings, week in and week out! Are you subscribed to the Whales Online newsletter?



WINDOW ON BELUGAS

Since 2019, GREMM has been working in collaboration with the Marine Mammal Observation Network (MMON) on a bold undertaking blending science and education. Based on a 2018 pilot project carried out in Baie Sainte-Marguerite, Window on Belugas will attempt to establish a network of "connected" observation sites to offer live streams or delayed broadcasts of beluga images and sounds captured simultaneously by overhead drones and underwater hydrophones, respectively. The combination of sounds and images will be used for scientific purposes and presented to visitors to our partners' sites, allowing them to see and hear the richness of the belugas' social lives while offering them an exciting alternative to whale-watching at sea!

The pandemic significantly slowed down the development of this project. In Fall 2021, the financial participation of the Government of Quebec, which had been expected since 2019, was ultimately confirmed, giving new impetus to the project. Marie Spehner joined GREMM's team as Window on Belugas coordinator with the goal of relaunching the project. Efforts were quickly ramped up to design and develop the recording and retransmission system, develop interpretation activities, create educational video clips and sign partnership agreements. The first beluga brigades are planned for deployment in Summer 2022.

Window on Belugas Partner Sites:

The Baie Sainte-Marguerite beluga lookout in the Fjord-du-Saguenay National Park (Sépaq);

Putep 't-awt, a beluga observation site in Cacouna located on the sacred mountain of Gros-Cacouna (Wolastoqiyik Wampanagik First Nation);

The Pointe-Noire Interpretation and Observation Centre in Baie-Sainte-Catherine (Parks Canada);

The Marine Mammal Interpretation Centre in Tadoussac (CIMM-GREMM).



QUEBEC MARINE MAMMAL EMERGENCY RESPONSE NETWORK: STATUS REPORT

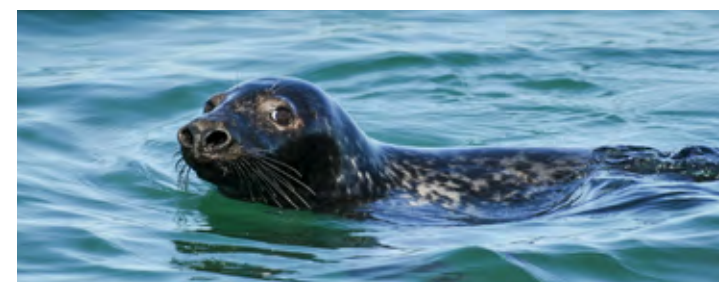
In 2021, the Quebec Marine Mammal Emergency Response Network (QMMERN) responded to a considerable number of calls. The Network handled a total of 730 reports, which translated into 417 separate cases involving marine mammals.

Throughout the year, belugas were often the focus of the Network's attention. On several occasions, they were reported outside their normal summer range. These observations often concerned animals swimming alone, which is unusual for such a gregarious cetacean. In the summer months, belugas are found in the Upper Estuary, i.e. upstream of Rimouski and Forestville. In 2021, nearly a dozen cases were recorded farther east (downstream) in Matane and Bonaventure, as well as in Prince Edward Island, New Brunswick and Nova Scotia.

Fascinating discoveries were made in Gaspé and in Chaleur Bay: a leatherback turtle carcass was reported, as were two stranded Northern bottlenose whales. The leatherback turtle, an endangered species as well as the largest turtle in the world, visits the waters of the St. Lawrence in summer in search of jellyfish. The presence of these individuals from the Atlantic population in the area is of particular interest to the QMMERN's partners. In the case of the Northern bottlenose whales in Listuguj, the skeleton of the individual that perished will be preserved and ultimately prepared for display at the CIMM museum.

As is the case every year, the QMMERN received a number of calls regarding seals. Some animals were discovered in unusual places, like a grey seal pup at an inland location in the Magdalen Islands or a bearded seal in Laval. The QMMERN also played an educational role by reminding the public of the importance of not disturbing young or adult seals on the beach, as well as what course of action to take should an injured animal be found.

For its interventions, the QMMERN was able to count on a team of experienced volunteers. Thanks to the involvement and dedication of these 234 volunteers, the Network was able to gather precious scientific data for marine mammal conservation.



Grey seal



Northern bottlenose whale, Restigouche © QMMERN

MAKE A DONATION

CONTRIBUTE TO GREMM

A DONATION FOR THE PRESENT

Every year, we spend hundreds of hours at sea with whales in an effort to better understand them and meet with tens of thousands of individuals whom we help get better acquainted with these fascinating animals. With your donations, we will be able to do even more.

You can make a donation by sending us a cheque, contacting us at 418-235-4701 or visiting our website at gremm.org/en/donate/. Whether it's \$50, \$20, or even just \$5, your monthly donations all add up! We also accept donations in the form of stocks, material, capital property and bequests.

GREMM is a registered charity organization and an official donation tax receipt will be issued for any donation of \$20 or more.

A DONATION THAT WILL GIVE US A WHALE OF A BOOST!

Show your support for marine mammals with a plaque in front of Tadoussac's Marine Mammal Interpretation Centre. Your message will be engraved in one of the 600 plaques that will form the outline of a life-size blue whale. Each plaque represents a generous donation of \$1,000.

A DONATION FOR THE FUTURE

Whales have a life expectancy comparable to our own. To understand them, they need to be monitored from generation to generation. Their protection requires sustained actions over the long term. With your help, we are preparing the next generations of researchers and citizen scientists.

Our Research and Education Endowment Fund, managed by Fondation Québec Philanthrope, has collected nearly a half a million dollars to date. Proceeds from these funds are used to:

- Ensure the long-term pursuit of our research and education programs;
- Consolidate our permanent team as well as ensure succession;
- Host master's students or doctoral candidates.



Plaques forming a life-size blue whale outline in the CIMM's Jardin de la Grève.

ADOPT A BELUGA

In addition to being a thoughtful and philanthropic gesture, adopting a beluga allows you to pair up an individual, organization, business, school or group with a St. Lawrence beluga. Thanks to photo-identification, the belugas available for adoption have been known to our research team for years. They each have a life story to which you can contribute. By adopting a beluga, you will be making a financial contribution to scientific research, participating in the search for solutions to stem the decline of the population, raising awareness in the plight of the species and demonstrating your attachment to the St. Lawrence and all its denizens.

How does it work?

1. Select your beluga from amongst those featured in the "family album." No need to provide it with food or shelter... We'll keep an eye on your beluga for you when we're out on the water.
2. Come up with a name, which we will subsequently use to reference this individual in all of our official communications.
3. Make your donation of \$5,000 to complete the adoption. We encourage sponsors to renew their donation two times to symbolize the three years that a female cares for her calf. Smaller budget? Consider participating in a collective adoption.
4. Receive news about your beluga and the scientific research conducted on your behalf.

INVALUABLE DONATIONS

Of the CIMM'S 37,000 or so visitors this year, we should mention artists Safia Nolin and Pomme, both of whom care deeply about whale conservation, especially belugas. Québécoise at heart, French singer-songwriter Pomme chose to pen a tune about the belugas of Tadoussac. With her delicate voice and moving music video, she strikes a chord with many a listener while at the same time helping the CIMM in its outreach mission. All proceeds generated by the song "À perte de vue" will be channelled back to GREMM to support conservation research and the protection of these cherished white whales that are so emblematic of the St. Lawrence.

Listen to the song here:



© Pomme, Universal Musique

THANK YOU FOR YOUR SUPPORT

OUR GENEROUS DONORS WHO GAVE OVER
\$250 OR WHO REACHED THIS THRESHOLD
IN 2021



Kate Alexander, Simon Beaudry, Emily Cole, Julie Deshaies, Richard Elson, Mireille Fisette, Cynthia Fish,
Anne Greschuk, Ken Hough, Odile Jalbert, Édouard Maccolini, Anais Palmers, Adelaide Park Gomer,
Michael Parfig, Nathalie Pratte, Stéfanie Simon, Keith Wilkinson

AdoptaBeluga.org

In 2021,

5 BELUGAS
joined the family.

Ultra, Les Trails du Saguenay-Lac-Saint-Jean (Béluga Ultra Trail) • *AL*, Les Bières Béluga Ltd (Foodrinc)

Bubulle, collective adoption • *Montpetit-Gustave*, collective adoption • *Nona*, Édouard Maccolini

They join the 56 belugas adopted since 2014.

ALBIORIX, Mathias Buchi • *AMALENA*, Road Scholar • *ANIMO*, devoted viewers of the program *Animo*

ANNAKPOK, Canada Steamship Lines • *APRIL*, le Regroupement des plaisanciers du Québec • *AQUABELLE*, Aquarium du Québec

AQUARELLE, City of Lévis • *ARTSEA*, customers of Simons department stores • *ATHÉNA*, collective adoption • *BÉLIBEC*, ville de Québec

BE-LOU-GA, Red Rock Films • *BLANCHE*, Tadoussac • *BLANCHON*, Yolande Simard Perrault • *BLEUOUTREMER*, Bleuoutremer

BLUE, Ella Issac • *BRAD*, Gail Wylie, in memory of Brad Wylie • *CANDY C*, Tiffany Chamandy and Matthew McMillan

CŒUR, Manon Ratelle • *DELPHI* et *LEUCAS*, two belugas entrusted to the Right Honourable Justin Trudeau, Prime Minister of Canada, and

the Honourable Philippe Couillard, Quebec Premier • *DL0370**, Vancouver Aquarium • *DL0553**, Tadoussac Summer Community

DL?, Eleonore Rose Casserley • *DL1214**, Shedd Aquarium • *DL1670**, Great Lakes and St. Lawrence Cities Initiative

*DL1935**, Mylène Paquette • *DL9071**, anonymous • *DOROTHY*, Mathijs and Anneke Wittink • *ÉCHO*, David Heurtel • *FAYO*, Mongeau family

GASTON, Pratte family • *HECTOR*, Les Cowboys Fringants and their fans • *HOPE*, collective adoption • *JP*, Jacob Issac

LULA, CIMM naturalists and visitors • *MADELEINE*, Bourgault family • *MARJO*, 10th medical congress on emergency medicine in regional

communities, Haute-Côte-Nord–Manicouagan CSSS • *MIRAPAKON*, MIRAPAKON Inc • *NEIGE*, *NICS*, *SOLIDAIRE*, *BILOU* et *CICA*, riverside municipalities of the St. Lawrence • *NIKAMUN*, Project Red Alert • *NOMI*, Road Scholar • *NOVO*, W. Maxwell Agendas • *OCYA*, collective

adoption • *OR BLANC*, Salaberry-de-Valleyfield, Beauharnois and Châteauguay • *POLYNIX*, collective adoption • *PURE LAINE*, Cynthia Fish

SERENA, Jo-Ann Florida • *SPLASH*, Ville de Montréal • *UAPAMEK*^U et *SAMAKWAN*, Prince Jacques and Princess Gabriella of Monaco

And the 130 adopted
in between 1988 and 2013

Thank you!

* Names to come



Part of the 2021 GREMM team

GREMM OWES ITS 36 YEARS OF SUCCESS TO ITS CREATIVITY, ITS AUDACITY, ITS EFFICIENCY, ITS RIGOUR... BUT ESPECIALLY TO ITS PARTNERS. TOGETHER WITH YOU, WE CONTINUED TO PURSUE OUR MISSION IN 2021:

« BETTER UNDERSTAND THESE ANIMALS, RAISE AWARENESS ABOUT THEM AND BETTER PROTECT THEM »

Special thanks to:

AMPHIBIA-NATURE, ANIMAVISION (ALAIN BELHUMEUR), AQUARIUM DU QUÉBEC, CAMPOBELLO WHALE RESCUE, CANADIAN MUSEUMS ASSOCIATION, CANADIAN WHALE INSTITUTE, CENTRE D'ÉDUCATION ET DE RECHERCHE DE SEPT-ÎLES, CENTRE QUÉBÉCOIS POUR LA SANTÉ DES ANIMAUX SAUVAGES, DEPARTMENT OF BIOLOGY OF SAINT MARY'S UNIVERSITY, DEPARTMENT OF NATURAL SCIENCES OF UNIVERSITÉ DU QUÉBEC EN OUTAOUAIS, ECO-WHALE ALLIANCE AND MEMBER COMPANIES, ENVIRONMENT AND CLIMATE CHANGE CANADA, EXPLORAMER, FACULTY OF VETERINARY MEDICINE AT UNIVERSITÉ DE MONTRÉAL, FERME 5 ÉTOILES, FISHERIES AND OCEANS CANADA, FONDATION QUÉBEC PHILANTHROPE, GEORGIA AQUARIUM , LE QUÉBEC MARITIME, MARINE ANIMAL RESPONSE SOCIETY, MARINE MAMMAL OBSERVATION NETWORK, MÉRISCOPE, MINGAN ISLAND CETACEAN STUDY, MONTRÉAL SPACE FOR LIFE – BIODÔME, MUNICIPALITÉ DE TADOUSSAC, MYSTIC AQUARIUM , NEW ENGLAND AQUARIUM, PARKS CANADA, RAINCOAST CONSERVATION FOUNDATION, RENAUD PINTIAUX, RENÉ ROY, RESEARCH GROUP IN ENVIRONMENTAL TOXICOLOGY AT UNIVERSITÉ DU QUÉBEC À MONTRÉAL, SAGUENAY-ST. LAWRENCE MARINE PARK, SHEDD AQUARIUM, SOCIÉTÉ DES ÉTABLISSEMENTS DE PLEIN AIR DU QUÉBEC, SOCIÉTÉ DES MUSÉES QUÉBÉCOIS, ST. LAWRENCE NATIONAL INSTITUTE OF ECOTOXICOLOGY, WHALE RELEASE AND STRANDINGS, WHALE STEWARDSHIP PROGRAM, WOLASTOQIYIK WAHSIPEKUK FIRST NATION, OBSERVERS FOR THE OBSERVATIONS OF THE WEEK COLUMN, CITIZENS AND BUSINESS OWNERS OF TADOUSSAC.