



Linguists of the Sea

Belugas chirp, click, whistle, buzz and shriek. Experts say they're not just making noise — they're speaking

By Zack Metcalfe Photography by Ellen Cuylaerts



A pod of belugas in Hudson Bay near Churchill, Manitoba.

Each spring, the largest population of beluga whales in Canada departs its wintering grounds in the Hudson Strait and swims southwest into Hudson Bay. Following the coastline in a clockwise migration, the whales eventually

congregate in a series of estuaries on the western shore. It's here, where the Seal, Nelson and Churchill rivers empty into Hudson Bay, that they will spend their summers. There are 54,000 in this population alone, perhaps significantly more.

Maybe they come to escape the killer whales prowling the open Hudson, or to feed on the capelin that populate each estuary, or to give birth and moult in waters relatively warm and shallow. Whatever their reasons — and researchers can't say for sure — they are a force of nature, arriving from mid-June through July, turning the water white in a continuous show of porcelain backs, coiling as quickly as waves, and sending their whistles, calls and clicks through the water.

That belugas are capable of passing knowledge from one generation to the next is on display during these seasonal migrations. A newborn calf learns from its mother where their ancestors have summered and wintered for thousands of years, such that belugas born into the western Hudson Bay population will faithfully summer in the western Hudson Bay, even though their migration route takes them past the estuaries of the eastern Hudson Bay and James Bay beluga populations much sooner, populations they overlap and intermingle with during winter. These "migratory traditions" are learned behaviours, defining populations that would otherwise be indistinguishable.



My kayak was among the last from our group to hit the Churchill

River estuary late in July. Being a strong paddler and a zealous twit, I promptly took the lead over fellow tourists, closing the gap between us and the 4,000 belugas that might at any time be found off Churchill, a Subarctic community of northern Manitoba built on the border between boreal and tundra. We could see belugas from shore, surfacing by the dozens in every section of the estuary. But when I cruised headlong into their domain, they were suddenly absent, a peculiar quiescence that made me pause, then put down my paddle.

For a moment all was still. Then, my kayak began to move as if under its own power, slowly at first and then in bucks and lurches. I twisted in my seat to discover three or four grey and blue juveniles shoving me forward, pressing their bulbous heads into the hard plastic of my kayak. "Belugas like to play tag," is how we'd been prepped for this interspecies horseplay.

Until you've had a two-tonne marine mammal nuzzle your flimsy solo kayak, you really cannot comprehend the potent blend of delight and terror it provokes.

We would see a lot of these whales over the coming days, from kayak or ship or Zodiac. At a distance, it's easy to imagine their procession of dorsal ridges belonging to a single, massive serpent, but up close it is a riot of swimming individuals, comprising separate pods of males and females with calves, the infants riding their mother's hip, the so-called "echelon position," to stay in her jet stream and keep pace with the stronger, faster adults. On close inspection, the white skin of the adults is deeply grooved by networks of scars, almost hieroglyphic in revealing the random adversities of life, including the distinctive, parallel lines left by their fellow belugas "raking" their teeth along their backs.

The vertebrae of the neck are not fused in belugas as they are in most whales, so while humpbacks must pivot their entire bodies to look behind, belugas merely turn their heads. Floating among them, their long faces swivelled to stare unambiguously back at us, they appeared to be asking us the same questions we have for them: What are you? Why are you here?

When European mariners first encountered belugas in and around the St. Lawrence River (the most southerly population in the world), two features of this novel "fish" stuck out to them: first, the snowy whiteness of their skin, and then their calls, clearly audible through the wooden hulls of passing ships. Belugas became known as "canaries of the sea." It is an enduring misnomer.

Canaries sing by calling upon a limited repertoire of melodies they repeat ad infinitum. Humpback whales sing too, composing and exchanging tunes throughout a season and across populations. Their songs help them find mates and intimidate rivals. But some researchers say belugas do more than sing; they speak.







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Valeria Vergara, co-director of the Raincoast Conservation Foundation, has studied beluga vocalization since 2002, initially among captive whales in the Vancouver Aquarium and now in the wild, off Nunavut's Somerset Island, along the St. Lawrence River and throughout Hudson Bay. She joined the same Churchill expedition I was on, and was a regular fixture on board, next to the speaker connected to a hydrophone under the boat, playing for us the ruckus melody of beluga speech occurring just beneath us, a dizzying array of chirps, clicks, claps, whistles, buzzes and shrieks.

While we have no clue what belugas are actually saying to one another, experts have managed to organize beluga vocalizations into broad categories. Vergara can distinguish belugas that are fighting from those that are playing, for instance, not by understanding the substance of their dialogue, but by interpreting the tone and tenor of their noises. The whales were not always visible from our boat, hiding a few feet beneath the translucent waters of the Churchill River, but we could hear them, dozens of them, Vergara describing the drama with a trained ear. These ones are fighting, she would say, and those ones are using echolocation to study the hydrophone. A pod nearby is playing, or else they're having sex. Somewhere, a mother is looking for her calf.

Humans use phonemes (units of sound we arrange to produce words) and syntax (the arrangement of words to produce sentences) to convey an extraordinary range of ideas. We also speak using symbolic references, to ourselves, to others, to coming storms or shifting seasons, and how each will affect the others.

"We don't know if those attributes of human language exist in belugas," said Vergara, "but the more we study them and the more we discover, the more it seems that they might. [Their speech is] extraordinarily complex and I think we're nowhere near deciphering it."

Her career has been dedicated to one beluga sound in particular — contact calls. These have been identified in several species of social mammal, even some birds, which typically use them to maintain group cohesion, whether in a herd, flock, pod or troop.

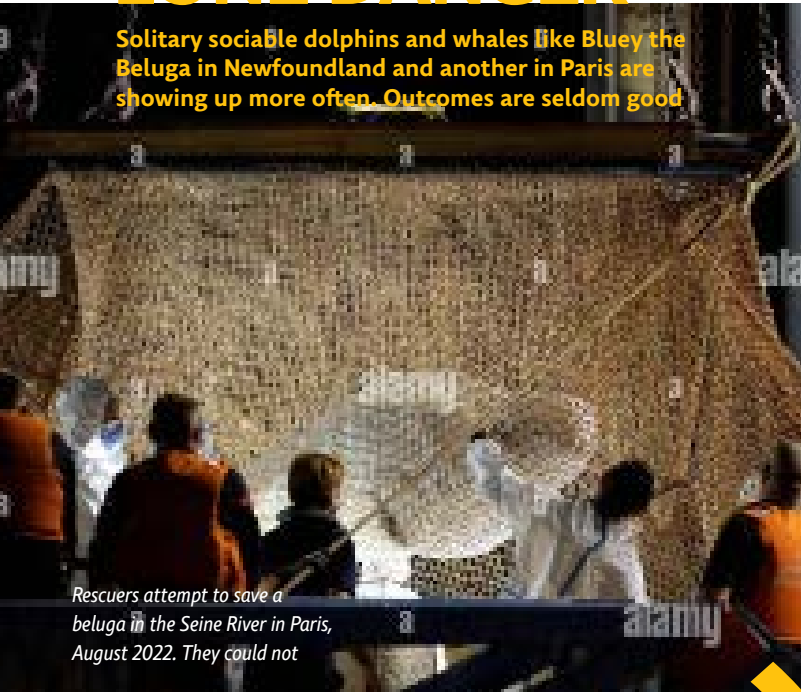
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"In belugas," said Vergara, "contact calls sound like a chainsaw married a rusty door."

What seems to vary from one species to another is not the nature of the contact call — each has evolved to stand out from the background chatter of the species — but rather the call's complexity. Sperm and killer whales tend to remain in the same tight-knit groups for a lifetime, using contact calls to announce their membership in a particular pod or population. Belugas are more gregarious, moving freely from one pod to another, visiting old friends and making new ones. Vergara contends that beluga contact calls are more sophisticated precisely to accommodate these "fission-fusion" societies, in which strong relationships are formed between individual belugas that do not necessarily stay together. Specifically, she believes each beluga generates a contact call entirely unique to itself, a genuine vocal signature. In essence, a name.

LONE DANGER

Solitary social dolphins and whales like Bluey the Beluga in Newfoundland and another in Paris are showing up more often. Outcomes are seldom good



Rescuers attempt to save a beluga in the Seine River in Paris, August 2022. They could not

Fronting Random Sound on the east coast of Newfoundland not far

north of Come-By-Chance, Clarenville is a nice place with an interesting local history. That lore grew over the last few years thanks to a wayward white whale loitering in its harbour. The errant beluga hung around so much the locals eventually gave it a cute moniker, Bluey. He made the news in the summer of '21 when he was rescued from entanglement. Despite the care taken by locals in and on the water, he had been caught up in gear at least five times and nearly hit a few times as well. He made the news again a few months later when he died as a result of another entanglement. It seemed inevitable.

Bluey may have been what is called a “solitary sociable cetacean.” Increasingly common, it refers to a single individual of a non-native dolphin or whale species residing in an atypical locale. Lacking interaction with their own species, these normally social creatures eventually draw nearer to humans, seeking touch, play and other social interactions. Inevitably, local media pick up the story, and everyone comes out for a look. Newspapers in London and Paris recently have reported on huge crowds gathering to observe whales in the Thames and the Seine. Selfie-time.

The problem is that while they may appear playful, even childlike, the whales are wild animals, powerful and unpredictable. Worthy of caution and respect. As human interactions rise, so too do wildlife management and animal welfare issues and, frequently, the untimely death of the animal.

It is a sad story that is happening more than ever. In Canada, reports of solitary belugas have increased. No one is certain why, but a partial theory is that as populations have dropped (due to human causes), the distance between pods has increased. When an individual becomes separated — more likely with increased noise pollution, food scarcity and ship-strike fatalities — it is much less probable the solitary whale will be able to re-find its pod or come across another to join.

“They’re literally swimming around advertising their identity,” said Vergara.

True vocal signatures of this kind have been confirmed only in some species of dolphin. Proving their existence among belugas has been an exercise in perseverance, but Vergara has published a wealth of preliminary evidence to support her hypothesis and hopes to settle the matter soon, drawing on more than 90 hours of recorded beluga speech from 22 known individuals in the St. Lawrence River.

Belugas are auditory creatures. In the haze of the Arctic Ocean, where darkness reigns for six months of the year, sound is their only guide. Since water conveys sound five times more efficiently than air, beluga adults can communicate across up to six kilometres.

“They use echolocation and sonar to find their food,” said Vergara. “They use sound to advertise, to maintain group cohesion for moms and calves, to stay in touch with one another, to stun prey — you name it. They are a very, very sound-centred species.”

But the ocean is getting louder. The myriad propellers of increasing ship traffic are producing what researchers call “acoustic smog,” reducing the range over which belugas can effectively communicate. Hudson Bay is still a relatively quiet place, but as the summers grow longer, and the more ice melts, more shipping traffic will come to the Northwest Passage, made accessible by a warming climate.

The belugas of the St. Lawrence River, far to the southeast, already suffer extremes of acoustic fog. They offer a disquieting preview. Vergara, who has studied this population since 2008, has demonstrated the range of their calls drops by roughly half in the presence of ship traffic. For adults, it is challenging, but for newborn calves, it can be life-threatening. Their developing voices carry just 360 metres under ideal conditions, a range that acoustic fog can reduce to 170 metres. It’s not unusual, said Vergara, for an infant to stray 170 metres from its mother, something that may help explain the alarming number of dead calves washing ashore in the St. Lawrence River.



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Solutions abound for acoustic fog. Ships can slow down or avoid beluga hotspots at key times of year, two strategies now used in the St. Lawrence River. Noise reduction technologies also exist, including specialty propellers that do away with spinning blades. These alternatives cost money but could reduce the impact of acoustic fog before it reaches Hudson Bay.

Our final day on the water was via Zodiac, promptly swarmed by pods of boisterous males, their bodies long and wide, gliding beneath and around us, emitting deep, foghorn moans. And while they were splendid, their female counterparts, which we joined soon after, were by far the more interesting.

Beluga females are cooperative in the extreme, sharing the responsibility of child care so completely that researchers struggle to pair calves with their biological mothers. Females will nudge unrelated calves back into formation if they go astray, provide them with a jet stream in which to swim, hoist them above water so they can catch their breath, even spontaneously lactate to give them milk. Female belugas undergo menopause, a sign of prolonged social utility.

Vergara has seen what she calls beluga “kindergartens,” during which younger females watch over several dozen rambunctious infants while their biological mothers are otherwise engaged. She has also witnessed groups of females taking turns comforting a frightened calf, wrapping their tails around the tiny creature until its cries subside.

Some of this was on display in the Churchill River, especially when we shut down our engines and allowed a pod to overtake us in a chorus of spouts. Infants were unmistakable in the crowd, smooth but for the occasional roll of superficial fat, their faces expressionless, their visits to

the surface enthusiastic and sudden, punctuated by the sharp rise of their chins. One infant thrust its head above the water immediately next to our Zodiac, then lingered a long while, staring at us in abject curiosity, its mouth slightly agape.

It looked to be very young, which means it would spend the next two years learning the speech of its elders, even as it made the autumn migration to the Hudson Strait, perhaps for the very first time. Whether it would turn east and depart Hudson Bay counter-clockwise or turn north, swimming first up the western shore and departing through Roes Welcome Sound, between the Nunavut mainland and Southampton Island, we couldn't say.

All things being equal, this infant should outlive me, but its ocean will be one of constant climatic and acoustic change, perhaps on unprecedented scales. One can only hope the cultural, cognitive and communicative tools of the beluga are enough for it to adapt to a changing world, and that we Canadians have the forethought to meet it halfway, preserving an Arctic in which belugas can thrive. 🐋

BELUGA WHALE

One of only two members of the family Monodontidae (the other is the narwhal)

Adult males can weigh up to 1,900 kilograms and be 4.5 metres long. Females generally are about 80 per cent smaller

Easily distinguished by their white colour, stout bodies, visible necks and small heads, belugas don't have a dorsal fin

Belugas have a heavy layer of blubber (for insulation and energy storage), very thick skin and sharp teeth. Their short paddle-like flippers are broad and powerful (on males, they have a distinctive upward bend)

In the wild, belugas can live for 75 years or more, reaching sexual maturity around 12 to 14 years for males; females mature between 8 and 14 years

All belugas are warm-blooded, air-breathing mammals, capable of vocalizing a wide range of repeating sounds from high whistles to low grunts

They use echolocation to sound out prey such as squid, crabs, shrimp, clams, mussels, snails and all manner of fish

The English name “beluga” is derived from *bielo*, which in Russian means “white.” In fact, beluga are born slate grey and turn white only about eight years after birth

Belugas breed about every three years, from April to June; after a gestation period of more than 14 months, the female gives birth to a single 1.5-metre calf in July or August

Maktaaq, or muktuk, a traditional food source for Inuit that consists of whale skin and blubber, often comes from belugas