THE CENTRAL ARCTIC OCEAN

Accessing the No Longer Inaccessible

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Take 10 strangers, two sailing yachts, and a dog to the Central Arctic Ocean (CAO), the most remote corner of the Arctic, and you would probably think it's the perfect recipe for disaster. We were setting out to sail as far north as possible in this unsailed ocean and to conduct vital scientific research in this unique and fragile environment as part of a project called Arctic Mission. Other than four highly experienced ice skippers, Frances Brann, Jaap van Rijckevorsel, my husband Erik de Jong, and me, the rest of the Arctic Mission team had never worked together, including a few that had never sailed before or been to the Arctic. How were they going to handle being at sea with no land in sight for up to six weeks or longer if we inadvertently got stuck in the ice?

When polar explorer Pen Hadow first approached us about sailing through the Bering Strait and into the CAO, I have to admit that we initially thought it wasn't possible without freezing in and drifting into its waters like the *Fram* in 1893 or the *Tara* in 2006. Instead, a quick look at the ice charts from the previous summer showed us that Pen's proposal was actually achievable. While it was exciting to have the

***Bagheera* and *Snow Dragon II* conning through broken sea ice.**

opportunity to explore a newly accessible part of the Arctic, it was shocking to see so much open water in an area that has historically been shielded by perennial ice.

Pen knew exactly how we felt. He had been to the North Pole many times, but on his last trek he could not believe the amount of water he was encountering. This led him to start planning Arctic Mission with three simple goals in mind. First, show the world how accessible and vulnerable the CAO has become by sailing two yachts as far north into its waters as the sea ice allows. Second, conduct scientific research to find out more about the ecosystem in the CAO. Third, use our findings to stimulate discussion about whether commercial fishing and shipping should take place in these international waters.

While it was challenging enough getting *Bagheera* and *Snow Dragon II* ready with limited funding and time, we also had the added bonus of knowing that we would be going beyond the insurance limits of our boats. A comforting thought, I assure you! Not that the perks on offer for our fellow team members were any more glamorous. In return for paying their own way to Nome, Alaska, they got seasickness, tight living conditions, and limited possibility of rescue if anything went wrong.

In addition to the increased safety factor of going with two boats and four ice skippers, I had the opportunity to co-skipper *Bagheera* with Erik. While I normally tell people that two boats are the secret to a happy marriage, it is nice to occasionally sail together on the same boat for more than the odd day.

Even though 2012 had the lowest summer sea ice extent on record, the most intriguing to us was the ice situation of September 2016. That would, to a great extent, predict how the ice was going to break up during the summer of 2017. When the Arctic refreezes in the fall, the ice that is still there becomes second-year and multiyear ice and hardens up over the winter. While newly formed first-year ice is brittle and will be the most vulnerable during the summer melt, second-year ice and multiyear ice takes much longer to melt and erode. Generally speaking, you can say that the breakup of the ice occurs in a similar order as the freeze-up. According to the 2016 ice chart, we would have been able to sail all the way up to 88° N in the CAO, and with the winter ice extent of 2017 being a record low, we had reason to believe a similar breakup would occur the following summer.

By the time our departure date arrived, even Fukimi, our 19-month-old Shikoku ken, was ready to leave the never-ending list of boat tasks behind and head out to sea. The weather, however, had other plans,

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Krystina at the helm of *Bagheera* with Fukimi providing additional ice watch.

The Arctic Mission team at 80 North, from left to right: Conor McDonnell, Heather Bauscher, Jaap van Rijckevorsel, Frances Brann, Nick Carter, Erik de Jong, Tim Gordon, Krystina Scheller, Fukimi, Pen Hadow, and Tegid Cardwright.

and we spent an additional week in port, waiting for the strong north wind blowing through the Bering Strait to settle down. While *Snow Dragon* floated comfortably in Nome harbor with her five-foot draft, *Bagheera* and her 10-foot draft were not having the same experience, and she found herself balancing on her keel, with her waterline increasingly exposed as the gale continued to blow the water out of the harbor.

While Pen and the team doctor, Nick Carter, decided to put their extra time in port to good use and scrubbed *Bagheera's* exposed waterline, Jaap continued to work on setting up an Iridium Pilot on *Bagheera* and an Iridium Go! on each boat. Though we had worked with Jaap before and knew he was a highly capable skipper who was always willing to lend a helping hand, it was a welcome surprise to find out that he was also an information technology expert. Every member was willing to contribute beyond their assigned roles, which really helped all 10 of us feel like a team even before we left port.

Once the gale subsided and the water began returning to Nome harbor, we were finally able to untie the dock lines and begin making our way north. It wasn't long before we lost the protection of the Seward Peninsula and found ourselves adjusting to life at sea as we motored into the steep seas left behind by the gale. Conor McDonnell, our expedition photographer, decided the best way to cope with his new surroundings was by not leaving his horizontal position on *Bagheera's* salon couch until we arrived in the CAO. His ability to sleep through the six-day passage became a legendary event that caused a bit of good-natured jealousy amongst other team members who couldn't manage

Fukimi playing on the ice.

to force their bodies to sleep through the entire passage. Meanwhile, on *Snow Dragon*, scientist Tim Gordon managed to get his seasickness under control by hand-steering in the Chukchi Sea, which made him feel as if he was evolving from a land crab to a sea crab.

The division between the United States' 200-mile exclusive economic zone and the CAO might be invisible, but we felt a noticeable difference as we entered the flat calm waters of the Central Arctic Ocean near 163° west longitude. The conditions were perfect for Tim

and wildlife biologist Heather Bauscher to begin their work. After carrying out scientific research from *Snow Dragon*, including doing a vertical drop to gather water samples and temperature information from different depths by using *Snow Dragon*'s spinnaker pole as a hoist, they readied the tender in preparation for acoustics sampling. Once the science team was ready, both *Bagheera* and *Snow Dragon* motored away from the small inflatable.

Suddenly the fog rolled in, and Tim, Heather, and Conor found themselves sitting in a small tender surrounded by nearly freezing water, with both *Snow Dragon* and *Bagheera* drifting over a mile away with all instruments except VHF and radar turned off in order to minimize noise interference with the acoustics sampling. While there were frequent position updates and VHF communication, it was still a humbling experience for the science team. Once they were ready to be picked up, Frances gave them a course to steer towards *Snow Dragon* as she approached their location. While the radar picked up the dinghy clearly, it wasn't until *Snow Dragon* was just over a boat length away that the ghostly shape of three relieved faces in a small boat loomed out of the fog.

> *"Though we now occasionally needed to make navigational adjustments to avoid bands of ice, we still found ourselves regularly in open water, clear all the way to the horizon. We needed to pre-plan our stops on the ice to ensure we found suitable floes."*

The calm water was also a clear sign that we were nearing the ice edge. Just after midnight, the water temperature dropped to 33° F and we knew we were approaching the ice. With the dense fog, we were completely reliant on our radars, which dutifully picked up the ice edge ahead of us. Once we started to encounter larger ice floes that were stable enough to walk on, no one was more excited to leave the boats than Fukimi, who leaped across the ice like a young fawn. While the presence of ice made it easier to transfer team members and gear between the boats, it also meant we had to keep an even more vigilant polar bear watch, both on and off the boats. The day after we began seeing scattered ice, Frances spotted fresh polar bear tracks as she steered *Snow Dragon* between the floes. While Frances focused on navigating, Heather scanned the ice ahead with her binoculars and spotted tiny off-white specks in the distance that turned out to be a mother with cubs.

Though we now occasionally needed to make navigational adjustments to avoid bands of ice, we still found ourselves regularly in open water, clear all the way to the horizon. We needed to pre-plan our stops on the ice to ensure we found suitable floes. There was no question in our minds that the CAO was already easily accessible for commercial fishing vessels if they wished to fish these waters.

A few days after our arrival in the CAO, Nick asked, "Do we need to switch water tanks?" When he opened the galley tap to demonstrate his point and nothing came out, it was an alarming realization that a third of our water supply was gone in just over a week. The tank meter was still registering nearly three-quarters full. Could our new tank meter really be faulty? We switched tanks, but after the foot pump also failed to produce any water, we decided there must be a blockage in the waterline. When an air gun powered by a dive bottle did not resolve the issue, Erik unscrewed the inspection hatch from the water tank and found a thick layer of ice at the bottom, blocking the pickup line.

In the past, we have had ice crystals form near the bottom of the tank and then float up, creating a layer of ice at the top of the tank without interfering with the water pickup. The issue on *Bagheera* was easily resolved by drilling a hole in the lid of a water collection barrel for the galley faucet intake to run through. We didn't even have to bother with siphoning the water out of our tanks. If we needed to top up the barrel, we just pulled up to an ice flow and filled the barrel with fresh snow. To everyone's amusement, the magic blue barrel even produced hot water. Too bad showers were still not on offer.

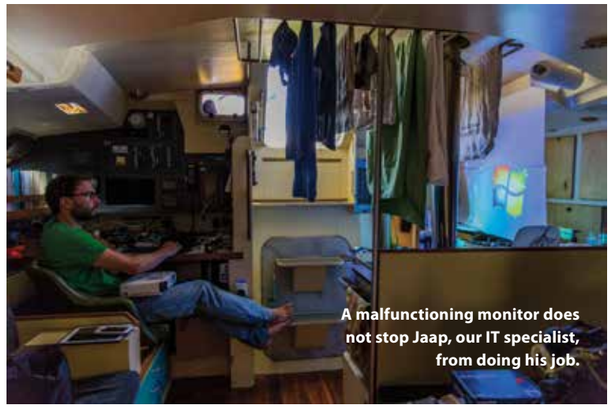
The further we pushed into the CAO, the more we wondered about its history.

Other than the *Tara* briefly entering the CAO to collect scientific data while circumnavigating the Arctic via the Northeast and Northwest Passages in 2013, we couldn't find any documentation of a sailing yacht or normal surface vessel moving freely in the Arctic's international waters.

Until the late 19th century, it had been commonly believed that the polar sea was navigable. The 1879 *U.S.S. Jeanette* expedition changed that. With orders to find an open sea route to the North Pole, the *Jeanette* set sail through the Bering Strait under captain George de Long. Fifty miles northeast of the Russian coast, the vessel became trapped in the ice. Even though the *Jeanette* drifted for two years, she never reached the CAO and only a handful of the crew survived the walk to Russia after she was crushed by ice.

It has only been 40 years since the first icebreaker made it to the North Pole, and in that short time icebreakers are already noticing that it is becoming increasingly easier to reach the geographic pole. When the Russian icebreaker *50 Years of Victory* commemorated the 40th anniversary of the *Arktika* journey, the first surface ship to reach the North Pole in 1977, it took them only 79 hours, a new record and less than half the time the *Arktika* needed. It's not the icebreakers that have changed. It's the ice density and thickness.

With the Arctic sea ice breaking up more and more every year, leads are getting wider and the ice is getting more dynamic, skewing the statistics. It is impossible to measure absolute ice coverage from satellite or radar images. If a square degree of latitude and longitude has more than 15 percent of its surface covered by ice, the whole square is considered covered and counts as such in the statistics, when in



A malfunctioning monitor does not stop Jaap, our IT specialist, from doing his job.

The Arctic Mission team at work on the ice.

Polar bear with her two cubs.

reality there could be as much as 85 percent open water in that area.

An ice chart from the last week of August 2017 showed that there was a lead from the Russian coast all the way to the geographic pole. The lead appeared to be navigable, but we were over a thousand miles to the east and the lead was open for only five days. Nonetheless, it was a sobering reminder that it is only a matter of time before a small yacht can get to 90° N and the myth of an open water route to the North Pole becomes a reality.

Krystina walking on the ice.

At 80° 10' N, we rafted *Bagheera* and *Snow Dragon* to the ice for a 24-hour science stop, and to get a better feel for how the ice was moving, before continuing north. While we were getting into thicker ice, the wind, current, and water temperature forecast implied we were going to have favorable conditions that would open up more leads in the ice. Those favorable conditions never materialized, and the updated satellite image showed the ice was actually closing in behind us. We could see that the water around us was showing signs of freezing, and there was no question what we as skippers thought was best. The rest of the team unanimously supported our decision to head south as soon as the science team had wrapped up their work and retrieved their equipment from the ice.

As *Snow Dragon* approached the ice to pick up team members who had gone out to retrieve acoustics equipment, a single pair of fresh polar bear tracks was clearly visible along the edge of the ice. A swimming bear had recently checked out the equipment but had not bothered to fully get out of the water in that location. Not knowing whether the bear was still in the immediate area, the team members on the ice quickly returned to the boat.

On our way north, we had stopped at every degree of latitude to run through six science experiments. Now we were stopping at every half-degree as we headed south to continue our data collection. Keeping the team, including the skippers, well rested was impossible with the continuous need to keep moving or assist the science team with their work. It was a fine balance to make sure everyone was getting enough sleep to function properly in a part of the world where mistakes can lead to dangerous situations.

Even the members of the science team occasionally stood watch and learned how to navigate through ice, but it was important that they focus on their research while we were in the CAO. Part of the scientific research involved trawling for microplastics. While this involves collecting samples to be analyzed in a lab, we unfortunately also found clear evidence of plastic pollution in the form of sizable chunks of polystyrene on two separate occasions, one embedded in the ice and another floating in open water.

We felt privileged to sail 409 miles into an ocean that had previously been inaccessible. We wanted to stay longer to explore and document the sea birds, seals, fish, and jellyfish we were seeing in addition to collecting more scientific samples, but we only had to look up at the delicate ice crystals covering the rigs of our boats or the thin layer of ice forming on the water's surface to be reminded that we needed to keep moving.

Our last day in the CAO was perfect. The sky was blue and the odd bits of ice we encountered were glistening in the sun. This time, sunglasses were more essential than hats, gloves, and insulated suits, and for once, the paddleboard was used for its manufactured purpose. A few hours later, we began to feel a hint of swell that continued to build as we sailed out of the CAO and into the Beaufort Sea, where a northerly wind filled our sails.

As we sailed downwind back to Nome, we heard a loud thud coming from *Bagheera*'s hull. At first, we thought a fuel barrel had gotten loose in the lazarette. When that proved not to be the case, we were mystified until Nick suggested, "Could it be the ice in the tanks?" Sure enough, our lingering souvenir from the CAO was banging around as the warmer water and big seas encouraged the ice layer in our water tank to break up. The noise gradually abated to resemble the sound of ice cubes until disappearing altogether before we reached the Bering Strait.

Back in Nome, showers, Wi-Fi, and laundry became the priority for most of the team. Aside from our shore team, we had had very little contact with the outside world and restricted water usage during our five weeks at sea. We did, however, regularly send out media content on the Iridium Pilot, including photos and occasional short video clips. It was strange being so wired to technology while sailing in one of the most remote corners of the planet.

While the rest of the team packed up their gear and samples, Frances, Erik, and I got *Bagheera* and *Snow Dragon* ready to head back out to sea. After dropping off the last team member at the airport and letting Fukimi have one last run on the beach, we headed out of the harbor and began making our way south through a turbulent Bering Sea to our home base of Sitka, 1,700 miles away. Even though our time in the Arctic had only just finished, we were already making plans to return to the Central Arctic Ocean to continue bringing awareness to this unique and vulnerable part of the Arctic.

Four weeks after we left the CAO, Senator Sheldon Whitehouse used one of Conor's photographs of the polystyrene we found to convey to the U.S. Senate the importance of protecting our oceans. While many still don't know the history, location, or the unique, nearly untouched ecosystem of the CAO, it was a small but important step forward in the conversation about protecting a no longer inaccessible ocean.

ABOUT THE AUTHORS

Both Krystina and Erik started blue-water cruising as infants onboard their parents' boats. Being drawn to Arctic waters, they met each other in Greenland and have sailed together ever since, either on the same boat or on separate boats in company with each other. In the winter, they live at their house in Sitka and in the summer, they sail in the Arctic, where new waters are constantly opening up with the ever-retreating ice.