

Beaufort Gyre Exploration Project: Dispatch 15: More Moorings

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Moorings fasten to anchors at the bottom of the sea. They are held taut by a large buoy, suspended from the bottom roughly 50 meters (164 feet) line, instruments monitor the conditions of the sea. Over the past three days, WHOI technicians and CCGS *Louis S. St.-Laurent* crew have completed several recoveries. Each recovery and deployment requires several hours of carefully planned labor in the frigid cold.

Though conceptually simple, subzero temperatures, winds, and heavy ice cover present mooring recoveries with numerous challenges. All mooring recoveries start at the bottom of the Beaufort Sea to the deck of the *Louis*.

Step 1: Find the general location of the mooring

The mooring remains anchored to the same place on the sea floor all year, making its location easy to track. The mooring's enormous underwater weight is marked by these numerical markers, sea ice complicates the search.



Morning on the Beaufort Sea. Frost on deck railings indicates a cold morning, and a chilly environment for the recovery ahead.



Coast Guard Cadets Ryan Gurr and Kristir

Step 2: Mow the lawn

"Mowing the lawn" is the technical term for breaking up the ice around the mooring site so that when the line floats to the surface, it can be easily recovered. The ship's paths through the ice, which resemble the ribbons of texture a mower leaves in a grassy yard.

The ship first "mows the lawn" by triangulating the mooring site. Based on radar images, the ship plows through the ice to enclose the site in a triangle. From the mooring from the vertices of the triangle, the ship can accurately break up ice throughout the site, allowing for an efficient recovery that reduces



Mow, mow, mow your boat.

The Arctic mooring recovery's equivalent o

Step 3: Detachment

A two-ton anchor connects the line to the ocean floor. A sound wave of a specified frequency zaps the acoustic release of the mooring, causing i
implements—the huge top buoy, and yellow floats on the bottom—then carry the ends of the line to the surface of the water.

If all goes as planned, the huge top float will be visible on the surface of the water, or among small ice chunks that can be pushed aside with con



Buoy in the Beaufort Sea. Notice the ship's mowing path in the background. The 64-inch buoy looks like a fishing line's bobber amid the enormo

Step 4: Link the float

Now that the mooring is floating on the surface of the water, it needs to be brought to the surface of the boat.

This isn't as easy as it sounds. Like all other recoveries, this process resembles one of those stuffed animal crane games you find in the entrywa
wide hook into a metal loop at the top of the buoy, a linkage that requires a platform to be lowered from the deck of the ship to the surface of the



WHOI's Kris Newhall and Coast Guard Winchman Al Jarvis lower to the sea to retrieve the mooring.

Step 5: Start reeling

Once the buoy is linked, the mooring line is fed into the enormous winch system on the deck, which reels in the 3,800 meters (12,467 feet) of line complicated because crewmen must detach all scientific gear without loosening the line from the winch. To accomplish this, the portion of line is held by a crane, where it remains suspended until it can be fed once again into the winch system.



The buoy, fully removed, resembles a rejected Sputnik prototype. Its top was coated in the lone plant species of the /

Step 6: Collect samples

Any samples collected by devices on the line must be quickly removed and stored to avoid contamination.



A sediment trap reels to the deck of the ship, splashing water as it ascends. The bottles in the sediment trap carousel rotate one notch twice a year. Scientists at WHOI will analyze the sediment to determine the species of phytoplankton and zooplankton that exist in the column of water below.

Step 7: Figure out how to deal with an infestation of yellow balls

No, these aren't exotic aquatic Arctic grapes. They're floatation devices known as glass balls, which get their name from the fact that they're actually made of glass. The floats bring the bottom of the line to the surface of the water to aid in retrieval. They also take up a ton of space on deck, necessitating a quiet and orderly deck.



Bacchus has no interest in these grape-shaped buoys.

And lastly, by far the most important step in a mooring recovery.

Step 8: Enjoy a well-earned cup of coffee, relax, and warm up

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