

An Advisory of high cell counts of the algal species *Alexandrium catenella* from the scientists onboard the research vessel Norseman II – August 19, 2022

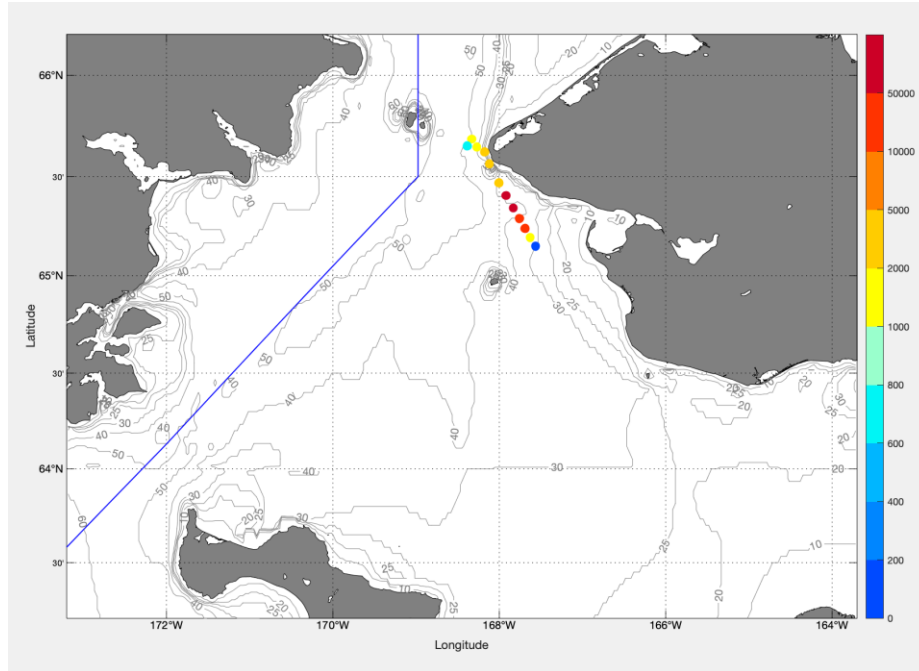
Researchers aboard the Norseman II vessel are continuing to encounter extremely high concentrations of the alga *Alexandrium catenella* in the Bering Strait region. This *Alexandrium* species is known to produce a biotoxin called saxitoxin. Maximum surface cell densities in this bloom are now estimated to be >55,000 cells/L, this concentration was recorded on 18-August-2022 and is very high compared to past observations in the region. Notable densities of cells (>1,000 cells/L) were observed along the ship's transit path on 18-August-22, which passed 1.5 nautical miles offshore of Wales (see map below). The ship is currently collecting additional samples in the Bering Strait.

These concentrations of *Alexandrium catenella* are considered dangerous and are high enough to trigger an advisory for nearby coastal communities to be cautious when consuming marine wildlife resources, such as clams, crabs, and tunicates, etc. Marine wildlife that have consumed the *Alexandrium* algae or that have obtained the toxin through food web transfer may contain a high concentration of saxitoxin that could affect human and animal health. For example, marine wildlife will ingest the saxitoxin when they eat clams containing the biotoxin. They can also accumulate toxins by feeding on zooplankton, filter-feeding fish, tunicates, and other animals within the food web. As the current health risks are unknown to seabirds and marine mammals, or to humans who consume those resources, it is best to be cautious and remain vigilant.

Next steps to be taken:

- The Norseman II crew will continue to report what they see as this cruise continues its work in the Northern Bering Sea, Chukchi Sea, and Beaufort Sea.

Disclaimer: The opinions, findings, and conclusions, or recommendations expressed are those of the authors and do not necessarily reflect the views of the National Science Foundation.



Estimated cell concentrations of the marine algae Alexandrium catenella sampled on 18 August based on data collected by the Imaging FlowCytobot. This instrument is onboard the Norseman II collecting imagery of the plankton community as the ship travels, allowing real-time identification and enumeration of different algae types. Additional seawater samples are being collected, which will be used to manually confirm which algae species are present and how many. The amount of saxitoxin in the water will not be available until the seawater is analyzed back on the mainland.

Thoughts on subsistence uses of marine wildlife:

- Paralytic shellfish poisoning (caused by ingesting saxitoxin) in Alaska and the U.S. is generally associated with the consumption of contaminated shellfish (e.g., clams, crabs). Thus, **eating clams, crab guts/butter, and/or other shellfish has always carried a risk of ingesting algal toxins**, whether shellfish are gathered from the beach or from the stomach of a walrus or bearded seal.
- Unlike the crab guts/butter, crab meat has not been found to contain saxitoxins.
- Based on our understanding of toxin uptake and storage in shellfish and fish elsewhere in the world, muscle and blubber are not likely to accumulate saxitoxin at levels that pose a human health hazard, although these tissues have not yet been tested.
- Thorough cleaning of the inside of marine mammal intestines and stomach contents with water is an important aspect of traditional and customary food preparation methods. We do not know if these food preparation practices safeguard against ingesting saxitoxin when consuming marine mammal intestines or stomach contents. **Consuming intestine, stomach, and/or their contents in areas with known biotoxins likely has the same risk as consuming shellfish from those areas.**
- Other known vectors for saxitoxin are filter feeding fish like herring or other fish that consume zooplankton (e.g., sand lance) or small fish (mackerel). Likewise, tunicates (sea squirts) are known vectors for saxitoxin.
- Remember: you cannot see, smell, or taste algae toxins. Cleaning, cooking or freezing these foods will not lessen the toxin's effects.
- We know that some clams can retain saxitoxin for long periods (months to years) so clams taken from guts of walruses or seals carry the same risks as any other harvested clams.

If you feel sick from eating clams, crab guts/butter, or other shellfish, please contact your health care provider immediately.

- For more information on harmful algae toxins in humans —symptoms, treatment, etc.— **call the Alaska Section of Epidemiology at: (907) 269-8000 Mon-Fri or (800) 478-0084 after hours**
- **Remain vigilant:** if you see any marine wildlife acting in an unusual manner or dead please contact:
 - **USFWS – Marine Mammals Management: (800) 362-5148**
 - **Norton Sound Health Corporation OEH Dept.** – Emma Pate (907) 443-3308
 - **Norton Sound Health Corporation OEH Dept.** – Racheal Lee (907) 434-0543
 - **NOAA Alaska Marine Mammal Stranding Network: (877) 925-7773**
 - **Alaska Sea Grant (Nome) - Gay Sheffield: (907) 434-1149**
 - **Kawerak (Nome) - Brandon Ahmasuk: (907) 443-4265**
 - **NSB-Dept. of Wildlife Management (Utqiagvik): (907) 852-0350**