

Canaries in the Coalmine

Permitted Discharge and Known Contaminants Affecting Cook Inlet Belugas



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BACKGROUND

Cook Inlet beluga whales are an endangered species whose numbers have significantly declined from about 1300 in the late 1970s to around 300 today. Their numbers are not increasing despite efforts for the past couple of decades to recover them. These beluga whales reside in Cook Inlet, Alaska year-round and are isolated from other beluga populations. If these whales go extinct, no other belugas will repopulate Cook Inlet.



Water quality standards for the primary habitat of Cook Inlet belugas are developed and implemented by the Alaska Department of Environmental Conservation (ADEC).

Several categories of activities are permitted to discharge contaminants in Cook Inlet, with discharge, monitoring and contaminant testing requirements varying by category. Several categories of dischargers (e.g., wastewater, seafood processing, oil & gas) may also be authorized to exceed water quality standards within defined mixing zones.

Information about the number and types of permits authorized to discharge in Cook Inlet, including the presence of a mixing zone, is maintained by ADEC on their public Environmental Data Management System (EDMS) online portal.¹



CONCERNS

Compromised Health of Cook Inlet Belugas

Often overlooked in discussions of the lack of beluga recovery is the evidence available suggesting their health is compromised. This is indicated by:

- Increased viral/pathogen infections^{2,3,5}
- Depressed reproductive rates⁴
- Evidence of birth defects²
- Aborted fetuses^{2,5}
- Shorter lifespans⁵

Belugas may be exposed to environmental contaminants during foraging activities or direct contact with polluted water. Multiple sources of pollution are cumulatively contributing to an unhealthy environment for Cook Inlet belugas.

Water Pollution

Since belugas reside in Cook Inlet year-round, any contaminants they encounter are associated with the water quality of Cook Inlet.

Contaminants can be discharged into Cook Inlet by either permitted or unpermitted sources. Some permitted discharges authorize mixing zones where water quality standards may be legally exceeded.

Permits don't require testing for the bulk of contaminants known to be of concern to belugas (e.g., pharmaceuticals, pesticides) or other fish and wildlife.

There is no Cook Inlet-wide monitoring for known contaminants of concern to the biota.

What We Know

- There are a lot of emerging contaminants documented in the waters of Cook Inlet, in belugas' prey, and belugas themselves, affecting their health and reproduction.
- These documented contaminants are not required to be tested for by permitted dischargers.

What We Don't Know

- Where most of the contaminants found in the water, fish, and belugas are coming from.
- The levels across the Cook Inlet environment of emerging contaminants.
- How to improve the health of Cook Inlet belugas without knowing the source or extent of the emerging contaminants of concern in their environment.

What We Recommend

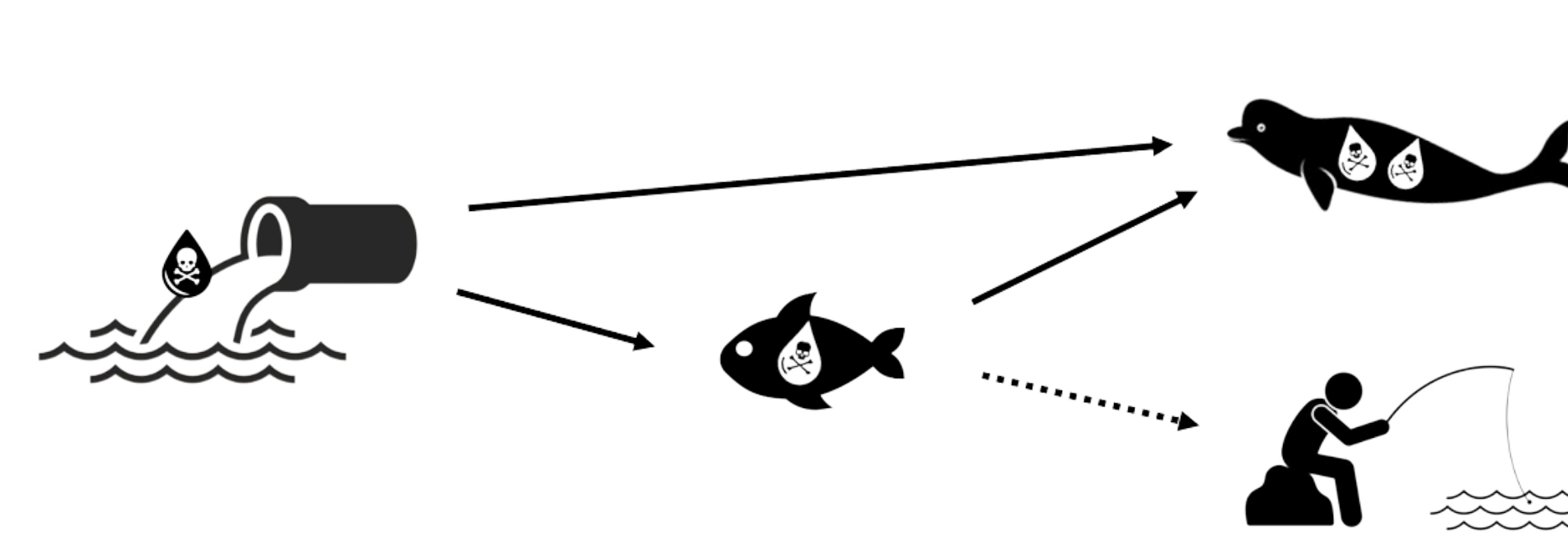
- A long-term, Inlet-wide monitoring program focused on testing for known contaminants of concern; possibly via a coordinated community science effort for 1 year
- A comprehensive review of permitting requirements to require consistent testing of these newer contaminants of concern
- Prioritization of testing for contaminants in biological sampling programs for Cook Inlet belugas and fish.
- Testing and regular monitoring to understand the sources of these known contaminants will help provide a way to regulate and potentially eliminate them from the environment.

CONTAMINANTS THE CHEMICALS

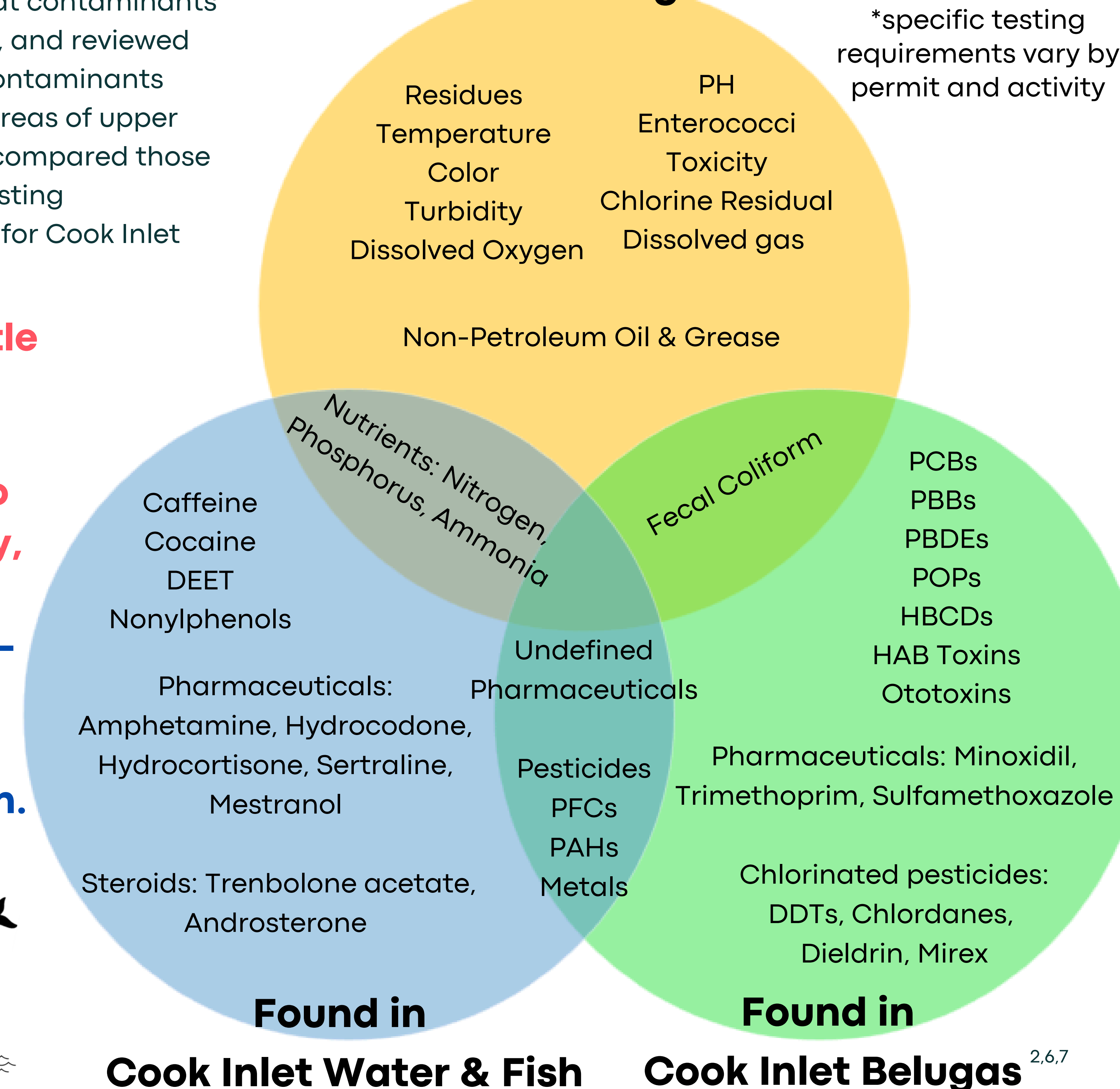
Literature Review

We conducted a literature review to learn what contaminants have been documented in Cook Inlet belugas, and reviewed results of a 2018 study by NOAA Fisheries of contaminants found in waters and fish collected from four areas of upper Cook Inlet (obtained via a FOIA request). We compared those with information in ADEC's EDMS portal for testing requirements of 2018-2023 discharge permits for Cook Inlet waters.

Based on our review, there is little overlap of the contaminants discharge permits require to be tested for, and what is known to be present in belugas, their prey, or their environment, highlighting the need for a long-term, Inlet-wide monitoring program focused on testing for known contaminants of concern.



Required Parameters Tested for by Authorized Discharge Permits



CONCLUSIONS

REFERENCES

1. Alaska Department of Environmental Conservation's Environmental Data Management System: <https://dec.alaska.gov/water/edms>
2. Burek-Huntington, K., et al. 2002. Congenital defects and herpesvirus infection in beluga whale *Delphinapterus leucas* calves from the critically endangered Cook Inlet population. *Dis Aquat Org* 151: 29-35.
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4. McGuire, T. et al. 2020. Reproductive natural history of endangered Cook Inlet Beluga whales: insights from a long-term photo-identification study. *Polar Biology* 43:1851-1871.
5. McGuire, T. et al. 2021. Patterns of mortality in endangered Cook Inlet beluga whales: Insights from pairing a long-term photo-identification study with stranding records. *Mar Mam Sci* 37:492-511.
6. Sheldon, K. E. W., et al. 2018. Beluga whale, *Delphinapterus leucas*, satellite-tagging and health assessments in Cook Inlet, Alaska, 1999 to 2002. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-369, 227 p.
7. URS 2010. Chemical Exposures for Cook Inlet beluga whales: A literature review and evaluation. Report prepared for NOAA Fisheries, National Marine Fisheries Service, Anchorage, Alaska. NMFS contract no. AB133F-06-BU-0058.

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