NOAA FISHERIES
Alaska Region

The Arctic Invasive Alien Species (ARIAS) Strategy and Action Plan: Implementation in the Alaskan Arctic and Ballast Water

Pacific Ballast Water Group

April 12, 2018

Seattle, Washington

NOAA FISHERIES
Alaska Region

The Arctic Council approved the ARIAS Strategy and Action Plan at their May 11, 2017 Ministerial Meeting in Fairbanks, Alaska

Who is the Arctic Council?

The Arctic Council is a high-level international forum for political discussions on common issues of the Arctic States and their inhabitants.

Canada

United States of America

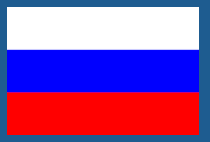
Denmark

Sweden

Finland

Iceland

Norway



Russian Federation

What is the ARIAS Strategy and Action Plan?

The plan provides a framework for Arctic stakeholders to address the threat and introduction of invasive species.

The plan **encourages** Arctic States and their partners to take **priority actions** in three categories—

1. **Inspire urgent and effective action.**
2. **Improve the knowledge base for well-informed decision making**
3. **Undertake prevention and early detection/rapid response initiatives.**

The plan has no requirements for Member States and implementation is voluntary.

What are the Next Steps?

NOAA Fisheries, Alaska Region and NOAA International are participating in Arctic Council Working Groups and a U.S. Interagency Working Group that are exploring opportunities to implement the ARIAS Strategy and Action Plan.

Arctic Council Working Groups are Writing an Implementation Plan Proposal

The US Arctic Working Group has a subcommittee to "step-down" the international plan to an Alaska-wide strategy

Alaska Strategic Planning

The US Arctic Working Group subcommittee "step-down" includes so far:

*

- Alaska Department of Fish and Game, US Fish and Wildlife Service and NOAA Fisheries are members of the subcommittee to develop an Alaska Strategic Plan as a "step-down" to the ARIAS Strategy and Action Plan.

- Plan to include Terrestrial, Freshwater and Marine Components.

- Workshop in fall, 2018, with stakeholder input.

Alaska Strategic Planning

*

- What are issues for the Arctic and Alaska related to ballast water?

Arctic Invasion

From literature and webinar outreach from Andrew Cohen of the Center for Research on Aquatic Bioinvasions in Richmond, California,

When combining the increase in shipping, climate change and the relatively pristine nature of the Arctic marine region could conceivably see

the most rapid invasion by non-native species of any major biogeographic zone in the planet's history. **(Cohen 2017)**

What are unique challenges for ballast water in the Arctic?* (*based on ideas from A. Cohen, 2015 & 2017)

- 1) Low biological diversity and changing environmental conditions in Arctic marine waters means *low biotic resistance.* People, plants and animals in the Arctic are vulnerable having had little exposure to worldwide invasive species and pathogens.

- 2) Loss of sea ice opens the Arctic to new pathways and vectors from shipping, oil and gas, mining, fishing and tourism.

More unique challenges for ballast water in the Arctic?* (*based on ideas from A. Cohen, 2015 & 2017)

- 3) Increased activity will lead to nearshore development (artificial islands, harbors and shoreline hardening, pollution) that create habitat for invading organisms.

- 4) There is a lack of broader infrastructure and human capacity to respond to technical needs of ballast water exchange for safety, monitoring and enforcement or emerging ideas for treatment such as shore side or mobile treatment.

What are some sources of risk from ballast to the Arctic? (Cohen 2017)

- 1) Eco-tourism vessels are seasonally re-locating from from Antarctica to the Arctic carrying ballast
- 2) Ballast exchange between one part of the Arctic and another.
- 3) Ballast exchange from adjacent Boreal/Cold Temperate waters.
- 4) Tests so far have not found any trends in reduced effectiveness of ballast water treatment at lower temperatures although the coldest waters possible in the Arctic have not been tested.

What are more sources of risk from ballast to the Arctic? (Cohen 2017)

5) Among approved on-board treatment systems tested, there is a wide range of average performance with the best performing systems for zooplankton being 20,000 times, phytoplankton 1 million times and bacteria 1.6 millions times better than the worst performing systems.

6) There is currently no requirement for operators to use the best performing systems, as long as they meet the standards, which are much below what the current technology can perform.

What are sources of risk? (Cohen 2017)

7) Public health microbes (cholera, E. coli, and intestinal enterococci) testing protocols do not require intake levels high enough to know if the treatment systems actually work at removing these organisms and are therefore worthless.

8) In addition they do not require any testing for bacteria and viruses (as is required by California, the entity with the most stringent ballast water protocols) and there is a fear that ballast has and may spread other disease organisms to fish and marine mammals, such as phocine distemper virus.

Specific examples of possible risk for Arctic communities from Cohen. (Cohen 2015)

- Specific examples of possible risk for Arctic communities:
- 1) 2008/9 outbreak of Salmonella typhinurium bacteria from ballast discharge in Norway infected cattle grazing the intertidal. Floated on lower salinity surface water. Demonstrates ballast water as a risk to terrestrial animals.
- 2) Human disease pathogens. A 1991 cholera epidemic in Peru linked to ballast water killed 10,000 people. Harmful algal blooms in North Pacific?

What are possible solutions to unique challenges for ballast water in the Arctic? *(based on ideas from A. Cohen, 2015)

*

- 1) No high seas ballast water exchange in the Arctic. Too difficult to monitor and nearly impossible to enforce.

- 2) No ballast discharge that originated in areas with harmful algal blooms, near sewage discharge, or where there is human disease. Requires regulation on the front end of ballasting operations, currently no one is doing this, regulation is on the back end, the discharge.

- 3) Implement more stringent standards based on what the best shipboard treatment systems can do. Assure they work in Arctic temperatures.

What are possible solutions to unique challenges for ballast water in the Arctic? *(based on ideas from A. Cohen, 2015)

*

- 4) Consider shore-based or mobile treatment based on costs compared to shipboard treatment. Co-locate with LNG or other natural resource export terminals in the Arctic.

- 5) Correct issues with test protocols (temperature, minimum organisms in control discharge too low, no #s of organisms specified in intake water.)

- 6) Do not allow use of treatment systems for which full test data on which the approval was based are not made public.

Link to ARIAS Strategy and Action Plan:
https://www.caff.is/strategies-series/415-arctic-invasive-alien-species-strategy-and-action-plan

linda.shaw@noaa.gov

Literature Cited

Cohen, AN. 2017. An Assessment of Ballast Water Treatment to Protect Arctic Waters: A Report for Friends of the Earth U.S.

Cohen, AN. 2015. White paper on Ship-mediated Bioinvasions in the Arctic: Pathways and Control Strategies, prepared for Friends of the Earth in preparation for PAME I-2016

Cohen, AN, Carlton JT. 1998. Accelerating invasion rate in a highly invaded estuary. Science 279: 555-558.