Assessing Baleen Whale Incidents Relative to Human Pressures in the Northwest Atlantic Ocean

Hannah Solway, Derek Tittensor, Gabriel Reygondeau, Tonya Wimmer, and Boris Worm

FUTURE OF MARINE ECOSYSTEMS RESEARCH LAB

Background

Blue Whale

Endangered

Fin Whale

Special Concern

Humpback Whale

Minke Whale

North Atlantic Right Whale

Endangered

Sei Whale

Endangered

- Vessel activity, combined with other threats such as climate change and entanglement, along with the residual impacts of whaling, has led to the serious decline of many NWA baleen whale populations.
- As a result, some species have been listed under the Species at Risk Act and are monitored by the Committee on the Status of Endangered Wildlife in Canada.

Baleen Whale Incidents

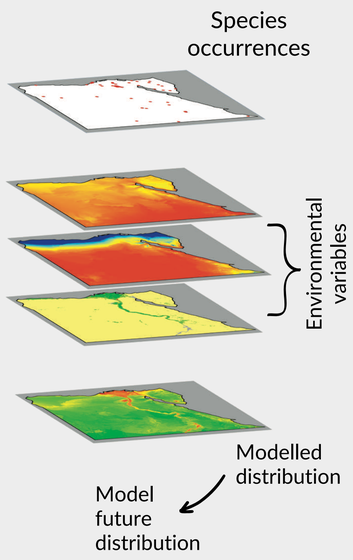
- When a whale is seen entangled, injured, unwell, or dead, often as a result of vessel strikes, it is known as an "**incident**".
- Evidence of lethal incidents exists for all baleen whales.
- Current incident management includes distance and speed measures, ghost-gear retrieval, and targeted time-area closures for Right whales only.

Research Questions

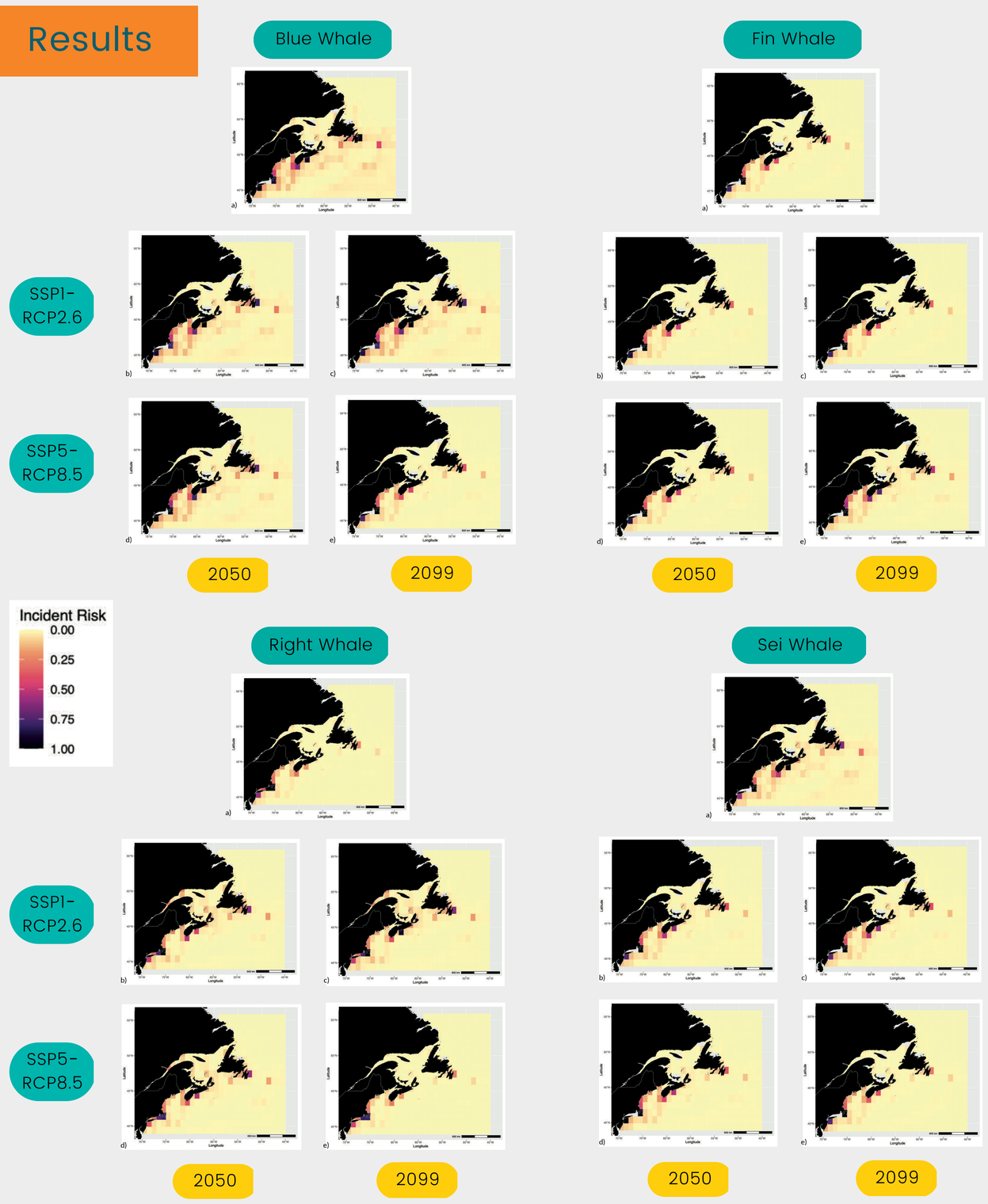
1. Can vessel activity and baleen whale presence/habitat suitability inform where incidents are likely to take place?
2. Where are current and future incident risk hotspots in the NWA?
3. What is the overlap of current incident management tools with the current and future incident hotspots for all six species?

Methods

1. Model incidents as a function of whale presence, habitat suitability, and vessel activity.
2. Determine areas of **high incident risk** using the above parameters and SDM outputs.
3. Determine **future incident hotspots** under two climate scenarios (SSP1-RCP2.6, SSP5-RCP8.5) across 2050 and 2099.
4. Compare current and near-future incident hotspots to existing incident reports and current management measures.



Results



Figures. Incident risk for the Blue, Fin, Right, and Sei whale. Displayed for the current time point (a), under climate scenario SSP1-RCP2.6 for the mid time point (2050) (b) and end time point (2099) (c), and under climate scenario SSP5-RCP8.5 for the mid (d) and end (e) time point is included. Dark values indicate high incident risk, light values indicate low to no incident risk.

- All species of **baleen whale share similar spatial distributions** and habitat suitability currently and under both climate scenarios at both time points.
- The **species are at similar risk of being involved in an incident** currently and under both climate scenarios at both time points.
- Habitat suitability and vessel activity are significant predictors of incidents for Fin, Humpback, and Minke whales.
- Neither habitat suitability nor vessel activity had a significant relationship to Blue, Right, and Sei whale incidents.
- Vessel activity and areas with high habitat suitability displayed a relatively **strong spatial overlap** for all species of baleen whale.

Significance

- Better understand baleen whale distribution and habitat use in the NWA.
- Widen the focus of previous work on incident risk to all baleen whales.
- Understand current and potential areas of management concern.
- Compliment existing acoustic, telemetry, and remote sensing research.

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Contact:
hannah.solway@gmail.com
Twitter: @hannahbsolway