



## North Atlantic Right Whale Consortium Annual Meeting

24-25 October 2023  
Halifax Convention Center

With Special Remote Attendee Programming on 23 October 2023

### MEETING FORMAT AND AGENDA

#### **Pre-Meeting:**

Prior to the meeting, all registered participants will receive a unique meeting site login code that will allow them to view all pre-recorded presentations in advance of the meeting. All underlined presentations should be viewed **in advance of the meeting** as they will not be shared live. Those presentations that are not underlined will be shared **live** during the meeting. The six-digit number preceding the presentation title corresponds to the video number on the meeting site. Please note that presentations that are to be viewed live will be uploaded to the meeting site **post meeting**, and therefore have six-digit codes as well.

Participants (both onsite and remote) may submit questions/comments for presenters in advance of the meeting using the question submission link on the meeting page.

Electronic copies of the Poster Presentations will be available on the Meeting page in advance of the meeting.

#### **Live Meeting:**

Remote participants will be able to view the meeting, including live presentations and discussions, using the zoom access links on the meeting site.

Following any live presentations within a session, a discussion panel will take place with all presenters within that session. Presenters who are onsite will gather at the front of the auditorium and presenters who are remote will be pinned to the top of the zoom meeting and visible to onsite participants. The panel will take questions/comments from both onsite and remote meeting participants. Remote participants will be able to come off mute to ask their questions and/or can submit via the zoom chat.

**All meeting materials (both static and live) are intended for registered participants only and may not be shared in any capacity. All participants have agreed to the meeting Code of Conduct. There is no external recording (including but not limited to video, audio, screenshots, or photography) or sharing (including social media) of any material (including but not limited to presentations, presentation content, discussions) without explicit consent of the presenter, speaker, moderator, etc. The meeting will be recorded to facilitate the synthesis of meeting notes to be distributed to participants only.**

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**23 October 2023**

**6:00PM Special Remote Attendee Evening Programming**

*Zoom link posted on meeting page*

**Community and Youth Engagement in Conservation**

*Moderators: Bill McWeeny, The Calvin project*

*Jen Kennedy, Blue Ocean Society for Marine Conservation*

Remote meeting attendees are invited to join the Calvineers and other community conservation organizers for this pre-meeting event.

Twenty years ago, a small group of 7th and 8th grade Adams School Students and their teacher, Bill McWeeny, formed The CALVIN Project for the purpose of educating people about the world's most endangered large whale, the North Atlantic right whale. Known as the Calvineers, these students continue their efforts today.

The Calvineers will share their short film about Calvin, a 31-year-old North Atlantic right whale, and along with other community conservation organizers, will provide their perspectives on advancing right whale and ocean conservation through community engagement.

**24 October 2023**

**800-830AM Check in**

**830AM Opening / Keynote**

Scott Kraus, NARWC Chair

**900AM Session 1: Data Collection and Management**

*Moderated by Scott Kraus*

**01.01.01 North Atlantic Right Whale Catalog update and whale naming results**

- *Philip Hamilton, Anderson Cabot Center at the New England Aquarium*

**01.01.02 Report on the September 2023 workshop to review and evaluate current telemetry technologies for NARW conservation**

- *Kim Damon-Randall, NOAA's National Marine Fisheries Service*

**01.01.03 A Management-focused population viability analysis for North Atlantic right whales**

- *Daniel Linden, NOAA/NMFS/NEFSC*

**01.01.04 A new statistical method for estimating the population size of the North Atlantic right whale**

- *Steve Wang, Swarthmore College*

**01.01.05 Fisheries and Oceans Canada: An update on research and monitoring activities for North Atlantic right whales (*Eubalaena glacialis*)**

- *Angelia Vanderlaan, Fisheries and Oceans Canada, Bedford Institute of Oceanography*

**01.01.06 Near real time monitoring of North Atlantic right whale injuries 2023**

- *Heather Pettis, Anderson Cabot Center for Ocean Life at the New England*
- *Allison Henry, Northeast Fisheries Science Center*

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**1030AM Break**

**1100AM Session 2: Health, Reproduction, and Mortality**  
*Moderated by Philip Hamilton*

01.02.01 **Estimating the effects of multiple stressors on the health, survival, and reproduction of North Atlantic right whales**

**Atlantic right whales**

- *Enrico Pirotta, University of St Andrews*

01.02.02 **North Atlantic Right Whale Mortality Events 2023**

- *Bill McLellan, University of North Carolina, Wilmington*

01.02.03 **Effects of fishing gear entanglement on the health, survival, and reproductive dynamics of North Atlantic right whales**

- *Nathan Crum, Fish and Wildlife Research Institute, Florida Fish and Wildlife Conservation Commission*

01.02.04 **Update on the North Atlantic Right Whale Unusual Mortality Event: 2017-Present**

- *Deborah Fauquier, National Marine Fisheries Service*

01.02.05 **Investigating the effects of inbreeding depression on reproductive success in North Atlantic right whales**

- *Carla Crossman, Saint Mary's University*

01.02.06 **What's in a biopsy: Maximizing the use of skin and blubber for North Atlantic right whale health assessment research**

- *Marisa Trego, NOAA Fisheries*

**1200PM Session 3: Acoustics**  
*Moderated by Hansen Johnson*

01.03.01 **Identifying North Atlantic right whale upcalls using a model of human auditory perception: Comparison with the Low Frequency Detection and Classification System (LFDCS)**

- *Wilfried Beslin, Fisheries and Oceans Canada, Bedford Institute of Oceanography*

01.03.02 **Autumn acoustic behavior of right whales in Southern New England**

- *Susan Parks, Syracuse University*

01.03.03 **Current NARW Passive Acoustic Monitoring Project updates from the NEFSC**

- *Julianne Wilder, NOAA NEFSC*

01.03.04 **Detection range estimates of glider-recorded baleen calls in proximity to Gulf of St. Lawrence shipping lanes**

- *Katherine Indeck, University of New Brunswick*

01.03.05 **Using synthetic NARW upcalls and deep artificial neural networks for acoustic detection**

- *Fabio Frazao, Dalhousie University*

**100PM Lunch – Extended**

Lunch provided onsite. The break is long by design to allow for breakout sessions and for participants to take advantage of being together to connect, engage in strategic planning, etc.

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## 145PM Breakout Session

- **Right Over the Edge: The Search for the North Pacific Right Whale – Main Meeting Hall**  
*Remote participants should remain in the main meeting zoom to participate.*

Stream the film online and join the discussion of how a film can inform conservation for North Pacific right whales. The stream link and password will be shared with registered participants on October 17, 2023.

With an estimated 30 right whales in the Northeast Pacific, there is no time to spare bringing the plight of these critically endangered whales to the attention of the world. The organization Save the North Pacific Right Whale hopes to leverage the film to forward our conservation strategy for these whales.

After folks have streamed the film online prior to the meeting, Kate and Kevin from Save the North Pacific Right Whale will lead a discussion about our conservation plan with a focus on learning lessons from efforts to protect North Atlantic right whales.

Discussion will focus on:

- Forming partnerships
- What can be accomplished by a small team
- Key points in NARW conservation that should be employed in the Pacific
- Our conservation and education strategy
- How to speed up the timeline for NPRW protection

## 245PM Session 4: Distribution

*Moderated by Mark Baumgartner*

- 01.04.01 **A comprehensive assessment of drivers of North Atlantic right whale habitat use in the Northeast United States: beyond *C. finmarchicus***
  - *Taylor Evans, Stony Brook University SoMAS*
- 01.04.02 ~~**Explaining the spatial and temporal distribution of right whales in the Gulf of St. Lawrence : A modelling approach**~~
  - ~~*Arnaud Mosnier, Fisheries and Oceans Canada*~~
- 01.04.03 **More than just a migration corridor: Important North Atlantic right whale surface-active behaviors observed in the western Mid-Atlantic**
  - *Amy Engelhaupt, Amy Engelhaupt Consulting*
- 01.04.04 **Incorporating prey information into North Atlantic right whale density surface models used in decision support**
  - *Camille Ross, Bigelow Laboratory for Ocean Sciences/UMaine*
- 01.04.05 **Assessing North Atlantic right whale abundance: A novel data fusion**
  - *Rob Schick, Duke University*
- 01.04.06 **Where the whales go for spring break: recent North Atlantic right whale observations near the shelf break south of New England and potential oceanographic drivers behind these distributions**
  - *Christopher Orphanides, NOAA Fisheries*

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**400PM**      **Session 5: Feeding Ecology**  
*Moderated by Kimberley Davies*

- 01.05.01 **Dive behavior of North Atlantic right whales (*Eubalaena glacialis*) in New England Waters: Insights from inertial sensor suction cup tagging**  
• *Heather Foley, Integrated Statistics/Northeast Fisheries Science Center*
- 01.05.02 **Understanding the energetic importance of Cape Cod Bay to the North Atlantic right whales**  
• *Christine Hudak, Center for Coastal Studies*
- 01.05.03 **The southern Gulf of St. Lawrence as foraging habitat for the North Atlantic right whale**  
• *Catherine Johnson, Fisheries and Oceans Canada*
- 01.05.04 **High variability in Bay of Fundy zooplankton 2006-2022**  
• *Heather Koopman, Grand Manan Whale & Seabird Research Station/University of North Carolina Wilmington*
- 01.05.05 **Diel patterns in the vertical distribution of North Atlantic right whale prey in the southwestern Gulf of St. Lawrence, Canada**  
• *Gina Lonati, University of New Brunswick Saint John*
- 01.05.06 **Abundance and energy density of subsurface layers of *Calanus* spp. in the southern Gulf of St. Lawrence in spring 2022**  
• *Kevin Sorochan, Fisheries and Oceans Canada*

**500PM**      **Calvin's Life History – A Short Film**

- *Aurora Simmons, Acadia Simmons, Luke Cukierski, Annabelle Kniesel; The CALVIN Project*

The Calvineers film about Calvin's Life History was produced to illustrate the remarkable amount of data scientists have amassed about the North Atlantic right whale. Narration uses the hundreds of facts specifically collected about Calvin over her 31-year life span so far. Calvin's life is dramatized by giving her a voice and imagined thoughts throughout the film. The film will be presented as a work in progress.

Following their presentation, the Calvineers will remain in the main meeting hall for questions and conversation with attendees.

**530PM**                      **Day 1 Wrap**

**530-700PM**      **Onsite and Remote Poster Session (see list of posters below)**  
**Onsite Reception**

Light hors d'oeuvres, two drink tickets per attendee, cash bar

**800PM**                      ***Between Breaths* – Neptune Theater**

Please join us for a special performance of *Between Breaths* - a fascinating retelling of the story of Dr. Jon Lien who pioneered techniques for rescuing whales trapped in fishing entanglements. Tickets are required for this event. Discounts available to NARWC and Ropeless participants through October 12<sup>th</sup>. Tickets go on sale to the general public on October 13<sup>th</sup>. Order your tickets [HERE](#).

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**25 October 2023**

**830AM Business Meeting**

**\*\*The business meeting is open to ALL attendees. Please join us!\*\***

**0915AM Break**

**0945AM Session 1: New Technologies/Data Collection Techniques**

*Moderated by Timothy Frasier*

- 02.01.01 **A glider-mounted shadowgraph camera for measuring pelagic copepod abundance and distribution in North Atlantic right whale habitat**
  - *Natasha Hynes, University of New Brunswick Saint John*
- 02.01.02 **Increasing whale detection capacity in the Canadian Atlantic waters by utilizing thermal land- and vessel-based automatic detection and classification systems**
  - *Aymeric Houstin, Woods Hole Oceanographic Institution*
- 02.01.03 **Satellite detection of North Atlantic right whales in foraging habitats**
  - *Kimberley Davies, University of New Brunswick*
- 02.01.04 **Development of an Integrated AIS-Based Alert System for North Atlantic Right Whales (NARW) and Vessel Collision Avoidance**
  - *Moses Calouro, Maritime Information Systems, Inc.*

**1030AM Session 2: Offshore Wind Interactions and Mitigation**

*Moderated by Michael Moore*

- 02.02.01 **Upcalling behavior and patterns in North Atlantic right whales, implications for wind energy development**
  - *Genevieve Davis, Northeast Fisheries Science Center*
- 02.02.02 **Recommendations for real-time passive acoustic monitoring near offshore wind energy development activities to help mitigate risks to North Atlantic right whales**
  - *Mark Baumgartner, Woods Hole Oceanographic Institution*
- 02.02.03 **From wind to whales: Potential hydrodynamic impacts of offshore wind on Nantucket Shoals region ecosystems**
  - *Erin Meyer-Gutbrod, University of South Carolina*
- 02.02.04 **Exploring overlap between NARW and ocean features: An autonomous-based oceanographic and ecological baseline**
  - *Josh Kohut, Rutgers University*

**1200PM Lunch**

**Student/Early Career Roundtables**

Remote session moderated by Genevieve Davis (see meeting site for zoom link)

Join professionals in the right whale community as they share their career journeys and experiences. Host bios are provided in the abstract booklet. Look for reserved tables for onsite hosts. Remote session will be moderated by Genevieve Davis. Start with brief introductions followed by opportunities to join remote hosts in their own breakout rooms for discussion.

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**100PM Ropeless Consortium Meeting Summary**

- *Mark Baumgartner, Woods Hole Oceanographic Institution*
- *Sean Brilliant, Canadian Wildlife Federation*
- *Michael Moore, Woods Hole Oceanographic Institution*

**130PM Session 3: Anthropogenic Event Monitoring and Mitigation - Entanglement**  
*Moderated by Sean Brilliant*

02.03.01 **North Atlantic Right Whale Attached Gear Entanglements and Response 2023**

- *Moira Brown, Canadian Whale Institute*
- *Bob Lynch, Center for Coastal Studies*

02.03.02 **Quantifying entanglement risk of North Atlantic right whales in Canadian lobster fisheries**

- *Shiva Jian-Javdan, Canadian Wildlife Federation*

02.03.03 **Habitat use of North Atlantic right whales in traditional lobster fishing grounds: Insights from a five-year fishermen-led data collection program**

- *Lyne Morissette, M - Expertise Marine*

02.03.04 **The effects of North Atlantic right whale fishery closures on entanglement risk to other large whales in the Gulf of St. Lawrence**

- *Alexandra Friedman, Canadian Wildlife Federation/Dalhousie University*

02.03.05 **Fisheries and Oceans Canada (DFO): An adaptive fisheries management approach**

- *Melissa Landry, Fisheries and Oceans Canada*

02.03.06 **A decision support tool for assisting multi-interest stakeholders in assessing the entanglement risk of large whales in commercial fishing gear**

- *Laura Solinger, Integrated Statistics/Northeast Fisheries Science Center*

**230PM Break**

**300PM Session 4: Anthropogenic Event Monitoring and Mitigation - Vessel Strikes**  
*Moderated by Jessica Redfern*

02.04.01 **Assessment of Vessel Strike Mortality Risk for North Atlantic Right Whales (NARW) along the U.S. Coast**

- *Hannah Blondin, University of Miami CIMAS/NOAA Southeast Fisheries Science Center*

02.04.02 **The probability of a lethal vessel strike for large whales: An update of available data and models to improve risk assessment**

- *Lance Garrison, Southeast Fisheries Science Center*

02.04.03 **Modeling changes in vessel strike risk to North Atlantic right whales as a result of Canada's traffic management measures in the Gulf of St. Lawrence**

- *Alexandra Mayette, Canadian Wildlife Federation*

02.04.04 **Recommended lanes for North Atlantic right whale conservation: An assessment of design and mariner cooperation**

- *Lisa Neyman, Florida Fish and Wildlife Conservation Commission*

02.04.05 **NOAA Fisheries role in vessel strike mitigation moving forward**

- *Caroline Good, National Marine Fisheries Service*

02.04.06 **Transport Canada (TC) update on North Atlantic right whale vessel management measures**

- *Maxine Bilodeau, Transport Canada*

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**400PM**      **Open Forum**  
*Moderated by Scott Kraus*

**500PM**      **Meeting Wrap and Close**

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## **2023 NARWC POSTER SESSIONS**

In person and remote poster sessions will happen concurrently on the evening of **24 October 2023**. Remote posters will be presented during a zoom session with link posted on meeting site.

### **REMOTE POSTER SESSION**

*Moderated by Robert Kenney*

#### **Feeding Ecology**

- 01 **Are New York Bight copepods abundant and energy-rich enough to be prey for North Atlantic right whales?**
- Joseph Warren, Stony Brook University

#### **New Technologies/Data Collection Techniques**

- 02 **An active learning pipeline for identifying whales in satellite imagery at scale**
- Caleb Robinson, Microsoft AI for Good Research Lab

#### **Distribution**

- 12 **Spring and fall right whale presence in the Gulf of St Lawrence inferred from mark-recapture aerial surveys**
- Tim Cole, NOAA Fisheries Northeast Fisheries Science Center

#### **Anthropogenic Event Monitoring and Mitigation - Vessel Strikes**

- 03 **Sailing sector - Marine mammal impacts**
- Damian Foxall, 11th Hour Racing team
- 23 **A vessel speed dashboard for North Atlantic right whale management areas**
- Jeff Adams, Office of Protected Resources, National Marine Fisheries Service
- 25 **U.S. Army Corps of Engineers updates on conservation and protection measure implementation in the South Atlantic region**
- Kathryn Lebow, US Army Corps of Engineers - Jacksonville District
- 29 **Alternative ecotourism as an example of how whale watch companies can support right whale protection**
- Laura Howes, Boston Harbor City Cruises/University of Massachusetts Boston

### **ONSITE POSTER SESSION**

#### **Data Collection and Management**

- 04 **Aerial line-transect surveys efforts of North Atlantic right whales in eastern Canada from 2017 to 2022 – data exploration**
- Angélique Ollier, Maurice Lamontagne Institute, Department of Fisheries and Oceans Canada
- 05 **Whale Insight: a tool in support of advancing science communication for the North Atlantic right whale in Canada**
- Katherine McKercher, Fisheries and Oceans Canada
- 06 **An international collaboration to produce transboundary models of occurrence and absolute density of North Atlantic right whales**
- Robert Schick, Duke University

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## **Behavior**

- 07 **In the strike zone? Tag data provides a better understanding of dive and surface behavior of North Atlantic right whales in the western Mid-Atlantic**
- Dan Engelhaupt, HDR Inc.
- 08 **Interannual and spatial heterogeneity of North Atlantic Right Whale diving behaviour presents challenges for estimating availability bias to aerial surveys, entanglement and collision risks in the Gulf of St. Lawrence**
- Adèle Labbé, Fisheries and Oceans Canada

## **Distribution**

- 09 **An analysis of North Atlantic right whale/human interactions in the southeast US calving grounds relative to the northern foraging grounds**
- Amadi Afua Sefah-Twerefour, University of South Carolina
- 10 **Prediction of potential foraging areas for the North Atlantic right whale in its main summer habitat**
- Andeol Bourgoïn, Université Laval
- 11 **Near real time prediction of the North Atlantic Right Whales distribution in the Gulf of St. Lawrence**
- Fanny Thiéry, Université Laval
- 13 **North Atlantic right whale sightings and group composition in the VA/NC Mid-Atlantic: 2018–2023**
- Jessica Aschettino, HDR Inc.
- 14 **North Atlantic right whale distribution in Southern New England during the winter and spring of 2023**
- Katherine McKenna, Anderson Cabot Center for Ocean Life, New England Aquarium
- 15 **Distribution patterns of North Atlantic right whale aggregations in the Shediac Valley**
- Andréa Mesquita, University of New Brunswick
- 16 **Applying an individual movement model to quantify dynamic habitat use of North Atlantic right whales**
- Abigail Kreuser, University of South Carolina
- 17 **Abundance estimates of North Atlantic right whales in eastern Canada from aerial line-transect surveys between 2017 and 2022**
- Anne P. St-Pierre, Department of Fisheries and Oceans Canada

## **Feeding Ecology**

- 18 **Preliminary results from the deployment of high-resolution inertial sensing tags and collocated prey field analysis of North Atlantic Right Whales in the Gulf of St Lawrence**
- Jay Kirkham, Dalhousie University

## **Genetics**

- 19 **Genome-wide patterns of mutation load indicate genetic purging through inbreeding in the endangered North Atlantic right whale**
- Richard Orton, Saint Mary's University

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## **New Technologies/Data Collection Techniques**

- 20 **Scaling whale monitoring using deep learning: A human-in-the-loop solution for analyzing aerial datasets**
- Malcolm Kennedy, Whale Seeker
- 30 **Canadian Space Agency: smartWhales initiative**
- Laurent Giugni, Canadian Space Agency

## **Anthropogenic Event Monitoring and Mitigation - Entanglement**

- 21 **The importance of fine-scale data on fishing methods to improve entanglement risk assessments**
- Alexandra Cole, Canadian Wildlife Federation
- 22 **Measuring weak breaking strength gear modifications before and after use in Atlantic Canadian fixed-gear fisheries**
- Krystyna Urbancic, Canadian Wildlife Federation

## **Anthropogenic Event Monitoring and Mitigation - Vessel Strikes**

- 24 **Speeding towards extinction: Vessel strikes threaten North Atlantic right whales**
- Julia Singer, Oceana
- 26 **A review of vessel strikes of right whales- when, where, what types of vessels, and impact to whales**
- Amy Knowlton, Anderson Cabot Center for Ocean Life at the New England Aquarium
- 27 **Vessel strike forensics of right whales - a review of methodology and new findings**
- Paul Kamen, Surface Propulsion Analysis
- 28 **Co-occurrence of North Atlantic right whales and vessel traffic in emerging and existing habitat**
- Emily O'Regan, Cummings School of Veterinary Medicine at Tufts University

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