



## North Atlantic Right Whale Consortium

### Annual Meeting

26-27 October 2021

The times list below indicate timing for the live Q&A sessions with those who have uploaded pre-recorded presentations to the meeting site. Meeting participants will receive a unique site login code and should view these presentations in advance of the meeting. Participants may submit questions/comments for presenters both in advance and during the meeting. The six-digit number preceding the presentation title corresponds to the video number on the meeting site.

**Please Note: The materials contained (both static and live) within the meeting site are intended for registered participants only and may not be shared in any capacity. All meeting participants have agreed to the meeting Code of Conduct. There is no 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, breakout sessions) without explicit consent of the presenter, speaker, moderator, etc.**

#### 26 OCTOBER 2021

**1000 Keynote/Opening:** *Scott Kraus, NARWC Chair*

**1015 Session 1: Species Status**

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

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

**01.01.02 Mortality update:**

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

**01.01.03 Entanglement/injury update**

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

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

- *Deborah Fauquier, National Marine Fisheries Service*

**1100 Session 2: General Updates**

**01.02.01 North Atlantic Right Whale Species in the Spotlight: Overview and implementation of a NOAA Fisheries 5-year Action Plan**

- *Diane Borggaard, National Marine Fisheries Service*

**01.02.02 Marine Mammal Commission general update**

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\*Time listed are EDT

- *Peter Thomas, Marine Mammal Commission*
- 01.02.03 DFO science update**
  - *Angelia Vanderlaan, Fisheries and Oceans Canada*
- ~~**01.02.04 Orsted offshore wind science initiatives updates**~~
  - ~~▪ *Laura Morse, Orsted, North American Offshore*~~
- 01.02.05 The other right whale: North Pacific right whale status update**
  - *Kevin Champion, Save the North Pacific Right Whale*
- 01.02.06 Last of the Right Whales film and impact campaign**
  - *Nadine Pequenezza, HitPlay Productions*
  - *Joanne Jackson, HitPlay Productions*
  - *Sholeh Fabbri, HitPlay Productions*

**1200 Session 3: Anthropogenic Event Management**

- 01.03.01 Fisheries and Oceans Canada (DFO) update on North Atlantic right whale fisheries management measures**
  - *Adam Burns, Fisheries and Oceans Canada*
- 01.03.02 Atlantic Large Whale Take Reduction Plan updates: Recent and planned modifications**
  - *Marisa Trego, Greater Atlantic Regional Office, National Marine Fisheries Service*
- 01.03.03 Implementation of reduced breaking strength vertical lines in the Massachusetts trap/pot fishery**
  - *Erin Burke, Massachusetts Division of Marine Fisheries*
- 01.03.04 Transport Canada management update**
  - *Michelle Sanders, Transport Canada*
- 01.03.05 US Vessel Strike Rule update**
  - *Caroline Good, National Marine Fisheries Service*
- 01.03.06 A multi-state mark-recapture-recovery model to estimate rates of severe injury and cause-specific mortality in North Atlantic right whales**
  - *Daniel Linden, National Marine Fisheries Service*
- 01.03.07 The (en)tangled web they weave: Stakeholder and social learning in the take reduction process**
  - *Kimberly Ohnemus, University of Rhode Island*
- 01.03.08 Shiny tools for management rules: using R and ‘shiny’ to inform dynamic management of North Atlantic right whales (*Eubalaena glacialis*)**
  - *Leah Crowe, Integrated Statistics/Northeast Fisheries Science Center*

**1300 LUNCH**

**1330 Session 4: Anthropogenic Events and Mitigation – Entanglement & Vessel Strike**

- 01.04.01 Ropeless Consortium meeting summary**
  - *Sean Brilliant, Canadian Wildlife Federation; Dalhousie University*
  - *Mark Baumgartner, Woods Hole Oceanographic Institution*
  - *Michael Moore, Woods Hole Oceanographic Institution*
- 01.04.02 Conservation, concertation, and innovative technologies for co-existing in the Gulf of St. Lawrence: the crabbers perspective**
  - *Philippe Cormier, CORBO, Inc*
- 01.04.03 Whales and fishermen in Gaspésie: towards a coexistence on the maritime territory:**
  - *Lyne Morissette, M-Expertise Marine, Inc*
- 01.04.04 Quantifying the effects and risk reduction of the annual Canadian North Atlantic right whale fishery closure strategies in the Gulf of St. Lawrence snow crab fishery:**

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- *Alexandra Cole, Canadian Wildlife Federation*
- 01.04.05 Elevations of lobster fishery groundlines in relation to entanglement risk to North Atlantic right whales in Atlantic Canada**
  - *Rhyl Frith, Canadian Wildlife Federation*
- 01.04.06 Quantifying rope density in the Scotian Shelf and Bay of Fundy lobster fishery considering fishing methods and effort**
  - *Farheen Kadwa, Canadian Wildlife Federation*
- 01.04.07 Documented early-stage North Atlantic right whales (*Eubalaena glacialis*) entanglements in the southern Gulf of Saint Lawrence**
  - *Delphine Durette-Morin, Canadian Whale Institute*
- 01.04.08 Marine Aquaculture: An emerging industry. An emerging threat?**
  - *Matt Thompson, Anderson Cabot Center for Ocean Life at the New England Aquarium*
- 01.04.09 Evaluation of surface-based detection performance for vessel strike mitigation of North Atlantic right whales**
  - *Loïcka Baille, Woods Hole Oceanographic Institution*
- 01.04.10 Fishing-vessel-strike risk to North Atlantic right whales in the Gulf of St. Lawrence**
  - *Meg Carr, Dalhousie University*
- 01.04.11 Navy Maritime Domain Awareness (MDA) Systems leveraged for North Atlantic right whale alerting**
  - *Erin Murnane, Naval Research Laboratory*

## 1445 Break

## 1500 Breakout Sessions I

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### #1 Linking Drone Imagery and Catalog Data

- *Co-Chair: Philip Hamilton, Anderson Cabot Center for Ocean Life at the New England Aquarium, NARWC Identification Catalog Database Curator*
- *Co-Chair: Monica Zani, Anderson Cabot Center for Ocean Life at the New England Aquarium, NARWC Identification Catalog/Database Data Manager*

As the curators of the North Atlantic Right Whale Catalog, we are trying to make sure we have a data coding system on our end that creates the strongest links between any drone imagery submitted to the Catalog and the original field data associated with those images. We anticipate a lot more drone imagery coming into the Catalog in the future, so we want to get this right. To do this, we need to understand how drone operators are collecting and tracking their drone imagery. We want any image we have to have the strongest link to the most accurate location, date, and observer. If there is a question about an image in 20 years, how will we best be able to find the answer? We would like to invite anyone contributing drone imagery of right whales to the Catalog to discuss this. We have developed some questions to guide the discussion which we will provide before the meeting.

### #2 Student/Early Career Research “Roundtables”

- *Chair: Hansen Johnson, Dalhousie University*
- *Moderated by NARWC Members*

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An informal opportunity to meet and chat with various Consortium members who represent different areas of expertise. Ask questions about their fields and how they view their role in right whale conservation.

## 1600 Breakout Sessions II

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### #1 Using Social Movement Scholarship to Develop Strategies to Grow Support for NARW Conservation

- *Chair: Randle Hart, St. Mary's University, Sociologist*

In this breakout session, we will discuss how social movement and science communication scholarship may be employed to develop strategies to increase the effectiveness of the Consortium's efforts to publicize the plight of the North Atlantic Right Whale, to amplify the pressing need to act collectively to save the species from extinction, and to respond to, and correct, misinformation, especially on social media. There will be time for participants to share their perspectives/experiences of obstacles in effectively communicating the science and urgency of the right whale issue. The session will be led by Randle Hart, a sociologist and co-investigator on the recently awarded Genome Canada grant, *Conservation Genomics of the Endangered North Atlantic Right Whale* (PIs T. Frasier and P. Hamilton). As part of this grant, Randle and his research team are studying the collaboration networks of the North Atlantic Right Whale conservation community and will be conducting ethnographic research in the USA and Canada on efforts to protect the species.

### #2 How can Offshore Wind Energy Development Advance in a Way that Protects the North Atlantic Right Whale (NARW)?

- *Chair: Michael Moore, Woods Hole Oceanographic Institution*
- *Co-Organizer: Jessica Redfern, New England Aquarium*
- *Co-Organizer: Francine Kershaw, Natural Resources Defense Council*
- *Co-Organizer: William Rossiter, NY4WHALES.*

Offshore wind energy development areas currently extend along almost the entire East coast (from Maine to North Carolina), directly coinciding with the NARW migratory corridor. Recently, NARW have favored waters off Southern New England (SNE). This distribution change is likely a result of climate change creating new thermal gradients that change the location and predictability of NARW optimal foraging. This area coincides with a high density of wind energy lease areas that will be constructed over the next two to five years. Offshore wind energy development—while necessary to meet the nation's ambitious clean energy goals—poses several potential risks to NARWs. Noise sources harmful and/or disruptive to NARW will occur during site assessment (geophysical surveys), construction (pile driving, dredging, dynamic positioning systems), and may occur during operations (broadband and tonal turbine noise) and decommissioning. Increased vessel use associated with wind energy development and operation pose the risk of NARW sublethal and lethal trauma. Large numbers of turbines may also lead to oceanographic changes, such as increased water turbulence, that may change prey density and distribution. Prospective floating offshore wind energy development in the Gulf of Maine also poses some unique challenges, including the potential for secondary entanglement risk in the mooring lines and inter-array cables. Together, potential impacts from offshore wind—if inadequately mitigated—may lead to displacement of individuals or the following suite of effects for individuals that remain in the area: increased vessel strike and entanglement risk, disruption of

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foraging success and other vital behaviors, and increased stress, which, collectively, may result in reduced energy balance and reproductive success, and increased mortality. The goal of this session is to discuss these concerns, to assess the completeness of current research, including the status of baseline data collection on NARW in waters off SNE, and consider the adequacy of current mitigation plans and opportunities for improvement (e.g., new monitoring and mitigation technologies).

## **1715 Recap Day 1**

### **1730 Social – Trivia Night**

Following the success of last year's trivia event, we will host a **TEAM** trivia night at the 2021 meeting. Gather your team (up to 10 people), grab a beverage/food of choice, and get ready to show off how much you know about right whales, the NARWC, your colleagues, and everything in between. We will be using the platform "Wonder" for this event and will offer a tutorial as we get closer to the meeting. In the meantime – feel free to check it out! [www.wonder.me](http://www.wonder.me). You can also get into our [NARWC room](#) passcode **NARWC2021** and play around so that you have a good feel for how it works prior to the event. Trivia night SIGN UP is open. We are also taking fun and creative right whale related questions for the event! Submit questions [HERE](#).

### **1930 Screening of “The Last of the Right Whales” film**

*“Last of the Right Whales”* will be available to screen from 7-10 pm EDT on October 26th. This virtual screening is open to registered NARWC participants only. Registrants must sign up to reserve a screening ticket with a private viewing link.

Reserve here: <https://watch.showandtell.film/watch/lastoftherightwhales-narwc>

A panel discussion on the film and the NARW Impact campaign will take place during the breakout sessions on October 27th (3PM EDT)

## **27 OCTOBER 2021**

### **1000 Welcome Day 2**

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## 1015 Session 1: Demographics and Species Assessments

- 02.01.01 **How should we think about reproduction in North Atlantic right whales?**
  - *Timothy Frasier, St. Mary's University*
- 02.01.02 **Estimating the population size of the North Atlantic right whale**
  - *Chongkyung Kim, Swarthmore College*
- 02.01.03 **Multi-state modeling of true reproductive states of individual female right whales provides new insights into their decline**
  - *Joshua Reed, Macquarie University*

## 1100 Session 2: Acoustics and Acoustic Detections

- 02.02.01 **North Atlantic right whale presence and vocal activity in New York waters: Implications for their protection and safe passage**
  - *Anita Murray, Wildlife Conservation Society; Bronx Zoo*
- 02.02.02 **Near real-time passive acoustic monitoring for right whales on the U.S. east coast – an update**
  - *Mark Baumgartner, Woods Hole Oceanographic Institution*
- 02.02.03 **Impacts of COVID-19 pandemic-related changes in shipping on the soundscape and calling behavior of right whales in the New York Bight**
  - *Susan Parks, Syracuse University*
- 02.02.04 **Current NARW PAM Project updates from the NEFSC**
  - *Genevieve Davis, Northeast Fisheries Science Center*
- 02.02.05 **Using sonobuoys and visual surveys to characterize North Atlantic right whale (*Eubalaena glacialis*) calling behavior in the Gulf of St. Lawrence**
  - *Kimberly Franklin, Dalhousie University*
- 02.02.06 **Ambient acoustic noise with depth in the Houguedo Strait, Gulf of St Lawrence and implications for baleen whale detection**
  - *Romina Gehrman, Dalhousie University*
- 02.02.07 **The value of incorporating bearing estimation into real-time right whale mitigation systems**
  - *Kaitlin Palmer, SMRU Consulting*
- 02.02.08 **Detecting and classifying right whale upcalls in Cape Cod Bay and co-locating calls with aerial observations**
  - *Tina Yack, Duke University*

## 1200 BREAK/LUNCH

### LUNCH BREAKOUT SESSION

#### **The Northeast Implementation Team for Right Whale Recovery: Informal discussion forum on team activities and future directions**

- *Chair: Desray Reeb, Bureau of Ocean Energy Management*

The Northeast Implementation Team (NEIT) is a multi-disciplinary group formed under the U.S. Endangered Species Act that advises NOAA Fisheries on issues related to the status and conservation of right whales in the Northeast U.S. (Maine to Virginia). The NEIT considers issues that are impeding right whale recovery, including (but not limited to) vessel strikes, climate change, pollution and contaminants, and acoustic threats. While the threat of entanglement is addressed through other avenues, such as the Atlantic Large Whale Take Reduction Team process, the NEIT can support the Take Reduction process, if needed, to help implement recovery goals. This breakout session will offer an opportunity for the right whale stakeholder community to learn more about what the NEIT is working on and offer feedback and suggestions for future work.

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## 1245 **Session 3: Distribution and Behavior**

- 02.03.01 **A comparison of three approaches to estimate North Atlantic right whale regional abundance**
  - *Nathan Crum, Fish and Wildlife Research Inst., FL Fish and Wildlife Conservation Comm.*
- 02.03.02 **Repatriation of a historical right whale habitat and novel year-round occurrence during an era of rapid climate change**
  - *Orla O'Brien, Anderson Cabot Center for Ocean Life at the New England Aquarium*
- 02.03.03 **Predicting endangered North Atlantic right whales using prey fields**
  - *Camille Ross, Bigelow Laboratory for Ocean Sciences*
- 02.03.04 **Predicted distribution and abundance of zooplankton species in Cape Cod Bay in 2019**
  - *Robert Schick, Duke University*
- 02.03.05 **Matrilines and migratory patterns explain high variation in the fecundity of a critically endangered baleen whale**
  - *Ana Bishop, University of South Carolina*
- 02.03.06 **Residency, demographics, and movement patterns of North Atlantic right whales (*Eubalaena glacialis*) in an offshore wind energy development area in southern New England, USA**
  - *Ester Quintana-Rizzo, Simmons University*
- 02.03.07 **Observations of adult-calf non-reproductive copulatory behavior in North Atlantic right whales**
  - *Gina Lonati, University of New Brunswick, St. John*

## 1345 **Session 4: Feeding Ecology, Health, and Physiology**

- 02.04.01 **Variation in near-bottom aggregations of North Atlantic right whale prey in the southern Gulf of St. Lawrence in summer**
  - *Kevin Sorochan, Fisheries and Oceans Canada*
- 02.04.02 **North Atlantic right whale (*Eubalaena glacialis*) habitat in the southern Gulf of St. Lawrence**
  - *Hansen Johnson, Dalhousie University*
- 02.04.03 **Biogeochemical analysis of baleen as a wildlife forensic tool: Reconstructing the lives (and deaths) of North Atlantic right whales**
  - *Nadine Lysiak, Suffolk University*
  - *Elizabeth Burgess, Anderson Cabot Center for Ocean Life at the New England Aquarium*
- 02.04.04 **Health indicators to predict the cumulative effects of multiple stressors on the vital rates of North Atlantic right whales**
  - *Peter Tyack, University of St. Andrews*
- 02.04.05 **Development of a mass spectrometry method capable of detecting and quantifying a panel of steroid hormones in right whale blow**
  - *Andrew Wright, Fisheries and Oceans Canada*

## 1445 **Break**

## 1500 **Breakout Sessions I**

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### **#1 Last of the Right Whales Film & Impact Campaign**

- *Co-Chair: Nadine Pequenezza, Producer/Director, Last of the Right Whales*
- *Co-Chair: Joanne Jackson, Executive Producer/Impact Producer, Last of the Right Whales*
- *Co-Chair: Sholeh Fabbri, Impact Producer, Last of the Right Whales*
- *Panelist: Moira Brown, Senior Scientist, Canadian Whale Institute*
- *Panelist: Sean Brilliant, Senior Conservation Biologist, Marine Programs, Canadian Wildlife Federation*
- *Panelist: Patrick Ramage, Senior Director of Outreach & Program Collaboration, IFAW*

With unprecedented access to film the critically endangered North Atlantic right whale from Florida to the Gulf of St. Lawrence, a new feature documentary bears witness to their challenges and offers hope for their survival. *Last of the Right Whales* had its world premiere at the Calgary International Film Festival on September 26th and will continue to screen at festivals and theatres before airing on CBC's *The Nature of Things* in Fall 2022. In tandem with the film's release, a 10-month impact campaign is being planned for North America in collaboration with the film's outreach partners: International Fund for Animal Welfare (IFAW), Sierra Club Canada Foundation, Canadian Wildlife Federation, Canadian Whale Institute, and Oceans North. *Last of the Right Whales* will be used to engage stakeholders – fishers, boaters, retailers, shipping and cruise lines as well as consumers – in discussions about what we can each do to ensure the survival of this great whale facing extinction. Join this breakout session to find out how you can be part of the film's impact campaign and help amplify the call to protect North Atlantic right whales.

### **#2 Health Indicators to Predict the Cumulative Effects of Multiple Stressors on the Vital Rates of North Atlantic Right Whales.**

- *Chair: Peter L Tyack, Sea Mammal Research Unit, School of Biology, University of St Andrews*

A large research project that aims to better understand the cumulative effects of multiple stressors on marine mammals (funded by SERDP from 2021-2025) has selected North Atlantic Right Whales as an important case where the effects of multiple stressors threaten the survival of an endangered species. My talk at the consortium with the same title as the breakout session above introduces the approaches we are currently taking. One approach to understand how short-term effects accumulate to affect vital rates is to seek health indicators whose status can be estimated based on exposure to stressors and that have consequences for survival and reproduction. In our breakout session, we encourage all participants to suggest indicators for health, how to estimate them, and what their link is to survival and reproduction. We aim to develop models that help decide how much each stressor in combination with others needs to be reduced in order to reduce the risk to the species to an acceptable level. We particularly hope to hear from about ideas that we may have missed and hope to discuss how best to match our work to the highest priorities for right whale conservation.

## **1600 Breakout Sessions II**

### **#1 We Are All Whalers**

- *Chair: Michael Moore, Woods Hole Oceanographic Institution*  
<https://press.uchicago.edu/ucp/books/book/chicago/W/bo113867120.html>

Discussion of consumer education and engagement in right whale conservation, in the context of the book 'We are all Whalers', by Michael Moore, Woods Hole Oceanographic Institution, recently published by

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University of Chicago Press. Michael will briefly introduce the book, and read a few key pieces from it in the context of the above. Then a discussion will follow as to how to better engage ethical consumers to seek goods shipped by sea, and caught in trap fisheries, that are provided in a manner that is sustainable to both the relevant industries and whales.

## **1700 Wrap Up/Meeting Close**

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