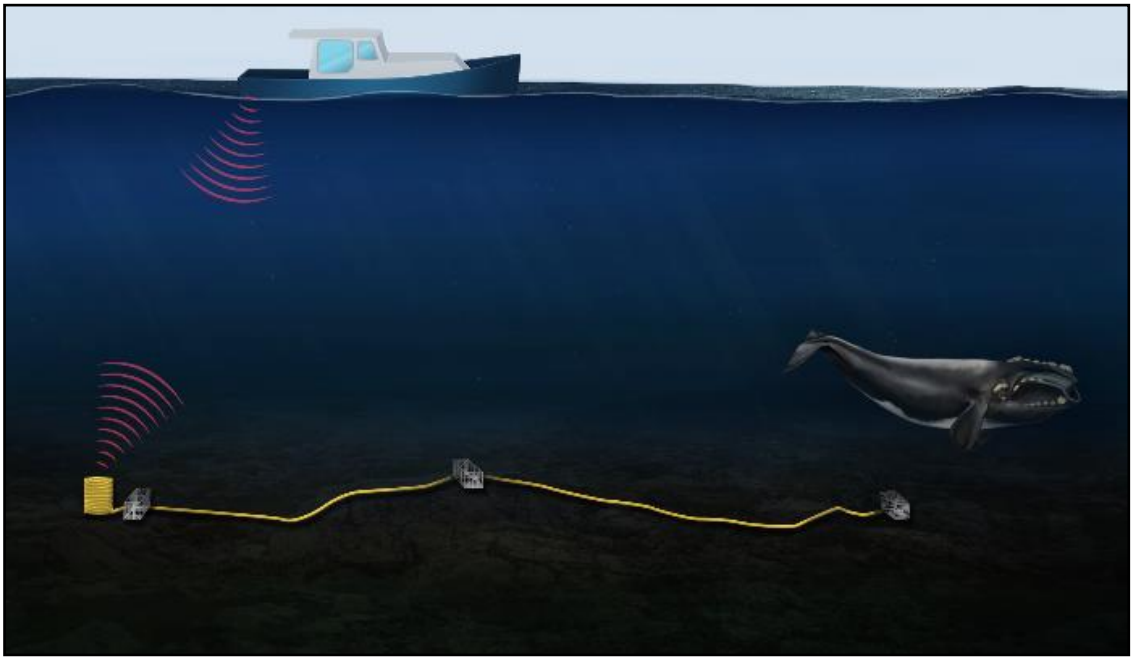
Ropeless Consortium Annual Meeting



26 October 2020

www.ropeless.org

Ropeless Consortium

Annual Meeting

26 October 2020

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 four digit number preceding the presentation title corresponds to the video number on the meeting site.

26 OCTOBER 2020

1000AM **Keynote/Opening:** *Sean Brillant, RC Chair – Canadian Wildlife Federation*

1015AM **Session 1: Marking Systems**

- **01.01: EdgeTech Trap Tracker application for ropeless fishing**
  - *Rob Morris – Edgetech*
- **01.02: Using subsea acoustics to communicate with and position fishing gear**
  - *Dan Shropshire - Teleydne Technologies*
- **01.03: Developing requirements and specifications for a gear location marking system**
  - *Mark Baumgartner – Woods Hole Oceanographic Institution*
- **01.04: Market Research to identify geolocation strategies for ropeless fishing**
  - *Christin Khan - NOAA NE Fisheries Science Center*
- **01.05: The Fishing Gear Location Marking Fund: jumpstarting commercial development of gear location marking technology**
  - *Andrea Bogomolni – Island Foundation*

1100AM **Break**

1115AM **Session 2: Retrieval Systems and Testing**

- **02.01: Ropeless RISER™: a system and method to implement ropeless fishing and eliminate whale entanglements**
  - *Bud Vincent - DBV Technology, LLC*
- **02.02: Desert Star Systems**
  - *Marco Flagg - Desert Star Systems LLC*
- **02.03: A proposed framework based on the needs of fishers to ensure comparability of ropeless gear evaluations**
  - *Elizabeth Baker and Sean Brillant – Canadian Wildlife Federation*
- **02.04: Ongoing collaborative trials of ropeless fishing gear in Atlantic U.S. waters: status and updates**
  - *Eric Matzen and Henry Milliken – NOAA Northeast Fisheries Science Center*
- **02.05: The opus of ropeless in the offshore lobster fishery**
  - *Erica Fuller – Conservation Law Foundation and Eric Matzen – NOAA Northeast Fisheries Science Center*

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***Time listed are EDT**

- **02.06: Using ropeless in closed fishing areas: Sea trials of snow crab fishing gear in the Gulf of St. Lawrence**
  - *Philippe Cormier - CORBO Engineering*
- **02.07: Preliminary results from fishing trials of two "ropeless" fishing systems in the Gulf of Maine**
  - *Tim Werner - Ocean Associates Incorporated; UMASS-Boston*
- **02.08: Fishing and testing SMELTS ropeless lift bag fishing gear in the Gulf of Maine**
  - *Richard Riels - SMELTS*
- **02.09: Testing ropeless fishing systems in Maine waters off Mount Desert Island**
  - *Zack Klyver – Blue Planet Strategies*
- **02.10: A pilot project to modernize pot fishing for the black sea bass fishery using acoustic subsea buoy retrieval systems**
  - *Bryan Fluech - UGA Marine Extension and Georgia Sea Grant*

1215PM Lunch

1245PM <u>Session 3:</u> <u>Market Interests, Management and Policy</u>

- **03.01: New Fishery Improvement Project (FIP) in Canada's largest snow crab region, zone 12, in the Gulf of St. Lawrence.**
  - *Katherine Morissette – MKM Global*
- **03.02: Ropeless fishing in Scotland**
  - *Kim Sawicki – Sustainable Seas*
- **03.03: Ropeless Fishing in Atlantic Canada: advances and remaining challenges**
  - *Ed Trippel – Department Fisheries and Oceans Canada*
- **03.04: Learning from lobstermen: issues to address for ropeless adoption in Maine**
  - *Libby Jewett - NOAA Oceanic and Atmospheric Research*

130PM Break

140PM Panel Discussion
Adam Kenney – Canadian Wildlife Federation/Cape Sable Island fisherman
Rob Martin - NOAA Gear Specialist, South Shore Lobster Fishermen's Association
Martin Noel – APPCA
Marc Palombo - offshore fisherman

Breakout Session Discussions
Participants will access this breakout session via zoom link on the main Ropeless Meeting landing page. Once in the zoom discussion, all participants will have the ability to be on or off video. All participants will be muted upon entry, and can turn their mute off when speaking. We will run **four** moderated discussions during this time. Please utilize the hand-raise function to be acknowledged by a moderator to participate with a question/comment.

215PM Ropeless technologies: Perception vs reality
Moderated by Mark Baumgartner/Lyne Morissette
A discussion of the current state of ropeless fishing, including what remains to be done to (1) evaluate its operational and economic feasibility, (2) implement at a commercial scale to provide options for fishermen affected by time-area closures, and (3) consider ropeless fishing as a viable

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remedy to mitigate whale entanglements range-wide.

300PM **Testing/trial protocol framework**
Moderated by Sean Brillant/Elizabeth Baker
Discussion of recent and current tests and trials, data collected, data gaps, and enhancing the framework moving forward.

345PM **Risk discussion: What level of risk is acceptable?**
Moderated by Michael Moore/Sean Brillant
Vessel strike reductions have embraced strategies that retain some risk. Likewise trawl groundlines between traps have residual risk. How is that risk factored into ropeless deployment plans, and discussions?

430PM **Ropeless Consortium role and looking forward**
Moderated by Mark Baumgartner/Michael Moore
Review of the consortium's achievements to date, and what it can usefully do in the next few years.

500PM **Wrap Up**

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***Time listed are EDT**

A proposed framework based on the needs of fishers to ensure comparability of ropeless gear evaluations

Baker, E.[1], Brillant, S.[1]

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Ropeless gear has been and continues to be tested and evaluated by individual groups of fish harvesters, conservationists, government departments and academics internationally. However, the methods used to conduct this testing and evaluation are seldom aligned. This has created a situation in which many individual tests of various ropeless systems have been conducted, with few options for compiling or comparing results of the trials to provide greater insight to their suitability for commercial fisheries. We propose a draft framework based on conversations with commercial fish harvesters that outlines the questions to be answered, functions to be evaluated, measurements to be collected, and considerations to be aware of when testing the suitability of ropeless gear for commercial fisheries. International collaborators have also provided revisions and suggestions to further develop the framework. This framework can be used to advise the planning of trials, the development of data collection protocols, and ultimately, the suitable types of ropeless gear for specific commercial fisheries. We will also present challenges and limitations associated with this framework, and with ropeless testing generally.

Developing requirements and specifications for a gear location marking system

Baumgartner, M.[1], Baumwell, L.[2], Brillant, S.[3], Baker, E.[3]

[1]*Woods Hole Oceanographic Institution, 266 Woods Hole Road, Woods Hole, MA, 0, 02543, United States (mbaumgartner@whoi.edu)*
[2]*The Pew Charitable Trusts, 901 E Street, NW, Washington, DC USA 20004*
[3]*Canadian Wildlife Federation, 1355 Oxford St. PO Box 15000, Halifax, NS B3H 4R2 Canada*

Buoyless (or ropeless) fishing results in the removal of buoys and end lines from trap/pot fishing gear, but the role fulfilled by buoys in marking the location of gear is still vital for avoiding gear conflict. The greatest obstacle to developing a commercially viable buoyless gear location marking system is the universal adoption of a single method to locate gear on the sea floor. There are several proposed methods: GPS marking of the deployment location, acoustic ranging, directional acoustic ranging, and acoustic self-localization. GPS marking has been implemented by several manufacturers of buoyless fishing gear, but none of the proposed methods have been rigorously reviewed to determine if they meet the needs of industry, enforcement, and regulators. Furthermore, there has been no formal comparison of the various gear location marking options to determine which is best. We believe that the decision of which gear location marking method to adopt must be made as a community of fishers, enforcement, and regulators, with input from engineers, scientists, conservationists, and gear manufacturers. Toward that end, we have begun a process to document the requirements of a gear location marking system from all of these stakeholders, choose a gear location marking method that will meet these requirements, and develop specifications for a system that commercial manufacturers can begin to build. We will describe this process and provide an update on our efforts to collect initial requirements in advance of a workshop that will finalize the requirements, select a gear location marking method based on these requirements, and convene a technical working group to develop system specifications.

The Fishing Gear Location Marking Fund: Jumpstarting commercial development of gear location marking technology

Bogomolni, A.[1], Baumgartner, M.[2]

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[2]*Woods Hole Oceanographic Institution, Woods Hole MA 02543*

While regulators in both the United States and Canada are increasingly considering buoyless gear as a solution to eliminating lethal entanglements of marine wildlife, there is currently no government mandate for buoyless fishing. In the absence of these regulatory requirements, there is no market for buoyless gear and little incentive for companies to develop the needed technology to mark the location of fixed fishing gear and manage gear conflict. Without a demonstration of a feasible, accurate and commercially viable method to manage gear conflict, government regulators are unlikely to mandate buoyless fishing. This chicken-and-egg scenario threatens to stall the development of buoyless fishing. We have established the Fishing Gear Location Marking Fund to provide vital support to commercial manufacturers to jumpstart the development of prototype gear location marking devices. We anticipate that successful testing and demonstration of these devices will encourage government regulators to establish buoyless-only fishing areas, which in turn will create a market for buoyless fishing technologies and the appropriate profit incentive for companies to advance their prototypes into commercial products. The Fund will also play a crucial role in encouraging the adoption of standards and protocols by participating companies that will ensure interoperability among manufacturers' devices as well as healthy commercial competition to keep the cost of buoyless fishing gear as low as possible. The Fund aims to raise $1M through philanthropic contributions to be disbursed in a design phase and a prototype phase over the next 2 years.

Using ropeless in closed fishing areas: sea trials of snow crab fishing gear in the Gulf of St. Lawrence

Cormier, P.[1], Haché, R.[2], Morissette, L.[3] , Chiasson, R.[4], Chiasson, S.[2] , Demers, G.[1], Ferron, S.[4], Gionet, J.[2] , Haché, P.[4], Légère, P.[1], Loubier Chiasson, V.[1], Noël, G.A.[2] , Noël, L.[4], Noël, M.[4], Noël, P.[4], Roussel, M.[2] , Thériault, Y.[1]

[1]*CORBO engineering, Caraquet, New Brunswick, Canada, E1W 1B6 (pcormier@corboinc.com)*
[2]*Association des Crabiers Acadiens, Shippagan, New Brunswick, Canada, E8S 1M8*
[3]*M – Expertise Marine, Sainte-Luce, Québec, Canada, G0K 1P0*
[4]*Association des Pêcheurs Professionnels Crabiers Acadiens, Shippagan, New Brunswick, Canada, E8S 1M8*

Over the past two years, we have witnessed a positive transformation of the fishers' perception towards this new gear technology as commercial fishers become increasingly aware of the need to find a way to access their traditional fishing grounds when they are closed to fishing in order to protect North Atlantic Right Whales (NARW). Fishers from Association des crabiers acadiens (ACA) and Association des Pêcheurs Professionnels Crabiers Acadiens (APPCA) tested three ropeless snow crab gear systems during the 2018, 2019 and 2020 fishing seasons. The purpose of these tests was to eventually and, under the right conditions, allow fishers to experiment with new ways of harvesting snow crab safely without requiring the presence of ropes in the water column as they are a serious threat to the well-being of NARW commonly present on the fishing grounds during the fishing season. In 2020, ACA was issued an experimental fishing licence that allowed 10 snow crab professional fishers to access fishing

areas that were closed to commercial fishing due to the observed presence of NARW. Each fisher was allowed 10 additional experimental ropeless traps to prosecute this "real life" experimental fishery. In this talk, we will present the results of these sea trials and discuss the technical reliability of the system, the harvesters' needs, the trustworthiness of the release mechanism and the relative efficiency of using trawls of trap instead of individual unit to catch snow crab. All ten fishers recommend that further expended experimentations be planned for the 2021 fishing season. Fishers are practical specialists and when push comes to shove, they will find a way to make things work on their vessels. Real progress is being achieved here thanks to the successful interaction between fishers and the engineers/scientists that are involved in this project. Getting ten commercial fishing skippers to partake in this experiment helps promote positive attitude towards change as the crews of these 10 vessels learn and share their experience within the industry.

A pilot project to modernize pot fishing for the black sea bass fishery using acoustic subsea buoy retrieval systems

Fluech, B.[1], Sawicki, K[2]

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[2]*University of Massachusetts, Dartmouth*

Vertical end lines and buoys, such as those utilized in the Black Sea Bass (BSB) pot fishery, present an entanglement risk to the critically endangered North Atlantic right whale, a species which migrates and calves off the coast of Georgia in the winter months. Due to potential entanglements, the winter closure of BSB pot fishery has been implemented from November 1st through April 30th to comply with the Atlantic Large Whale Take Reduction Plan. Adaptation of Acoustic Subsea Buoy Retrieval Systems (ASBRS) for this style of pot fishing could remove nearly all risk to these whales and other marine animals that suffer entanglements. For fisheries management to determine if these devices can be relied upon, a detailed performance analysis is required that examines the refinement and successful use of ASBRS in the fishery. This pilot project, currently in progress, is examining the potential usefulness of ASBRS in the BSB pot fishery off the coast of Georgia. It is hoped this project will assist local fishing communities resolve species conflict issues that affect the ability to fish and allow for the expanded harvest BSB in a sustainable manner. Data are being collected through an ongoing and collaborative effort of different ASBRS manufacturers, fisheries industry partners, and UGA Marine Extension and Georgia Sea Grant. Dockside trials were conducted to familiarize partners with ASBRS gear, while an Exempted Fishing Permit was obtained from the National Marine Fisheries Service to test these gears in federal waters in September and October 2020. Control traps are being fished as singles with a traditional configuration while experimental configurations of black sea bass pots will be fished without vertical buoy lines on live bottom in the vicinity with the control pots. This presentation will provide details about the pilot project's status and share preliminary data collected to date.

The opus of ropeless in the offshore lobster fishery

Fuller, E.[1], Asmutis-Silvia, R.A.[2], Matzen, E.[3], Milliken, H.O.[3], Morris, R.[4], Harry, C.T.[5], Baumgartner, M.F.[6], Moore, M.J.[6]

[1]*Conservation Law Foundation, 62 Summer St.,Boston, MA, 02110, United States (efuller@clf.org)*
[2]*Whale and Dolphin Conservation, 7 Nelson St. Plymouth MA 02360*
[3]*Northeast Fisheries Science Center, 166 Water St., Woods Hole MA 02543*
[4]*EdgeTech, 4 Little Brook Rd., West Wareham MA 02576*

[5]*International Fund for Animal Welfare, 1400 Sixteenth St. NW Suite 510, Washington DC 20036*
[6]*Woods Hole Oceanographic Institution, 266 Woods Hole Rd., Woods Hole MA 02543*

Just as an opus is serially composed over time before its completion, so too is the process of modifying fixed gear fisheries to successfully operate with on-demand vertical lines. While the benefits of on-demand vertical line retrieval have been touted by researchers and conservationists as a means to reduce the accidental entanglement of marine species, particularly the critically endangered North Atlantic right whale, the fishing industry has raised significant and legitimate concerns with its performance, reliability, safety and cost. Through open and honest dialogue, a small group of conservationists, researchers, and fishermen designed an experiment to trial EdgeTech's acoustic release system in the offshore lobster fishery. We planned to outfit four to five vessels with at least four units each to replace one vertical line in an actively fished trawl. Here we present the initial outcomes of the experiment including the challenges and ongoing remedies of collaborating, training, software, data collection, gear deployment and retrieval, and COVID. We will outline what we believe are the necessary next steps to successfully and affordably enable some portion of the fishery to transition to on-demand vertical lines.

Learning from lobstermen: issues to address for ropeless adoption in Maine

Jewett, L.[1]

[1]*NOAA Ocean Acidification Program, 1315 East West Hwy (SSMC 3: 12826), Silver Spring, MD 20910 (libby.jewett@noaa.gov)*

In December 2019, Maine lobstermen and others associated with the Maine lobster industry were interviewed to invite their perspectives and ideas on how to reduce the risks that the lobster industry poses to right whales. Maine lobstermen and lobsterwomen provided important insights which should help the broader community as we look for solutions. Fishermen want to do the right thing but they also don't want to unnecessarily sacrifice without knowing with greater certainty that changing their fishing practices will make a difference. Although removing vertical lines from the water column makes good sense, no proven, off the shelf ropeless technologies exist which will meet all the requirements of fishing in Maine waters, especially in deep offshore areas. Cost and complexity are major issues with the technologies currently available. Maine lobstermen must be included as technologies are developed otherwise obstacles to adoption will be difficult to overcome.

Market research to identify geolocation strategies for ropeless fishing

Khan, C.[1], Milliken, H.[1], Baumgartner, M.[2], Matzen, E.[1]

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[2]*Woods Hole Oceanographic Institution, Woods Hole, MA 02543*

One of the obstacles to the advancement of ropeless fishing to mitigate whale entanglement is the development of an affordable system to locate and track gear deployments without a surface buoy. While there are known companies that are capable of developing such a system based on their expertise in underwater acoustics, presently the known options are limited and expensive. In an effort to understand available technologies and companies capable of assisting in this effort, we have undertaken a worldwide technology search on the platform Yet2 for products and companies that may help to solve the underwater gear marking problem. After a comprehensive search, there have been three

significant outcomes of this effort: 1) acoustic technology remains the only viable solution to mark and communicate the exact location of the gear on the seafloor (e.g., radio and optical methods are inadequate), 2) we have identified a much larger pool of capable manufacturers than was previously known, and 3) acoustic modems with potential applications to ropeless fishing can be produced at much lower cost than what is currently available today. We will summarize the results of this process and give a brief description of the technologies that hold potential to further the development of gear marking needed to advance ropeless fishing.

Testing ropeless fishing systems in Maine waters off Mount Desert Island

Klyver, R.Z.[1], Fleming, R.[1], Richard Riels[2], Rand, K.[3], B**a**umwell, L[4]

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[4]*The Pew Charitable Trusts, 901 E Street, NW, Washington, DC USA 20004*

We will provide an update on the first testing of SMELTS Ropeless Lobster Raft and EdgeTech 5112 Ropeless Fishing Systems in Maine state and federal waters during the fall of 2020. Testing took place in Frenchman Bay, at its entrance, and in the waters around Mount Desert Rock. Tests were primarily conducted in 50 to 300 feet of water in a variety of benthic substrates including mud, cobble, and boulder fields and on slopes with an angle of up to 45 degrees. Teledyne and Fiomarine modem systems were used to trigger gear to the surface. Testing was done for range to gear, time to surface after trigger, time to buoy or lift bag, and other parameters. Various sized Smelts Lobster rafts were tested with and without lobster traps. All lobster traps were mock traps and all openings were shut off with wire mesh so that they were not capable of fishing during the testing. For example, during the first phase of testing medium sized Smelts module unit with a 185-pound lift bag was repeatedly capable of lifting three lobster traps completely off the bottom before hauling commenced. Testing was completed in a number of the most rigorous Maine bottom types that could be located, in areas with strong currents, and in a wide range of weather conditions including thick fog and rough seas. Lobster Raft systems were highly visible from a significant distance upon reaching the surface. A variety of GoPro and Paralenz systems were used to capture underwater footage of the gear when deployed, interacting with the bottom, and during retrieval.

Ongoing collaborative trials of ropeless fishing gear in Atlantic U.S. Waters: status and updates

Matzen, E.[1], Milliken H.O.[1], Hayes, S.[1]

[1]*Northeast Fisheries Science Center, 166 Water St., Woods Hole MA 02543 (eric.matzen@noaa.gov)*

The Northeast Fisheries Science Center (NEFSC) initiated a collaboration to investigate innovative ropeless fishing technologies that may provide new options to mitigate large whale and leatherback sea turtle entanglement. As part of this ongoing effort, NEFSC partnered with fishermen, gear engineers and manufacturers, research institutions and conservation organizations to fund gear acquisition, trial ropeless systems under real world conditions, and collect vital data and fishermen feedback on gear performance. To date, we have made, or will make available shortly, 43 ropeless systems for trials from seven different manufacturers including Ashored, DBV technologies, Desert Star, Edgetech, Fiomarine, and SMELTS, and Sub Sea Sonics. We are working with fishermen in both inshore and offshore environments to

help them investigate ropeless operations under a variety of conditions. Our growing gear library will help engineers and manufacturers trial their systems out on commercial fishing vessels to identify and resolve operational and other issues. The long-term goal of these trials is to promote the development, safety and availability of new options for fixed gear fisheries to mitigate the threat of entanglement with protected species.

New Fishery Improvement Project (FIP) in Canada's largest snow crab region, zone 12, in the Gulf of St. Lawrence.

Morissette, K.[1]

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We are delighted to announce the launch of a new Fishery Improvement Project (FIP) in Canada's largest snow crab region, zone 12, in the Gulf of St. Lawrence. This FIP is led by New Brunswick and Quebec Seafood Processors and Fishermen Associations who have been, for the past years, actively involved in establishing stakeholder and governmental support in pilot and sea trials of new and emerging technologies for the reduction of interaction between right whales and snow crab fishing in the Gulf of St. Lawrence and surrounding areas. We wish to emphasize the importance of maintaining our fishery sustainable and reiterate our commitment to implementing the initiatives necessary to protect fishery resources and ensure the long-term future of the snow crab fishing industry. Along with the fishery management reforms set by the Canadian Government, we have conducted several trials using different types of ropeless gear, as we consider it urgent to see ropeless commercial fishing being used in Canada in the near future. The proactiveness that we have demonstrated over the past several years, has led to the creation of this FIP. We are convinced that the results of the pilot projects and sea trials that we lead will play an integral role in the sustainability of fisheries during this era of rapid climate change. Through this ordeal, an incredible collaboration has taken place between the different fishermen's associations and processors from Quebec and New Brunswick, First Nations, governments, ONG, scientists, engineers, retailers, distributors, industry stakeholders and soon to be more! We are confident that our unified and combined effort is the key in reducing the risk to endangered, threatened, and protected (ETP) species, and specifically to NARWs in the GSL snow crab fishery. We want to present you this collaboration.

EdgeTech Trap Tracker application for ropeless fishing

Morris, R.[1], Ubik. E[1]

[1] *EdgeTech, 4 little Brook Road, West Wareham MA, 02576, United States (rob.morris@edgetech.com)*

EdgeTech has been the leader Acoustic release and Pop-up buoy technology for 30 years. This paper describes how EdgeTech has developed the Trap Tracker Application. The Trap Tracker application, using a Real-time Cloud database, positions traps on the seafloor to help fishers locate their own gear and see other fishers gear within a preset distance to avoid gear conflicts with other fixed and mobile gear operators. The data base will allow enforcement to virtually plot and monitor all traps deployed using the Trap Tracker app while sitting in an office. The Trap Tracker application records all activity like date of deployment and recovery, position, water temperature and catch and trap count if desired for each fishers' traps in. This history can be easily exported by the fisher for record keeping.

Fishing and testing SMELTS ropeless Lift Bag fishing gear in the Gulf of Maine

Riels, R.[1]

[1]*SMELTS, 1003 Iowa Heights Rd, Sedro Woolley, WA, 98284, United States (info@smelts.org)*

SMELTS team continue testing retrieval strategies in Gulf of Maine lobster fishery with partner fishermen using multiple acoustic systems and marking strategies. SMELTS continue exploring subsea and surface marking strategies for ropeless lift bag fishing using acoustic, GPS and passive marking systems. SMELTS has been testing gear in 300' depths lifting gear in 3 pot trawls off bottom to better understand lifting gear directly and reducing loads at the surface. Discuss our planned work for upcoming year.

Using subsea acoustics to communicate with and position fishing gear

Shropshire, D.[1], Mancuso, C.[1], Pinelli, R.[1]

[1]*Teledyne Technologies, 49 Edgerton Dr, North Falmouth, MA, 02556, United States (dan.shropshire@teledyne.com)*

Teledyne Benthos has been a manufacturer of subsea acoustics for over 30 years. Benthos products include: wireless modems for communication, positioning devices for tracking and marking subsea assets, acoustic releases for retrieval of subsea packages, passive acoustic monitors, locator devices for finding assets, hydrophones, and transducers. Benthos has a long history of working with commercial, and academic entities as well as governmental agencies to provide communication and position services to solve a wide array of challenging problems. Acoustic modems and positioning devices present a critical capability to the future of the ropeless fishing industry. Modems can be used to help communicate with subsea lobster and crab pots, and to trigger lift bags, releases, drop weights, etc. Position systems can be used to locate, mark, and identify pots and traps from the surface to avoid gear conflict and allow for regulation of the industry. Combined with a minimal boatside electronics package and marking software, acoustic solutions provide a wide array of capabilities to enable a truly ropeless solution to the fishing community at large. Here we present several technical solutions for addressing needs of the ropeless community, and discuss the current state of acoustic hardware needed to support this mission. We point out areas where further development and research needs to be completed and discuss the economic feasibility of integrating these items into current fishing vessels.

Ropeless fishing in Atlantic Canada: advances and remaining challenges

Trippel, E.[1]

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In February 2020, the Minister of Fisheries and Oceans Canada announced gear modifications to come into effect that are directed at reducing/eliminating serious injury and mortality of North Atlantic Right Whales in fishing gear. These will be done working with industry identifying specific requirements and will be phased in by the end of 2021 and beyond. To this end, an International Gear Innovation Summit was held in early 2020 attracting ~250 participants from the fishing industry, entrepreneurs, indigenous groups, environmental non-government organizations, academia and government. Opportunities to learn about Ropeless Fishing devices and associated field trials was made through oral presentations, panel discussions and trade booths. Several types of acoustic releases have been field trialed in eastern Canada since 2018 with advances leading to one type being integrated during the 2020 commercial snow crab fishery in the Gulf of St. Lawrence.

Financial support for gear innovation and field trials is available from provincial and federal sources. This presentation will focus on advances made to date and remaining challenges to overcome to further forward Ropeless Fishing in Canada.

Ropeless RISER™: a system and method to implement ropeless fishing and eliminate whale entanglements

Vincent, H. T.[1], Dunne, A. D.[1], Radke, H. N.[1], Vincent, C. T.[1], Alberg, T. J.[1], Dunne, M. J.[1], Capotosto, D.A. [2]

[1]DBV Technology, LLC, North Kingstown, RI 02852 (bud@dbvtechnology.com)
[2]Ropeless Systems, Inc., Biddeford, ME 04005

Ropeless Systems Inc. and DBV Technology, LLC have developed the Ropeless RISER™ system to implement Ropeless Fishing (aka Buoyless Fishing). The system eliminates whale entanglements while simultaneously providing several features to make it attractive for commercial trap fisheries. The system design has focused on ease of operation with no ropes to re-stow, re-pack or re-wind. Trawl recovery and deck operations remain essentially the same as they are performed now (in fact we believe our system can make the gear setting and retrieval process more efficient). Most importantly, our system provides automatic gear location marking in an easy and intuitive manner with no action required by the fishers. No locations are required to be recorded by fishers because gear location and identification is performed automatically by an echosounder and displayed on a chartplotter. This approach eliminates any chance for human error associated with manual position recording and reporting methods. Ropeless RISER™ identifies where gear is actually located on the bottom, even if it moves. More importantly, there is no sharing or reporting of gear location required by operators because only vessels in close proximity to the bottom gear can "see" the locations of all seafloor gear. In this way, setting gear remains much like it is done now, in which visual observations and radar displays are used to locate gear and prevent conflicts. Lastly, we have designed the system to allow large volume production so that it will be an affordable and attractive solution for trap fisheries.

Preliminary results from fishing trials of two "ropeless" fishing systems in the Gulf of Maine

Werner, T.[1,2], Palombo, M.[3]

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[2]UMASS-Boston, 100 William T, Morrissey Blvd, Boston, MA 02125, United States
[3]F/V Terri Ann, Sandwich, MA

"Ropeless fishing", which involves the entire or partial elimination of fishing lines on fixed gear from the water column, is considered the most effective technique for eliminating entanglement risk to baleen whales and leatherback sea turtles. In this talk we present the preliminary results from evaluation of two ropeless gear types—a submersible "at-call" flotation spool and the Edgetech ropeless fishing system—in trials aboard a offshore lobster fishing vessel operating in the Gulf of Maine. Both systems function by retaining the endline of a pot string ("trawl"), in which each pot is connected to another by groundline. The endline rises to the ocean surface for hauling by using an EdgeTech 5112 acoustic release. The rope on the spool was manufactured to retain its coiled shape using a plastic coating. Rope coils are maneuvered over the spool barrel to retain their shape. The Edgetech system has line packed inside a cage that is essentially an empty lobster pot, with pots secured above it. So far, deployments of these ropeless systems have been made with 40-pot trawls 112 km south of Nantucket in water depths of between 42 and 59fa. All gear was

retrieved successfully and resurfaced undamaged. The time to locate and release the trawl averaged a maximum additional retrieval and redeployment time of 10 minutes, which effectively would reduce the number of trawls/day by one. Trials are on-going into next year, and monitoring is being achieved through a combination of logsheets filled in by the crew and an electronic monitoring system (EMS). Lastly, a new system for securing and recoiling rope on the spool prototype has been constructed and will be tested as a more practical and environmentally sound approach to plasticizing rope coils.