FISHING INNOVATION
& SUSTAINABILITY RESEARCH

Innovation for Bycatch Mitigation

Noëlle Yochum
Director, Fishing Innovation & Sustainability
Trident Seafoods

Alaska Bycatch Advisory Council Meeting - 23 September 2025

FISHING INNOVATION
& SUSTAINABILITY RESEARCH

Trident Seafoods is taking leadership in fishing innovation and sustainability to reduce incidental fishing impacts through collaborative research initiatives.

FISHING INNOVATION
& SUSTAINABILITY RESEARCH

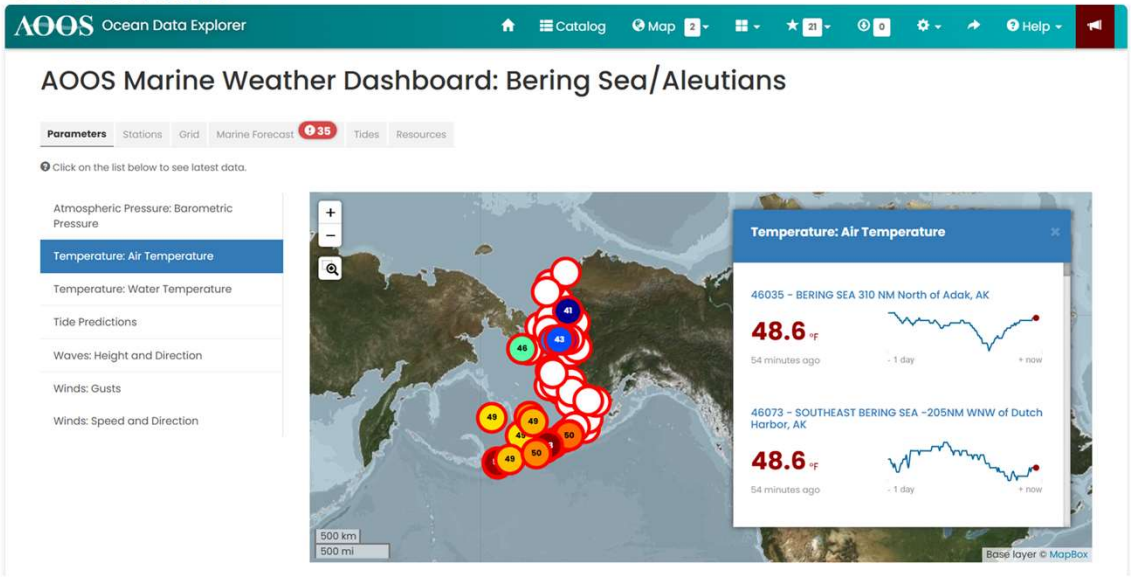
Trident Seafoods is taking leadership in fishing innovation and sustainability to reduce incidental fishing impacts through collaborative research initiatives. These innovations augment the ongoing efforts made by our captains to avoid areas with bycatch using shared information among the fleet and from our operations team, processing plants, cooperatives, and third party organizations (Sea State). This communication is an effective tool for minimizing bycatch, along with the technology used to monitor catch and gear performance (e.g., acoustics, cameras).

FISHING INNOVATION
& SUSTAINABILITY RESEARCH

Trident Seafoods is taking leadership in fishing innovation and sustainability to reduce incidental fishing impacts through collaborative research initiatives. These innovations augment the ongoing efforts made by our captains to avoid areas with bycatch using shared information among the fleet and from our operations team, processing plants, cooperatives, and third party organizations (Sea State). This communication is an effective tool for minimizing bycatch, along with the technology used to monitor catch and gear performance (e.g., acoustics, cameras).

Trident Seafoods also supports external research through contributing $300,000 toward the Pollock Conservation Cooperative Research Center and $30,000 to the Bering Sea Fisheries Research Foundation; and supporting initiatives through universities and other organizations, including the involvement of students.

OCEAN DATA NETWORK



FISHING INNOVATION & SUSTAINABILITY RESEARCH

Trident Seafoods is taking leadership in fishing innovation and sustainability to reduce incidental fishing impacts through collaborative research initiatives.

FISHING INNOVATION
& SUSTAINABILITY RESEARCH

Director, Fishing Innovation & Sustainability

- Mechanistic understanding of salmon ‘excluders’ (including the role of salmon vision)
- Machine learning species detection and fish tracking in trawl video

Oregon State University

- Estimating discard mortality rates of crab (and understanding the influence of study design)

FISHING INNOVATION & SUSTAINABILITY RESEARCH

Trident Seafoods is taking leadership in fishing innovation and sustainability to reduce incidental fishing impacts through collaborative research initiatives. These innovations augment the ongoing efforts made by our captains to avoid areas with bycatch using shared information among the fleet and from our operations team, processing plants, cooperatives, and third party organizations (Sea State). This communication is an effective tool for minimizing bycatch, along with the technology used to monitor catch and gear performance (e.g., acoustics, cameras).

Trident Seafoods also supports external research through contributing $300,000 toward the Pollock Conservation Cooperative Research Center and $30,000 to the Bering Sea Fisheries Research Foundation; and supporting initiatives through universities and other organizations, including the involvement of students.

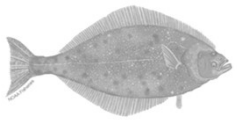
SEAFLOOR CONTACT

- Developing a modified footrope to minimize potential contact when fished near the seafloor

PACIFIC SALMON BYCATCH

- Testing passive and active ‘excluders’, and lights to augment them
- Evaluating bycatch patterns with existing data* and new data collection approaches

PACIFIC HALIBUT BYCATCH



- Testing lights to deter halibut from entering the cod trawl**
- Evaluating critical elements of halibut bycatch reduction devices**

CRAB DISCARD

- Improving crab escapement mechanisms with A.I. to evaluate crab movement**

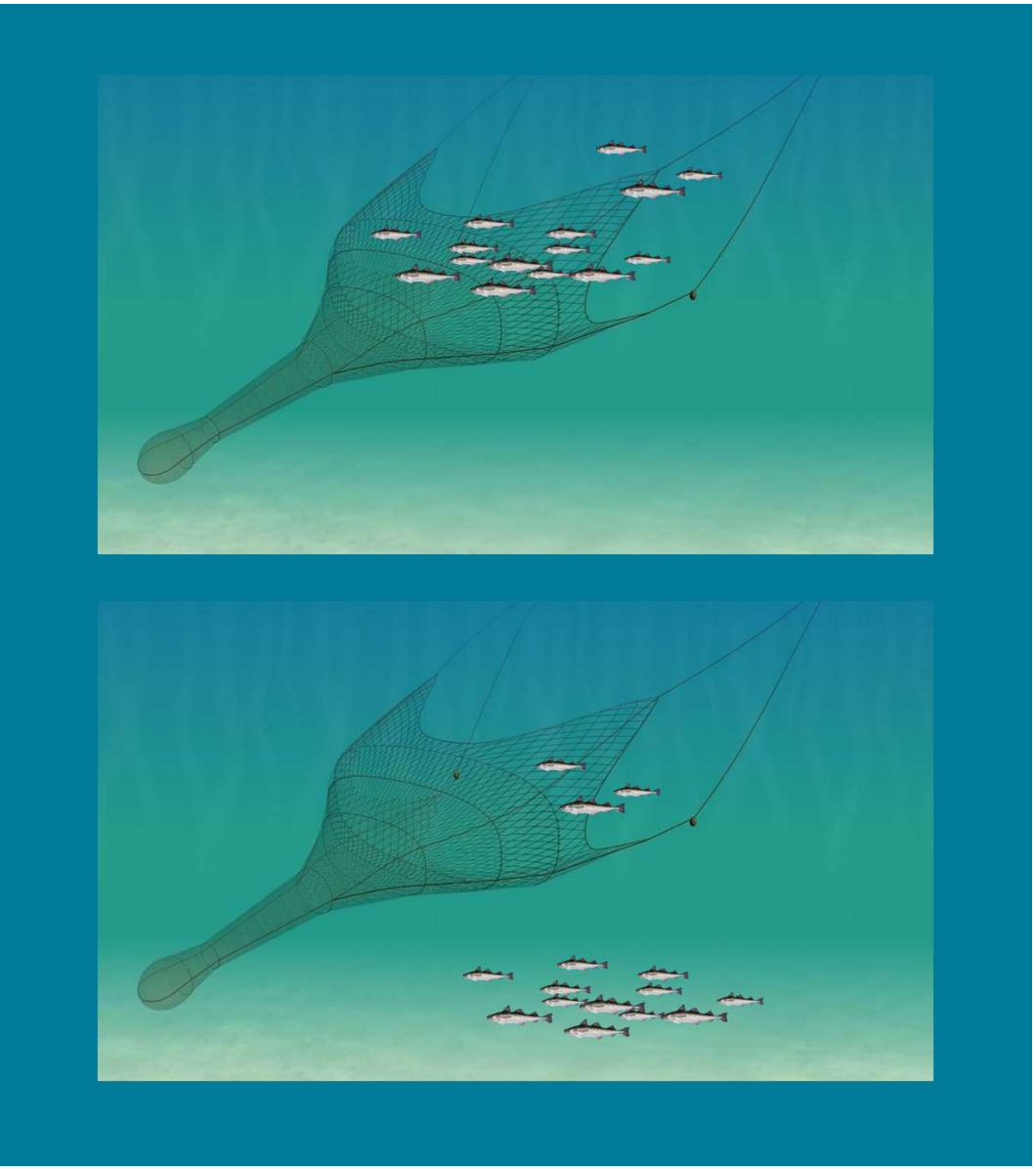
Involvement by:

* UAF graduate student

** UW undergraduate and graduate students

Seafloor Contact

- Developing a modified footrope to minimize potential contact when fishing near the seafloor
- Maintain efficiency and minimize impact to operations and safety

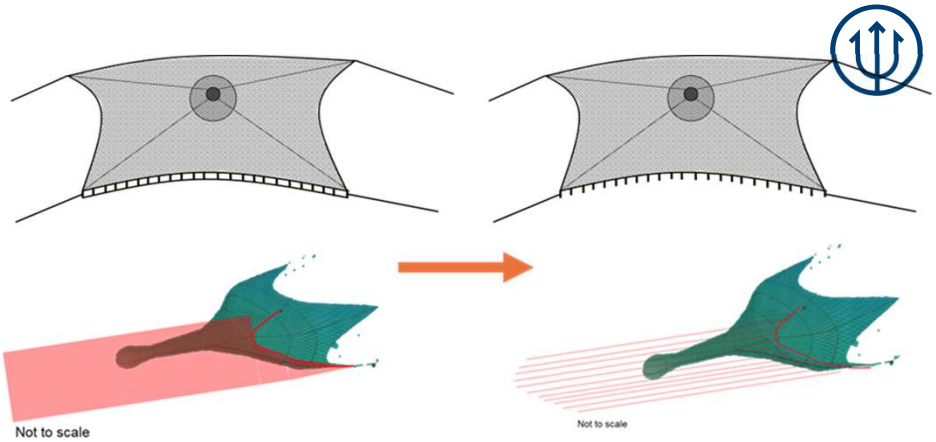


Fishing Efficiently Means Less Impact

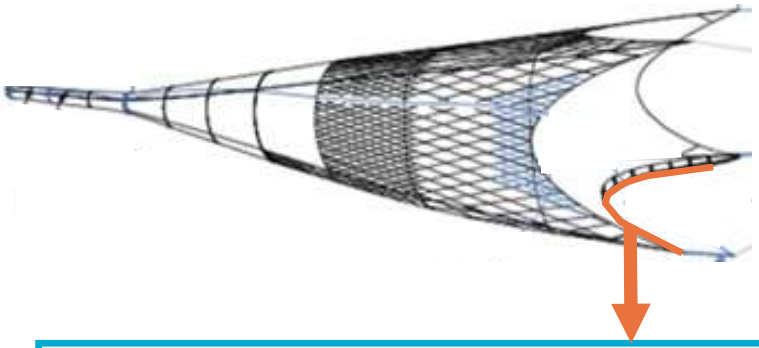
Suspended Parallel Footrope

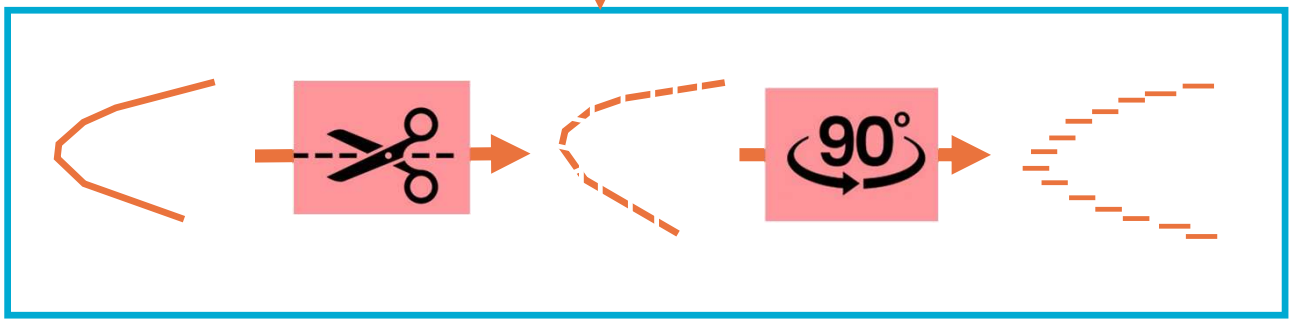
- EFP project

- Developed, built, and tested (with Seamus Melly/ Swan Nets) a modified footrope that alters the length and orientation of the existing footrope components, but maintains the same weight needed to ensure opening of the gear



[The above is for demonstration only- it assumes contact over the extent of the footrope and tow, which is not representative]





Research: Suspended Parallel Footrope (SPF)

- 4 CVs, 1 CP; variety of nets and vessels
- Data collection and dedicated research
- Continue to monitor and test

Crab Discard

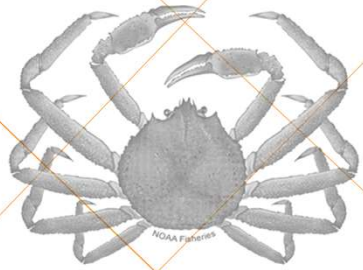
Increasing undersized crab escapement

- A.I. to evaluate crab movement

C.S., University of Washington,

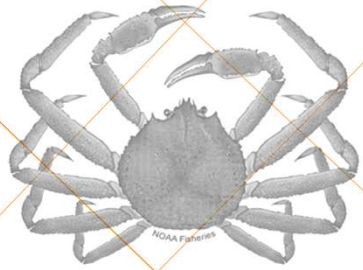
- Moses Lurbur (PhD student)
- René Just (Professor)

Reducing Undersized Crab Discard

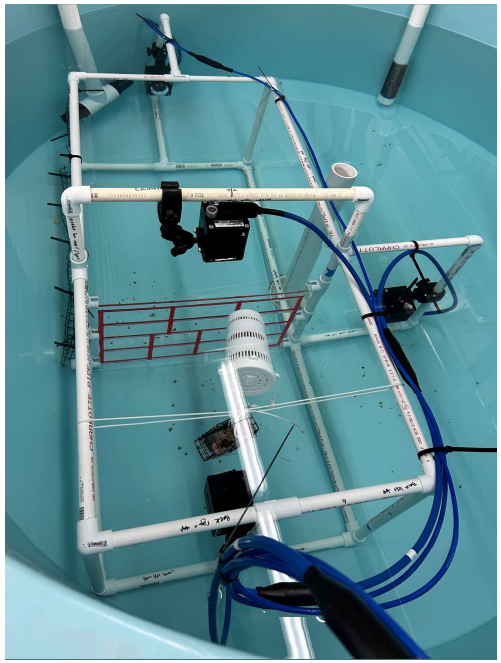


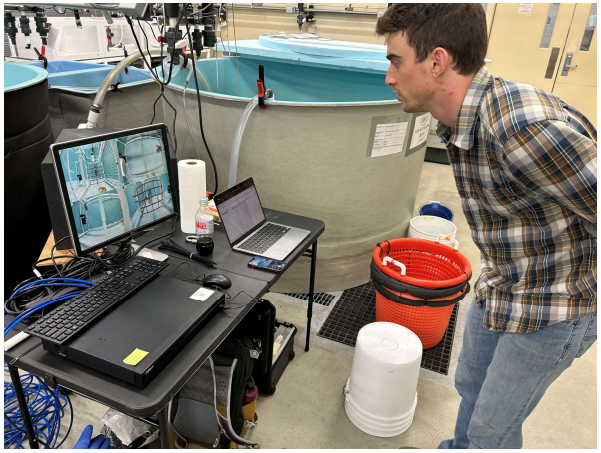
Understanding behaviour/ movement to optimize the design of escapement openings

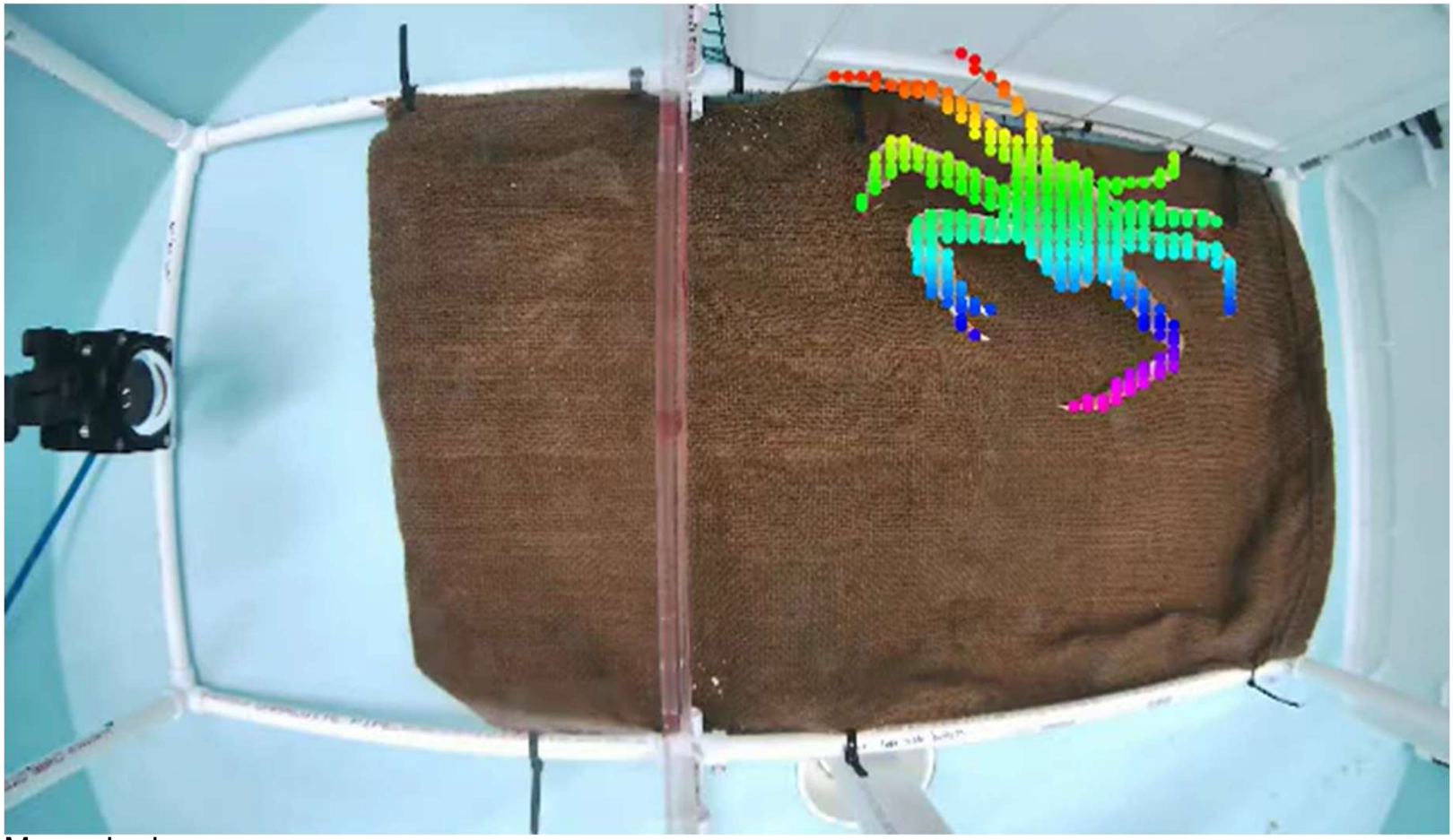
Reducing Undersized Crab Discard



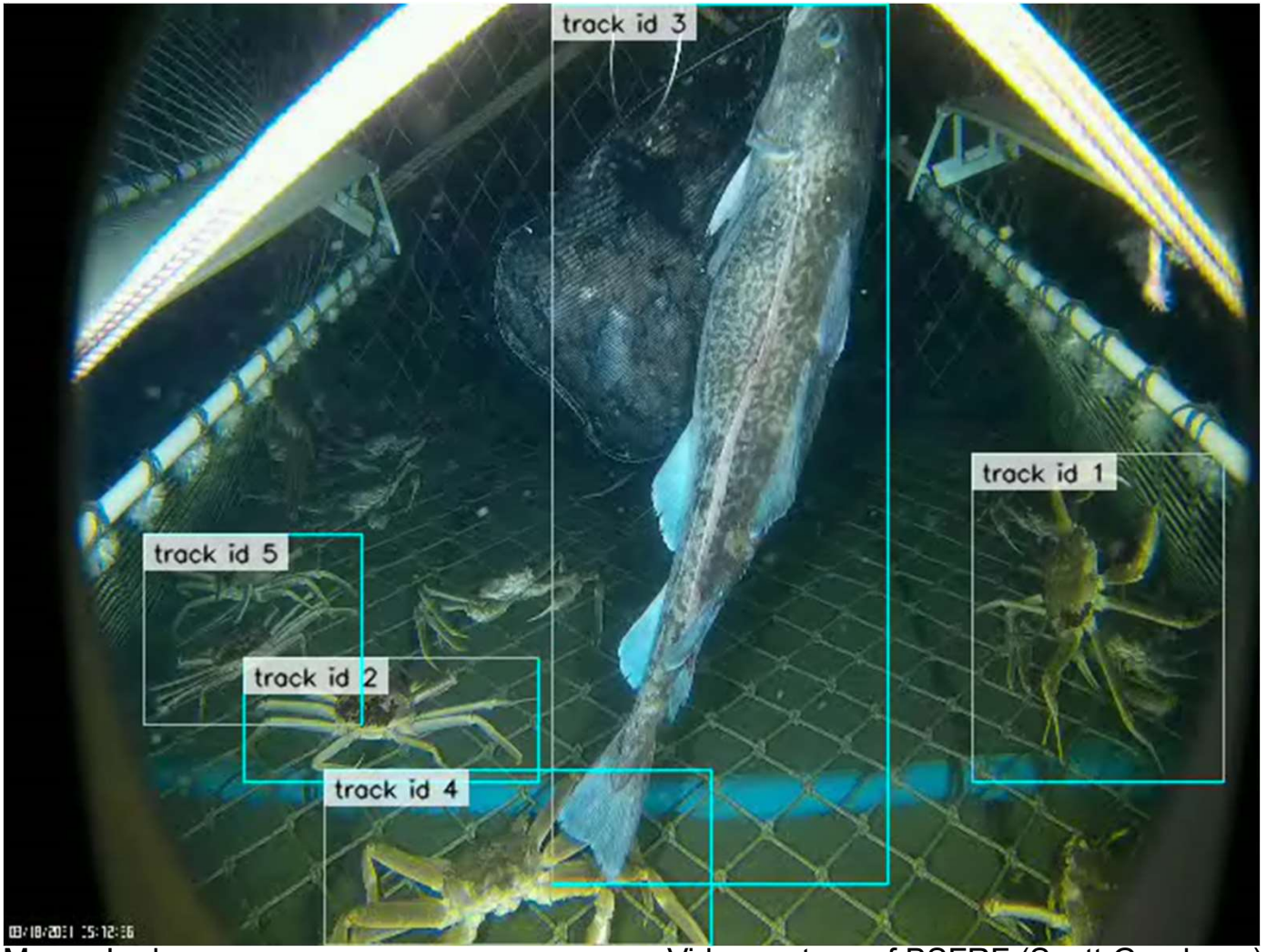
Understanding behaviour/ movement to optimize the design of escapement openings







Moses Lurbur



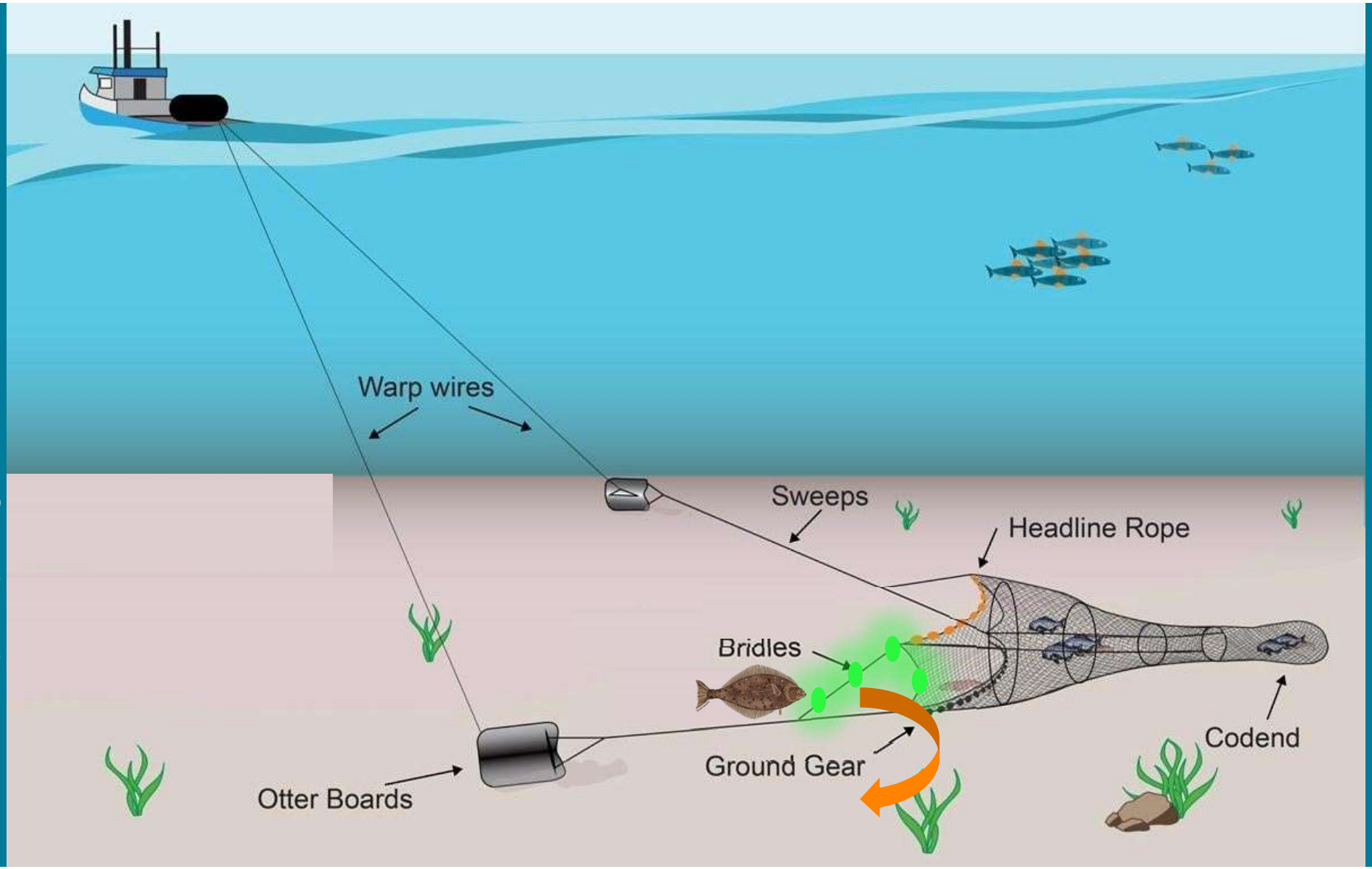
Moses Lurbur

Video curtesy of BSFRF (Scott Goodman)

Halibut Bycatch

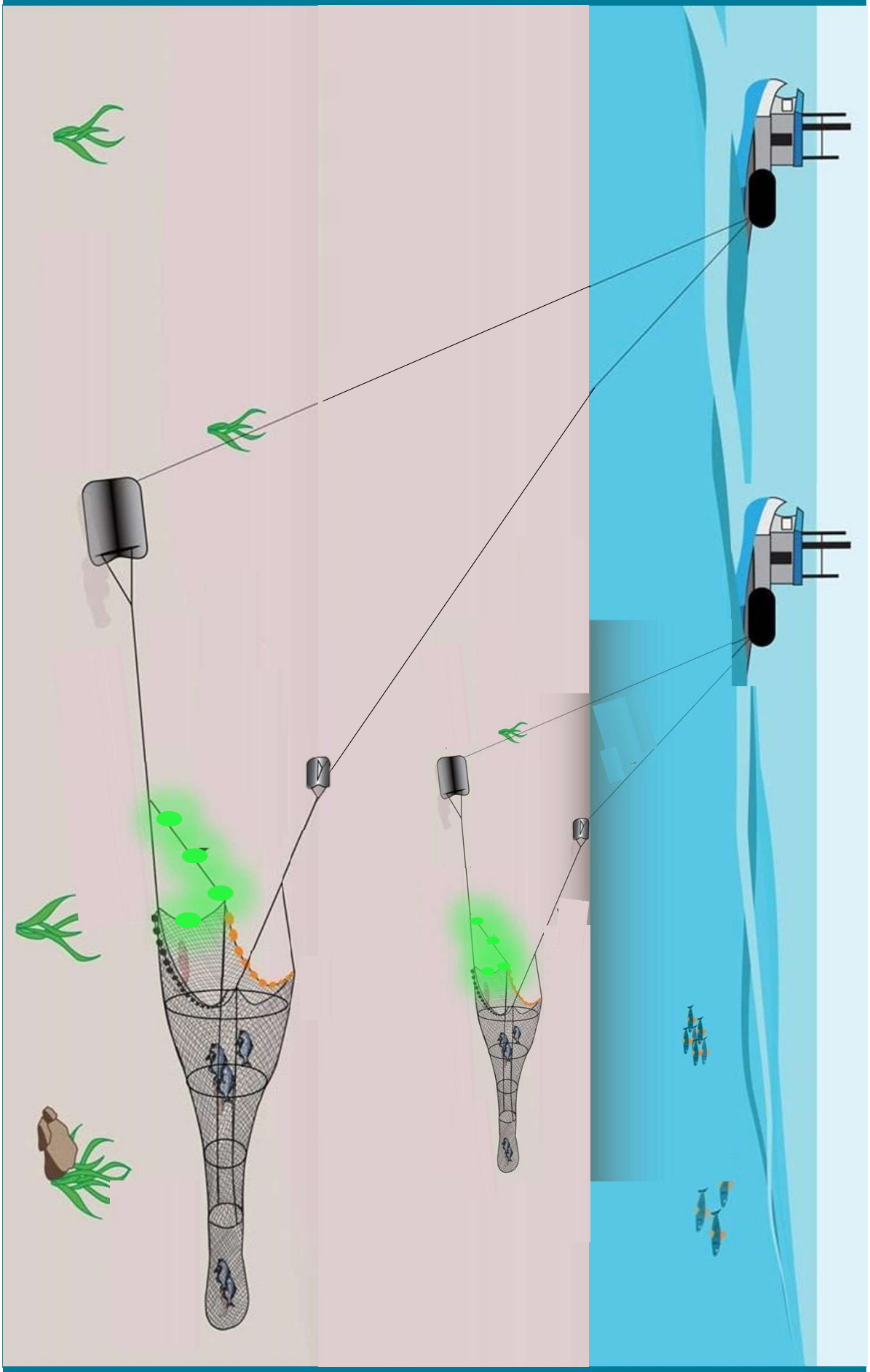
Collaboration with UW SAFS (Co-PI: John Horne), NOAA, IPHC, others

- Lights to deter halibut from entering the cod trawl
- Evaluating critical elements of bycatch reduction devices



Edited from: https://mpeda.gov.in/

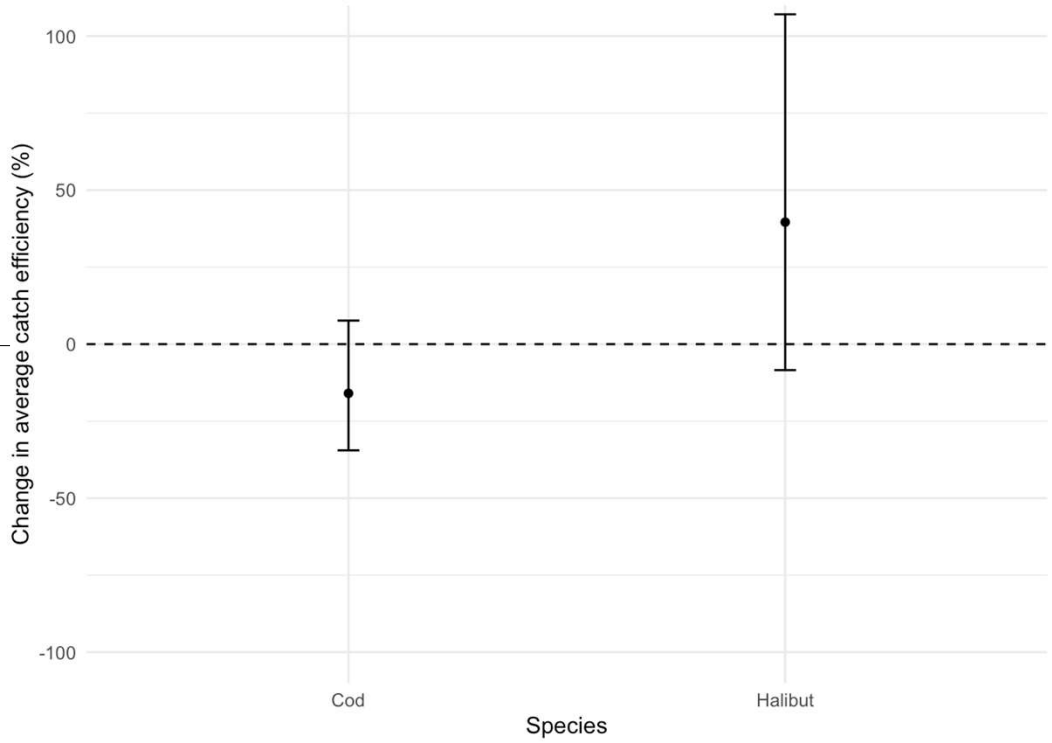
Edited from: https://mpeda.gov.in/



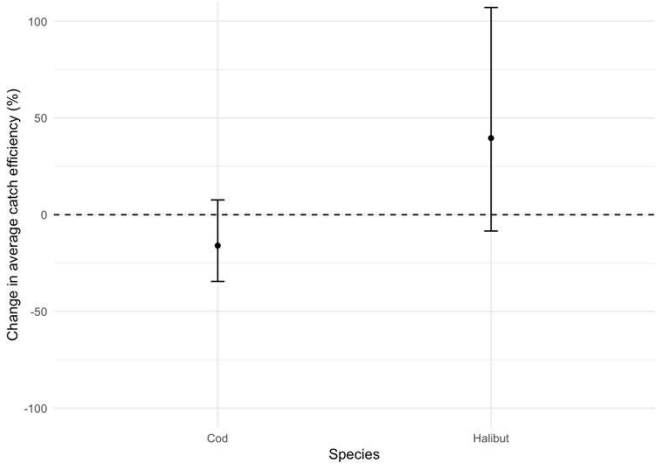
Average Catch Efficiency

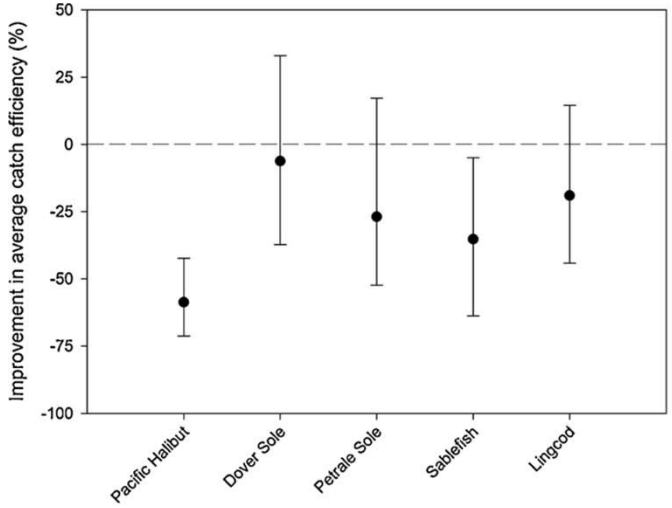
Catch increases with light

Catch decreases with light

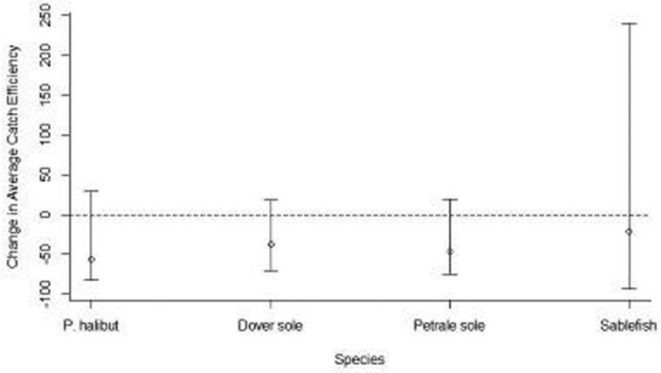


Average Catch Efficiency





Lomeli et al. 2021



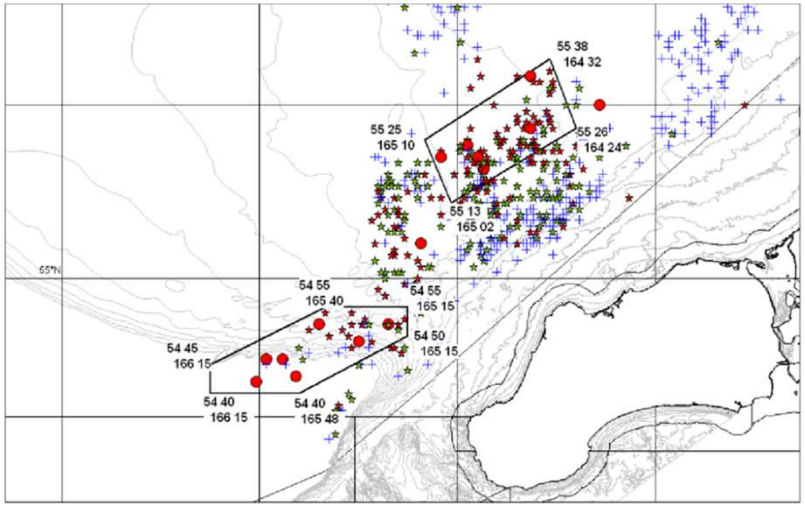
Jackson et al. 2023

Bycatch Reduction Device Performance Indicator

Salmon Bycatch

- Hot spot management
- Fleet communication
- Evaluating bycatch patterns with existing data and new data collection approaches

Hot Spot Management & Communication



http://www.akleg.gov/basis/get_documents.asp?session=30&docid=13337)

https://www.mackaycomm.com/

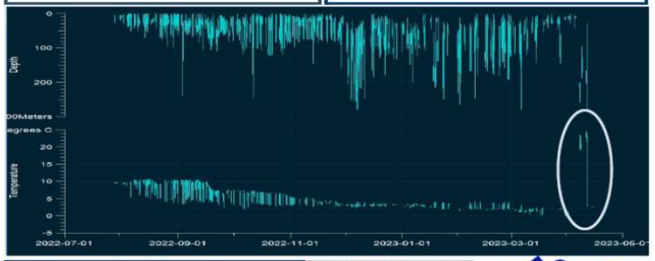
STARLINK

Using predictive models to reduce Chinook salmon prohibited species catch (PSC) in the Bering Sea pollock fishery

UPDATE #3: November 29, 2023

- Project goal: Determine whether Chinook salmon hotspots can be predicted before fishing using environmental data.
- Updates: Unable to deploy satellite tags in summer 2023 due to vessel limitations. Final course for PhD and dissertation proposal will be completed next month.
- Next steps: Begin modelling Chinook salmon distribution using fishery catch data, satellite tag data, and environmental variables. Deploy 16 satellite tags on Chinook salmon in the Bering Sea between March and September 2024.

Figure below: Depth (top panel) and temperature (bottom panel) recorded by an immature Chinook salmon satellite-tagged in the Bering Sea in July 2022. Based on the temperature record, this Chinook is believed to have remained in the Bering Sea over winter. The increase in temperature at the end of the time series suggests salmon shark predation (white circle). The next step is to use these data to estimate the daily positions of this Chinook for fitting the species distribution model.



Sabrina Garcia, PhD student

sgarcia19@alaska.edu; 907-205-1502

College of Fisheries and Ocean Sci.
University of Alaska Fairbanks

(Dr. Andrew Seitz, Advisor)

POLLOCK CONSERVATION COOPERATIVE Research Center

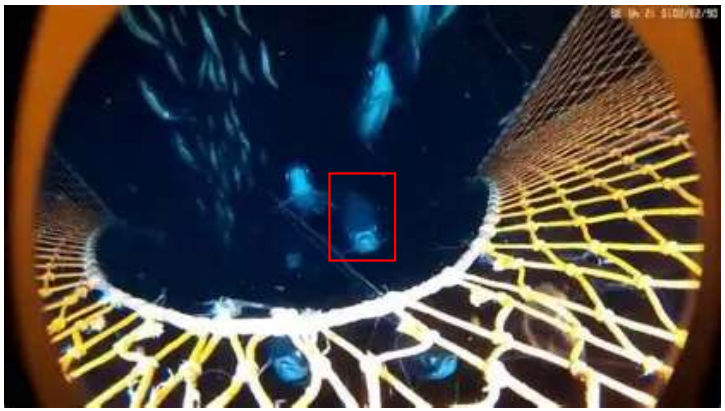
UAF

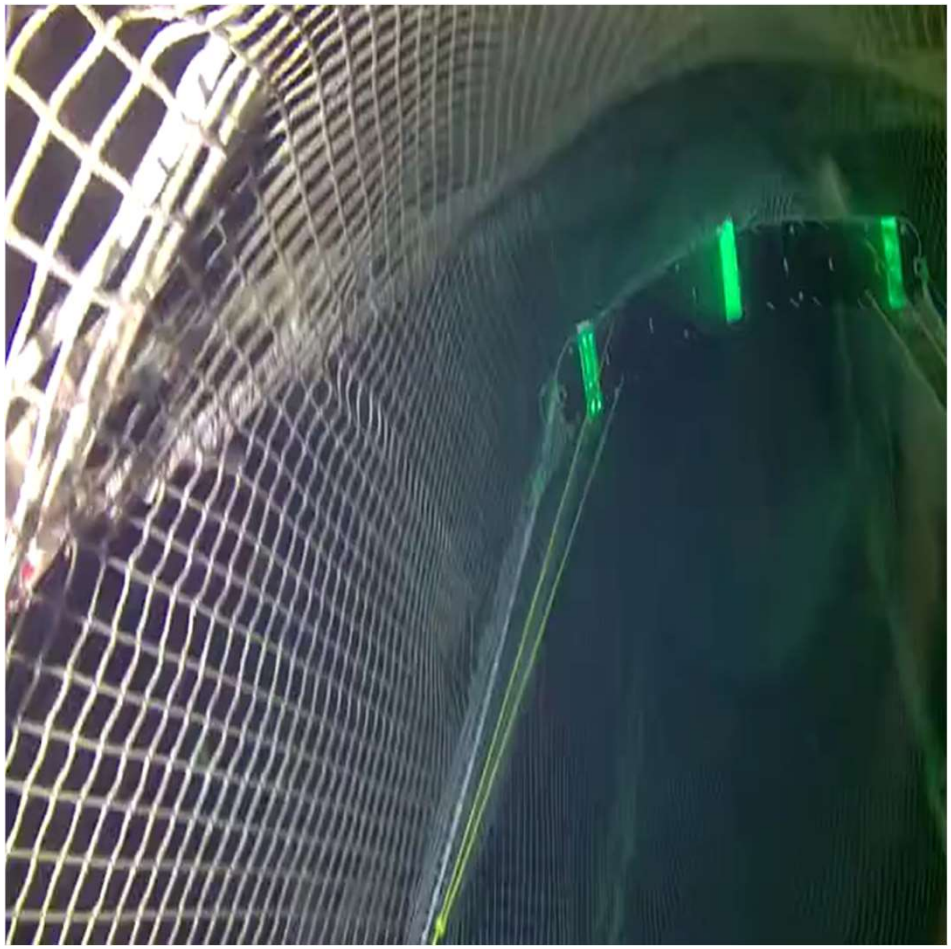
NOAA FISHERIES

Salmon Bycatch

- Hot spot management
- Fleet communication
- Evaluating bycatch patterns with existing data and new data collection approaches
- Testing active and passive excluders (with the addition of lights)

Salmon Excluders: Passive & Active





FISHING INNOVATION & SUSTAINABILITY RESEARCH

Trident Seafoods is taking leadership in fishing innovation and sustainability to reduce incidental fishing impacts through collaborative research initiatives. These innovations augment the ongoing efforts made by our captains to avoid areas with bycatch using shared information among the fleet and from our operations team, processing plants, cooperatives, and third party organizations (Sea State). This communication is an effective tool for minimizing bycatch, along with the technology used to monitor catch and gear performance (e.g., acoustics, cameras).

Trident Seafoods also supports external research through contributing $300,000 toward the Pollock Conservation Cooperative Research Center and $30,000 to the Bering Sea Fisheries Research Foundation; and supporting initiatives through universities and other organizations, including the involvement of students.

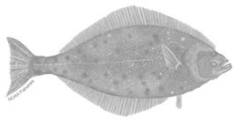
SEAFLOOR CONTACT

- Developing a modified footrope to minimize potential contact when fished near the seafloor

PACIFIC SALMON BYCATCH

- Testing passive and active ‘excluders’, and lights to augment them
- Evaluating bycatch patterns with existing data* and new data collection approaches

PACIFIC HALIBUT BYCATCH



- Testing lights to deter halibut from entering the cod trawl**
- Evaluating critical elements of halibut bycatch reduction devices**

CRAB DISCARD

- Improving crab escapement mechanisms with A.I. to evaluate crab movement**

Involvement by:

* UAF graduate student

** UW undergraduate and graduate students

Trident Seafoods

FISHING INNOVATION
& SUSTAINABILITY RESEARCH

- Bycatch mitigation is multi-dimensional
- We are committed to continuous improvement

Thank you!