Can fish be caught efficiently? Ways to improve trawling

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Background
- Trawling is widely used, its an effective method in catching fish but produces environmental issues
  - Erupted seafloor
  - Harms biodiversity
  - Decrease in population

In order to understand bycatch video analysis is a useful tool therefore refining video methods is essential in improving trawl efficiency.

Figure 1. The mesh-designed net sweeps numerous fish at a time, pushing them to the back of the net. Credit to MSC

Research question
How can underwater video analysis be used to evaluate bycatch impacts in the California halibut fishery?

Internship
I worked with NOAA Fisheries to record species behavior when interacting with the net in Southern California.

Methods
- Literature review- Traditional trawl gear impact and effects on species and ecosystem.
- Record fish behavior from underwater video analysis.
- Developed a written protocol for future interns

Results
Fish behavior displayed in the net showed most species to be calm except for California halibut and Dungeness crabs.

In figure 2, this shot here contains a Dungeness crab and a California Halibut that’s caught in the net struggling to escape. Credit to NOAA Fisheries

Results (continued)
- Data showed that there were a few non-target species caught but the majority caught was the intended catch.
- More research/video analysis needs to be done in order to understand the effects of trawl gear.
- The method is somewhat limited by visibility and the mounting and attachment of the gear.

Figure 4. Comparison of species caught. Credit to Yeandy.

Significance/Next steps
- The method of how and where the camera is placed can decrease the possible limitations.
- Underwater video footage allows us to review bycatch and get a sense of what their behavior is in the net.
- Visibility can sometimes be compromised but improved with future models.

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Species caught

- Unidentified fish: 1.2%
- Surfperch: 44.4%
- Skate/rays: 1.1%
- CAHB: 4.2%
- Crab: 4.0%
- Dungeness: 8.0%
- Flatfish: 18.6%
- Green sturgeon: 0.1%
- Jellyfish: 0.9%
- Roundfish: 15.9%