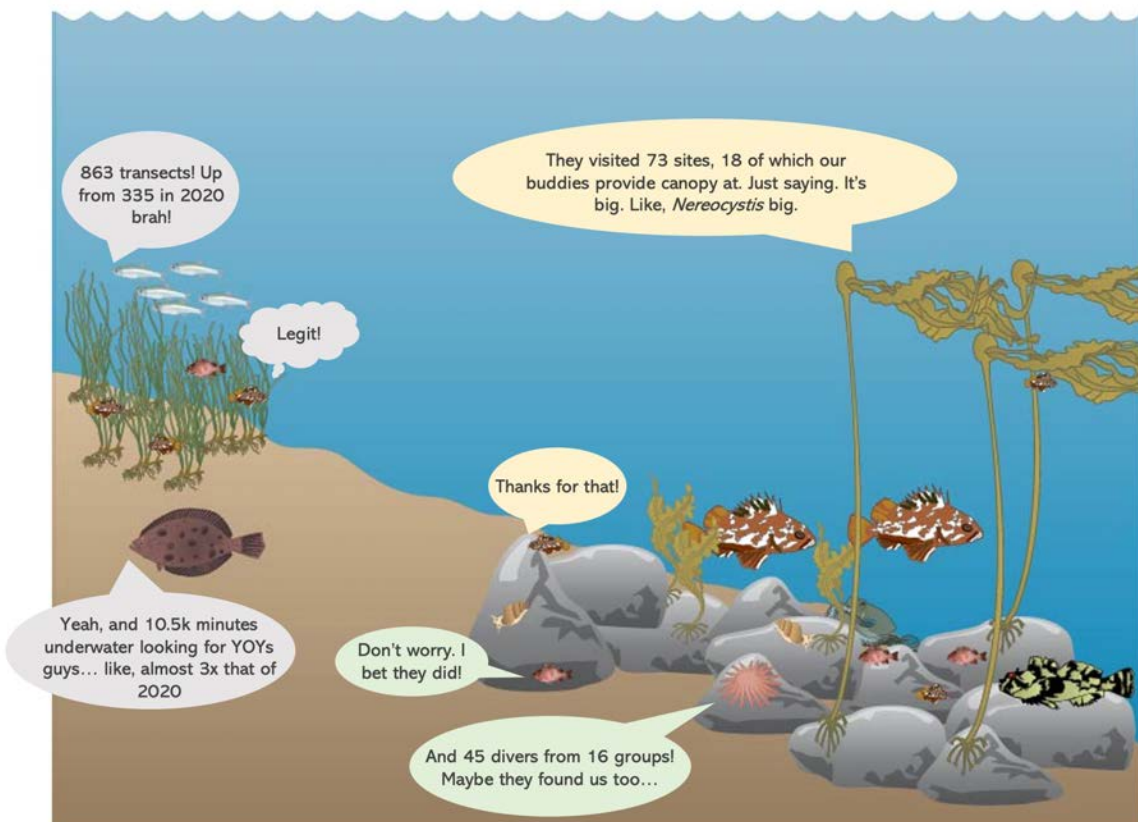
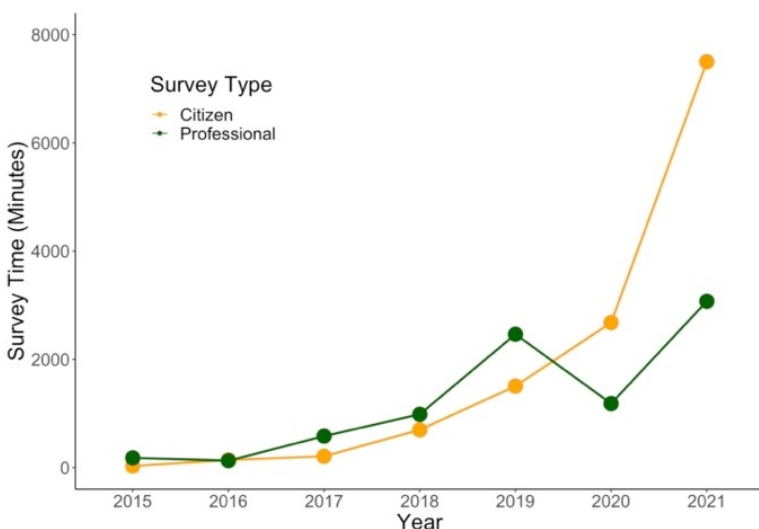


Young-of-the-Year Rockfish Survey Program 2021 Year in Review

We spent a lot of time underwater in 2021.

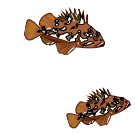


Partners have a huge impact!

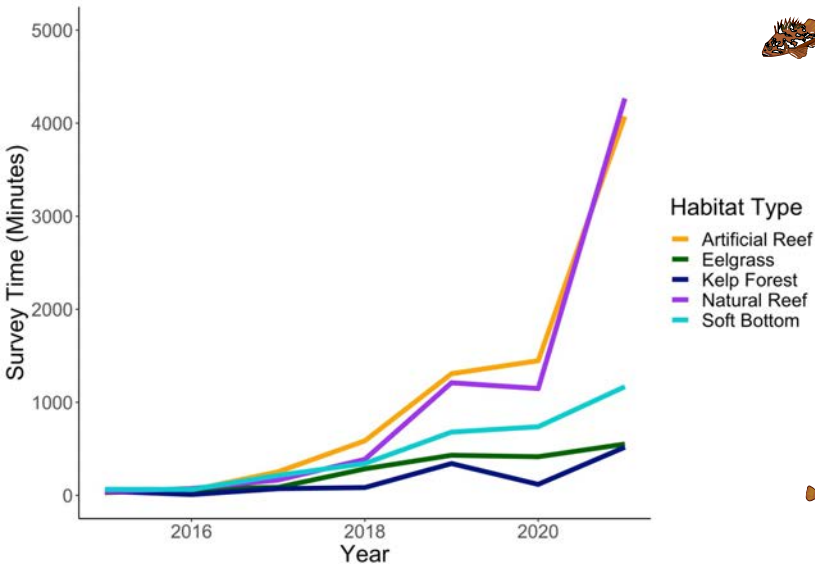
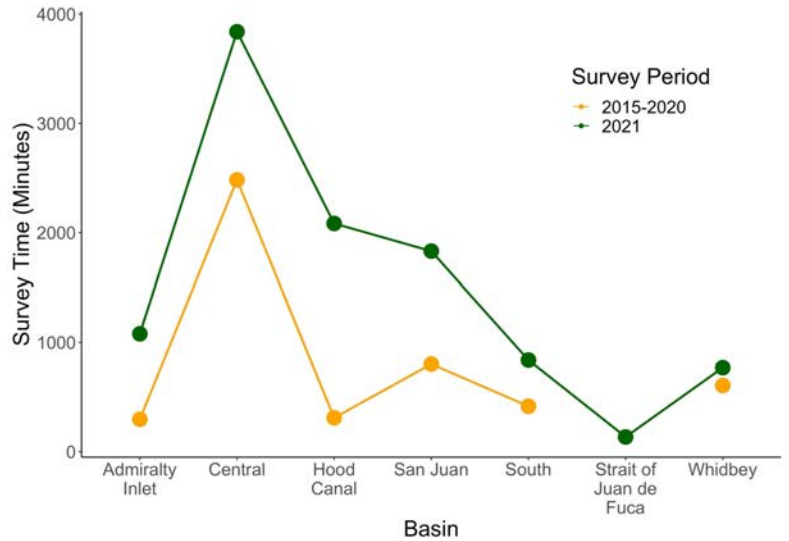


2021 was a record year in many ways for the program. Time spent underwater searching for YOYs increased, with citizen partners substantially outpacing professional researchers.

We visited new and more distant sites ...



We spent more time surveying in nearly all basins in the San Juan Islands and South Salish Sea in 2021 than the first five years of the program combined.



2021 saw the biggest increase in coverage in five key habitat types, particularly natural and artificial reefs, where effort was nearly three- and four-times greater than in 2020.

.... Increasing effort in key habitats.

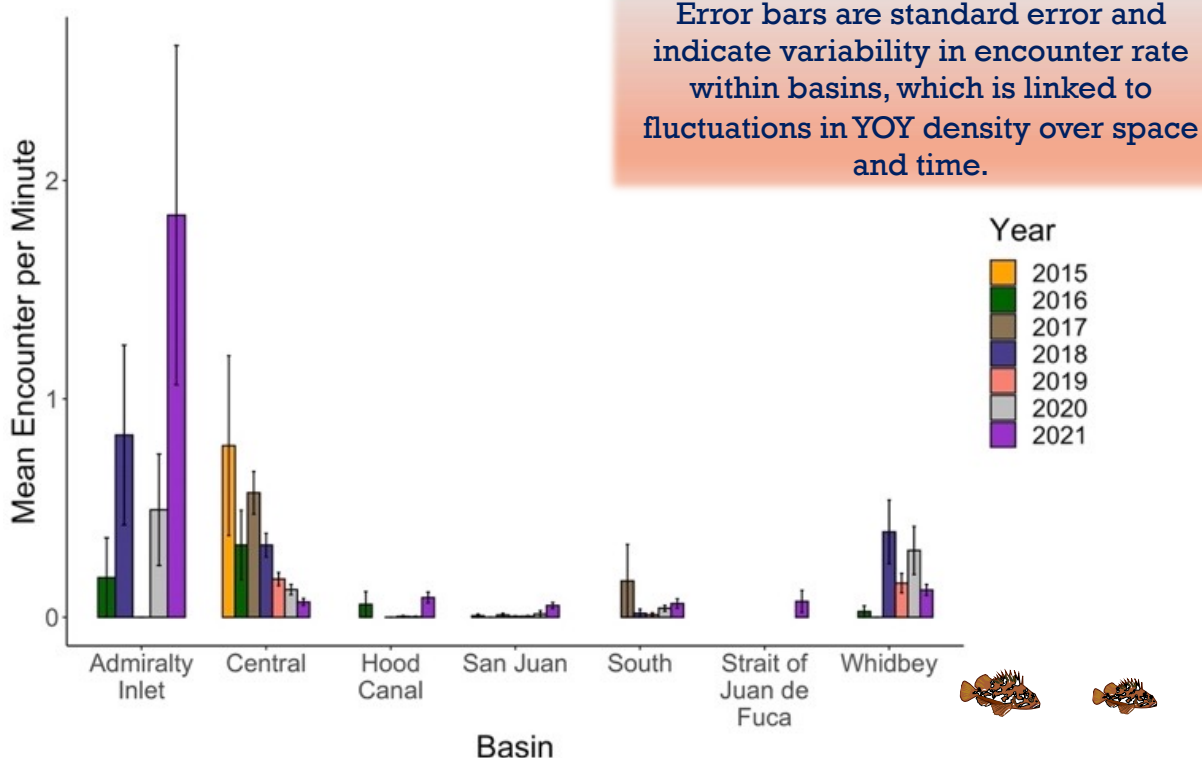
We collected data at 10 and 18 more sites within kelp forests and natural reefs, respectively, than in the next greatest year.

Increased coverage among all habitat types is critical for understanding how habitat plays a role in YOY recruitment.



YOY Encounter Rates

In 2021, we encountered 0.25 YOY per minute of survey time for all observers, sites, and habitats combined. Encounter rates within Admiralty Inlet basin were remarkably high, though variability was also high among sites and seasons.



While the combined encounter rate is higher than all prior years except 2015 and 2017 (0.26 and 0.34 YOY/min, respectively), there was one big difference in 2021; we encountered two groups of YOY more frequently than expected ...



... those with elongate bodies and a dark dorsal spot (like the yellowtail rockfish pictured left) and elongate with no dorsal spot (such as the Puget Sound rockfish pictured below).

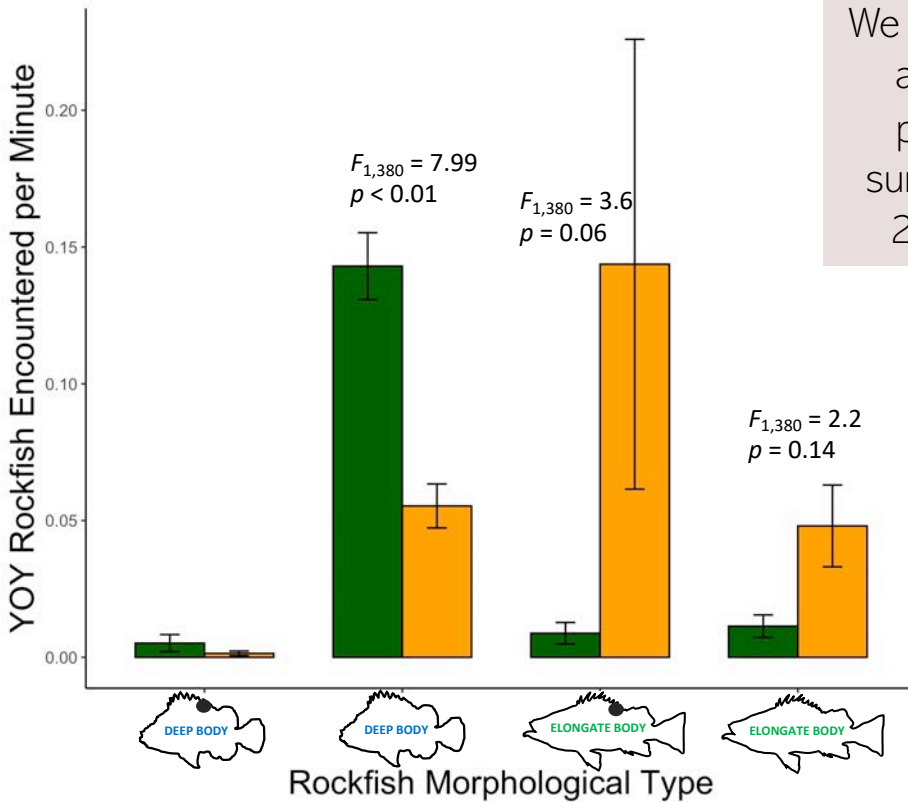
We encountered these two types most frequently in northern Puget Sound, closer to the Strait of Juan de Fuca, notably within the Admiralty Inlet and Whidbey basins.





Was 2021 a 'Boom' Recruitment Year?

The higher counts of these two YOY groups led us to question whether 2021 was an extraordinary, or "boom," recruitment year.



We compared 2021 to a *baseline* survey period of all prior survey years (2015-2020) combined.

Survey Period

- 2015-2020
- 2021

Key Results

- From 2015 to 2020, the vast majority of YOY recorded were deep body/no dorsal spot, comprising 66-100% of encounters. This group includes copper, quillback, and brown rockfish.
- In 2021, this group represented only 27% of YOY encountered, whereas nearly 50% were elongate body/dorsal spot.
- While we saw a very strong trend for higher encounters in both elongate body types, the results were not statistically significant. We might call this a high recruitment but not a 'boom' year.
- Conversely, we encountered significantly fewer deep-body/no spot YOY than expected, which may indicate a low recruitment, or 'bust,' year.



Elongate body/dorsal spot

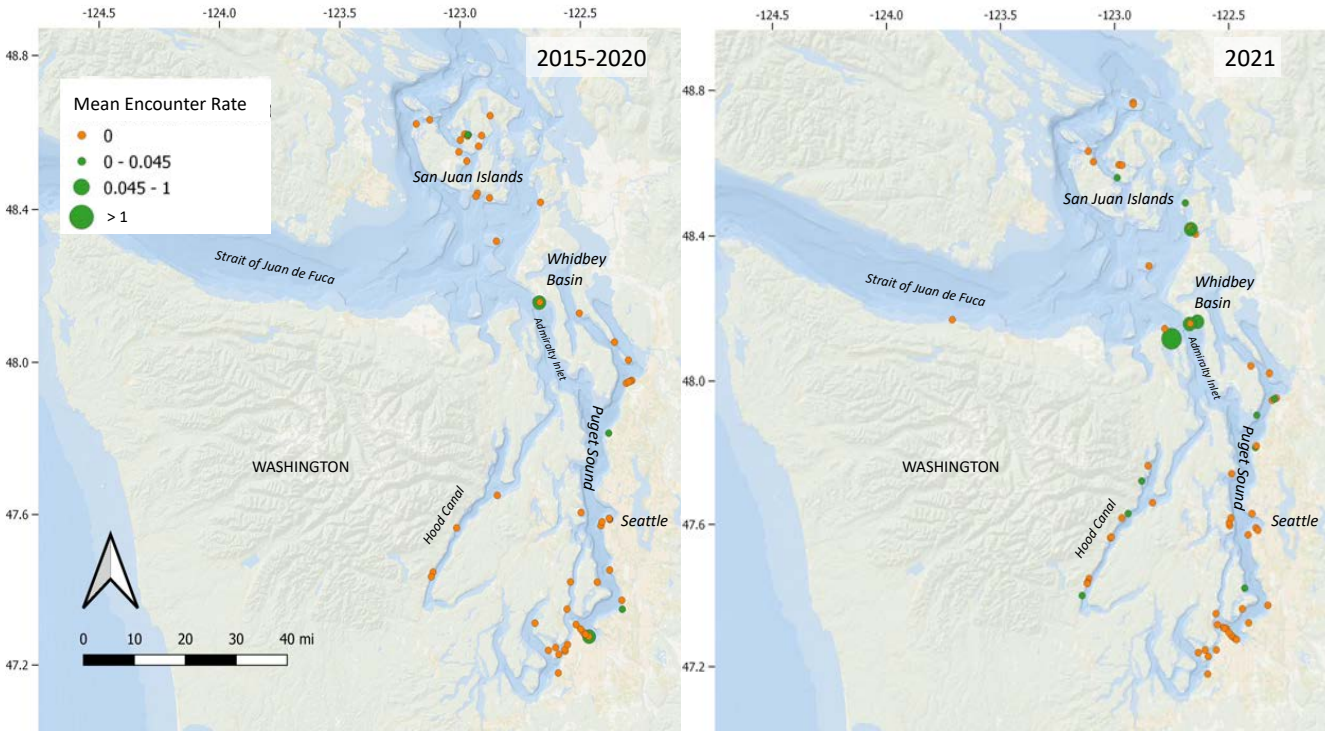


Deep body/no dorsal spot

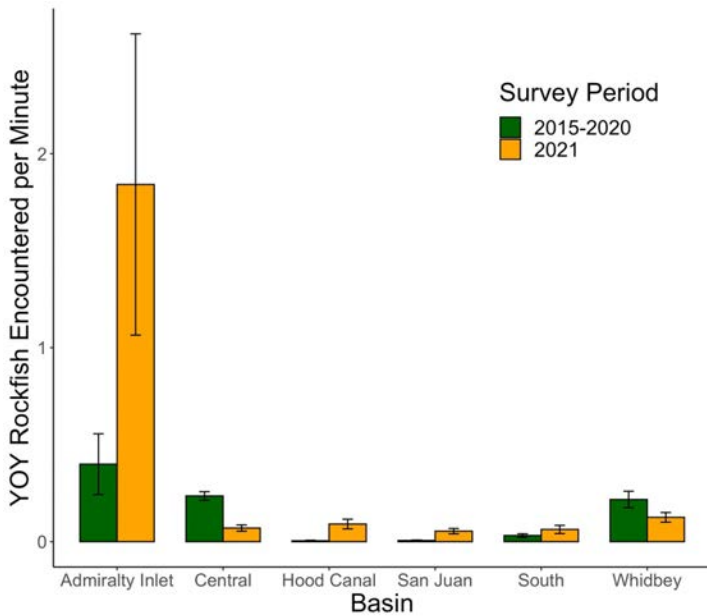
Photo: Dave Witting



YOY Encounter Rates – Elongate/Dorsal Spot

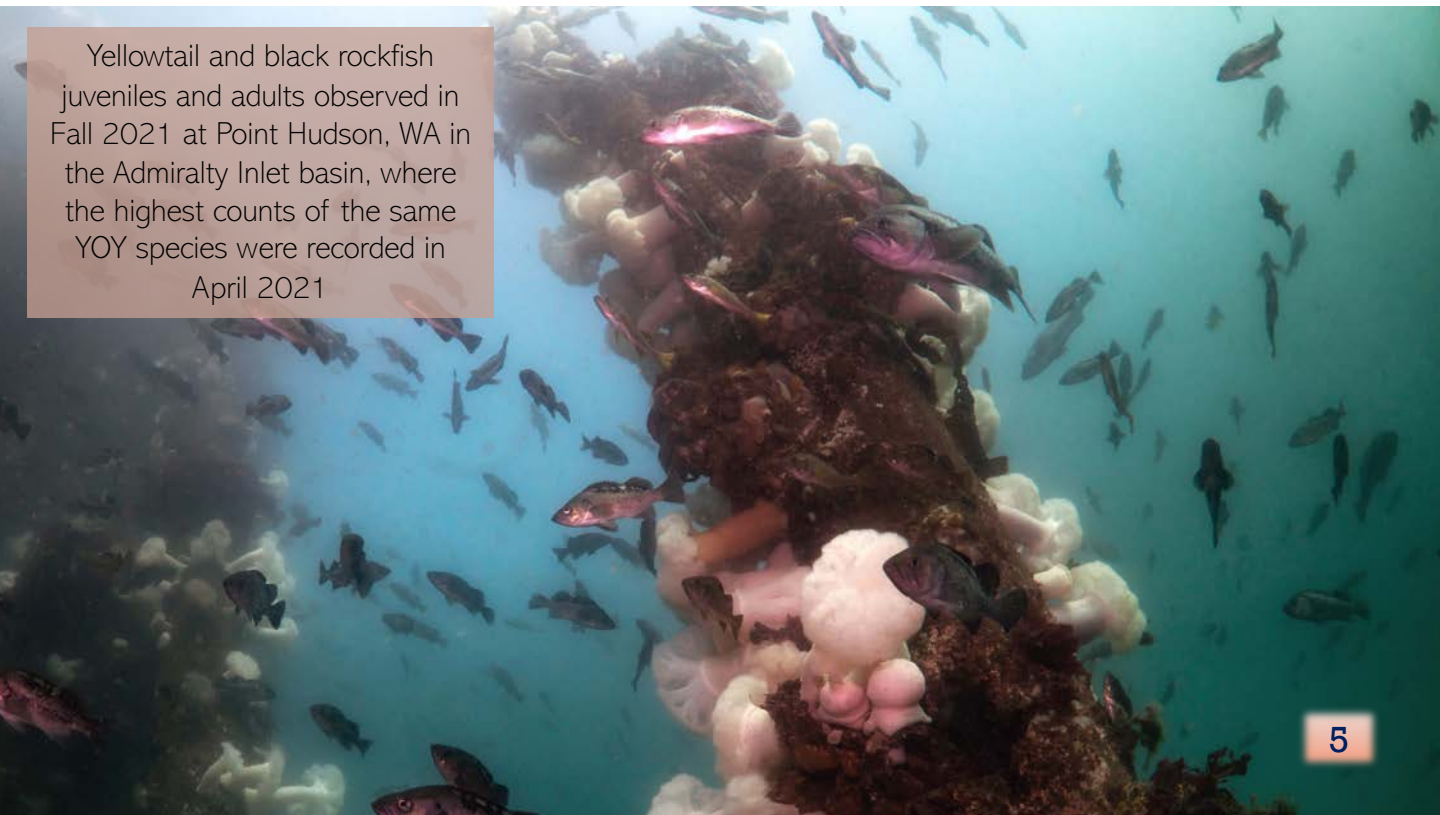


Encounter rates of elongate/dorsal spot YOY were highly variable among sites, particularly in 2021 compared to the baseline period and within the Admiralty Inlet basin, where we saw a substantial increase in this YOY group in 2021.



- Though there are a lot of 'zero' counts, increased survey effort over time and space has allowed us to measure and identify important recruitment events!
- Long-term monitoring is vital to understanding the magnitude and timing of YOY recruitment in the South Salish Sea.

Yellowtail and black rockfish juveniles and adults observed in Fall 2021 at Point Hudson, WA in the Admiralty Inlet basin, where the highest counts of the same YOY species were recorded in April 2021



Thank you to our partners!

We cannot do this without you.

This program is generously funded through the National Marine Fisheries Service West Coast Region Education and Outreach Program.

Photo: Canary rockfish (*Sebastes pinniger*) YOY and juveniles at Salt Creek in the Strait of Juan de Fuca in April 2021.

Partners: Bottom Dwellers Dive Club, Everett Community College, Emerald Sea Dive Club, Harbor WildWatch, NOAA Affiliates, Tacoma SCUBA, Surfrider Foundation, Point Defiance Zoo and Aquarium, JenJay Consulting, Pacific Marine Research, Lighthouse Diving, Northwest Dive Adventures, Puget Sound Restoration Foundation, SeaDoc Society, Rosario Beach Marine Laboratory, and Western Washington University.



Learn More & Get In Touch with Us!

To learn more, you can mosey on over to PMRG's website where you will find a variety of rockfish-related resources: www.pauamarineresearch.com

If you want to participate or simply have questions and want to talk to a human, reach out to us at Adam@pauamarineresearch.com or RockfishID@noaa.gov.