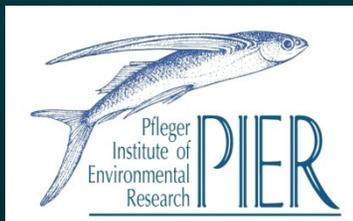


POST-RELEASE MORTALITY FOR COMMON THRESHER SHARKS (*Alopias vulpinus*) CAPTURED IN THE SOUTHERN CALIFORNIA RECREATIONAL FISHERY

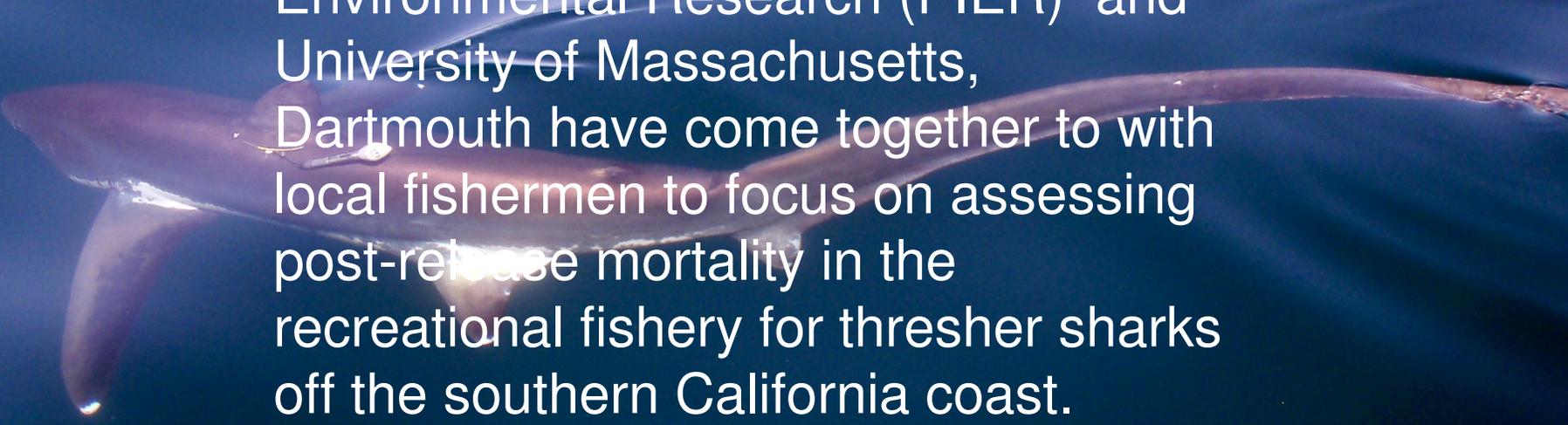


Photo: Richard Herrmann

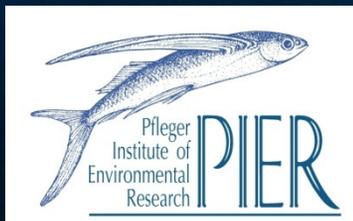
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Aalbers, D. Bernal and S. Kohin**



Funding support from the NOAA Fisheries
Bycatch Reduction Engineering Program



This is a collaborative project funded in part by the Bycatch Reduction and Engineering Program. Researchers from NOAA, the Pflieger Institute of Environmental Research (PIER) and University of Massachusetts, Dartmouth have come together to with local fishermen to focus on assessing post-release mortality in the recreational fishery for thresher sharks off the southern California coast.



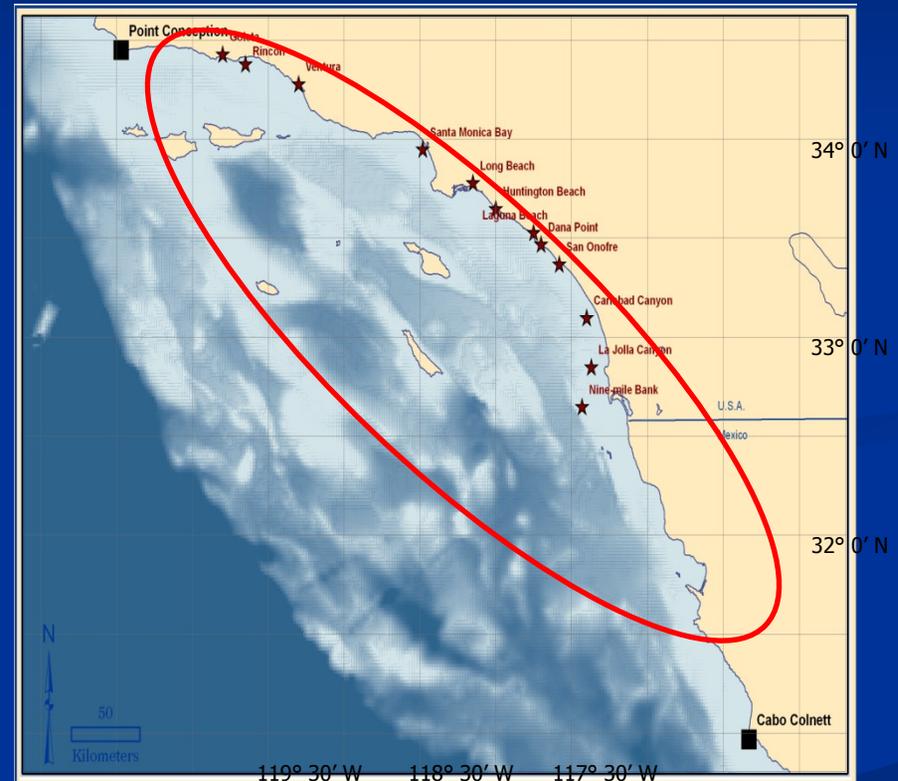
Overview...

- Background on the common thresher resource in CA
- Description of the CA recreational fishery
- Project objectives
 - Pop-off satellite archival tagging
 - Blood bio-chemistry
 - Gear & technique modifications... beyond foul-hooking, towards safer release



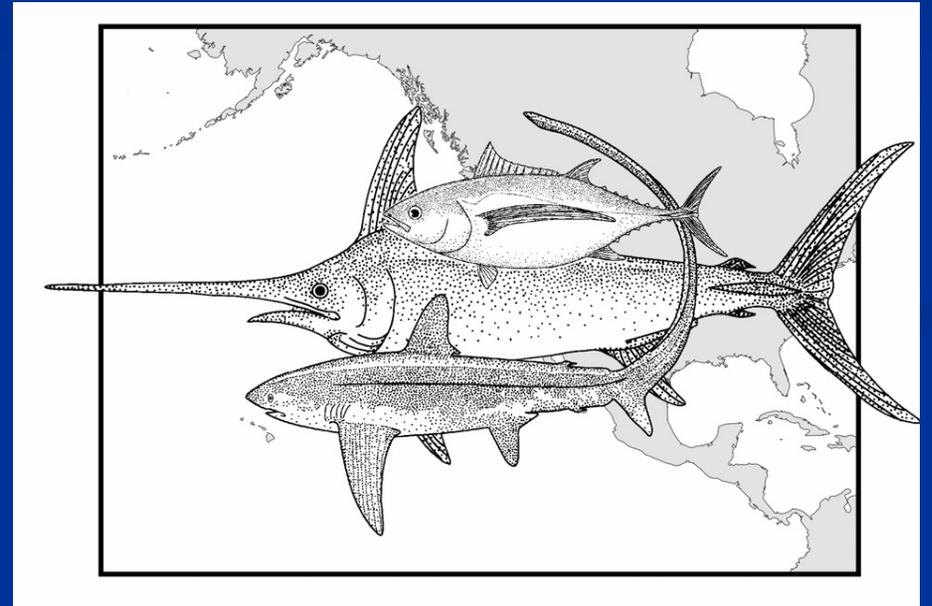
Thresher Life History Facts...

- Long lived species can reach ages over 20 years and weights in excess of 1,000 lbs. (>500 kg)
- Utilize southern California Bight (SCB) as pupping ground
- Mature at 5-6 years and produce 2-4 pups per cycle.
- Low resiliency to exploitation
- Utilize upper lobe of caudal fin to immobilize prey...



Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species

- Common thresher is harvested principally by three gear types
 - gillnet
 - commercial hook and line
 - recreational
- 340 mt harvest guideline
- As the commercial fishery declines the recreational appears to be growing and gaining popularity in Southern California

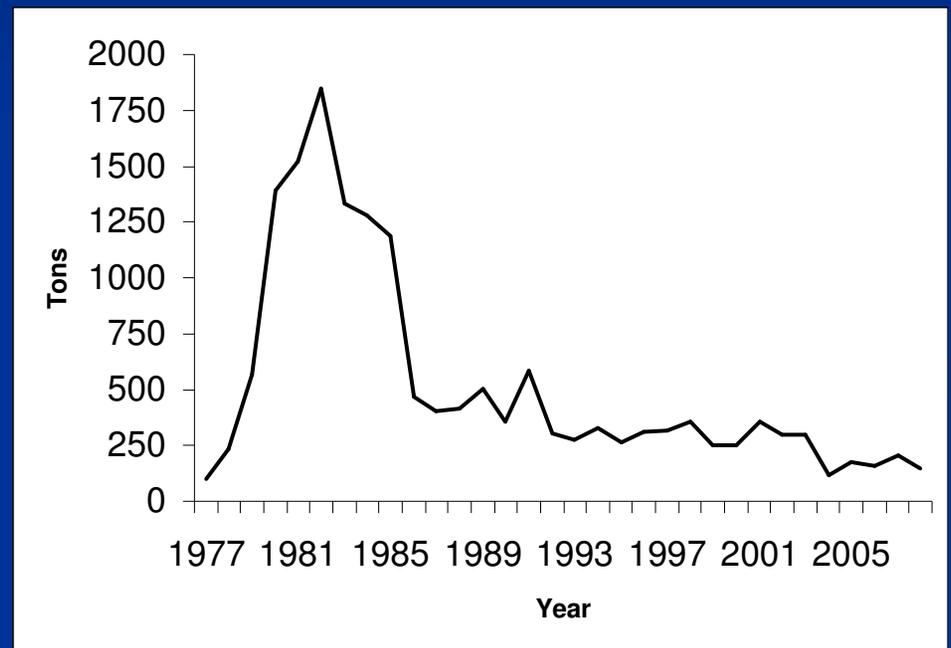


3-200 mile EEZ

California, Oregon, and Washington

Current Status – Commercial Fishery

- Drift gillnet swordfish/thresher primary commercial gear
- Heavy exploitation 1980's
 - Impacts to both juvenile and adult sharks
- Fishery is in decline due to:
 - Stringent temporal and regional regulations (closure north of Pt Conception Aug 15-Nov 15)
 - Declining effort (less than 40 vessels)
 - Low market price
- Current annual catches 100-250 tons



Current Status – Recreational Fishery

- Regulations allow 2 thresher per day regardless of season, size, or area.
- Recent years have seen an increase in effort likely due to:
 - The rebounding of the stock
 - The advent of internet/information sharing
 - Focused targeting
 - Simple techniques, close to port
 - High capture success rates



Inherent problems with recreational thresher shark fishery



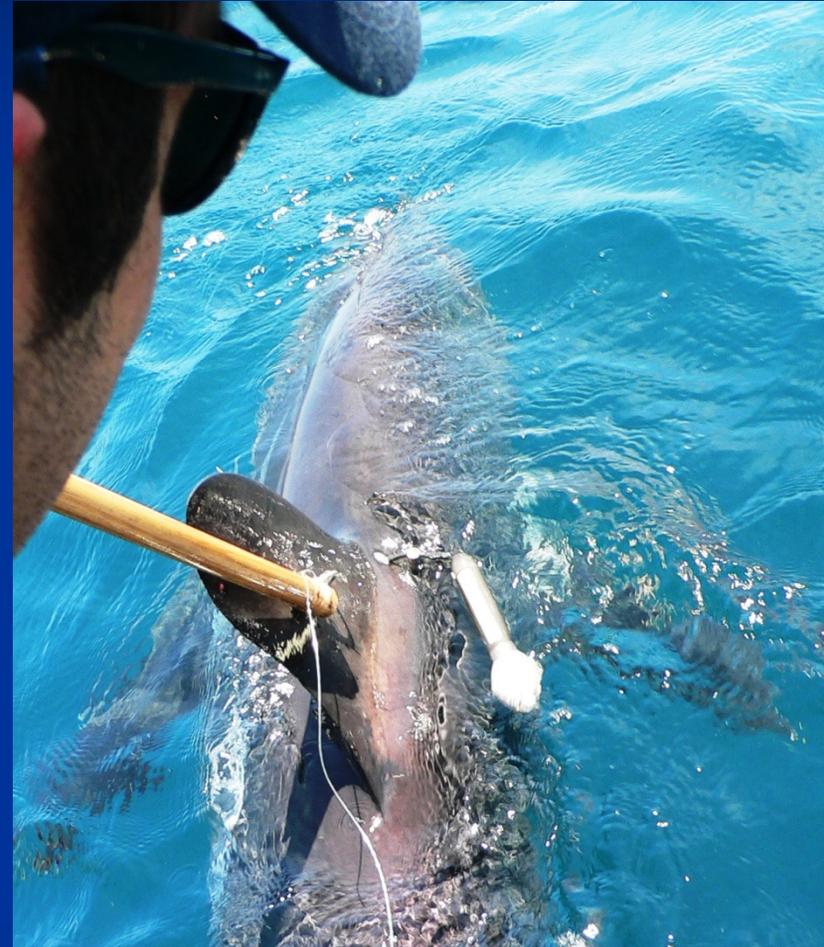
- High percentage tail-hooked when trolling lures
- Increased fight times when tail-hooked
- No ram ventilation when hauled in backwards
- Survivorship estimates for released sharks are not known

Objectives:

- Determine post-release survivorship for sport caught common thresher sharks in the CA recreational fishery.
- Determine the degree to which biochemical stress indicators in the blood manifest when using the caudal-based methods .
- Use public outreach to promote sustainable practices (e.g., switch to circle hooks) in the CA recreational fishery for common thresher sharks

Methods to assess survivorship...

- Use standardized CA fishery techniques
- Record fight time, sex, and fork length
- Place sat-tag in dorsal musculature and release
 - Tag releases after 48 hours if no vertical movement (dead?)
 - Tag releases after 10 days for living sharks
- Blood was sampled from sharks that were not used for the survivorship estimates and several stress related proteins were assayed



Wildlife Computers MK-10 tag

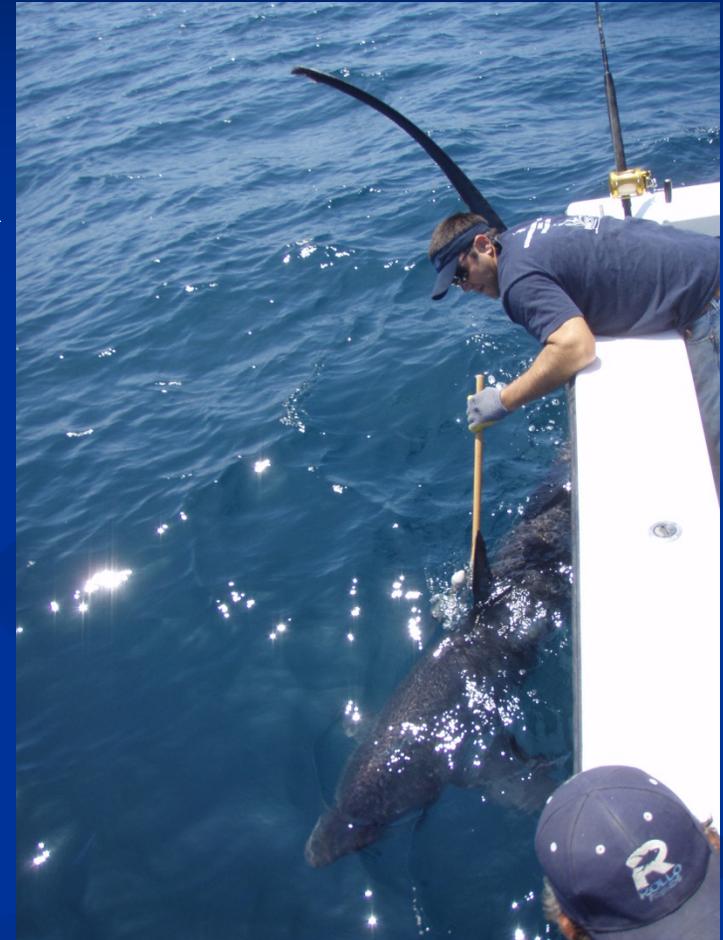
Results

- 50 thresher sharks captured during study (2007-2010)
 - 94% tail-hooked
- Avg fight time 73 min (30-140 min)
- Avg fork length 182 cm (165-221 cm)
- Avg weight 227 lbs (150-400 lbs)
- Blood samples were taken from seven sharks that were not used for the survivorship studies



Results

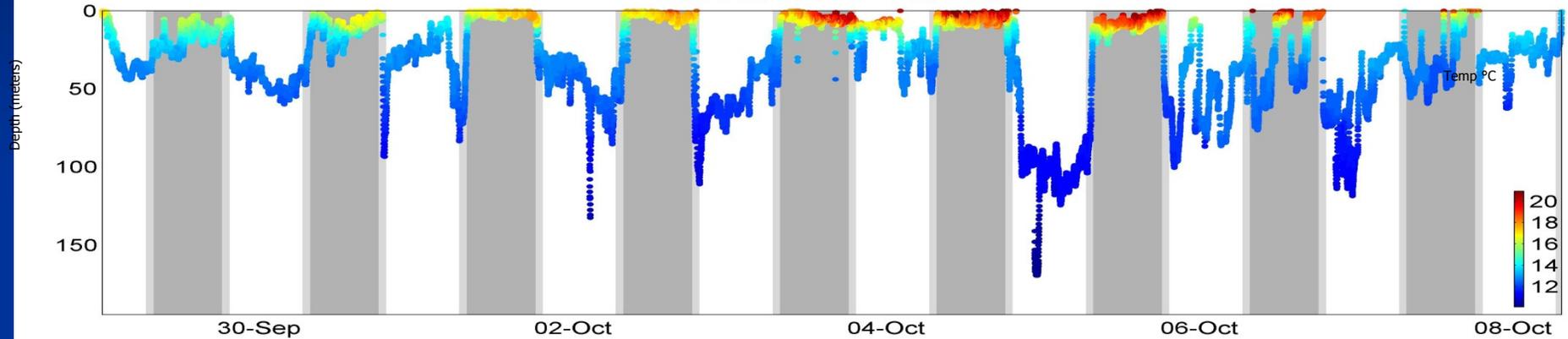
- 20 PSATs deployed
 - 5 tags reported after 48 hr period (dead)
 - 14 tags reported after 10 day period (survived)
 - 1 tag did not report...tag failure?
- **~26% mortality estimate**
- All mortalities were from large sharks with fight times >85 minutes
- Plasma lactate and hematocrit were significantly elevated with increased fight time



PSAT data showing both living and dead sharks

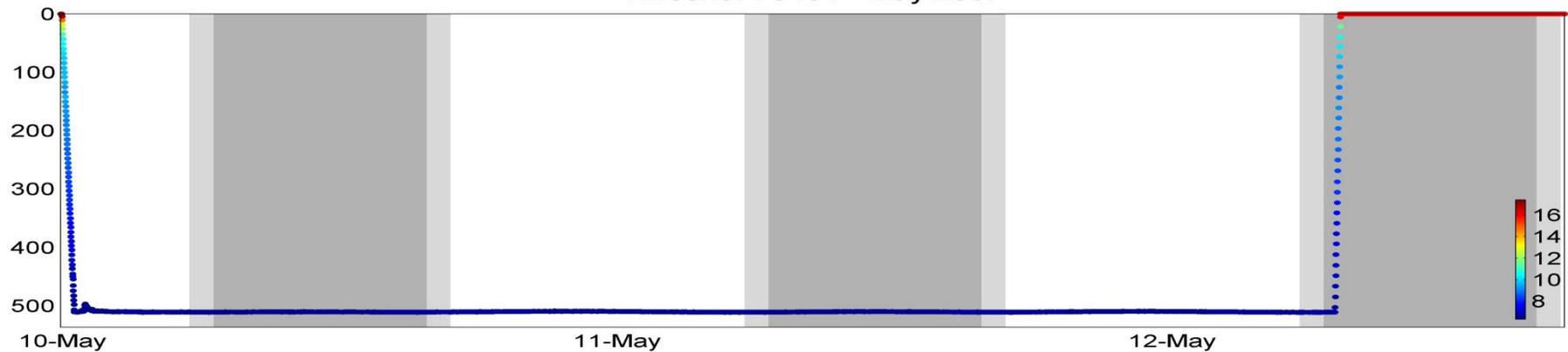
Living

Thresher 77175 - Fall 2008



Dead

Thresher 70401 - May 2007



117° 30' W

Temp (C)

Key Points

- Sharks with fight times from 30 – 60 minutes were released in good condition and survived.
- All 5 sharks that incurred fight times greater than 85 minutes did not survive.
- Blood plasma indicators of stress were elevated and increased with fight time.
- High rates of foul hooking occur with J-hook gear
- Next phase to focus on the effects of trailing gear in this foul-hook fishery



Working with fishermen to develop alternatives...

Circle hooks and mouth-hooking

- Develop innovative solutions that lead to reduced tail-hooking
- Angler involvement, change culture of tail-hooking



Eagle Claw L2004 9/0 circle hook



Outreach

- Outreach and Best Practices
 - Seminars
 - Brochures and video links
 - Promoting mouth hooking innovations



SHARK TAG REWARD

The Southwest Fisheries Science Center has an ongoing shark research program and we need your support in the return of any tags that you may encounter in the dorsal region of shortfin mako, blue, and thresher sharks. Information from tagged sharks is essential towards shark age, growth, and movement studies. Tagged mako sharks have been injected with oxytetracycline which leaves a reference mark on the shark's skin for a US Fish and Wildlife Service tag with a unique number. Please call the Southwest Fisheries Science Center if you catch a tagged shark.



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Phone: (858) 546-7000

Best fishing practices for safe handling



Common Thresher Shark (*Alopias vulpinus*)
Photo © Phil Zerofski

Next Steps...

- Produce a Best Practices video for effective techniques to catch threshers without tail-hooking
- Work with sportfishing constituents to foster use of alternative fishing methods
 - Fishing Clubs & Tournaments
 - Fred Hall Show Seminars
 - Radio and print media outreach
- Place 10 sat-tags on thresher sharks carrying trailing gear to assess survivorship
 - 3 sharks tagged to date, 2 died and third may have been tag failure... may have high mortality when all said and done.

Acknowledgements



- Lee Benaka, NOAA Fisheries
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