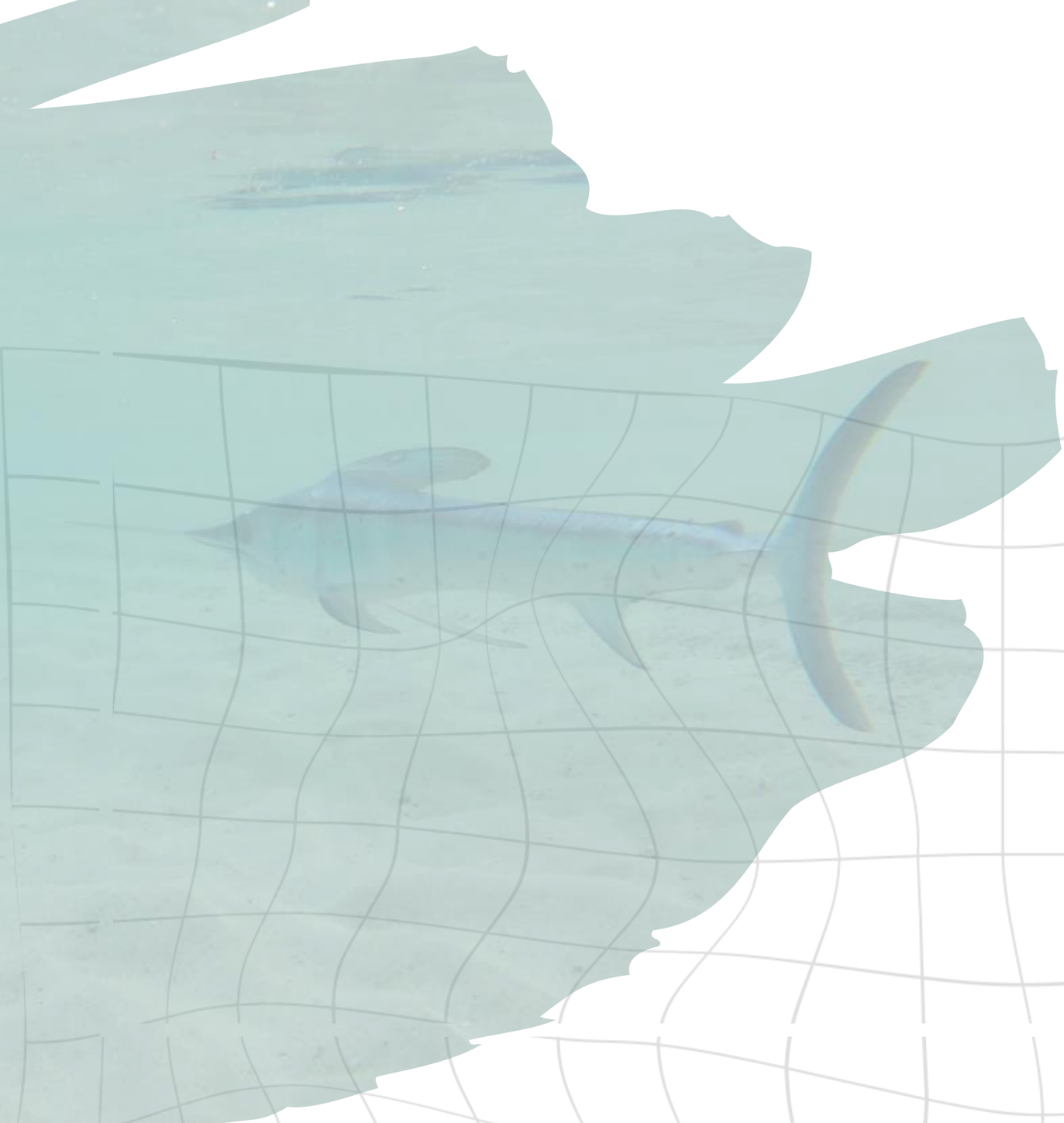


Can Dynamic Ocean Management tools prove useful for a fishery about to sunset?

PICES ANNUAL MEETING 2024, HONOLULU

RACHEL SEARY, EMILY NAZARIO, ELLIOTT HAZEN, STEVEN BOGRAD, AMBER RHODES, DAN LAWSON, REBECCA LEWISON, HELEN BAILEY, HEATHER WELCH, AUSTIN SELL

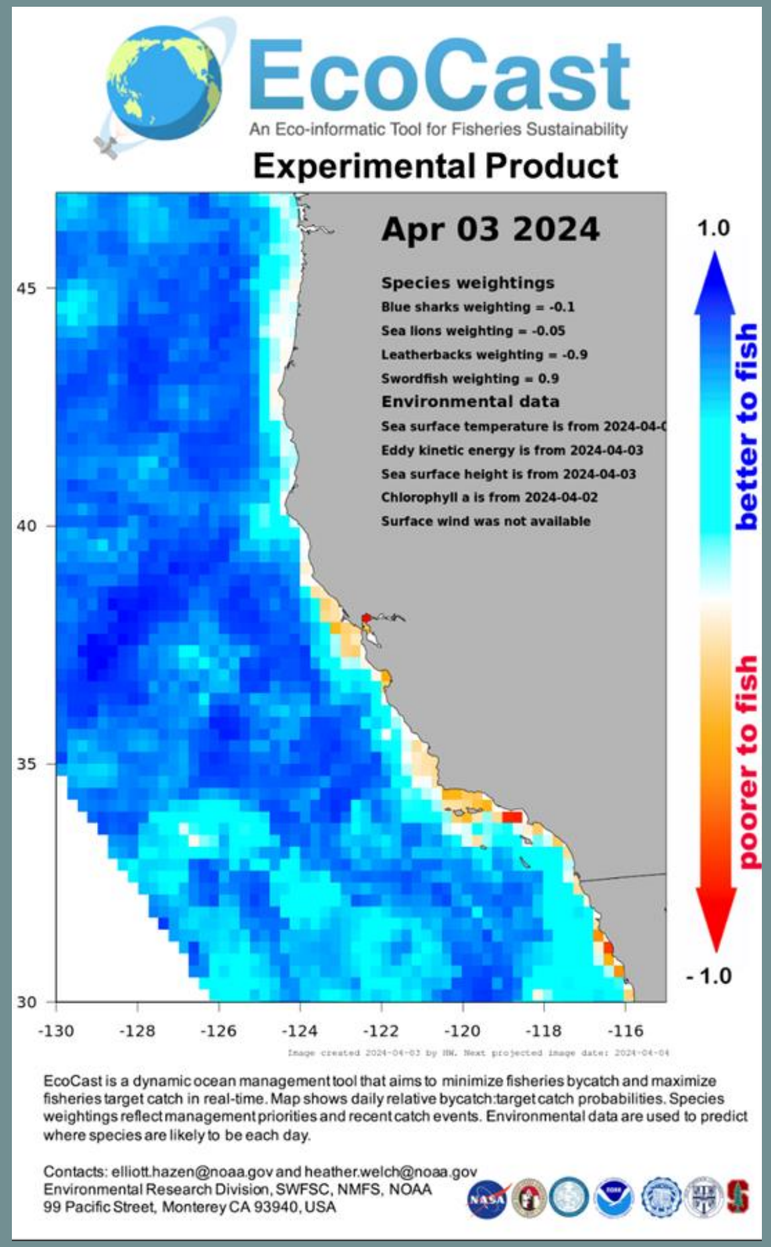
DYNAMIC OCEAN MANAGEMENT is;

management that uses near real-time data to guide the spatial distribution of human activities

used to balance multiple objectives

an adaptive approach under a changing climate.

The Tool – EcoCast



https://coastwatch.pfeg.noaa.gov/ecocast/

Finding a good place to fish....

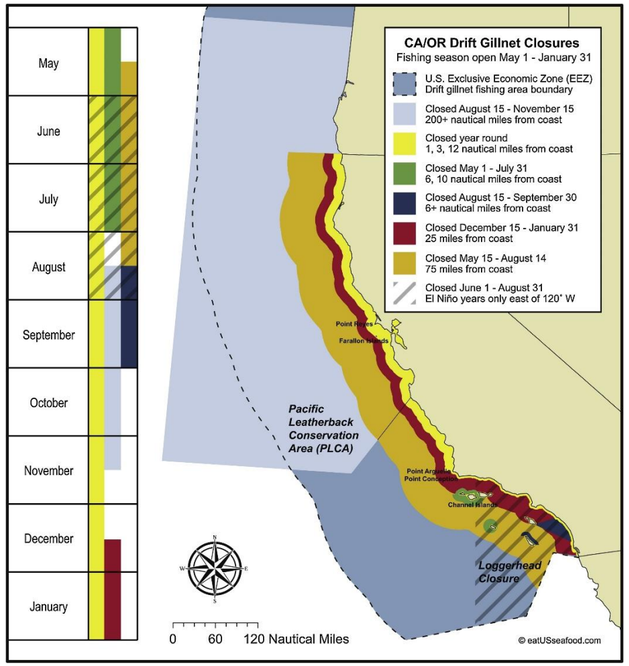
- Decision-support tool for use by fishermen
- Near-real time (daily)
- Predicted distributions of target catch species and bycatch species combined into a single map
- Suggests better and poorer locations to fish

Hazen, L., K.L. Scales, S.M. Maxwell, D.K. Briscoe, H. Welch, S. J. Bograd, H. Bailey, S.R. Benson, T. Eguchi, H. Dewar, S. Kohin, D.P. Costa, L.B. Crowder and R.L. Lewison. 2018. A dynamic ocean management tool to reduce bycatch and support sustainable fisheries. Science Advances 4: eaar3001.

THE CALIFORNIA DRIFTGILLNET FISHERY

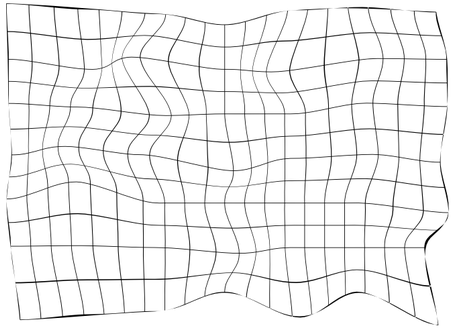
Sustainability threatened by….

Bycatch of protected species



- Fishing areas restricted by Leatherback and Loggerhead turtle conservation areas
- Number of participants depleting

A ban on Drift gillnet



- Fishery phase-out by 2027 under the Driftnet Modernization and Bycatch Reduction Act

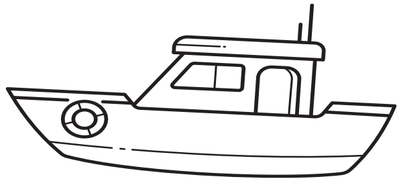
Exempted fishing permits to be granted

- Using EcoCast as a condition of those permits

Climate shifts in species distribution

- Potential climate-driven redistribution of swordfish poleward and offshore (Smith et al., 2023)

Can EcoCast be useful for this new sustainable evolution of this fishery?

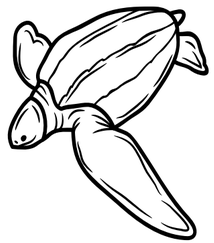


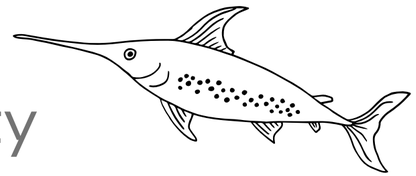
QUESTION

Is EcoCast useful as a decision-support tool for fishermen to achieve these objectives?

OBJECTIVE

To evaluate the efficacy of EcoCast for meeting its intended goals

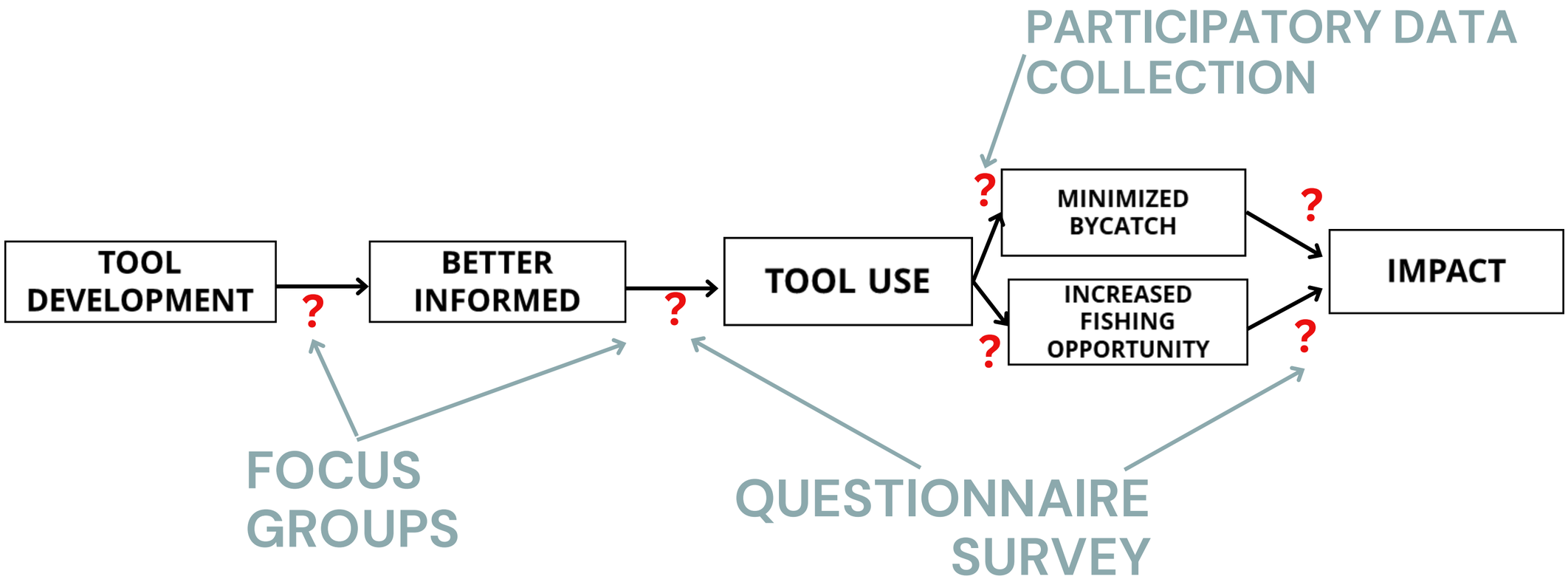




- Minimize bycatch
- Increase fishing opportunity

APPROACH

Program performance evaluation



- Mixed methods to develop an evidence base at each of these change points
- Determine how EcoCast development leads to a positive impact

PRELIM RESULTS

FOCUS GROUPS

- Operationalized
- Spatially and temporally dynamic
- Multiple species
- Protected and target species

- 2019 Exempted Fishing Permit Holders
- 2024 Exempted Fishing Permit Holders

- Evidence of efforts to reduce interactions
- Potential fishing ground access

- Other DOM tools inspired by EcoCast

TOOL DEVELOPMENT → ? → **BETTER INFORMED** → ? → **TOOL USE** → ? → **MINIMIZED BYCATCH** / **INCREASED FISHING OPPORTUNITY** → ? → **IMPACT**

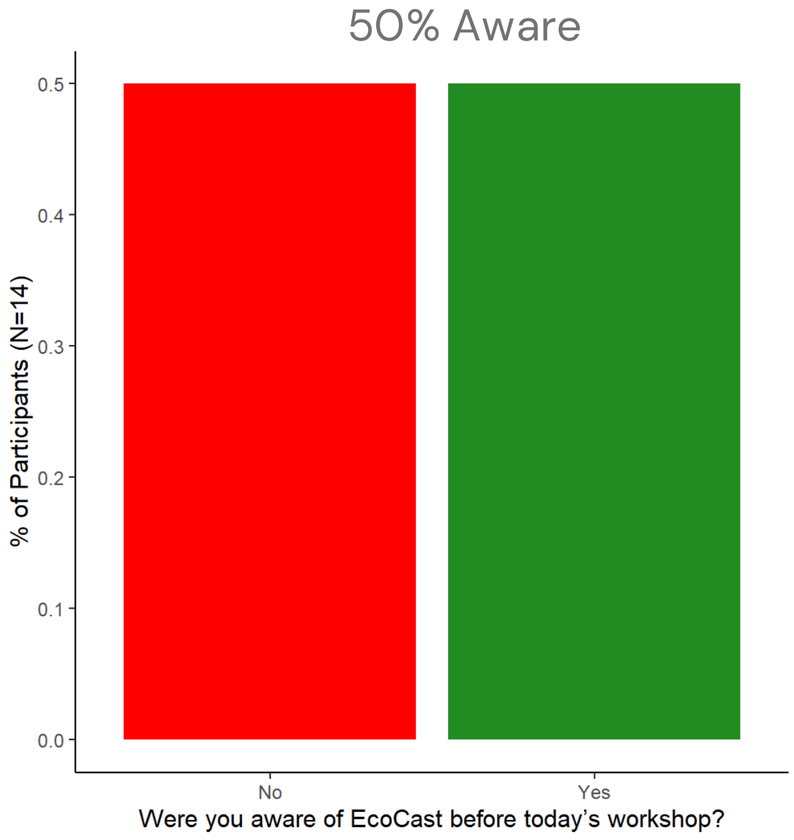
- Future performance
- Spatial resolution
- Consistent funding

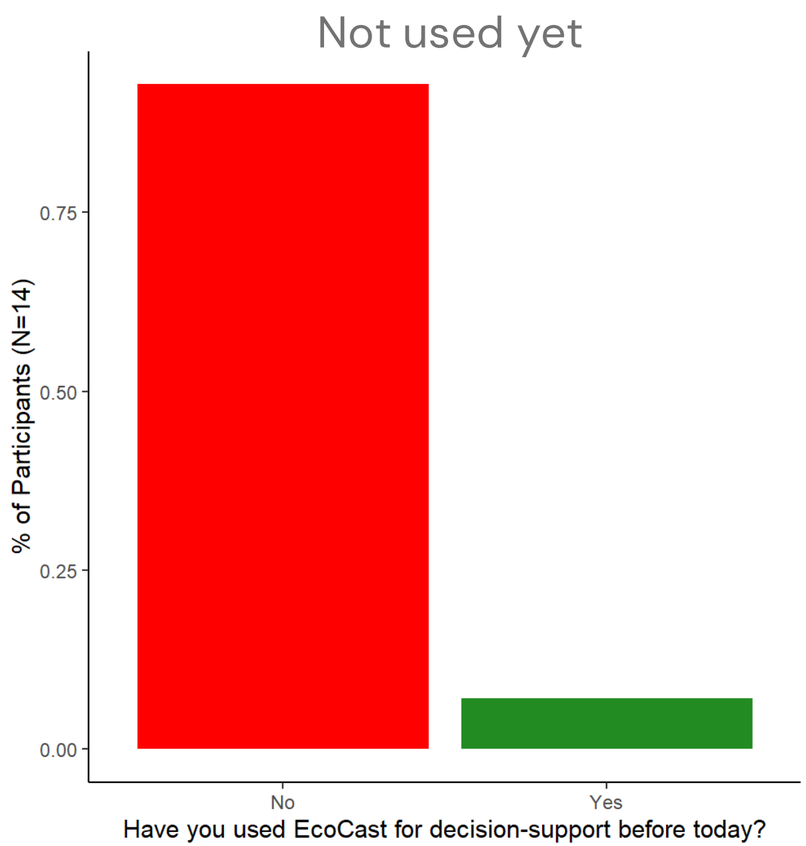
- Delivery system
- Political barriers (fishery sunsetted)
- Model uncertainty
- Opposition by conservation groups
- Fear of losing opportunity

- Not there yet on bycatch

PRELIM RESULTS

Skipper Questionnaire Survey

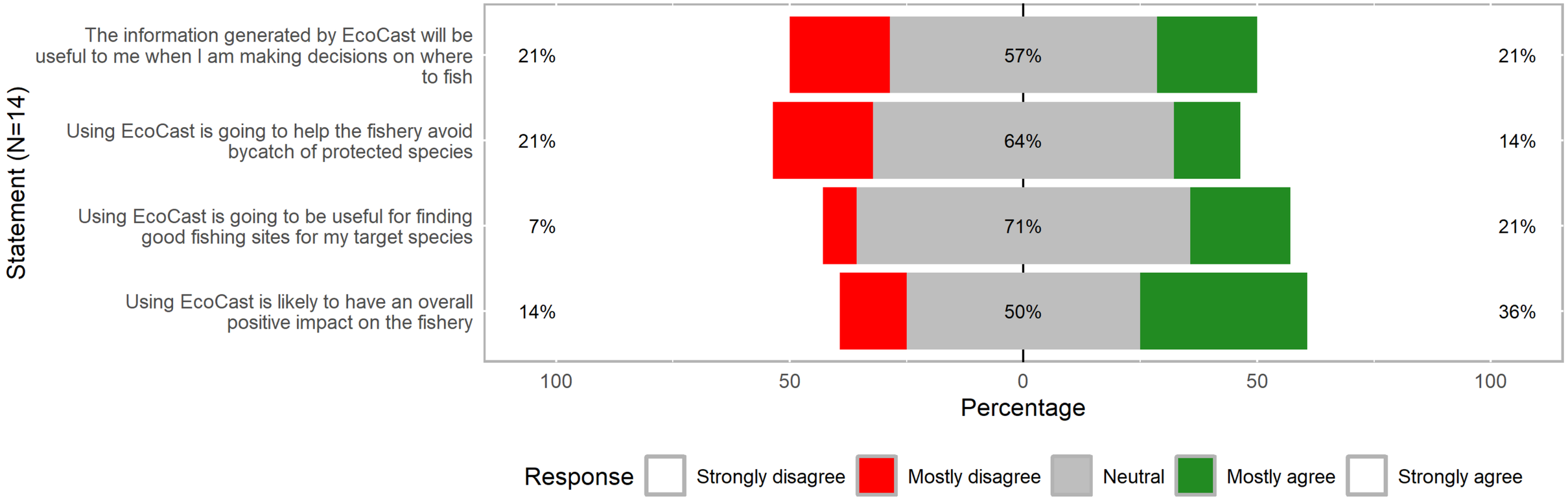




PRELIM RESULTS

Skipper Questionnaire Survey

To be tested pre and post EcoCast use



Upcoming

PARTICIPATORY DATA COLLECTION

Voluntary (compensated) data collection by HMS EFP holders to test the reliability of EcoCast

SURVEY CARD

Participants fill out a short survey card during normal fishing trips

PROJECTION VS REALITY

Note EcoCast projection, and then make an assessment of pre-set and post-haul real fishing conditions

MEASURE THE DIFFERENCE

We compile data and measure the difference between EcoCast projections and skipper evaluations of conditions to assess how well the tool works

Consult EcoCast

Basic trip information

Assess real fishing conditions on arrival

Decision on whether to deploy gear

Assess again post-catch

Comments

EcoCast Survey Card

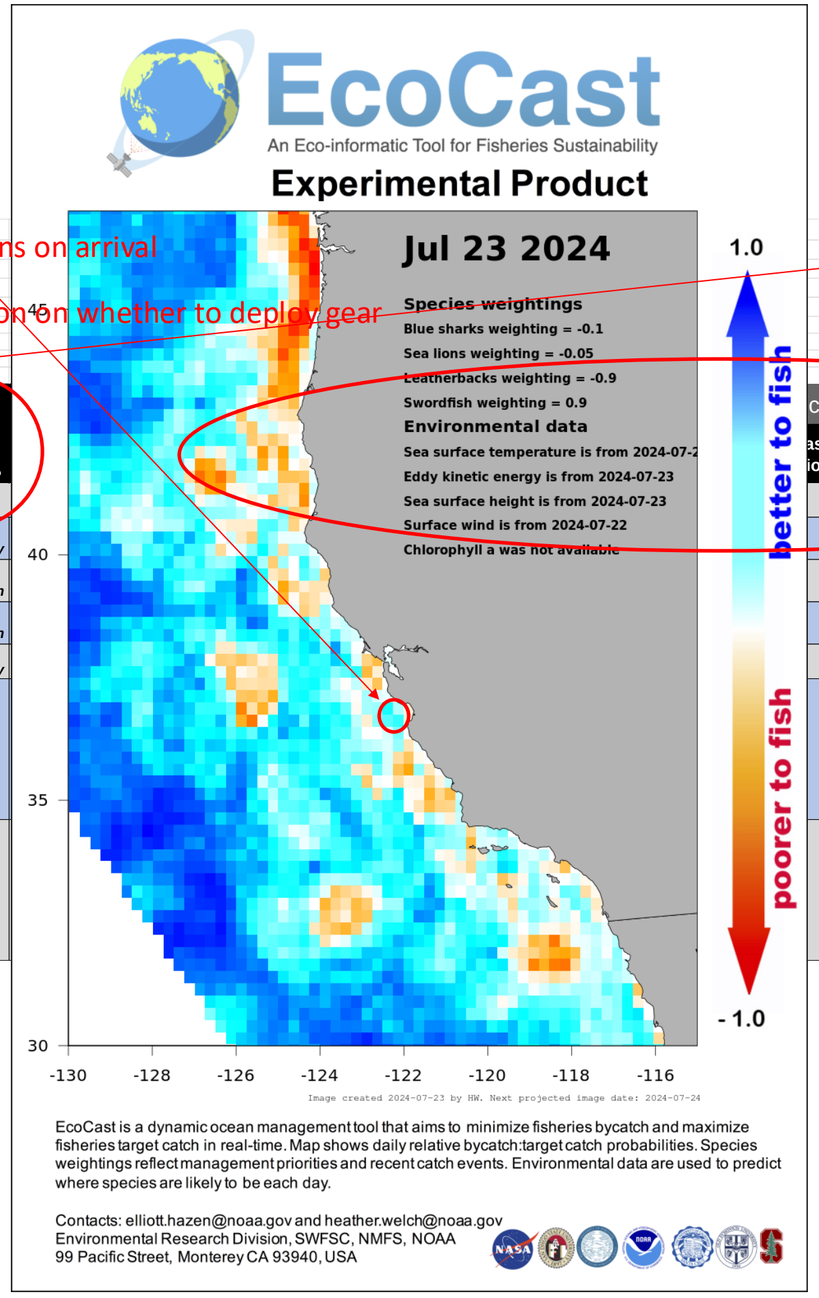
Captain name:

Trip date	Vessel identification number	Gear type	Lat	Lon	EcoCast map date	EcoCast Prediction	Pre-set Assessment	Fishing gear deployed?	ast ions	Sighting of non-target species	Sighting of target species	Other	Post-haul Assessment	Comments
									check "y" on all that apply):					
Example:														
9/12/2023	*CF1234AB*	*MWSG*	*36.60385*	*-121.89464*	*9/12/2023*	*light blue*	*light blue*	*y*	*y*	*n*	*n*	*e.g. cloud cover*	*light blue*	*Lots of blue sharks in catch, not many swordfish*
9/12/2023	""	""	*36.75385*	*-121.89464*	*9/12/2023*	*red*	*light blue*	*n*	*y*	*n*	*n*		*NA*	*water looks good but decided not to fish due to EcoCast predictions*
9/12/2023	""	""	*36.65385*	*-121.89464*	*9/9/2023*	*dark blue*	*red*	*n*	*n*	*y*	*n*		*NA*	*was going to fish but saw 10 leatherbacks on surface of water*
9/14/2023	*665885*	*XLBG*	*36.75385*	*-121.89464*	*9/13/2023*	*red*	*orange*	*y*	*n*	*n*	*n*	*e.g. previous catch reports*	*red*	*decided to fish because other fishermen said it was good, but we got only unwanted catch*

Assessment Key:

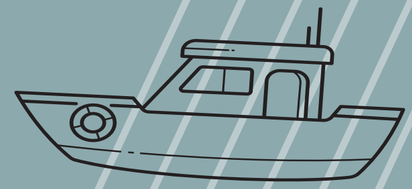
Color	Description
Dark blue	Best to fish (highest chance of catch, lowest bycatch)
Light blue	Good to fish
White	Neutral
Orange	Poor to fish
Red	Worst to fish (lowest chance of catch, highest bycatch)

**Please note that the scale is relative to the conditions of the day.



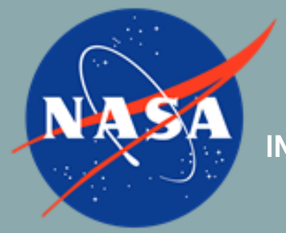
EXPECTED OUTCOMES

- Quantify difference between EcoCast prediction and real fishing conditions
- Engage fishing community in developing a tool that works for them
- Learn key improvements we can make to EcoCast model and tool
- Feed all of this information back for further tool development



SUGGESTIONS/QUESTIONS?

Rachel Seary
UC Santa Cruz/NOAA SWFSC
rseary@ucsc.edu



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