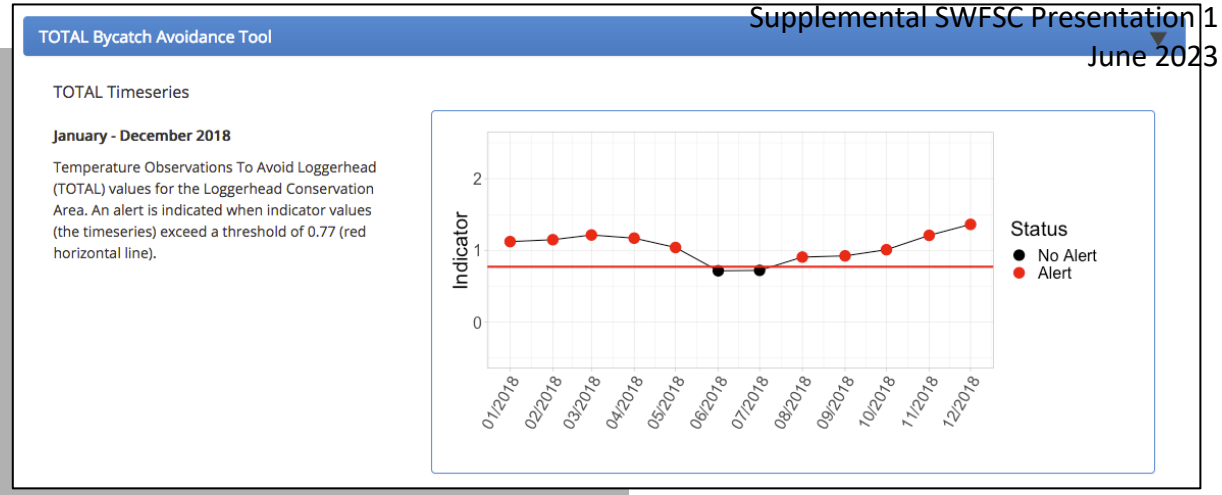
Temperature Observations To Avoid Loggerheads (**TOTAL**) tool

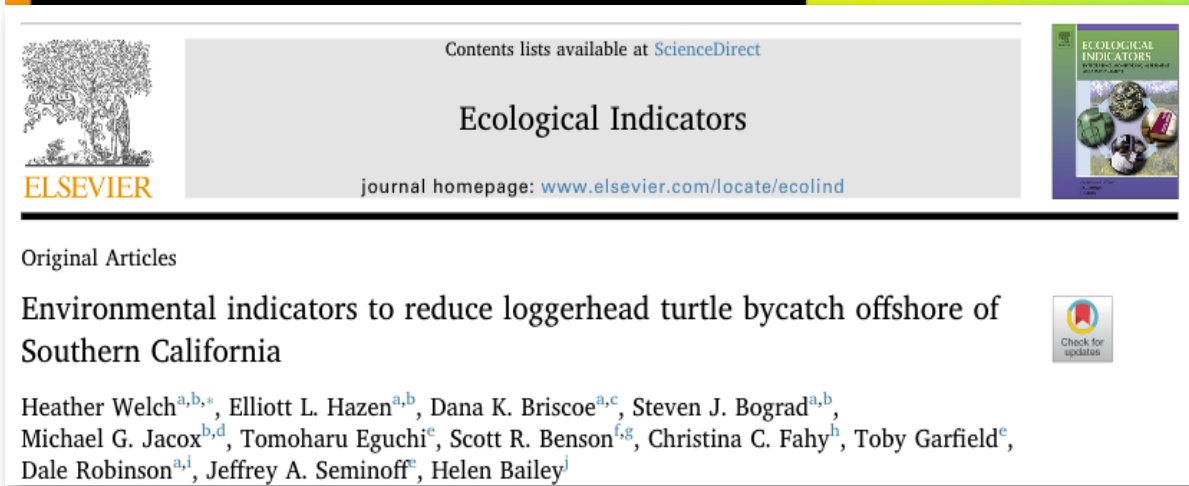
NOAA COASTWATCH WEST COAST REGIONAL NODE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



WELCH ET AL. 2018. ECOLOGICAL INDICATORS.

Environmental indicators to reduce loggerhead turtle bycatch offshore southern California

A temperature-based indicator to guide the timing of a fishery closure that maximizes loggerhead turtle avoidance and minimizes opportunity costs to fishers.


Contents lists available at ScienceDirect

Ecological Indicators

journal homepage: www.elsevier.com/locate/ecolind

Original Articles

Environmental indicators to reduce loggerhead turtle bycatch offshore of Southern California

Heather Welch[a,b,*], Elliott L. Hazen[a,b], Dana K. Briscoe[a,c], Steven J. Bograd[a,b], Michael G. Jacox[b,d], Tomoharu Eguchi[e], Scott R. Benson[f,g], Christina C. Fahy[h], Toby Garfield[e], Dale Robinson[a,i], Jeffrey A. Seminoff[e], Helen Bailey[j]

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

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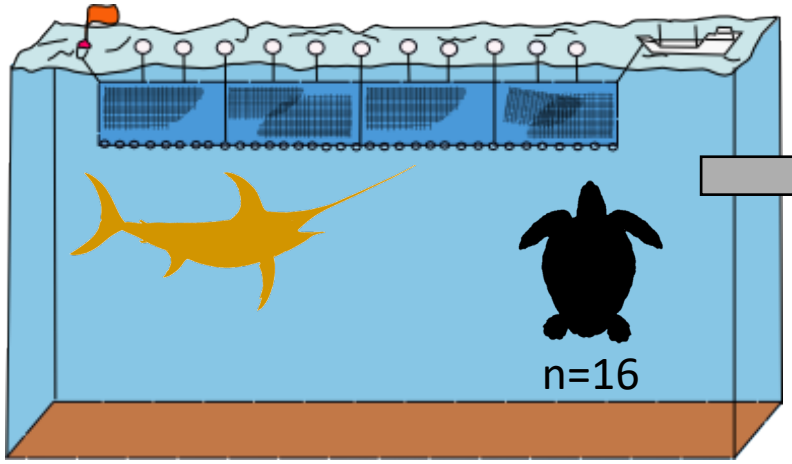
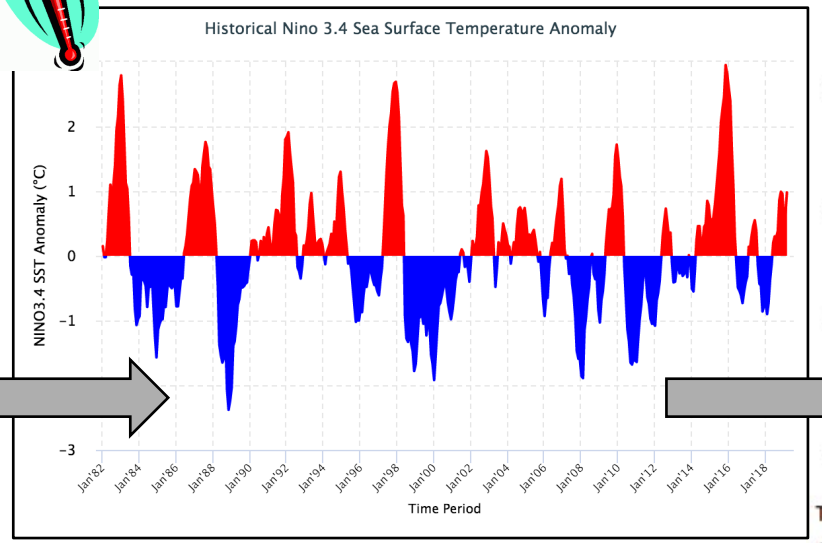
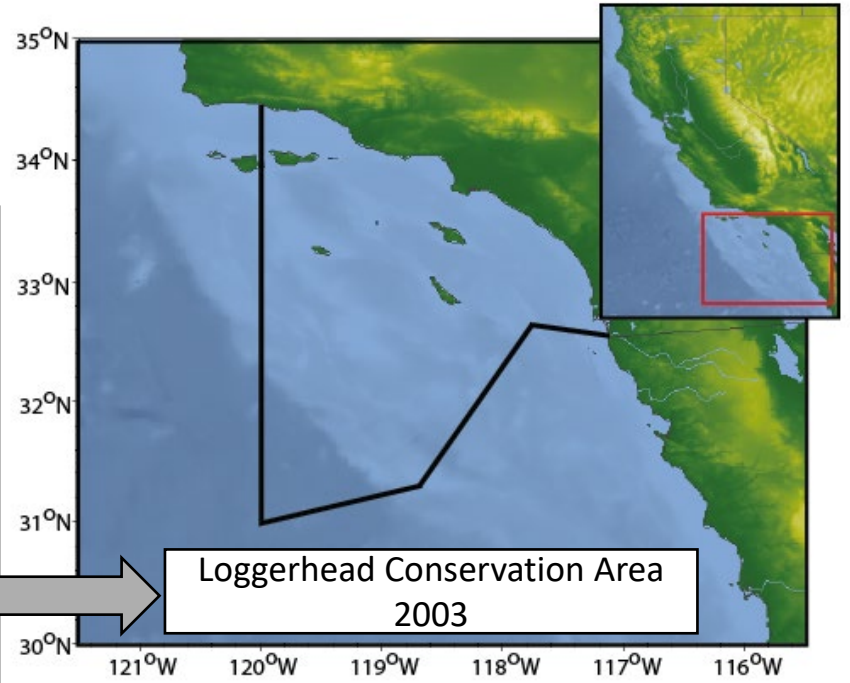
Temperature Observations To Avoid Loggerheads (**TOTAL**) tool

Project motivation







The Conservation Area encompasses U.S. waters of the Pacific Ocean off the Southern California coast that are within the black line to the coast.

Can we use additional loggerhead distribution datasets collected since 2003 to **refine and quantify the closure rule**?

Welch et al. 2018. Environmental Indicators to reduce loggerhead turtle bycatch offshore Southern California. Ecological Indicators.

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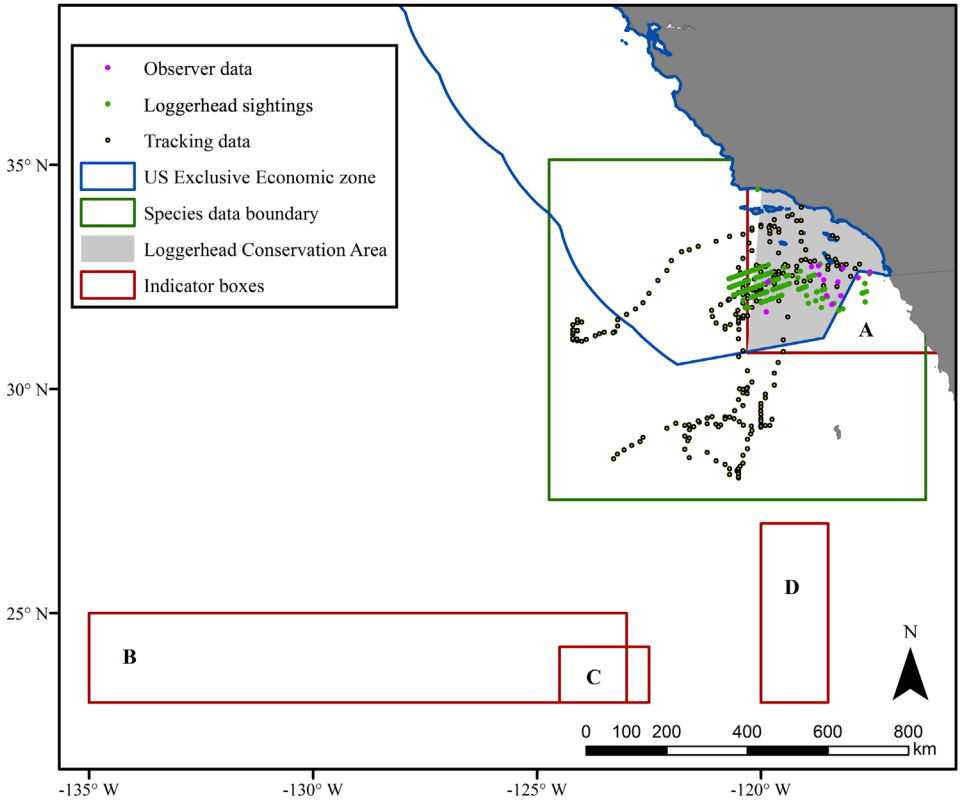
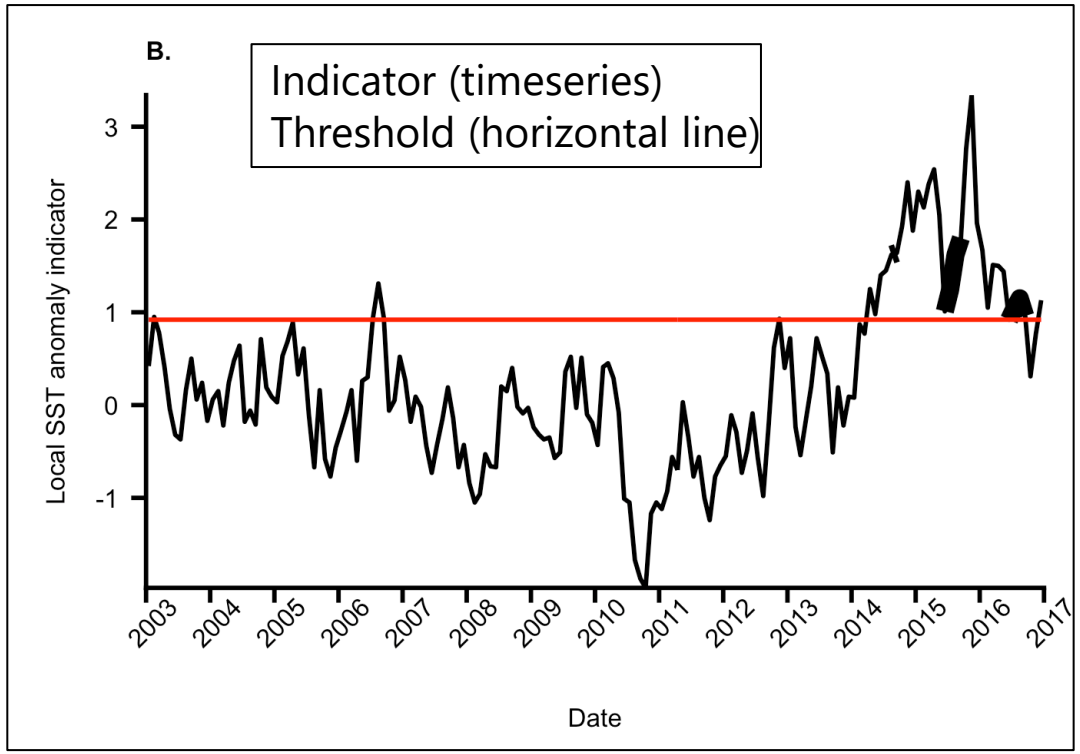
Temperature **O**bservations **T**o **A**void **L**oggerheads (**TOTAL**) tool



Science behind the tool



Welch et al. 2018. Environmental Indicators to reduce loggerhead turtle bycatch offshore Southern California. Ecological Indicators.

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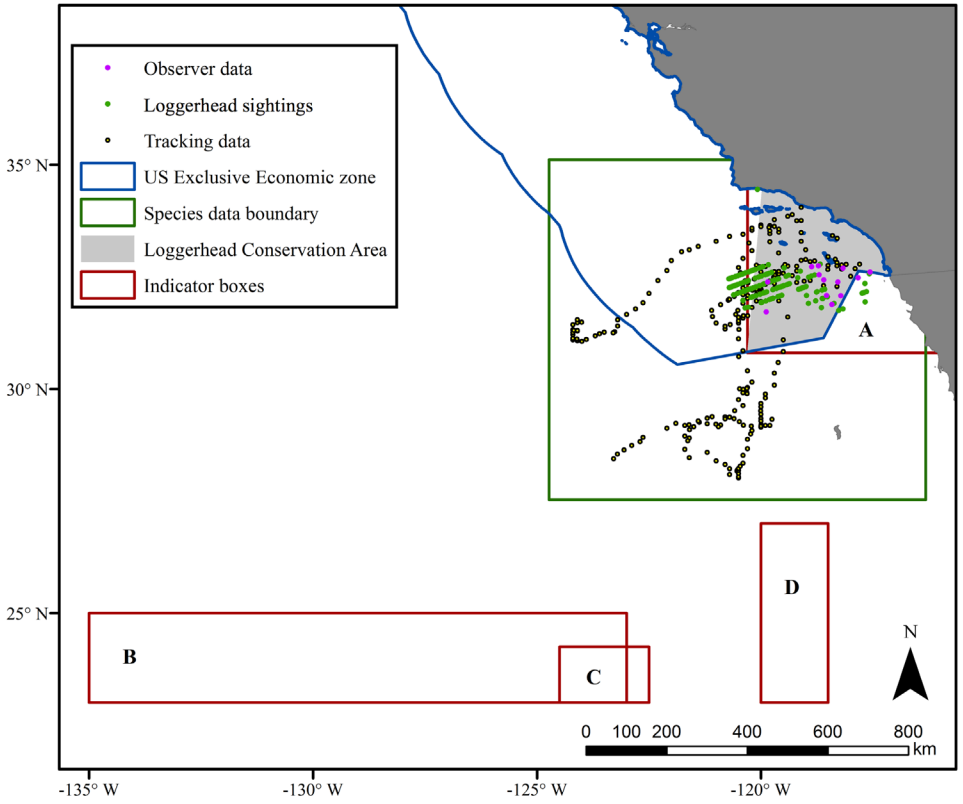
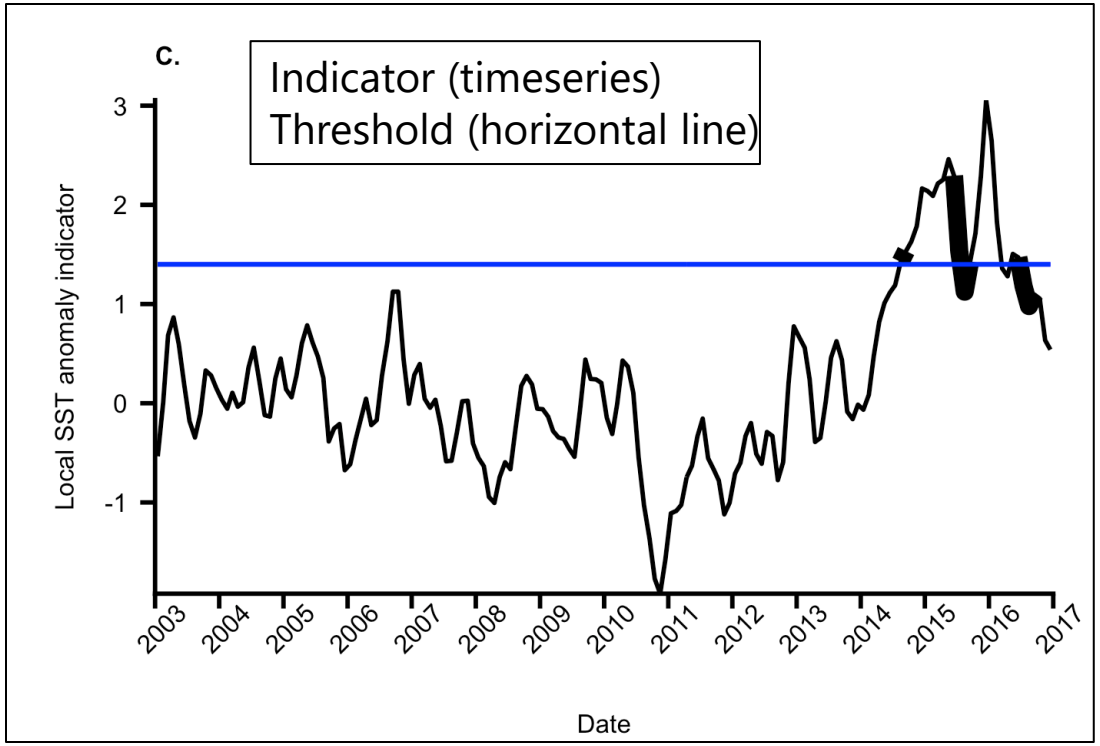
Temperature **O**bservations **T**o **A**void **L**oggerheads (**TOTAL**) tool



Science behind the tool



Welch et al. 2018. Environmental Indicators to reduce loggerhead turtle bycatch offshore Southern California. Ecological Indicators.

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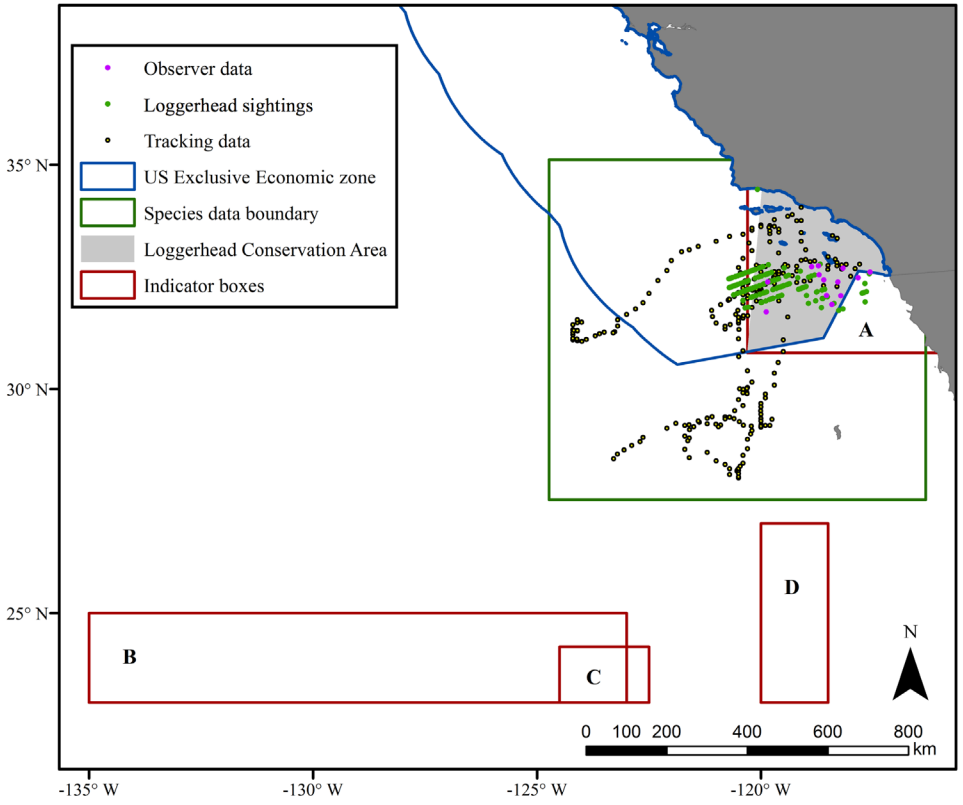
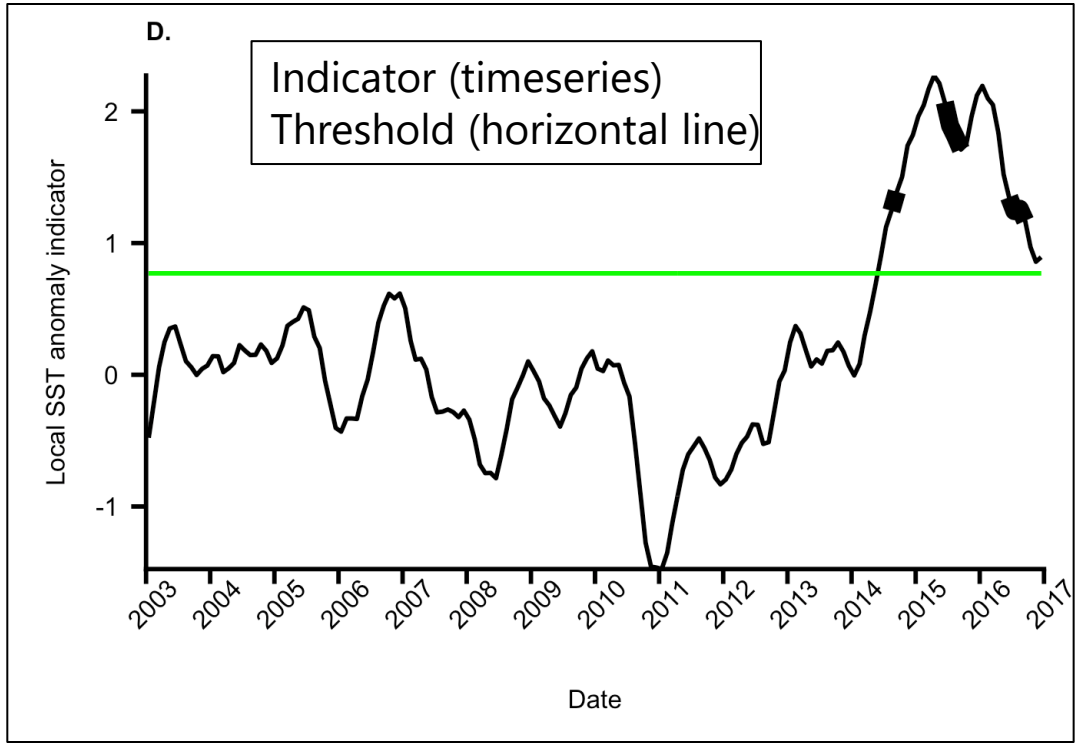
Temperature Observations To Avoid Loggerheads (**TOTAL**) tool



Science behind the tool



Which rule has the **lowest opportunity cost**?
Which rule has the **most overlap** with sighted turtles?
Which rule has the highest **avoidance of historical bycatch**?

Welch et al. 2018. Environmental Indicators to reduce loggerhead turtle bycatch offshore Southern California. Ecological Indicators.

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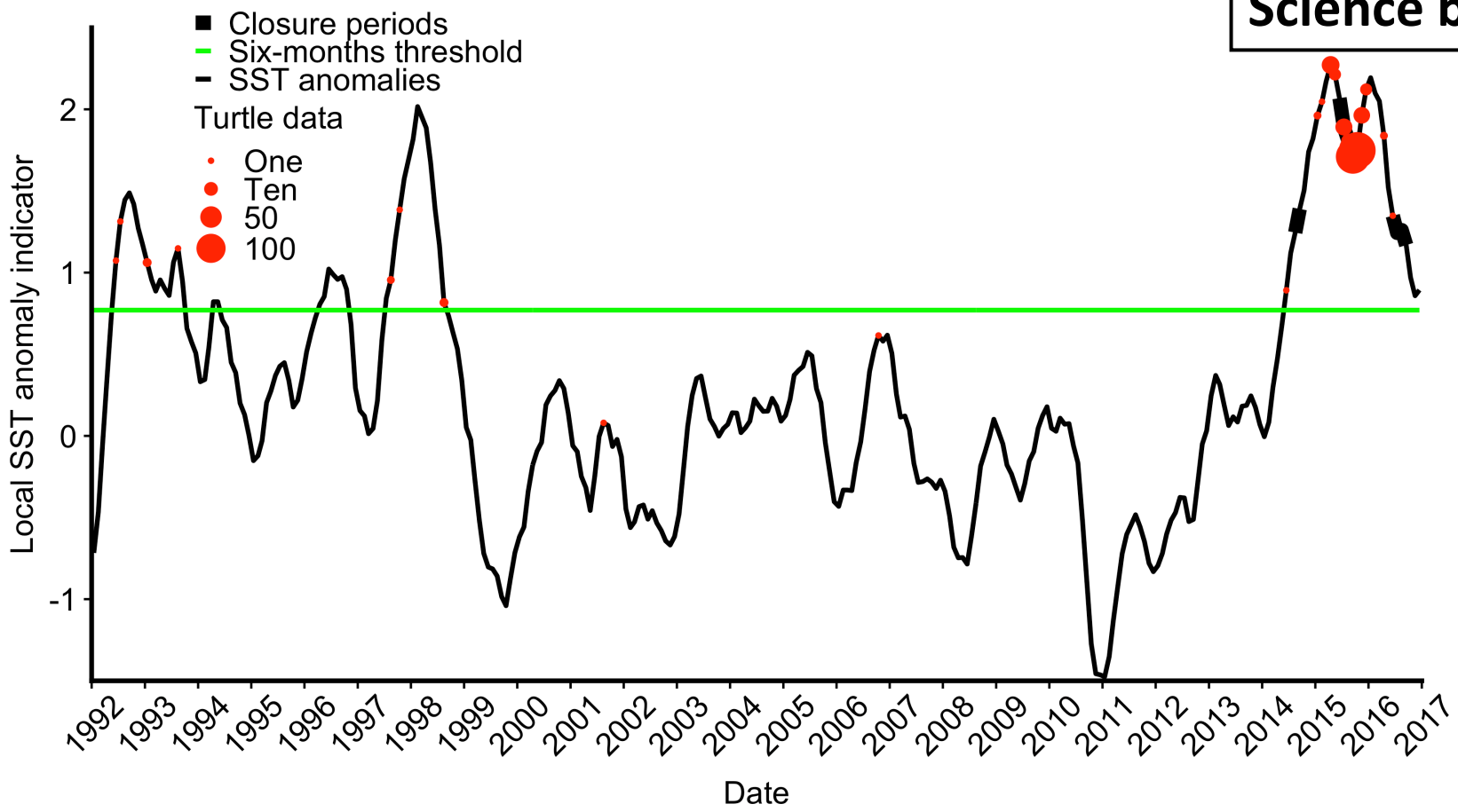
Temperature Observations To Avoid Loggerheads (TOTAL) tool

Science behind the tool



Which rule has the **lowest opportunity cost**? **(19% of the time)**
Which rule has the **most overlap** with sighted turtles? **(100% overlap)**
Which rule has the highest **avoidance of historical bycatch**? **(88% avoided)**

Welch et al. 2018. Environmental Indicators to reduce loggerhead turtle bycatch offshore Southern California. Ecological Indicators.

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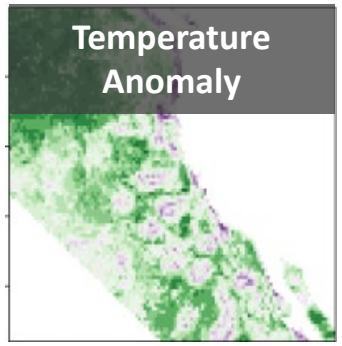
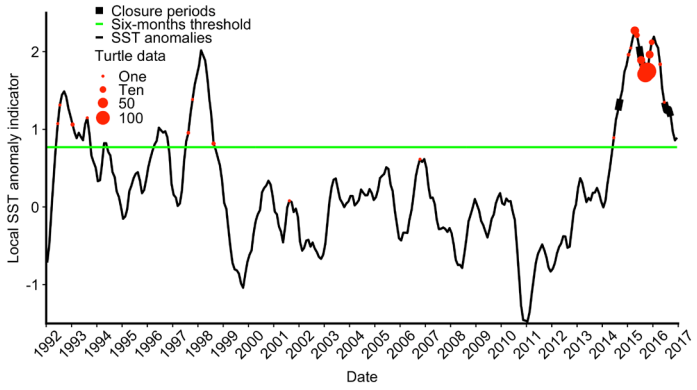
Temperature Observations To Avoid Loggerheads (**TOTAL**) tool

Tool Operationalization



Best indicator and threshold

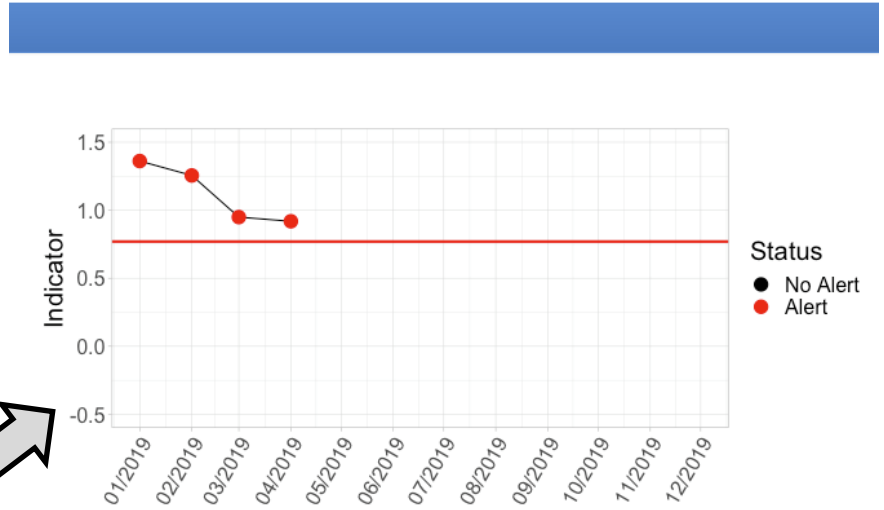


1) Acquisition
- New biological, environmental, economical, and/or social (BEES) data

2) Prediction
- Target feature attributes
- Management recommendation
- Final product

3) Dissemination
- Dissemination pathways
  - Managers
  - Practitioners
  - Public

4) Automation
- Workflow repeated at a prescribed temporal frequency



Welch et al. 2018. Journal of Applied Ecology.

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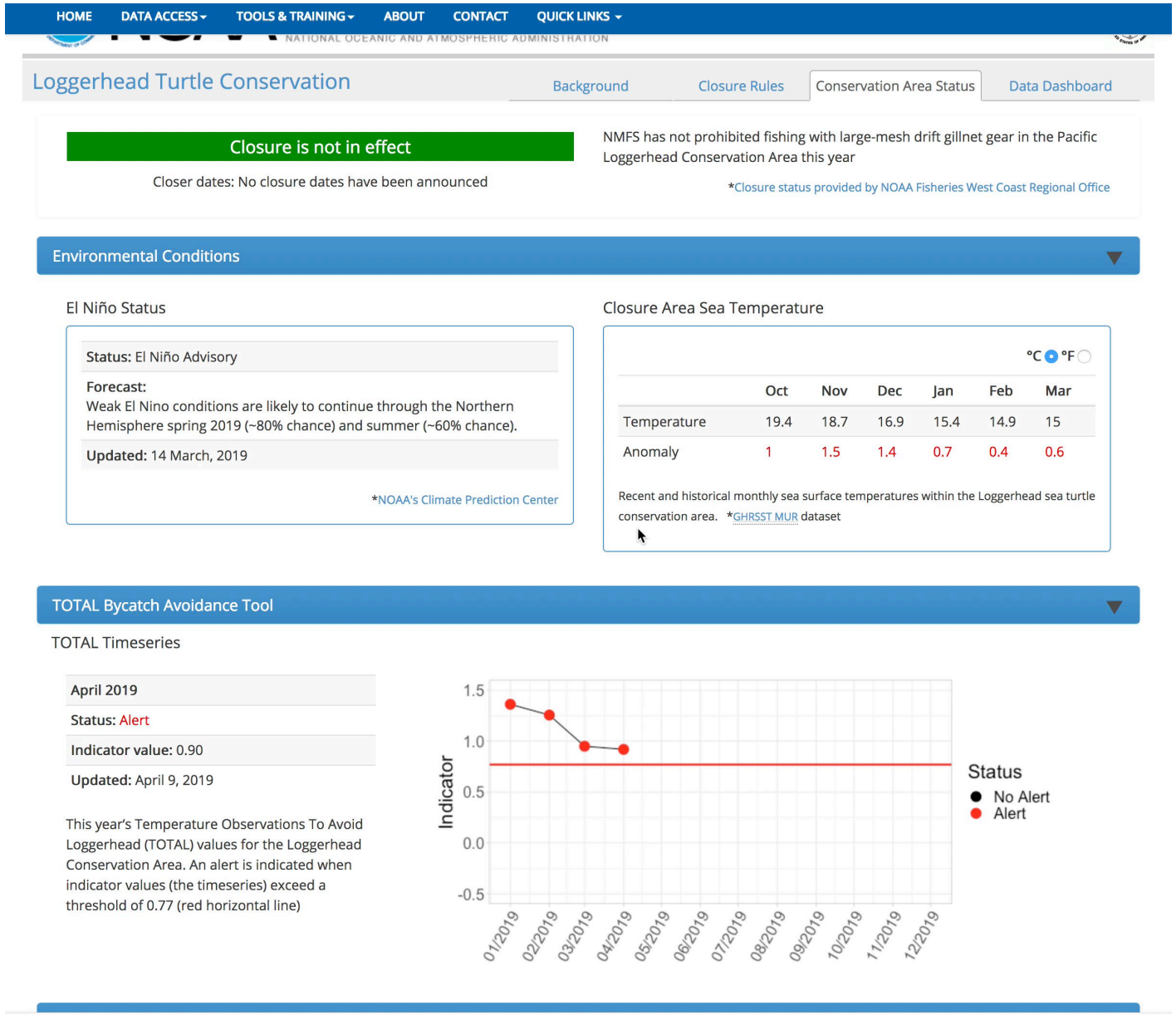
Temperature **O**bservations **T**o **A**void **L**oggerheads (**TOTAL**) tool



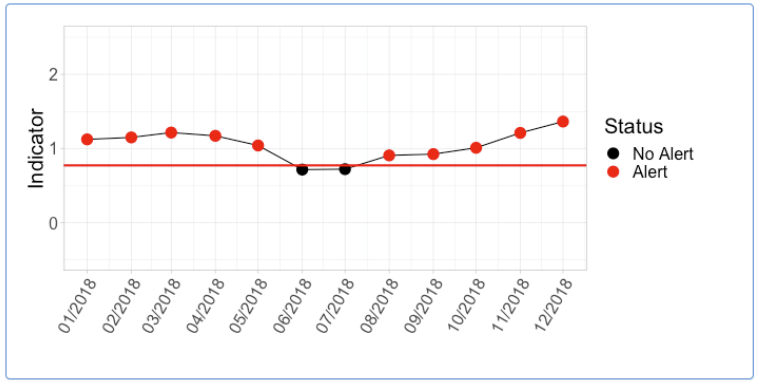
Website developed by Dale Robinson (NOAA SWFSC)

Tool Operationalization

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

Future Steps

- Continue aerial surveys for turtles
- Monitor alert status



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