

Hawaii

Climate Indicators Summary

June 2021

PMNM Climate Change Working Group

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U. S. Fish & Wildlife Service

Honolulu, HI

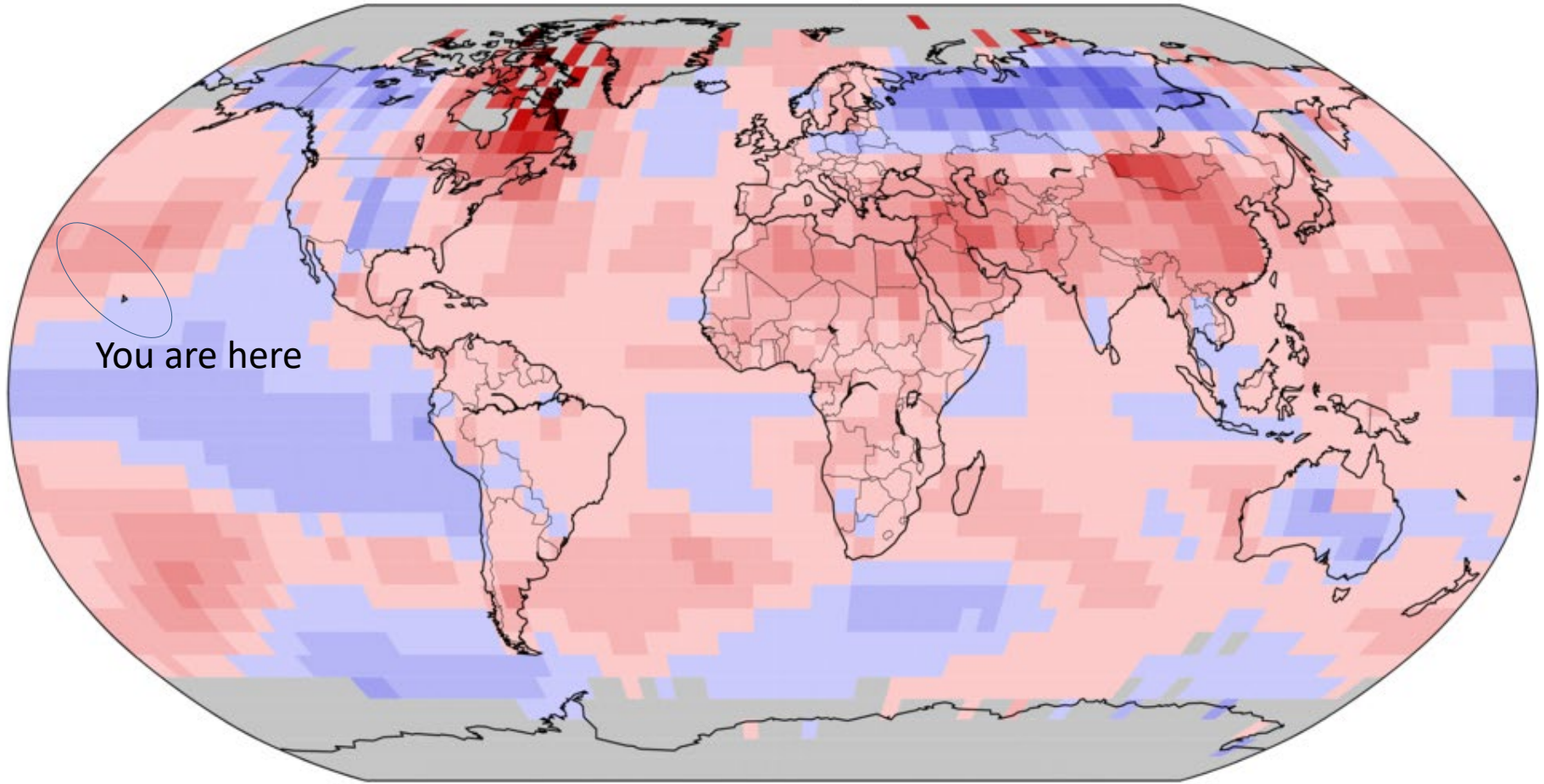
A displaced Polar Vortex pattern notably cooled the Northern Hemisphere continents in early 2021



This is evident in the following global plots for January-April 2021, and the April data itself, but this pattern did not noticeably affect air temperatures in the Pacific

Land & Ocean Temperature Departure from Average Jan–Apr 2021 (with respect to a 1981–2010 base period)

Data Source: NOAA GlobalTemp v5.0.0–20210509



Degrees Celsius



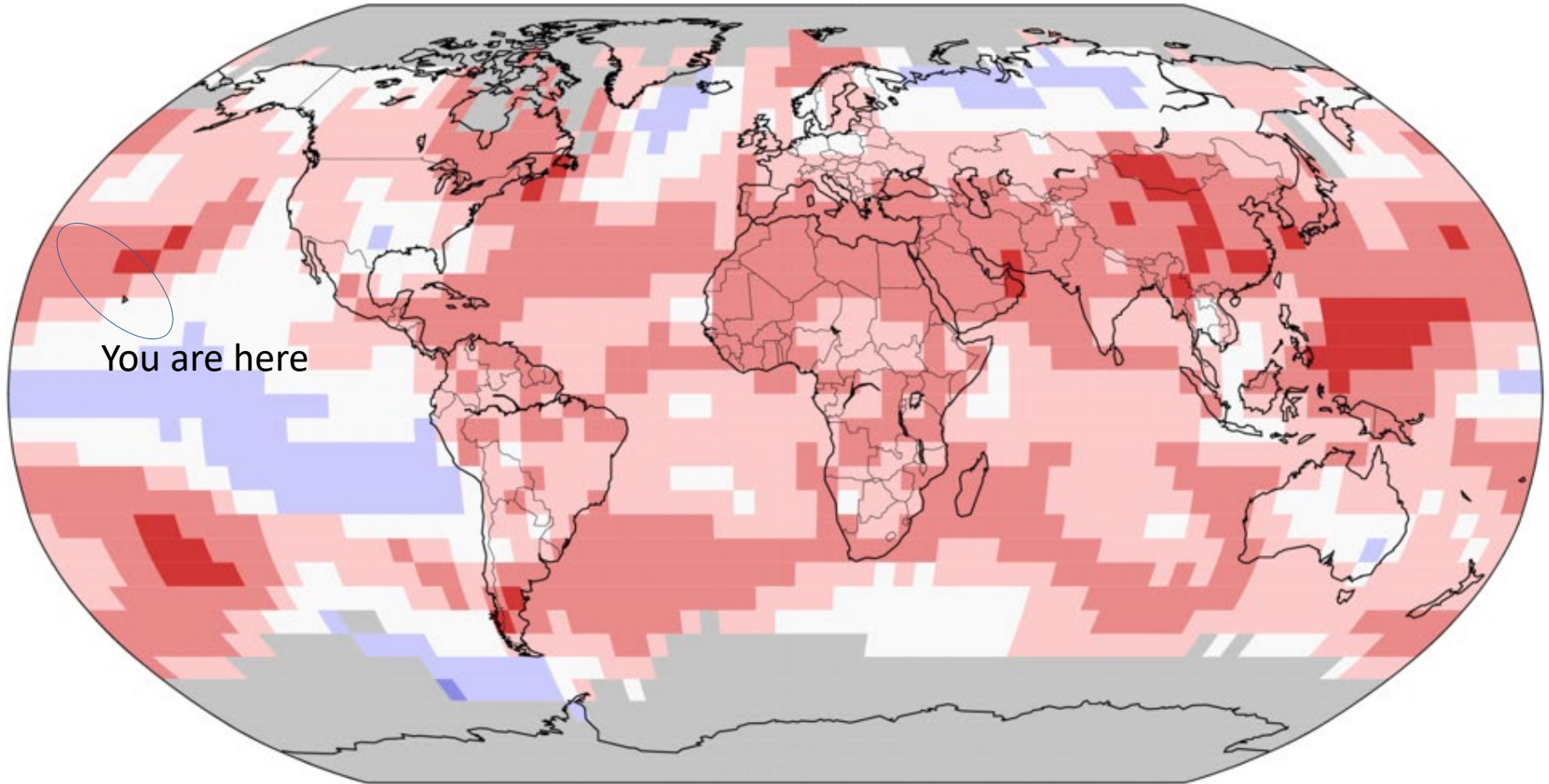
National Centers for Environmental Information
GHCNM v4.0.1.20210507.qfe

Please Note: Gray areas represent missing data
Map Projection: Robinson

Land & Ocean Temperature Percentiles Jan–Apr 2021

NOAA's National Centers for Environmental Information

Data Source: NOAA GlobalTemp v5.0.0–20210509



You are here



Record Coldest



Much Cooler than Average



Cooler than Average



Near Average



Warmer than Average



Much Warmer than Average

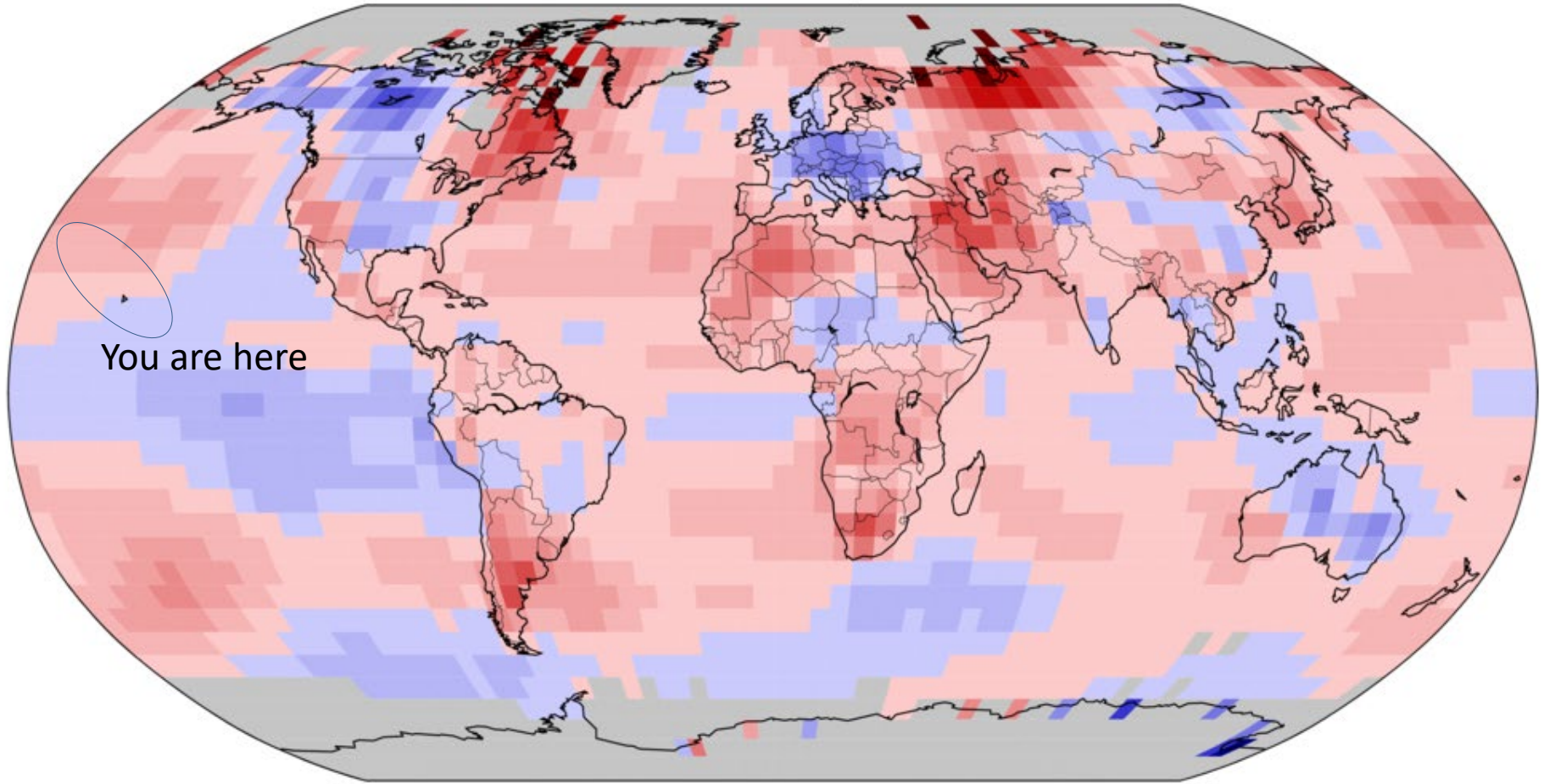


Record Warmest



Land & Ocean Temperature Departure from Average Apr 2021 (with respect to a 1981–2010 base period)

Data Source: NOAA GlobalTemp v5.0.0–20210509



Degrees Celsius



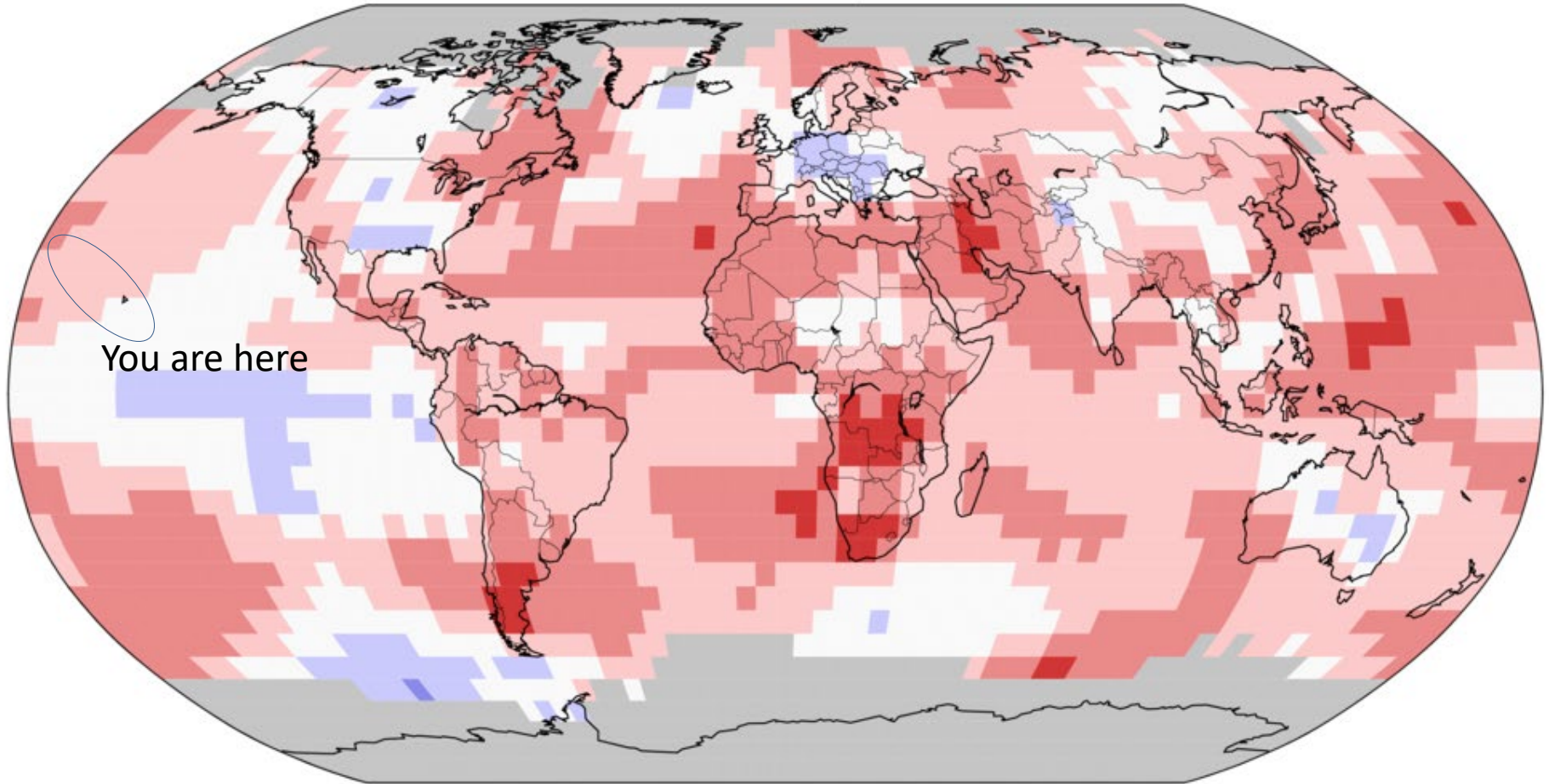
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Land & Ocean Temperature Percentiles Apr 2021

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Data Source: NOAA GlobalTemp v5.0.0-20210509



You are here



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Cooler than Average



Near Average



Warmer than Average



Much Warmer than Average

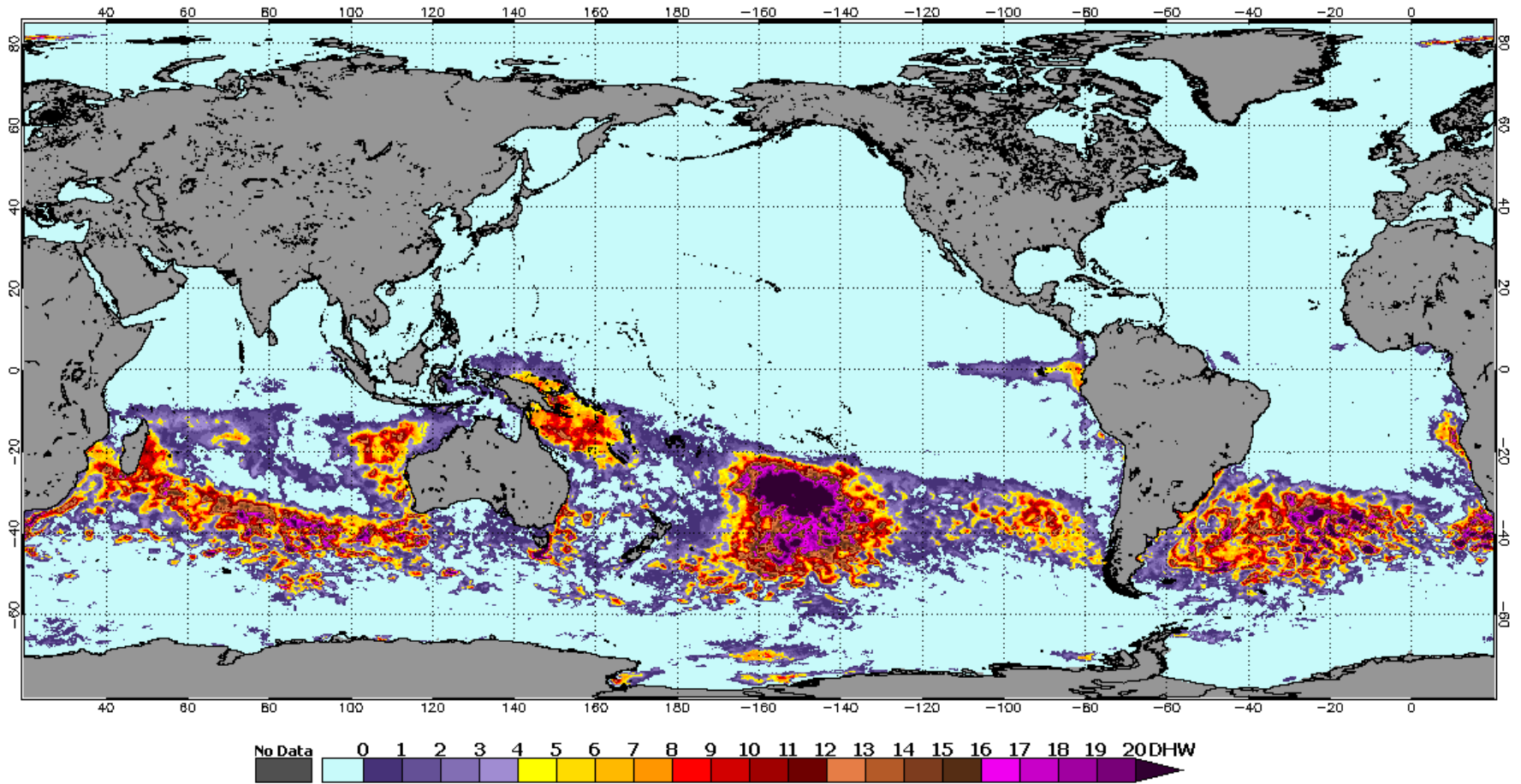


Record Warmest



Degree Heating Weeks – 21 March 2021

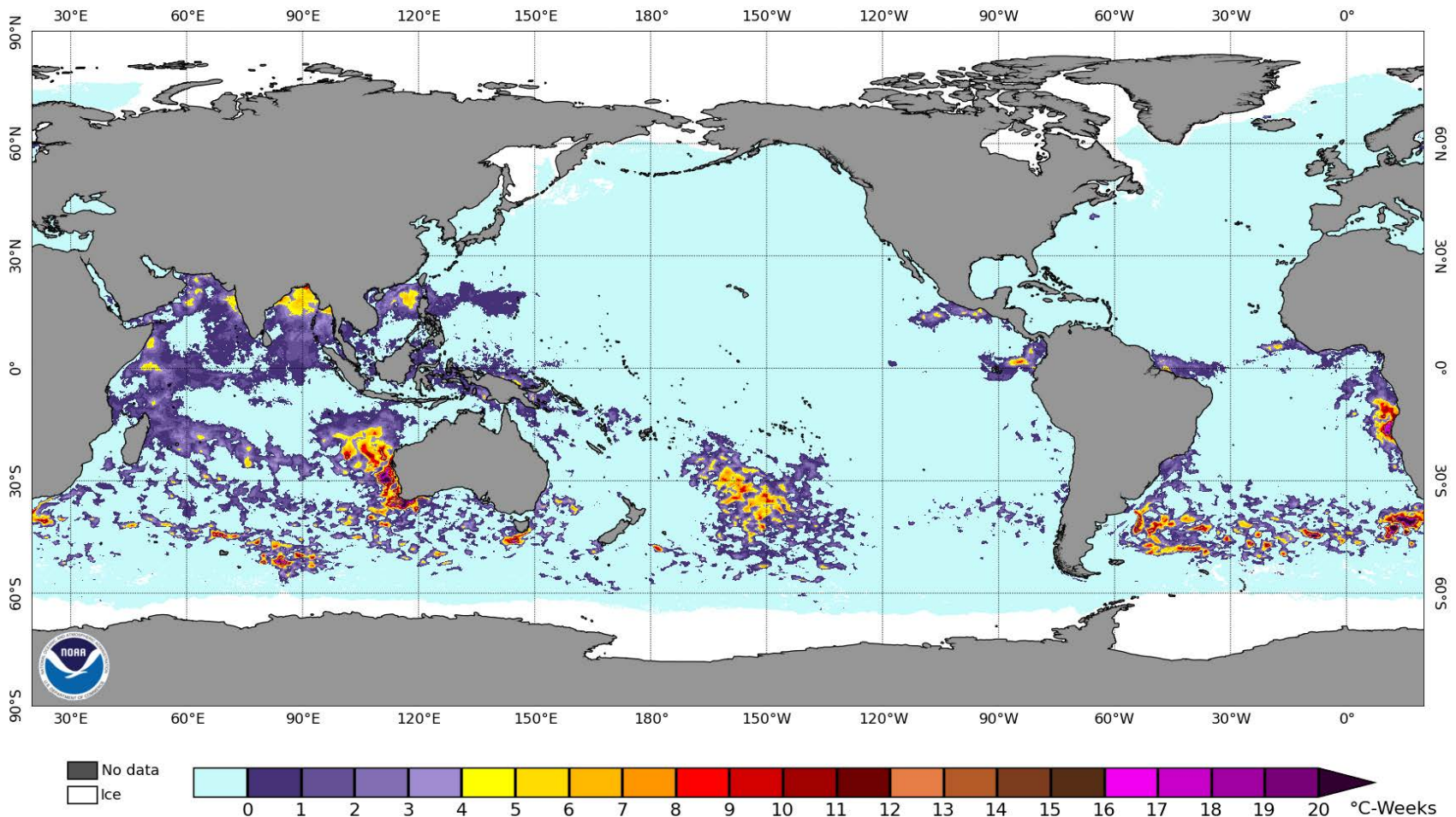
NOAA Coral Reef Watch Daily 5km Degree Heating Weeks (Version 3.1) 21 Mar 2021



By the time we got to spring the Northern Hemisphere was still cool coming out of winter, while south of the equator, the Great Barrier Reef barely dodged a predicted bleaching event

Not much has changed since Degree Heating Weeks – 13 June 2021

NOAA Coral Reef Watch Daily 5km Degree Heating Weeks (v3.1) 13 Jun 2021

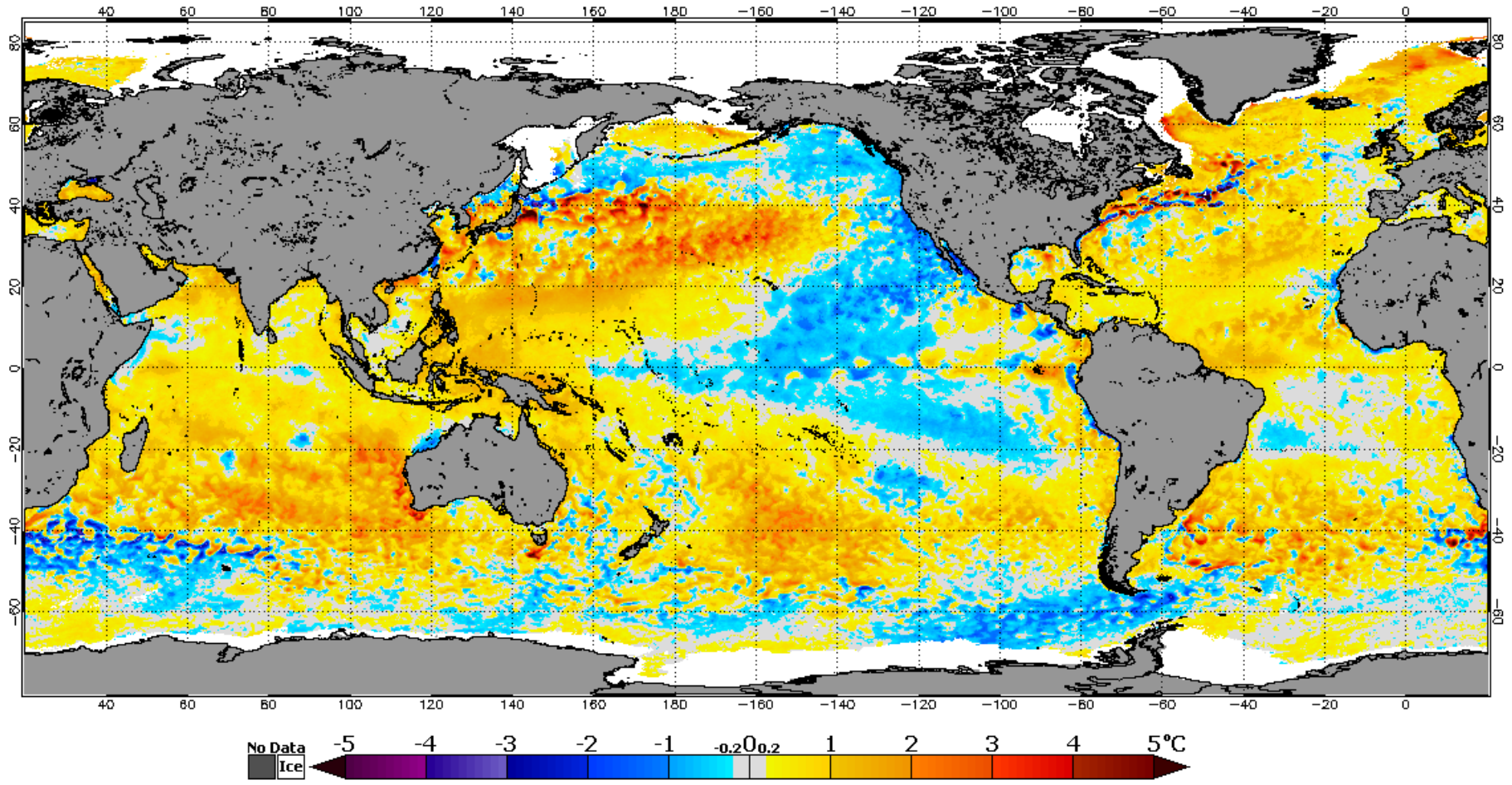


The waters in the Monument have not yet accumulated excess heat at depth this year

At the sea surface, however, some excess heat carried through winter

Global Sea Surface Temperature Anomaly – 21 March 2021

NOAA Coral Reef Watch Daily 5km SST Anomalies (Version 3.1) 21 Mar 2021

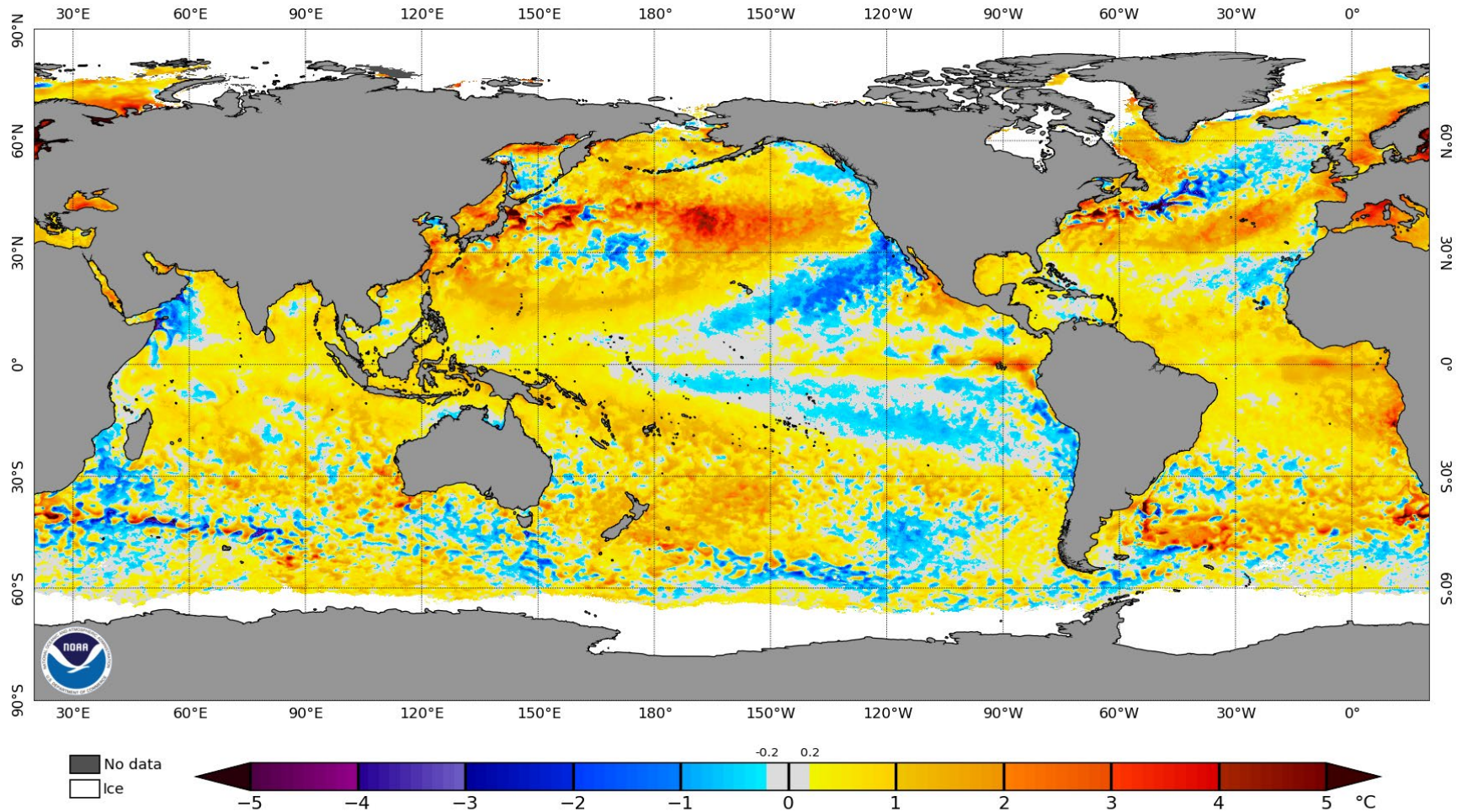


A large pool of anomalously warm surface water was present in the northwest portion of the Monument, and La Niña was waning as we moved into spring

This surface temperature anomaly has persisted

Global Sea Surface Temperature Anomaly – 13 June 2021

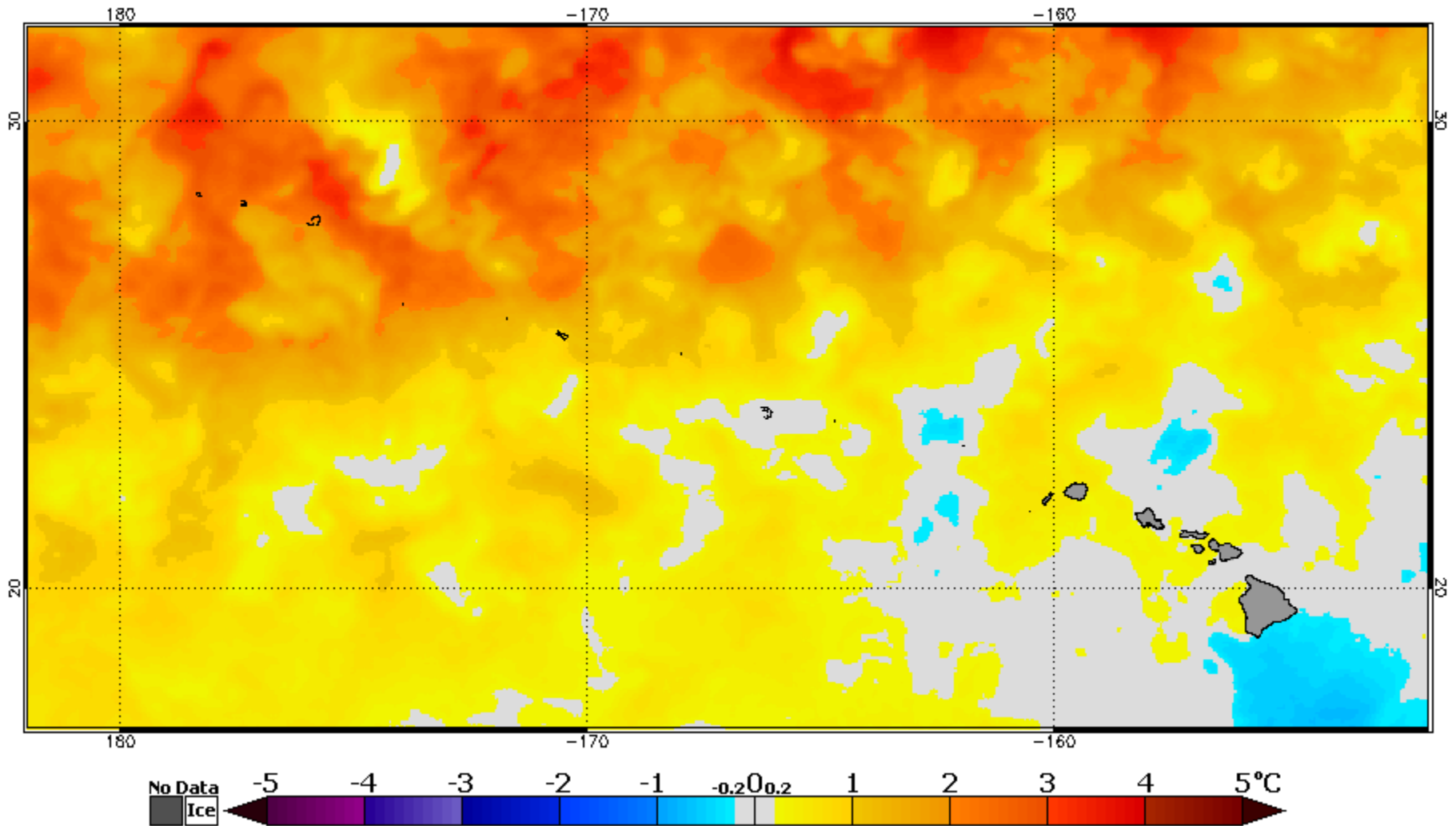
NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 13 Jun 2021



The area of warmer than average surface water northeast of Hawaii has persisted through the winter
This raises some concerns for late summer conditions, particularly near Midway

Sea Surface Temperature Anomaly, Hawaii Sector – 21 March 2021

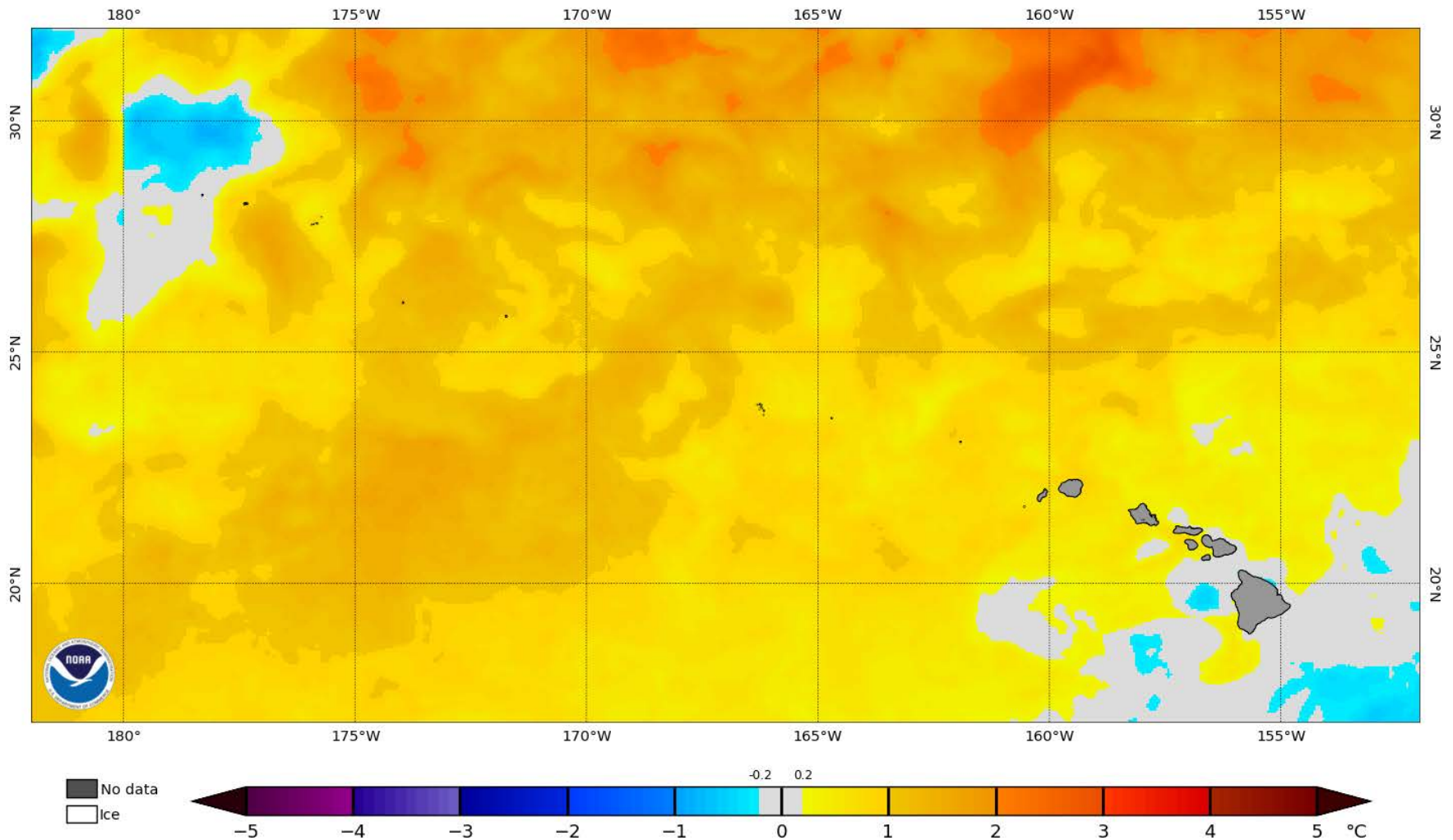
NOAA Coral Reef Watch Daily 5km SST Anomalies (Version 3.1) 21 Mar 2021



In late March, sea surface temperatures near Midway were 3-4 °C above normal

Sea Surface Temperature Anomaly, Hawaii Sector – 13 June 2021

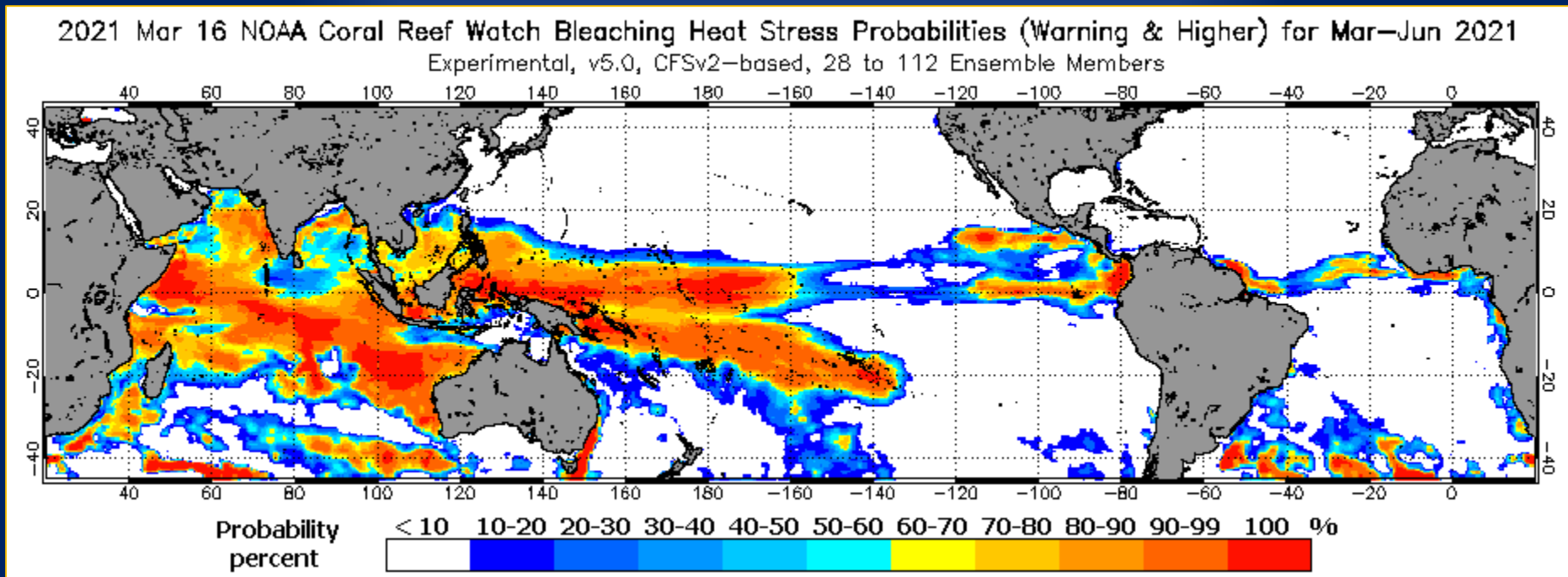
NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 13 Jun 2021



Things have improved somewhat by June, but heat still lurks to the north

Bleaching Stress Probability – March-June 2021

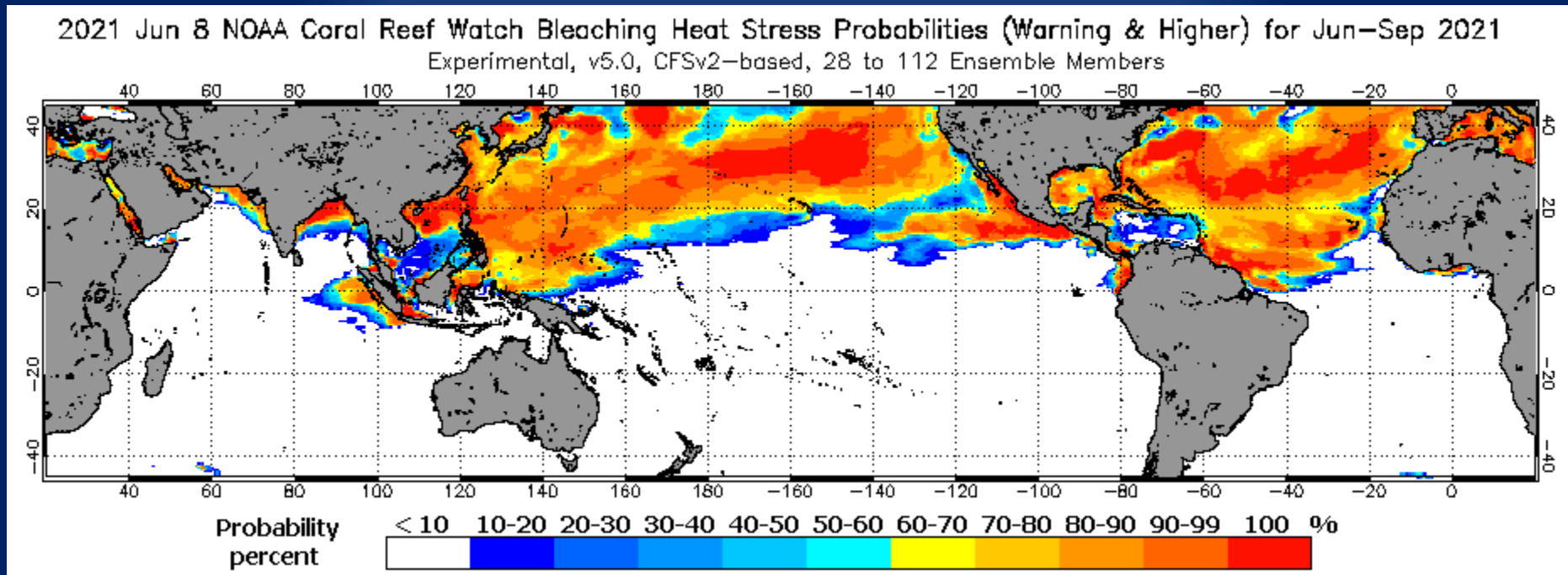
Prediction as of 16 March 2021



Back in March, no significant thermal stress was predicted in the Monument through June of this year

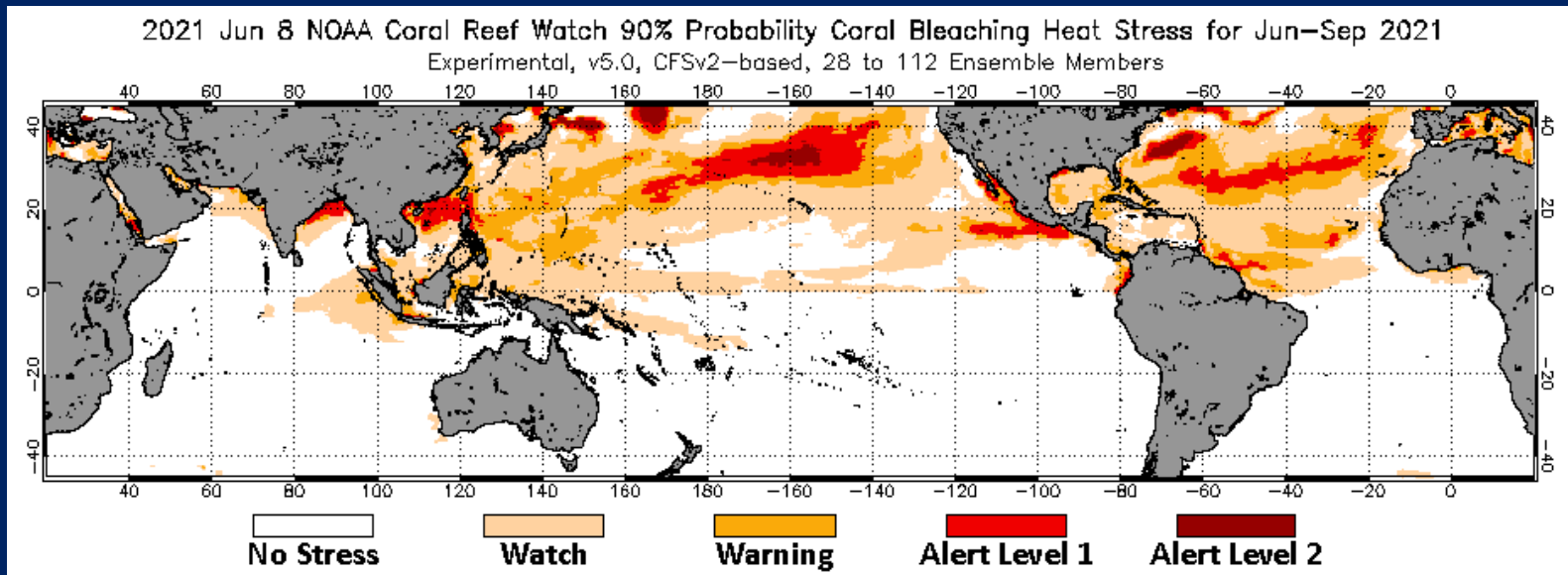
Bleaching Stress Probability – June-September 2021

Prediction as of 8 June 2021

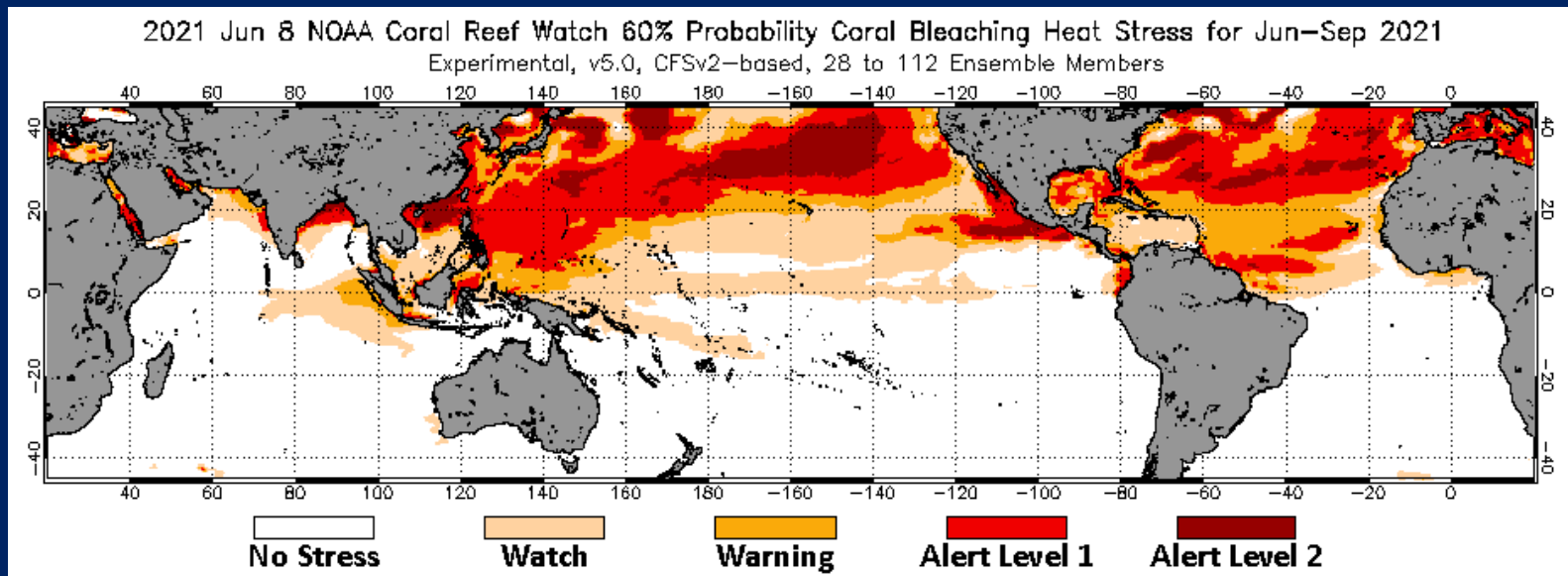


By June, the output from the NOAA experimental tool indicated a strong probability of reaching bleaching warning conditions or higher across the entire Hawaiian archipelago by September of this year

90% Stress Level Probability – June-September 2021



60% Stress Level Probability – June-September 2021



Ninety percent probability of reaching Bleaching Alert Level 1 at Midway by September

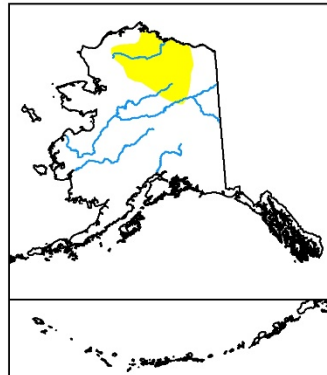
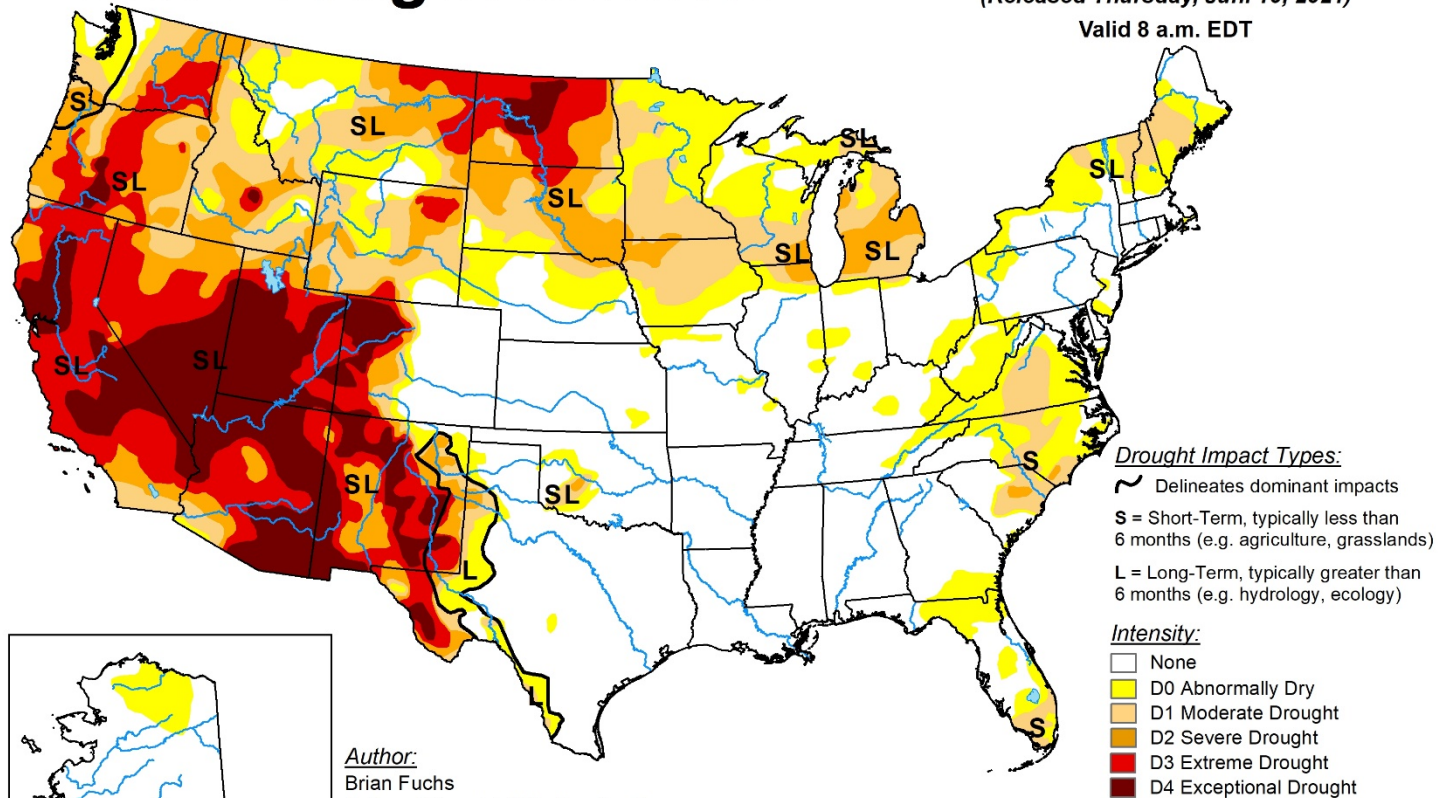
The current La Niña has been correlated with western drought
Even in Hawaii, mild drought conditions are present, despite a wet March

U.S. Drought Monitor

June 8, 2021

(Released Thursday, Jun. 10, 2021)

Valid 8 a.m. EDT



Author:
Brian Fuchs
National Drought Mitigation Center

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

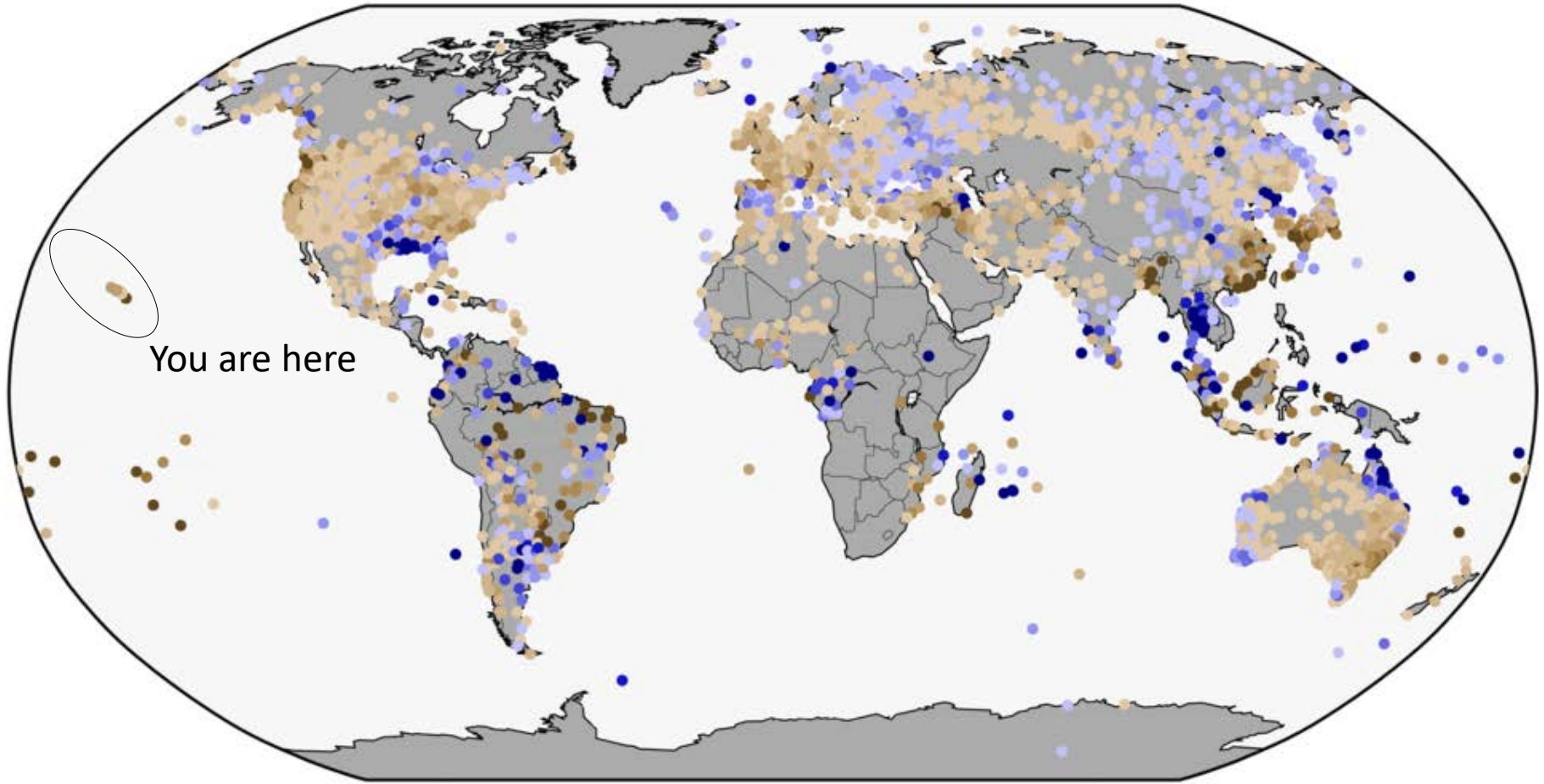


droughtmonitor.unl.edu

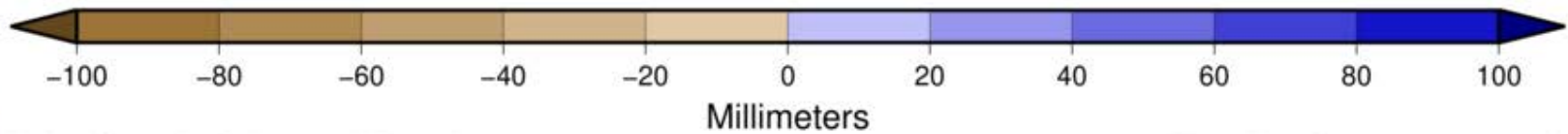
The southwestern US is now in exceptional, record-setting drought status

Land-Only Precipitation Anomalies Apr 2021 (with respect to a 1961–1990 base period)

Data Source: GHCN-M version 4beta



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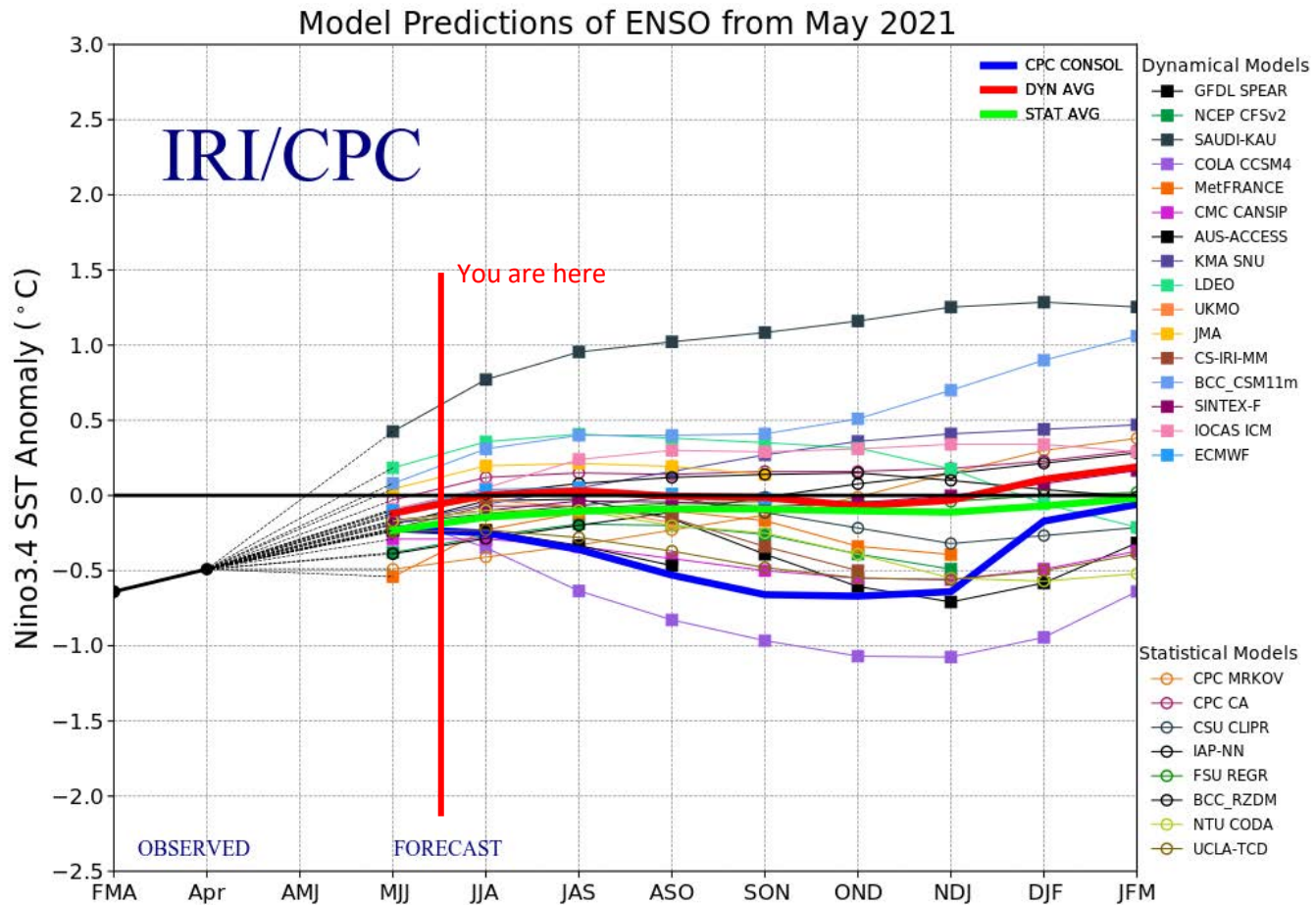


National Centers for Environmental Information

Please Note: Gray areas represent missing data
Map Projection: Robinson

Looking Forward

An ensemble of 27 climate models predicts **La Niña** trending into ENSO-neutral conditions from now through early summer 2021



The range of model predictions has narrowed since March

Conclusions

2021 has begun cooler than record-hot 2020, due to a displaced polar vortex pattern in the late winter and spring

Even so, the Northern Pacific Ocean carried excess heat content through winter in the sector north of the Monument

La Niña conditions are waning, and a transition to ENSO-neutral is underway

ENSO-neutral conditions should continue through the summer, with no El Niño this year

There is an increasing probability of thermal stress to Monument coral reefs by late summer, particularly in the Pearl & Hermes-Midway-Kure sector

We will need to see whether carry-over surface heat from winter is built upon through the summer and fall; at the moment, the models predict it will be

Tropical cyclone formation is generally low during La Niña, and not heavily favored during ENSO-neutral conditions that are now starting to prevail

At the present time, risk from summer cyclones thus appears average at best

Sea level continues to rise at 3-5 mm per year, and this trend is increasing

Inundation is a long-term problem that will not go away, and may increase over time depending on future melting trends in Greenland and Antarctica

Sorry – gone holoholo
So cannot answer questions this time around

