

## Weekly Report

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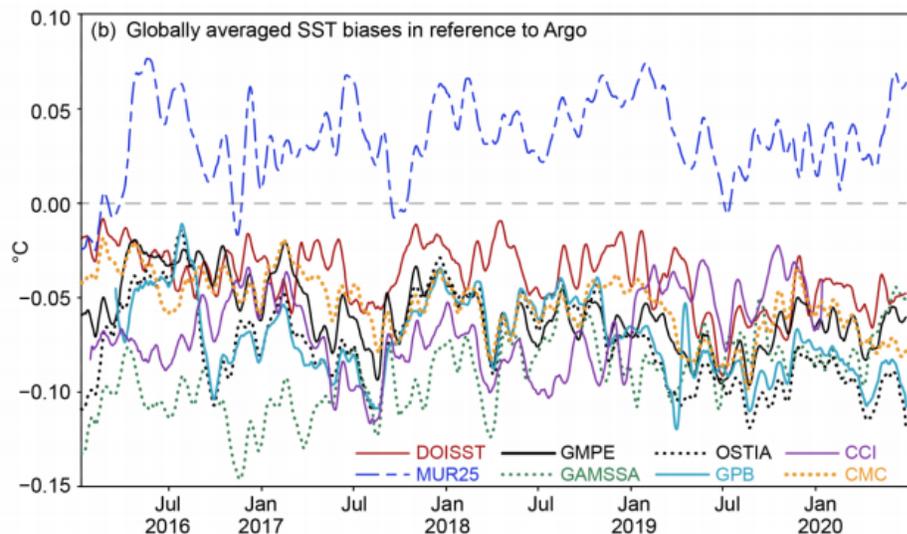
CISESS  
Cooperative Research Program Division (CoRP)  
STAR/NESDIS  
National Oceanic and Atmospheric Administration (NOAA)

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Date of Submission: 6/18/2021

### Publications

**NOAA Daily Optimum Interpolation Sea Surface Temperature:** T. Smith coauthored a new paper in the Journal of Climate published online today, June 17th. This article shows the relative quality of a NESDIS SST analysis of NOAA Daily Optimum Interpolation Sea Surface Temperature (DOISST) version 2.1. The paper shows that the current version of the analysis has skill comparable to other global SST analyses.

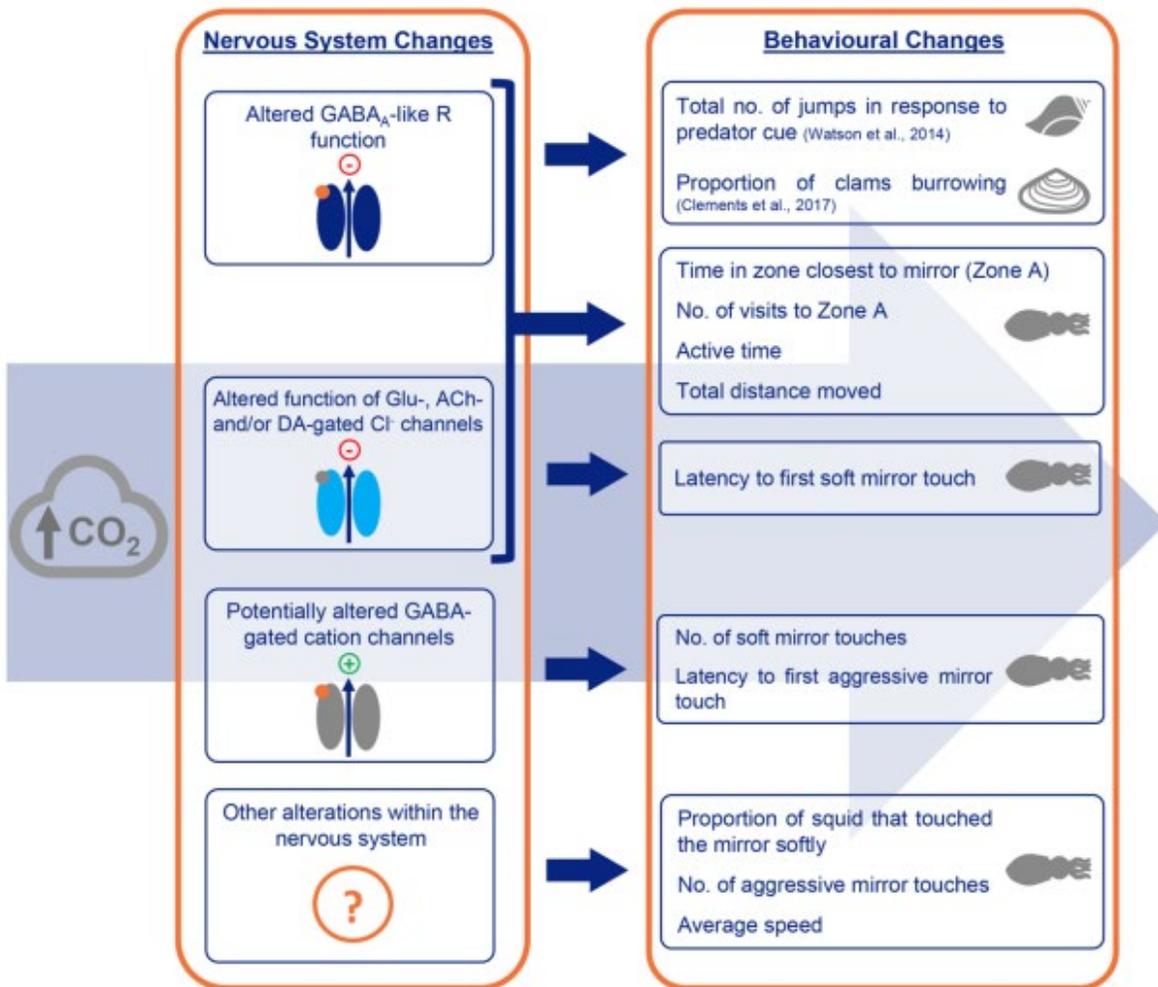


The figure above shows collocated and globally averaged SST biases of DOISST (solid red), MUR25 (dashed 937 blue), GMPE (solid black), GAMSSA (dotted green), OSTIA (dotted black), GPB (solid light 938 green), CCI (solid purple), and CMC (dotted orange) against Argo observations.

B. Huang, C. Liu, E. Freeman, G. Graham, T. Smith, and H.-M. Zhang, 2021: Assessment and Intercomparison of NOAA Daily Optimum Interpolation Sea Surface Temperature (DOISST) version 2.1. *J. Climate*, DOI: <https://doi.org/10.1175/JCLI-D-21-0001.1>.

(POC: T. Smith, [tom.smith@noaa.gov](mailto:tom.smith@noaa.gov), Funding: PDRA)

**Ocean Carbon Effects on Marine Life Behavior:** CISESS Consortium Scientist Blake Spady, who works with NOAA Coral Reef Watch, has a new journal article published online in the *Journal of Experimental Biology* on June 8th. It documents the effects that higher CO<sub>2</sub> levels in the ocean affect the nervous system and, as a result, the behavior of cephalopods, a class of marine creatures that includes squid, octopus, cuttlefish, and nautilus. They tested these effects in the laboratory by exposing one group of pygmy squids to ambient CO<sub>2</sub> and another to more than double that level for seven days. They then tested the effects using different neurotransmitter thought to be affected by enhanced carbon and observing their attractive and aggressive behavior by monitoring their movements, speed and responses to a mirror. The chart below documents some of the behavioral changes they observed along with the neural circuits with which these changes were associated.



They found that elevated CO<sub>2</sub> increased attraction and aggression as well as activity levels in pygmy squid and their results support the hypothesis that these changes are induced by CO<sub>2</sub> through its effects on GABA<sub>A</sub> receptors.

Thomas, Jodi T; **Blake L Spady**, Philip L Munday and Sue-Ann Watson, 2021: The role of ligand-gated chloride channels in behavioural alterations at elevated CO<sub>2</sub> in a cephalopod, *J. Exp. Biol.*, in press, <https://doi.org/10.1242/jeb.242335>.

(POC: Blake Spady, [blake.spady@noaa.gov](mailto:blake.spady@noaa.gov). Funding: NOS)

## **Training and Education**

**CISESS Summer Internships Begin:** The CISESS Summer Internship program has match 20 students with CISESS scientists this summer to work on a variety of difference projects, which include:



- Constructing a training dataset for remote sensing of earth surface cover types (water, coral reefs, seagrass, oil slicks, etc.) using deep learning;
- Developing a Python based microwave radiative transfer model mainly for educational purposes;
- Designing website or an automated validation routine for satellite-based precipitation estimates;
- Analyzing extreme event with JPSS VIIRS data;
- Conducting a National Coral Reef Monitoring Program socioeconomics literature review;
- Analyzing the seasonal and interannual variations in the 2002 MODIS Fraction of Photosynthetically Active Radiation (FPAR) data;
- Testing, critiquing and updating NOAA CoastWatch satellite data training course and tutorial materials;
- Investigating the brightness temperature signature from multiple satellites over an Antarctic station;
- Building a microwave radiometer for cloud and rain observations;
- Identifying spatial and temporal patterns of sea surface temperature and coral bleaching heat stress from satellite data; and
- Helping to design the new Ocean Carbon and Acidification Data System website.

We have four graduate, 12 undergraduate and four high school students participating this year. Most of the internships will be remote but five will include some on-site activities. Six have already started working with a mentor and the rest will begin their 10-week internships on Monday.

(POC: Hugo Berbery, [berbery@umd.edu](mailto:berbery@umd.edu), Funding: Task I & Cost Share)