

ANALYZING CORAL THERMAL STRESS USING NOAA'S CORAL WATCH MONITORING SYSTEM IN GOOGLE EARTH

IMPORTANT INFORMATION –

1. Use the information from the work you did on the handout, NOAA Coral Reef Watch Data Set Methodology
2. For conversions from Celsius to Fahrenheit

$$\frac{C^{\circ} (9)}{5} + 32 = F^{\circ}$$

3. Reminder: An anomaly is something different from the norm or from the usual.

DATA COLLECTION

Latitude and longitude for Christmas Island: _____

Date of collection? _____

Is the planet currently experiencing and El Niño or La Niña weather event? _____

1. Click on “Sea Surface Temperature”, by clicking in the box and record the following information.
 - Using the key, what is the temperature of the waters surrounding Christmas Island? _____
 - Convert this temperature to degrees Fahrenheit. _____
2. Click off “Sea Surface Temperature”, by clicking in the box and click on “Sea Surface Temperature Anomaly”, by clicking in the box.
 - Using the key, what is the SST anomaly surrounding Christmas Island? _____
 - Convert this temperature to degrees Fahrenheit. _____
 - In words describe what this SST anomaly means. _____
3. Click off “Sea Surface Temperature”, by clicking in the box, and turn on “Degree Heating Weeks”, clicking in the box.
 - Record the number of Degree Heating Weeks, DHW. _____
 - At this time are the corals surrounding Christmas Island experiencing thermal stress based on this data? _____ Explain your response _____

THE YEARS OF LIVING DANGEROUSLY - EDUCATIONAL COMPANION

4. Click off “Degree Heating Weeks”, by clicking in the box, and turn on “HotSpot”, by clicking in the box.

- Record the degrees Celsius for Christmas Island. _____
- Convert this temperature to degrees Fahrenheit. _____
- What does this reading tell us about corals at this point in time?

5. Click off “HotSpot”, by clicking in the box, and click on “Bleaching Alert Area”, by clicking in the box.

- What is the current thermal stress for the corals surround Christmas Island? _____
- Is this what you expected to see based on your understanding so far? _____

Explain _____

6. Click off “Bleaching Alert Area”, by clicking on the box, and click on “Bleaching Outlook”, by clicking in the box.

- What is the current outlook period? (looking for a 3-month time frame) _____
- What is the current “potential stress level” for this 3 month period? _____
- Based on the time of year, do you predict an increase or decrease in the alert levels?

Explain _____

THE YEARS OF LIVING DANGEROUSLY - EDUCATIONAL COMPANION

ANALYSIS

7. Turn off “Bleaching Outlook”, by clicking in the box. Near Christmas Island on the Google Earth map is a NOAA symbol in yellow and blue. Click on it.
 - Here you will have a breakdown of the data you just collected. Fill in the chart with the data you now see on the screen.



Christmas Island, Australia	
Thermal Stress Level:	
Date:	
DHW (C-weeks)	
HotSpot (C)	
SST (C)	
SST Anomaly (C)	
Max Month SST Climatology	

- Taking this complement of data under consideration what is the current health of the corals surrounding Christmas Island? _____

- What evidence leads you to believe coral health will remain the same, decline, or improve over the coming months? _____



THE YEARS OF LIVING DANGEROUSLY - EDUCATIONAL COMPANION

- Click on the blue hyperlink, Time Series Graph and Data. There are several Australian locations on this page, be sure you are always looking at the data for Christmas Island. The data on these graphs only go back to 2000. The strongest El Nino event in the time span available was during 2002-2003 and was categorized as a "moderate" event. The strongest La Nina was in 2010-2011 and was categorized as "strong".

Take a moment to digest the graph. Look carefully at labels and the key to help you make sense of the data. In the space provided below summarize the comparison of data between years 2002-2003, 2010-2011, and the most current calendar year.



- What's the point? Why is coral health important? Is it a variable that helps us better understand global warming and the impacts of climate change? _____

- Connect this problem, climate change, to you, specifically coral health. Remember, we are all connected in this web of life; where are you connected? _____
