Trethewy (44883005) – COMP777 Major Assessment

Supplementary Material

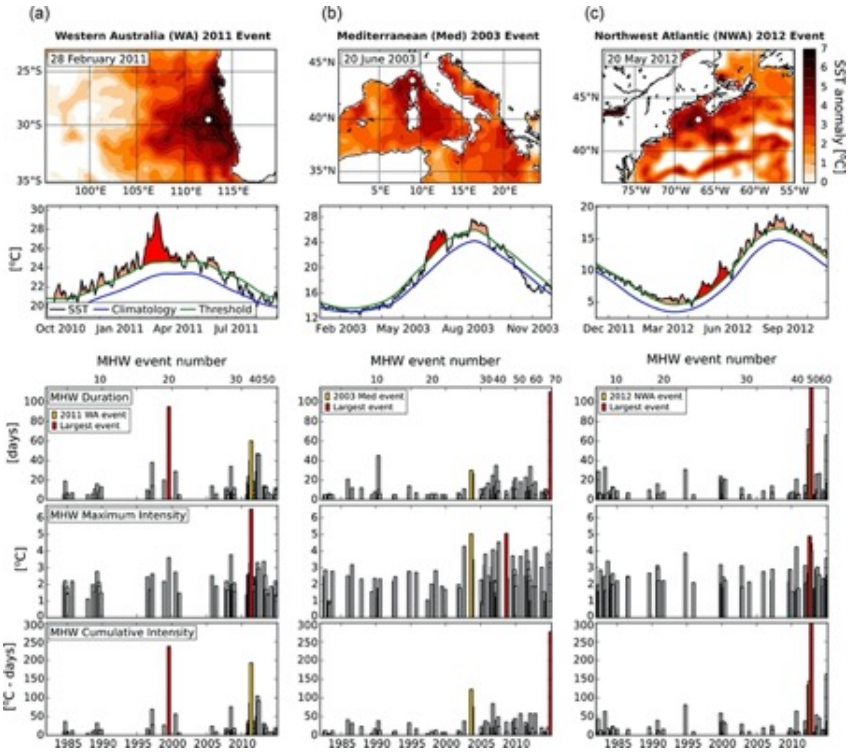

Figure 1. The three marine heatwave events identified by Hobday et al. (2016)
This figure has been extracted from Hobday et al. (2016) (Figure 3), and highlightes the temperature trends, the duration, maximum intensity and cumulative intensity of marine heatwaves observed in a) Western Australia 2011, b) the Mediterranean Sea 2003 and c) Northwest Atlantic Ocean 2012

a) Western Australia 2011 b) Mediterranean Sea 2003 c) Northwest Atlantic 2012

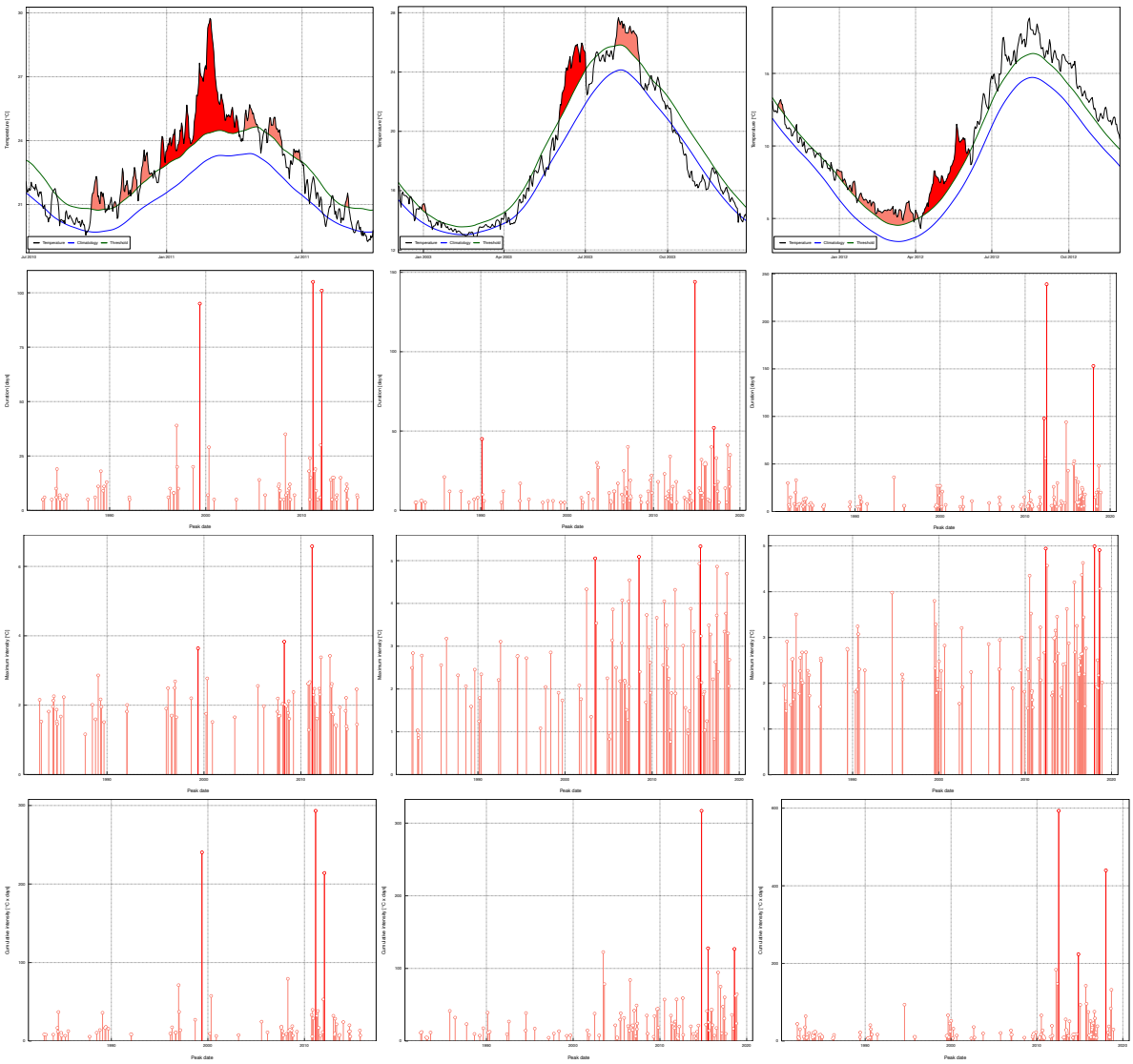

Figure 2. Replication of the Original Data

Each of the above graphs were created when running the RStudio script of Hobday et al. (2016) data. Each of the graphs yielded the similar results to the original graphs (Figure 1), with some extra marine heatwave events also being included. Each line of graphs represents a different aspect of the data; the first line indicates the time period of the specific marine heatwave event and as well as the ocean temperature, the climatology and threshold, the second highlights the duration of each of the observed marine heatwave events, the third displays the maximum intensity of each event and the last line shows the cumulative intensity of marine heatwaves in each location.

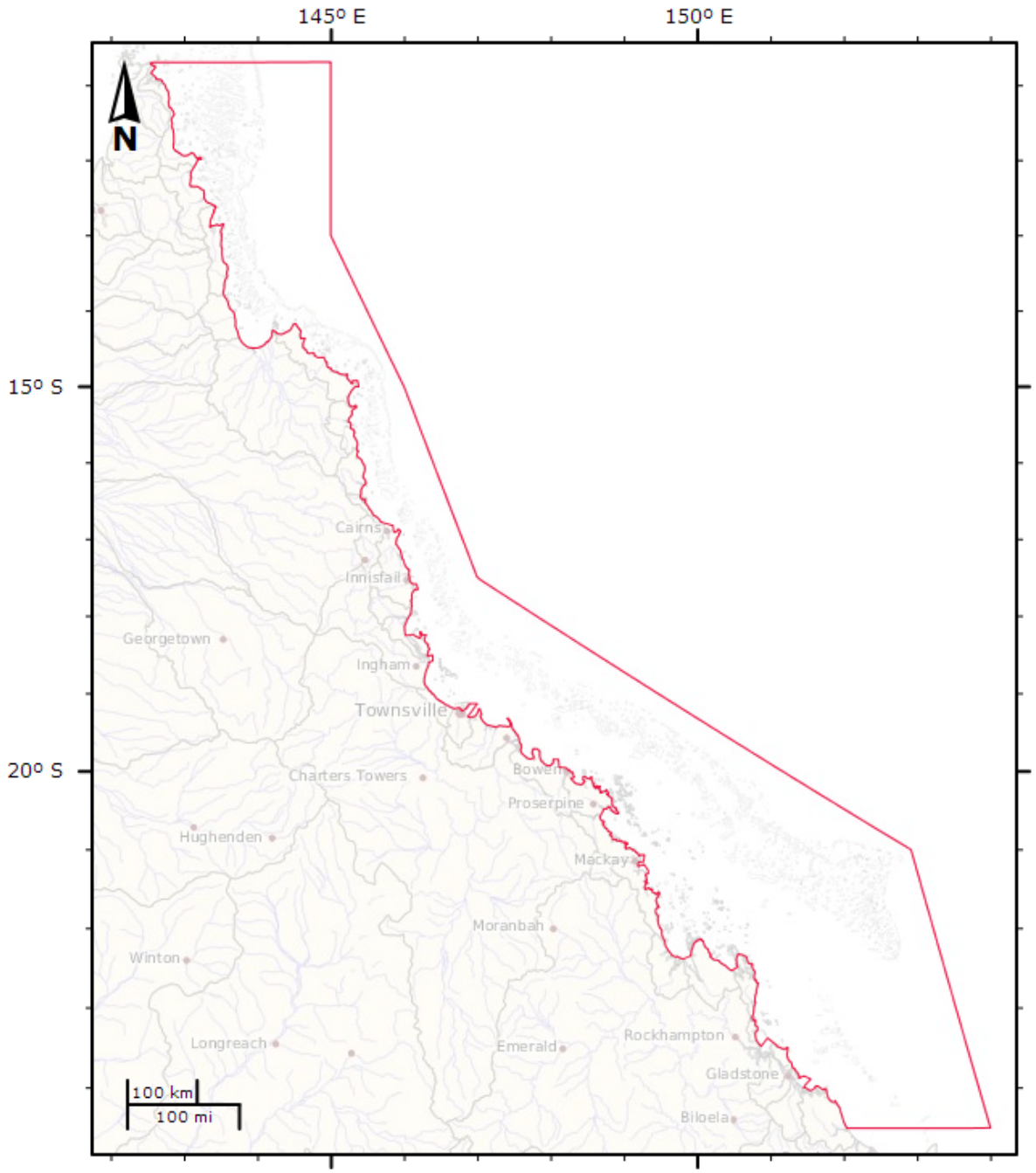

Figure 3. Map of the Great Barrier Reef, Australia
This figure indicated the geographical distribution of the Great Barrier Reef, used for the creation of the new dataset
Source: https://eatlas.org.au/data/uuid/1762af85-49a6-481c-a77d-105026b75b02

Great Barrier Reef 2016-2017

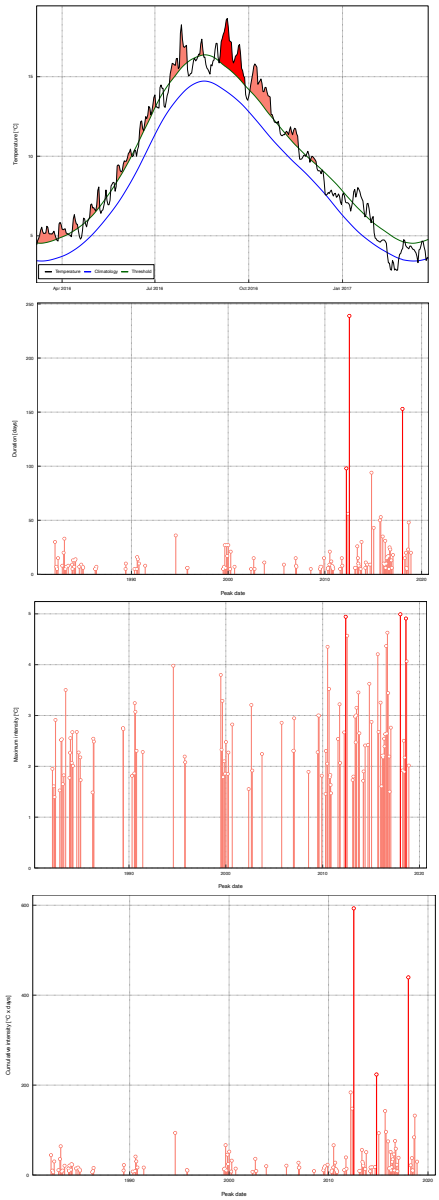

Figure 4. New Dataset, Great Barrier Reef, Australia
These graphs were produced when the new dataset was run through the original code. Each of the graphs refer to the marine heatwave event of 2016-2017 that occurred on the Great Barrier Reef. The top graph displays the ocean temperature, climatology and threshold of the 2016-17 event, the second highlights the duration of other marine heatwaves that occurred in this area, the third indicated the intensity maximum of each event and the final graph highlights the cumulative intensity of the events.

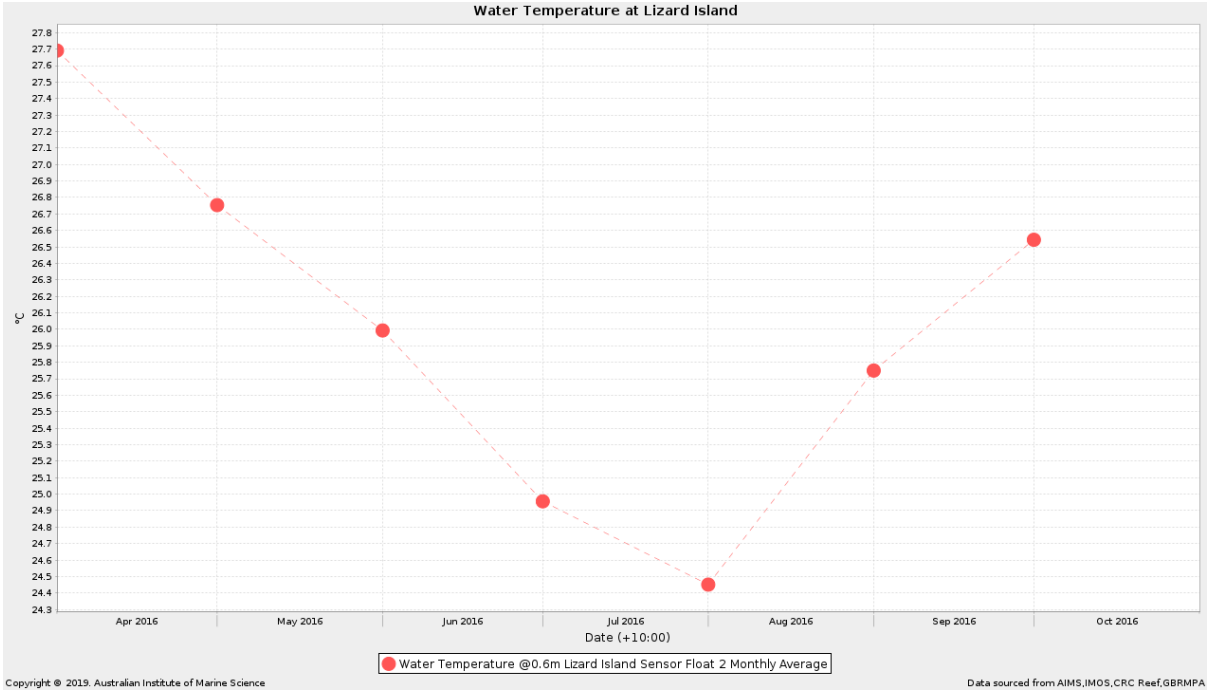

Figure 5. Ocean Temperature Data, Great Barrier Reef

This graph displays the ocean temperature data from the 2016-2017 marine heatwave event on the Great Barrier Reef, from April to October 2016 (the middle of the event), collected form Lizard Island (halfway along the reef). There is a peak at the start of the year in ocean temperature (2016 event), dropping in winter and then beginning to rise in spring for the next heatwave (2017).

Source: http://data.aims.gov.au/aimsrtds/datatool.xhtml?from=2016-04-01&thru=2017-03-31&period=MONTH&aggregations=AVG&channels=1881,3541

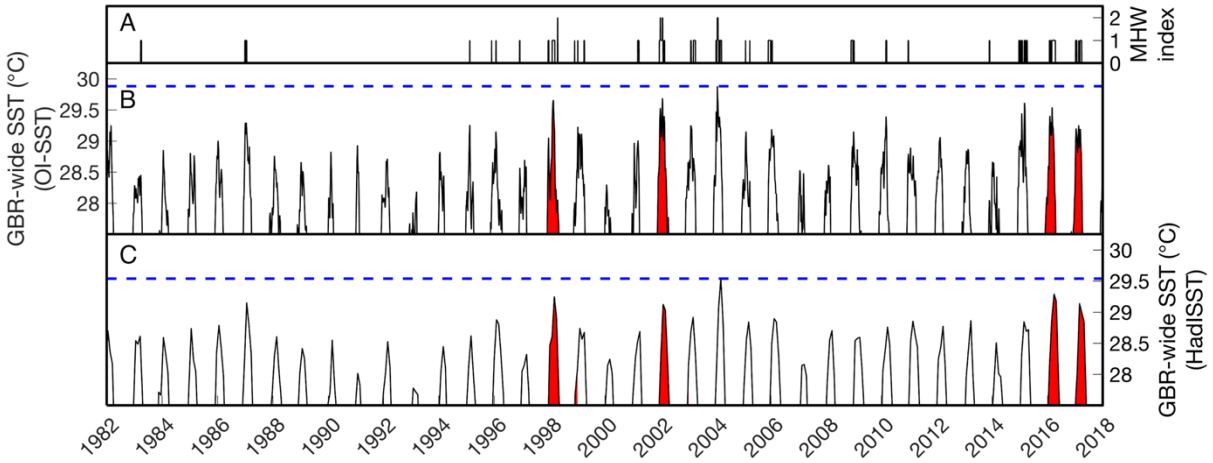

Figure 6. Marine Heatwave Events on the Great Barrier Reef, 1982 to 2018
This figure has been sourced from DeCarlo and Harrison (2019) (Figure 1), in which they used Hobday et al. (2016) Python code to observe the number of marine heatwave events that have occurred on the Great Barrier Reef. This highlights the number and temperature of events, and the events in red are ones that caused significant coral bleaching.