

Dataset: Environmental data collected from biomimetic and other data loggers located in rocky intertidal zones of global oceans between July 1999 and October 2013

Project(s): Environmental signal analysis: Monitoring the impacts of climate change on rocky intertidal ecosystem across a cascade of scales (Monitoring Rocky Intertidal Ecosystems)

Abstract: At a proximal level, the physiological impacts of global climate change on ectothermic organisms are manifest as changes in body temperatures. Especially for plants and animals exposed to direct solar radiation, body temperatures can be substantially different from air temperatures. We deployed biomimetic sensors that mimic the thermal characteristics of intertidal mussels at 66 sites worldwide, from 1998-present. Loggers recorded temperatures at 10-15 minute intervals nearly continuously at multiple intertidal elevations. Comparisons against direct measurements of mussel tissue temperature suggest errors of $\sim 2.0\text{-}2.5^\circ\text{C}$, during daily fluctuations that often exceed $15^\circ\text{-}20^\circ\text{C}$. Geographic patterns in thermal stress based on biomimetic logger measurements were generally far more complex than anticipated based only on "habitat" level measurements, and show that animals are reaching temperatures far above air temperature on sunny days. This unique data set provides a means of assessing spatial and temporal variability in intertidal thermal stress, and links physiological measurements to field patterns. Awaiting finalized data from the PI. Just reserved the DOI for his publication. For a complete list of measurements, refer to the supplemental document 'Field_names.pdf', and a full dataset description is included in the supplemental file 'Dataset_description.pdf'. The most current version of this dataset is available at: <http://www.bco-dmo.org/dataset/555780>

Description: Environmental data (water temp, air temp, etc.) from biomimic devices and other loggers located in the rocky intertidal zone.

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Acquisition Biomimetic loggers (instruments that closely mimic the thermal characteristics of animals) that can be deployed in the field, have been deployed at multiple sites along the west coast of North America. Data from these devices is recorded at regular time intervals.

Processing BCO-DMO processing notes:

Description: - Re-sorted data provided in original Excel file containing site metadata.

- Replaced "N/A" and missing values with "nd" to indicate "no data".

- Replaced spaces with underscores.

- Modified parameter names to conform with BCO-DMO naming conventions.