

Fall 10-22-2021

Supporting dataset for observed and forecasted global warming pressure on coastal hypoxia

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Recommended Citation

Whitney, Michael M., "Supporting dataset for observed and forecasted global warming pressure on coastal hypoxia" (2021). *Department of Marine Sciences*. 13.
https://opencommons.uconn.edu/marine_sci/13

Supporting dataset for observed and forecasted global warming pressure on coastal hypoxia

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This archive contains the supporting dataset for the *Biogeosciences* manuscript “Observed and forecasted global warming pressure on coastal hypoxia” by Michael M. Whitney. The main objective of the manuscript is studying global patterns exacerbating coastal hypoxia by analyzing linear trends in SST, surface oxygen capacity, and (vertical-minimum) oxygen concentration. Observations from a satellite-derived SST global climate data are analyzed to provide context for coastal SST and oxygen-capacity trends over the last four decades. New analysis of 21st century forecasts from the Community Earth System Model (CESM) Large Ensemble Project is completed for coastal areas. Observed and forecasted coastal SST and oxygen capacities are compared for the first 16 years of the forecast period that already have occurred. The study investigates forecasts for documented coastal hypoxic locations and also considers the entire global coast to include unknown and potentially emerging hypoxic areas. Global open-ocean rates also are included for context.

The Zip file (Whitney_global_coastal_hypoxia_dataset.zip) contains a MATLAB data file Whitney_global_coastal_hypoxia_dataset.mat. Variable units and dataset information are included in the README variable. Variables correspond to graphed data of each figure in the manuscript. A full description of research methods and results is included in the manuscript.

Observational variables:

Global:

- OBS_global_lat
- OBS_global_lon
- OBS_global_sst_rate
- OBS_global_sst_pval
- OBS_global_oxysat_rate
- OBS_global_oxysat_pval

Coastal:

- OBS_coastal_lat
- OBS_coastal_lon
- OBS_coastal_sst_rate
- OBS_coastal_sst_pval
- OBS_coastal_oxysat_rate
- OBS_coastal_oxysat_pval
- OBS_distribution_sst_bin_centers
- OBS_distribution_coastal_sst_percent

OBS_distribution_oxysat_bin_centers
OBS_distribution_coastal_oxysat_percent

Documented Hypoxic Areas:

OBS_hypoxic_lat
OBS_hypoxic_lon
OBS_hypoxic_sst_rate
OBS_hypoxic_sst_pval
OBS_hypoxic_oxysat_rate
OBS_hypoxic_oxysat_pval
OBS_distribution_sst_bin_centers
OBS_distribution_hypoxic_sst_percent
OBS_distribution_oxysat_bin_centers
OBS_distribution_hypoxic_oxysat_percent

CESM forecast variables:

Global:

CESM_global_lat
CESM_global_lon
CESM_global_sst_rate
CESM_global_sst_pval
CESM_global_oxysat_rate
CESM_global_oxysat_pval
CESM_global_oxy_rate
CESM_global_oxy_pval

Coastal:

CESM_coastal_lat
CESM_coastal_lon
CESM_coastal_sst_rate
CESM_coastal_sst_pval
CESM_coastal_oxysat_rate
CESM_coastal_oxysat_pval
CESM_coastal_oxy_rate
CESM_coastal_oxy_pval
CESM_distribution_sst_bin_centers
CESM_distribution_coastal_sst_percent
CESM_distribution_oxysat_bin_centers
CESM_distribution_coastal_oxysat_percent
CESM_distribution_oxy_bin_centers
CESM_distribution_coastal_oxy_percent

Documented Hypoxic Areas:

CESM_hypoxic_lat
CESM_hypoxic_lon
CESM_hypoxic_sst_rate

CESM_hypoxic_sst_pval
CESM_hypoxic_oxysat_rate
CESM_hypoxic_oxysat_pval
CESM_hypoxic_oxy_rate
CESM_hypoxic_oxy_pval
CESM_distribution_sst_bin_centers
CESM_distribution_hypoxic_sst_percent
CESM_distribution_oxysat_bin_centers
CESM_distribution_hypoxic_oxysat_percent
CESM_distribution_oxy_bin_centers
CESM_distribution_hypoxic_oxy_percent

Comparison between observational and CESM forecast points:

Coastal:

COMPARE_OBS_coastal_sst
COMPARE_CESM_coastal_sst
COMPARE_coastal_sst_regression
COMPARE_OBS_coastal_oxysat
COMPARE_CESM_coastal_oxysat
COMPARE_coastal_oxysat_regression

Documented hypoxic areas:

COMPARE_OBS_hypoxic_sst
COMPARE_CESM_hypoxic_sst
COMPARE_OBS_hypoxic_oxysat
COMPARE_CESM_hypoxic_oxysat