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Supporting Dataset for Observed and Projected Global Warming Pressure on Coastal Hypoxia

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This archive contains the supporting dataset for the *Biogeosciences* article "Observed and projected global warming pressure on coastal hypoxia" by Michael M. Whitney. The main objective of the article is studying global patterns exacerbating coastal hypoxia by analyzing linear trends in SST, surface oxygen capacity (saturation concentration), and (vertical-minimum) oxygen concentration. Observations from a satellite-derived SST global climate dataset are analyzed to provide a context of coastal SST and oxygen-capacity trends observed over the last four decades. New analysis of 21st century projections from the Community Earth System Model (CESM) Large Ensemble Project is completed for coastal areas. Observed and projected coastal SST and oxygen capacities are compared for the first 16 years of the projection period that already have occurred. The study investigates projections 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 abbreviations, units, and dataset information are included in the README variable. Variables correspond to graphed data of each figure in the article. A full description of research methods and results is included in the article.

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 projection 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 projection 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