

Forecast Ecosystem Conditions in Gulf of Mexico OCS Habitats Using Coupled Modeling and Climate Scenarios

**Quarterly Report (Y3Q4 – Jul 1-Sep 30, 2019)
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This quarterly report is filed per requirements of BOEM-NRL IAA # M16PG00027 with respect to our research project focused on climate-scale ocean model simulations for the Gulf of Mexico. The focus of this study is to forecast, through year 2050, marine ecosystem conditions in the Gulf of Mexico (GoM) using RCP climate scenarios prescribed by the NCAR CESM Large Ensemble (LE) atmospheric forcing.

1. WORK ACCOMPLISHED

NCAR was visited during July of 2019. Unfortunately, due to NRL policies, the visit, originally intended to be 10-14 days, was limited to 3 days, which only allowed for isolating priorities and identifying data requirements. It was not sufficient to conduct sensitivity simulations or exchange data, but a priority action plan was outlined to have all the atmospheric data inputs processed and sent to NRL by October 2019; that is,

- ERA5: 1980 to present day at hourly frequency
- LE: present-day (minimum 10-year overlap with control simulation) to at least 2050
- ME: present-day (minimum 10-year overlap with control simulation) to at least 2050

The NRL NAVGEM atmospheric forcing products, used for the initial model control simulation, were delivered to NCAR for analysis and evaluation against ERA5.

A long-term animation was generated from Experiment 2.0 (forced with NAVGEM) and posted on the project's website main page.

2. PROBLEMS

No HPC time left this year to run simulations. New allocations are in place as of October 1, 2019.

3. PLANNED ACTIONS FOR NEXT QUARTER

Receive and process NCAR data products, and configure and start running the ERA5 'control' 1980 to present-day simulation.

4. BUDGET

\$280K has been received (Y1:\$80K, Y2:\$80K, Y3:\$120K).

Expenditures to date: ~\$130K to date.

Y4 funds expected next quarter.