

AQRP Monthly Technical Report

PROJECT TITLE	Improving WRF representation of coastal, marine, and residual boundary layers and quantifying the effects on ozone prediction	PROJECT #	24-021
PROJECT PARTICIPANTS	Yuxuan Wang, James Flynn	DATE SUBMITTED	01/10/2025
REPORTING PERIOD	From: 12/01/2024 To: 12/31/2024	REPORT #	4

A Financial Status Report (FSR) and Invoice will be submitted separately from each of the Project Participants reflecting charges for this Reporting Period. I understand that the FSR and Invoice are due to the AQRP by the 15th of the month following the reporting period shown above.

Detailed Accomplishments by Task for reporting period

Task 3: Finished. Task 3 Technical Report was submitted on 01/10/25.

Preliminary Analysis

Figure 1 shows the spatial variation of observed and model PBLH over the Gulf of Mexico for September 2022 and May-October 2023. The spatial map shows that the observed PBLH values are lower in the morning and higher in the afternoon over the Gulf of Mexico, indicating a diurnal pattern of PBLH. The model captures this variation well for 2022, with a slight underestimation (-0.14 km) for 2023. The model prediction of PBLH is influenced by the time of the day. In the morning, as observed from **Figure 1b (iv)**, e.g., in 2023, the model slightly overestimated the PBLH, while in the afternoon, the model underestimated PBLH.

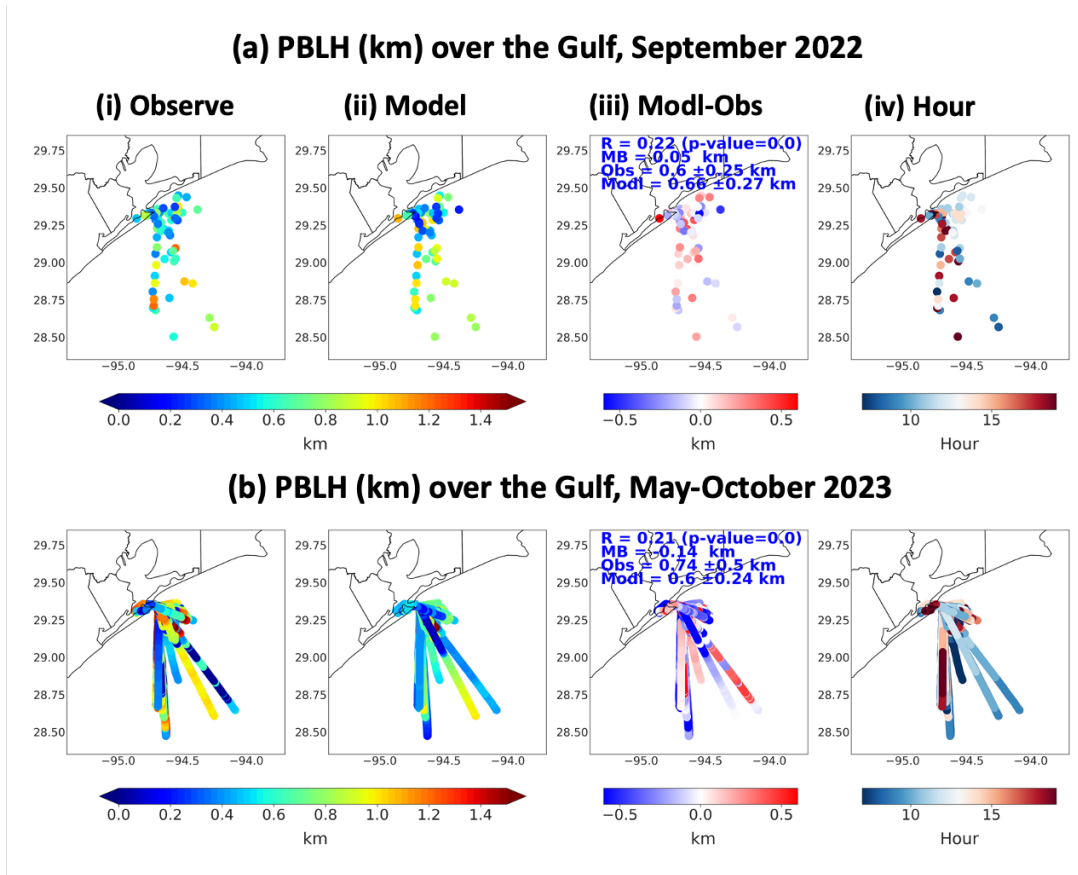


Figure 1. (a) Map of the observed, modeled, and modeled-observed PBLH (km) over Gulf of Mexico for September 2022, along with the time/hour when the boat was mobile. (b) Same as (a), but for 2023 from May-October. The plot shows daytime (7:00 CDT – 19:00 CDT) mobile data only.

Data Collected

None

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

None

Goals and Anticipated Issues for the Succeeding Reporting Period

Goals: Compile a list of physical parameters in WRF for used by the PPEs in Task 4.

Anticipated Issues: None.

Detailed Analysis of the Progress of the Task Order to Date

None

Do you have any publications related to this project currently under development? If so, please provide a working title, and the journals you plan to submit to.

Yes No

Do you have any publications related to this project currently under review by a journal? If so, what is the working title and the journal name? Have you sent a copy of the article to your AQRP Project Manager and your TCEQ Liaison?

Yes No

Do you have any bibliographic publications (ie: publications that cite the project) related to this project that have been published? If so, please list the reference information. List all items for the lifetime of the project.

Yes No

Do you have any presentations related to this project currently under development? If so, please provide working title, and the conference you plan to present it (this does not include presentations for the AQRP Workshop).

Yes No

Do you have any presentations related to this project that have been published? If so, please list reference information. List all items for the lifetime of the project.

Yes No

Have any personnel changes occurred that were not listed in the original proposal? If so, please include a detailed description of the personnel change(s) below.

Yes No

Are any delays expected in the progress of the research? If so, please include a detailed description of the potential delay below.

Yes No

Describe any possible concerns/issues (technical or non-technical) that AQRP should be made aware of.

Are you anticipating using all the available funds allocated to this project by the end date? If not, why and approximately what is the amount to be returned?

Yes No

Submitted to AQRP by
Yuxuan Wang