AQRP Monthly Technical Report

PROJECT TITLE	Improving Emission Rates Estimates of Commercial Marine Vessels	**PROJECT #**	24-003
PROJECT PARTICIPANTS	University of Houston, Ramboll, FluxSense	**DATE SUBMITTED**	04/10/2025
REPORTING PERIOD	**From:** 03/01/2025 **To:** 03/31/2025	**REPORT #**	8

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

- Conducted sampling missions for 12 days
- Measured discreet plumes from 198 boats, including push boats and oceangoing vessels.
- Sampled four Volatile Organic Compounds (VOC) canisters.
- Performed multipoint calibrations.

Preliminary Analysis

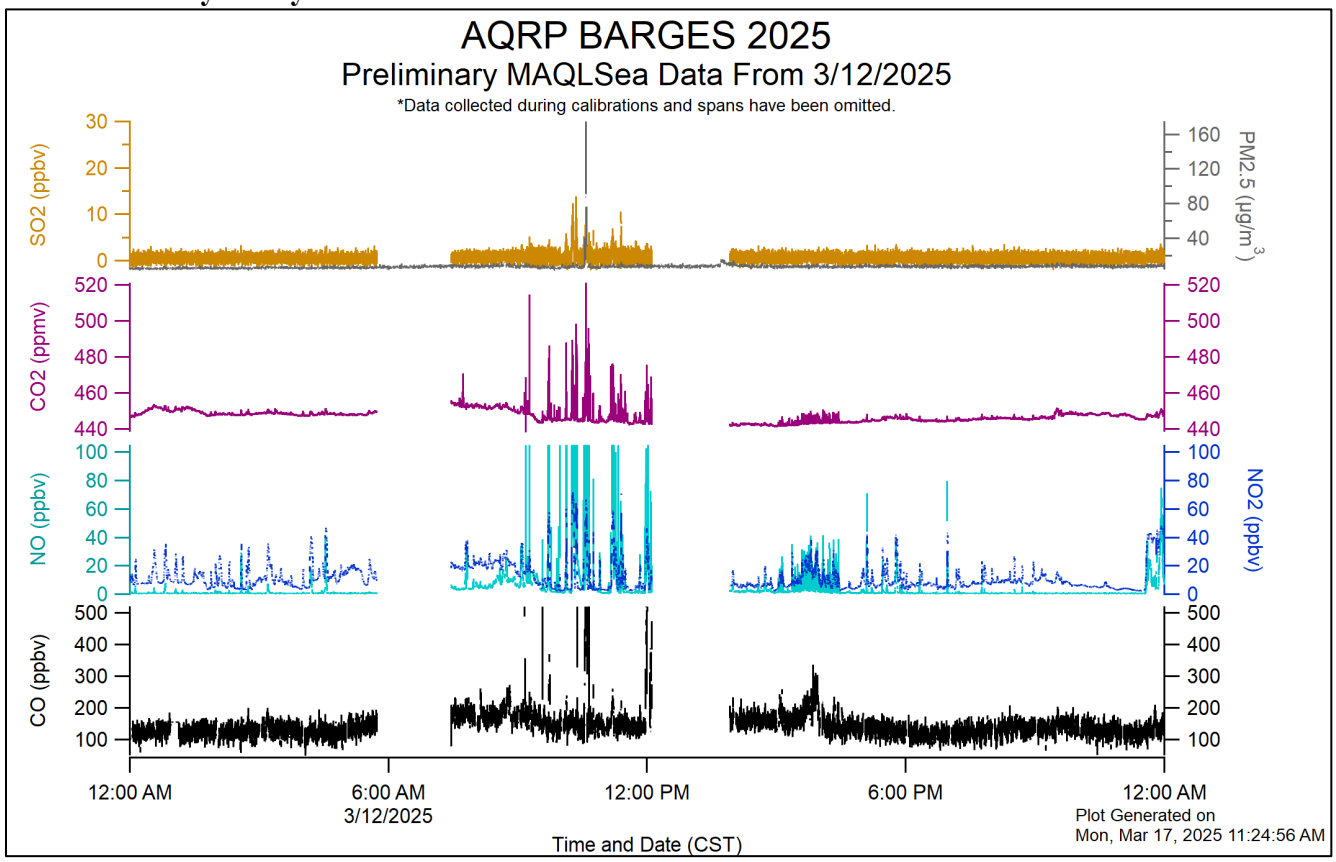

Figure 1. Preliminary gas and aerosol data collected on 3/12/2025 on board the UH research boat.

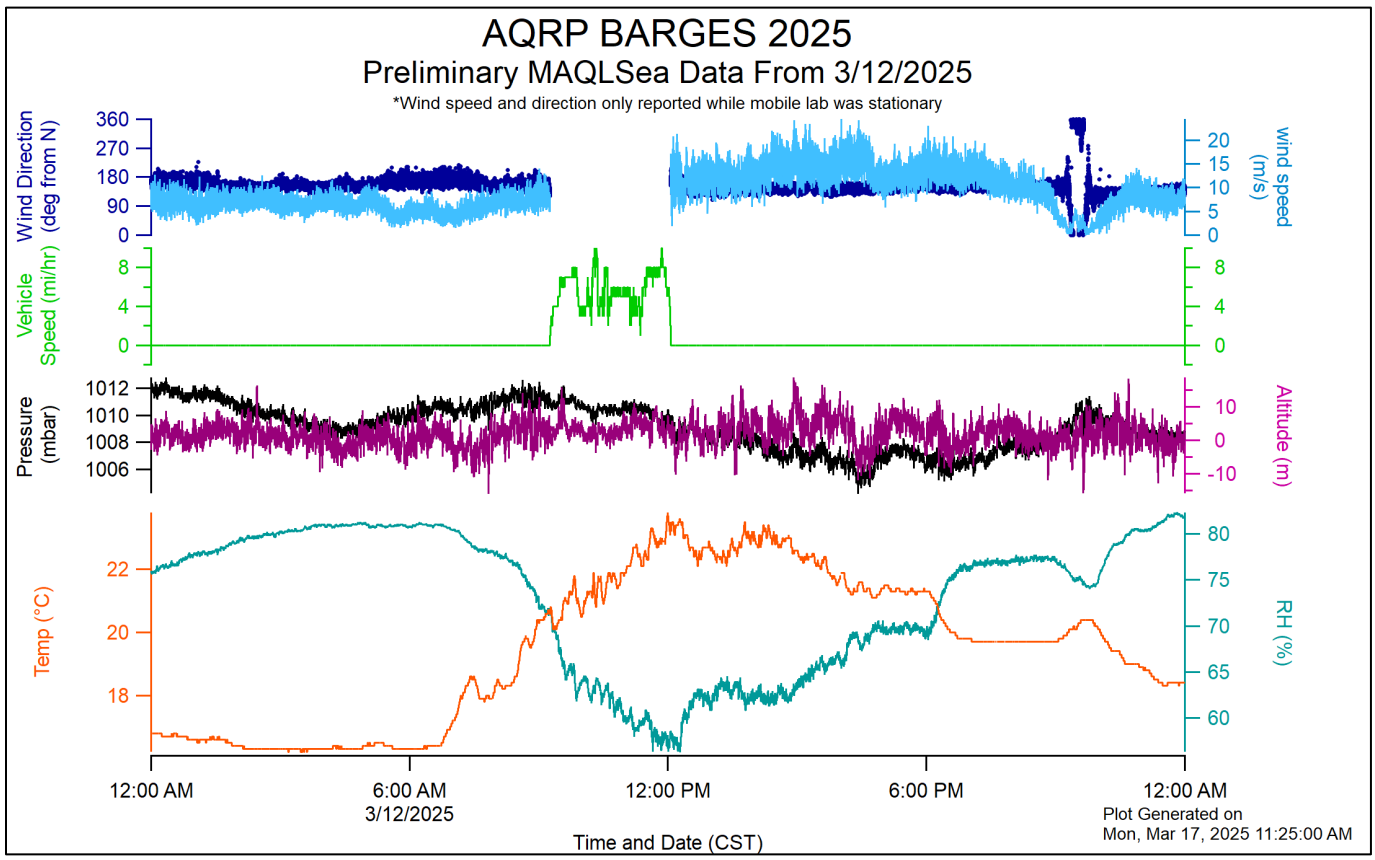

Figure 2. Preliminary meteorological data collected on 3/12/2025 on board the UH research boat.

Data Collected

Yes

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

- Original anchor windlass (winch; ~2001 build date) broke plastic guide to keep line from fouling roller – immediate solution was to sample plumes by trailing vessels since we could not maintain a stationary position; long-term solution was to replace windlass with new fully stainless steel windlass.
- Recommendation by marine mechanics was to tie off the anchor line to the bow cleat to relieve stress on the new windlass. This resulted in an unexpected pull angle on the line at the bow roller, which caused the line to chafe on a metal edge, ultimately causing the line to fail and a loss of the anchor – Solution was to return to the marina immediately, and the marine mechanics were contacted in route to the marina. They came out and installed a new anchor and anchor line, as well as installing a cleat near the windlass to maintain the desired pull angle and prevent chafing and damage to the anchor line in the future.
- Occasional overheating issues on FluxSense instruments due to the requirement for blowing ambient cabin air as a method of buffering swings in temperature from the air conditioning cycling on and off. The fan installed was underpowered for the length of ductwork required to reach the instrument enclosure on the rear deck, causing the instrument internal temperature issues as the weather warmed up. – The solution was to

adapt a continuous duty marine bilge blower, which significantly increased air flow to the FluxSense instruments.

- Nitric Oxide instrument's Photo Multiplier Tube (PMT) cooler failed and was replaced.
- MeFTIR and MeDOAS mirrors were adjusted to optimize the signal (photon counts).

Goals and Anticipated Issues for the Succeeding Reporting Period

- Complete sampling of boats and begin data processing
- Receive full funding from the University of Houston Division of Research for this project

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.

N/A

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
James Flynn