Where: Guyana, South America  
Product: Series 500 monitors (SO$_2$, H$_2$S, NO$_2$, VOC, CO)  
Installed: 2017  
Result: Low power demand, no reagents or expendables required, and internal data logging proved a good match for the demands of ship-based air monitoring.

THE CUSTOMER

Environmental Resources Management, Inc. (ERM), is a global environmental consultancy, with a strong reputation in ambient air quality monitoring. ERM has more than 160 offices in over 40 countries and territories and employs more than 4,500 people who work on projects around the world. ERM is committed to providing a service that is consistent, professional and of the highest quality to create value for its clients.

THE PROBLEM

ERM’s client needed to characterize background ambient air quality in order to support the environmental impact assessment of a proposed new development. This is a service ERM routinely provides throughout the globe on land. But the client’s proposed development was offshore energy production requiring characterizing ambient air quality in the Atlantic Ocean, approximately 100 kilometres offshore of Guyana, South America.

The project was coordinated from ERM’s office in Illinois, USA. However the budget did not allow for a dedicated air monitoring technician to attend to the equipment, so the selected instruments needed to be reliable and capable of operating for extended periods of time without intervention. Since a research ship would be hosting the air monitors, space and power were scarce so the equipment needed to be compact with low power requirements.

“The Series 500 air monitors proved rugged and reliable, and were a good fit for the project demands.” — Richard Osa, Technical Director, ERM
THE SOLUTION

To meet this need, and the constraints of the marine application, ERM turned to Aeroqual’s flexible Series 500 sensor-based air monitors. In all, five Series 500 monitors were deployed to measure SO₂, H₂S, NO₂, VOC, and CO. Since some of these pollutants are also emitted by the host ship’s diesel engines, the instruments were mounted in the bow of the ship and two sets of wind speed and direction sensors were collocated with the air monitors (one set served as a redundant system) to determine when the sensors were downwind of ship-board emission sources.

A passive monitor (diffusion tube or evacuated cylinder) was paired with each Aeroqual Series 500 to provide an independent method for confirming the portable monitor’s continuous measurements.

The Series 500 monitors and sensors were selected because they could provide continuous measurements without the need for elaborate climate controlled shelters, which would not have been feasible on board the ship. Low power demands and the small form factor of the Series 500 were also good matches for the facilities available on the research ship.

The Aeroqual monitors required occasional checks to ensure they were still powered on and collecting data. However, no expendables, filters, or reagent replacements were needed which was another a good fit for the limited resources on-board. Data was recorded within each instrument’s internal data logger, providing redundancy against a single point of failure.

EVALUATION

Not surprisingly, the measurements for most of the pollutants were very low, less than the detection limits for both the Series 500’s and passive samplers. Finding a reservoir of air pollution 100 kilometres offshore South America would have been both an amazing discovery and deeply disturbing. The readings were in line with predictions with no significant anomalies in the data.

The Series 500 air monitors proved rugged and reliable. While one unit stopped collecting data 35 days into the voyage, later inspection found a power cable disconnection to be the cause, an issue that could, and should have been identified by the daily inspections.

The measurements collected by the Aeroqual monitors have enabled ERM to deliver value for their client. The dataset provides both a solid foundation for the proposed project’s environmental impact assessment as well as a benchmark against which post-operation conditions may be compared.