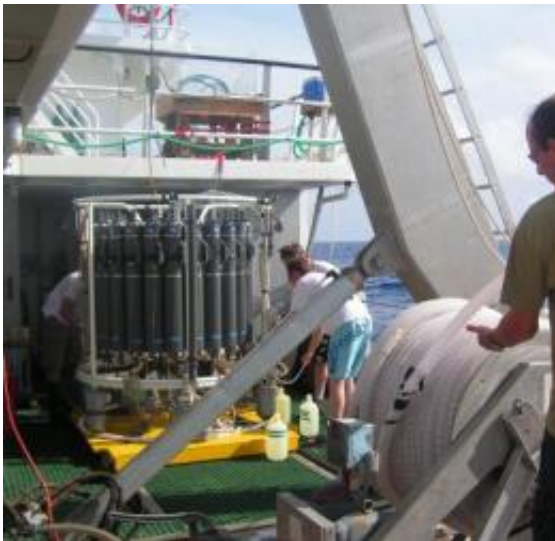


Scientists find new way to estimate global rainfall and track ocean pollution

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University of Miami (UM) scientists have found a new way to estimate global rainfall and track ocean pollution. A portion of the precipitation sampling for the study was carried out at this site, located on the extreme west end of Bermuda, and at the Bermuda Institute of Ocean Sciences (BIOS). The site was erected in the late 1980s by UM Professor Joe Prospero's aerosol research group as part of the Atmosphere-Ocean Research Program. The station is now operated by BIOS. Credit: UM/RSMAS

A study by scientists at the University of Miami (UM) Rosenstiel School of Marine & Atmospheric Science suggests a new way to estimate how much of the ocean's pollution is falling from the sky. The new findings can help improve scientific understanding of how toxic airborne

chemicals, from the burning of fossil fuels and industrial power plants emissions, are impacting the oceans globally.

By measuring Beryllium-7 (^7Be) isotope concentrations in the [ocean](#), which is found naturally throughout Earth's atmosphere, Rosenstiel School scientists David Kadko and Joseph Prospero were able to provide a method to accurately estimate [rainfall](#) in remote regions of the ocean. The two-year study measured ^7Be deposited in rain collectors at two sites in Bermuda and compared these estimates to those observed in the nearby Sargasso Sea.

"Over vast areas of the oceans the only rainfall data available are those made by using conventional rain collectors placed on islands," said Prospero, professor of marine and atmospheric chemistry at the UM Rosenstiel School. "However, rainfall on the island is not necessarily representative of that which falls in the surrounding ocean. Our paper shows that properly placed rain collectors on Bermuda do yield rainfall rates that agree with those determined through the ^7Be measurements."

Rainfall is a major pathway by which man-made airborne pollutants and other naturally occurring chemicals enter the oceans.

Beryllium-7, like man-made pollutants and other naturally occurring chemicals, attaches itself to atmospheric dust particles and enters the ocean during rain events. By understanding this process, scientists can establish new ways to quantify airborne pollutants deposited to the ocean.

"The accumulation of ^7Be in the upper ocean provides a means of assessing ^7Be deposition to the ocean on regional and global scales," said Kadko, professor marine and atmospheric chemistry of at the Rosenstiel and lead author of the study. "This then can be used to assess the deposition of other chemical species."

More information: The paper, titled "Deposition of ^7Be to Bermuda and the regional ocean: Environmental factors affecting estimates of atmospheric flux to the ocean" was published in the Feb. 9 issue of the American Geophysical Union *Journal of Geophysical Research*.

Provided by University of Miami Rosenstiel School of Marine & Atmospheric Science

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