

UH scientists scour sky for atmospheric clues

By Helen Altonn

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Hawaii may be the proving ground for a theory suggesting that tiny plants in the ocean could be emitting gases that affect the Earth's climate.

Investigators have been flying about 500 miles out of Hilo in a special research plane doing atmospheric studies.

Among other missions, they are looking for evidence of a connection between microscopic marine plants, cloud formation and the Earth's radiation and climate.

Hawaii is a good place to look for changes because it is relatively pollutant-free, said Antony Clarke, University of Hawaii Institute of Geophysics researcher participating in the experiments.

He said the scientists encountered Asian dust in Hawaiian skies this week from the cloud tops up to 20,000 feet. "The week before it was very clean — what you might call pristine."

The Asian dust was generated by cyclones that occur this time of year over the Gobi Desert and was brought here by winds, he said.

And several weeks ago, they detected what they believed was a layer of pollution at about 17,000 feet, he said. They hope to determine with further analysis whether the pollutant mass came from Asia or the mainland United

States.

Clarke was among five investigators funded by the National Science Foundation to conduct experiments aboard the aircraft, which is from the National Center of Atmospheric Research in Boulder, Colo.

The aircraft is outfitted with state-of-the-art instruments for quick chemical and aerosol measurements of the atmosphere, enabling the scientists to track changes and gain some understanding of air masses, Clarke said.



Antony Clarke

Since Hawaii is so remote, he said, natural processes can be studied here, and scientists can detect continental influences on a global scale.

Among his other interests is a possible chemical link between ocean plankton and clouds — a theory advanced by one of his former professors, Robert Charlson of the University of Washington in Seattle.

Charlson and his colleagues have proposed that plankton cells excrete a sulfur compound called dimethylsulfide that reaches the atmosphere from sea water and

causes increased cloudiness.

Clarke said the flights, winding up here this week, were the first of a series focusing on that topic and other aspects of the remote Pacific atmosphere. "There is instrumentation on the flight to start tackling this subject," he said.

"We want to go into regions where we'd expect plankton to be productive and can measure the gases emitted and also particles we know are related to these gases and get some indication whether this goes on."

Among other findings, Clarke said scientists may have to rethink their ideas of a well-mixed atmosphere because they found it was "incredibly layered."

"It can go from highly concentrated to highly clean in relatively short distances, both vertical and horizontal. This was relatively surprising and will be one of the things we'll be looking at a lot closer."

Coordinating the program the past three weeks was Alan Bandy, chemistry professor at Drexel University, Philadelphia.