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Out Of Africa: Large Quantities Of Saharan Dust Help Fertilize Massive Plankton Blooms

ScienceDaily (Apr. 6, 2006) — Large quantities of Saharan dust are helping to fertilize the massive plankton blooms that occur in the tropical eastern Atlantic, a research project has confirmed.

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A team including researchers from the School of Environmental Sciences at the University of East Anglia has been studying the desert dust, which is rich in nitrogen, iron and phosphorus, and its effect on the ocean's nutrients, plankton production and the food chain.

The £600,000 project, is part of the Surface Ocean Lower Atmosphere Study, UK SOLAS, funded by the Natural Environment Research Council, NERC, and involves co-ordinating samples taken at sea with atmospheric measurements made from a research aircraft.

Visitors to The Science Museum in London will be able to participate in a hands-on exhibition, which includes

satellite images and a dust sample, as well as getting the chance to ask scientists about the project this week (April 4 and 5).

The researchers carried out the first combined ship and aircraft campaign in the tropical Atlantic around the Cape Verde islands last month. A BAe 146 research aircraft made sorties from Dakar, Senegal over the Cape Verde islands to investigate the composition, radiative properties and deposition of the dust flowing from west Africa over the tropical Atlantic.

Dr Ellie Highwood of the University of Reading and her team in the aircraft sampled dust at different heights over the ocean while UEA's Claire Powell and researchers from other universities were stationed on a ship collecting dust particles falling into the ocean.

The total quantity of dust involved, about 500 million tonnes per year, is sufficient to affect the climate. By partly absorbing and partly reflecting sunlight, the dust particles heat the air but cool the ocean surface.

The dust particles also encourage cloud formation, which reinforces the reflection of light back into space. Such effects can be far-reaching: hurricanes in the Caribbean begin their life off north-west Africa, with atmospheric dust being one of many factors influencing their early development.

Investigators confirmed that wind-blown dust from the Sahara desert plays a crucial role in fertilizing large areas of the Atlantic Ocean. The delivery of nutrients, and some metals common on land but scarce in the open ocean, stimulates the production of massive plankton blooms.

Dr Phil Williamson, project coordinator at UEA's School of Environmental Sciences, said: "This study shows how important the links are between the different parts of the climate system.

"Dust storms are sporadic events and Saharan dust can come from many sources – it can be mixed with soot, from grassland and forest fires; and it can change its chemical and physical properties as it is carried in the atmosphere, at different heights and different moisture conditions. These complications make it difficult to include the dust effects in climate models."

The UK SOLAS studies involve researchers from the National



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(University of Reading), in collaboration with the UK Meteorological Office, the African Monsoon Multidisciplinary Analysis (AMMA), German SOLAS researchers and other international research groups.

For more information, visit the Science Museum's website at: <http://www.sciencemuseum.org.uk/antenna/saharandust/>

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