innovations report
Forum for Science, Industry and Business
Sponsored by SIEMENS N24

go!
Reports b2b-Service Profiles JobNews Research
Home About us Contact Join us Search deutsch english
Earth Sciences

Other Sponsors of the Forum
BASF ruhrgas
DaimlerChrysler
Infineon PEUGEOT
kfw BEHR
BMW MINI
Deutsche Börse Bayer
FWD accenture
Deutsche Bank
KPMG SAP
Continental
Allianz ILOG
Verity SCHOTT glass made of ideas
HEIDELBERG
watt KABA BENZING
Dräger medical A Dräger and Siemens Company
LipoNova SurTec
Dresdner Bank Die Beraterbank
G.A.G BioScience HTP
Roland Berger Strategy Consultants

Rutgers, the State University of New Jersey 28.04.2004

Ocean dye to help Rutgers scientists trace Hudson River's path miles into the Atlantic

Shipboard marine scientists from Rutgers, The State University of New Jersey, will release a nontoxic red dye into the Atlantic Ocean off New Jersey during the week of May 2 to help reveal the contents and fate of Hudson River water after it joins the Atlantic.
The dye release is the first of three experiments in Rutgers' ongoing study of the Hudson River Plume – the mix of river water and substances that flow into the ocean at a rate of 500 billion gallons per day. Preliminary studies indicate that the plume tends to sweep southward along the New Jersey coast.

The exact location and time of the dye release will be determined by the position of the plume and other conditions. Robert J. Chant, professor of physical oceanography with Rutgers' Institute of Marine and Coastal Sciences (IMCS), said he hopes to release the dye sometime Sunday or Monday in an area a few miles southeast of Sandy Hook.

The dye initially will be visible on the ocean as a red patch, perhaps a mile or more long, Chant said. "It will then disperse and gradually become invisible to the human eye, but remain detectable by our sensors. Essentially we're tagging a piece of the ocean and following it."

Chant and a crew of fellow oceanographers plan to follow the flow of the dye on a research vessel for about five days, and possibly 100 or miles more. Throughout the voyage, they will be testing the water to increase their knowledge about where the plume goes and what it contains.

A live streaming video and audio feed of experiment activities and scientists' commentary during the cruise will available online at http://marine.rutgers.edu/cool/latte. IMCS will take aerial photos of the dye patch and then post and later archive the images online.

The five-year study, called the Lagrangian Transport and Transformation Experiment (LaTTE), also involves the ongoing use of unmanned submarines, satellites, coastal radar and other technologies. It is funded through a $4.2 million grant from the National Science Foundation.

As the study progresses, Rutgers scientists will add the data to computer models for predicting plume behavior and content under a wide range of conditions. Such information will be useful, for example, in predicting potentially dangerous algae blooms along the coast and making decisions about sewage disposal.

Chant is the principal investigator on the study. He is working along with fellow IMCS scientists Scott M. Glenn, Oscar Schofield and John

Ads b

UNE
Coas
Deve
spec
www.

Flon
Dyn
Flow
exan
exan
www.

Paci
Drifti
Coas
telen
www.

Got
Rhoc
fluor
quer
www.

Fluo
Prote
Purif
Fluo
to 70
www.

Content Partners of the Forum

L. Wilkin, and John R. Reinfelder of Rutgers' environmental sciences department.

Facts

- The dye consists of about 100 gallons of Rhodamine WT, a nontoxic liquid red dye commonly used in water-tracing studies. It is detected optically by monitoring a characteristic reflection. Rhodamine can be detected down to 10 parts per trillion, or the equivalent of 1/50th of an ounce dropped in an Olympic-size swimming pool.
- While following the dye patches, researchers will run many tests to evaluate how nitrogen, lead, cadmium, mercury and other substances are transported by the plume at different depths and under different conditions. They will study microscopic phytoplankton and zooplankton, and research how metals and nutrients enter the base of the food chain.
- "Lagrangian" in the title of the study comes from Joseph-Louis Lagrange, an 18th century French mathematician who developed formulas for studying the motion of fluids while following their flow.
- The LaTTE acronym will have special meaning for coffee lovers. One of the chemicals to be monitored in the Hudson River Plume is caffeine. It passes though sewage treatment plants unchanged, and because it has no oceanic source, it can be used as an additional tracer.
- Shipboard testing will provide real-time results, allowing scientists aboard the vessel to produce computer images of the Hudson River Plume as they travel.
- The model will evolve as test cruises continue through 2006. Analysis of the comprehensive plume model is expected to be completed by 2008.
- Computer modeling in LaTTE will tackle such complex issues as turbulent mixing and photosynthesis in microscopic ocean plants. The rotation of the earth will figure in the model because it causes ocean water in the northern hemisphere to turn to the right. This phenomenon, called the Coriolis effect, drives the plume up against the New Jersey coast.
- In previous testing, water from the Hudson River Plume was detected in the ocean as far south as Cape May.

More information: www.rutgers.edu/

28.04.2004 | Joseph Blumberg | Source: EurekAlert! | CMS by NETZGUT

Imprint