



## Professor Puts Science On A Sphere In New Smithsonian Hall

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DURHAM, N.H. - When the Smithsonian Institution opened its eagerly anticipated Sant Ocean Hall at the Museum of Natural History in Washington, D.C. earlier this fall, the work of University of New Hampshire professor Colin Ware made a splash.

Ware, who directs the Data Visualization Research Lab at UNH's Center for Coastal and Ocean Mapping (CCOM), created the global ocean currents animation that appears on the room-sized Science on a Sphere exhibit, one of the major attractions of the Sant Ocean Hall. Ware's work helps museum visitors better understand how ocean waters flow around the planet.

"It's not really a system of currents, it's a system of processes," says Ware, adding that the visualization aims to debunk the misleading "global ocean conveyor belt" image of a ribbon of ocean currents wrapping the globe.

By layering moving swirls of color atop each other, Ware's narrated animation shows the movement of surface currents, which are driven by winds; then coherent currents like the Gulf Stream, 100 meters below the surface; then the lugubrious waters at 2500 meters, which have not seen the surface for between ten (at the Arctic) and 1800 (in the southern Pacific) years.

Ware color-codes the currents and adds "virtual dyepots" to areas such as the Antarctic circumpolar current, to further aid visitors' visualization of the complex processes of ocean currents. As colors and currents fill the globe, the effect recalls Van Gogh. "It is like painting in this fluid medium," Ware says, "which is fun to do."

Science on a Sphere, developed by the National Oceanic and Atmospheric Administration (NOAA), suspends a white sphere six feet in diameter from the ceiling onto which data can be projected. At the Sant Ocean Hall, Ware's ocean currents animation is one of four programs that highlight complex aspects of the ocean. Although his four-minute animation provides only a basic introduction to ocean currents, "currents are fundamental to all sorts of life in the ocean," he says.

Ware's animation for Science on a Sphere extends his work designing three-dimensional interactive visualization systems for ocean mapping. "My job is to push the bounds of what ocean mapping is," he says; he uses color, texture and form to turn points on a graph or lines on a map into stunning visual representations that imbue data with life and easily-grasped meaning.

Ware's Ph.D. is not in oceanography or computer science but the psychology of perception; specifically, he applies principles of human perception (how we see and perceive color, texture, images and motion) to data visualization. He's written two books that translate concepts from the modern science of perception to be easily understood by designers and applied to the effective display of scientific data. He has also published more than 120 scientific articles and has developed software for data visualization that is used around the world.

For his next project, Ware ascends from ocean depths to the atmosphere for a weather exhibit he's developing for the planetarium company Sky-Skan. With funding from a Granite State Technology Innovation Grant, he's created an interactive Weather Now display where viewers

can interact, via a touch screen, with ground-level winds, the jet stream, and atmospheric pressure. The display will upload real-time data from the National Weather Service, giving display viewers an opportunity to interact with weather as it's happening.

For more information about Colin Ware and the Data Visualization Research Lab, go to <http://www.ccom.unh.edu/vislab/index.html>. To learn more about Science on a Sphere and the Sant Ocean Hall at the Smithsonian Museum of Natural History, go to [http://ocean.si.edu/ocean\\_hall/](http://ocean.si.edu/ocean_hall/).

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**Photographs available to download:**

[http://newsdesk.si.edu/images\\_full/images/museums/nmnh/sant\\_ocean\\_hall/ocean\\_hall/science\\_sphere.jpg](http://newsdesk.si.edu/images_full/images/museums/nmnh/sant_ocean_hall/ocean_hall/science_sphere.jpg)

Caption: UNH professor Colin Ware created the global ocean currents animation for the Science on a Sphere exhibit at the Smithsonian Museum of Natural History's new Sant Ocean Hall. Ware is director of the Data Visualization Research Lab at UNH's Center for Coastal and Ocean Mapping.

Credit: Chip Clark, Smithsonian Institution

[http://www.unh.edu/news/cj\\_nr/2008/nov/ColinWare\\_OceanCurrents.jpg](http://www.unh.edu/news/cj_nr/2008/nov/ColinWare_OceanCurrents.jpg)

Caption: UNH professor Colin Ware, director of the Data Visualization Research Lab at UNH's Center for Coastal and Ocean Mapping.

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