The Nicholas Environmental Notebook II*

Stories from the front line

Mapping out solutions for marine conservation

Armed with field notes, aerial photos and GIS software, ecologists can piece together a pretty clear map of what's what in the terrestrial world. But shift the scene offshore and the picture gets murky. Depths and distances make observation difficult. Tides, currents and migrating sea life keep oceans and coastal waters in flux.

Pat Halpin is integrating new technologies to take stock of this fragile world and help scientists, conservationists and policymakers find better ways to protect its endangered species, restore its declining fisheries and manage its resources.

Halpin heads the Marine Geospatial Ecology Laboratory at Duke University's Nicholas School of the Environment and Earth Sciences. He and his team of computer-savvy ecologists adapt sophisticated tools like GIS, satellite remote sensing and simulation modeling to answer questions unique to marine conservation.

When Environmental Defense needed a strategy for restoring river herring habitat in coastal North Carolina, Halpin's team created customized network models that charted the best approach.

They've devised datasets and software to help the Nature Conservancy evaluate marine conservation priorities along the southeastern U.S. coast.

And working with the Nicholas School's Center for Marine Conservation, they're developing OBIS-SEAMAP, an online database (seamap.env.duke.edu) that tracks the movements of hundreds of endangered marine species and can be used to create predictive maps of the animals' whereabouts, to help reduce harmful run-ins with fishing gear, shipping hazards and underwater sonar.

Last year, the David and Lucile Packard Foundation awarded Halpin's lab $1.24 million to launch the Marine Ecosystem-Based Management Tool Innovation Fund, a pilot program to get the most promising new technologies for marine and coastal management into the field more quickly.

"Geospatial technologies are transforming how we study marine ecology and apply discoveries in the classroom and policy arena," he says. "They help us surmount problems that used to be insurmountable and collect, manage, analyze and share data in ways that were unimaginable before."

Solutions start here at the Nicholas School

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*Notebook I, a series of environmental commentaries, and Notebook II are online at **www.nicholas.duke.edu/notebook**