New map charts troubled status of ocean life

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(PhysOrg.com) -- A new map provides the most detailed overview yet of life in the world's oceans. The two-sided, poster-sized map was developed by Duke University researchers in partnership with the Census of Marine Life and National Geographic Maps. The map, available online at comlmaps.org/oceanlifemap , is based on 10 years of data from the international Census of Marine Life and other scholarly sources.

It is being publicly presented for the first time, along with other documents and findings from the census, at a news conference today (Oct. 4) at the Royal Institution of Great Britain in London.

The map took more than two years to plan, develop and design, and includes new data previously not available in any one document, says Patrick Halpin, associate professor of marine geospatial ecology at Duke's Nicholas School of the Environment.

"The value of this map is that lets us see patterns of species diversity and migration in a new light, and provides a clearer picture of biological abundance, which is very hard to measure," he says. "We see connections that couldn't be documented before."

The hope, adds Halpin, is that the map will attract greater public attention to the census and its discoveries.

Among other things, the map identifies the regions that are home to the world's greatest concentrations of marine biodiversity and abundance;

the long-distance migration paths of key predators; the regions that have experienced the greatest impacts from human activities; and the locations of coral reefs, hydrothermal vents, seeps, seamounts and other geological features that act as "islands of high diversity and abundance," says Halpin.

His team at Duke's Marine Geospatial Ecology Laboratory created the document with input from census leaders.

Each side of the color-coded map illustrates a different set of related topics or themes. On the side titled "Diversity, Distribution, Abundance," the main image tracks the long-distance migrations of 11 taxonomic groups of ecologically important predators, including sharks, sea turtles, seabirds and tuna. A smaller panel maps fish and zooplankton migrating up and down in the water column, from sunlit surface waters to the murky depths, in response to changing diurnal and seasonal stimuli.

On the side of the map titled "Past, Present and Future," the main image shows which regions of the world's oceans are home to the greatest biodiversity of species, and which have experienced the greatest human impacts. Marine hot spots appear around the Philippines, Japan, China, Indonesia, Australia, India and Sri Lanka, South Africa, the Caribbean and the Gulf of Mexico. Biodiversity and high human impacts collide in coastal areas such as the Western Pacific and North Atlantic.

A smaller map charts the abundance of seafloor life of the world's oceans - the quantity of animals, measured as biomass, found in each region regardless of the number of species.

"While the greatest biodiversity is found in the warm waters of the tropics, the greatest abundance of life appears in high latitudes in the polar regions," Halpin says. "So diversity and abundance have almost

exactly opposite trends.

"Ninety-nine percent of the data from the census isn't here, but the key themes - that life in Earth's oceans is richer, more connected and more altered than expected - are represented."

Provided by Duke University