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ENVIRONMENT
Slow-Motion Disaster Below the Waves

By **Randy Olson**

There is a new term in the environmental movement. It sounds esoteric, like the kind of thing you don't really need to understand, something you can leave to the more technical types.

The term is "shifting baselines," and you do need to know it, because shifting baselines affect the quality-of-life decisions you face daily. Shifting baselines are the chronic, slow, hard-to-notice changes in things, from the disappearance of birds and frogs in the countryside to the increased drive time from L.A. to San Diego. If your ideal weight used to be 150 pounds and now it's 160, your baseline -- as well as your waistline -- has shifted.

The term was coined by fisheries biologist Daniel Pauly in 1995. It was a term we'd apparently been needing, because it quickly spread to a variety of disciplines. It's been applied to analysis of everything from deteriorating cities to declining quality of entertainment.

Among environmentalists, a baseline is an important reference point for measuring the health of ecosystems. It provides information against which to evaluate change. It's how things used to be. It is the tall grass prairies filled with buffalo, the swamps of Florida teeming with bird life and the rivers of the Northwest packed with salmon. In an ideal world, the baseline for any given habitat would be what was there before humans had much impact.

If we know the baseline for a degraded ecosystem, we can work to restore it. But if the baseline shifted before we really had a chance to chart it, then we can end up accepting a degraded state as normal -- or even as an improvement.

The number of salmon in the Pacific Northwest's Columbia River today is twice what it was in the 1930s. That sounds great -- if the 1930s are your baseline. But salmon in the Columbia River in the 1930s were only 10% of what they were in the 1800s. The 1930s numbers reflect a baseline that had already shifted.

This is what most environmental groups are now struggling with. They are trying to decide: What do we want nature to look like in the future? And more important: What did nature look like in the past?

These questions are particularly important to ask about oceans, my main research interest. Last year Jeremy Jackson of the Scripps Institution of Oceanography brought the problem into focus with a cover article in Science that was chosen by Discover magazine as the most important discovery of the year.

Jackson and his 18 co-authors pulled together data from around the world to make the case that overfishing had been the most important alteration to the oceans over the past millennium. Furthermore, humans have had such a strong effect on the oceans for so long that, in many locations, it is difficult to even imagine how full of life the oceans used to be.

One of scientists' biggest concerns is that the baselines have shifted for many ocean ecosystems. What this means is that people are now visiting degraded coastal environments and calling them beautiful, unaware of how they used to look.

People go diving today in California kelp beds that are devoid of the large black sea bass, broomtailed groupers and sheephead that used to fill them. And they surface with big smiles on their faces because it is still a visually stunning experience to dive in a kelp bed. But all the veterans can think is, "You should have seen it in the old days."

Without the old-timers' knowledge, it's easy for each new generation to accept baselines that have shifted and make peace with empty kelp beds and coral reefs. Which is why it's so important to document how things are -- and how they used to be.

For the oceans, there is disagreement on what the future holds. Some marine biologists argue that, as the desirable species are stripped out, we will be left with the hardiest, most undesirable species -- most likely jellyfish and bacteria, in effect the rats and roaches of the sea. They point to the world's most degraded coastal ecosystems -- places like the Black Sea, the Caspian Sea, even parts of the Chesapeake Bay. That's about all you find: jellyfish and bacteria.

We have already become comfortable with a new term, "jellyfish blooms," which is used to describe sudden upticks in the number of jellyfish in an area. The phenomenon has become sufficiently common that an international symposium was held on the subject in 2000. Meanwhile, other types of world fisheries are in steep decline.

It is easy to miss changes in the ocean. It's big and deep. But sometimes, if people have studied the same oceanic trends over time, we get a glimpse of a highly disturbing picture. The Scripps Institution's Jackson, for example, has documented the nearly complete disappearance of the ecosystem he built his career studying: the coral reefs of Jamaica. "Virtually nothing remains of the vibrant, diverse coral reef communities I helped describe in the 1970s," Jackson says. "Between overfishing, coastal development and coral bleaching, the ecosystem has been degraded into mounds of dead corals covered by algae in murky water." Nothing you would want to make into a postcard.
Next year two major reports will be released on the state of the oceans: the Oceans Report from the Pew Charitable Trusts, and the report of the U.S. Oceans Commission. The advance word on both is that the news will not be good.

The last major U.S. report on the oceans was 30 years ago. That report warned that "there may be a risk some day of severely declining oceans." The inside word on the upcoming reports is that they will conclude that the oceans are today in severe decline.

The Ocean Conservancy, Scripps Institution and the Surfrider Foundation are mounting a major media campaign for early next year to call attention to the overall fate of the oceans and the problem of shifting baselines. The solutions are already known: We must care more about the environment and work to prevent its decline. Hundreds of environmental groups have action plans to help achieve such goals. The only thing they are lacking is mass support.

The oceans are our collective responsibility. We all have to ask the questions: What did they used to look like? What are we putting into them? Where did these fish we are eating come from? Are my food preferences jeopardizing the health of the oceans?

And, in a more philosophical vein, we should consider the shifting baselines in our own lives, examining how and where have we lowered our standards to the point that we accept things that once would have been unacceptable. Our environment has clearly suffered from our increasing comfort with shifting baselines. I suspect our lives have suffered in other ways as well.

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