

Oceans In Crisis: What You Should Know

“It is clear that human activities are altering ocean ecosystems beyond a point of return. We urgently need to prevent further ocean degradation and reverse the damage before it is too late. We have less than 10 years to save living oceans.”

– *State of the Oceans Forum, The Explorers Club 2009*

1. We are coming to the end of the oceans unless human activities radically change – the cumulative impacts of pollution, overfishing, and climate change are killing ocean life faster than predicted, and could lead to a globally significant marine extinction within one generation.
2. The oceans are becoming more toxic from the billions of tons of man-made pollutants, plastics, metals, and pharmaceuticals we release to the sea annually -- and climate change is exacerbating the toxicity. At the top of the ocean food web, marine mammals are the most polluted animals on earth and many populations are living at the edge of their physiological tolerance range.
3. Since the 1980s, mass mortalities have been sharply increasing among marine mammals. Tens of thousands of seals, dolphins, porpoises, and small whales inhabiting the Baltic Sea, North Sea, Caspian Sea, Mediterranean, US Atlantic coast, and other polluted waters have succumbed to sweeping epidemics, most of which are linked with immunotoxic pollutants that compromise the animals' resilience to disease. The IUCN predicts that 1/3 of all marine mammals will go extinct by 2030 from man-made pollution and physical destruction (ship strikes, hunting).
4. Rapidly increasing atmospheric carbon dioxide (CO₂) emissions during the 20th century are radically altering ocean chemistry, acidifying the oceans, propelling global warming, and decimating corals and other calcareous species and larval fish. Approximately half of the world's coral reefs, supporting an estimated 25% of all marine life, have already disappeared and 75% of corals are at risk of dying. As oceans become warmer and more acidic, all the world's corals will be threatened by mass bleaching, disease, and mortality.
5. More than 500 dead zones have formed along the world's coastlines near densely populated urban areas where runoff of pesticides, fertilizers and human sewage create anoxic (oxygen deficient) or hypoxic (oxygen starved) waters that suffocate fish, shellfish, and almost all other marine species. Altogether dead zones account for 95,000 square miles, about the size of New Zealand.
6. Huge volumes of human plastic debris the size of small continents are collecting in ocean gyres in every ocean. Plastics photo-degrade into tiny microplastic particles that persist for centuries and release toxic chemicals into the sea, killing hundreds of thousands of marine mammals and millions of seabirds annually.

Can the Oceans Be Saved?

The solutions to the crisis include immediate reduction in carbon dioxide emissions, control of pollution (including plastics), a network of marine protected areas, and a way to protect ocean life that goes beyond national jurisdictions. To succeed will not only require unprecedented cooperation between nations and international government bodies -- it will take political will and pressure from informed citizens and policymakers to drive change in the face of opposing political and economic interests.

Susan D. Shaw, DrPH
Director, Marine Environmental Research Institute
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Bio: Susan D. Shaw, DrPH (source: <http://www.meriresearch.org/>)

Dr. Susan Shaw is a marine toxicologist, author, explorer, ocean advocate, and director of the Marine Environmental Research Institute (MERI) based in Blue Hill, Maine. A Fulbright Scholar with dual degrees from Columbia University in film and public health/ environmental health sciences, Shaw was commissioned by Ansel Adams in 1980 to write *Overexposure*, the first book on the health hazards of photographic chemicals.

For the past two decades, Shaw has conducted pioneering research documenting the effects of hundreds of man-made chemicals in the ocean environment. She is credited as the first scientist to show that flame retardant chemicals used in consumer products have contaminated marine mammals and commercially important fish stocks in the northwest Atlantic Ocean. Her research has influenced policy decisions in the US and abroad, including the Maine legislature's decision to ban the neurotoxic flame retardant Deca, and the subsequent US phase-out of the chemical.

An outspoken and influential voice on ocean pollution, Shaw dove in the Gulf of Mexico oil slick in May 2010 and subsequently influenced the national debate on the hazards of chemical dispersants. She is currently leading a region-wide investigation on the effects of oil and chemical dispersants in the Gulf ecosystem. She serves on the Strategic Sciences Working Group (SSWG), the U.S. Department of Interior's team of 14 scientists charged with assessing health consequences of the oil spill and recommending policy actions to lessen stress in the region.

Shaw is a keynote speaker on marine pollution, ecotoxicology, public health, and science and chemicals policy at universities and major venues around the world. She is chair/founder of The Explorers Club State of the Oceans Forums highlighting solutions to the crisis facing the world's oceans. She serves on the International Panel on Chemical Pollution, a select group of scientists advising policymakers on the management of toxic chemicals in developed and developing countries.

The recipient of numerous awards, Shaw was named Gulf of Maine "Visionary" by the Gulf of Maine Council on the Marine Environment representing the New England states and Atlantic Canada. In 2010, she received MORE magazine's "Noisemaker" Award for her work in the Gulf of Mexico, and a Woodrow Wilson Visiting Fellowship for 2011-12. This spring, Shaw will receive the Society of Women Geographers' Gold Medal Award for her "pioneering research of major significance that continues to influence health and toxics policy in the US and abroad." Joining the ranks of Amelia Earhart, Margaret Mead, Jane Goodall, and Sylvia Earle, she will be the 19th woman to receive the society's highest award in 78 years. Dr Shaw will also be honored at the Audubon Society's Women in Conservation 2011 Rachel Carson Awards for her work in the Gulf of Mexico. In November 2011, she will deliver the keynote address at the Swedish Society for Marine Sciences national conference.