



OUR OCEAN

MALTA, 5-6 OCTOBER 2017

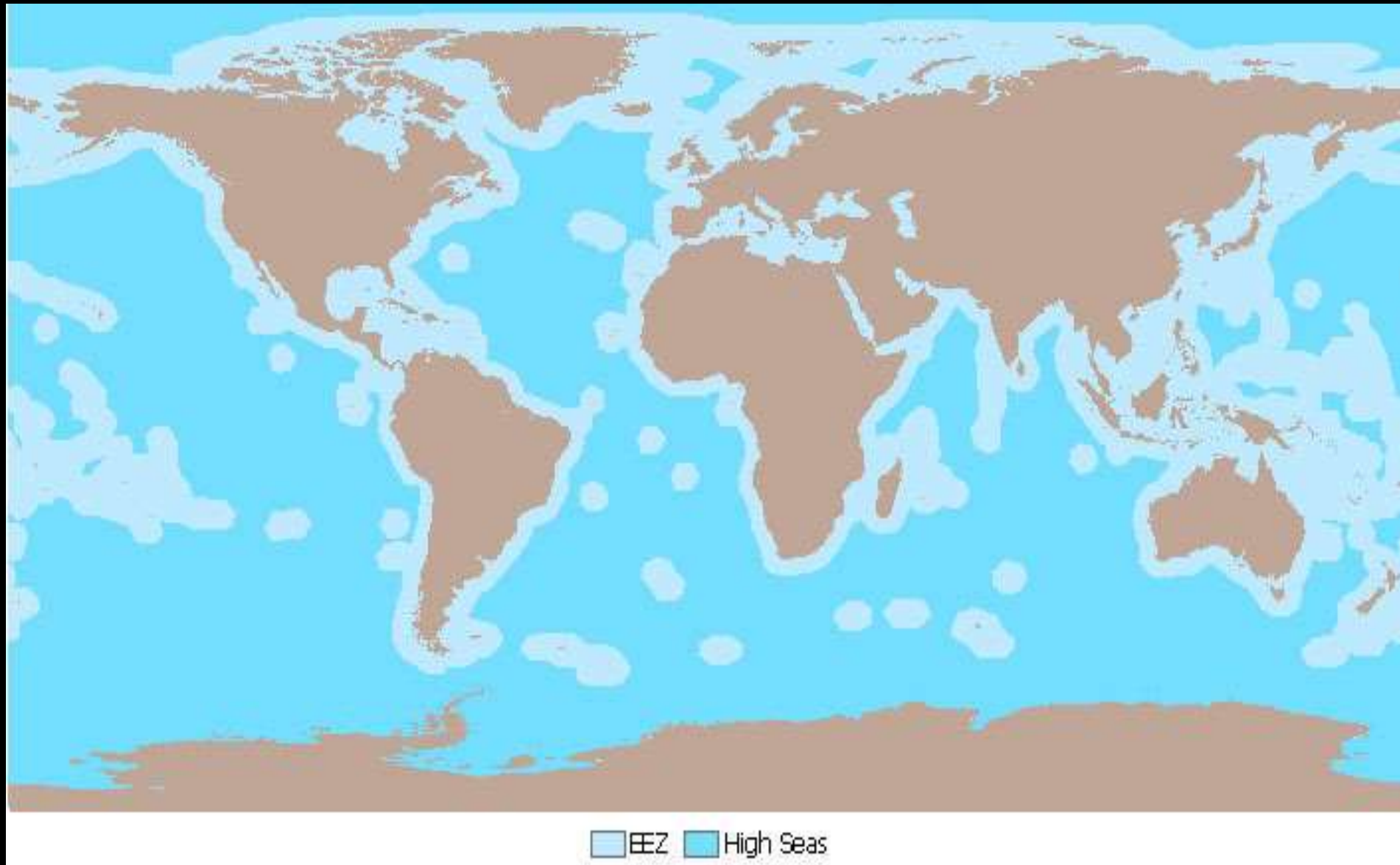


How to further good management for a safe and healthy ocean?

Scenesetting
Our Ocean Leadership Panel
Friday 6 October 15:45-17:15

Kristina M. Gjerde
Senior High Seas Advisor
IUCN Global Marine and Polar Programme
Adjunct Professor, Middlebury Institute of
International Studies at Monterey, California

64 % of the ocean is beyond the limits of national jurisdiction



Ocean Life

Diversity, Distribution, Abundance



RED CRAB
A common sight in coastal waters, the red crab is a species of the genus *Libinia*. It is found in the western Atlantic Ocean, from the Gulf of Mexico to the Caribbean Sea. The red crab is a highly adaptable species, able to survive in a wide range of habitats, from shallow bays to deep-sea hydrothermal vents.



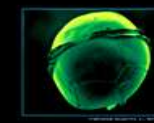
SQUID
Squid are cephalopods, a group of mollusks characterized by a mantle with fins, a beak, and a specialized respiratory system. They are found in all major oceans and are highly adaptable to various environments, from shallow coastal waters to the deep sea.



DEEP-OCEAN JELLYFISH
The deep-ocean jellyfish, *Aequorea victoria*, is a bioluminescent species found in the deep sea. It is known for its ability to produce the green fluorescent protein (GFP), which has become a valuable tool in molecular biology.



SEA BIRD
A seabird, such as a booby, is a bird that spends most of its life at sea. They are highly adapted to life in the ocean, with specialized feet for swimming and diving, and a diet of fish and squid.



GLYPTIDAE
The glypterid jellyfish, *Glyptotendipes*, is a small, bioluminescent species found in the deep sea. It is known for its unique ability to produce light through a symbiotic relationship with bioluminescent bacteria.



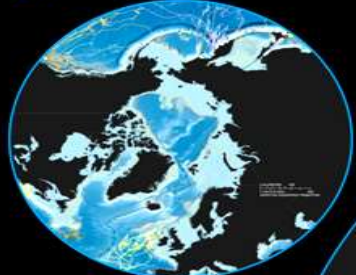
SEA SPIDER
The sea spider, *Stylocostella*, is a unique species of arachnid found in the deep sea. It has extremely long, thin legs and a small body, and is known for its ability to survive in the dark, high-pressure environment of the deep ocean.



SEA CRAB
The sea crab, *Alpheidae*, is a group of decapod crustaceans found in the deep sea. They are highly adapted to life in the dark, high-pressure environment of the deep ocean, with specialized appendages for feeding and defense.

CENSUS OF MARINE LIFE

Of all the organisms that inhabit the planet, only a tiny fraction live in the oceans. The Census of Marine Life is a global effort to discover, describe, and estimate the number of species that live in the world's oceans. This is the first time that scientists from all over the world have joined forces to study the life in the oceans.



For millennia, the ocean has rivaled human imagination with the lure of discovery, mystery, and mystery. All hidden beneath a seemingly endless surface. Countless explorations have revealed wonders beneath the waves, but much more remains to be discovered. Facets of oceanography and marine biology remain only partially understood, including questions about the diversity, distribution, and abundance of the life that dwells in the ocean.

A collaboration of scientists working in 100 major countries across the globe has provided a glimpse to answer many of these questions. In the year 2000, the Census of Marine Life began a 10-year effort to reveal the state of life in the ocean. Entitled "The Census of Marine Life," the project is the largest and most comprehensive scientific effort in the history of oceanography. It is a global effort to discover, describe, and estimate the number of species that live in the world's oceans.

The last decade has improved our understanding of the very small, the very large, and very remote creatures that call the ocean home. Marine life continues to bring forth surprises. In the Caribbean, explorers rediscovered a clam that thrived 250–300 million years ago, thought to have been extinct since the early 1800s. In the Mariana Trench, they found cold water corals extending more than 300 kilometers seawater 500 meters deep—one of the world's longest reefs. Near Chile, they found giant squid that were covering an area of water the size of Greece. Long-term tracking revealed migratory high-seas. Combining all this information has revealed a deeper understanding of how habitats and ecosystems, and animal habitats that have a long history of human contact.

This map highlights discoveries of ocean life—as variety, extent, and habitat. It offers a glimpse into the discovery of a decade's worth of marine life in all ocean realms from microbes to whales.

Discovery and Fascination

Life thrives over a vast range of oceanography and biology because the sea. Our knowledge of the diversity and abundance of life in the ocean is still expanding by hundreds of thousands of species. Discoveries are being made and new species are being discovered. The world is still a vast and unexplored frontier.

Ocean Habitats

The ocean can be divided into distinct realms where changes in temperature and salinity create unique habitats for life. The ocean floor is characterized by a variety of habitats, from shallow coastal waters to the deep sea. The ocean is a vast and diverse environment, with a wide range of habitats and ecosystems.

- CORAL REEF
- CONTINENTAL SHELF
- CONTINENTAL SLOPE
- DEEP OCEAN
- HYDROTHERMAL VENTS
- JELLY
- SEA SPIDER

- POLAR REGIONS
- TROPICAL OCEAN
- SUBTROPICAL OCEAN
- TEMPERATE OCEAN
- COLD OCEAN
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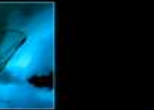
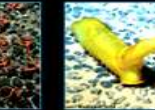
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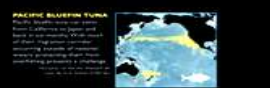
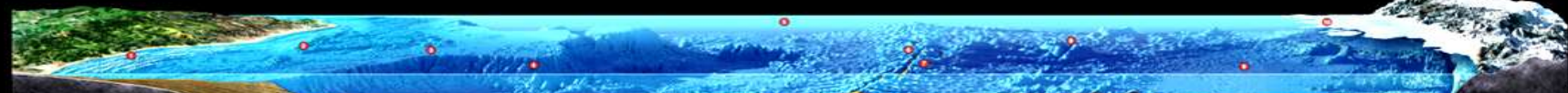
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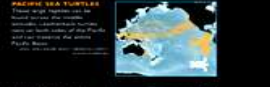
Polar Regions
The polar regions are the coldest and most remote parts of the ocean. They are characterized by low temperatures, high salinity, and a lack of ice. The polar regions are home to a variety of unique species, including polar bears, walrus, and icefish.



www.cml.org
The Census of Marine Life is a global effort to discover, describe, and estimate the number of species that live in the world's oceans. This is the first time that scientists from all over the world have joined forces to study the life in the oceans.



PACIFIC BLUEFIN TUNA
The Pacific bluefin tuna, *Thunnus orientalis*, is a highly migratory species found in the North Pacific Ocean. It is known for its ability to travel long distances and its high value as a food source.



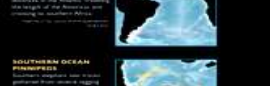
PACIFIC SEA TURTLES
The Pacific sea turtles, including the hawksbill, leatherback, and olive ridged turtles, are highly migratory species found in the Pacific Ocean. They are known for their long lifespans and their ability to travel vast distances.



PACIFIC SEABIRDS
The Pacific seabirds, including the booby, albatross, and shearwater, are highly migratory species found in the Pacific Ocean. They are known for their long lifespans and their ability to travel vast distances.



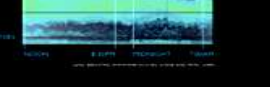
PACIFIC SHARKS
The Pacific sharks, including the great white, tiger, and hammerhead sharks, are highly migratory species found in the Pacific Ocean. They are known for their predatory behavior and their ability to travel vast distances.



ATLANTIC BLUEFIN TUNA
The Atlantic bluefin tuna, *Thunnus thynnus*, is a highly migratory species found in the Atlantic Ocean. It is known for its ability to travel long distances and its high value as a food source.



ATLANTIC SEA TURTLES
The Atlantic sea turtles, including the hawksbill, leatherback, and olive ridged turtles, are highly migratory species found in the Atlantic Ocean. They are known for their long lifespans and their ability to travel vast distances.



SOUTHERN OCEAN PINNAE
The Southern Ocean pinnae, including the giant and giant fan corals, are highly migratory species found in the Southern Ocean. They are known for their long lifespans and their ability to travel vast distances.

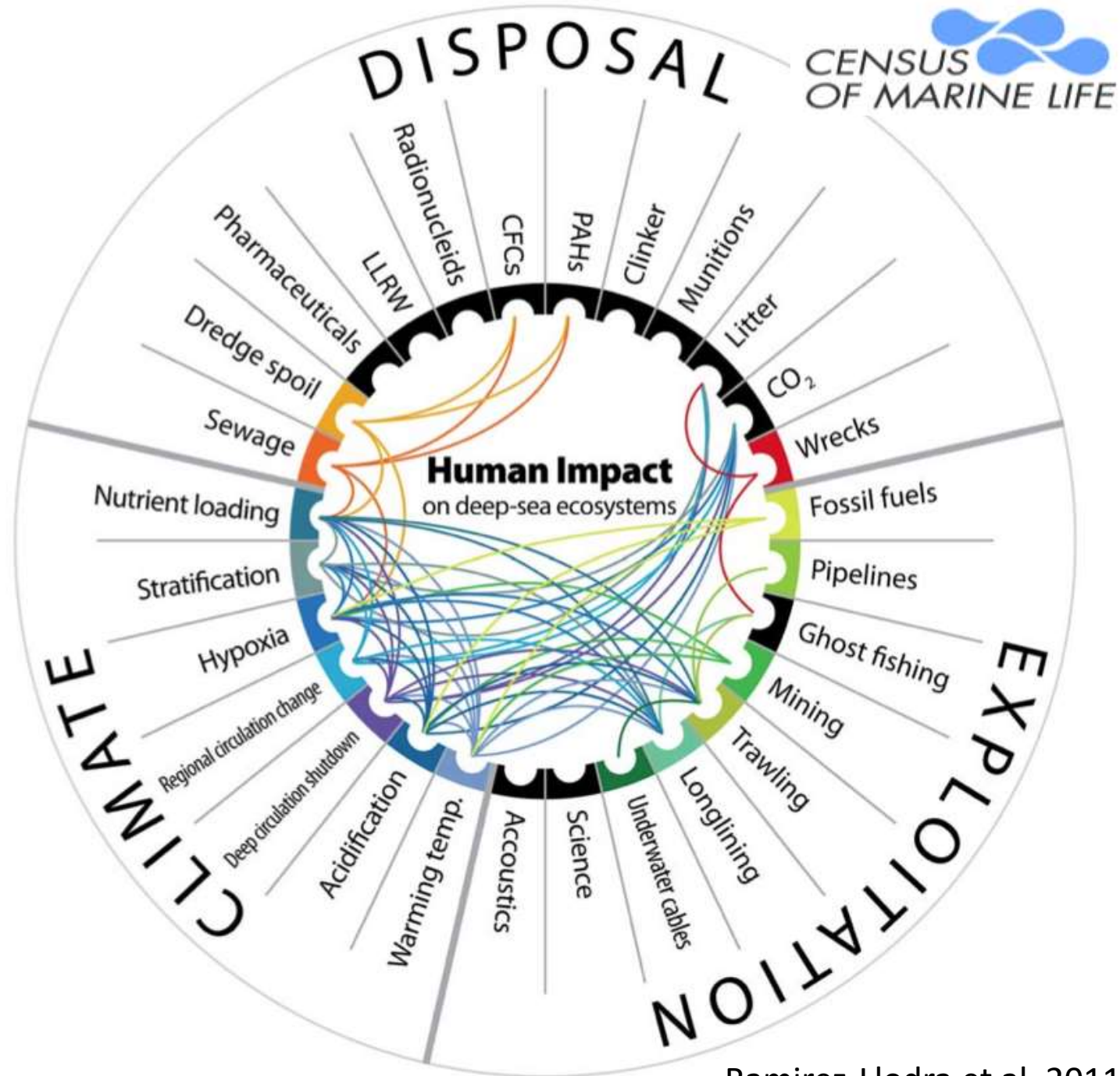
INDIAN OCEAN WHALES
The Indian Ocean whales, including the blue whale, humpback whale, and minke whale, are highly migratory species found in the Indian Ocean. They are known for their long lifespans and their ability to travel vast distances.

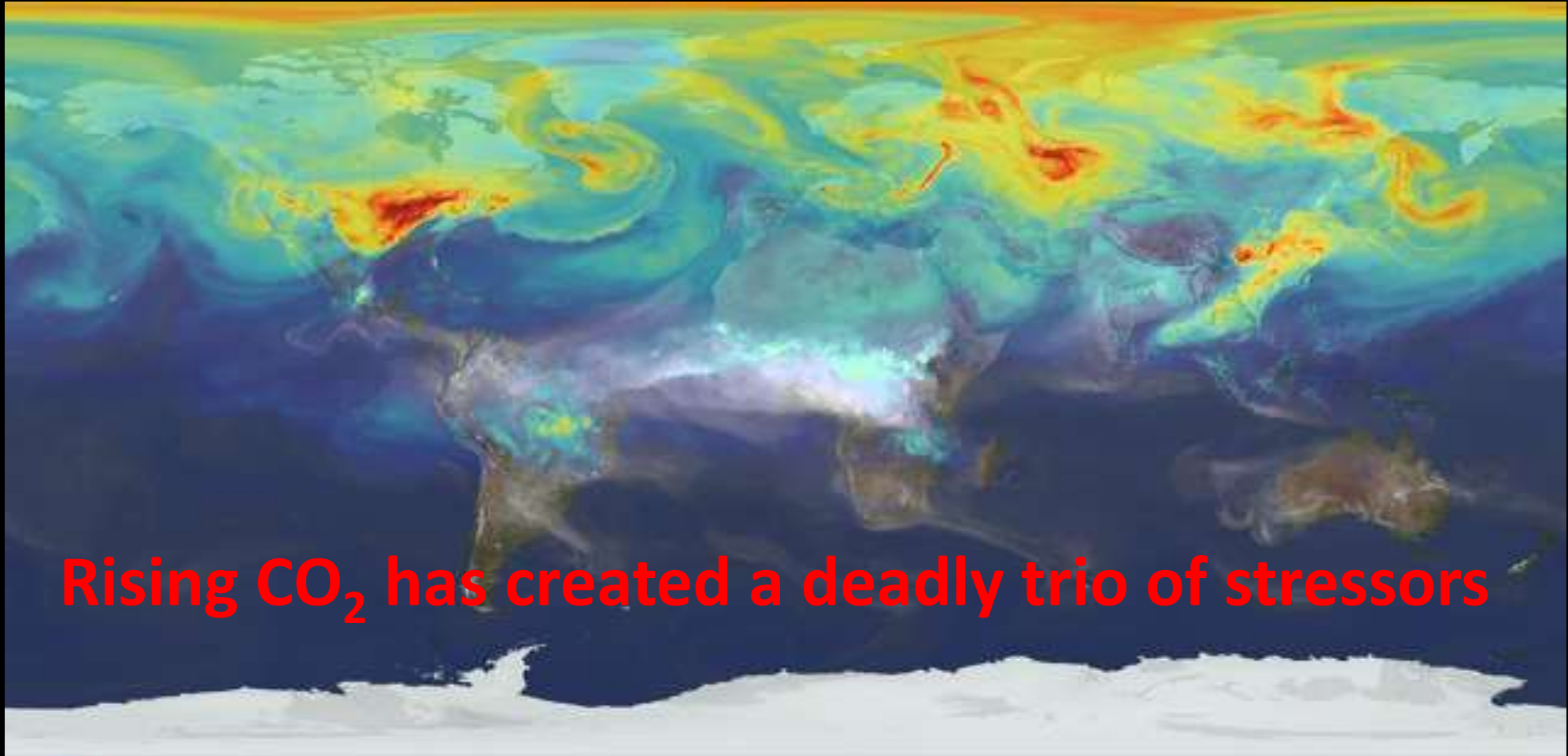
VERTICAL MOVEMENT
Vertical movement is a key feature of many marine organisms, allowing them to move between different depths of the water column. This movement is often driven by changes in temperature, salinity, and light intensity.

“The greatest threat to the ocean comes from a failure to deal quickly with the manifold problems that have been described above.”

UN Regular Process, 2015. FIRST GLOBAL INTEGRATED MARINE ASSESSMENT

http://www.un.org/depts/los/global_reporting/WOA_RegProcess.htm





Rising CO₂ has created a deadly trio of stressors



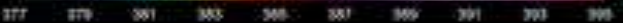
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Global Modeling and Assimilation Office

Carbon Monoxide Column Abundance [1.0e18 molec cm-2]



Carbon Dioxide Column Concentration [ppmv]

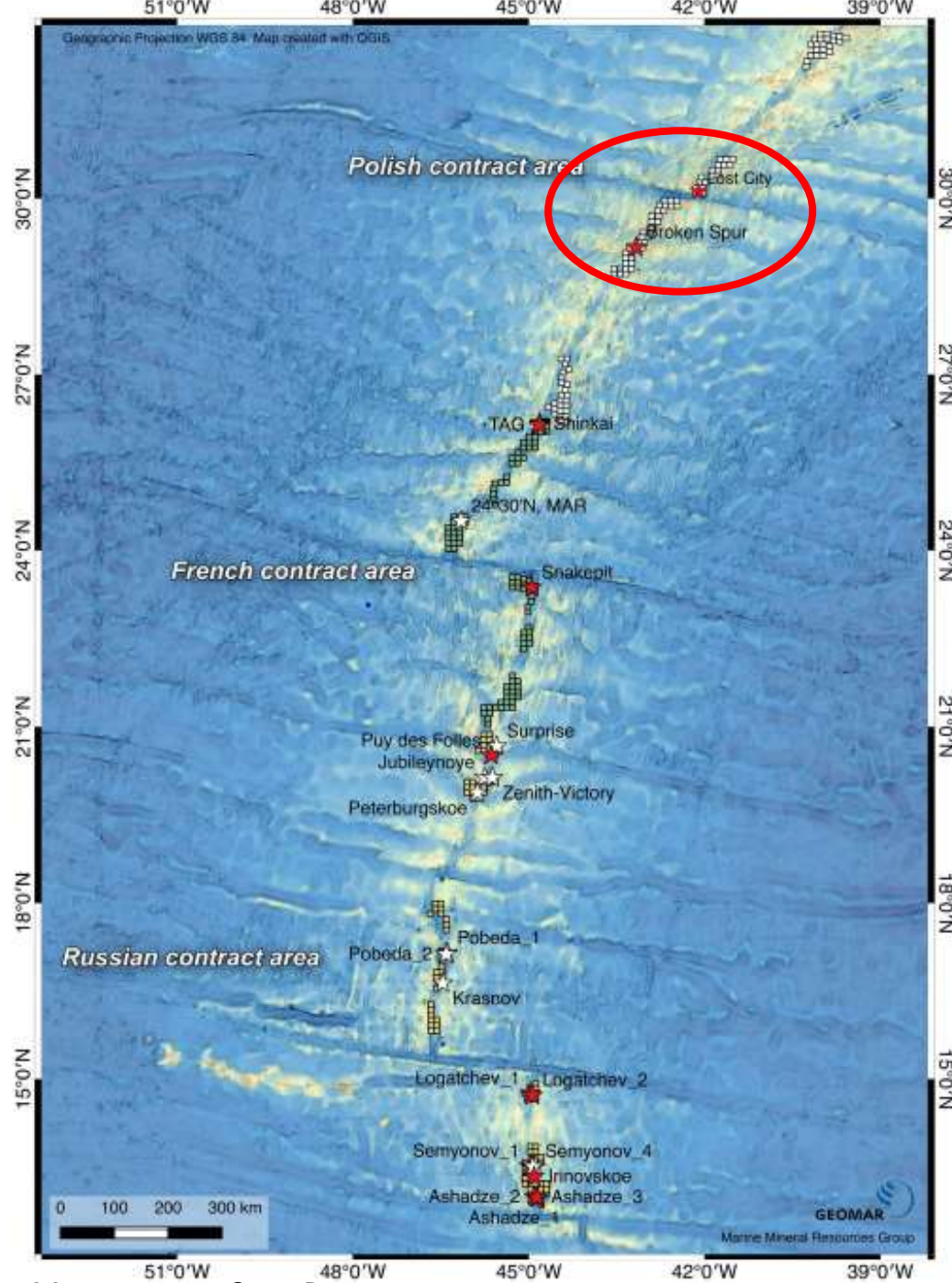


Slide courtesy Lisa A. Levin, PhD.
Center for Marine Biodiversity & Conservation,
Scripps Institution of Oceanography, La Jolla, CA



Photo courtesy John B. Weller

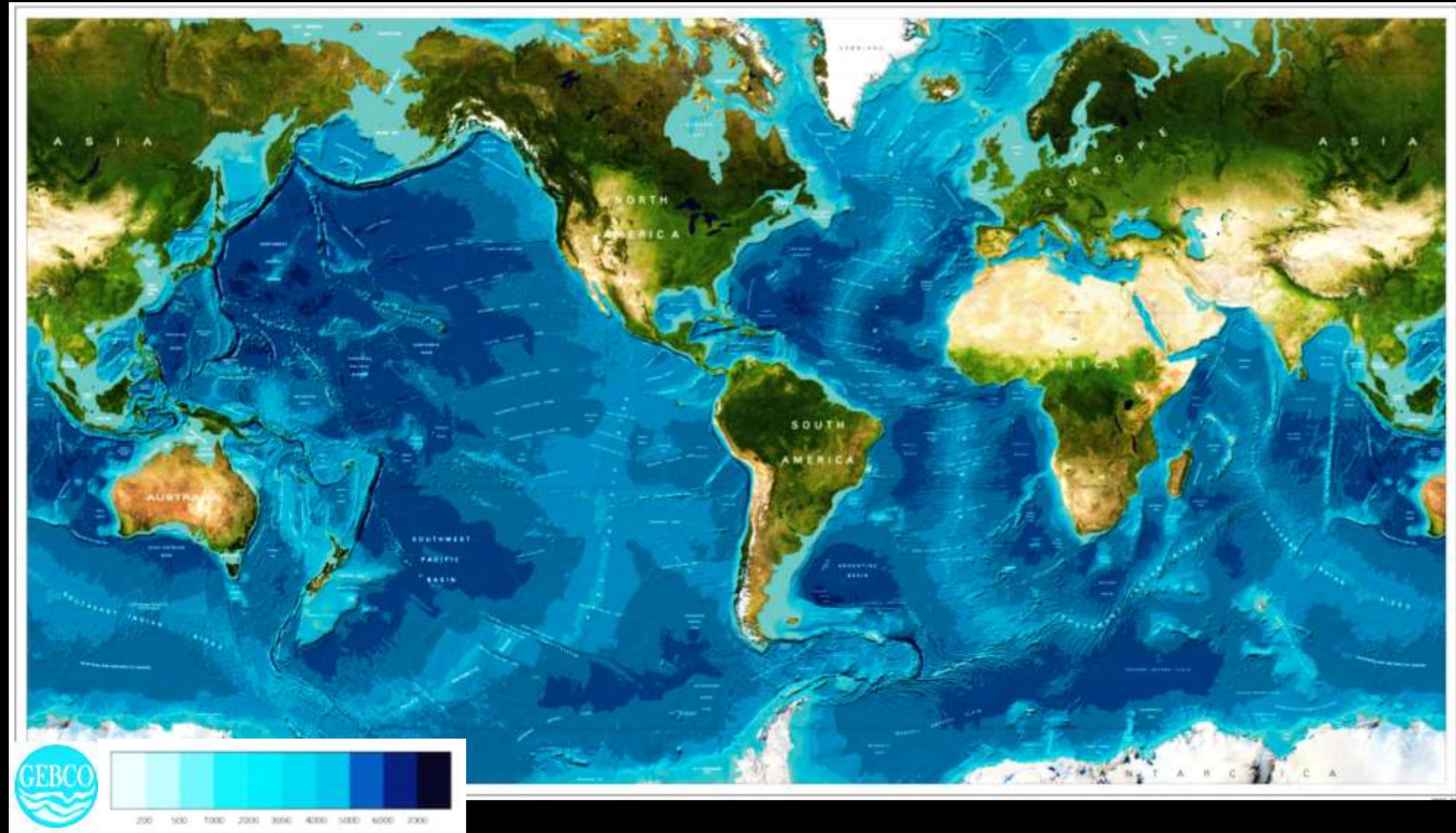
The Lost City
Hydrothermal
Field,
Atlantis Massif,
Mid-Atlantic Ridge



Map courtesy Sven Petersen

Courtesy of IFE, URI-IAO, Lost City science party, and NOAA

The largest habitat for life on Earth is highly diverse & largely unexplored



98% of the ocean's volume is > 200m deep

Time for an Ocean Sustainability Bank?

- National implementation
- Collective conservation
- Research and observations
- Ocean innovation



Slide courtesy Torsten Thiele, Global Ocean Trust

Forty years from now
children will live in a world
shaped by our choices

Gregory C. Johnson, 2013
Climate Change Science Haiku



Thank you for your attention!

NASA, 2010. View from the International Space Station

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