One Ocean: Dead Zones

Background on Dead Zones

Dead zones are regions in fresh and marine aquatic environments in which dissolved oxygen concentrations drop to extremely low levels. The condition of oxygen deprivation, known as *hypoxia*, results from a combination of biological, chemical and physical processes. While such zones do develop naturally in some aquatic ecosystems, many dead zones have expanded and new ones have been formed. The expansion of dead zones can be traced back to human activities—population growth and associated sewage discharges, increased run-off of fertilizers from agricultural use, loss of wetlands and forests to urban development, and deposition of nitrogen from the burning of fossil fuels. Dead zones currently occur in many aquatic ecosystems around the world, including Lake Erie, the northern Gulf of Mexico, Chesapeake Bay, Black Sea, Baltic Sea, in the coastal waters off South America, China, Japan and Australia, and Cape Perpetua off the Oregon coast.

Answer the following questions:

1. Coastal waters occupy only a small portion of the world's oceans (10 per cent), yet they support 90 per cent of sea life. Fifty per cent of the human population is located in areas adjacent to these coastal waters. How does an increase in population in areas adjacent to the world's coastal waters increase pollution and decrease the role that coastal waters play?

2. How do traditional methods of fishing compare with the large fishing fleets that use high-tech equipment?

3. Most countries have quotas for the fish that can be harvested off their shores. Are quotas sustainable?

4. What would be the consequences of a moratorium on fishing a specific species?

5. What has happened to the ocean's harvest as the demand for protein from the sea has increased?

6. Use a world map to show the dead zones of the ocean (show locations and size).

7. Explain why dead zones throughout the ocean have increased and why some have gone from temporary dead zones to permanent ones.

8. What effects do low levels of oxygen have on the reproductive processes of fish?

9. At the bottom of some dead zones no oxygen is present. Explain why areas like this have no living organisms.

10. Why are coastal zones so important to ocean life? Give 3 reasons.

11. Not all organisms in dead zones die, but they still affect the ecosystem. Explain. Use the references to the Mediterranean Sea, Gulf of Mexico and Indian Ocean near Zanzibar.

12. Coral reefs are the most threatened ecosystems of the ocean. Why are they called the jewels of the ocean?

13. Why are Mexican Squid invading B.C? What are the squid doing the fishery of B.C?

14. Why is upwelling so important to marine ecosystems? Explain how dead zones form when phytoplankton over populate?

15. Explain ocean ventilation? Why is this process slowing down?

16. How does the melting of the polar ice caps affect the coastal waters of the world's oceans?

17. What is causing the destruction of the coral reefs and shelled creatures? What dangers does ocean acidification pose to marine organisms?