

Chapter 8 & 11 Review Questions + Problem Set

Directions- On loose-leaf paper, answer the following questions in well-written complete sentences. You do not need to write the question. Number each answer so the number corresponds the question that you have answered. **Only hand-written responses will be accepted. Typed or emailed copies will not be graded.**

Chapter 8 Review Questions

1. What is a coral reef and why should we care about coral reefs?
2. What is coral bleaching?
3. What is an aquatic life zone?
4. Distinguish between a saltwater (marine) life zone and a freshwater life zone and give two examples of each.
5. What major types of organisms live in the top, middle, and bottom layers of aquatic life zones?
6. Define plankton and describe three types of plankton.
7. Distinguish among nekton, benthos, and decomposers and give an example of each.
8. List five factors that determine the types and numbers of organisms found in the three layers of aquatic life zones?
9. What is turbidity, and how does it occur, and what are its harmful impacts?
10. What major ecological and economic services are provided by marine systems?
11. What are the three major life zones in an ocean?
12. Distinguish between the coastal zone and the open sea.
13. Distinguish between an estuary and a coastal wetland and explain why each has high net primary productivity.
14. Explain the importance of sea grass beds.
15. What is a mangrove forest and what is its ecological and economic importance?
16. What is the intertidal zone?
17. Explain the importance of coral reefs.
18. Describe the three major zones in the open sea.
19. What human activities pose major threats to marine systems and to coral reefs?
20. Explain why the Chesapeake Bay is an estuary in trouble and what is being done about some of its problems.
21. What major ecological and economic services do fresh-water systems provide?
22. What four zones are found in deep lakes?
23. Distinguish among oligotrophic, eutrophic, and mesotrophic lakes.
24. What is cultural eutrophication?
25. Define surface water, runoff, and watershed (drainage basin).
26. Describe the three zones that a stream passes through as it flows from mountains to the sea.
27. Describe the relationships between dams, deltas, wetlands, hurricanes, and flooding in New Orleans, Louisiana.
28. Give three examples of inland wetlands and explain the ecological and economic importance of such wetlands.
29. What are four ways in which human activities are disrupting and degrading freshwater systems?
30. Describe inland wetlands in the United States in terms of the area of wetlands lost and the resulting loss of ecological and economic services.

Chapter 11 Review Questions

1. What are three general patterns of marine biodiversity?
2. Describe the threat to marine biodiversity from bottom trawling.
3. How have coral reefs been threatened?
4. What are two causes of disruption of freshwater habitats?
5. Why is marine biodiversity higher (a) near coasts than in the open sea and (b) on the ocean's bottom than at its surface?
6. Give two examples of threats to aquatic systems from invasive species.
7. What are two harmful effects on aquatic systems resulting from the increase in the human population in coastal areas?
8. Give two examples of how pollution is affecting aquatic systems.
9. What are three ways in which projected climate change could threaten aquatic biodiversity?
10. Define fishery.
11. What are three major harmful effects of overfishing?
12. Describe the collapse of the Atlantic cod fishery and the resulting effects on the fishery's ecosystem.
13. What is a fishprint?
14. Describe the factors leading to the near extinction of the blue whale.
15. Describe the effects of trawler fishing, purse-seine fishing, longlining, and drift-net fishing.
16. What is bycatch?
17. How have laws and treaties been used to help sustain aquatic species?
18. Describe international efforts to protect whales from overhunting and premature extinction.
19. How can economic incentives help sustain aquatic diversity? Give two examples.
20. Describe threats to the leatherback turtle and efforts by some people to protect the species.
21. Describe the use of marine protected areas and marine reserves to help sustain aquatic biodiversity and ecosystem services.
22. Describe the roles of fishing communities and individual consumers in regulating fishing and coastal development.
23. Give two examples of the restoration of marine systems.
24. Describe threats from increasing ocean acidity.
25. What is integrated coastal management?
26. Describe the efforts of local fishing communities in helping to sustain fisheries.
27. How can government subsidies encourage overfishing?
28. What are major ecological services provided by wetlands?
29. How does the United States attempt to reduce wetland losses?
30. Describe efforts to restore the Florida Everglades.
31. Describe the major threats to the world's rivers and other freshwater systems.
32. What major ecological services do rivers provide?
33. Describe invasions of the U. S. Great Lakes by nonnative species.
34. Describe ways to help sustain rivers.
35. What are three ways to protect freshwater habitats and fisheries?

Problem Set → Show All Work Do Not Use A Calculator**36. The Effects of Ocean Acidification on Coral Reefs**

Use the assumptions in the table below to perform the calculations that follow.

Assume that the total global area of corals growing in reefs is $2.5 \times 10^{11} \text{ m}^2$.
Assume that corals grow only vertically and that the average vertical growth rate of corals is 3 mm/year.
Assume that the average density of CaCO_3 in corals is $2 \times 10^3 \text{ kg/m}^3$.

- Calculate the current annual global increase in volume, in m^3 , of CaCO_3 in coral reefs.
Show all steps in your calculation.
- Calculate the current annual global increase in mass, in kg, of CaCO_3 in coral reefs.
Show all steps in your calculation.
- Because of ocean acidification, it is expected that in 2050 the mass of CaCO_3 deposited annually in coral reefs will be 20 percent less than is deposited currently. Calculate how much less CaCO_3 , in kg, is expected to be deposited in 2050 than would be deposited if ocean water pH were to remain at its current value.

37. Assessing the Recovery of Coral Reefs in Belize

At least 25% of the world's coral reefs have been severely damaged. A number of factors have played a role in this serious loss of aquatic biodiversity (Figure 8-13), including ocean warming, sediment from coastal soil erosion, excessive algae growth from fertilizer runoff, coral bleaching, rising sea levels, overfishing, and damage from hurricanes.

In 2005, scientists Nadia Bood, Melanie McField, and Rich Aronsosn conducted research to evaluate the recovery of coral reefs in Belize from the combined effects of mass bleaching and Hurricane Mitch in 1998. Some of these reefs are in protected waters where no fishing is allowed. The researchers speculated that reefs in waters where no fishing is allowed should recover faster than reefs in water where fishing is allowed. The graph below shows some of the data they collected from three highly protected (unfished) sites and three unprotected (fished) sites to evaluate their hypothesis.

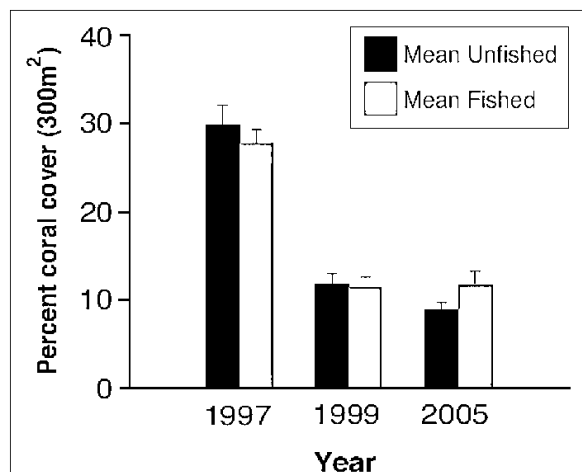


Figure 8-13. Percentage of coral cover fished versus unfished coral reefs in Belize after bleaching and hurricanes.

- By about what percentage did the mean coral cover drop in the protected (unfished) reefs between 1997 and 1999?
- By about what percentage did the mean coral cover drop in the protected (unfished) reefs between 1997 and 2005?
- By about what percentage did the coral cover drop in the unprotected (fished) reefs between 1997 and 1999?
- By about what percentage did the coral cover change in the unprotected (fished) reefs between 1997 and 2005?
- Do these data support the hypothesis that coral reef recovery should occur faster in areas where fishing is prohibited? Explain.

38. Collapse of the Cod Fishery Off the Canadian Coast

Fish landings are simply catches or fish catch.

- What was the maximum fish catch, in tons per year, between 1900 and 2000.
- What fishing practice likely started this trend and what year do you think this practice was implemented?
- Extreme overexploitation of the fishery initiated a steady decline in fish catch. In what year did this decline begin?
- During what years did a slight recovery occur?
- This slight recovery was followed by a total collapse, what year did it happen?
- Identify the 10-year period in which the greatest decline in fish harvest took place.
- For the 10-year period showing the greatest rate of decline, calculate the rate of decline in tons per year.

