

Question 1) What physical/environmental factors affect gray whales?

Amount of sea ice, ocean temperature, food availability, El Nino, Pacific Decadal Oscillation

1 point for each factor

Question 2) How do these factors affect the biology of the gray whale? Match the environmental/physical factor with the behavioral change.

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|--------------------------------|--|
| A) El Nino | 1. Increased calf production as result of more food access |
| B) Pacific Decadal Oscillation | 2. One week delay in southbound migration |
| C) Reduction in Sea Ice | 3. Reduced calf numbers, change in breeding lagoon occupancy |

A = 3, B = 2, C = 1

1 point for each correct response

Question 3) Provide 3 reasons that gray whales have been considered 'ecosystem sentinels'.

1. Gray whales migrate and their behavior is dependent upon environmental factor such as water temperature
2. Gray whales reproductive behavior is dependent upon access to food sources that vary according to climate changes, specifically ice cover in higher latitudes.
3. Gray whales show responses to environmental factors associated with climate change, specifically El Nino and Pacific Decadal Oscillation events.

2 points per response, 1 point for factual correctness, 2 points for linkages between behavior and environmental factor