Climate Change and Species Adaptation

Theme 1: Arctic Species and Cold-Climate Adaptations

- **Polar Bear Migration & Sea Ice Loss**: Polar bears adjust movement patterns due to earlier sea ice melting, impacting their ability to find food (Cherry et al., 2013).
- **Beluga Whales & Prey Availability**: Beluga whales alter feeding behaviors as environmental factors change, affecting their body condition (Choy et al., 2017).
- **Polar Bear Genetic Fragmentation**: Reduced Sea ice limits polar bear movement, increasing genetic isolation and reducing population resilience (Maduna et al., 2021).
- **Little Auk Survival Decline**: Warmer temperatures affect prey availability, nesting grounds, and reproductive success, increasing mortality rates (Hovinen et al., 2014).
- **Polar Bears & Narwhal Space Use**: As sea ice declines, polar bears move inland while narwhals shift migration routes, increasing human-wildlife interactions (Hamilton et al., 2019).
- **Narwhals & Rising Sea Temperatures**: Higher Ocean temperatures force narwhals to relocate for cooler water and food, impacting survival (Chambault et al., 2020).

Theme 2: Coral Reefs and Ocean Warming

- **Arctic Seabird Metabolism & Climate Change**: Increased temperatures raise metabolic rates, causing oxidative stress and reducing reproductive success in Arctic terns and long-tailed jaegers (Fowler, 2023).
- **Marine Species & Ocean Acidification**: Some marine organisms adjust to acidification through biochemical adaptations, while others struggle, reducing biodiversity (Parker et al., 2020).

Theme 3: Forest Ecosystem Species and Terrestrial Adaptations

- **Caribou Migration Timing & Climate Effects**: Rising temperatures alter migration timing, affecting habitat use, food access, and predator exposure (Gurarie et al., 2019).

Theme 4: Marine Species and Oceanic Adaptations

- **Sculpins & Temperature-Driven Competition**: Warmer waters increase metabolic demands in Greenland sculpins, intensifying competition for resources (Seth et al., 2013).
- **Narwhals & Ocean Warming Impact**: Narwhals shift habitat to maintain optimal temperatures and prey availability, highlighting climate-related survival challenges (Chambault et al., 2020).

Theme 5: Implications for Biodiversity

- **Species Adaptation & Ecosystem Balance**: Genetic diversity enhances species survival in acidified environments, while others face extinction risks (Parker et al., 2020).
- **Polar Bear Genetic Decline & Habitat Loss**: Loss of genetic diversity due to habitat fragmentation threatens polar bear populations and long-term adaptability (Maduna et al., 2021).

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