Climate Change Impacts on Coral Reef Ecosystems and Societal Implications

Hazard Events
- Ocean Acidification
  - Bioerosion, Dissolution
  - Recruitment, Growth
- Elevated Sea Temperature
  - Bleaching
  - Growth
- Storm Events
  - Structural Damage

Ecological Exposure
- Coral Reef
  - Habitat
  - Reef Structure
  - Local Stressors

Ecological Services
- Fisheries
  - Ecosystem Services
- Shoreline Protection
  - Against waves, surge, and sea level rise

Dependence
- Livelihoods and Nutrition
- Lives, Property, and Businesses

Figure 20.10: The figure shows the connections between climate-related impacts (ocean acidification and warming as well as severe storms), responses of marine habitats and species to these impacts, and, ultimately, the effects to ecosystem services (such as fisheries and shoreline protection) and, in turn, the human community. Specifically, the figure depicts how degradation of coral reefs due to climate change is expected to affect fisheries and the economies that depend on them as habitat is lost. The figure also shows how reef degradation decreases shoreline protection for local communities, which affects the economy and human populations more generally. Source: adapted from Pendleton et al. 2018. Photo credits: NOAA.