

Ecological Effects of Climate Fluctuations

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Abstract

Climate influences a variety of ecological processes. These effects operate through local weather parameters such as temperature, wind, rain, snow, and ocean currents, as well as interactions among these. In the temperate zone, local variations in weather are often coupled over large geographic areas through the transient behavior of atmospheric planetary-scale waves. These variations drive temporally and spatially averaged exchanges of heat, momentum, and water vapor that ultimately determine growth, recruitment, and migration patterns. Recently, there have been several studies of the impact of large-scale climatic forcing on ecological systems. We review how two of the best-known climate phenomena—the North Atlantic Oscillation and the El Niño–Southern Oscillation—affect ecological patterns and processes in both marine and terrestrial systems.