
AQUATIC-TERRESTRIAL LINKAGES: FORMATION, IMPORTANCE, AND DISRUPTION

Merav Ben-David, University of Wyoming, Laramie, Wyoming 82071

We can no longer regard ecosystems as discrete entities in space. Similar to human societies, the natural environment is a product of a wide range of transport, propagation, and communication processes. Spatial coupling of ecosystems through cross-habitat fluxes of energy and matter may modify food web interactions, change ecosystem function, and alter community diversity. Lateral fluxes of matter and energy between discrete ecosystems have been shown to elicit variable responses in the recipient ones depending on trophic position, ecological process, biotic and abiotic conditions, and the ratio between the subsidy and local resources. In some cases, cross ecosystem nutrient fluxes can be as important as transfers within individual ecosystems. Some of the best documented ecosystem linkages occur in aquatic-terrestrial systems. For example, terrestrial animals feeding in freshwater and marine habitats transfer nutrients from these aquatic to adjacent terrestrial ecosystems leading to increases in primary production in the latter. Such increases in production are comparable in magnitude to positive effects of moderately elevated local herbivory observed in some systems or nitrogen fixation by alder. Nonetheless, recent human-induced ecosystem alterations result in disruption of the spatial continuity of ecosystem linkages. Here I evaluate the current knowledge on the formation and importance of aquatic-terrestrial linkages and provide examples of the consequences of discontinuity in these transport processes.