Implications of Climate Change for Invasive Species

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Abstract

Invasive species and climate change are two of the most prominent forms of anthropogenic global change identified by the Millennium Ecosystem Assessment. Invasive species have pronounced negative impacts on ecosystems and economies, and these impacts may be exacerbated by climate change. But, for most invasive species and invaded ecosystems, the outcomes of this interaction remain unknown. This presentation will review the current state of knowledge about how climate change influences invasive species.

The presentation covers the following topics: Effects of rising temperature, potential range shifts, novel disturbance regimes, and plant response to rising CO_2.

1. Rising temperature could benefit invasive species directly by increasing growth rates relative to native species, and by expanding the growing season to create more opportunities in time for invasive species to establish and thrive.

2. Warming and altered precipitation are already causing the ranges of species to shift, including invasive species. But many invasives are already widely introduced and will have a head start relative to native.

3. Climate change is likely to lead to a 'peakier' precipitation cycle, increasing both drought and flood events. Invasive species tend to thrive under these conditions with higher disturbance.

4. Finally, although rising CO_2 provides a resource for all plants, invasive plants consistently outperform native plants with elevated CO_2 and are more resistant to herbicides. Collectively, these findings suggest that we should be on the lookout for invasive species expanding into new landscapes, emerging earlier in the growing season, and becoming even more competitive.

Presenter

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Dr. Bethany Bradley is a Professor of Biogeography and Invasion Ecology in the Department of Environmental Conservation at the University of Massachusetts, Amherst. She is interested in how the geographical locations of species across landscapes and regions can inform ecological understanding of species distributions, invasion risk assessments, and conservation planning. Her research has a strong focus on terrestrial plant invasions, with a goal of understanding how invasive plant distributions, abundance, and impact vary spatially. Dr. Bradley also leads the Northeast Regional Invasive Species & Climate Change (RISCC) Management network, which addresses the question of how we can better manage for upcoming biological invasions in light of climate change.