
Towards island-specific scenarios of biological invasions in the 21st century

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Abstract

Biological invasions have emerged as an eminent feature of recent global change, with substantial impacts on the environment and human livelihoods. Recent research demonstrated that numbers and impacts of alien species are rising unabatedly. At the same time, we lack a thorough understanding of potential future trajectories for the decades to come. With the recent establishment of comprehensive global databases on alien species distributions and impacts, it is for the first time feasible to develop and quantify future scenarios of biological invasions. Islands are especially interesting study systems as they host major biodiversity hotspots with exceptionally high endemic richness. However, anthropogenic pressures, like climate change, land use and land-cover change, pollution, overexploitation and invasive species increasingly threaten native island biodiversity. From a biological invasion perspective, islands host disproportionately high numbers of alien species compared to mainland regions and absolute numbers often exceed the native richness of flora and fauna. Further, invasive alien species are among the major threats for island biodiversity being involved in 86% of all recorded island extinctions. Here, we present a conceptual framework and a roadmap for the development of island-specific scenarios and models on how alien species richness and impact might change in the 21st century. This includes the establishment of qualitative scenario narratives and the quantification of pressures and impacts for these narratives. We aim at understanding the long-term trajectories of biological invasions on islands under different assumptions of the future, both qualitatively and quantitatively. Evaluating the option space for reducing the impacts of invasive species on island biota is crucial to develop adequate management and policy options. Finally, we aim to engage with the participants of the Island Biology Conference and utilize their expertise and wide variety of backgrounds to refine the central questions such scenarios should address.

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