

It's a small, small world: viruses, vectors, and invaders

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Growing evidence indicates that viruses shape biological systems in profound ways and deserve attention in analyses of invasive species. Viruses are ubiquitous in oceans, where they influence carbon cycling dynamics as well as production of marine aerosols--both factors that contribute to development of climate and weather patterns. Viruses are also widespread among organisms on land, where they exert numerous effects that are only now being examined. For example, a virus of a fungal endophyte has recently been identified as the key element conferring adaptation to extreme heat in host plants. Viruses may play several roles in invasions. In some cases, viruses and/or the vectors that move them may be the invaders, introduced to new environments by natural events or by human transportation of biological materials; because viruses and vectors are small, they may easily escape detection focused on larger organisms. Alternatively, the invasion of new host species may alter the dynamics of established viruses, with numerous possible consequences for resident communities. In some cases, viruses may even facilitate the success of invasive hosts. New molecular screening tools will increase our understanding of viruses' roles in invasions and the need for management.