What and where? Identifying high-risk aquatic invasive species and hotspots of suitable habitat in the Arctic

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Abstract

The risk of aquatic invasive species (AIS) introductions in the Arctic is expected to increase with ongoing trends of greater shipping activity, resource exploitation, and climate warming in the region. We identified a suite of AIS (benthos, zooplankton and macroalgae) with the greatest likelihood of introduction and impact in the Canadian Arctic using the Canadian Marine Invasive Screening Tool. The top sixteen riskiest species (mainly benthic) were then modelled to predict the potential spatial distributions (habitat modelling using Maximum Entropy) at an Arctic scale. Modelling was conducted under present environmental conditions and under two future global warming scenarios (2050 and 2100). Results show that hotspots or regions where suitable habitat is more densely accumulated for modelled AIS are in the Hudson Complex, Chukchi / Eastern Bering Sea, and Barents / White Sea. Most taxonomic groups showed a trend for a positive poleward shift in the future, increasing from the present time to the end of the century. This approach will aid in the identification of present and future high-risk areas for AIS in response to global warming.

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