



<p>WORKING PROJECT TITLE</p>	<p>Shipping as a pathway of introduction for invasive species in Africa</p>
<p>CORE TEAM MEMBER</p>	<p>Mark Robertson</p>
<p>ACADEMIC LEVEL OF THE PROJECT</p>	<p>MSc</p>
<p>PROJECT BACKGROUND</p>	<p>Shipping is a major pathway of introduction for marine alien species that are transported on ships' hulls or in ballast water carried by ships. There is a strong relationship between shipping traffic and the number of species introduced, and more species are likely to be introduced to ports that are on busy shipping routes. However, whether these introduced species establish and become invasive depends on the suitability of the environment and the dissimilarity of the recipient community. Furthermore, species with a history of invasion elsewhere are most likely to cause negative impacts on the recipient community. In order to identify the potential donor ports of species that could be introduced to and establish in a particular port, it is necessary to determine which ports are linked to the recipient port via busy shipping routes, and evaluate the environmental similarity between these ports and the seasonal timing and duration of the voyages between them (Faulkner et al. 2017). Species that occur in potential donor ports and that have a history of invasion and impact elsewhere can then be identified and early</p>



detection and eradication measures can be planned for these species. The aim of the project is to identify shipping routes to major African ports that are likely to facilitate the introduction of species that could establish and identify species with a history of invasion and impact that could be transported along these routes. Prospective students will need to have some programming experience and knowledge of GIS.

FURTHER READING

Faulkner KT, Robertson MP, Rouget M, Wilson JR (2017) Prioritising surveillance for alien organisms transported as stowaways on ships travelling to South Africa. *Plos One* 12: e0173340.

Sardain A, Sardain E, Leung B (2019) Global forecasts of shipping traffic and biological invasions to 2050. *Nature Sustainability* 2: 274-282.

Seebens H, Schwartz N, Schupp PJ, Blasius B (2016) Predicting the spread of marine species introduced by global shipping. *Proceedings of the National Academy of Science of the United States of America* 113: 5646-5651.

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