



## Challenges in quantifying, interpreting and predicting distributional shifts of marine species

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## Species on the Move 2019 (<http://www.speciesonthemove.com/> )

Monday 22 to Friday 26 July 2019, Skukuza Rest Camp, Kruger National Park, South Africa

Theme 1. **Detection, attribution & prediction of changes in species distributions**

### **Challenges in quantifying, interpreting and predicting distributional shifts of marine species**

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Abstract submitted:

Oceans are absorbing approximately 80% of the extra heat and 50% of additional CO<sub>2</sub> trapped in the atmosphere and, as a result, have undergone rapid changes in temperature and acidity. The evidence for climate-driven global re-distribution of marine species is growing but often based on the distribution of fish species, many of which are mobile and able to rapidly shift their ranges in response to changing environmental conditions. Standardised surveys are commonly used for inferring spatial distribution, however, there are many examples of species moving beyond the bounds of a survey which then limits our understanding. Additionally, there are often non-climate factors that confound the interpretation of range shifts, e.g. fishing or habitat changes. Quantifying the magnitude and rates of distributional shifts is further complicated by the variety of metrics that are used to describe historical species distributions and then contemporary changes in these distributions. Accurately specifying both the suite of drivers underpinning range shifts and the magnitude of range shifts is essential due to the societal importance of marine species for food, local economies and future projections of commercial fish species. Here, based on a cross-comparison of methodological approaches from a range of globally important marine ecosystems, we make recommendations for appropriate approaches to the collection, analysis and interpretation of data describing the abundance and location of marine species.