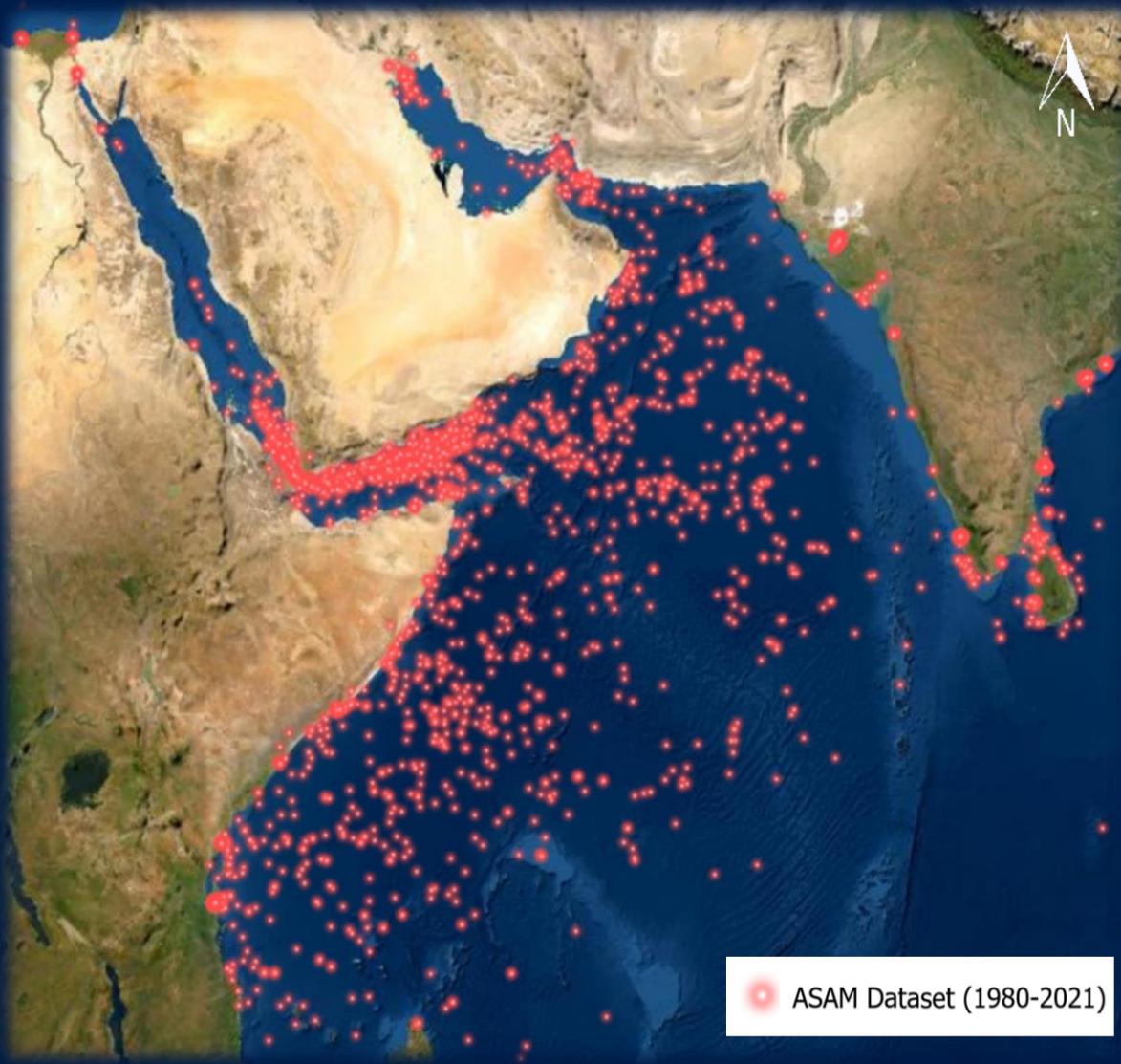


# Spatial and Temporal Patterns in Piracy

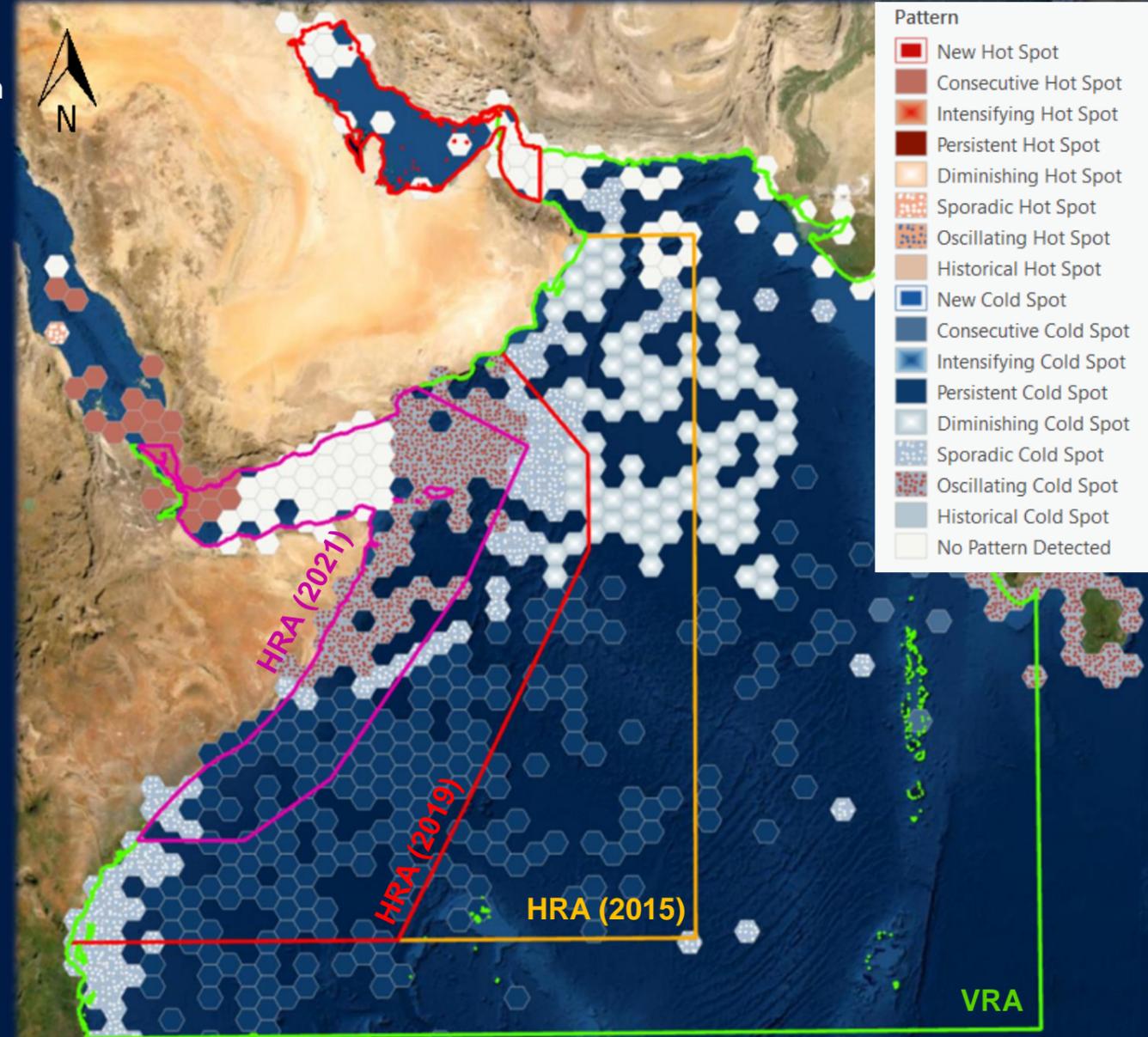
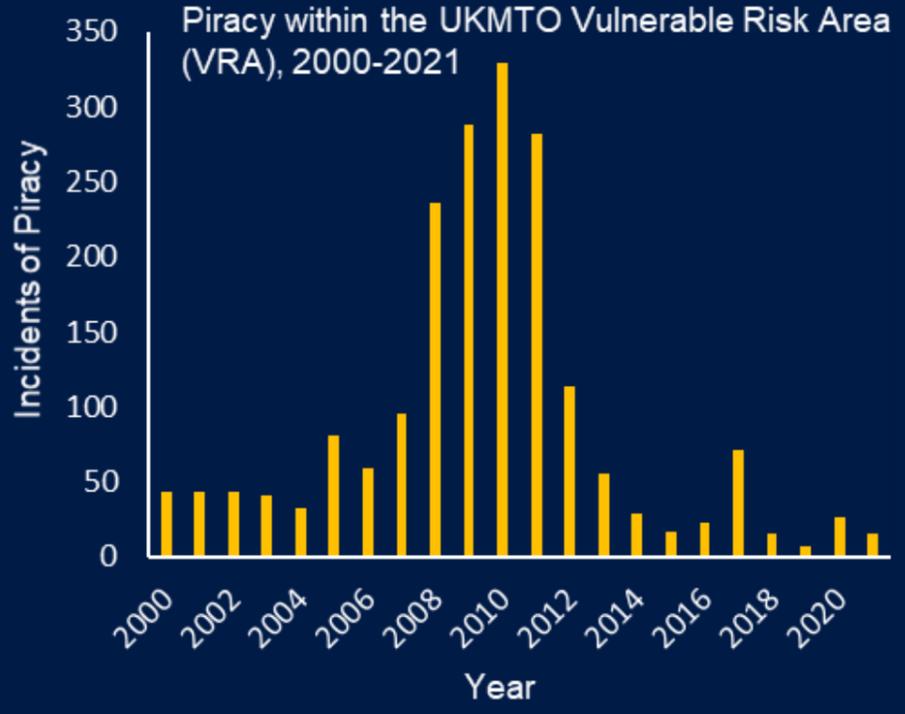
Investigating trends in incidents of piracy using the Anti-Shipping Activity Messages (ASAM) dataset (1980-2021), with a spatial focus on the Gulf of Aden and a temporal focus on the reduction in the UKMTO's High Risk Area (HRA) over the last 6 years.



From 2015 until 2021, the UKMTO have reduced the boundaries of their HRA in the Indian Ocean. Using the Space-Time Pattern Mining Toolbox in ArcGIS Pro, spatial and temporal trends can be visualised to indicate as to why this decision has been made.

Emerging Hotspot Analysis and Space-Time cube visualisations were used to highlight that between 2000 and 2021, areas further out into the Indian Ocean have been subject to a decrease in the number of piracy incidents.

This is highlighted by the *down trends* bottom left and *diminishing, sporadic* or *oscillating* cold spots to the right. Piracy has been statistically significantly decreasing in these areas over the last 20 years and thus the UKMTO has seen fit to reduce the boundaries of it's HRA.



Emerging Hotspot Analysis with ASAM data 2000-2021 (1,000km<sup>2</sup> neighbourhood distance at 10 year time steps)