Piracy and Conflict in the Nigerian Littoral
Risk and Change Analyses

Piracy Hotspots

Risk of Piracy
- Medium
- Medium High
- High
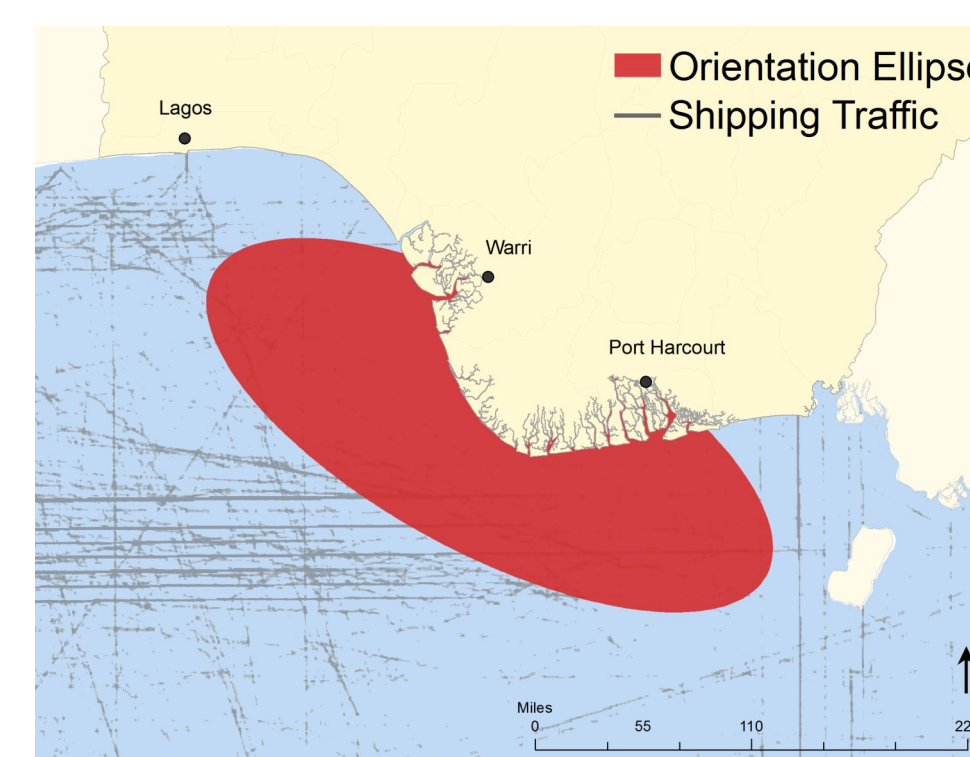- Very High
- — Shipping Traffic

Background

More piracy incidents occurred in the Gulf of Guinea than anywhere else in 2013. Nigeria in particular faces serious security threats, mostly in the Niger Delta. Because of the diverse heterogeneity of the Delta, which is home to more than 40 ethnic groups, the government has little political legitimacy crisis. Without strong government control, non-state armed groups have proliferated, and the Niger Delta has been beset by violent crime including terrorist attacks, oil theft, kidnappings, trafficking of illicit goods and persons. The active non-state armed groups are quite frequently involved in more than one domain, i.e. piracy and theft, or terrorism and trafficking. The maritime domain is particularly vulnerable in Nigeria, with a 583 km coastline, 3,200 km of navigable delta rivers, as well as extensive offshore oil extraction, shipping traffic, and rich fishing resources.

Research Questions

1) Are certain shipping routes at high risk for piracy and armed robbery? What areas are most vulnerable to piracy attacks?

2) Is there a relationship between piracy and conflict on land? Given that non-state armed groups are involved in both piracy and armed conflict on land, is there a spatial relationship? Can we visualize a temporal and spatial relationship?

Methodology

To measure **risk**, I used a kernel density analysis to create 100,000 kilometer hotspots, and classified areas of risk from medium to very high. I also used spatial statistics to measure a directional distribution (one standard deviation) of the piracy attacks to visualize the spatial orientation of attacks. I also converted the piracy hotspots into polygons and used zonal statistics to measure of shipping traffic at risk.

To measure **changes over time**, I subset a conflict dataset twice - first selecting for conflict events within 100 kilometers of the coast, and then selecting two time periods, 2000-2004 and 2005-2009. I also subset an older, piracy data set into 2000-2004 and 2005-2009. I then conducted kernel density analyses for all four data sets. After mapping the hotspots of each data set, I used the raster calculator to measure changes over time in both conflict on land and piracy.

Limitations

This project is a demonstration of methods cartographers can use to conduct piracy hotspot analyses , as well as visualize changes in conflict over time. There are several limitations to the present analysis. Since piracy data is based on self-reporting, the incidents are not representative of all attacks, and are biased towards the inclusion of larger ships with a global reach. Second, piracy and conflict data do not always contain accurate geospatial information, and it is difficult to discern if attack locations are accurate or are approximations.
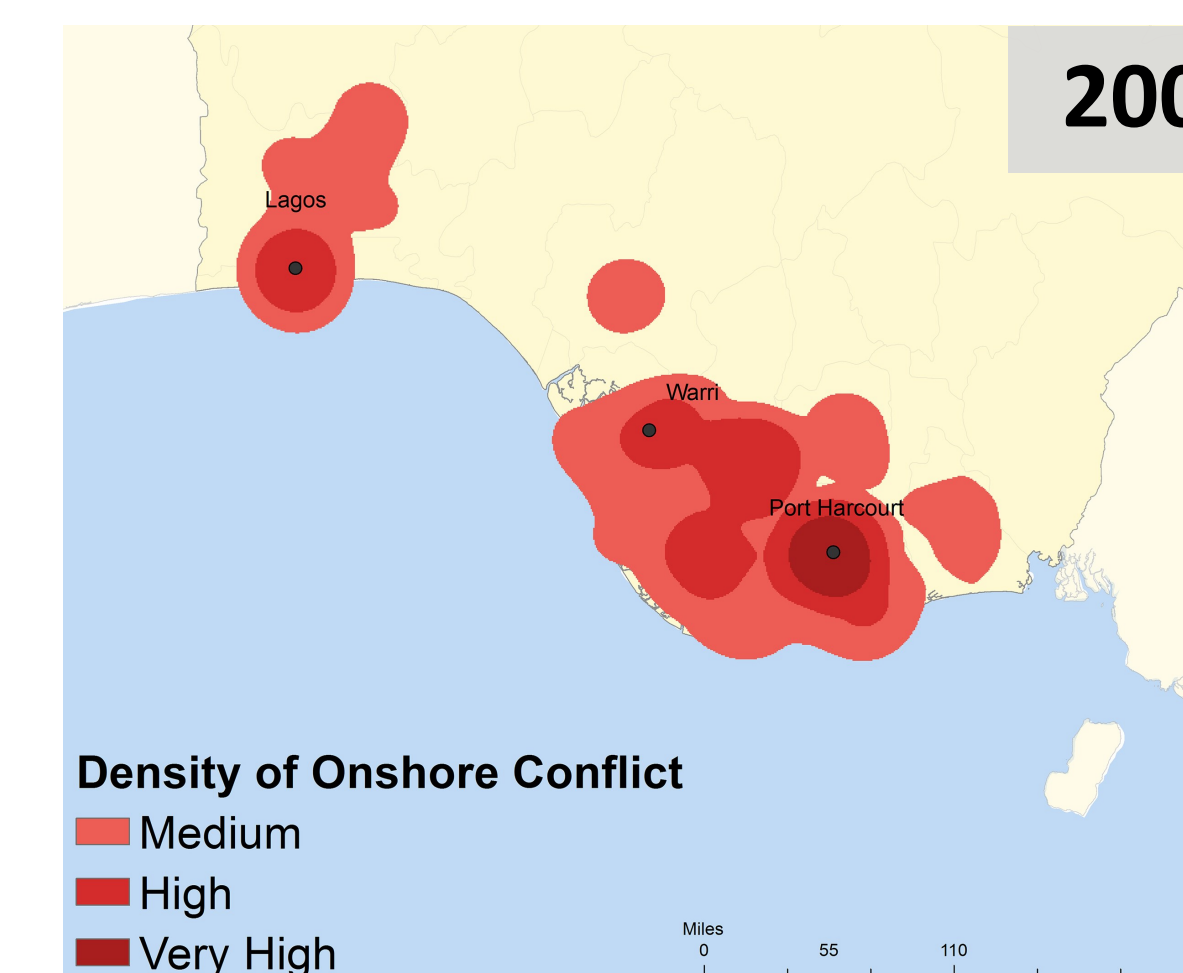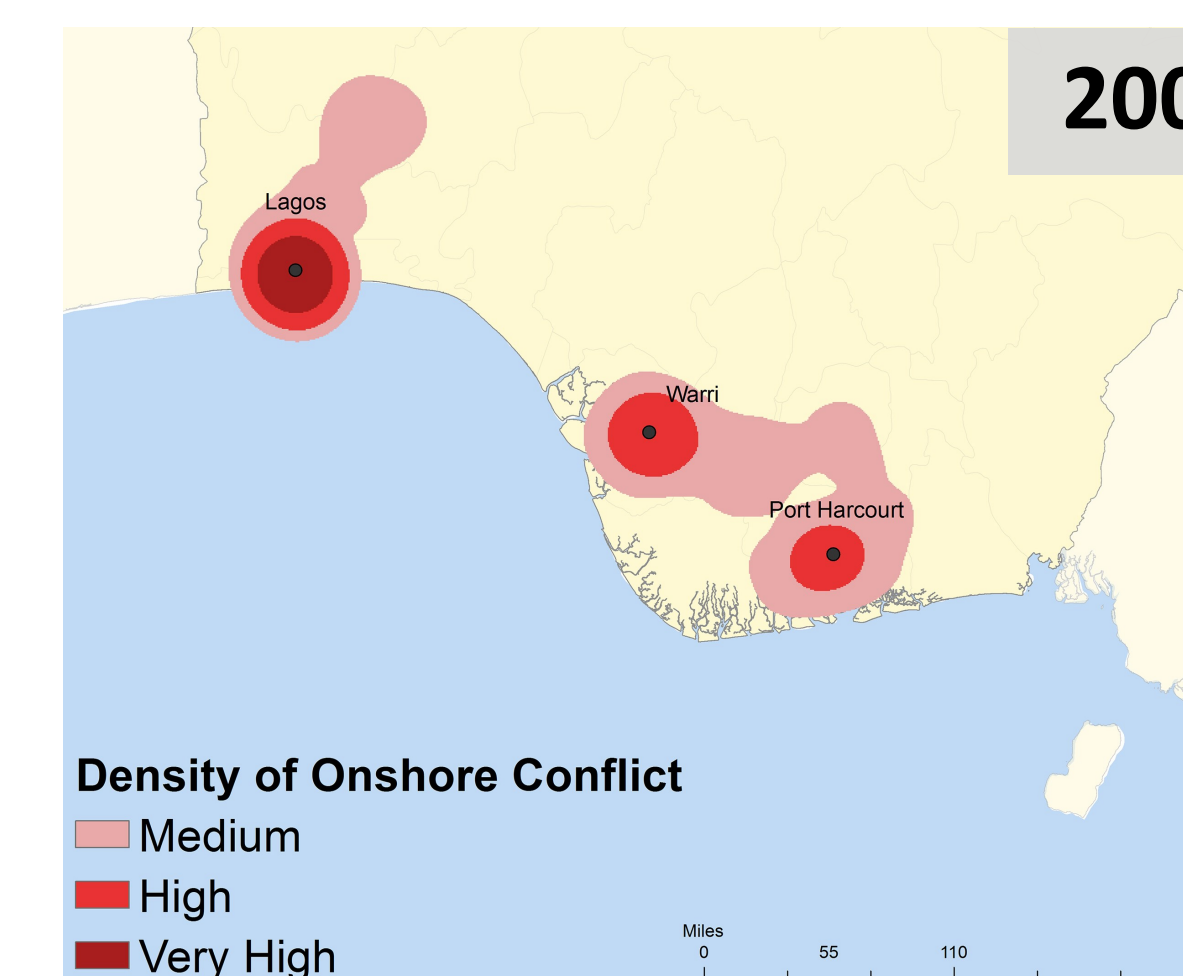

Findings

The piracy hotspot map is a useful guide for policymakers and ship captains, since it offers a visualization of most at-risk areas. Similarly, the standard deviation ellipse provides a general orientation of pirate incidents, which might guide efforts to improve maritime patrols.
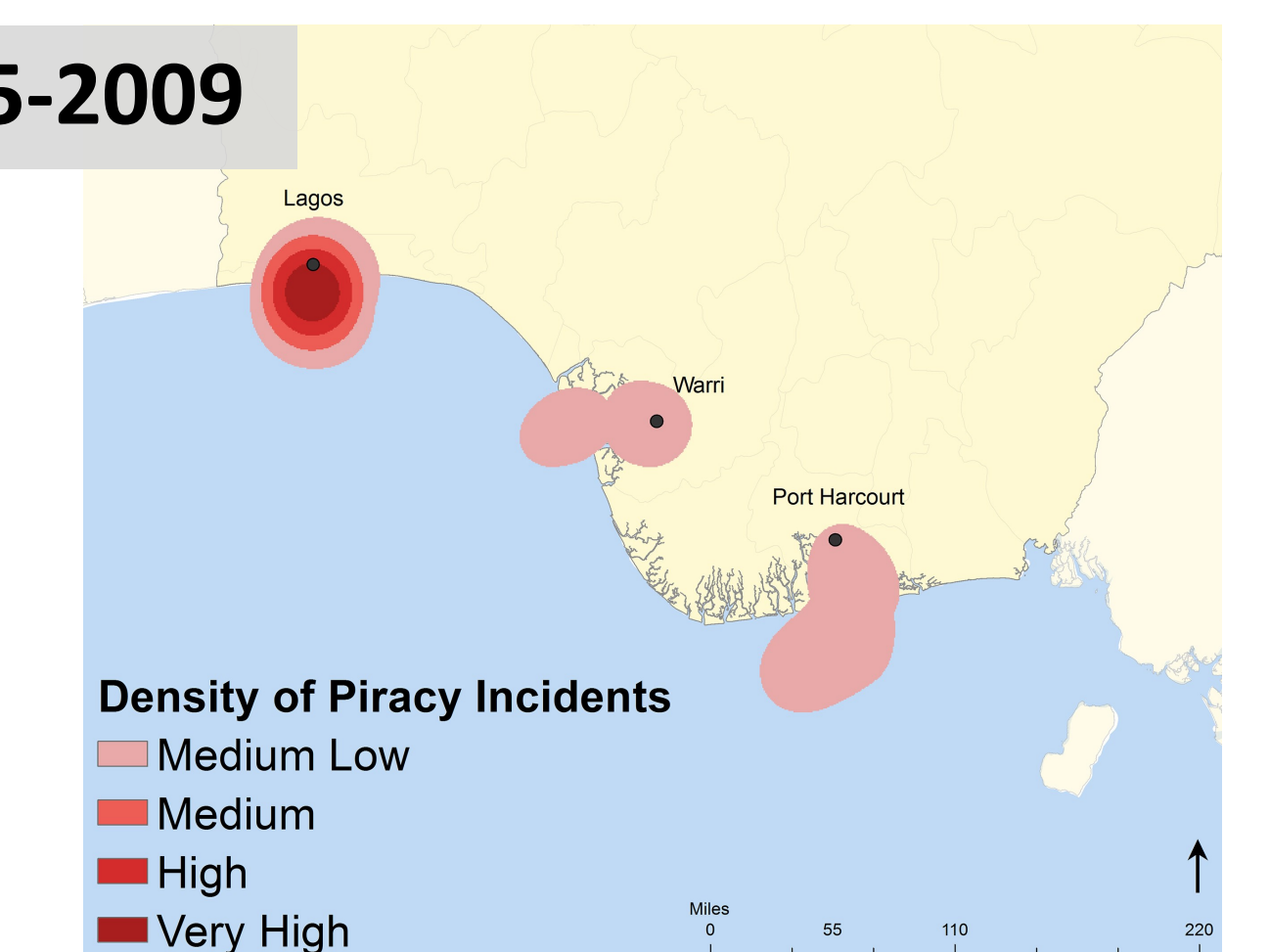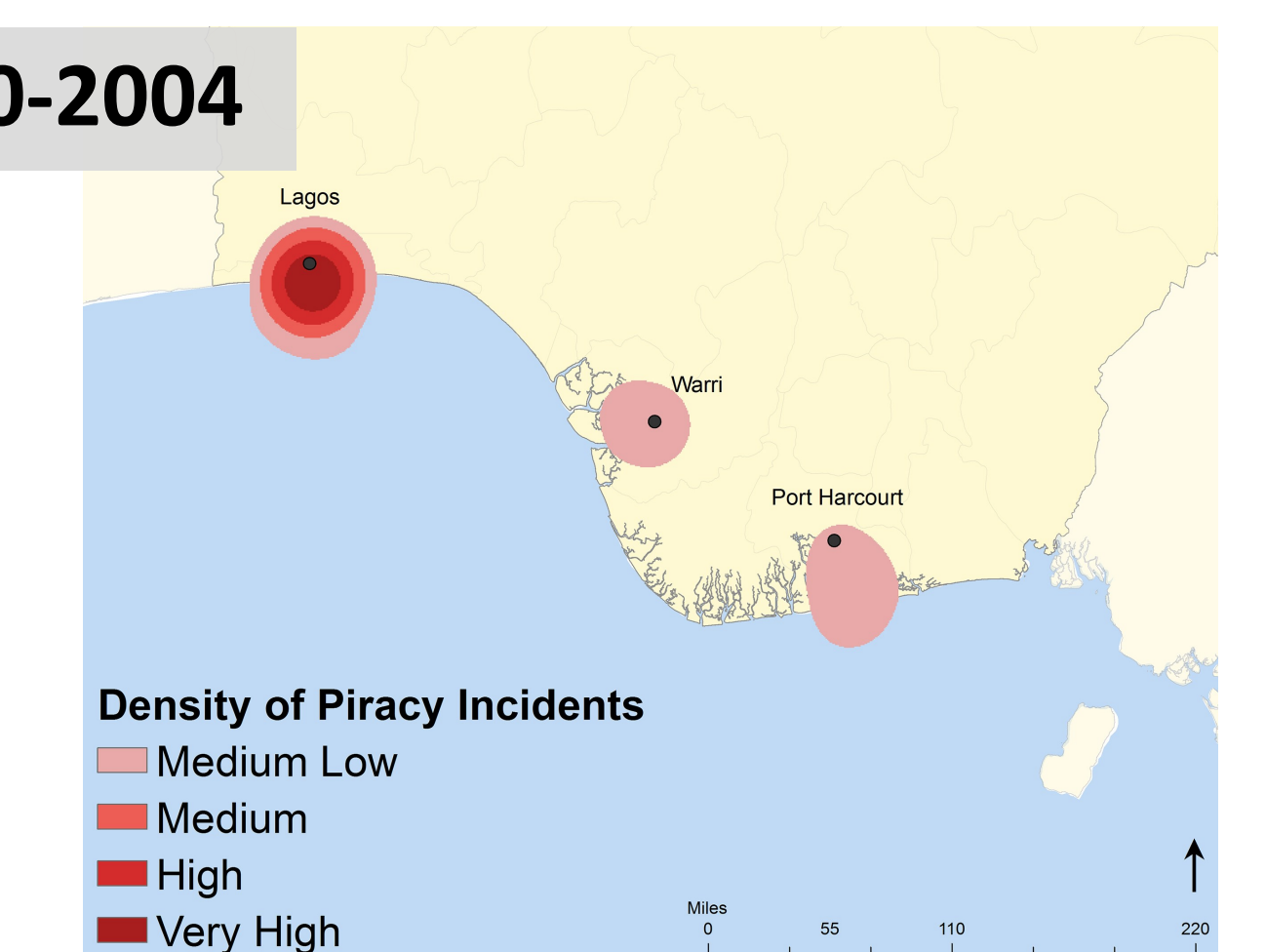
The change detection analysis is interesting since it shows that in areas where conflict on land decreased, so did piracy and armed robbery. This finding supports the hypothesis that armed conflict on land
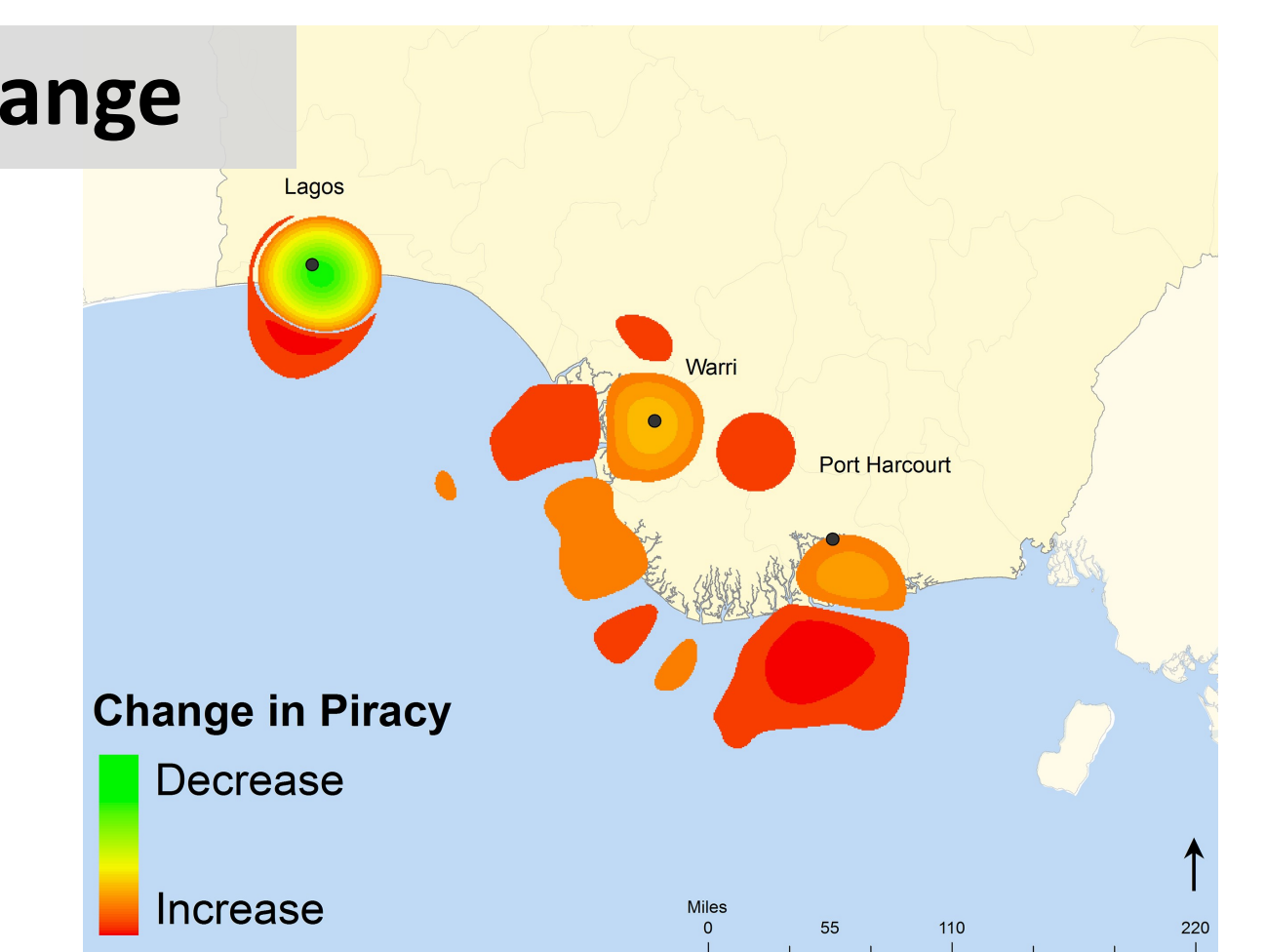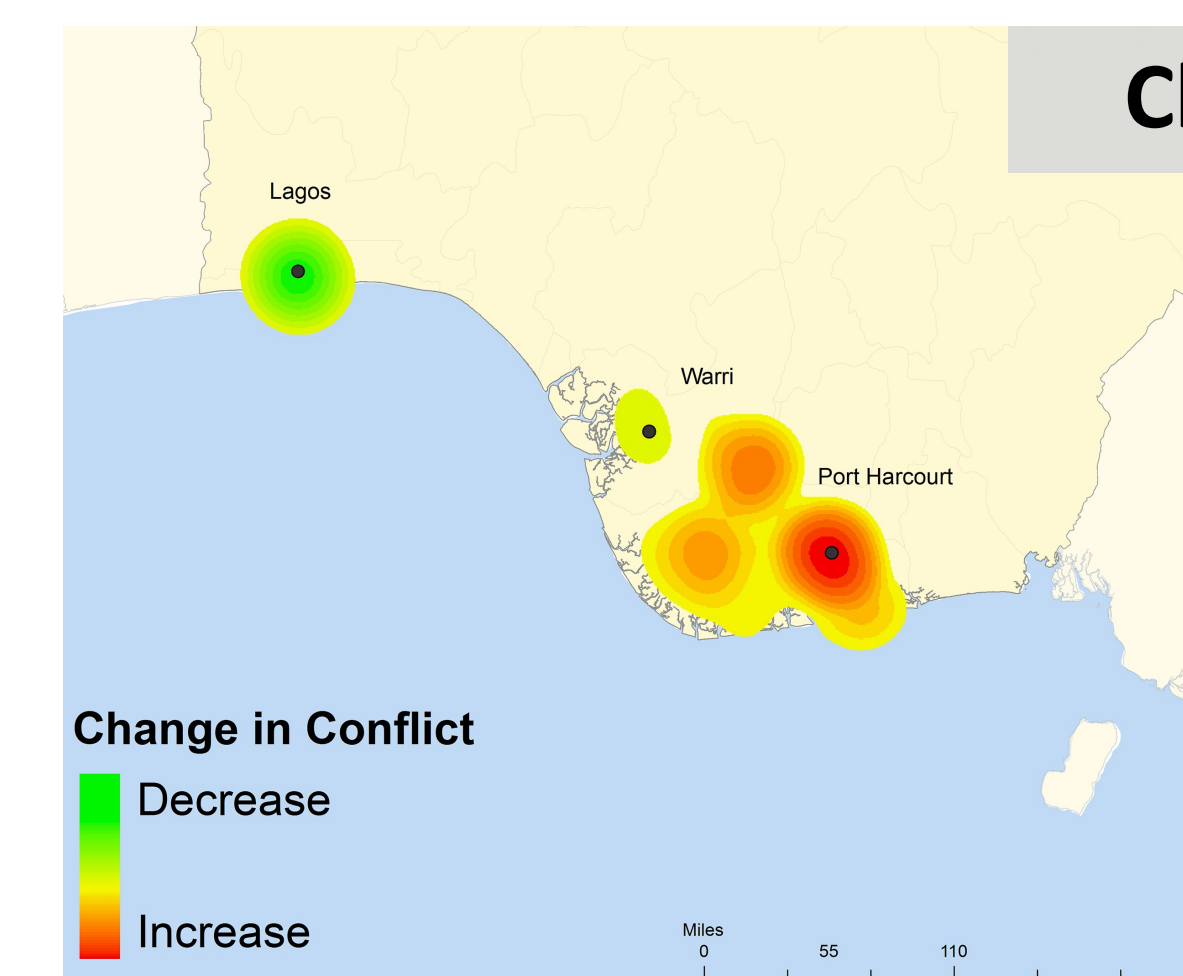
Changes in Conflict

Onshore Conflict   **Piracy**

2000-2004

Density of Onshore Conflict
- Medium
- High
- Very High

Density of Piracy Incidents
- Medium Low
- Medium
- High
- Very High

2005-2009

Density of Onshore Conflict
- Medium
- High
- Very High

Density of Piracy Incidents
- Medium Low
- Medium
- High
- Very High

Change

Change in Conflict
- Decrease
- Increase

Change in Piracy
- Decrease
- Increase

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Sources: International Maritime Bureau (*2013 Annual Piracy Report*), National Center for Ecological Analysis and Synthesis (*A Global Map of Human Impact on Marine Ecosystems*), International Peace Research Institute (*Armed Conflict Location and Event Data Project*), Global Administrative Areas Database Version 2.0 (*Country Boundaries*), National Geospatial-Intelligence Agency.