Terrorism in Lebanon: Identifying high-risk areas for attack

Introduction

Since 2011 Lebanon has suffered from overspill effects from the Syrian war, ISIS' successes, and regional confrontations between Iran and Saudi Arabia across the Levant. The Lebanese military, along with Hezbollah fighters, have fought to keep groups such as ISIS and al-Qaeda's affiliate Jabhat al-Nusra from expanding in influence in the small country. The town of Arsal, near the Syrian border has already seen clashes between Lebanese forces and militants, resulting in the capture of dozens of Lebanese soldiers.

These events are likely to increase to frequency as the Syrian war evolves and continues. With over 1 million Syrian refugees currently registered in Lebanon, a wave of suicide bombings and attempted attacks since 2013, and reports of Salafist groups on the rise, it is vital that security forces, community leaders, and those trying to maintain stability in Lebanon identify areas most at risk for attacks from Islamic extremists in order to best plan responses and prevention measures.

Using a set of likely targets, past targets, and likely routes of travel, this project identifies areas across Lebanon at most at risk for terrorist attacks.

Methodology

This project begins with set of criteria to assess likely target areas for an Islamic extremist attack. These criteria are: locations of terrorist attacks from 2012-2013; locations of common targets (places of worship, hospitals, embassies, universities); as well as the proximity to airports, international borders and international roads. Geospatial data for these criteria were sourced from publically available databases .

The greater the density of the 5 sets of point data (locations of past attacks, places of worship, hospitals, embassies, and universities), the higher the risk of attack by an extremist group on an area. To illustrate this, the density of the 5 sets of point data per Lebanese cadastral was calculated and then scored using natural breaks in the data on a scale of 1 to 5 (lowest to highest density). This allows for a visualizations of cadastrals with the highest concentration of targeted infrastructure and those that have been targets in the past.

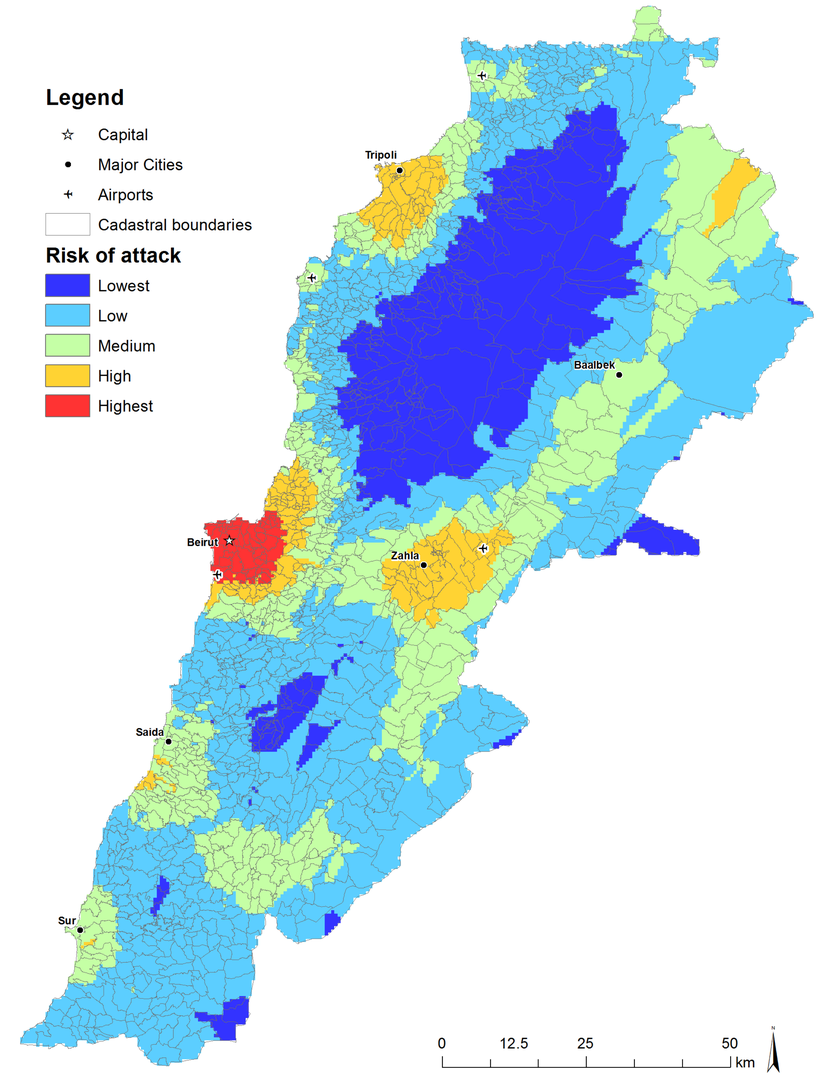
Additionally, the risk of attack likely increases as the distance from airports, borders, and international roads decreases. Airports are a common target of terror attacks, and would-be attackers in Lebanon have a history of using border crossing and major roadways to stage their operations. Therefore, the distance of each pixel on the map from airports, Syrian and Israeli borders, and international roads was calculated and scored on a scale of 1 to 5.

Once each of the 8 criteria was mapped and classified into the 5-point ranking system, the criteria were overlaid and their rankings added, resulting in possible total scores of 8 to 40 for each pixel on the map. The sums were then classified into a final ranking of 1 to 5 (lowest risk of attack to highest) according to natural breaks in the data.

Results

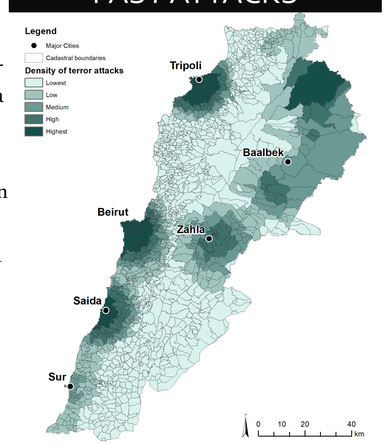
The results of this process reveal a relatively expected outcome: Beirut's cadastral's are at most risk of future terror attacks. There is also a correlation between medium and high risk areas and the routes of international roadways, particularly running parallel to the Syrian border and directly from the Syrian border to Beirut. The proximity to the Israeli and Syrian border was less correlated to risk of attack than the proximity to roads and density of infrastructure.

One challenge for this analysis was the accessibility of reliable data for Lebanon. Lebanon has not taken an official census in decades in order to preserve to current configuration of power in the government, so population data is generally not available. Also unavailable at the time of this project was geospatial data regarding the Syrian refugee population. These kinds of data might have added additional information to the analysis and should be integrated in future studies.

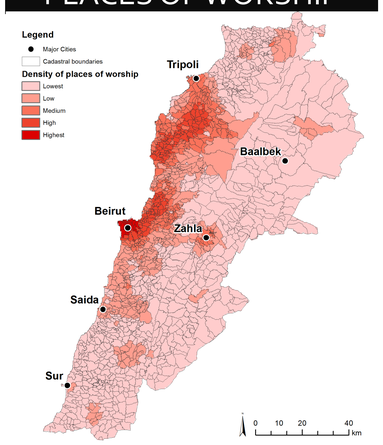


Cartographer: Emma Fredieu
Developed for: DHP P207: GIs for International Application, The Fletcher School of Law and Diplomacy
Date produced: May 1, 2015
Data sources: ESRI, Tufts GIS (1994), Open Street Map data via Geofabrik (2015), Humanitarian Response COD FOD Registry (2002, 2006, 2012), OurAirports (2015), National Consortium for the Study of Terrorism and Responses to Terrorism's (START) Global Terrorism Database (2012-2013)
Image sources: *The Independent*, *The Daily Beast*
Projection: WGS_1984_UTM_Zone_36N_Transverse_Mercator

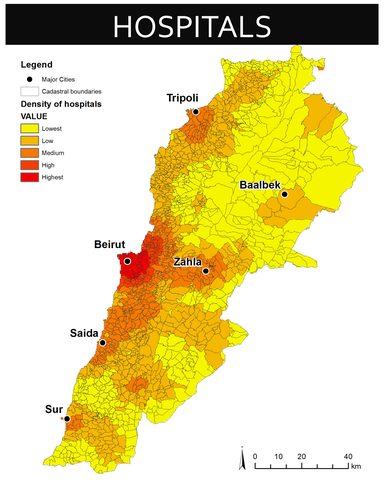
PAST ATTACKS



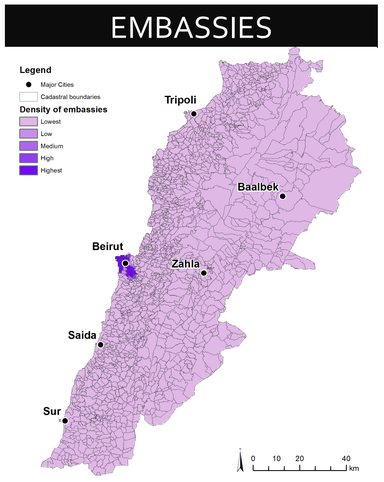
PLACES OF WORSHIP



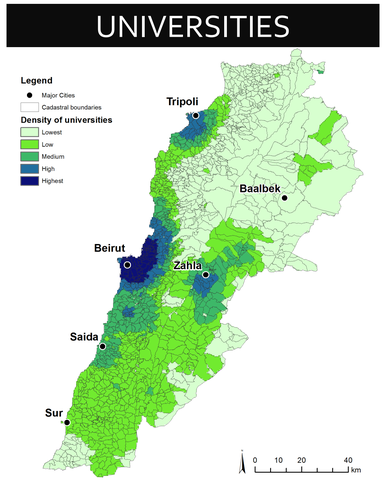
HOSPITALS



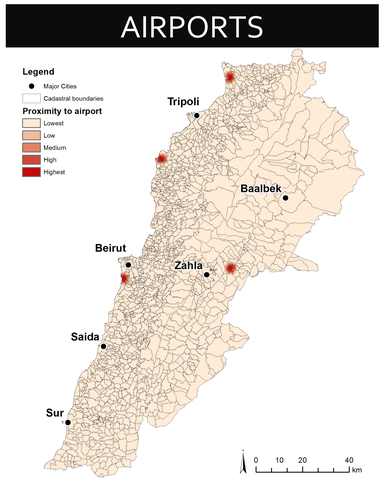
EMBASSIES



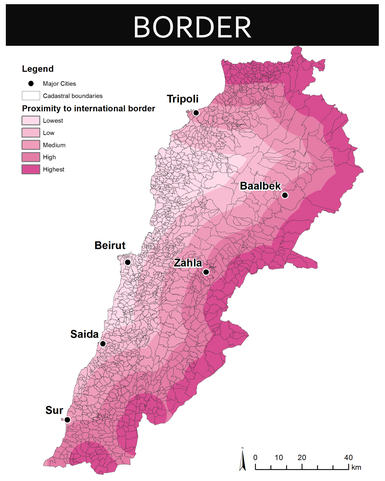
UNIVERSITIES



AIRPORTS



BORDER



INTERNATIONAL ROADS