

Drones Over Pakistan

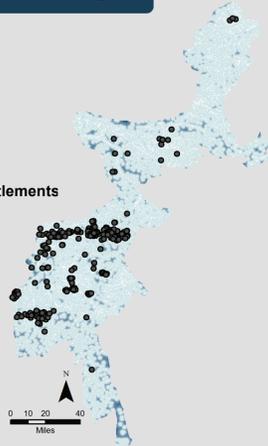
A Geospatial Analysis of the U.S. Drone Campaign in the Federally Administered Tribal Areas of Pakistan

Proximity

Proximity to Settlements

- 0-2 KM
- 2-3 KM
- 3-5 KM
- 5-7 KM

Settlements
• Drone Strikes

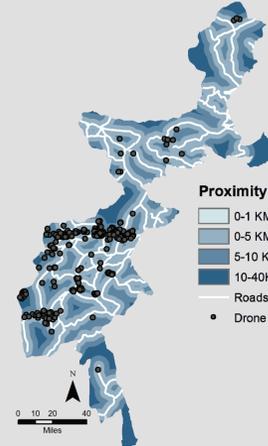


Proximity Statistics	Distance to Settlements	Distance to Roads
All Strikes	836 M	2685 M
Strikes w/o Civ. Casualties	864 M	2753 M
Strikes with Civ. Casualties	736 M	2446 M

Proximity to Roads

- 0-1 KM
- 0-5 KM
- 5-10 KM
- 10-40KM

Roads
• Drone Strikes

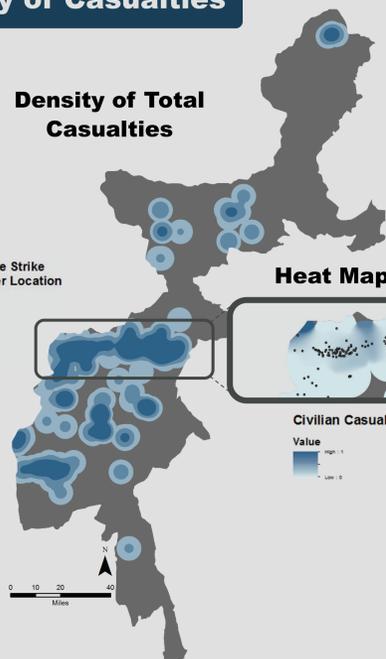


Density of Casualties

Density of Total Casualties

Ratio of Drone Strike Casualties Per Location

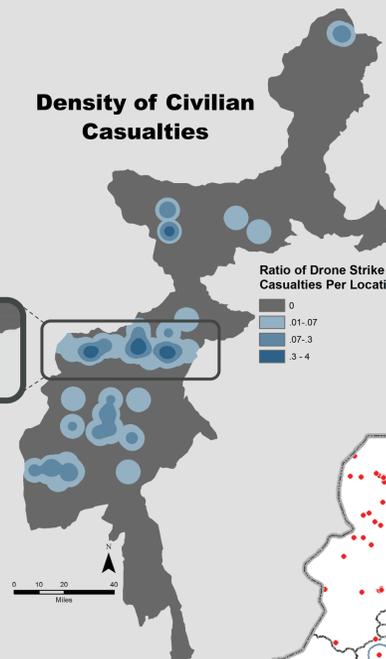
- 0
- 01-07
- 07-3
- 3-4



Density of Civilian Casualties

Ratio of Drone Strike Casualties Per Location

- 0
- 01-07
- 07-3
- 3-4



Heat Map of Casualties

Civilian Casualties Per Total Casualties

Value
High = 1
Low = 0

• Drone Strikes

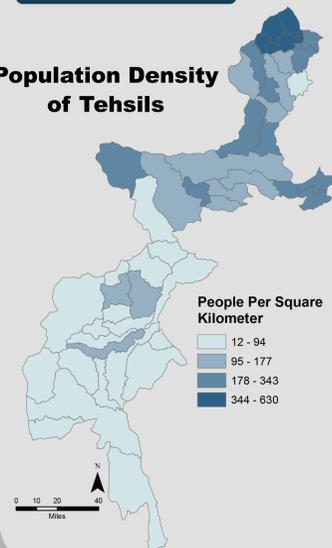


Location

Population Density of Tehsils

People Per Square Kilometer

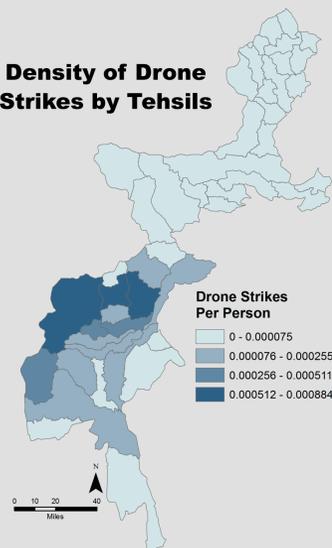
- 12 - 94
- 95 - 177
- 178 - 343
- 344 - 630



Density of Drone Strikes by Tehsils

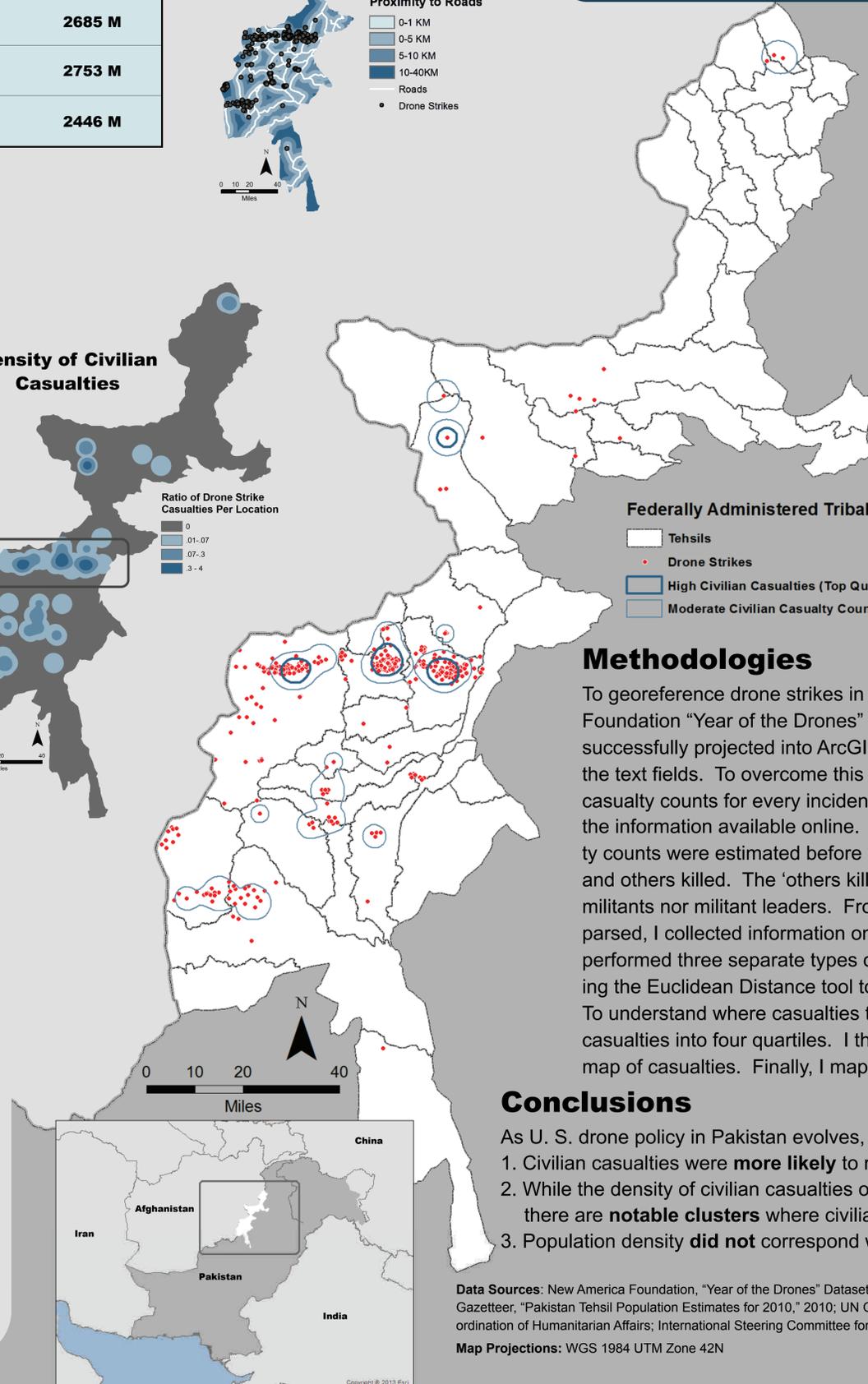
Drone Strikes Per Person

- 0 - 0.000075
- 0.000076 - 0.000255
- 0.000256 - 0.000511
- 0.000512 - 0.000884



Federally Administered Tribal Areas (FATA)

□ Tehsils
• Drone Strikes
■ High Civilian Casualties (Top Quartile)
■ Moderate Civilian Casualty Count (Second Quartile)



Methodologies

To georeference drone strikes in FATA, I utilized the New America Foundation "Year of the Drones" dataset. While the spatial data successfully projected into ArcGIS, casualty information was lost in the text fields. To overcome this obstacle, I manually entered the casualty counts for every incident (336 in total) that corresponded to the information available online. I coded this information cautiously, using the middle ground when casualty counts were estimated before separating each incident into three categories: total killed, militants killed, and others killed. The 'others killed' indicates the casualties of individuals who were identified as neither militants nor militant leaders. From this group, civilian casualties are compiled. With the drones data parsed, I collected information on Pakistan roads, settlements, and census records at the Tehsil level and performed three separate types of geospatial analysis through ArcGIS. 'Proximity' was determined by using the Euclidean Distance tool to calculate the range of roads and settlements to drone strikes in FATA. To understand where casualties took place, I used the Kernel Density feature to plot both civilian and total casualties into four quartiles. I then divided the densities through the Raster Calculator to create a heat map of casualties. Finally, I mapped the location of drone strikes per Tehsil by performing a Spatial Join.

Conclusions

As U. S. drone policy in Pakistan evolves, the findings of this project are insightful:

1. Civilian casualties were **more likely** to result from drone strikes closer to both settlements and roads.
2. While the density of civilian casualties often corresponded with the number of strikes in the area, there are **notable clusters** where civilian casualties remain low relative to militants killed.
3. Population density **did not** correspond with the location of drone strikes.

Data Sources: New America Foundation, "Year of the Drones" Dataset, 2013; World Gazetteer, "Pakistan Tehsil Population Estimates for 2010," 2010; UN Office for the Coordination of Humanitarian Affairs; International Steering Committee for Global Mapping

Map Projections: WGS 1984 UTM Zone 42N

Project Overview

The Obama administration has pursued an aggressive policy of targeting militants located in Pakistan's Federally Administered Tribal Areas (FATA) via drone strikes. Introducing a nascent form of warfare, drone strikes have proven an effective counter-terrorism measure, allowing the U. S. to disrupt the networks of al Qaeda affiliated groups based out FATA, while reducing risks to U. S. military personnel. Nevertheless, while drone strikes are very accurate relative to cruise missiles and airplane bombings, collateral damage is inevitable. This latter issue has caused many – especially within Pakistan – to vehemently criticize the program. Civilian casualties, as opponents of the drone policy contend, reduce the popularity of the U.S. abroad and increase radicalization. Consequently, if the Obama administration intends on continuing the drone program, it is inherent that all measures are utilized to ensure the reduction of civilian casualties. To explore this point, this project performs a geospatial analysis of drone strikes in the

region. Specifically, this project examines (a) the proximity of civilian casualties to settlements and roads, (b) whether there are areas where civilian casualties are most prevalent, and (c) the location of drone strikes in relation to the most densely populated Tehsils (sub-districts).

Total Drone Strikes	336
Total Casualties	2546
Total Civ. Casualties*	410

*Civilians classified as casualties not identified as militants

Poster Design and Cartography
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