Armed conflict increases with proximity to borders in Africa

Borders: Colonial, Ethnic, and Religious

Spatial Regression Analysis

CSCI 491

Project 4

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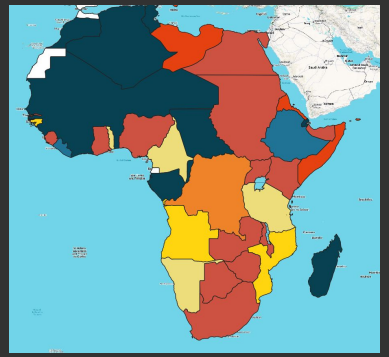
Data for border types

Polygons for each category

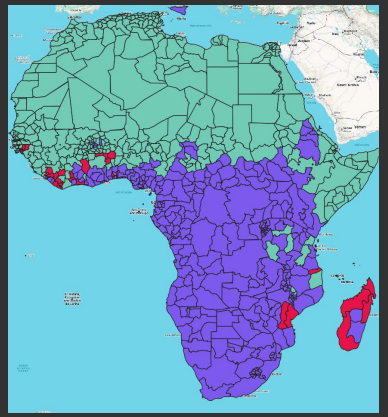
Political

Polygons of present-day national borders.



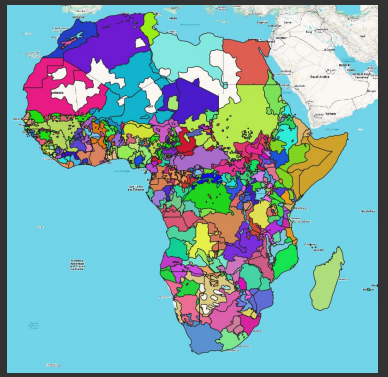
Colonial

Former European demarcation of the continent.



Religious

Religious majority per adm3 polygons.



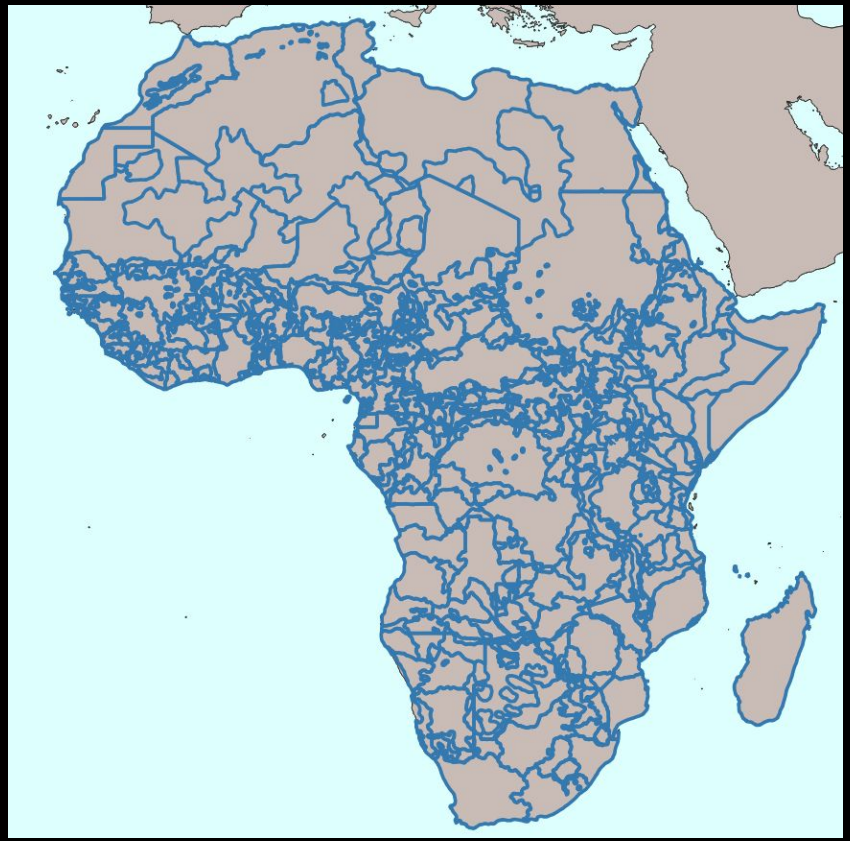
Ethnic

Polygons of major ethnic groups in Africa.

Borders Data

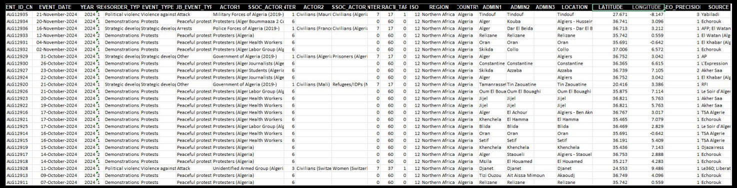
Vectorizing polygon perimeters as lines.

- Basis of our distance calculations.
- Save attributes to categorize each border type: national, colonial, ethnic, and religious.
- These vectorized lines will be used to calculate the closest distance between a cell centroid and a border.



ACLED: https://acleddata.com/curated/data-africa-12-month-lag

Data for conflict violence



Event type

Battle / Protest / Riot / Explosion / Violence Against Civilians / Strategic Development

Each has more subcategories

Date

Date with specification of time precision (day, month, year)

Actor

Perpetrator of incident and any association with movements

Multiple actors possible

Location

Country, Region, Subregion, District, City, Latitude/Longitude (EPSG:4326)

Includes geoprecision scale from 1-3

Fatalities

Number of fatalities recorded per event

Notes

Short description of event.

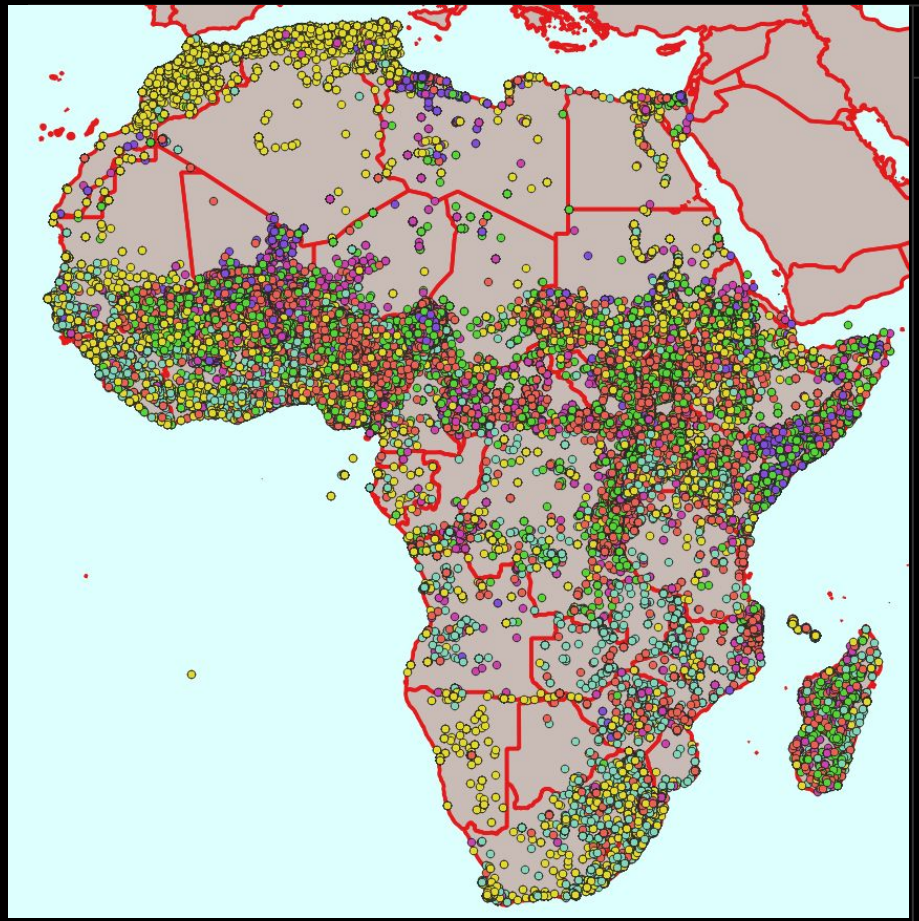
Can help decide whether to exclude event from analysis

Source

Sources used to codify conflict event.

Civilian targets

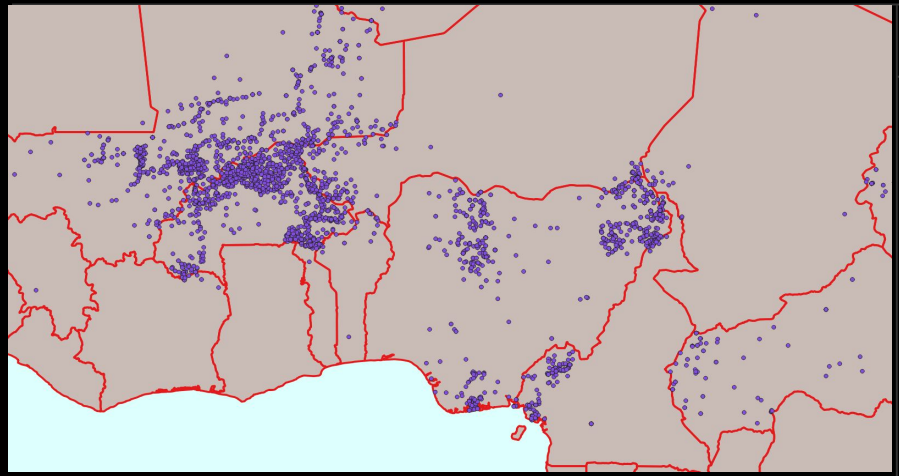
Binary 0/1 for events targeting civilians

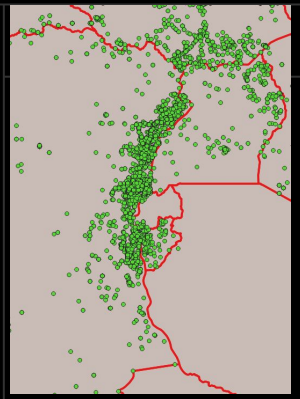


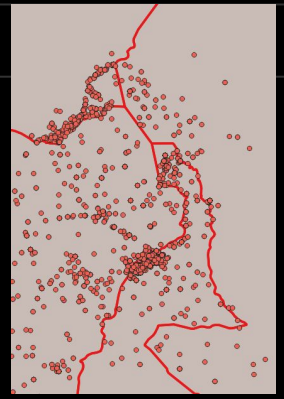
QGIS Visualization

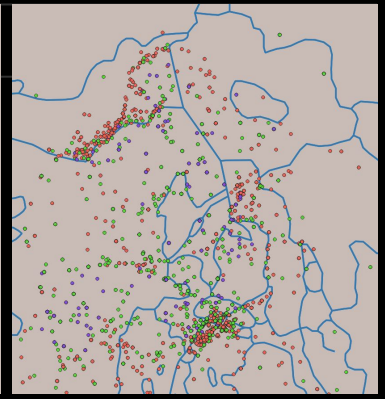
Provider: ACLED
Dataset: Africa (12-month lag)
Period: 2020-2024

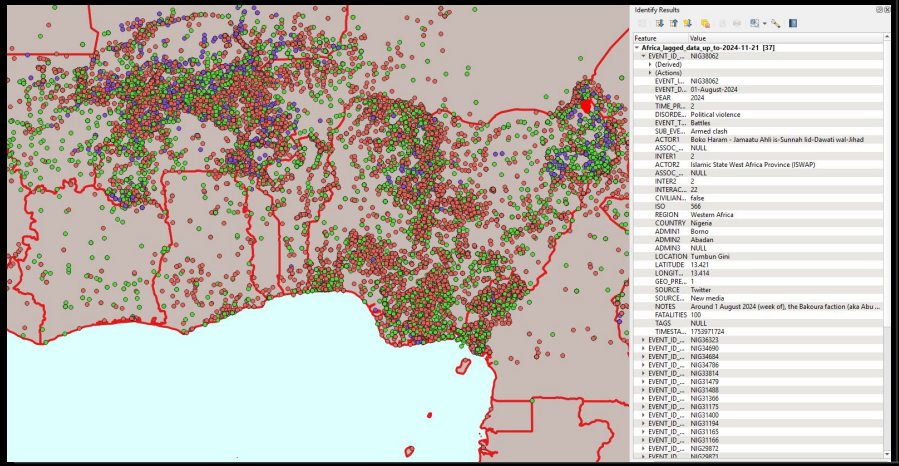
Symbolized by event type category







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(Actions)
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EVENT_D...
01-August-2024
YEAR
2024
TIME_PR...
2
DISORDE...
Political violence
EVENT_T...
Battles
SUB_EVE...
Armed clash
ACTOR1
Boko Haram - Jamaatu Ahli is-Sunnah lid-Dawati wal-Jihad
ASSOC_...
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INTER1
2
ACTOR2
Islamic State West Africa Province (ISWAP)
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INTER2
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INTERAC...
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REGION
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COUNTRY
Nigeria
ADMIN1
Borno
ADMIN2
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Around 1 August 2024 (week of), the Bakoura faction (aka Abu ...
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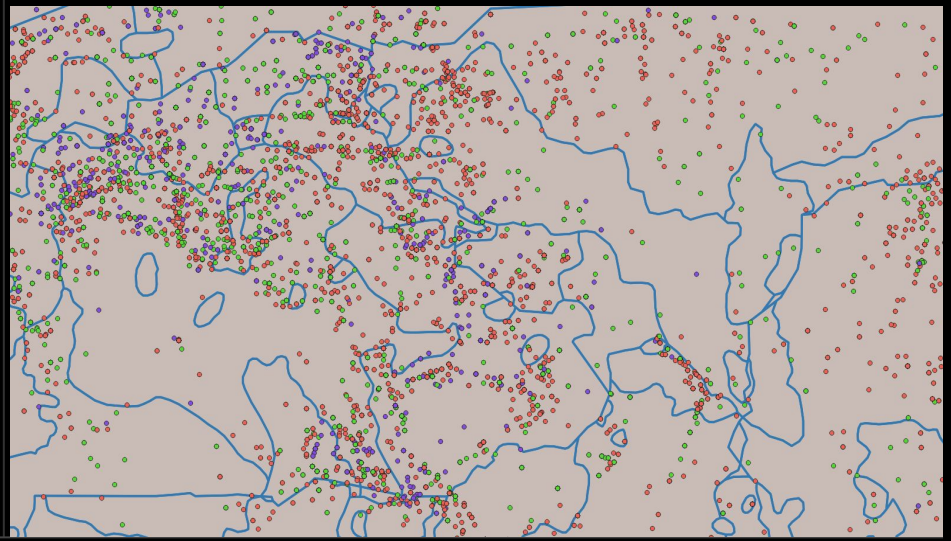

Control Variables

Population
NASA

Areas with more people will inherently have more reports of violent conflict.

Road km
OpenStreetMap

Control for easily accessible areas versus areas with less motorized access.

War Status
ACLED

Important to determine whether the area (country, region) is in a state of war.
Helps to determine the conflict-risk of the neighborhood surrounding a cell.

Land cover
Google Earth Engine

Urban areas will likely have more events reported than remote areas. Challenging terrain will also likely have an effect that should be controlled for (desert, jungle, riversheds, etc.)

Temporal
ACLED

Control for seasonality which might affect some areas more than others.

Consider counting number of conflict incidents per month.

Plan for analysis

When two cells are otherwise similar, does the one closer to a border have a higher expected number of violent events?

1

Grid

Apply grid across area of analysis to create equal-area cell units.

2.1

Cell data aggregation

Aggregate statistics per grid cell: count of conflict event (by type, per month), population, road kms, land cover, etc.

2.2

Measure distances

Compute distance between each grid cell centroid to closest border (of each type).

3.1

Regression on distance

Predicts expected number of conflict events per cell by distance to borders.

3.2

Control variables

Control for factors that may affect the presence/lack of violent conflict depending on where the cell exists in space.