



IE CONNECT FOR IMPACT

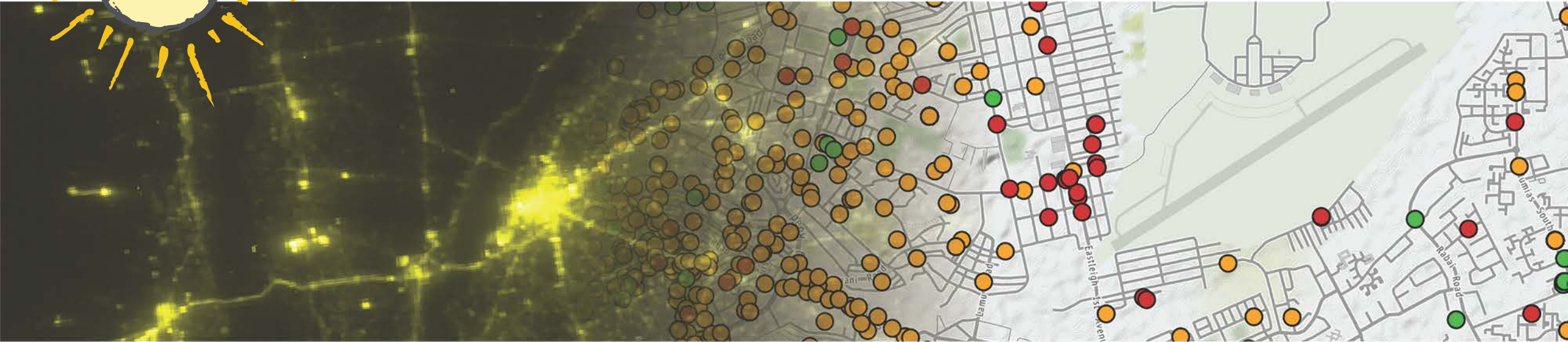
Transforming the Growth Potential
of Transport Investments

How to Evaluate a Road Project using Remote Sensing Data: The Case of Iraq Expressway

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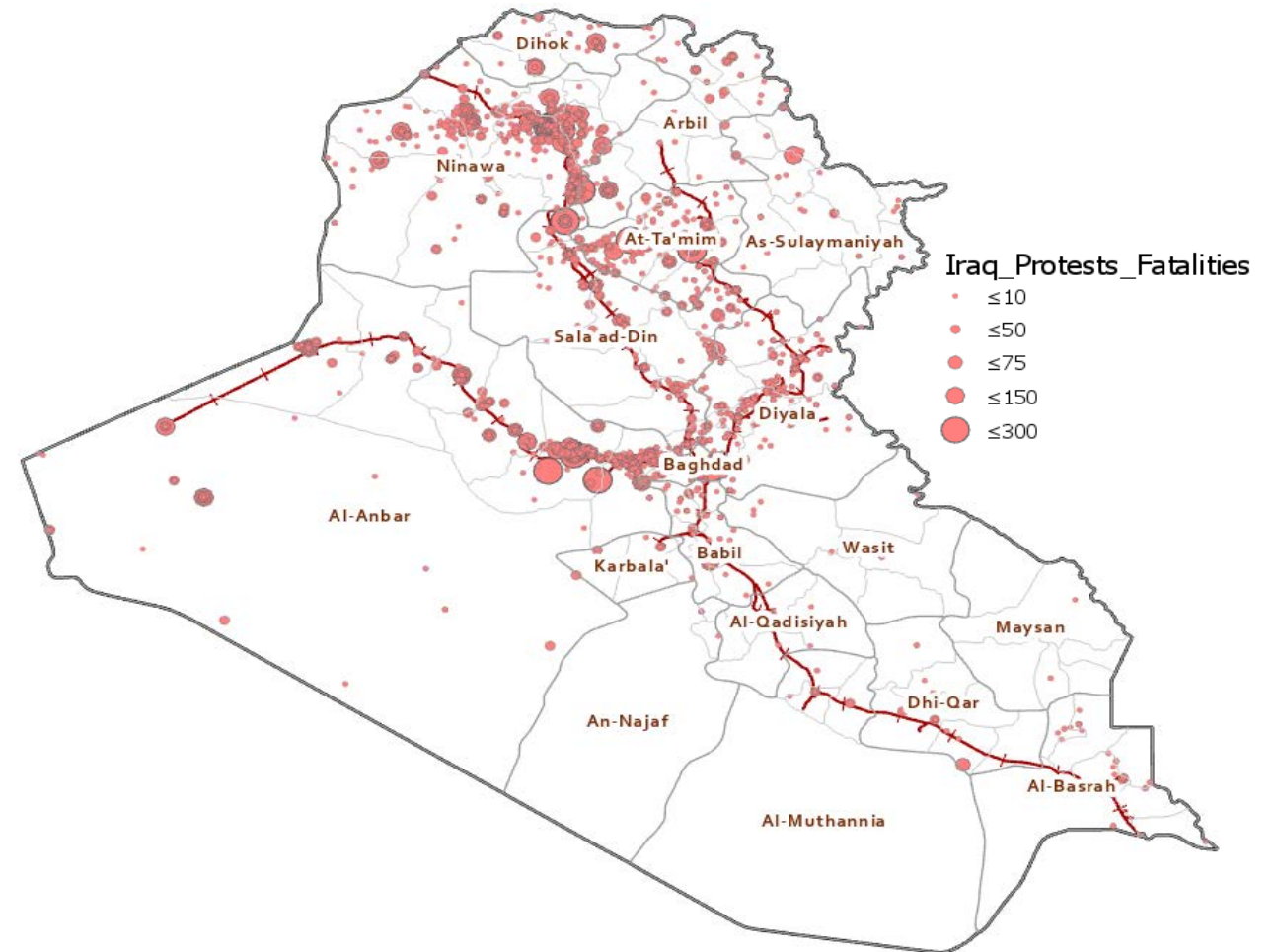
Marrakech, December 3rd, 2019



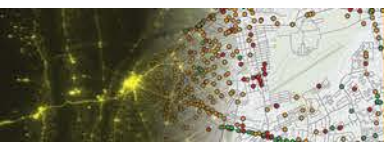
Context and Challenges to Collect Data

- Dealing with a geography marred by unrest
- This limits our ability to work directly with counterparts on the ground
- Limits also data collection options
- How then, can we find innovative ways to use other sources of data?

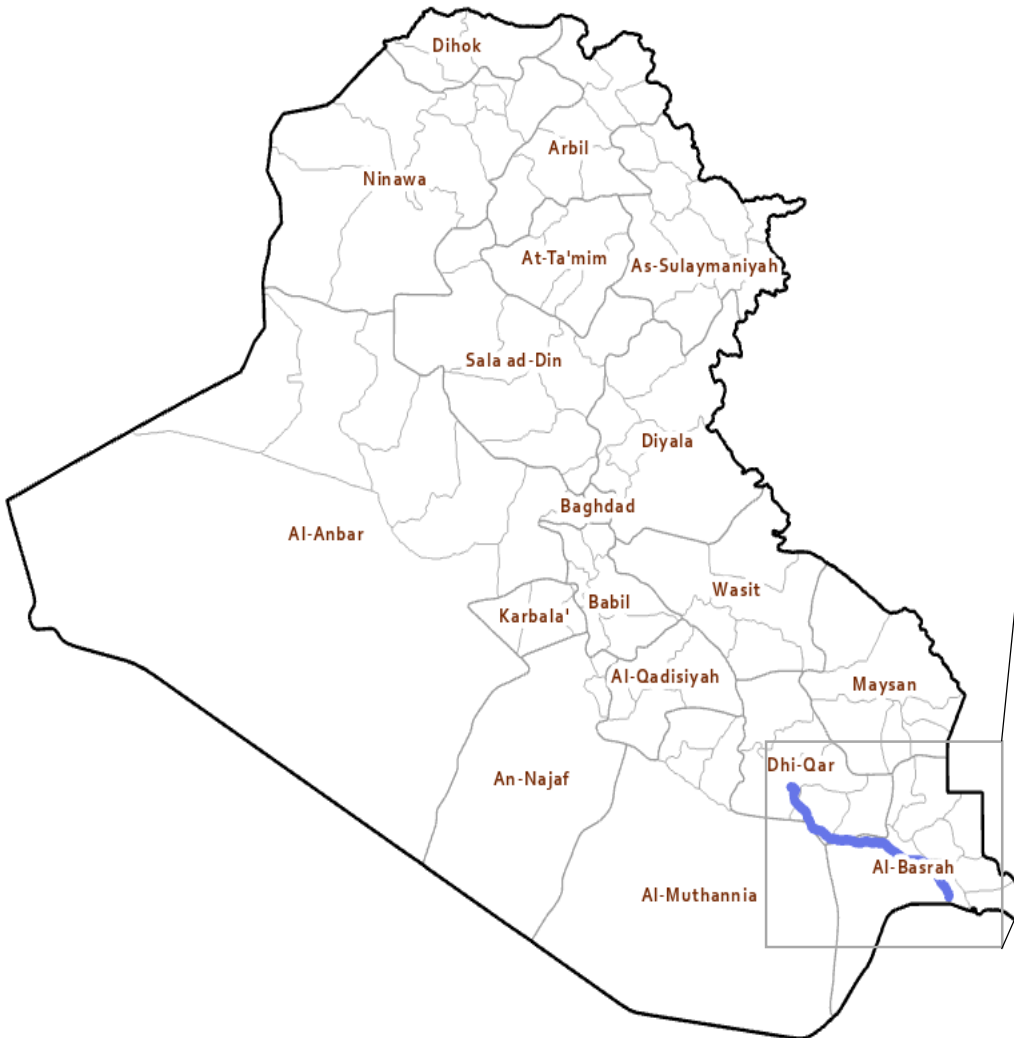
Protests and Fatalities in Iraq -2016 to 2018



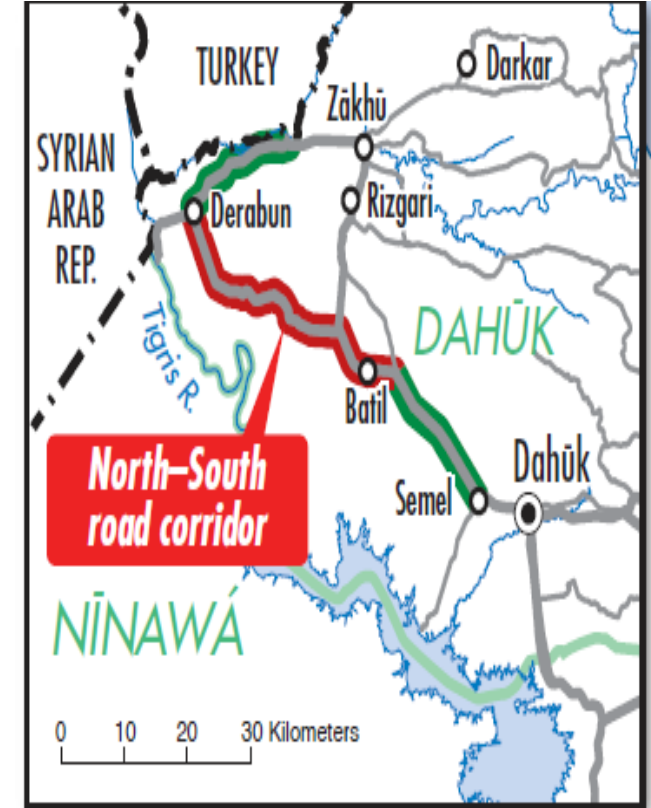
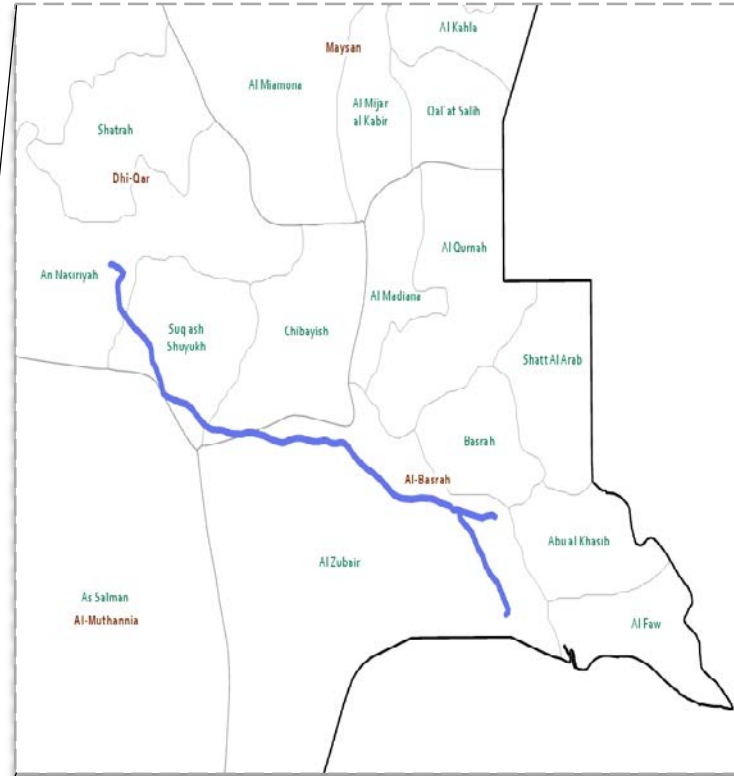
Source: Armed Conflict Location and Event Data (ACLED)



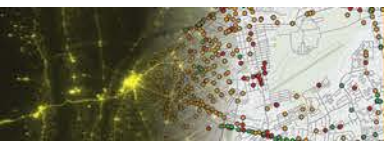
Intervention: Expressway and the N-S Corridor



Sections of Expressway Rehabilitation (R7&8): 257km

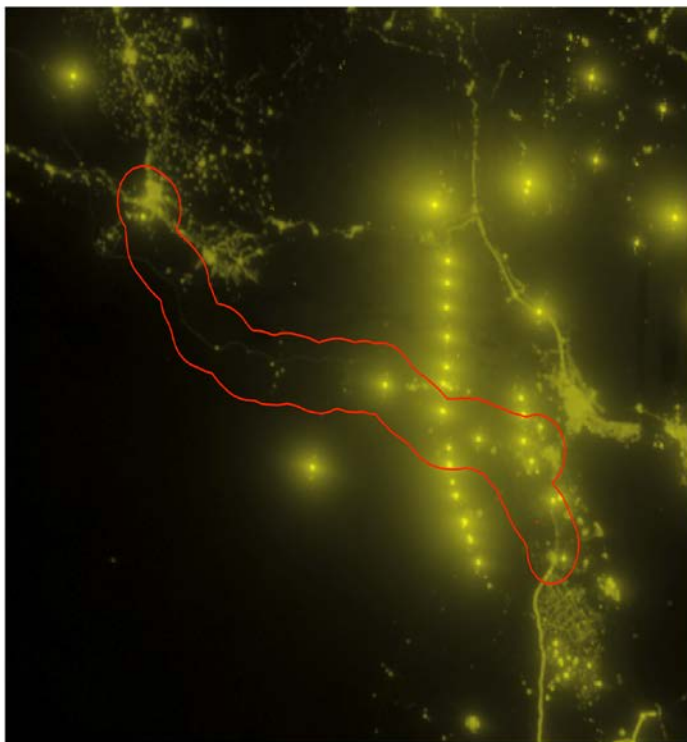


Girsheen and Suheila Road: 23km



Geospatial IE: A Method to Assess Transport Corridor

Iraq Expressway and Local Economic Growth



Infrastructure deficiencies limit Iraq's transport and trade corridors' abilities to play their role efficiently



Use geographically precise information on the timing and location of road improvement to examine changes in nighttime lights by pixel for the Expressway 1 (red outlined area)

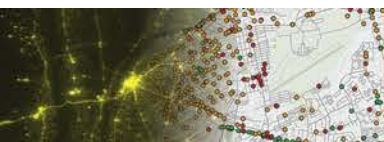


Merging multiple sources of spatial data with quasi-experimental methods (triple difference, synthetic control, event study, etc.) to determine the project's impact.

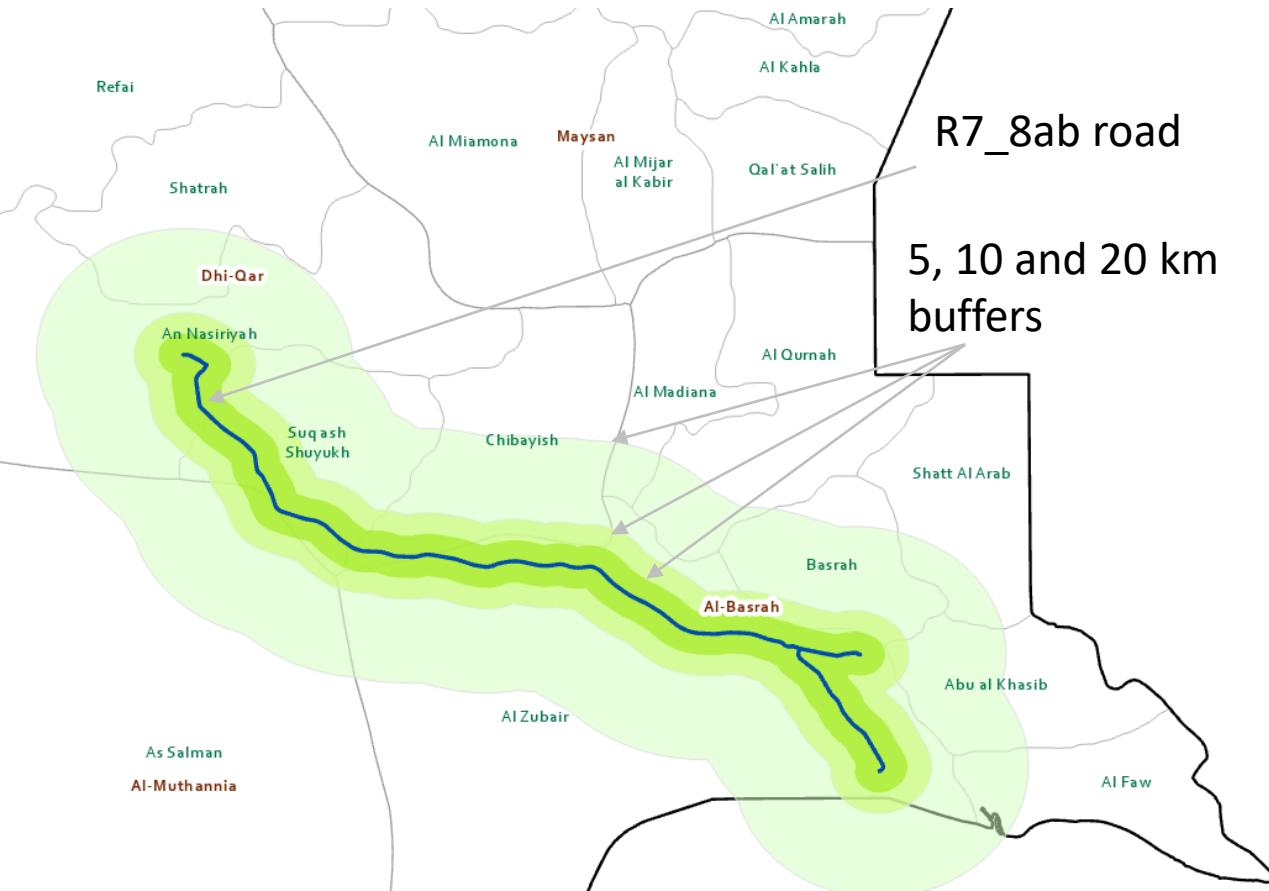
- ✓ Is there enough variation in the light **across the study area** and **over time** to detect substantive changes due to treatment?
- ✓ **YES:** Between 2012 and 2016, 45.7% (51.5%) increase in the mean (median) value of nighttime lights around the Expressway

Data Strategy

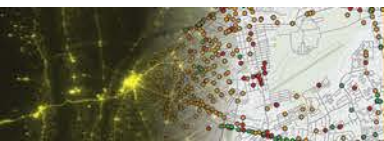
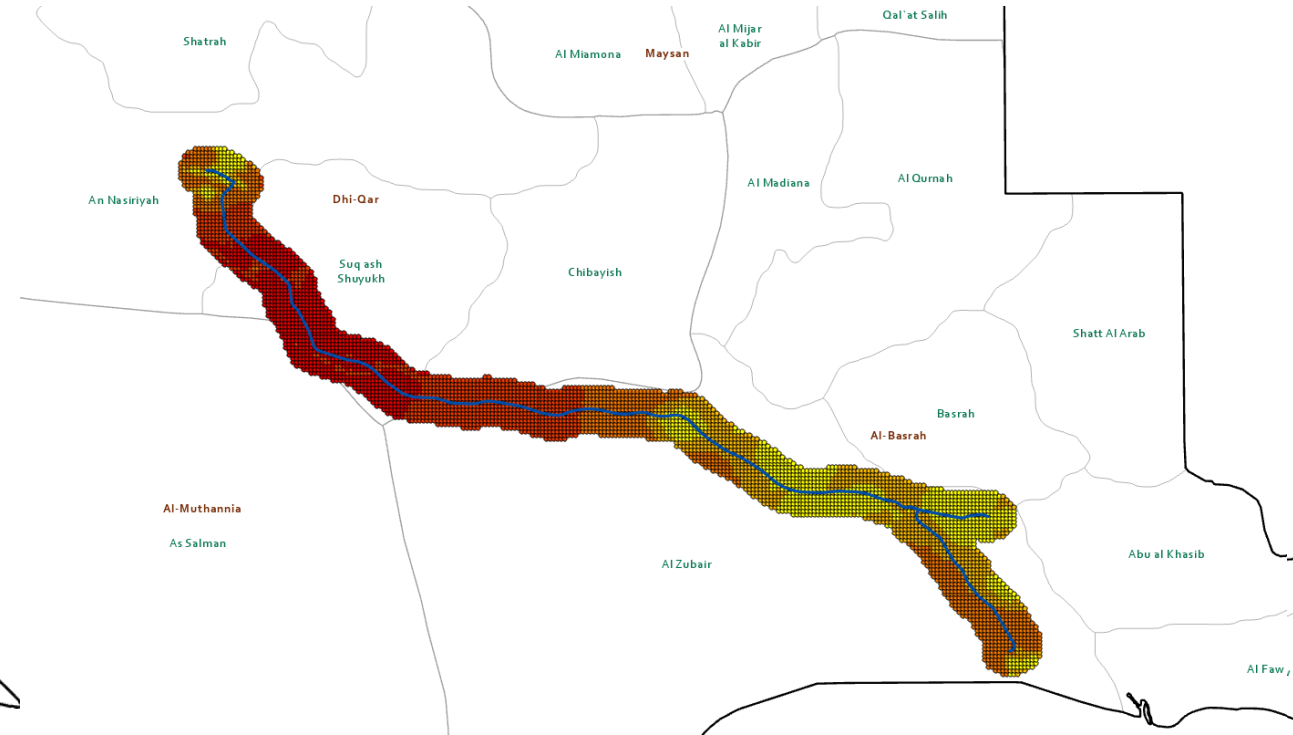
- Satellite Remote Sensing: High frequency nighttime lights data
- Administrative Data: Household Socio-Economic Survey 2006, 2012, 2017
- High-resolution population data: LandScan
- Settlement Data from UN OCHA: Cities, towns, villages and neighborhoods
- Empirical Studies of Conflict (ESOC): Violent and non-violent actions
- Road Network of Iraq



Nighttime Light around R7&8 and along Expressway



Example: Mean Nighttime Light Data 2012



LSMS Household Data: 2012-2013

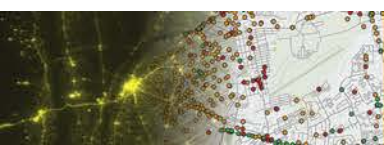
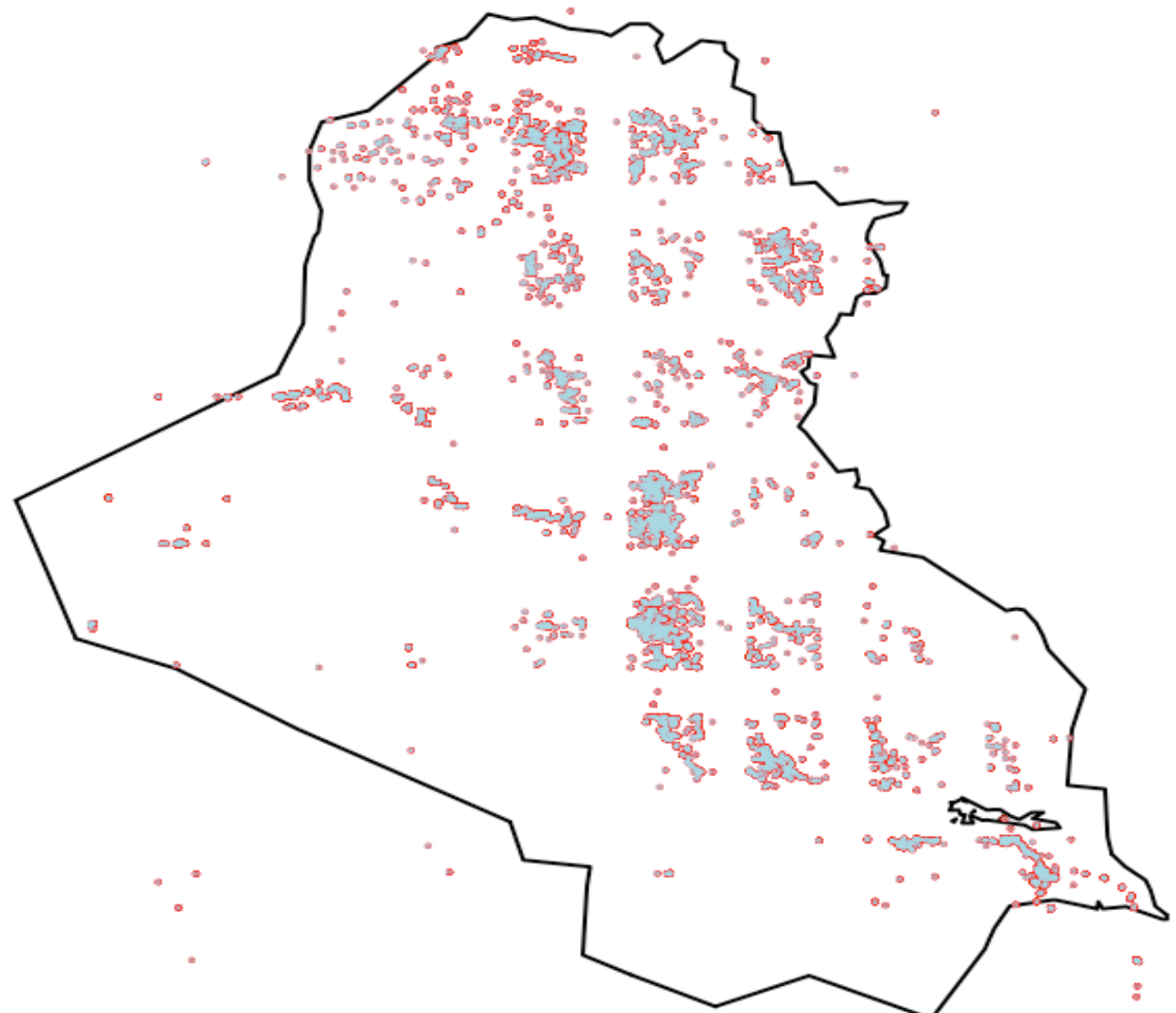
Created 750m buffers around households in the LSMS Survey



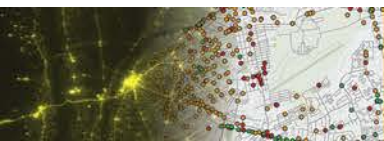
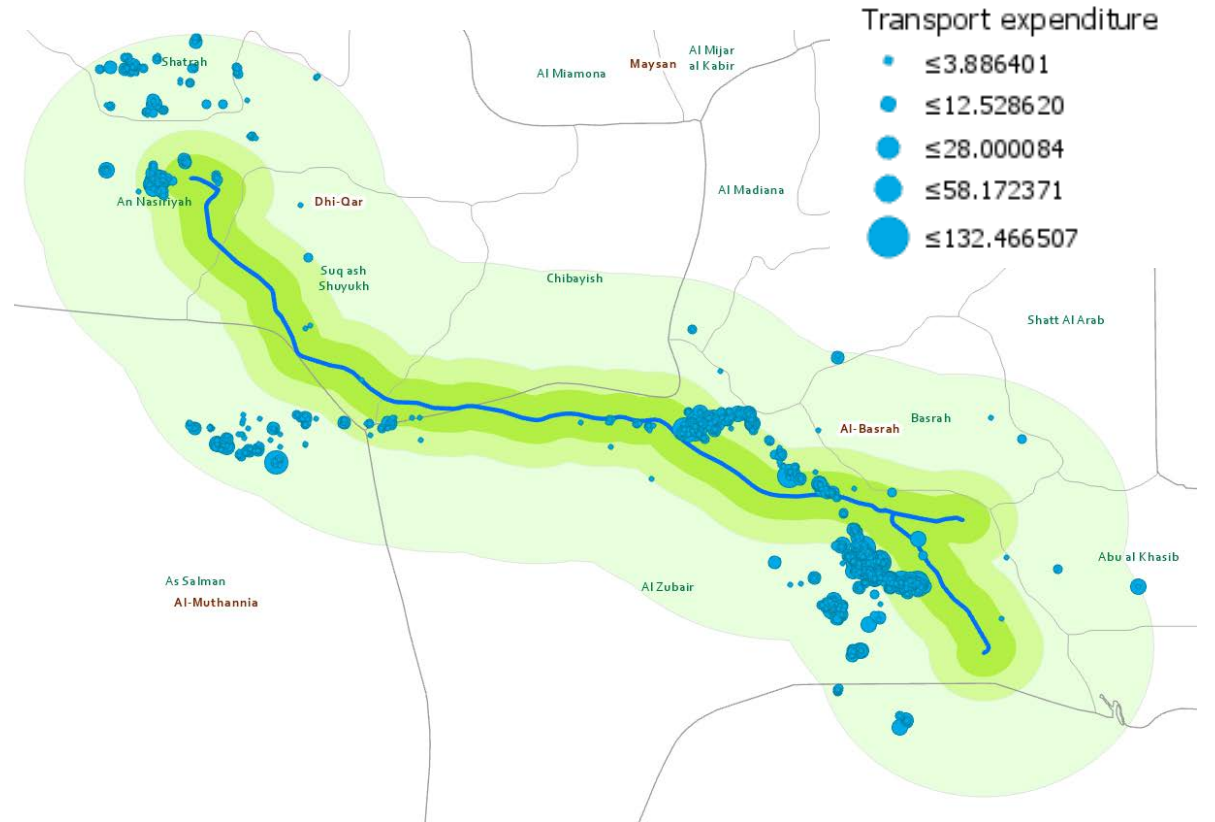
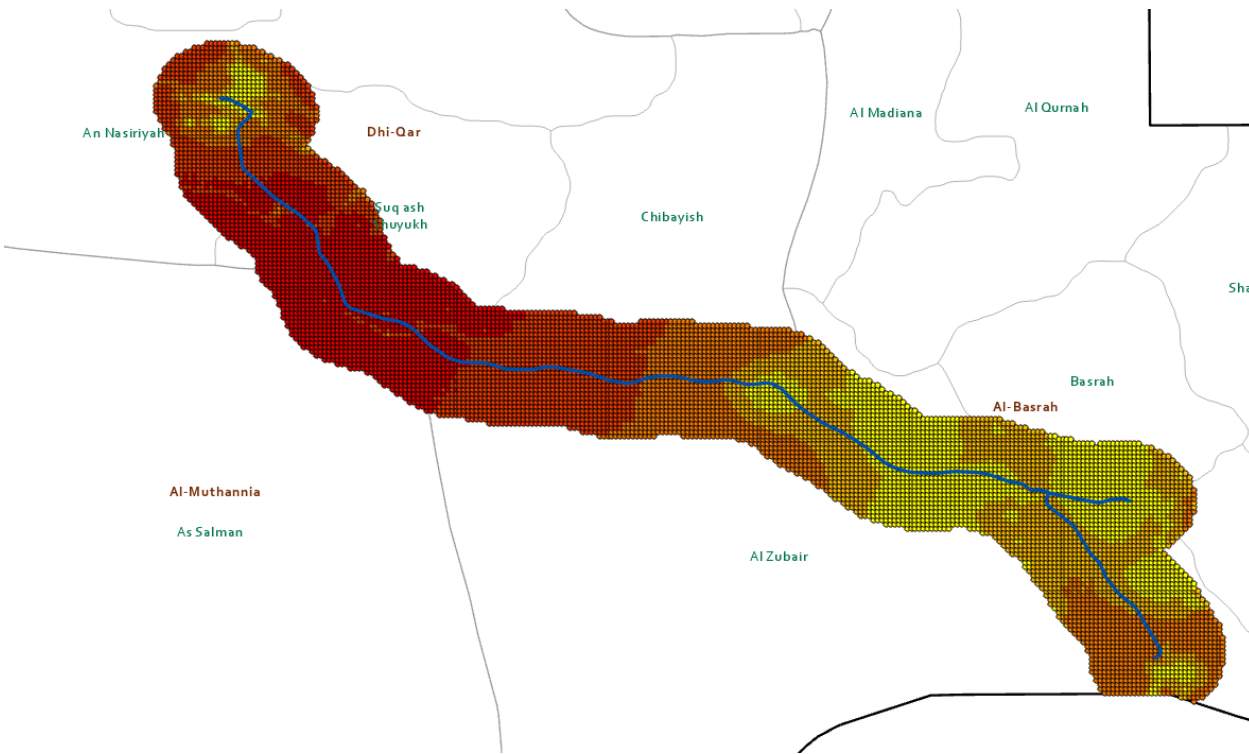
Extracted the average nighttime light data from the buffer



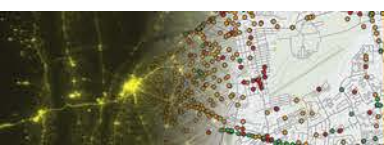
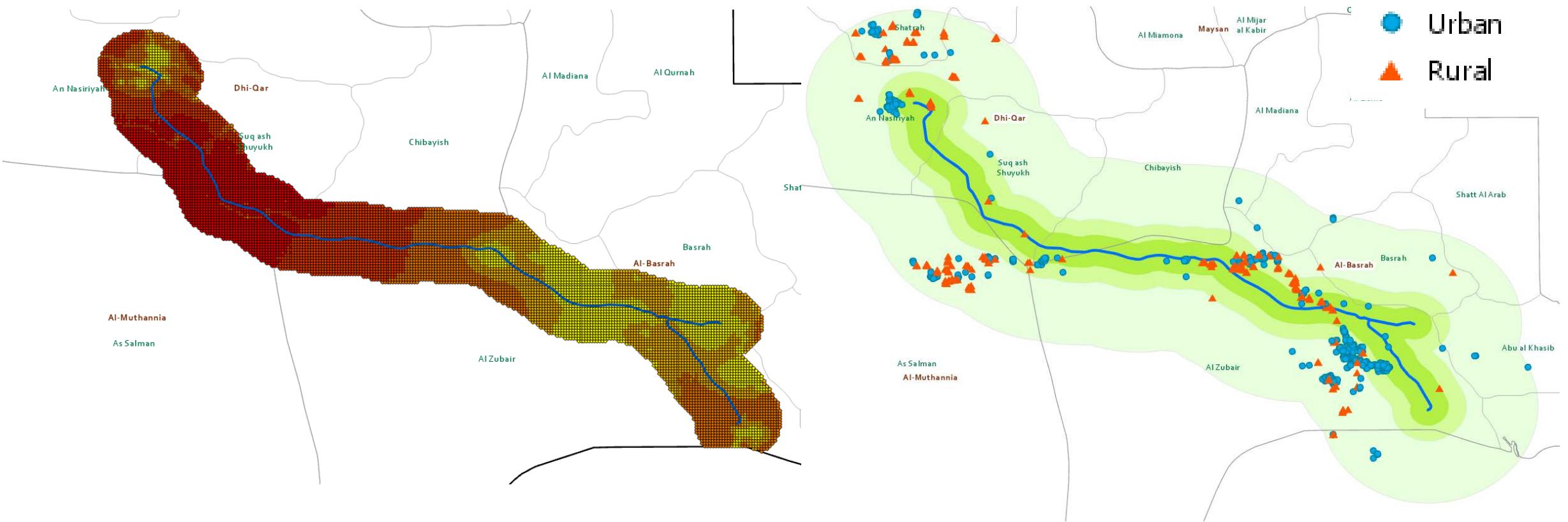
Correlated with household, health, transport, and communication expenditure data



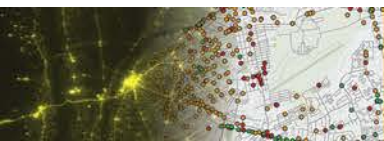
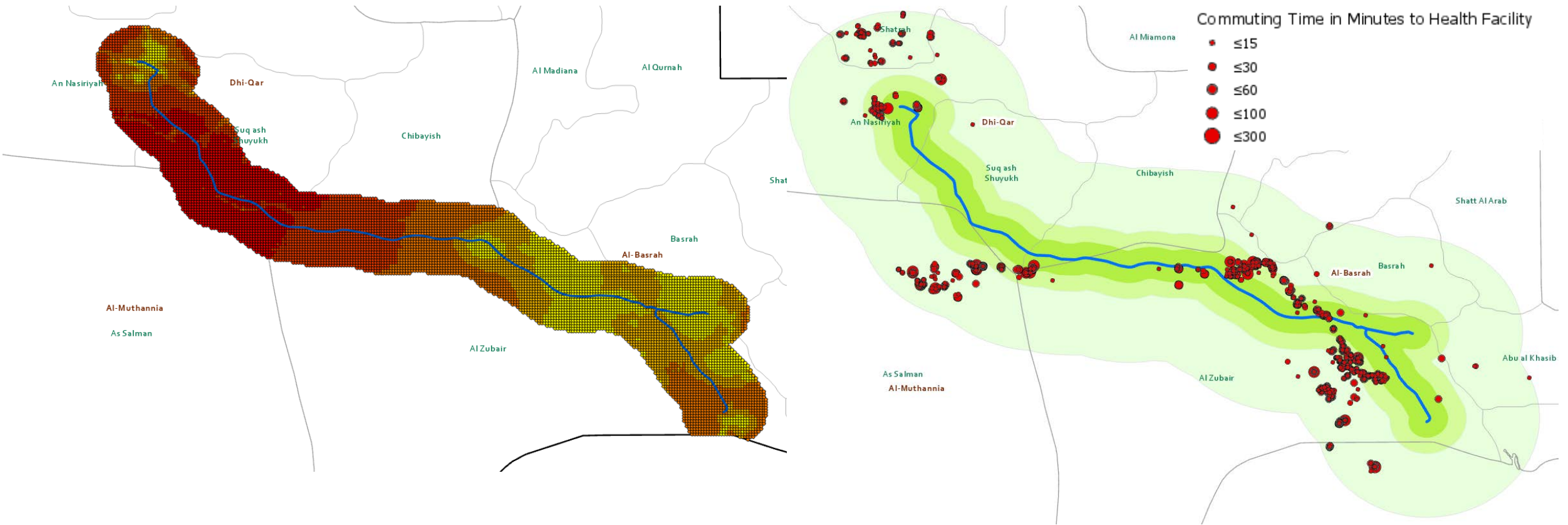
NTL 2012 and LSMS Data 2012



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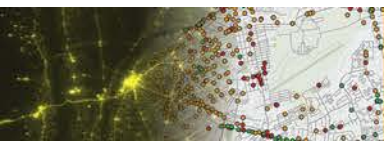
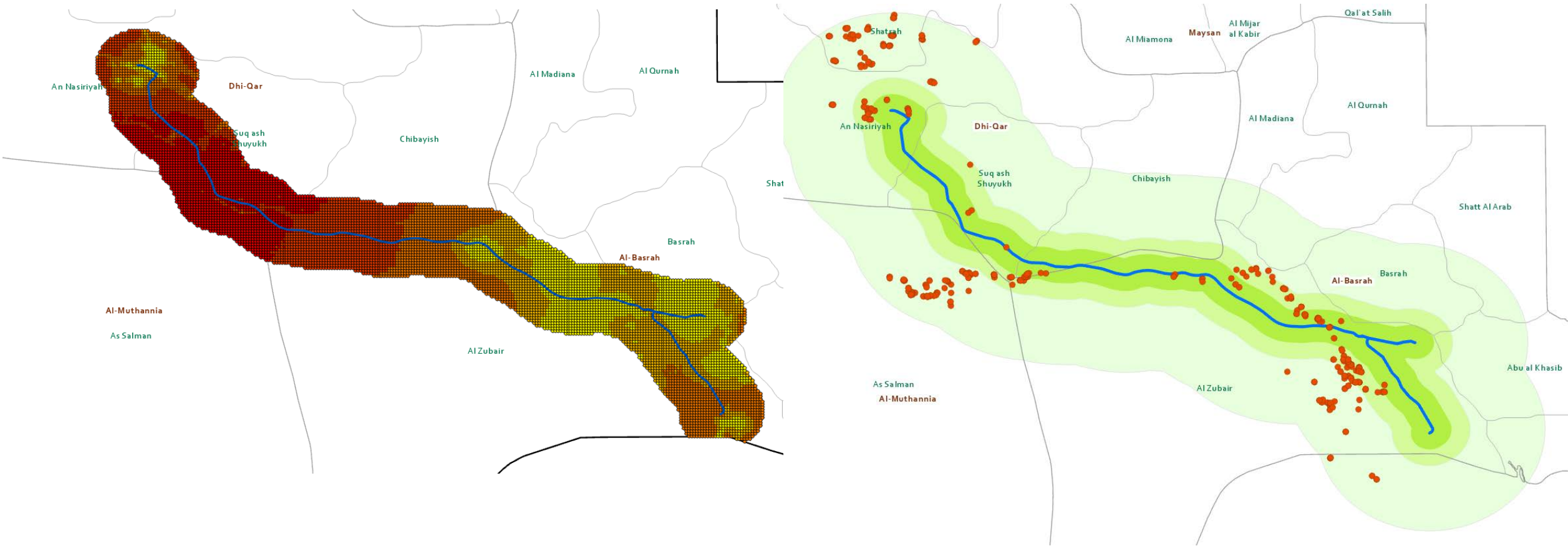


NTL 2012 and LSMS Data 2012



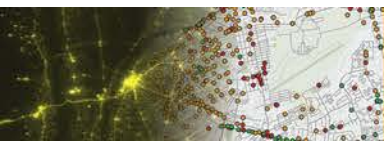
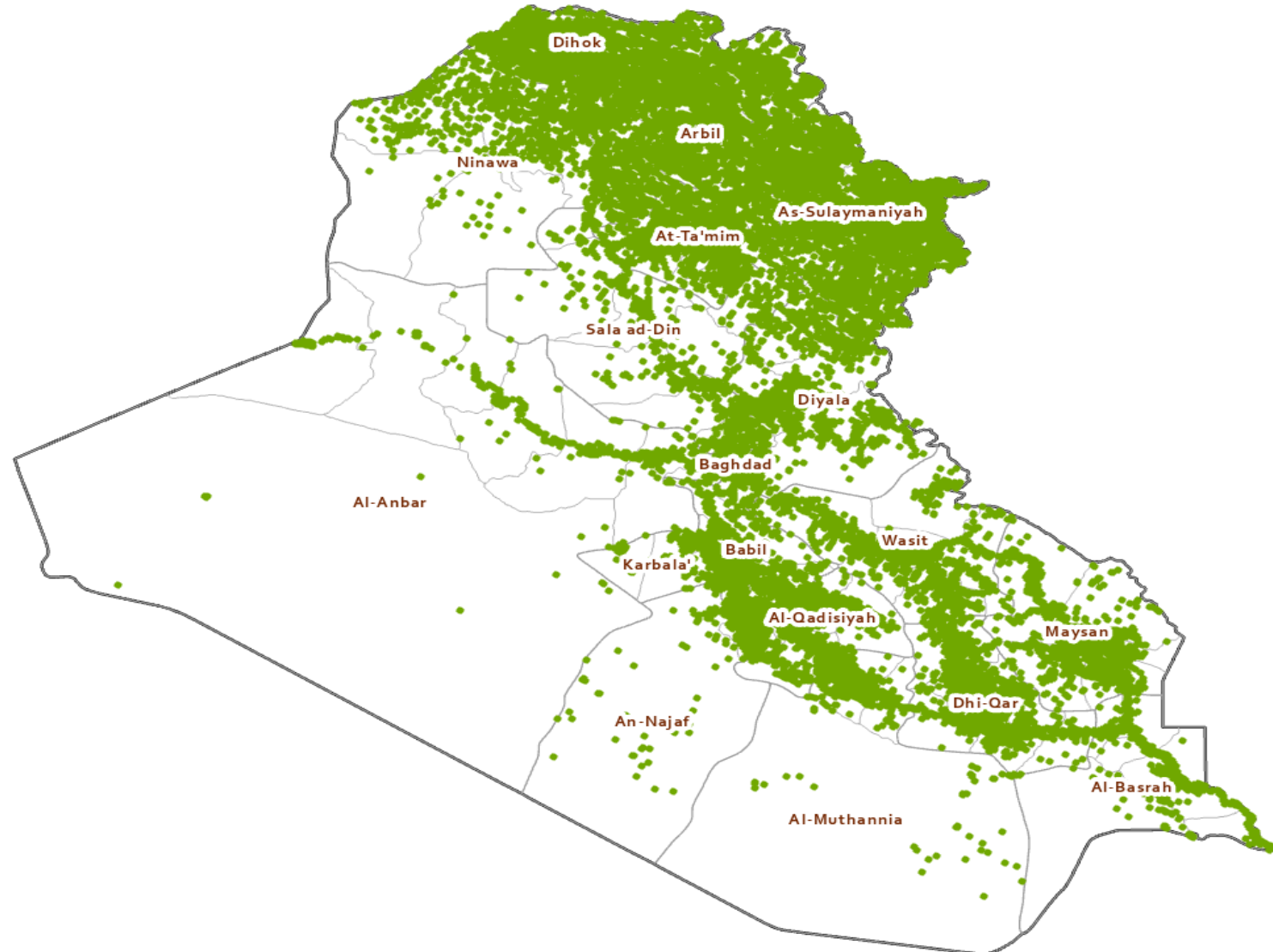
NTL 2012 and LSMS Data 2012

Households That Said Yes to Having Problems in Transportation



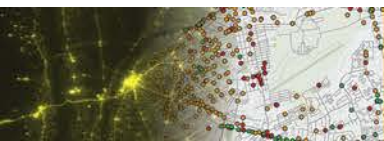
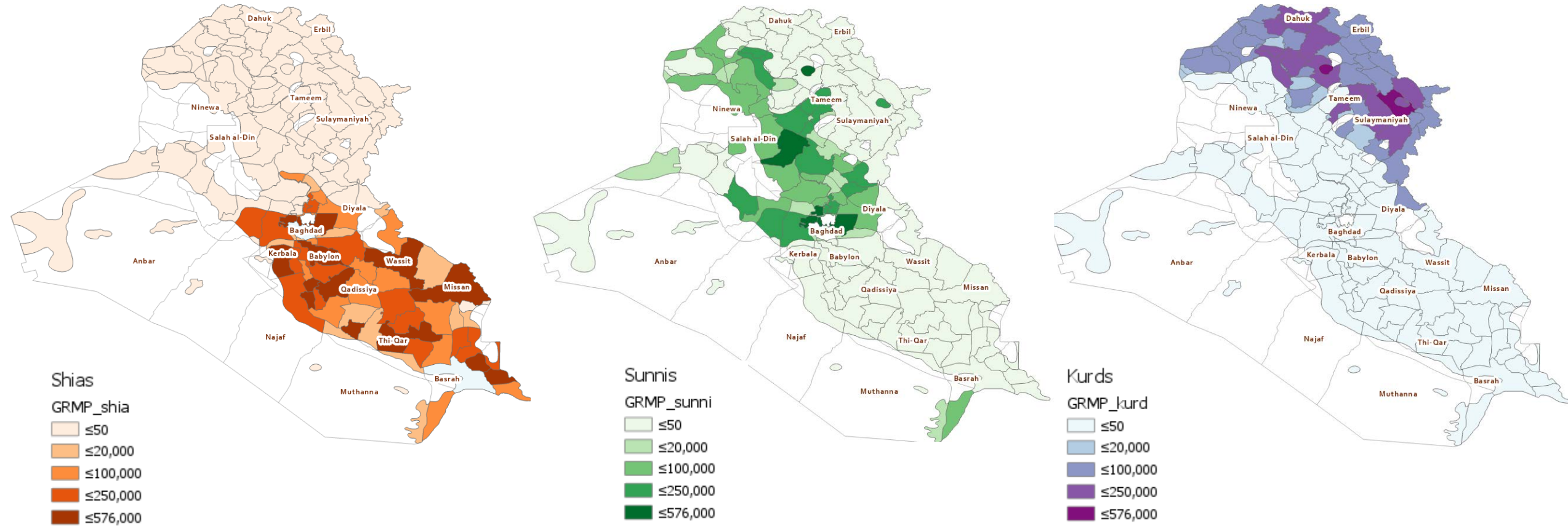
Other Sources of Data

Settlement
Data 2014
from
UN OCHA



Empirical Studies of Conflict (ESOC) Database

Distribution of Ethno-religious Groups and Tribes in Iraq



ESOC data on Protests and Fatalities: 2016-2018

