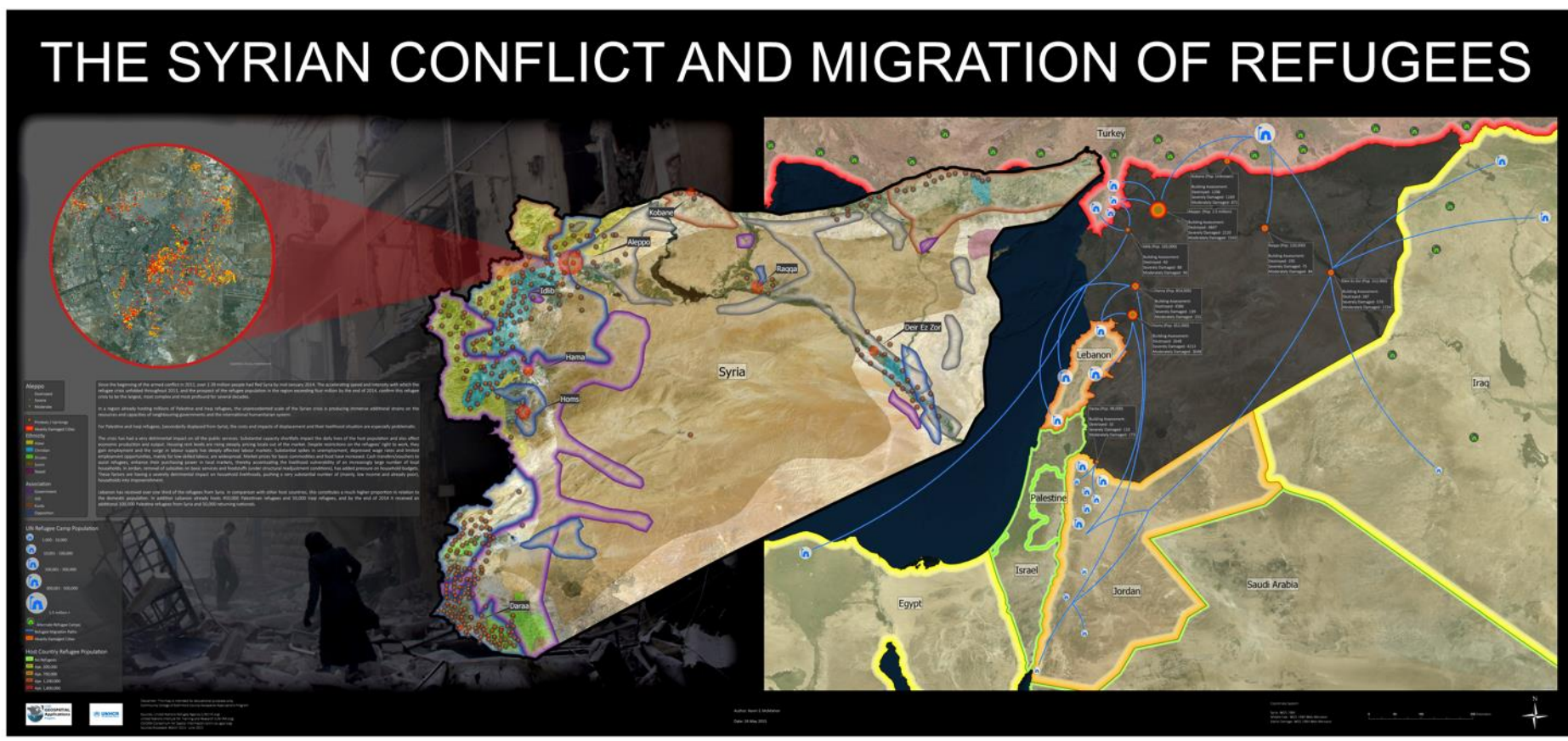


THE SYRIAN CONFLICT AND MIGRATION OF REFUGEES

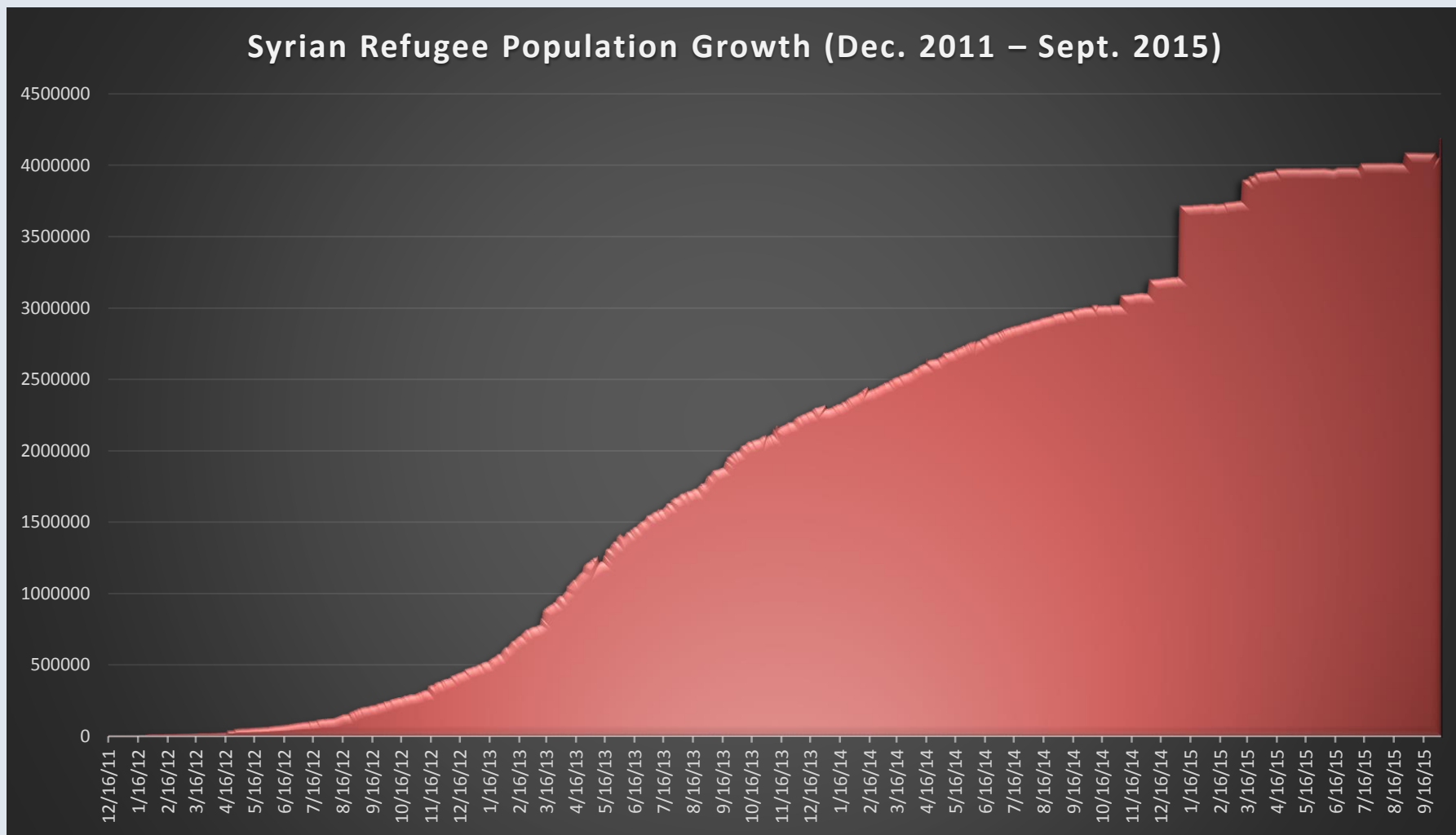
By: Kevin McMahon (Community College of Baltimore County Geospatial Program)

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The Crisis



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Methodology

The goal of this project was to create a map depicting the Syrian refugee crisis and provide an overview of the causes that contributed to it and the environments in which this event is still occurring.

- Merge pre-existing point and polygon features with tabular data and field reports from the UNHCR, to delineate the migration of refugees in relation to the conflicts that surround them.
- Areas of conflict, factional control and uprisings are constantly evolving across the Syrian landscape, but their inclusion into the project was key. The project represents the landscape as it existed in the Spring of 2015.
- To disseminate accurate and up to date information to show the true scale of the crisis as it applied to the region, not just a single country.

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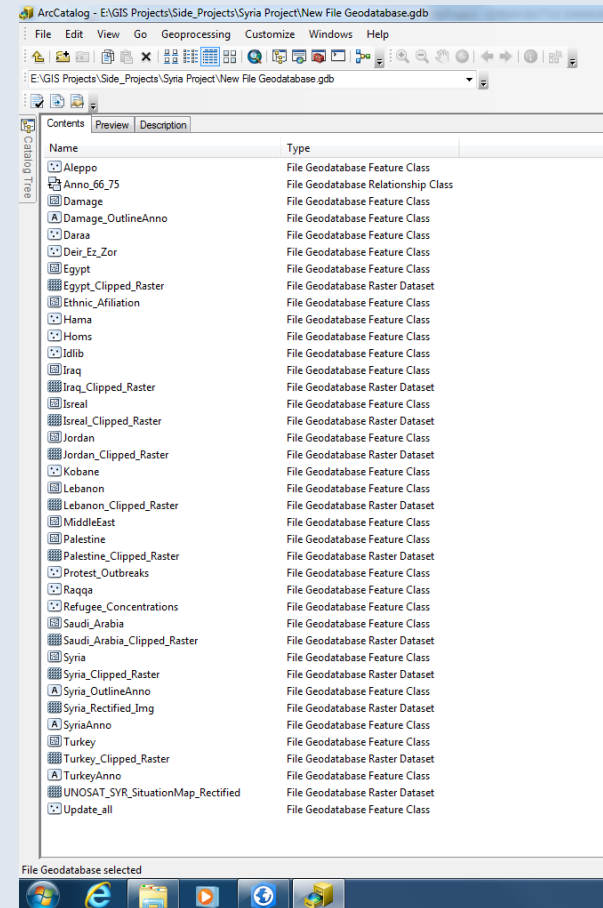
Data Sources

- United Nations High Commissioner for Refugees (tabular data)
 - <http://data.unhcr.org/syrianrefugees/region>
- United Nations Institute for Training and Research (Aleppo damage)
 - <http://www.unitar.org/unosat/maps/98>
- CGIAR Consortium for Spatial Information (Digital Elevation Models)
 - <http://srtm.csi.cgiar.org/SELECTION/inputCoord.asp>

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Data Creation

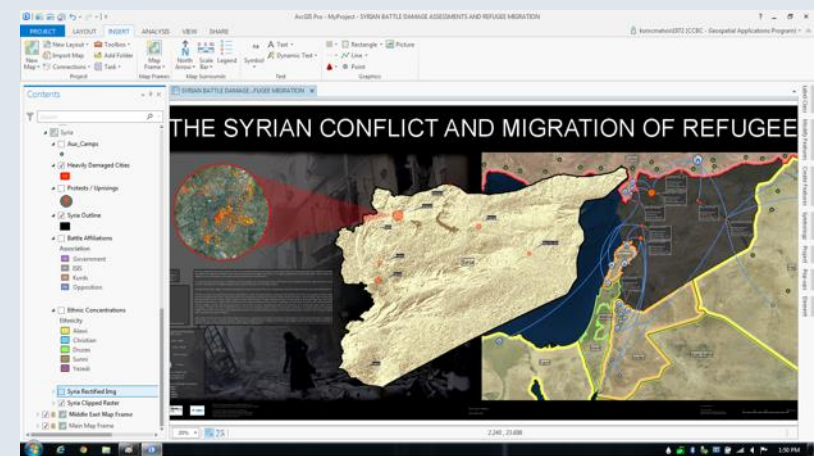
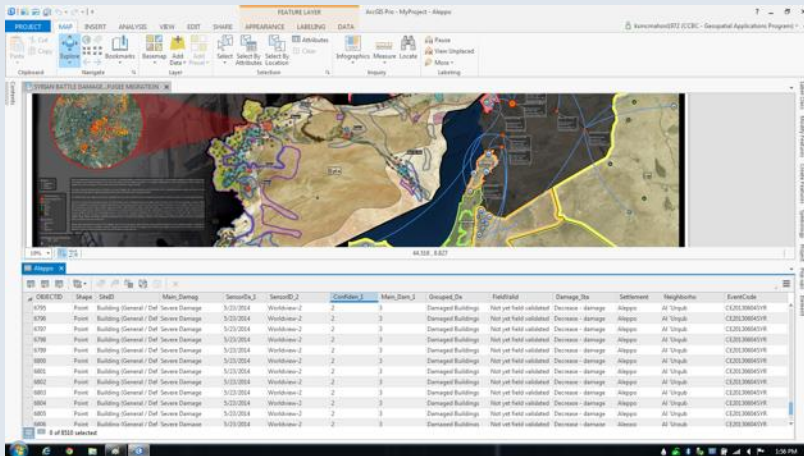
- DEM's from countries surrounding Syria were mosaicked and clipped to the focus area (Middle East data frame). Hill shade and an earth tone color ramp was later applied for additional detail and depth.
- Polygons representing the individual host nations had fields added to the attribute tables to represent refugee populations, current national populations and GDP.
- Situational maps depicting conflict areas, protests and ethnic concentrations had to be geo-referenced and traced over to create the polygons representing them.



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Data Creation

- UNHCR camp data only existed in tabular form with population numbers and lat. / long. coordinates. These locations were plotted in ArcMap and built into point features symbolized proportionately by their individual populations.
- Battle damage assessments from Aleppo and seven other cities were broken into three categories (destroyed, severe and moderate). Buffers were created encompassing these points and used to represent the footprint of damaged major cities throughout Syria.

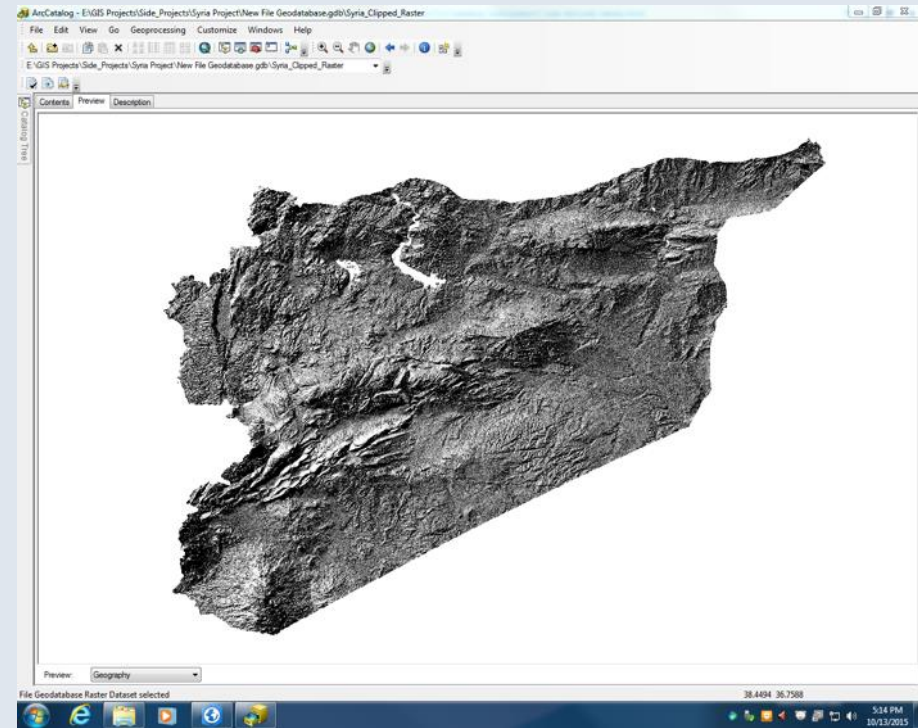
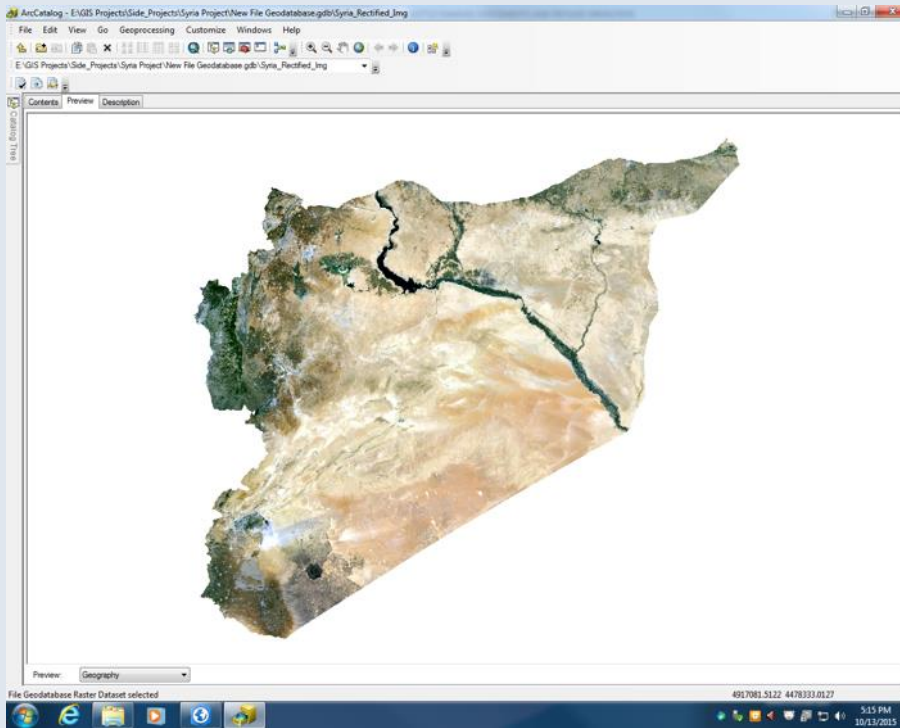


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Cartography

Clipped geo-referenced 4k image

Clipped 90m DEM with hill shade



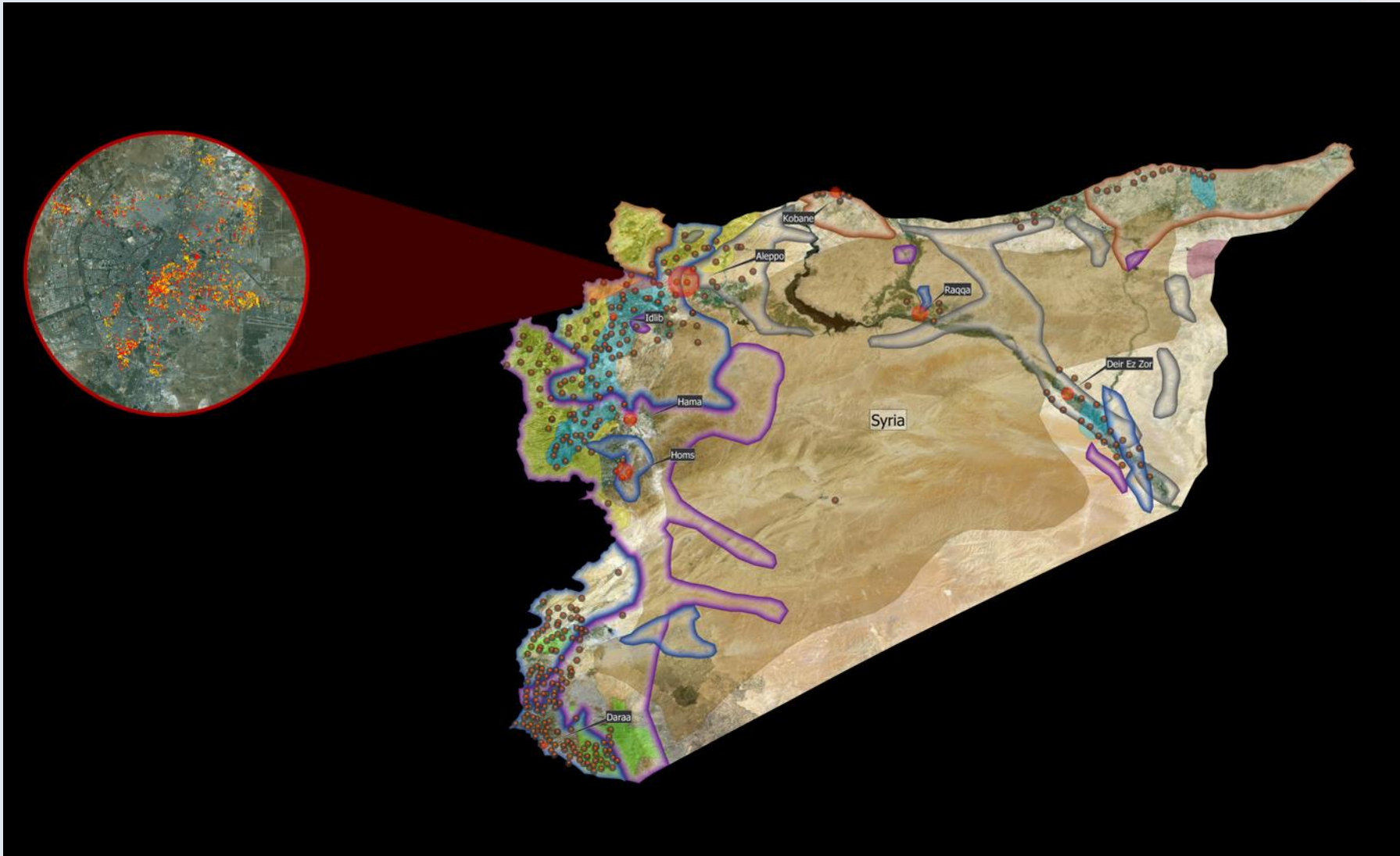
This image was draped over the DEM with 40% transparency applied. This gave an element of depth to the main data frame beyond what a basemap could deliver.

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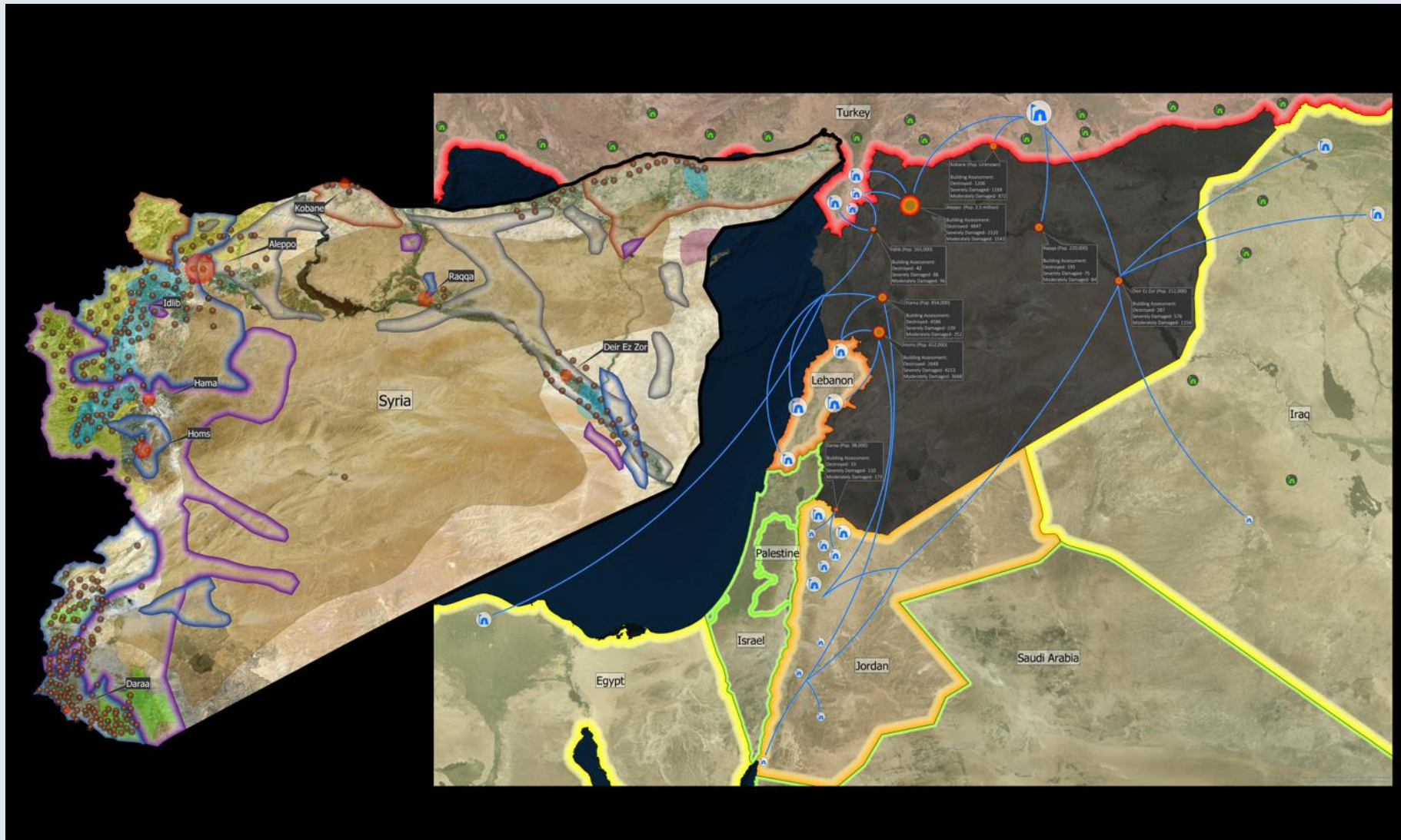
Cartography

- The primary goal was to create a project that focused on multiple aspects of the refugee crisis. The numbers by themselves are tragic, but have little significance if a comparison cannot be made, this ultimately lead to three distinctly separate but flowing dataframes.
- Due to ArcMap's limitations in graphics rendering, specifically overlapping clipped rasters with transparencies, the project was migrated into ArcGIS Pro approximately mid way through.
- Delineating twelve overlapping features within the main data frame also proved to be challenging. Allowing each entity to be represented without obscuring or stealing focus from the others was one of the greatest obstacles to overcome.
- The primary cartographic focus was providing the viewer with a stunning graphical overview of the conflict and crisis without losing them in statistical data.

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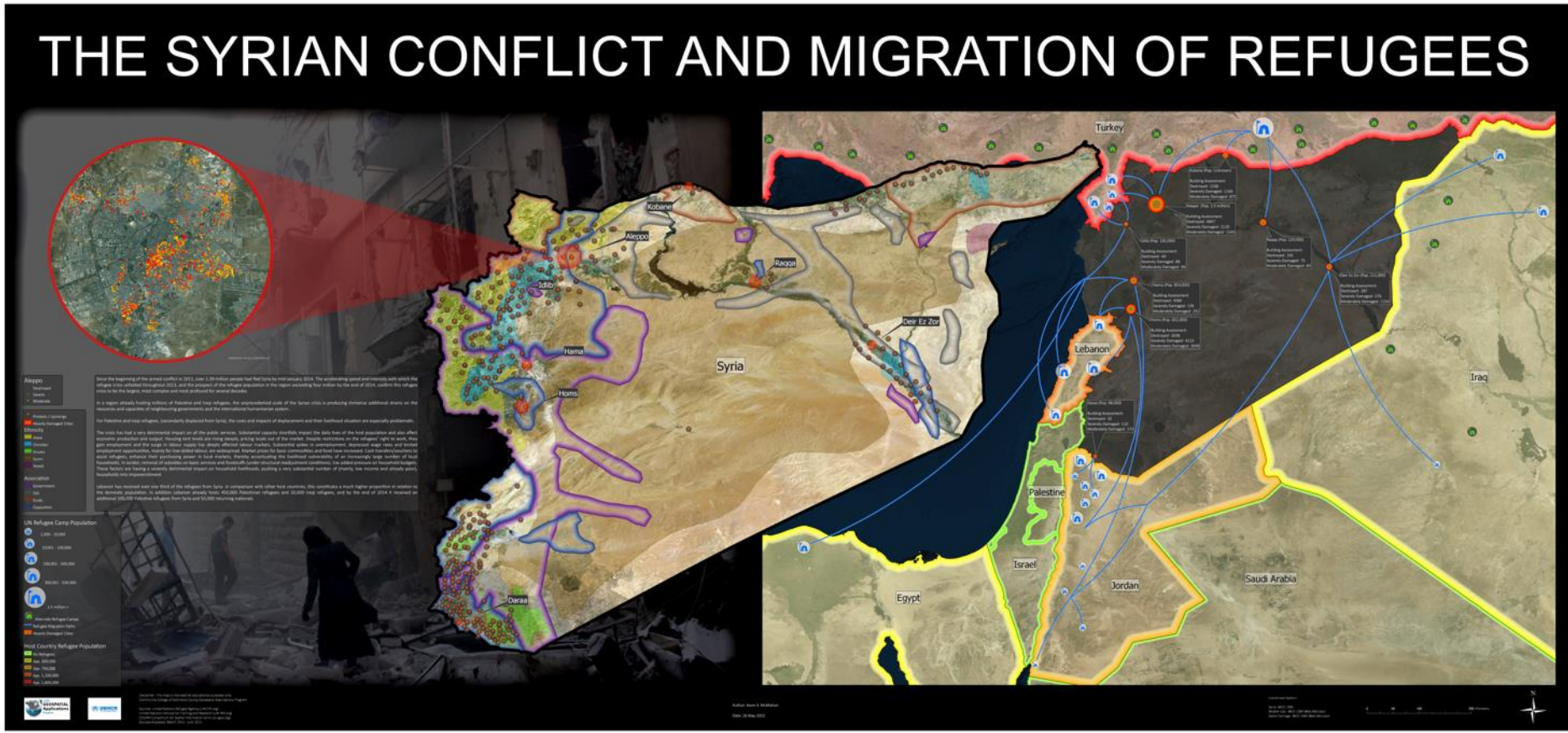


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