

Building Data Analysis Tools For Future Research in the Aida Refugee Camp



Background

The Aida Refugee Camp is a community of roughly 4700 Palestinian refugees in the West Bank, on the northern edge of Bethlehem.

One of the largest issues of concern in the camp is a lack of access to an adequate supply of water. Piped service is unpredictable, and regularly has gaps of several weeks. During these periods, most residents rely on rooftop storage tanks,

which are filled when the water is running through the use of electric pumps.

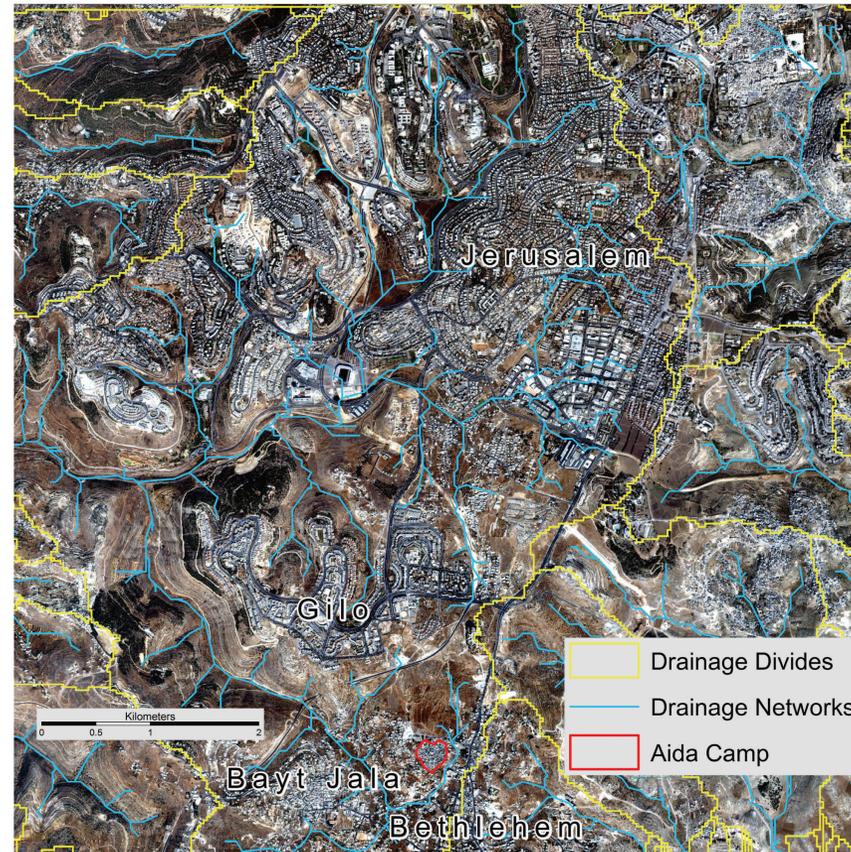
While the quantity of supply is the driving water issue for Aida Camp, water quality is the focus of increasing concern. The rooftop storage tanks are seldom cleaned, and many residents supplement their piped supply with water bought from unregulated sources. Aging and poorly maintained infrastructure also raise fears of drinking water's contamination from the sewer system.



Project Rationale

In May 2012, a group of Tufts faculty and students will travel to the Aida Refugee Camp as part of a practicum for the Water: Systems, Science, and Society Program. The primary goals of the practicum are to implement a water quality testing program in the camp, to assess the possible correlation between poor water quality and the health problems of camp residents, and to build a relationship with the camp community on which further research projects could be built.

This project is an initial step in a process of gathering data and building analytical tools to support future work on Aida Camp's water problems. I hope that the framework I have created will be strengthened by data acquired during the upcoming practicum, that it will enable future projects in the camp to set more ambitious goals, and that it will be useful in achieving those goals.

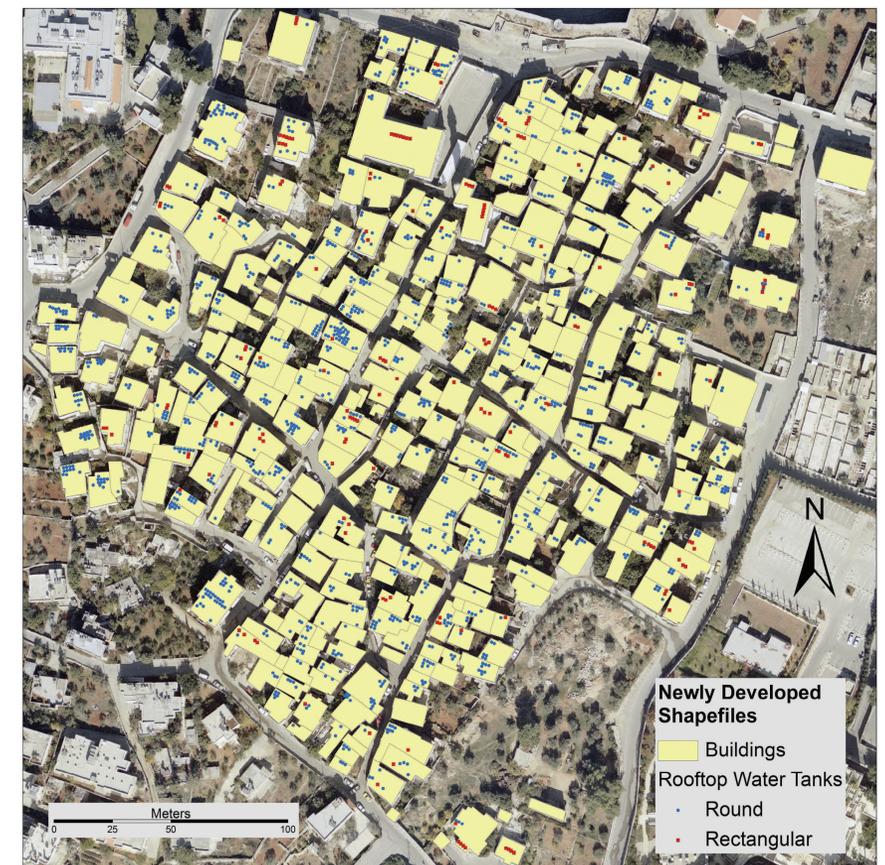


Modeling Drainage

I mapped the drainage divides and natural drainage networks in the area around Aida Camp. Beginning with an ASTER Global Digital Elevation Map, I derived flow direction, identified and filled in sinks, derived the updated flow direction and accumulation, and created a watersheds raster. I then converted this to a shapefile, and used the flow accumulation raster to delineate a drainage network.

Shapefile Creation

Much of the work for this project was derived from two data sources created by a PhD student working in Aida Camp in 2007: an aerial photograph of the camp and a sketch of rooftop storage tanks. After georeferencing both of these items, I used them to create two shapefiles: a polygon shapefile of camp rooftops, and a point shapefile of storage tanks.



Future Use

While the drainage data is not directly applicable to Aida camp's water problems, it should be useful background information for future efforts to map the piped drainage system of the camp.

The newly developed shapefiles will be useful for the initial practicum in Aida Camp, in planning locations for surveying and water sampling. They also have great potential as analytical tools, with the addition of newly collected data. With updated data for storage tanks per house, and the addition of data on the volume of each type of tank, rooftop storage capacity for each building would be simple to derive. With data on occupancy, one could model the amount of time that a building's water supply would last, at a given per capita rate of consumption.

Cartographer: Franklin Crump

Data Sources: ESRI Datamaps, GADM Database, GIST Database, LP DAAC Global Data Explorer, the dissertation of Linda Quiquix

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