



Teaching Forced Displacement with Geospatial Technology in Refugee Camps: Lessons from Rwanda and Jordan

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Forced displacement is inherently spatial, with aspects operating at multiple scales. At the individual scale, space shapes a survivor's experience. At the regional scale, space mediates our understanding of global processes of forced displacement and shapes our local responses to these worldwide trends. As long as there has been forced displacement, some form of geographic mapping has been used to understand, represent, and reason about forced displacement. In modern times, mapping technology comes in the form of geospatial technologies that can range from a displaced person using Google Maps on their phone to navigate in an unfamiliar environment as they migrate from their home country, to powerful geographic information systems (GISs) that drive core operations of organizations such as United Nations High Commissioner for Refugees (UNHCR), supporting countries hosting refugees and international humanitarian operations.

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The varied spatial aspects of forced displacement combined with geospatial technologies create excellent educational opportunities for a wide range of learners: undergraduate and graduate students, service providers to displaced populations, and displaced people themselves.

In this essay, I describe my experiences developing educational programs using geospatial technology centered on forced displacement in refugee camps. Specifically, I discuss my work of bringing undergraduate students to Rwanda to map refugee camps as well as, in Jordan, building a program to empower refugees to use geospatial technology to map refugee spaces. The experiences in Jordan, in particular, created a broader educational opportunity for virtual learning for my students back in the United States, as well as opportunities for service providers in Jordan to learn about geospatial technology to improve community services. The essay concludes with reflections on these experiences and ideas to consider for educators interested in teaching forced displacement using geospatial technology in refugee camps.

RWANDA: MAPPING REFUGEE CAMPS VIA STUDY-ABROAD EXPERIENCE

If one is truly interested in educating students about human-created spaces of forced displacement (like refugee camps), ideally one will be able to visit and experience life inside a refugee camp. However, actually gaining access to a refugee camp can be incredibly difficult. Camps are often closed and heavily militarized, meaning that only nationally recognized NGOs who run the camps have access. It takes time to build relationships with officials from the host country who ultimately decide who can enter a refugee camp. Also, refugee camps are often intensely resource-constrained environments that simultaneously receive many requests from academic practitioners wishing, for example, to do their next theoretical study on forced displacement, but offering nothing of practical value to the organizations who have limited time and resources to operate the camp, thus creating an imbalanced relationship. That imbalance is even greater between the scholars seeking access and the displaced people housed in these camps.

Having worked in Rwanda for several years before making a career shift into forced displacement, I was keenly aware of these issues when I began approaching officials from the Rwandan government about accessing Kigeme refugee camp, which was, as of 2021, home to around 18,000

refugees from the Democratic Republic of Congo (DRC).¹ As a geographer specializing in Geographic Information Science and Technology, I had done background research on geographic mapping of the camp and found that Rwandan officials had limited capacity to use mapping technology to support their camp operations, even though geospatial technologies were well-established in the international humanitarian community. Further, I saw a tremendous opportunity to bring these tools to a wide range of learners that included undergraduate students in the U.S., officials from the Rwandan humanitarian community, and the Congolese refugees themselves. I approached the Rwandan and UNHCR authorities with my idea to bring American college students to Rwanda to map the Kigeme refugee camp in detail as part of a study-abroad experience at my university. The goal was to create a very detailed map of the camp that would go beyond the excellent and important efforts of groups like OpenStreetMap that often map refugee camps by looking at satellite imagery, but do not actually enter the camps to conduct more detailed exploration of the space.²

Of course, being on the ground in Rwanda was also an invaluable opportunity to show U.S. undergraduate college students what life is like in refugee camps and to provide them some understanding of the type of spaces created for, and adapted by, refugees. In planning this study trip, I was also very conscious of the valid criticisms that such trips of U.S. college students to Africa can be exploitative in nature.³ Thus, the study-abroad experience was designed to take into account the needs of Rwandan officials and the refugees themselves, and to make capacity-building and educational opportunities for them, rather than the students, central to the trip. To achieve this goal, the program was designed to use very basic yet effective mapping technologies.⁴ Geospatial technologies have been criticized as difficult to master. However, many of the tools have evolved to the point that their technical operations, with proper setup and

¹ United Nations Office for the Coordination of Humanitarian Affairs (OCHA). "UNHCR Rwanda: Kigeme Refugee Camp Profile (as of April 15, 2021)." ReliefWeb. <https://relief-web.int/report/rwanda/unhcr-rwanda-kigeme-refugee-camp-profile-15-april-2021>.

² Missing Maps, <https://www.missingmaps.org/>. Last accessed January 23, 2022.

³ Ben Gardner and Ron Krabill, "Against the Romance of Study Abroad," *Africa is a Country*, July 5, 2017, <https://africasacountry.com/2017/07/against-the-romance-of-study-abroad/>.

⁴ See Brian Tomaszewski, *Geographic Information Systems for Disaster Management (Second Edition)*, (Oxfordshire and New York, Routledge: 2021).

maintenance, are no more difficult than common tasks people around the world do with their smartphones, such as using Facebook.

I picked this approach for several reasons. First, we did not require participating students to have backgrounds in forced displacement or geospatial technology before traveling to Africa. Second, the geospatial technical capacities of humanitarian professionals in Rwanda were somewhat limited. Thus, it was important that any interventions that we presented could, ideally, be sustained after we left.

In that regard, the program set the following schedule. A total of fifteen students traveled to Rwanda over the winter break for two weeks between two study-abroad trips. During this time, we gathered as much data as possible from the camps using mapping tools. Whenever possible, we created opportunities for the refugees to use mapping tools on smartphones to do the actual mapping in the camp. After the students returned to campus, they were required to take a three-credit semester-long course to process the data into maps and other information products that were then sent back to Rwanda.

Over the course of two study-abroad trips (2016 and 2017), this time frame proved to be generally effective. As project leader, I had to keep up momentum, especially when students got back from Rwanda. All too often, once the thrill of fieldwork and international travel is over, student time and attention move on to the next thing. It is essential to emphasize to the students the reciprocal nature of such an undertaking. They needed to remember the Rwandans who gave their time and resources to enable their educational experience in the camp, as well as to think of the refugees themselves, who can potentially benefit from the mapping intervention.

JORDAN: THE REFUGEE GEOGRAPHIC INFORMATION SYSTEMS (REFUGIS) PROJECT

After the program in Rwanda, Jordan permitted continued reflection on how best to engage students and affected communities. My work in Jordan focused on the Za'atari refugee camp located in northern Jordan, which was, as of 2021, home to just under 80,000 people.⁵ This camp was well-documented, receiving intense media attention at the beginning of

⁵United Nations High Commissioner for Refugees, "Zaatari Refugee Camp," Situation Syria Regional Refugee Response. Last modified December 31, 2021. <https://data2.unhcr.org/en/situations/syria/location/53>.

the Syrian conflict. As I have discussed in several previous publications,⁶ on my first visit to Za'atari in 2015, I was struck by how massive the refugee camp was, and, by extension, how essential geospatial technology and mapping were for the practical aspect of understanding space and also how geospatial technology could be used—not so much to educate American students, as to create and represent ideas of space and belonging for the refugees living in Za'atari.

Geospatial technology itself has its own interesting discourse in the operation of the camp. When I initially arrived at the camp, much of the actual mapping was done by an external NGO contracted by international humanitarian providers. This created contested, conflicted aspects of information sharing, and thus competing power relations among the various humanitarian actors in this very large, complicated humanitarian situation. From the beginning I believed that the refugees themselves needed to become actors in the information management of the camp through mastering geospatial technology. When the opportunity arose to apply for funding from the UNHCR Innovation initiative,⁷ and working in conjunction with dedicated technicians from the camp's community services, we were able to create the Refugee Geographic Information Systems project or "RefuGIS." Now, my students were Syrian refugees themselves, perhaps one of the most creative, innovative, and rewarding groups of students I've ever had the pleasure to teach. Over the course of several years, I made numerous trips to Jordan and gave lessons on geospatial technology to refugees. Lessons started with practical topics such as how to operate commercial GIS software, work with spatial data, and create the maps that the humanitarian professionals need for their work. Over time, I began to teach the students more about how they can communicate and represent the space they inhabit. Most notably in this regard, I taught them how to use Esri story maps.⁸ Story maps are a way to construct spatial narratives that combine multimedia artifacts such as pictures, videos, geographic maps, text, and more. I guided the refugee partners to create story maps on a wide variety of topics of interest to their lived experiences in the camp: ranging from the experiences of women in the refugee camp

⁶ Brian Tomaszewski, "I Teach Refugees to Map Their World," *The Conversation*, May 18, 2018, <https://theconversation.com/i-teach-refugees-to-map-their-world-94160>.

⁷ UNHCR, "Innovation Service," <https://www.unhcr.org/innovation/>. Last accessed January 23, 2022.

⁸ Esri, "ArcGIS StoryMaps," <https://storymaps.arcgis.com/>. Last accessed January 23, 2022.

to a compelling story about surviving the violence in Syria, coming to the camp, or facing difficult illnesses.⁹

Although I never brought any U.S. college students to Jordan, the overall project created numerous opportunities for my students to learn about the spaces of refugee camps and the lived experiences of the refugees themselves. Specifically, virtual collaboration technologies brought my Jordan students into conversation with my U.S. students. Students in Jordan shared experiences about what life is like in a refugee camp, and all my students bonded over the common ground of studying GIS.

The RefuGIS project continues to prosper. With time now to reflect upon the accomplishments, I see that teaching geospatial technology has shaped how the refugees themselves view and experience the space they live in. The more senior members of the RefuGIS project are now leading much of the initiative. RefuGIS is included in discussions with camp management on spatial topics such as winterization, redevelopment, and any other spatial aspect of the camp that will ultimately require the use of geospatial technology for decision-making.

The innovation created through the refugee project has also had a synergistic effect with other innovation in the camp. Members of the RefuGIS project are now working on projects ranging from robotics to video game development. The technology focus of the RefuGIS project has also enabled several project team members to go on to formal university studies in Jordan related to technology. I was thrilled to hear that the RefuGIS project, which involves several women—a group underrepresented in technology, particularly in the Arab world—inspired other women to pursue careers in educational study in technology, even if not specifically geospatial technology.

CONCLUSION

Refugee camps offer a unique lens into the construction of space—both the literal construction of physical space, but also the lived experience of space. Geospatial technologies are powerful tools that can represent and provide an analytical framework needed for decision-making that has important effects on the lives of displaced people. Additionally, they are

⁹Brian Tomaszewski, “Helping Syrian refugees share their stories with Esri Story Maps,” *ArcGIS Blog*, August 22, 2019, <https://www.esri.com/arcgis-blog/products/story-maps/sharing-collaboration/helping-syrian-refugees-share-their-stories-with-esri-story-maps/>.

relatively easy to teach on the new platforms that exist. As I discussed in my study-abroad trips in Rwanda, they can provide a practical benefit for educators and humanitarian professionals who may lack the training to use geospatial technology to its fullest extent even though they may be aware of its existence. The combination of these ideas makes geospatial technology an excellent choice for developing educational programs related to forced displacement for college students, humanitarian professionals, and refugees themselves.

However, geospatial technologies certainly cannot provide a complete understanding of forced displacement or life in a refugee camp. The long-standing critique of geospatial technologies as a tool of state interests and surveillance is well taken.¹⁰ If not employed with sensitivity and cultural awareness, geospatial technologies can efface the lived realities of displaced people by abstracting geographic reality to points, lines, and polygons. It can be difficult to capture anyone's sense of "belonging" on a map; this is perhaps an even greater challenge for displaced people. How does one map the meaning of a small garden created by an elderly Congolese woman living in a refugee camp in Rwanda? How does one represent the emotion that comes from seeing a metal caravan painted with scenes of Syria in a refugee camp in Jordan? How does one best account for informal communities based on ties back to the home country that do not conform to the official districts designated by camp officials?

Ideally, enabling refugees themselves living in camps to use methods like participatory mapping and access to geospatial tools, as demonstrated in the RefuGIS project, can begin to shed light on these issues. By extension, teaching geospatial technology to displaced, marginalized communities (in refugee camps or otherwise) can create opportunities for increasing diversity in fields like Geography—particularly when geospatial technology education is emphasized for improving students' technical skill and employment opportunities. Highlighting the experiences of displaced people around the world as an educational focus can bring broader cultural awareness and cross disciplinary boundaries to help solve global challenges.

¹⁰Mei-Po Kwan, "Affecting Geospatial Technologies: Toward a Feminist Politics of Emotion." *The Professional Geographer* 59 (1: 2007): 22–34.

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