Towards Humanitarian GIScience: Myriad Maps in an Applied Forensic Humanitarian Context

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What is Humanitarian GIScience?

Humanitarian GIScience
- The application of spatial analytical perspectives and tools to genocide studies, spatial forensics, and, in general, human rights topics and events (Miranker and Giordano 2020)
- A mixed methods approach

Humanitarian Forensic Action (HFA)
- Action conducted to alleviate human suffering and protect the dignity of conflict or disaster victims (Cordner and Tidball-Binz 2017)

Migrant/Border Death
- Transnational forensic cases
- “Dying of migration” (Cuttitta 2020)

Unidentified Human Remains of Probable Migrants (UHRpm)

1. Locate
2. Account
3. Understand
4. Identify
5. Notify families

UHRpm

Forensic Anthropology

Geographic Information Science

Geography
Case Study: What we know

Graph 1. Migrant Border Deaths in Texas and Arizona Recorded by Border Patrol per Sector

(Humane Borders 2022)
Texas' Brooks County Is 'Death Valley' for Migrants

A deputy in one of the counties that has seen a surge in undocumented children says they have found 37 migrants' bodies this year alone.

In Border’s ‘Killing Fields,’ a Desperate Fight to Stay Alive

Each marker is the geolocated coordinates of a recovered body within Brooks County (2009-2019). [Courtesy Stephanie Leutert, Director of the Mexico Security Initiative at the University of Texas at Austin in Lawfare Blog; statistics via Brooks County Sheriff’s Office.]
Case Study: Research Questions

Where do migrant deaths occur in South Texas?
  • Task: Create an unidentified remains mortality profile for South Texas

How might an account for these kinds of deaths serve both forensic and humanitarian aims?
  • Task: Examine the spaces and places of death
  • Task: Review how migrant mortality is (or is not) recorded

How does GIScience ameliorate or propel these goals forward?
  • Task: Identify hindrances to forensic and humanitarian action
Case Study: Data

- **1,412 recorded cases** of migrant deaths
  - 2009-2020
  - Sheriff’s, Justices of the Peace, and Border Patrol

- **57 interviews and observations**
  - IRB #7568
  - March 2021 - July 2021

- **Local newspapers** (Texas and Mexico)
  - 1993 – 2020
  - N = 580, n = 65 for analysis here

- **Uncertainties**
  - Access
  - Representativeness
Case Study: Mixed Methods

- **ArcGIS Pro ® v2.9.3**
  - **Spatial Statistics**
    - For the region (n = 10 counties)
    - Per county where at least 40 of records are available

- **SaTScan® v10.0**
  - **Space-time cluster analysis**

- **Qualitative Spatial Representation (QSR)**
  - News articles semantic triples (Stell 2019; Murrieta-Flores et al. 2019)

- **Interviews (currently working on)**
  - **Corpus Linguistics (CL)**
    - Hand-drawn map and Google Maps shared by participants

- **Social Network Analysis**
  - *To be decided after completing interviews analysis*
Case Study: Some Findings
Spatial Statistics per County (2009-2020)

Expected
1. Border counties river deaths
2. Smaller SD circles when more UHRpm reported

Less expected/ Unexpected
1. “Blank spaces” between border counties and near-border counties. Proximity to Border Patrol checkpoints a factor
Regional Space-Time Scan Statistics

Expected
1. More clustering detected in Brooks County
2. More cases recovered in winter months

Notable/Unexpected
1. Nothing detected near the River in Webb County
2. “Blankness” along the Gulf Coast and between Jim Hogg/Brooks and Starr/Hidalgo counties
**County Space-Time Scan Statistics**

**Expected**
1. More clustering detected in Brooks County

**Notable/Unexpected**
1. Visual (not statistical) nearness to a major roadway or major water way
2. Mostly “blank” spaces
<table>
<thead>
<tr>
<th>Newspaper</th>
<th>Del Rio Herald News (metadata)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>2020 (metadata)</td>
</tr>
<tr>
<td>Published</td>
<td>Acuña Fire and Civil Protection Department Aquatic Squad first responders</td>
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<tr>
<td>Element 1</td>
<td>Organized the search near</td>
</tr>
<tr>
<td>Element 2</td>
<td>The Rio Grande River</td>
</tr>
<tr>
<td>E1</td>
<td>The first responders</td>
</tr>
<tr>
<td>R2</td>
<td>The Rio Grande River</td>
</tr>
<tr>
<td>R3</td>
<td>The first responders</td>
</tr>
<tr>
<td>Element 3</td>
<td>The first responders</td>
</tr>
<tr>
<td>R4</td>
<td>The remains of the two brothers</td>
</tr>
</tbody>
</table>

Two brothers. Located near Rancho La Vega, in the city’s north side and a few miles downstream of Rancho El Olmo where they were last seen alive.

The father

And sent for autopsies

Criminal Investigations Agency/ Office of the State of Coahuila General Prosecutor

(Cantu 2020, Del Rio Herald News) 

#64
QSR: Late 1990s

QSR: 2012
Interviews

Mission, TX Fire Department Dive Team’s Tour of Typical Rescue and Recovery Sites in the Rio Grande River
Interviews

Hand-drawn maps
Where do migrant deaths occur in South Texas?
• Unidentified remains mortality profile for South Texas, most deaths found and reported close to Border Patrol interior Checkpoints

How might an account for these kinds of deaths serve both forensic and humanitarian aims?
• Exposes where there are conspicuous gaps in data
  o Lack of access
  o Absence of records

How does GIScience ameliorate or propel these goals forward?
• Situates local knowledge and traditional geospatial analyses together
• “Blank spaces” become areas for action: the silences of the map

To accomplish Humanitarian GISci juxtaposing heterogeneous datasets together can provide a better view of the situation and offer place-specific action
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