Creating a Dashboard to Identify and Enhance Preventive Search and Rescue Efforts

Lindsay Ciurleo
Penn State University
MGIS Program
Advisor: Dr. Gregory Thomas
Agenda

Background
Goals & Objectives
Study Area
Proposed Methodology
Anticipated Results
Future Considerations
Project Value
Timeline
Background: WiSAR

• Wilderness Search and Rescue (WiSAR)
  • About
  • Challenges

• Previous studies
  • Last Known Point (LKP)
  • Lost Person Behavior (LPB)
  • Incident Planning Point (IPP)
  • Mobile Applications

Background: Preventive Search and Rescue (PSAR)

- About
- Importance
- Previous Studies
- Successful PSAR Programs
  - Grand Canyon National Park
  - Yosemite National Park

Background: New York Search and Rescue

- Annually, over 300 individuals are lost or injured in New York’s wilderness
- NYS DEC Forest Rangers empowered by NYS Environmental Conservation Law
- Typical missions: lost persons, downed aircraft or rescue operations

Other Rescue Groups
- Adirondack Mountain Rescue
- Lower Adirondack Search and Rescue: LASAR
- Search and Rescue of Northern Adirondacks
- Central Adirondack Search and Rescue
Goals & Objectives

Goals

• To reduce the number of missing persons in the wilderness and increase people’s safety
• Create a template dashboard focused on preventive search and rescue efforts for others
• Discover characteristics that provide insights into reducing people going missing

Objectives

• Create a dashboard from Adirondack Park search and rescue data from 2012 to 2022 that presents information where authorities can implement efforts to prevent future wilderness search and rescue operations.
Study Area

Boundary Line of Adirondack State Park in New York State
Proposed Methodology

1. Obtain Data
2. Process Data
3. Add Data into ArcGIS Pro
4. Create Maps
5. Create Webmap
6. Create Dashboard in ArcGIS Dashboards
## Proposed Methodology: Data

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildland Search and Rescue Missions by NYS Forest Rangers: Beginning 2012</td>
<td>Shapefile – Date ranges from 2012 to March 2023. Attributes include demographic information, found in search area, last known location county and land cover, number of rangers found, incident time and date, type of SAR incident, and latitude and longitude where found</td>
<td>DATA.NY.GOV: <a href="https://data.ny.gov/Public-Safety/Wildland-Search-and-Rescue-Missions-by-NYS-Forest-/u6hu-h7p5">https://data.ny.gov/Public-Safety/Wildland-Search-and-Rescue-Missions-by-NYS-Forest-/u6hu-h7p5</a></td>
</tr>
<tr>
<td>Adirondack Boundary file</td>
<td>Shapefile - Outer boundary of the New York State Adirondack Park as described in Section 9-0101 of the New York Environmental Conservation Law. Also known as the &quot;Blueline.&quot;</td>
<td>Adirondack Park Agency ArcGIS Data: <a href="https://apa.ny.gov/gis/ApaData.html">https://apa.ny.gov/gis/ApaData.html</a></td>
</tr>
<tr>
<td>Adirondack Park Land Classification</td>
<td>Shapefile - Represents state and private land classifications and open water</td>
<td>Adirondack Park Agency ArcGIS Data: <a href="https://apa.ny.gov/gis/ApaData.html">https://apa.ny.gov/gis/ApaData.html</a></td>
</tr>
</tbody>
</table>
Proposed Methodology: Data

- Total of 5,414 Incidents (Adirondack – 3,414)
- Date span: January 2012 - December 2022
- Incidents
Proposed Methodology

- Heat Map/Dot Density Map
- Colocation Analysis
- Spatial Association Between Zones
Proposed Methodology

• Add elements
  • Demographics
  • Location
  • Activity
  • Incident Totals and Time of Year

• Interactive Elements

Create Dashboard in ArcGIS Dashboards
Anticipated Results

- Interactive dashboard that identifies trends and patterns to implement targeted PSAR tactics
- Benefit to SAR personnel, resources, and public safety
Future Considerations

• Dashboard Elements
• Interactive Elements
• Possible FOIL results
Project Value

- Analyzing and visualizing historical data will cut down resources and increase public safety
- Shows the importance of collecting standard data points that are critical to WiSAR analysis
- Dashboard could be implemented in other WiSAR efforts depending upon data availability
Proposal Timeline

**STEP 1:**
Capstone Presentation

**STEP 2:**
Capstone Proposal Complete

**STEP 3:**
Summer Classes Begin

**STEP 4:**
Summer Classes End

**STEP 5:**
596B begins

**STEP 6:**
Project Completed

- Present Capstone Proposal
- Incorporate Review Comments
- Submit Final Capstone Proposal
- Photograph and measure
- Start Summer Classes (GEOG 406 and GEOG 871)
- Completed Summer Classes
- Possible Publication: Adirondack Journal of Environmental Studies or Wilderness and Environmental Studies
- Capstone Completion
- Complete Analysis and Dashboard
Questions
References


