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A vibrant mural featuring a globe with latitude and longitude lines. The globe is surrounded by stylized, colorful elements in shades of blue, yellow, and black. Large, bold letters are visible on the mural, including 'RE' on the left and 'BU' on the right. The overall style is graphic and artistic.

**Building Data from the
Ground Up:
Flooding and Disaster
Management in Hopkins,
Belize**



The Team:



UCF Amanda Ashby: Sociology

Sarah Kuo: Geological/Environmental Science



Jasmine Perez: Environmental Engineering

Jake Wade: Economics and Geography



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Flooding Background

- Climate Change
 - Strong impacts in Caribbean
- Development and Urbanization









Participatory GIS

- Community involvement
- Record and represent local knowledge
- Replicable methodology





Community-Based Research Objectives

- Open-source Hopkins data
- Training locals/youth on data collection methods
- Recording historical/local knowledge
- Creating flood and disaster management methodology
- Rebuilding trust in researchers

Aerial Imagery

- DJI Phantom 3 Advanced Quadcopter
- Updated image, road placement







Baseline Data

- Roads
 - Condition, use, etc
- Culverts
 - Condition, material, etc
- Structures
 - Material, elevation, etc
- ArcCollector






Community Perceptions

- Flood-Prone Areas
 - Land use in flooded areas
 - Level of impact
- Primary cause of flooding
- Primary problem with flooding







Community Perceptions: Results

Cause of flooding:

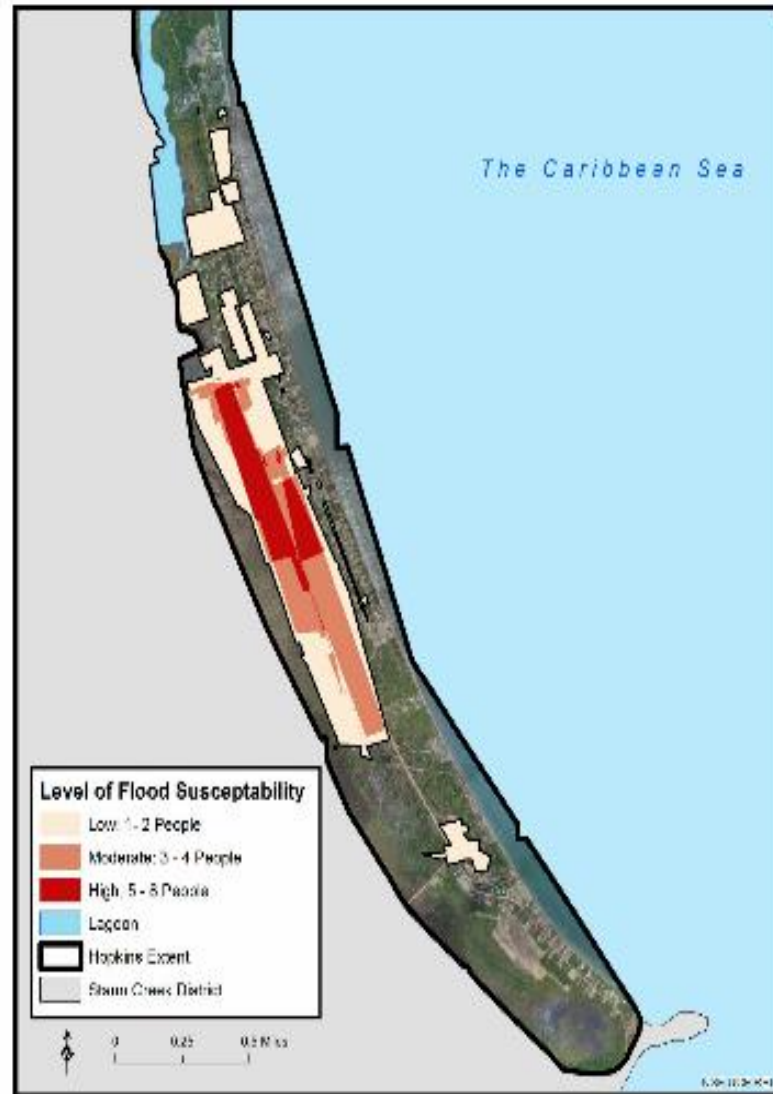
- 1) Poor drainage
- 2) Development

Main effect of flooding

- 1) Standing Water and Disease
- 2) Transportation
- 3) Property damage



Community Perception of Flood Susceptibility



Cartography by: Jake West, Anamika Ashby, Sarah Ray, Joanne Price

This map shows personal data by community members, made to represent sense of perceived flooding

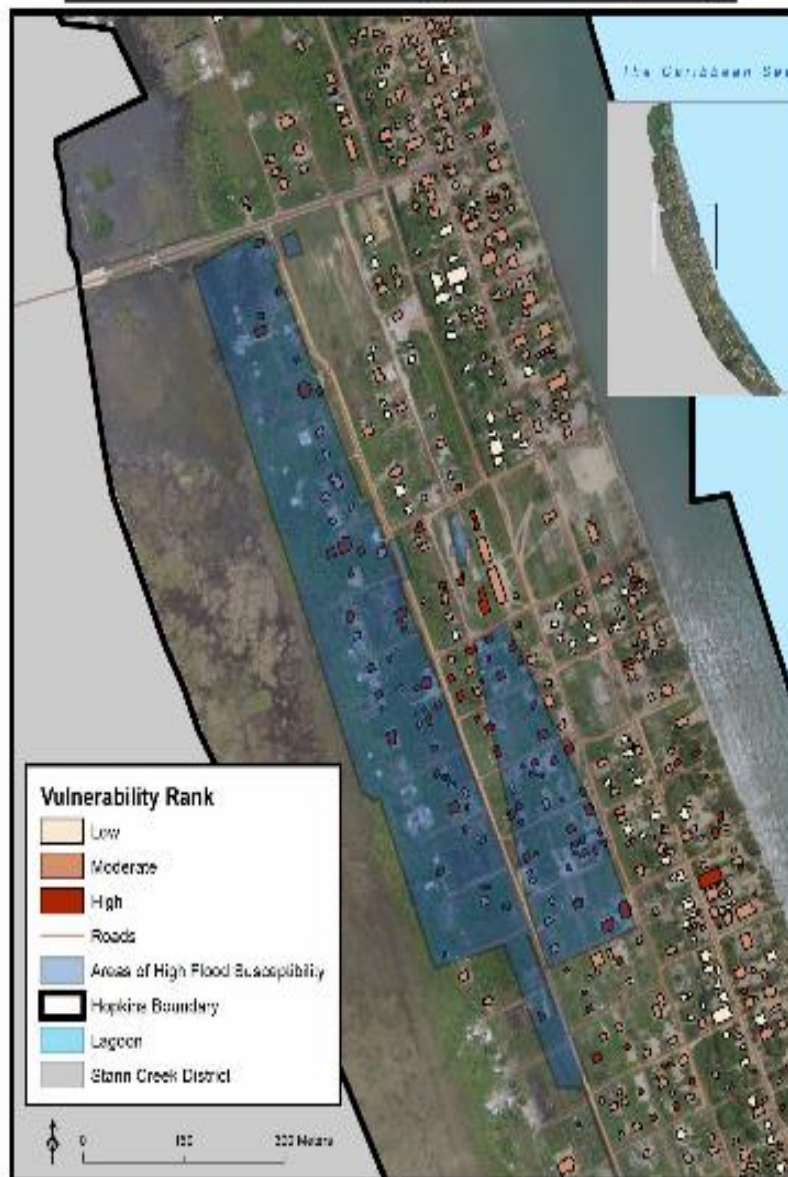


The background of the slide is a painting. On the left, a dark bear's face is shown in profile, looking towards the right. The bear has light-colored eyes and is framed by a white and yellow border, suggesting it is inside a boat. In the background, there is another boat with a similar white and yellow border, and a body of blue water. The overall style is somewhat abstract and textured.

Determining Flood Risk

- Perception Mapping
- GIS analyses on structures
- Focus on physical and geospatial vulnerability

Flood Risk Assessment: High Flood Susceptibility



Cartography by: Jairo Wade, Amanda Kirby, Sarah Kuo, Jeannine Perez

This map shows digital structures in the areas of highest flood susceptibility, identified by the community, and their vulnerability rank.



Building Use in Flood Zones

- Residential vs. Commercial
- 2 Highest Flooding Zones:
 - 241/273 structures in flood zones are residential
 - 211/239 commercial structures outside flood zones

Residential vs. Nonresidential Structures



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Culvert Condition/Location

- Most culverts are in flood zones
- 1st flood zone: good condition culverts
- 2nd flood zone: completely broken
- 3rd flood zone: no culverts





An aerial photograph of a coastal area, possibly a beach or a small town, with a yellow and black patterned overlay. The pattern consists of thick, irregular lines that form a grid-like structure, with some areas filled with yellow and others with black. The background shows a mix of green vegetation, blue water, and some buildings or structures. The overall style is graphic and abstract.

Site Suitability Analysis

- Eliminated Structures
 - Thatched Roof
 - Less than 125 square meters
 - Private Businesses
- Ranking Scale
 - Size
 - Construction Material
 - Elevation of Structure
 - Roof Material



Site Suitability Results

- 90 Structures After Elimination
- Top 12:
 - 11 Resorts
 - #6: Holy Family School

Site Suitability Analysis



Generated by Esri, with data provided by Esri, NOAA, and the U.S. Army Corps of Engineers

This map shows the approximate location of the shelter locations. It does not represent the actual location of the shelter locations.

Interpretation of Key Findings

- Local knowledge confirms baseline data findings
 - High risk flood zones lack proper drainage
 - Majority of homes are at risk and the best shelters are resorts



Conclusions

- Created open-source baseline data
- Created replicable and cost-effective methodology
- Documented local/historical knowledge
- Trained and collaborated with community members







Future Work

- Data
 - Elevation, substrate, precipitation, flood gauges
- Investigate opening natural outlets
- More sketch mapping
- Strengthen community partnerships
 - Raise awareness





Thank You!

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