

# Green Stormwater Infrastructure in Northeast Wilmington, DE

Emily Rodden<sup>1</sup>, Rachel Zobel<sup>2</sup>, Vaishnavi Tripuraneni<sup>1</sup>, Carolyn Voter<sup>2,3</sup>, Victor Perez<sup>4</sup>, Silvie Sandeen<sup>1,5</sup>, Camryn Walker<sup>1</sup>

<sup>1</sup>Department of Geography and Spatial Science, <sup>2</sup>Department of Civil, Construction, and Environmental Engineering, <sup>3</sup>Department of Earth Sciences, <sup>4</sup>Department of Sociology & Criminal Justice, <sup>5</sup>Georgetown University

✉ ERodden@udel.edu

✉ Zobel@udel.edu



## 1. OVERVIEW & APPROACH

Wilmington, Delaware faces **worsening flood risks** from **aging infrastructure** and **climate change**. This project examines how green stormwater infrastructure (**GSI**) can **mitigate flooding** while **addressing community needs** and **equity** in Northeast Wilmington by **integrating qualitative and quantitative** approaches and analyses.

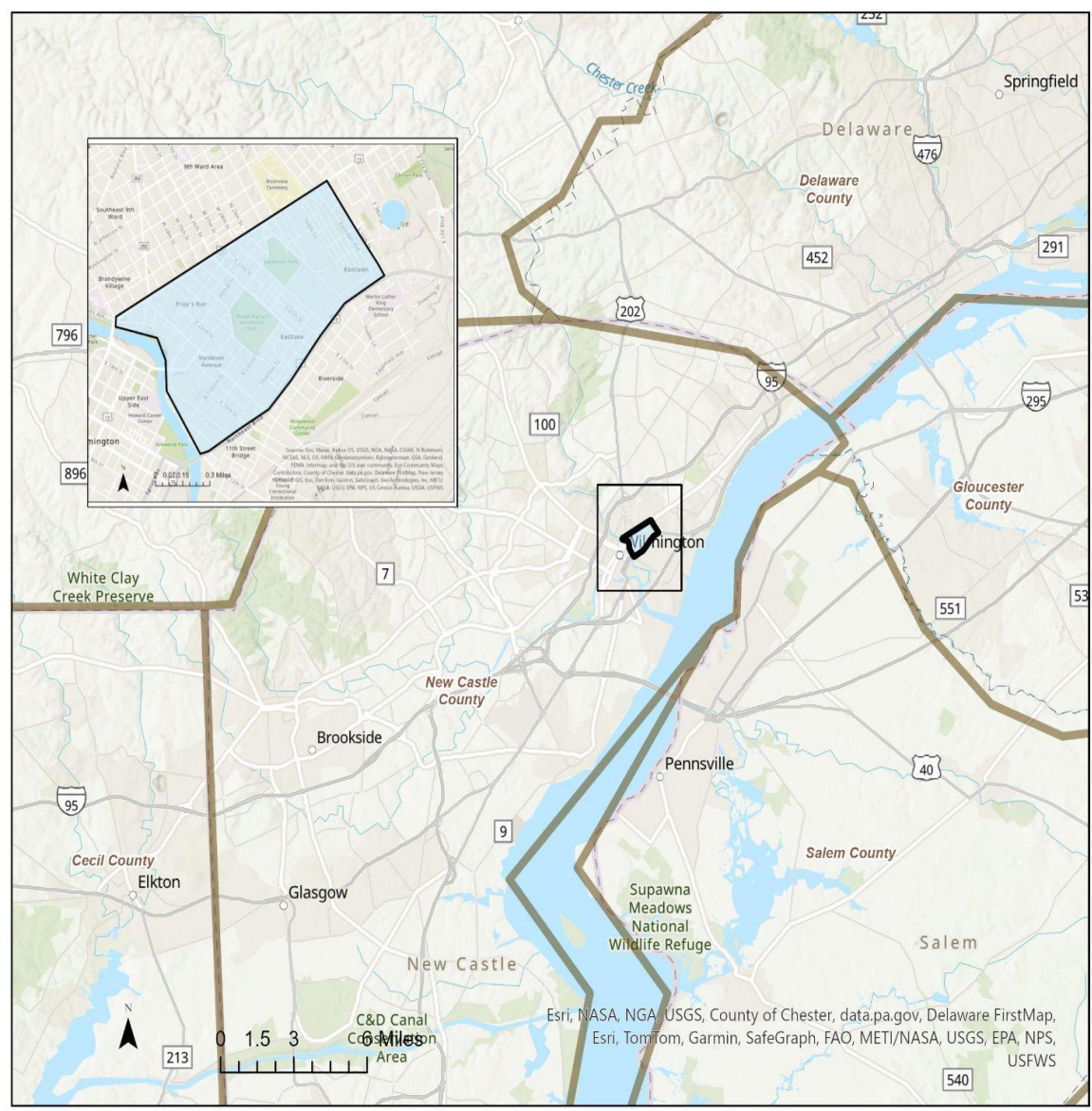
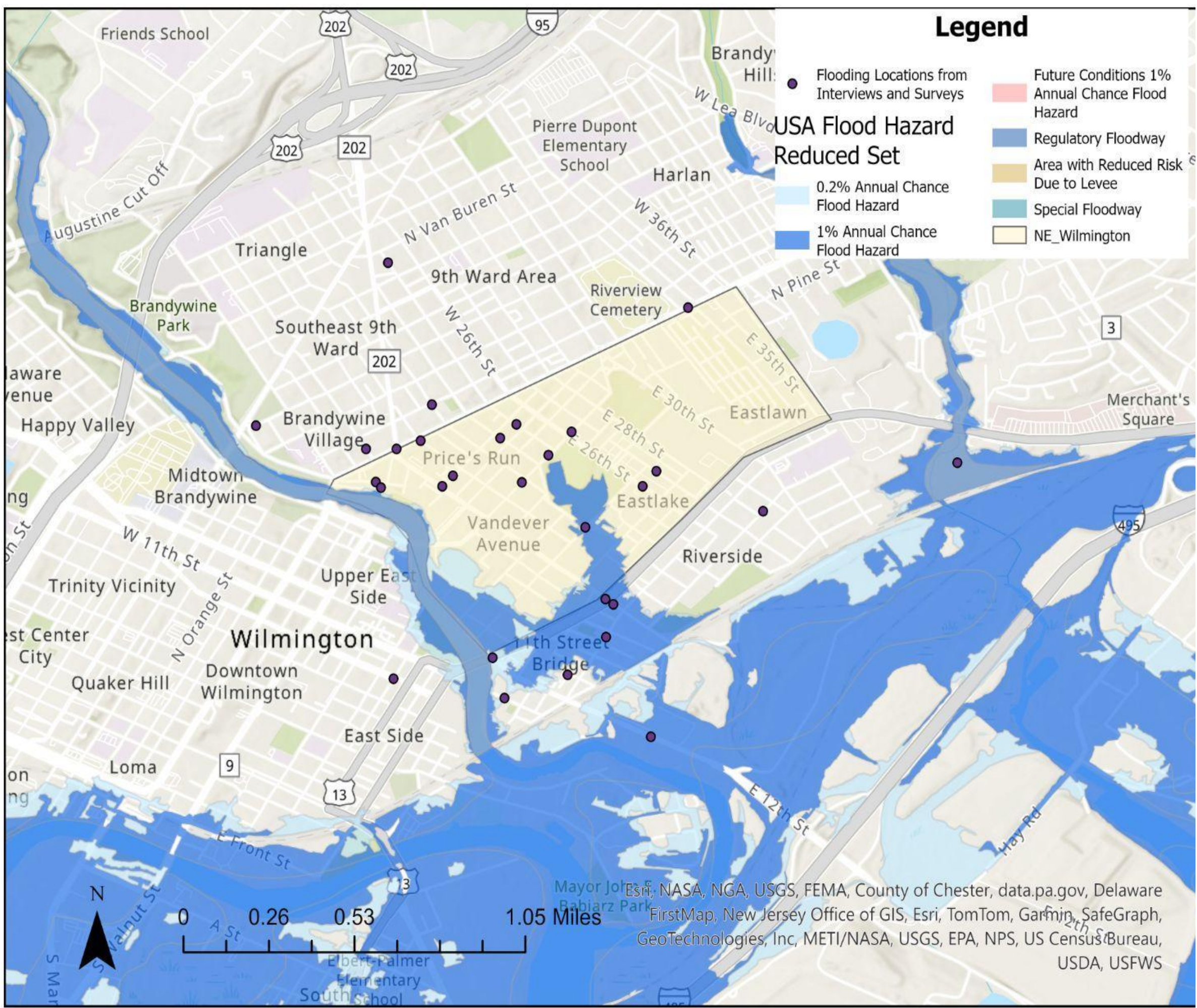


Figure 1: Research area in Northeast Wilmington, DE, bounded by the Brandywine River (south), N. Market St. (west), Northeast Blvd. (east), and 35th St. (north).

### Interviews & Survey Methods

**Interviews: 26**  
Purposive and Snowball Sampling  
Conducted over zoom or in-person  
Subcode and In Vivo code

**Surveys: 68**  
Postcards to online  
Random sample, In-person events  
Greenspace usage, barriers to GSI, flooding, generalized perceptions of GSI



### GIS & Hydrologic Modeling

#### GIS

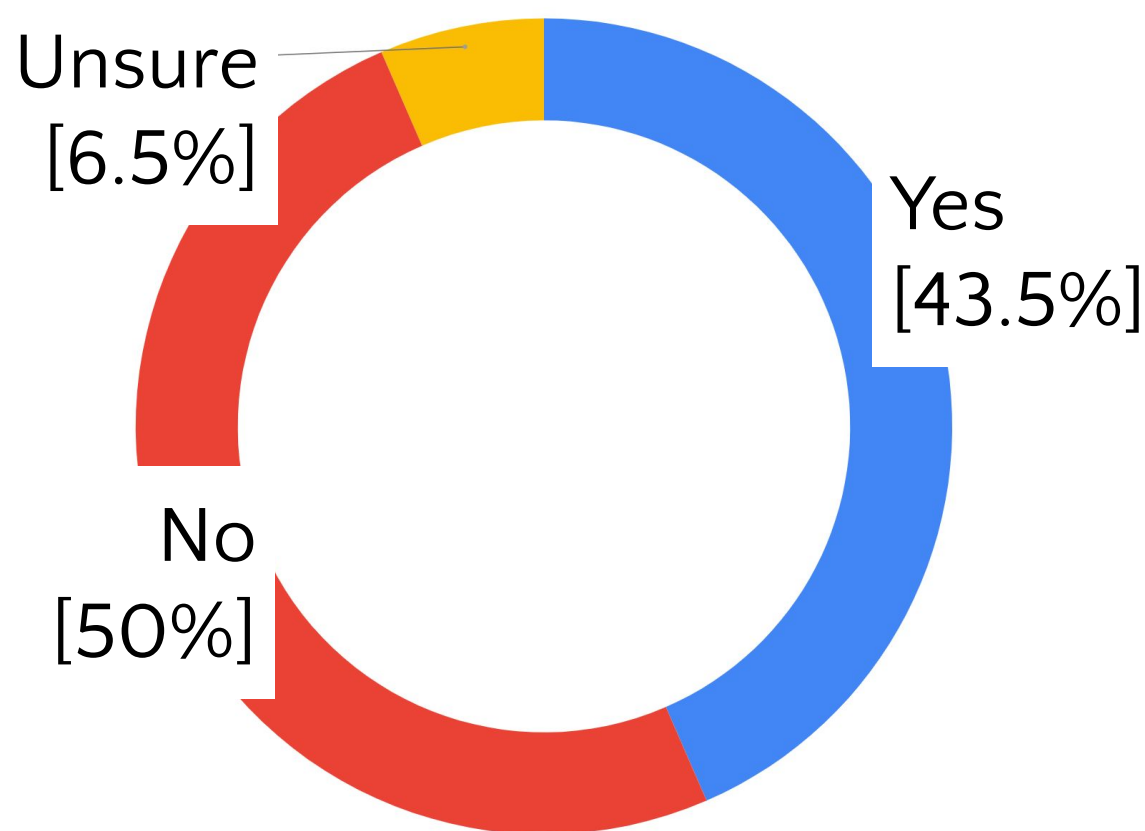
Parcel and impervious surface layers from Delaware and New Castle County resources

#### PCSWMM

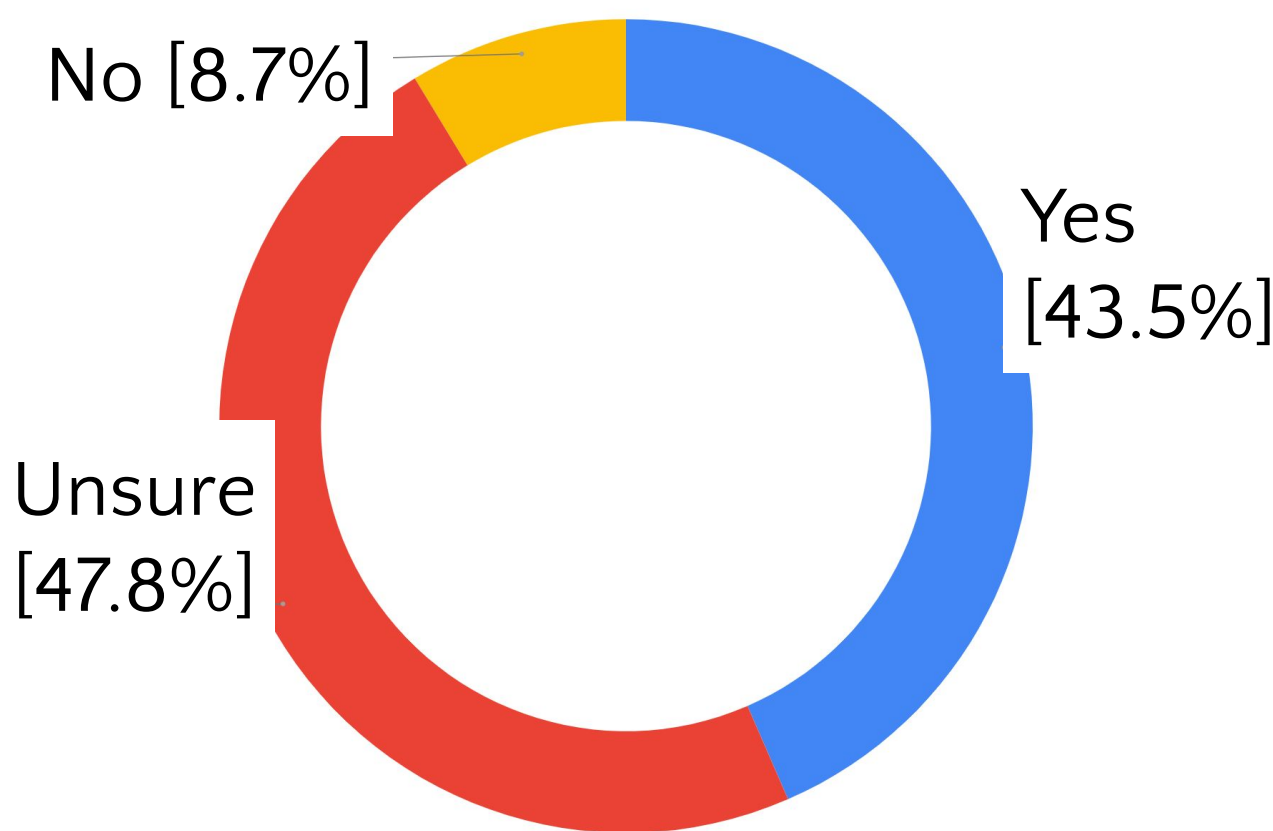
Integrate GIS layers with PCSWMM model from City of Wilmington and Tetra Tech

## 2. SURVEY RESULTS

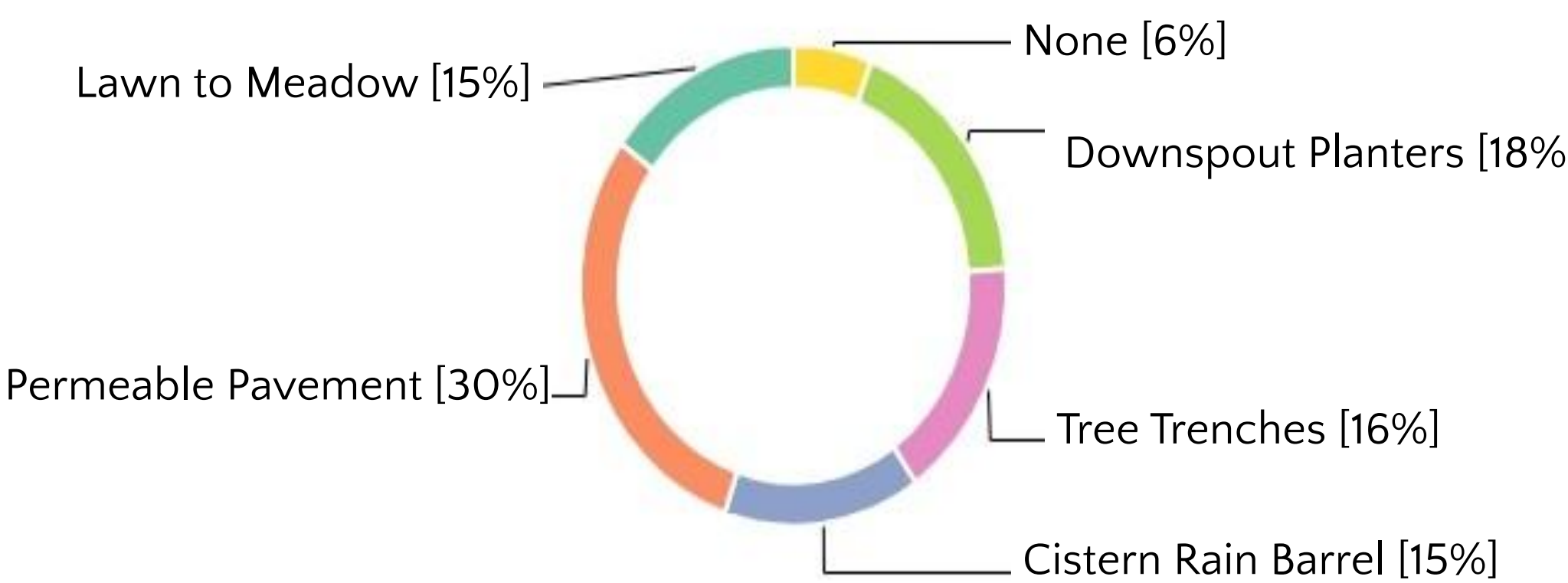
Do you experience flooding on, in, or around your home?



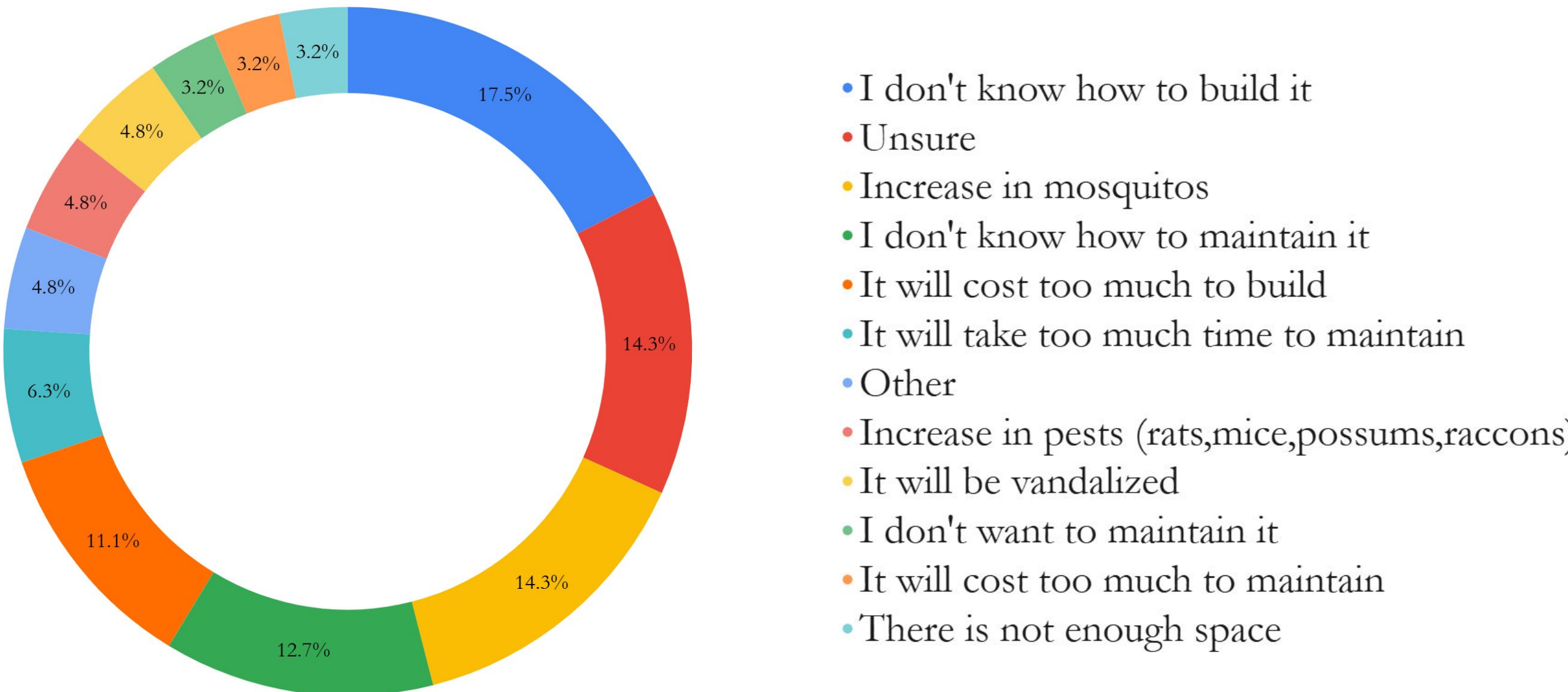
Would you implement GSI on your property?



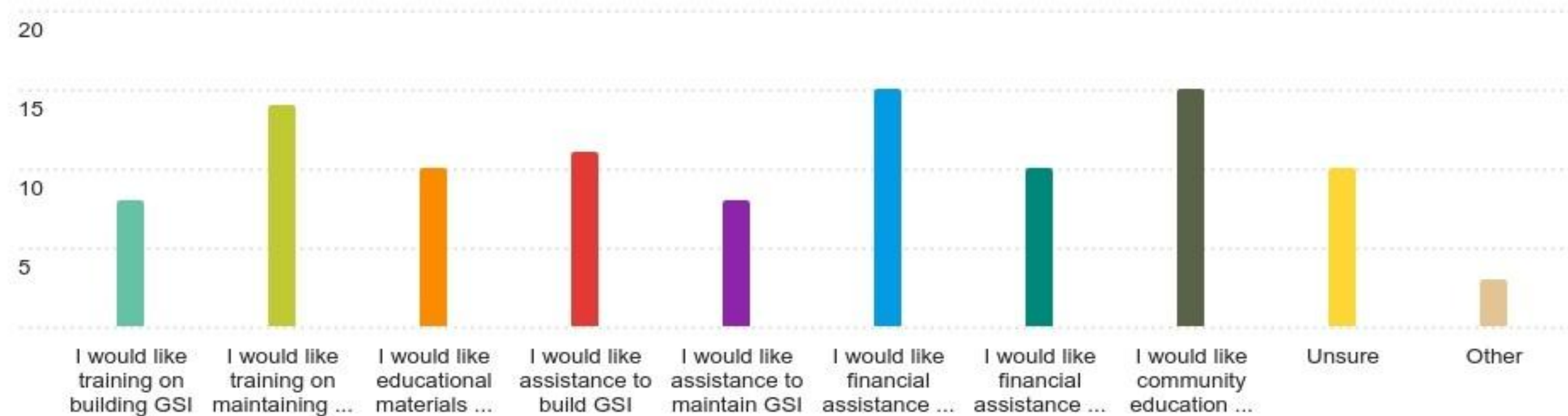
What type of GSI would you like to see on your own property? (Select all that apply)



What are some reasons that you do not support GSI? (Select all that apply)



What would make green stormwater infrastructure on your property successful? (Select all that apply)



## 3. HYDROLOGIC MODELING

Model Wilmington's sewershed with PCSWMM to assess how bioretention GSI can mitigate flooding, informed by site data and community priorities as well as extreme scenarios under average and wet conditions.

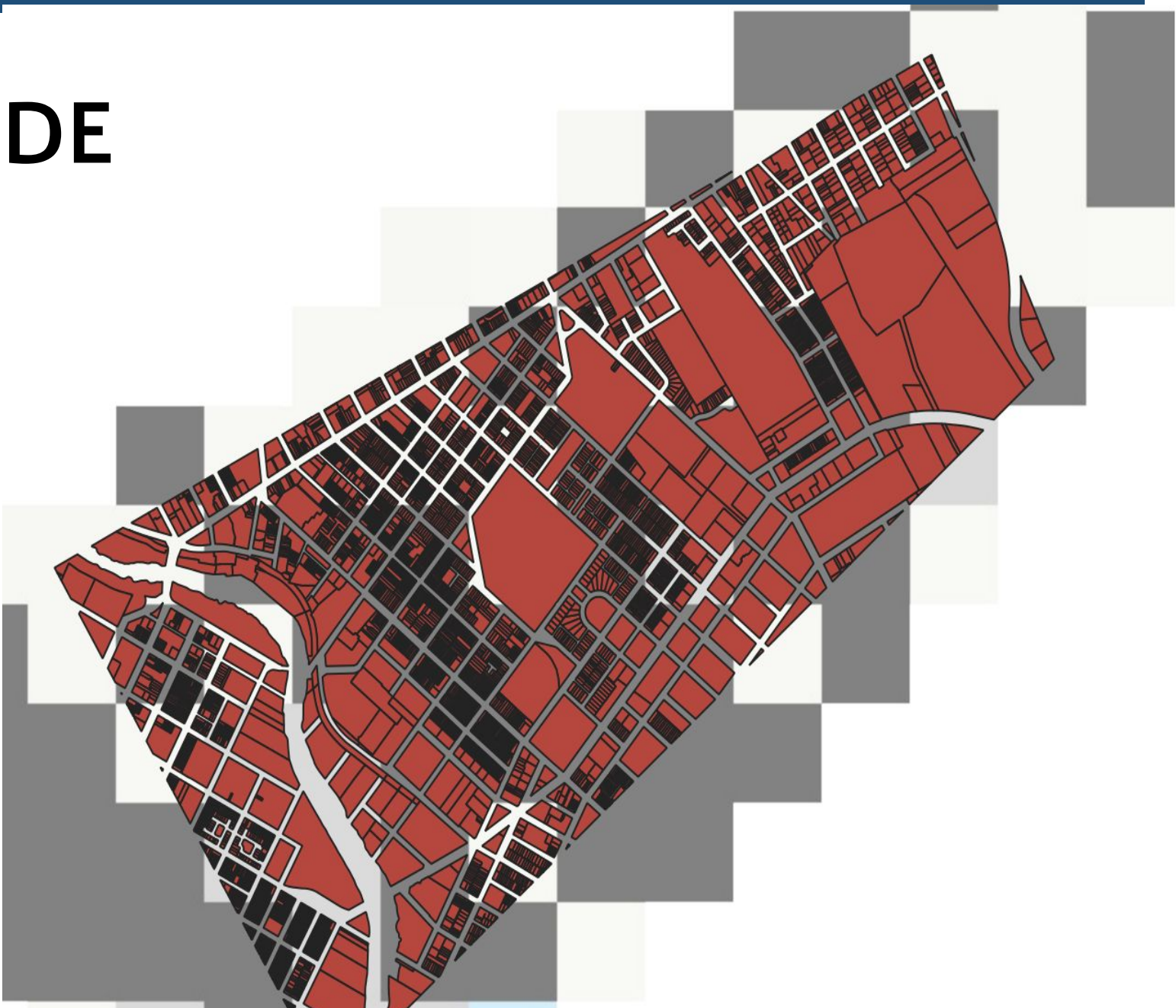
### GIS

Northeast Wilmington, DE

Parcel Layer

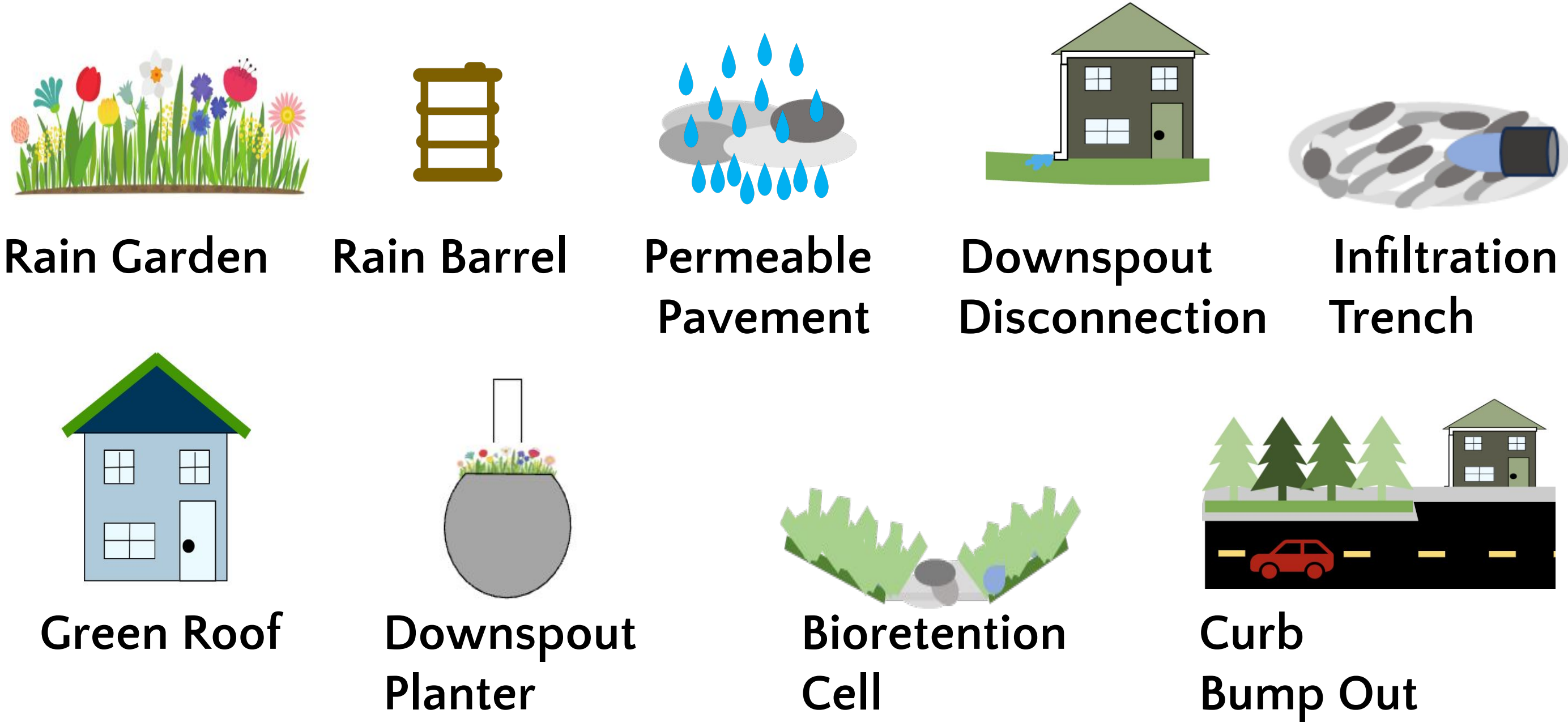
Impervious Surface

Pervious Surface



Using GIS, we will **overlay parcels** and **impervious surfaces** to pinpoint **optimal, realistic GSI locations** by identifying **available space** and **favorable conditions** for GSI.

### PCSWMM



Integrating GIS and PCSWMM will allow us to **identify optimal parcels** and **GSI type** (from above list) by evaluating **available space** and **parcel type** for maximum benefit.

## 4. NEXT STEPS

### Hydrologic Modeling

Explore the maximum potential benefits of GSI, then refine the scenarios by incorporating survey responses and participatory mapping results to align with community priorities and perspectives.

### Participatory Mapping

We are holding three participatory mapping sessions at the North Wilmington Library on October 27th, November 10th, and November 17th. We will ask residents to place stickers representing various GSI and public planning initiatives onto maps. These maps will be uploaded to ArcGIS for further analysis.

## 5. ACKNOWLEDGEMENTS

This work was made possible by Delaware Sea Grant (R/RCE-22) and University of Delaware. We would also like to thank our partner community organization Northeast CDC (formerly known as Collaborate Northeast), the community of Northeast Wilmington, DE for their expertise and support during this project, and the City of Wilmington and Tetra Tech for their collaboration and guidance with hydrologic modeling.