

Overview

- **Summary:** PIVOT is a crowdsourced decision-support tool that enables communities to prioritize specific areas for development based on existing data (e.g., maps of flooding) and their understanding of residential needs (e.g., lack of adequate housing) on an online interface.
- **Opportunity:** An early version of PIVOT is publicly available and GLISA seeks practitioners to use the tool in their communities to plan for potential climate-induced migration and flooding. GLISA can offer free technical assistance to use the tool and invites feedback to inform future updates and improvements.
- **To learn more:**
 - [Video tutorial](#)
 - [PIVOT Tool \(pilot version\)](#)
 - [Publication](#) in Earth's Future
 - [GLISA webpage](#)

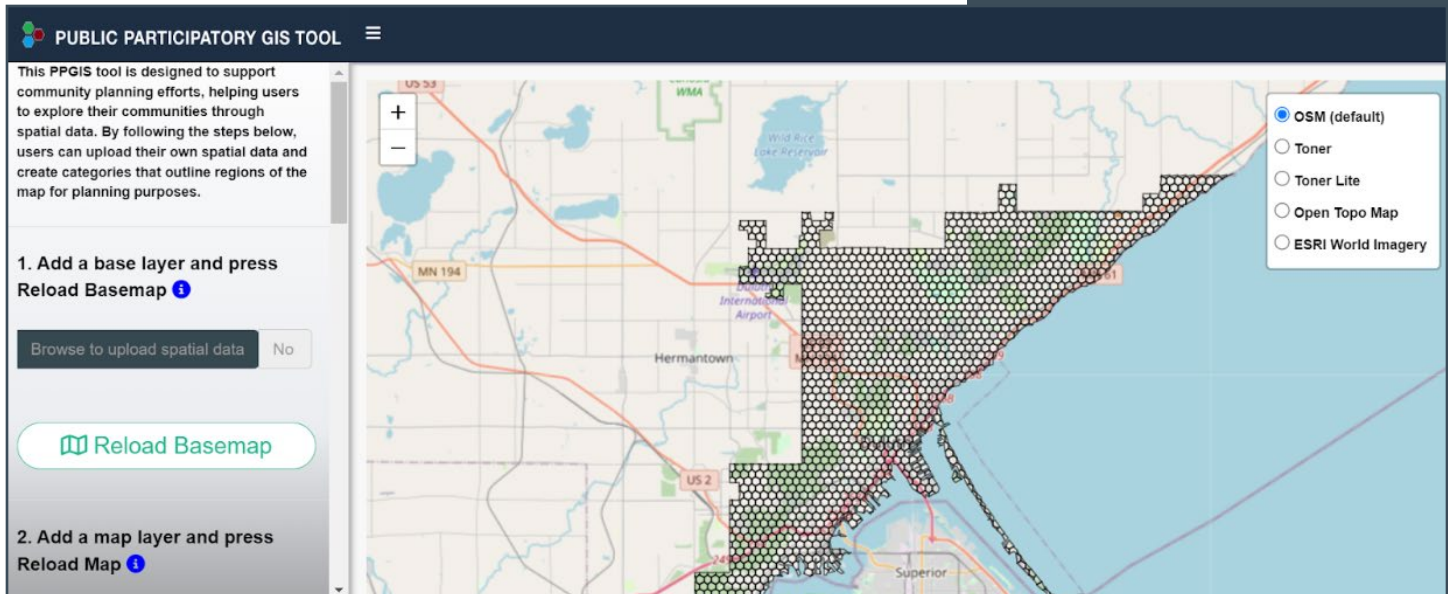
Motivation: There is growing interest in understanding how climate change might make the Great Lakes region a more attractive place to live, due to its abundant natural resources and projected fewer extreme events compared to the rest of the U.S. This idea has gained traction as an academic, public, and policy issue, and a handful of Great Lakes cities like Duluth and Buffalo have received considerable media attention for referring to themselves as climate havens, seeing this as an opportunity for renewed population growth. While scholarly literature on climate migration has rapidly increased recently, less is known about potential in-migration - people moving into new regions. Will they come? If so, who will they be, how many, and where might they settle? It's essential that Great Lakes communities plan so potential growth can be done sustainably and without exacerbating existing inequalities and vulnerabilities.

Intended Audience: The intended audience for PIVOT is local planners and community members in Great Lakes urban communities.

Applications: To help Great Lakes urban communities plan for potential climate migration scenarios, GLISA is developing a land-use model and decision-support tool, called the Participatory GIS urban deVeLOpment Tool (PIVOT). PIVOT allows practitioners and community members to access and respond to spatial data on a community scale related to urban development and growth. PIVOT can display mapped information on current conditions (e.g., demographics, economic trends, tree cover) and climate-related stressors (e.g., projected changes in precipitation and temperature, flood and heat events risk) for users to interactively explore different vulnerabilities within their communities. Individuals will be able to identify opportunities and stressors and test different management scenarios. For example, they can prioritize specific areas for redevelopment or new development based on residential needs (i.e., lack of adequate housing). The eventual aim is to help communities learn how population increases may result in complex social and climate trade-offs over time, and to consider those trade-offs in the face of changing demographics, patterns of growth, and flood risk.

“ While we do not know if people will come, how many, who they might be and where they might settle, it is important that Great Lakes communities prepare and plan for a potential future that includes new residents. ”

-Derek Van Berkel, GLISA Co-PI and project lead, as quoted in a Michigan Radio story on this work



Screenshot of the PIVOT tool, displaying the city of Duluth (MN) as an example. Users can add a base map and additional layers to customize the tool to their location and spatial information of interest. The categories option enables users to create their own maps and label areas of interest. The final map is downloadable for future use. Credit: GLISA.

Data Sources: The information in PIVOT is based on an urban land change model, which looks at current categories of land development (e.g., agricultural lands, urban, forests, water, roads) and predicts whether these parcels will change categories over a given time period as a result of a suite of pressures (e.g., accessibility to the city core, greenspace, etc.). The model looks at historical population changes and suggests suitable sites for future populations. Factors going into site suitability include: proximity to existing development, travel time to nearest urban hub, and distance to water, lakes, tree canopy, floodplain, public schools, and historic buildings. City-specific data can be added to the tool, as well as projections of future urban growth.

History: GLISA started work on climate in-migration in [2020](#) with another NOAA CAP/RISA team, Western Water Assessment, to co-develop a land change model that simulates scenarios of urbanization and landscape change in two regions that struggle with extreme rain events and urban flooding. In the Great Lakes region, GLISA engaged with 18 members of the Great Lakes Climate Adaptation Network to pilot the model and interactive platform and is now developing a completely new model and online participatory GIS interface based on that model (i.e., PIVOT).

Limitations: PIVOT is in the early stages of development. Participating communities will have the opportunity to influence the design of the tool, like identifying user requirements, data types, and areas for improvement.

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About GLISA

GLISA was established in 2010 and is a collaboration between the University of Michigan, Michigan State University, The College of Menominee Nation, and the University of Wisconsin. GLISA is the NOAA CAP (formerly RISA) team for the Great Lakes region. GLISA works at the boundary between climate science and decision-makers, striving to enhance Great Lakes communities' capacity to understand, plan for, and respond to climate impacts now and in the future.

Learn more at:
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