FIVE MINUTE RESEARCH
POSTDOC COMPETITION

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Bridging the Gap in Green Stormwater Infrastructure Planning: An Equity Index for Socioeconomic and Environmental Metrics Across the U.S.

The Office of Postdoctoral Affairs

The Graduate School | Florida State University

Background: Environmental Justice

- Environmental justice: Everyone -regardless of race, color, national origin, or income- has the right to the same environmental protections and benefits, as well as meaningful involvement in the policies that shape their communities

https://grist.org/politics/how-environmental-justice-fared-in-2014-and-the-outlook-for-2015/

- Example of environmental injustice: Flooding

https://urbansystemslab.com/urbanfloodrisk

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Background: Green Stormwater Infrastructure

- Reducing stormwater runoff and improving runoff quality by mimicking the natural water cycle.

- Co-benefit:

  - Habitat creation and biodiversity enhancement

  - Urban heat island reduction

  - Improve air quality

  - Improve public health
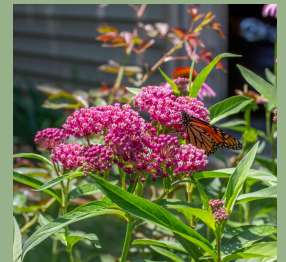
  - Enhanced urban aesthetics

Stormwater Bioretention Pond
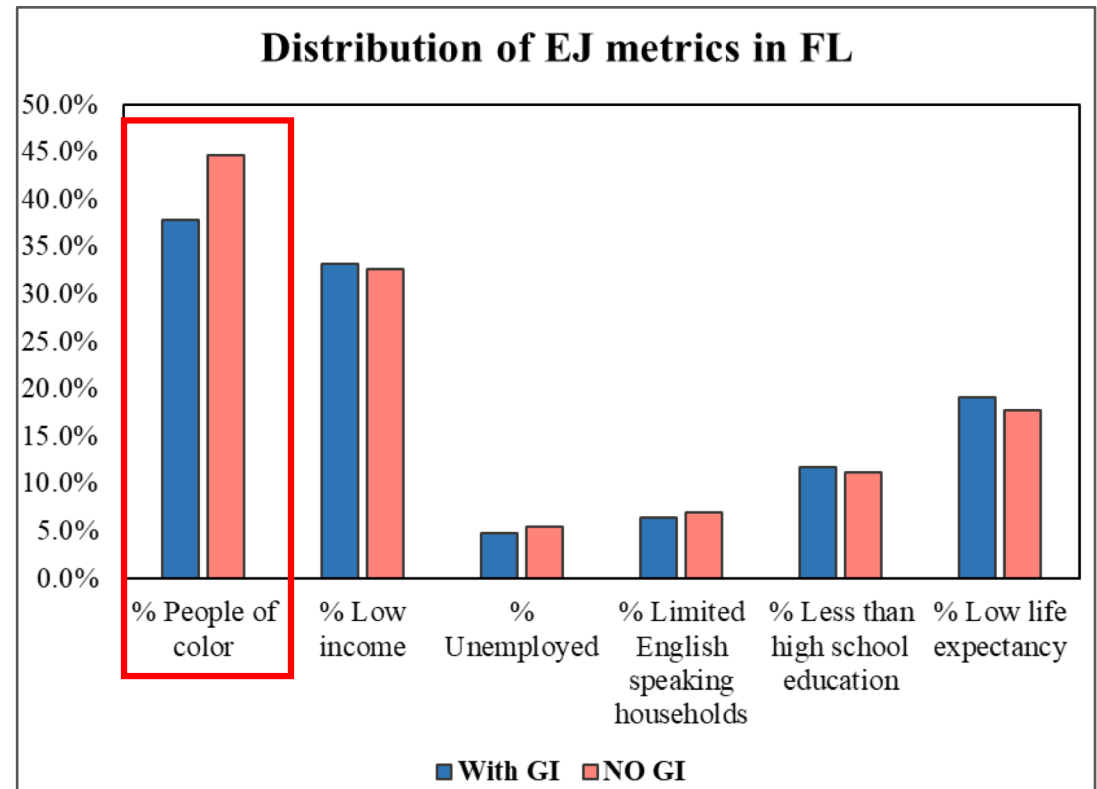
Tall Coreopsis   Northern cardinal   Swamp milkweed

Happy Wildlife, Happy Life!

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Inequitable Green Infrastructure Planning

- We analyzed whether the distribution of GI is equitable.

- In <u>22</u> out of <u>29</u> states, GIs are implemented in block groups with significantly lower people of color and higher socioeconomic status.

- In Florida, block groups with GI have a percentage of people of color of 38%, while block group without GI has 45% people of color.

Distribution of EJ metrics in FL
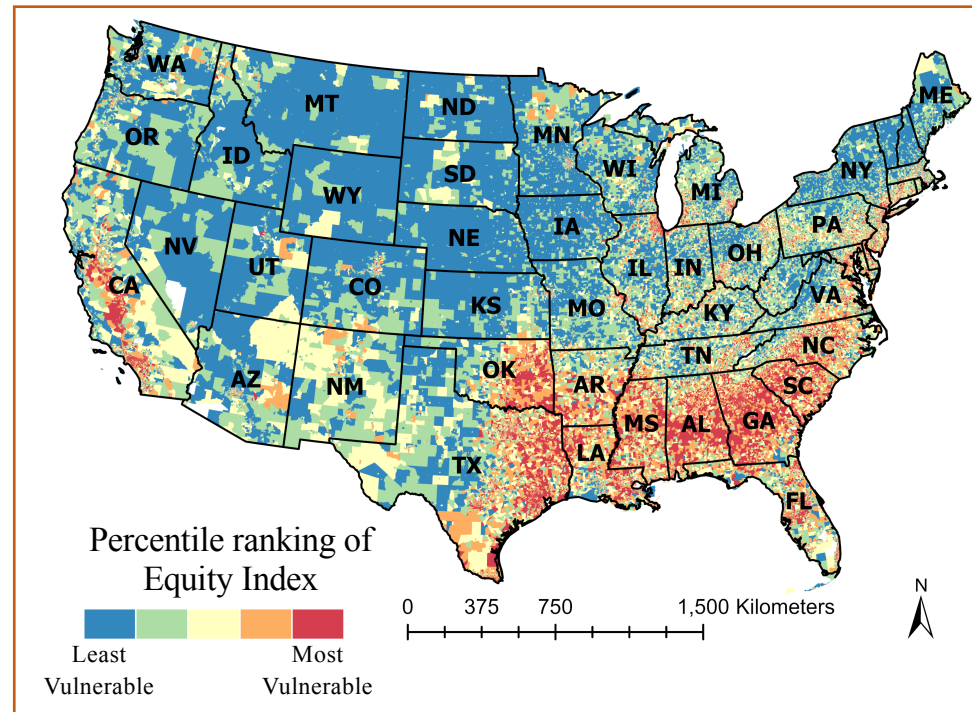
Green Infrastructure Equity Index

Input

Social Vulnerability
- % Black
- % Asian
- % Hispanic
- % Native
- % Low income
- % Less than highschool dipmola
- % Unemployed
- % Limited English speaking
- % Low life expectensy
- % Over 65 years
- % Under 5 years

Environmental vulnerability
- Fluvial flooding
- Pluvial flooding
- Imperviousness
- Tree canopy
- PM2.5
- Ozone
- Traffic proximity

GI Equity Index

Percentile ranking of Equity Index

Least Vulnerable — Most Vulnerable

0   375   750   1,500 Kilometers

Outcome

Reduced risks of flooding in underserved communities

Identified areas most in need of Green Infrastructure

Equitable Distribution of Resources

Informed Decision-Making

Be the **FIRST** User!
Be the Change!

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Significance of Study

1. Provided **science-based evidence** regarding the **inequitable** implementation of green stormwater infrastructure

2. Developed a green infrastructure **equity index** that can be used by researchers and decision-makers in prioritizing GI in the **intersection of social** and **environmental vulnerability**, where GI is most needed.

> "Human beings are members of a whole,
> in creation of one essence and soul.
> If one member is afflicted with pain,
> other members uneasy will remain."
>
> Sa'adi, Persian poet, *The Rose Garden*,
> c.1258 A.D.

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