Building Knowledge to Support Equitable Climate Resilience in the Upper Mississippi River Basin

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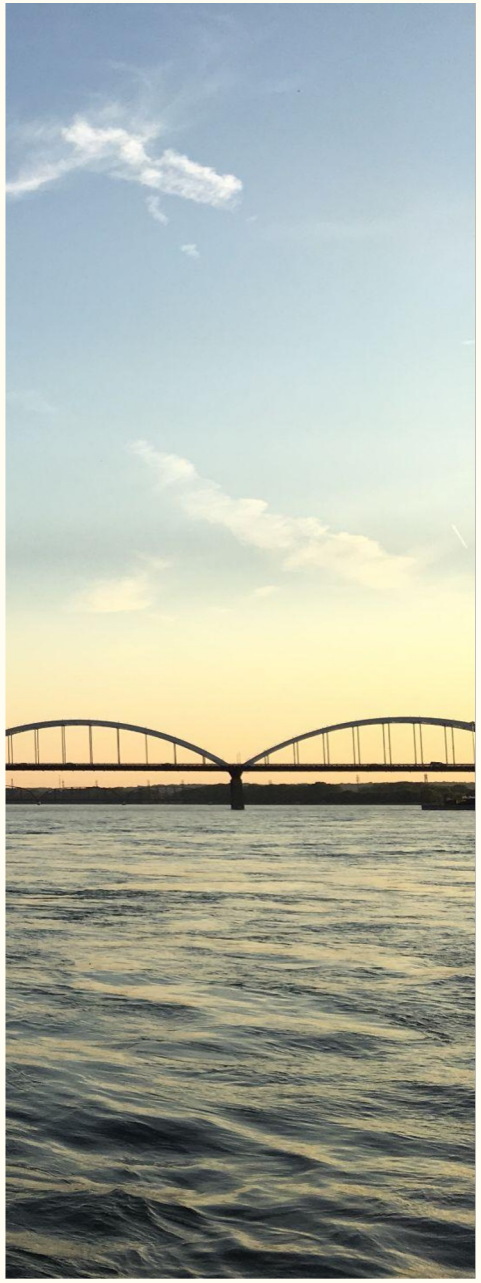

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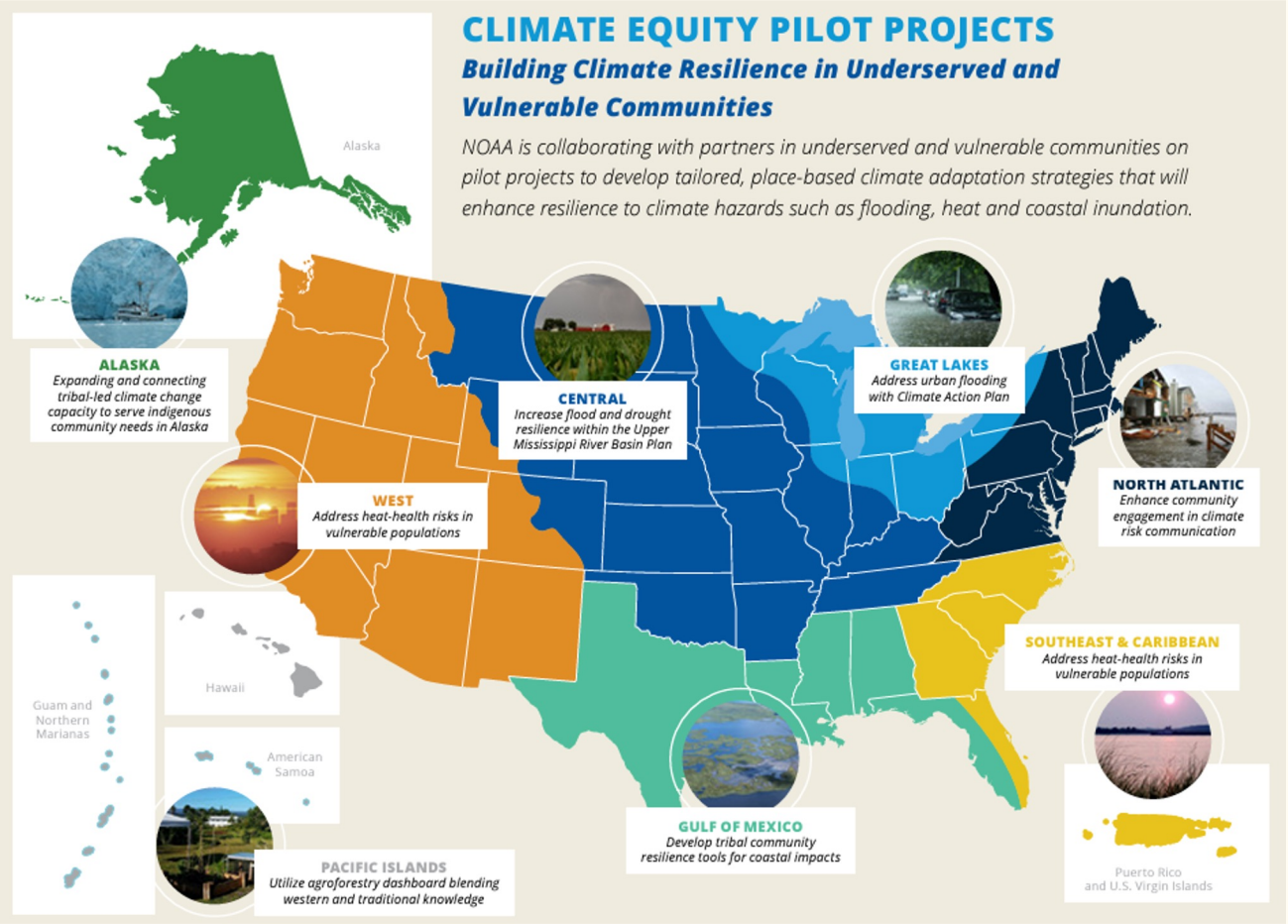
NOAA Climate and Equity Pilot Project

- One of seven **NOAA Climate and Equity Pilot Projects** - initiated in 2021
- Pilots **respond directly to feedback** on how NOAA provides climate services and engages with underserved and vulnerable communities.
- **Supporting equitable climate resilience** through projects focused on community involvement, equity and environmental justice.



Project Objective

Objective

Estimate hydrologic risk and resilience opportunities for at-risk communities in the Upper Mississippi River Basin leading to more inclusive river management

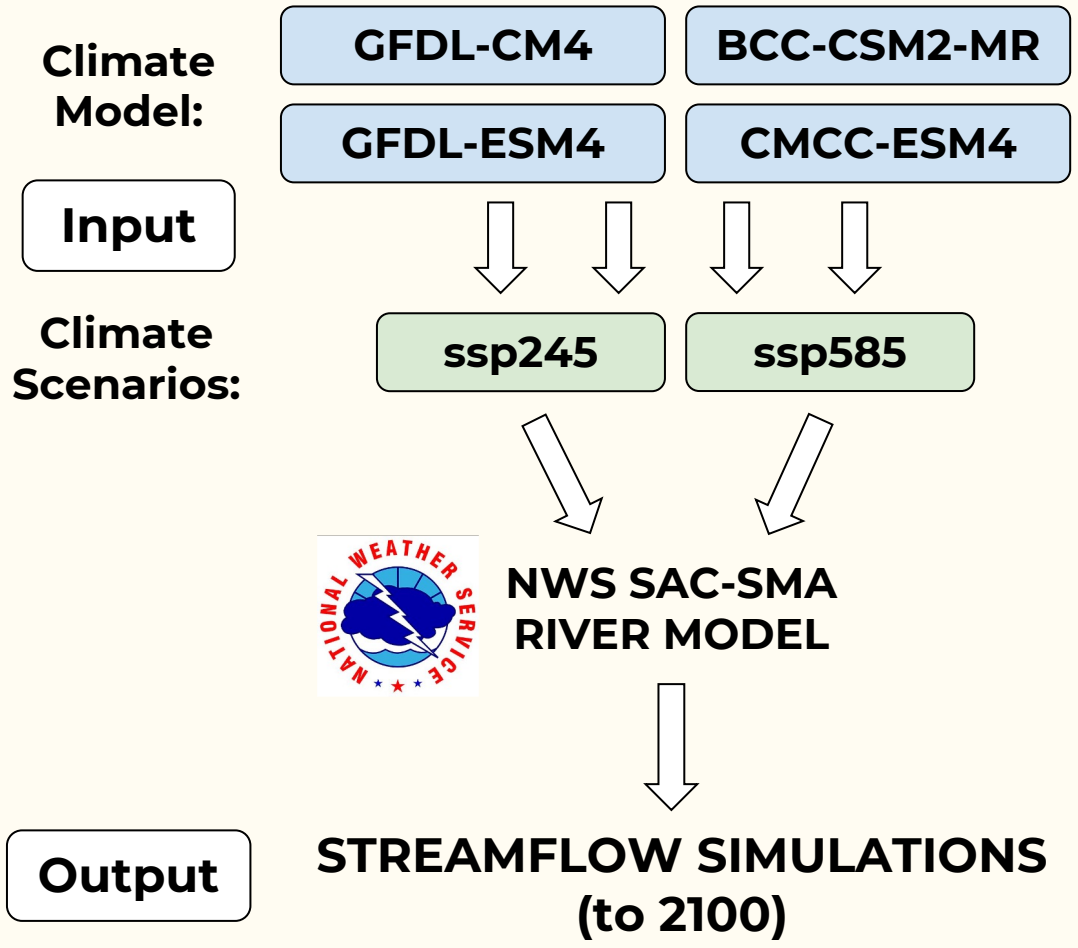
Today's Presentation

- Hydrologic Modeling
- Technical Stakeholder Engagement
- Hotspot Mapping
- Community Engagement
- Adapt + Adjust

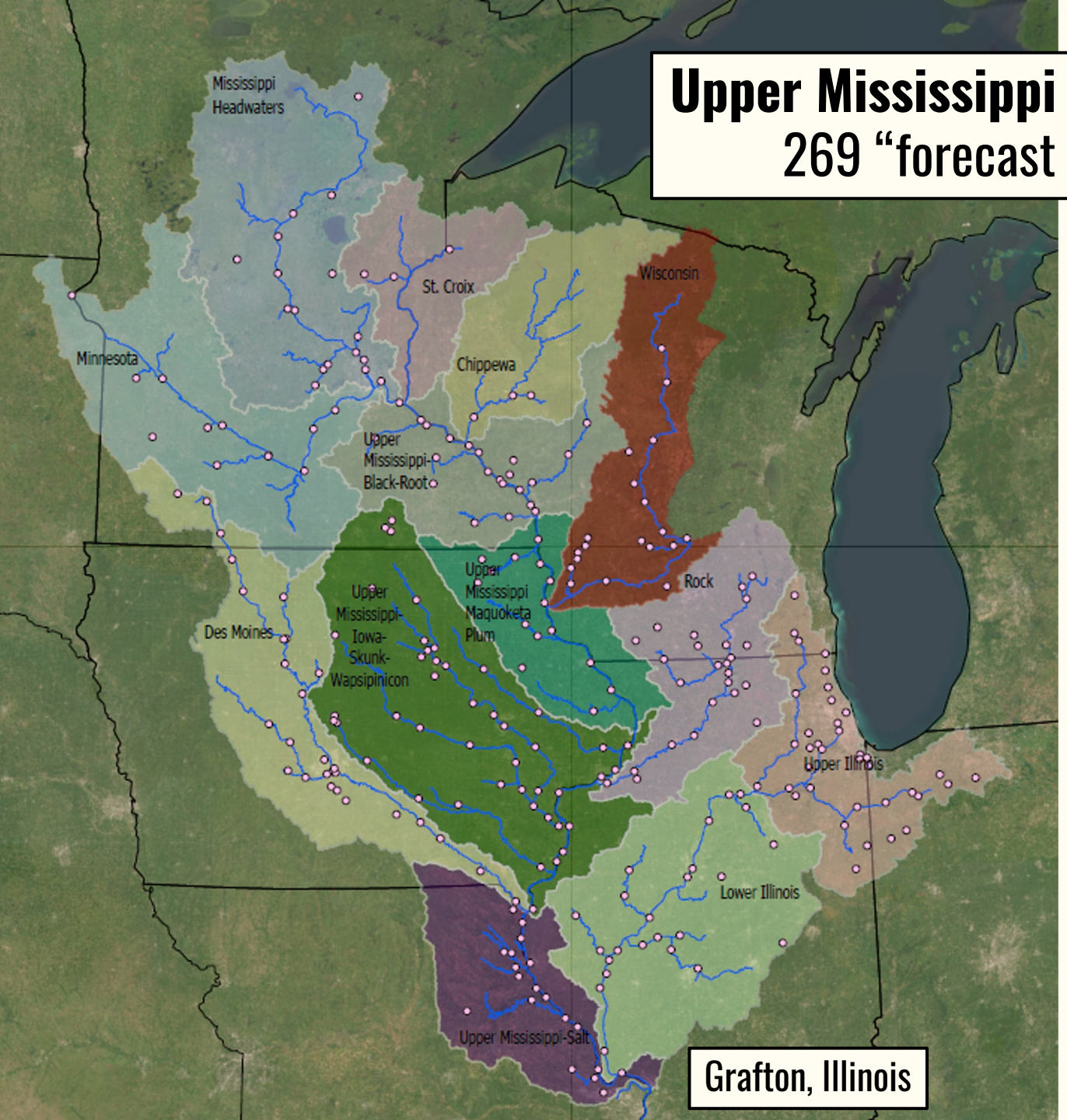
Catchment-Scale Streamflow Modeling Using Climate Projections

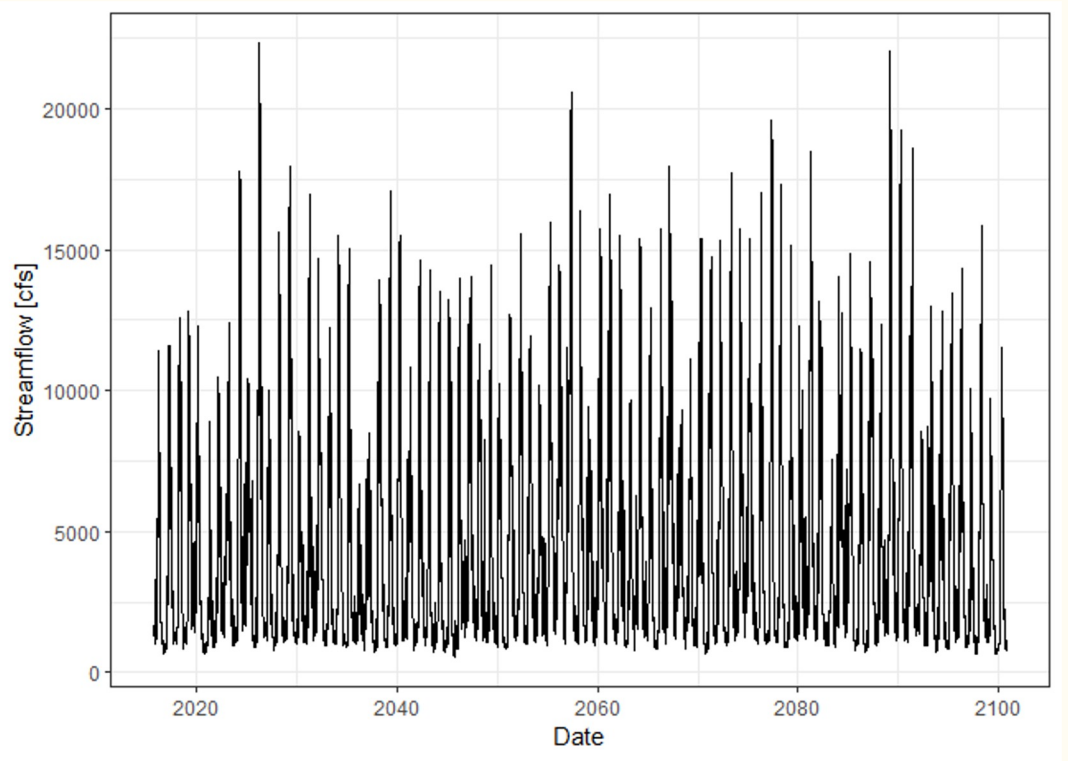
Climate scenarios used were from the **NEX-GDDP-CMIP6** dataset, prepared by the Climate Analytics Group and NASA Ames Research Center using the NASA Earth Exchange and distributed by the NASA Center for Climate Simulation (NCCS) – Thrasher et al., 2022; Thrasher et al., 2021

- Daily precipitation and mean temperature at a **0.25-degree** scale
- Statistically downscaling from daily to **6-hourly** data to meet requirements of the calibrated river model



Upper Mississippi River Basin
269 “forecast points”





Stakeholder Engagement

Upper Mississippi River Basin Downscale Climate Modeling User Discussion Sessions

Purpose: provide users' perspectives for use in developing climate and hydrologic outputs that allow for integration into decisions and reuse by technical stakeholders

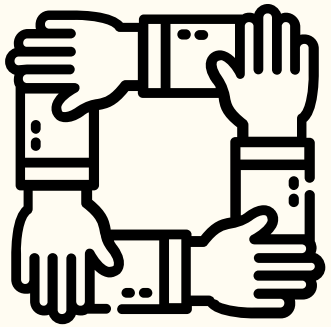
- Hydrology modelers (Nov 2023)
- Engineers (Nov 2023)
- Emergency managers and public health officials (Dec 2023)

UMRBA
Upper Mississippi River Basin Association

Community Engagement

Hotspot Mapping

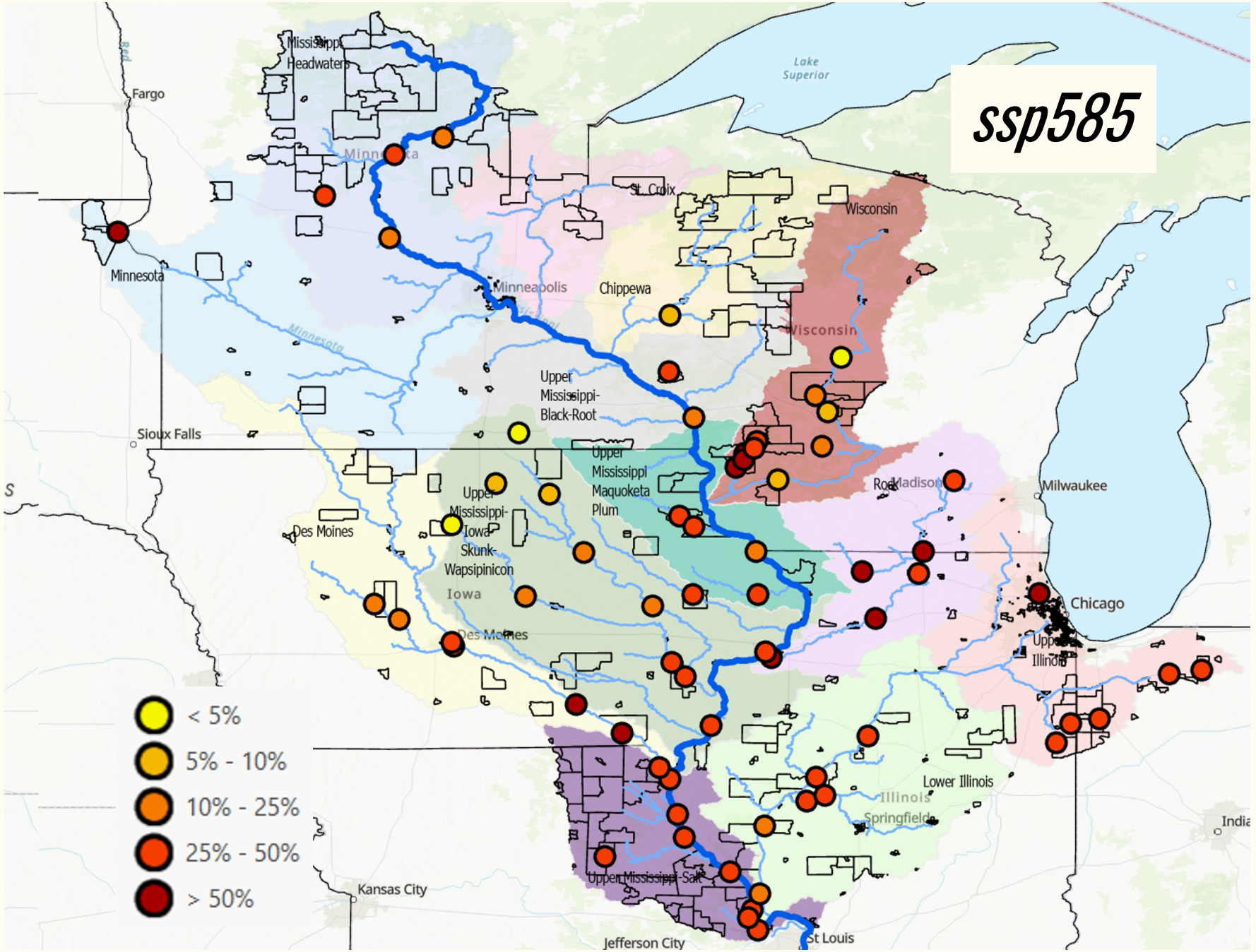
Conversations with Communities



More Inclusive River Management

Hotspot Mapping Example

Percent increase in 100-yr floods where a forecast point is within a Justice40 community



Selecting and Engaging with Communities

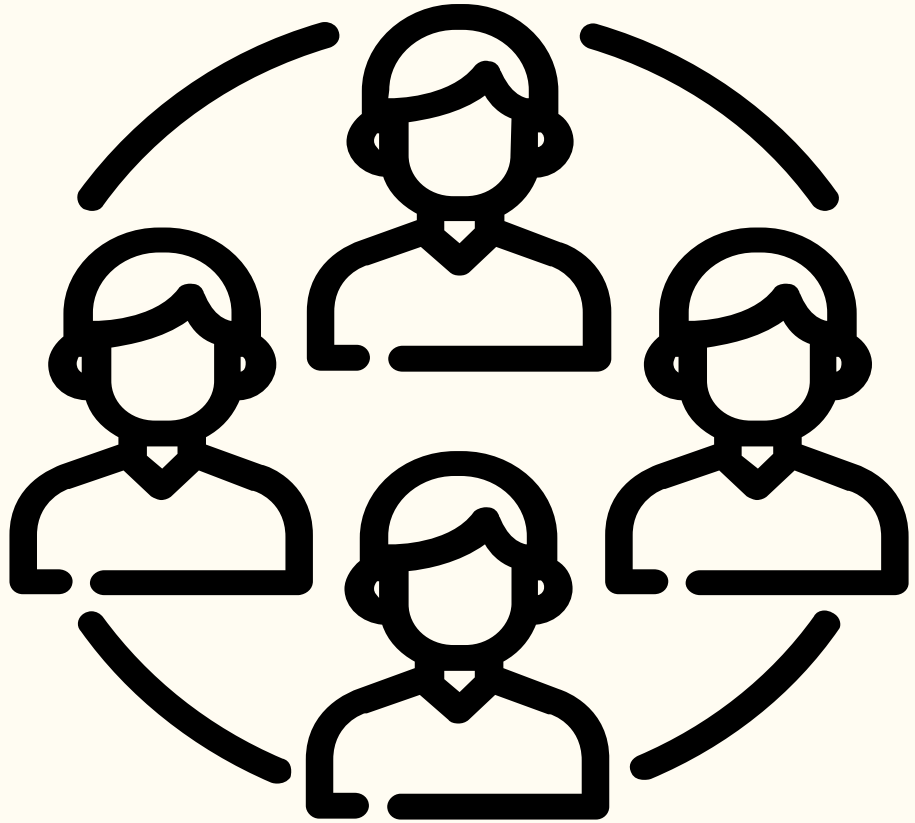
Through partnership with Rainbow Research and Transformational Solutions

- **Identify** flood- and drought-impacted communities with Environmental Justice Organizations
- **Listen and engage** in understanding their climate resilience challenges and opportunities
- **Discuss** potential uses of the project's hydrologic projections in their climate resiliency decisions

Conversations with Communities

Working Together!

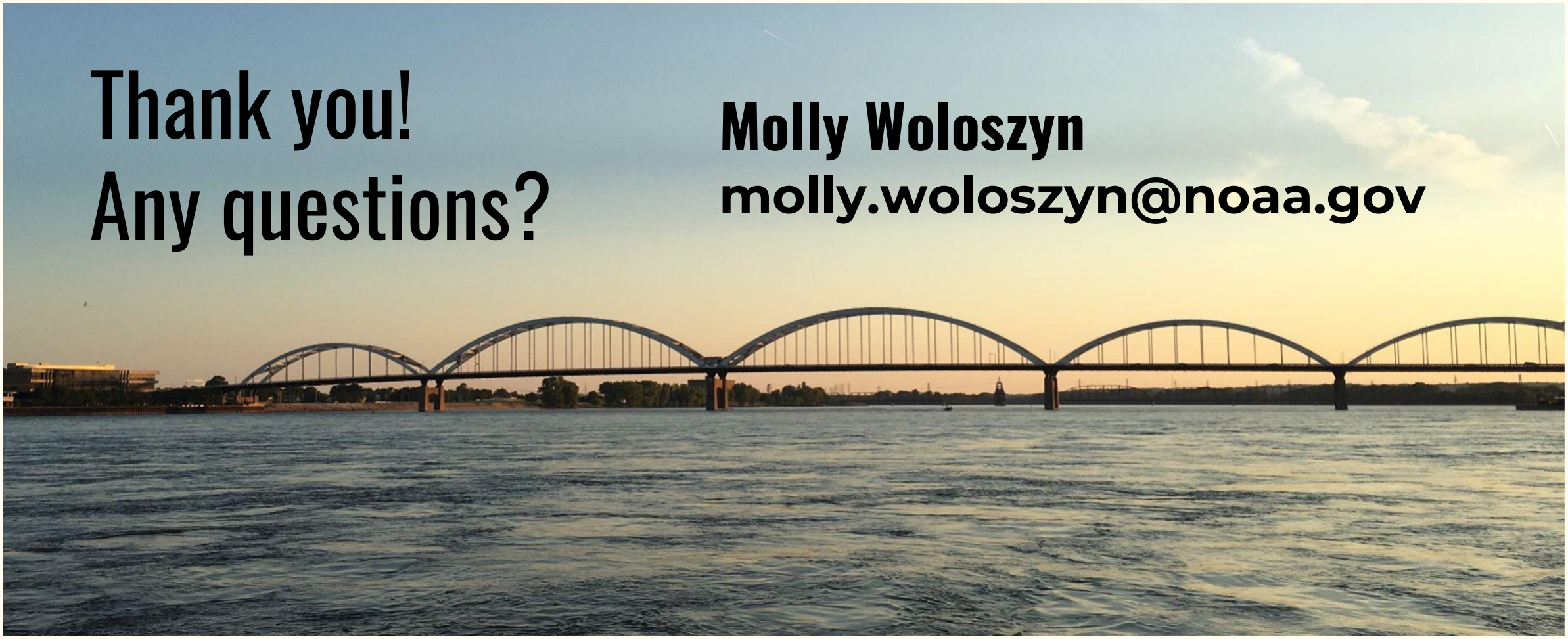
- Constant communication **at formative stages of the analysis**: *what analysis products/variables are useful?*
- **Adapt + Adjust:** Technical stakeholder focus groups have changed the analysis
- Identifying new ways that such analysis support **equitable climate actions**
- More to come as we integrate our efforts more this year…



Conclusions

Structure project with goals in mind, recognizing multifaceted nature of the problem.

- Climate influence on river trends according to base NWS model
- Where is land cover most important?
- Hot spot mapping and Community Engagement
- **These all make sense if centered on community and stakeholder needs**



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