

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

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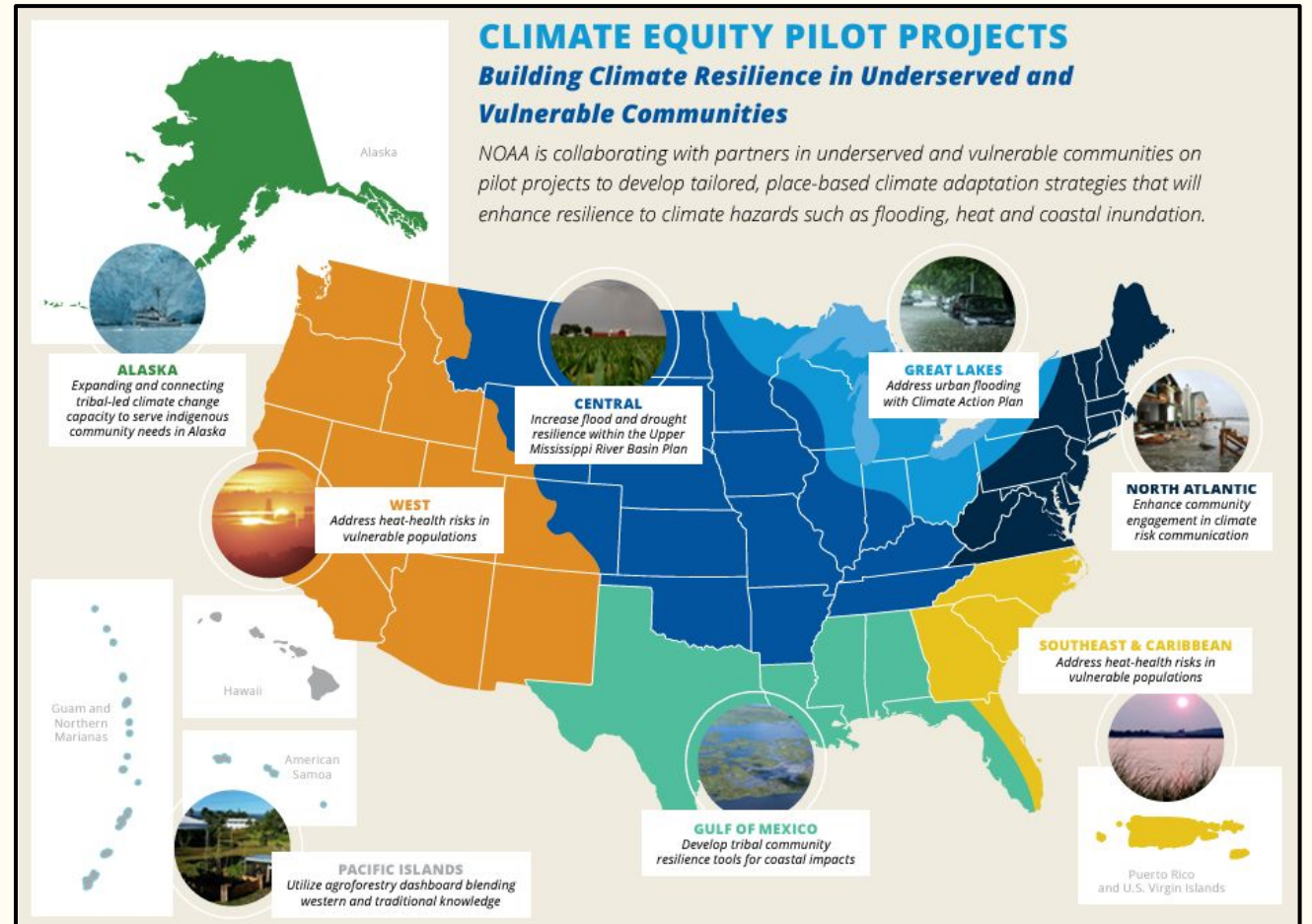
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NOAA Climate and Equity Pilot Project

- 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

Today's Presentation

- Hydrologic Modeling
- Stakeholder Engagement
- Community conversations
- Lessons Learned for working together!

Hydrologic Modeling

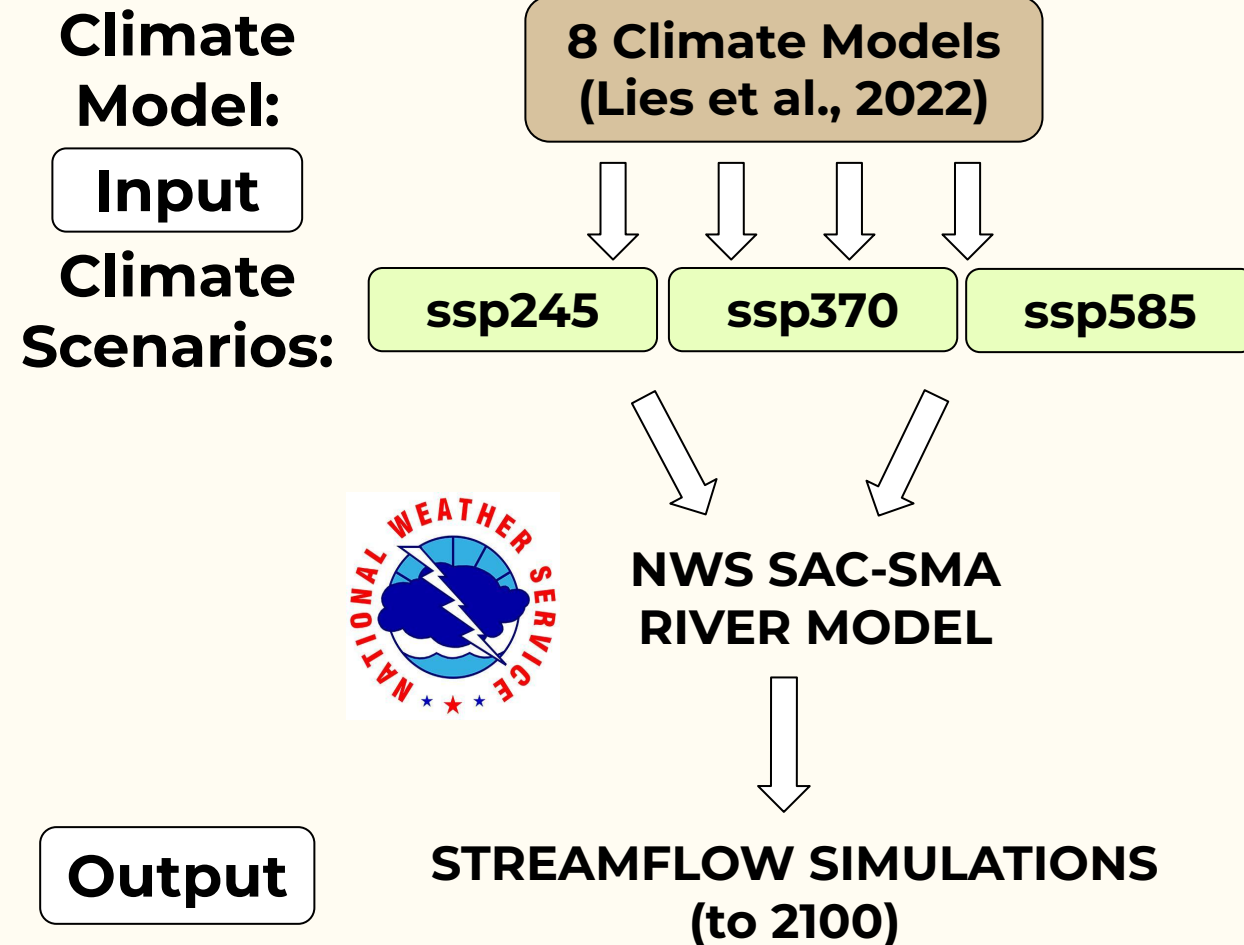


Catchment-Scale Streamflow Modeling Using Climate Projections

Climate scenarios from the **NEX-GDDP-CMIP6** dataset*

- 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

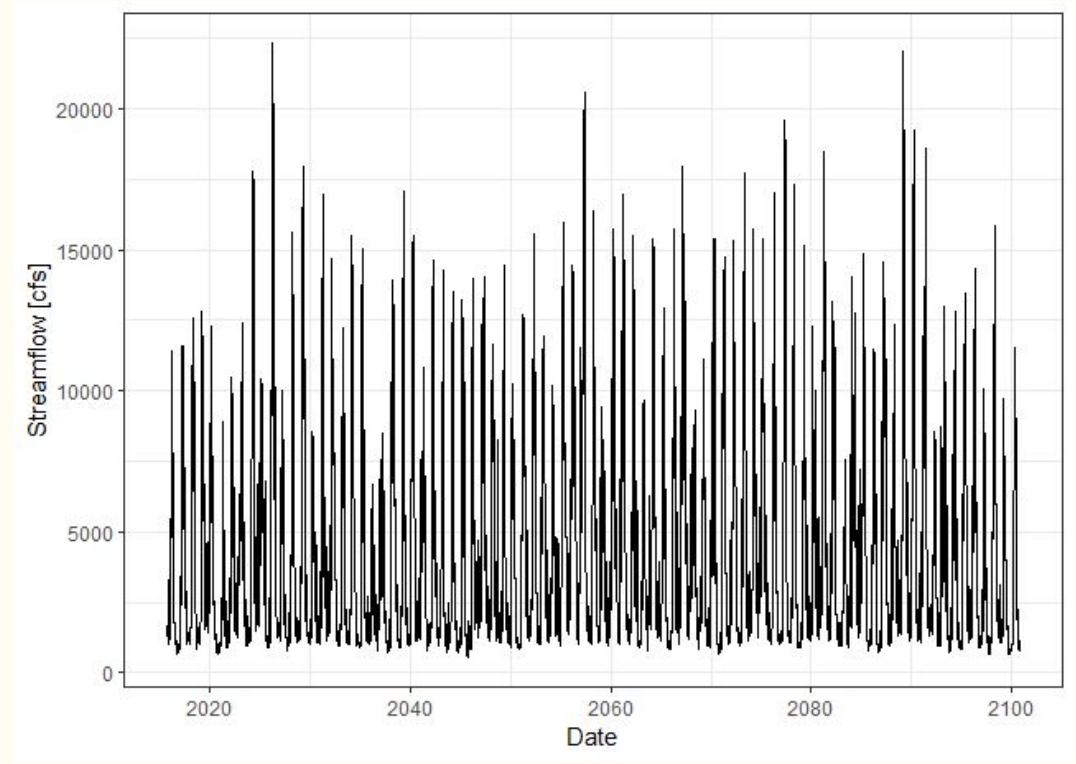
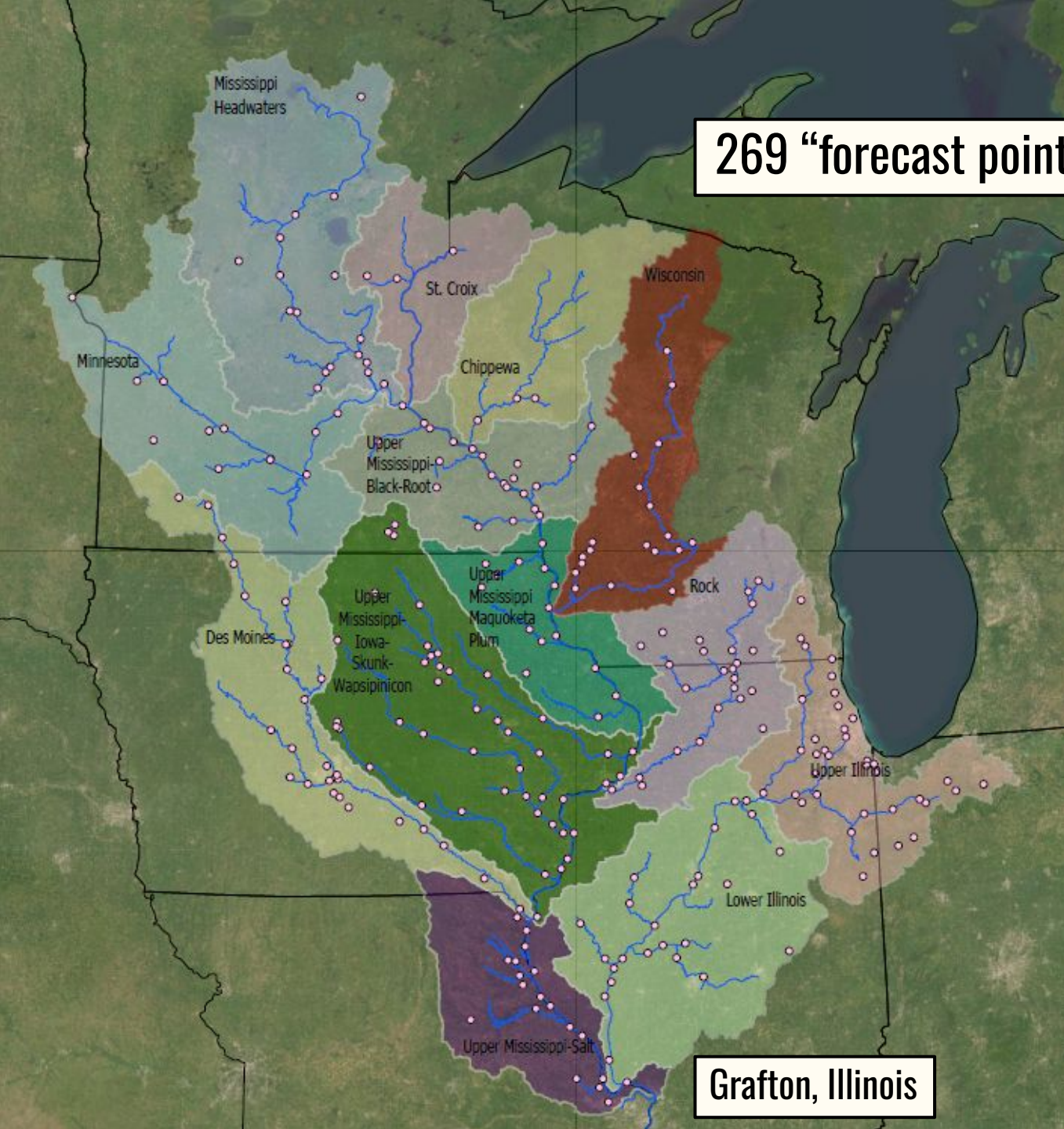
*prepared by the Climate Analytics Group and NASA Ames Research Center using the NASA Earth Exchange and distributed by the NASA Center for Climate Simulation (NCCS)
– Thrasher et al., 2022; Thrasher et al., 2021



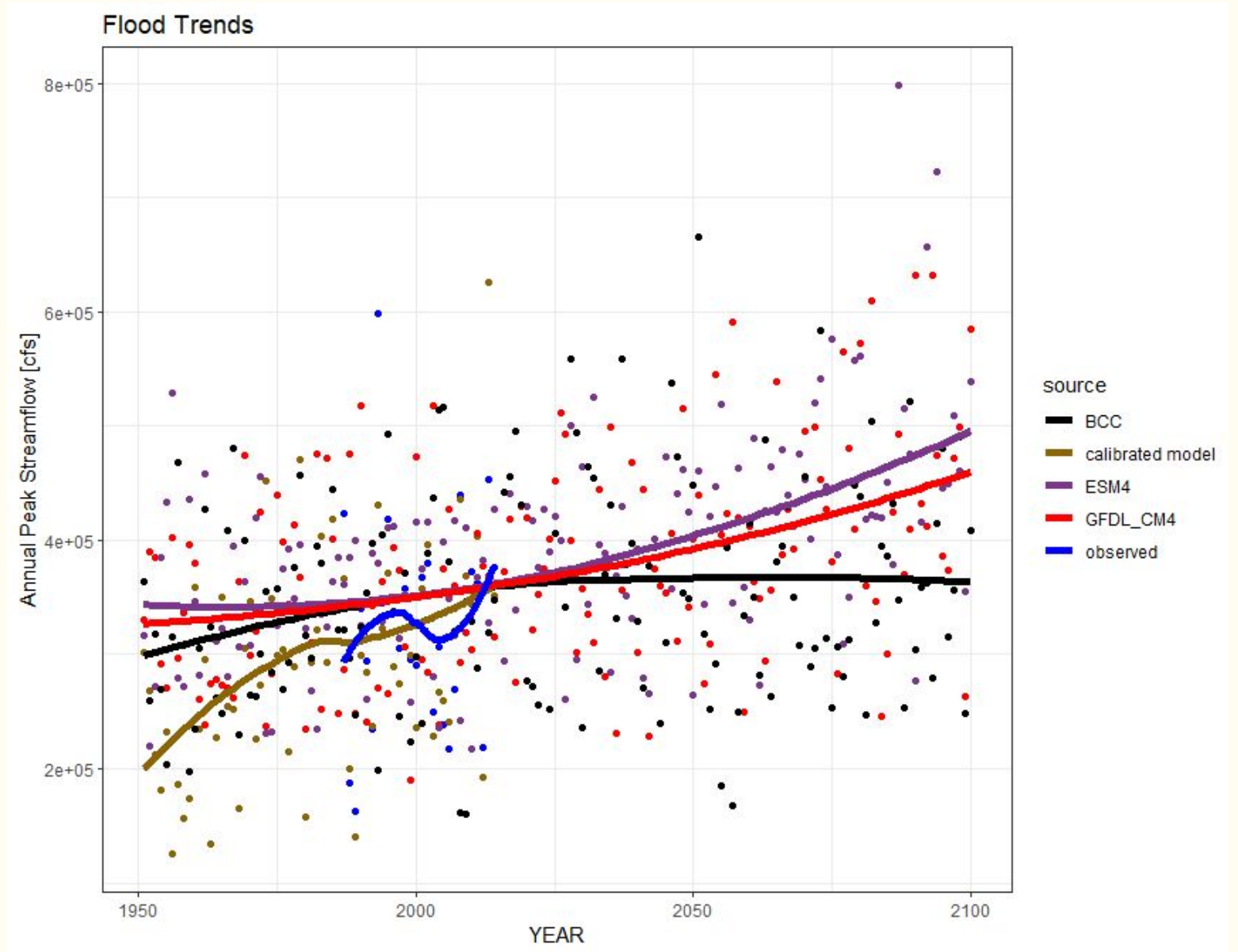
**NWS River Model:
Sacramento Soil
Moisture
Accounting Model**



Think: Buckets!!



Preliminary Results: Four Climate Models



Stakeholder Engagement

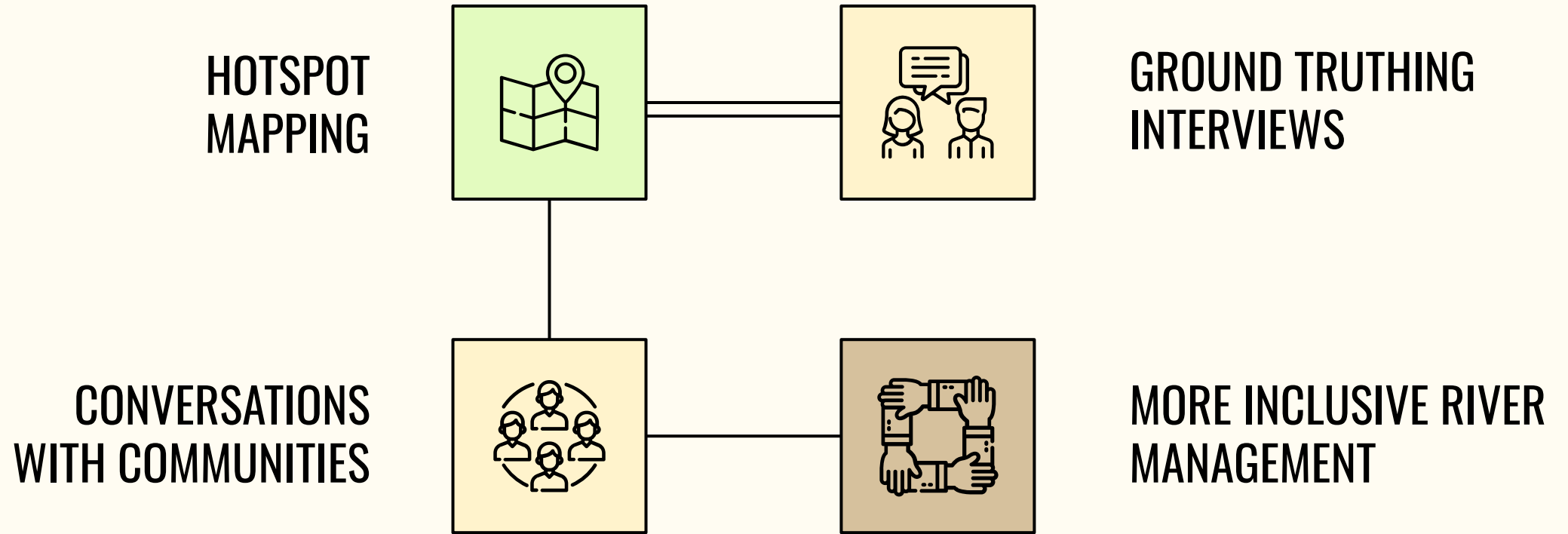
Upper Mississippi River Basin Downscale Climate Modeling User Discussion Sessions

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)



COMMUNITY ENGAGEMENT



Community conversations

- **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

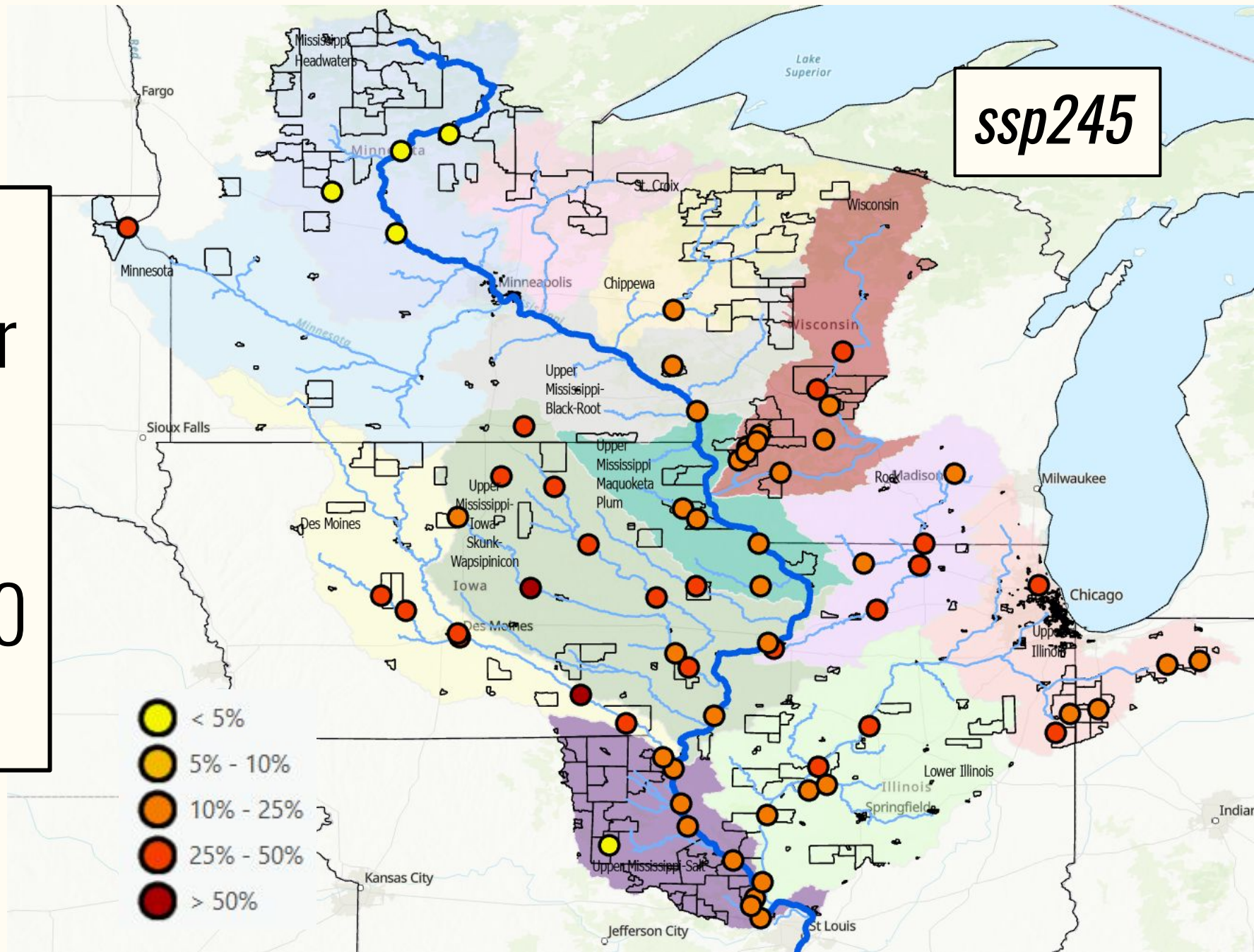
What are significant ways climate change and extreme weather are impacting quality of life?

By what means can people reduce flood and drought risk by increasing local resilience?

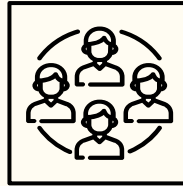
How do flood and drought patterns interrelate with other community concerns?



EXAMPLE:
Increasing 100-yr
floods where a
forecast point is
within a Justice40
community

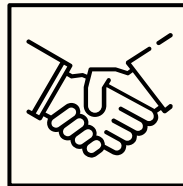


WORKING TOGETHER: Lessons learned



CONSTANT COMMUNICATION

What products or outputs are useful? What are the models telling us? How do the pieces fit together?



CO-CREATION

Allow communities to drive the conversation, and be open and available to meet their needs

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?
- **These all make sense if centered on community and stakeholder needs**



Thank you!

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