



PLATTE RIVER BASIN WATER RESOURCES

Assessing Urban Flood Vulnerability to
Select Restoration Sites for Urban Woods
and Prairies in the Great Plains

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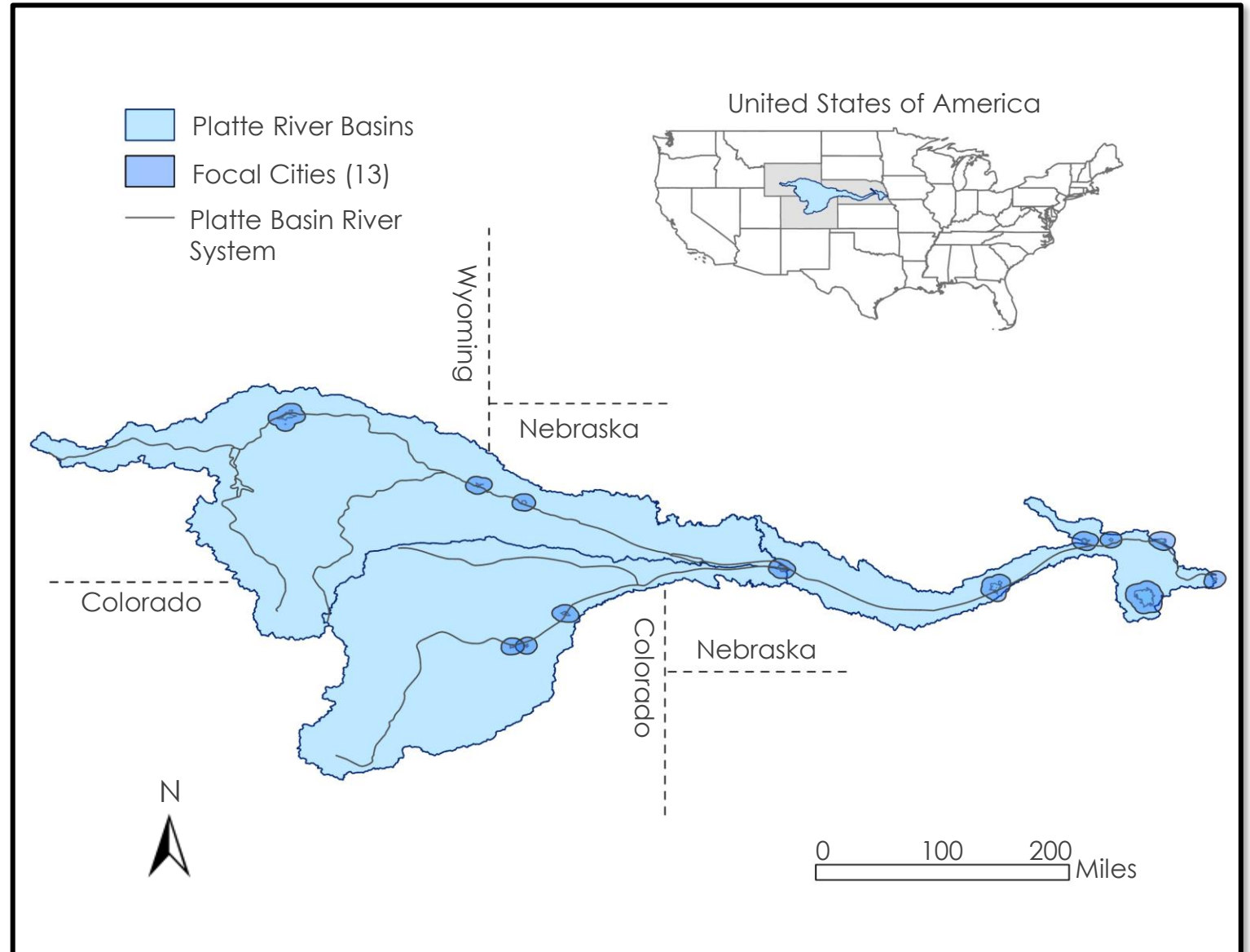


Study Area

Platte River Basin
(Wyoming, Colorado,
and Nebraska, USA)



Focal cities



Community Concerns

- Community Vulnerability
- Urban Flooding

- Green Infrastructure
- Habitat Fragmentation



Partner

Audubon Great Plains

"To **protect birds** and the **places** they need, today and tomorrow. Audubon works throughout the Americas using **science, advocacy, education**, and on-the-ground **conservation**."

Land use change
Floodplain mapping



Focused **restoration** work through
the **Urban Woods and Prairies (UWP)**
Initiative



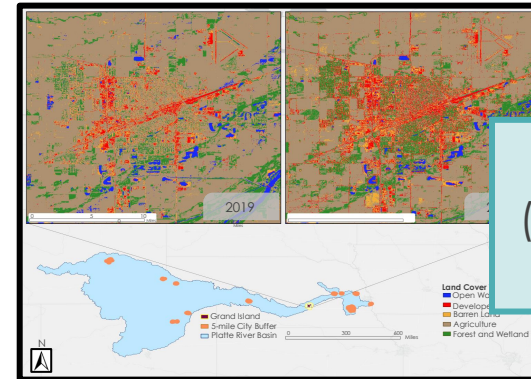
Objectives

Objective

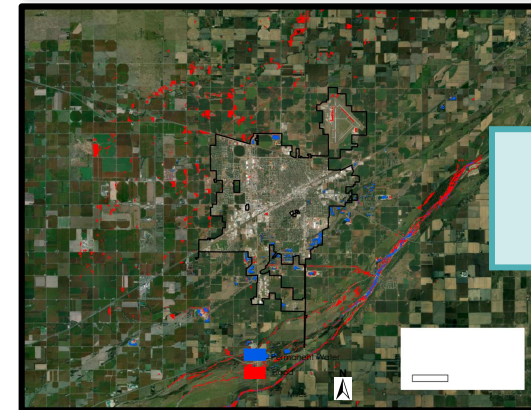
Provide scientific guidance for restoration work our partner will conduct.



End products

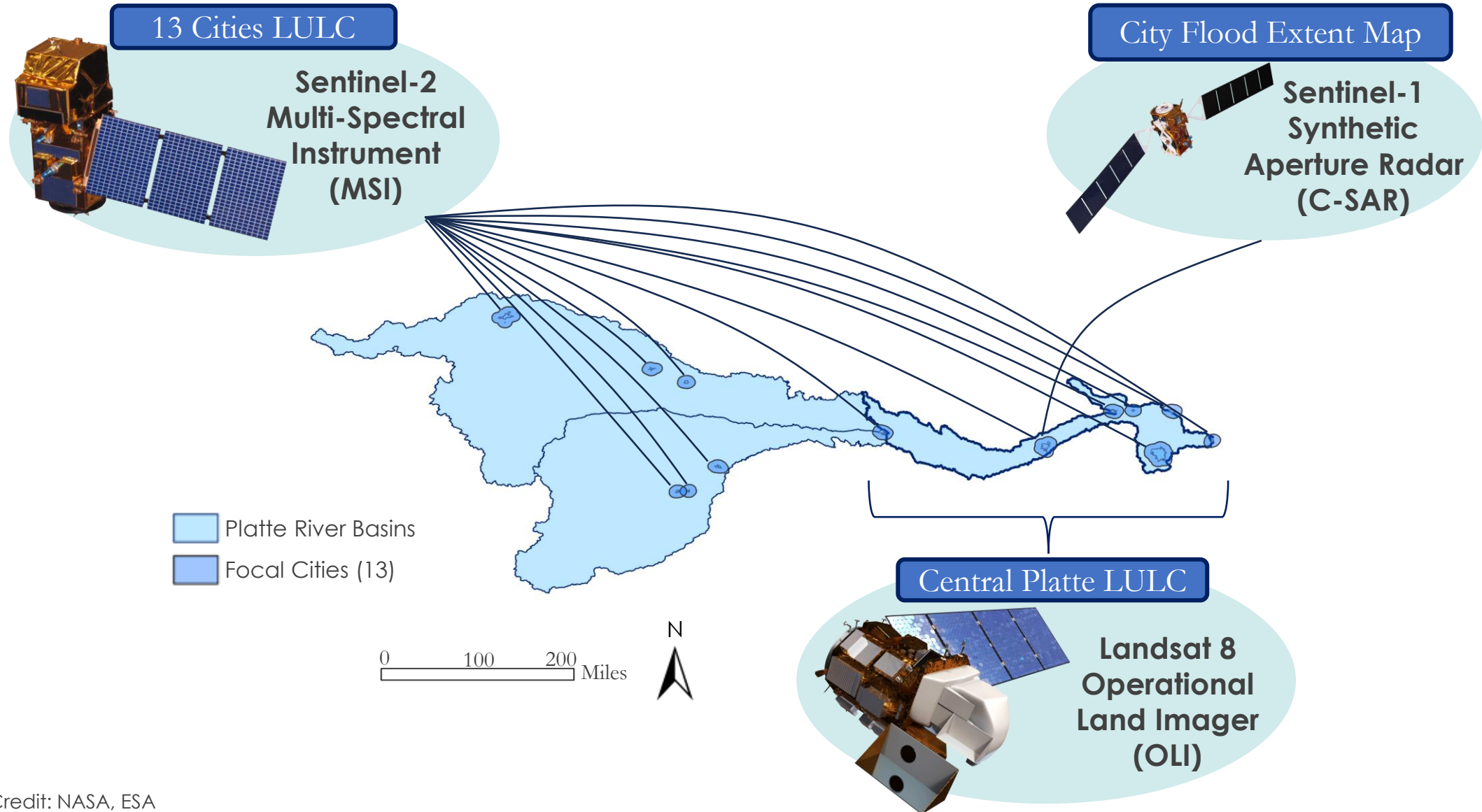


Land Use Land Cover
(LULC) 10-year time series
(2013 – 2023)

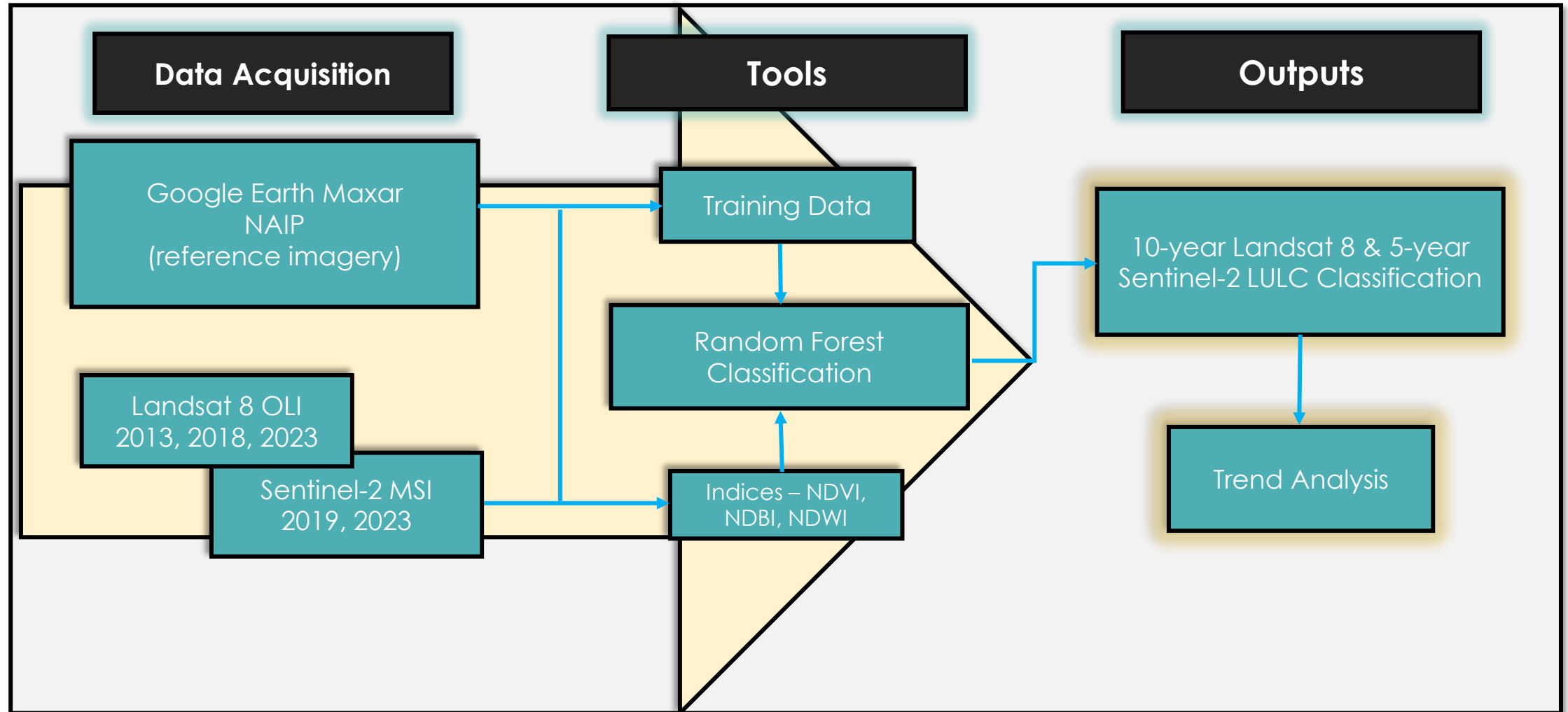


30m Flood Risk Map

Earth Observations

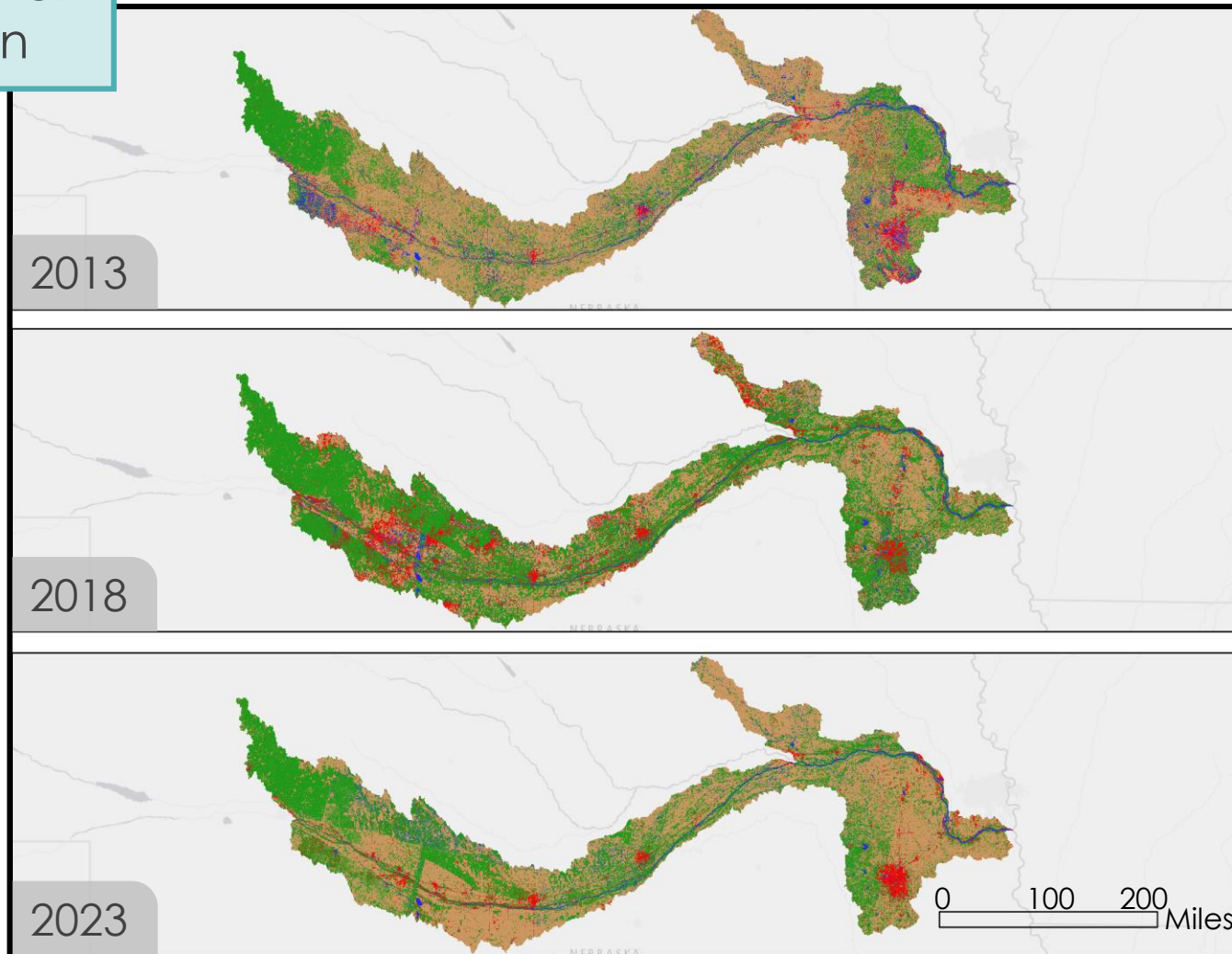


Methods – LULC



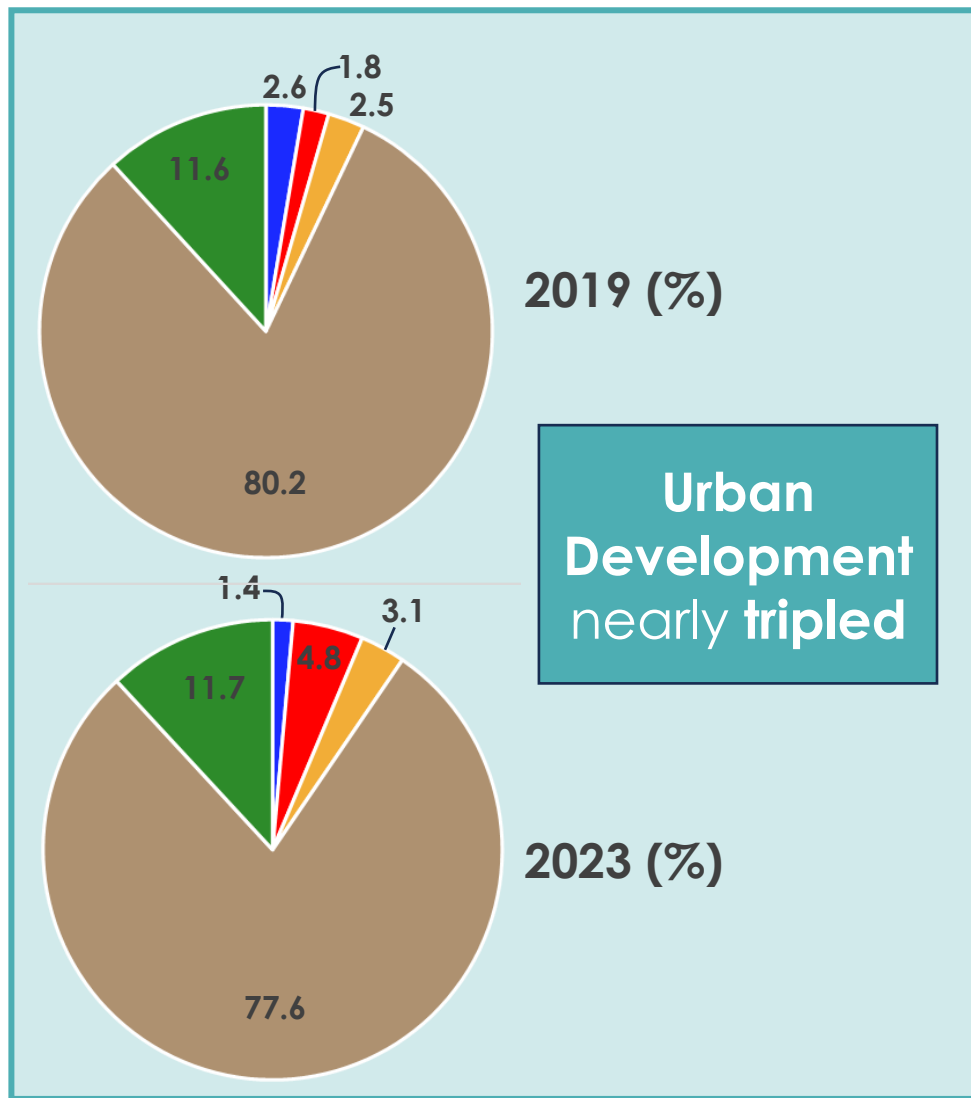
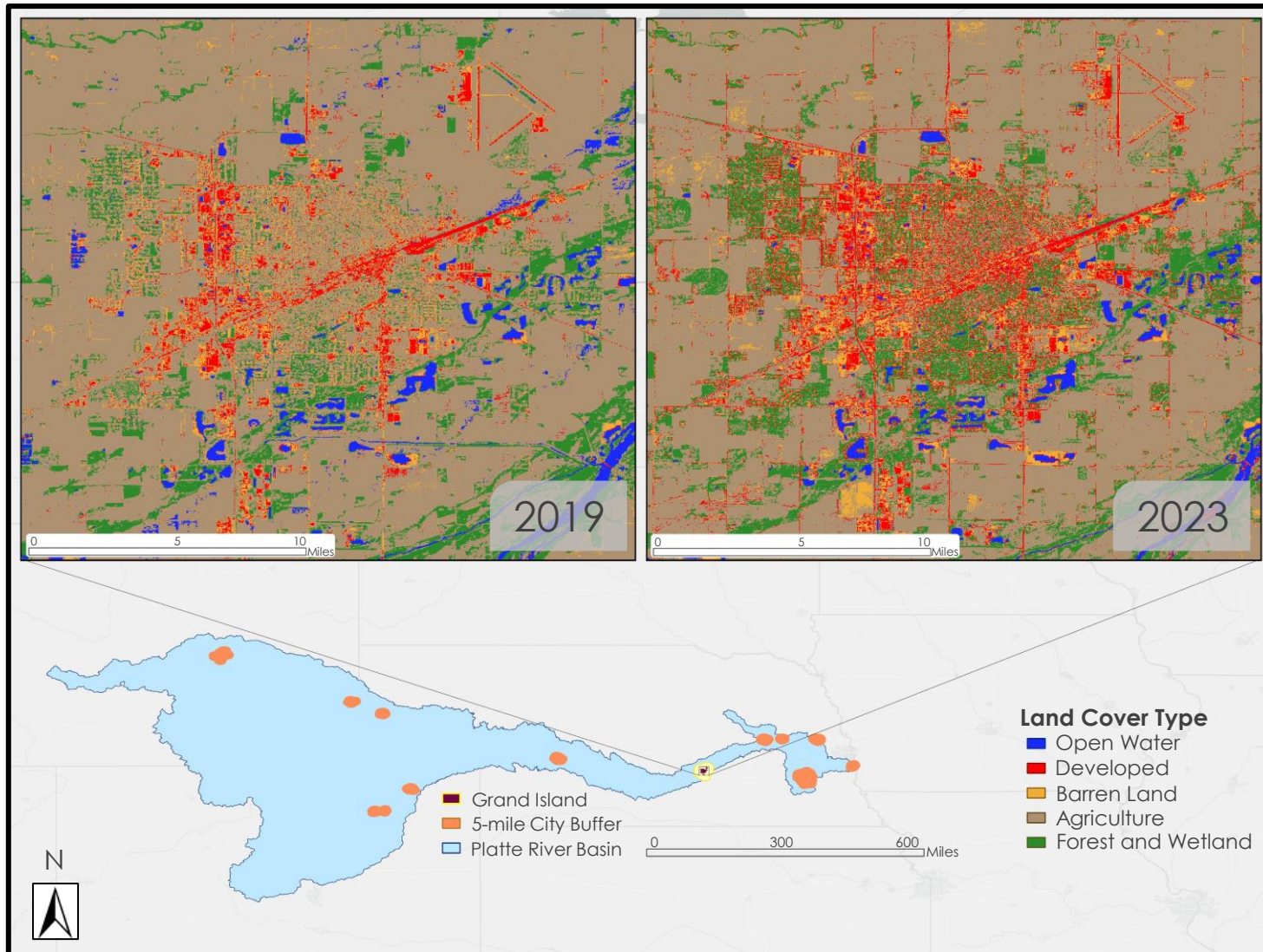
Results – LULC Time Series (Landsat 8)

Land Use Land Cover Central Platte Basin

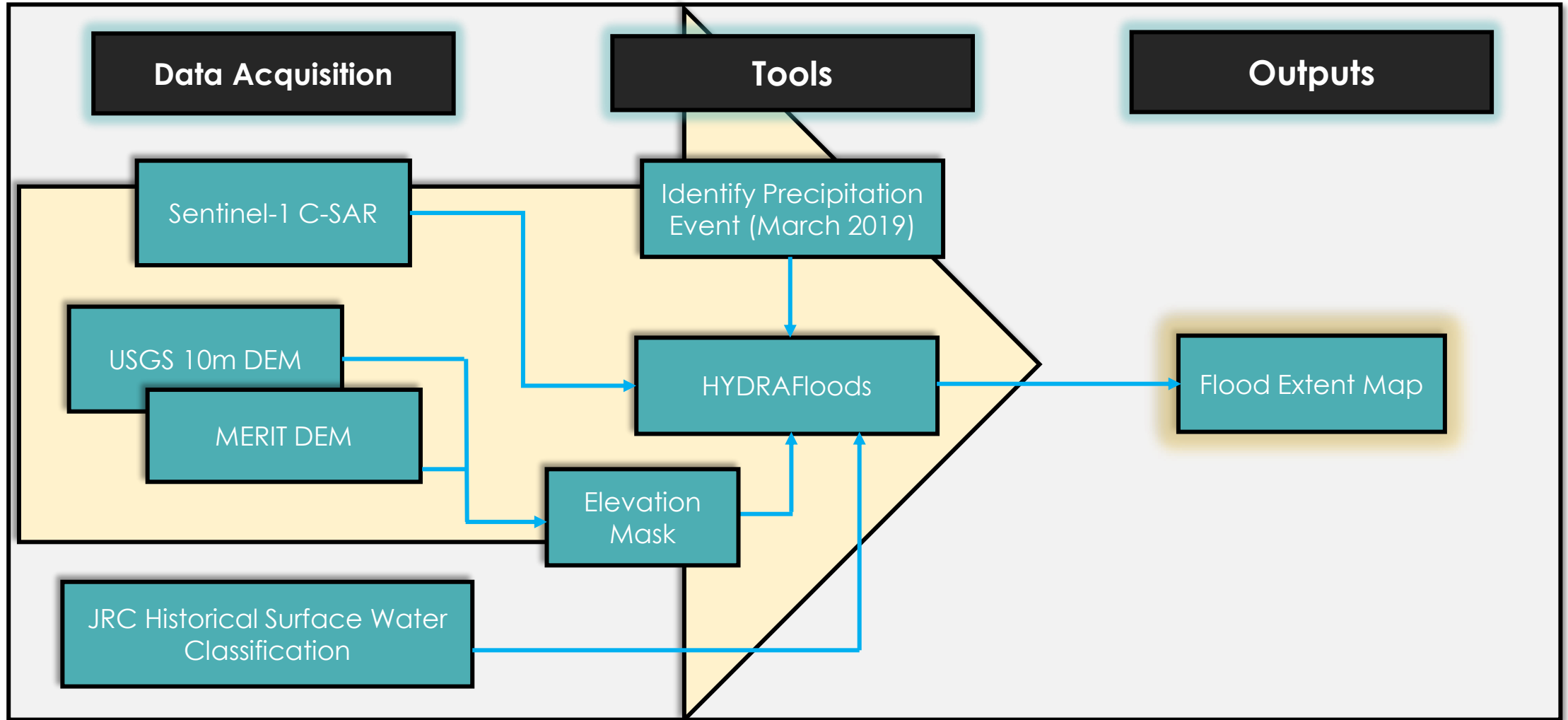


- Open Water
- Developed
- Agriculture
- Vegetation & Grassland

Results – LULC Change Detection (Sentinel-2)



Methods – Flood Extent

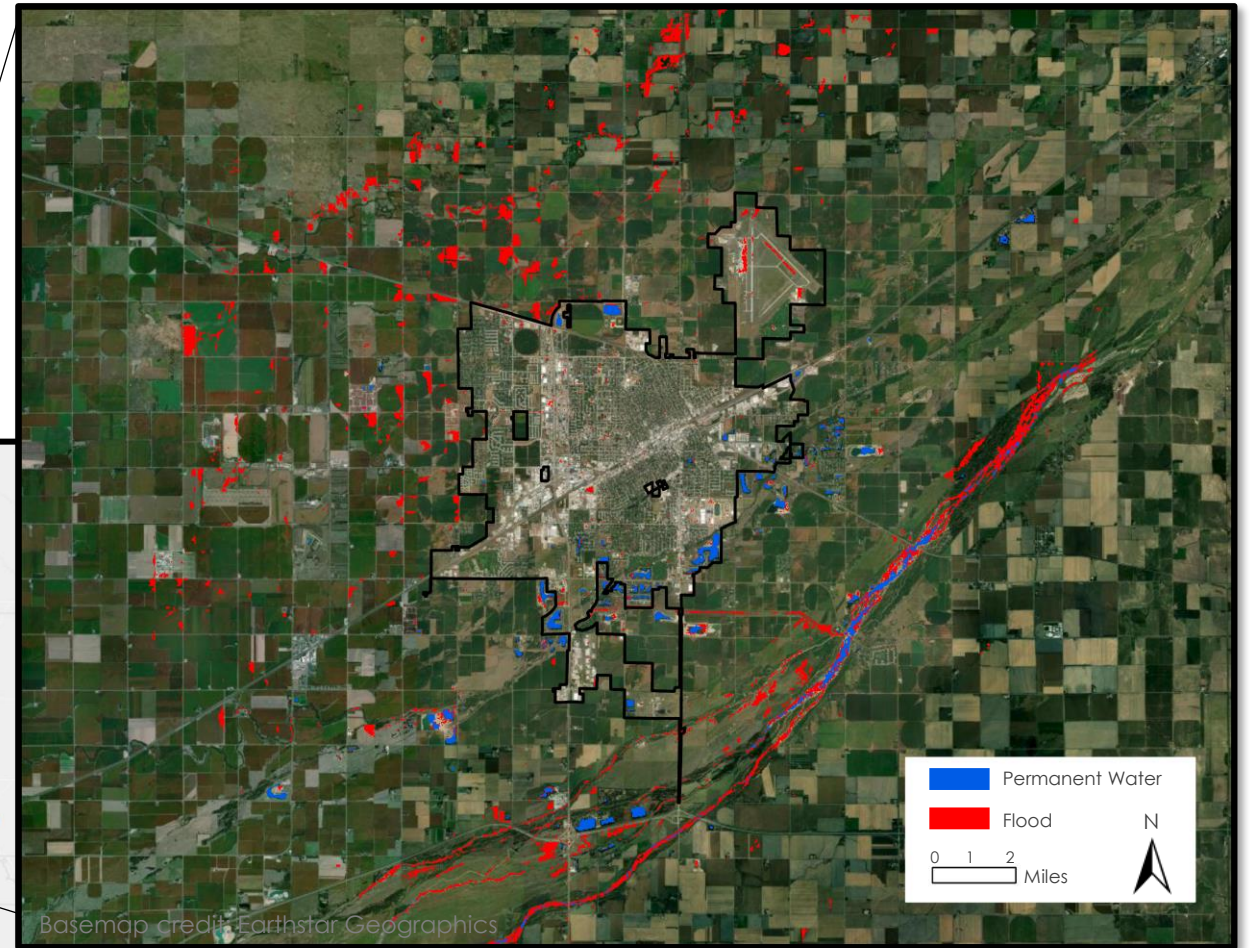
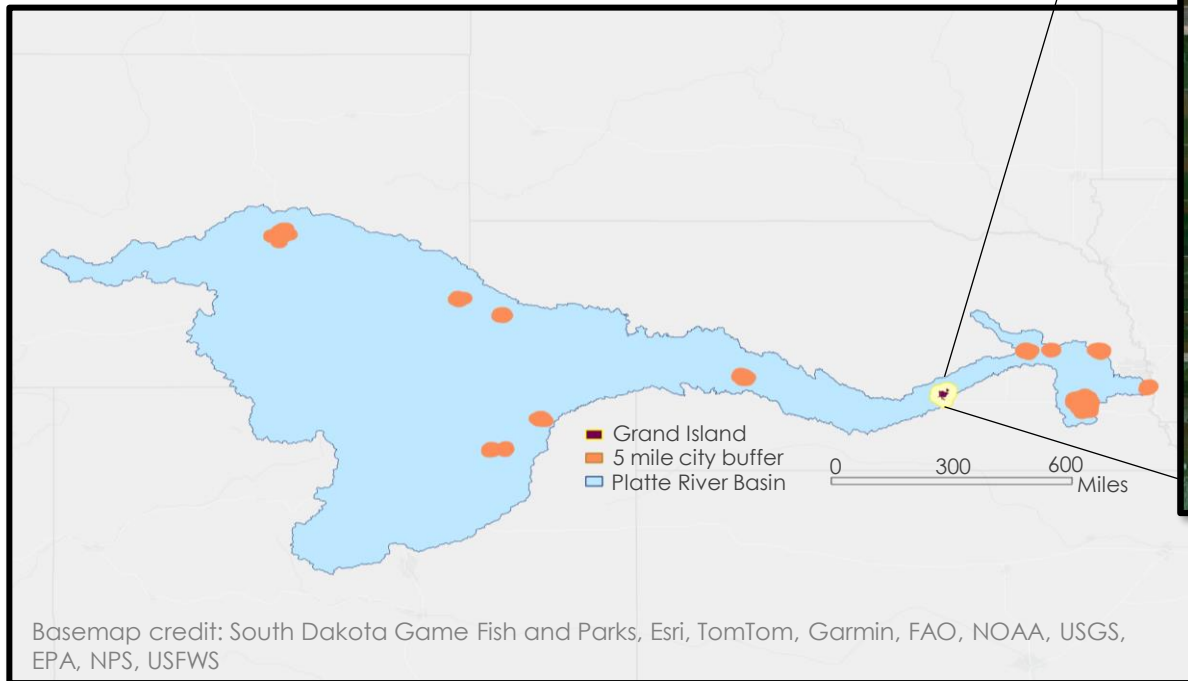


Results – Flood Extent

Flood Extent, 30 m

Grand Island, NE
March 1 – 21, 2019

Capturing March 14th, 2019 flood event



Limitations

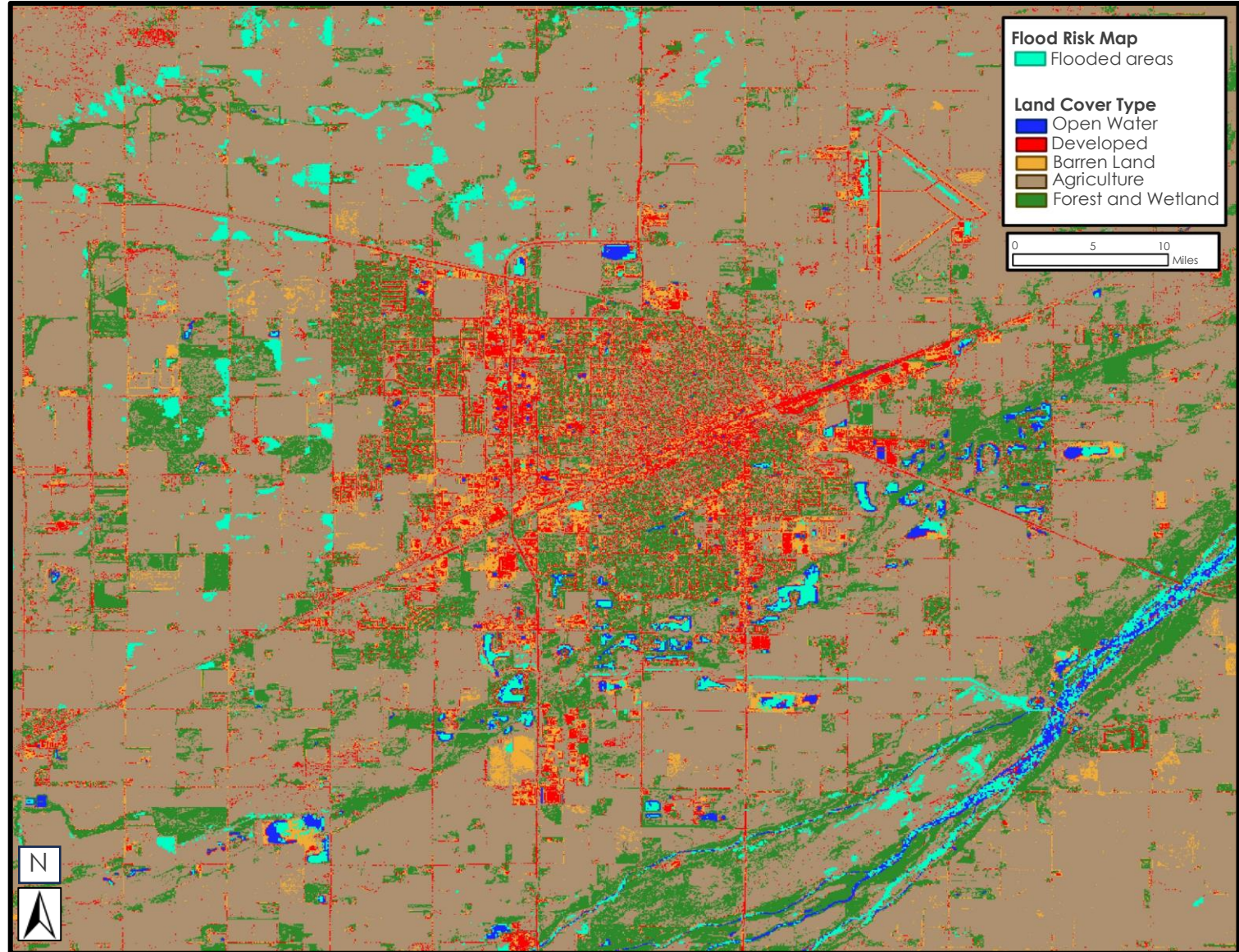


Image Credit: Lindsay Vivian, USFWS

- **Size** of the basin introduced difficulties
- Our reduced area of interest highlights **priority cities**
- Limited **field verification** for flood events
- **Limited availability** of Sentinel-1 images for HYDRAFloods
- **Satellite imagery resolution** made wetland classification difficult

Conclusions

- Combination of classifications and flood risk map identifies possible restoration sites (depicted in Grand Island)
- High-resolution ML classifications in targeted cities aid in understanding the relationship between urban growth, wetland delineation, and other LULC variables



Future Work



Image Credit: Tom Koerner, USFWS

- Fine-tuning classification
- Complete HYDRAFloods for other cities
- Mask wetlands in land classification using SAR, LiDAR, or National Wetland Inventory datasets
- Urban Growth Model

Acknowledgments

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