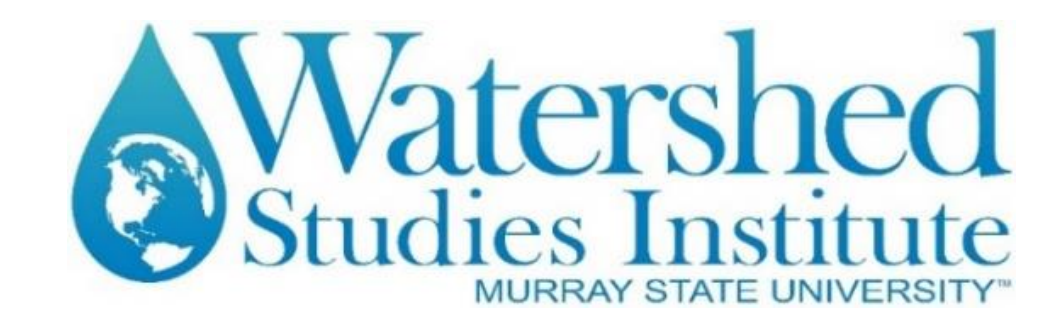


Modeling Inundation to Identify Amphibian Habitats in a Restored Wetland



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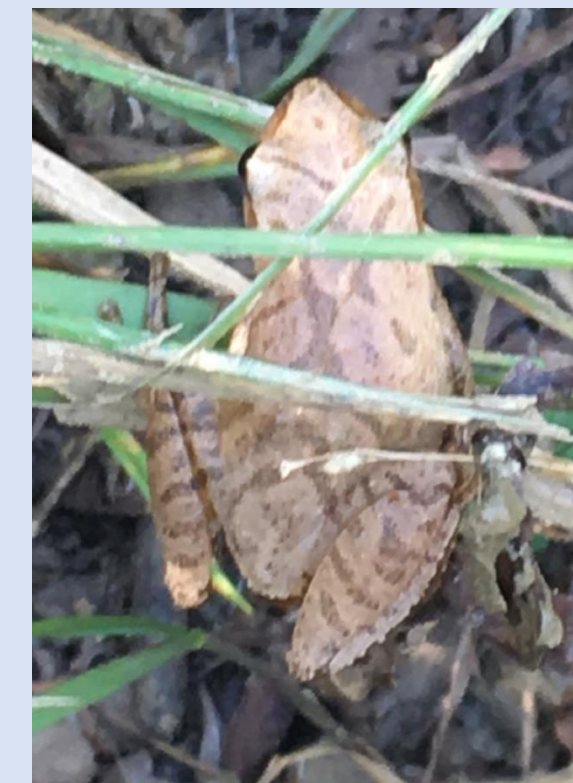


Introduction

- Wetlands are critical ecosystems¹, serving to promote high biodiversity² and provide numerous ecosystem services³.
- Within the US, wetlands have declined by 53% as of 1990¹.
- Kentucky has lost 81% of its wetlands as of 1990¹.
- The Wetlands Reserve Program (WRP) was created to combat wetland loss by restoring/creating wetlands on private land.
- Few studies have examined the impact of restoration on wetland taxa (amphibians and reptiles) in WRP^{4,5}.
- Surveys for amphibians are time and cost prohibitive for many agencies, thus GIS presents a unique opportunity to identify critical zones within wetlands to target sampling.



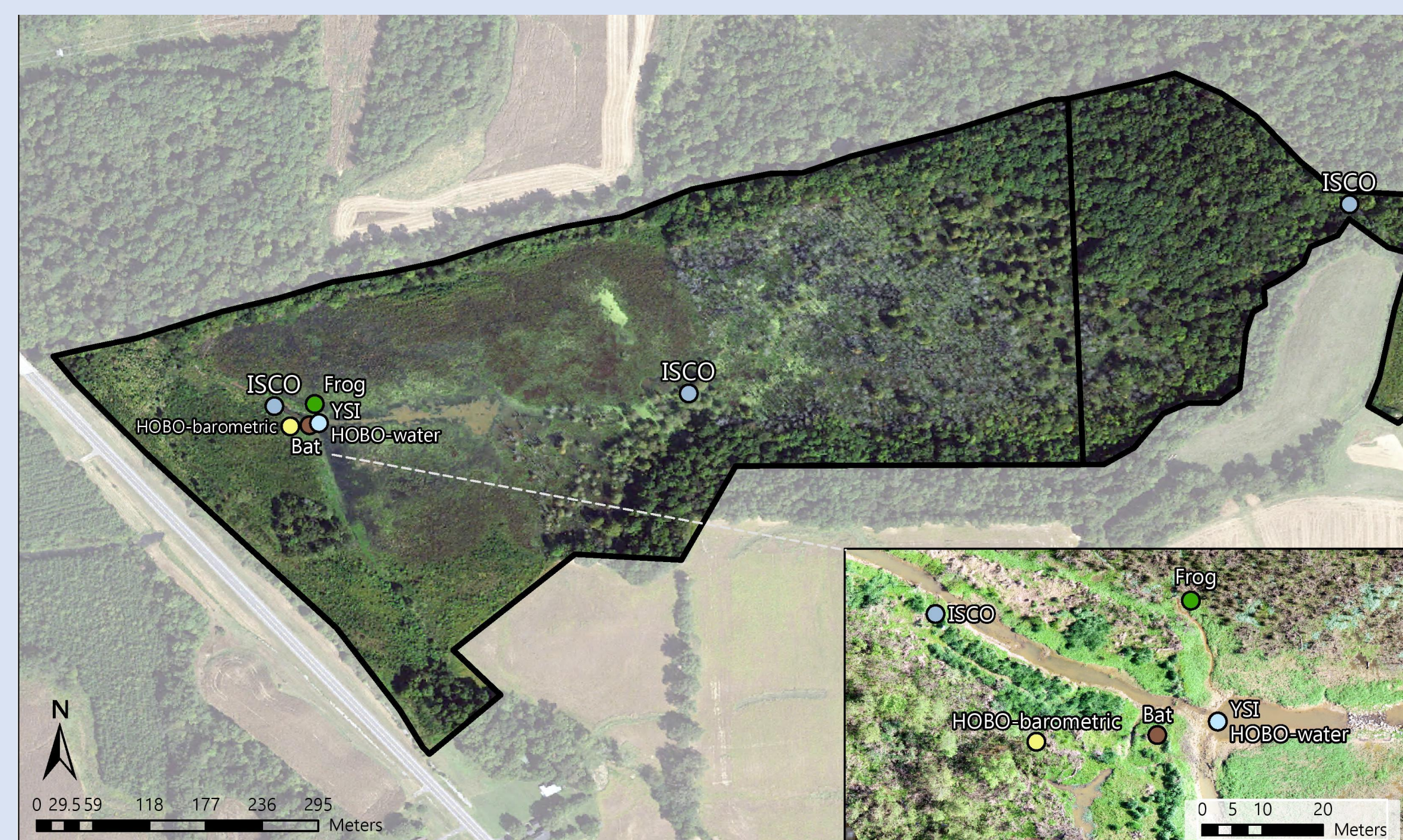
Metamorph Spotted Salamander



Spring Peeper

Methods and Study Site

- Selected one study site within MSU WRP Study
 - 7 years post restoration using a ditch plug
 - Using pre-restoration imagery to model wetland pools
- GIS Software: ArcGIS Pro 2.7.0
- Datasets: Kentucky Elevation Data (5ft DEM) tiles and MSU WRP Site shapefiles
- DEM-derived datasets: Inundation models clipped to site



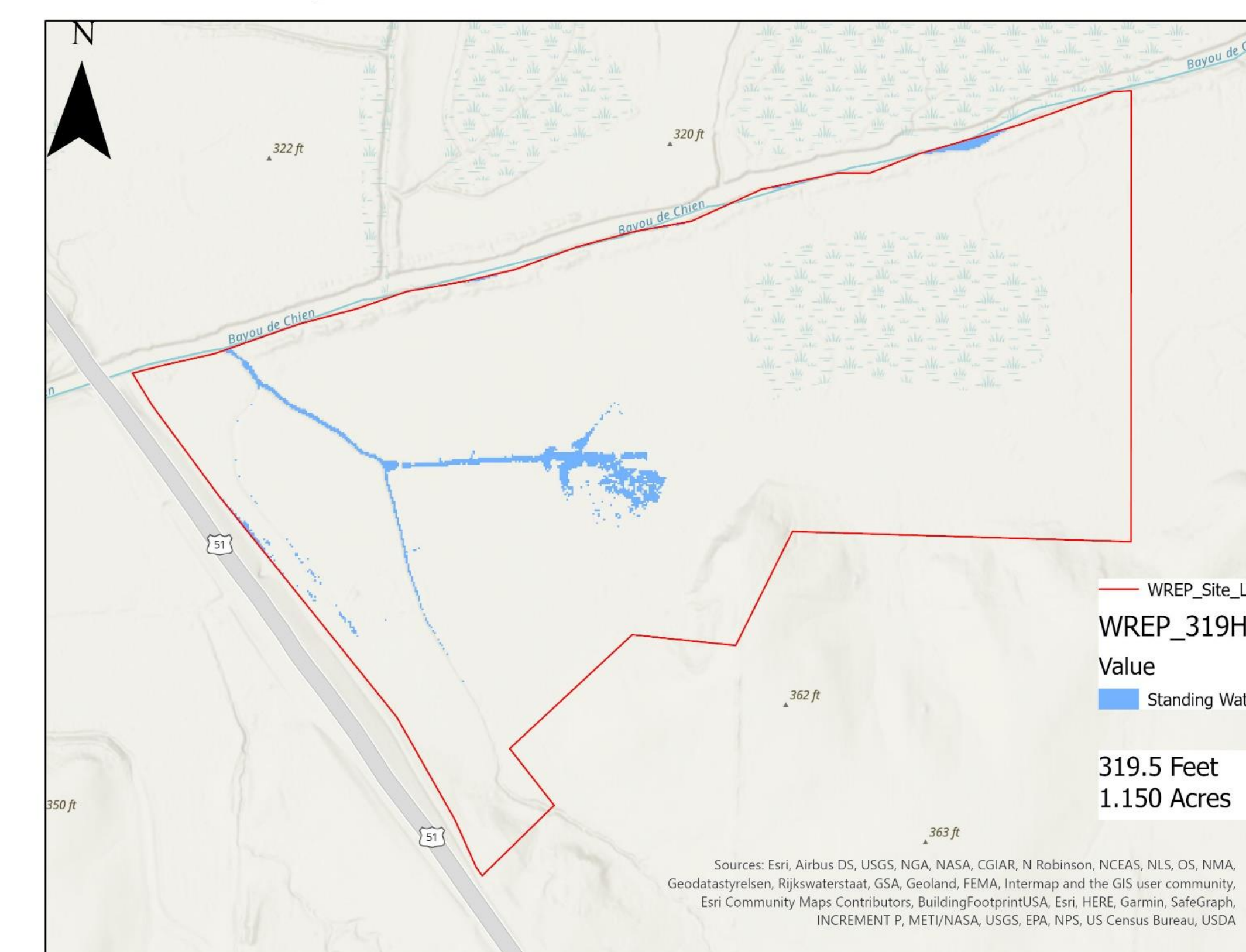
Locations of Murray State University sampling instruments



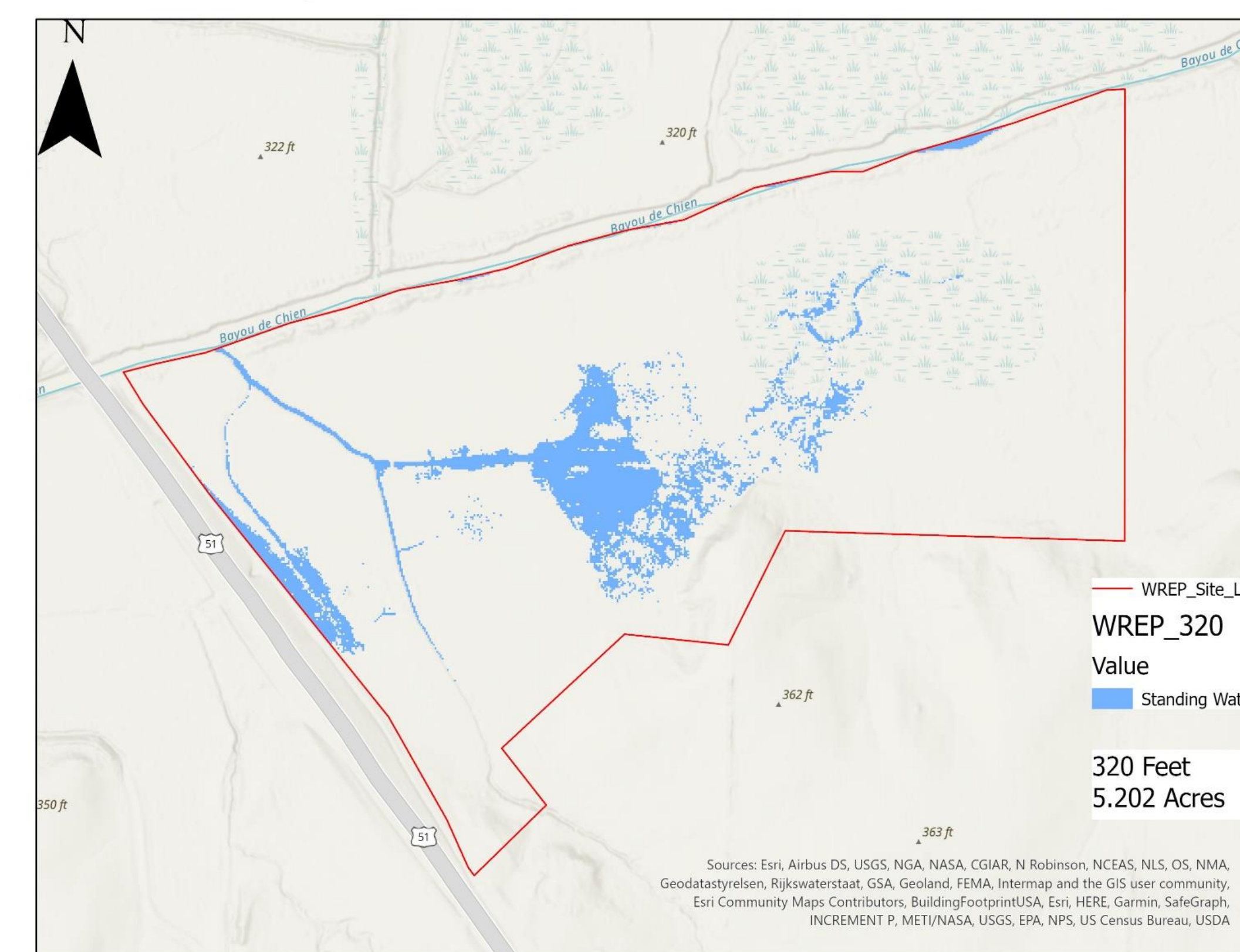
Map prepared by: Kinga Stryszowska-Hill
July, 23, 2020

Results

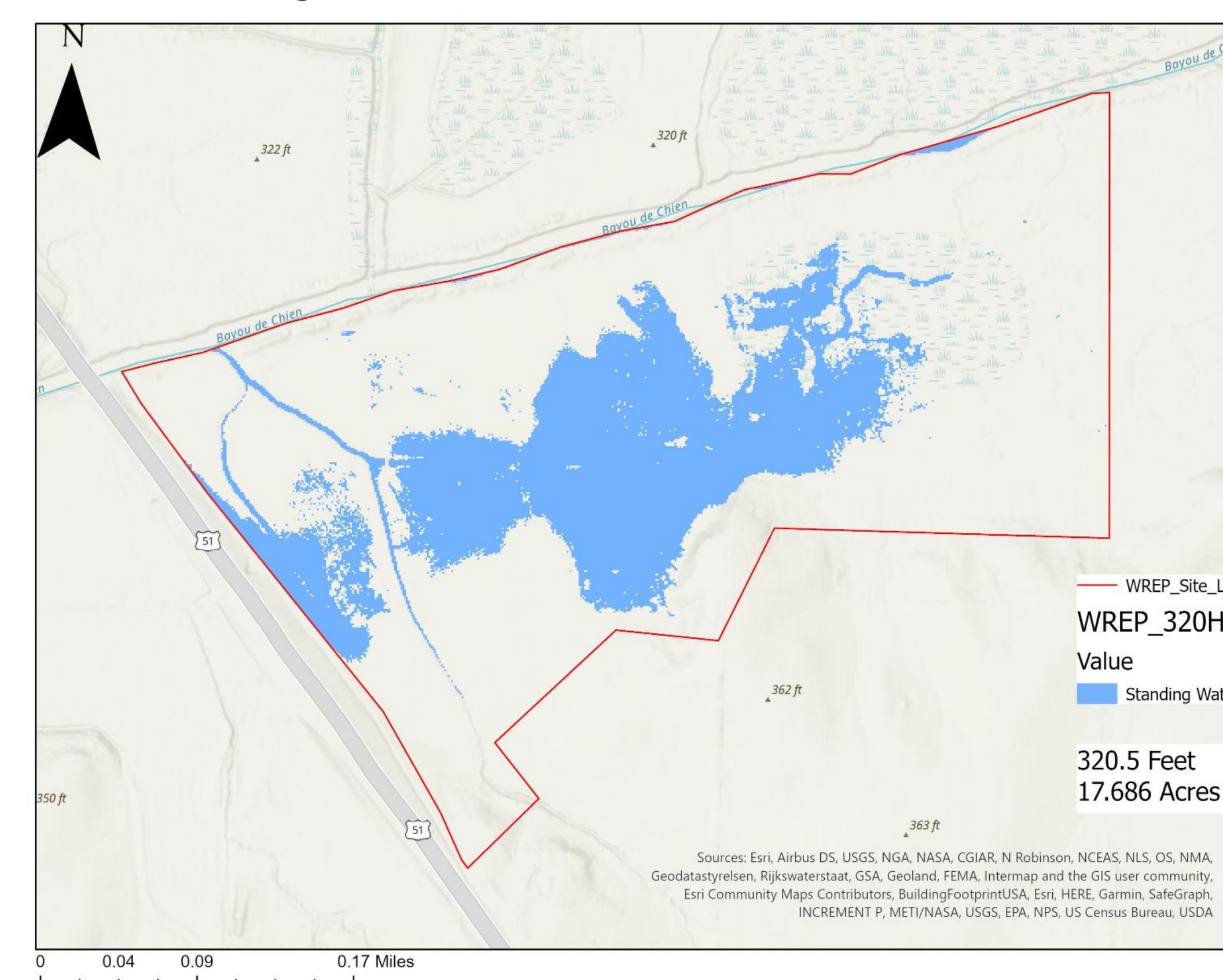
Inundation models at 319.5, 320, 320.5, and 321 ft
 Surface of Standing Water at a WRP site when at 319.5 feet relative to sea level



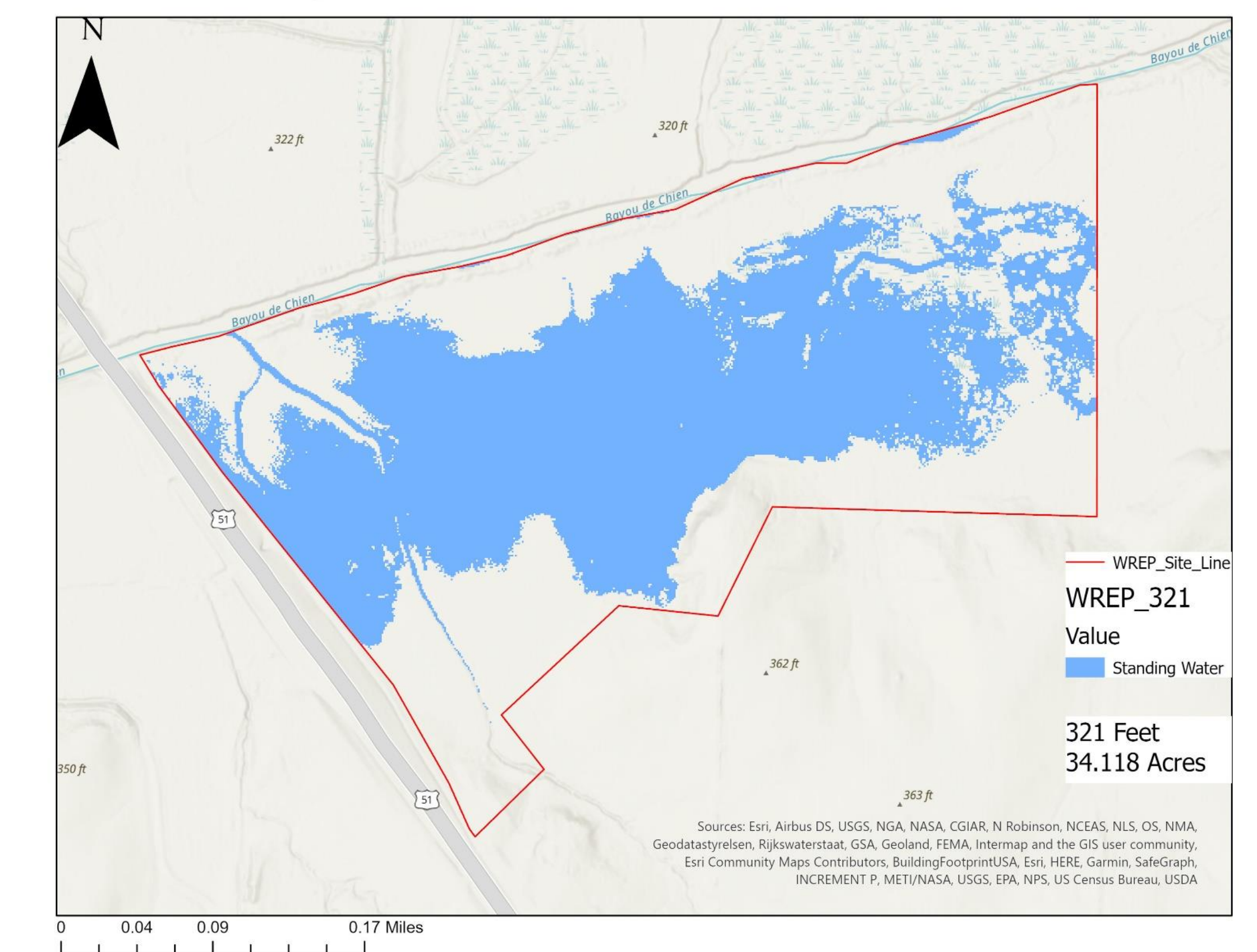
Surface of Standing Water at a WRP site when at 320 feet relative to sea level



Surface of Standing Water at a WRP site when at 320.5 feet relative to sea level



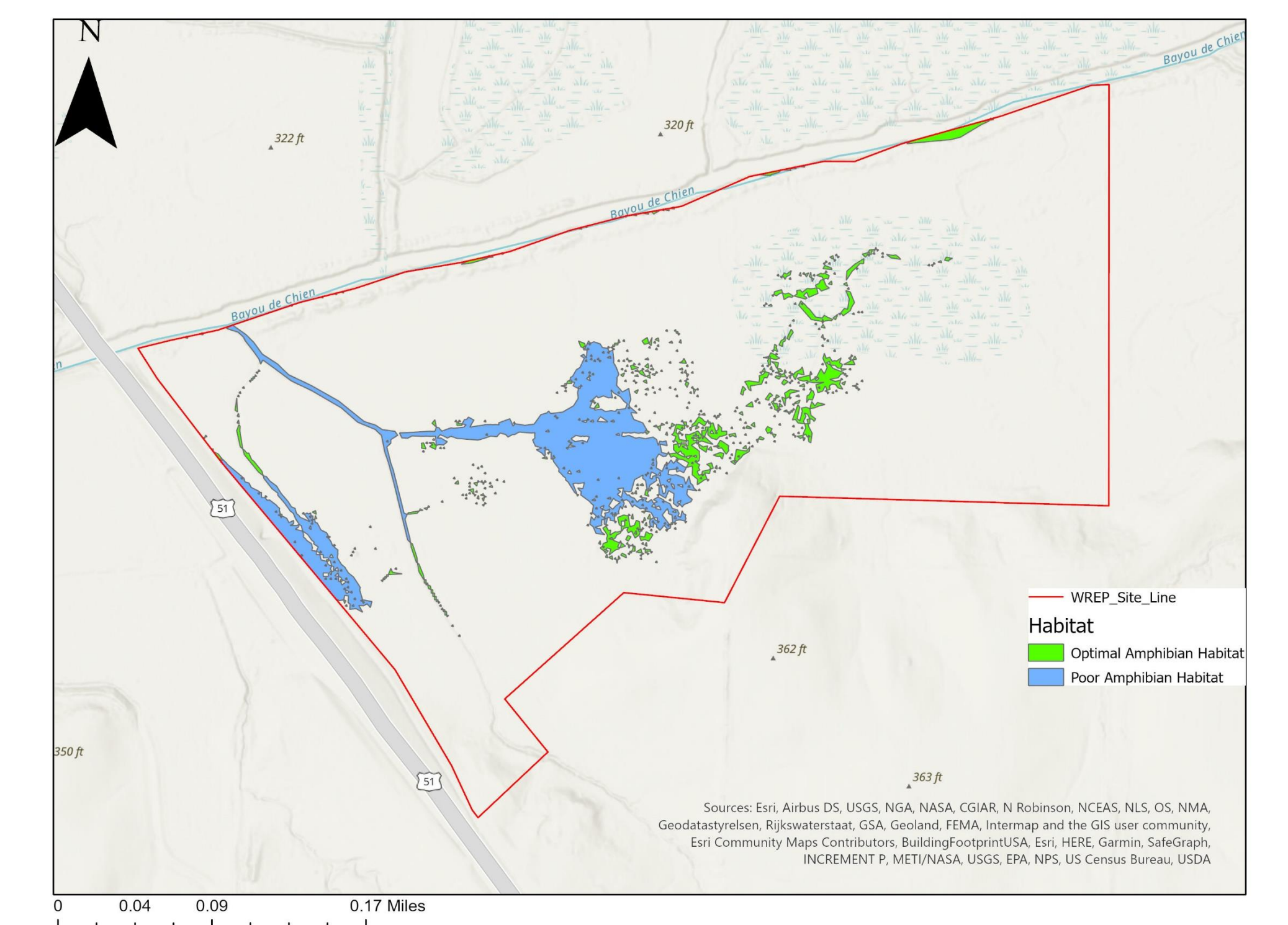
Surface of Standing Water at a WRP site when at 321 feet relative to sea level



Discussion and Implications

- Restoration of wetlands can be a boon for amphibian species.
- Creation of deepwater wetlands (>1m) hinders amphibian use.
- Identify water levels to maintain a complexity of habitats.
- Next Steps:
 - Calculate depth and area of small pools within larger wetland
 - Expanding to rest of WRP study sites at MSU

Amphibian Habitats at a WRP site when Surface Water is at 320 feet relative to sea level



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