

# Mosaicking and Georeferencing Thermal Infrared Imagery of Swaner Preserve, Park City, Utah

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## Methods:

- Infrared images collected using a FLIR camera attached to a drone.
- 48 ground control points.
- Images extracted using ResearchIR software.
- Mosaic frames together using Adobe Photoshop CS5.
- Georeference finished mosaic using ArcGIS 10.4.

## Why Does This Matter?

Determining how much water is on Swaner Preserve is the first step toward quantifying the amount of water that life in the preserve's ecosystem requires for survival.

## Objectives:

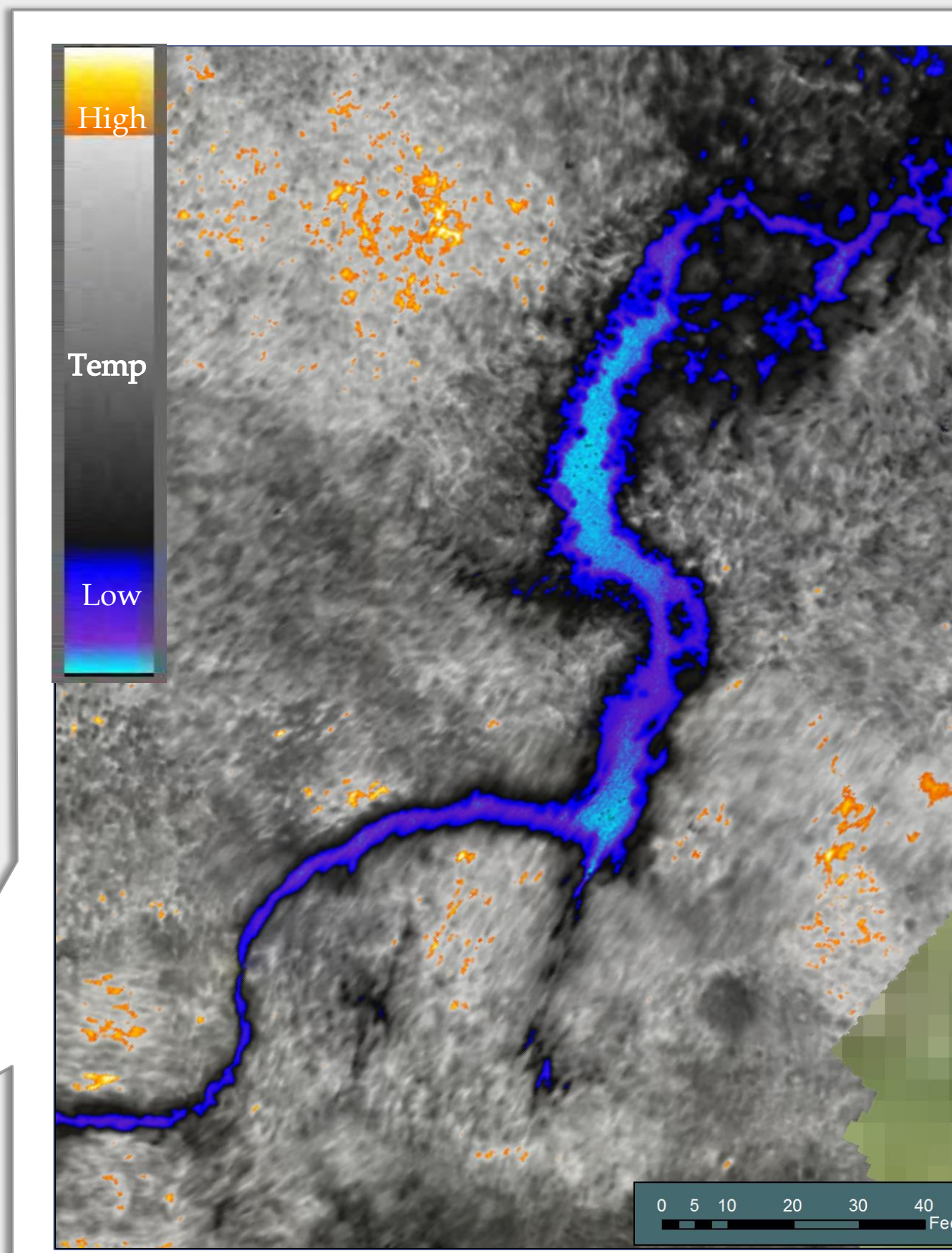
Produce a georeferenced mosaic using thermal infrared imagery of Swaner Preserve that will show the location of water on the preserve and represent variance in the water temperature.

## Introduction:

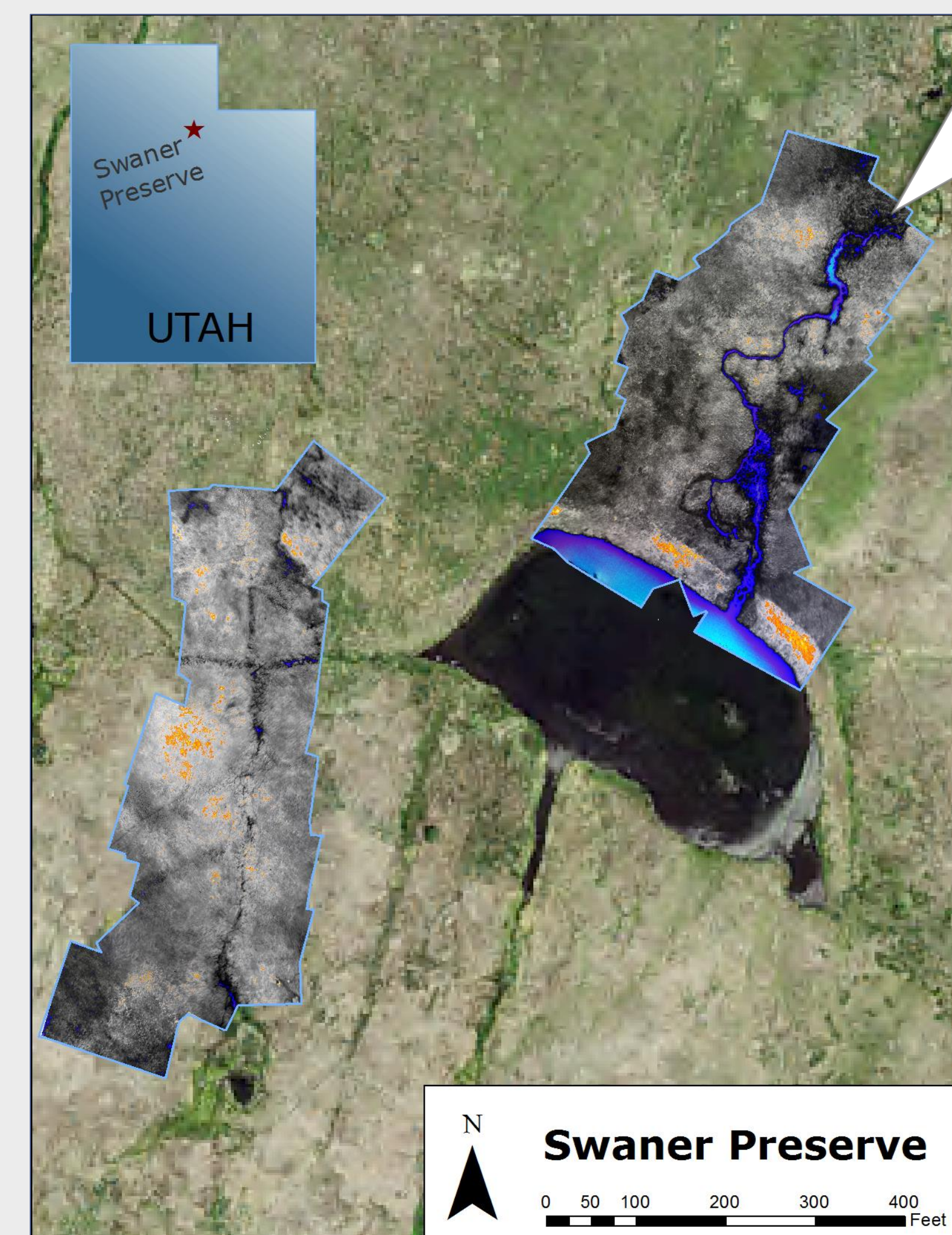
- Swaner Preserve and EcoCenter is a 1200 acre wetland with streams and ponds that host many species of plants and animals.
- Water on the preserve fluctuates throughout the year. Using infrared imagery we can identify where water exists on the preserve season to season.
- Collecting thermal infrared imagery is made easy by using a forward looking infrared (FLIR) camera attached to a small drone.
- Collected thermal IR imagery is mosaicked and georeferenced to create a visual representation of the radiant temperatures.



Above left and Bottom right: The drone takes launches on its flight to take thermal infrared imagery of Swaner Preserve.



Left: Completed mosaic of an area on Swaner Preserve after georeferencing in ArcGIS. Above: Zoomed in IR image of a stream in Swaner Preserve.



Below: The drone launches at Swaner Preserve.



Right: Maggi Kraft records the exact GPS location of the control point. Left: A GPS control point which is visible in the IR imagery. Later used to georeferenced the image.



## Results:

- Each flight by the small drone is limited to about 20 minutes which is why only a small section of Swaner Preserve is covered in this mosaic.
- The mosaic is a composite of nearly 175 individually selected frames that were extracted from 16,000 frames of video collected in the 20 minutes of flight.
- A couple different mosaicking software were tested in this project we chose to use Adobe Photoshop CS5 because of its photomerging tool that automates the process.



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