Vineyard High Resolution Imagery Analysis with Arc Map

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Application of GIS in Water Resources
Term Project

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Motivation

- AggieAir produce High Resolution Imagery (HRI) for Remote Sensing
- Farmers interest in Precision Agriculture
- Vineyards Yield Analysis based on Precision Agriculture
- Webservices: Landsat Data

Data Collection

- RGB imagery @ 500 meters of altitude.
- NIR imagery @ 500 meters of altitude.
- Thermal imagery @ 500 meters of altitude.

Flying AggieAir @ 500 meters produce an image resolution of 15 cm (6 inch).
These HRI datasets are to be compared with LandSat imagery with a resolution between 15 and 90 meters.

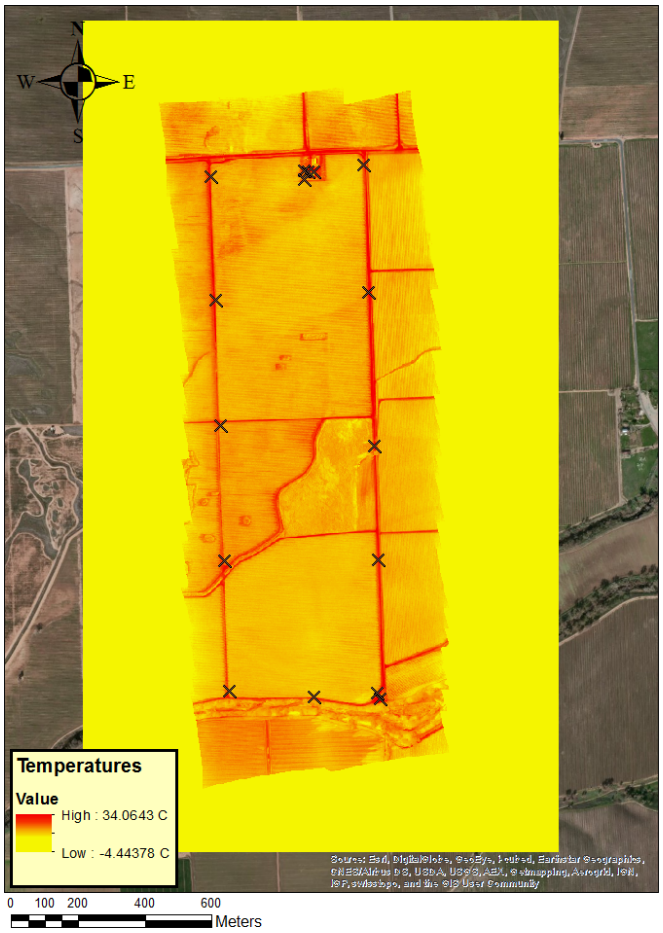
Mosaics

AGGIEAIR RGB MOSAIC

AGGIEAIR NIR MOSAIC

Mosaics

AGGIEAIR THERMAL MOSAIC MORNING



AGGIEAIR THERMAL MOSAIC AFTERNOON

Analysis Description

Purposes of image analysis:

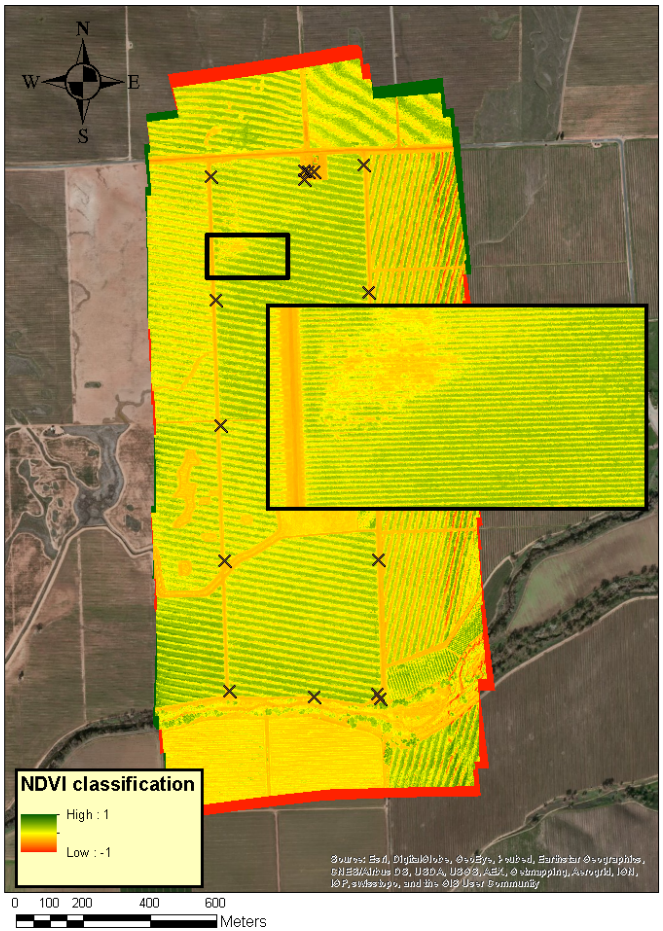
- Identify rows and individual plants.
- Identify which areas and which plants need treatments.
- Evapotranspiration (ET) - "Where water is going and in what quantity?"

ArcMap Tools

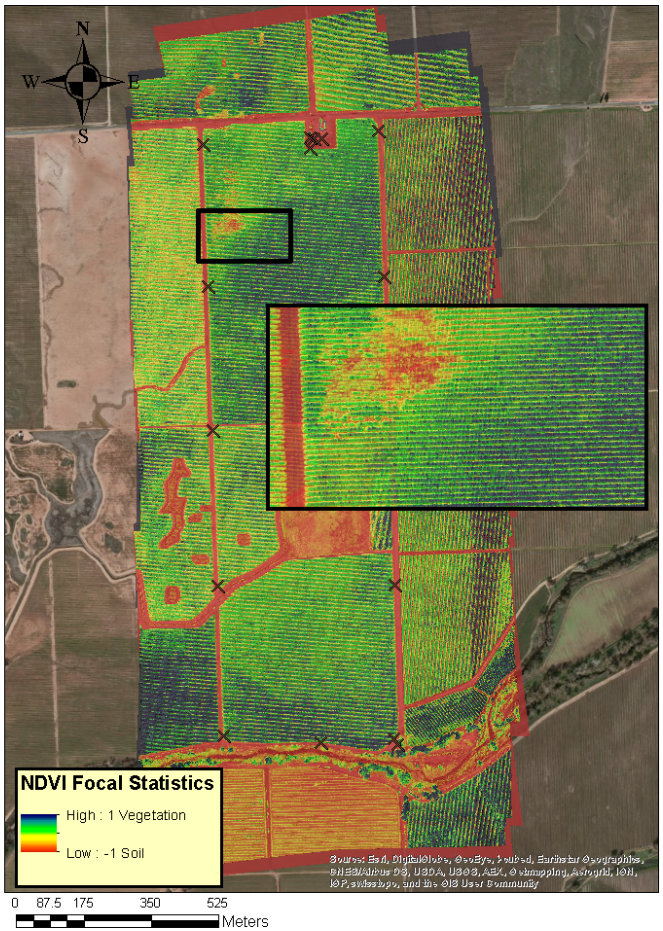
- **Raster Calculator** - Created NDVI raster layer from Red and NIR layers of the maps.
- **Reclassify** - Helped identify Soil and Vegetation from NDVI.
- **Focal Statistics**.
- **Hillshade** - Create a 3D look, helped identify plants clusters.
- **Contour List**. - Creates polygons based on NDVI levels.
- **3D Analyst**-Calculated statistics of the Rows.

Results

VINEYARD NDVI MAP



VINEYARD NDVI ANALYIS



Future Work

- Complete and test the Vineyard Analysis set of tools that will provide reports of the vines rows condition.
- Perform ET analysis
- Test these tools with other type of fields.

Conclusion and Time for Questions

- In summary all we want is to be able to save water and economic resources using the technology available.
- Maps and statistics help to find critical points when doing precision agriculture.
- Maping and interpretation processes have to be easy, plug and play.

Time for questions.
Thanks.