Air Data Solutions
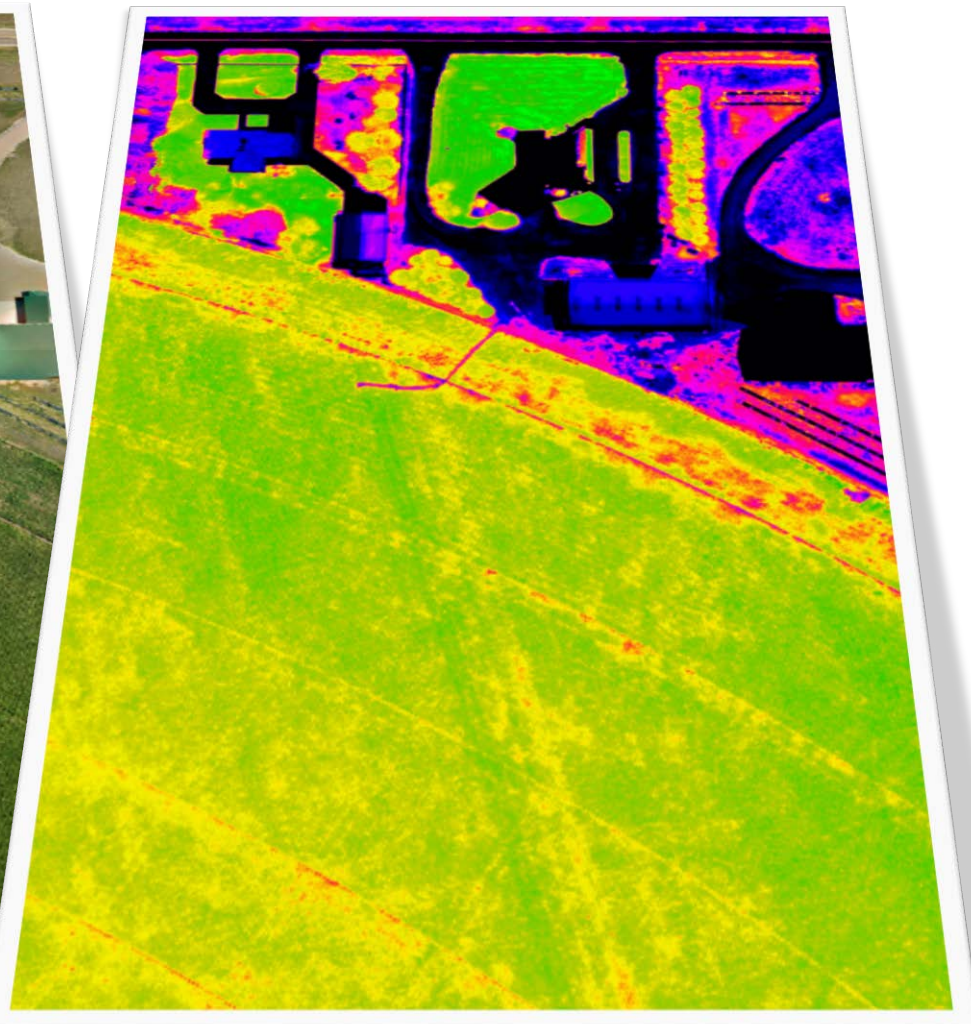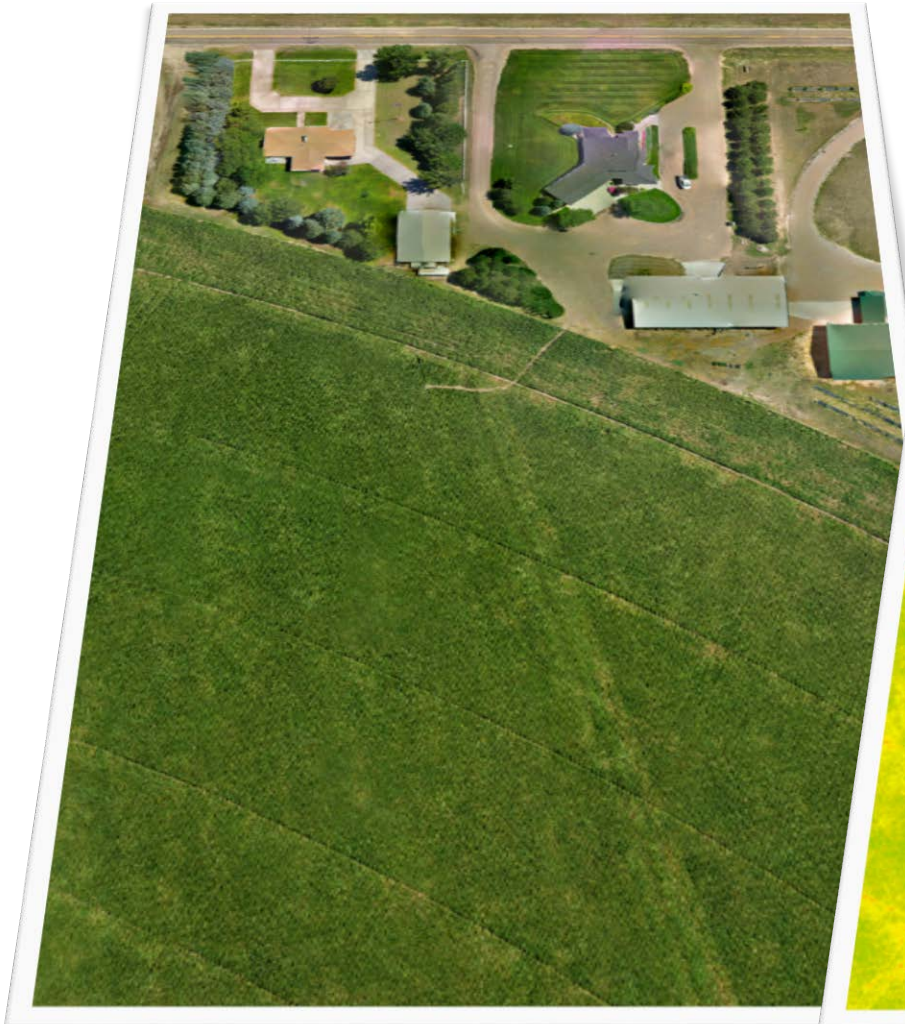
Air Data Solutions
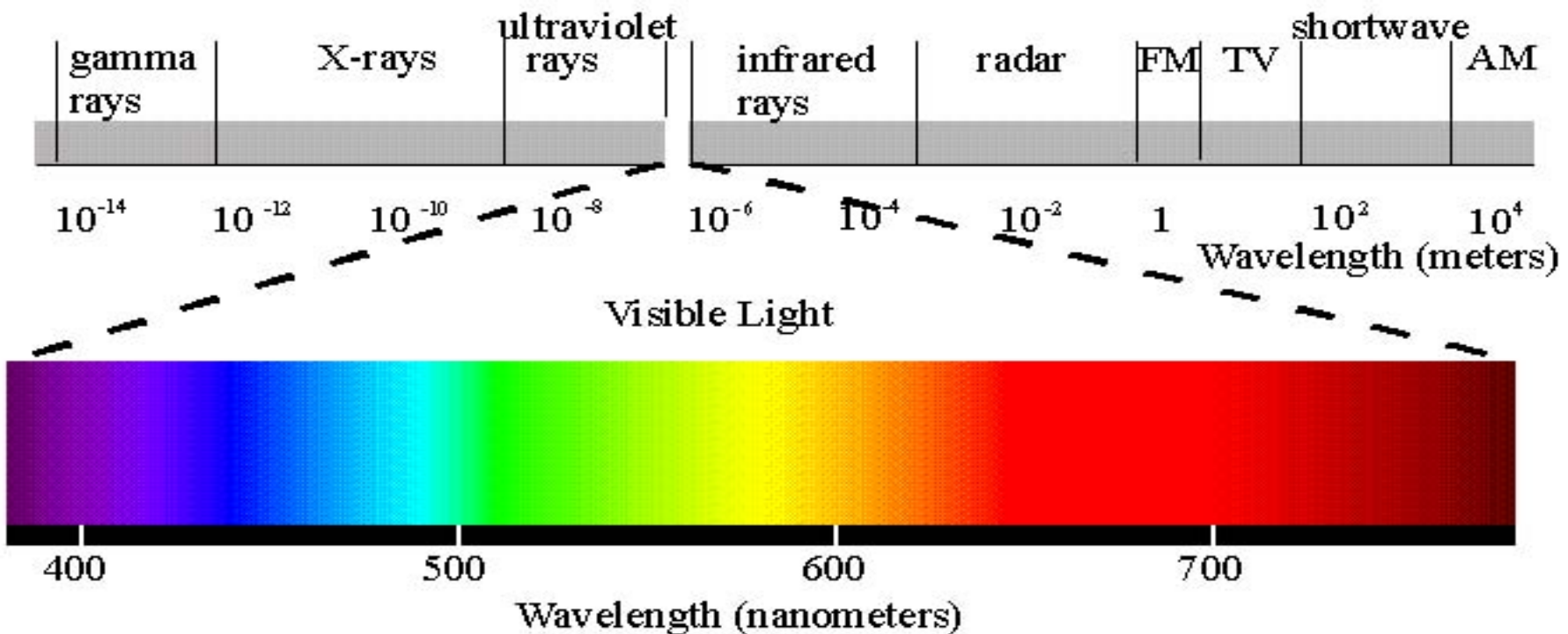## Crop Stress Mapping

What is NDVI Mapping?

The Human Eye only senses energy in what we call the VISIBLE portion of the electromagnetic spectrum
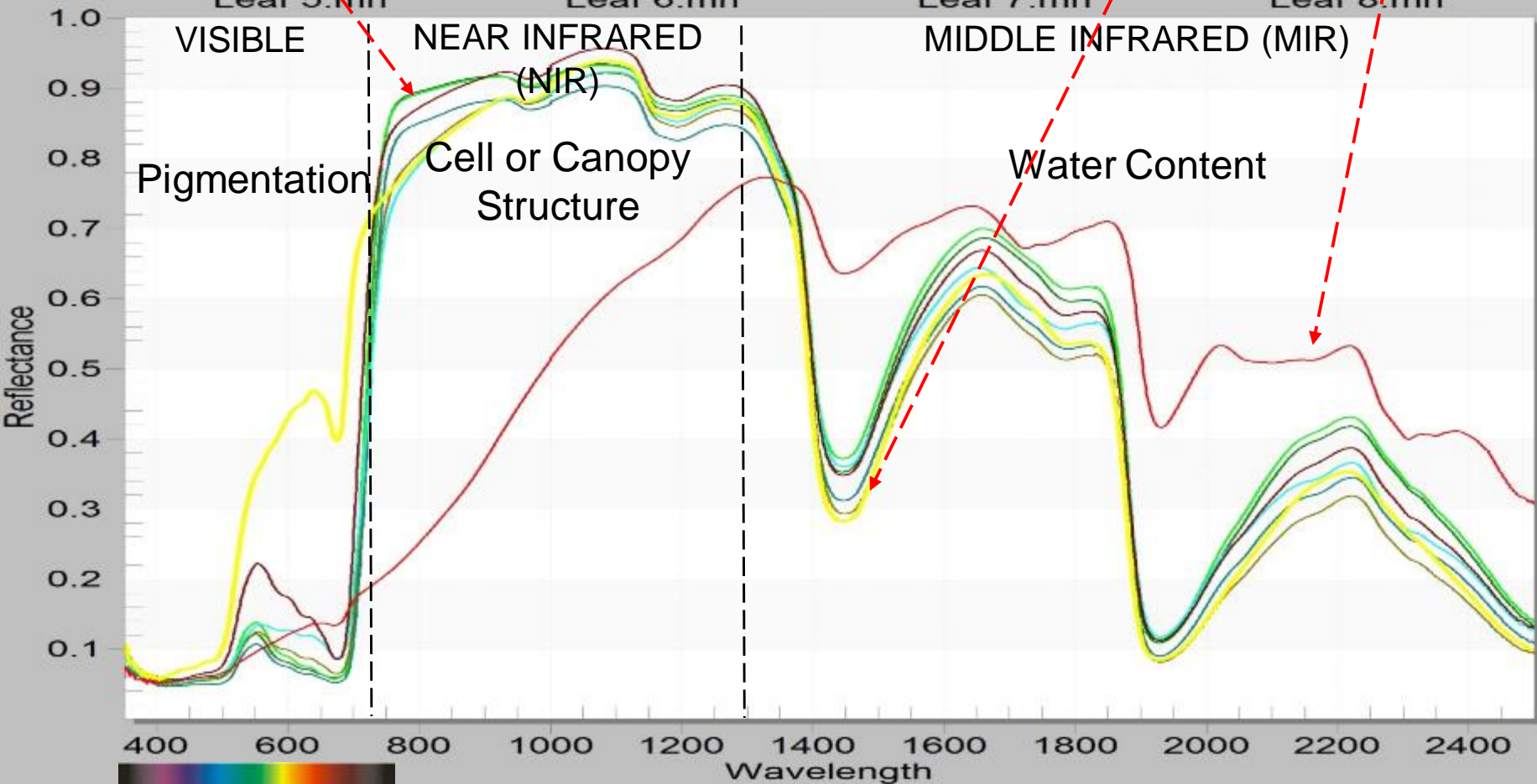
Soybean Leaf Phenology States

VISIBLE   NEAR INFRARED (NIR)   MIDDLE INFRARED (MIR)

Pigmentation   Cell or Canopy Structure   Water Content

Leaf 1.mn   Leaf 2.mn   Leaf 3.mn   Leaf 4.mn
Leaf 5.mn   Leaf 6.mn   Leaf 7.mn   Leaf 8.mn

Reflectance

Wavelength

Air Data Solutions

STITCHING (LEFT) VS. ORTHOMOSAIC (RIGHT) OF 388 IMAGES

Stitched Image (Not Orthomosaic)　　**Orthomosaic**
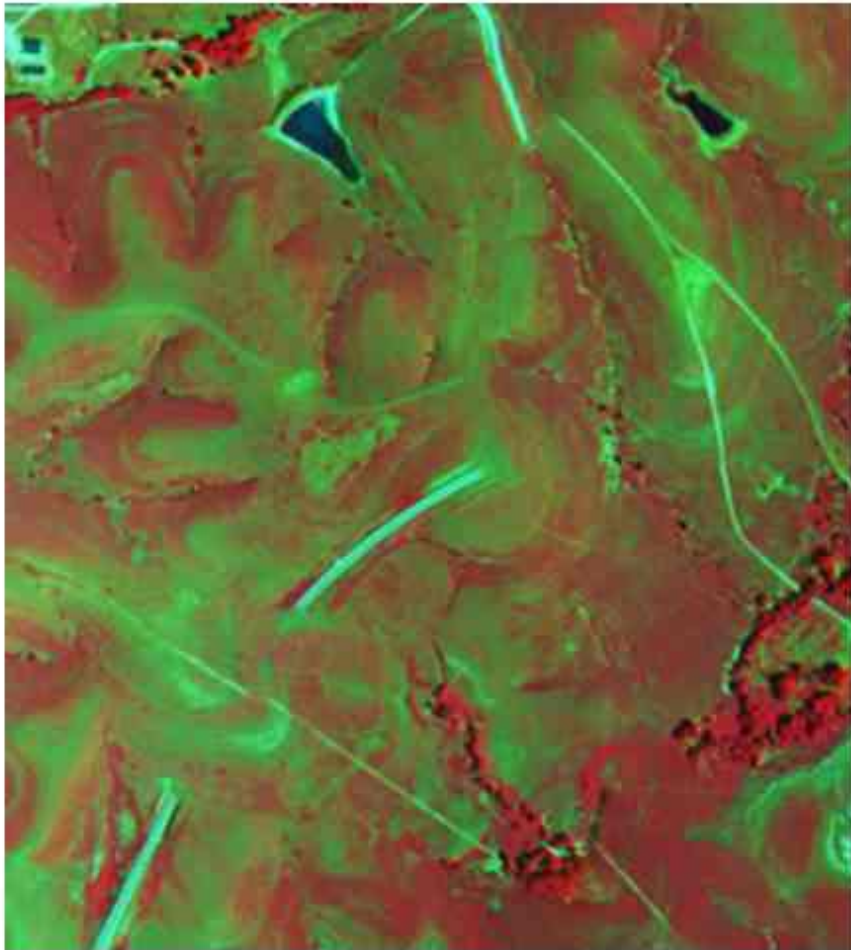
Sugar Cane Irrigation Study
8-14-15

Flood Irrigation
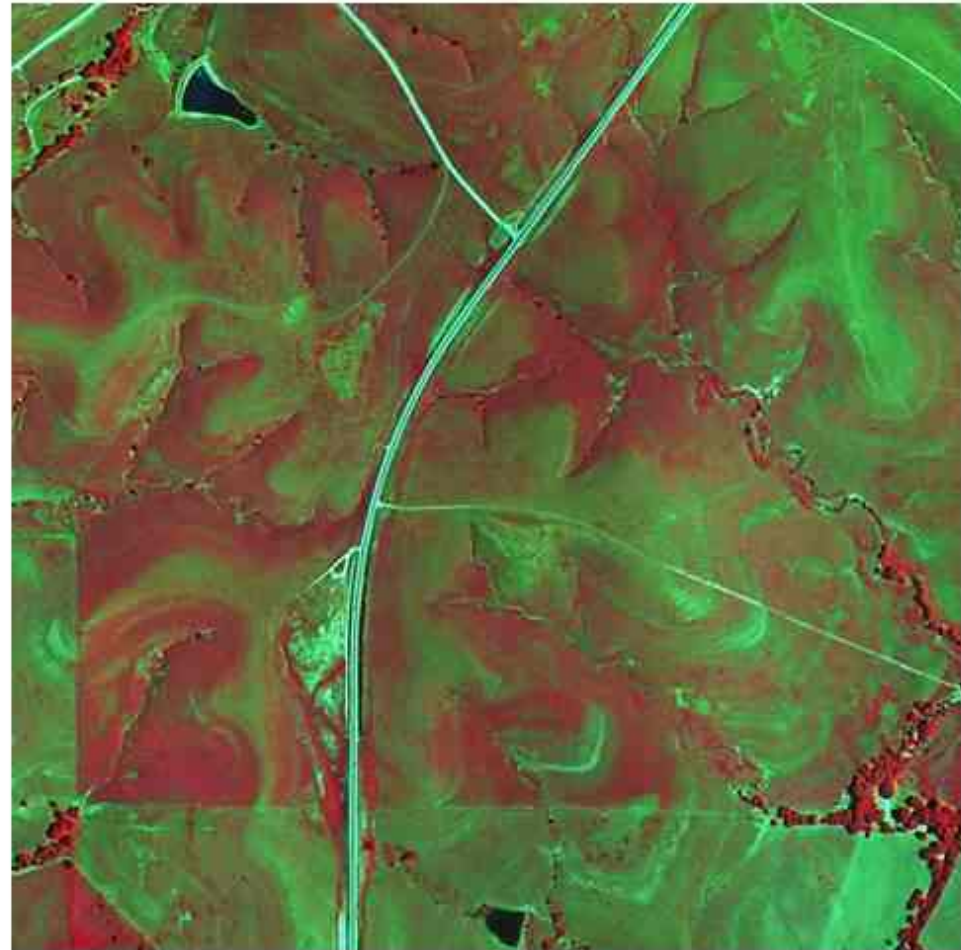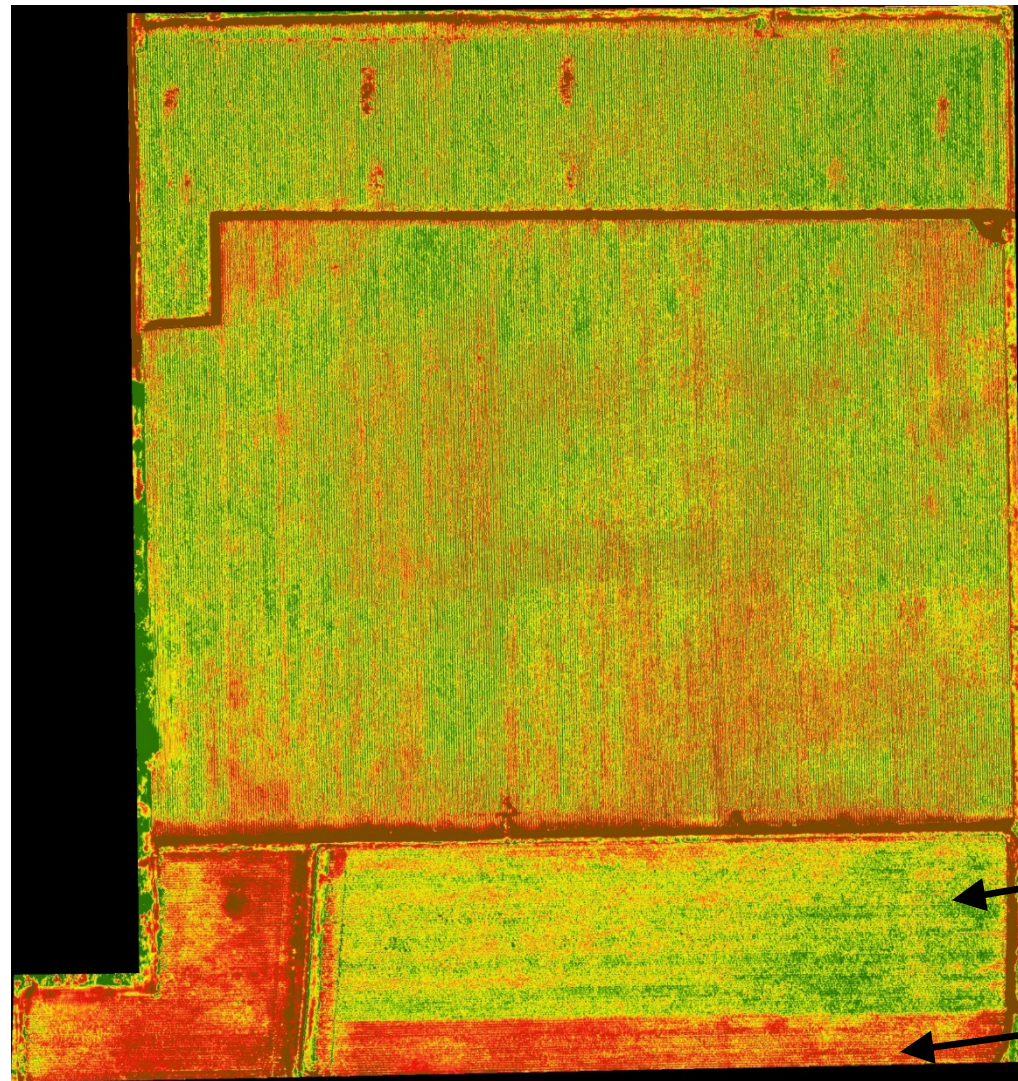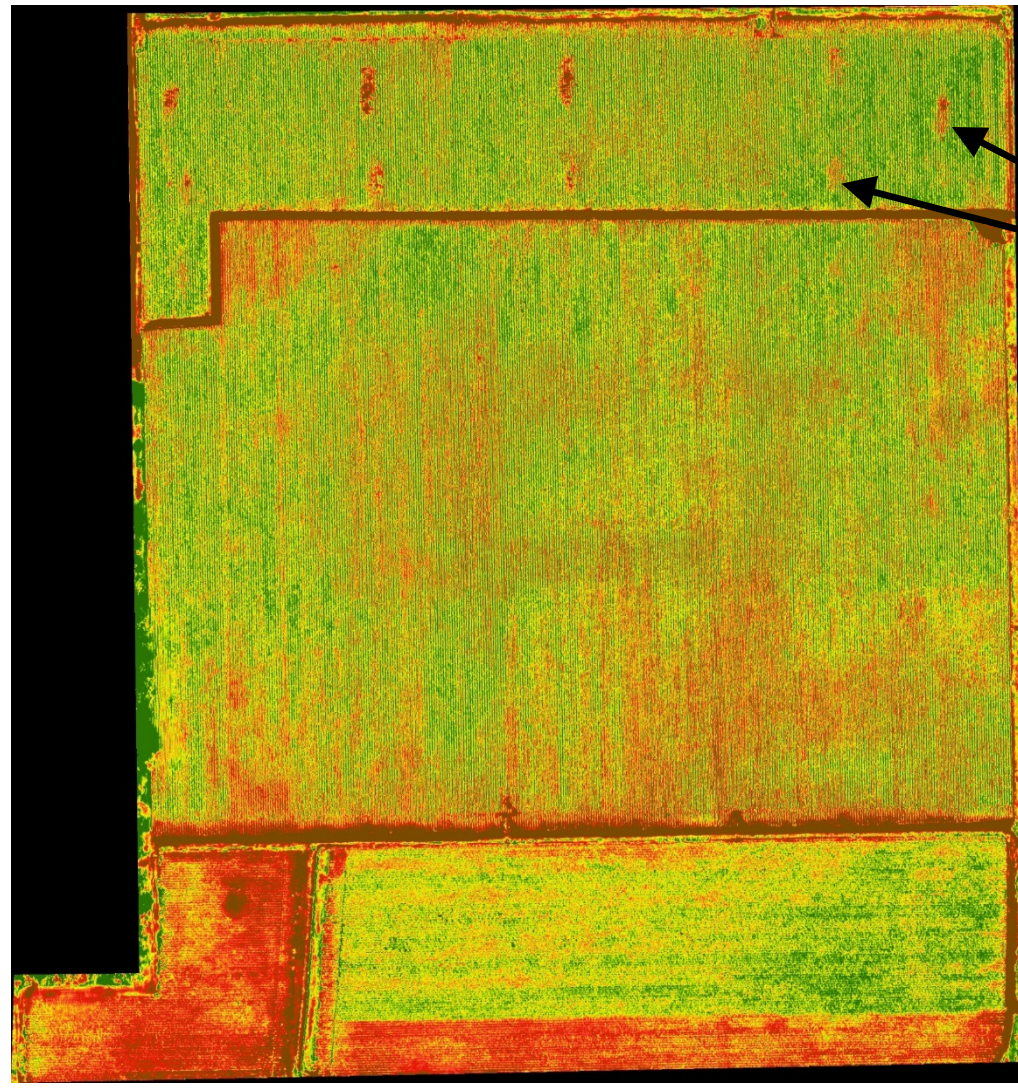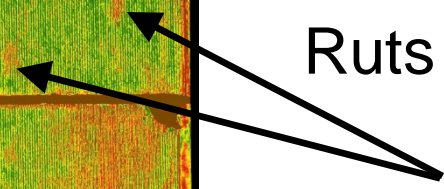
No Flood Irrigation
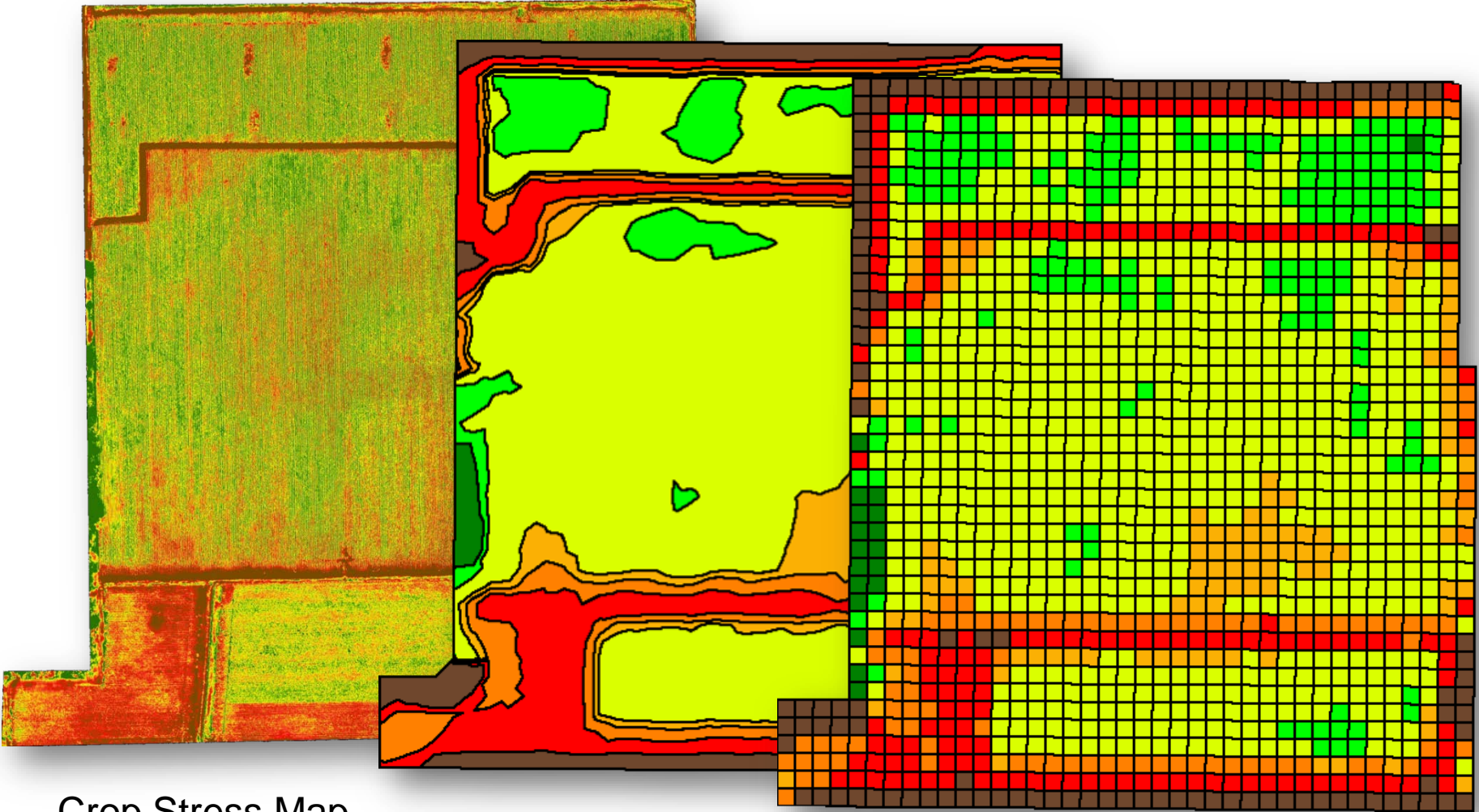
Sugar Cane Irrigation Study
8-14-15

Ruts

Variable Rate

Crop Stress Map

Zone Map (SMS)

Prescription Map (SMS)

Yield Forecasting

Appendix A: Supporting Materials

Figure 1.1 illustrates how visible and NIR light interacts with a green plant leaf cross section indicating that light from the sun is either absorbed, reflected, or transmitted. Curves representing the spectral response of soybean leaves at various phenology states (or stages of senescence) are illustrated in Figure 1.2. This graphic shows that spectral response is a clear indicator of the relative stress or vigor of the plant leaves.
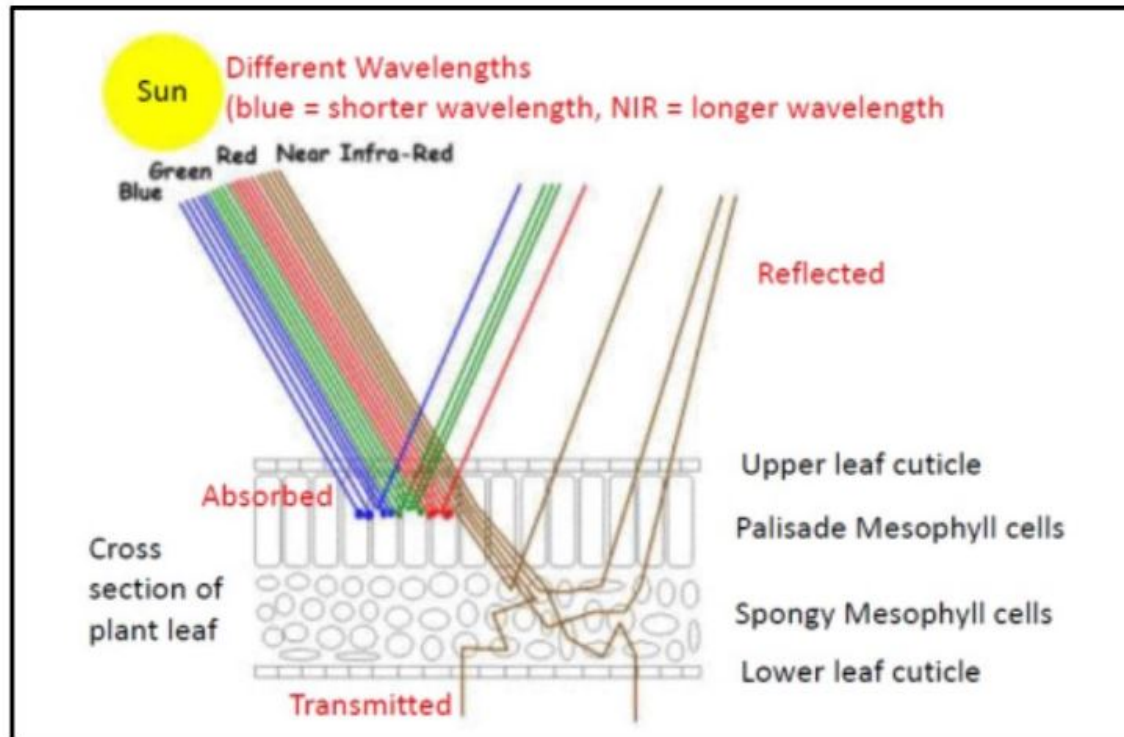
Yield Forecasting

The color infrared image in Figure 2 demonstrates the ability of remotely sensed image data to capture differences in grazed versus un-grazed Tallgrass Prairie. As illustrated in the embedded graph, numerical reflectance values were used to estimate the quantity of biomass in a Tallgrass Prairie study for which this imagery was captured. The r^2 value of 0.96 indicates that NDVI image values can be used to predict biomass within this study area. A review of the literature supports the correlation between NDVI and biomass in multiple vegetated settings.
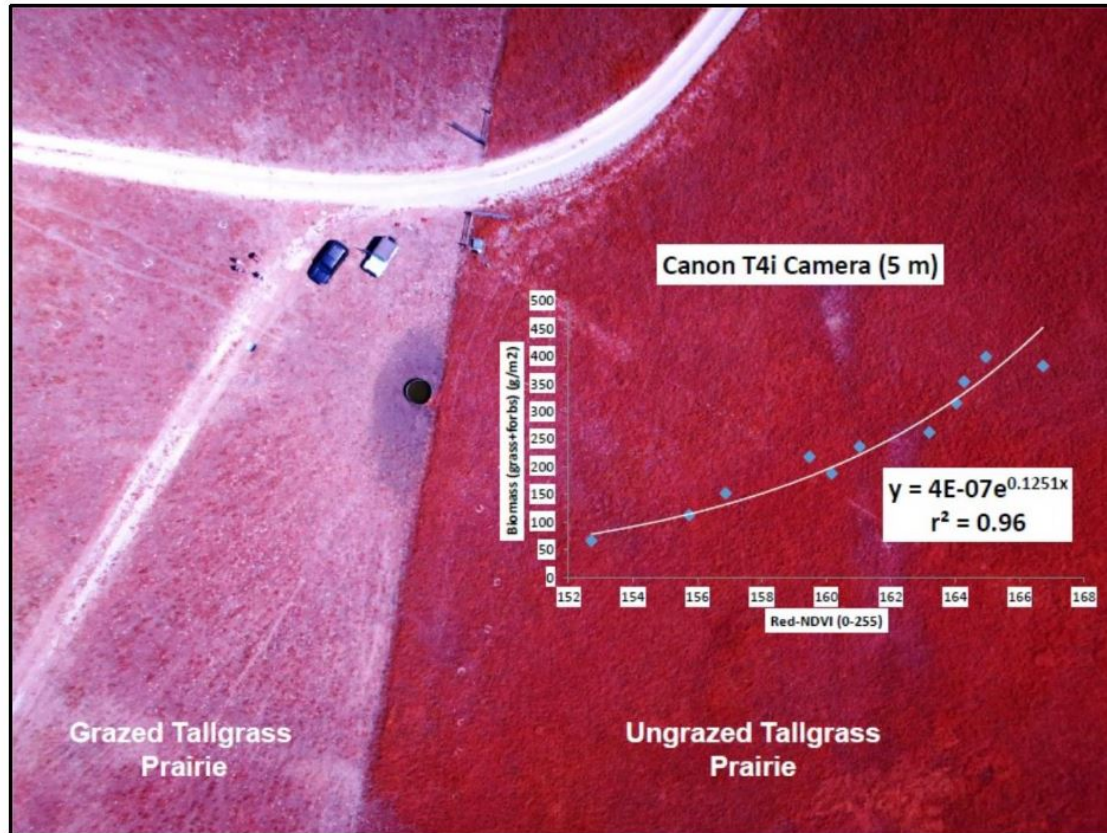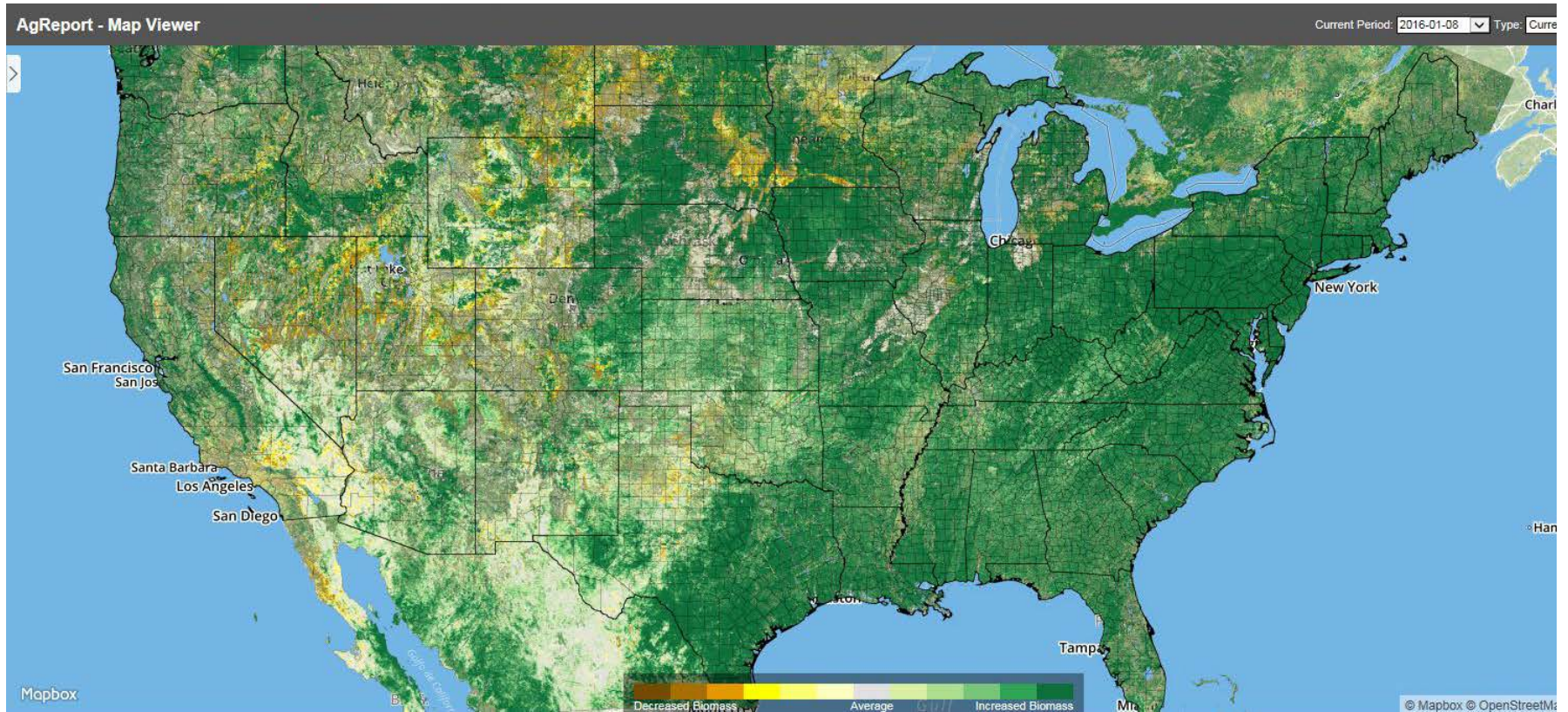

Figure 2. Color infrared image highlighting the contrast between grazed and un-grazed Tallgrass Prairie. The embedded graph depicts the numerical relationship between prairie biomass and NDVI values, indicating a high correlation between the two.

Ag Report

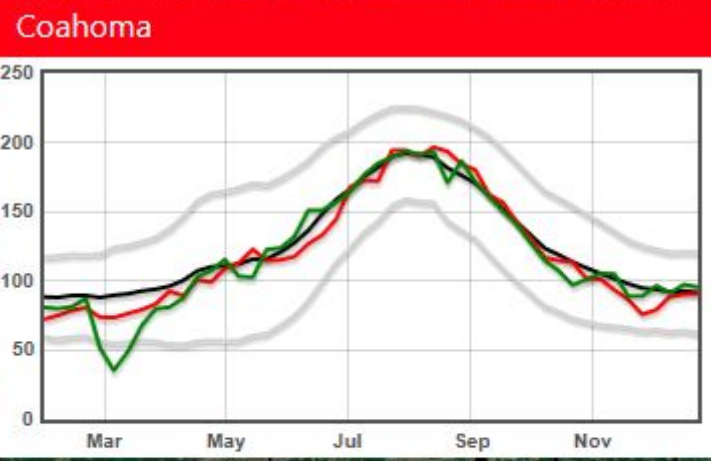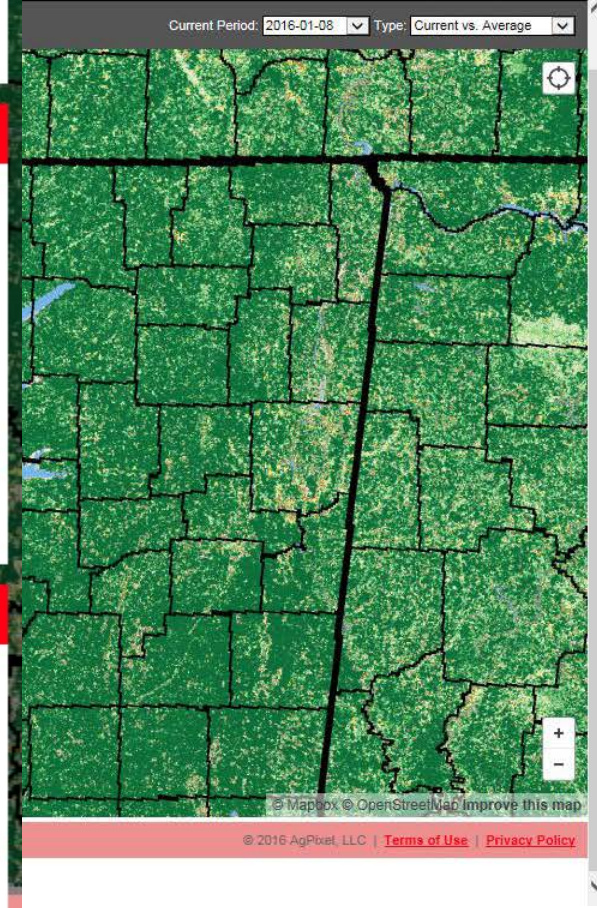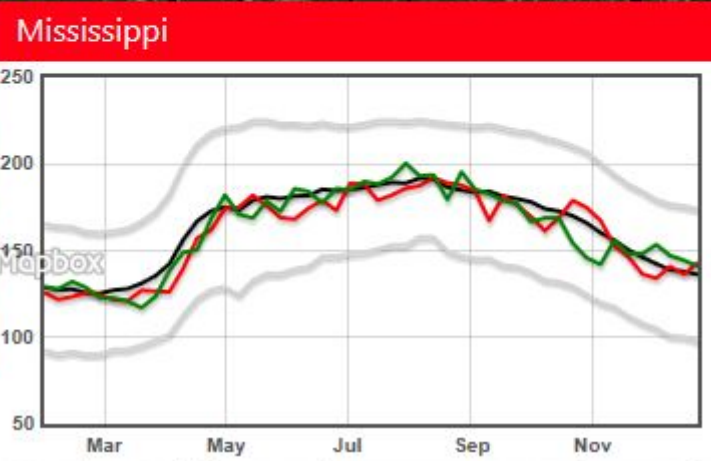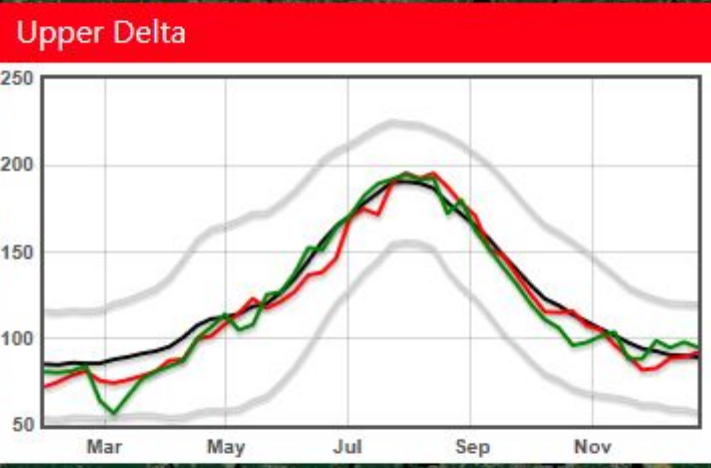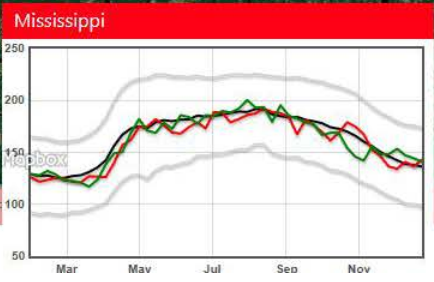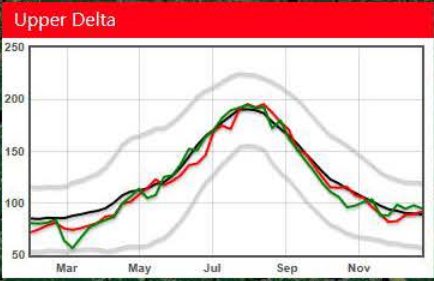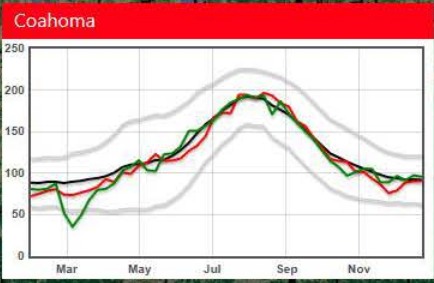**Regional Satellite NDVI Data showing biomass trend on a weekly basis.**

Coahoma County, ~~...~~ **...red to 10 year average.**

Benefits:

1. Feed the crop when it needs it.
2. Push the potential
3. Reduce inputs in low production areas
4. Spot disease, pests, and stress early
5. Locate source of problem
6. Forecast yield potential

Recommendations

| MAR | APR | May | JUNE | JULY | AUG |

Flight 1 **Flight 2** **Flight 3**

1. Early after emergence (Mar-Apr)
   A. Plant density and replants
   B. Use as scouting map for tissue and soil sampling
   C. Determine 2nd application of variable rate nitrogen

2. Mid-Season (May-July)
   A. Determine effectiveness of applications
   B. Use as scouting map for pest and weed infestations
   C. Variable rate PGR for cotton, or pesticide and herbicide applications
   D. Forecast yield potential

3. Late Season (July-Aug)
   A. Monitor irrigation effectiveness
   B. Use as scouting map for pest and weed infestations
   C. Burn down variable rate applications
   D. Forecast yield potential
   E. Insurance Claims, accurate zoning of affected acres

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