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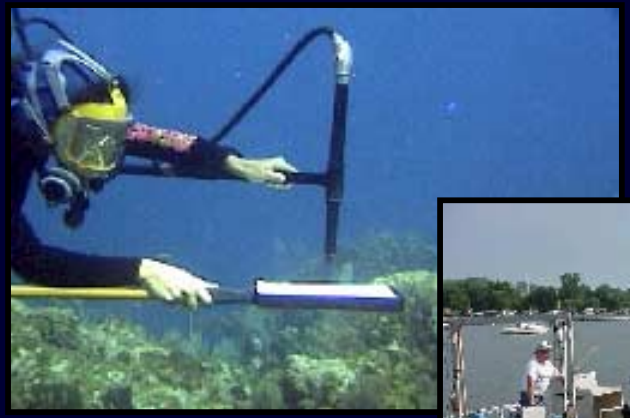

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Assessing Seasonal Vegetation Response to Drought

Lei Ji

Department of Geography

University of Nebraska-Lincoln

AVHRR-NDVI: July 1999

AVHRR-NDVI: Jan 1999

Introduction

- Drought and drought indices, e.g. Standardized Precipitation Index (SPI)
- Use of AVHRR – NDVI in detecting vegetation vigor and drought
- Relationship between NDVI and SPI

Objectives

- Determine seasonal NDVI response to moisture
- Determine relationship between NDVI and SPI

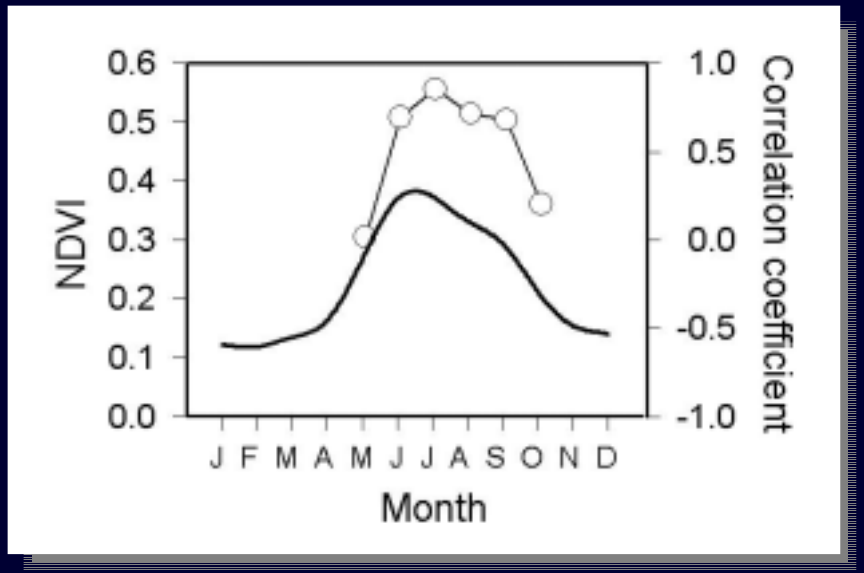
Study Area Data Methods

Northern and Central Great Pains

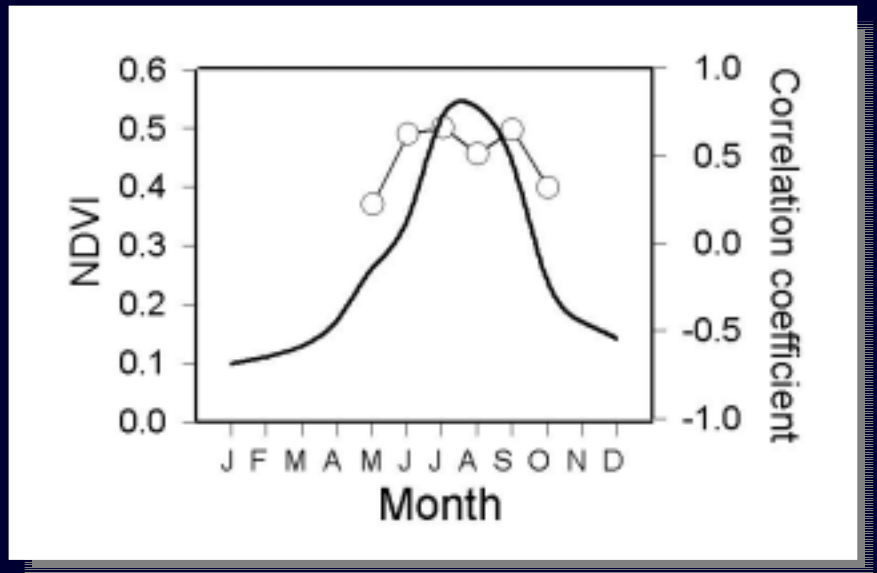
- AVHRR–NDVI (1989–2000)
- Standardized Precipitation Index (SPI)
- Time series analysis of monthly NDVI and SPI for grassland and crop by climate division (CD)
- Correlation Analysis of monthly NDVI and SPI
- Regression with seasonal-effect adjustment

Results

- Correlation of monthly NDVI and SPI



Grassland
Nebraska North-central CD



Cropland
Nebraska Northeastern CD

——— NDVI ○ Correlation Coefficient

- Regression Model Test

Land Cover	Seasonal Adjusted Regression	Simple Regression
Grassland **North-central CD**	**$p < 0.0001$** **$R^2 = 0.674$**	**$p = 0.0016$** **$R^2 = 0.135$**
Cropland **northeastern CD**	**$p < 0.0001$** **$R^2 = 0.792$**	**$p = 0.0027$** **$R^2 = 0.123$**

Conclusions

- Relationship between vegetation condition and moisture availability is strong
- Relationship varies with growth stage
- Use of NDVI for drought monitoring requires consideration of the *seasonal effect*

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Effects of Corn Tassel on Canopy Optical Measurements

Andrés Viña

CALMIT

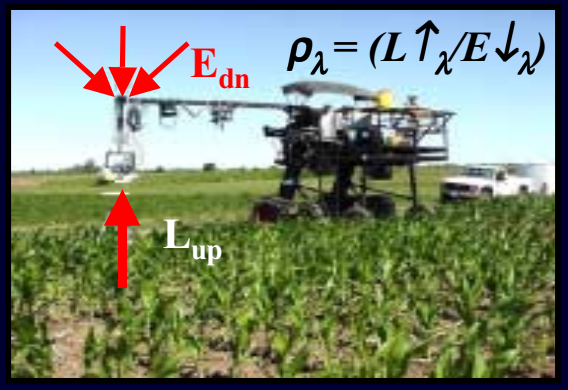
University of Nebraska-Lincoln

December, 2002

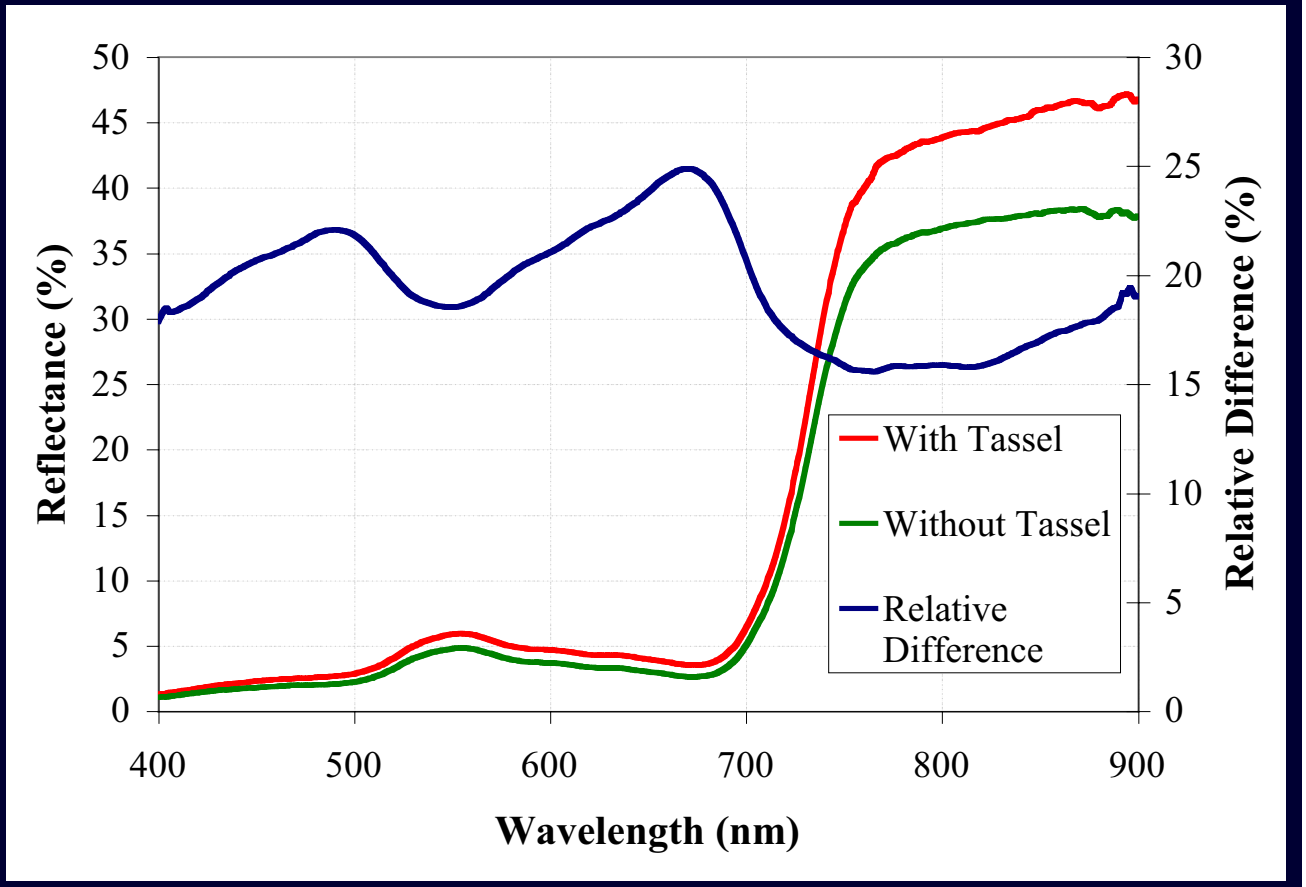
Objective

To evaluate the effects of corn tassels (flowers) on canopy optical measurements, specifically:

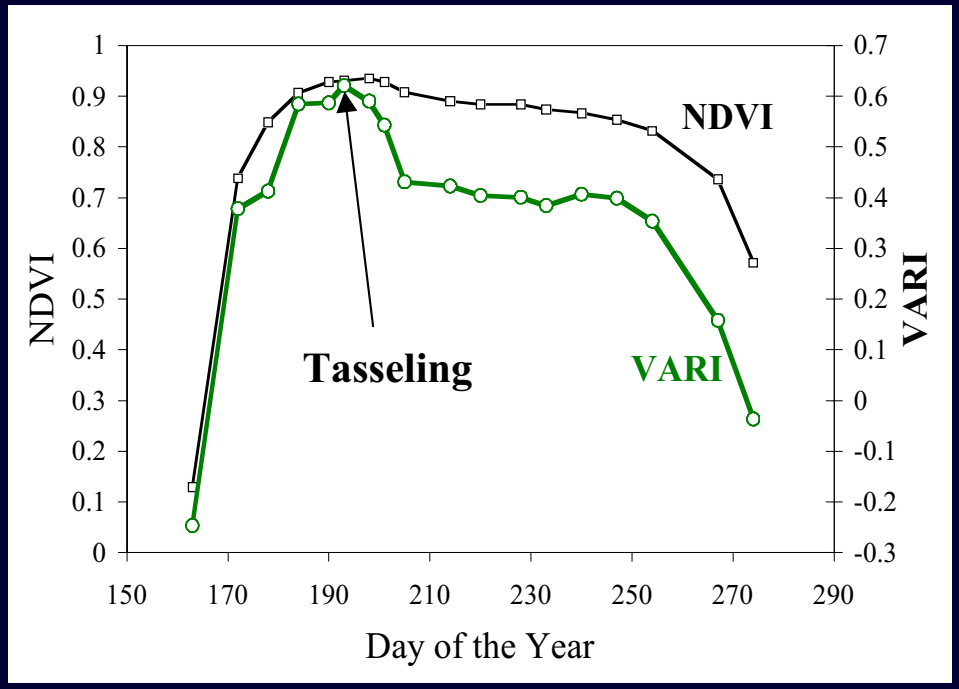
- Spectral regions of maximal effect
- Vegetation indices
- Leaf Area Index estimation



Results – Reflectance

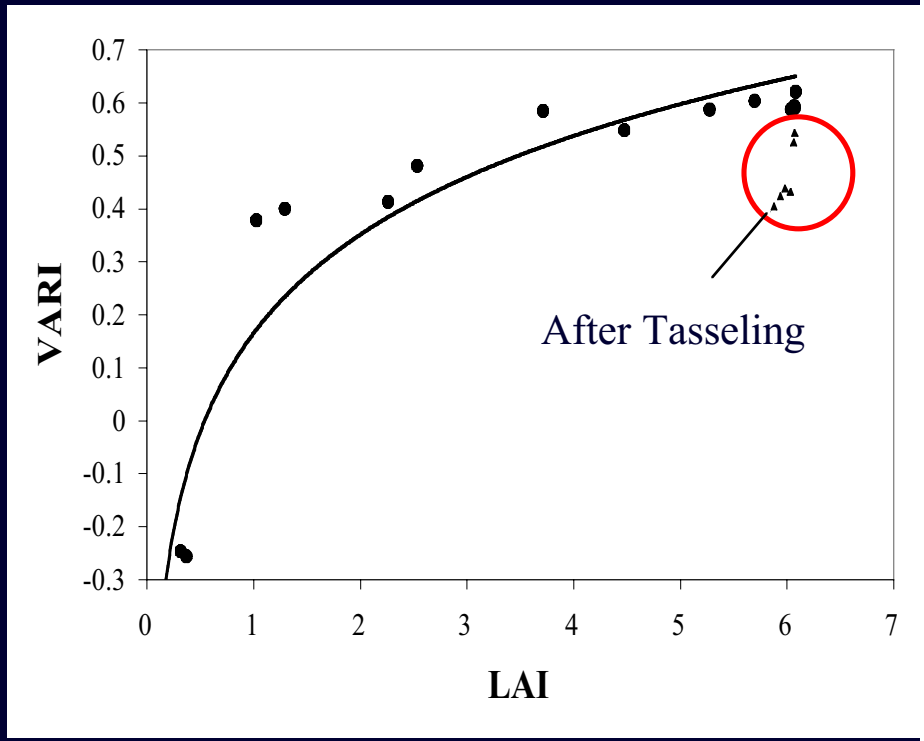


Results – Vegetation Indices/LAI



$$NDVI = (\rho_{Red}-\rho_{NIR})/(\rho_{Red}+\rho_{NIR})$$

$$VARI = (\rho_{Green}-\rho_{Red})/(\rho_{Green}+\rho_{Red}-\rho_{Blue})$$



Conclusions

- The red region (around 676 nm) showed the maximum relative response to the appearance of tassels.
- NDVI showed little or no sensitivity to the tassel.
- VARI showed high sensitivity to the tassel.
- VARI is a good estimator of LAI, although its predictive capability is reduced when tassels appear.

Commercial Agricultural Applications of Remote Sensing

- Doug Miller
- University of Nebraska - Lincoln

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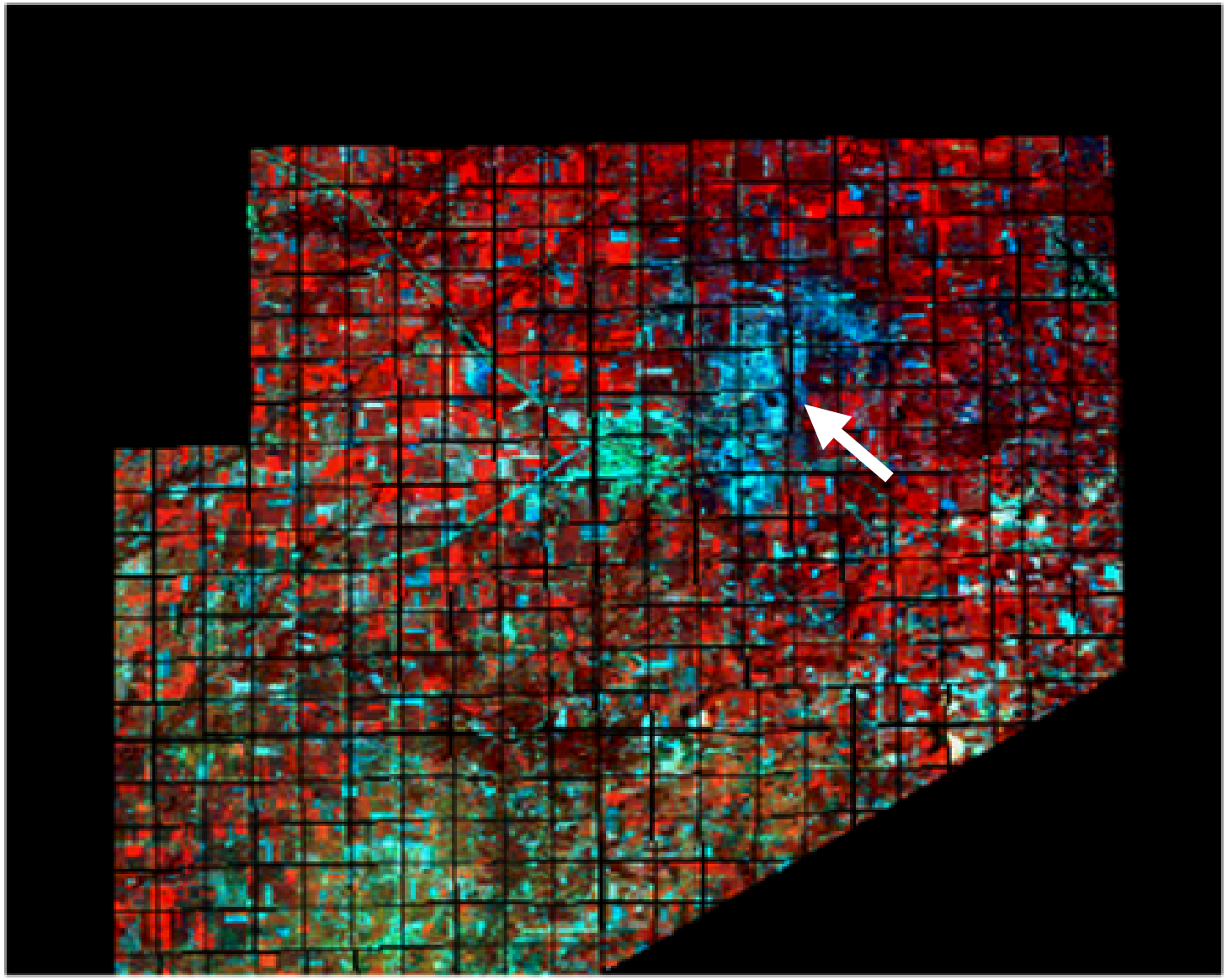
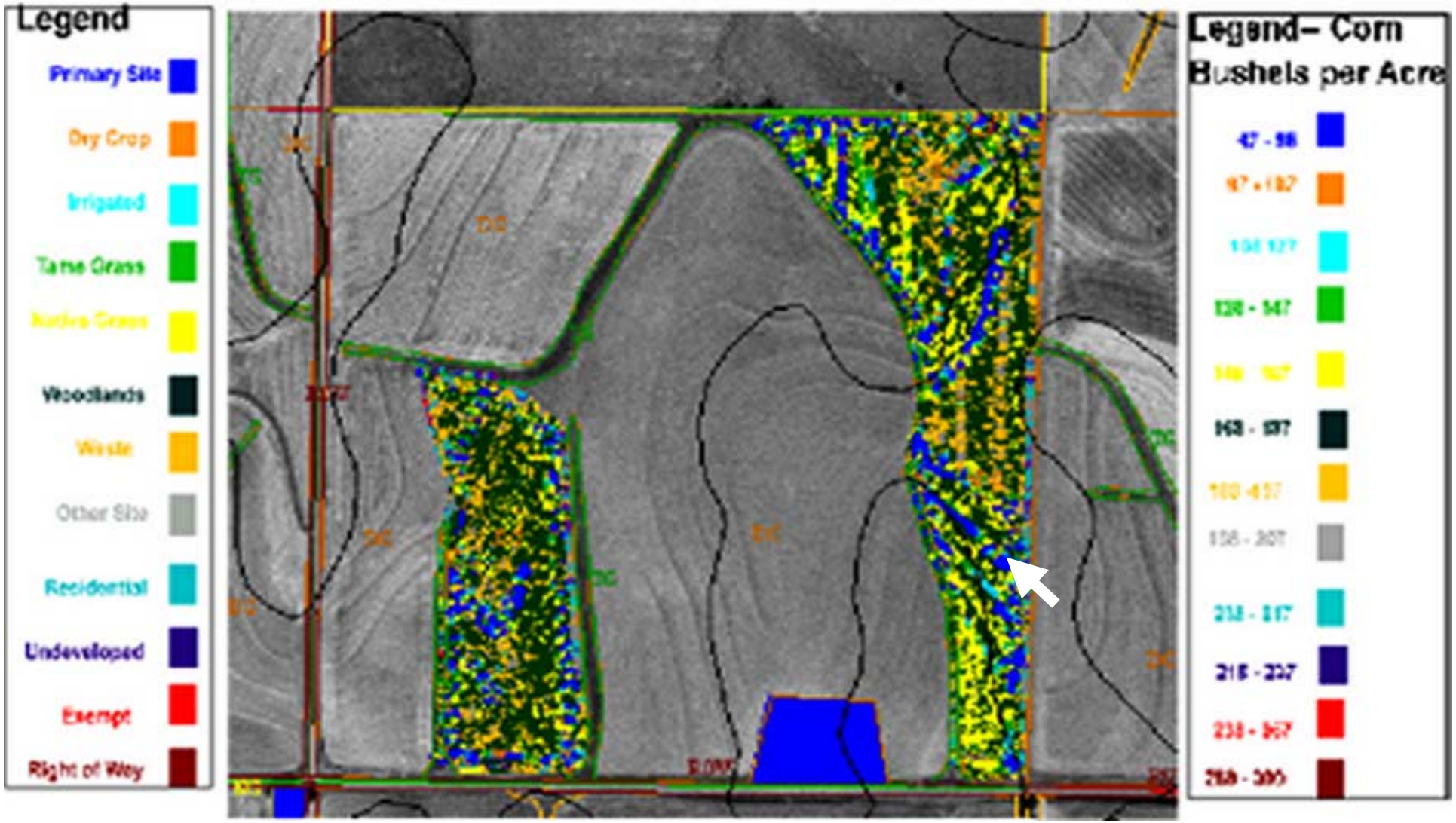
Landsat July 10, 1994 - Decatur County IN



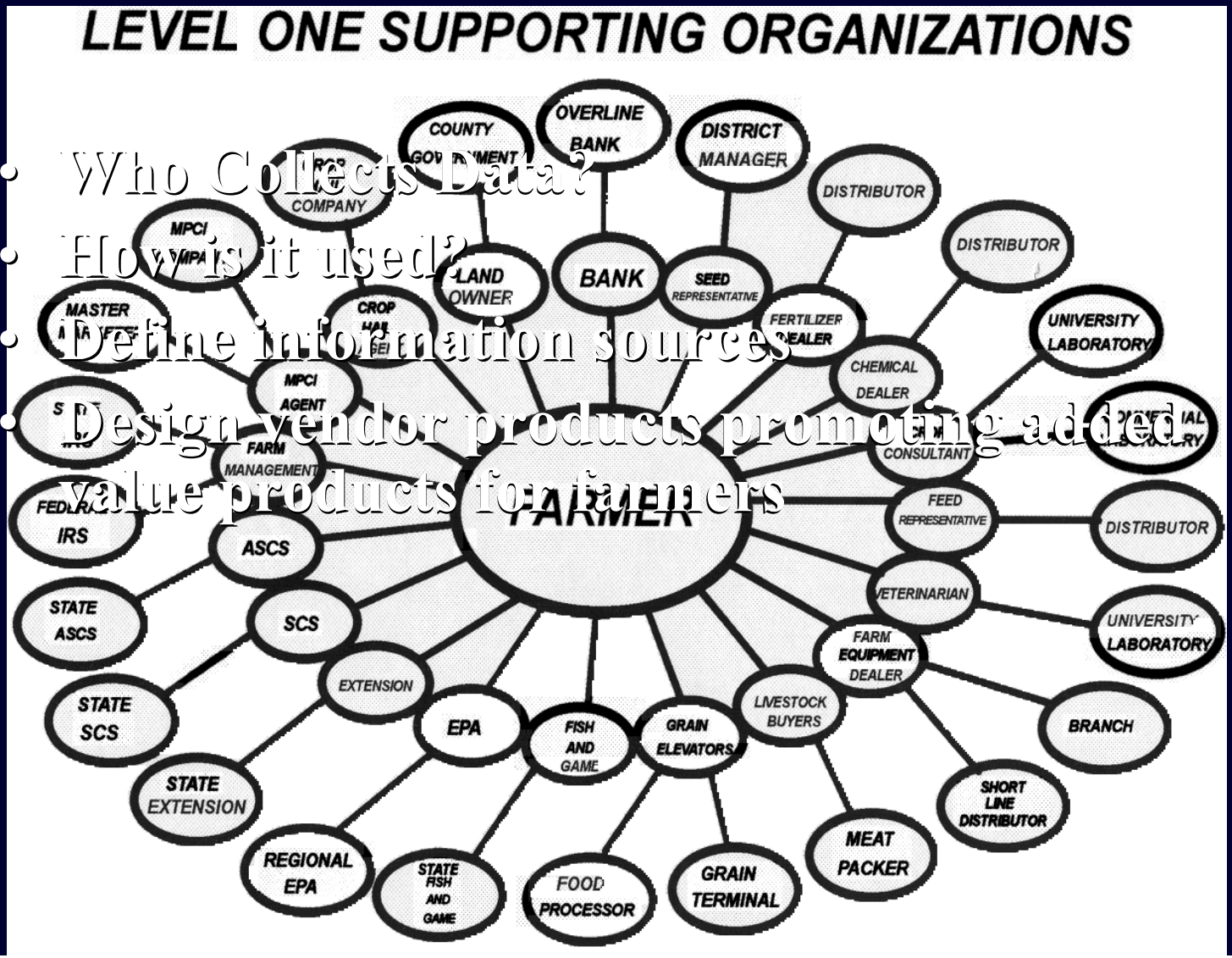
Product Parameters

GPS Data Collection SE Qtr 16-1-18



Defining Market Segments in Agriculture

- Who Collects Data?
- How is it used?
- Define information sources
- Design vendor products promoting added value products for farmers



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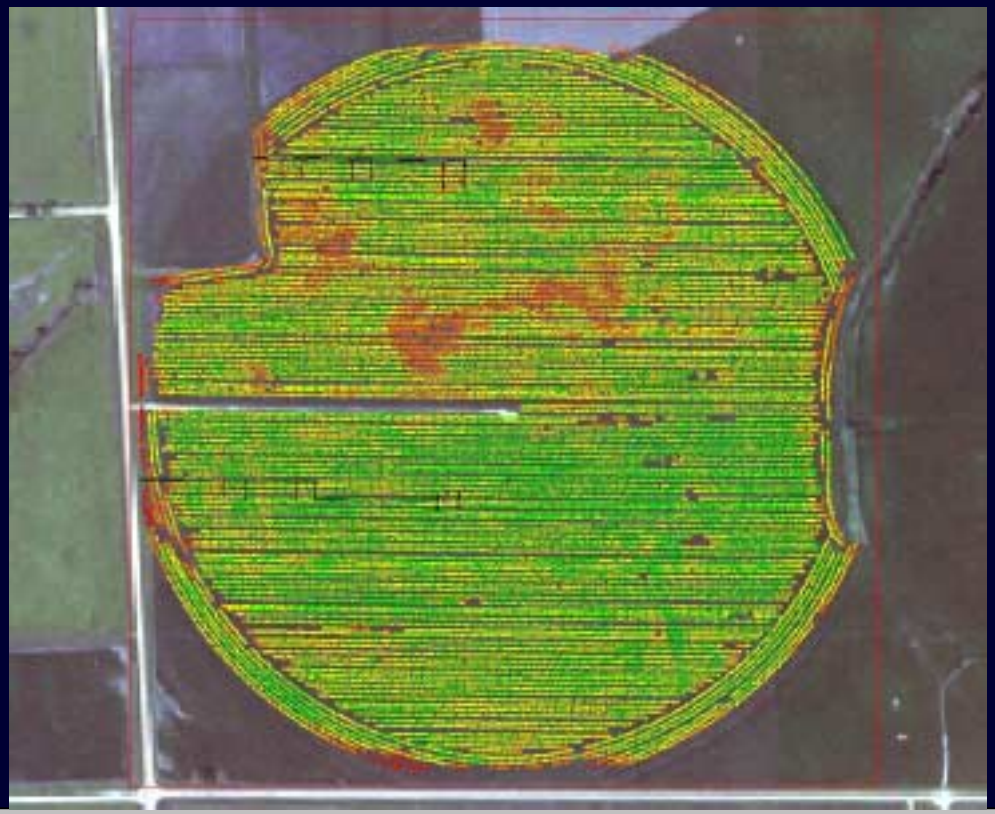
Walima Systems

File TSA Tools View Models Weather

Easting	Northing	Value
711467.1	4560270.9	165.6



Buffer Zone 100 m

Available Attributes

- DEM
- Soils
- Insect
- Weed
- Variety
- Population
- Tillage
- Nutrient
- LAI
- Biomass
- Harvest Yield

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ALGORITHMS FOR REMOTE ESTIMATION OF WATER QUALITY

Giorgio Dall'Olmo

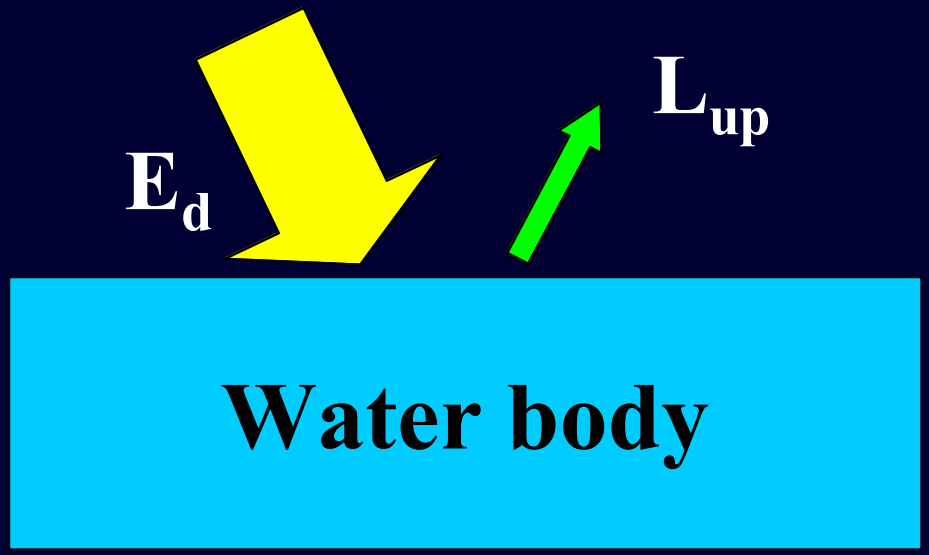
Center for Advanced Land Management Information Technologies,

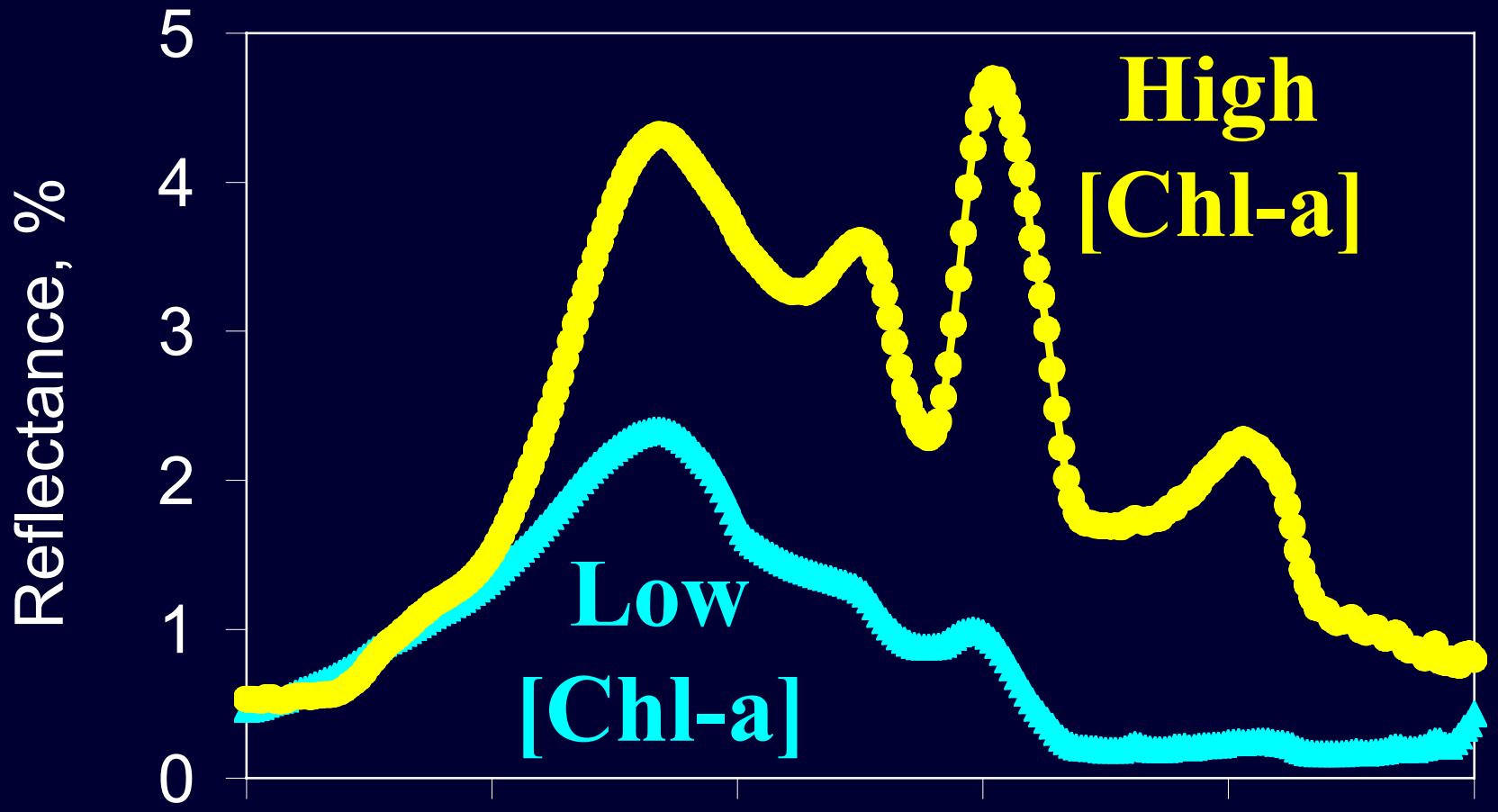
School of Natural Resource Sciences,

University of Nebraska-Lincoln

Spectral Reflectance

The **percentage of light reflected by a target**

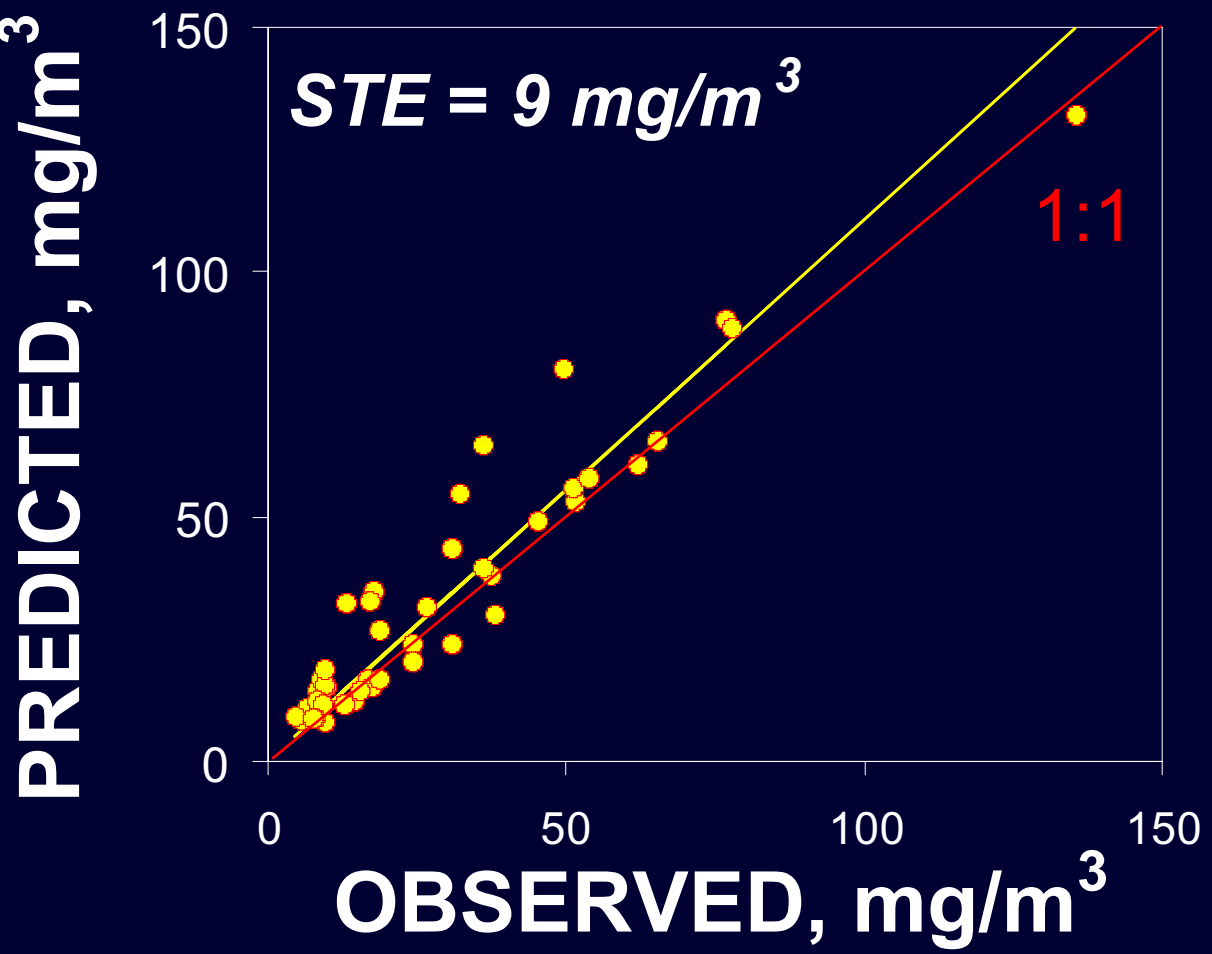



Reflectance, %
5
4
3
2
1
0
400
500
600
700
800
900
Wavelength, nm
High
[Chl-a]
Low
[Chl-a]

Spectral Indices

Combinations of reflectance values at different wavelengths

Results: Chl-*a* model validation



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Geospatial Technologies for Homeland Security

Jeff Arnold

Featured in *PE&RS* September 2002, Volume 68, Number 9

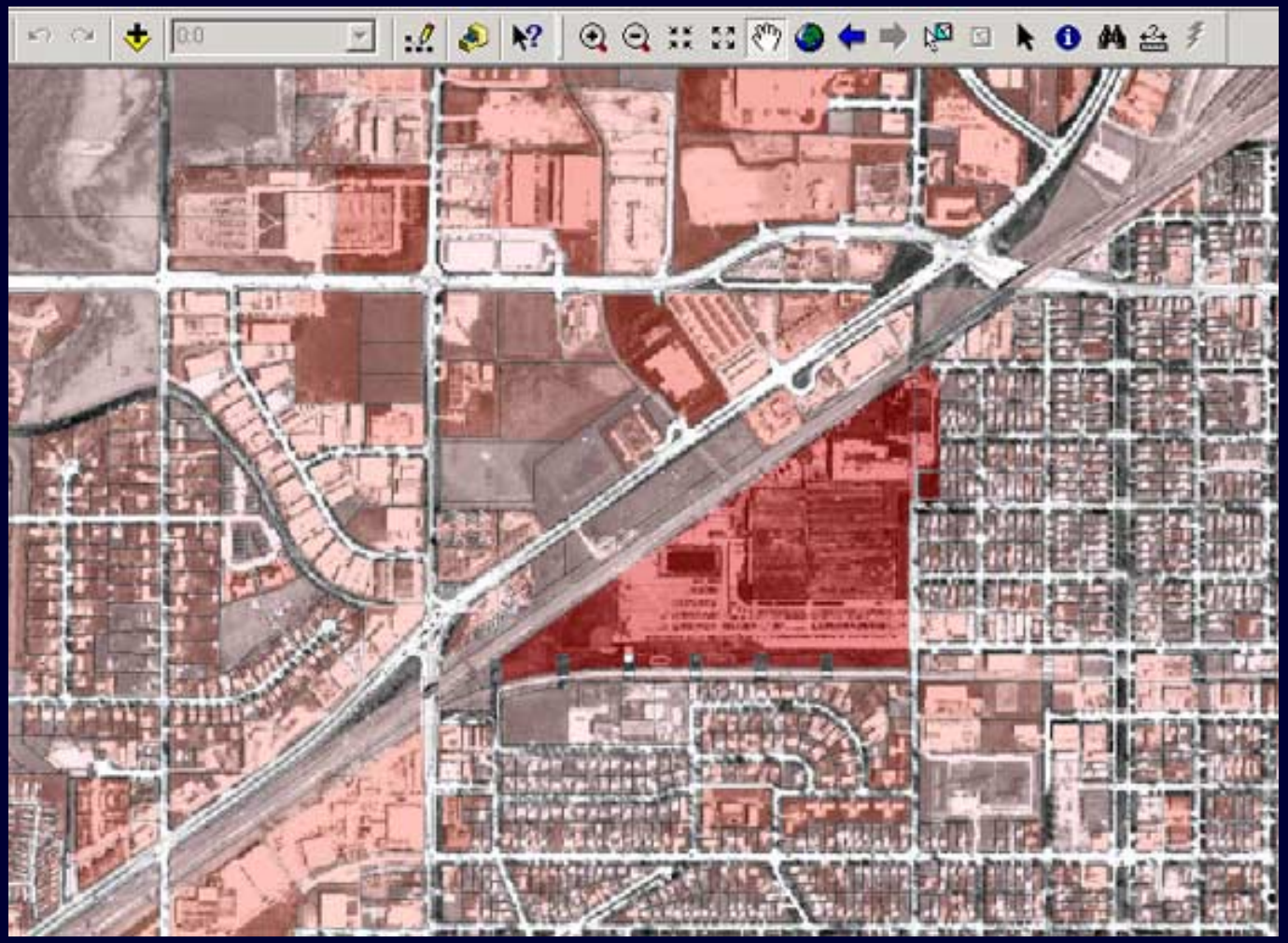
Risk Assessment and Preparation

Emergency Services, Notification and Evacuation Mapping

Critical and Sensitive Facilities Inventory

Special Needs Population Determination

Response and Recovery



Prioritization of medical response efforts

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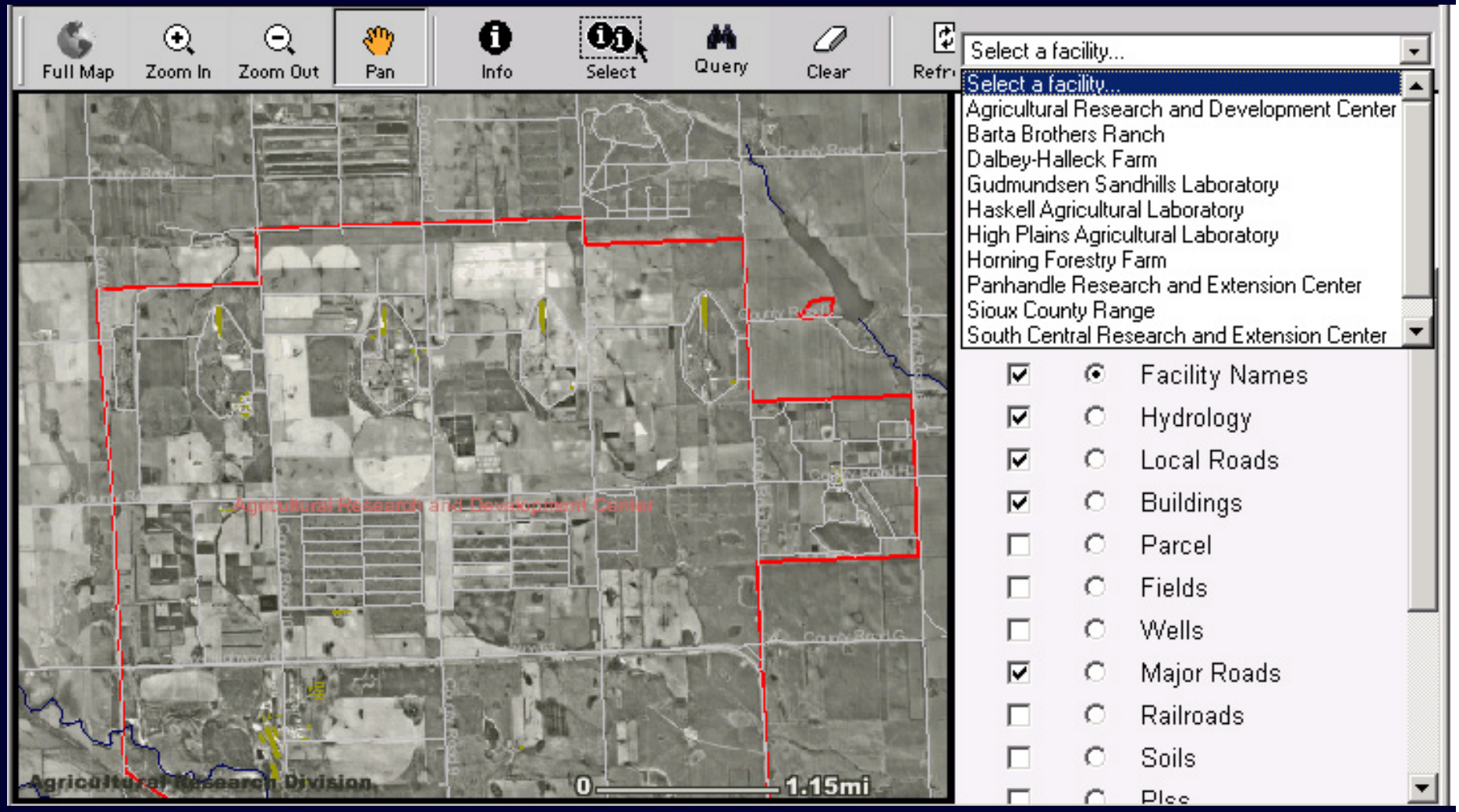
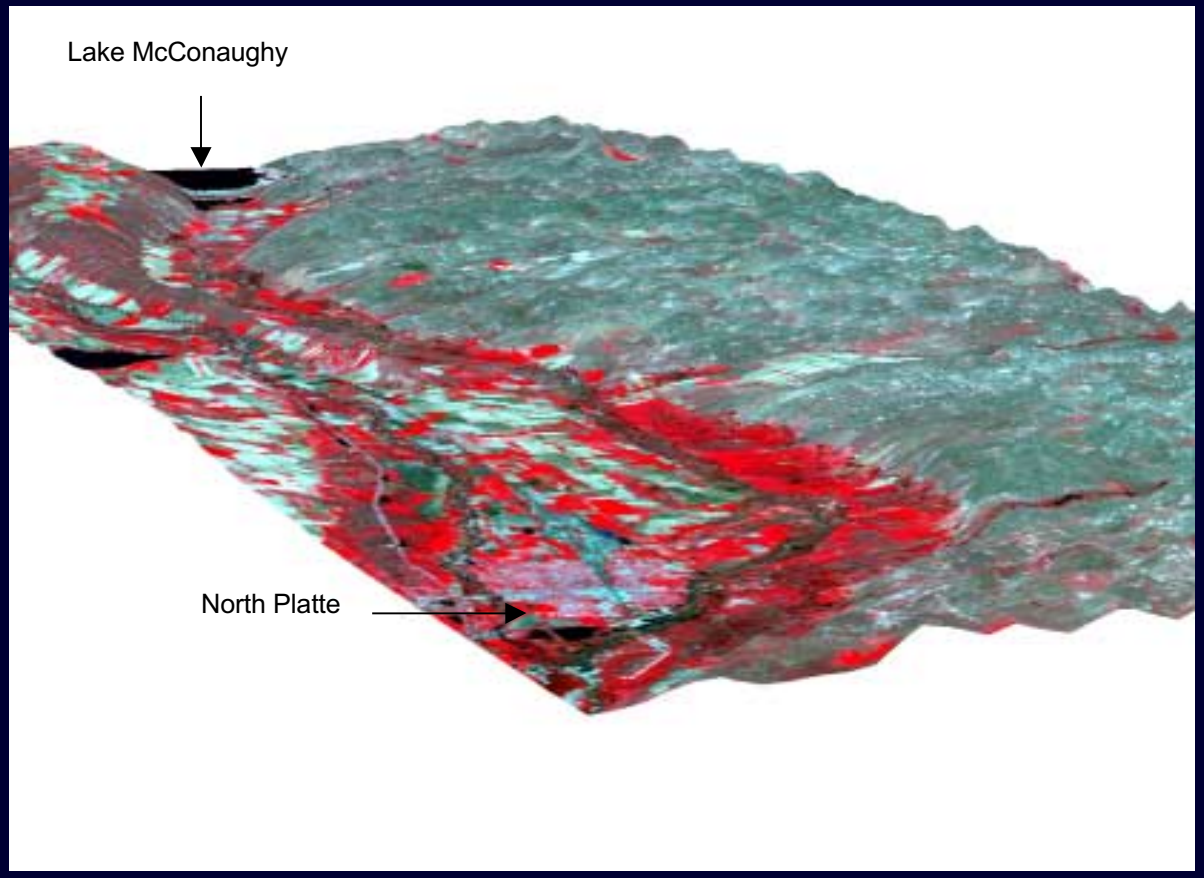
Information Distribution



On-line maps with query capabilities

Modeling & Analysis



Digital elevation model indicating areas flooded

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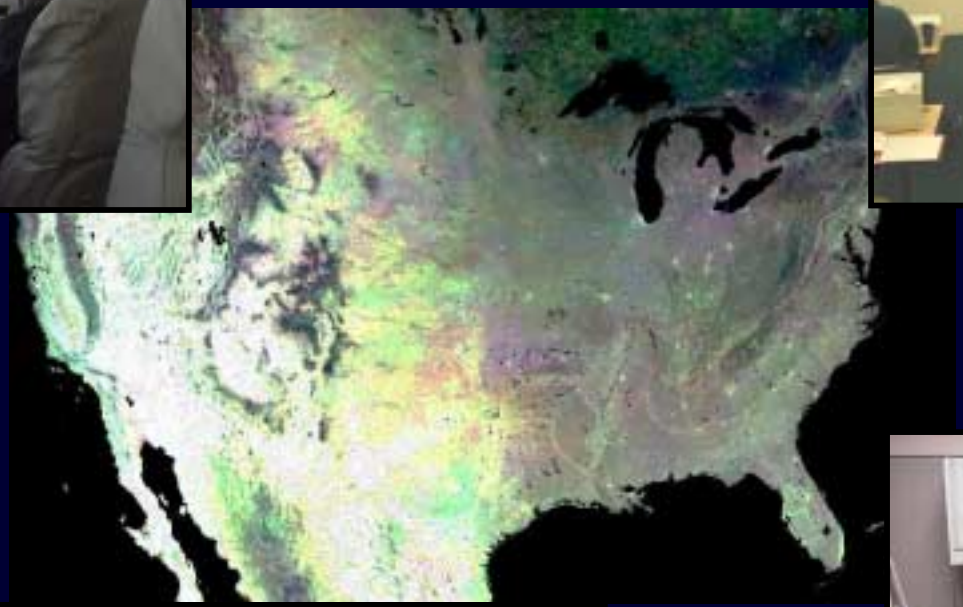

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