



NATIONAL
TORNADO
SUMMIT
& *DISASTER SYMPOSIUM*

FEBRUARY 26 - 28, 2018
COX CONVENTION CENTER
OKLAHOMA CITY

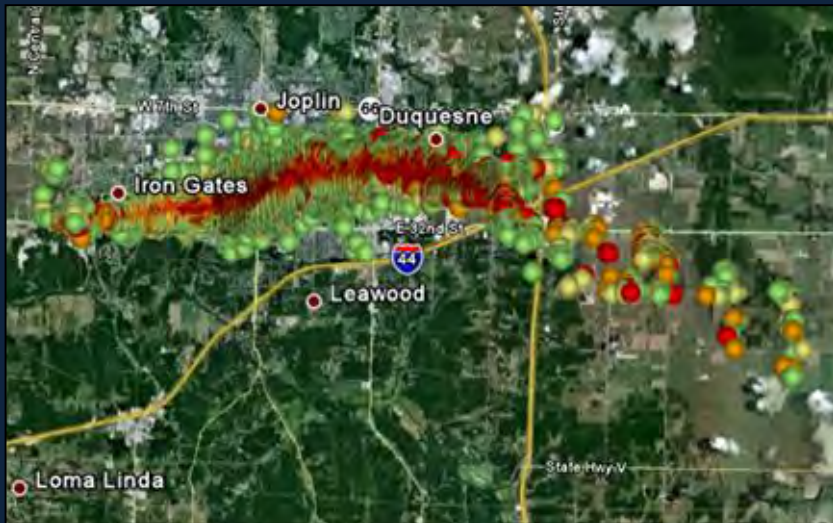
Remote Sensing Subcommittee

J. Arn Womble

West Texas A&M University
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Remote Sensing

- Chair: Dr. Arn Womble (WTAMU)
- Current focus on visual assessments (current application)



FEMA Damage Classification

- Catastrophic damage
- Extensive damage
- Moderate damage
- Limited damage

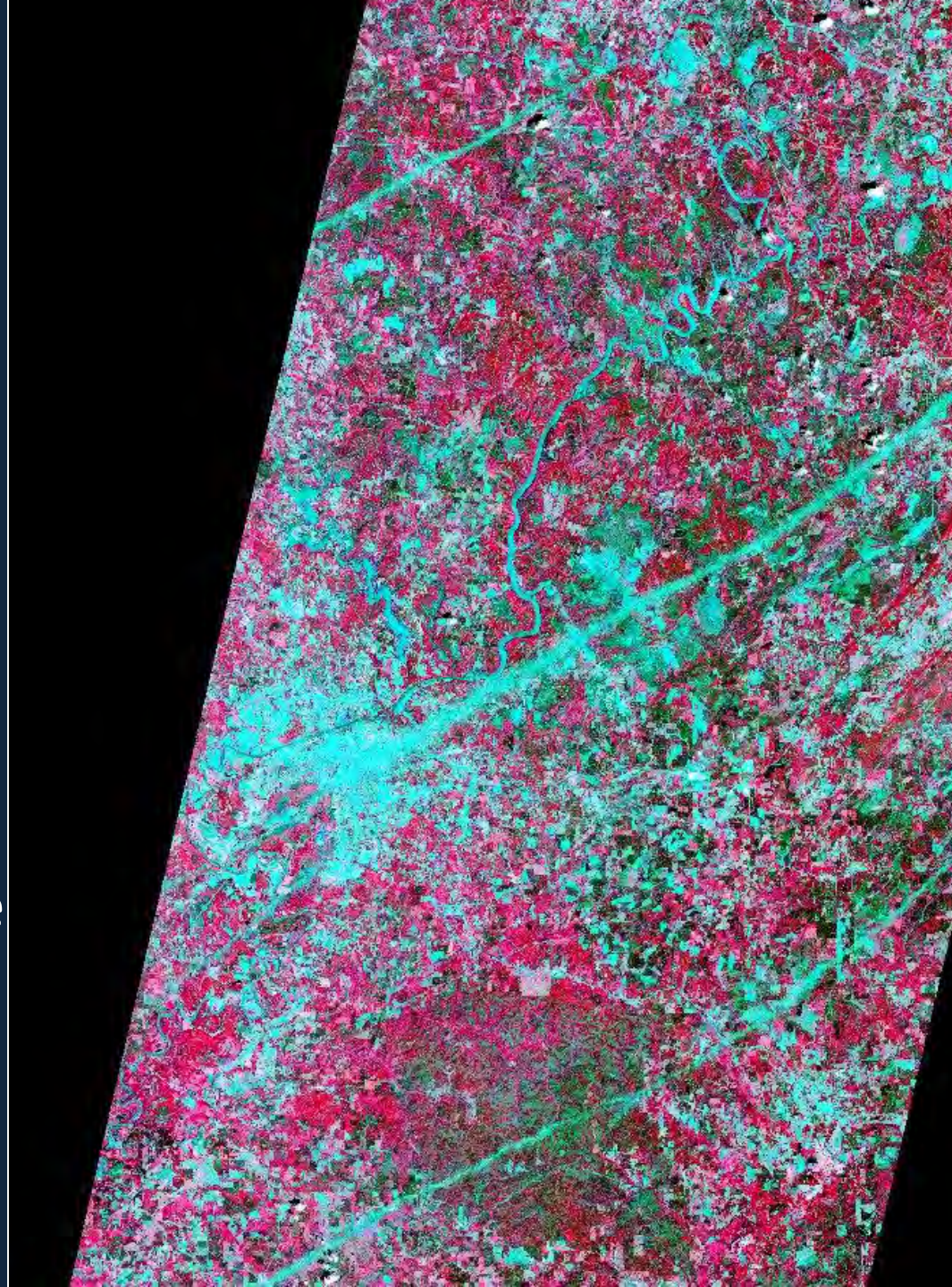
Joplin, MO (2011)



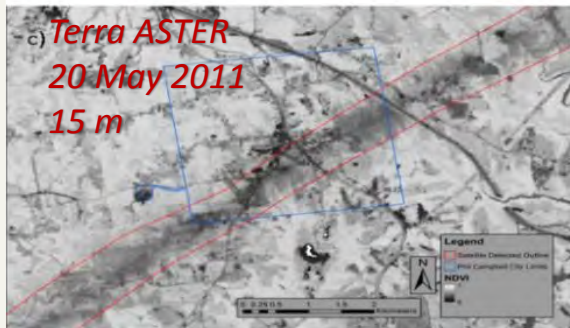
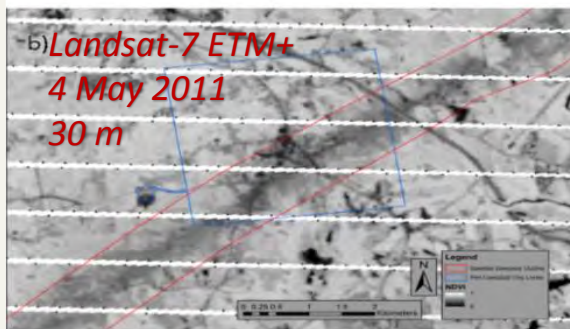
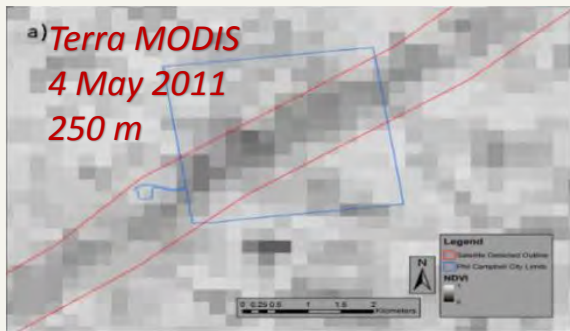
ImageCat/NewLight Technologies report to FEMA (2011)

Large-Scale Remote Sensing

- 1 m to 1 km
- Tornado tracks
- Multi-spectral
- Hyperspectral data
- Partners
 - Natl. Weather Service
 - NASA SPoRT



Factors Affecting Damage Detection



Resolution:

- Increases in spatial resolution improves detection capabilities

Sky Conditions:

- Clouds restrict view of the ground
- Thin clouds can allow some view, yet accuracy/confidence is diminished

Availability:

- Imaging sensors with adequate resolution are all located on polar-orbiters
 - Repeat time & swath width
 - Use restrictions on high-resolution, commercial imagery
 - NRT versus complex analysis products

Reference: Molthan, A. L., J. R. Bell, T. A. Cole, and J. E. Burks, 2014: Satellite-based identification of tornado damage tracks from the 27 April 2011 severe weather outbreak. *J. Operational Meteor.*, 2 (16), 191–208.

Small-Scale Remote Sensing

- 1 m and finer – Individual DIs
- Precision to determine DODs varies with spatial resolution
- Assistance with EF-Scale Method



Pictometry 15-cm images 2008 and 2013 (Moore, OK)

“Fine-Scale” Remote Sensing

- Resolution < 1 cm
- Laser scanning and photogrammetry
 - measurement of structural members (sizes and deformations)
- Assistance with forensic analysis



Dr. R. Wood (UNL)