

README.txt v1.0
Stoughton, WI Tornado August 18, 2005

This README.txt file describes the GeoTIFF images produced as part of the analysis of satellite imagery collected before and after an F3 Tornado passed through Stoughton, WI August 18, 2005. Peter Wolter, a graduate student with the University of Wisconsin-Madison's Environmental Remote Sensing Center (ERSC) worked with staff members Dr. Tim Olsen and Dr. Sam Batzli to process Landsat 5 TM imagery from July 19, 2005 (before) and Terra ASTER imagery from August 28, 2005 (after) using a techniques including "Principle Component Analysis" (PCA) to identify tornado damage location with Leica Geosystems IMAGINE software. Principal component transformations are used to enhance the differentiation of pixel values in the imagery. Analysis was conducted at 30m resolution.

Data sources:

Imagery:

The July 19 Landsat scene was initially purchased by ERSC/WisconsinView from the USGS/EDC and processed to study the Watertown tire fire. The August 28 ASTER image was purchased by the USGS and donated to WisconsinView and Wisconsin Emergency Management for use in recovery operations.

Shapefile:

wi_tornado_swaths: Created at ERSC by WisconsinView coordinator, Sam Batzli. See shapefile metadata for more information.

Imagery files included in this directory:

These images are all GeoTIFF format projected in UTM Zone 16N with WGS84 datum.

Set 1

- 1) stoughton_before.tif – near true color Landsat image of July 19, 2005.
- 2) stoughton_after.tif – false color composite image using ASTER band 2 (red) and Landsat bands 2 and 1 (green and blue). The Landsat bands are from July 19th. ASTER does not have a blue band. The ASTER band is of August 28, 2005 with tornado damage area and some unrelated fields in red.
- 3) stoughton_pc5.tif – grayscale single band image showing 5th principle component to highlight the statistical difference between the before and after images.
- 4) stoughton_pc5_hillshade.tif – grayscale single band image showing 5th principle component to highlight the statistical difference between the before and after images. The image is displayed on a 30m shaded relief base map from the Wisconsin DNR.

Set 2

- 1) stoughton_before_labeled.tif – same as above with labels.
- 2) stoughton_after_labeled.tif – same as above with labels.
- 3) stoughton_pc5_labeled.tif – same as above with labels.

For more information about Landsat data see:

USGS Landsat Site (current)
<http://landsat.usgs.gov/>

NASA Landsat Site (old)
<http://geo.arc.nasa.gov/sge/landsat/landsat.html>

For more information about ASTER data see:

JPL ASTER Instrument site:
<http://asterweb.jpl.nasa.gov/instrument.asp>

JPL ASTER Document list page:
<http://asterweb.jpl.nasa.gov/documents.asp>

General EOS ASTER site:
http://terra.nasa.gov/About/ASTER/about_aster.html

ASTER Handbook (everything you'd ever want to know and more):
http://www.science.aster.ersdac.or.jp/en/documnts/users_guide/index.html