



GIS in Crop Insurance

United States Department of Agriculture
Risk Management Agency

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USDA – Risk Management Agency

Topeka Regional Office



Risk Management Agency (RMA)

- The role of USDA's Risk Management Agency (RMA) is to help producers manage their business risks through effective, market-based risk management solutions. RMA's mission is to promote, support, and regulate sound risk management solutions to preserve and strengthen the economic stability of America's agricultural producers. As part of this mission, RMA operates and manages the Federal Crop Insurance Corporation (FCIC). RMA was created in 1996; the FCIC was founded in 1938.

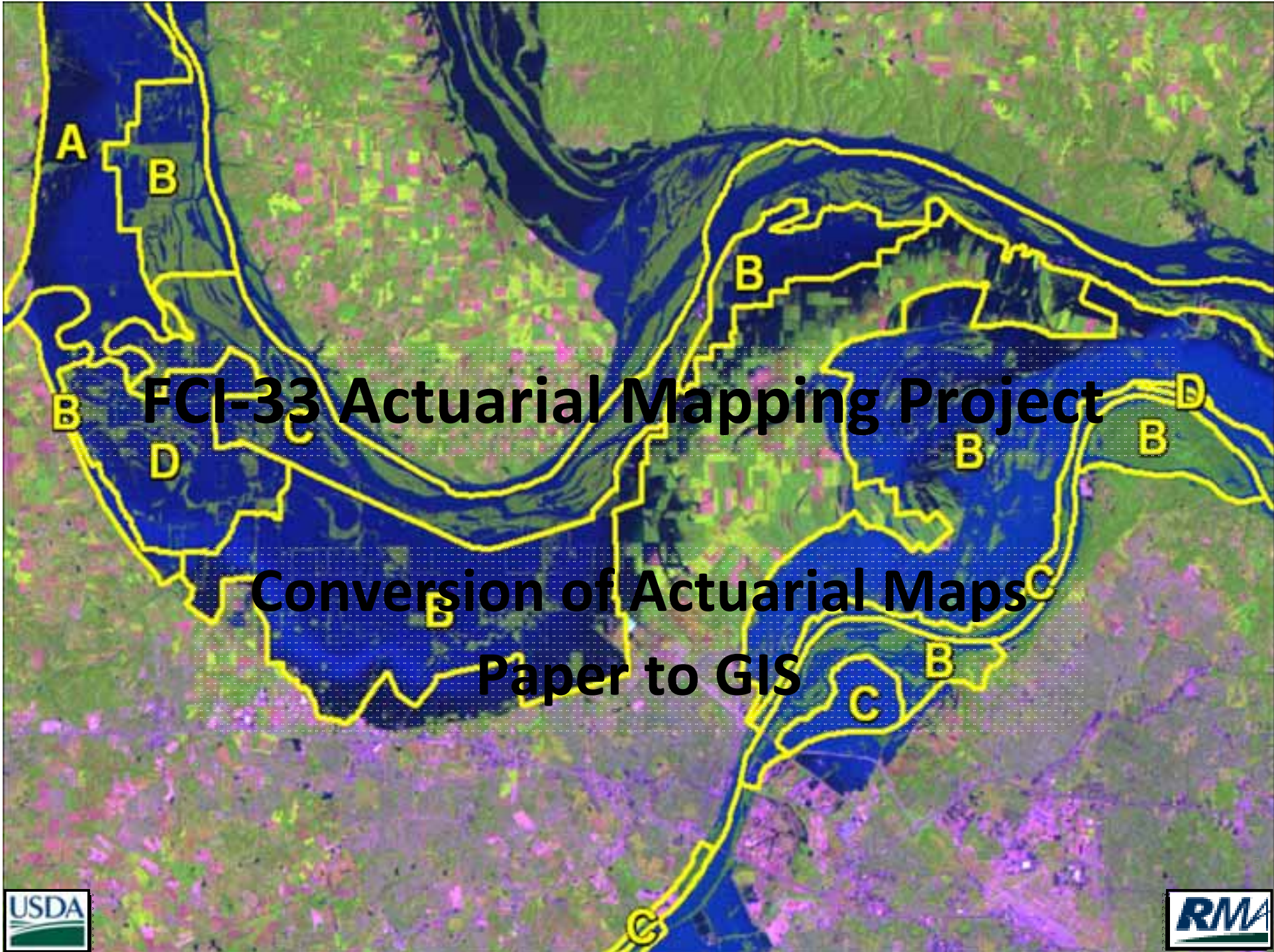


Risk Management Agency (RMA)

- RMA, through FCIC, provides crop insurance to American farmers and ranchers. Sixteen private-sector insurance companies sell and service the policies. RMA develops and/or approves the premium rate, administers premium and expense subsidies, approves and supports products, and reinsures the companies.
- In crop year 2009, RMA managed nearly \$80 billion worth of insurance coverage.

GIS in Crop Insurance

- FCI-33 Actuarial Map Digitizing Project
- Using GIS to Analyze the Program
- Using GIS in the Validation of Crop Policies



FCI-33 Actuarial Mapping Project

Conversion of Actuarial Maps
Paper to GIS



FCI-33 Actuarial Map

FC



Actuarial Information Browser - Microsoft Internet Explorer provided by RMA - USDA

USDA United States Department of Agriculture Risk Management Agency

RMA

Actuarial Information Browser

State: Nebraska (31)
County: Chase (029)
Map File Name: 310291
Data: Draft

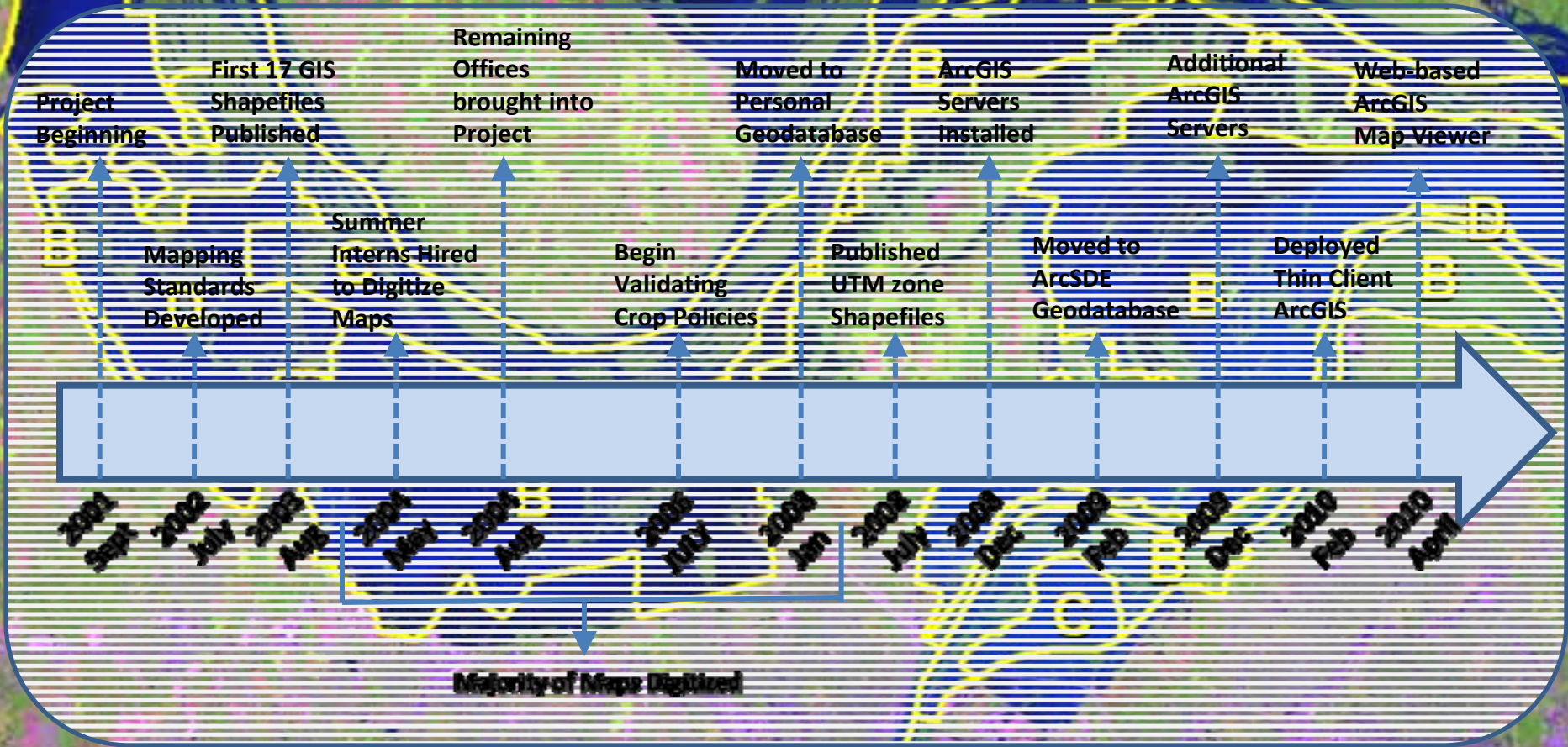
Commodity: Wheat (0011)
Commodity Year: 2011
Insurance Plan/Field Protection (01)
Type: No Type Specified 997
Practice: SummerFallow 005

Map Contents

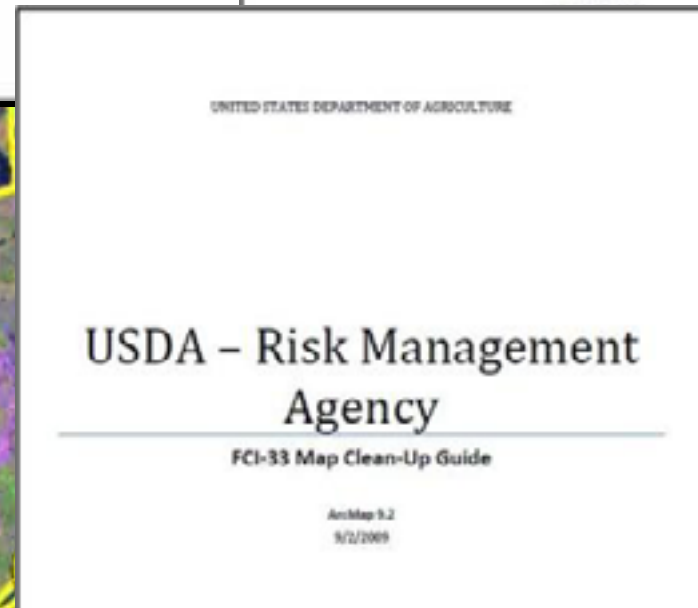
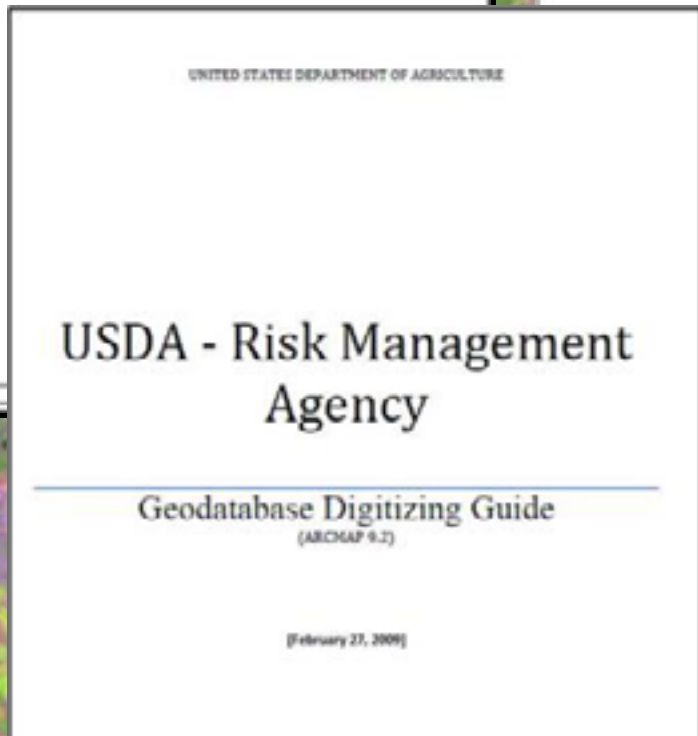
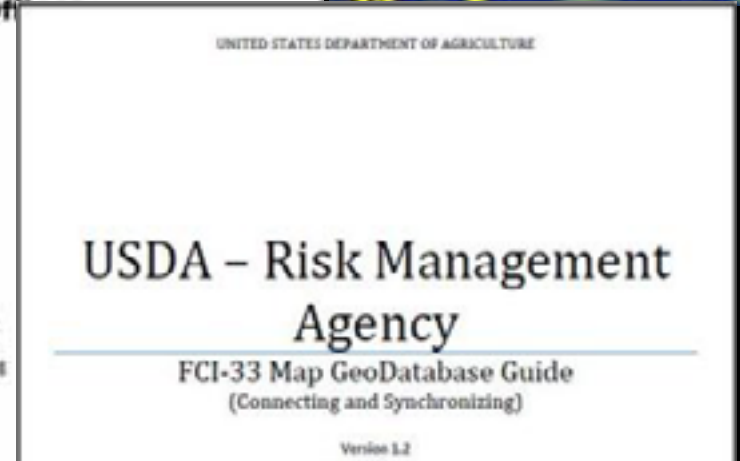
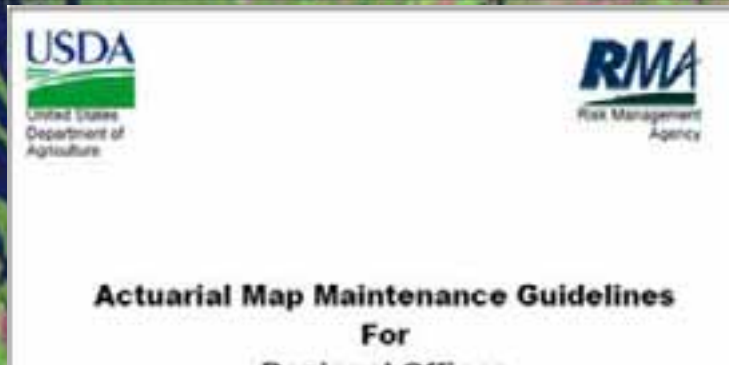
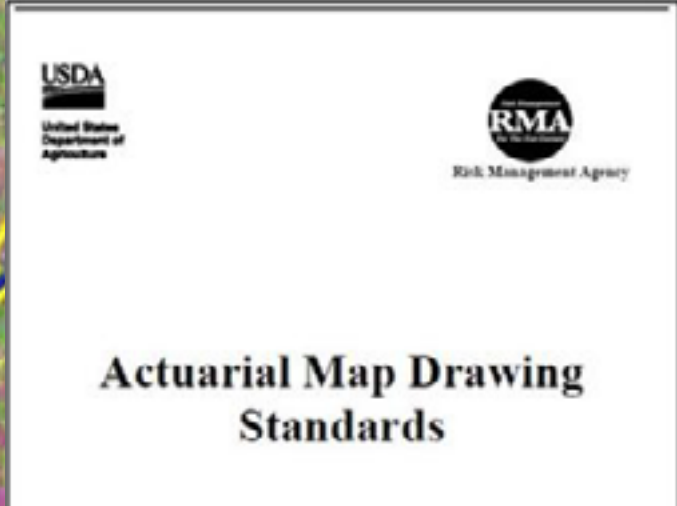
- FCI33 Draft
 - FCI33_2011_UTM14_Draft
- Base Map Layers
 - UTM
 - Counties
 - Roads
 - Highways
 - States
 - Waterway
 - Urban Area
 - Waterbody
- NADP Imagery
 - UTM 14 2006 NADP 4N 1C
 - UTM 14 2006 NADP 4N 1D
 - UTM 14 2006 NADP 4N 1E
 - UTM 14 2006 NADP 4N 1F
 - UTM 14 2006 NADP 4N 1G
 - Pre 2006 0.50 Aerial NC Base
 - Pre 2006 0.50 Aerial CD Base
 - Pre 2006 UTM 14 NADP 4N 1C
 - Pre 2006 UTM 14 NADP 4N 1D
 - Pre 2006 UTM 14 NADP 4N 1E
 - Pre 2006 UTM 14 NADP 4N 1F
 - Pre 2006 UTM 14 NADP 4N 1G



FCI-33 Digitizing Project Timeline



Handbooks



Working with Shapefiles

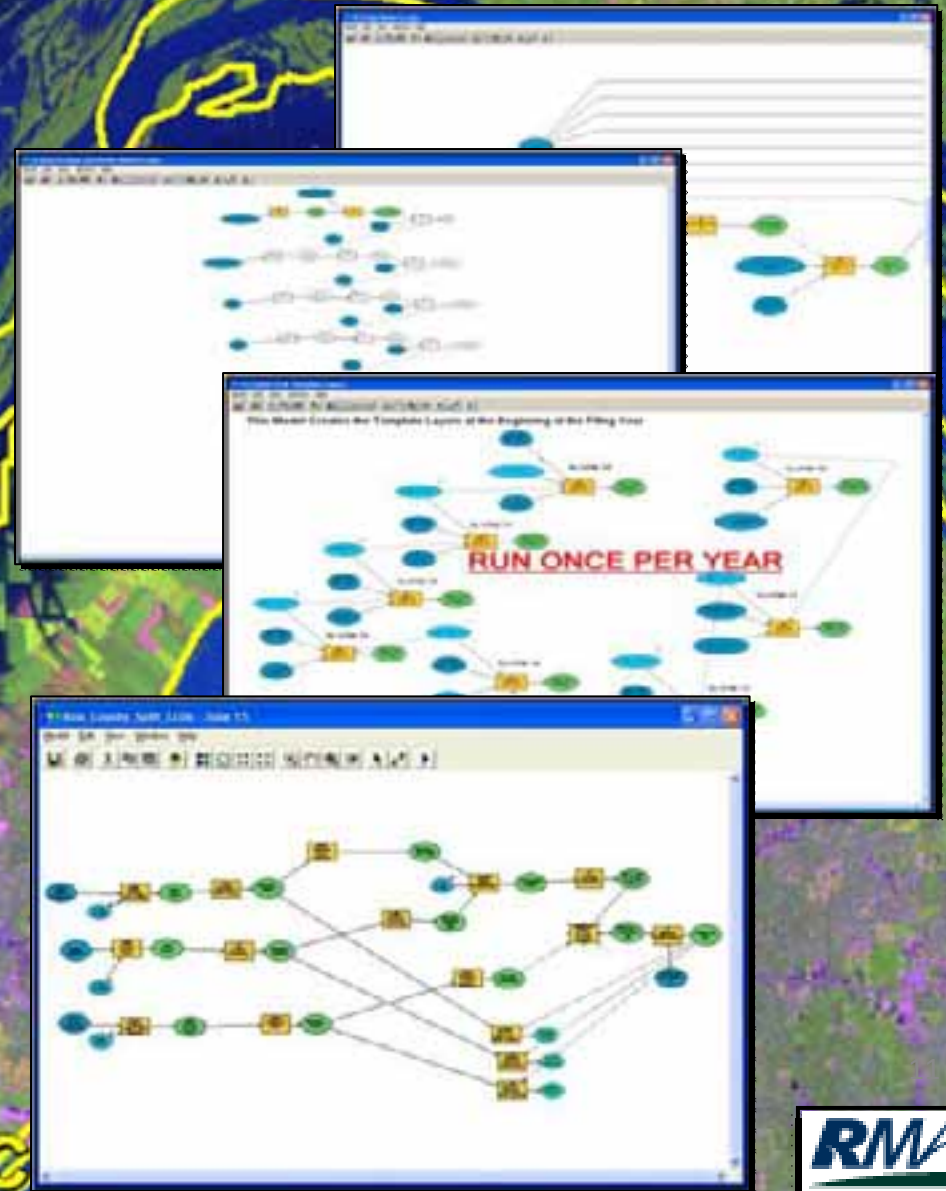
- From 2003 – 2008
- Each Actuarial Map was 1 Shapefile
- Managed 1,300+ shapefiles
- Stored on each Regional Offices Network Drives
- Numerous Problems with Shapefiles

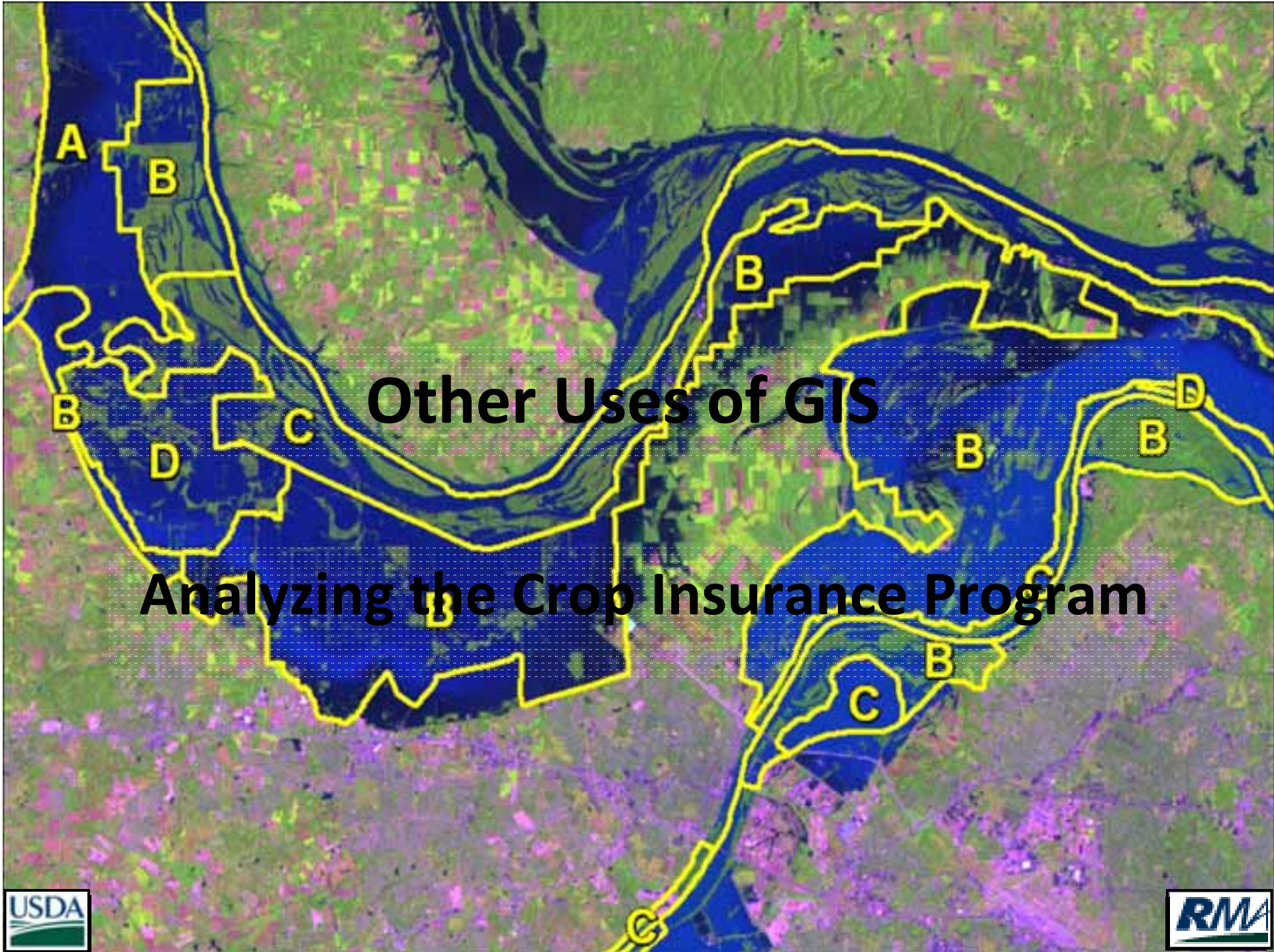
Move to Personal Geodatabase

- 2008
- Merged all the Actuarial Maps into UTM Zones
- Managed 9 shapefiles
- In preparation to move to ArcSDE

ModelBuilder Applications

- Access queried out Maps From Actuarial Database that needed to be moved
- Models used Access Table to identify the map and move it to be published.
- Exported map from SDE into shapefiles for distribution to Insurance Companies.



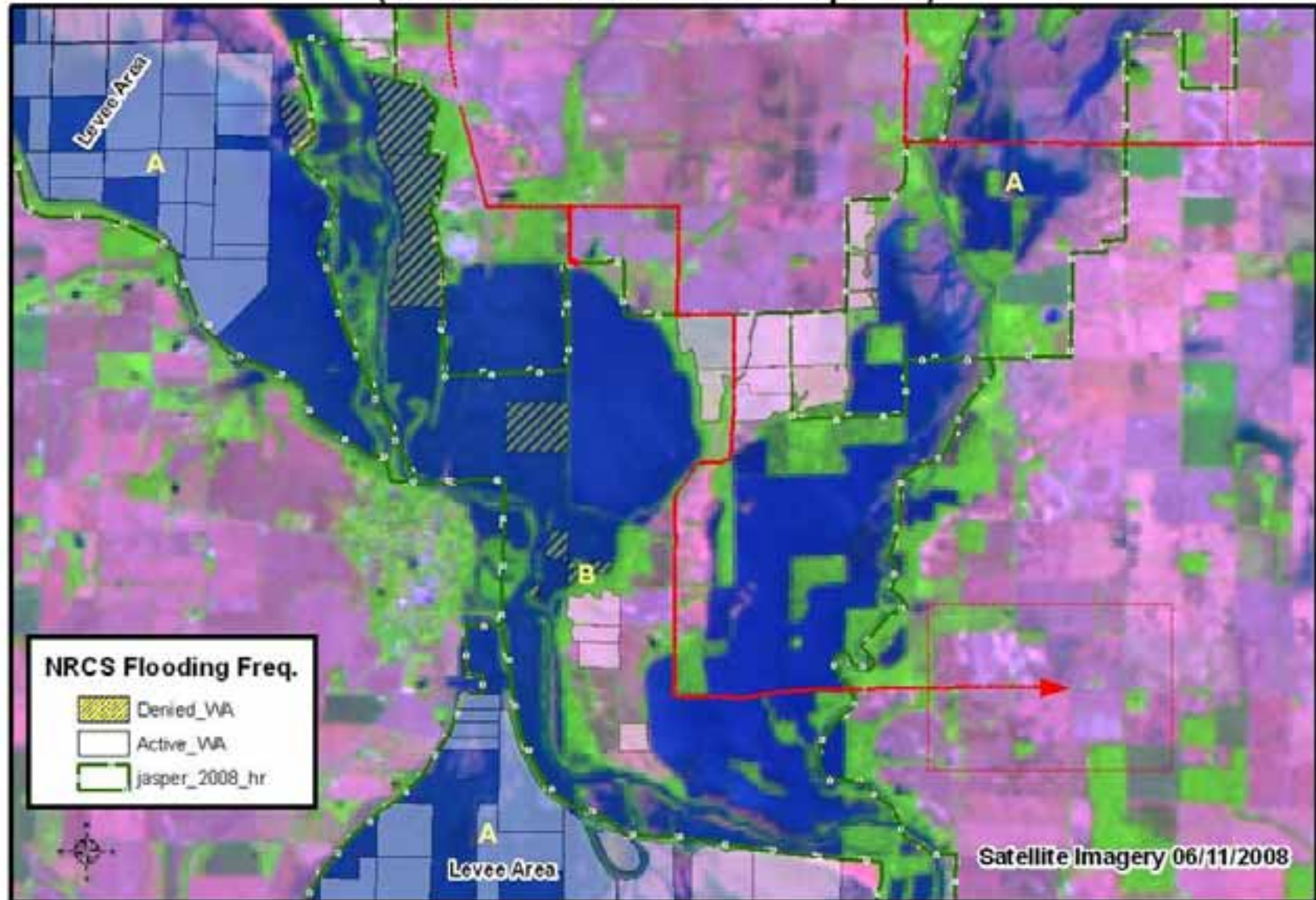


Other Uses of GIS

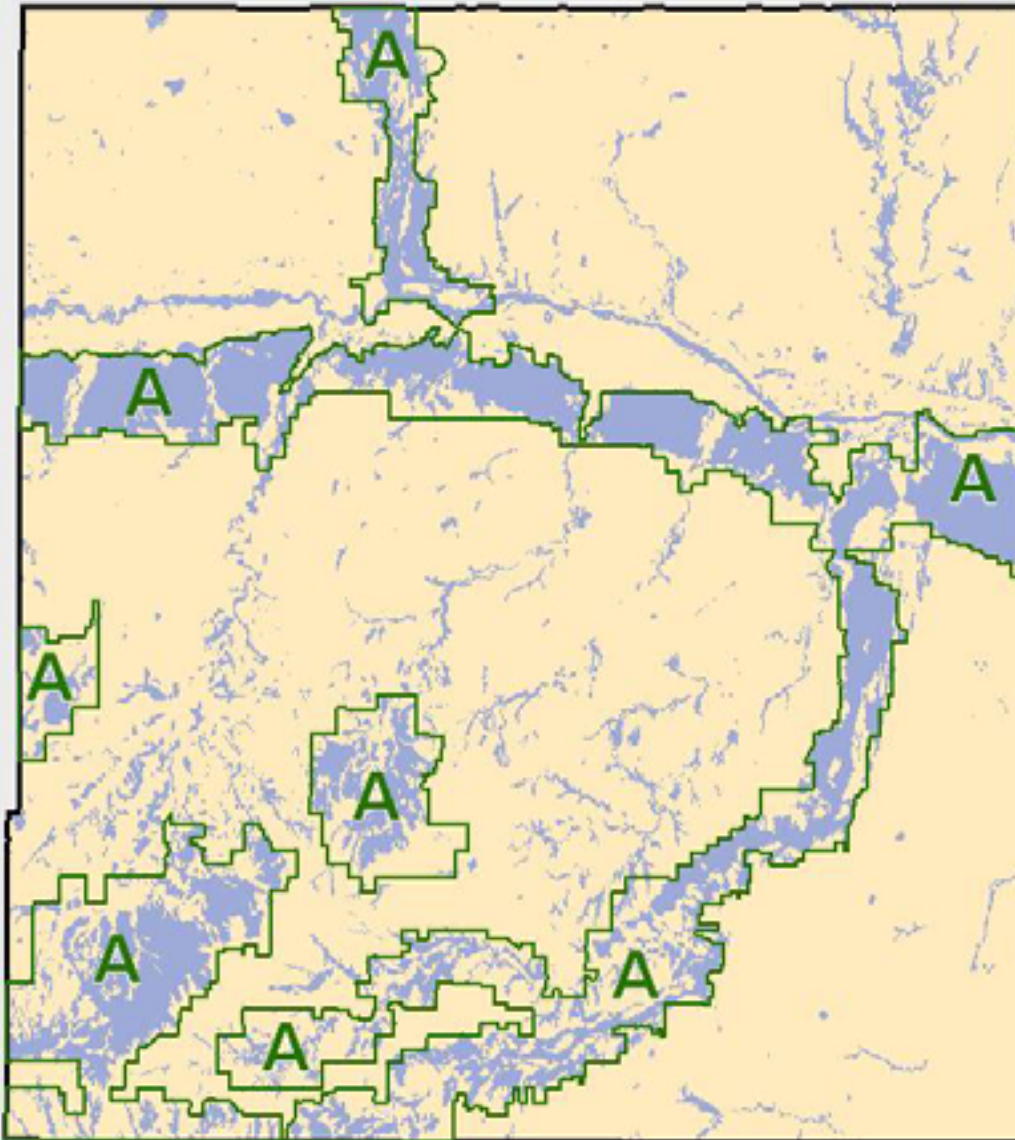
Analyzing the Crop Insurance Program



Satellite Imagery & High Risk Lines with Written Agreement Requests (Both Active and Denied Requests)

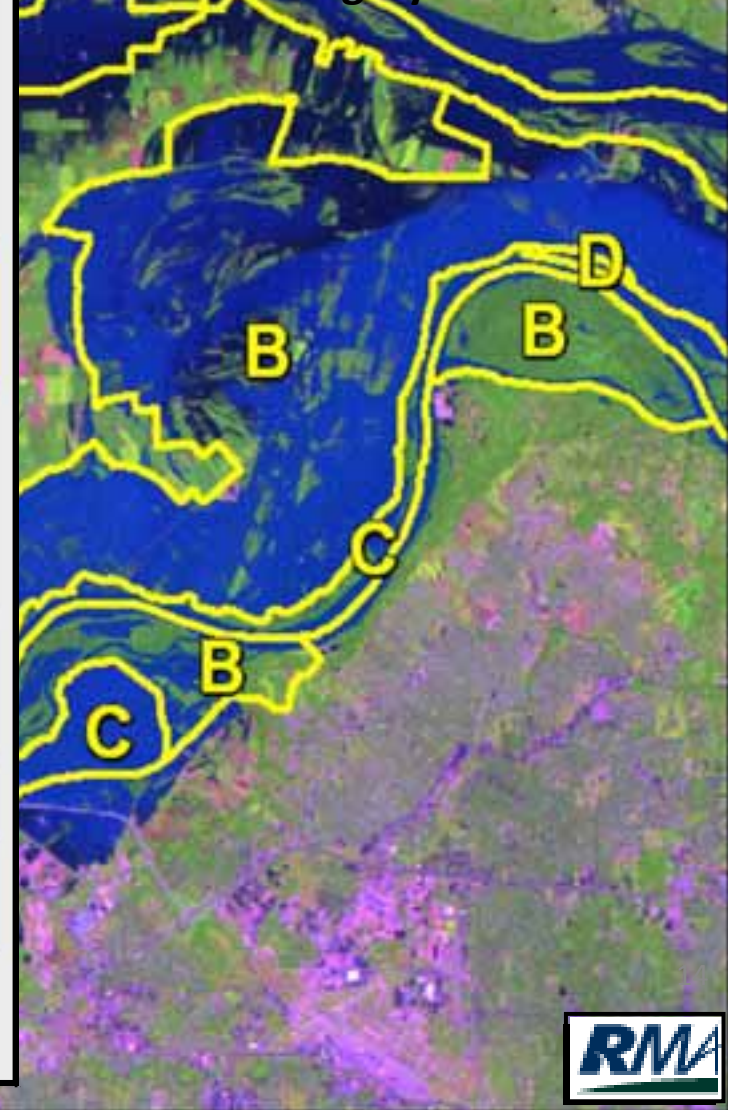


Prowers, Colorado Non-Irrigated High Risk Map



Map Reviews/Redraws

- Use of NRCS Soils
- Satellite Imagery



Mismatched High Risk Area Between County/State



Soil: 2000 # FGD 9 & NE 009 FGD 008

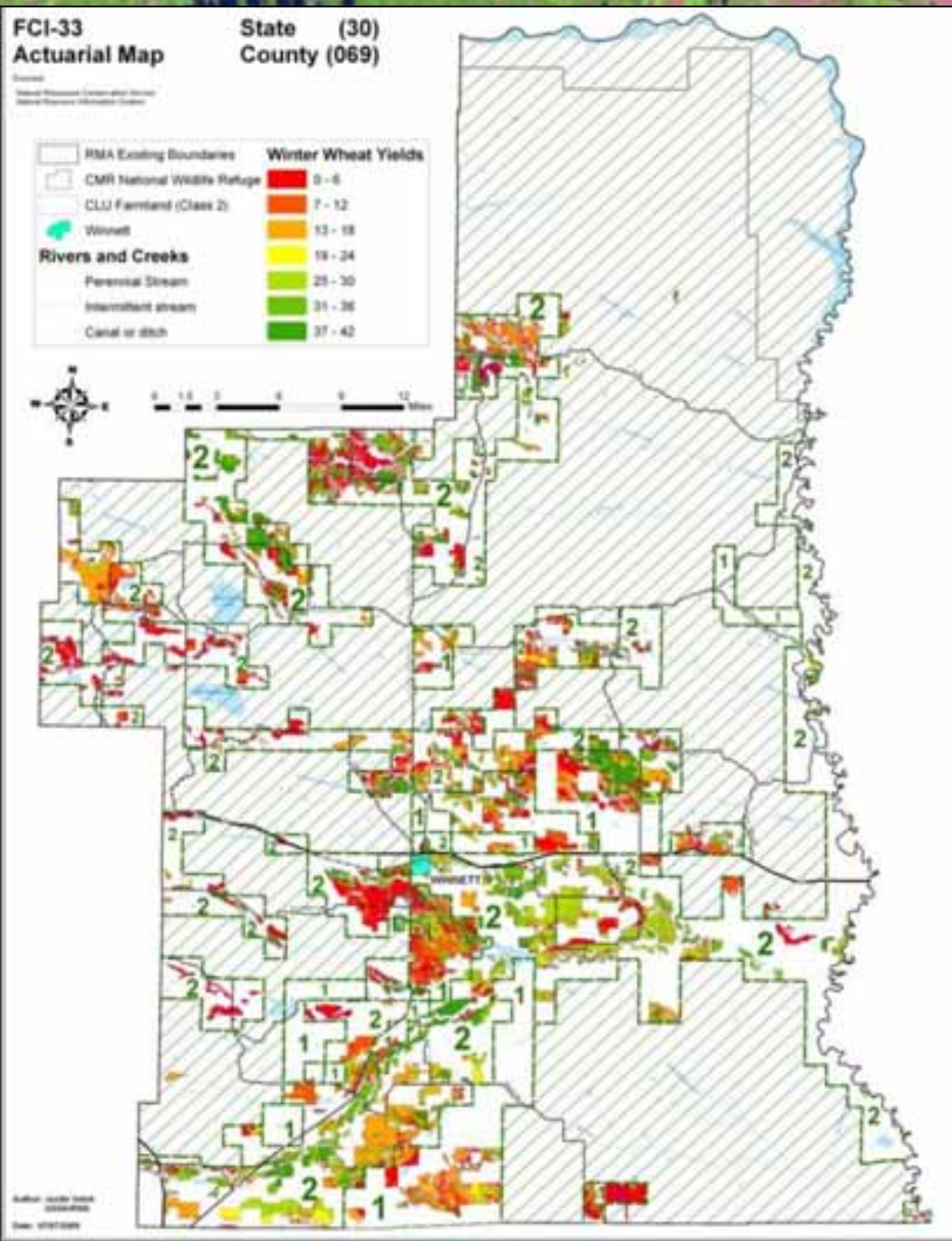


Future Focus:

Review High Risk Areas
Ensure Consistency across
State and County Lines

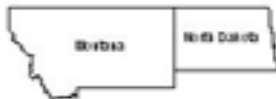
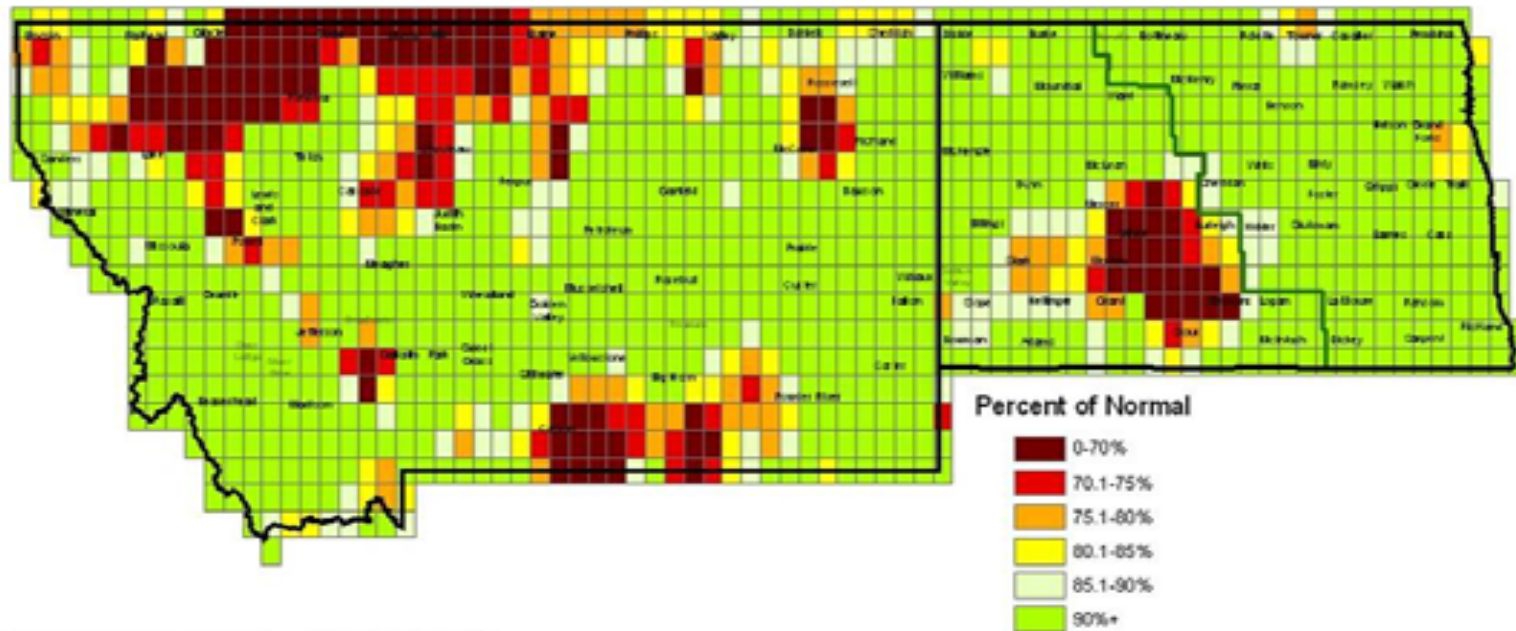
Redrawing T-Yield Map Areas

Combining use of NRCS and FSA Cropland Data



Thematic Maps

**Deviation from Normal by Grid
Rainfall Index
2009 Interval 4 (August - September)**

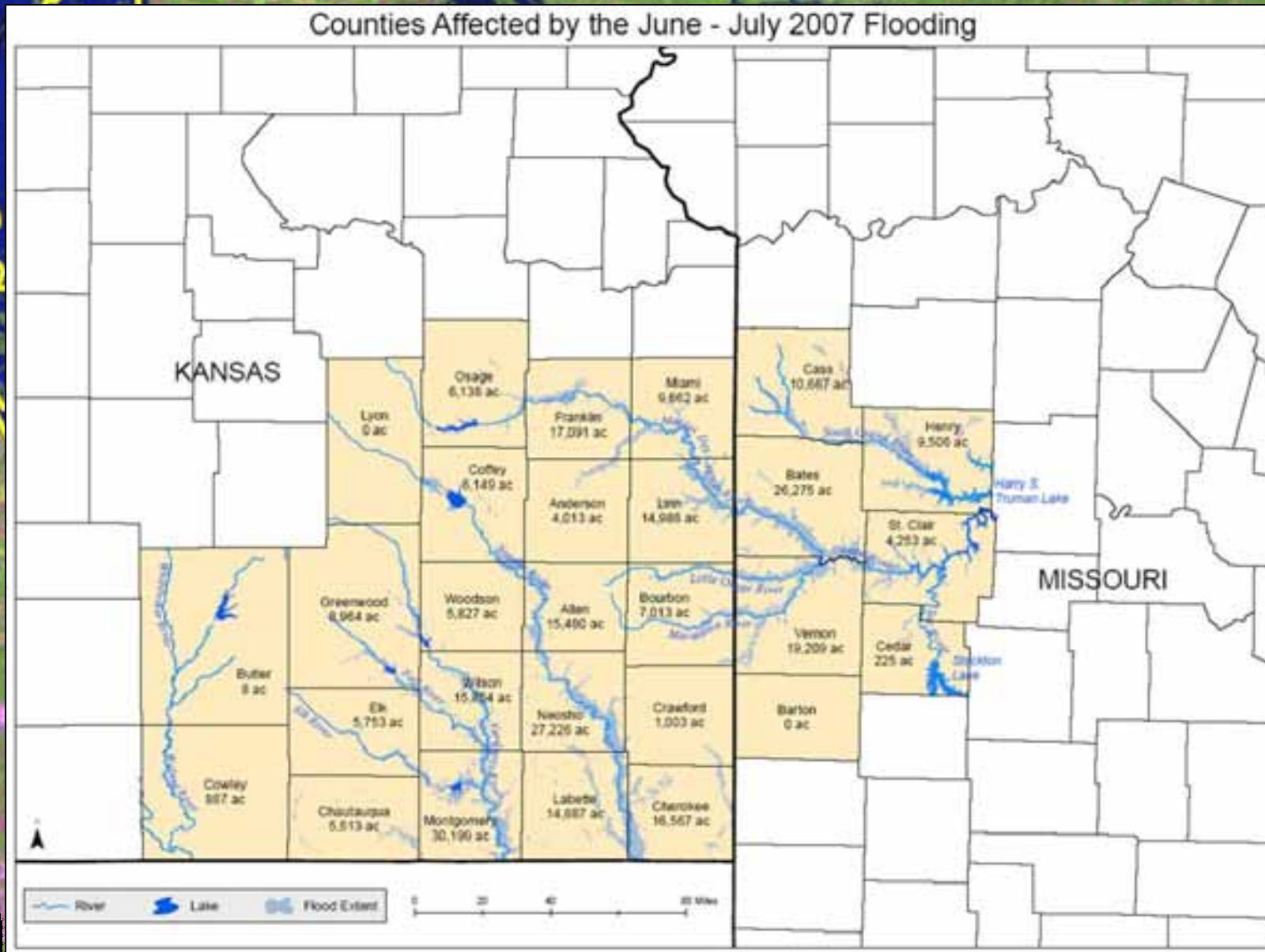


This map was produced by the
US OLR Risk Management Agency
Billings Regional Office
Data Source: USDA NIDR
Date: November 18, 2009

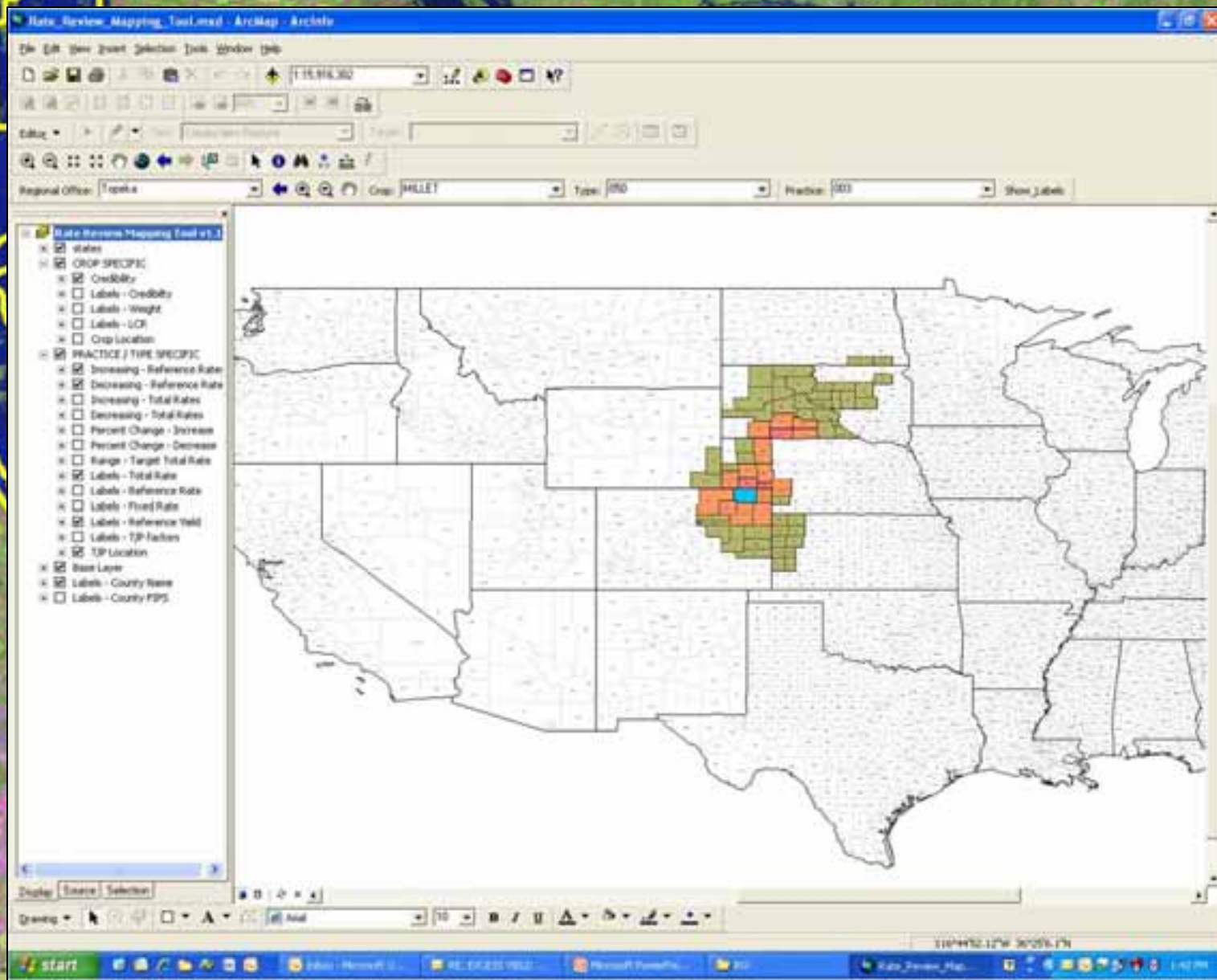
World Mercator
GCS_NAD_1983

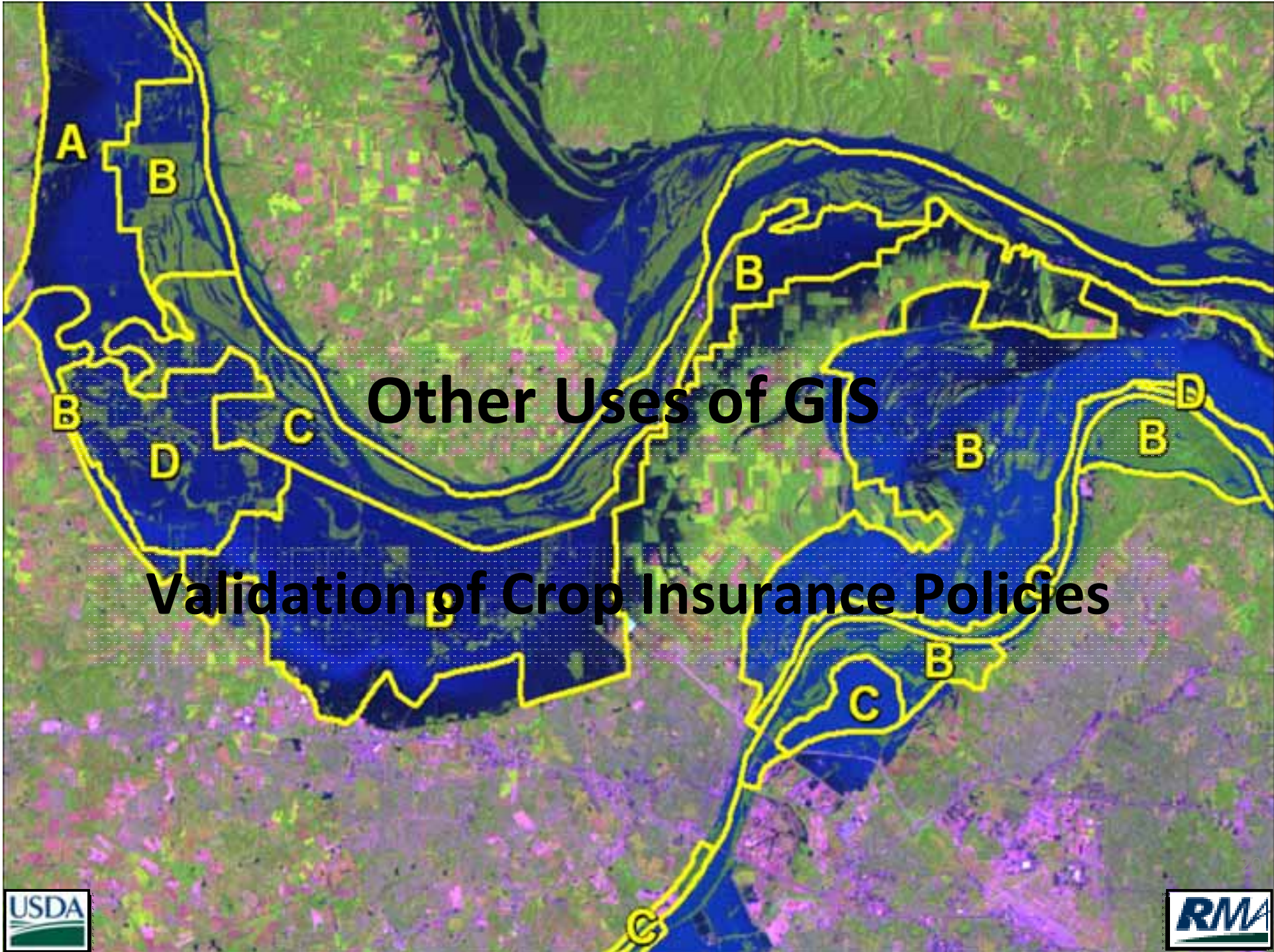
NOTE: This map serves as a reference
only. It does not alter the content of any
official document.

Indemnity Estimates – Quick Response



Rate Review Tool



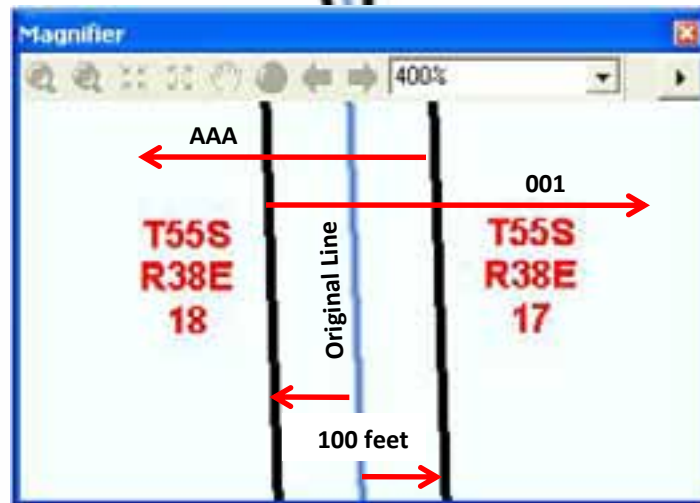


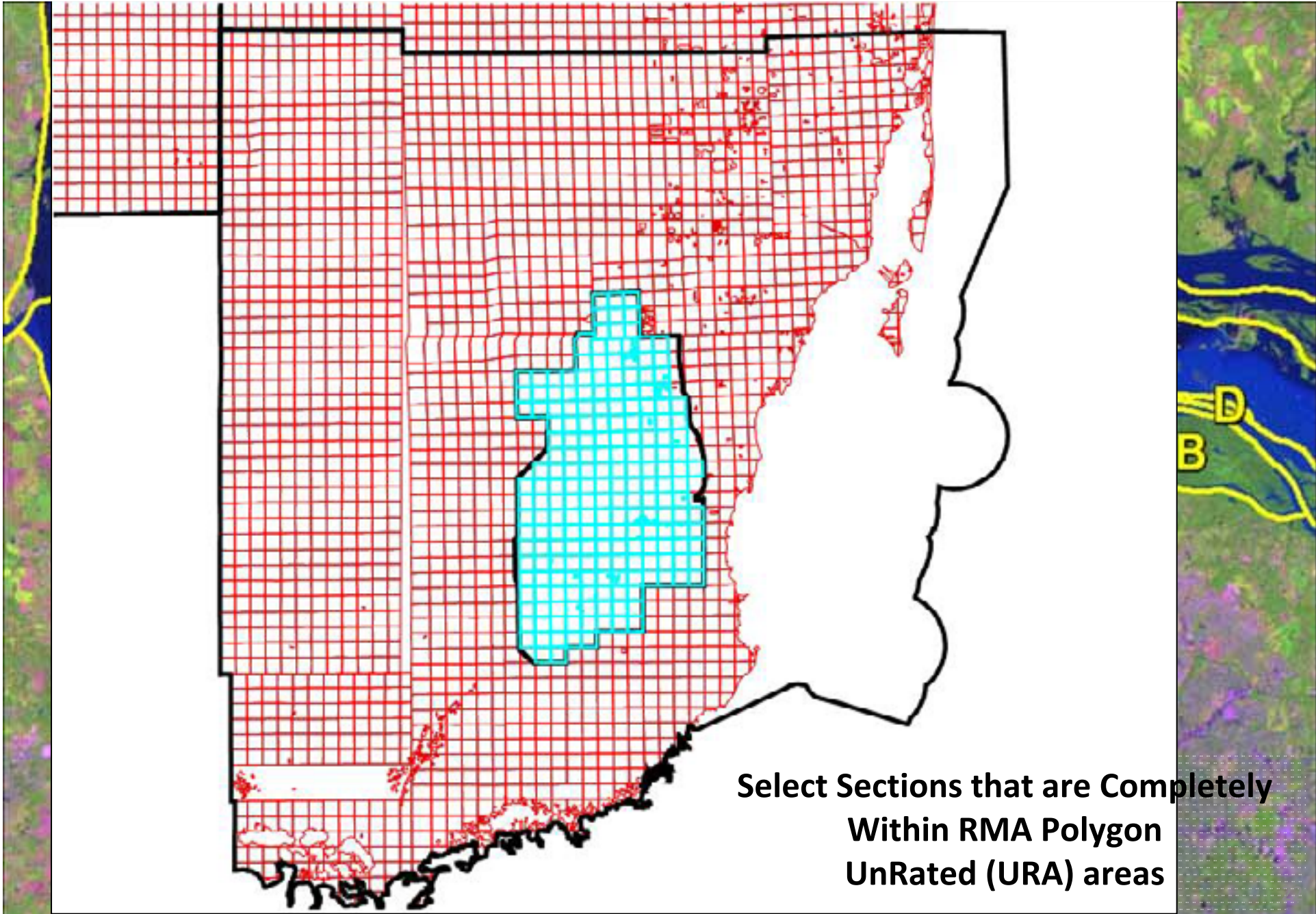
Other Uses of GIS

Validation of Crop Insurance Policies

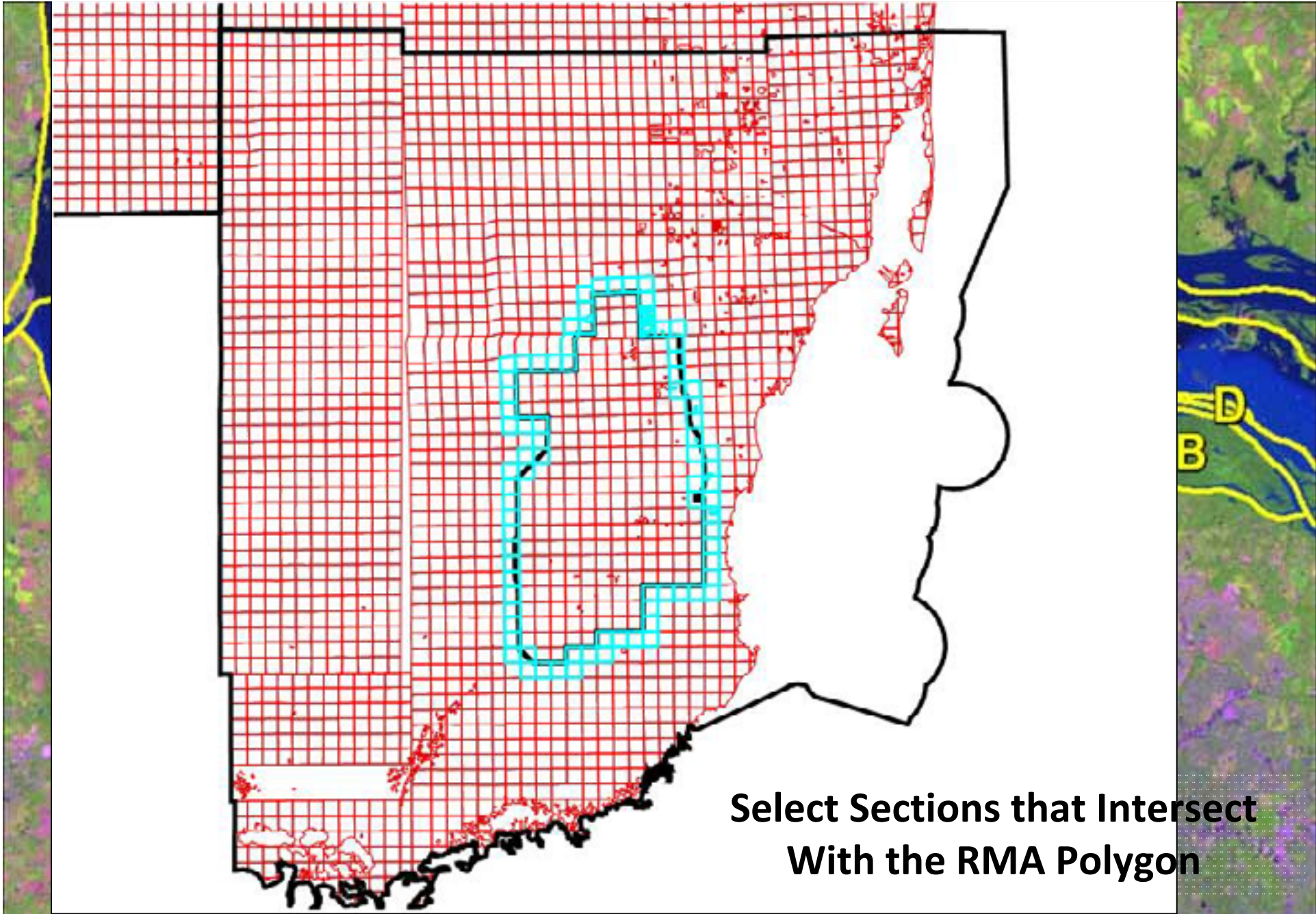


Buffer is Applied to RMA Area Lines 100 Feet for PLSS



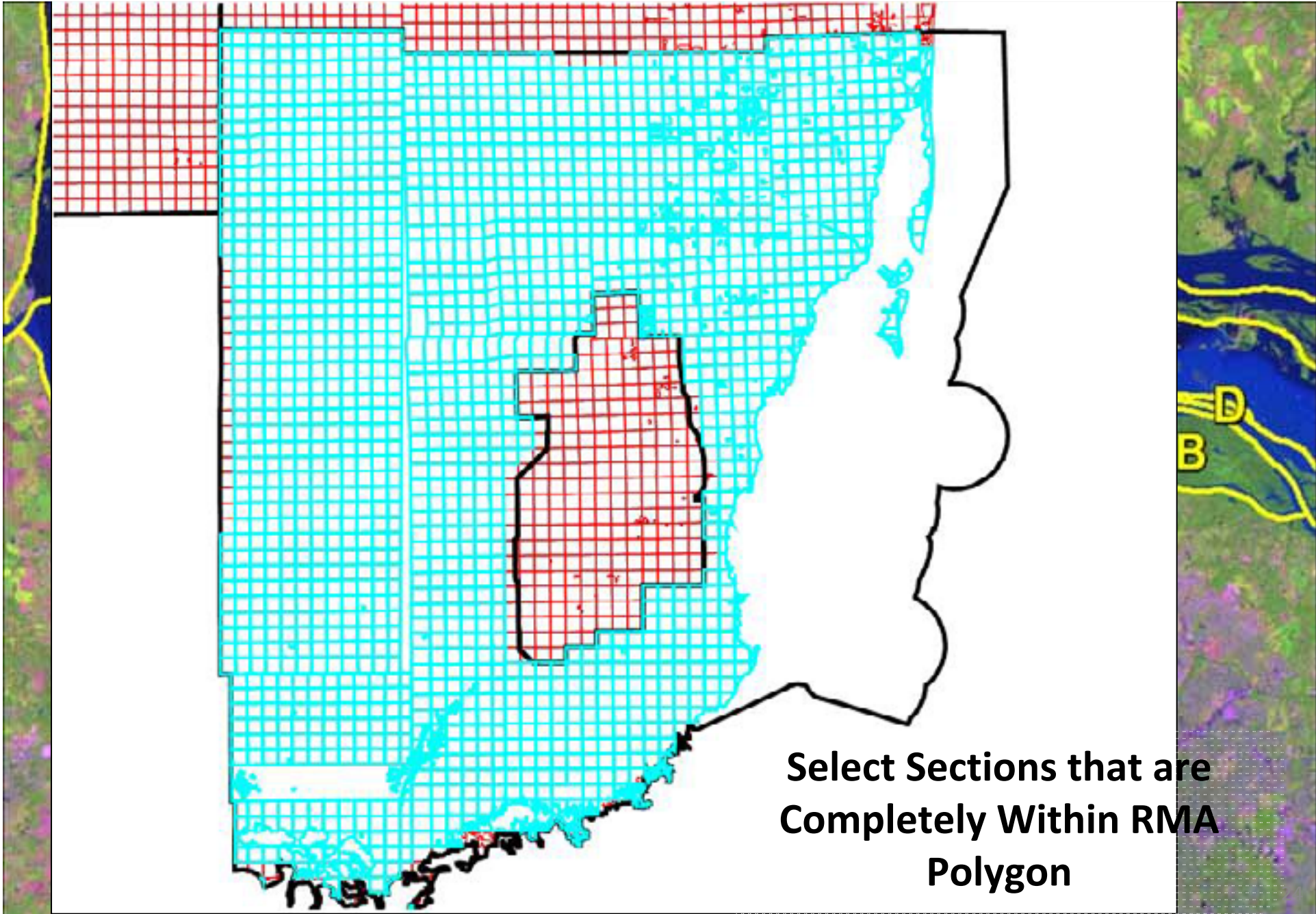


Select Sections that are Completely
Within RMA Polygon
UnRated (URA) areas

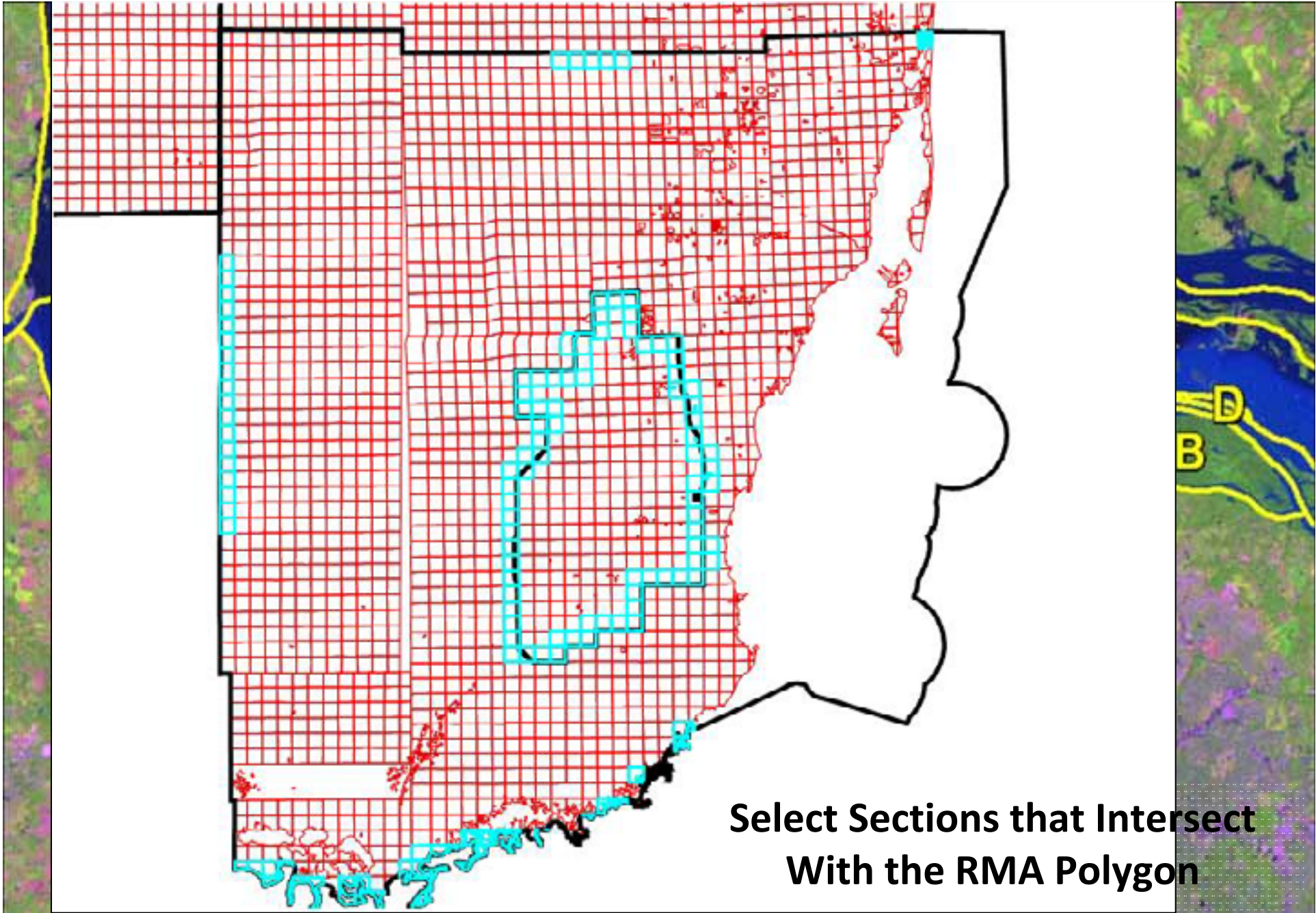


Select Sections that Intersect
With the RMA Polygon





Select Sections that are
Completely Within RMA
Polygon



Select Sections that Intersect
With the RMA Polygon

Example of OUTPUT Provided to Insurance Companies

FIPS	StateCode	CountyCode	LANDID	SubCountyCode	Status	MapfileName
12071	12	071	042S024E005	002	C	120711
12071	12	071	043S020E001	002	C	120711
12071	12	071	043S020E011	002	C	120711
12071	12	071	043S020E014	002	C	120711
12071	12	071	043S020E023	002	C	120711
12071	12	071	043S020E026	002	C	120711
12071	12	071	043S021E006	002	C	120711
12071	12	071	043S021E007	002	C	120711
12071	12	071	043S021E008	002	C	120711
12071	12	071	043S022E001	002	C	120711
12071	12	071	043S022E012	002	C	120711
12071	12	071	043S022E013	002	C	120711
12071	12	071	043S023E005	002	C	120711
12071	12	071	043S023E006	002	C	120711

```

Export_AllAreas.txt - Notepad
File Edit Format View Help
FIPS, StateCode, CountyCode, LANDID, SubCountyCode, Status, MapfileName
12021,12,021,048S029E010,002,C,120212
12021,12,021,048S029E005,002,C,120211
12021,12,021,048S029E015,002,C,120212
12021,12,021,048S029E015,002,C,120211
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12021,12,021,048S029E013,002,C,120211
12021,12,021,048S029E012,002,C,120212
12021,12,021,048S029E012,002,C,120211

```




Return on Investment...

- In 2007
 - 364 Map Files
 - 12 States
 - \$7.3 Million in missed premiums
 - Only in states with Legal Descriptions

RETURN

- \$20 Million/year
- Lower Premiums for Regular Rated land
 - Reduces Government Subsidy on All Acreage





Any Questions?

Thank You!

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