Cropland Mapping with Satellite Data

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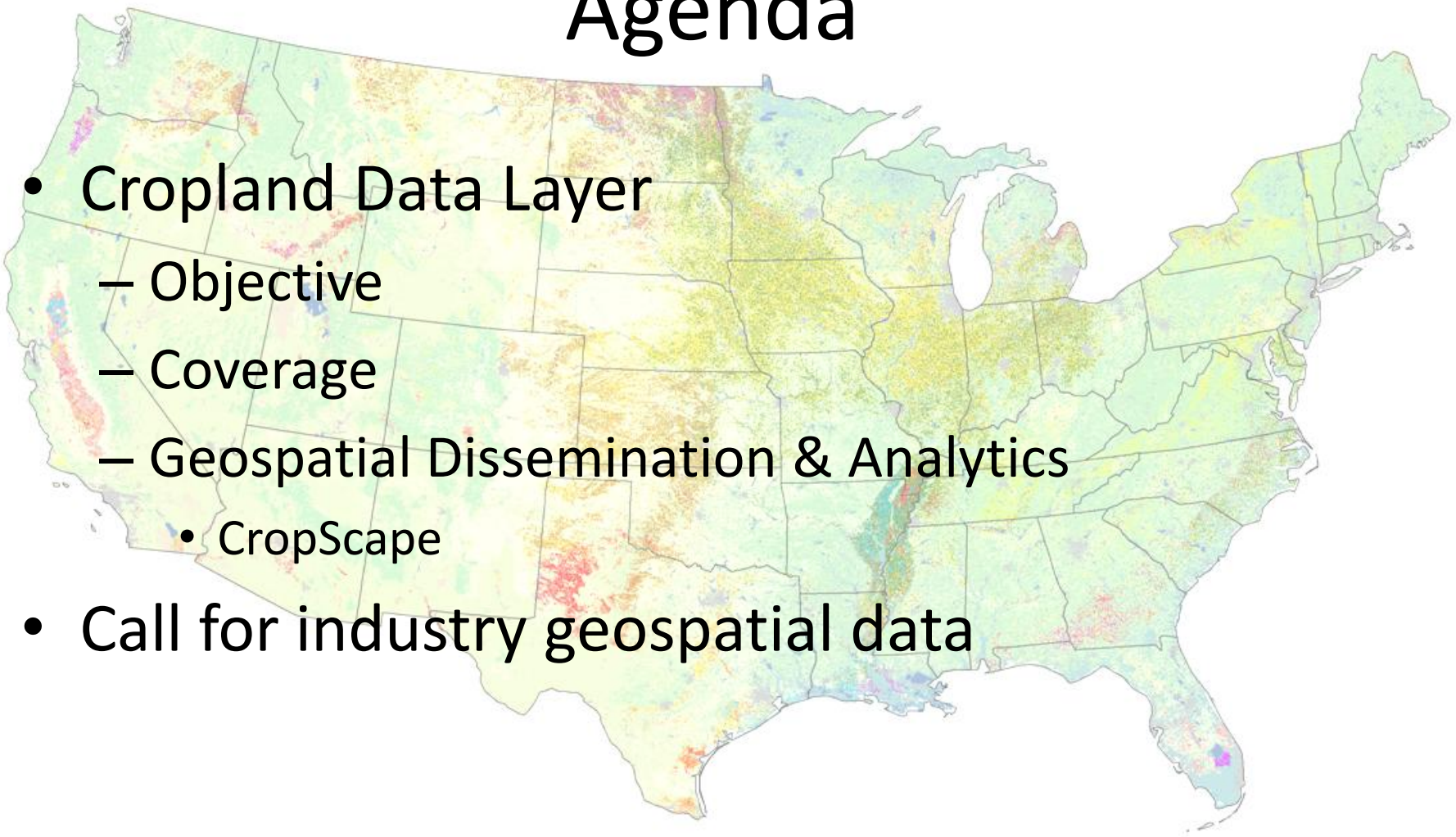
USDA/National Agricultural Statistics Service

Border-Area Water Management Remote Sensing Workshop

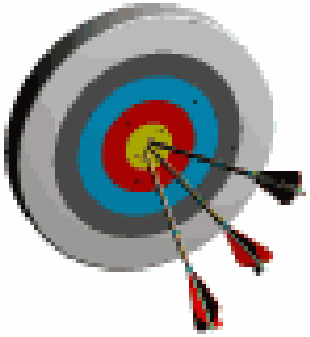
Agenda



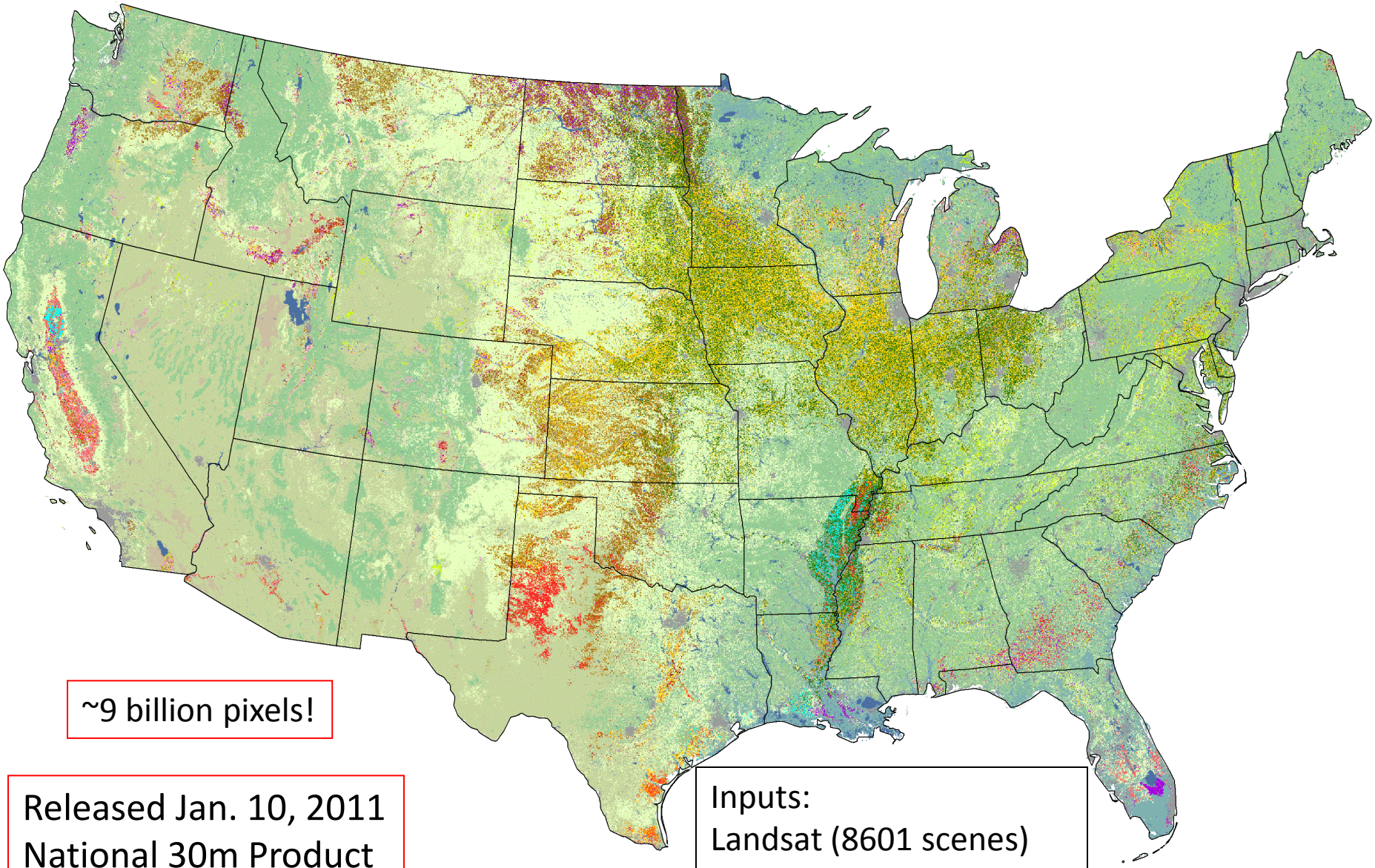
- Cropland Data Layer
  - Objective
  - Coverage
  - Geospatial Dissemination & Analytics
    - CropScape
- Call for industry geospatial data

Cropland Data Layer (CDL) Objectives

- "Census by Satellite"
  - *Annually* cover major program crops and regions
  - Operational Program
- Deliver in-season remote sensing acreage estimates
  - For June, August, September, and October Official Reports
  - Update planted area
  - Reduce respondent burden
- Provide timely, accurate, useful estimates
  - Measurable error
  - Unbiased/independent estimator
  - State, District, County
- Public domain crop specific crop classification
  - http://nassgeodata.gmu.edu/CropScape
  - NRCS Geospatial Data Gateway
  - http://www.nass.usda.gov/research/Cropland/SARS1a.htm
  - Google "CropScape"



2010 Cropland Data Layers

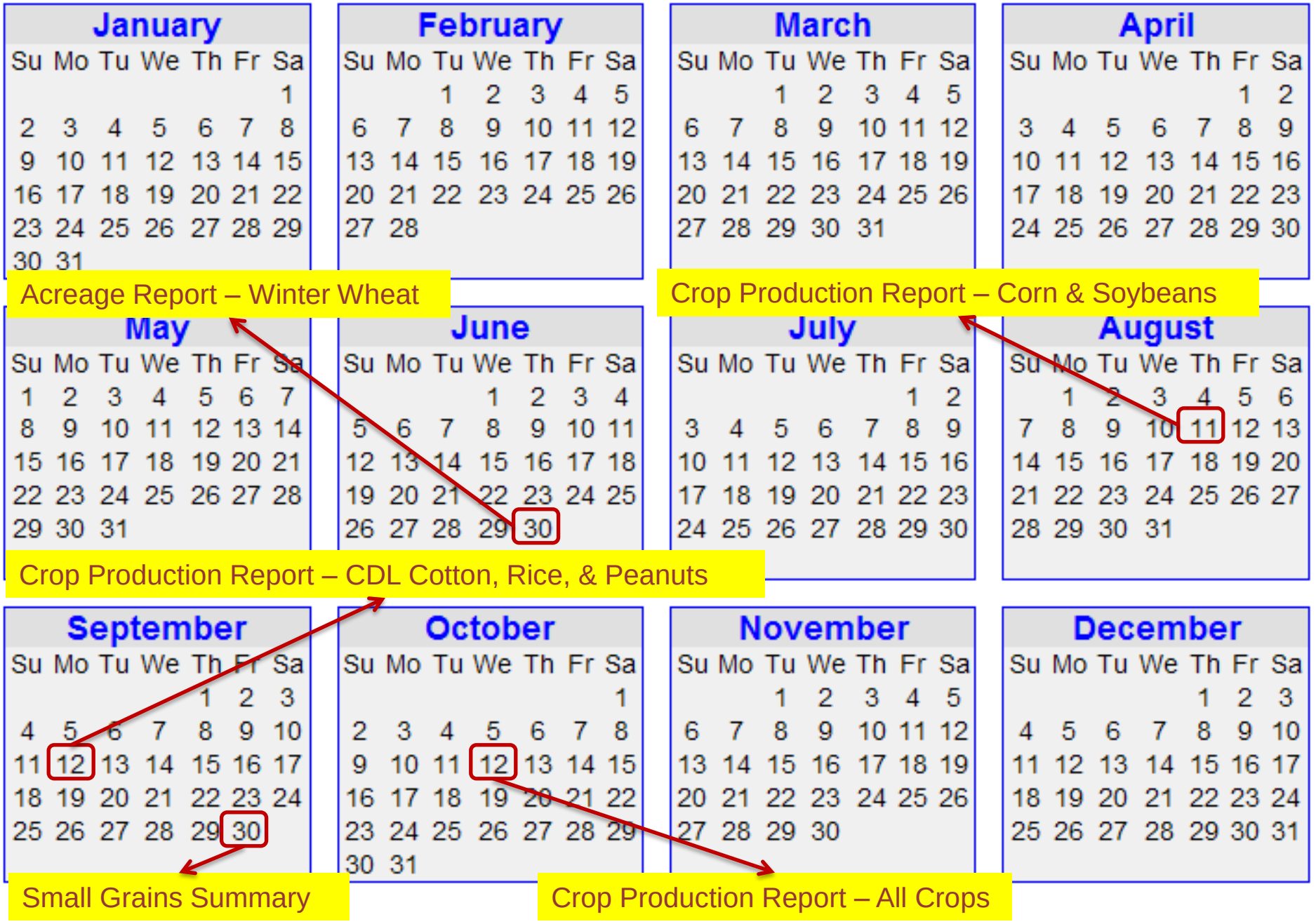


~9 billion pixels!

Released Jan. 10, 2011
National 30m Product

Inputs:
Landsat (8601 scenes)
AWiFS (1194 scenes)

2011 Production Plans



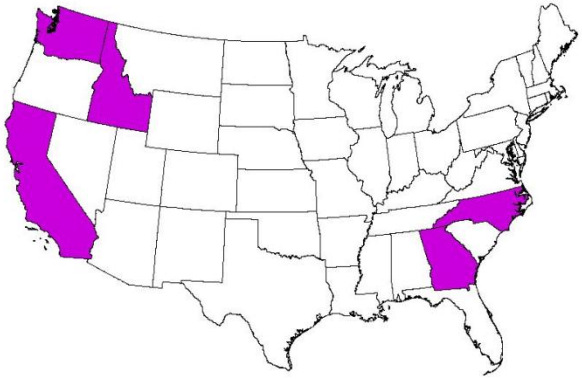
CDL Analyst Coverage

Jun winter wheat

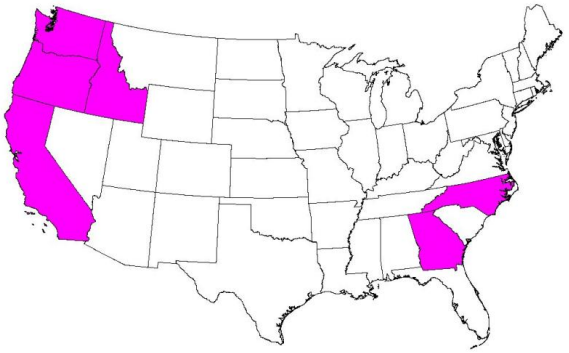
Aug assessment

Sep cotton/peanuts

Sep all small grains



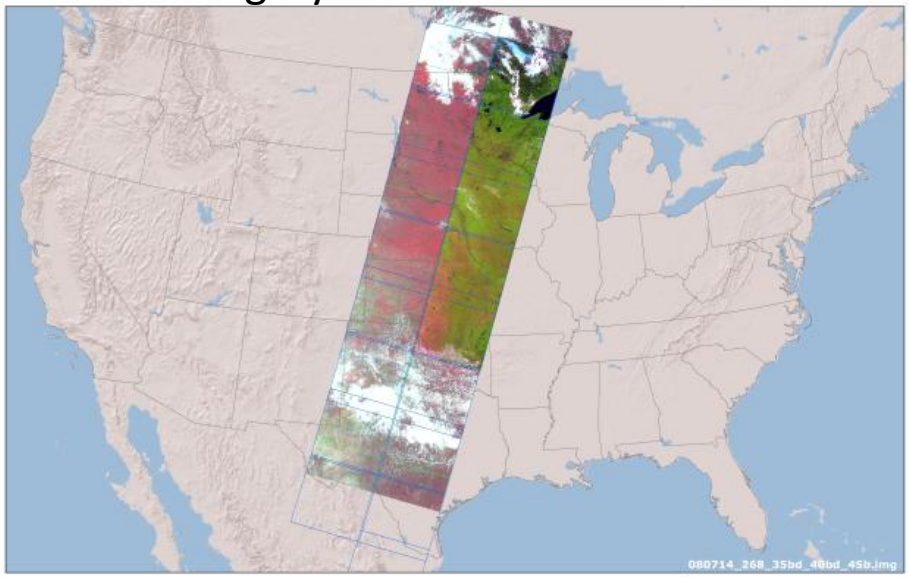
Oct all crops



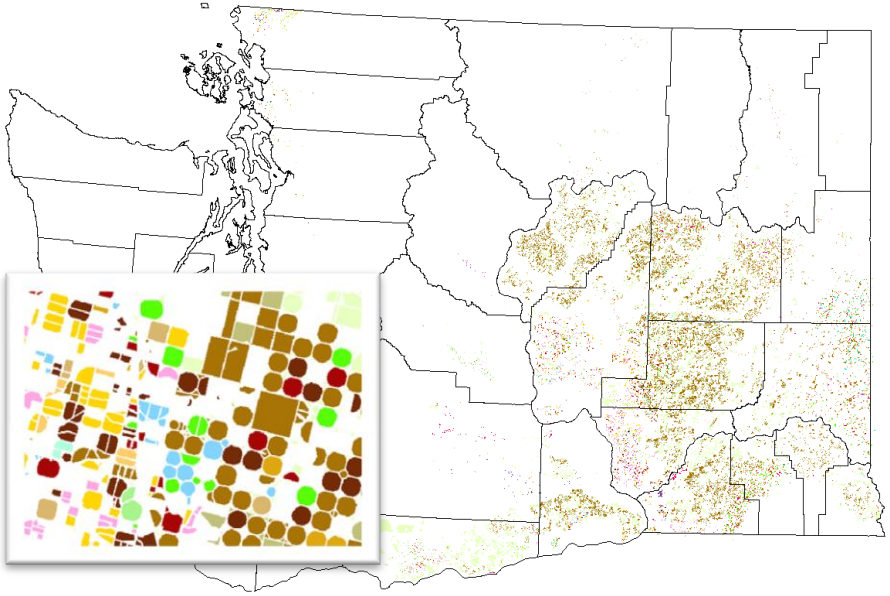
Total season analyst coverage

2011 Cropland Data Layer Inputs

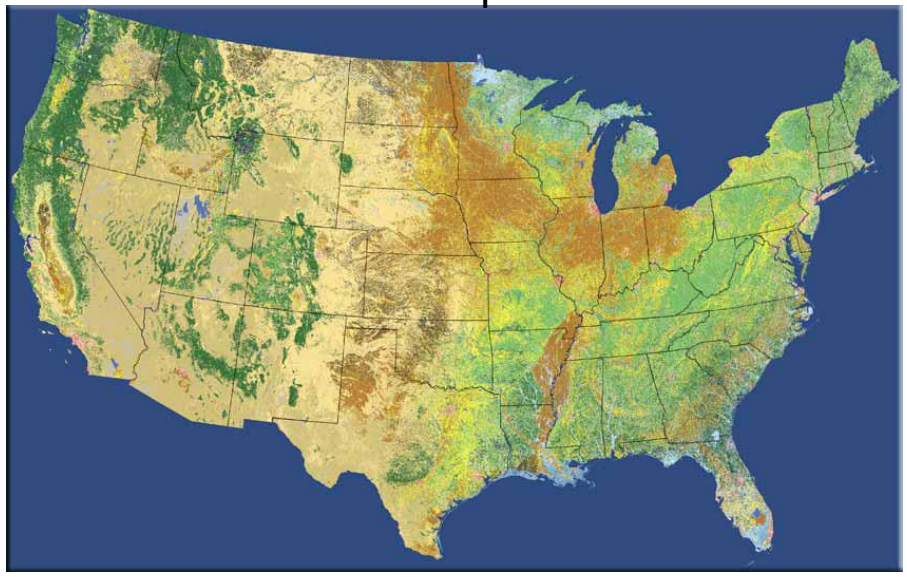
Satellite Imagery – DMC & Landsat



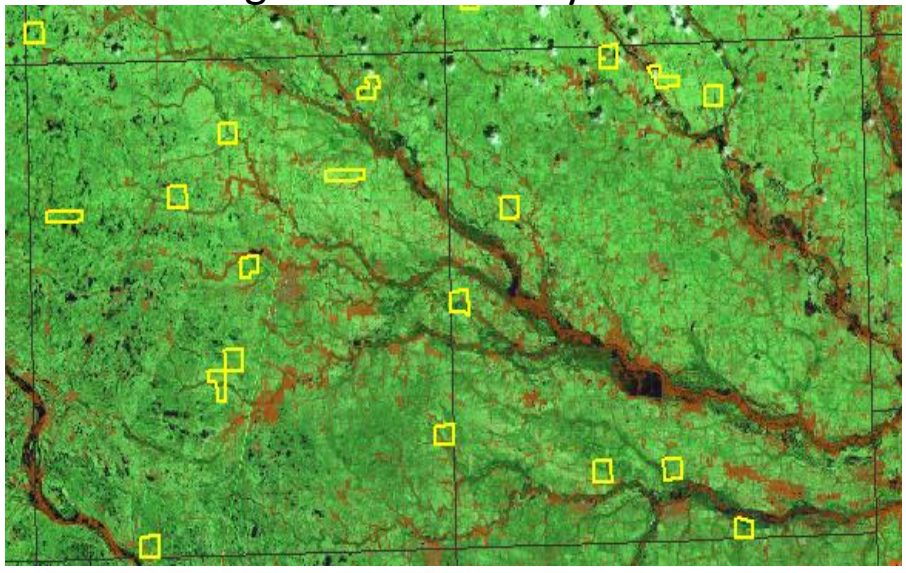
Farm Service Agency: Common Land Unit



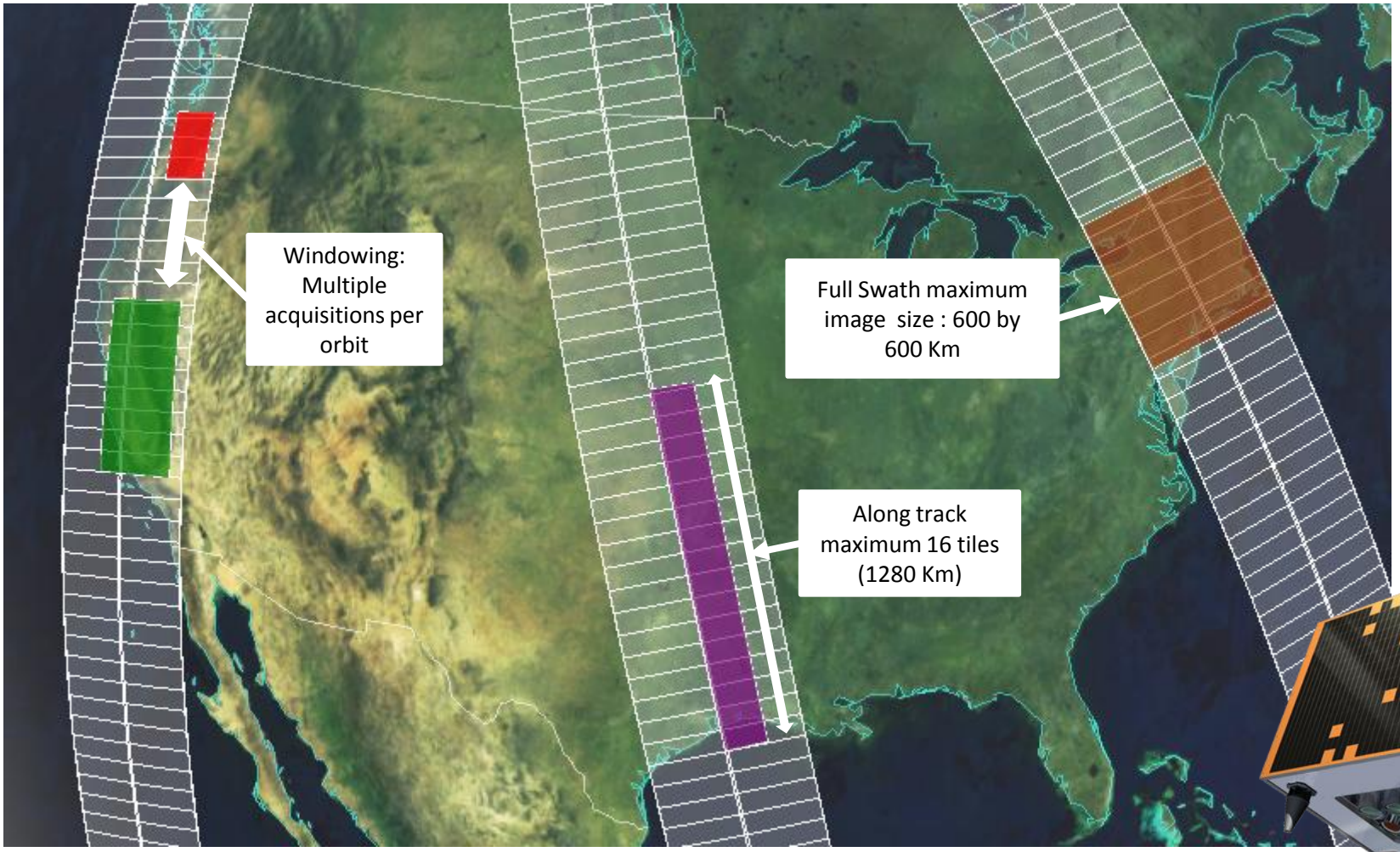
2006 NLCD & Derivative products

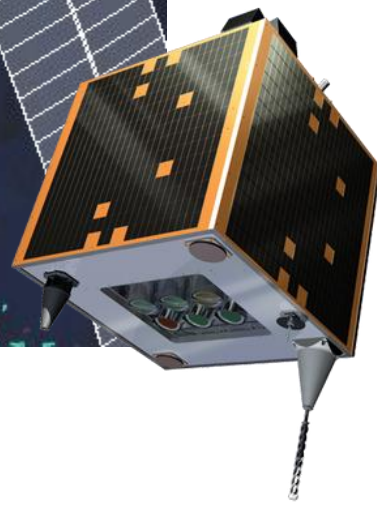


NASS June Agricultural Survey



2011 Deimos-1/UK2 Satellite Tasking

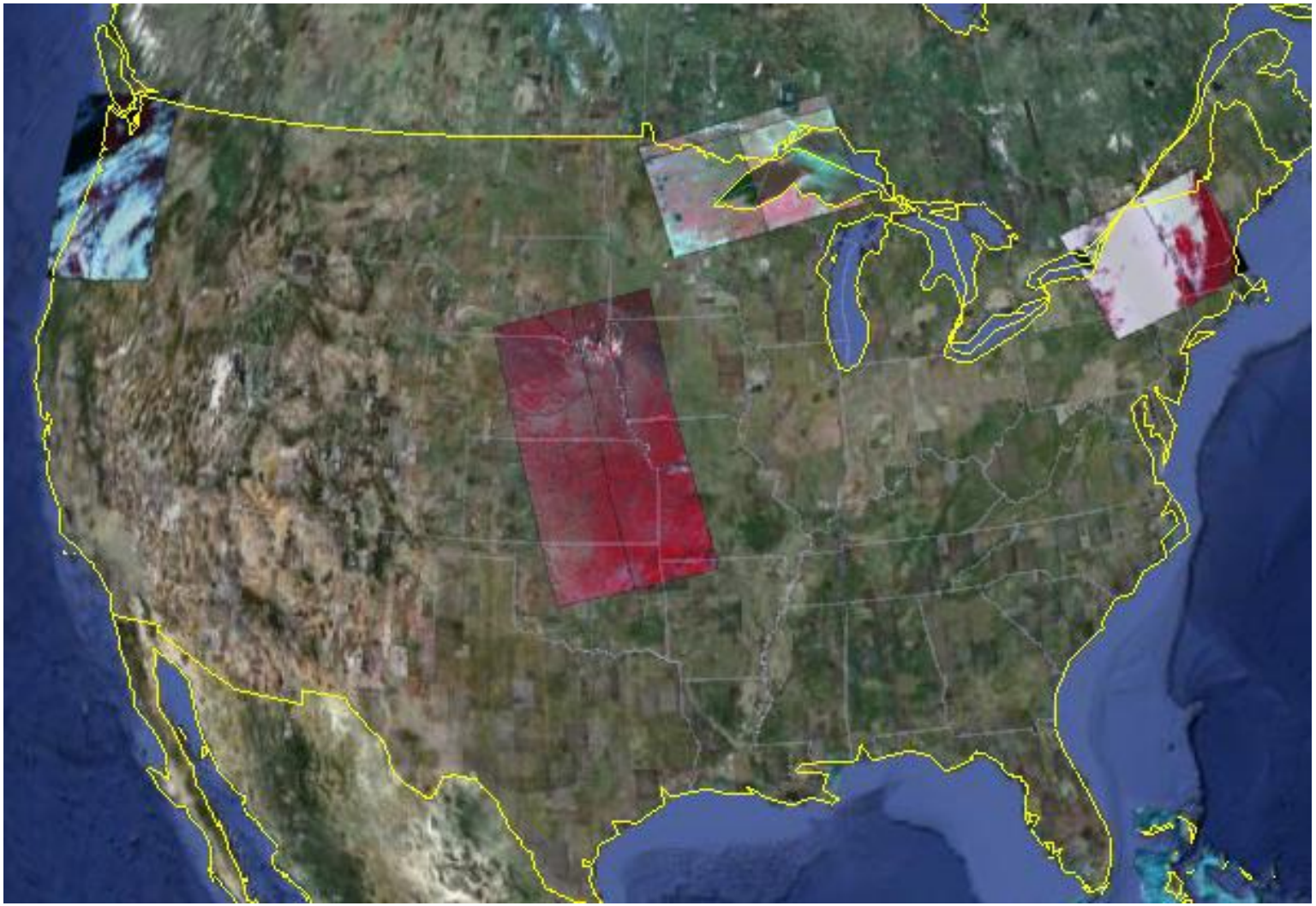




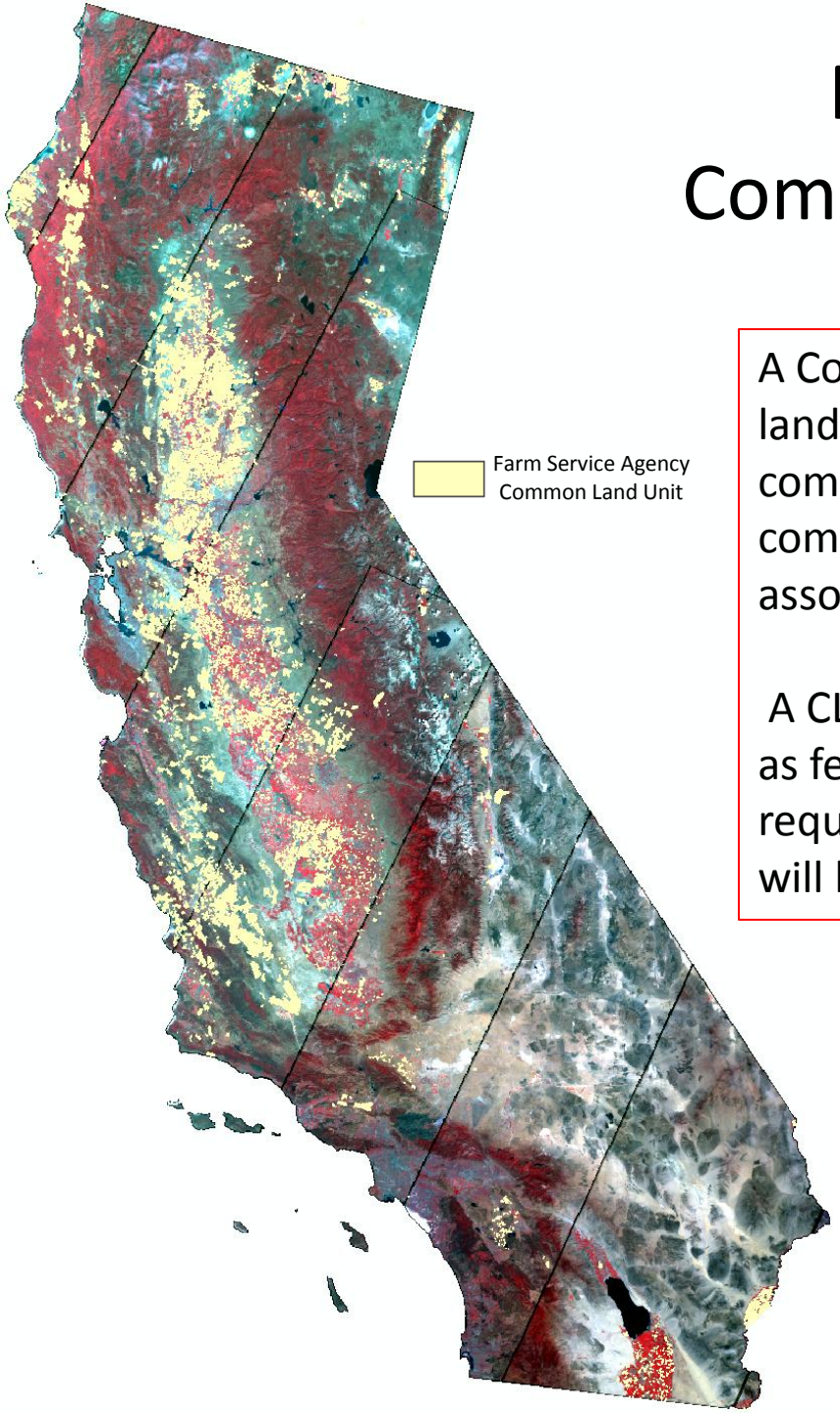
Comparative Satellite Information

	Deimos-1/UK2	AWiFS	Landsat
Launch Date	Jul 2009	Oct. 2003	1984 & 1999
Resolution	22m	56m	30m
Spectral Bands	B2: 0.52 – 0.60 B3: 0.63 – 0.69 B4: 0.77 – 0.90	B2: 0.52 - 0.59 B3: 0.62 - 0.68 B4: 0.77 - 0.86 B5: 1.55 - 1.70	B2: 0.52 - 0.60 B3: 0.63 - 0.69 B4: 0.75 – 0.90 B5: 1.55 – 1.75
Swath	600km	740km	185km
Revisit Rate	4 Days	5 Days	16 Days
Radiometric Resolution	8 or 10 bit	10 bit	8 bit

Deimos-1 & UK2 June 5 Collects



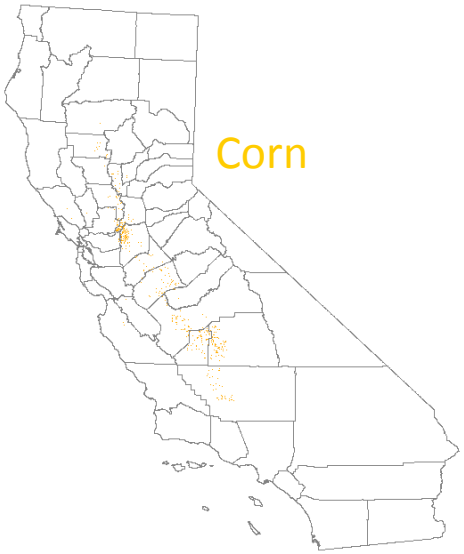
Farm Service Agency Common Land Unit Coverage



A Common Land Unit (CLU) is the smallest unit of land that has a permanent, contiguous boundary, a common land cover and land management, a common owner and a common producer association.

A CLU is delineated from permanent features such as fence lines, roads, and or waterways. This requirement minimizes the number of changes that will be required in the CLU boundary.

California Individual Crop Maps



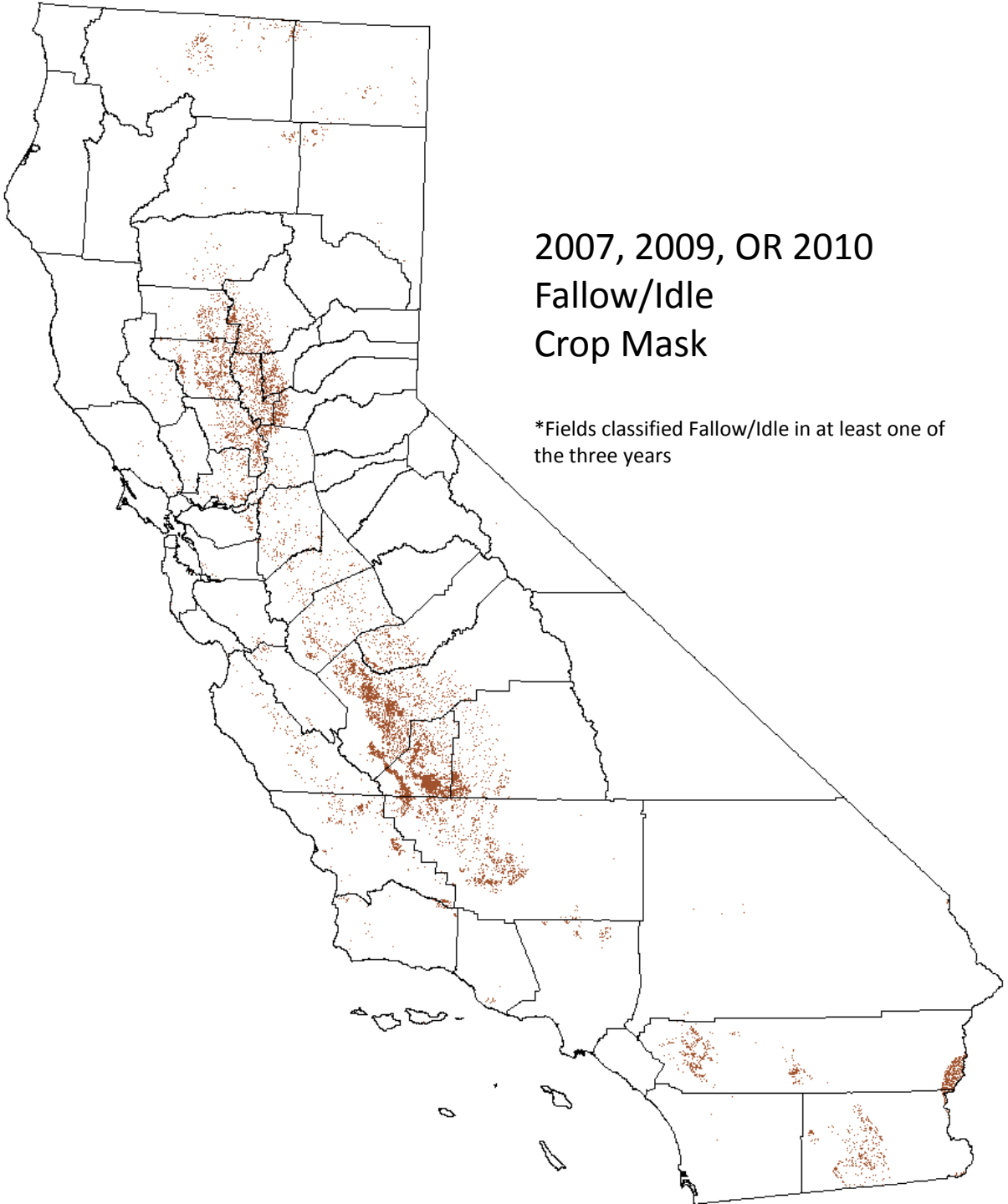
2007
Fallow/Idle
Crop Mask

2009
Fallow/Idle
Crop Mask


2010
Fallow/Idle
Crop Mask

2007, 2009, AND 2010
Fallow/Idle
Crop Mask

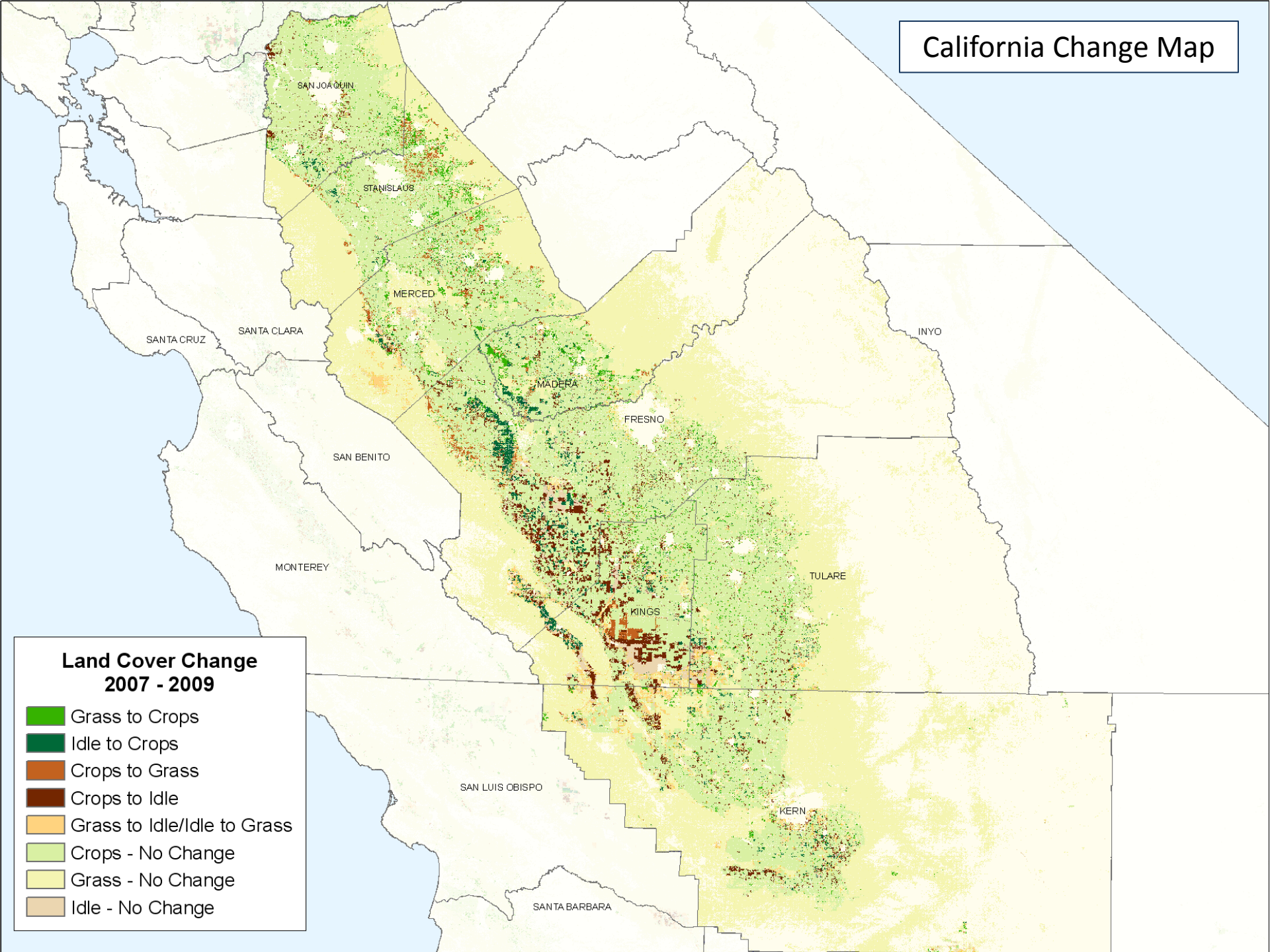
*Fields classified Fallow/Idle in all three years

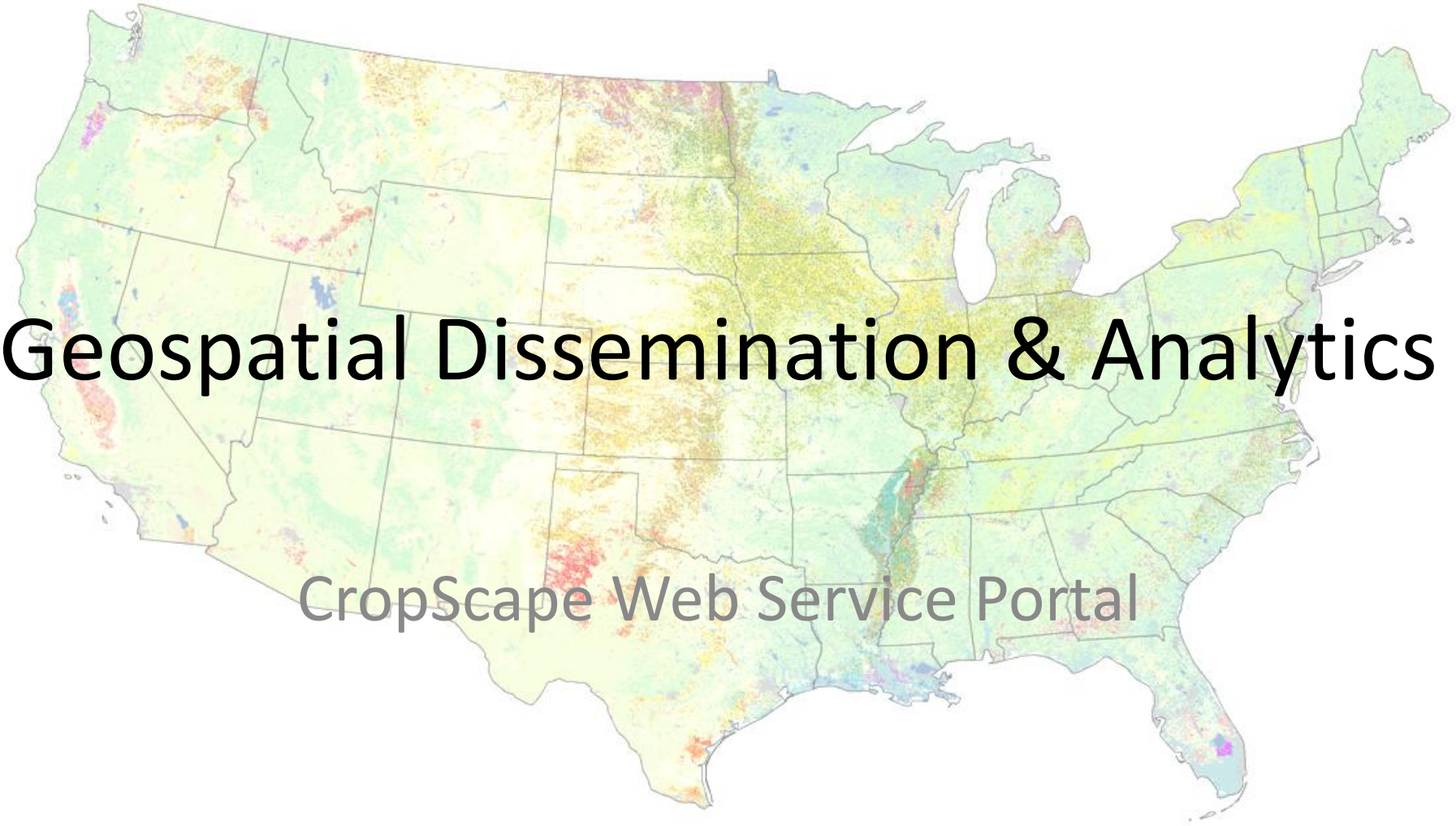


2007, 2009, OR 2010
Fallow/Idle
Crop Mask

*Fields classified Fallow/Idle in at least one of the three years

California Change Map

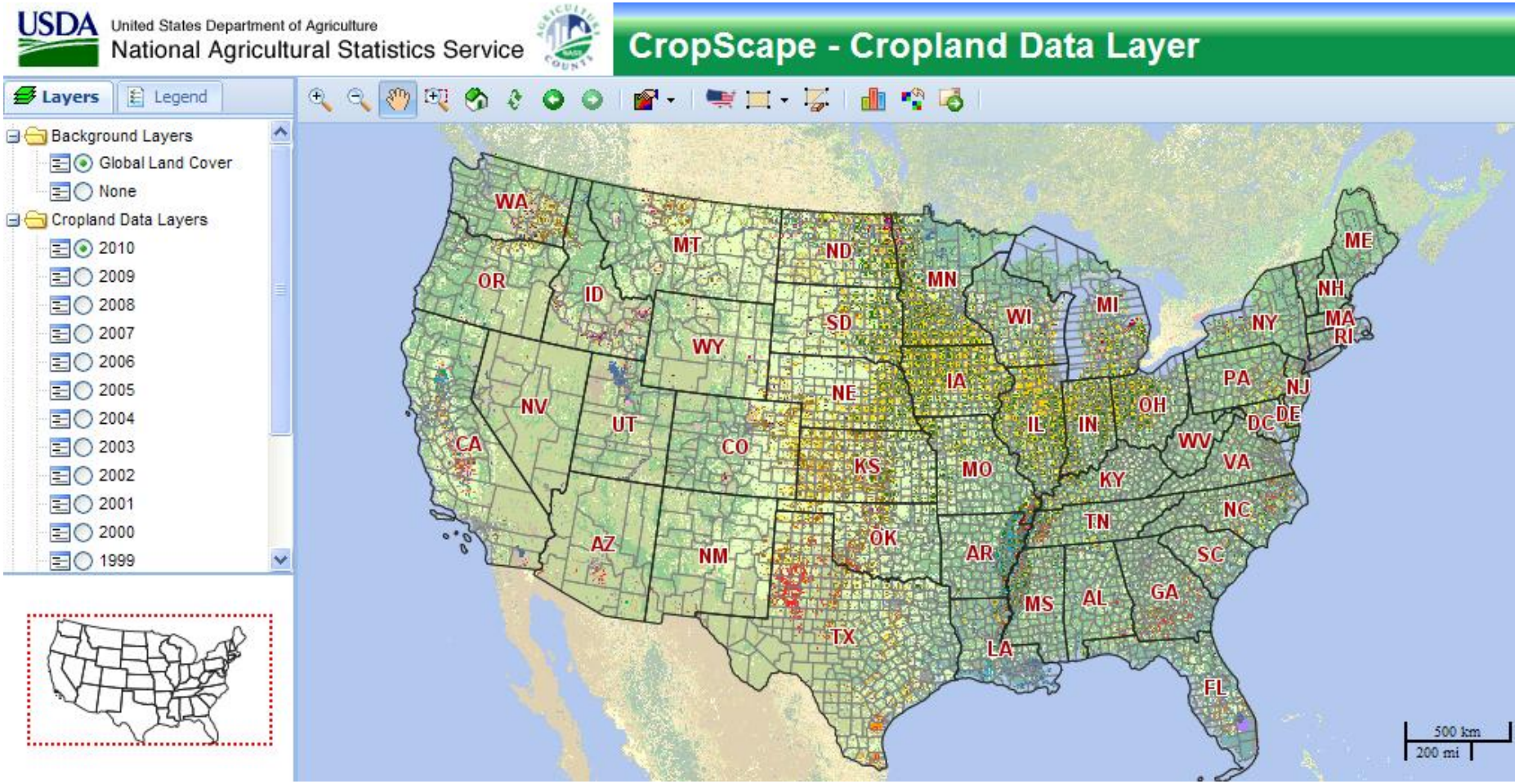




Geospatial Dissemination & Analytics

CropScape Web Service Portal

http://nassdata.gmu.edu/CropScape



Harmonize ALL historical CDL products to standards:
color scheme, categories, projection, metadata

2007 Pixel Count Acreage vs. 2007 Census of Agriculture

ORANGE ACREAGE				
County	Pixel Acreage	Census of Ag	Difference	%
Tulare	14,089	89,671	-75,582	16%
Kern	29,356	52,049	-22,693	56%
Fresno	1,470	35,503	-34,033	4%
Riverside	328	9,272	-8,944	4%

ALMONDS ACREAGE				
County	Pixel Acreage	Census of Ag	Difference	%
Kern	202,473	143,473	59,000	141%
Stanislaus	97,968	123,528	-25,560	79%
Fresno	189,267	123,117	66,150	154%
Merced	109,159	103,736	5,423	105%
Madera	73,351	70,299	3,052	104%

WALNUT ACREAGE				
County	Pixel Acreage	Census of Ag	Difference	%
San Joaquin	68,921	39,859	29,062	173%
Butte	34,660	30,798	3,862	113%
Sutter	31,615	28,149	3,466	112%
Tulare	24,991	26,418	-1,427	95%
Stanislaus	20,551	24,414	-3,863	84%
Tehama	12,155	15,119	-2,964	80%
Glenn	16,890	14,664	2,226	115%
Kings	12,354	12,161	193	102%
Yolo	17,102	10,999	6,103	155%
Fresno	12,200	7,842	4,358	156%
Yuba	16,057	7,193	8,864	223%
Merced	4,774	5,164	-390	92%

Summary

- CDL program paramount to other NASS geospatial activity
- Partnerships with cooperating agencies critical for success
- Timely delivery of geospatial data and statistical information are critical

Thank you!

Spatial Analysis Research Section
USDA/NASS R&D Division

nassgeodata.gmu/CropScape