



# Overview of Case Study - Prometryn

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# Overview

- Product Use and Characterization
  - General information and Registered Products
  - Label Use Restrictions
  - Usage information
- Endangered Species Assessment Models and Prometryn inputs
  - Environmental Fate Data
  - Ecological Effects Data
- Geographical Scope of Use and Proximity analysis

## General Information On Prometryn

- First Registered in the U.S. in 1964
- Used historically in cotton, celery and pigeon peas (Puerto Rico only)
- Recently approved for use in carrot, celeriac, cilantro, okra, parsley, rhubarb, and the leafy petiole crop subgroup 4B (celery, cardoon, Chinese celery, celtuce, Florence fennel, Swiss chard)
- Permitted for use on a 24c label: parsley and dill (Florida); seed carrot, seed parsley, seed parsnip, and seed dill (Washington); and carrots, parsley, and coriander grown for seed (Oregon).
- Used to control many annual broadleaf weeds and grasses
- Applied both pre- and post-emergence
- Acts by inhibiting photosynthesis at photosystem II
- Scheduled to begin Registration Review in 2013

# Registered Products

Technicals	EPA Reg. No.	Registrant	Active Ingredients
Prometryn Technical	100-542	Syngenta Crop Protection, LLC	Prometryn
Prometrex <sup>®</sup> Technical	46386-2	Verolit Chemical Manufacturing CO, LTD	Prometryn
<b>End Use Products</b>			
Caparol <sup>®</sup> 4L	100-620	Syngenta Crop Protection, LLC	Prometryn
Vegetable Pro <sup>®</sup> /Cotton Pro <sup>®</sup>	66222-15	Makhteshim Agan of North America, Inc	Prometryn
Prometryne 4L	9779-297	Winfield Solutions, LLC	Prometryn
Prometryne 4L	34704-692	Loveland Products, Inc	Prometryn
<b>Formulated Mixture</b>			
Suprend <sup>®</sup>	100-1163	Syngenta Crop Protection, LLC	Prometryn + Trifloxysulfuron

# Example Labeled Use Restrictions Relevant to Endangered Species Assessments

- Maximum individual rates, number of allowable applications, timing
- Geographical and Soil Specific Rate Restrictions
  - Use rates specified in many states
  - Soil-type restrictions are state and crop specific
    - Generally lower rates (or no use in certain states) on sand and sandy loam soils, or lower organic matter; higher rates on all loamy, silt, fine texture soils, or higher organic matter
- Spray Drift Restrictions
  - Spray droplet size/nozzles, wind speed, ground, aerial, and chemigation specific restrictions
- Surface Runoff Restrictions:
  - Do Not apply to water, where surface water is present, below high-tide mark, or where runoff is likely to occur

# Prometryn Maximum Rates and Application Methods

Use	Max. Single Appl. Rate(lb ai/A)	Max. Number Appl. per Year
Celery	2	1
Cotton	2.4	Varies <sup>a</sup>
Dill	1.6	1
Fennel	2	1
Parsley	2	1
Carrot	2	Varies <sup>b</sup>
Celeriac	2	1
Cilantro	1.6	1
Cardoon, Chinese celery, Celtuce, Swiss chard	2	1
Okra	1.5	1
Pigeon Peas	3	1
Rhubarb	2	1

<sup>a</sup> Max 5.5 lb AI/A total per year over the following main application times: Pre-plant (max application of 2.4 lb AI/A); post-emergence (up to 3 applications totaling 2 lb AI/A); lay-by (maximum 1.6 lb AI/A); and winter weed control (maximum 2.4 lb AI/A).

<sup>b</sup> Max 4 lb AI/A total per year over the following main application times: preemergence (max application of 2 lb AI/A); and postemergence (up to 2 applications of 2 lb AI/A)

## Example of Soil/Geography Specific – Restrictions for Cotton, Postemergence Lay-by Application (Cotton must be at least 12" tall)

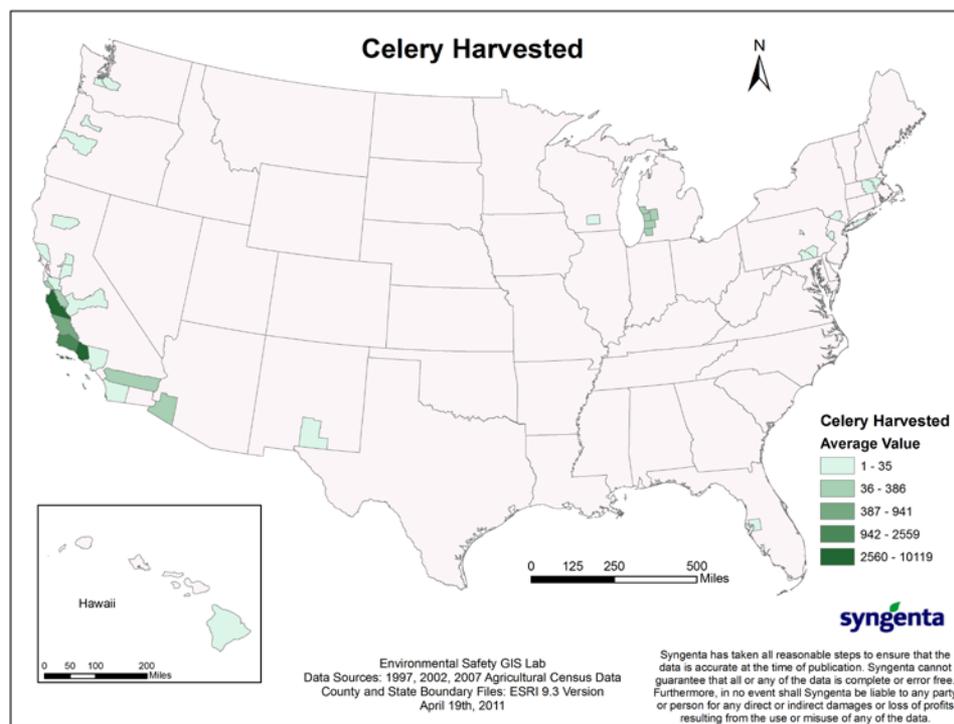
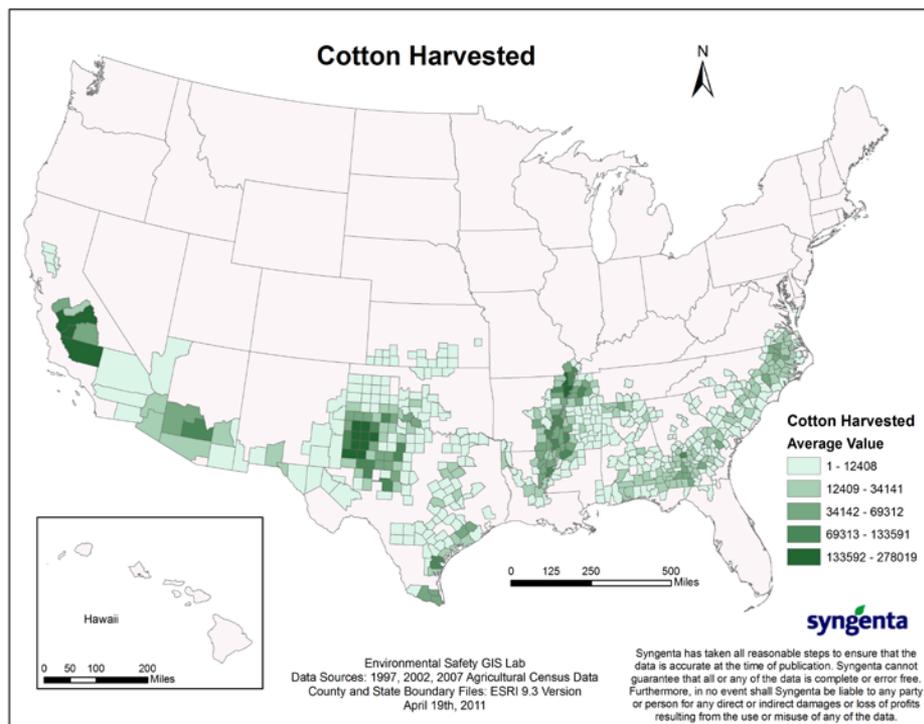
Region	Soil Texture	Broadcast Rate Per Acre
Mid-South and Southeast	sandy	2.4 pts.
	loam	2.8 pts.
	clay	3.2 pts.
Blacklands of OK and TX	loam	1.6 pts.
	clay	3.2 pts.
High Plains of NM and TX	sandy	1.6 pts.
	loam and clay	2.4 pts.
Southwest TX	loam	2.4 pts.
	clay	3.2 pts.
Rio Grande Valley of TX	DO NOT USE	
AZ and CA (Do not use in the Coachella Valley)	sand and loamy sand	DO NOT USE
	sandy loam	2.4-3.2 pts.
	loam	3.2 pts.

# Spray Drift Restrictions

- Apply only as a medium or coarser spray (ASAE standard 572) or a volume mean diameter of 300 microns or greater for spinning atomizer nozzles
- Apply only when the wind speed is 2-10 mph
- Use high flow rate nozzles to apply the highest practical spray volume
- Use the minimum number of nozzles that provide uniform coverage
- Spray drift restrictions for ground boom application:
  - Do not apply with a nozzle height greater than 4 feet above the crop canopy
  - Preplant incorporated or preemergence: use flat fan nozzle tips
  - Postemergence band: use drop extraction tubes off-center nozzle tips
  - Postemergence broadcast: use flat fan or off-center nozzle tips
- Spray drift restrictions for aerial application:
  - Apply aurally for cotton & pigeon peas only
  - Apply at a maximum height of 10 feet above vegetation
  - Use low-drift nozzles at a maximum pressure of 40 psi
  - Apply only when wind speed does not exceed 10 mph
  - Apply at a minimum upwind distance of 400 ft. from sensitive plants
  - When applications are made with a crosswind, the swath will be displaced downwind. The applicator must compensate for this displacement at the downwind edge of the application area by adjusting the path of the aircraft upwind

# Geographic Scope of Prometryn Uses – crop locations

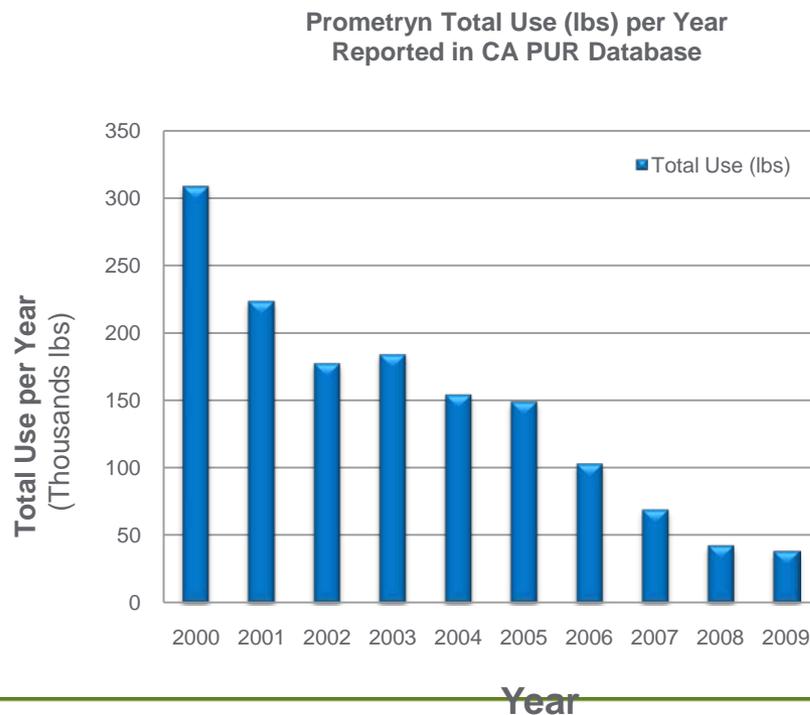
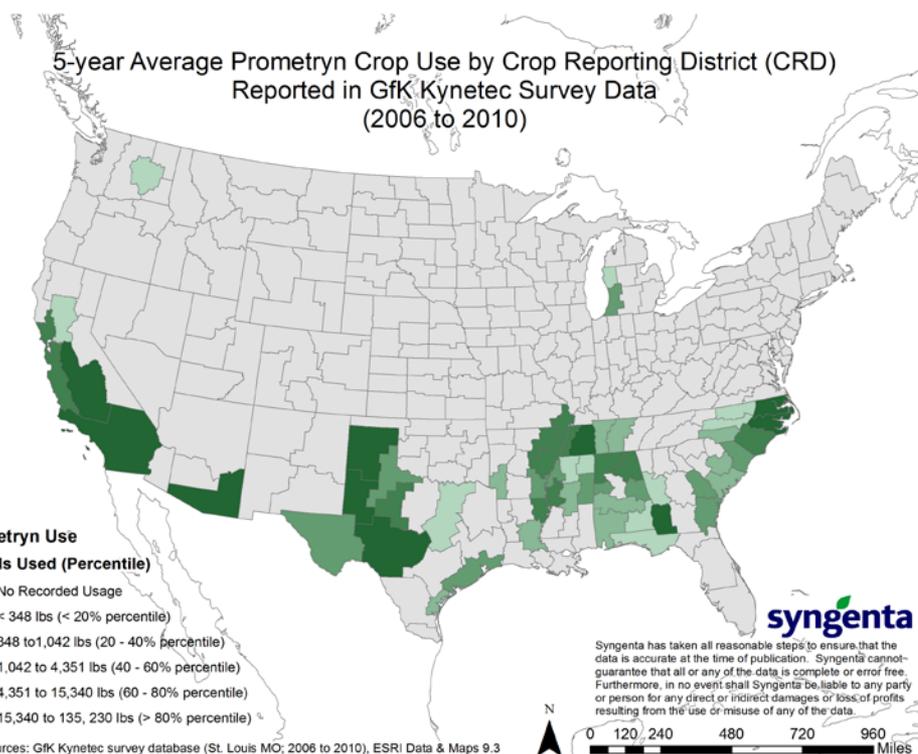
- Registered Crop Uses: Cotton, Celery, and Pigeon Peas (for Puerto Rico only). Recently, new additional crop uses including carrot, celeriac, cilantro, cardoon, celtuce, Chinese celery, Florence fennel, Swiss chard, okra, parsley, and rhubarb were added.
- Permitted for use on a 24c label: parsley and dill (Florida); seed carrot, seed parsley, seed parsnip, and seed dill (Washington); and carrots, parsley, and coriander grown for seed (Oregon).
- Information from growers and other crop experts



\* The maps show cotton and celery production counties reported in the 1997, 2002, or 2007 Census of Agriculture.

# Geographic Scope of Prometryn Uses – use location sources

- GfK Kynetec use survey data provides annual pesticide product use datasets at Crop Reporting District (CRD) level
- California Pesticide Use Reporting (PUR) Data
- Confidential marketing sales data can be shared under CBI
- Information from growers and other experts

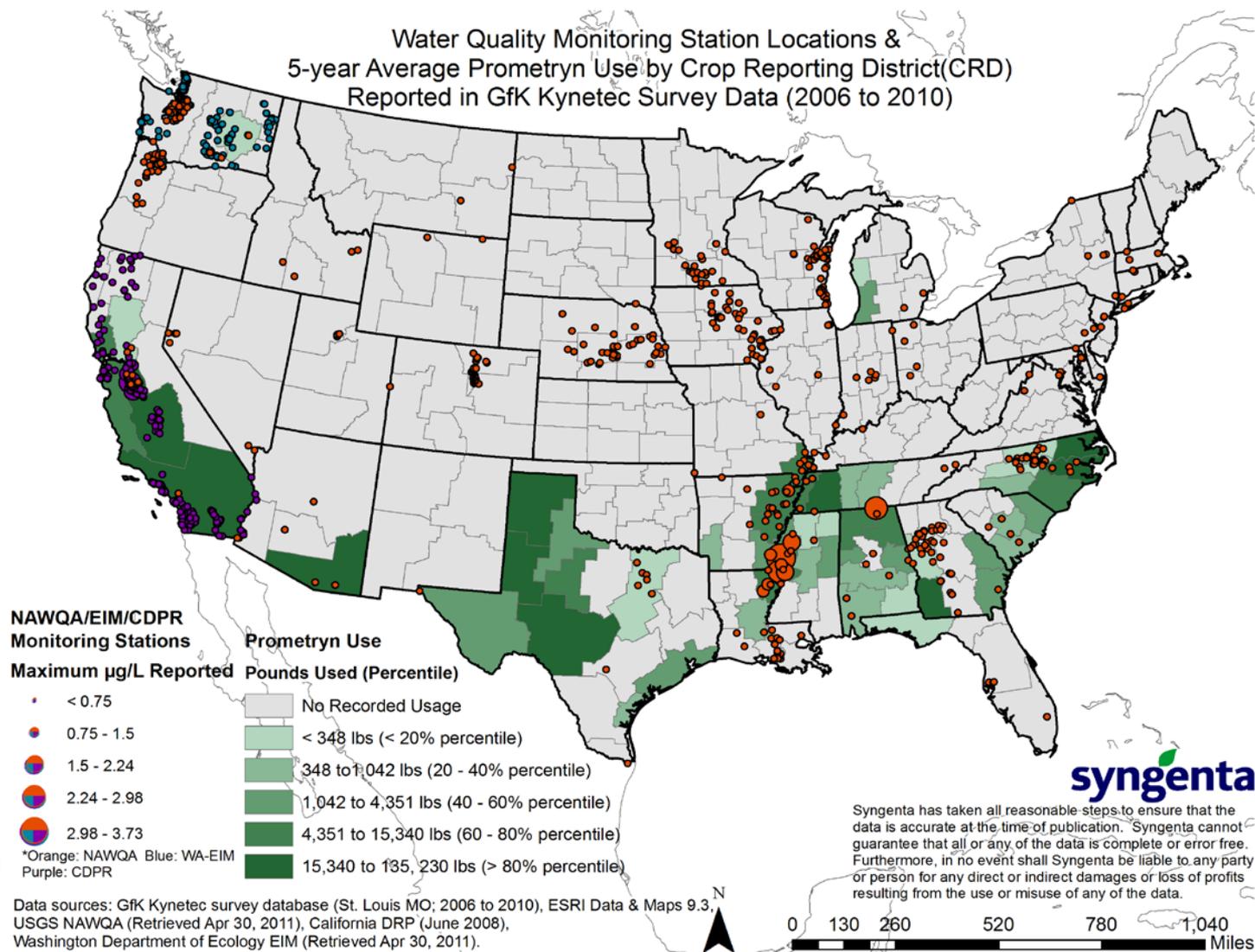


## Prometryn Environmental Fate Data

- Types of registrant data available for prometryn:
  - Physical Chemical properties (water solubility, volatility, etc)
  - Half-life data in soil and water
  - Sorption to soil (Koc, column leaching studies)
  - Terrestrial field dissipation studies (TX and CA, bare ground and planted to cotton)
- Types of literature studies available for prometryn:
  - Physical Chemical properties (water solubility, volatility, etc)
  - Half-life data in soil and water
  - Sorption to soil
  - Runoff and leaching in a field soil

# Example Surface Water Monitoring Data

- USGS NAWQA (8676 samples, 110 samples > 0.1 ppb, 3.7 ppb max)
- CA DPR (1312 samples, 64 samples > 0.1 ppb, 3.13 ppb max)
- Washington State Environmental Information Management (3004 samples, 47 > 0.1 ppb, 0.3 ppb max)



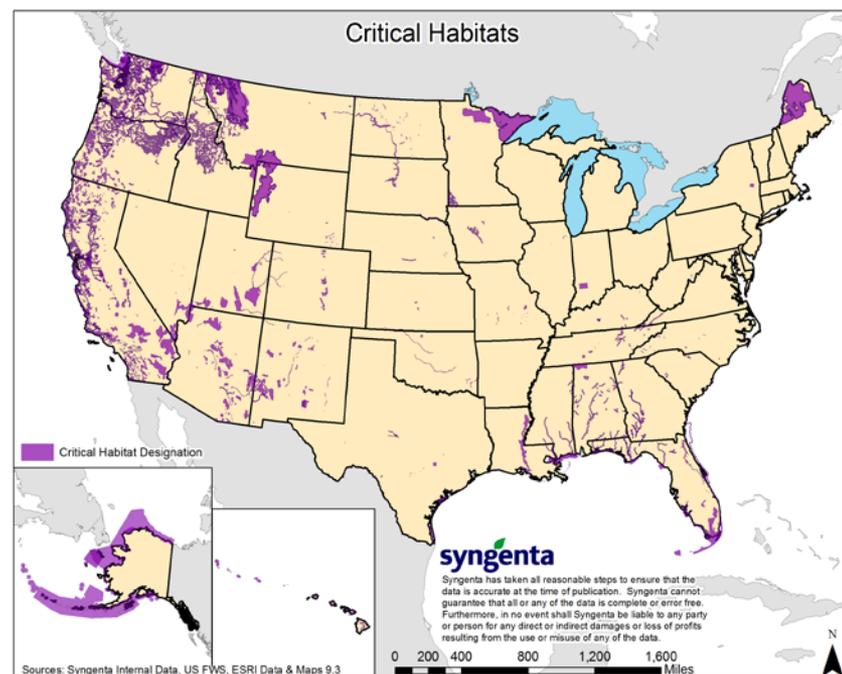
## Prometryn Ecological Effects Data

- Types of data available for animal species
  - Freshwater Fish (96-hour trout, chronic fathead minnow)
  - Marine Fish (96-hour sheepshead minnow)
  - Freshwater Invertebrate (48-hour and 21-day *Daphnia*)
  - Marine invertebrate (48-hour mysid shrimp)
  - Avian acute and chronic reproduction studies (mallard duck and bobwhite quail)
  - Acute and chronic mammalian studies
  - Acute terrestrial invertebrate species (honey bee)
- Types of data available for plant species
  - Seedling emergence and vegetative vigor for representative monocots and dicots.
  - Aquatic plants (freshwater and marine plant and algae studies)
- Other higher tier studies (e.g. mesocosm, plant community studies)

# Geospatial Data and Analysis

## ● Species Information

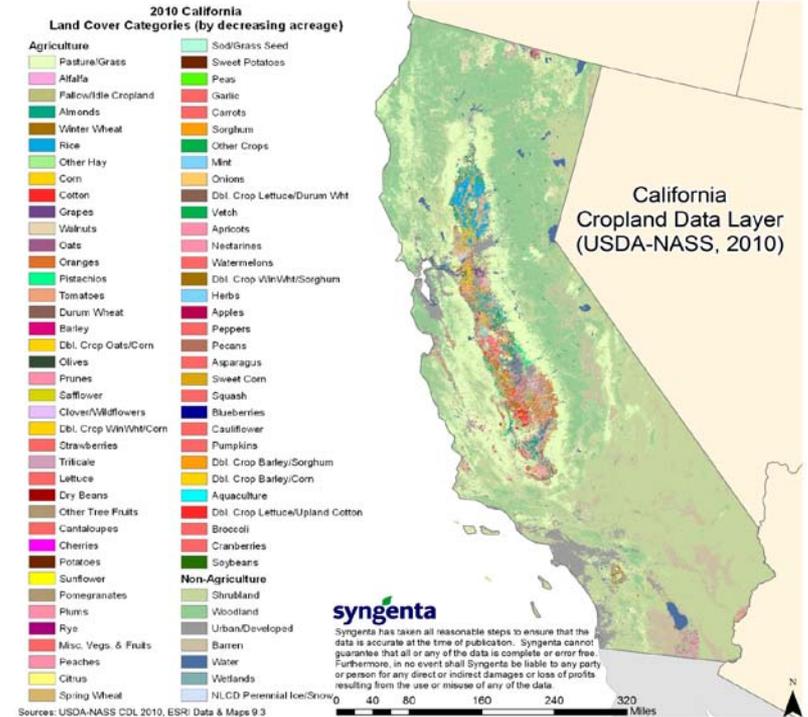
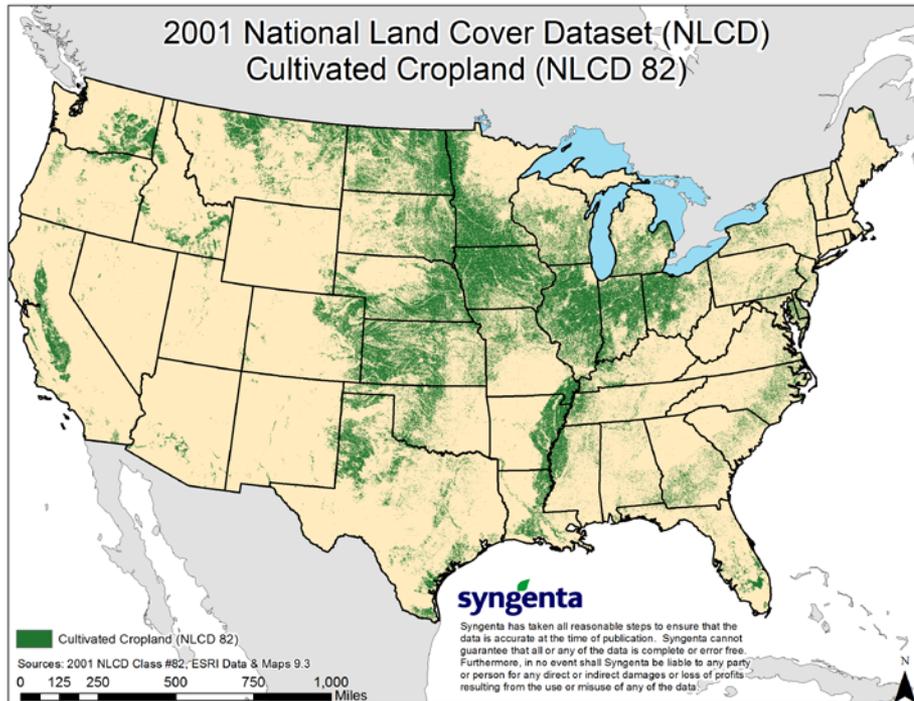
- **Federally Listed Species Information:** U.S. Fish and Wildlife Service Threatened and Endangered Species System (TESS, accessible at URL: [http://ecos.fws.gov/tess\\_public/](http://ecos.fws.gov/tess_public/)) is available to identify all federally listed (endangered, threatened, and proposed) species.
- **Critical Habitats:** Spatial data files (shape files) of the listed species with final or proposed designated critical habitats are available from the U.S. FWS Critical Habitat Portal [URL: <http://criticalhabitat.fws.gov>].
- **Work products of FIFRA Endangered Species Task Force (FESTF)**
  - **Information Management System (IMS):** The IMS system contains the county-level species data provided from US EPA/US FWS and crop data from the USDA Census of Agriculture.
  - **Multi-Jurisdictional Database (MJD):** The FESTF MJD provides an extensive database that contains location-specific information provided by NatureServe, along with its member Natural Heritage Programs and Conservation Data Centers.



# Geospatial Data and Analysis

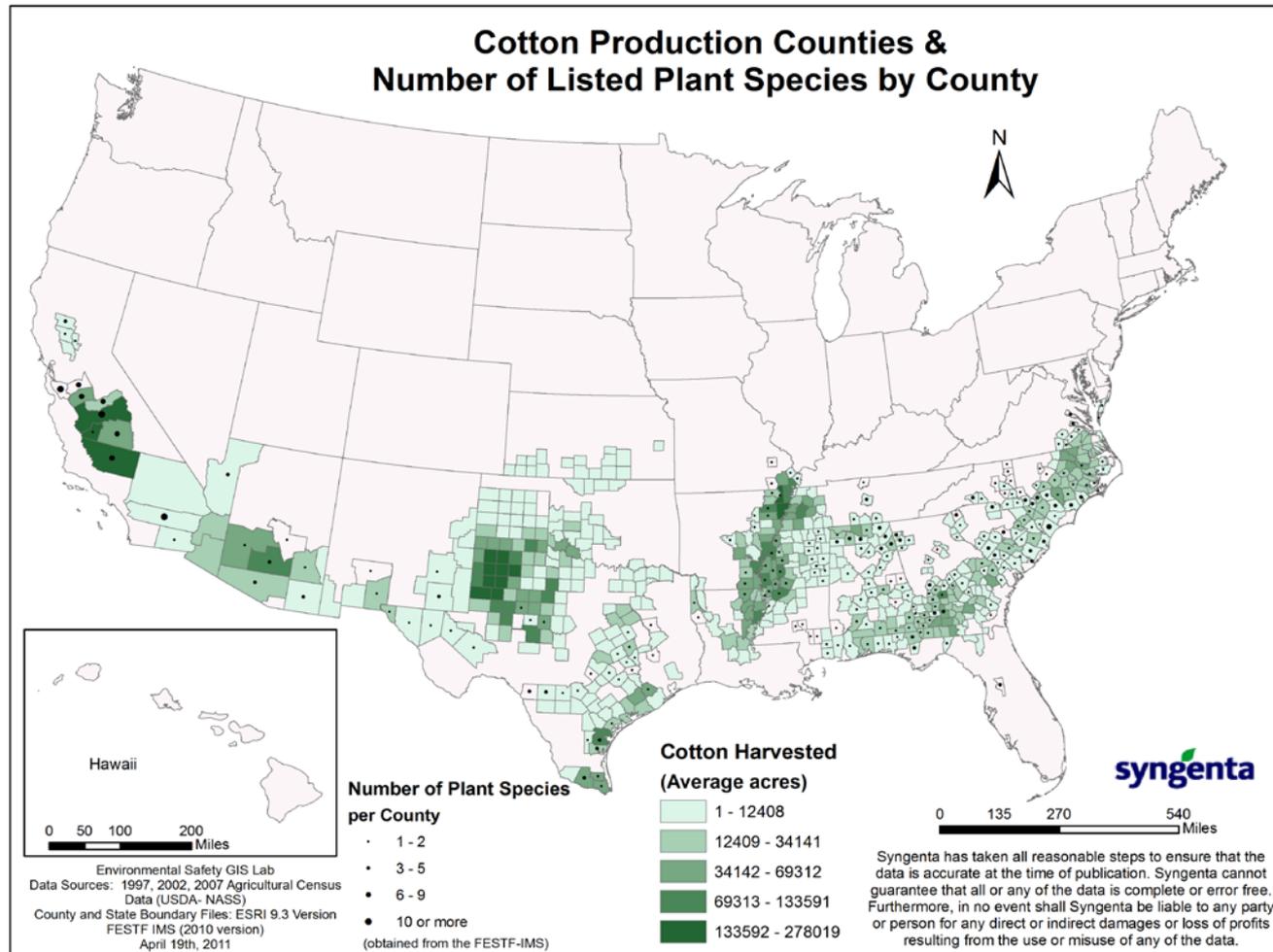
## ● Crop and Land Use Information

- **1997, 2002, or 2007 Census of Agriculture:** Comprehensive agricultural survey data
- **National Land Cover Database (NLCD):** High-resolution spatial data on the location of cultivated land through the US
- **Cropland Data Layer (CDL):** Crop-specific digital data layers. The 2009 and 2010 CDL datasets are currently available for the entire contiguous US.



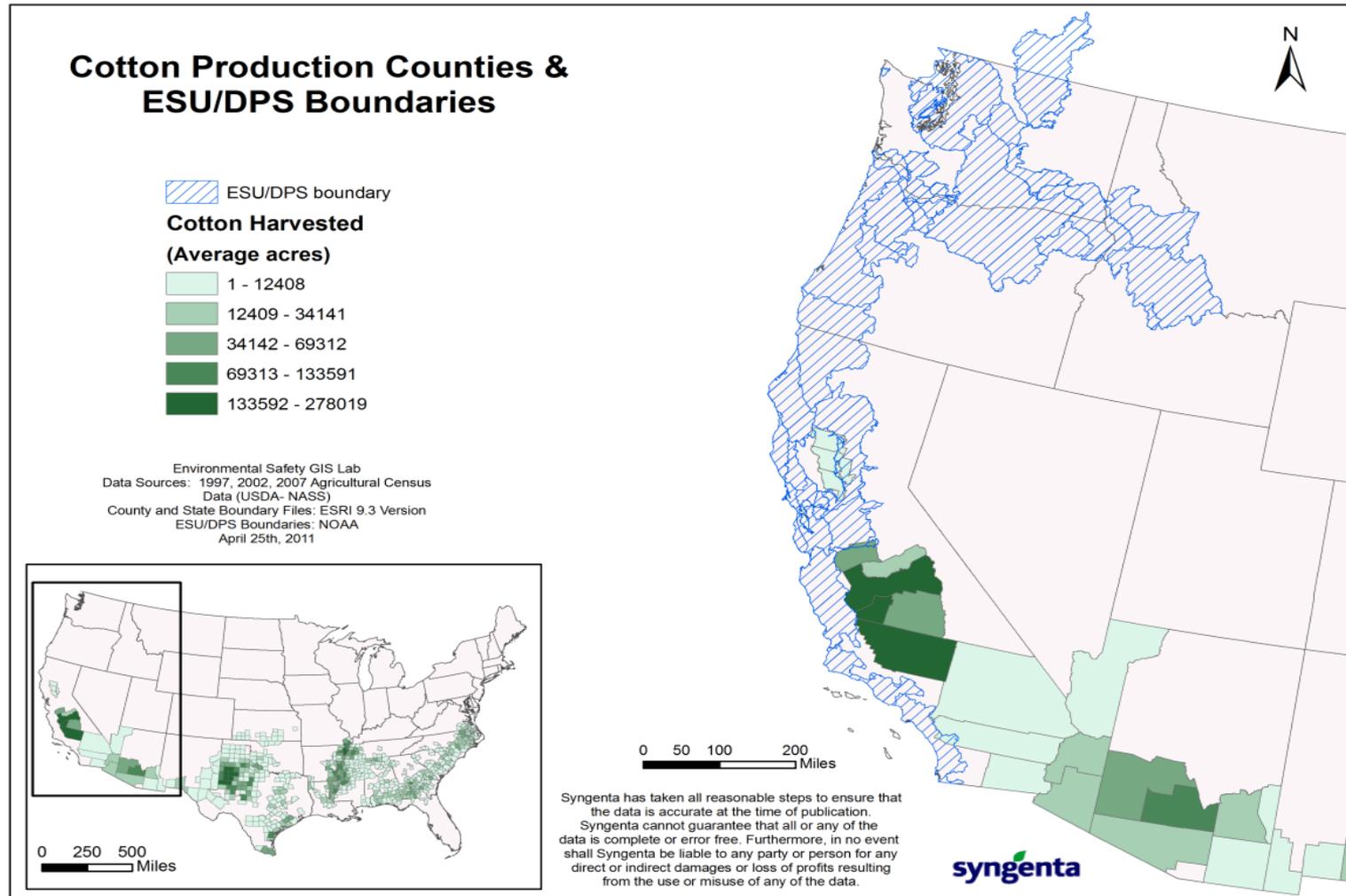
# Co-occurrence Analysis Examples

- Number of listed plant species by county found in cotton growing counties in the US as an example of county-level co-occurrence analysis



# Co-occurrence Analysis Examples

- Cotton growing counties in California in relation to the 28 listed evolutionary significant units (ESUs) and distinct population segments (DPSs) related to five salmonid species; chinook, chum, coho, and sockeye salmon, and steelhead trout as an example map of county-level co-occurrence analysis



# Celery Production Counties & ESU/DPS Boundaries

 ESU/DPS boundary

## Celery Harvested

(Average acres)

 0 - 35

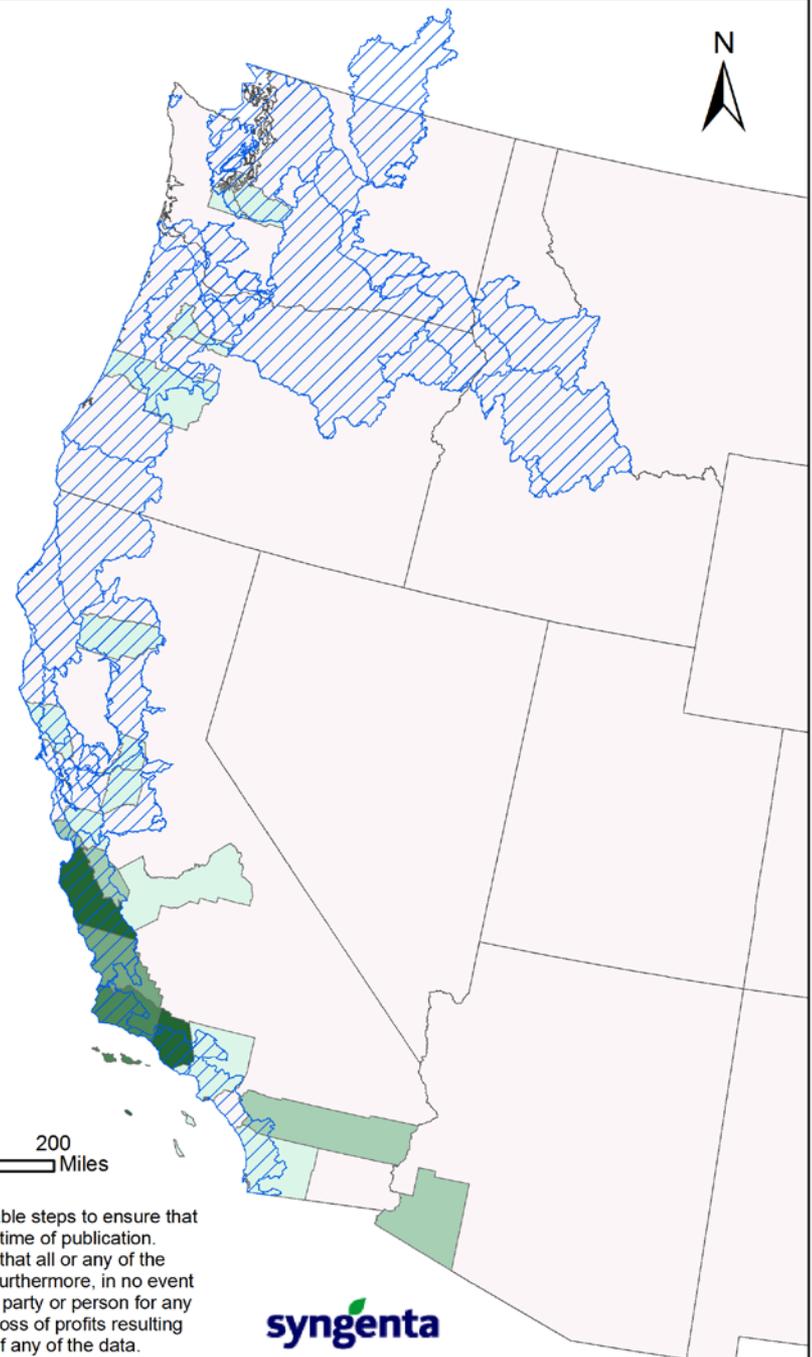
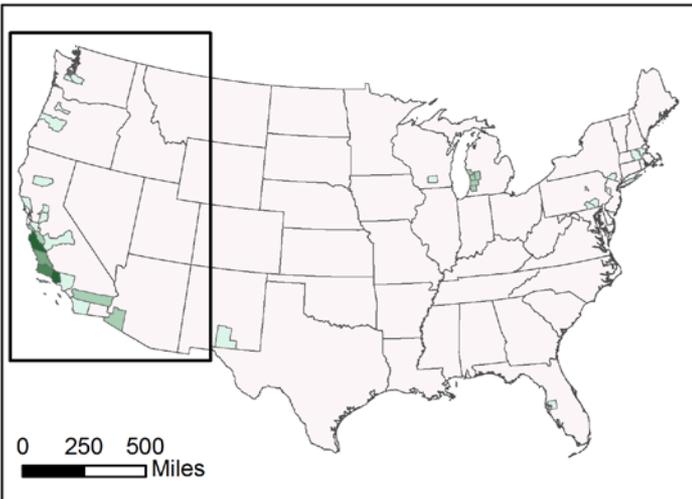
 36 - 386

 387 - 941

 942 - 2559

 2560 - 10119

Environmental Safety GIS Lab  
Data Sources: 1997, 2002, 2007 Agricultural Census  
Data (USDA-NASS)  
County and State Boundary Files: ESRI 9.3 Version  
ESU/DPS Boundaries: NOAA  
May 9th, 2011



Syngenta has taken all reasonable steps to ensure that the data is accurate at the time of publication. Syngenta cannot guarantee that all or any of the data is complete or error free. Furthermore, in no event shall Syngenta be liable to any party or person for any direct or indirect damages or loss of profits resulting from the use or misuse of any of the data.



## Proximity Analysis

- For the species found within registered crop production counties, further refined spatial analysis using high resolution species and crop data are required to understand proximity of species locations to potential crop use locations.
- Site-specific spatial data of species locations from NatureServe MJD database or other species location information (e.g. US FWS critical habitats or salmon habitat stream information from NOAA) can be used to identify the locations of species.
- Land use data from 2001 NLCD (US-EPA) and 2009/2010 CDL (USDA-CDL) can be applied to find potentially labeled crop growing areas.
- As a work product from FESTF, a proximity database including all distance information between EO and NLCD 82 locations is available through the FESTF website (<http://www.festf.org/>).

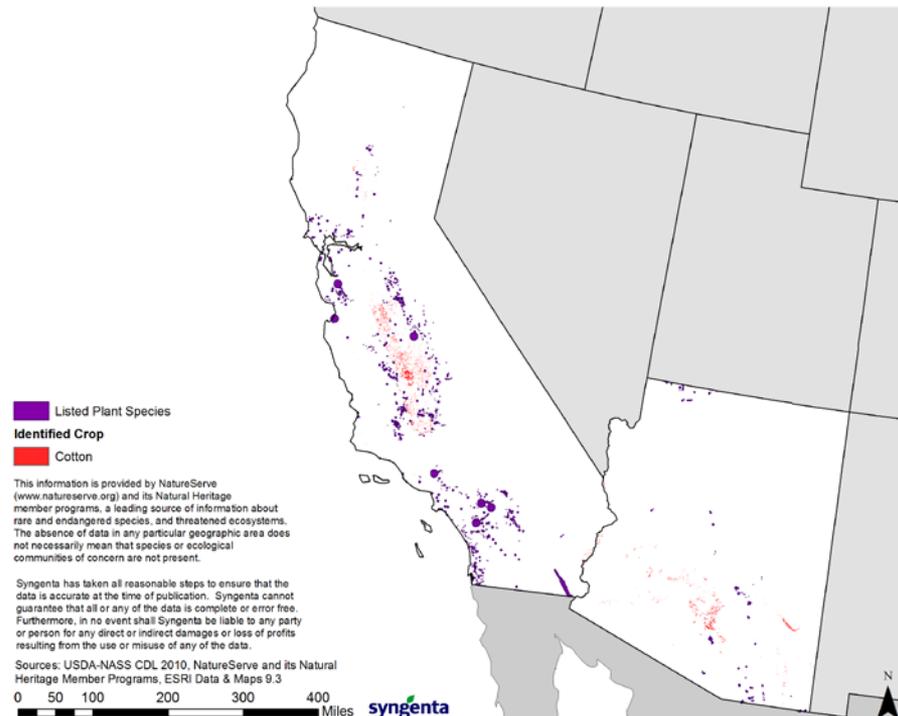
# Refined Spatial Analysis Example

- Comparison of potential use areas estimated by using two different land use datasets of NLCD 82 (cultivated crops including areas used for the production of annual crops) and actual cotton growing areas from 2010 CDL in relation to the listed plant species locations found in cotton growing counties.

## NLCD 82

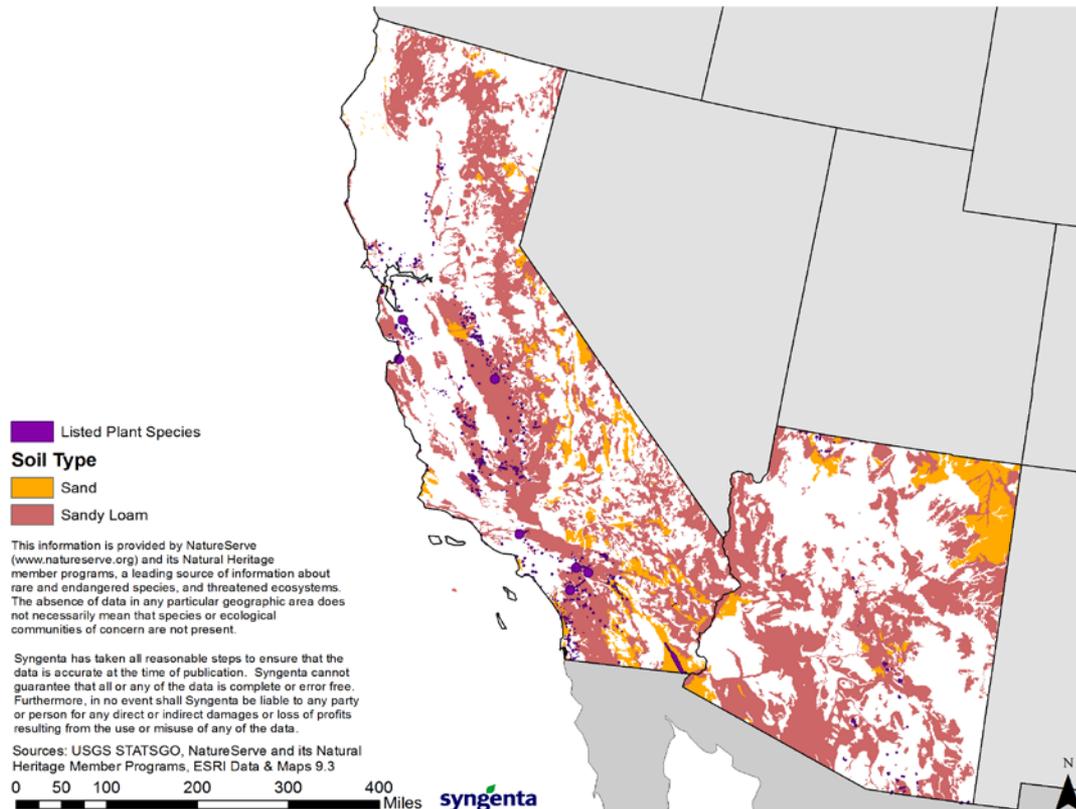


## 2010 CDL



# Refined Spatial Analysis Examples

- **Additional Spatial Data to be Considered for Refinement**
  - **Label use restrictions:** Prometryn label use restrictions vary based on use region and soil texture of a product use field. As an example, Caparol 4L cannot be used on any coarse sandy soils in AZ and CA.
  - **Species habitat requirement:** Elevation data, soil type, climate condition, etc.



**Species/County Selection**

Select by species  
 Select by county

Species: Hidden due to sensitivity  
 County:

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**Results**

**Layer Transparency**

MJD EOs:   
 NLCD Class 82:

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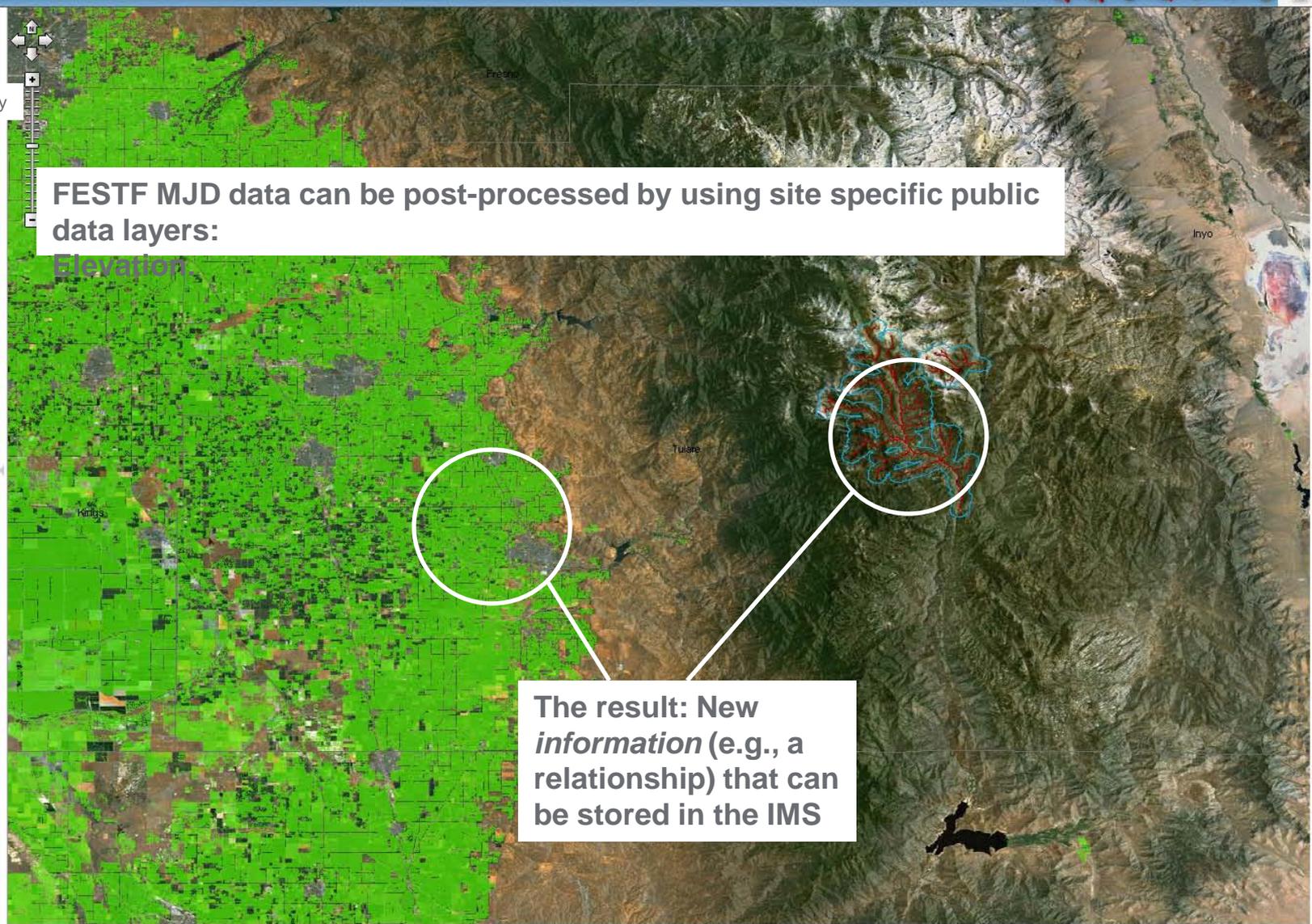
**Map Contents**

States  
 Counties  
 MJD EO Locators  
 MJD EOs (2008/9/25)  
 NLCD Class 82  
 Shaded Relief  
 Streetmap  
 Imagery  
 Topographic Map  
 No base layer

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**Legend**

NatureServe Species Occurrence  
 NLCD Cultivated Crops (Class 82)  
 Species Occurrence Locator



**FESTF MJD data can be post-processed by using site specific public data layers:**

**Elevation**

**The result: New information (e.g., a relationship) that can be stored in the IMS**

# Summary

- Variety of prometryn data exist for initial endangered species assessments including co-occurrence / proximity analysis
- Examples where grower data is important,
  - Actual use rates vs. label maximums
  - Crop location information
  - Crop timing information
  - Geographical scope of uses
  - Potential effects on riparian zones
  - Spray drift reduction and other application methods and practices
  - etc.

Thank you !!!!