The Development of Pesticide Related Spatial Data in California

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GIS and the Pesticide Regulatory Program

• Brief program overview

• The geospatial component - why and how?
  - History and progress
  - What’s involved

• Current status

• Planning for the future
DPR’s Pesticide Regulatory Program is the functional equivalent of the California Environmental Quality Act (CEQA)

- Regulated use of restricted materials require an EIR.
- Program carried out jointly by DPR and County Agricultural Commissioners (CAC) – approx. 325 County inspector biologists.
- Restricted Material Permitting is site, crop, chemical, & time specific.
- The CAC evaluates, mitigates, approves or denies permits; can recommend alternative chemicals or practices.
- Growers must submit a Notice of Intent 24-48 hours prior to any proposed restricted material application.
1. Permits - **Site Identified.** Permit evaluated, issued/denied.
2. Notice of Intent for Restricted Materials - Reviewed by CAC.
3. Pesticides applied by Grower/PCO.
4. All Pesticide Use reported to CAC.
5. **Section-based** Pesticide Use data reported to DPR.
6. DPR disseminates *Section-based* PUR data.
Annual Figures

In California there are approximately:

- 49,000 operator IDs/permits
- 189,000 unique site IDs
- 250,000 notices of intent for restricted materials
- 2,500,000 use records for all pesticides

2002 data
Why use GIS?

- Until recently PUR data collection in the counties had spatial resolution only to a square mile section, which has limited usefulness where distances are < 1 mile.
- PUR data reported to DPR still uses the square mile as the geographic component.
- CACs understand that improving the spatial resolution of pesticide applications from the current square mile section to an actual field site significantly improves their ability to regulate responsibly pesticide use at the appropriate operational scale.
Using section-based data has its limitations. Field-based data improves spatial accuracy.
In 1995 six CACs joined with DPR to establish the Permit Mapping Developers Group.

The group’s purpose was to develop guidelines and recommendations for the integration of GIS into the pesticide permitting and use reporting programs.

One of the key focus points has been to standardize the way permitted sites are defined.

DPR has coordinated this effort and provided leadership, technical expertise, training, and support to the CACs.
How is Spatial Data Collected?

- Field border data are collected by each CAC, therefore data development is dependent on CAC resources.
- To ensure statewide consistency the DPR/CAC Developers Group has developed language for site definitions and guidelines.
- Data acquisition is time consuming and slow and is dependent on the availability of imagery and key base layers.
How is Data Collection Standardized?

Recommendations and guidelines for uniquely identifying permitted field sites using GIS have been developed:

- **Site IDs do not** have to be standardized, but there is a standard format that most CACs are following.
- Ideally a permitted site should be managed by *one* permit holder growing *one* commodity at any *one* time. However, guidelines have been developed for CACs who have to deal with sites where inter-planted commodities are grown, or where multiple growers and commodities are grown on small acreages under short rotation.
- Some CACs are now refining field boundaries to exclude certain features such as farm roads, farm buildings, headlands, etc.
How is Data Collection Handled?

- In most cases, permits must be identified using poor hand drawn maps and questionable information. Once permitted sites are identified in the GIS, permit maps are standardized and the process of permit issuance becomes easier.

- **CAC** biologists use imagery and other data to identify sites, and then digitize them on-screen.

- Using GIS many **CACs** have identified and been able to correct a large number of inconsistencies in their existing **RMPP Database using GIS**.
Using GIS Permit Maps can be transformed from

A hand drawing ————> A digital representation
CACs using GIS in 2004

GIS Programs - 04/04

- Field Borders Complete and Maintained
- Field Borders Complete but not Maintained
- Field Borders under Development
- Use GIS but not developing Field Borders
- Have no GIS
KGIS – ArcView 3.x Online Permit Issuance Application
Kern County
Department of Agriculture and Measurement Standards

Map of October 2003 Chloropicrin Incident

Spic N Span Area
37 people with symptoms
- 26 on 10/3/2003
- 37 on 10/4/2003

Ruben J. Blunt Village
116 people with symptoms
- 12 on 10/3/2003
- 116 on 10/4/2003

0 People with Symptoms in this area

Triage Location
56 people were triaged on 10/4/2003

Chloropicrin Incident Location

1 Home
2 people with symptoms on 10/4/2003

A. Villalobos 10/27/2003
Methyl Bromide Notification
Statewide Permitting and Use Reporting System (SPURS)

• A collaborative effort among DPR and the CACs.
• The goal is to identify and implement a software solution that will support business processes for complying with environmental regulations for pesticide use.
• SPURS will be a GIS-based solution and will provide CACs with the ability to track pesticide use site- and time- specifically.
• Field Border & PUR data will be available through SPURS
DPR’s Long-term Goals

- Continue to implement the Permit Mapping using GIS until it is statewide.
- Continue to address issues of statewide consistency and standards.
- Work cooperatively with other agencies to share data and resources.
- Address centralized shapefile warehousing and distribution issues at DPR.