DPR
Chlorpyrifos Mitigation

Nan Singhasemanon
Sr. Environmental Scientist (Supervisor)
DPR Environmental Monitoring Branch
Surface Water Protection Program

Chlorpyrifos

- Organophosphorus Insecticide – broad spectrum
- Used for many years in California
  - First products registered in early 80's
  - ~20th highest use active ingredient (a.i.) in CA
- Popular pesticide in agriculture
  - Irrigation-season & dormant-season use
  - Urban use until ~2003
- Commonly detected in ag drains & ag effluent-dominated water bodies. Not a GW concern.

Historical Monitoring

- Extensive ag monitoring
  - Particularly in Central Valley, Central Coast & Imperial Valley
- 1991-2010: detected in 2,413 of ~11,000 samples (21%).
  - USEPA's Water Quality Criteria of 0.04 µg/L was exceeded in 840 (7%)
- After ~2003, urban detections fell sharply, but ag detection continued
- Much early Ag data from wet season

Early DPR Mitigation

- Chlorpyrifos Ag product reevaluation in 2004
  - DPR & CVRWQCB → reduction necessary to meet proposed TMDL targets
- DPR engaged with registrants to:
  - Identify mechanisms of off-site movement
  - Identify mitigation strategies to reduce/eliminate concentrations in surface water
- 2006 DPR adopted Dormant Spray Regulations (CCR3 §6960) to reduce use in winter season
  - Apply dormant oil, biocontrol agent or apply to hydrologically-isolated site, or divert to recirculating system or hold runoff for 72 hours before release
  - Otherwise, requires: written recommendation from licensed PCA, 100-ft. buffer, wind speed restriction. Aerial applications discouraged. No application if rain expected within 48 hours before <u>or after</u> planned application.

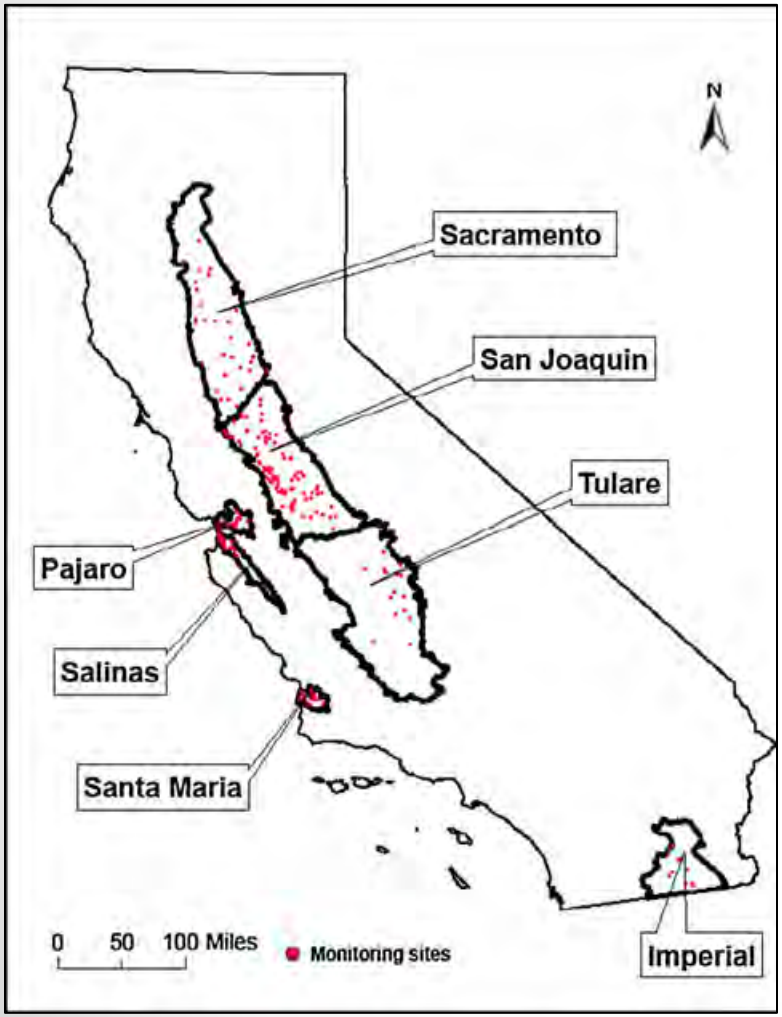
Post Dormant Spray Regs

- In 2006, buffer zones (25-150 ft.) & reduced application rates also added to product labels (US EPA)
- Monitoring continued…
  - 2005-2007 Central Valley, 2006→ Central Coast & Imperial Valley
- TMDL development continued:
  - Sacramento R./Feather R. (2003), San Joaquin R. (2005), Delta (2006), Salinas R. (2011), Pajaro R., (2013)…
- Irrigated Lands Regulatory Program being implemented in Central Valley (2003) & Central Coast

DPR Data Analysis

- In 2010, DPR revisited chlorpyrifos data that accumulated after 2006
  - DPR, Water Boards & USGS data
- Use & detections in dormant season ↓ but <u>in-season use & detections persisted</u>
- DPR investigated processes & factors that contributed to off-site movement
  - More specifically to identify use scenarios: commodities, application methods & irrigation methods → frequent detections
- Looked at 7 major CA Ag regions (2,495 samples, 222 sites)

Areas of Concern



Region	sites	samples	Detect %	Exceed %
Santa Maria	19	84	79.8	57.1
Imperial	15	72	47.2	30.6
Salinas	20	241	44.0	26.1
Pajaro	21	68	17.6	13.2
San Joaquin	96	1575	12.9	6.5
Sacramento	35	352	5.1	0.6
Tulare	16	103	1.0	1.0
All Regions	222	2495	17.7	9.9

[a] The lowest U.S.EPA benchmark of 0.04 µg/L was used to determine number of exceedances.

DPR Irrigation-Season Mitigation

- Analysis showed:
  - Areas of concern → Central Coast > Imperial Valley > Central Valley
  - Factors that lead to offsite movement: use intensity, crop type, irrigation method, timing of application
  - Central Coast, significant scenario = cole crop use (broccoli & cauliflower)
  - Imperial = sugar beets
  - Central (SJQ) Valley = alfalfa, corn & asparagus
- Mitigation Priority #1 = Central Coast cole crops
- 2012, DPR & Central Coast CACs formed workgroup
  - Goal: to evaluate regional chlorpyrifos use & develop use limitations or management practices that may serve as <u>conditions</u> for restricted materials permit

Central Coast Workgroup

- Included experts in:
  - Irrigation management, cole crop pest management, entomology, local water quality, mitigation research & Region 3 staff (Peter Meertens)

- Group reviewed monitoring data & considered/discussed management practices as options
  - No-use buffer zones
  - Application equipment shut-off technology
  - Water/Irrigation management
  - Runoff filtration/treatment
  - Use of alternative pesticides
  - Pest Control Advisor recommendation to use
  - Applications under supervision of a DPR certified applicator

- DPR also met with SJQ Valley CACs & Imperial Co. CAC to discuss monitoring data & potential mitigation in those areas

DPR Rulemaking

- 2014 - Due human health & water quality concerns, DPR increased internal discussion of the designation of chlorpyrifos Ag products as CA Restricted Materials
  - Designation proposed September 2014
  - Became effective July 2015 (CCR Title 3, Section 6400)

- Designation =
  1) must now obtain a permit to buy & use
  2) applications made by or under the supervision of a certified applicator
  3) a valid written recommendation from a licensed Pest Control Adviser

- Recommended Permit Condition =
  - "Incorporate or clean-up granules that are spilled during loading or are visible on the soil surface in turn areas."

- 25-150 ft. no spray buffer already exists on product labels(USEPA 2006)

Where Now for Chlorpyrifos?

- PUR shows that use in some areas have been decreasing
  - Central Coast since 2010 (Ag Order tiered requirements?)
- DPR will continue monitor use & water quality to assess cumulative impacts of DPR, Water Boards, & USEPA regulatory actions
  - Latest data 2014: 22% detection rate, 15% benchmark exceedance frequency. Noticeable drop in 2012…
- Latest… USEPA recently issued proposed rule to <u>revoke ALL tolerances</u> for chlorpyrifos.
  - Tolerances are needed for use on Ag commodities. If finalized, Ag use would end
  - Final rule expected December 2016 → 2017 ?

Thank you…