California Environmental Protection Agency
Department of Pesticide Regulation

Update on Volatile Organic Compound Emissions from Pesticides

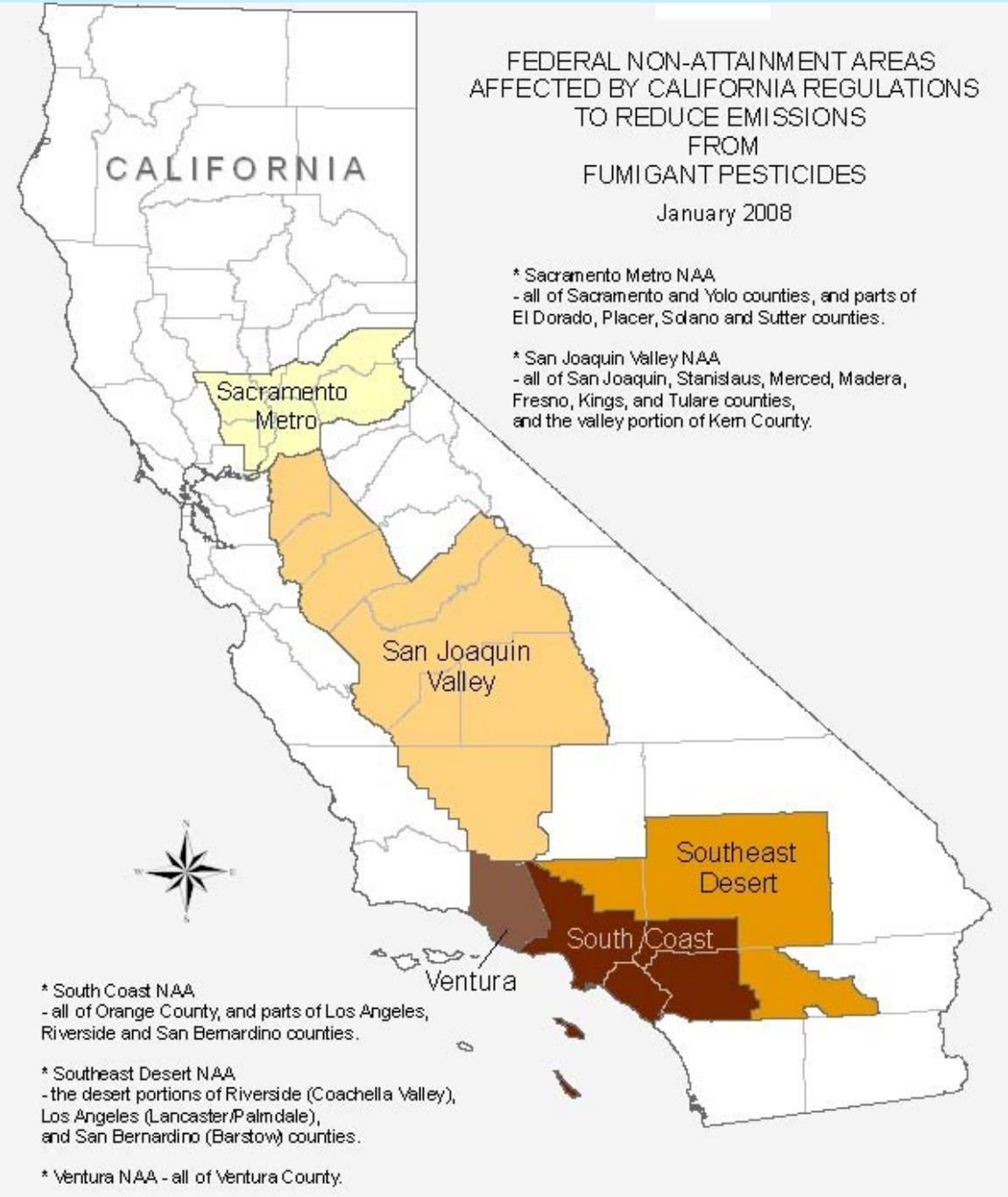
January 2014

Overview

- Background
- Pesticide VOC emissions inventory
- Fumigant VOC regulations
- Nonfumigant VOC regulations

Background

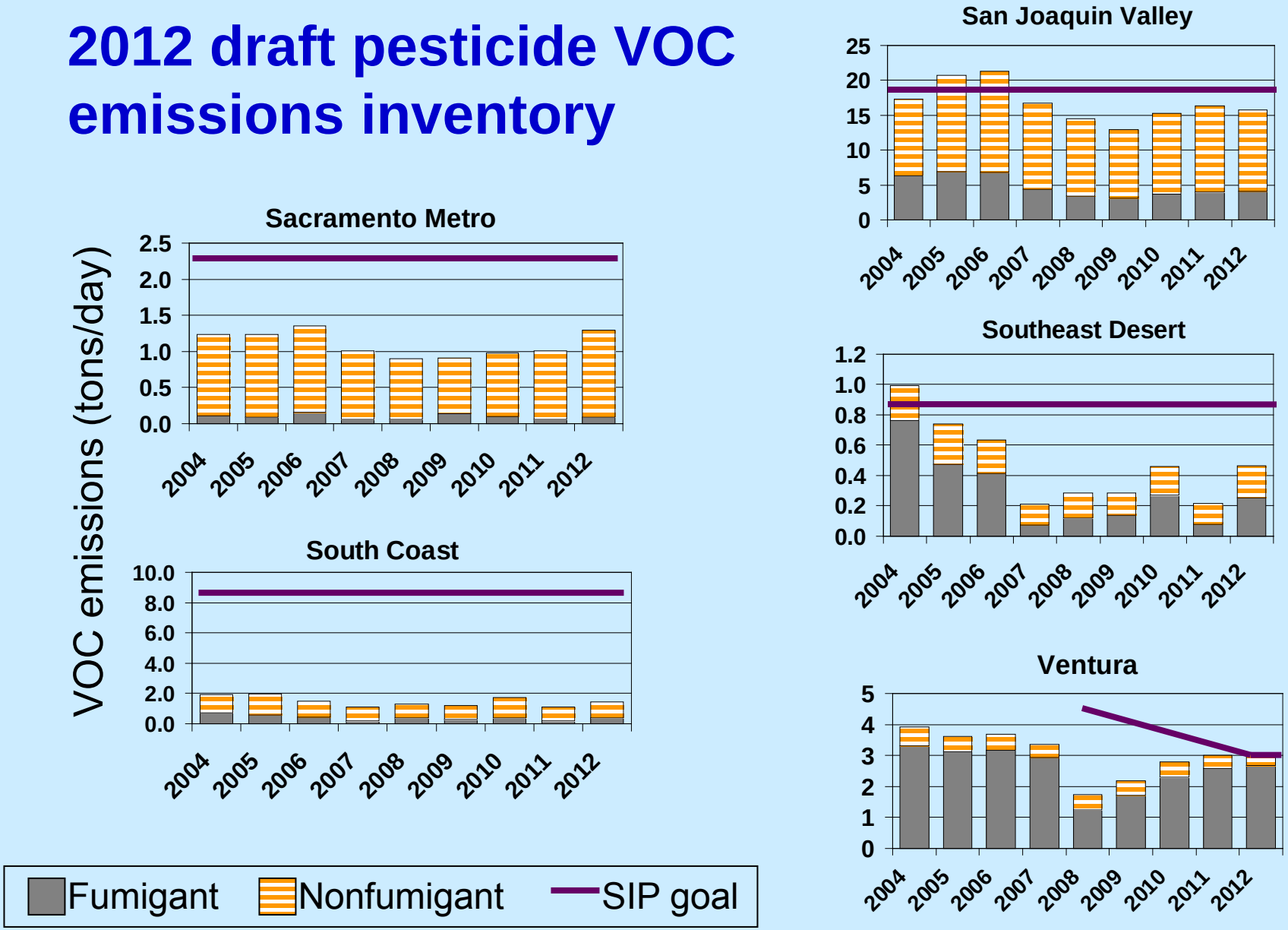
- Volatile organic compounds (VOCs) and nitrogen oxides (NOx) react with sunlight to form ozone
- The state implementation plan (SIP) for the Clean Air Act describes measures to reduce VOCs and NOx to achieve ozone standard, and requires DPR to
  - Develop and maintain an inventory to track pesticide VOC emissions in five nonattainment areas
  - Reduce pesticide emissions by specified amounts during May-Oct peak ozone season
  - Require low-emitting fumigation methods
  - Implement restrictions on nonfumigant pesticides for the San Joaquin Valley by 2014


FEDERAL NON-ATTAINMENT AREAS
AFFECTED BY CALIFORNIA REGULATIONS
TO REDUCE EMISSIONS
FROM
FUMIGANT PESTICIDES
January 2008
CALIFORNIA
* Sacramento Metro NAA
- all of Sacramento and Yolo counties, and parts of
El Dorado, Placer, Solano and Sutter counties.
* San Joaquin Valley NAA
- all of San Joaquin, Stanislaus, Merced, Madera,
Fresno, Kings, and Tulare counties,
and the valley portion of Kern County.
Sacramento
Metro
San Joaquin
Valley
Southeast
Desert
South Coast
Ventura
* South Coast NAA
- all of Orange County, and parts of Los Angeles,
Riverside and San Bernardino counties.
* Southeast Desert NAA
- the desert portions of Riverside (Coachella Valley),
Los Angeles (Lancaster/Palmdale),
and San Bernardino (Barstow) counties.
* Ventura NAA - all of Ventura County.

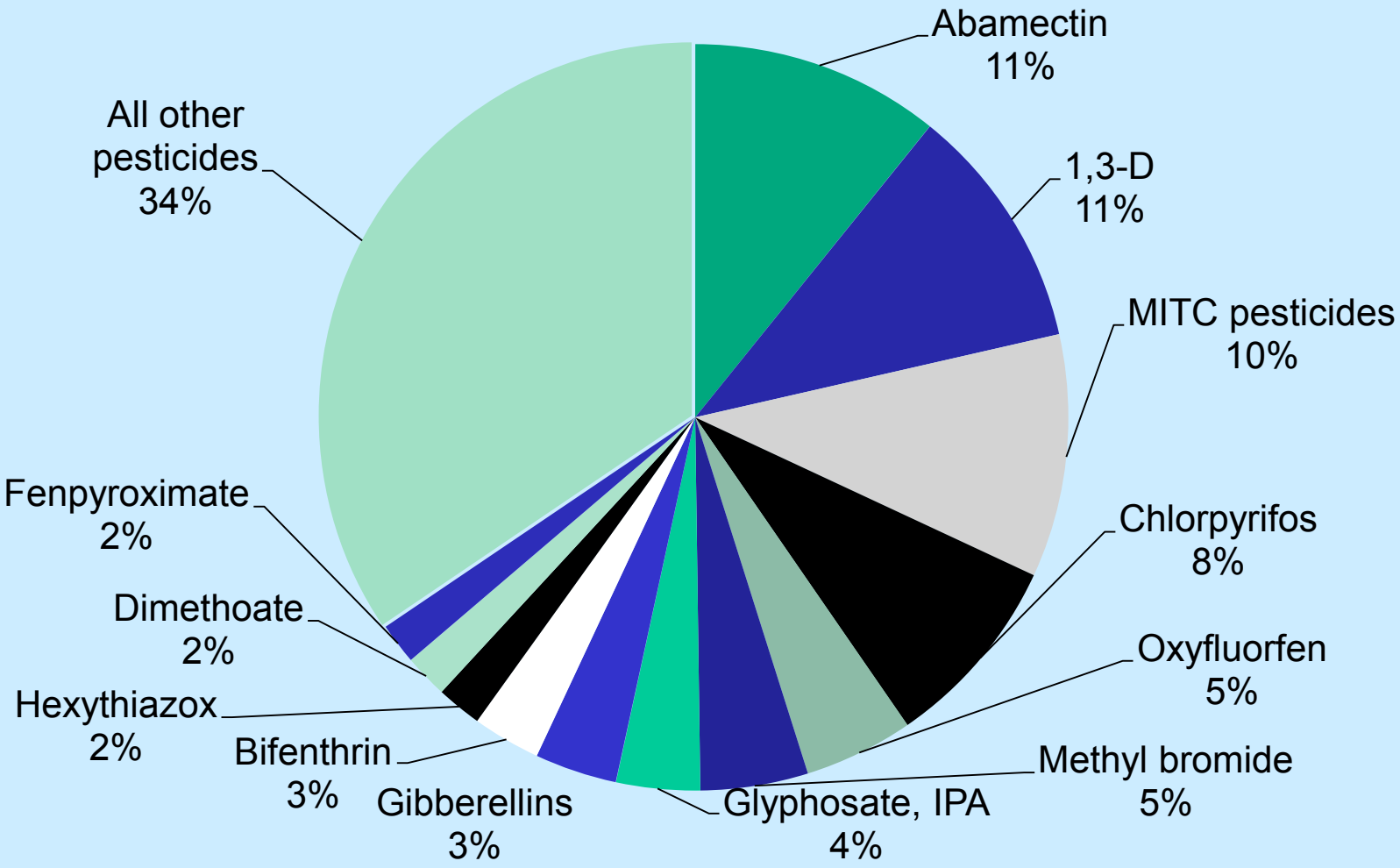
Pesticide VOC emissions inventory

- VOC emissions from a pesticide product are calculated by multiplying:
  - Amount of product applied (from pesticide use reports)
  - VOC fraction in product (emission potential, EP), determined by thermogravimetric analysis (TGA) and other methods
  - Fumigants are adjusted by an additional factor to account for emissions under field conditions
- Most pesticide VOC emissions from
  - Fumigants
  - Emulsifiable concentrate products (mainly inert ingredients)

2012 draft pesticide VOC emissions inventory



Top pesticide VOC products for San Joaquin Valley, May-October 2012 (draft)



Emissions inventory issues

- Default EPs for glyphosate products
- Fumigant VOC tracker error
  - DPR Excel file used to track fumigant emissions in Ventura
  - Error in one of the application method adjustment factors led to underestimation of emissions, error corrected
- Duplicate 2012 pesticide use reports for fumigations
  - A pest control business submitted duplicate pesticide use reports for several fumigations in several counties
- Accepting comments on draft report for 2012 until 1-24-14

2008 fumigant VOC regulations

- "Low-emission" fumigation methods required during May-October ozone season in San Joaquin Valley, Southeast Desert, Ventura
- Backup measure if trigger level (95% of SIP goal) exceeded: fumigant VOC emissions limit
  - Currently required in Ventura
  - San Joaquin Valley has different backup measure
- DPR required to publish annual pesticide VOC emissions inventory report, including determination if trigger level exceeded

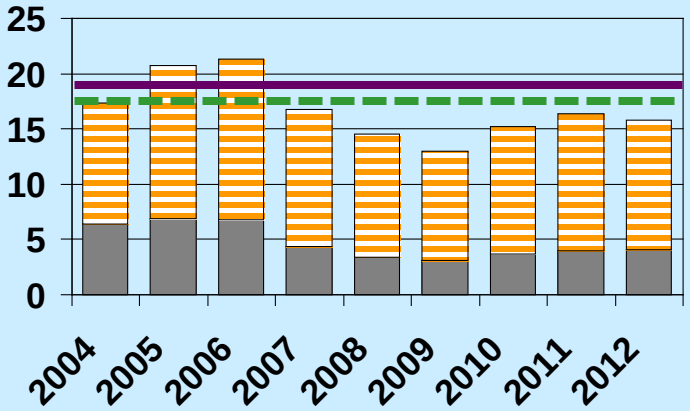
New fumigation methods

- Issued interim approval to allow use of methods with totally impermeable film (TIF, tarps with 60% buffer credit)
  - To allow TIF permanently, DPR should notice regulations for public comment in late 2014

Fumigant	Emissions With Std Tarp (% of applied)	Emissions With 60% Tarp (% of applied)
Chloropicrin	12-64	7
1,3-D	26-65	10
Me Bromide	48-100	No change-insufficient data

Need for nonfumigant restrictions in San Joaquin Valley

- SIP requirement – “DPR will implement restrictions to reduce VOC emissions from nonfumigant pesticides by 2014.”
- San Joaquin Valley SIP emissions limit (18.1 tpd) – fumigant regulations alone may not achieve goal in high use year
- Avoid triggering a fumigant limit for San Joaquin Valley (17.2 tpd) – replace with different restrictions



Nonfumigant VOC regulations effective 11-1-13

- VOC content (EP) thresholds specified to designate certain agricultural products as “high-VOC” or “low-VOC”
- For high-VOC products used in San Joaquin Valley
  - Pesticide dealer required to provide information to purchasers
  - Growers required to obtain a pest control adviser (PCA) recommendation for some applications
- Backup measure if trigger level exceeded in San Joaquin Valley: prohibition of several uses of high-VOC nonfumigant products

Designating high-VOC and low-VOC products

- Restrictions on agricultural products containing top 4 nonfumigant VOC contributors in San Joaquin Valley
  - Low-VOC products feasible for most uses
  - Switching to low-VOC products achieves target reductions

Active Ingredient	VOC EP Threshold	Example High-VOC	VOC EP	Example Low-VOC	VOC EP
Abamectin	**35%**	Agri-Mek EC	55%	Agri-Mek SC	6%
Chlorpyrifos	**25%**	Lorsban 4E	50%	Lorsban Advanced	18%
Gibberellins	**25%**	Falgro 4L	94%	Falgro LV	18%
Oxyfluorfen	**15%**	Goal 2XL	62%	Goaltender	8%

dpr

Pesticide dealer requirements

- Always in effect
- All dealers statewide must provide specified VOC information in writing to purchaser if selling
  - High-VOC product containing abamectin, chlorpyrifos, gibberellins, or oxyfluorfen; and
  - For use in San Joaquin Valley
- No requirements for sale of low-VOC products

Grower and pest control adviser requirements

- Grower must obtain a PCA recommendation if
  - Use a high-VOC product containing abamectin, chlorpyrifos, gibberellins, or oxyfluorfen; and
  - Applied in San Joaquin Valley during May 1 - Oct 31; and
  - Application to
    - Alfalfa
    - Almonds
    - Citrus
    - Cotton
    - Grapes
    - Pistachio
    - Walnuts

    - **These crops account for >90% of emissions from the 4 AIs**
    - **Switching to low-VOC products achieves VOC target emissions**
    - **Feasibility of low-VOC products for other crops uncertain**

- Backup measure: if emissions exceed 95% of SIP goal, most applications above are prohibited for upcoming May-Oct

Exceptions if high-VOC prohibitions triggered

- Low-VOC products are not always feasible
- With PCA recommendation, high-VOC products can be used for
  - Chlorpyrifos to control aphids on cotton
  - Gibberellins applied at ≤16 grams active ingredient/acre
  - Oxyfluorfen applied at ≤0.125 (1/8) pounds active ingredient/acre
  - Section 18 or 24(c) applications
  - USDA/CDFA invasive pest requirements (e.g., ACP quarantine)
  - Applications with precision sprayer (NRCS criteria)

Key points

- Draft 2012 pesticide VOC emissions complied with SIP goals in 4 of 5 nonattainment areas
  - Ventura exceeded SIP goal due to error in fumigant tracking system, error corrected
- Fumigant regulations
  - Additional emissions reductions due to interim approval of TIF methods
  - DPR will begin rulemaking in 2014 to permanently add TIF methods
- Nonfumigant regulations
  - Effective 11-1-13
  - Sales and use requirements for high-VOC products containing the top 4 nonfumigants in San Joaquin Valley

Additional information and questions

- DPR web site
  - www.cdpr.ca.gov
  - “Quick Links” tab
  - Click on “VOCs”
- Contact
  - Randy Segawa
  - 916-324-4137
  - rsegawa@cdpr.ca.gov