

Ecological Valuation and Dairies in the San Joaquin Valley: A Regional Perspective

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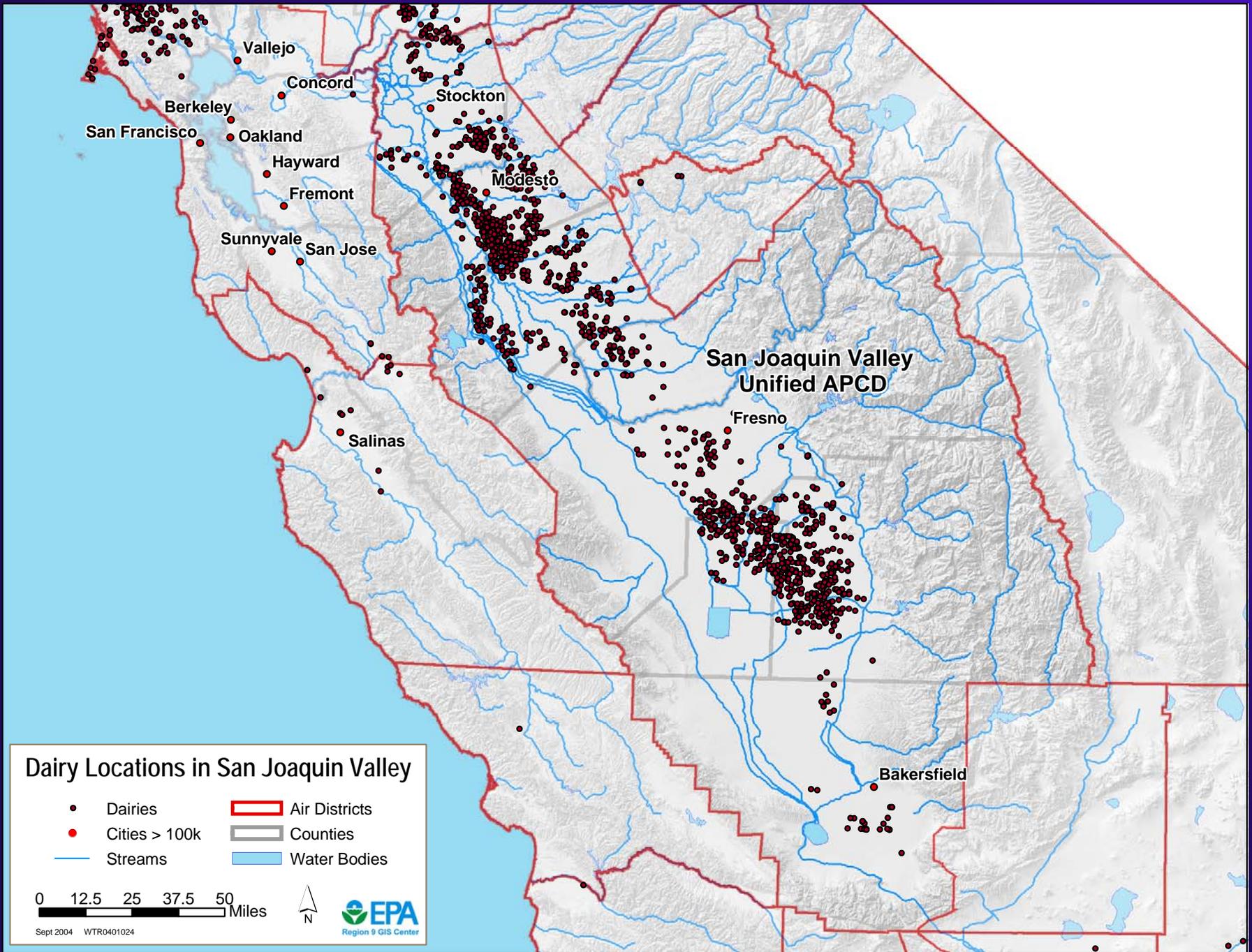
Overview

- **Background on dairies in the San Joaquin Valley and their ecological impacts**
- **Describe Region and State's role in the valuation of ecological systems in relation to dairies**
- **Discuss Region 9's science needs and priorities**

Background

California's San Joaquin Valley

- *1.2 million cows*
- *1550 dairies*
- *dairies contribute \$3.2 billion to economy*
- *3.2 million people*
- *altered ecosystem*
 - *hydromodification (e.g., water diversions, network of irrigation canals)*
 - *large-scale farming operations and agricultural inputs*
 - *urbanization*



Dairy Impacts on Ecological Systems in the San Joaquin Valley

Surface Water

- ***discharges not common in semi-arid SJV***
- ***increased nutrients, sediment, pathogens, salts***
- ***eutrophication, reduced dissolved oxygen, impairments to sensitive aquatic life***

Ground Water

- ***overapplication of manure nutrients to cropland; nitrate and salt contribution to surface water recharge***

Emerging Potential Contaminants

- ***pharmaceuticals (e.g., hormones, antibiotics)***

Impacts

■ Air Quality

- *Ambient Ozone can damage sensitive plant species (e.g., cotton, plants in National Parks)*
- ***Uncertainty** about emissions of Volatile Organic Compounds – linked to ozone formation*
- *Particulate Matter deposition on foliage increases mite populations and pesticide use*

■ Global Warming

- *Methane emissions; long-term impacts?*

Ecological Valuation and the CAFO Rule

- Valuation of CAFO Rule's ecological benefits determined on a national scale during adoption of the Rule.
- Region oversees implementation and insures minimum requirements met by state permitting authority.
- Further quantification of ecological benefits will not be undertaken by Region or state when CAFO permit adopted by permitting authority .

Will the CAFO Rule Benefit Ecological Systems in the San Joaquin Valley?

YES ... but those benefits will not be quantified using ecological indicators ... instead ...

- *Sources permitted*
- *Nutrient management plans implemented*

State Consideration of Ecological Systems

California Environmental Quality Act requires that new dairies assess potential impacts on biological resources, e.g.,

- *loss or degradation of:*
 - *native or naturalized habitats*
 - *vernal pools and wetlands*
 - *aquatic life*

State Consideration of Ecological Systems

Consistent with the Clean Water Act, State **Basin Plans** include water quality objectives and “beneficial uses,” including ...

- *Freshwater Habitat*
 - *Rare, Threatened, or Endangered Species*
 - *Preservation of Biological Habitats of Special Significance*
- r** However, the state does not monetize ecological benefits during Basin Plan process

Science Needs and Priorities

- *Identify and demonstrate technologies that mitigate cross-media environmental impacts from dairies*
- *Dairy Manure Collaborative*
 - minimize air and water impacts
 - maximize energy capture (e.g., digesters)
 - *and ... maximize benefits to ecological systems?*

Science Needs and Priorities

- **Region's current emphasis ...**
 - *Better emission estimates of volatile organic compounds at dairies*
 - *Better tools to evaluate ground water impacts and nutrient management plan effectiveness*
- **Top 10 AFO Science Questions**
 - *ORD-led effort with regional input*
 - *Indicator of national research needs in relation to ecological systems*

Science Needs and Priorities

Options for Valuation of Ecological Systems

- *Improve baseline information on ecological systems*
- *Use bioindicators as a surrogate for quantifying value of recreational use*
- *Create a Biological Index as a measure of the quality of an ecosystem*
- *Understand relationships within the ecosystem*
 - e.g., algal blooms: how much is too much?
- *Develop tools to communicate science*

Thank you!