

California's Water Market

Ellen Hanak and Liz Stryjewski

Supported by the S.D. Bechtel, Jr. Foundation

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Our Focus: Water Marketing and Groundwater Banking

- **Water marketing:** temporary, long-term or permanent trades of water-use rights
- **Groundwater banking:** storage of surface water in aquifers in wet years for use in dry years
- Why these tools matter for California:
 - Reducing costs of drought
 - Accommodating shifts in demand
 - Adapting to a changing climate



Water Marketing Has Requirements and Constraints...

- Infrastructure is needed to connect source/destination
- Only “wet” water can be sold/leased
- State protections for groundwater are incomplete
- Local economic impacts of land fallowing are a concern



...So Does Groundwater Banking

- Infrastructure is needed to get/store/retrieve water
- Rules are needed to prevent harm to bankers/locals
- Water quality can be an issue

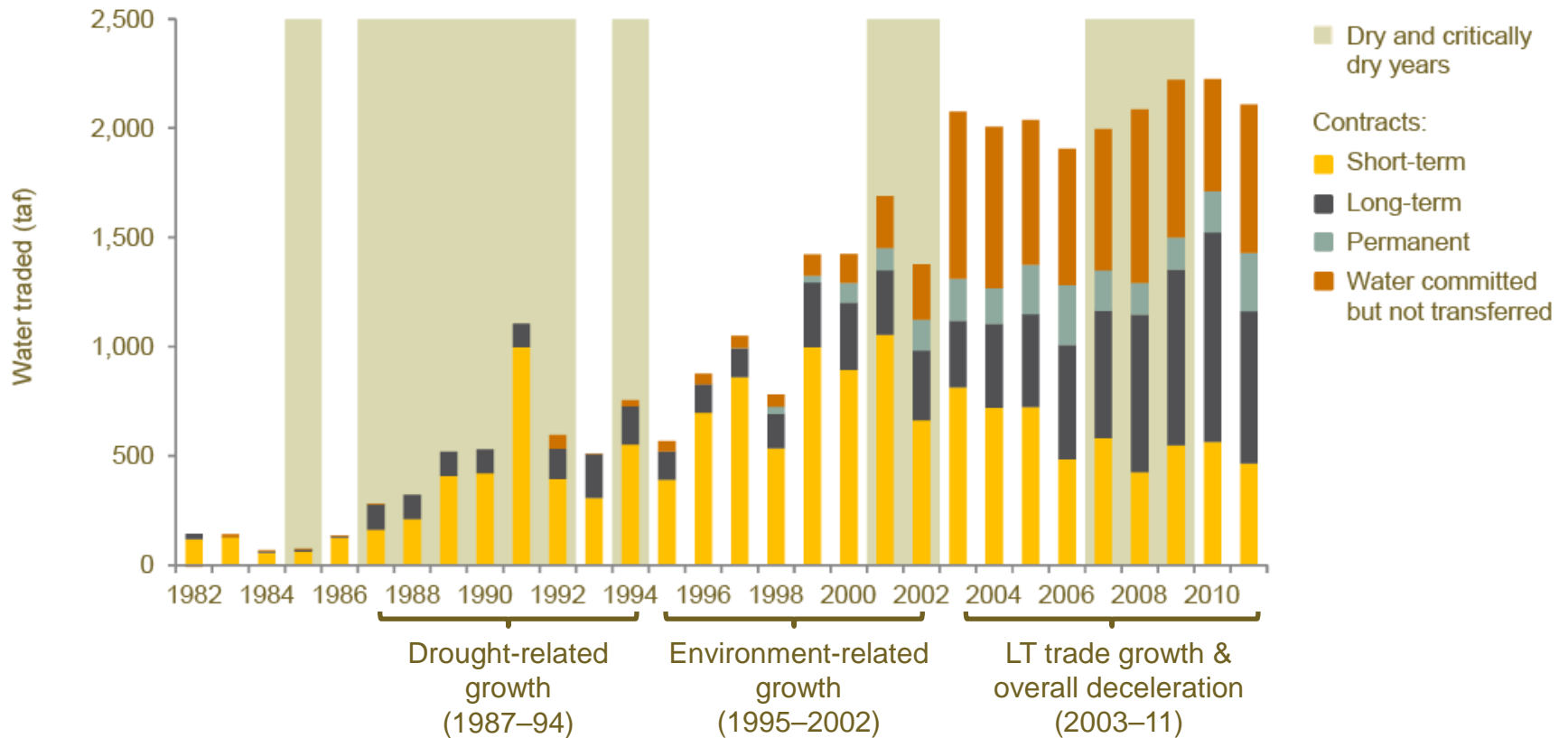


Outline

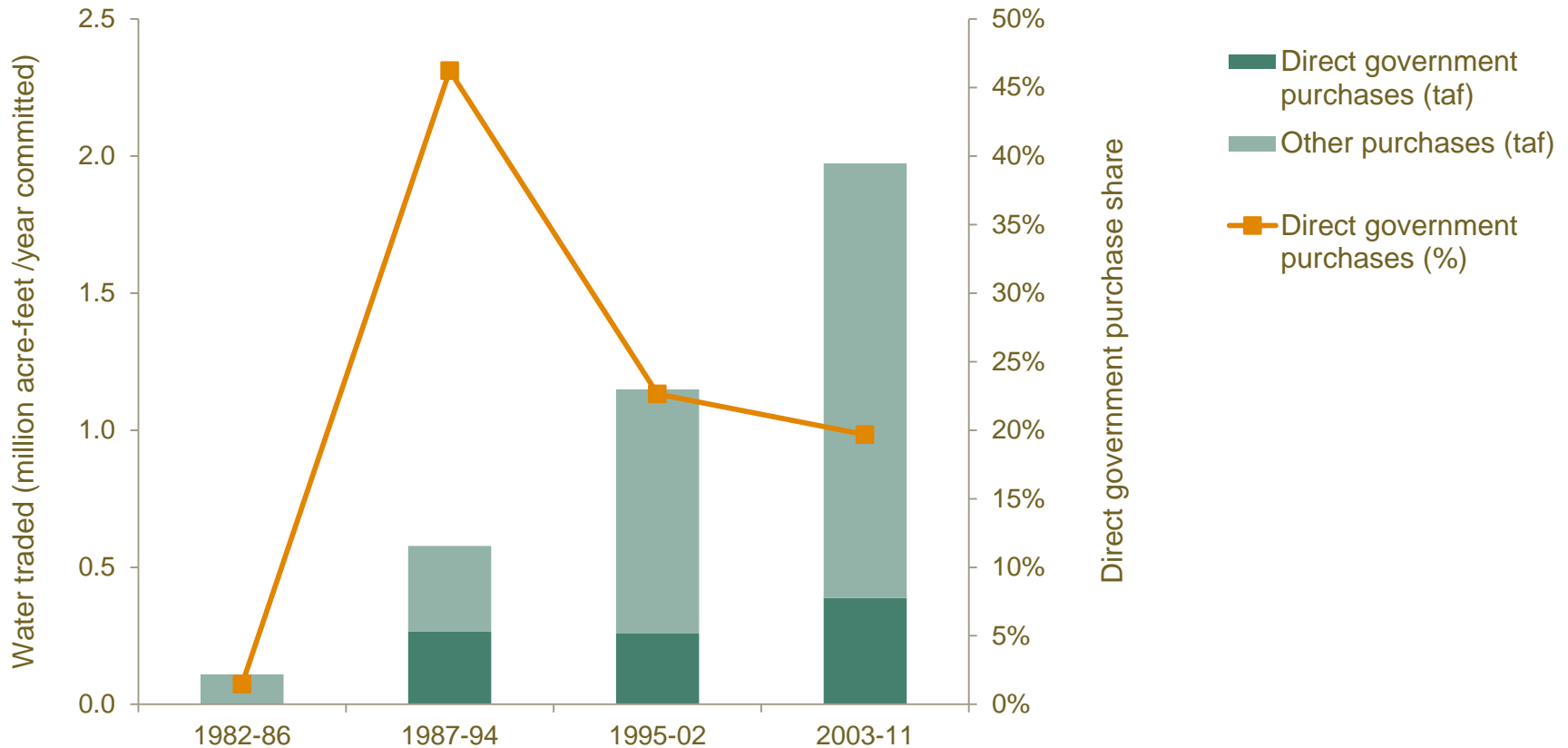
- **Water Market Trends**
- Groundwater Banking Trends
- Policy Recommendations



Three Phases in Water Market Development

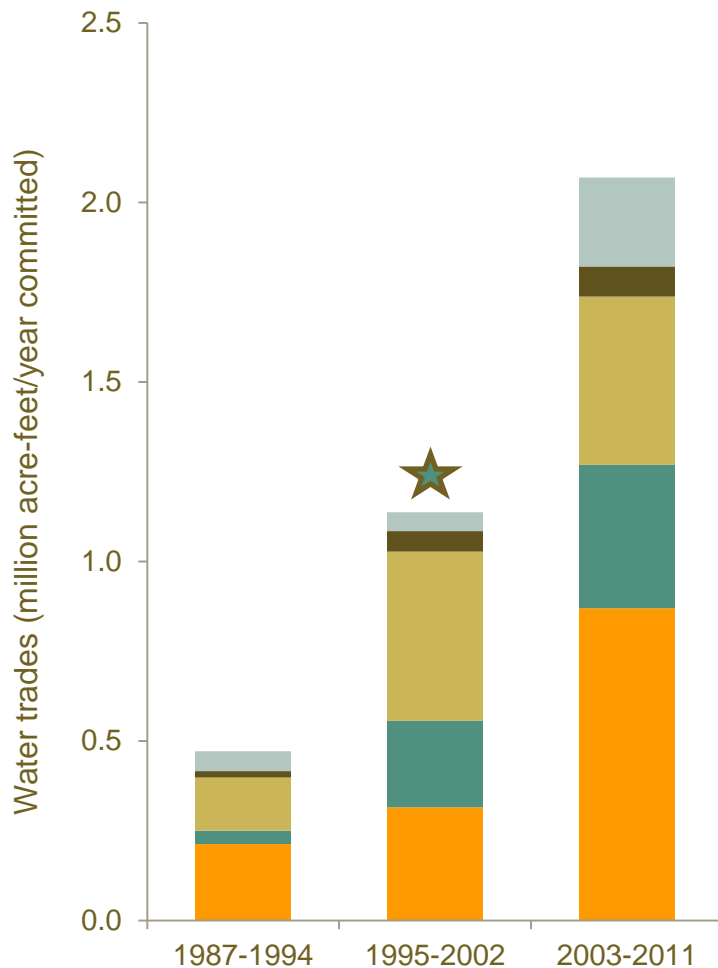


Direct Government Purchases Spurred Early Development

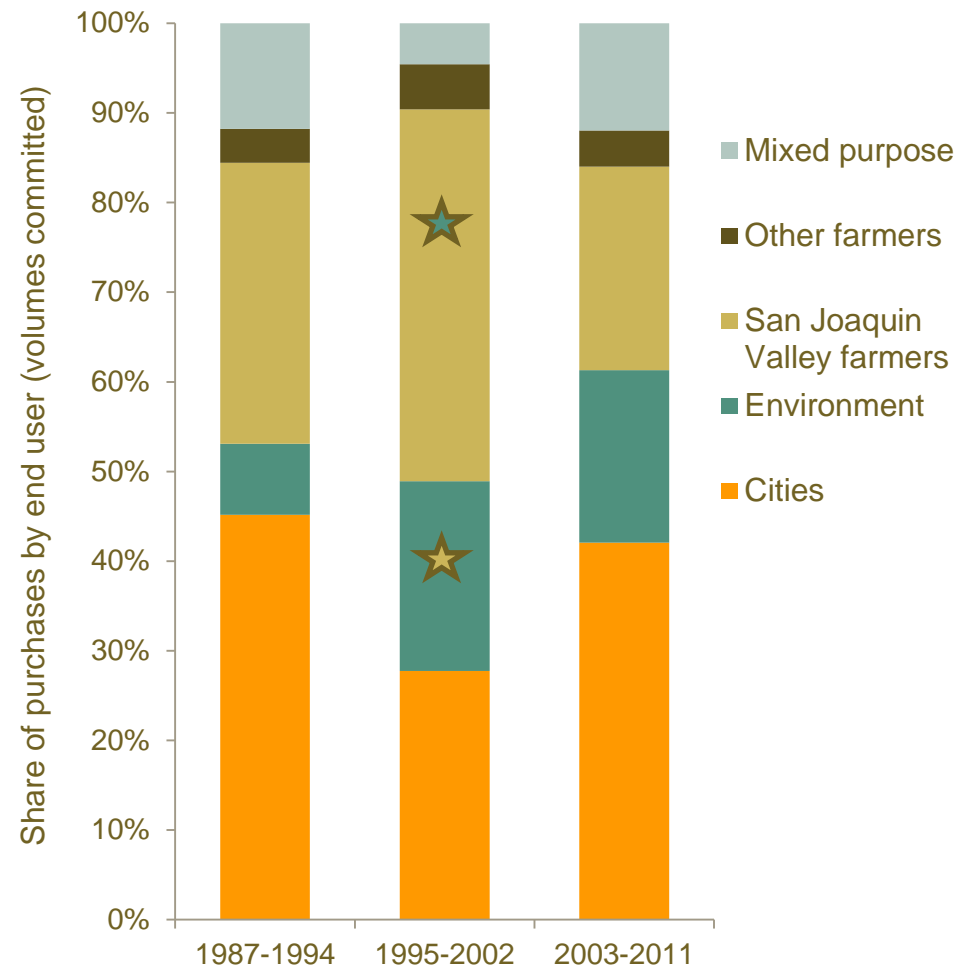


Environmental Concerns Drove Shifts in mid-1990s

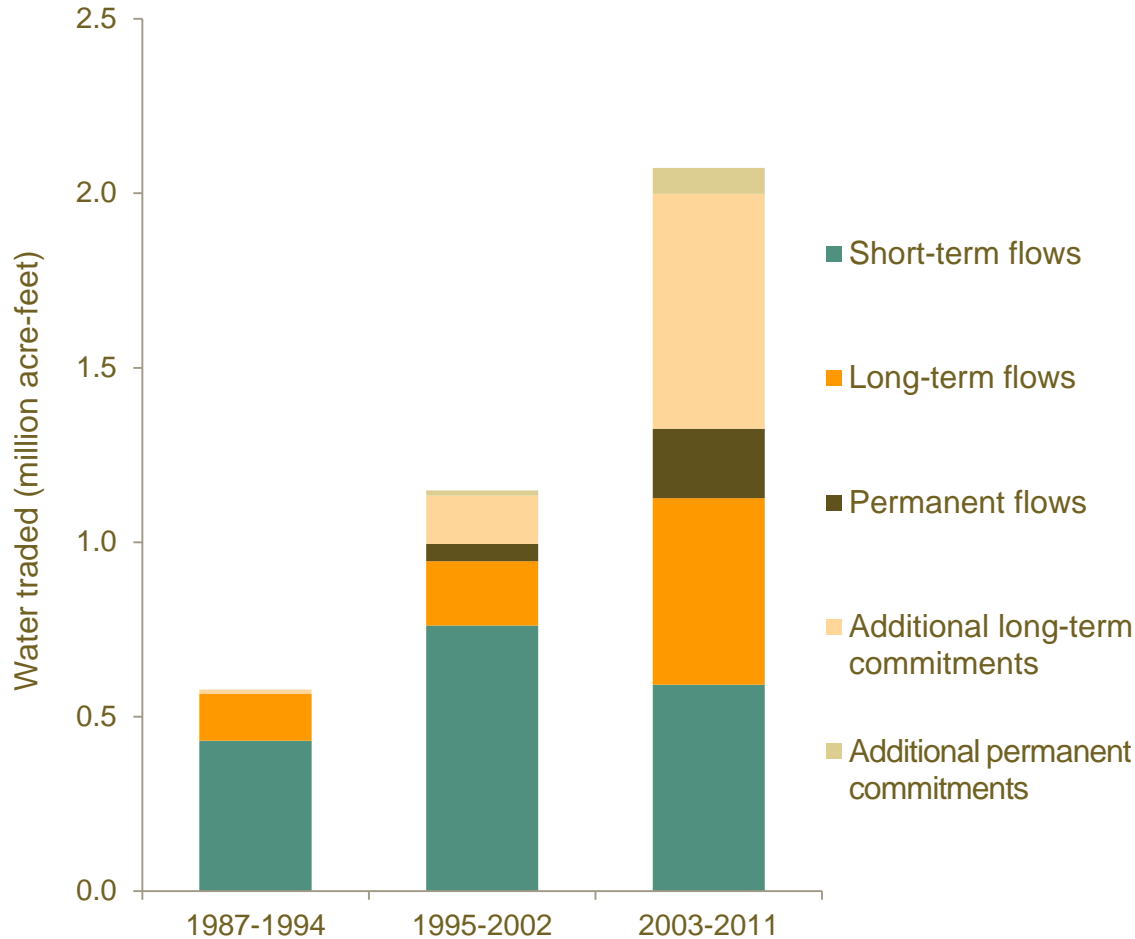
Average annual purchases by end-user



Share of purchases by end-user



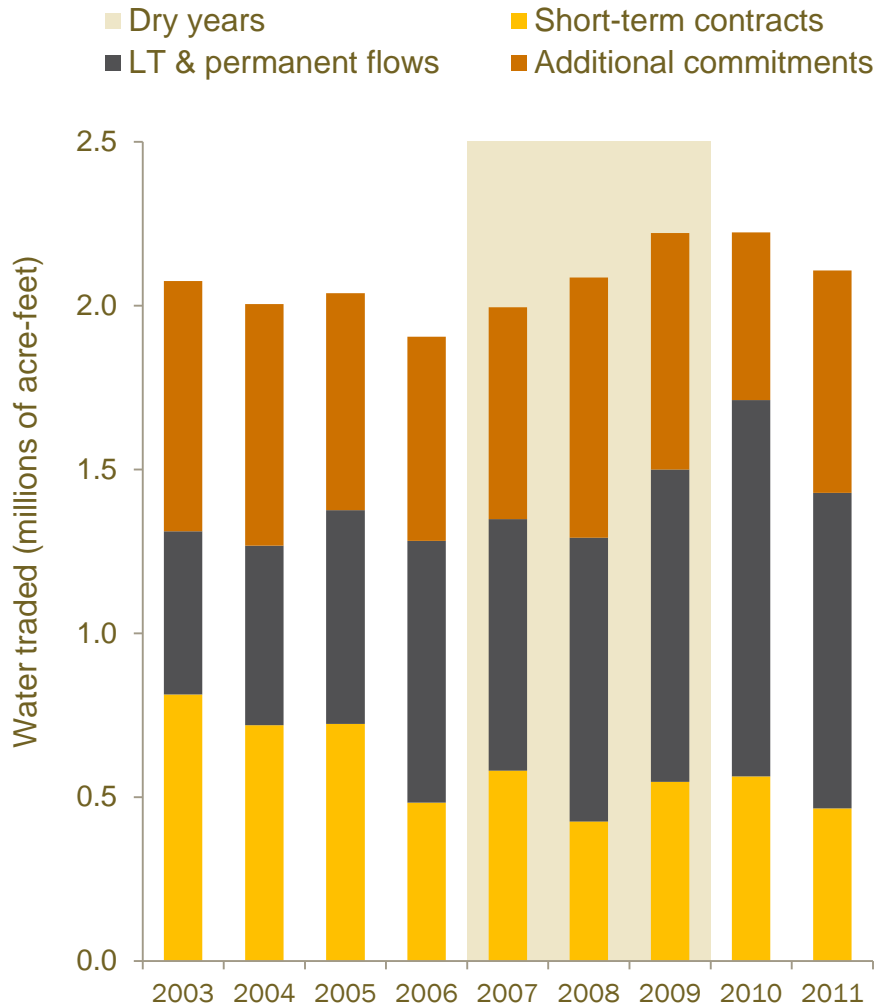
Long-term and Permanent Trades Now Dominate the Market



- Mostly for cities
- But also for high-value farms
- And some environmental uses



But Slowing Market Was Unable to Provide Much Drought Relief

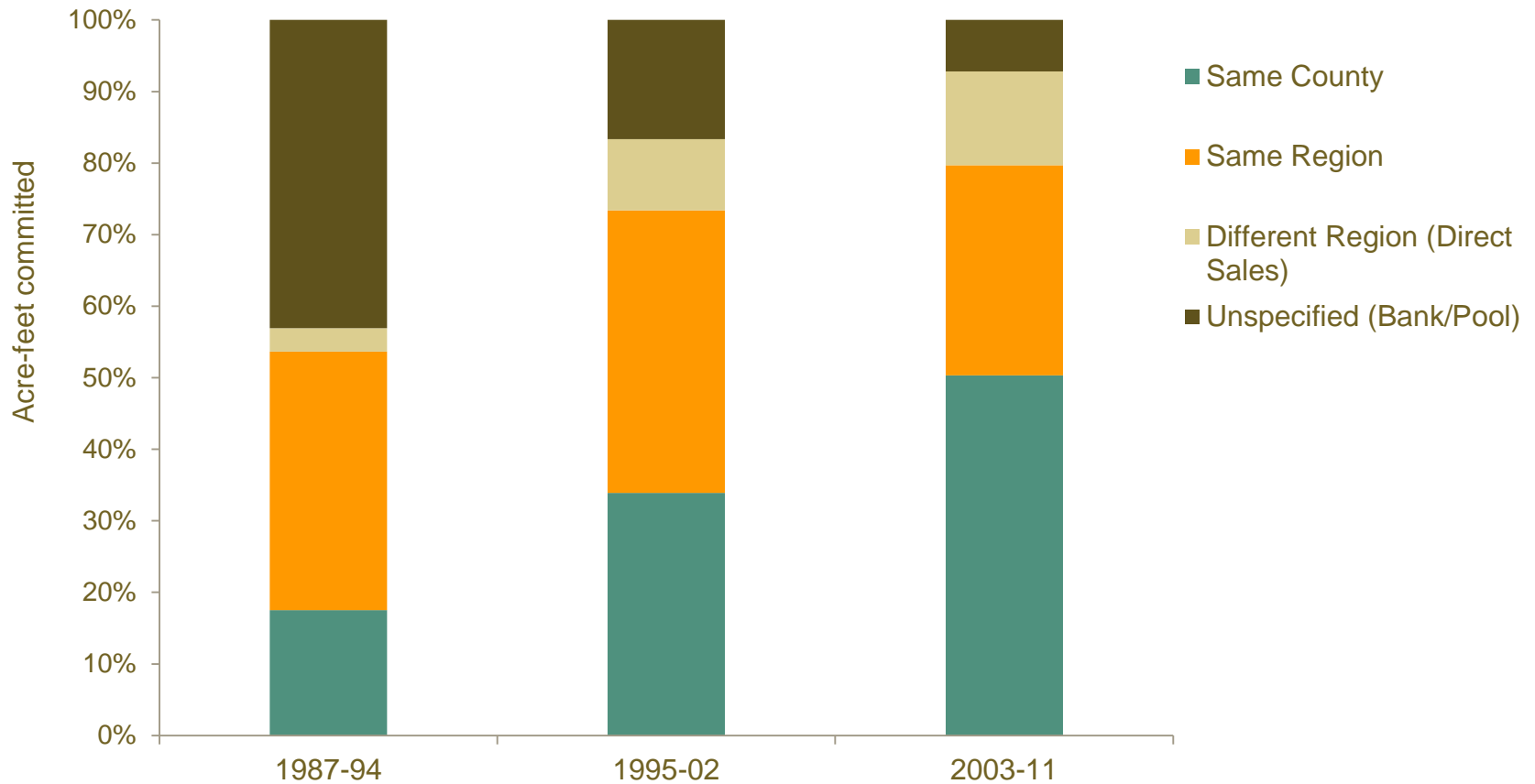


- Infrastructure constraints: Delta
- Institutional constraints: complex, frequently changing approval process
- In all, 500,000–600,000 acre-feet dry-year supplies from 2007–2010



Trades Are Becoming More Local

Share of non-environmental trades



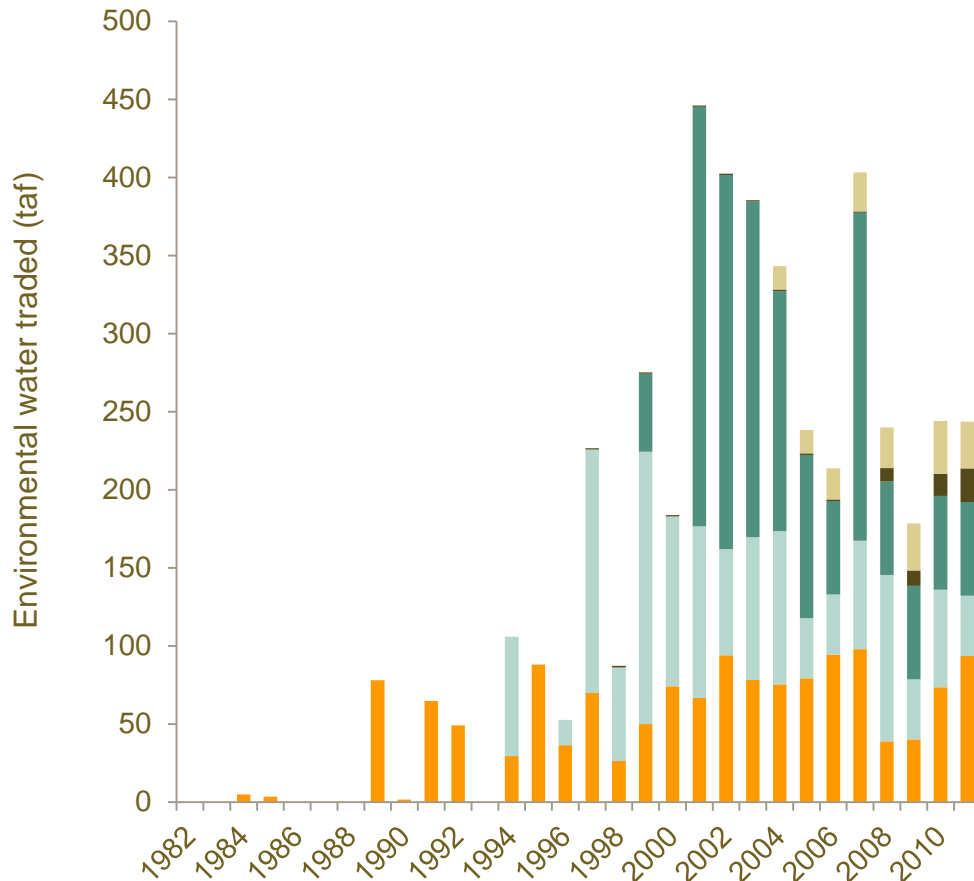
North-South Trades Are Down; San Joaquin Valley Is Now Net Exporter



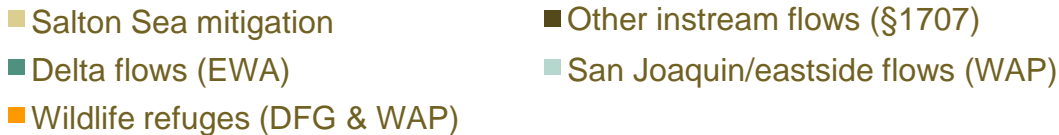
* non-environmental trades (actual flows)



Purchases of Water for the Environment Are Now Falling



- Can lessen conflicts and raise efficiency
- But cash running out (~50% was from state bonds)



Outline

- Water Market Trends
- **Groundwater Banking Trends**
- Policy Recommendations



Several Types of Groundwater Management and Storage

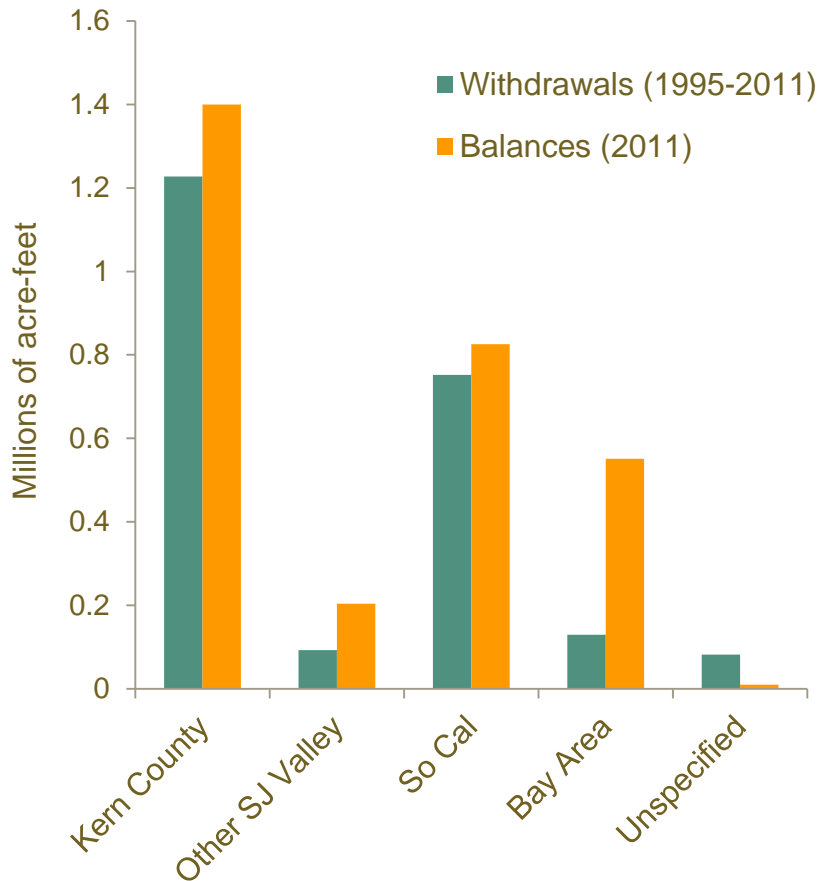
- **Formal:** adjudicated basins and special districts with accounting for pumping/recharge (So Cal, Silicon Valley)
- **Informal:** voluntary, price incentives but no accounting (most common)
- **Semi-formal:** accounting for bank members, not for other local pumpers (Kern County)

- Our focus: banking for offsite parties in Kern, So Cal



Diverse Users Are Storing Water in Kern County Banks

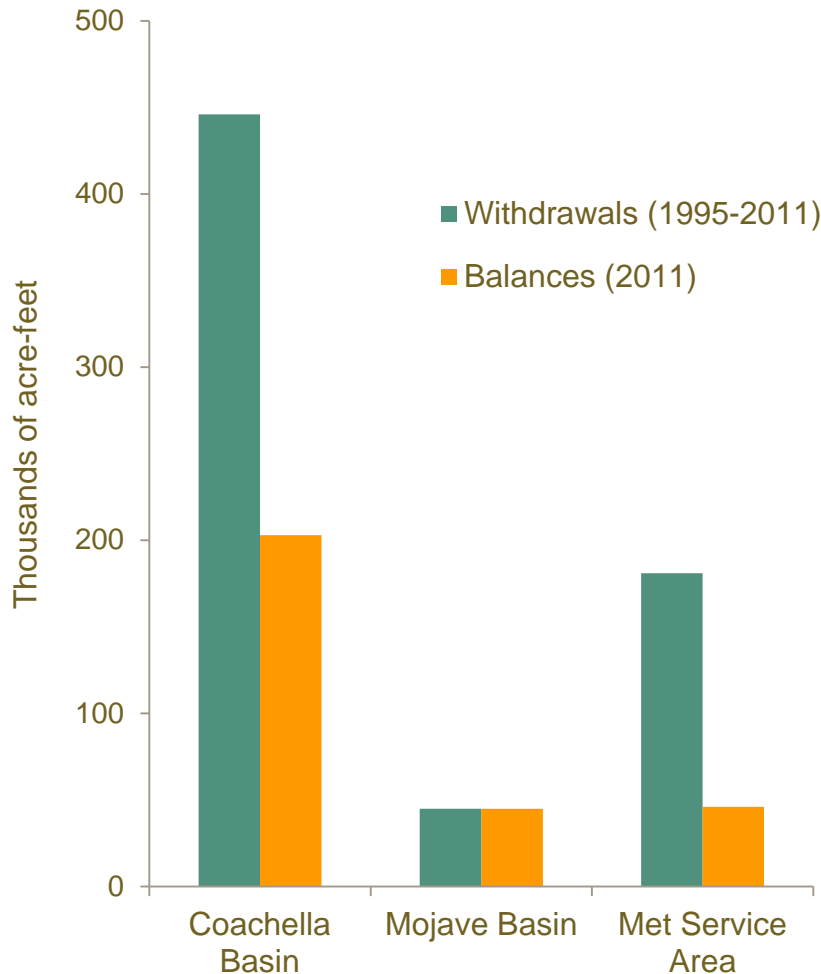
Cumulative withdrawals and balances (2011) by region



- Shares of balances:
 - Urban: 47%
 - Agriculture: 45%
 - Mixed: 8%



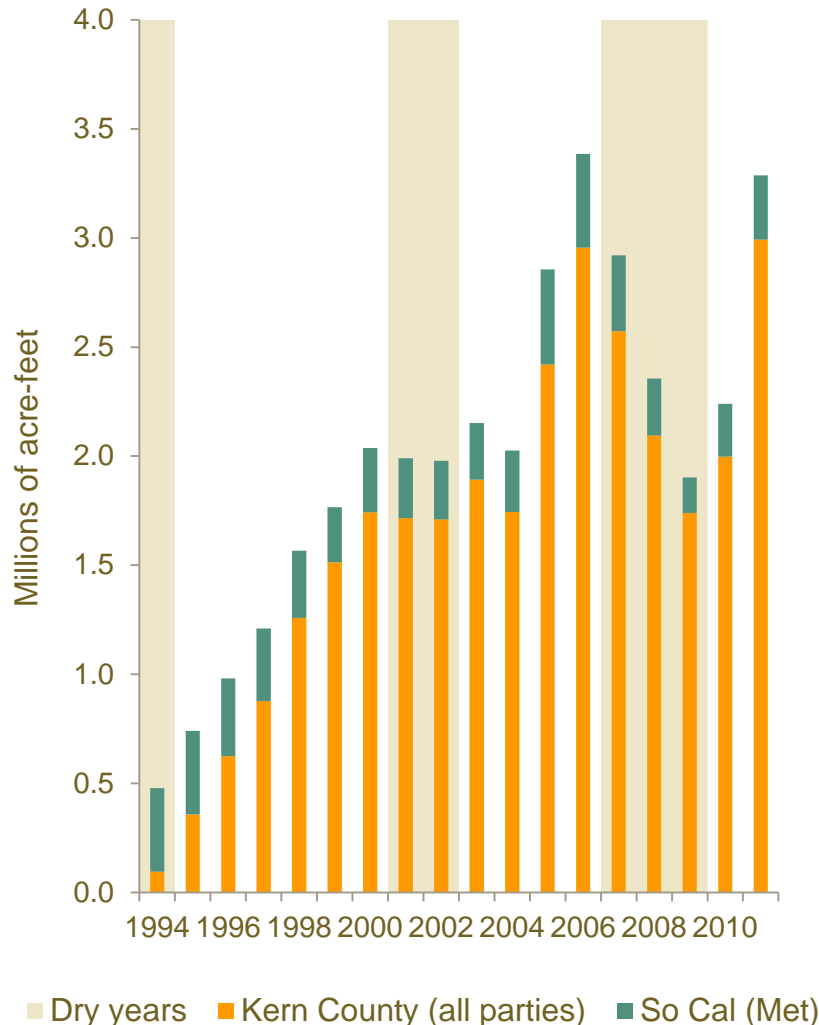
Metropolitan Water District Has Also Been Storing in So Cal Banks



- Exchange agreements with outside partners
- Infrastructure investments for partners within service area



New Groundwater Banks Were Very Useful During Recent Drought



- Total withdrawals 2007–10: 1.9 maf (3x more than water market)
- Rapid recharge thanks to post-drought rains
- But some conflicts in Kern County over falling groundwater tables



Outline

- Water Market Trends
- Groundwater Banking Trends
- **Policy Recommendations**



How Can We Work Out the Kinks in These Important Tools?

- Address infrastructure gaps
- Make institutional review process more consistent, transparent, predictable
- Strengthen local groundwater management
- Develop models to mitigate local economic impacts
- Pursue more environmental transfers
- Engage high-level leaders who can take needed risks and break through barriers



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Notes on the use of these slides

These slides were created to accompany a presentation. They do not include full documentation of sources, data samples, methods, and interpretations. To avoid misinterpretations, please contact:

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Thank you for your interest in this work.

