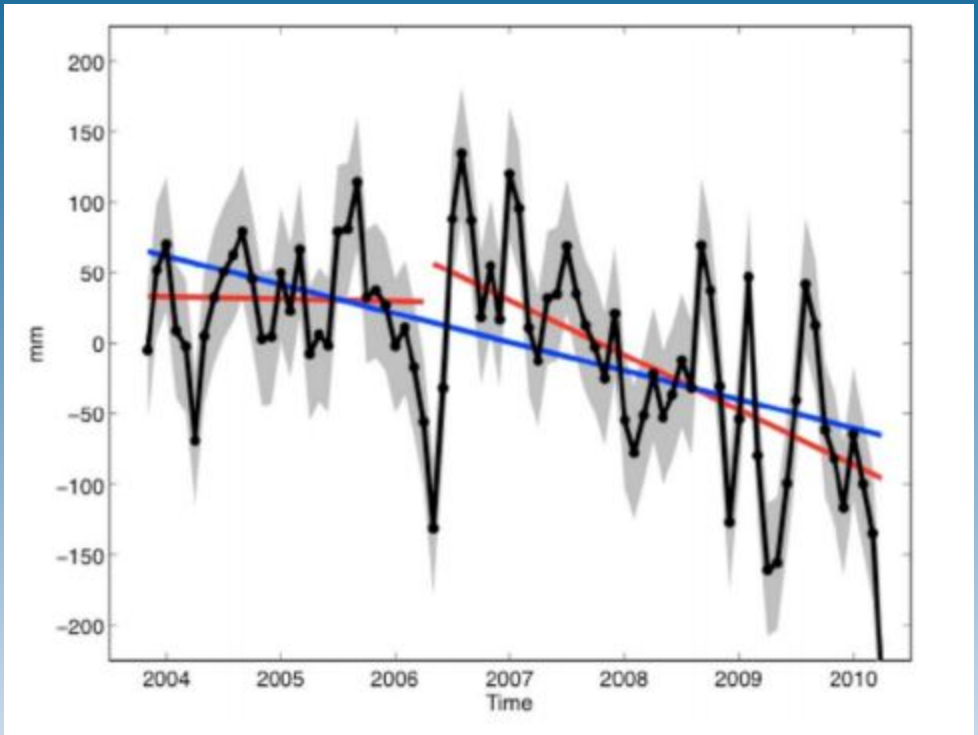
Innovative Groundwater Management In California



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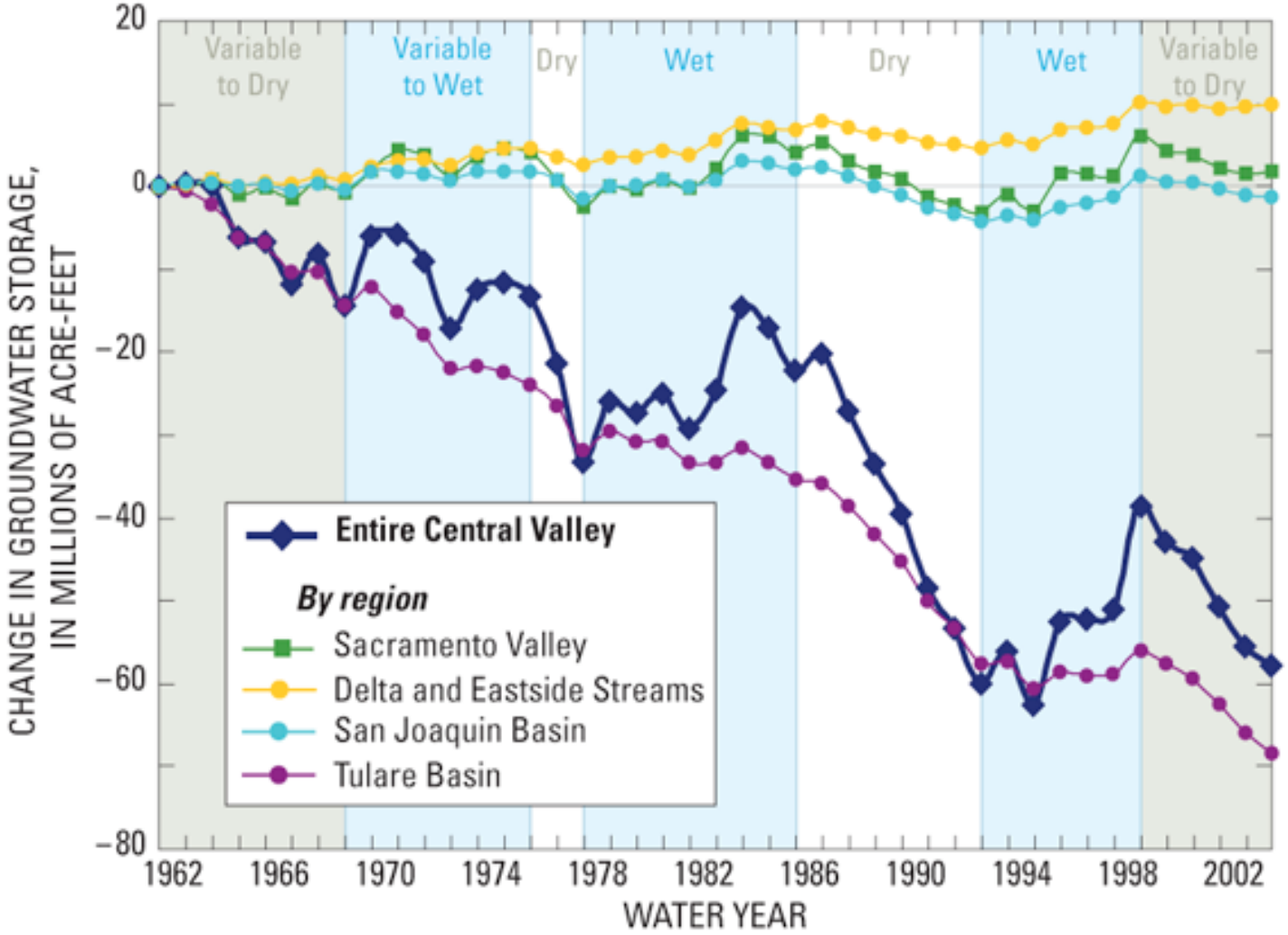
The Problem?

We take out more groundwater than nature replaces.

- The net loss in groundwater storage in an average year is about 1.4 million acre-feet.
- Some basins, such as Tulare, are far more severely overdrafted than others.

Declining Groundwater Levels



Source: Faunt, C.C., ed., 2009

The Bad News

- California is far, far behind other nations and states in addressing groundwater management.
- Our political, geological, and hydrological conditions make such management difficult.
- Without improved management, we are heading for serious local economic and environmental dislocations.

The Good News

- Statewide, comprehensive action is being discussed because local planning efforts are inconsistent.
- But local and regional groups are not waiting.
- Innovative policies are being proposed, tested, and improved.
- There are “success stories” worth understanding, sharing, and expanding.

Options for Reducing Groundwater Overdraft

- Expand **supply** (e.g., recycled water; new transfers),
- Improve **productivity** of water use,
- Do less.

Tools for Reducing Groundwater Overdraft

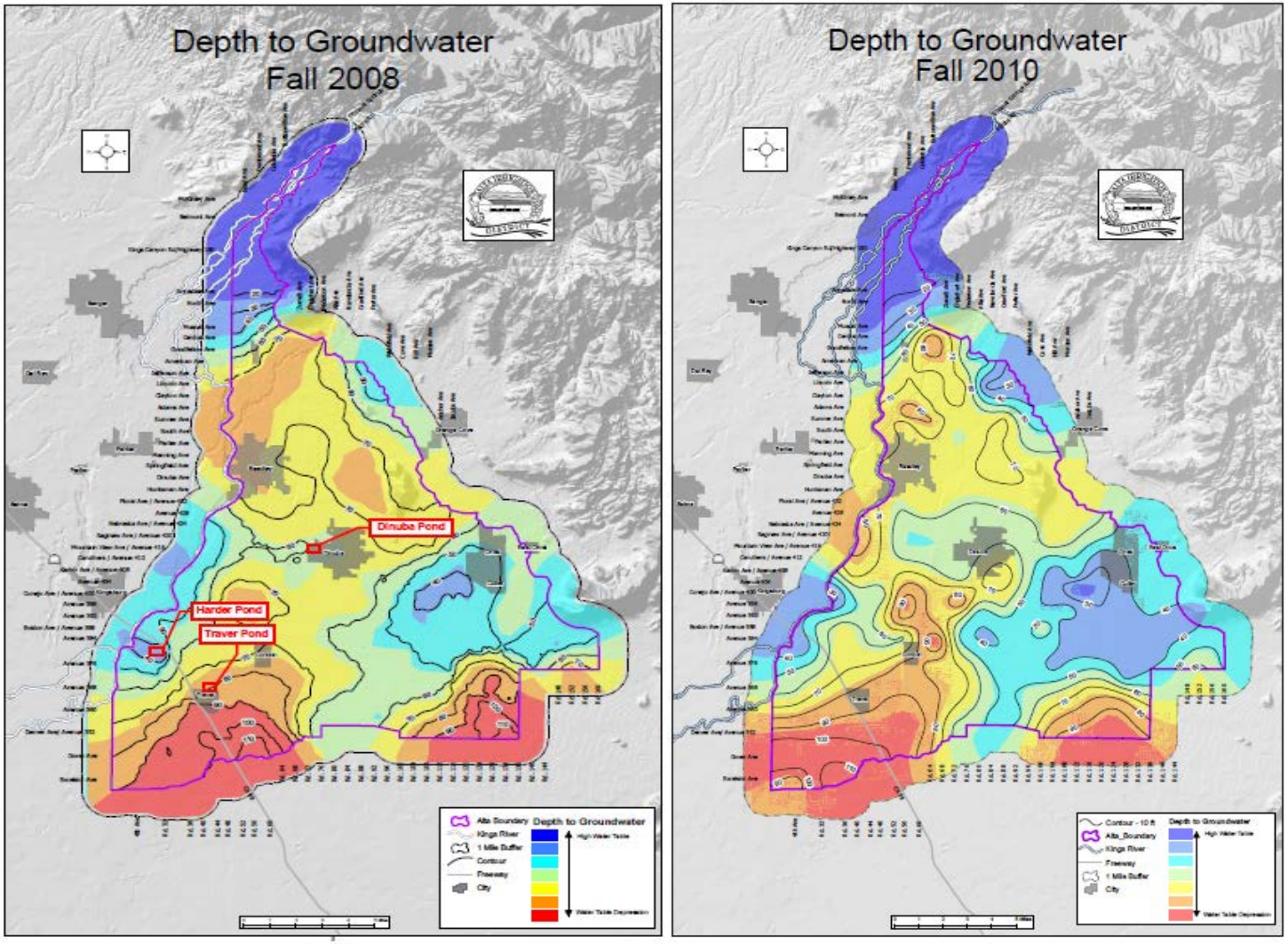
- Understand and measure: Comprehensive monitoring
- Expand best management practices
  - Pricing
  - Education/information
  - Water-use productivity
- Expand collaborations
- Develop new options/technologies for both expanding supply and improving productivity
- Many more

Case Study: Alta Irrigation District

- Volumetric pricing
- Regional conservation program
- Intentional recharge ponds
- Comprehensive monitoring
- Good outreach programs

http://www.pacinst.org/reports/success_stories/volumetric_water_pricing_and_conjunctive_use.pdf

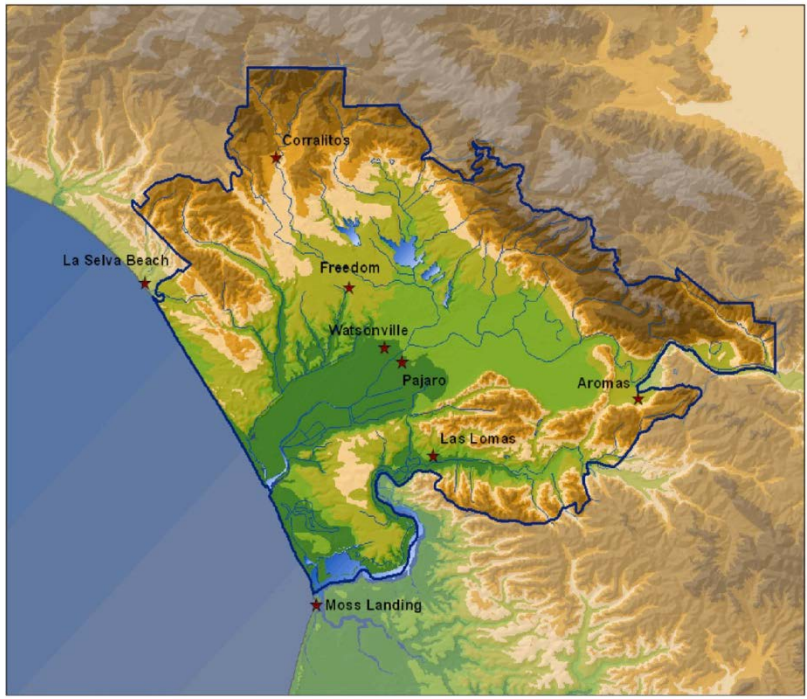
Alta Irrigation District Groundwater Levels



Source: Alta Irrigation District 2010

Case Study: Pajaro Valley

- Expansion of supply with recycled water
- Community stakeholder groups
- Intentional recharge ponds
- Comprehensive monitoring
- Good outreach programs



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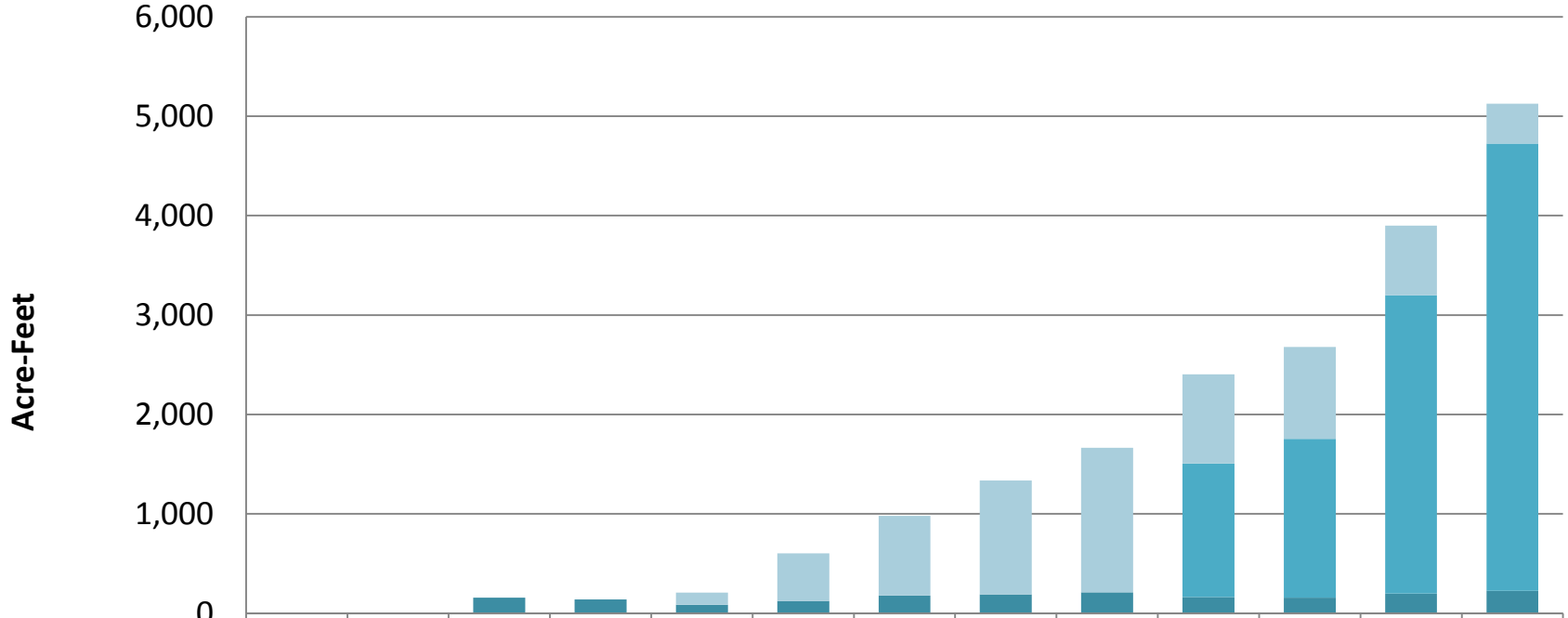
Pajaro Valley Basin: New Supplies

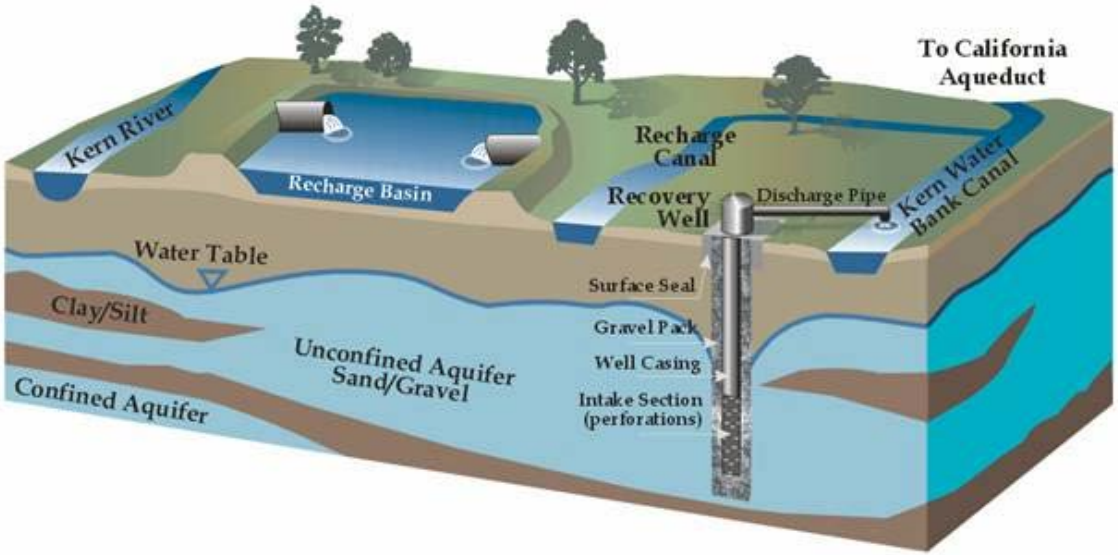


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011 *	2012 *
Blend Wells	0	0	0	0	120	479	804	1,146	1,453	900	926	700	400
Recycled Water	0	0	0	0	0	0	0	0	0	1,343	1,597	3,000	4,500
Harkins Slough	0	0	158	138	87	124	177	191	212	162	157	200	225

Source: Levy and Christian-Smith, 2011

Case Study: Groundwater Banking

- Approximately 10 million acre-feet of groundwater storage is available in Central Valley aquifers.



http://www.pacinst.org/reports/success_stories/groundwater_banking.pdf

Case Study: Groundwater Banking

- Today three major water banks (Arvin–Edison, Kern, and Semitropic) have a combined storage capacity of about 3 million acre-feet.
- Several smaller banking programs have been launched by the Buena Vista Water Storage District, **Rosedale-Rio Bravo Water Storage District**, and Kern Delta Water District.

http://www.pacinst.org/reports/success_stories/groundwater_banking.pdf

A Few Recommendations: Characteristics of All "Success Stories"

- Integrated water resources management must include groundwater management.
- Collect and rely on data: consistent and comprehensive monitoring of groundwater levels and quality.
- Involve stakeholders
- Finances must be sound: this requires proper financing mechanisms, rates, and cost allocations.
- Include options that both expand supply and improve productivity.

What is Needed

- A better understanding of where to recharge and when (AB 359)
- More flexible conveyance to allow recharge during wet season
- Comprehensive, real-time data to monitor levels and extractions
- Groundwater management plans that address the water rights challenge.

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