

Saving for a Dry Day: Promises & Challenges of Groundwater Banking

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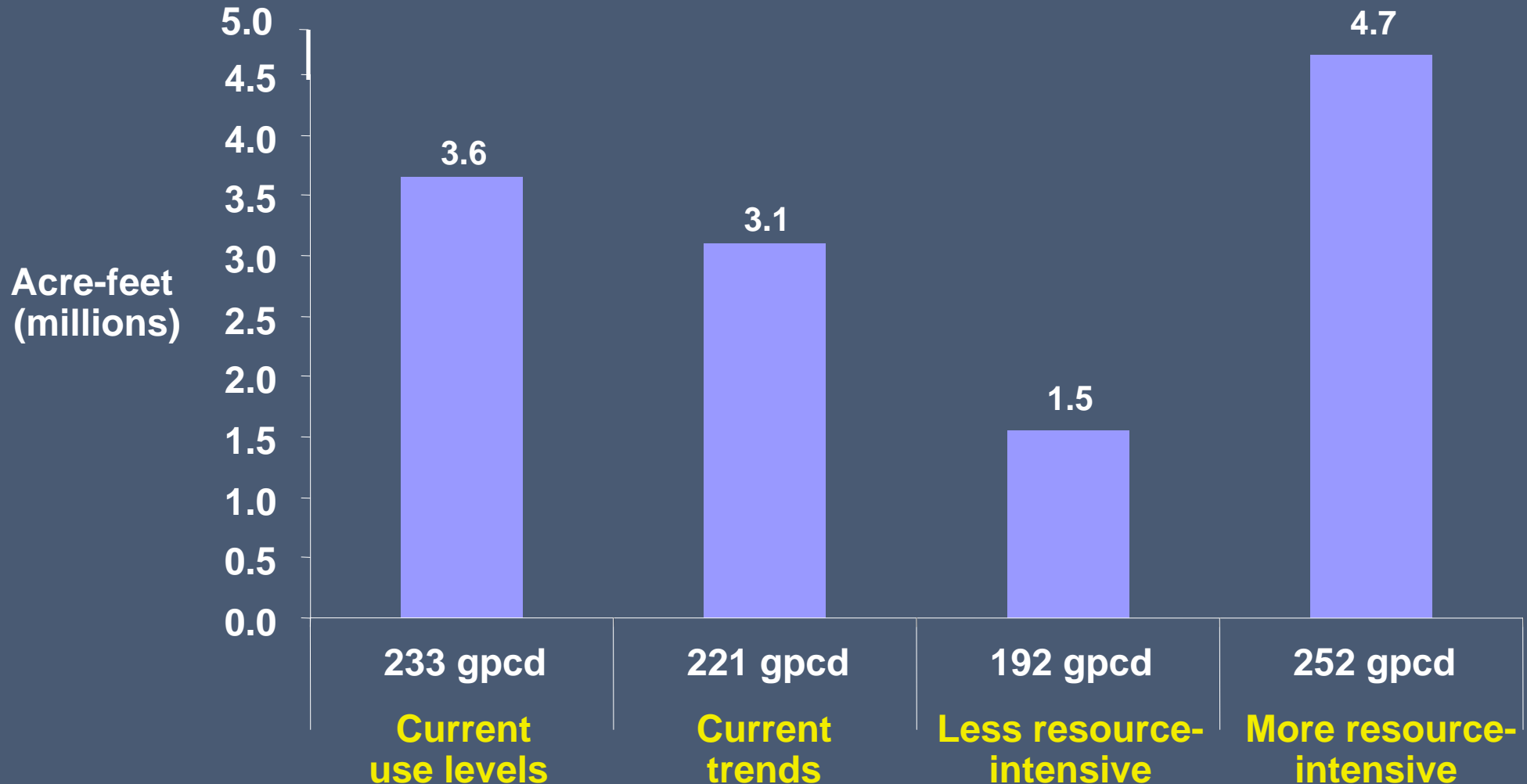
Biennial Groundwater Conference, Sacramento, Sept 18-19, 2007

Outline

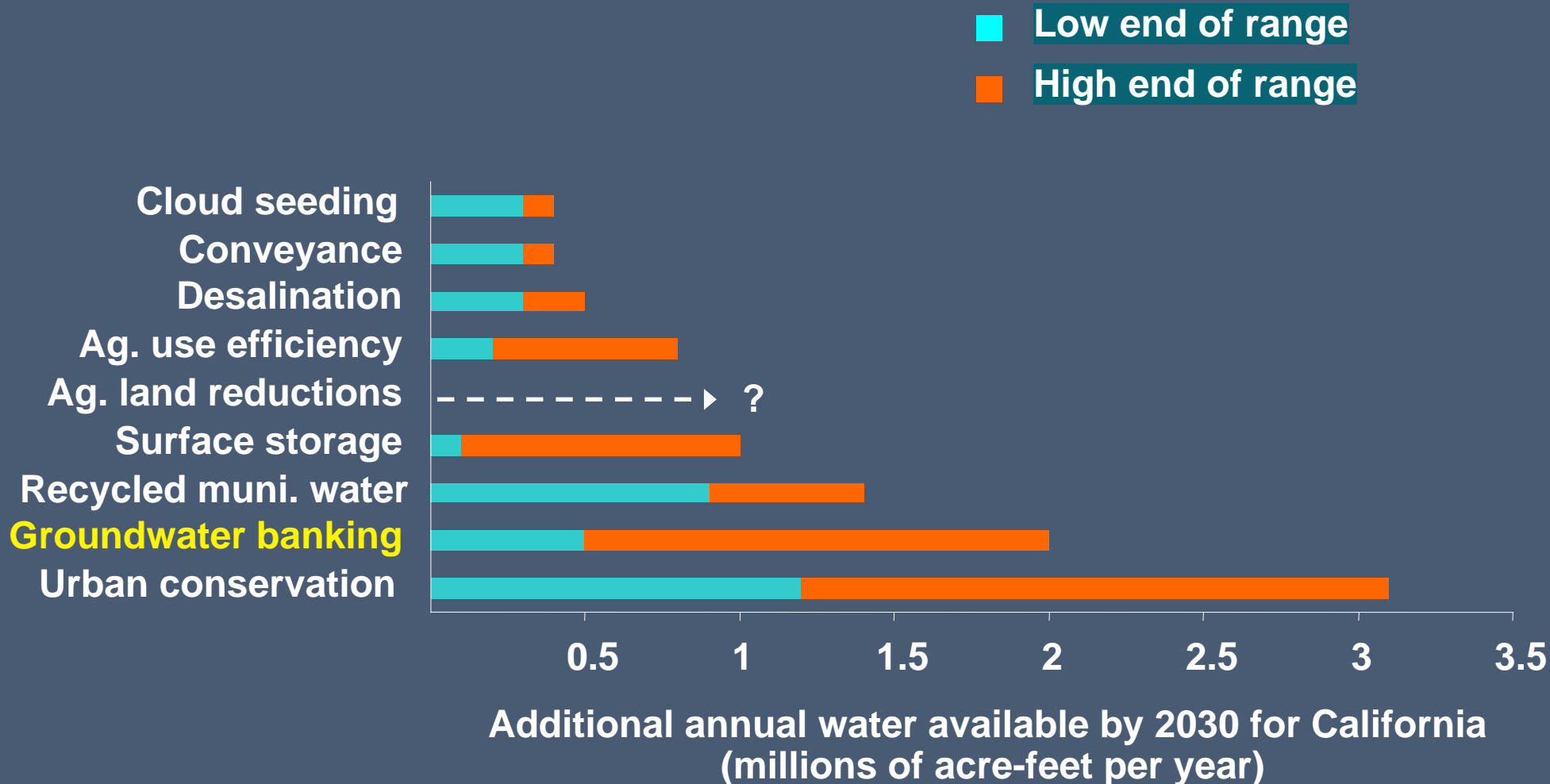
- **Banking and water supply**
- **Current basin management geography**
- **Innovations and policy challenges**

Even with conservation efforts, urban water demand is expected to grow

Projected demand growth, 2000 - 2030



Conjunctive use is a primary source for generating new supplies



Source: California Water Plan Update, 2005

It is also one of the cheapest sources

	Cost/af
Cloud seeding	\$19*
Desal. (seawater)	\$800 - \$2,000*
Ag. use efficiency	\$175 - \$450*
Ag. land fallowing	\$75 - \$400*
Surface storage	\$150 - \$1,000*
Recycled muni. water	\$300 - \$1,300*
Groundwater banking	\$110 +*
Urban conservation	\$220 - \$530*

* California Water Plan Update, 2005

*CALFED, 1999

* author estimates

Preconditions for successful banking projects

- **Technical feasibility**
 - Storage/recharge potential
 - Quality issues
 - **Institutions to guarantee protection of:**
 - Project participants
 - Neighbors in the basin
- ➔ **Monitoring, accounting, and safeguards**

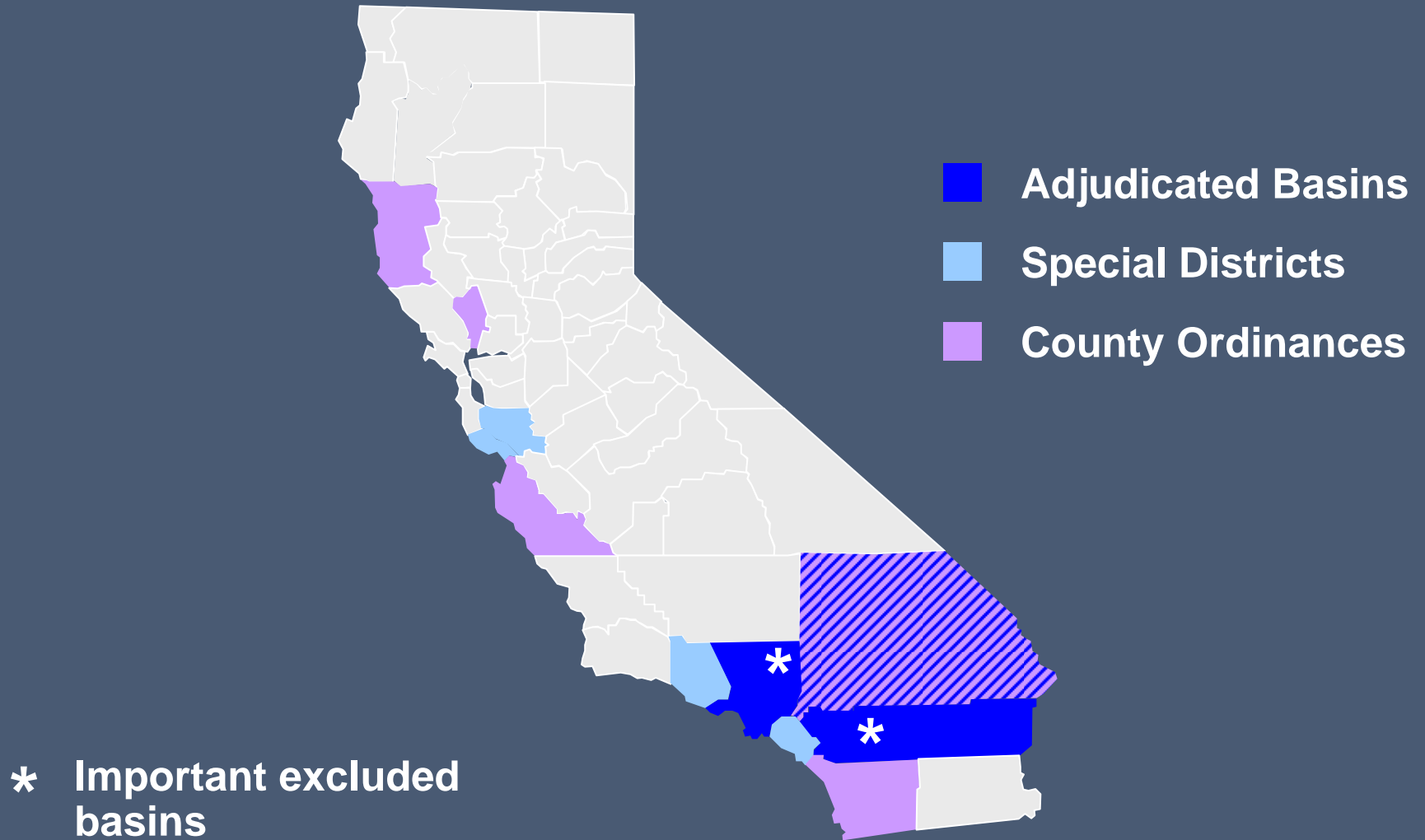
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Southern, coastal areas have tradition of active basin management

- **Principle: protect all users from effects of basin over-pumping**
- **Adjudicated basins: regulation through quantification of water rights**
- **Special districts: regulation through pricing (pump fees)**
- **Counties: permitting for local use**

Groundwater Management Systems in Southern and Coastal Areas



Impetus for groundwater management in southern and coastal regions

- **Urban development (e.g. Los Angeles)**
- **Salt water intrusion and subsidence**
 - **Orange County, Santa Clara**
 - **Monterey (harder because mostly farming)**

Urban and environmental demand growth are changing incentives in rural areas

- Local population growth
- Rise of water marketing (external demand)
- Increasing value of groundwater banking
 - Half of new potential is in Central Valley
- Two competing rural responses:
 - Close the basin to outsiders
 - Develop basin management protocols

By 2002, 22 rural counties had groundwater export restrictions



Second alternative has a local management focus

- **Various institutional forms**
 - **Multi-party groundwater management plans**
 - **Joint Powers Authorities**
 - **County, umbrella agency oversight**
 - **Focus on data gathering, monitoring, recharge**
 - **Compliance largely voluntary (no constraints on pumping, and no sanctions)**
- ➔ **“Light management”**

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Wave of the future?

New uses for managed basins

- **Integrating storm water management**
 - Dual benefits: non-point source control and water recharge
 - Example: Chino Basin
- **Recharging with recycled wastewater**
 - A way to get past “toilet to tap” concerns?
 - Example: Orange County
- **Reservoir re-operation to maximize storage**

Questions on the table in “light management” regions

- **With growth, external partnerships, active basin management needed to avoid conflicts**
 - Impartial monitoring system
 - Rules to protect local users and bankers
 - Example: Kern County banks
- **Is voluntary cooperation enough?**
- **What potential for “friendly” adjudications?**
 - E.g. Beaumont basin

How can state policy encourage active management (without requiring it)?

- **Technical support**
 - To help develop neutral information on basin characteristics
- **Financial incentives**
 - Contingent on basin management goals
- **State water and land-use planning laws**
 - Require identification of water supply for new development
 - Pushes local land-use authorities to limit competing claims on basins