A survey of northern California water reuse experiences: Learning from past experiences to inform the future

Preliminary Results for Discussion with the BACWA Recycled Water Committee, Dec. 1, 2010

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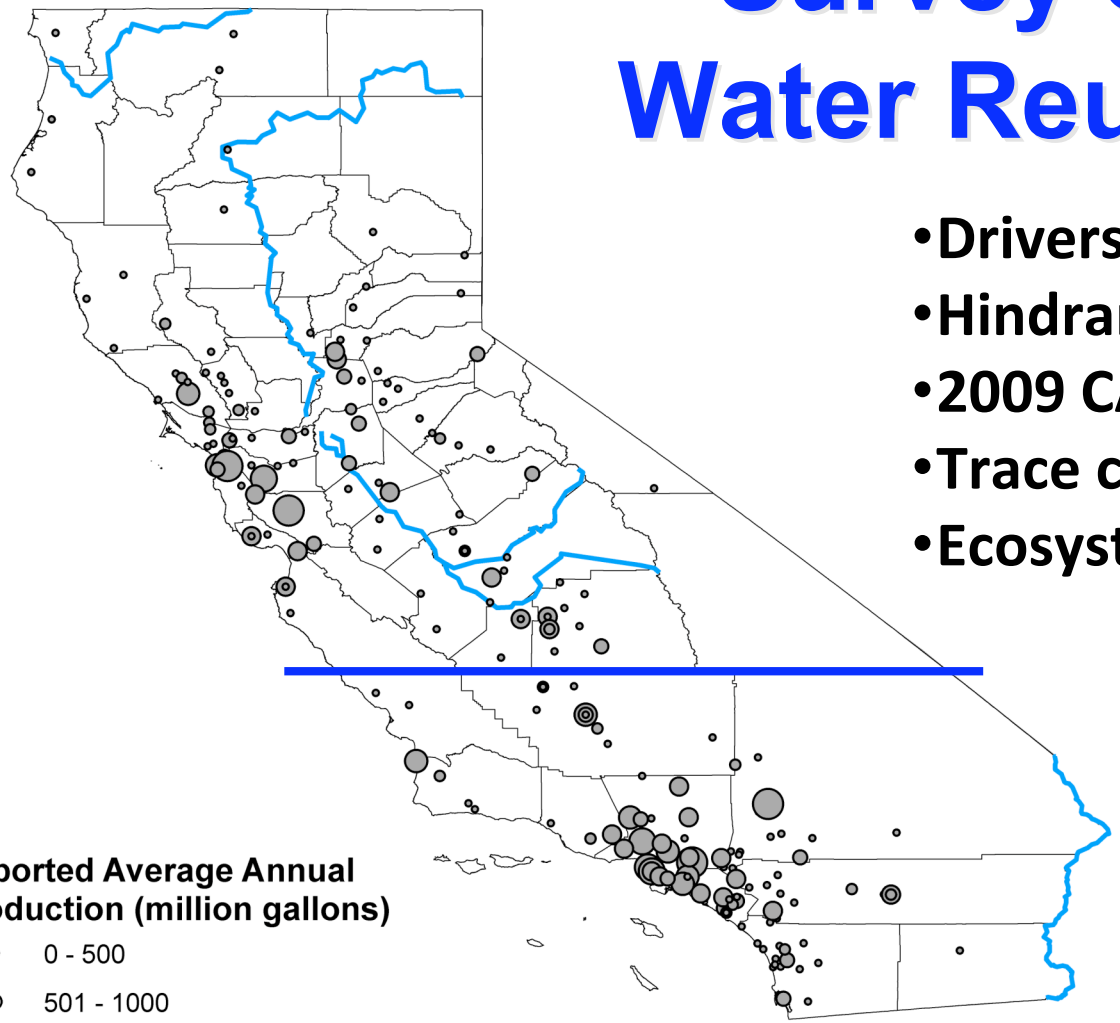
Survey of No. Calif. Water Reuse Managers

- Drivers of water reuse
- Hindrances of water reuse
- 2009 CA Recycled Water Policy
- Trace contaminants
- Ecosystem enhancements



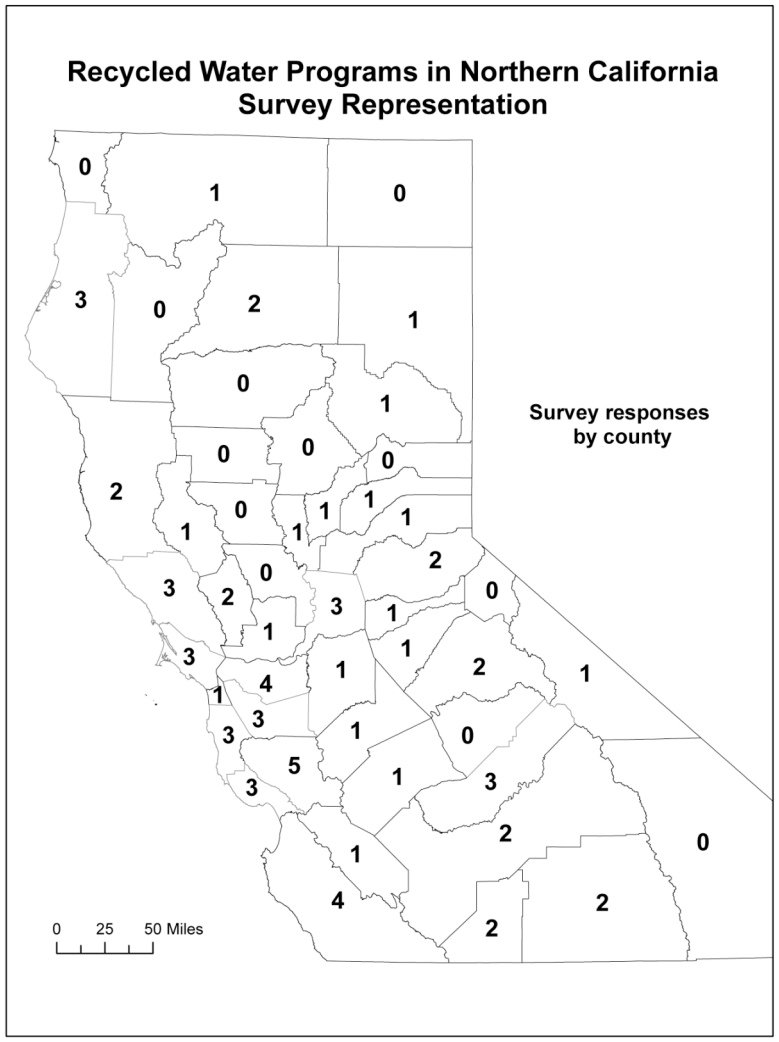
Reported Average Annual Production (million gallons)

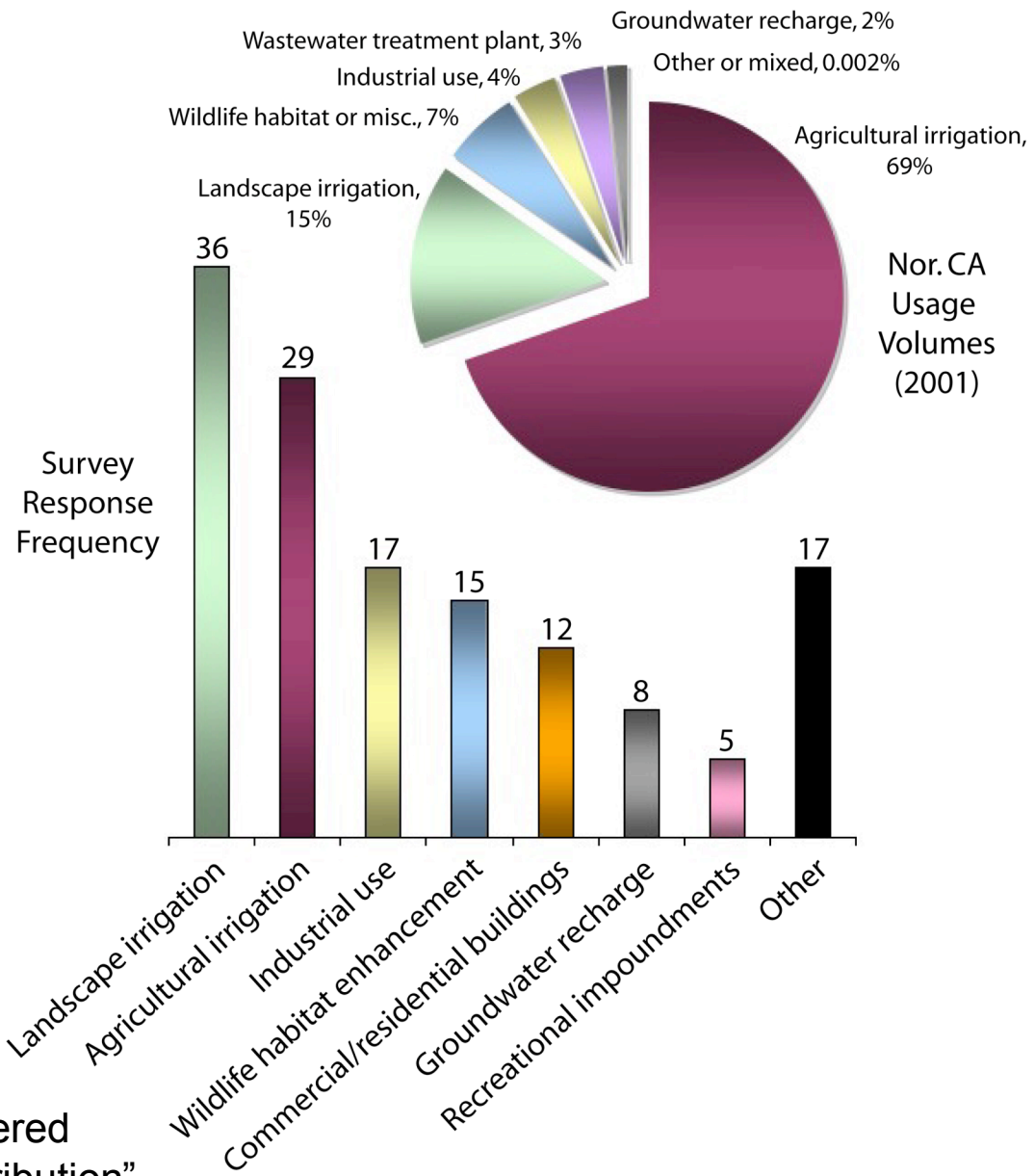
- 0 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- 10001 - 20000
- 20001 - 40000

Mapped Data from National Database of Water Reuse Facilities (Aug. 2010)

Survey Responses

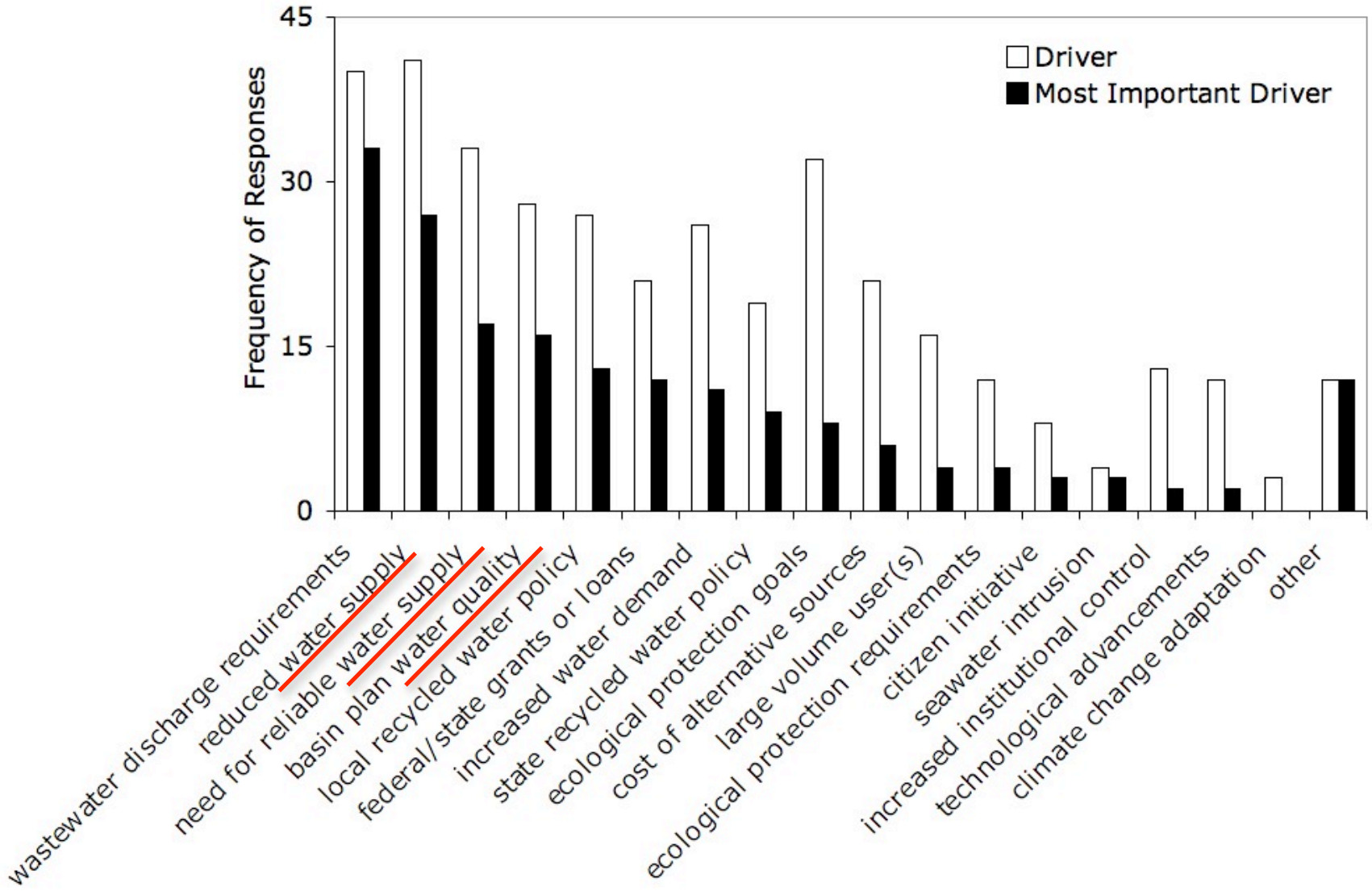
No. CA usage: 46,000 MGY
(140,000 ac-ft/year) in 2001



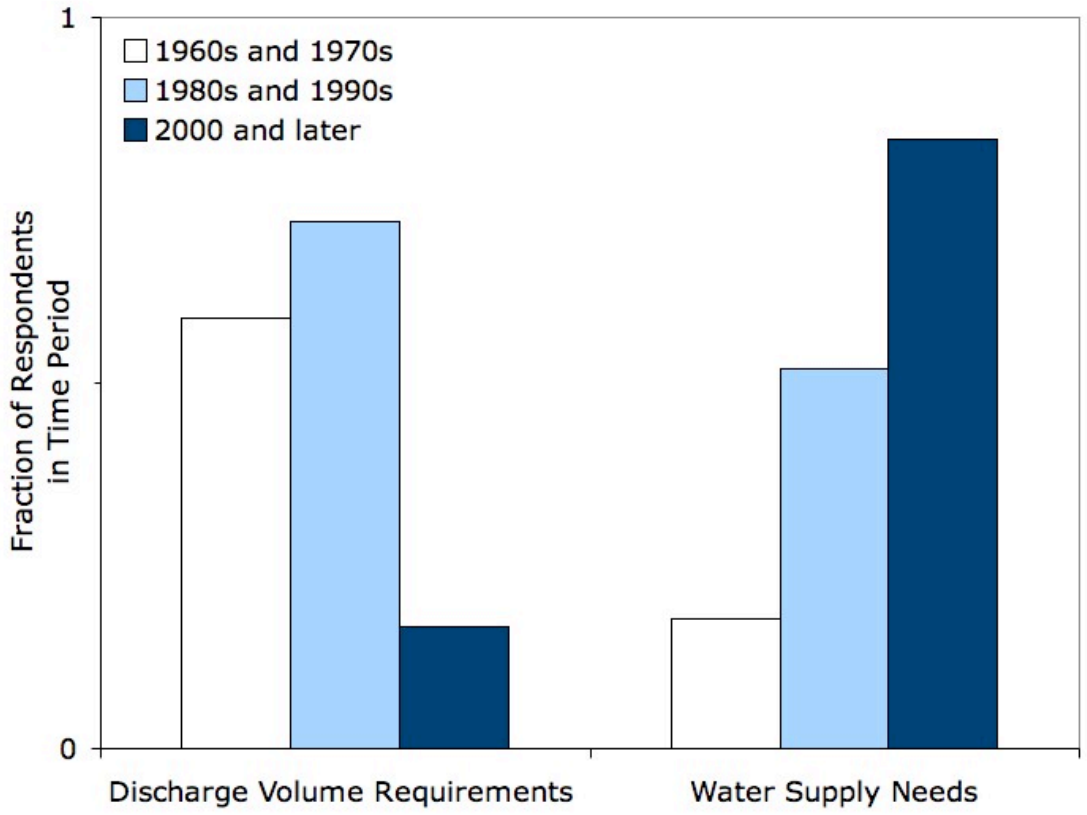


- 71 agencies represented
- Respondents reported ~60K MGY delivered
- 76% conduct “Both Production and Distribution”

Drivers of Water Reuse

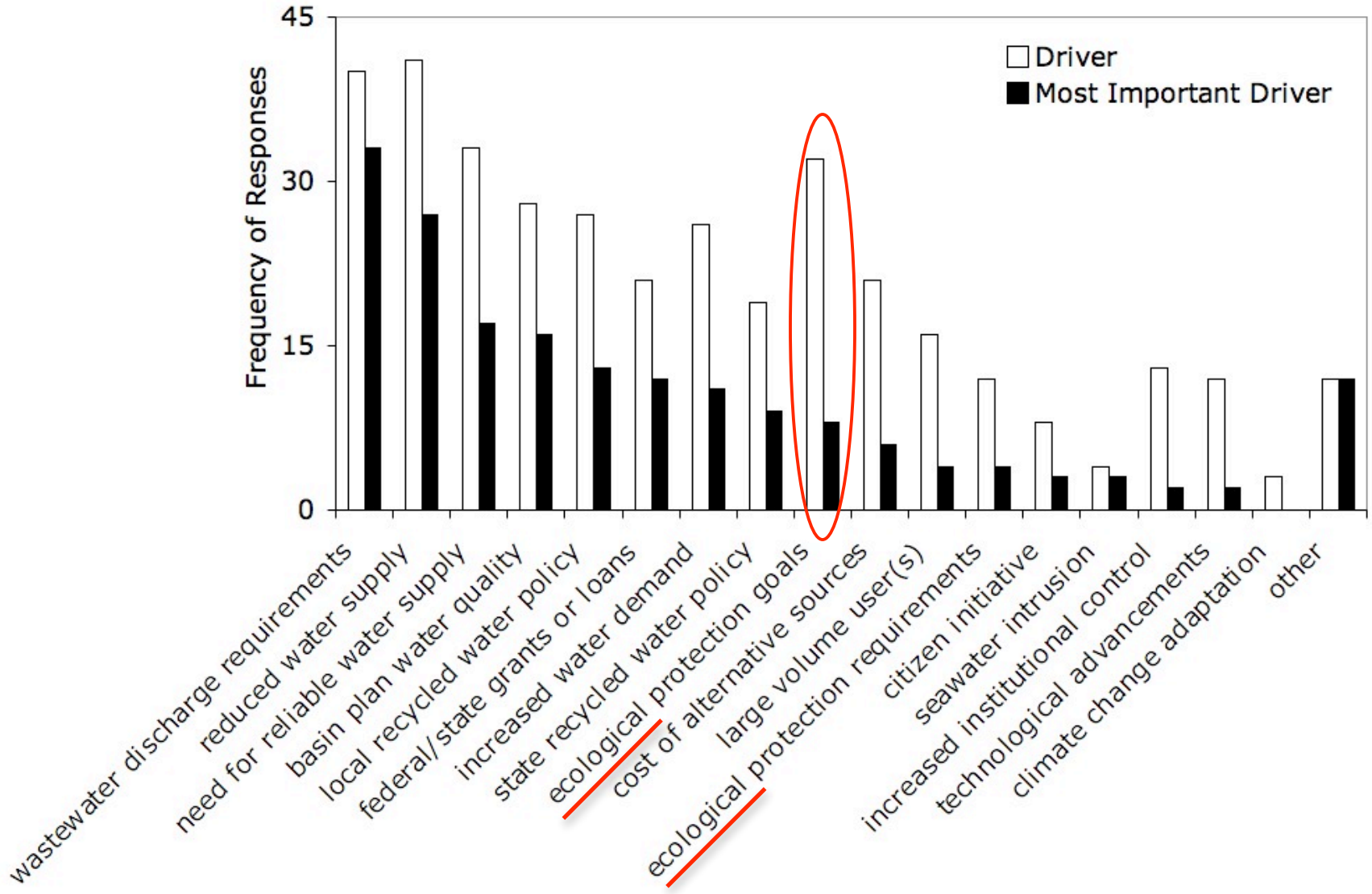


Drivers of reuse through time



Single Most Important Driver	Installed (1963-Present)	Expected (Future)
Discharge Volume Requirements	32%	6%
Water Supply Needs	27%	42%

Drivers of Water Reuse



Ecosystems: Limited Cases

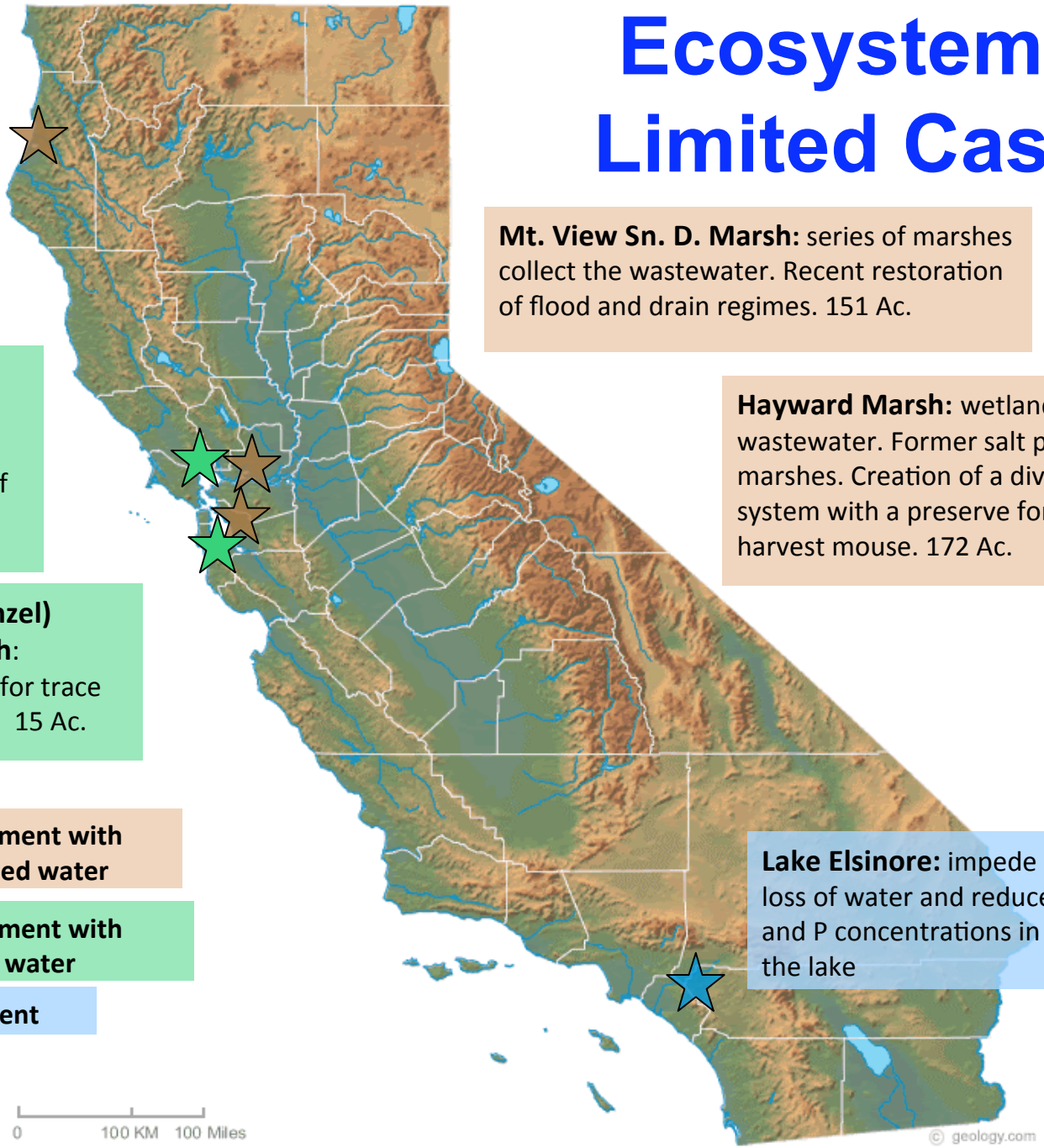
Arcata Marsh: restoration of a degraded urban waterfront. Freshwater and salt marshes. Brackish ponds, tidal sloughs. 100 Ac.

Napa River Salt Marsh: former salt evaporation ponds system. Restoration of large patches of tidal marshes. **9850** Ac.

Palo Alto (Emily Renzel) enhancement Marsh: monitoring programs for trace metal concentrations. 15 Ac.

Mt. View Sn. D. Marsh: series of marshes collect the wastewater. Recent restoration of flood and drain regimes. 151 Ac.

Hayward Marsh: wetlands from wastewater. Former salt production marshes. Creation of a diversified Marsh system with a preserve for the salt marsh harvest mouse. 172 Ac.



Marsh enhancement with secondary treated water

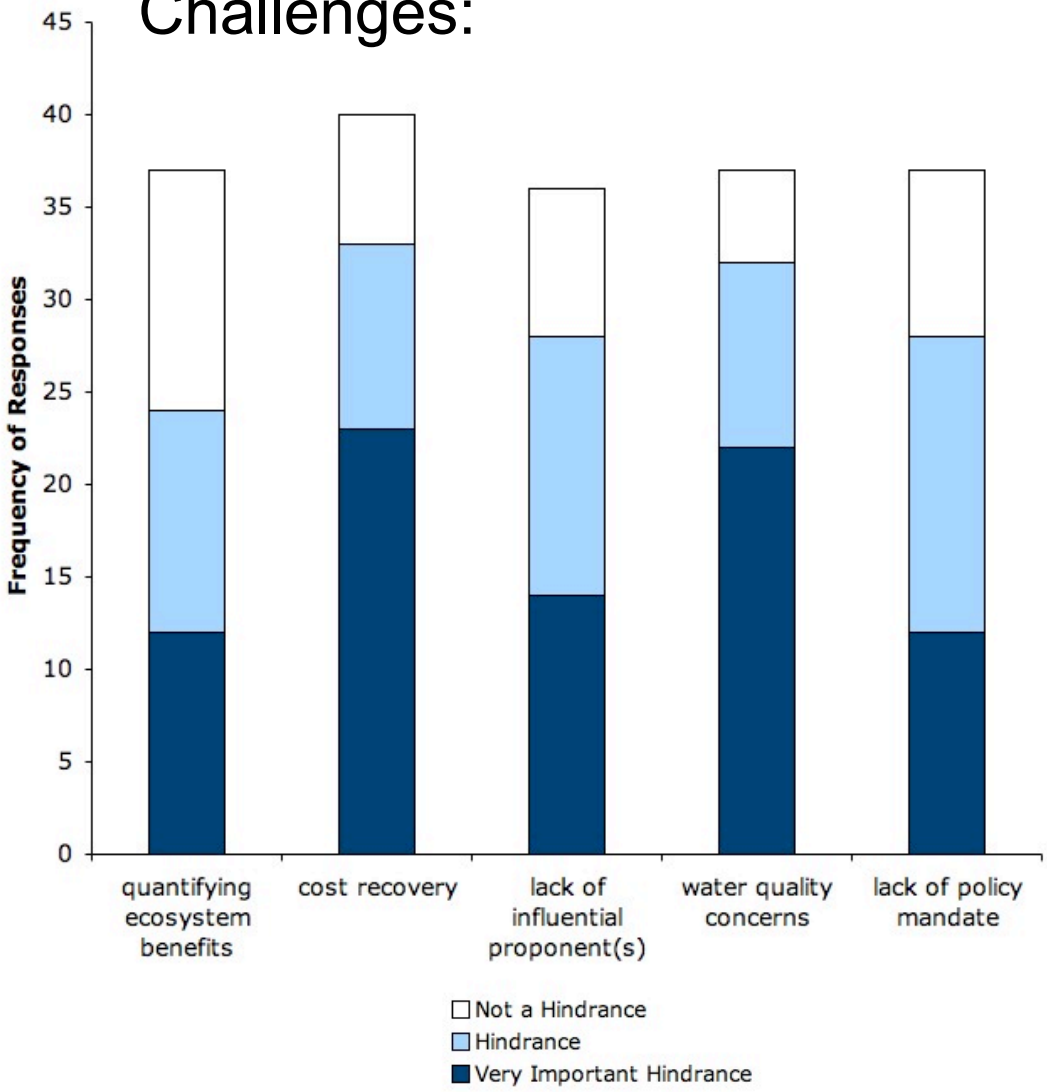
Marsh enhancement with tertiary treated water

Lake enhancement

Lake Elsinore: impede loss of water and reduce N and P concentrations in the lake

Water reuse for ecosystem enhancements

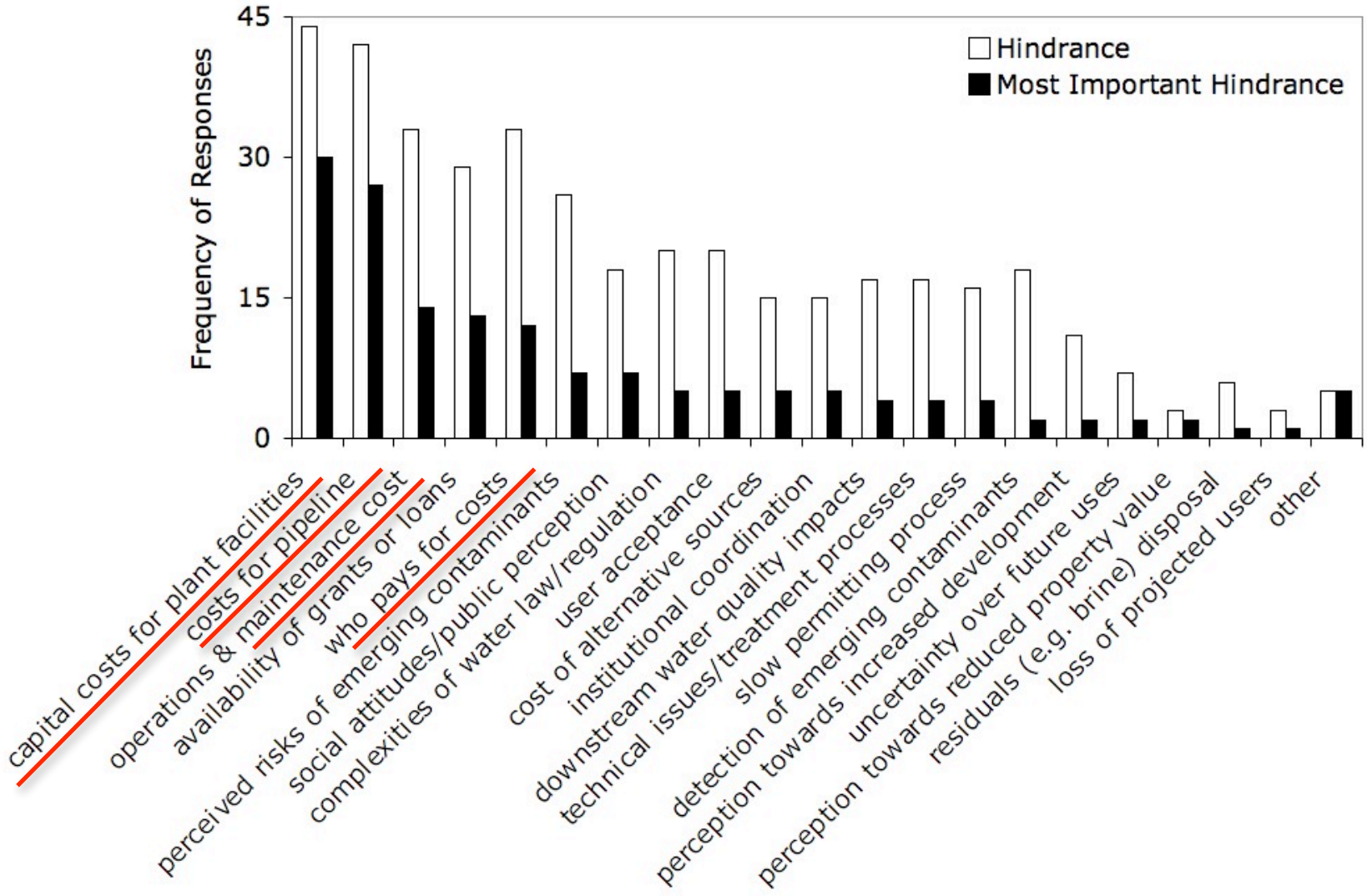
Challenges:



Opportunities:

- Ecosystem enhancements
- Natural treatment systems
- System-wide tradeoffs for upstream benefits

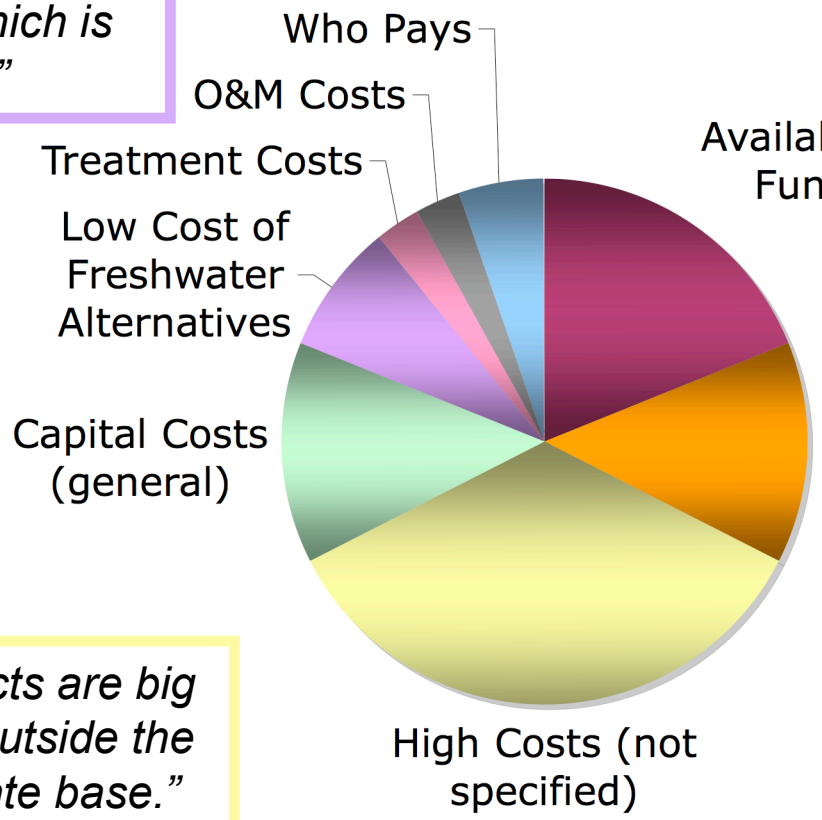
Hindrances to water reuse



Most Important Hindrance: Costs

"Cheap water in Northern California. Delta water is purchase from USBR by the local water agency for about $36/AF, which is almost free."

"The state grant funding opportunities are limited and even harder to get with the current budget crisis."



"These projects are big ticket items outside the range of a rate base."

"Generally in the industry and specifically for us, the cost of pipelines is really the only reason we haven't been recycling more."

(30 of 54 respondents)

CA 2009 Recycled Water Policy

How do you expect the
CA 2009 Recycled Water Policy will <u>facilitate</u> implementation
of new recycled water programs?

\+

- hope/expectations for more grants or funding from the policy (~14%)
- Language/tone will encourage reuse or appease opponents
- Streamline permitting
- Adoption/approach of CEC blue ribbon panel

"Maybe because of the new provisions new funding sources will become available for such projects."

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- will not facilitate or will hamper implementation (~10%)
- "quasi-onerous requirements" for salt and nutrient management plans
- No influence expected (~26%)
- More regulations and costs

"…practically speaking, there is nothing that really helps promote recycled water, just more regulations."

CA 2009 Recycled Water Policy

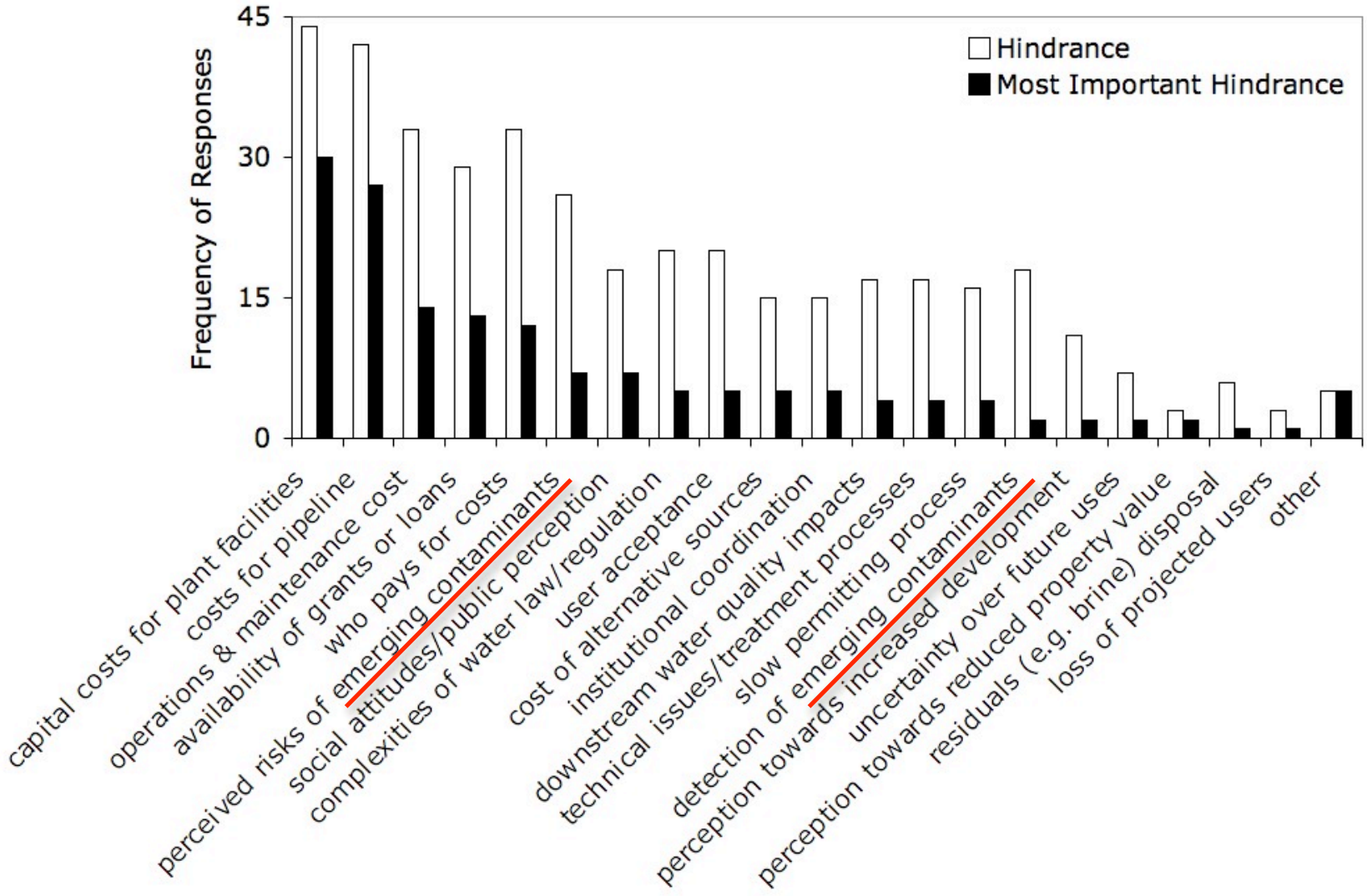
How do you expect the
CA 2009 Recycled Water Policy will <u>hinder</u> implementation
of new recycled water programs?

Salt and nutrient mgmt. plan req'ts (~20%)	Costs associated with policy req'ts (~23%)	No impact, N/A, or none expected (~20%)

Other: new regulatory burdens/stringent stds.; possible added reporting, monitoring, inspection, and oversight; missing industrial water reuse, greywater

- *"Nutrient plan requirements are almost non-sensical, given that a potable irrigation site is completely unregulated with regard to nutrients and could legally apply fertilizers at a rate many times that of a neighboring recycled irrigation site."*

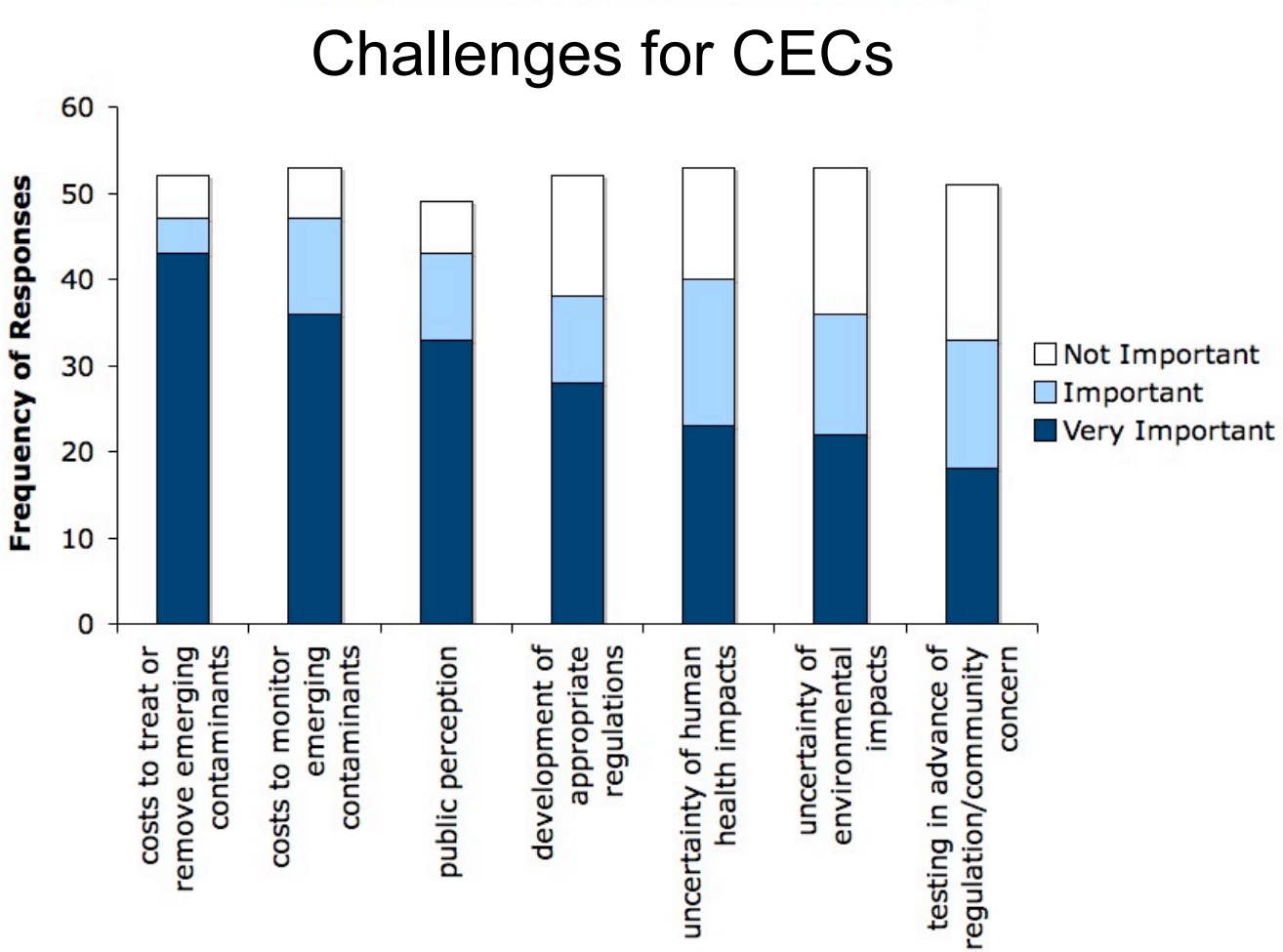
Hindrances to water reuse



Trace Contaminants

26 respondents indicated “perceived risk of human or environmental health due to constituents of emerging concern” hindered water reuse program implementation

“Appointing a blue ribbon panel to address CEC's is good, since someone needs to look at this sooner rather than later, and the approach developed in the policy seems like a good way go about it.”

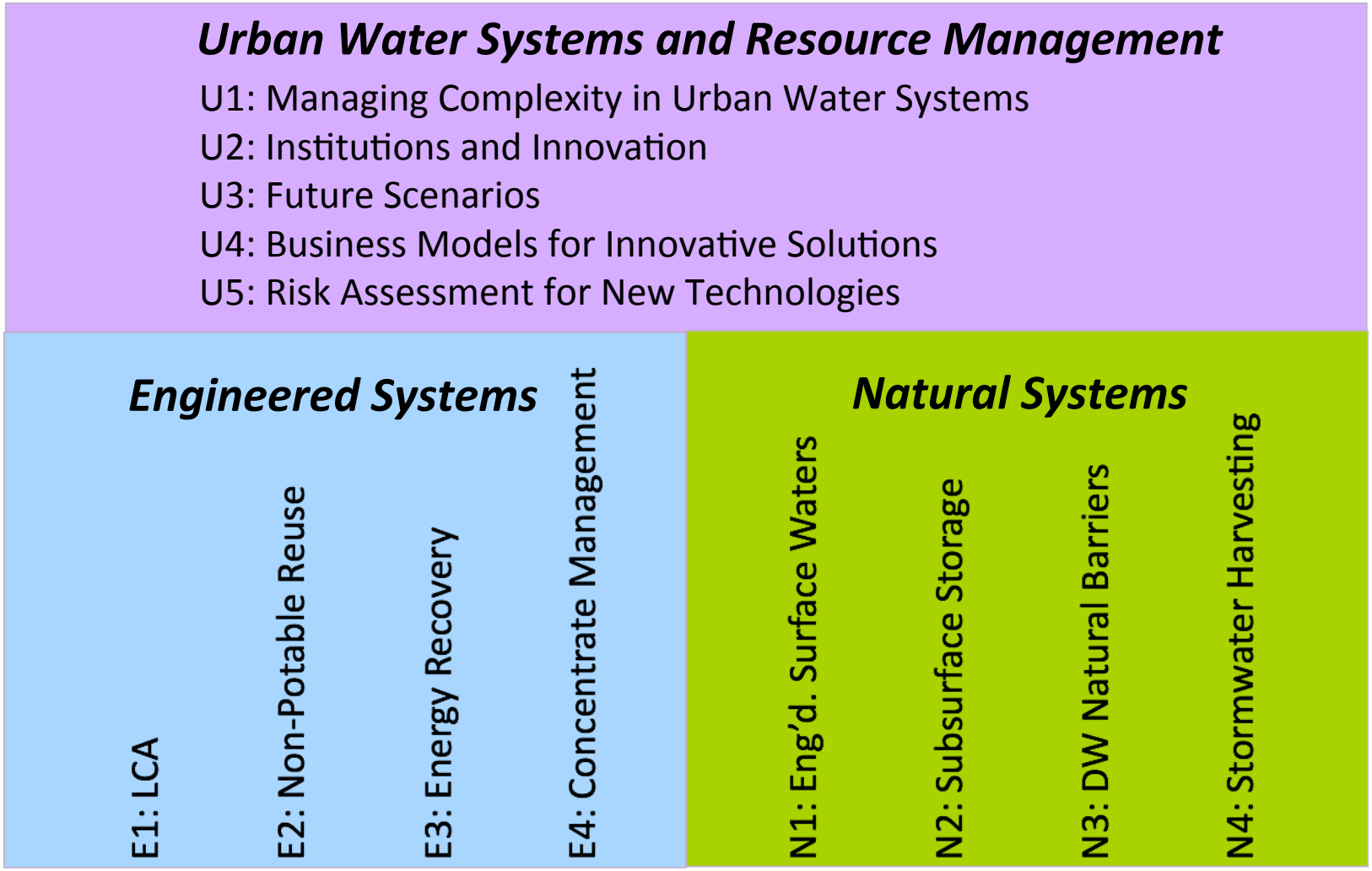


Opportunities for University Involvement

Stanford, UC Berkeley, Colorado School of Mines, New Mexico State Univ.

- Trace constituents measurement/modeling (e.g. Luthy, Reinhard)
- Ecosystem for treatment (e.g. Sedlak, Knight)
- Transformative technologies (e.g. Criddle, Drewes)
- Institutional impediments (e.g. Sunding, Thompson)
- Public perception (e.g. Krosnick)
- Education and outreach
- Industrial partners

Integrated research



Discussion

- Best format for survey impact
- Next steps for water reuse for ecosystem benefits
- Partners for Engineering Research Center

Happy engineers

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