

Cost-effective Groundwater Management Actions:

A Guide for Water Agencies Under The Sustainable Groundwater Management Act

Introduction

To meet the requirements of The Sustainable Groundwater Management Act, Groundwater Sustainability Agencies will likely need to employ management tools that reduce aggregate groundwater extraction. The choice of management tool to reduce basin-wide groundwater extraction will have significant cost implications for groundwater users. This handout compares the cost implications of three management actions: mandates on individual groundwater use, tradable permit programs, and taxes on pumping.

Management Actions for Reducing Groundwater Extraction

- Mandates (“cap-but-no-trade”): mandatory limits on individual use
- Tradable permits (“cap-and-trade”): allocate shares of the total allowable basin extraction and facilitate trading of those shares.
- Taxes on pumping: charge a fee per acre-foot extracted



Comparing Management Actions

Incentive-based policies (tradable permits and pumping taxes) can achieve sustainability at a lower total cost than mandated conservation. Relative to taxes, mandates and tradable permits increase the certainty of reaching a sustainability goal.

	Mandates	Tradable Permits	Taxes
Likelihood of reaching goal	+	+	-
Cost-effectiveness	-	+	+

Coachella Valley, Indio Subbasin

The cost-savings of incentive-based management actions were demonstrated for a subbasin in Southern California by combining an analytical model of groundwater trading with an econometric model of price-responsiveness.^a

Basin conditions:^b

- Medium-priority basin that requires a 20% reduction in extraction to correct overdraft
- 43% of water supplied by groundwater

Size:

- 300,000 total acres with 74,000 irrigated acres
- Total agricultural revenues around \$650 million annually

Estimated Costs:

- Estimated cost of mandates = \$190 million annually
- Allowing trade of groundwater allocations can generate benefits of \$73 million annually

Incentive-based policies can reduce costs by over 30%.

Outstanding Issues

- How will pumping shares be allocated across users?
- How will a trading platform be structured?
- How will surface water interactions be accounted for within a cap-and-trade program?
- How will revenues from a pumping tax be spent?

Recommendations

- Inform decisions with the best available data and science.
- Work closely with other groundwater agencies and engage stakeholders directly.
- Consider tradable permits as a cost-effective tool for achieving groundwater sustainability.

^aBruno, Ellen. 2018. “Agricultural Groundwater Markets: Understanding the Impacts of Market Power on the Gains from Trade” Working Paper. University of California, Davis. To download: ellen-bruno.com/research.

^bCalifornia Department of Water Resources. 2014. “California CASGEM and Groundwater Sustainability Basin Prioritization.” <www.water.ca.gov/Programs/Groundwater-Management/Bulletin-118/Basin-Prioritization>.

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