

A Southern California Water Market-
Managing in a Time of Scarcity
NGWA Groundwater Summit - December 4, 2017

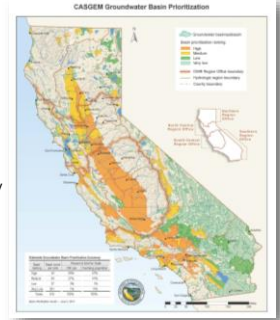


Presented by:
W.Greg Hamer, Amec Foster Wheeler

Background: California Groundwater



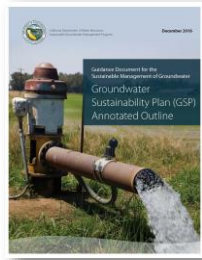
- ▶ 1/3 of potable water supplies are from groundwater
- ▶ In dry periods, groundwater represents more than 50% of supply in some areas
- ▶ There are 431 groundwater basins in California
 - ▶ 127 are high or medium priority: many with overdraft conditions
 - ▶ 27 basins are adjudicated: A Watermaster or other governing body regulates groundwater use



California Groundwater - SGMA



- ▶ Many groundwater basins are in overdraft
- ▶ The 2014 Sustainable Groundwater Management Act (SGMA) is California's first overall groundwater management regulation
- ▶ Non-adjudicated high- and medium-priority groundwater basins need Groundwater Sustainability Agency(s) (GSA)
- ▶ A Groundwater Management Plan (GMP) is required for each basin
- ▶ GMP considers six sustainability criteria



Getting to Sustainability



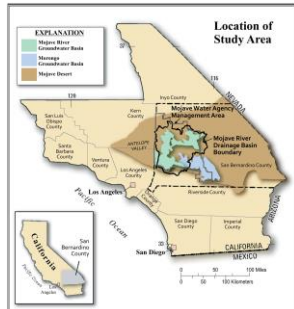
- ▶ Overdrafted groundwater basins face big challenges in reducing water demands
- ▶ Water markets can help ease the transition to sustainable groundwater use
- ▶ About 3% of water supplies are bought/sold or traded on water markets in California
- ▶ Water markets have not been easy to establish
- ▶ Most water markets or transfers are within single groundwater basins. The Mojave River basin is a good example



Mojave River Basin



- ▶ Inland drainage, with no outlet to the sea
- ▶ ~3,800 square miles in area
- ▶ Elevations from about 10,000 to 1,500 feet
- ▶ Desert climate
 - ▶ Hot and dry area
 - ▶ Average annual maximum is 80°F
 - ▶ Average annual precipitation is 4 to 5 inches
- ▶ Sources of potable supply are groundwater and imported Northern California water



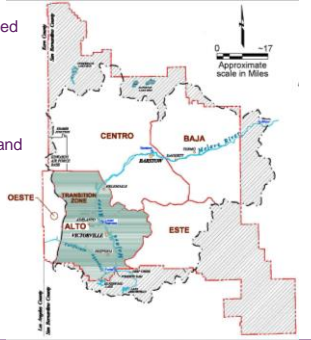
Mojave River Basin



Mojave River Basin



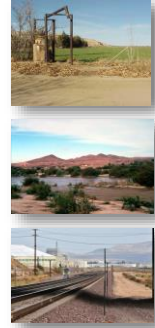
- ▶ Divided into 5 inter-connected subareas
- ▶ Alto Subarea is the most populated: 333,000±
- ▶ Communities of Victorville and Hesperia have grown considerably



Intensive Use of Groundwater



- ▶ Groundwater is the main source of supply for 333,000 people in the Alto Subarea
- ▶ Since 1950, groundwater levels have dropped 50 to 100 feet
- ▶ Groundwater use has shifted from agriculture to municipal and industrial uses
- ▶ The production safe yield of the Alto Subarea aquifers is 70,000 acre-feet (AF) per year
- ▶ Base annual water production was 120,000+ AF per year



Mojave River Judgement



- ▶ A 1996 Judgement to reduce overdraft
- ▶ In July 2002 legal challenges were settled
- ▶ Watermaster and Mojave Water Agency (MWA) manage basin water conditions and provide imported water from California State Water Project (SWP) Aqueduct
- ▶ Judgement established Base Annual Production (BAP) rights for about 450 major pumpers (% of production safe yield)
- ▶ Judgement established annual Free Production Allowances (FPA)
- ▶ FPAs are to decline over time, so pumping will better match production safe yield

Reduction in FPA



- ▶ Pumpers can extract up to their FPA without penalty
- ▶ Pump more than your FPA: pay Watermaster a Replacement Water Fee so they may buy and recharge imported aqueduct water
- ▶ Alternatively, buy (lease) someone else's unused FPA (a cheaper alternative) for the year
- ▶ Or buy someone's FPA on a permanent basis



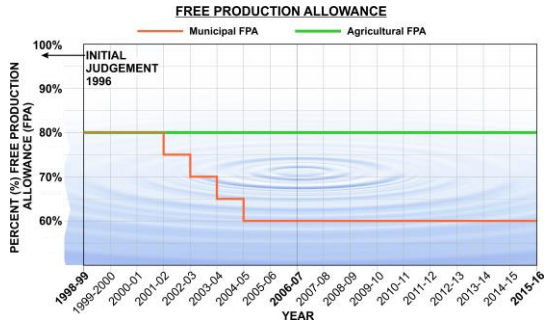
Mojave Basin Alto Subarea



- ▶ Water market allows for:
 - ▶ Selling and buying (leasing) unused pumping allowances for any single year (FPA - Temporary Transfer)
 - ▶ Selling and buying production rights in perpetuity (FPA - Permanent Transfer)
- ▶ Transactions are performed by unofficial "Brokers"
 - ▶ About 100 temporary transfers in 2015-2016
 - ▶ Six permanent transfers in 2015-2016
- ▶ Three main factors are controlling prices
 - ▶ Reduction in allowable pumpage (FPA)
 - ▶ Shift in water use from agricultural to industrial
 - ▶ Increased market stability related to Judgement



Alto Subarea Free Production Allowance



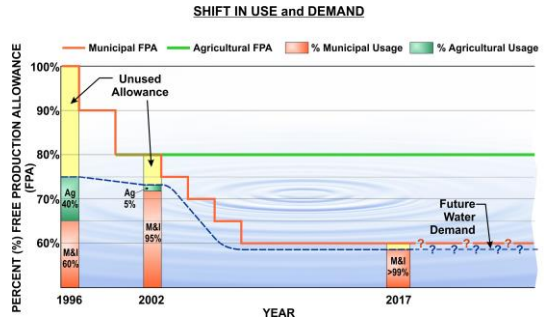
Shift in Use



- ▶ Some farmers are following land and/or changing crops and selling their unused allowance
- ▶ Some farmers are selling their land and keeping their water rights
- ▶ Municipal & industrial users buy FPA from farmers or others
 - ▶ Victor Valley Water District permanent FPA purchases
 - ▶ Baldy Mesa Water District temporary FPA purchases
 - ▶ City of Hesperia advertising for permanent FPA purchases



Mojave Basin Alto Subarea



Trends in Prices



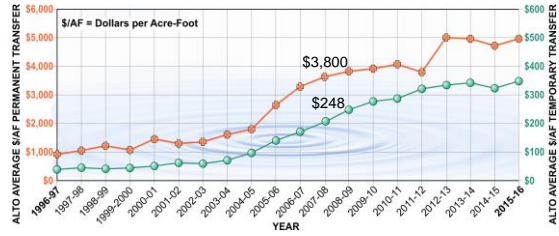
- ▶ Prices of annual leases and permanent purchases have risen at an average of about 12% per year
- ▶ Prices generally track with Watermaster's Replacement Water Assessment costs



Trends in Prices



- ▶ Price for temporary transfers generally tracks with purchase price for permanent transfers
- ▶ Prices have leveled off due to recession and drought



Market Conditions



- ▶ Every year there are unused FPAs in the Alto Subarea
- ▶ A few buyers are paying the Replacement Water Fee even though it costs more than FPAs that might be available
- ▶ There is an "untapped" market for FPAs, however the current decentralized market makes it difficult to utilize them
 - ▶ Buyers, such as cities, need to search out potential sellers
 - ▶ Sellers must search out buyers
 - ▶ For each transaction, there is uncertainty about prevailing market prices
- ▶ A centralized market place will help stabilize prices and increase utilization of available FPA

Questions?

