REIMAGINING
LOWER COLORADO
AGRICULTURE

Context & Solutions for the Restoration of Colorado River Ecosystems

James Powell LA602 Landscape Design : Natural Processes Winter 2012 Prof. Jessica Hall

PROJECT OVERVIEW

GOAL

Improve ecological and human health through revised agricultural practices in the Lower Colorado River watershed.

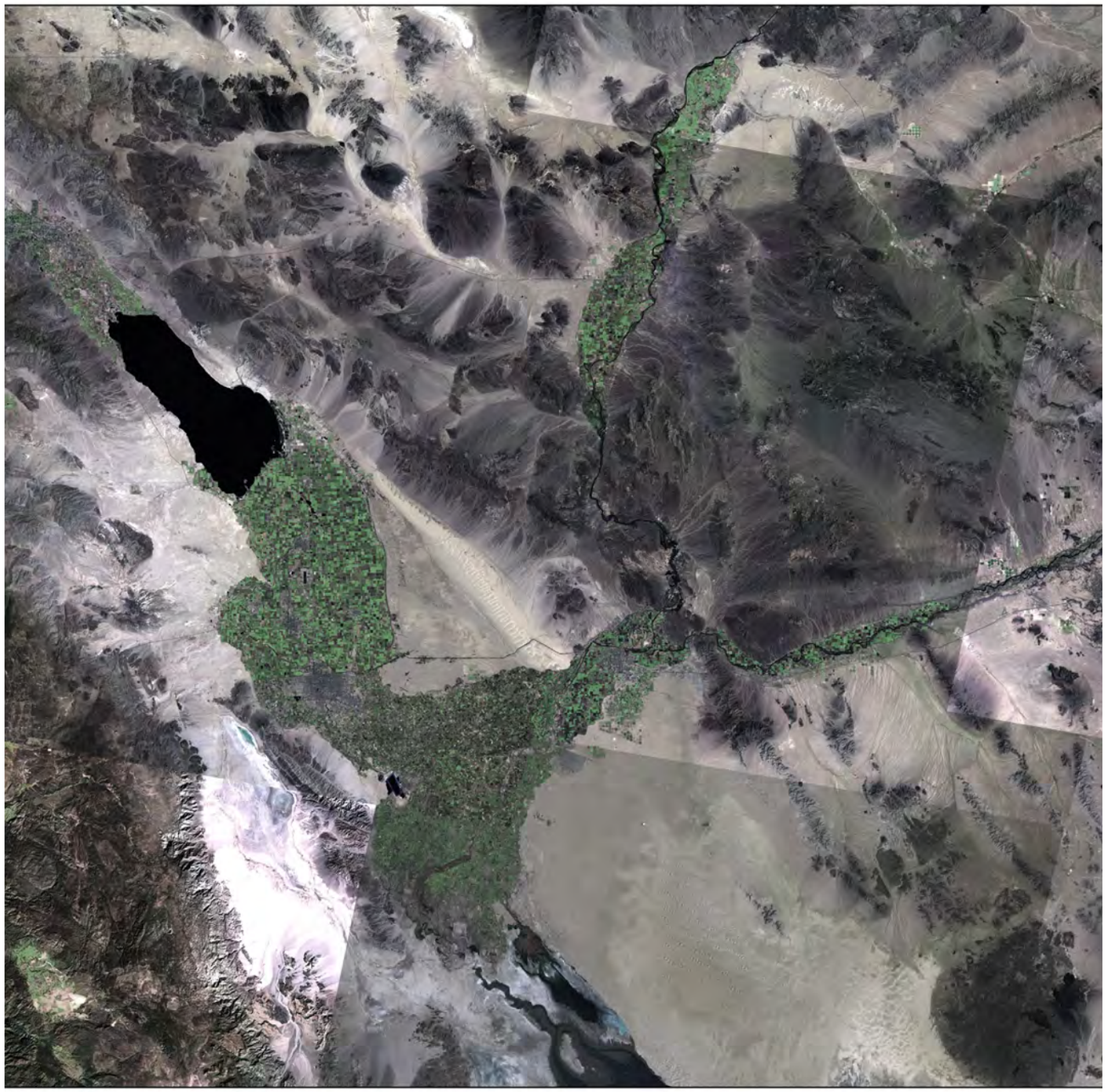
OBJECTIVES

Restore water to the Colorado River Delta.

Reduce toxicity in the Salton Sea.

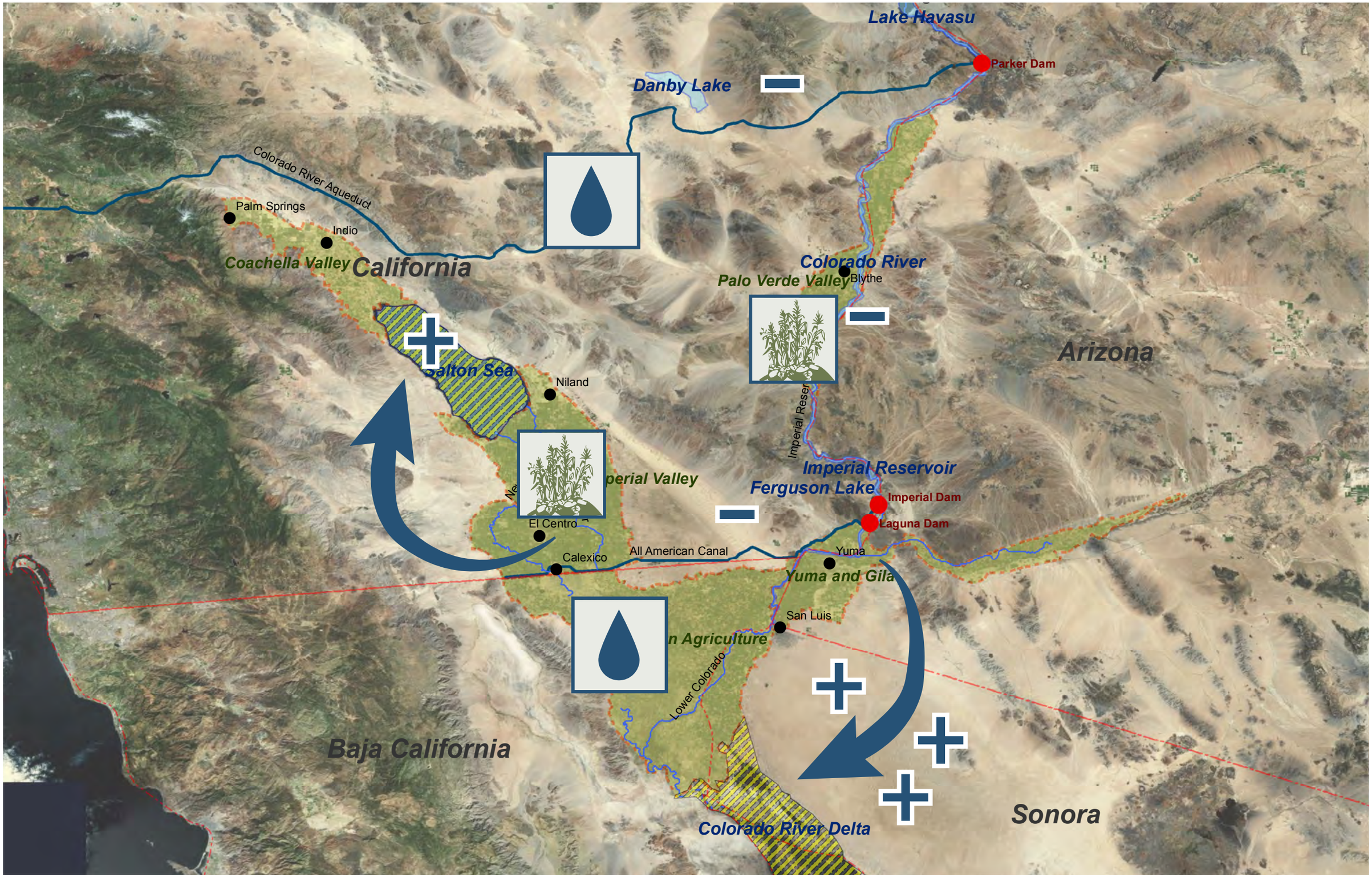
Identify alternatives to current crops and agricultural land use.

Encourage a market for healthier and more geographically-appropriate California foods.



LOWER COLORADO AGRICULTURE STUDY AREAS

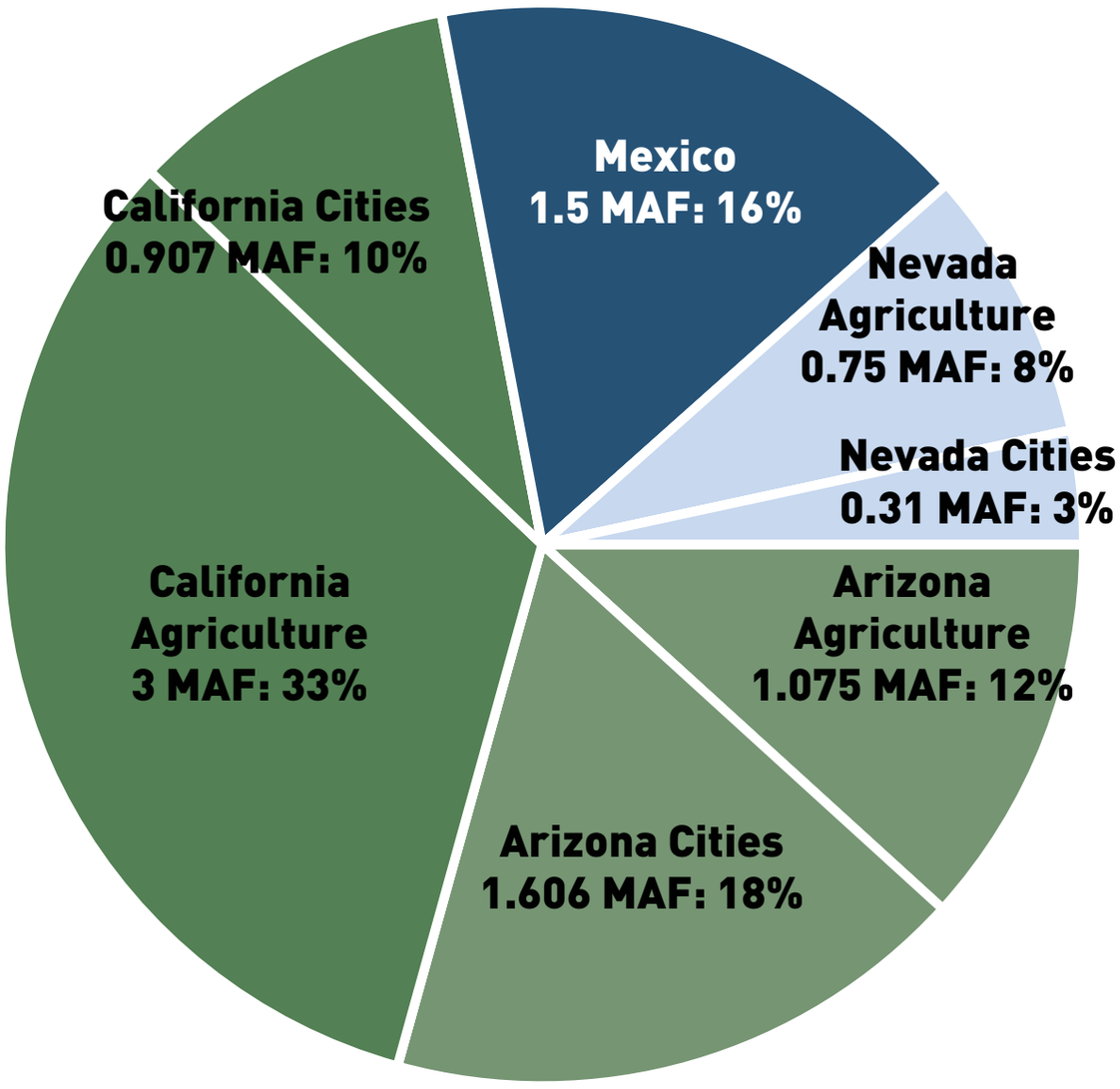
LOWER COLORADO AGRICULTURE PROJECT OVERVIEW



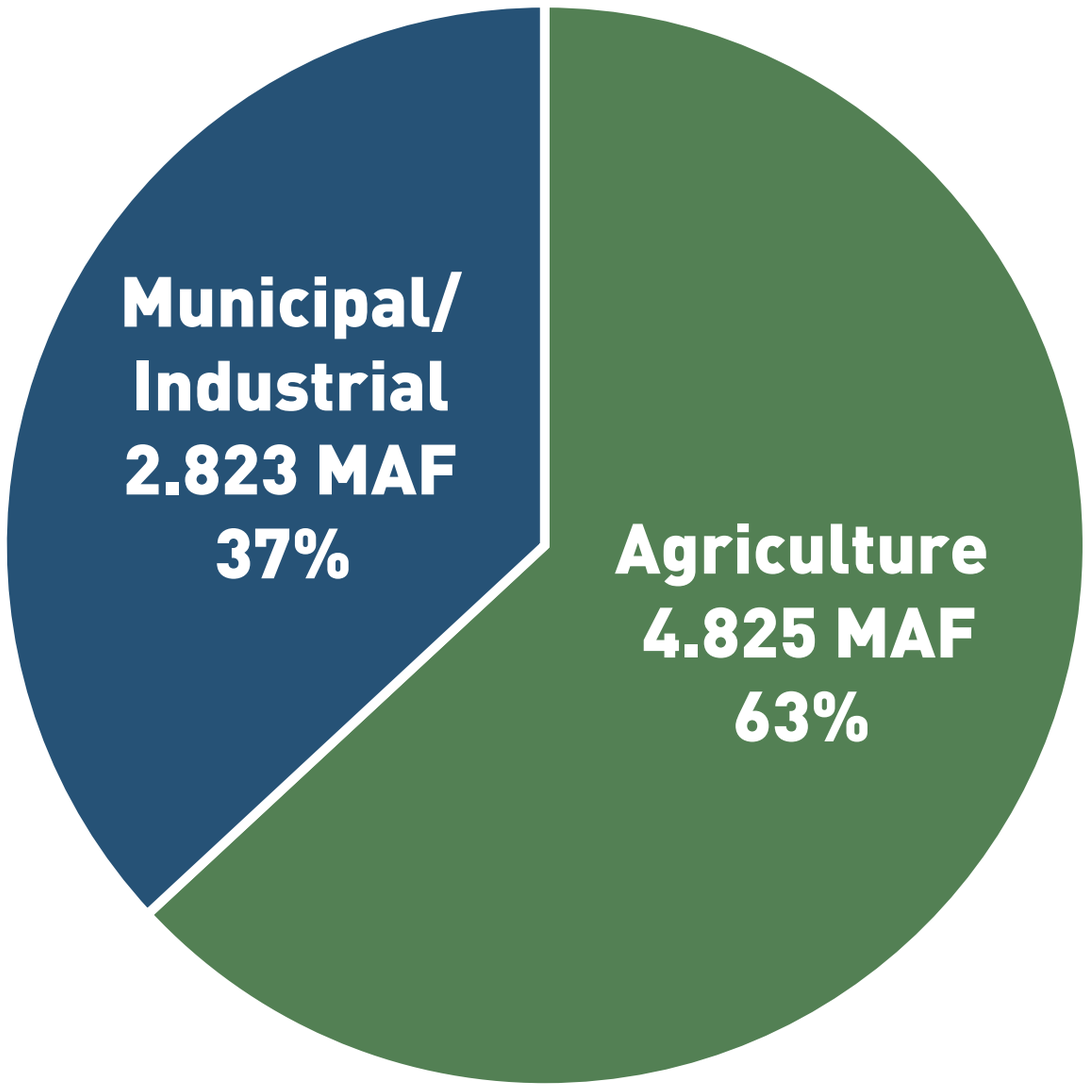
LOWER COLORADO AGRICULTURE REGIONAL FLOWS

LOWER COLORADO AGRICULTURE WATER USAGE

Lower Colorado Water Use by State

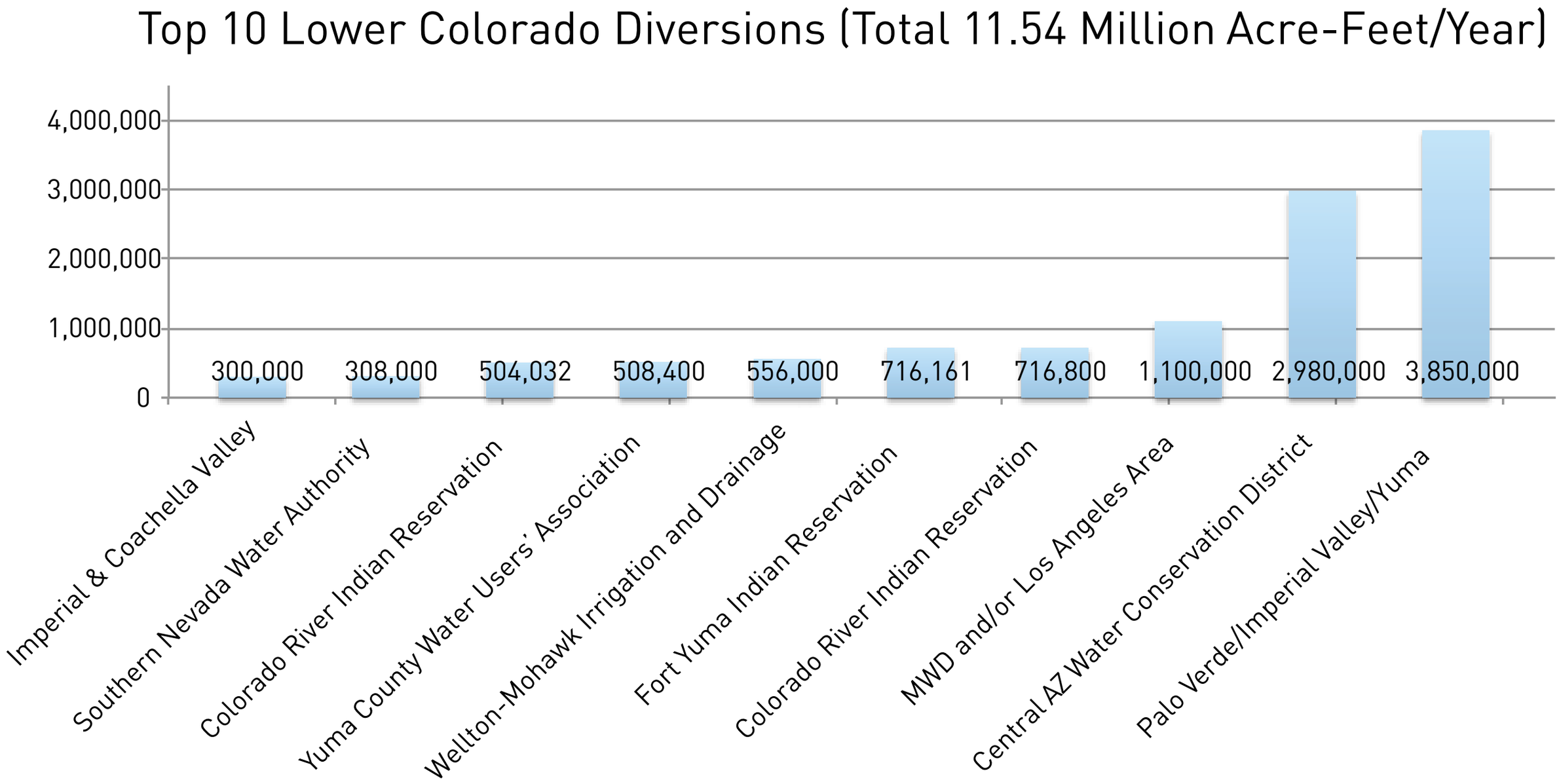


Lower Colorado Water Use by Type

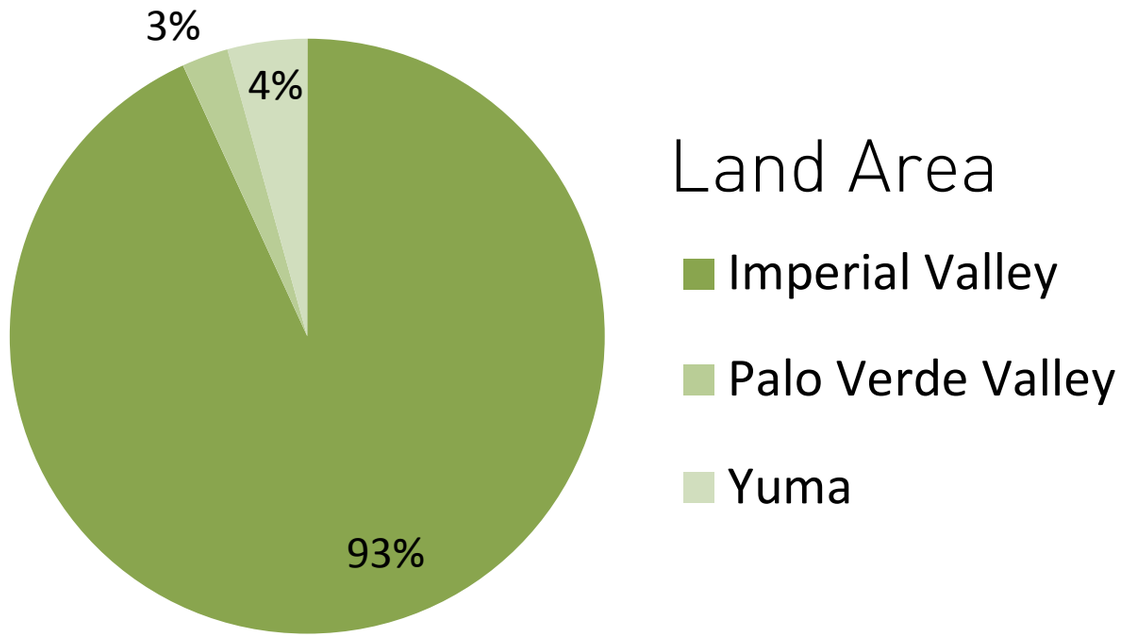


LOWER COLORADO AGRICULTURE

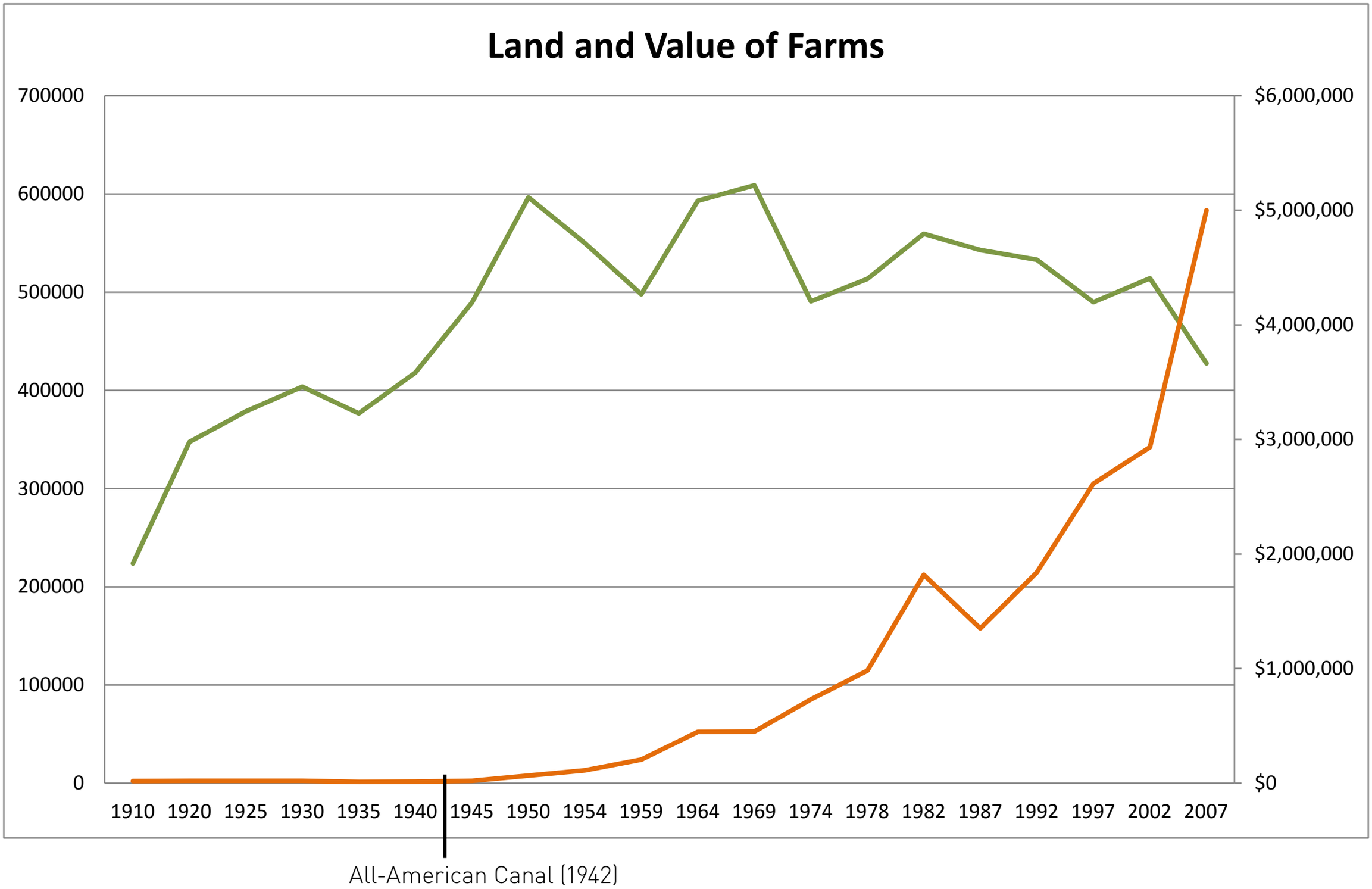
DIVERSIONS



IMPERIAL COUNTY

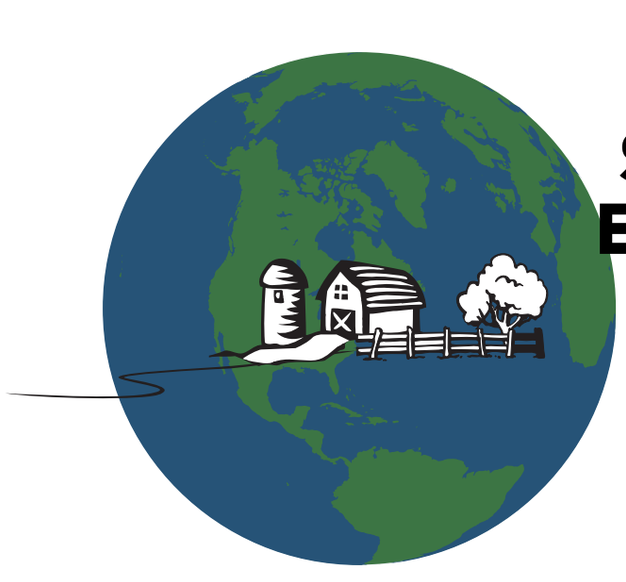


IMPERIAL COUNTY



LOWER COLORADO AGRICULTURE SUBSIDIES

$20,000,000,000
Domestic Subsidies

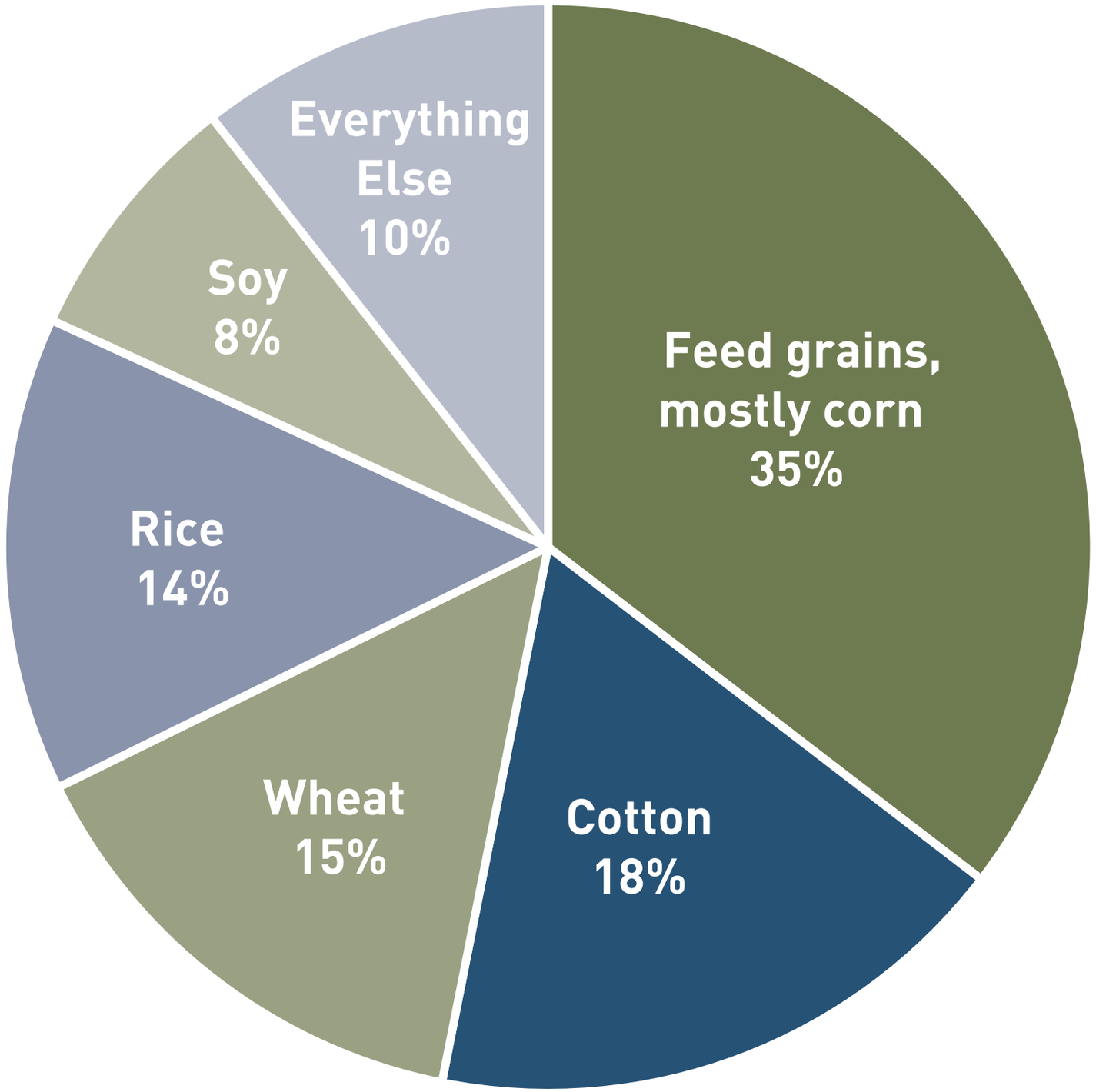


$1,000,000,000
Export Subsidies

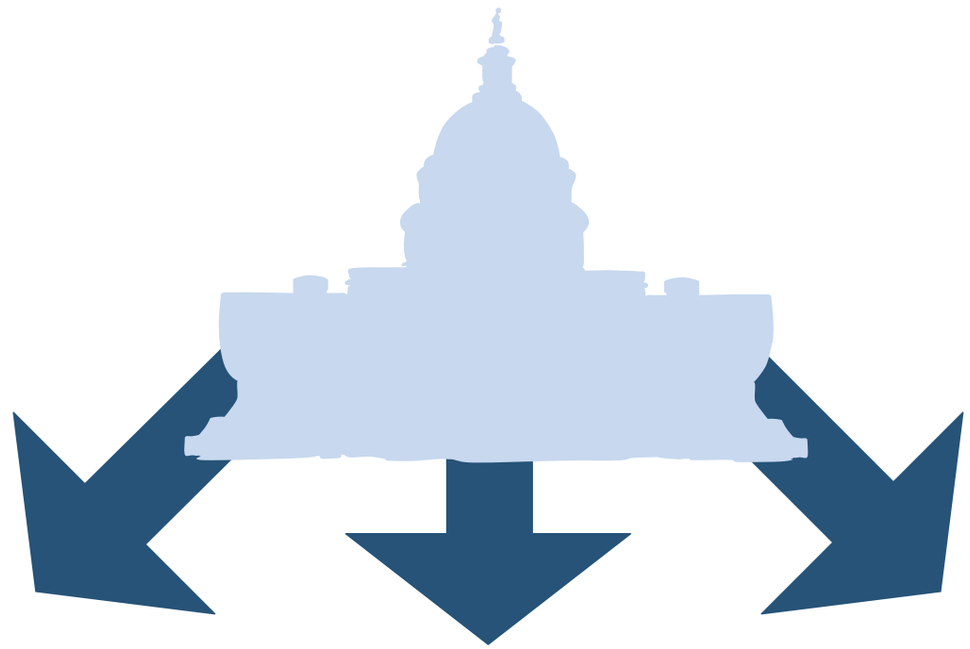
$240,242,000
To California Farms

LOWER COLORADO AGRICULTURE

SUBSIDY DISTRIBUTION



CALIFORNIA SUBSIDIES



Farms with sales of $100K-250K

Total subsidies
$19,990,000

$21,064
Avg/Farm

Farms with sales of $1-5 million

Total subsidies
$98,646,000

$59,821
Avg/Farm

Farms with sales of more than $5 million

Total subsidies
$36,607,000

$84,542
Avg/Farm

IMPERIAL COUNTY

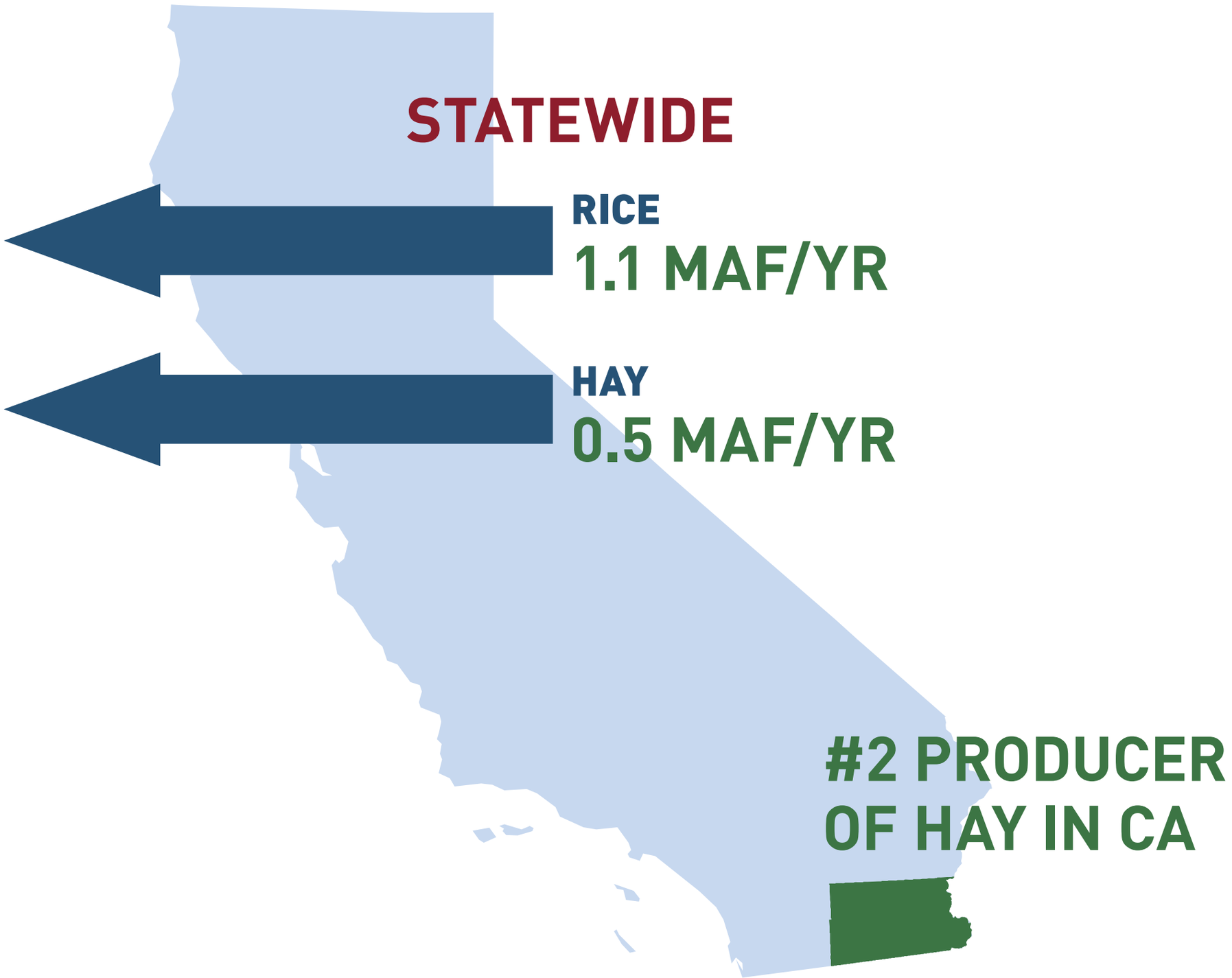
457 Farms in Imperial County, 45% have over $500K in sales

Total subsidies $4,885,000

$37,006 Avg/Farm

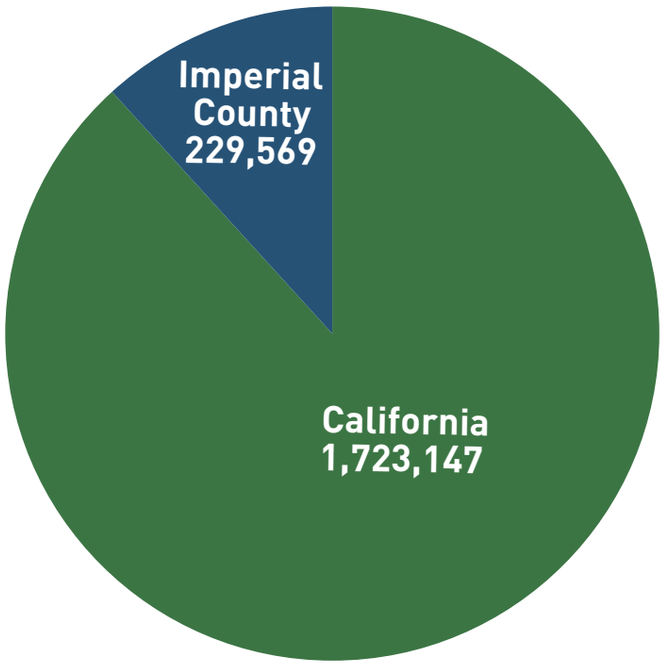
Average net income of Imperial County farms: $431,044

VIRTUAL WATER EXPORTS

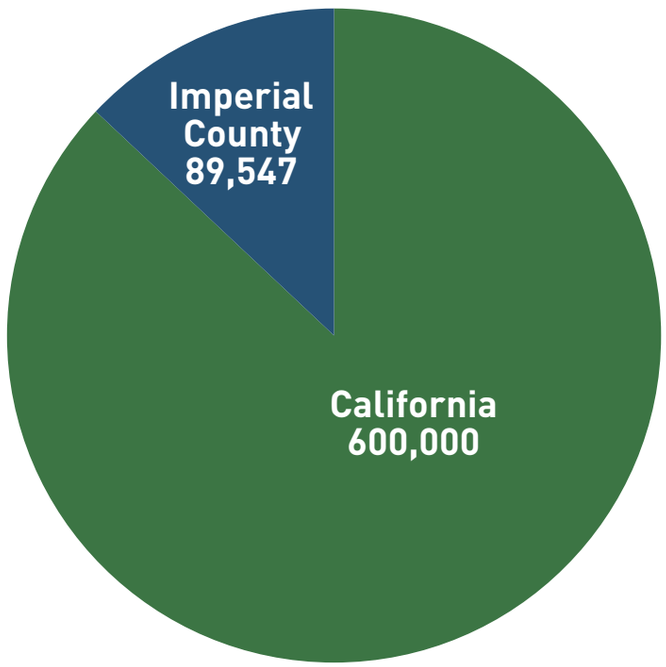


IMPERIAL WATER EXPORTS

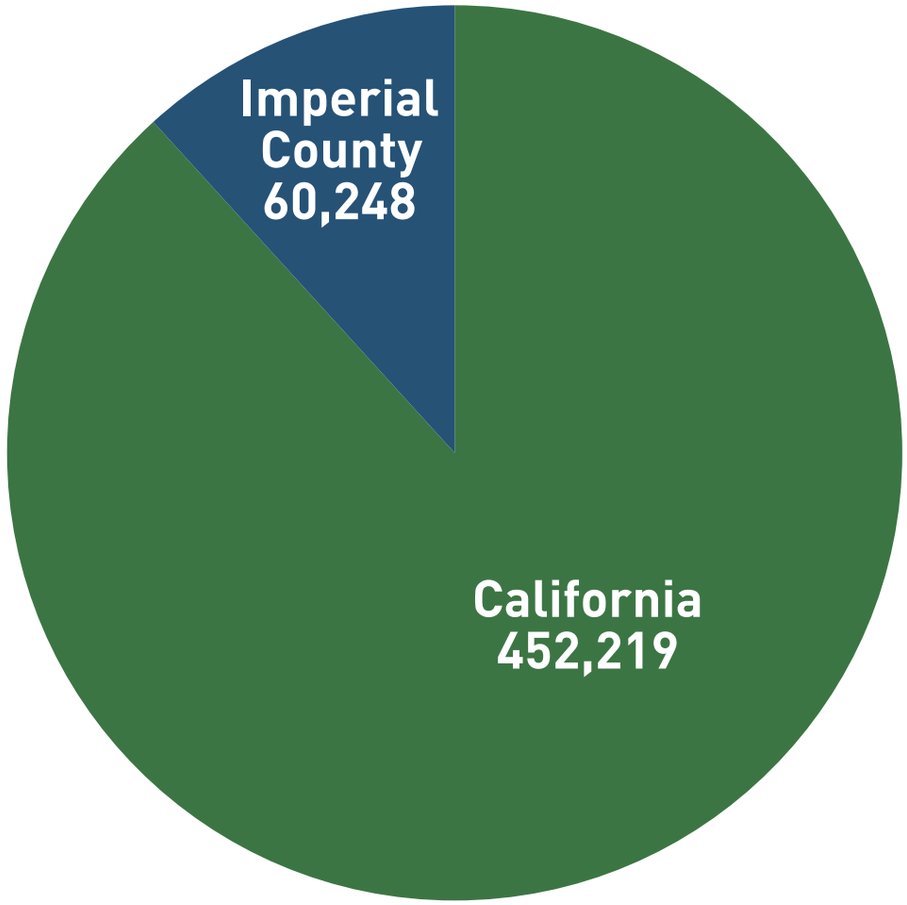
Acres of Forage Crops



Exported Tons of Forage



Exported AF as Forage

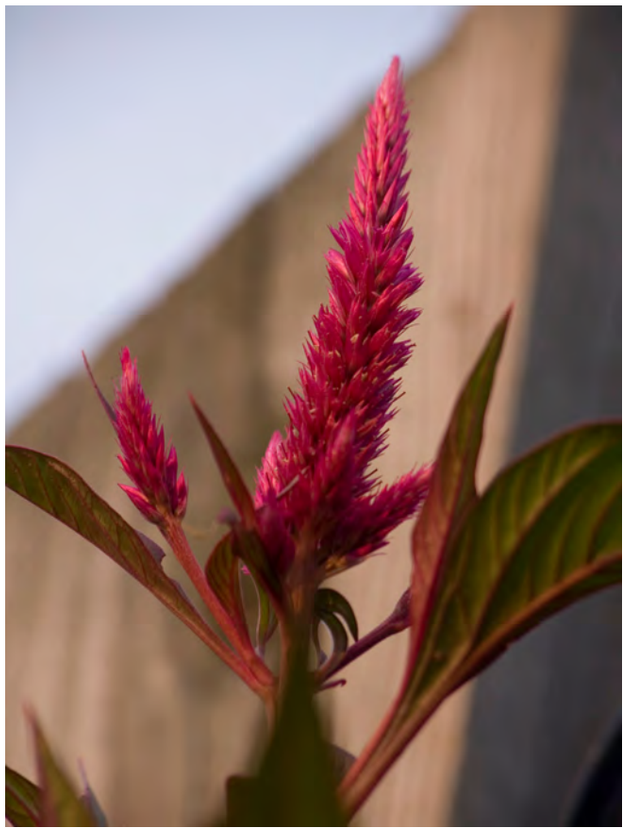


LOWER COLORADO AGRICULTURE

SPECIALTY CROPS

CALIFORNIA SPECIALTY CROP BLOCK GRANTS

$50,000 - $400,000 PER PROJECT



Andy Ciordia 2006

Victor Radziun 2006

flickr user graibeard 2010

IMPERIAL COUNTY

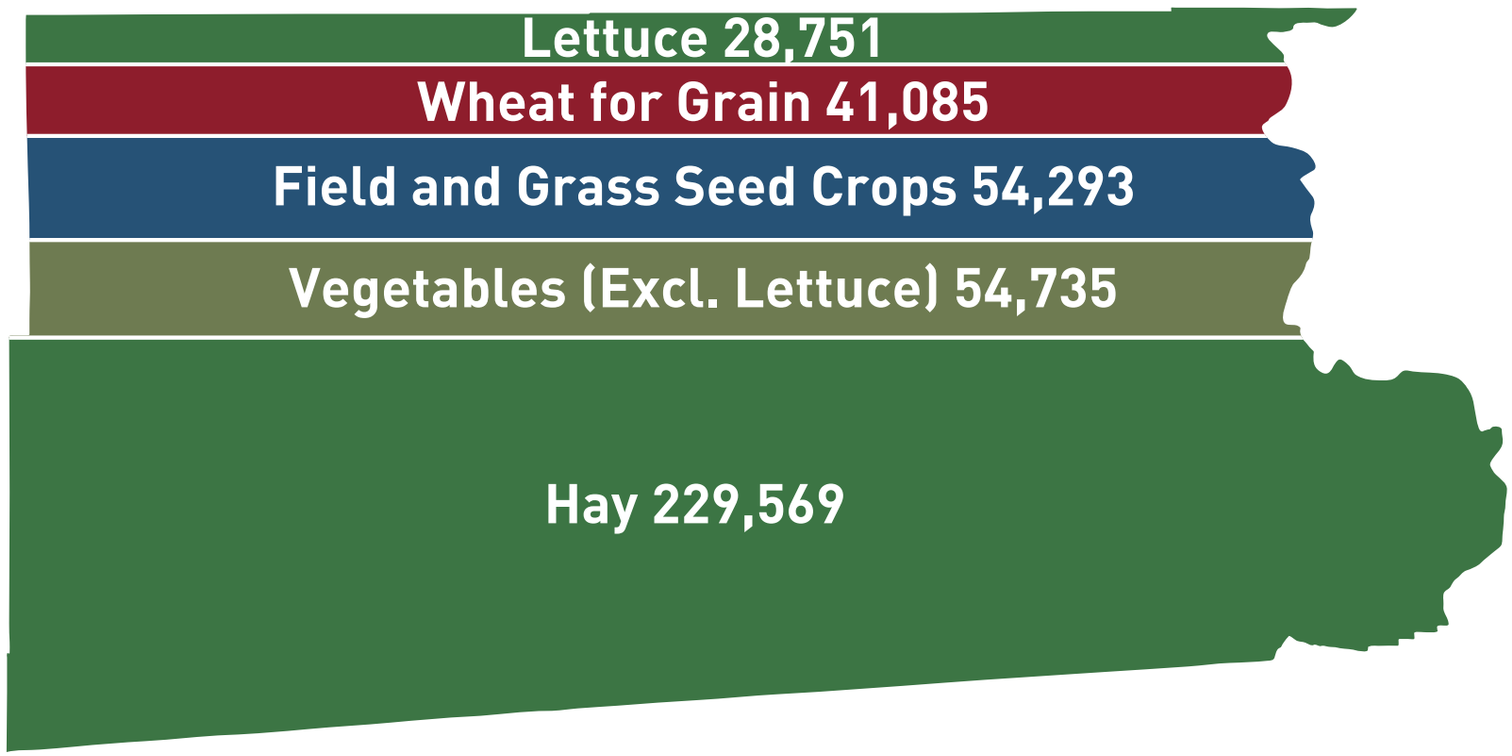
WATER PRICES

CA AVERAGE: $1303/AF
IMPERIAL VALLEY: $20/AF

FARM STATISTICS

452 FARMS
AVG. SIZE 945 ACRES
AVG. VALUE $5 MILLION
427,349 ACRES FARMLAND
376,535 ACRES IRRIGATED

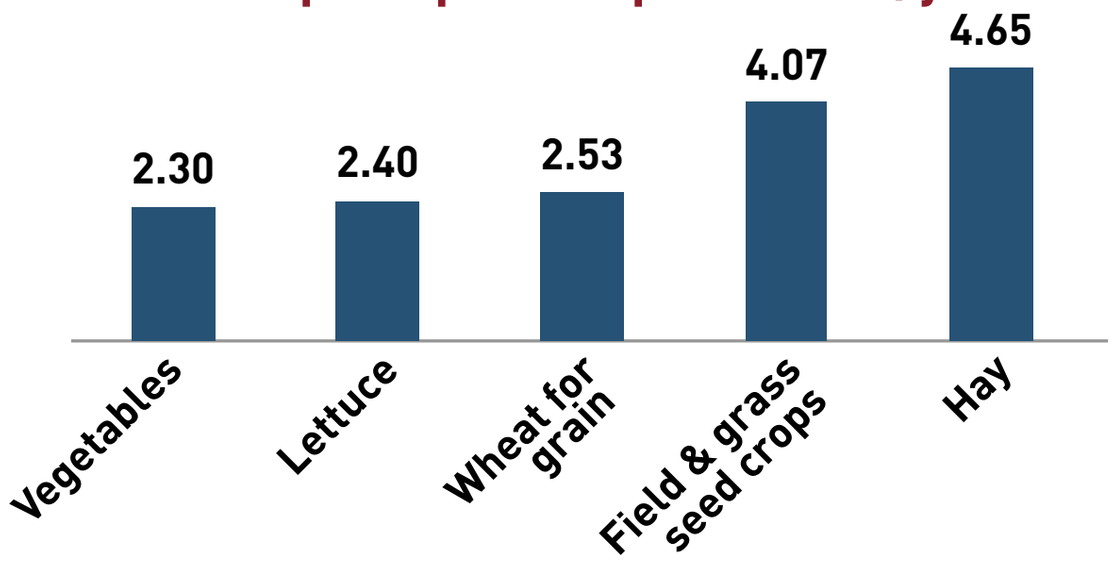
HARVESTED ACRES PER CROP



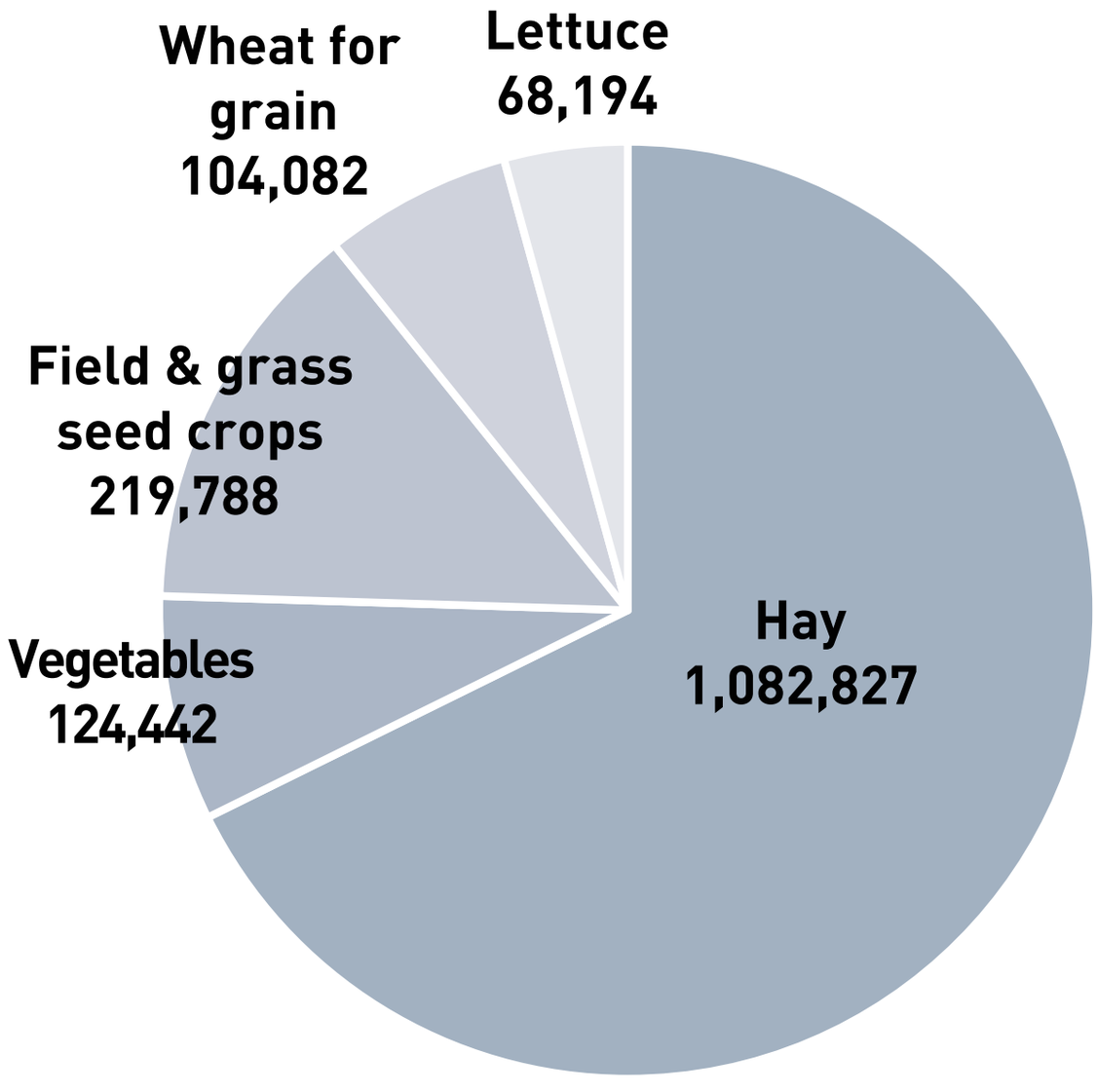
IRRIGATION DEMAND

ESTIMATING IRRIGATION NEEDS PER CROP TYPE

Crop Evapotranspiration Ft/yr



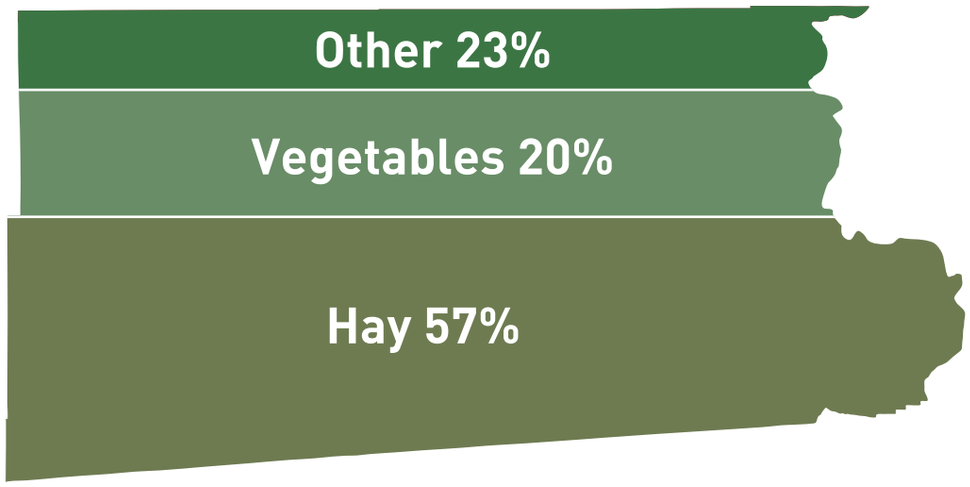
ESTIMATED IRRIGATION USAGE BY CROP (AF/YR)



LOWER COLORADO AGRICULTURE

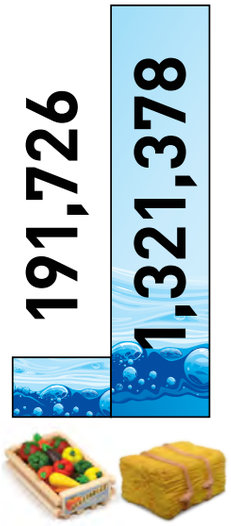
PROPOSED PRODUCTION

CROPS GROWN IN IMPERIAL COUNTY, 2007



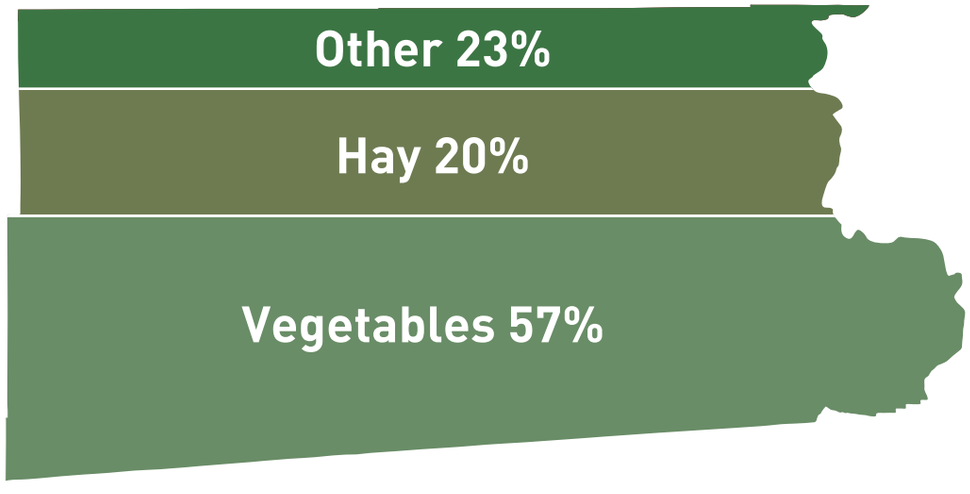
427,349 ACRES

$607 MILLION



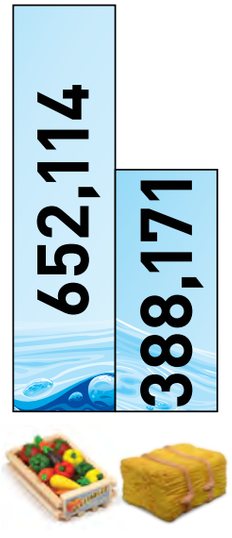
1.5 MAF TOTAL

PROPOSED CROP ALLOTMENT



427,349 ACRES

$620 MILLION ADDITIONAL SALES

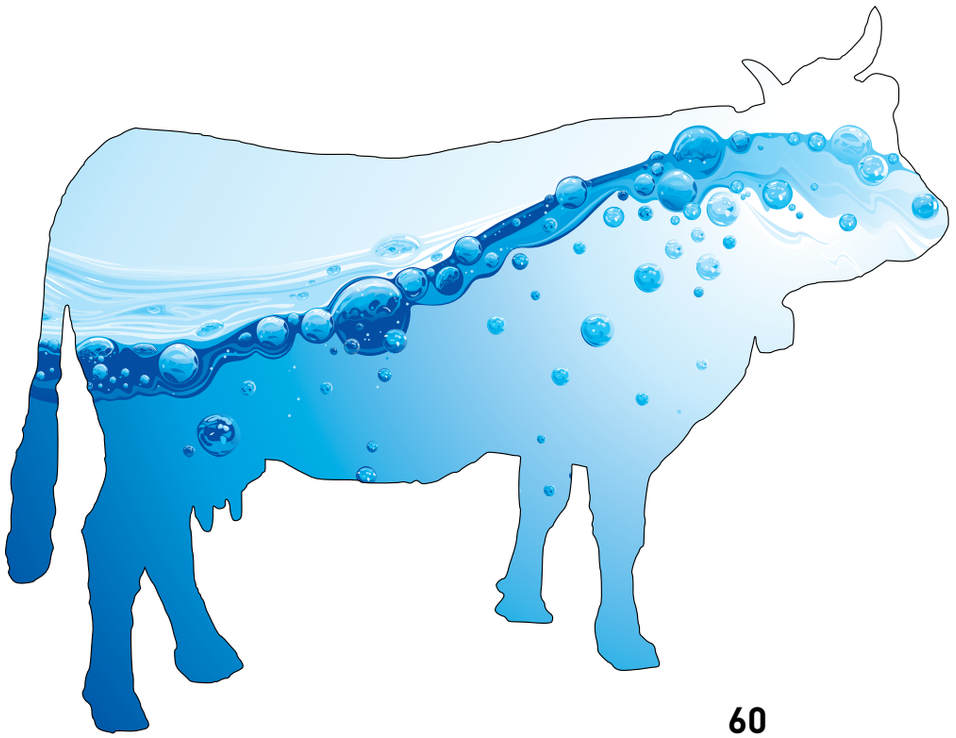


475,000 AF SAVINGS

$1.23 BILLION

1.04 MAF TOTAL

WATER NEEDS OF FOODS



AVERAGE WATER PER PERSON FOR ONE DAY'S MEALS: 800-1200 GALLONS

LOWER COLORADO AGRICULTURE

DIET ADJUSTMENT

LOWER COLORADO AGRICULTURE

CROP COMMUNITIES

IRRIGATED AREAS AND NEAR STREAMS

AMARANTH
(Amarantus cruentus)

SUNFLOWER
(Helianthus annuus)

TOMATOES
(Solanum lycopersicum)

MAIZE
(Zea mays)

SQUASH
(Cucurbita spp.)

BEANS
(Phaseolus spp.)

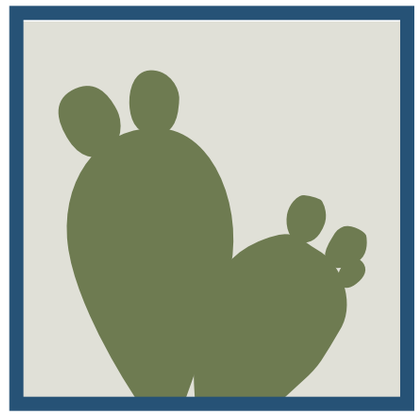
DRY AREAS DISTANT FROM WATER

HONEY MESQUITE
(Prosopis glandulosa)

PRICKLY PEAR
(Opuntia spp.)

JOJOBA
(Simmondsia chinensis)

SALTY SOILS, REMEDIATION AREAS

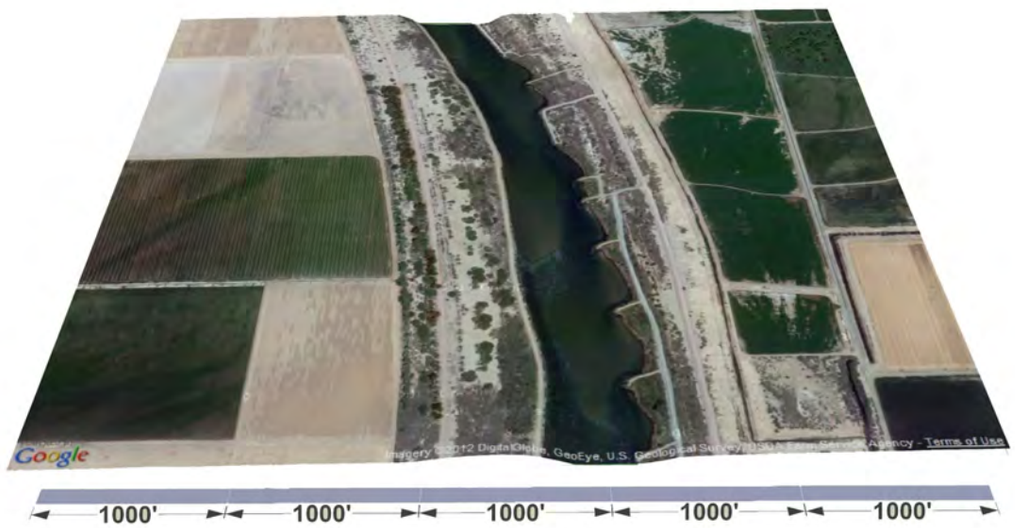


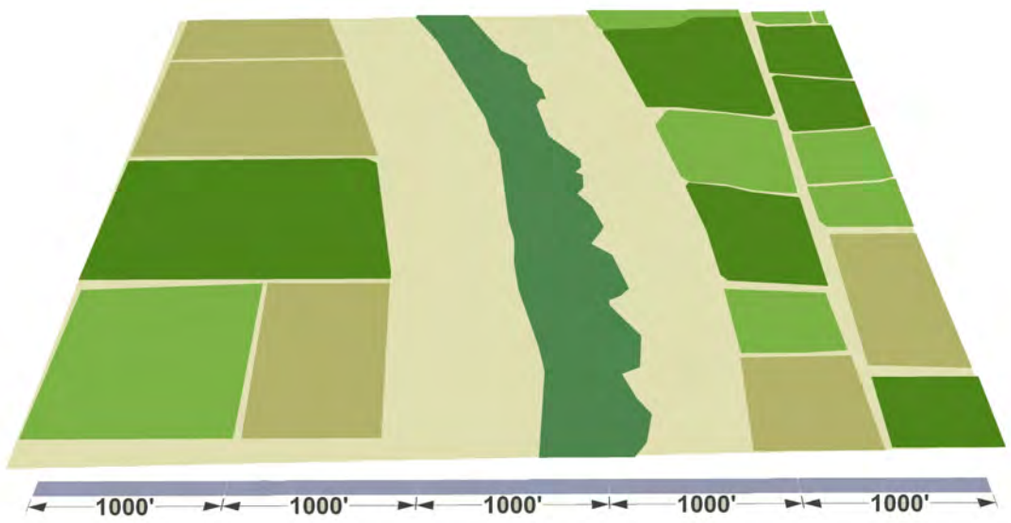
PRICKLY PEAR
(Opuntia spp.)

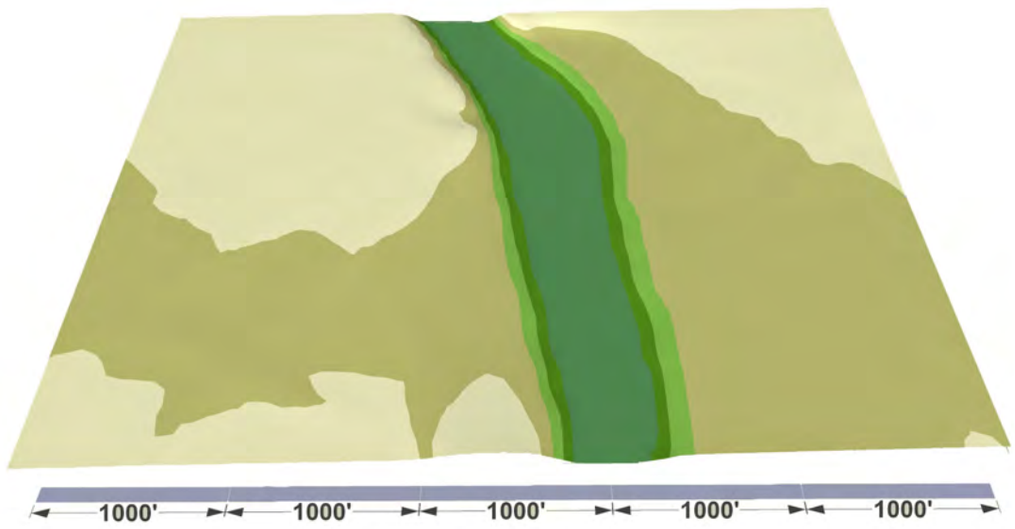
PICKLEWEED
(Salicornia subterminalis)

SEA PURSLANE
(Sesuvium verricosum)

FARM WITH THE RIVER



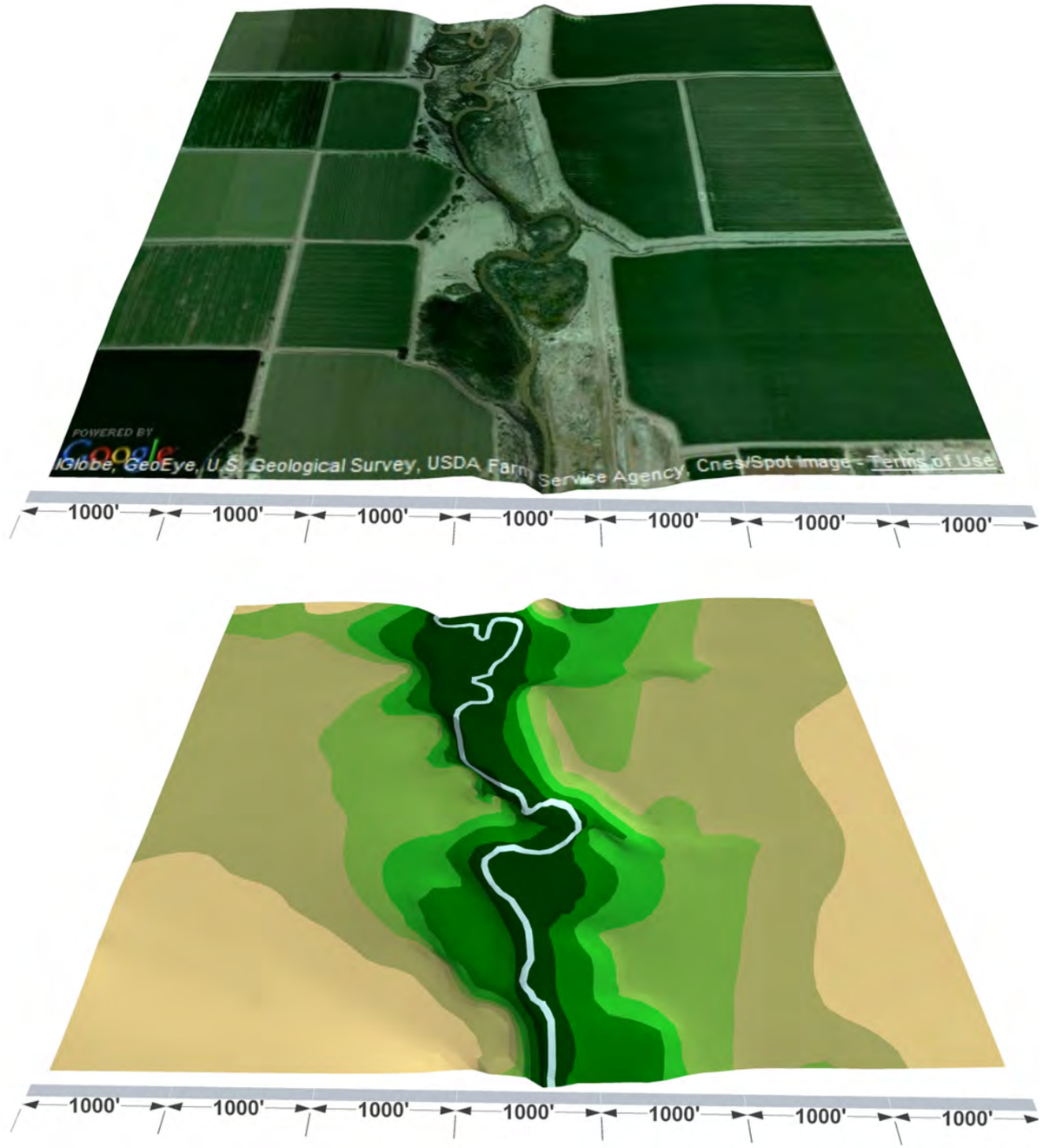




Fallow Lettuce Alfalfa

Mesquite Amaranth/Corn Opuntia

FARM WITH THE RIVER



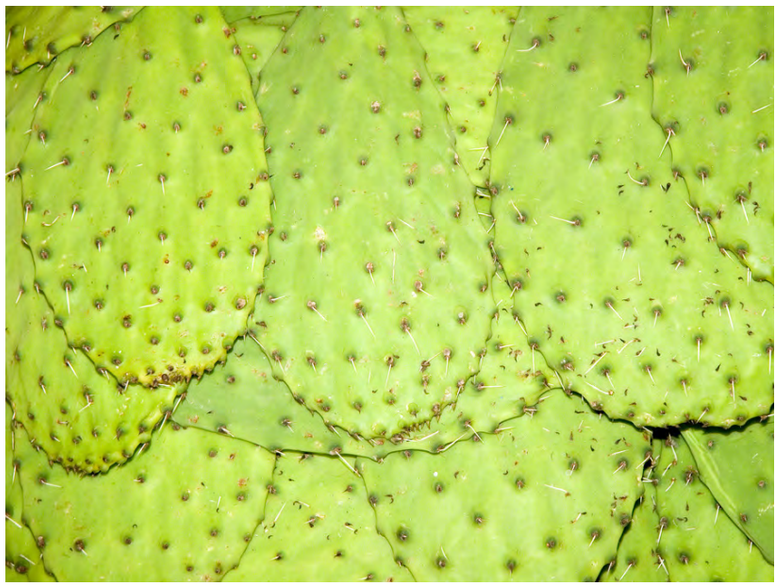
ANNUAL FLOOD

LEACH SALTS, REPLENISH GROUNDWATER, FEED SALTON SEA AND DELTA

ALFALFA ALTERNATIVES

AS FEED & FOOD

International Maize and Wheat Improvement Center 2007



Paul Asaman 2008

IN CROP ROTATION

flickr user Net_efekt 2010

Heather Dunhill 2011

CONCLUSIONS

Reprioritize subsidies to promote human health and water conservation over quantity and market domination.

Emphasize high-nutrition, low-water specialty crops.

Adapt heirloom crops and traditional growing methods to larger scales.

Direct conserved water to delta and Salton Sea for ecological remediation.