

**California State University
Water Resources and Policy Initiatives**

CSU Campus Water Use Assessment



ACTUAL WATER USE at CSU CO

2014 = 23 acre feet

2013 = 26 acre feet

2012 = 21 acre feet

2011 = 20 acre feet

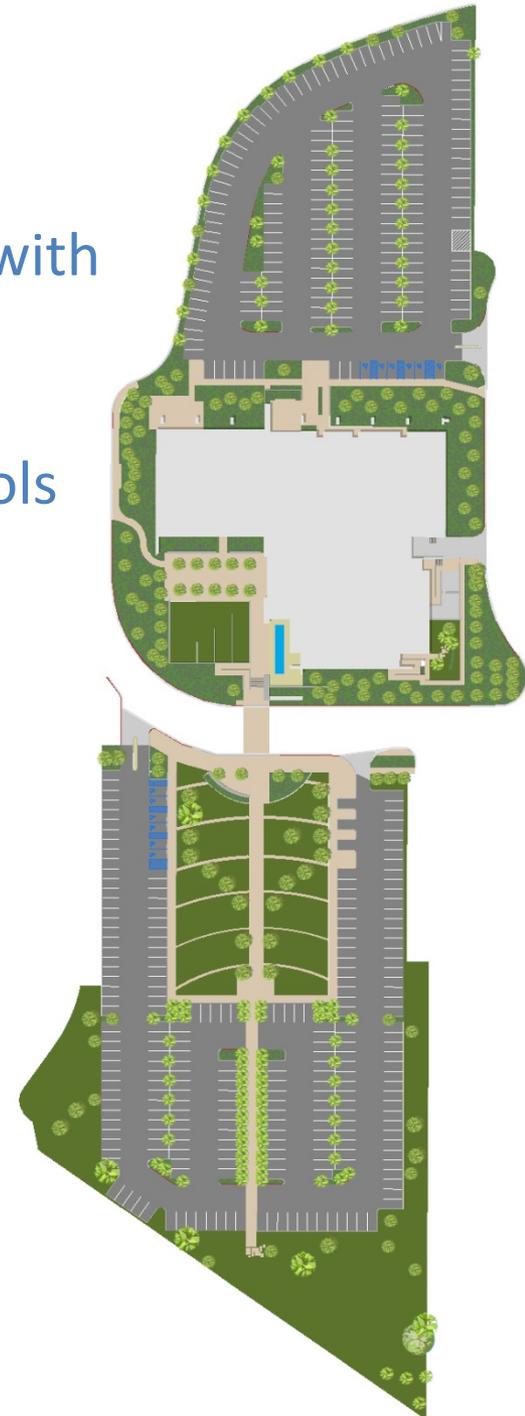
2010 = 22 acre feet

(in plain english please)

Fill this building with
27 feet of water

-or-

11.3 Olympic Pools



WATER USE CALCULATIONS

(in plain english please)

Maximum Applied Water Allowance (MAWA)

$$\text{MAWA} = (\text{ETo})(0.62)[(0.7 \times \text{LA}) + (0.3 \times \text{SLA})]$$

ETo	= Reference Evapotranspiration (inches per year)
0.62	= Conversion Factor (to gallons)
0.7	= ET Adjustment Factor (ETAF)
LA	= Landscape Area including SLA (square feet)
0.3	= Additional Water Allowance for SLA
SLA	= Special Landscape Areas (square feet)

What is the maximum water use that DWR allows*?

Estimated Total Water Use (ETWU)

$$\text{ETWU} = (\text{ETo})(0.62)[((\text{PF} \times \text{HA})/\text{IE}) + \text{SLA}]$$

ETo	= Reference Evapotranspiration (inches per year)
0.62	= Conversion Factor (to gallons)
PF	= Plant Factor from WUCOLS
HA	= Hydrozone Area (square feet)
IE	= Irrigation Efficiency (minimum 0.71)
SLA	= Special Landscape Areas (square feet)

How much water is your current design estimated to use?

*Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

Evapotranspiration, Maximum Applied Water Allowance, and Estimated Applied Water Use formulas per the California Department of Water Resources (DWR); <http://www.water.ca.gov/wateruseefficiency/landscape/>

CSU CO WATER USE CALCULATIONS

(estimated)

MAWA = 5.55 acre feet/year

$$= (39.01)(0.62)[(0.7 \times 106821) + (0.3 \times 0)]$$

= 1,808,516 gallons/year

= 2,418 hundred cubic feet/year

ETWU = 8.91 acre feet/year

Shrubs = $(39.01)(0.62)[((0.5 \times 57774.6)/0.9) + 0]$

= 776,304 gallons/year

= 1,038 hundred cubic feet/year

= 2.38 acre feet/year

Turf = $(39.01)(0.62)[((0.8 \times 82507)/0.75) + 0]$

= 2,128,566 gallons/year

= 2,845 hundred cubic feet/year

= 6.53 acre feet/year

(in plain english please)

Fill this building with
6.5 feet of water

-or-

2.7 Olympic Pools

Fill this building with
10 feet of water

-or-

2.7 Olympic Pools



1 gallon = 0.001336806 CCF (hundred cubic feet); 1 gallon = .00000306888 AF (acre feet)

CSU CO Building = 0.8562 acres; Olympic Swimming Pool = 660,000 gallons

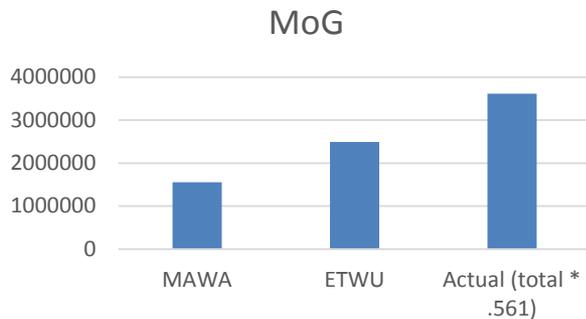
WATER USE COMPARISONS

Why is the actual water used so high?

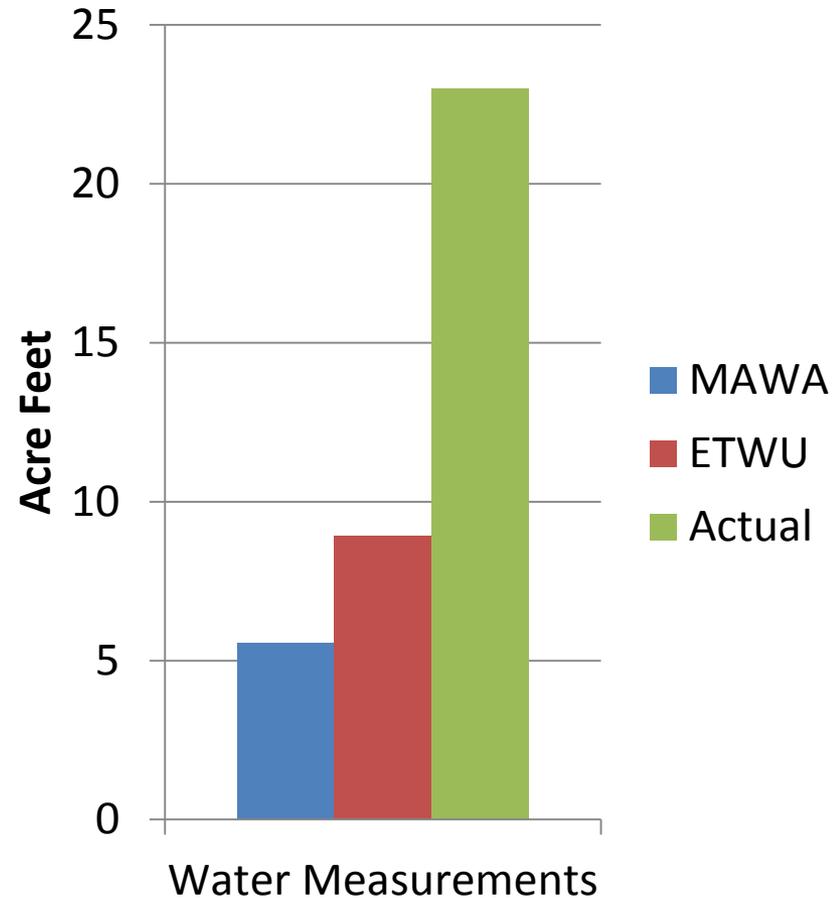
Metering

- The actual number persumably includes the building water
- Building vs landscape metering

Assumption #1



MAWA	1550000
ETWU	2490000
Actual (total * .561)	3612840

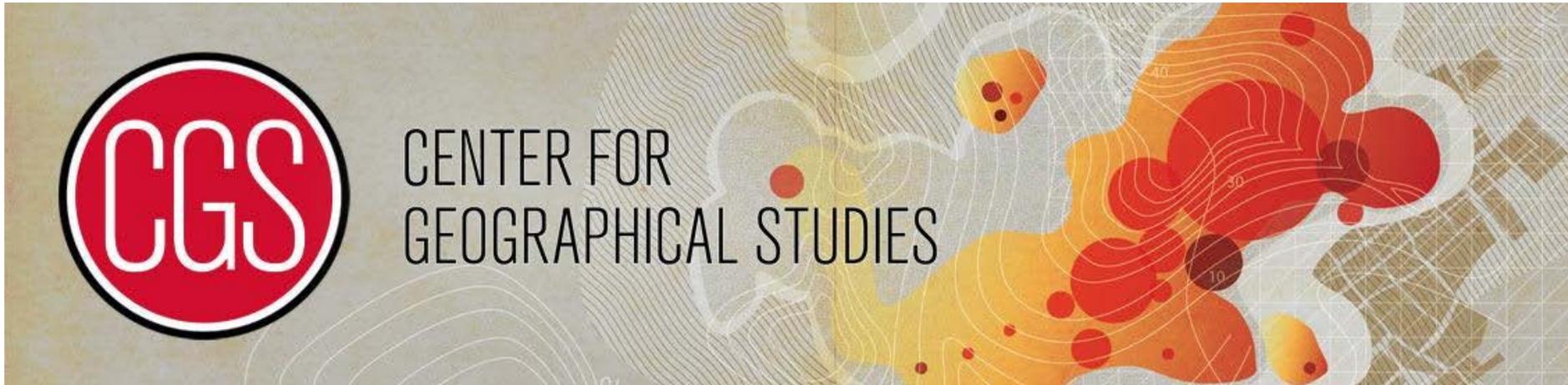




Thank you to Danielle Bram,
Director of the Center for Geographical Studies CSUN

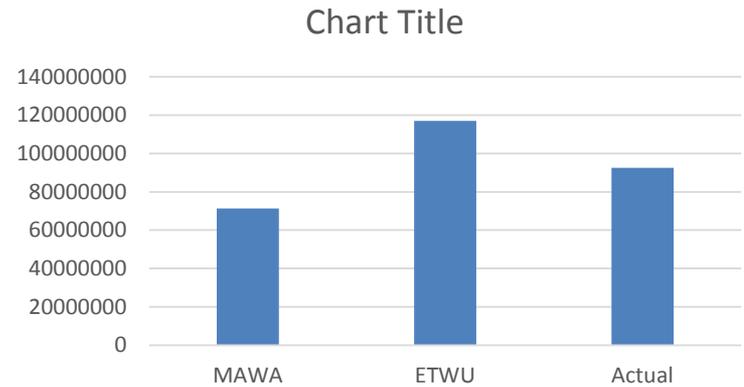


CENTER FOR
GEOGRAPHICAL STUDIES



CSU Sacramento Example

Irrigation Data for Jan – June 2013 - MoG



	Millions of Gallons 2013
MAWA	7136700
ETWU	11700000
Actual	9249176

First 6 months of 2013 37.68 MoG

First 6 months of 2014 20.01 MoG

47% reduction in water use

6 month MAWA = 35.66 MoG

For 6 months Sac State was operating at 15.65 MoG less than MAWA allowance

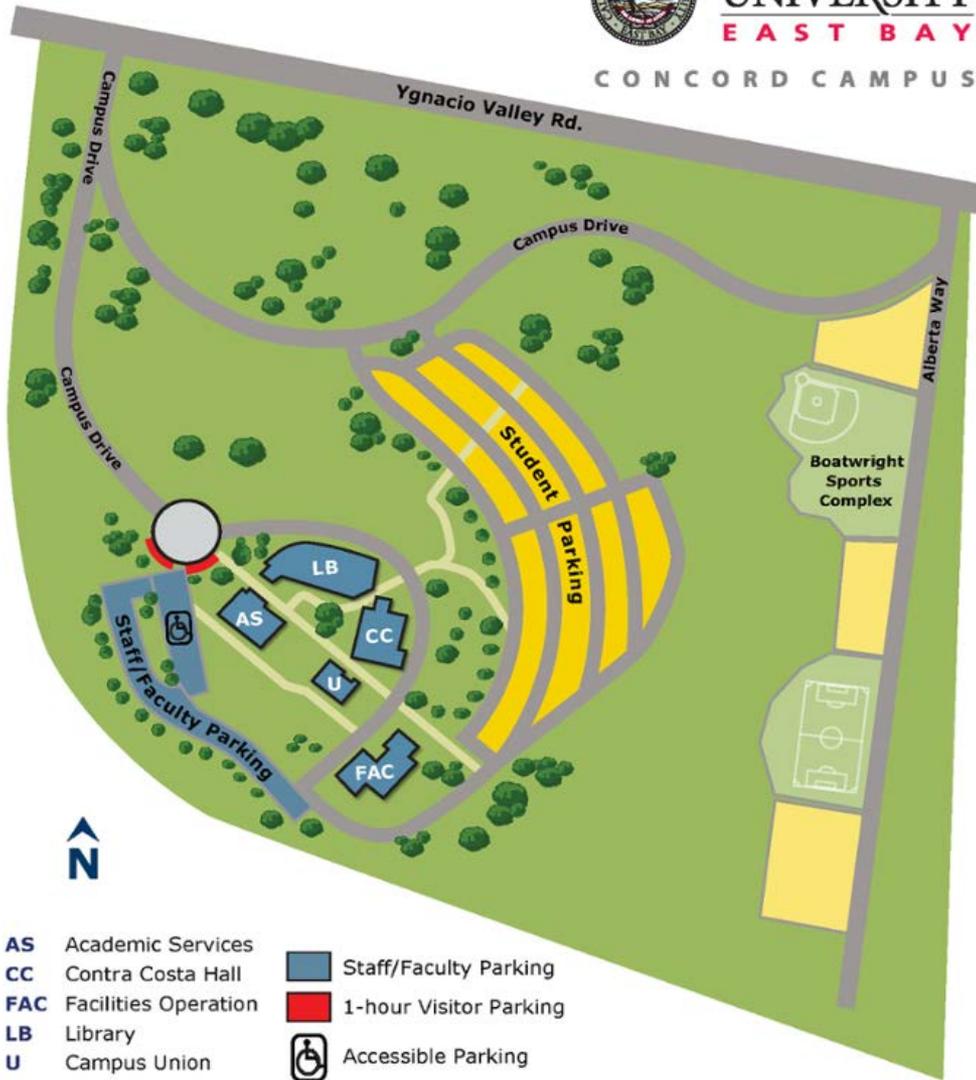
Assumption #1: Of campuses reporting domestic versus irrigation use, on average 44.2% domestic and 55.8% irrigation use for total water used.

				DOMESTIC	IRRIGATION
MARITIME				50%	50%
	From 2 yrs of data				
		Residence Halls	13%		
		Other Buildings	37%		
		Irrigation	50%		
EAST BAY					
	Hayward			42%	58%
	2010	Campus Buildings	18%		
		Student Housing	24%		
		Landscape	58%		
	2013	Campus Buildings	17%	41%	59%
		Student Housing	24%		
		Landscape	59%		
CSU SACRAMENTO					
	2013			43.9%	56.1%
Average				44.2%	55.8%



CALIFORNIA STATE
UNIVERSITY
EAST BAY

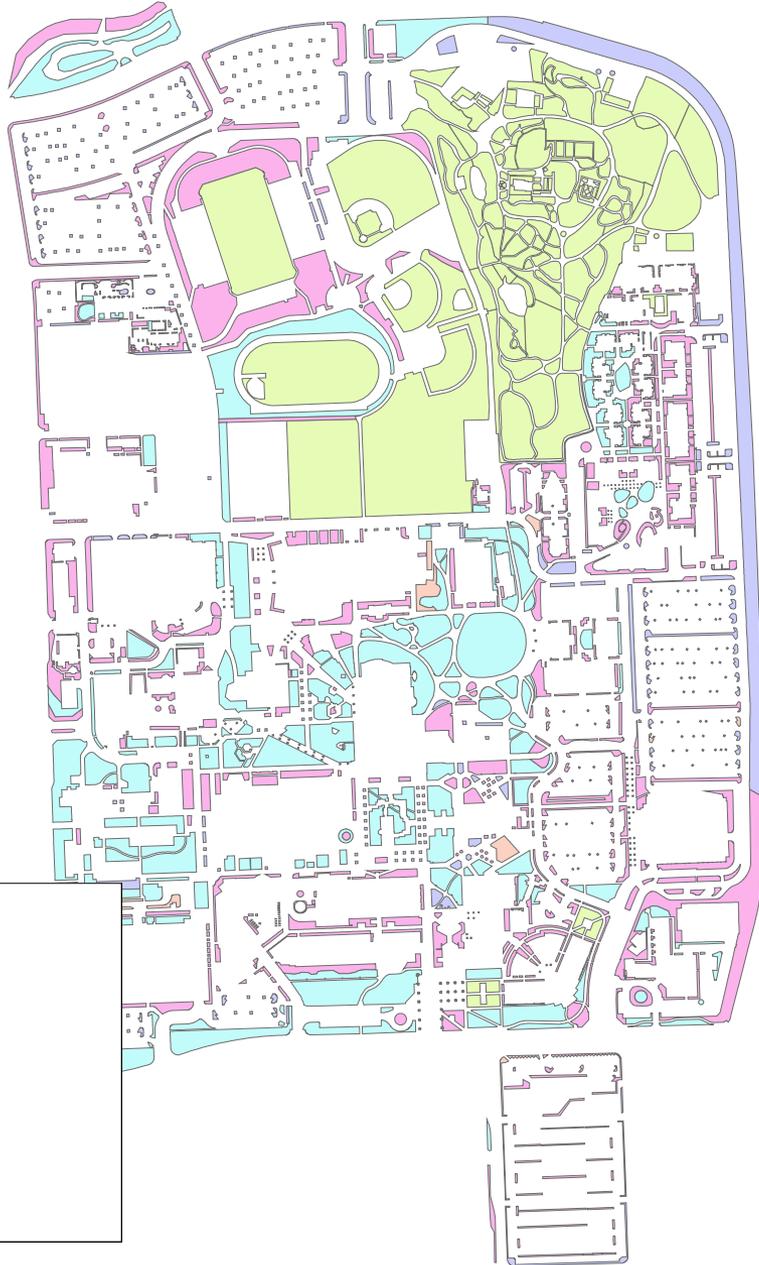
CONCORD CAMPUS



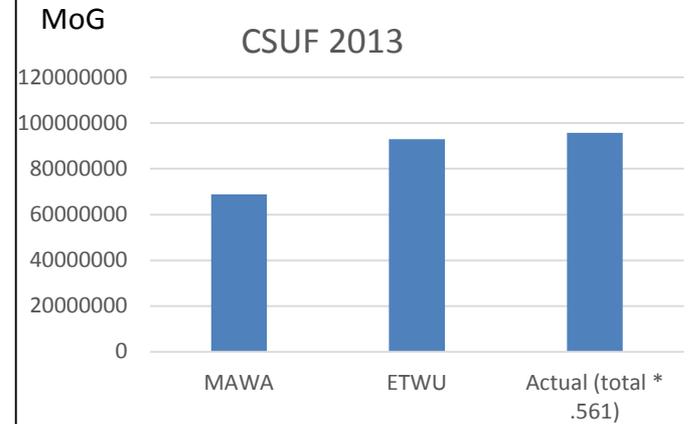
- AS Academic Services
- CC Contra Costa Hall
- FAC Facilities Operation
- LB Library
- U Campus Union
- Staff/Faculty Parking
- 1-hour Visitor Parking
- Accessible Parking
- Student Parking
- Athletic Fields Parking

2010	Irrigation	domestic
	16%	84%
2013	Irrigation	domestic
	12%	88%

CSU Fullerton Example



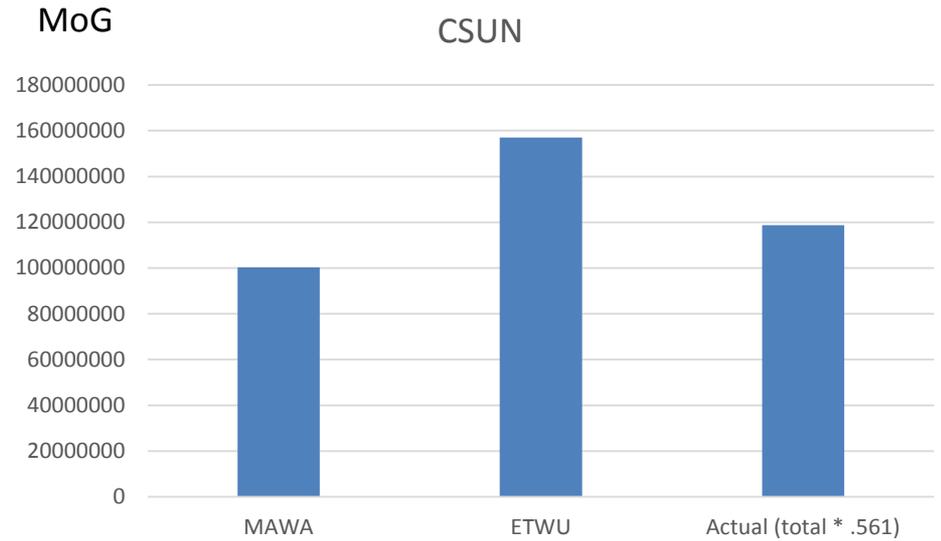
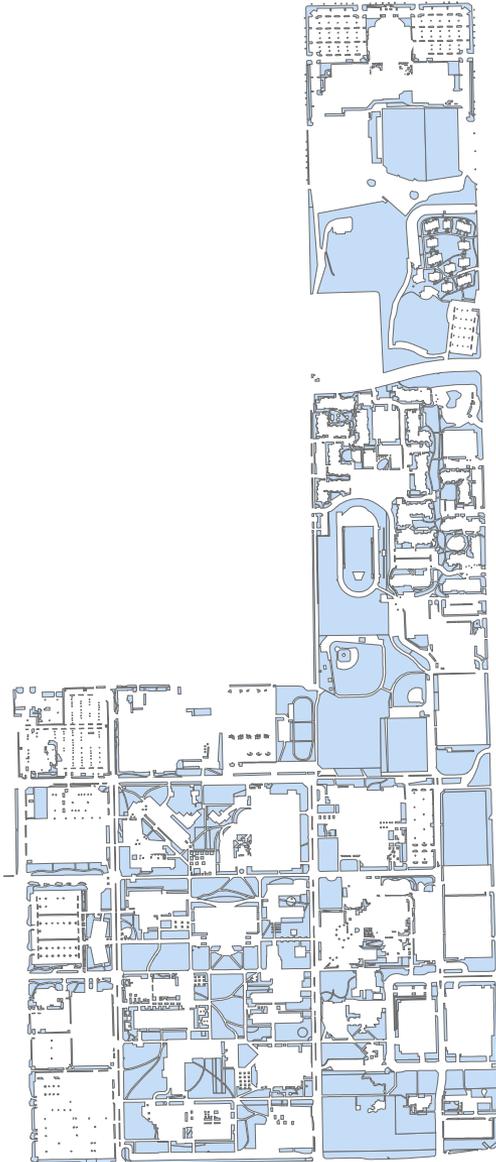
Assumption #1 Campus reporting domestic versus irrigation use are roughly 44.2% domestic and 55.8% irrigation use for total water used.



Fullerton	Mog 2013
MAWA	68803272
ETWU	93000000
Actual (total * .561)	95678890.53

Fun fact: total water bill for 2012-13
\$509,126.79

CSU Northridge Example



csu northridge	MoG	
MAWA	100271531	
ETWU	157000000	
Actual (total * .561)	118721573.4282921	CCF



ENVIRONMENTAL

Thank You,

Boykin Witherspoon III

Executive Director

Water Resources and Policy Initiatives
CSU, CO



AGRICULTURAL

ONE WATER



URBAN

