

Supplementary Materials – Wilson, T.S., Van Schmidt, N., and R. Langridge - Land-Use Change and Future Water Demand in California’s Central Coast

Table S1. List of Groundwater Sub-Basins, their numeric ID, and the map legend for Figure 1c.

1	HUASNA VALLEY	44	SALINAS VALLEY - MONTEREY
2	SAN BENITO RIVER VALLEY	45	POZO VALLEY
3	SAN ANTONIO CREEK VALLEY	46	DRY LAKE VALLEY
4	FOOTHILL	47	SALINAS VALLEY - UPPER VALLEY AQUIFER
5	SALINAS VALLEY - LANGLEY AREA	48	PANOCH VALLEY
6	MONTECITO	49	SALINAS VALLEY - PASO ROBLES AREA
7	GILROY-HOLLISTER VALLEY - NORTH SAN BENITO	50	QUIEN SABE VALLEY
8	BITTER WATER VALLEY	51	LOS OSOS VALLEY - LOS OSOS AREA
9	CARMEL VALLEY	52	SALINAS VALLEY - EAST SIDE AQUIFER
10	ARROYO DE LA CRUZ VALLEY	53	SANTA BARBARA
11	MORRO VALLEY	54	SAN CARPOFORO VALLEY
12	NEEDLE ROCK POINT	55	SAN JOAQUIN VALLEY - KERN COUNTY
13	WEST SANTA CRUZ TERRACE	56	GOLETA
14	SALINAS VALLEY - SEASIDE	57	SANTA MARIA RIVER VALLEY - SANTA MARIA
15	SAN LUIS OBISPO VALLEY	58	SALINAS VALLEY - 180/400 FOOT AQUIFER
16	UPPER SANTA ANA VALLEY	59	LOCKWOOD VALLEY
17	CAYUCOS VALLEY	60	SALINAS VALLEY - FOREBAY AQUIFER
18	SALINAS VALLEY - ATASCADERO AREA	61	OLD VALLEY
19	SANTA MARIA RIVER VALLEY - ARROYO GRANDE		
20	BIG SPRING AREA		
21	HERNANDEZ VALLEY		
22	SANTA YNEZ RIVER VALLEY		
23	CORRALITOS - PURISIMA HIGHLANDS		
24	LOS OSOS VALLEY - WARDEN CREEK		
25	CHORRO VALLEY		
26	VALLECITOS CREEK VALLEY		
27	CORRALITOS - PAJARO VALLEY		
28	SANTA ROSA VALLEY		
29	VILLA VALLEY		
30	SANTA ANA VALLEY		
31	SANTA CRUZ MID-COUNTY		
32	CARPINTERIA		
33	CHOLAME VALLEY		
34	SAN JOAQUIN VALLEY - DELTA-MENDOTA		
35	CARRIZO PLAIN		
36	RINCONADA VALLEY		
37	SANTA MARGARITA		
38	PEACH TREE VALLEY		
39	RAFAEL VALLEY		
40	CUYAMA VALLEY		
41	MAJORS CREEK		
42	SAN SIMEON VALLEY		
43	TORO VALLEY		

Table S2. List of water districts and groundwater sustainability agencies represented in Figure 1d. The map unit designations are an aggregate value of the associated water service district grouped with any existing groundwater sustainability agency in a single spatial unit, to identify jurisdiction-level projected water demand changes.

1	Arroyo Seco GSA - No Additional District
2	Arroyo Seco GSA - Salinas Valley Basin GSA - No Additional District
3	Atascadero Basin GSA - Atascadero Mutual Water Company
4	Atascadero Basin GSA - No Additional District
5	Atascadero Basin GSA - Paso Robles City Of
6	Atascadero Basin GSA - Templeton Community Services District
7	City of Arroyo Grande GSA - Arroyo Grande City Of
8	City of Paso Robles - Paso Robles City Of
9	City of San Luis Obispo GSA - No Additional District
10	City of San Luis Obispo GSA - San Luis Obispo City of
11	County of San Luis Obispo - No Additional District
12	County of Santa Cruz - No Additional District
13	County of Santa Cruz - Santa Cruz City Of
14	County of Santa Cruz - Soquel Creek Water District
15	Cuyama Basin GSA - No Additional District
16	Goleta Fringe GSA - Central Coast Water Authority
17	Goleta Fringe GSA - Central Coast Water Authority - Goleta City Of
18	Heritage Ranch Community Services District - Heritage Ranch Community Service District
19	Marina Coast Water District - Marina Coast Water District
20	Marina Coast Water District - Salinas Valley Basin GSA - Marina Coast Water District
21	Marina Coast Water District - Salinas Valley Basin GSA - Marina Coast Water District - Monterey Peninsula Water Management District
22	Montecito Groundwater Basin GSA - Central Coast Water Authority - Montecito Water District
23	Monterey Peninsula Water Management District - California American Water Company - Monterey District - Monterey Peninsula Water Management District
24	Monterey Peninsula Water Management District - Monterey Peninsula Water Management District
27	Monterey Peninsula Water Management District - Santa Lucia Preserve Water System
28	PVWMA - Aromas Water District
29	PVWMA - No Additional District
30	PVWMA - Pajaro Community Service District
31	PVWMA - Soquel Creek Water District
32	PVWMA - Watsonville, City of
33	Paso Basin - County of San Luis Obispo GSA - No Additional District
34	Salinas Valley Basin GSA - Alco Water Service
35	Salinas Valley Basin GSA - Aromas Water District
36	Salinas Valley Basin GSA - California American Water Company - Monterey District
37	Salinas Valley Basin GSA - California American Water Company - Monterey District - Monterey Peninsula Water Management District
38	Salinas Valley Basin GSA - California Water Service Company - Salinas
39	Salinas Valley Basin GSA - California Water Service Company - Salinas Hills
40	Salinas Valley Basin GSA - Monterey County Recycling Project
41	Salinas Valley Basin GSA - Monterey Peninsula Water Management District
42	Salinas Valley Basin GSA - No Additional District
43	San Antonio Basin GSA - Central Coast Water Authority
44	San Antonio Basin GSA - No Additional District
45	San Benito County Water District GSA - CA Parks And Recreation Department - Hollister Hills SVRA
46	San Benito County Water District GSA - No Additional District
47	San Luis Obispo Valley Basin - County of San Luis Obispo GSA - Golden State Water Company - Edna
48	San Luis Obispo Valley Basin - County of San Luis Obispo GSA - No Additional District
49	San Luis Obispo Valley Basin - County of San Luis Obispo GSA - San Luis Obispo City of
50	San Miguel Community Services District - No Additional District
51	Santa Clara Valley Water District - No Additional District
52	Santa Cruz Mid-County Groundwater Agency - Central Water District
53	Santa Cruz Mid-County Groundwater Agency - No Additional District
54	Santa Cruz Mid-County Groundwater Agency - Santa Cruz City Of
55	Santa Cruz Mid-County Groundwater Agency - Soquel Creek Water District
56	Santa Margarita Groundwater Agency - No Additional District
57	Santa Margarita Groundwater Agency - San Lorenzo Valley Water District
58	Santa Margarita Groundwater Agency - Scotts Valley Water District
59	Santa Margarita Groundwater Agency - Soquel Creek Water District
60	Santa Maria Basin Fringe Areas - County of San Luis Obispo GSA - No Additional District
61	Santa Maria Basin Fringe Areas - County of San Luis Obispo GSA - Pismo Beach City of
62	Santa Maria Basin Fringe in Santa Barbara County GSA - No Additional District
63	Santa Ynez River Valley Basin Central Management Area GSA - Central Coast Water Authority
64	Santa Ynez River Valley Basin Central Management Area GSA - No Additional District
65	Santa Ynez River Valley Basin Eastern Management Area GSA - Central Coast Water Authority
66	Santa Ynez River Valley Basin Eastern Management Area GSA - No Additional District
67	Santa Ynez River Valley Basin Western Management Area GSA - Central Coast Water Authority
68	Santa Ynez River Valley Basin Western Management Area GSA - Lompoc City of
69	Santa Ynez River Valley Basin Western Management Area GSA - No Additional District
70	Shandon-San Juan GSA - No Additional District
71	No GSA - Alco Water Service
72	No GSA - Aromas Water District
73	No GSA - Arroyo Grande City Of
74	No GSA - Atascadero Mutual Water Company
75	No GSA - CA Parks And Recreation Department - Hollister Hills SVRA
76	No GSA - California American Water Company - Monterey District
77	No GSA - California American Water Company - Monterey District - Monterey Peninsula Water Management District
78	No GSA - Cambria Community Services District
79	No GSA - Carpinteria Valley Water District - Central Coast Water Authority
80	No GSA - Central Coast Water Authority
81	No GSA - Central Coast Water Authority - Golden State Water Company - Orcutt
82	No GSA - Central Coast Water Authority - Goleta City Of
83	No GSA - Central Coast Water Authority - Montecito Water District
84	No GSA - Central Coast Water Authority - Santa Barbara City of
85	No GSA - Central Coast Water Authority - Santa Maria Valley Water Conservation District
86	No GSA - Golden State Water Company - Edna
87	No GSA - Golden State Water Company - Lake Marie
88	No GSA - Golden State Water Company - Los Osos
89	No GSA - Golden State Water Company - Orcutt
90	No GSA - Grover Beach City Of
91	No GSA - Heritage Ranch Community Service District
92	No GSA - Lompoc City of
93	No GSA - Los Osos Community Services District
94	No GSA - Marina Coast Water District
95	No GSA - Marina Coast Water District - Monterey Peninsula Water Management District
96	No GSA - Monterey Peninsula Water Management District
97	No GSA - Monterey Peninsula Water Management District - Santa Lucia Preserve Water System
98	No GSA - Morro Bay City Of
99	No GSA - Oceano Community Service District
100	No GSA - Pismo Beach City of
101	No GSA - San Lorenzo Valley Water District
102	No GSA - San Luis Obispo City of
103	No GSA - Santa Cruz City Of
104	No GSA - Santa Lucia Preserve Water System
105	No GSA - Santa Maria Valley Water Conservation District
106	No GSA - Soquel Creek Water District
107	No GSA - Templeton Community Services District
108	No GSA - Other Small Additional District

Table S3. Spatial datasets and zoning categories used in land use and land cover transition spatial multipliers for designating regions as “No Conversion” and regions of potential development or “To Developed” with data sources listed for the Central Coast study region and for each county.

Region	No Conversion	To Developed	Data Sources
Central Coast	Protected Areas Database – GAP Status 1,2,3 Department of Defense lands	U.S. Census Bureau Urban Areas	[66,73]
Santa Cruz	Any land use which included once of the following categories: (L) Historic Landmark (D) Designated park (O) Open Space Easement (P) Agricultural Preserve (SP) Salamander Protection (W) Watsonville Utility Prohibition (PR) Parks, Recreation Open Space Beach	Multi-Family Residential, Neighborhood Commercial, Professional-Administrative Office, Single-Family Residential, Light Industrial, Heavy Industrial, Public and Community Facilities, and Single-Family Ocean Beach Residential	Santa Cruz Zoning [92] ¹ [93]
San Benito	Parks	San Benito County General Plans 2016 data for Planned Unit Development (PUD), including: Ag Productive/PUD Single Family Residential/PUD Rural Transitional/PUD Rural/PUD	San Benito County General Plan 2016 and San Benito County Zoning [94,95] ¹ [96]
Monterey	Agriculture conservation (AC) Coastal Agriculture Preserve (CAP) Open Space Recreation (OR) Resource Conservation (RC) Historic Resources (HR)		[97]
	Open Space Open Space Forest Open Space Recreation Resource Conservation Areas (additional)	Commercial, General Commercial, Castroville Community Plan, Heavy Commercial, Heavy Industrial, Industrial, Master Plan, Neighborhood Commercial, Residential - High Density 5 - 20 Units/Acre, Residential - Medium Density 1 - 5 Units/Acre, Residential 2.4U/AC, Residential 2U/AC, Residential	[98] ¹ [99]

		4U/AC, or Visitor Accommodations/Professional Offices.	
San Luis Obispo	Open Space Public Facilities Recreation	Urban Lands, excluding Open Space and Recreation zones.	[100] ¹ [101]
Santa Barbara	Parks, Recreational Acreage	Apartment, Auditorium, Auto Sales, Bowling Alley, Commercial Building, Commercial Condominium, Dance Hall, Department Store, Drive In Theater, Financial Building, Food Processing, Heavy Industrial, Hospital, Hotel, Industrial Condominium, Light Industrial, Medical Building, Medical Condo, Misc. Building, Misc. Commercial Services, Mobile Home Park, Multi-Family Dwelling, Nursery School, Nursing Home, Office Building, Parking Lot, Race Track, Religious, Restaurant Building, Schools, Service Station, Shopping Center, Storage, Store Building, Stores and Offices, Supermarket, and Warehouse*	Santa Barbara County parcel dataset, Homeland Infrastructure Foundation Level Data [102]

¹ All 5 Counties utilized the same data for To Developed conversions as listed for Santa Barbara County from the Homeland Infrastructure Foundation Level Data (Corelogic, 2018a-f).

Table S4. Comparison of historical rates (2001-2016) of urbanization, agricultural expansion, and agricultural contraction derived from the Farmland Mapping and Monitoring Program (FMMP) data [68] with LUCAS modeled mean output for the California Central Coast region.

Year	Agricultural Contraction		Agricultural Expansion		Urbanization	
	FMMP	Modeled Mean	FMMP	Modeled Mean	FMMP	Modeled Mean
2002	35.73	35.43	37.87	38.93	19.18	18.81
2003	27.70	27.30	19.65	22.99	5.63	5.65
2004	27.70	27.88	19.65	23.09	5.63	5.75
2005	32.41	31.94	19.45	23.83	9.92	9.76
2006	32.41	30.90	19.45	24.05	9.92	10.16
2007	40.54	38.09	9.80	22.31	3.98	3.94
2008	40.54	34.46	9.80	21.50	3.98	3.88
2009	28.95	20.48	29.12	29.27	6.49	6.54
2010	28.95	20.78	29.12	29.56	6.49	6.17
2011	18.22	16.34	16.33	25.08	6.42	6.03
2012	18.22	17.98	16.33	24.87	6.42	6.34
2013	28.87	28.85	15.89	22.27	9.49	9.90
2014	28.87	29.14	15.89	21.88	9.49	9.07
2015	16.93	17.33	20.76	24.61	2.76	2.63
2016	16.93	16.56	20.76	24.62	2.76	2.91

Table S5. Comparison of modeled regional water demand (m³) for the California Central Coast with U.S. Geological Survey (USGS) [85] historical water use data for 2005 and 2010, which summarized public supply freshwater withdrawals, industrial self-supplied freshwater withdrawals, and irrigation freshwater withdrawal totals.

	Business-As-Usual	Recent Modern	USGS
2005	1,377,484,584.62	1,376,562,457.31	1,395,492,330.75
2010	1,380,654,478.06	1,381,094,290.67	1,572,443,521.64