SAN LUIS OBISPO COUNTY

Functionally Equivalent Stormwater Resource Plan (FE-SWRP)

APPENDIX 1-1

Primary Sources of Information

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INTRODUCTION

Both the San Luis Obispo County Flood Control and Water Conservation District (District) and the City of Arroyo Grande received planning grant funds toward stormwater resource planning efforts for all of the watersheds in San Luis Obispo County. A stormwater resource plan (SWRP) is required as a condition of receiving State bond grant funds for any stormwater and dry weather capture project (Water Code §10563). Task 3.1 of the SWRP is as follows: gather and review existing data appropriate to development of the FE-SWRP including maps, geographic information system (GIS) data, analytical tools, related plans, permits, and storm water management information. The results of Task 3.1 follow in this section.

A preliminary list of reports and data sets were compiled by the Consultant Team and circulated among the TAC for two weeks to review and elucidate reports and data sets not previously identified. Additions were requested from the TAC Leads as well as targeted stakeholders for each planning area. Responses were generated from TAC Leads and stakeholders with varying levels of input. During this solicitation process, sixteen additional reports, studies, and plans were recommended for inclusion in the Annotated List of Reviewed Data and Reports, and they have been added to the list presented at the end of this section.

GIS data necessary to complete the characterization of the San Luis Obispo County watersheds is complete. Given the prior projects already conducted on watersheds throughout the county, nearly all of these data had been previously compiled by the consultant team, County, and Regional Board. Those items that were judged to be of potential utility to this characterization have now been identified and acquired.

Some additional, more location-specific information on property ownership, storm drain systems, and infrastructure details may be necessary to support the evaluation of specific proposed projects or project locations. The sources of these data from the various jurisdictions within the county have now been identified. Actual acquisition of these data layers county-wide, however, is judged premature until potential project locations have been identified and the stage of SWRP preparation when evaluating their feasibility and potential benefits has been reached. As such, their absence in this compilation presently represents a "data gap," but its filling as/where needed is anticipated to be near-immediate and most efficiently executed when such need is identified.

Data related to identification of planned projects (i.e., potential projects that have already been identified by stakeholders or jurisdictions) has been solicited from all members of the Technical Advisory Committee and their associated jurisdictions. The following online questionnaire was widely distributed, with an anticipated return approximately coincident with this Task 3.1 assessment of data gaps:

1. Contact Information
2. Project Name (include project phase, if applicable)
3. Project Location (e.g., street address, nearest intersection, lat/long, APN)
4. Relevant watershed(s) or sub-watershed(s) based on SLO County Watershed Map and http://slowatershedproject.org

5. Brief Project Summary
6. Project Type
   - Regional Capital Improvement Project
   - Parcel-Scale Low Impact Development (LID) Retrofit
   - Parcel-Scale LID for New (Public-Agency) Construction
   - Green Street
   - Other (please specify)
7. Project Status
   - Conceptual Phase
   - Planning/Design Phase
   - Ready for Implementation
   - Other (please specify)
8. Project Information
   - Permitting Status
   - Estimated Project Cost
   - Funding Sources (incl. percentages)
   - Does the project benefit a disadvantaged community (DAC)?
   - Targeted Construction Start Date
9. Which **water quality** benefits will the project provide?
   - Increased filtration and/or treatment of runoff
   - Nonpoint source pollution control
   - Reestablished natural water drainage and treatment
   - Other (please specify)
10. Which **water supply** benefits will the project provide?
    - Water supply reliability
    - Conjunctive use
    - Water conservation
    - Other (please specify)
11. Which **flood management** benefits will the project provide?
    - Decreased flood risk by reducing runoff rate and/or volume
    - Reduced sanitary sewer overflows
    - Other (please specify)
12. Which **environmental** benefits will the project provide?
    - Environmental and habitat protection and improvement, including wetland enhancement/creation, riparian enhancement, and/or instream flow improvement
    - Increased urban green space
    - Reduced energy use, greenhouse gas emissions, or provides a carbon sink
    - Reestablishment of the natural hydrograph
    - Water temperature improvements
    - Other (please specify)
13. Which **community** benefits will the project provide?
    - Employment opportunities provided
    - Public Education
    - Community involvement

- Enhanced and/or created recreational and public use areas
- Other (please specify)

The planned compilation of this information into a project database is in progress. The team will also conduct additional stakeholder outreach to identify missing planned projects in the late spring of 2018. The current schedule calls for analysis of planned projects beginning in early June 2018; the SWRP Team will analyze all the data that has been obtained as of that time.

TECHNICAL REPORTS

Technical reports listed below were identified through a combination of TAC recommendations, prior studies conducted by the consulting team and PMT participants, and general familiarity with the information necessary to support credible, comprehensive regional water resource characterization and descriptions of the natural settings and management structures relevant to stormwater resource planning.

REGIONAL/GENERAL

State Water Resources Control Board (December 15, 2015). *Storm Water Resource Plan Guidelines.*

> *The Guidelines provide details for what should be included and instructions for how to prepare a SWRP, which will be referenced throughout the SLO County SWRP preparation.*

Booth, D.B., C. Helmle, E.A. Gilliam, and S. Araya (2012). *Methods and Findings of the Joint Effort for Hydromodification Control in the Central Coast Region of California*. Prepared by Stillwater Sciences and TetraTech, Santa Barbara, California, for California State Central Coast Regional Water Quality Control Board, 50 pp. Retrieved from https://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/hydromod_lid_docs/attach_1b_attach_e_methods_and_findings.pdf

> *The purpose of this report is to document the entire Joint Effort methodology and findings, including the determination of Watershed Management Zones and the identification of associated hydromodification management strategies, as they applied in the Central Coast Region for post-construction stormwater management requirements.*

State of California Department of Water Resources. (October 2003, plus updates). *California's Groundwater, Bulletin 118*. Retrieved from http://slowatershedproject.org/resources/

> *The bulletin includes recommendations for California groundwater management planning and implementation, a timeline of recent actions related to groundwater management, and a regional inventory of California's groundwater resources. An interim update, published in 2016, identifies three SLO County basins (Paso Robles [3-4.06], Los Osos Valley [3-08], and Cuyama Valley [3-18]) in "significant overdraft" (https://www.water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/Statewide-Reports/Bulletin_118_Interim_Update_2016.pdf)*

Central Coast Ambient Monitoring Program (CCAMP). Retrieved from http://www.ccamp.org/

An interactive, map-based website that provides available physical, chemical, and biological ecological monitoring data throughout Region 3. Over 50 sites are represented within San Luis Obispo County, although not every site includes information for every data type.

California Department of Transportation (CalTrans). *Water Quality Planning Tool*. Retrieved from http://svctenvims.dot.ca.gov/wqpt/wqpt.aspx

A useful interactive website that provides map-based information on 303(d) and TMDL-listed waterbodies, plus a variety of physical information and jurisdictional boundaries.

CDM. (November 2011). *Climate Change Handbook for Regional Water Planning*. Retrieved from http://slowatershedproject.org/resources/

The handbook provides strategies to evaluate projects, resource management strategies, IRWM plan benefits, and plan implementation under climate change uncertainty.

SLO COUNTY

County of San Luis Obispo, Flood Control and Water Conservation District. (September 2015). *San Luis Obispo Integrated Regional Water Management Plan.* Retrieved from https://www.slocountywater.org/site/Frequent%20Downloads/Integrated%20Regional%20Water%20Management%20Plan/IRWM%20Plan%20Update%202014/index.htm

The SLO County IRWMP includes an exhaustive compendium of water-resource information about the County, including much of the data for characterizing water resources that is required for the SWRP, plus a limited number of previously identified stormwater resource projects for inclusion in the SWRP.

Resource Conservation District of San Luis Obispo County. (July 2014) San Luis Obispo County Watersheds Management Plan, Phase I – Vision, Framework & Methodology Development.

This report identifies relevant spatial scales for watershed analysis, data gaps, and an approach to filling those data gaps. It provides the rationale for development of a watersheds-based data repository (www.slowwatershedproject.org) focused on improving natural resource management decisions via meaningful watershed characterization and improving spatial data accessibility.

County Of San Luis Obispo Sustainable Groundwater Management Act (SGMA) website: https://www.slocountywater.org/site/Water%20Resources/SGMA/

Provides links to groundwater basin-specific reports, including the six high- and medium-priority basins identified by the California Department of Water Resources in 2014:

- *Paso Robles (High Priority)*
- *Atascadero (High Priority)*
- *Santa Maria (High Priority)*
- *Los Osos (High Priority)*
- *San Luis Obispo (Edna) Valley (Medium Priority)*
- *Cuyama Valley (Medium Priority)*

Stillwater Sciences (2014). *San Luis Obispo County regional instream flow assessment*. Prepared by Stillwater Sciences, Morro Bay, California for Coastal San Luis Resource Conservation District, Morro Bay, California.

> *The purpose of this study is to provide a preliminary estimate of the magnitude and timing of instream flows that would support steelhead in creeks of San Luis Obispo County. The key objectives of the study are to further develop environmental water demand estimates to a County-wide assessment of instream flow requirements for steelhead based on existing instream flow assessments and prioritize streams for which detailed instream flow assessments would be most useful.*

SLO County Department of Planning and Building. (May 2010). *County of San Luis Obispo General Plan, Conservation and Open Space Element.* Retrieved from http://slowatershedproject.org/

> *The report contains goals, policies, and strategies to protect water resources, while discussing their relationship to existing plans and programs. The report goals align with the SLO County IRWM and the goals of the SWRP.*

Carollo. (May 2012). *San Luis Obispo County Master Water Report.* Retrieved from http://slowatershedproject.org/resources/

> *The SLO County Master Water Report includes valuable information on the water resource management in San Luis Obispo County, as well as available watershed data, water resource analysis, and water resource planning recommendations in connection to existing documents.*

Central Coast Regional Water Quality Control Board (June 2011 and September 2017). *Water Quality Control Plan for the Central Coast Basin.* Retrieved from http://slowatershedproject.org/resources/

> *The objective of this Water Quality Control Plan for the Central Coastal Basin, or Basin Plan, is to show how the quality of surface water and groundwater in the Central Coast Region should be managed to provide the highest water quality reasonably possible. It includes an implementation plan and monitoring guidelines to optimize water quality for various uses. The implementation plan includes programs, projects and other actions for incorporation into the SWRP.*

San Luis Obispo County Flood Control and Water Conservation District (December 2009). *Guide to Implementing Flood Control Projects.* Retrieved from http://slowatershedproject.org/resources/

The guide includes the process and constraints of general flood control project implementation, as well as specific regional analysis of significant issues and proposed solutions for projects in SLO County communities.

Stillwater Sciences (January 2014). *San Luis Obispo County Regional Instream Flow Assessment.* Retrieved from http://www.coastalrcd.org/

The study further develops estimates of environmental water demand (EWD) based on recommendations of the SLO County Master Water Report. The analysis provides an estimate of the magnitude and timing of instream flows, and can inform aquatic resources that merit higher levels of protection.

ClimateWise (November 2010). *Integrated Climate Change Adaptation Planning in San Luis Obispo County.* Retrieved from http://slowatershedproject.org/

The report discusses strategies to increase climate change resiliency in SLO County, with particularly relevant sections on water resources and ecosystem services. These strategies inform which areas and resources that may require higher levels of protection or restoration.

LOCALITIES AND SUB-REGIONS WITHIN SLO COUNTY

2NDNATURE (2017). *Urban catchment delineation and pollutant loading for MS4s in SLO County.*

Hydrographic delineation of urban drainages, runoff and pollutant load estimation for urbanized areas within the County of San Luis Obispo, submitted June 20, 2017. Catchment delineation, modeling inputs, outputs, and documentation are viewable by County of San Luis Obispo at https://swtelr.2nform.com/

Central Coast Low Impact Development Initiative (2017). *Central Coast Green Infrastructure Project*.

Identification and concept design for 25 projects that address stormwater management and provide ancillary community benefits.

City of Arroyo Grande (2010). *Stormwater Management Plan*. Retrieved from http://www.arroyogrande.org/documentcenter/view/312

The plan describes the City's program necessary to comply with the city's General NPDES MS4 Phase II Permit. It provides a framework for identifying, assigning, and implementing control measures and BMPs intended to reduce *the discharge of pollutants from the MS4 and protect downstream water quality. In addition, it functions as a planning and guidance document to be used by the City's regulatory body, all City departments, contractors, and the general public; define techniques and measurable goals for measuring BMP effectiveness; and sets a five-year schedule for Storm Water Management Program implementation to comply with the requirements of the General Permit.*

Water Systems Consulting, Inc. (2017). *Amended Final Draft 2015 Urban Water Management Plan for the City of Arroyo Grande.* Retrieved from *http://www.arroyogrande.org/DocumentCenter/View/4038*

> *The purpose of this plan is for water suppliers to evaluate their long-term resource planning and establish management measures to ensure adequate water supplies are available to meet existing and future demands. The plan summarizes service-area statistics, water demand and water supply, groundwater conditions, and potential projects. It also describes the network of stormwater infiltration, detention and retention basins throughout its service area. This stormwater collection system captures or retards runoff mainly for flood control and pollution prevention purposes, but it also recharges the groundwater basin with water that would otherwise ultimately runoff to the Pacific Ocean.*

City of Arroyo Grande (2012). *City of Arroyo Grande Water System Master Plan.* Retrieved from *http://www.arroyogrande.org/DocumentCenter/View/1067*

> *The plan reviews the current land use zoning and population distribution within the City limits; identifies water use characteristics of the developed and undeveloped land areas for both existing and future build-out; evaluates the adequacy and reliability of existing water supplies; evaluates the existing water storage system in the City and recommend water storage improvements to meet ultimate build-out; identifies existing system deficiencies and recommends corrective improvements ; and prioritizes recommended improvements.*

SLO County Drainage studies *(https://slocountywater.org/site/Drainage%20Studies/).*

> *This website is the portal for seven drainage and flood control studies conducted for Cambria, Cayucos, Los Osos, Nipomo, Oceano, San Miguel, and Santa Margarita.*

Stillwater Sciences. (September 2015). *Percolation Zone Study of Pilot-Study Groundwater Basins in San Luis Obispo County, California*. Amended Final Technical Memorandum. Retrieved from https://www.slocountywater.org/site/Water%20Resources/SGMA/slovalley/

> *The study locates areas with relatively high intrinsic percolation potential to enhance local groundwater supplies, filling the data gaps of the SLO County IRWM Plan.*

Stillwater Sciences (2017). *San Luis Obispo Creek Watershed Stormwater Resource Plan.*

> *The SWRP provides guidance on stormwater management to avoid negative impacts of urban runoff to receiving waters. The collaboration between Stillwater Sciences and 2N provides consistency for the County's SWRP.*

Balance Hydrologics. (August 2008). *Hydrology and Geology Assessment of the Pismo Creek Watershed, Sant Luis Obispo County, California.* Retrieved from https://www.slocountywater.org/site/Water%20Resources/SGMA/slovalley/

This watershed-wide characterization of hydrologic and geomorphic processes in the Pismo Creek watershed provides historical context, identifies some key issues to be addressed in watershed planning documents, and provides recommendations for monitoring programs.

Stillwater Science (2017). *Long-Term management of vegetation and Debris in the Salinas River through Paso Robles*. Technical memo, June 2017.

The report lines out some information specific to Salinas River flow characteristics, hydrology, and sediment loading. It evaluates whether debris removal in the channel and floodplain of the Salinas River would lead to any long-term benefits, and it concludes that it probably would not.

RMC (2015). *Salt/Nutrient Management Plan for the Paso Robles Groundwater basin.* Retrieved from http://www.prcity.com/government/departments/publicworks/wastewater/pdf/Salt-Nutrient-Management-Plan.pdf

The report provides a discussion of recharge and groundwater vulnerability in the groundwater basin.

AECOM (2014). *Recycled Water Master Plan.* Retrieved from http://www.prcity.com/government/departments/publicworks/wastewater/pdf/RecycledWMP-60194173.pdf

The report provides a discussion on groundwater replenishment from recycled wastewater from the City of Paso Robles.

Greenspace – The Cambria Land Trust (2011). *Santa Rosa Creek watershed management plan*. Prepared by Greenspace – The Cambria Land Trust, Central Coast Salmon Enhancement, and Stillwater Sciences for the California Department of Fish and Game, under a grant for the Fisheries Restoration Grant Program (P0740401).

The objectives of the WMP are to assess existing conditions, prioritize limiting factors for steelhead, and identify and prioritize science- and consensus-based recommendations to address these limiting factors and improve physical functions and ecological conditions in the watershed.

North Coast Engineering, Inc. (2014). *Templeton Drainage and Flood Control Study and Project 8* Addendum. Prepared for San Luis Obispo County Flood Control and Water Conservation District.

This study identifies deficient drainage areas, proposes projects with engineered solutions to these deficiencies, identifies the tangible benefits of each project, provides a cost estimate of proposed projects, and recommends a capital improvement program of priority projects. Potential projects to mitigate the existing high-priority flooding problems include vegetation removal, sediment removal, and increased detention.

U.S. Geologic Survey (1998). *Hydrogeology, Water Quality, Water Budgets, and Simulated Responses to Hydrologic Changes in Santa Rosa and San Simeon creek Ground-Water Basins, San Luis Obispo County, California.* Prepared in cooperation with the San Luis Obispo Flood Control and Water Conservation District. Water Resources Investigations, Report 98-4061. Retrieved from *https://pubs.er.usgs.gov/publication/wri984061*

> *Digital ground-water-flow models were used to estimate several items in the ground-water budgets and to investigate the effects of pumpage and drought. Increases in the area and intensity of irrigation could increase agricultural water demand by 26 to 35 percent, an increase that would lower water levels by as much as 10 feet and possibly cause subsidence in the lower Santa Rosa Basin. An additional municipal well in the lower Santa Rosa Basin could withdraw 100 acre-feet per year without causing seawater intrusion, but subsidence might occur. Decreases in agricultural pumping after a winter without streamflow could prevent seawater intrusion while allowing municipal pumping to continue at normal rates.*

RELEVANT WATER CODE SECTIONS 10560 et seq.

1. Water Code Section 10562(b)(1): Be developed on a watershed basis
2. Water Code Section 10562(b)(2): Identify and Prioritize stormwater and dry weather runoff projects
3. Water Code Section 10562(b)(3): Provide for multiple benefit project designs
4. Water Code Section 10562(b)(4): Provide for community participation
5. Water Code Section 10562(b)(5): Consistent with existing TMDL Plans and NPDES permits
6. Water Code Section 10562(b)(6): Be consistent with all applicable waste discharge permits
7. Water Code Section 10562(b)(7): Be submitted and incorporated into applicable IRWM
8. Water Code Section 10562(b)(8): Prioritize use of public lands and easements
9. Water Code Section 10562(d)(1): Identify beneficial use of runoff for groundwater recharge
10. Water Code Section 10562(d)(2): Identify opportunities for source control and infiltration
11. Water Code Section 10562(d)(3): Identify projects to mimic natural drainage and infiltration
12. Water Code Section 10562(d)(4): Identify projects to enhance habitat
13. Water Code Section 10562(d)(5): Identify opportunities to utilize public land and easements
14. Water Code Section 10562(d)(6): Identify effective design criteria
15. Water Code Section 10562(d)(7): Identify activities that general pollution
16. Water Code Section 10562(d)(8): Decision support tools for multiple benefits
17. Water Code Section 10562(d)(9): Ordinances and other mechanisms for effective implementation
18. Water Code Section 10562(3): Utilize measureable factors to prioritize projects.

ANNOTATED LIST OF REVIEWED DATA

Benefit Type	Data Set	Data Description	Data Unit (if applicable)	Spatial Resolution (where available)	Data Source	URL
Water Supply	Residential water use	The EPA EnviroAtlas Residential Water Use per 12-digit HUC dataset was clipped to California sub-watersheds (NRCS). Original Metadata: This EnviroAtlas national map estimates the total water used each day in millions of gallons for domestic or residential purposes for each subwatershed (12-digit HUC) in the contiguous United States. For this map, domestic or residential water demand includes all indoor and outdoor uses, such as for drinking, bathing, cleaning, landscaping, and pools for primary residences. It includes the demand on both public water distribution systems and self-supplied water from either ground water or surface water sources. It does not include second homes and vacation rentals. For this map, the United States Geological Survey (USGS) 2005 Water Use data was used to calculate the number of gallons used per person per day in each county in the contiguous United States. Within each state, these values were used to calculate a median per capita use for each state, to account for variation between counties. These median values were then applied to a distributed population map, known as dasymetric population data. This technique estimates the number of people in any given area and their estimated domestic water usage. The water use values were then summarized by 12-digit HUC, using the boundaries from the 2011 Watershed Boundary Dataset (WBD). The national per capita estimate is based on the USGS 2005 Water Use data and the 2010 US Census population estimation.	MG/year	NHD HUC 12 (40,000-250,000 acres)	EPA EnviroAtlas Water Usage data, per 12-digit HUC, California created by the Conservation Biology institute using USGS water usage data	https://www.epa.gov/enviroatlas

	Agricultural water use	This map was created using USGS 2005 Water Use data to estimate the daily agricultural irrigation per acre for each county in the contiguous U.S. Where available, irrigation for golf courses was excluded from the calculation. Some county results with zero reported use per acre may in fact have irrigated land, a result of complexities in reporting water use data. To ensure capture of this other irrigated land, counties with zero reported use per acre were assigned the generalized state-level median or mean, whichever was closest to the state-level majority. To distribute withdrawals for agricultural irrigation within the county, the final irrigation assignments were then converted and applied to more specific 30-meter locations using remotely sensed data on irrigation, land cover, and crop type. Irrigated locations were identified by applying algorithms, along with climate and agricultural data, to satellite imagery. For the purposes of EnviroAtlas, the potentially irrigated crop locations were further refined by crop type using the 2010 USDA Cropland Data and the 2006 MRLC National Land Cover Data. Finally, to represent these results in EnviroAtlas, the applied water use values were then summarized by 12-digit HUC.	MG/year	NHD HUC12 (40,000-250,000 acres)	EPA EnviroAtlas Water Usage data, per 12-digit HUC, California created vby the Conservation Biology institute using USGS water usage data	https://www.epa.gov/enviroatlas
	Industrial water use	This map was created by combining water use estimation data from the United States Geological Survey (USGS) and the location of industrial facilities from Dun and Bradstreet. The 2005 USGS estimated water use tables summarize the daily water withdrawals for industrial use by county throughout the US. The withdrawals for industrial use were then evenly distributed among the industrial facilities within the county. Where there was no county level water use data available for facilities, estimated water use was determined using an inverse distance-weighted grid derived from points with water use. For the purposes of EnviroAtlas, the estimated water use for each facility was summarized by subwatershed (12-digit HUC).	MG/year	NHD HUC12 (40,000-250,000 acres)	EPA EnviroAtlas Water Usage data, per 12-digit HUC, California created vby the Conservation Biology institute using USGS water usage data	https://www.epa.gov/enviroatlas
	Subsidence	Raster dataset depicting groundwater subsidence between March 2015 - September 2016,	ft/yr	90 m pixel	Raster dataset created by NASA delivered to DWR in October 2016.	http://www.water.ca.gov/waterconditions/docs/2017/JPL%20subsidence%20report%20final%20for%20public%20dec%202016.pdf

	Groundwater dependence index	"We developed an index of groundwater dependency by analyzing geospatial data for three ecosystem types that depend on groundwater: (1) springs and seeps; (2) wetlands and associated vegetation alliances; and (3) stream discharge from groundwater sources (baseflow index). Each variable was summarized at the scale of a small watershed (Hydrologic Unit Code-12; mean size = 9,570 ha; n = 4,621), and then stratified and summarized to 10 regions of relative homogeneity in terms of hydrologic, ecologic and climatic conditions. We found that groundwater dependent ecosystems are widely, although unevenly, distributed across California."	index score	NHD HUC12 (40,000-250,000 acres)	Howard, J. & Merrifield, M. 2010. Mapping Groundwater Dependent Ecosystems in California. PLoS One, 5, e11249. http://dx.plos.org/10.1371/journal.pone.0011249.	https://databasin.org/datasets/2c9f406a0a9f43fc81795a5c31e30b3e
	Base-flow index (BFI) raster	The base-flow index raster dataset was interpolated from a point dataset of USGS streamgage BFI values (Wolock, 2003). The streamgage BFI values were computed for each of the USGS streamgages in the historical database (more than 19,000 stations) using a Fortran program written by Tony Wahl (Bureau of Reclamation, U.S. Department of the Interior) and Ken Wahl (USGS) (http://www.usbr.gov/pmts/hydraulics_lab/twahl/bfi/) (Wahl and Wahl, 1988; 1995). A subset of the stream gage BFI values was selected before the interpolation process. The criteria for including a streamgage in the interpolation were (1) a period of record of at least 10 years of daily streamflow data, and (2) a maximum drainage basin area of 1,000 square miles (2,590 square kilometers). The first criterion selects stream gages with a reasonably long period of record, thereby averaging year-to-year variability in BFI values. The second criterion minimizes the effects of routing within the stream network on BFI values. Applying these selection criteria resulted in a point dataset of 8,249 streamgage BFI values. The mean period of record in the dataset was 33 years, and the mean drainage basin area was 204 square miles (528 square kilometers). The point dataset of streamgage BFI values was interpolated to a raster dataset using the ARCINFO inverse distance weighting interpolation method.	index score (0-90)	1 km pixel	Wolock, David. 2003. Base-flow index grid for the conterminous United States. Raster digital data. U.S. Geological Survey Open-File Report.	https://water.usgs.gov/GIS/metadata/usgswrd/XML/bfi48grd.xml#stdorder
	CA Groundwater Bulletin 118	Bulletin 118 is California’s official compendium on the occurrence and nature of groundwater statewide. Bulletin 118 defines the boundaries and describes the hydrologic characteristics of California’s groundwater basins. Bulletin 118 also provides information on groundwater management and recommendations for the future.			CA Department of Water Resources	http://www.water.ca.gov/groundwater/bulletin118/gwbasins.cfm

	Depth to water table	"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.	cm of water	Unspecified; likely 10s-100s of acres	USDA Soil Data Viewer for ArcMap	https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcseprd337066
	Soil available water capacity	Available water supply (AWS) is the total volume of water (in centimeters) that should be available to plants when the soil, inclusive of rock fragments, is at field capacity. It is commonly estimated as the amount of water held between field capacity and the wilting point, with corrections for salinity, rock fragments, and rooting depth. AWS is reported as a single value (in centimeters) of water for the specified depth of the soil. AWS is calculated as the available water capacity times the thickness of each soil horizon to a specified depth.	cm of water	Unspecified; likely 10s-100s of acres	USDA Soil Data Viewer for ArcMap	https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcseprd337066
Water Quality	Impervious area (TELR model input)	NLCD 2011 Percent Impervious Area Dataset	acres	30 m pixel	Xian, G., Homer, C., Dewitz, J., Fry, J., Hossain, N., and Wickham, J., 2011. The change of impervious surface area between 2001 and 2006 in the conterminous United States. Photogrammetric Engineering and Remote Sensing, Vol. 77(8): 758-762.	http://landcover.usgs.gov/uslandcover.php
	Hydrologic soil group (TELR model input)	SSURGO and STATSGO soils dataset	acres	30 m pixel	SSURGO and STATSGO soil layers that depict soil drainage.	https://swtelr.2nform.com
	Estimated runoff (TELR model output)	runoff baseline estimates using swTELR	ac-ft/ac/yr	100 ac	TELR (2nd Nature)	https://swtelr.2nform.com
	Estimated pollutant loading (TELR model ouput)	TSS baseline load estimates using swTELR	ton/ac/yr	100 ac	TELR (2nd Nature)	https://swtelr.2nform.com

	Structural stormwater BMPs (TELR input)	Extracted points from BMP RAM. Available for Paso Robles, Atascadero, Pismo, City of SLO, Morro Bay, Arroyo Grande, County of SLO	count		BMP RAM (2nd Nature)	https://bmpram.2nform.com
	Impaired waterbodies	303(d) listed impaired water bodies within SLO County	miles/ acre	stream segment	USEPA	https://ofmpub.epa.gov/waters10/attains_nation_cy.control#imp_water_by_state https://www.epa.gov/waterdata/waters-geospatial-data-downloads#303dListedImpairedWaters
	Soil erodibility	Derived from 1:250,000-scale USGS HUC 8 boundaries, this dataset represents the soil erodibility for the western USA. A weighted average was created for each HUC 8 watershed using approximate EMAP physical habitat substrate criteria. The values are based on the Universal Soil Loss Equation: A =R x K x LS x C x P, where A = potential long term average annual soil loss in tons per acre per year, R = rainfall and runoff factor by geographic location, K = soil erodibility factor, LS = slope length-gradient factor, crop/vegetation and management factor, and P = support practice factor. This dataset contains attribute fields with values for each factor.	ton/mi^2/yr	HUC 8 (1,000-3,300 sq mi in SLO County)	Soil Erodibility Index derived from the Revised Universal Soil Loss Equation. Weighted average gross soil erosion derived from USGS HUC 8 boundaries. Based on the revised universal soil loss equation (RUSLE).	https://databasin.org/datasets/7432f101133a463a8d477ca18a856b74
Environ-mental	Critical species habitat for steelhead	Endangered Species Act Critical Habitat GIS shapefiles from NOAA Fisheries.	locations	stream segment	NOAA	http://www.westcoast.fisheries.noaa.gov/maps_data/endangered_species_act_critical_habitat.html
	California Rapid Assessment Method (CRAM) survey results	CRAM assessment details (index, metric and attribute scores) visit dates, area boundaries, etc.	acres		San Francisco Estuary Institute	https://www.ecoatlas.org/regions/ecoregion/statewide?cram=1
	California Stream Condition Index	CSCI index scores for all CCAMP sites in SLO County.	index score	CCAMP stations	Downloaded this and all CCAMP data from CEDEN	http://ceden.waterboards.ca.gov/AdvancedQueryTool
Flood Control	Potential flooded area	FEMA's National Flood Hazard Layer. Downloaded from FEMA's ArcGIS Portal, November 2017.			FEMA	https://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cbe088e7c8704464aa0fc34eb99e7f30

Community	California Disadvantaged Communities (Block Groups)	This layer depicts data from the US Census ACS 2010-2014 showing census block groups identified as as disadvantaged communities (less than 80% of the State's median household income) or severely disadvantaged communities (less than 60% of the State's median household income).	locations		CA Department of Water Resources	https://gis.water.ca.gov/app/dacs/
Regional Hydro-Geographic Description	CalWater Planning Watersheds	Planning Watersheds in San Luis Obispo County. Also known as SLO County Subwatersheds.		30 m pixel	CA Department of Natural Resources	https://catalog.data.gov/dataset/calwater-2-233fac
	Watershed Planning Areas (as identified by the TAC for this SWRP) (WPA's)	Boundaries of nine management areas for San Luis Obispo County.		30 m pixel	SLO Watershed Project, and this Stormwater Resource Plan	http://slowatershedproject.org/resources/
	Watershed Management Zones	This layer shows Watershed Management Zones (WMZ) for the Central Coast Joint Effort for Hydromodification Control project area. This dataset is the result of the combination of 3 layers: Receiving Water Types, Physical Landscape Zones (PLZ), and Groundwater basin. The key attribute of WMZ is 'WMZ_VALUE', represented by a number and an associated category of watershed management zone, with specific stormwater management strategies to be applied to each zone (avoid OVERLAND FLOW; protect GROUNDWATER RECHARGE; protect INTERFLOW; protect EVAPOTRANSPIRATION; protect CHEMICAL AND BIOLOGICAL TRANSFORMATIONS; protect DELIVERY OF SEDIMENT; protect DELIVERY OF ORGANICS; protect GROUNDWATER RECHARGE where underlain by mapped groundwater basin.		30 m pixel	Central Coast Regional Water Quality Control Waterboard	https://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml
	National Hydrography Dataset	The National Hydrography Dataset (NHD), a component of The National Map, represents the water drainage network of the United States with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and streamgages. The NHD is the surface water component on the US Topo map product produced by the USGS. These data, in digital vector geographic information system (GIS) format, are designed to be used in general mapping and in the analysis of surface water systems.		30 m pixel	USGS	https://nhd.usgs.gov/NHD_High_Resolution.html
	Digital elevation model	30-meter resolution DEM of SLO County. Used for slope, aspect, elevation, and other spatial analysis.		30 m pixel	SLO Data Finder (CalPoly)	http://lib.calpoly.edu/gis/
	Slope	Slope raster layer derived from 30-meter resolution DEM.		30 m pixel	SLO Data Finder (CalPoly)	http://lib.calpoly.edu/gis/

	Land use (TELR model input)	NLCD 2011 Landcover Dataset.		30 m pixel	Land coverage from the National Land Cover Database 2011 derived from Landsat Satellite imagery. (Homer, et al., 2011)	http://landcover.usgs.gov/uslandcover.php
	California geologic units and features	Geologic units and structural features in California, including lithology and age.		1:750,000 (original map scale)	USGS Mineral Resources	https://mrdata.usgs.gov/geology/state/state.php?state=CA
	Coastal wetland locations	This dataset distinguishes coastal wetlands from inland wetlands while retaining the attributes from the original National Wetlands Inventory (NWI) data.			Pacific Institute	www.DataBasin.org

APPENDIX 1-B

Map folio for the San Luis Obispo County SWRP

For each of the 9 Watershed Groups, the following maps are included:

1. Municipal boundaries and service areas
2. Land cover
3. Groundwater basins and water features
4. Aquatic habitat
5. Watershed Management Zones

Index map of the Watershed Groups 1–9 (see following pages)


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
Oak Shores
Lake Nacimiento
SALINAS RIVER (7)
San Carpoforo Cr
Arroyo De La Cruz
SAN SIMEON/CAMBRIA (1)
1
San Simeon
San Simeon CSD
San Simeon Creek
Curti Cr
Santa Rosa Creek
Cambria
Cambria CSD
46
Perry Creek
Harmony
Pacific Ocean
CAYUCOS/MORRO BAY/LOS OSOS (2)
Cayucos
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Groundwater basins: DWR
Hydrology: San Simeon/Cambria (WG 1)
Community Service District
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
Oak Shores
Lake Nacimiento
SALINAS RIVER (7)
San Carpoforo Cr
Arroyo De La Cruz
SAN SIMEON/CAMBRIA (1)
1
San Simeon
San Simeon Creek
Curti Cr
Santa Rosa Creek
Pacific Ocean
Cambria
46
Perry Creek
Harmony
CAYUCOS/MORRO BAY/LOS OSOS (2)
Cayucos
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Landcover: NLCD 2011
Land Cover: San Simeon/Cambria (WG 1)
Land Cover
Agriculture
Forested
Grassland/Herbaceous
Other
Urban
Waters and wetlands
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
Oak Shores
Lake Nacimiento
SALINAS RIVER (7)
SAN CARPOFORO VALLEY GWB
San Carpoforo Cr
ARROYO DE LA CRUZ VALLEY GWB
Arroyo De La Cruz
SAN SIMEON/CAMBRIA (1)
1
San Simeon
San Simeon Creek
SAN SIMEON VALLEY GWB
SANTA ROSA VALLEY GWB
Curti Cr
Santa Rosa Creek
Cambria
46
Pacific Ocean
Perry Creek
Harmony
VILLA VALLEY GWB
CAYUCOS/MORRO BAY/LOS OSOS (2)
Cayucos
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Groundwater basins: DWR
Hydrology: San Simeon/Cambria (WG 1)
Groundwater basin (GWB)
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
Oak Shores
Lake Nacimiento
SALINAS RIVER (7)
SAN SIMEON/CAMBRIA (1)
San Carpoforo Cr
Arroyo De La Cruz
San Simeon
San Simeon Creek
Curti Cr
Santa Rosa Creek
Cambria
Pacific Ocean
Perry Creek
Harmony
CAYUCOS/MORRO BAY/LOS OSOS (2)
Cayucos
1
46
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Critical Habitat: USFWS
Steelhead habitat: based on Boughton & Goslin 2006
Fish Passage: CAFWS
Fish Habitat: San Simeon/Cambria (WG 1)
Tidewater goby critical habitat
Potential steelhead migratory channel
Potential steelhead rearing habitat
Watershed Group
Stream
Natural Partial Barrier
Natural Total Barrier
Partial Barrier
Total Barrier
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
Oak Shores
Lake Nacimiento
SALINAS RIVER (7)
San Carpoforo
Arroyo De La Cruz
SAN SIMEON/CAMBRIA (1)
1
San Simeon
San Simeon Creek
Santa Rosa Creek
Cambria
46
Perry Creek
Harmony
CAYUCOS/MORRO BAY/LOS OSOS (2)
Cayucos
Pacific Ocean
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Watershed Management Zones: San Simeon/Cambria (WG 1)
Watershed Management Zone
1
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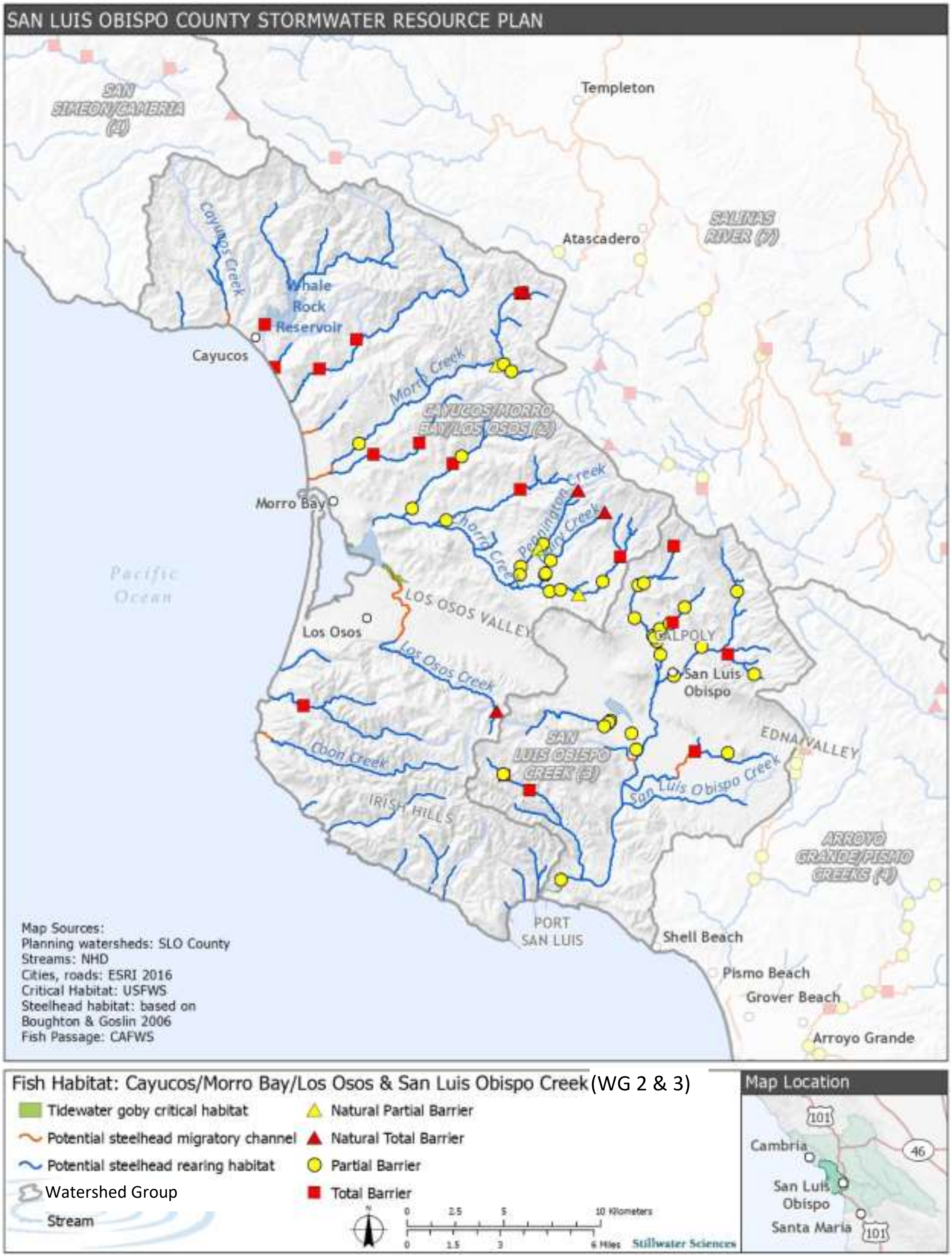
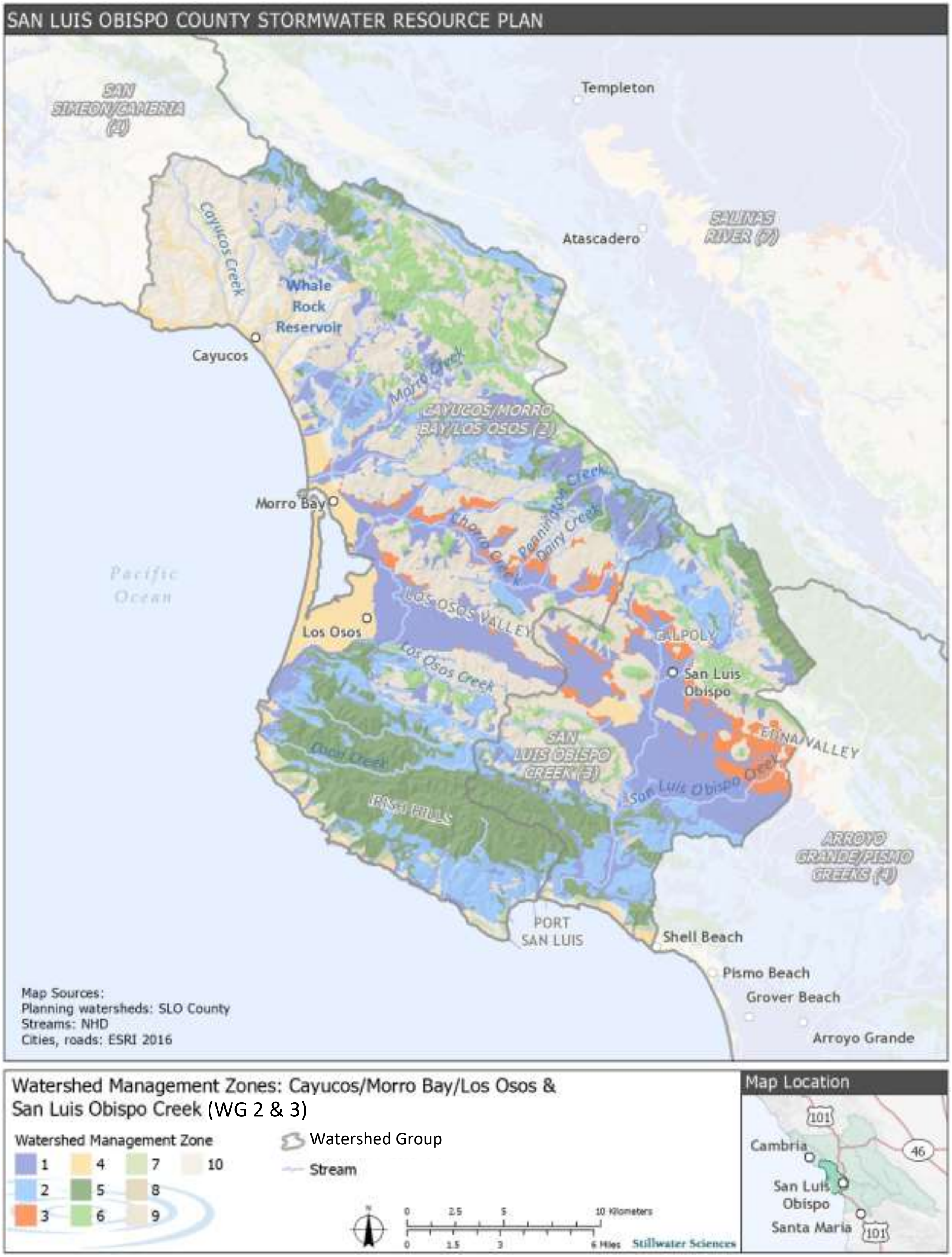
4
5
6
7
8
9
10
Watershed Group
Stream
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101
Stillwater Sciences


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
SAN SIMEON/CAMBRIA (1)
Templeton
Atascadero
SALINAS RIVER (7)
Cayucos Creek
Whale Rock Reservoir
Cayucos
Morro Creek
CAYUCOS/MORRO BAY/LOS OSOS (2)
Morro Bay
Pennington Creek
Dairy Creek
Chorro Creek
Pacific Ocean
Los Osos CSD
Los Osos
LOS OSOS VALLEY
Los Osos Creek
CALPOLY
San Luis Obispo
EDNA VALLEY
SAN LUIS OBISPO CREEK (3)
Coon Creek
San Luis Obispo Creek
IRISH HILLS
Avila Beach CSD
Squire Canyon CSD
ARROYO GRANDE/PISMO CREEKS (4)
PORT SAN LUIS
Shell Beach
Pismo Beach
Grover Beach
Arroyo Grande
Map Sources:
Planning watersheds, City limits, CSDs: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Municipal Services: Cayucos/Morro Bay/Los Osos & San Luis Obispo Creek (WG 2 & 3)
City Limits
Community Service District
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
SAN SIMEON/CAMBRIA (1)
Templeton
Atascadero
SALINAS RIVER (7)
Cayucos Creek
Whale Rock Reservoir
Cayucos
Morro Creek
CAYUCOS/MORRO BAY/LOS OSOS (2)
Morro Bay
Chorro Creek
Pennington Creek
Dairy Creek
Pacific Ocean
LOS OSOS VALLEY
Los Osos
Los Osos Creek
CALPOLY
San Luis Obispo
EDNA VALLEY
Coon Creek
IRISH HILLS
SAN LUIS OBISPO CREEK (3)
San Luis Obispo Creek
ARROYO GRANDE/PISMO CREEKS (4)
PORT SAN LUIS
Shell Beach
Pismo Beach
Grover Beach
Arroyo Grande
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Landcover: NLCD 2011
Land Cover: Cayucos/Morro Bay/Los Osos & San Luis Obispo Creek (WG 2 & 3)
Land Cover
Agriculture
Forested
Grassland/Herbaceous
Other
Urban
Waters and wetlands
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
SAN SIMEON/CAMBRIA (1)
Templeton
Atascadero
SALINAS RIVER (7)
OLD VALLEY GWB
CAYUCOS VALLEY GWB
Cayucos Creek
Whale Rock Reservoir
Cayucos
TORO VALLEY GWB
Morro Creek
CAYUCOS/MORRO BAY/LOS OSOS (2)
MORRO VALLEY GWB
Morro Bay
CHORRO VALLEY GWB
Chorro Creek
Pennington Creek
Dairy Creek
Pacific Ocean
LOS OSOS VALLEY
LOS OSOS VALLEY GWB
Los Osos
Los Osos Creek
CALPOLY
San Luis Obispo
EDNA VALLEY
Coon Creek
SAN LUIS OBISPO CREEK (3)
SAN LUIS OBISPO VALLEY GWB
San Luis Obispo Creek
IRISH HILLS
ARROYO GRANDE/PISMO CREEKS (4)
PORT SAN LUIS
Shell Beach
Pismo Beach
Grover Beach
Arroyo Grande
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Groundwater basins: DWR
Hydrology: Cayucos/Morro Bay/Los Osos & San Luis Obispo Creek (WG 2 & 3)
Groundwater basin (GWB)
Watershed Group
Stream
Map Location
Cambria
San Luis Obispo
Santa Maria
Stillwater Sciences


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Templeton
SAN SIMEON/CAMBRIA (1)
Atascadero
SALINAS RIVER (7)
Cayucos Creek
Whale Rock Reservoir
Cayucos
Morro Creek
CAYUCOS/MORRO BAY/LOS OSOS (2)
Morro Bay
Chorro Creek
Pennington Creek
Dairy Creek
Pacific Ocean
LOS OSOS VALLEY
Los Osos
CALPOLY
San Luis Obispo
Los Osos Creek
Coon Creek
SAN LUIS OBISPO CREEK (3)
EDNA VALLEY
San Luis Obispo Creek
IRISH HILLS
ARROYO GRANDE/PISMO CREEKS (4)
PORT SAN LUIS
Shell Beach
Pismo Beach
Grover Beach
Arroyo Grande
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Critical Habitat: USFWS
Steelhead habitat: based on Boughton & Goslin 2006
Fish Passage: CAFWS
Fish Habitat: Cayucos/Morro Bay/Los Osos & San Luis Obispo Creek (WG 2 & 3)
Tidewater goby critical habitat
Potential steelhead migratory channel
Potential steelhead rearing habitat
Watershed Group
Stream
Natural Partial Barrier
Natural Total Barrier
Partial Barrier
Total Barrier
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Templeton
SAN SIMEON/CAMBRIA (4)
Atascadero
SALINAS RIVER (7)
Cayucos Creek
Whale Rock Reservoir
Cayucos
Morro Creek
CAYUCOS/MORRO BAY/LOS OSOS (2)
Pennington Creek
Dairy Creek
Chorro Creek
Morro Bay
Pacific Ocean
Los Osos
LOS OSOS VALLEY
Los Osos Creek
CAL POLY
San Luis Obispo
EDNA VALLEY
SAN LUIS OBISPO CREEK (3)
San Luis Obispo Creek
IRISH HILLS
ARROYO GRANDE/PISMO CREEKS (4)
PORT SAN LUIS
Shell Beach
Pismo Beach
Grover Beach
Arroyo Grande
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Watershed Management Zones: Cayucos/Morro Bay/Los Osos & San Luis Obispo Creek (WG 2 & 3)
Watershed Management Zone
1
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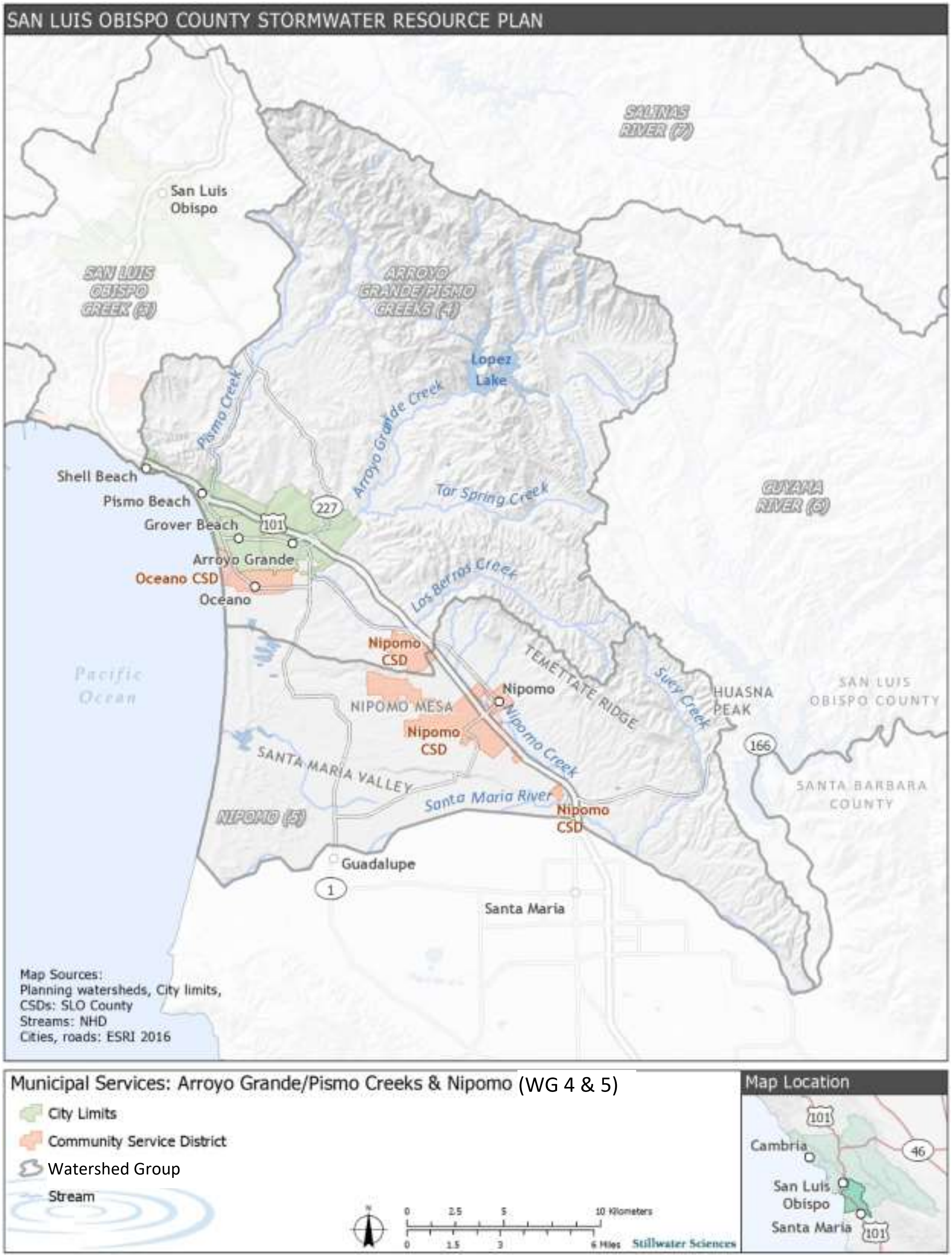
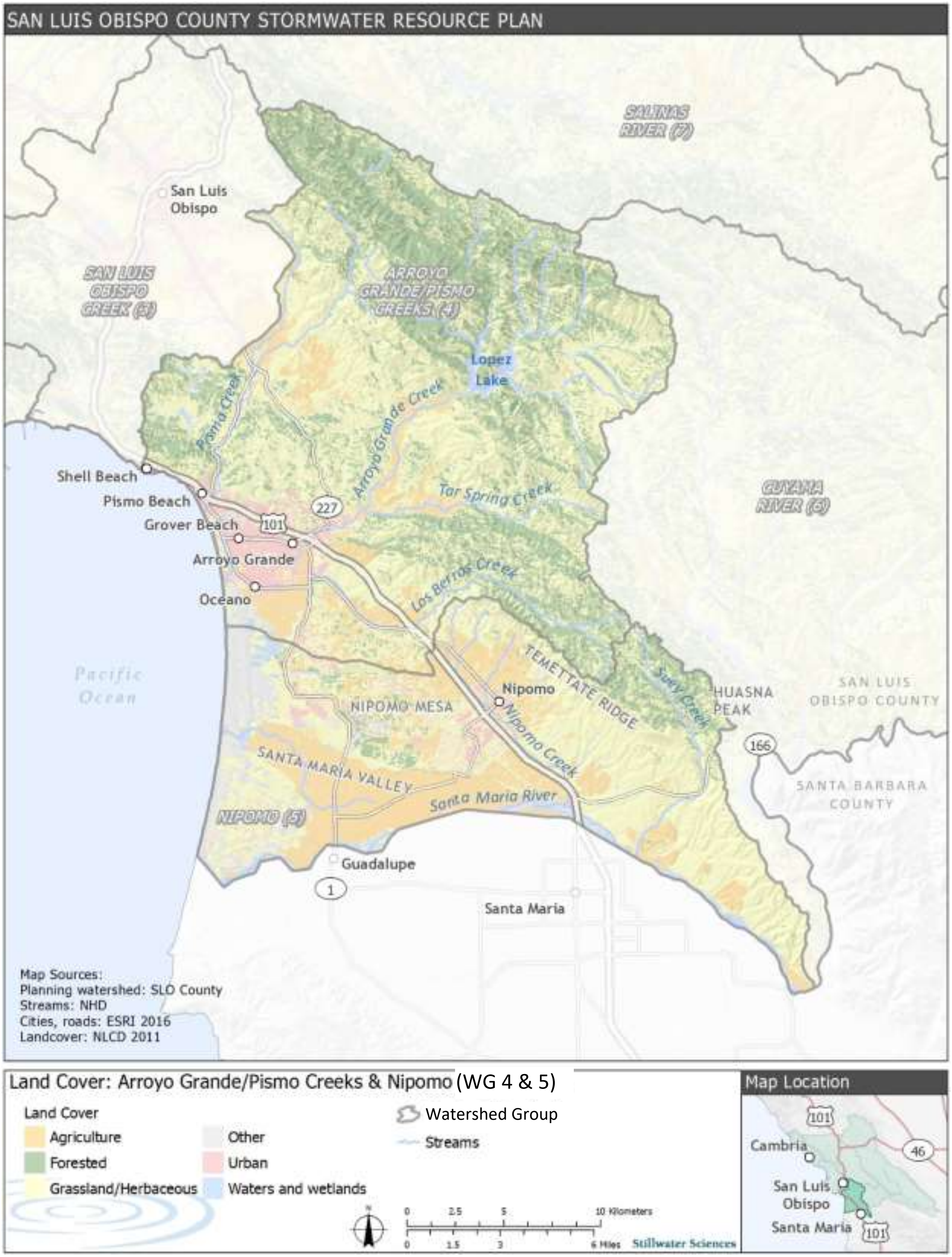
10
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
SALINAS RIVER (7)
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
Lopez Lake
Pismo Creek
Arroyo Grande Creek
Tar Spring Creek
CUYAMA RIVER (6)
Shell Beach
Pismo Beach
Grover Beach
Arroyo Grande
Oceano CSD
Oceano
Los Berros Creek
Nipomo CSD
TEMETTATE RIDGE
Suey Creek
HUASNA PEAK
SAN LUIS OBISPO COUNTY
Pacific Ocean
Nipomo
NIPOMO MESA
Nipomo Creek
SANTA MARIA VALLEY
Santa Maria River
SANTA BARBARA COUNTY
NIPOMO (5)
Guadalupe
Santa Maria
Map Sources:
Planning watersheds, City limits,
CSDs: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Municipal Services: Arroyo Grande/Pismo Creeks & Nipomo (WG 4 & 5)
City Limits
Community Service District
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
Cambria
San Luis Obispo
Santa Maria


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
SALINAS RIVER (7)
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
Lopez Lake
Pismo Creek
Arroyo Grande Creek
Tar Spring Creek
Los Berros Creek
CUYAMA RIVER (6)
Shell Beach
Pismo Beach
Grover Beach
Arroyo Grande
Oceano
227
101
Pacific Ocean
TEMETTATE RIDGE
Suey Creek
HUASNA PEAK
SAN LUIS OBISPO COUNTY
Nipomo
NIPOMO MESA
Nipomo Creek
166
SANTA MARIA VALLEY
Santa Maria River
SANTA BARBARA COUNTY
NIPOMO (5)
Guadalupe
1
Santa Maria
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Landcover: NLCD 2011
Land Cover: Arroyo Grande/Pismo Creeks & Nipomo (WG 4 & 5)
Land Cover
Agriculture
Forested
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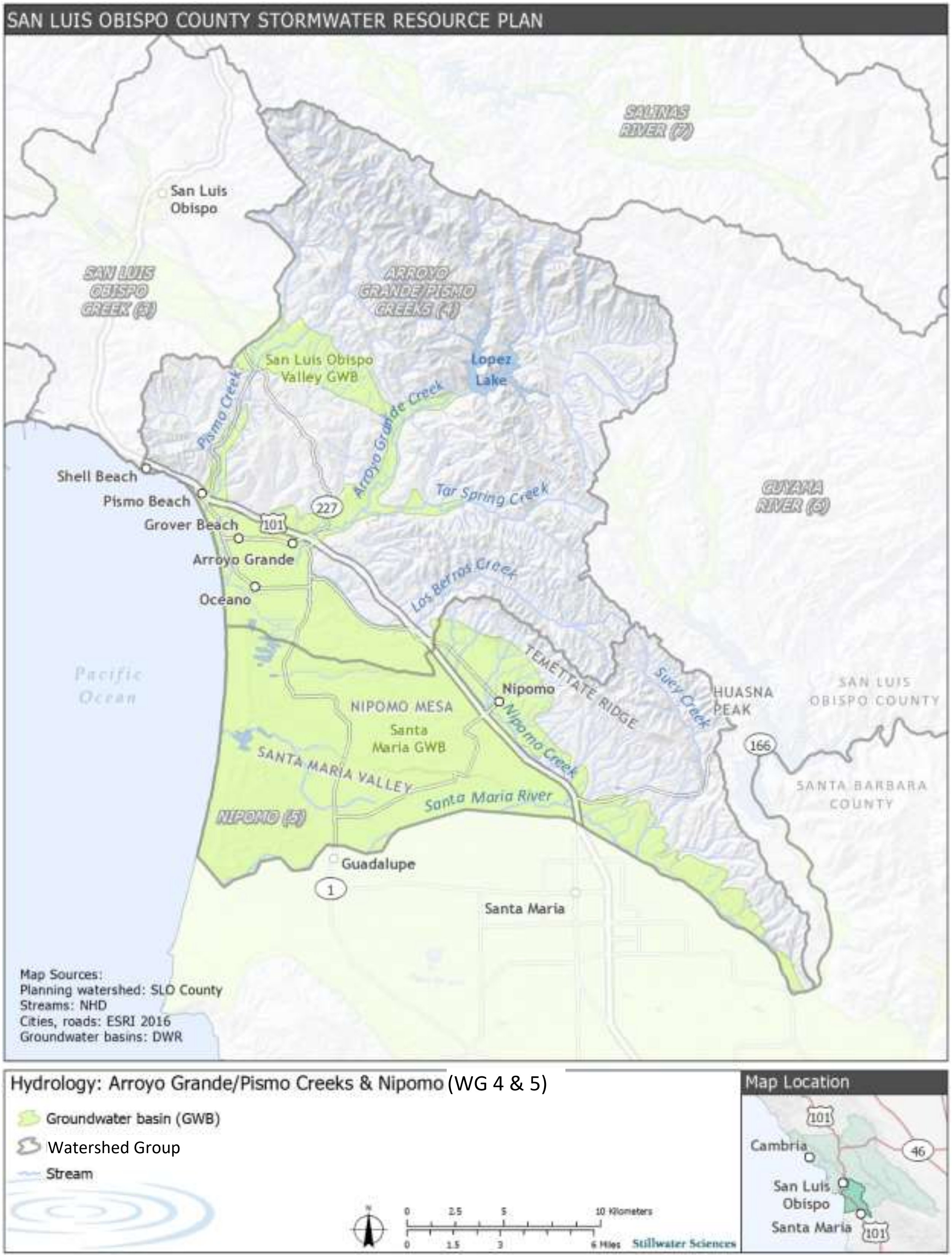
Other
Urban
Waters and wetlands
Watershed Group
Streams
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
SALINAS RIVER (7)
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
San Luis Obispo Valley GWB
Lopez Lake
Pismo Creek
Arroyo Grande Creek
Tar Spring Creek
CUYAMA RIVER (6)
Shell Beach
Pismo Beach
Grover Beach
Arroyo Grande
Oceano
Los Berros Creek
227
101
Pacific Ocean
TEMETTATE RIDGE
Suey Creek
HUASNA PEAK
SAN LUIS OBISPO COUNTY
Nipomo
NIPOMO MESA
Santa Maria GWB
Nipomo Creek
166
SANTA MARIA VALLEY
Santa Maria River
SANTA BARBARA COUNTY
NIPOMO (5)
Guadalupe
1
Santa Maria
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Groundwater basins: DWR
Hydrology: Arroyo Grande/Pismo Creeks & Nipomo (WG 4 & 5)
Groundwater basin (GWB)
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
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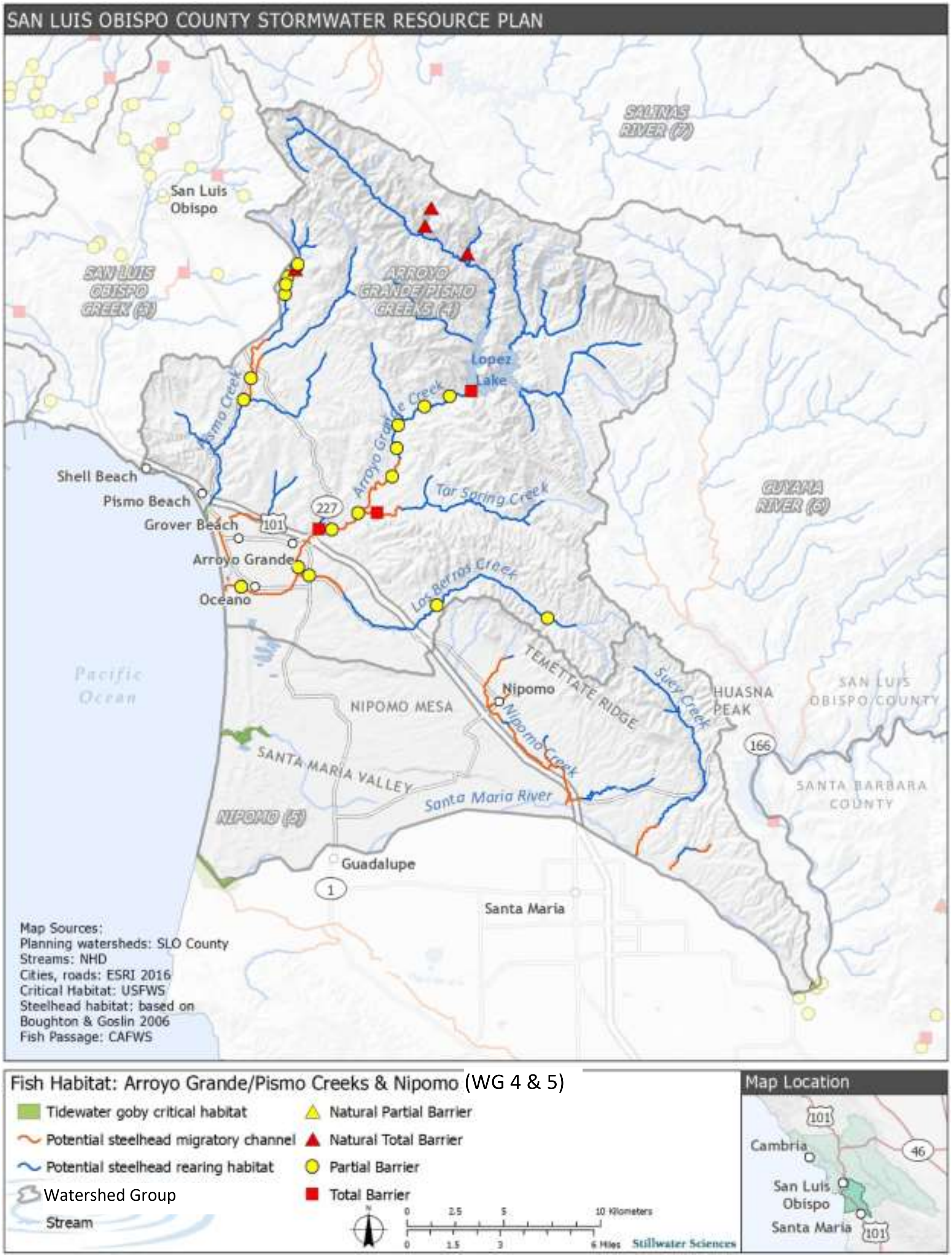
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
SALINAS RIVER (7)
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
Lopez Lake
Pismo Creek
Arroyo Grande Creek
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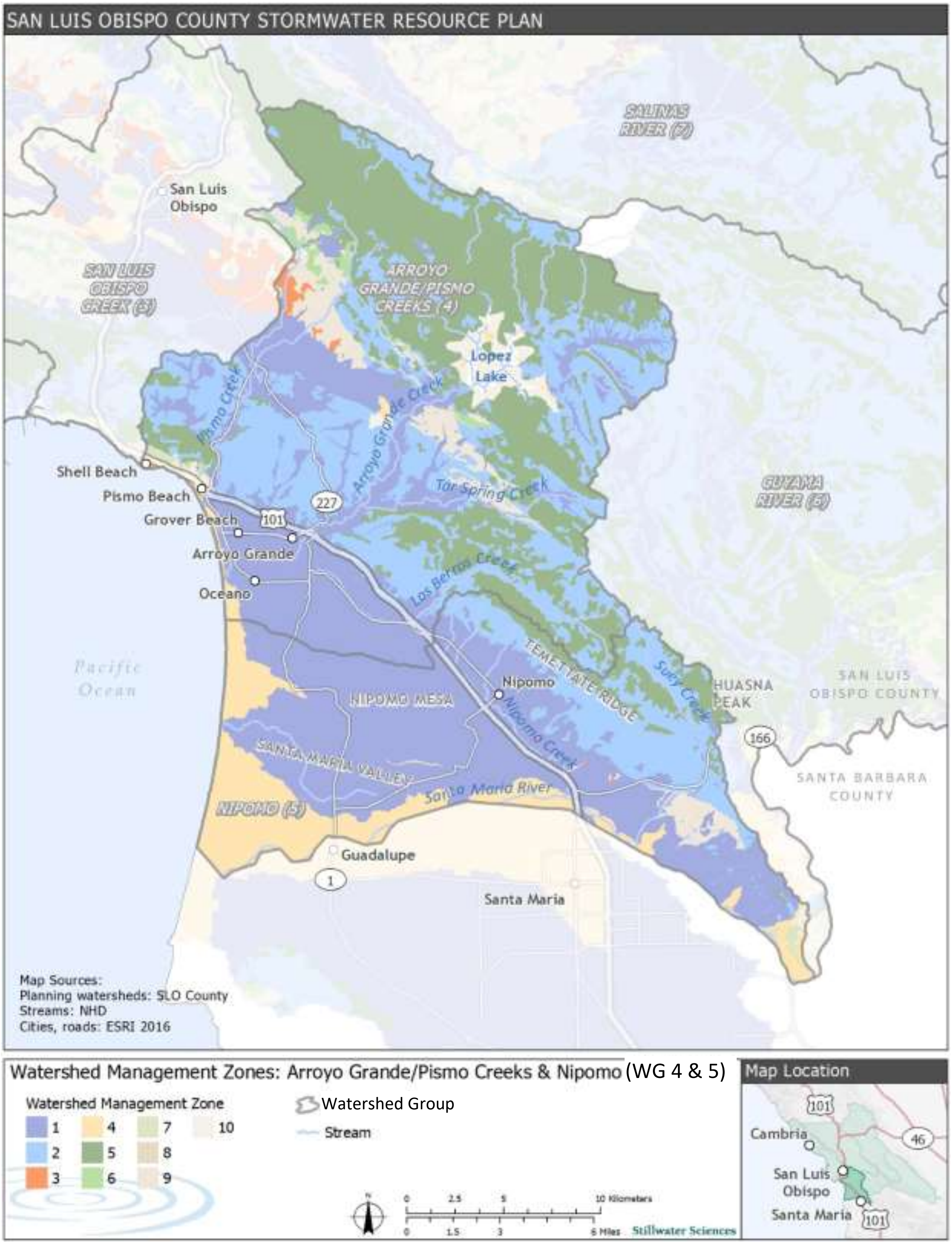
Pacific Ocean
TEMETTATE RIDGE
Nipomo
NIPOMO MESA
Nipomo Creek
Suey Creek
HUASNA PEAK
SAN LUIS OBISPO COUNTY
166
SANTA BARBARA COUNTY
SANTA MARIA VALLEY
Santa Maria River
NIPOMO (5)
Guadalupe
1
Santa Maria
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Critical Habitat: USFWS
Steelhead habitat: based on Boughton & Goslin 2006
Fish Passage: CAFWS
Fish Habitat: Arroyo Grande/Pismo Creeks & Nipomo (WG 4 & 5)
Tidewater goby critical habitat
Potential steelhead migratory channel
Potential steelhead rearing habitat
Watershed Group
Stream
Natural Partial Barrier
Natural Total Barrier
Partial Barrier
Total Barrier
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
SALINAS RIVER (7)
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
Lopez Lake
Pismo Creek
Arroyo Grande Creek
Tar Spring Creek
Los Berros Creek
HUASNA RIVER (6)
Shell Beach
Pismo Beach
Grover Beach
Arroyo Grande
Oceano
227
101
Pacific Ocean
NIPOMO MESA
Nipomo
TEMETTATE RIDGE
Suey Creek
Nipomo Creek
HUASNA PEAK
SAN LUIS OBISPO COUNTY
166
SANTA BARBARA COUNTY
SANTA MARIA VALLEY
Santa Maria River
NIPOMO (5)
Guadalupe
1
Santa Maria
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Watershed Management Zones: Arroyo Grande/Pismo Creeks & Nipomo (WG 4 & 5)
Watershed Management Zone
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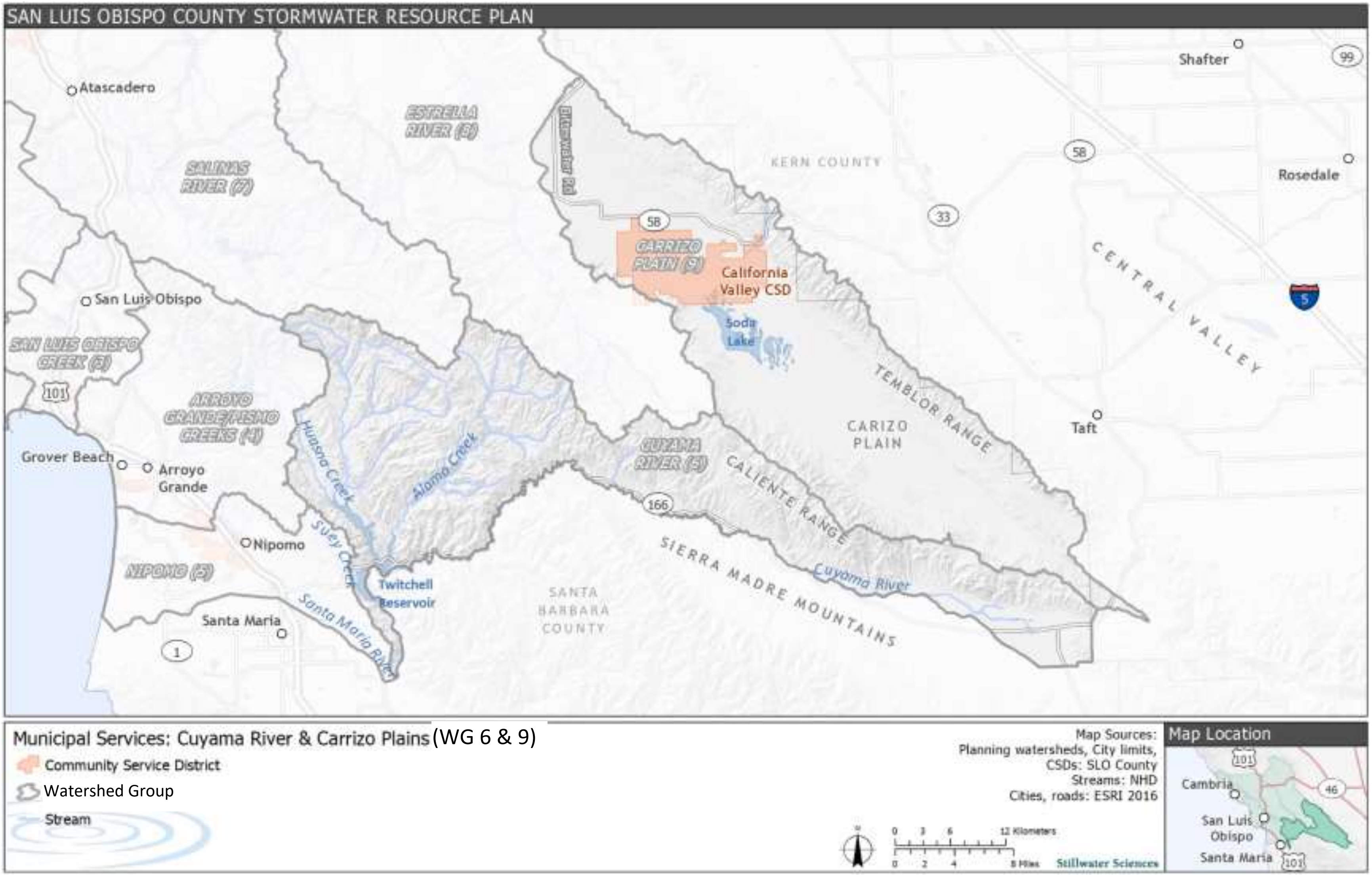
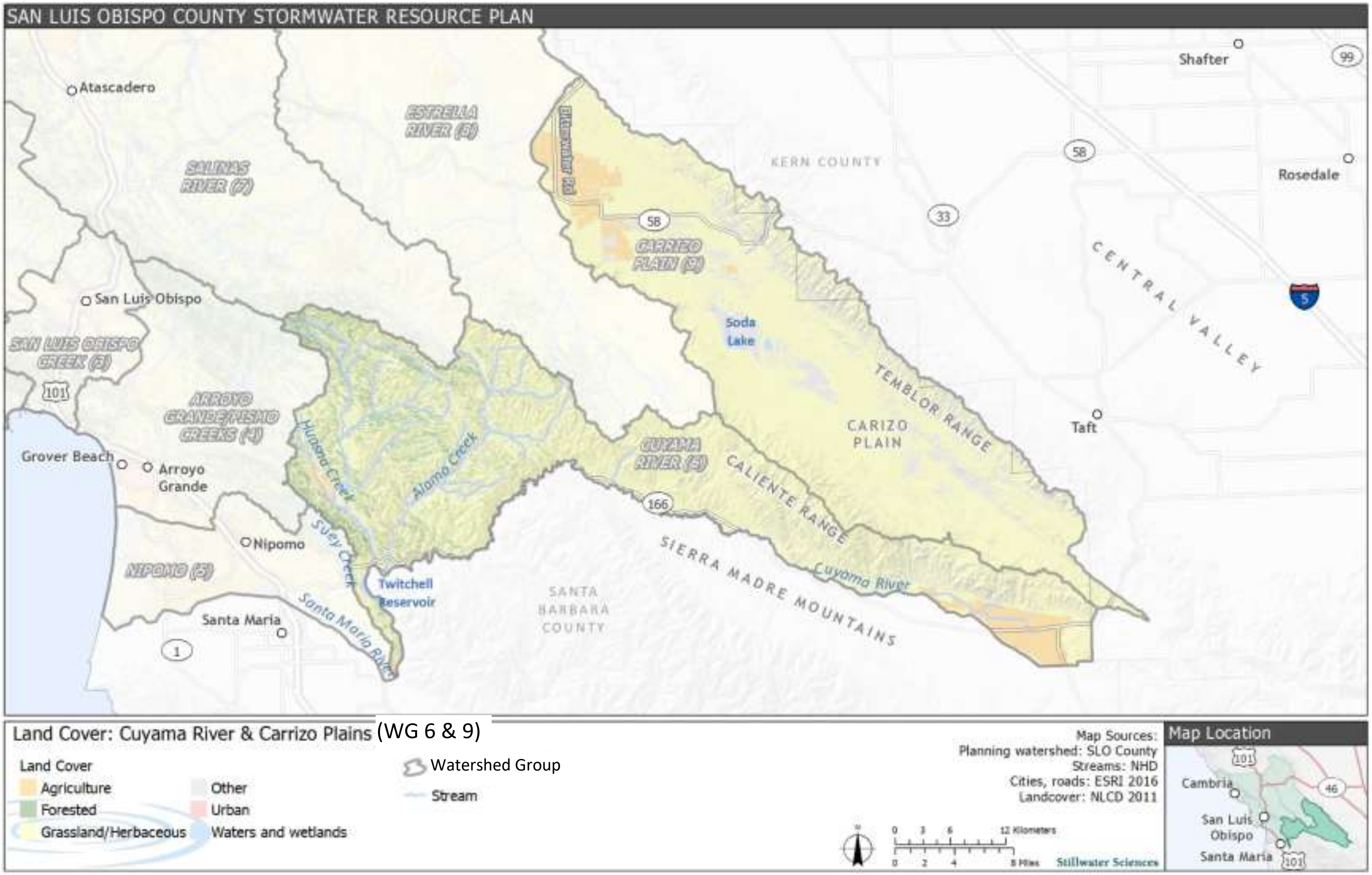
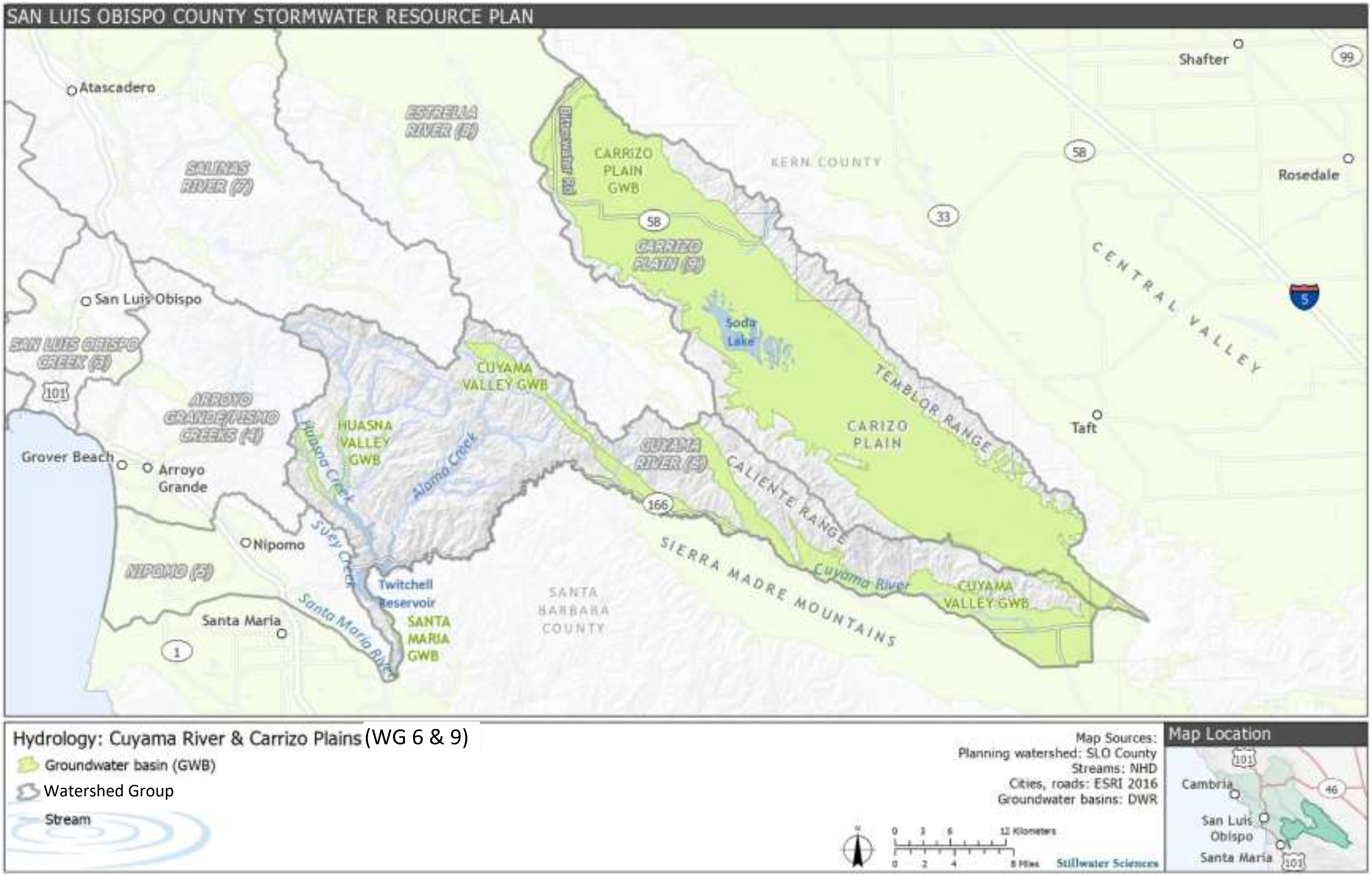
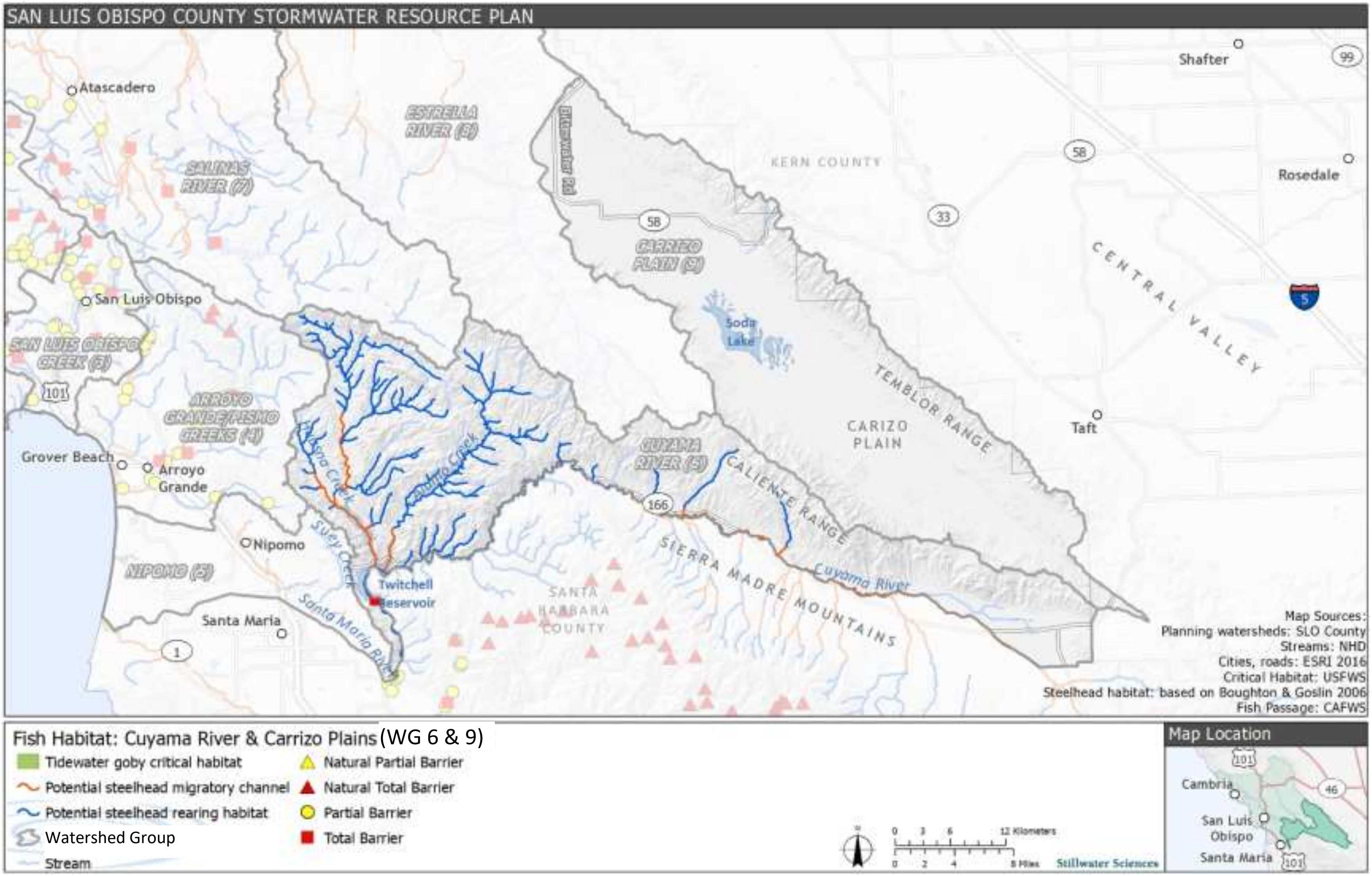
Watershed Group
Stream
Map Location
Cambria
46
San Luis Obispo
Santa Maria
Stillwater Sciences

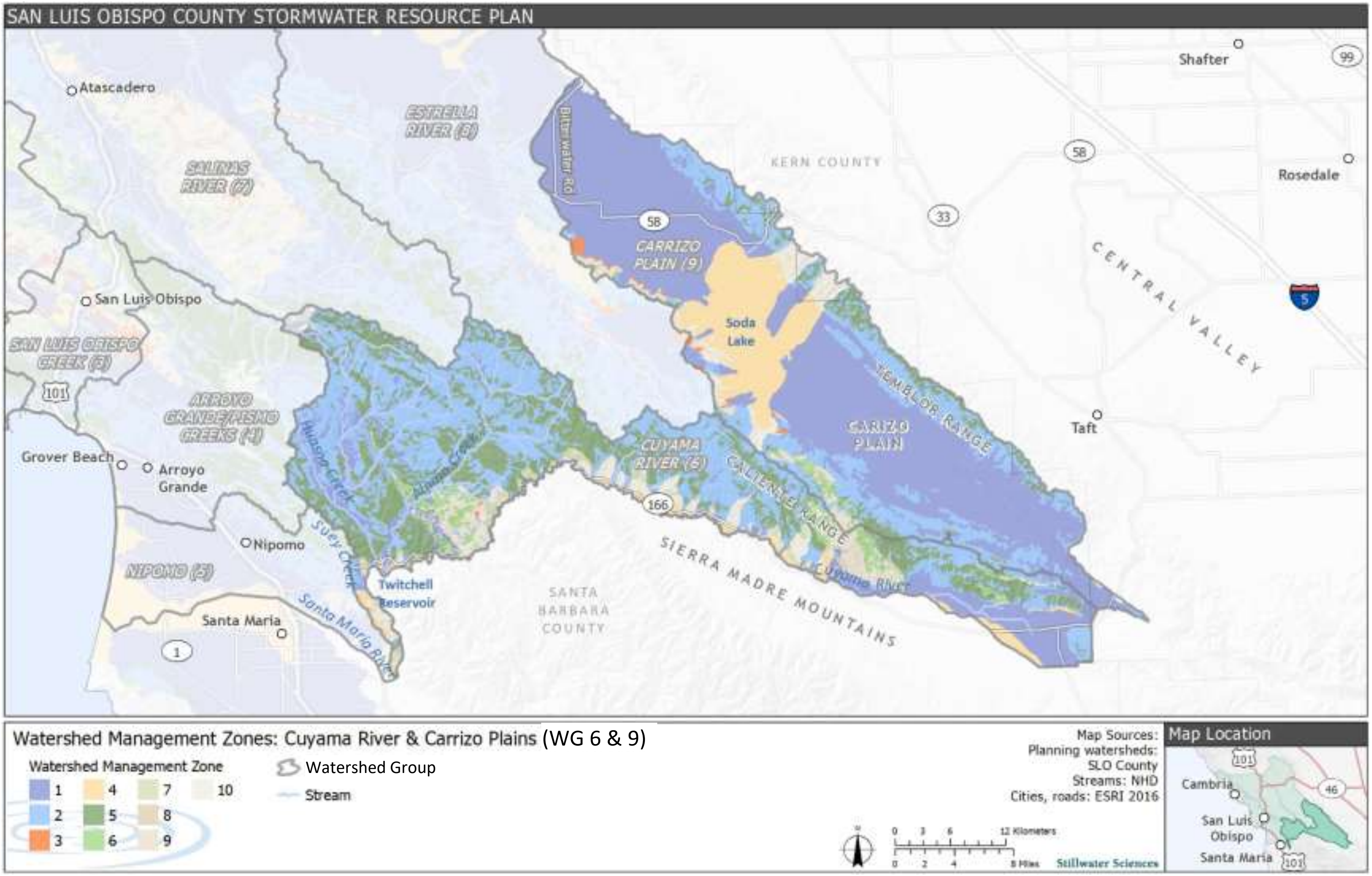

SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Atascadero
ESTRELLA RIVER (8)
SALINAS RIVER (7)
KERN COUNTY
Shafter
Rosedale
CARRIZO PLAIN (9)
California Valley CSD
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
Soda Lake
CENTRAL VALLEY
TEMBLOR RANGE
ARROYO GRANDE/PISMO CREEKS (4)
Huasna Creek
Alamo Creek
CARIZO PLAIN
Taft
Grover Beach
Arroyo Grande
CUYAMA RIVER (6)
CALIENTE RANGE
Nipomo
Suey Creek
NIPOMO (5)
Twitchell Reservoir
SIERRA MADRE MOUNTAINS
Cuyama River
Santa Maria
Santa Maria River
SANTA BARBARA COUNTY
Municipal Services: Cuyama River & Carrizo Plains (WG 6 & 9)
Community Service District
Watershed Group
Stream
Map Sources:
Planning watersheds, City limits,
CSDs: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Stillwater Sciences
Map Location
Cambria
San Luis Obispo
Santa Maria

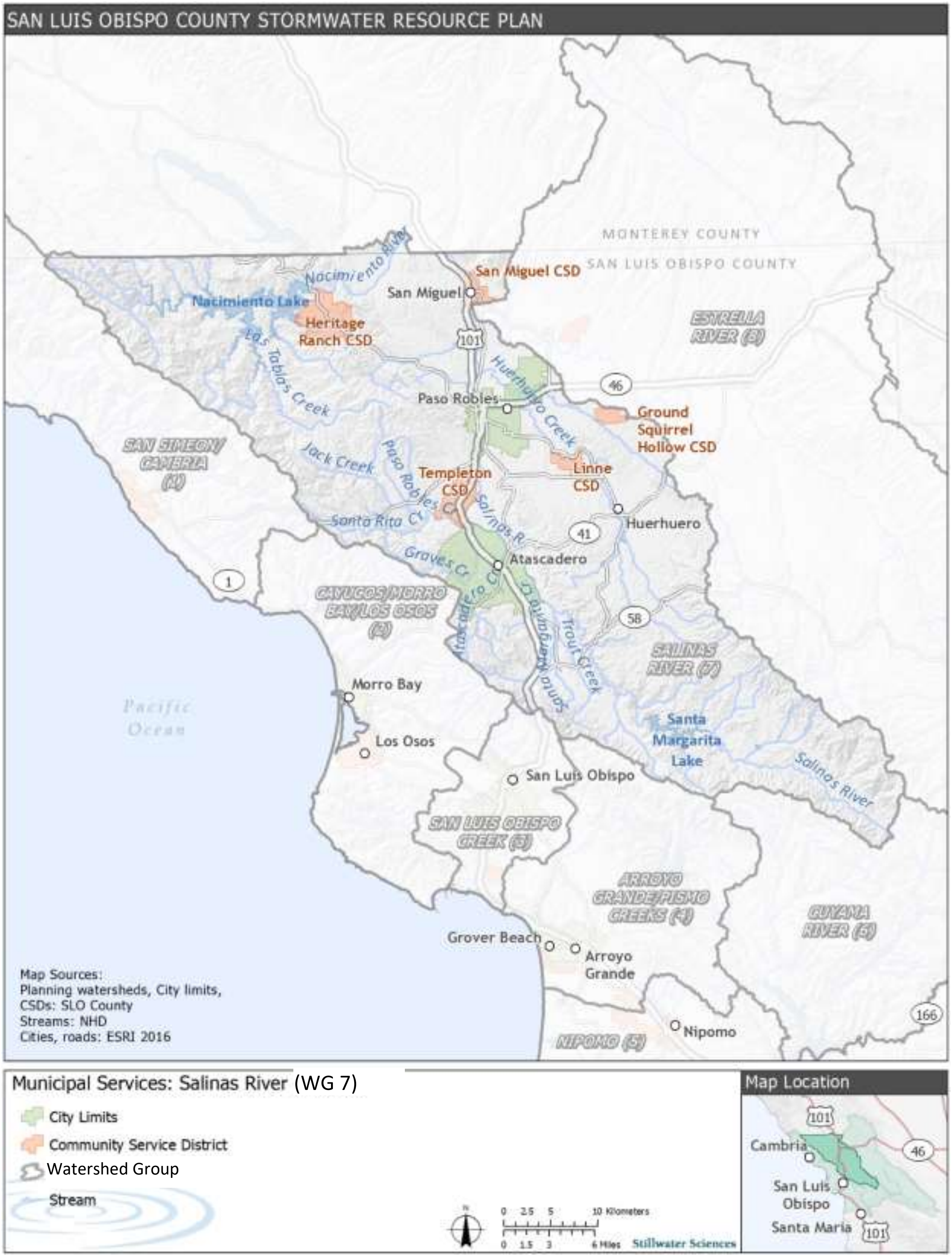


Land Cover: Cuyama River & Carrizo Plains (WG 6 & 9)


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Atascadero
ESTRELLA RIVER (8)
SALINAS RIVER (7)
CARRIZO PLAIN GWB
KERN COUNTY
Shafter
Rosedale
CARRIZO PLAIN (9)
CENTRAL VALLEY
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
Soda Lake
CUYAMA VALLEY GWB
TEMBLOR RANGE
ARROYO GRANDE/PISMO CREEKS (4)
HUASNA VALLEY GWB
Huasna Creek
Alamo Creek
CUYAMA RIVER (6)
CARIZO PLAIN
Taft
CALIENTE RANGE
Grover Beach
Arroyo Grande
Nipomo
Suey Creek
SIERRA MADRE MOUNTAINS
NIPOMO (5)
Twitchell Reservoir
Cuyama River
CUYAMA VALLEY GWB
Santa Maria
Santa Maria River
SANTA MARIA GWB
SANTA BARBARA COUNTY
Hydrology: Cuyama River & Carrizo Plains (WG 6 & 9)
Groundwater basin (GWB)
Watershed Group
Stream
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Groundwater basins: DWR
Stillwater Sciences
Map Location
Cambria
San Luis Obispo
Santa Maria

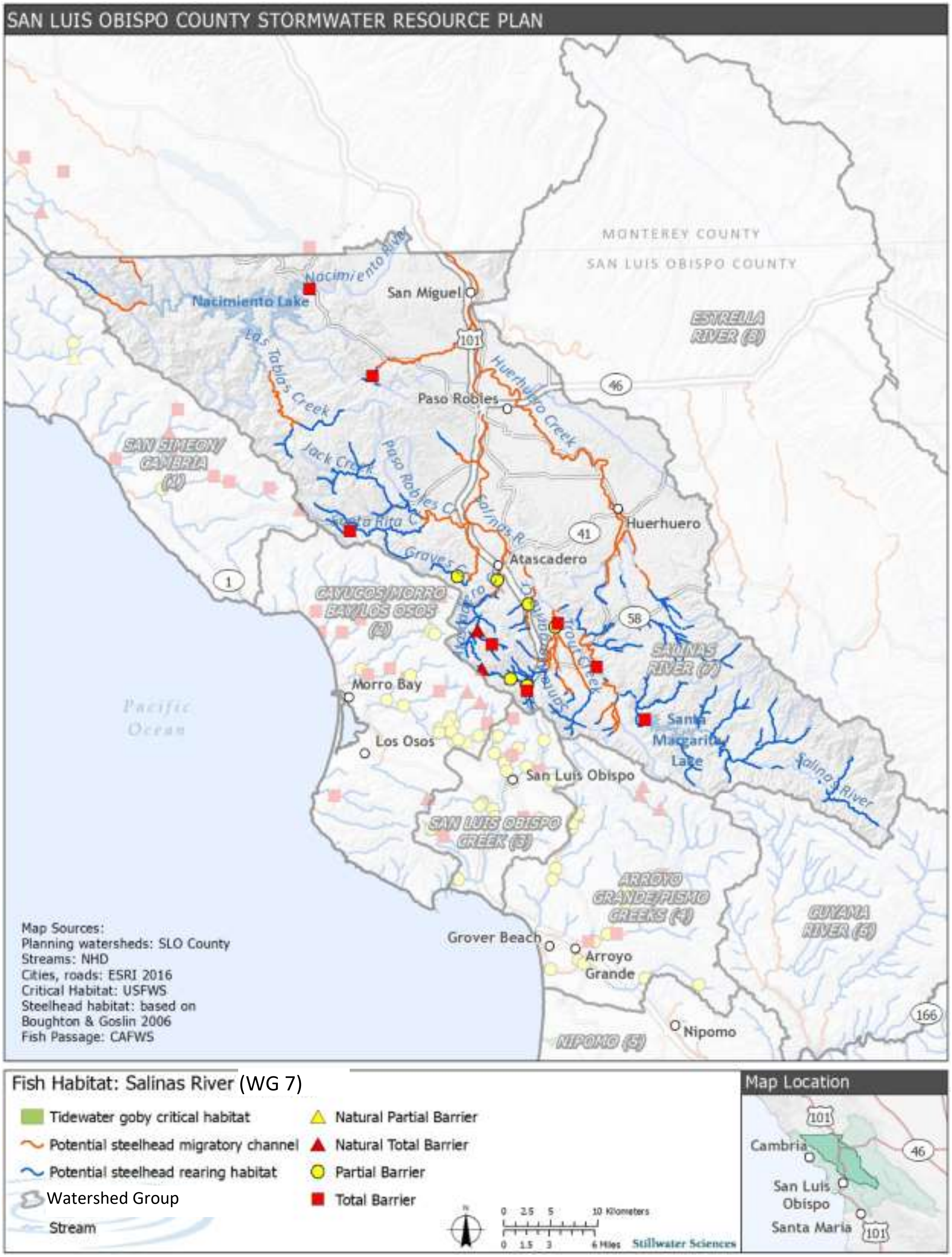

SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Atascadero
ESTRELLA RIVER (8)
SALINAS RIVER (7)
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
Grover Beach
Arroyo Grande
Nipomo
NIPOMO (2)
Santa Maria
Twitchell Reservoir
Santa Maria River
Cuyama River
CUYAMA RIVER (5)
CALIENTE RANGE
SIERRA MADRE MOUNTAINS
SANTA BARBARA COUNTY
KERN COUNTY
CARRIZO PLAIN (9)
Soda Lake
CARIZO PLAIN
TEMBLOR RANGE
CENTRAL VALLEY
Shafter
Rosedale
Taft
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Critical Habitat: USFWS
Steelhead habitat: based on Boughton & Goslin 2006
Fish Passage: CAFWS
Fish Habitat: Cuyama River & Carrizo Plains (WG 6 & 9)
Tidewater goby critical habitat
Potential steelhead migratory channel
Potential steelhead rearing habitat
Watershed Group
Stream
Natural Partial Barrier
Natural Total Barrier
Partial Barrier
Total Barrier
Stillwater Sciences
Map Location
Cambria
San Luis Obispo
Santa Maria

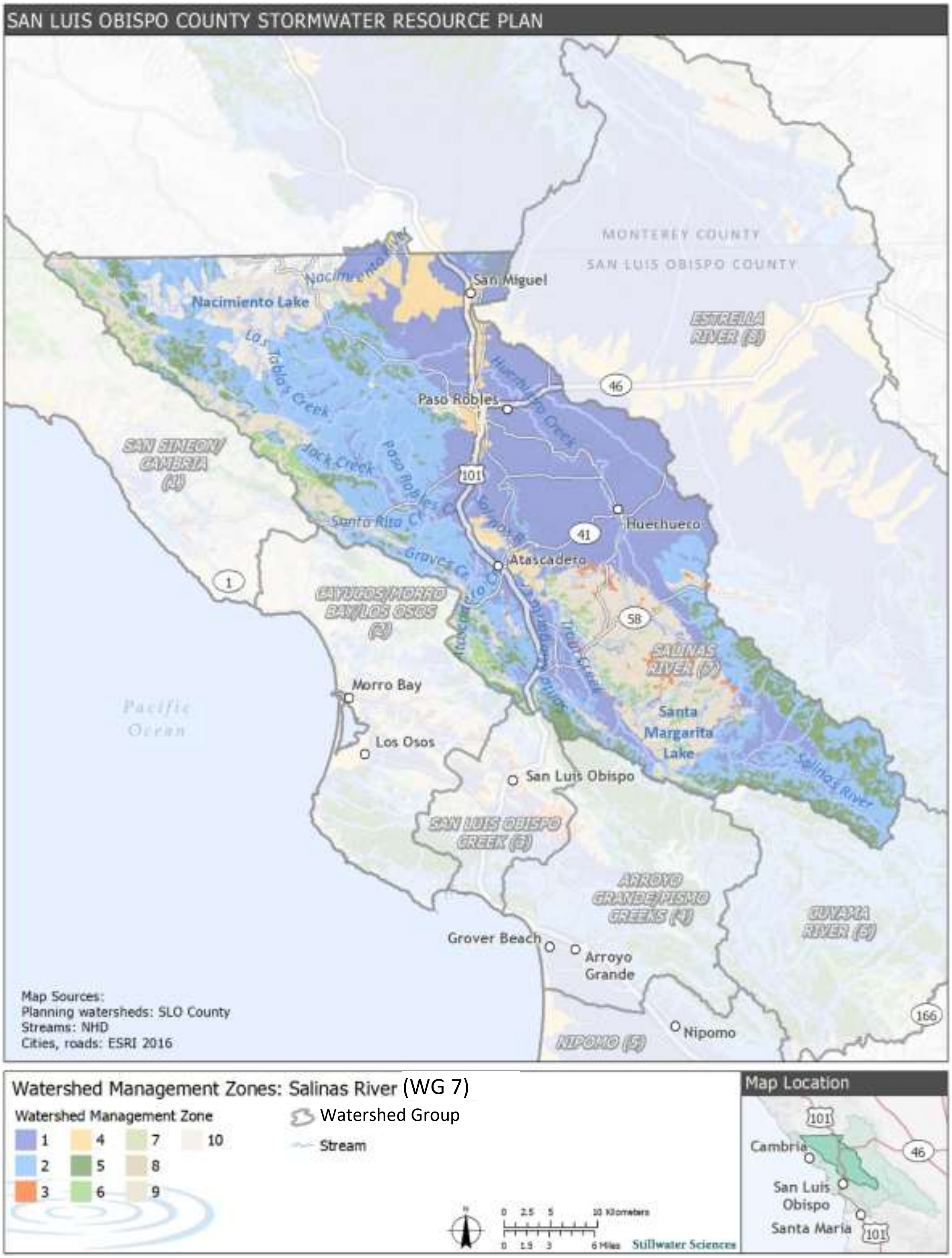

SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Atascadero
ESTRELLA RIVER (8)
SALINAS RIVER (7)
CARRIZO PLAIN (9)
KERN COUNTY
Shafter
Rosedale
CENTRAL VALLEY
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
Soda Lake
TEMBLOR RANGE
CARIZO PLAIN
ARROYO GRANDE/PISMO CREEKS (4)
CUYAMA RIVER (6)
CALIENTE RANGE
Taft
Grover Beach
Arroyo Grande
Nipomo
NIPOMO (5)
Twitchell Reservoir
SANTA BARBARA COUNTY
SIERRA MADRE MOUNTAINS
Santa Maria
Santa Maria River
Cuyama River
Watershed Management Zones: Cuyama River & Carrizo Plains (WG 6 & 9)
Watershed Management Zone
1
2
3
4
5
6
7
8
9
10
Watershed Group
Stream
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Stillwater Sciences
Map Location
Cambria
San Luis Obispo
Santa Maria

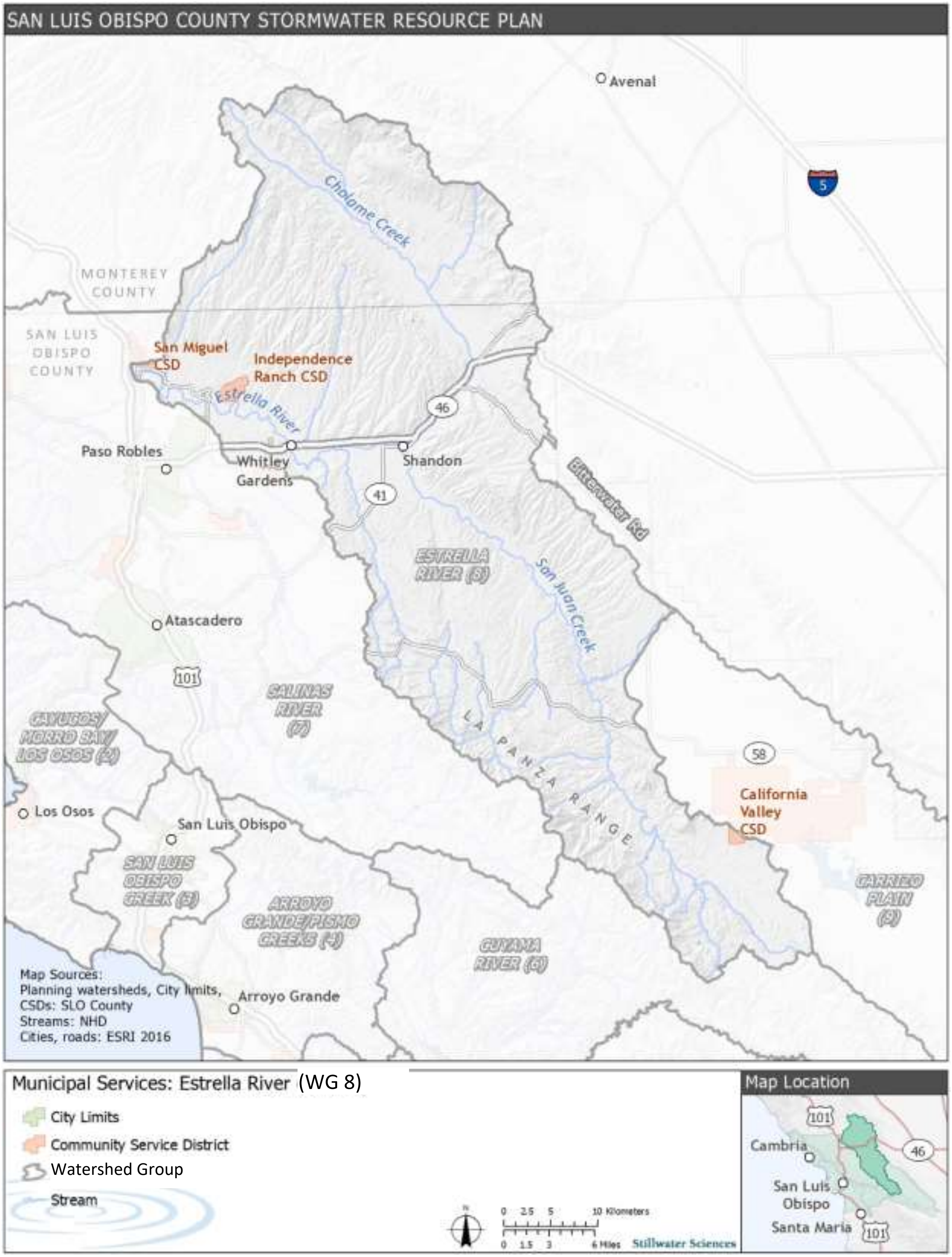

SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
San Miguel CSD
San Miguel
Nacimiento River
Nacimiento Lake
Heritage Ranch CSD
Las Tablas Creek
ESTRELLA RIVER (8)
Paso Robles
Huerhuero Creek
Ground Squirrel Hollow CSD
SAN SIMEON/ CAMBRIA (1)
Jack Creek
Paso Robles Cr
Templeton CSD
Linne CSD
Santa Rita Cr
Salinas R
Huerhuero
Graves Cr
Atascadero
CAYUCOS/MORRO BAY/LOS OSOS (2)
Atascadero Cr
Santa Margarita
Trout Creek
SALINAS RIVER (7)
Morro Bay
Pacific Ocean
Los Osos
Santa Margarita Lake
Salinas River
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
CUYAMA RIVER (6)
Grover Beach
Arroyo Grande
Nipomo
NIPOMO (5)
Map Sources:
Planning watersheds, City limits,
CSDs: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Municipal Services: Salinas River (WG 7)
City Limits
Community Service District
Watershed Group
Stream
Map Location
Cambria
San Luis Obispo
Santa Maria
10 Kilometers
6 Miles
Stillwater Sciences

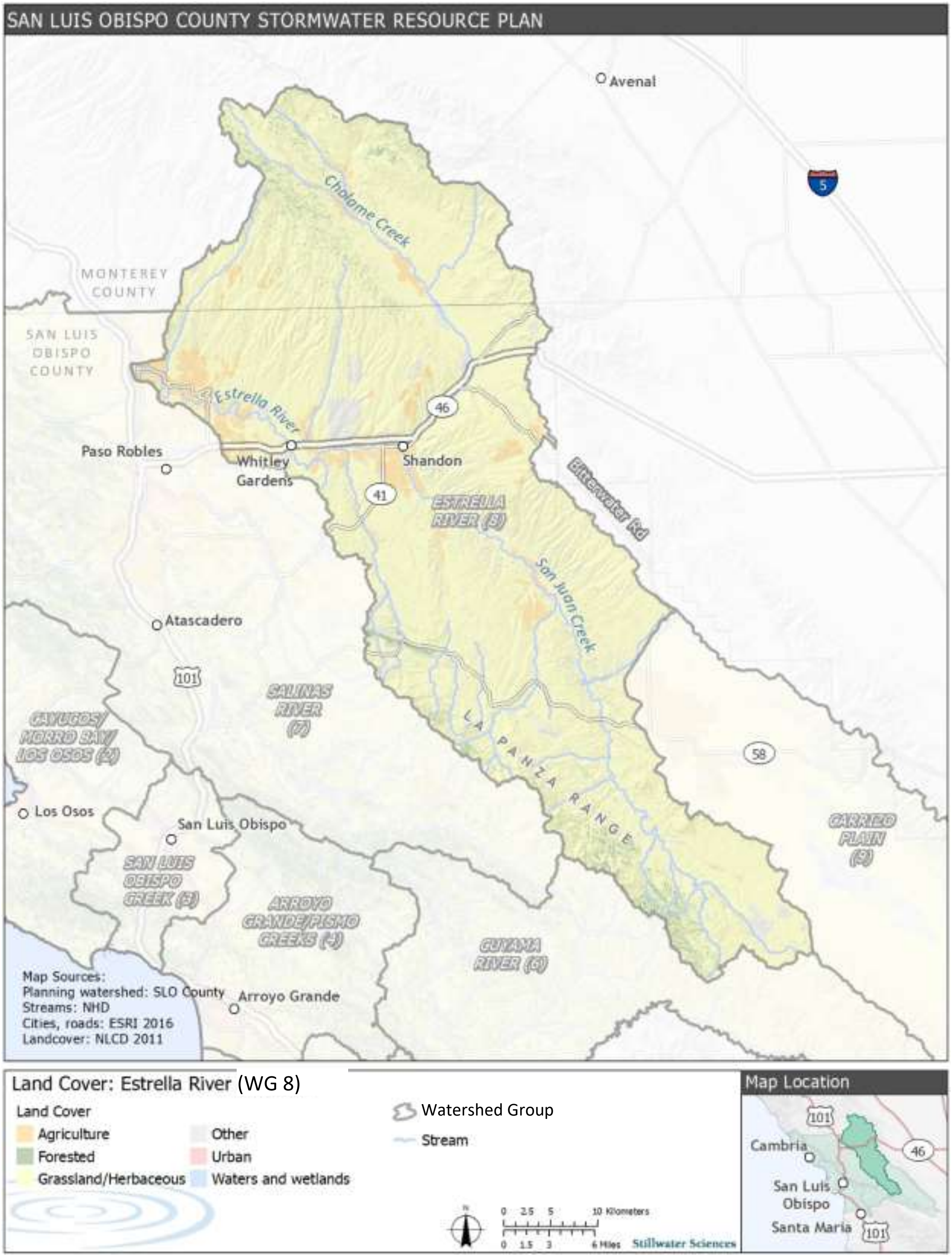

SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
ESTRELLA RIVER (8)
SAN SIMEON/ CAMBRIA (1)
CAYUCOS/MORRO BAY/LOS OSOS (2)
SALINAS RIVER (7)
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
CUYAMA RIVER (6)
NIPOMO (5)
Nacimiento River
Nacimiento Lake
Los Tablas Creek
Huerhuero Creek
Jack Creek
Paso Robles Cr
Santa Rita Cr
Salinas R
Graves Cr
Atascadero Cr
Trout Creek
Santa Margarita Lake
Salinas River
San Miguel
Paso Robles
Huerhuero
Atascadero
Morro Bay
Los Osos
San Luis Obispo
Grover Beach
Arroyo Grande
Nipomo
Pacific Ocean
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Landcover: NLCD 2011
Land Cover: Salinas River (WG 7)
Land Cover
Agriculture
Forested
Grassland/Herbaceous
Other
Urban
Waters and wetlands
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
Cambria
San Luis Obispo
Santa Maria

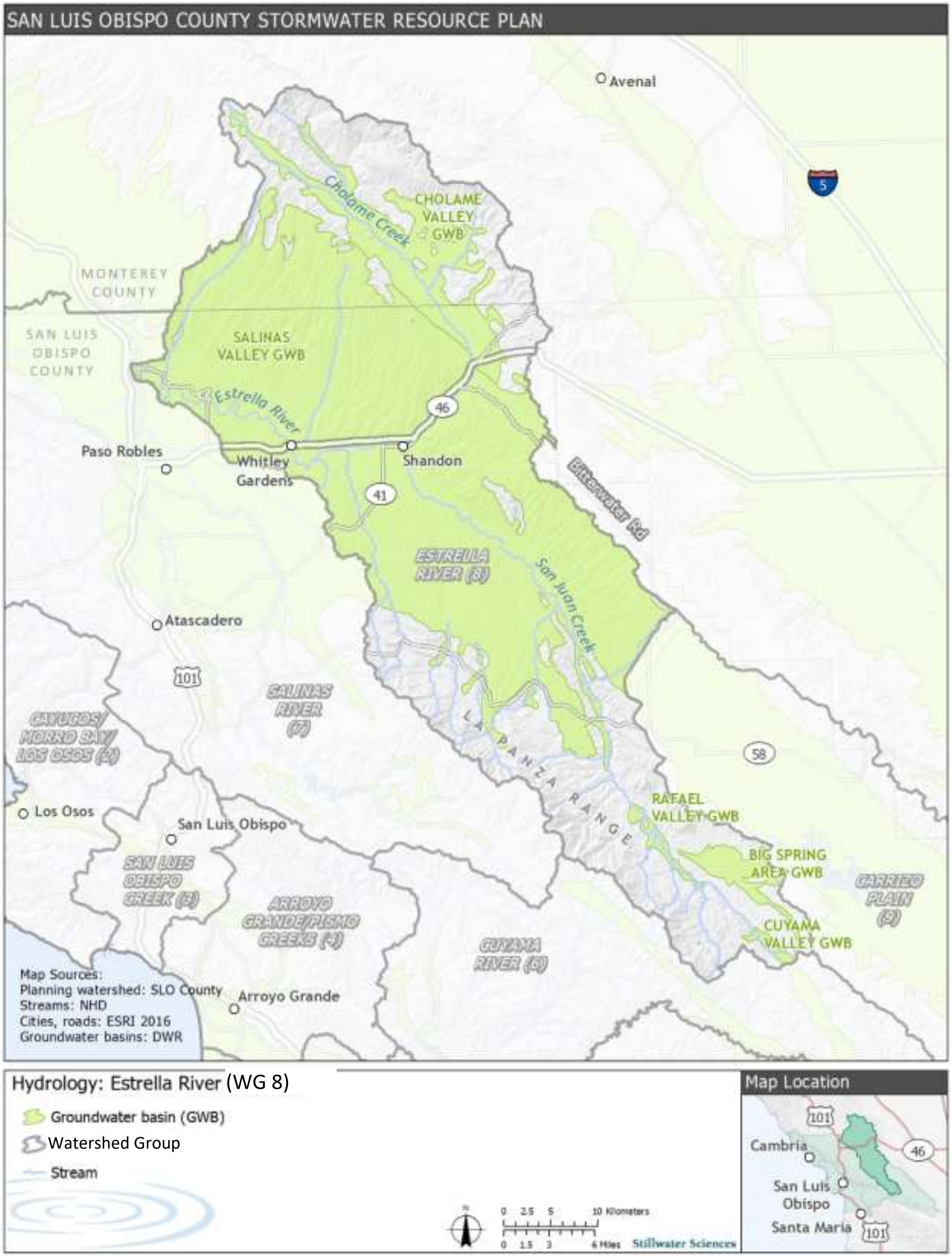
SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
ESTRELLA RIVER (8)
SALINAS VALLEY GWB
San Miguel
Nacimiento River
Nacimiento Lake
Las Tablas Creek
Huerhuero Creek
Paso Robles
46
SAN SIMEON/ CAMBRIA (1)
Jack Creek
Paso Robles Cr
101
Salinas R
Huerhuero
41
Santa Rita Cr
Graves Cr
Atascadero
1
CAYUCOS/MORRO BAY/LOS OSOS (2)
Atascadero Cr
Santa Margarita Cr
Trout Creek
58
SALINAS RIVER (7)
POZO VALLEY GWB
Morro Bay
Pacific Ocean
Los Osos
RINCONADA VALLEY GWB
Santa Margarita Lake
Salinas River
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
CUYAMA RIVER (6)
Grover Beach
Arroyo Grande
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Groundwater basins: DWR
166
Nipomo
NIPOMO (5)
Hydrology: Salinas River (WG 7)
Groundwater basin (GWB)
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101

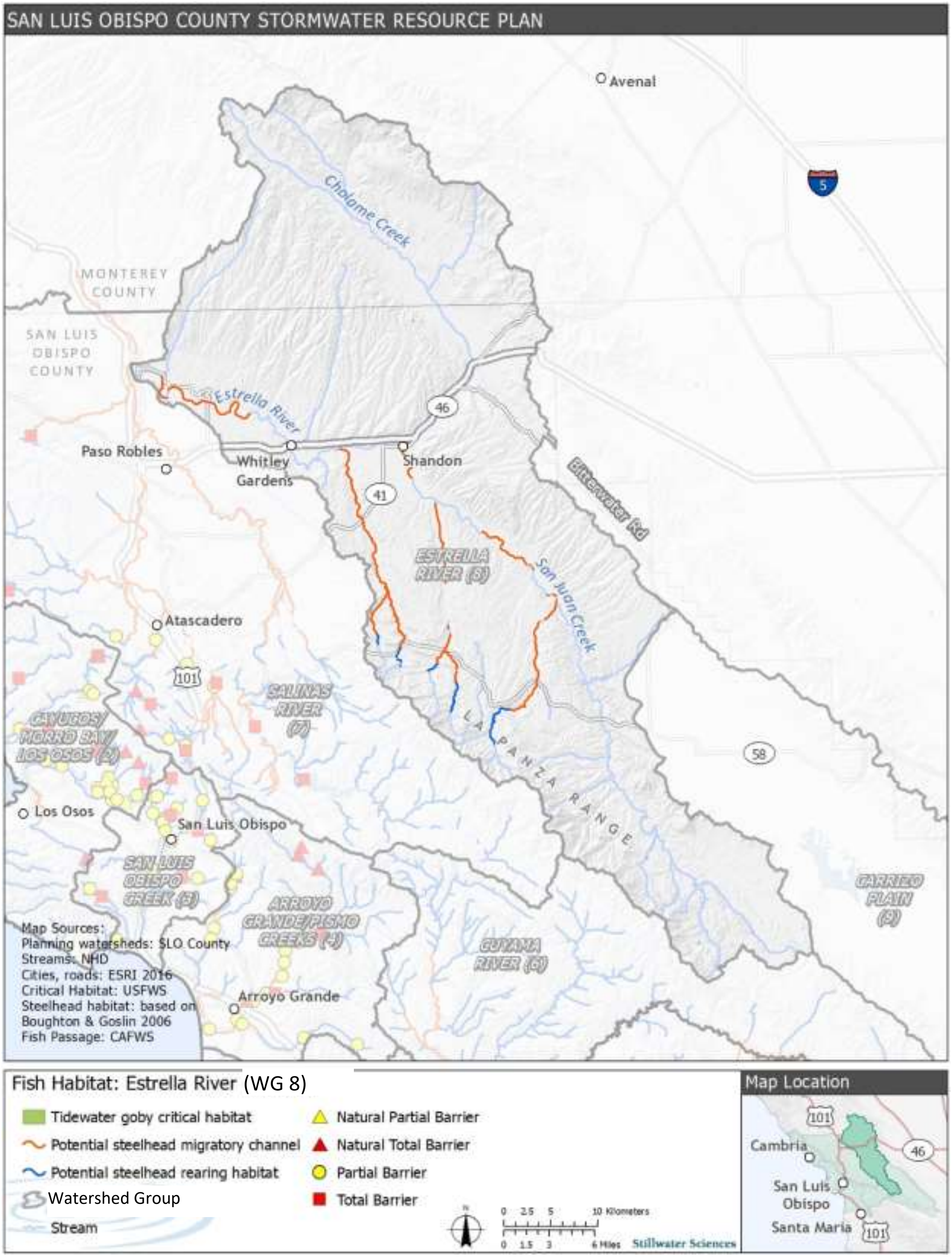

SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
ESTRELLA RIVER (8)
SAN SIMEON/ CAMBRIA (1)
CAYUCOS/MORRO BAY/LOS OSOS (2)
SALINAS RIVER (7)
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
CUYAMA RIVER (6)
NIPOMO (5)
Nacimiento River
Nacimiento Lake
San Miguel
Paso Robles
Huerhuero Creek
Las Tablas Creek
Jack Creek
Paso Robles C
Salinas R
Santa Rita C
Graves C
Atascadero
Huerhuero
Morro Bay
Los Osos
San Luis Obispo
Santa Margarita Lake
Salinas River
Pacific Ocean
Grover Beach
Arroyo Grande
Nipomo
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Critical Habitat: USFWS
Steelhead habitat: based on Boughton & Goslin 2006
Fish Passage: CAFWS
Fish Habitat: Salinas River (WG 7)
Tidewater goby critical habitat
Potential steelhead migratory channel
Potential steelhead rearing habitat
Watershed Group
Stream
Natural Partial Barrier
Natural Total Barrier
Partial Barrier
Total Barrier
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
Cambria
San Luis Obispo
Santa Maria

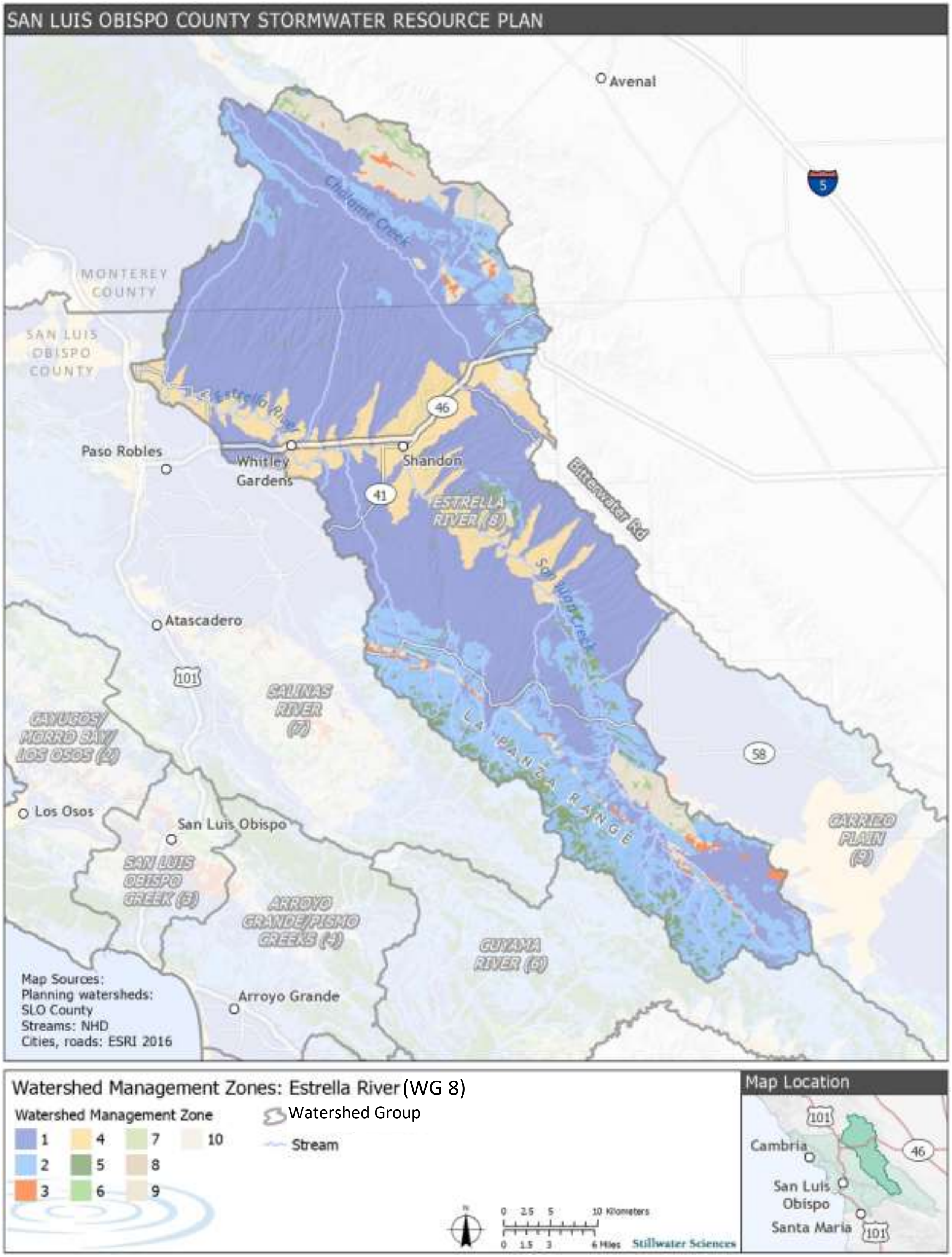

SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
ESTRELLA RIVER (8)
San Miguel
Nacimiento Lake
Paso Robles
SAN SIMEON/ CAMBRIA (1)
Huerhuero
Atascadero
CAYUCOS/MORRO BAY/LOS OSOS (2)
SALINAS RIVER (7)
Santa Margarita Lake
Salinas River
Morro Bay
Pacific Ocean
Los Osos
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
CUYAMA RIVER (6)
Grover Beach
Arroyo Grande
Nipomo
NIPOMO (5)
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Watershed Management Zones: Salinas River (WG 7)
Watershed Management Zone
1 4 7 10
2 5 8
3 6 9
Watershed Group
Stream
Map Location
Cambria
San Luis Obispo
Santa Maria
Stillwater Sciences


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Avenal
5
Cholame Creek
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
San Miguel CSD
Independence Ranch CSD
Estrella River
46
Paso Robles
Whitley Gardens
Shandon
41
Bitterwater Rd
ESTRELLA RIVER (8)
San Juan Creek
Atascadero
101
SALINAS RIVER (7)
CAYUCOS/ MORRO BAY/ LOS OSOS (2)
LA PANZA RANGE
58
California Valley CSD
Los Osos
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
CARRIZO PLAIN (9)
CUYAMA RIVER (6)
Map Sources:
Planning watersheds, City limits, CSDs: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Arroyo Grande
Municipal Services: Estrella River (WG 8)
City Limits
Community Service District
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Avenal
5
Cholame Creek
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
Estrella River
46
Paso Robles
Whitley Gardens
Shandon
41
ESTRELLA RIVER (8)
Bitterwater Rd
San Juan Creek
Atascadero
101
SALINAS RIVER (7)
CAYUCOS/ MORRO BAY/ LOS OSOS (2)
LA PANZA RANGE
58
Los Osos
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
CUYAMA RIVER (6)
CARRIZO PLAIN (9)
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Landcover: NLCD 2011
Arroyo Grande
Land Cover: Estrella River (WG 8)
Land Cover
Agriculture
Forested
Grassland/Herbaceous
Other
Urban
Waters and wetlands
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Avenal
5
CHOLAME VALLEY GWB
Cholame Creek
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
SALINAS VALLEY GWB
Estrella River
46
Paso Robles
Whitley Gardens
Shandon
41
Bitterwater Rd
ESTRELLA RIVER (8)
San Juan Creek
Atascadero
101
SALINAS RIVER (7)
CAYUCOS/ MORRO BAY/ LOS OSOS (2)
LA PANZA RANGE
58
RAFAEL VALLEY GWB
Los Osos
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
BIG SPRING AREA GWB
CARRIZO PLAIN (9)
ARROYO GRANDE/PISMO CREEKS (4)
CUYAMA VALLEY GWB
CUYAMA RIVER (6)
Map Sources:
Planning watershed: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Groundwater basins: DWR
Arroyo Grande
Hydrology: Estrella River (WG 8)
Groundwater basin (GWB)
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101


SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Avenal
Cholame Creek
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
Estrella River
46
Paso Robles
Whitley Gardens
Shandon
41
Bitterwater Rd
ESTRELLA RIVER (8)
San Juan Creek
Atascadero
101
SALINAS RIVER (7)
CAYUCOS/ MORRO BAY/ LOS OSOS (2)
LA PANZA RANGE
58
Los Osos
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
CUYAMA RIVER (6)
CARRIZO PLAIN (9)
Arroyo Grande
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Critical Habitat: USFWS
Steelhead habitat: based on Boughton & Goslin 2006
Fish Passage: CAFWS
Fish Habitat: Estrella River (WG 8)
Tidewater goby critical habitat
Potential steelhead migratory channel
Potential steelhead rearing habitat
Watershed Group
Stream
Natural Partial Barrier
Natural Total Barrier
Partial Barrier
Total Barrier
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
Cambria
San Luis Obispo
Santa Maria

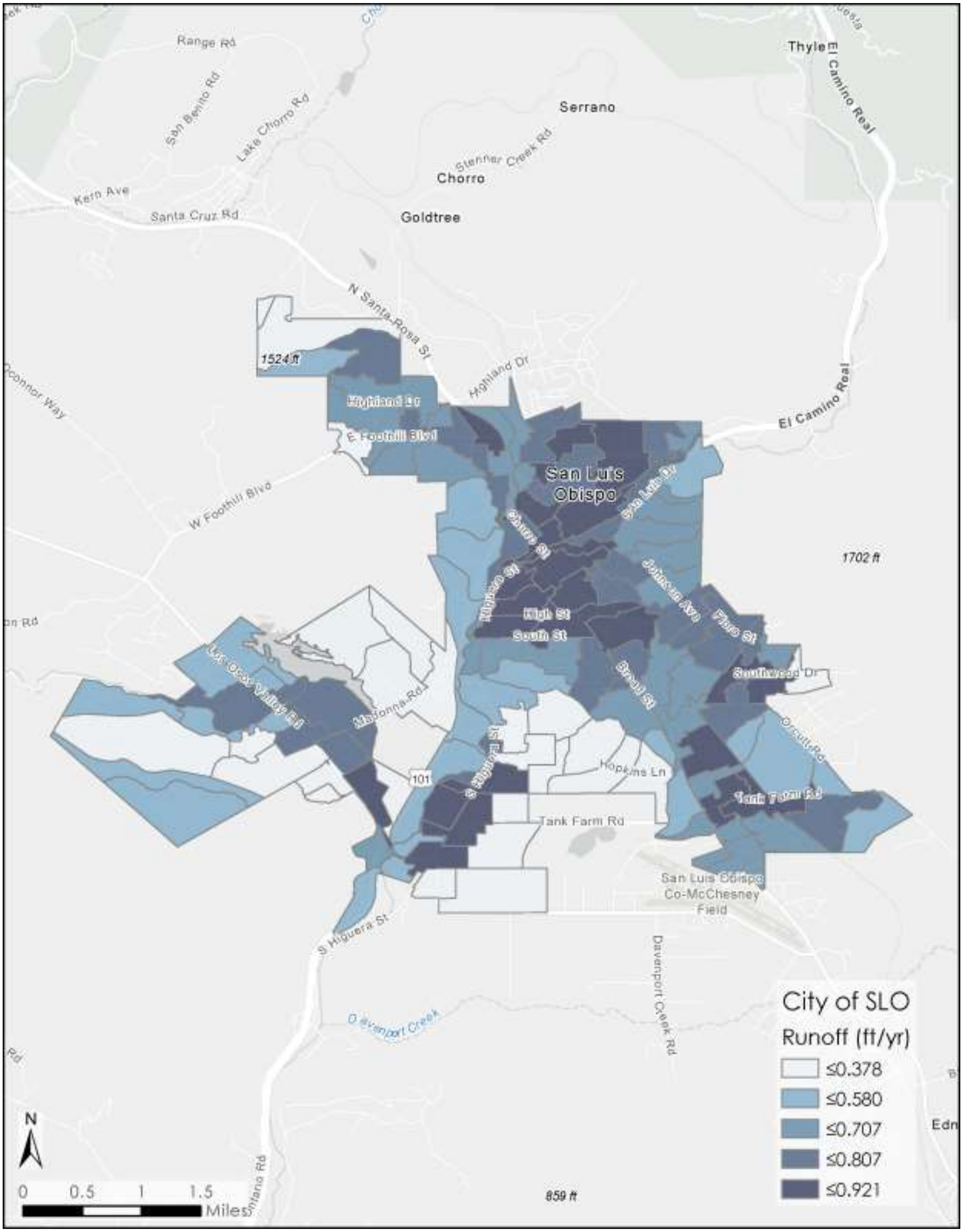

SAN LUIS OBISPO COUNTY STORMWATER RESOURCE PLAN
Avenal
5
MONTEREY COUNTY
SAN LUIS OBISPO COUNTY
Cholame Creek
Estrella River
46
Paso Robles
Whitley Gardens
Shandon
41
ESTRELLA RIVER (8)
Bitterwater Rd
San Juan Creek
Atascadero
101
SALINAS RIVER (7)
CAYUCOS/ MORRO BAY/ LOS OSOS (2)
LA PANZA RANGE
58
Los Osos
San Luis Obispo
SAN LUIS OBISPO CREEK (3)
ARROYO GRANDE/PISMO CREEKS (4)
CUYAMA RIVER (6)
CARRIZO PLAIN (9)
Map Sources:
Planning watersheds: SLO County
Streams: NHD
Cities, roads: ESRI 2016
Arroyo Grande
Watershed Management Zones: Estrella River (WG 8)
Watershed Management Zone
1
2
3
4
5
6
7
8
9
10
Watershed Group
Stream
0 2.5 5 10 Kilometers
0 1.5 3 6 Miles
Stillwater Sciences
Map Location
101
Cambria
46
San Luis Obispo
Santa Maria
101

APPENDIX 1-C

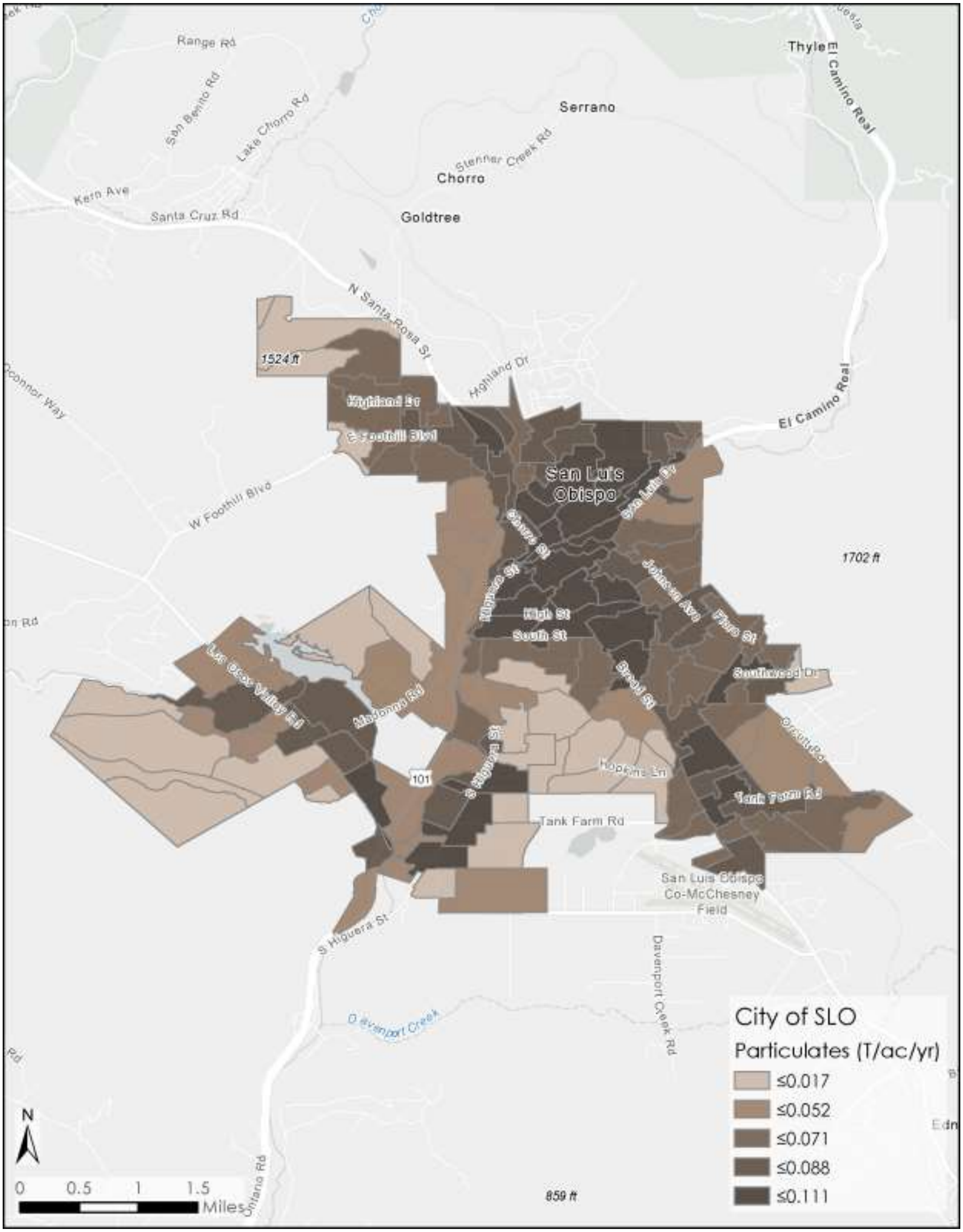
Map folio of modeled baseline runoff and particulate pollutant loading

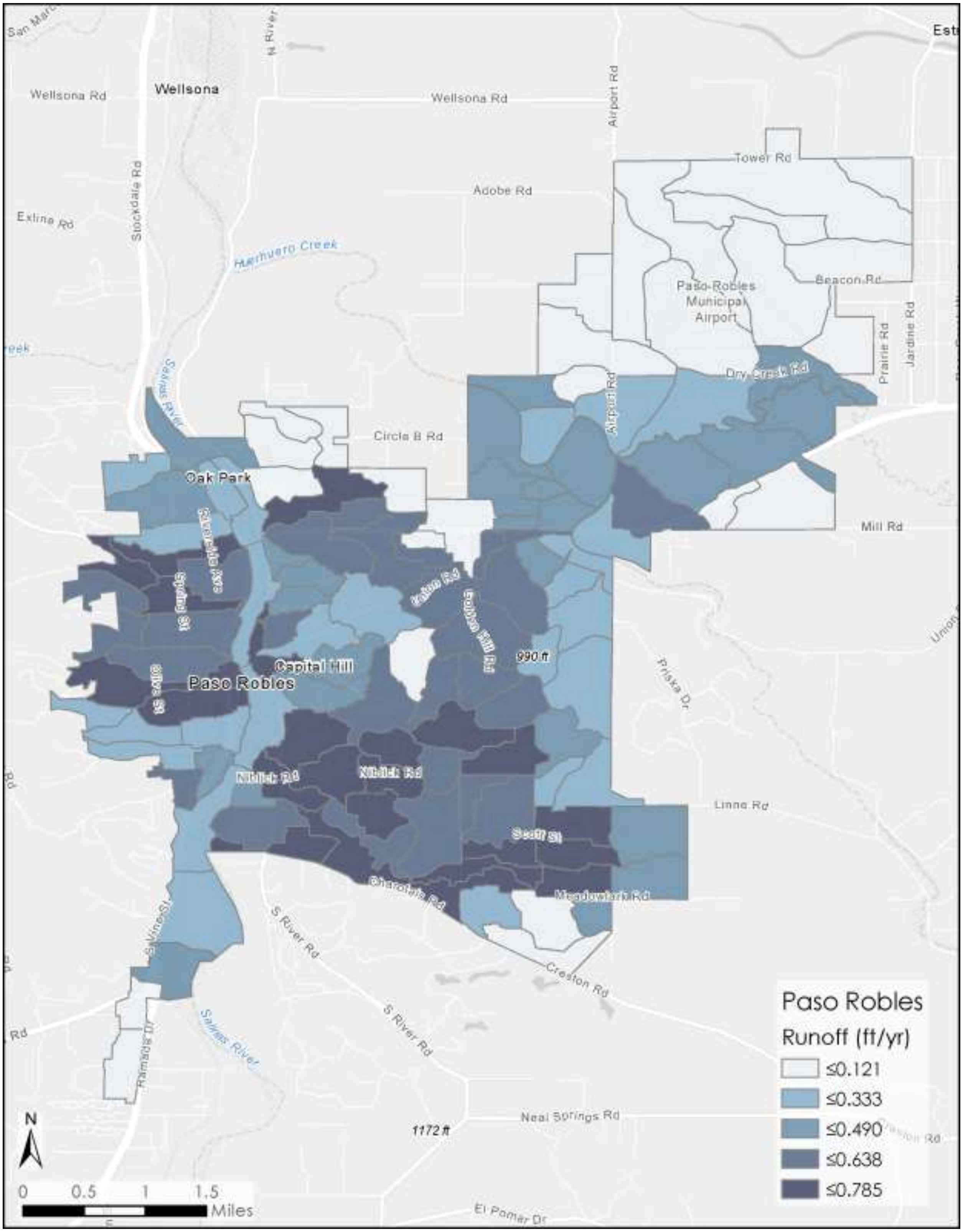
Data from TELR (Tool to Estimate Load Reductions). Map sets are included for the following jurisdictions:

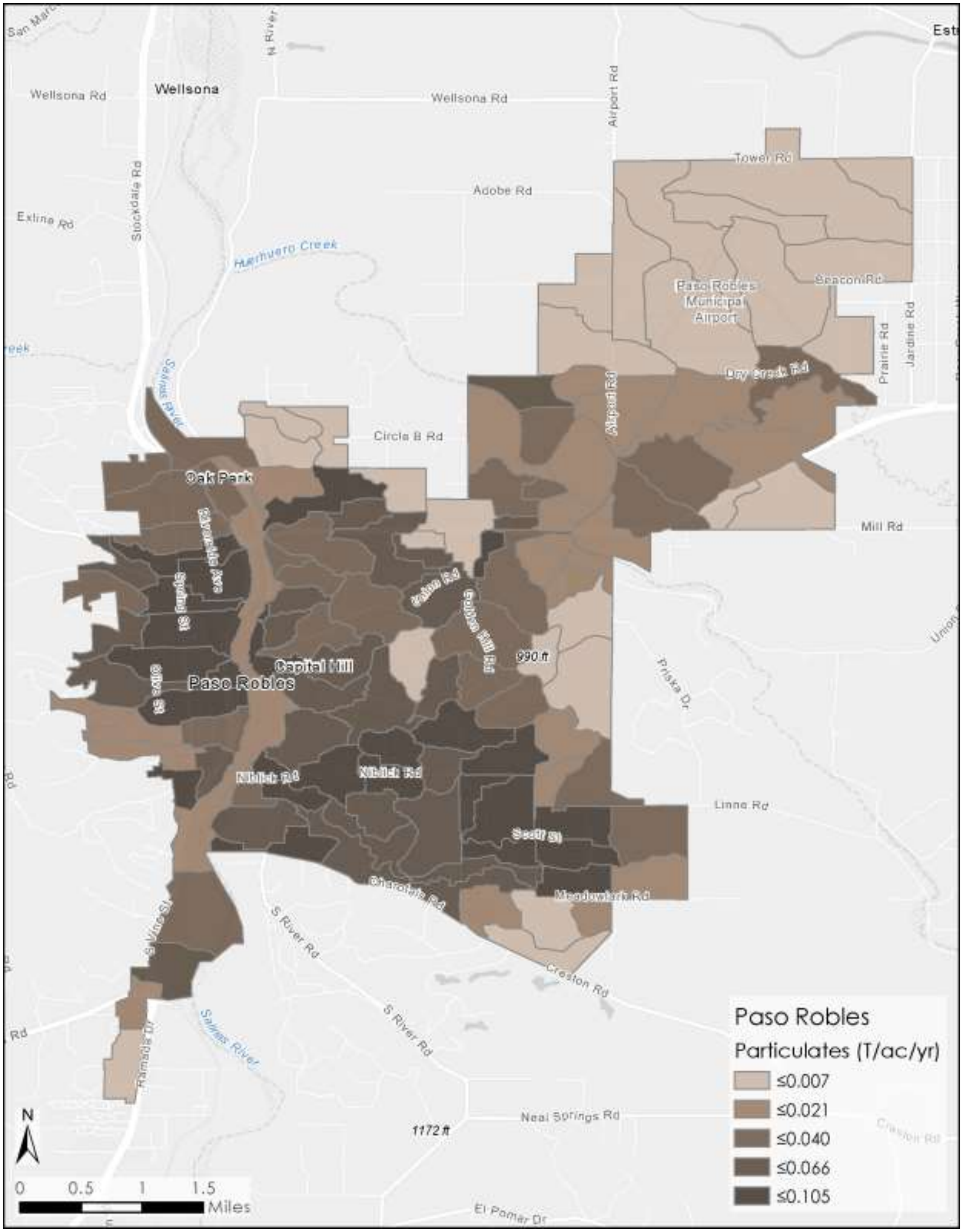
1. City of San Luis Obispo
2. Paso Robles
3. Atascadero
4. Morro Bay
5. Arroyo Grande
6. Pismo Beach
7. Other urbanized areas within San Luis Obispo County

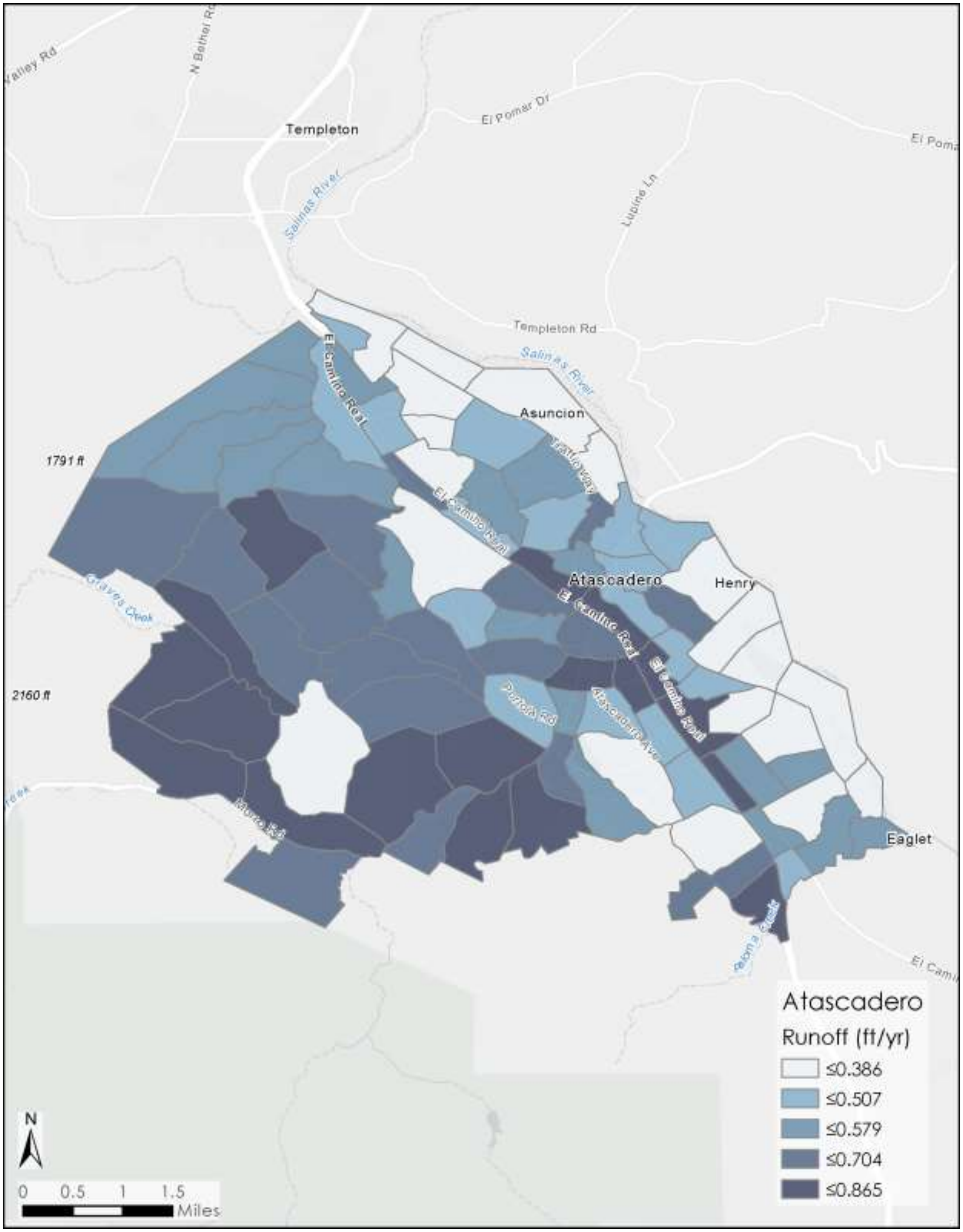


Range Rd
San Benito Rd
Lake Chorro Rd
Serrano
Thyle
El Camino Real
Stenner Creek Rd
Chorro
Kern Ave
Santa Cruz Rd
Goldtree
N Santa Rosa St
1524 ft
Highland Dr
Oconnor Way
Highland Dr
E Foothill Blvd
El Camino Real
San Luis Obispo
San Luis Dr
W Foothill Blvd
Chorro St
1702 ft
Higuera St
Johnson Ave
High St
South St
Flora St
Los Osos Valley Rd
Madonna Rd
Broad St
Southwood Dr
Orcutt Rd
101
S Higuera St
Hopkins Ln
Tank Farm Rd
Tank Farm Rd
San Luis Obispo Co-McChesney Field
S Higuera St
Davenport Creek Rd
Davenport Creek
City of SLO
Runoff (ft/yr)
≤0.378
≤0.580
≤0.707
≤0.807
≤0.921
N
0 0.5 1 1.5
Miles
859 ft

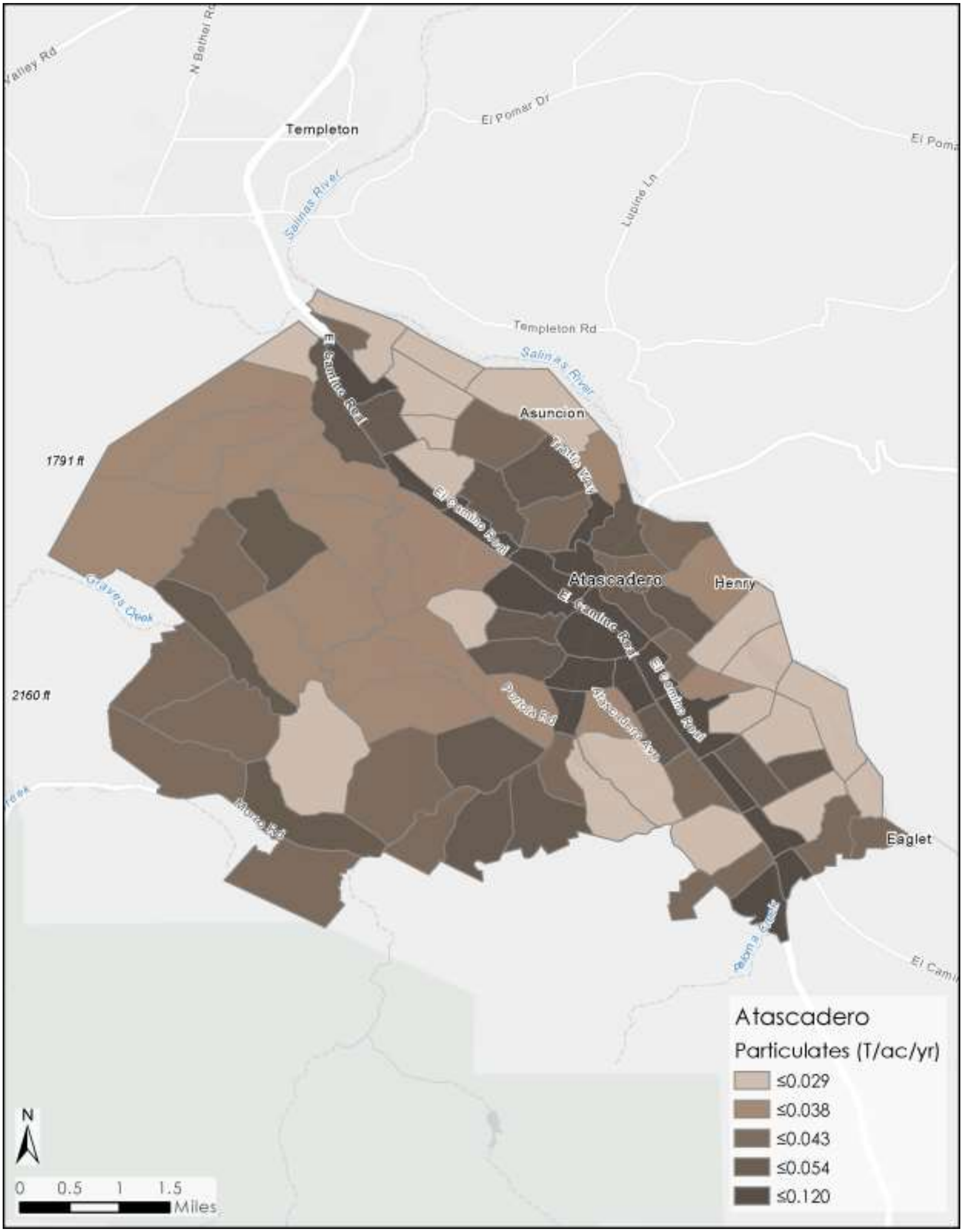

City of SLO
Particulates (T/ac/yr)
≤0.017
≤0.052
≤0.071
≤0.088
≤0.111
San Luis Obispo
Range Rd
Serrano
Chorro
Goldtree
Thyle
El Camino Real
Kern Ave
Santa Cruz Rd
N Santa Rosa St
Highland Dr
W Foothill Blvd
Los Osos Valley Rd
Madonna Rd
Higuera St
High St
South St
Broad St
Johnson Ave
Tank Farm Rd
Hopkins Ln
S Higuera St
San Luis Obispo Co-McChesney Field
Davenport Creek Rd
Davenport Creek
1524 ft
1702 ft
859 ft
N
0 0.5 1 1.5 Miles

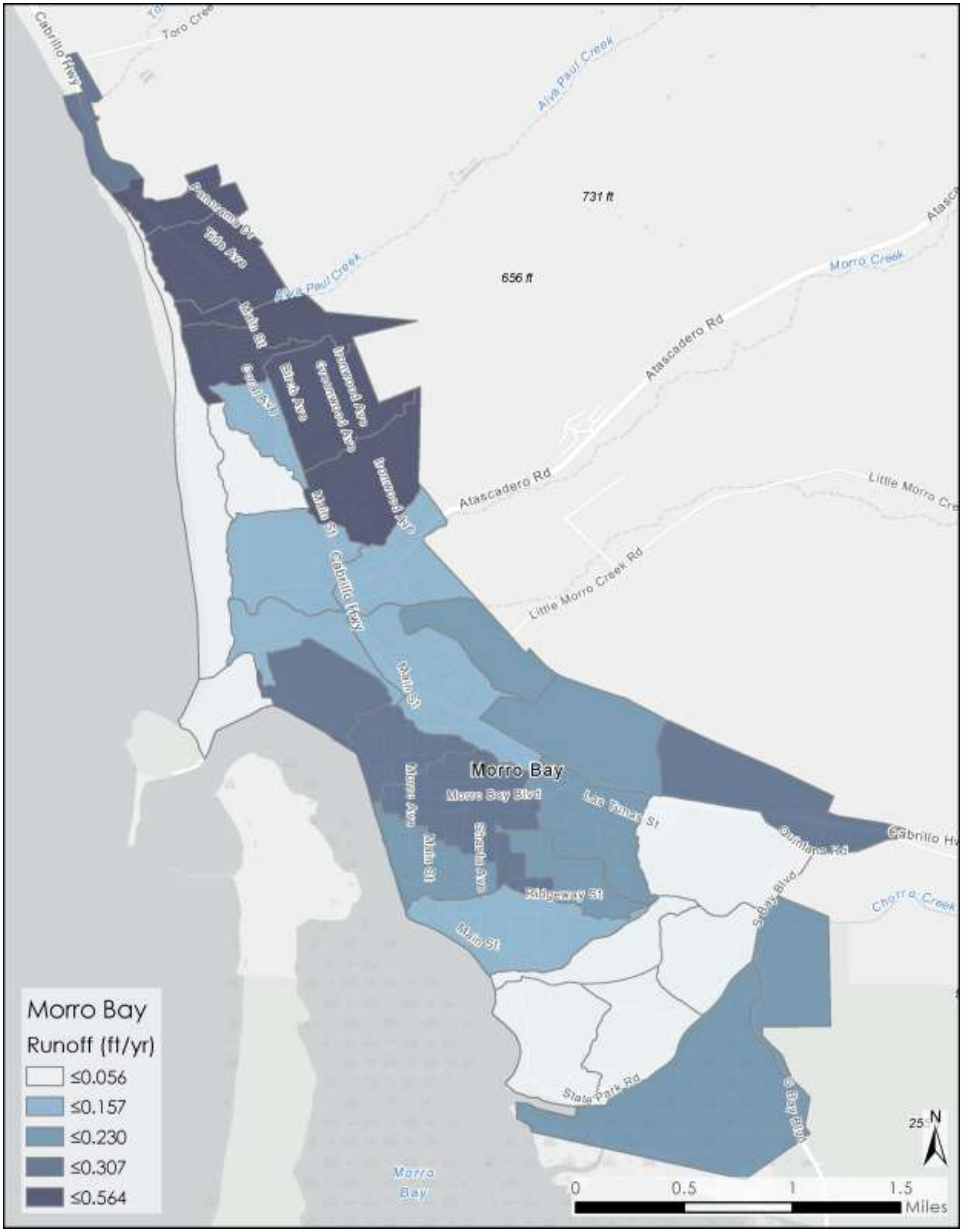

Paso Robles
Runoff (ft/yr)
≤0.121
≤0.333
≤0.490
≤0.638
≤0.785
Wellsona
Wellsona Rd
Adobe Rd
Tower Rd
Beacon Rd
Paso Robles Municipal Airport
Dry Creek Rd
Circle B Rd
Mill Rd
Oak Park
Capital Hill
Paso Robles
Niblick Rd
Linne Rd
Creston Rd
S River Rd
Neal Springs Rd
El Pomar Dr
Salinas River
Huerhuero Creek
0 0.5 1 1.5 Miles
N

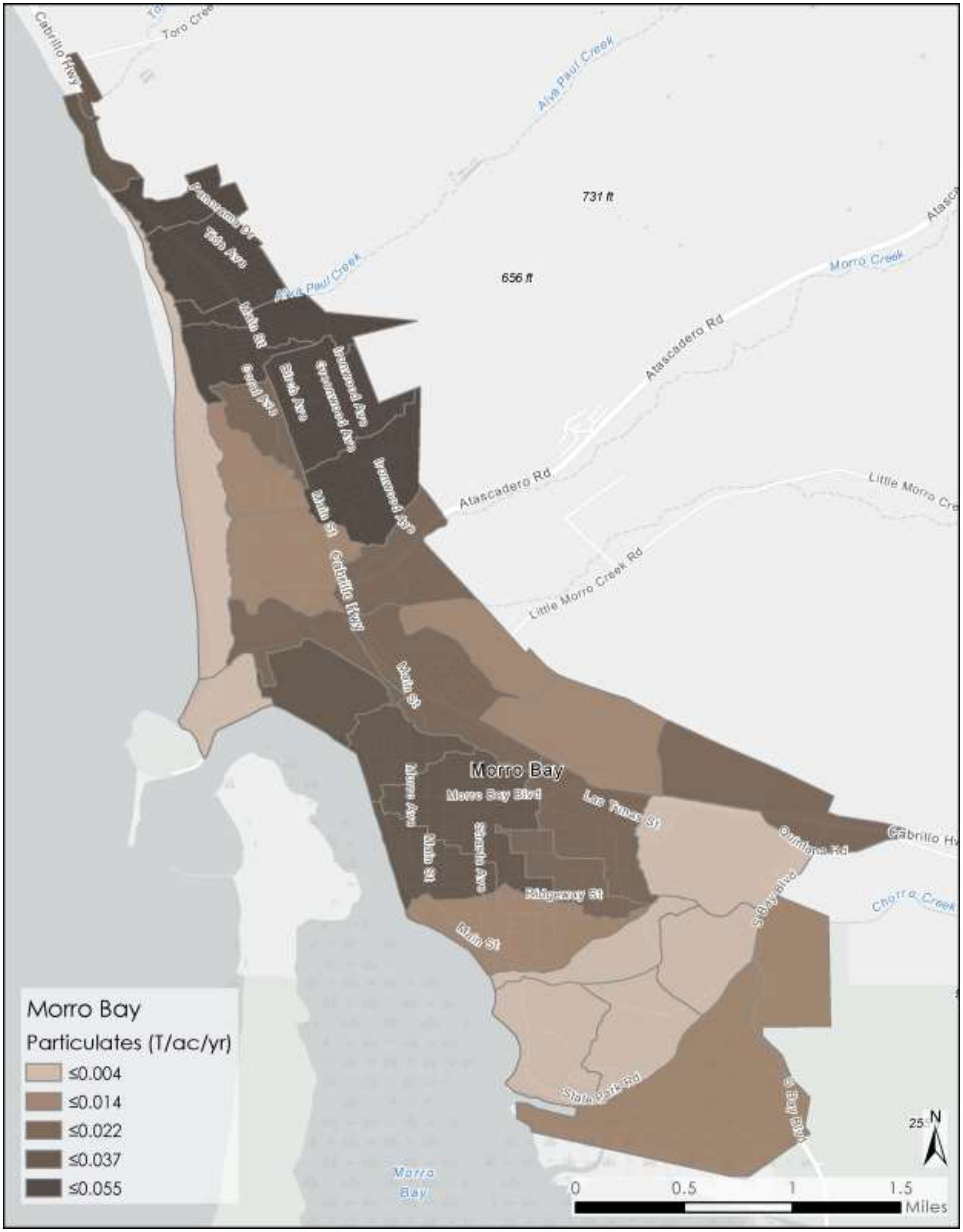

Paso Robles
Particulates (T/ac/yr)
≤0.007
≤0.021
≤0.040
≤0.066
≤0.105
N
0 0.5 1 1.5
Miles
Wellsona
Wellsona Rd
Adobe Rd
Tower Rd
Beacon Rd
Paso Robles Municipal Airport
Airport Rd
Dry Creek Rd
Circle B Rd
Mill Rd
Oak Park
Capitol Hill
Paso Robles
Niblick Rd
Linne Rd
Scott St
Meadowlark Rd
Creston Rd
S River Rd
Neal Springs Rd
El Pomar Dr
Huerhuero Creek
Salinas River
Stockdale Rd
Extina Rd
Prairie Rd
Jardine Rd
Golden Hill Rd
990 ft
1172 ft
Ramada Dr
S Vine St
Charolais Rd



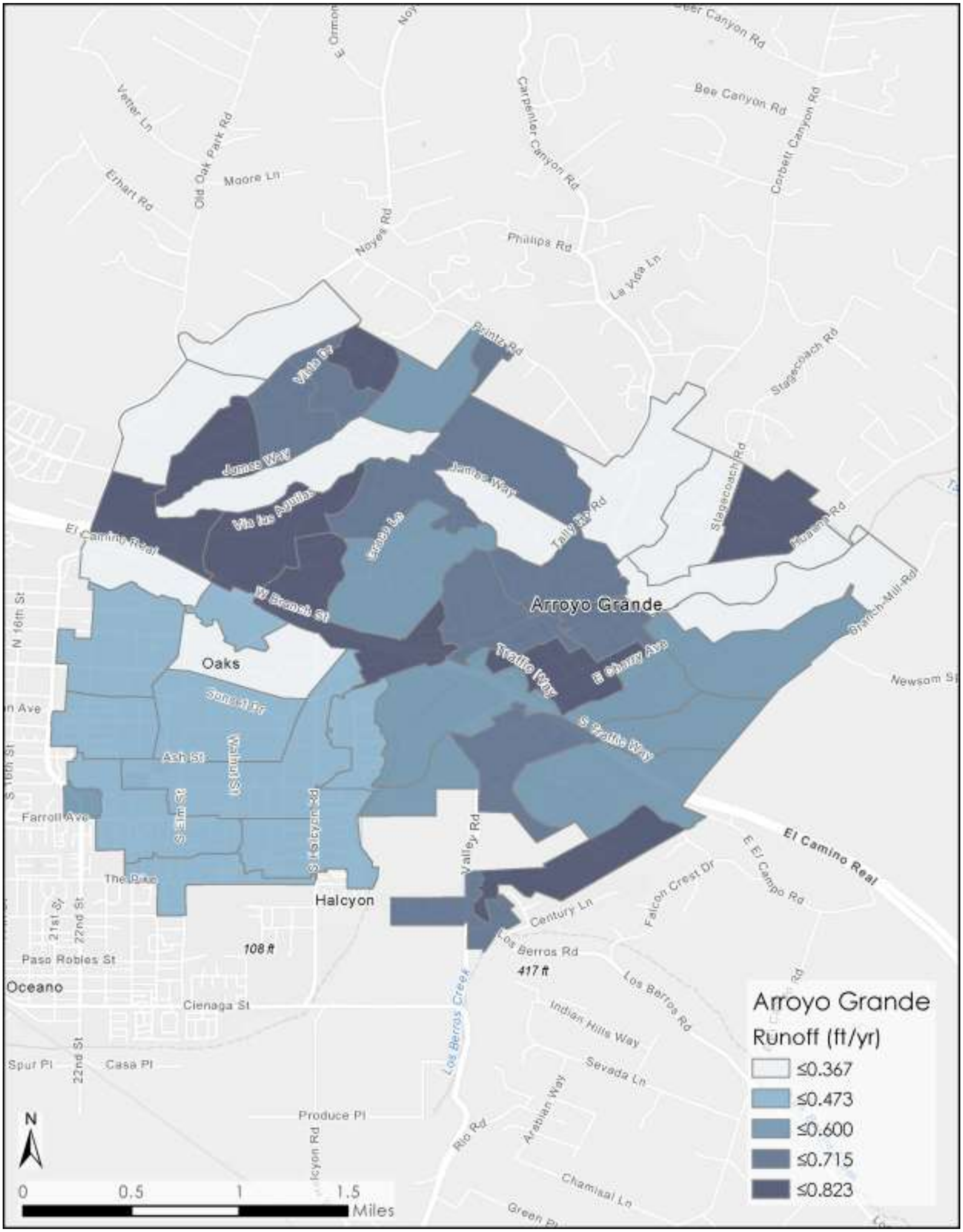
Templeton
El Pomar Dr
Salinas River
Lupine Ln
Templeton Rd
Asuncion
El Camino Real
1791 ft
Graves Creek
Atascadero
Henry
2160 ft
Portola Rd
Atascadero Ave
Morro Rd
Eaglet
Atascadero
Runoff (ft/yr)
≤0.386
≤0.507
≤0.579
≤0.704
≤0.865
N
0 0.5 1 1.5
Miles

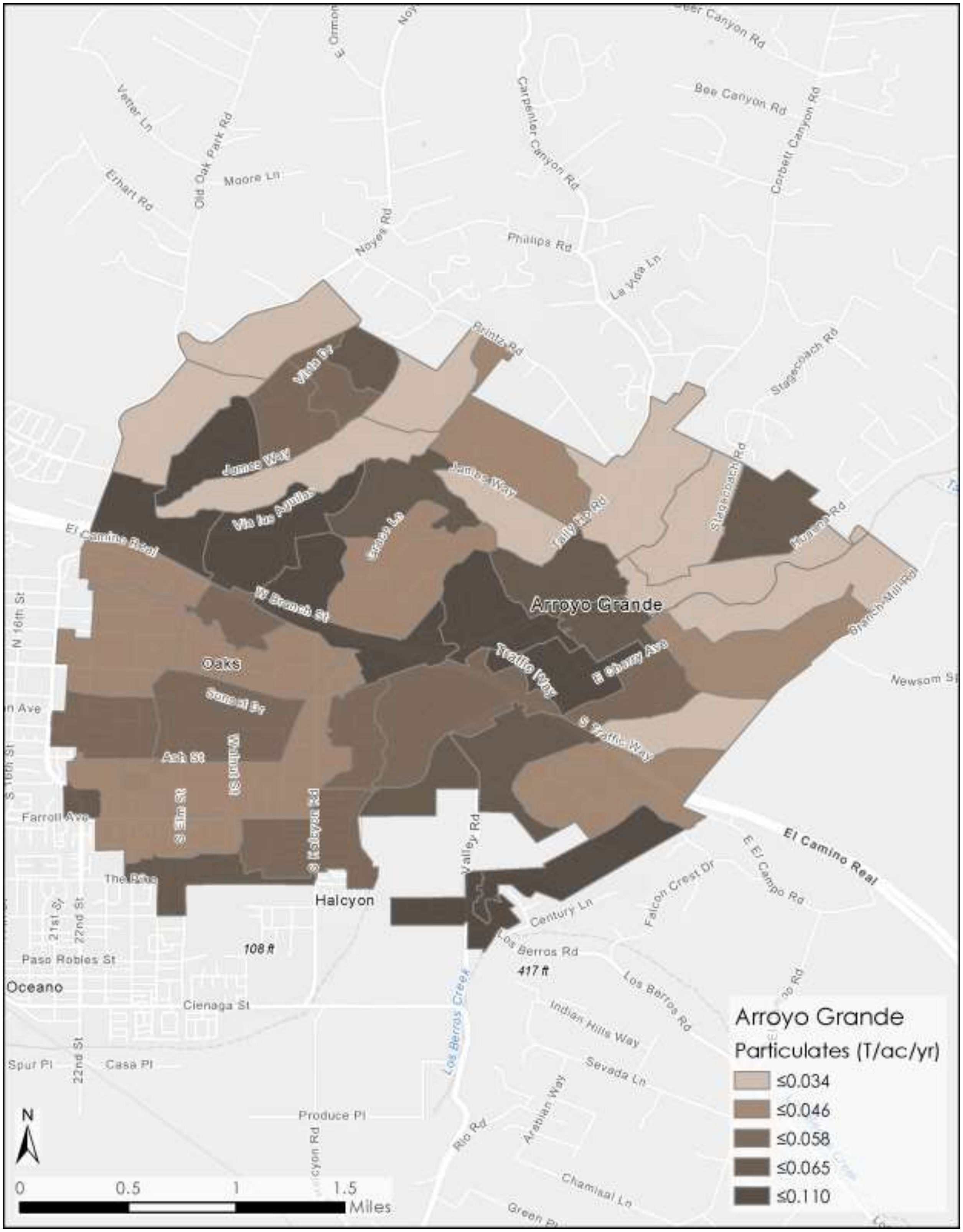

Templeton
El Pomar Dr
Salinas River
Lupine Ln
Templeton Rd
Asuncion
1791 ft
2160 ft
Graves Creek
El Camino Real
Traffic Way
Atascadero
Henry
Portola Rd
Atascadero Ave
Morro Rd
Eaglet
Atascadero
Particulates (T/ac/yr)
≤0.029
≤0.038
≤0.043
≤0.054
≤0.120
N
0 0.5 1 1.5
Miles


Morro Bay
Runoff (ft/yr)
≤0.056
≤0.157
≤0.230
≤0.307
≤0.564
Morro Bay
Morro Bay Blvd
Atascadero Rd
Little Morro Creek Rd
Alva Paul Creek
Morro Creek
State Park Rd
731 ft
656 ft
0
0.5
1
1.5
Miles
N



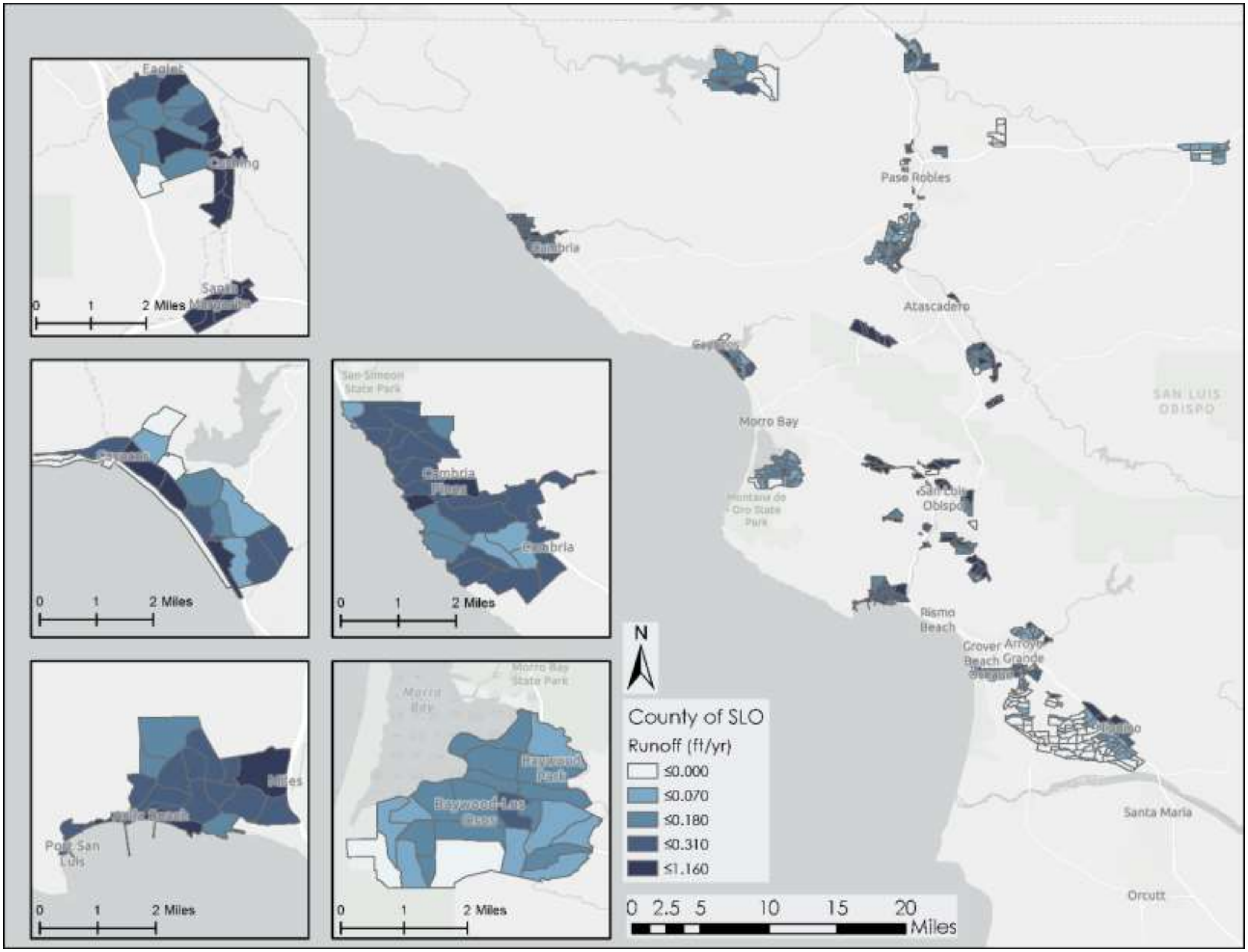
Morro Bay
Particulates (T/ac/yr)
≤0.004
≤0.014
≤0.022
≤0.037
≤0.055
0
0.5
1
1.5
Miles
N
Morro Bay
Morro Bay Blvd
Atascadero Rd
Little Morro Creek Rd
Morro Creek
Alva Paul Creek
Chorro Creek
State Park Rd
Cabrillo Hwy
731 ft
656 ft

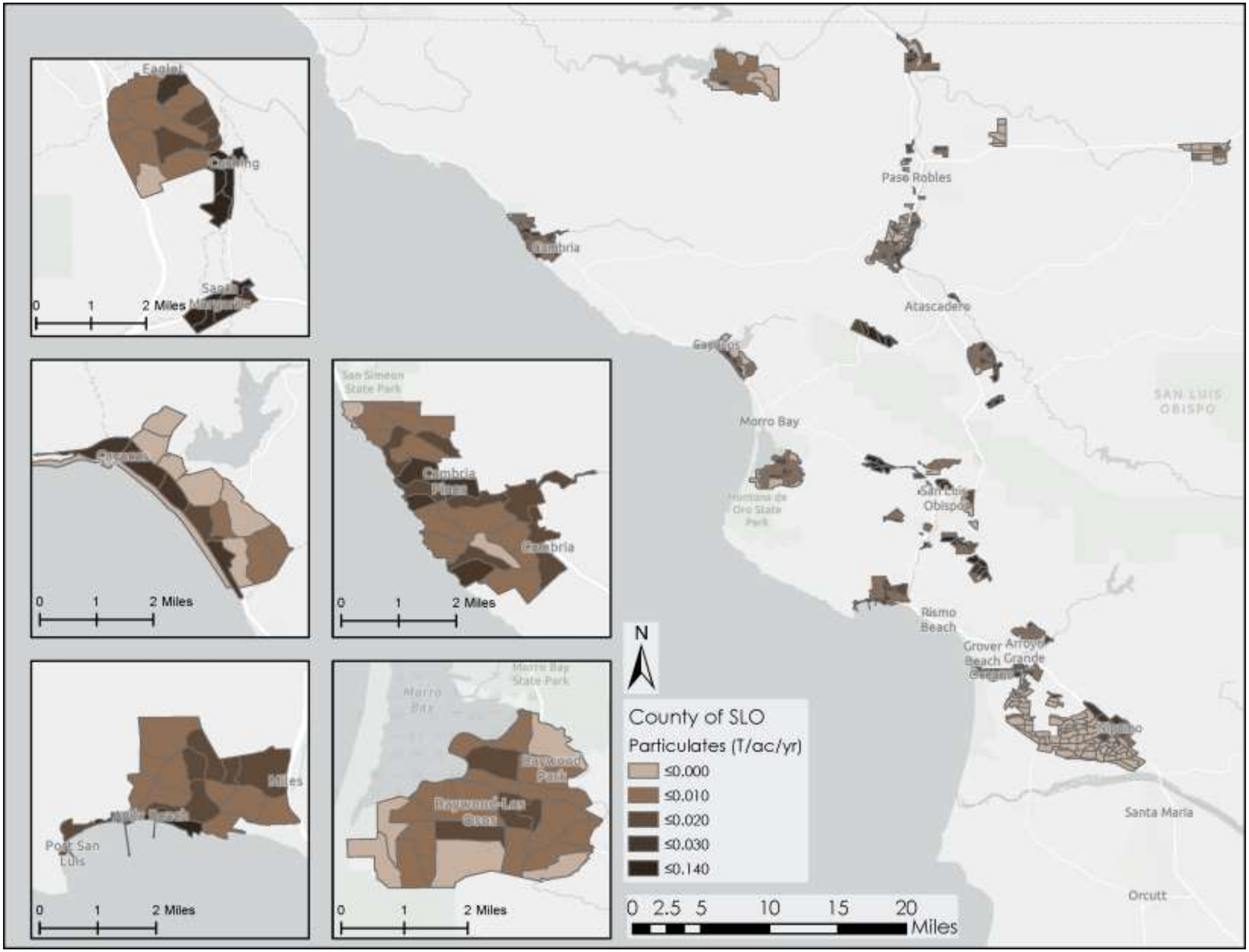

Arroyo Grande
Runoff (ft/yr)
≤0.367
≤0.473
≤0.600
≤0.715
≤0.823
Arroyo Grande
Oaks
Halcyon
Oceano
N
0 0.5 1 1.5 Miles


Arroyo Grande
Particulates (T/ac/yr)
≤0.034
≤0.046
≤0.058
≤0.065
≤0.110
Arroyo Grande
Oaks
Halcyon
Oceano
El Camino Real
Miles
0
0.5
1
1.5
N


Pismo Beach
Runoff (ft/yr)
≤0.283
≤0.407
≤0.483
≤0.630
≤0.766
0 0.5 1 1.5
Miles
N
Davenport Creek
Davenport Creek
Biddle Ranch Rd
Edna
Ontario Rd
San Luis Bay Dr
Sycamore Springs
Miles
859 ft
739 ft
981 ft
Tiber
Pismo Beach
Pacific Coast Hwy
James Way
El Camino Real
Saratoga Ave
Grover Beach
Long Branch Ave
Trouville Ave
S 4th St
Farroll Ave
The Pike
Oceano

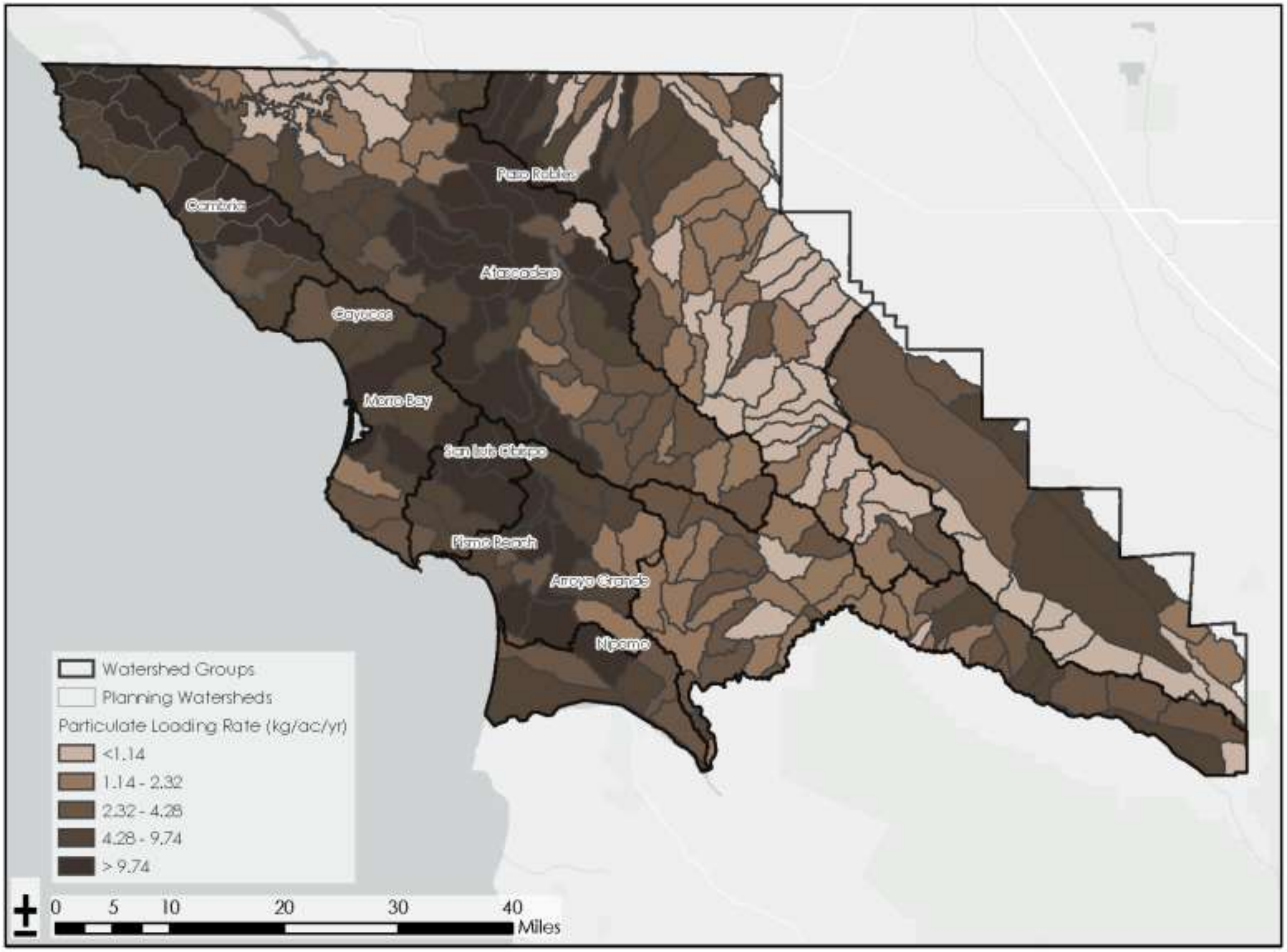
Davenport Creek
Davenport Creek
Biddle Ranch Rd
Edna
East Corral de
Ontario Rd
859 ft
San Luis Bay Dr
Sycamore Springs
Miles
739 ft
Tiber
W Ormond
981 ft
Pismo Beach
Vetter Ln
Pacific Coast Hwy
James Way
S Dolliver St
El Camino Real
Saratoga Ave
Grover Beach
Long Branch Ave
Trouville Ave
S 4th St
Farroll Ave
The Pike
Oceano
Pismo Beach
Particulates (T/ac/yr)
≤0.027
≤0.046
≤0.051
≤0.059
≤0.089
N
0 0.5 1 1.5
Miles

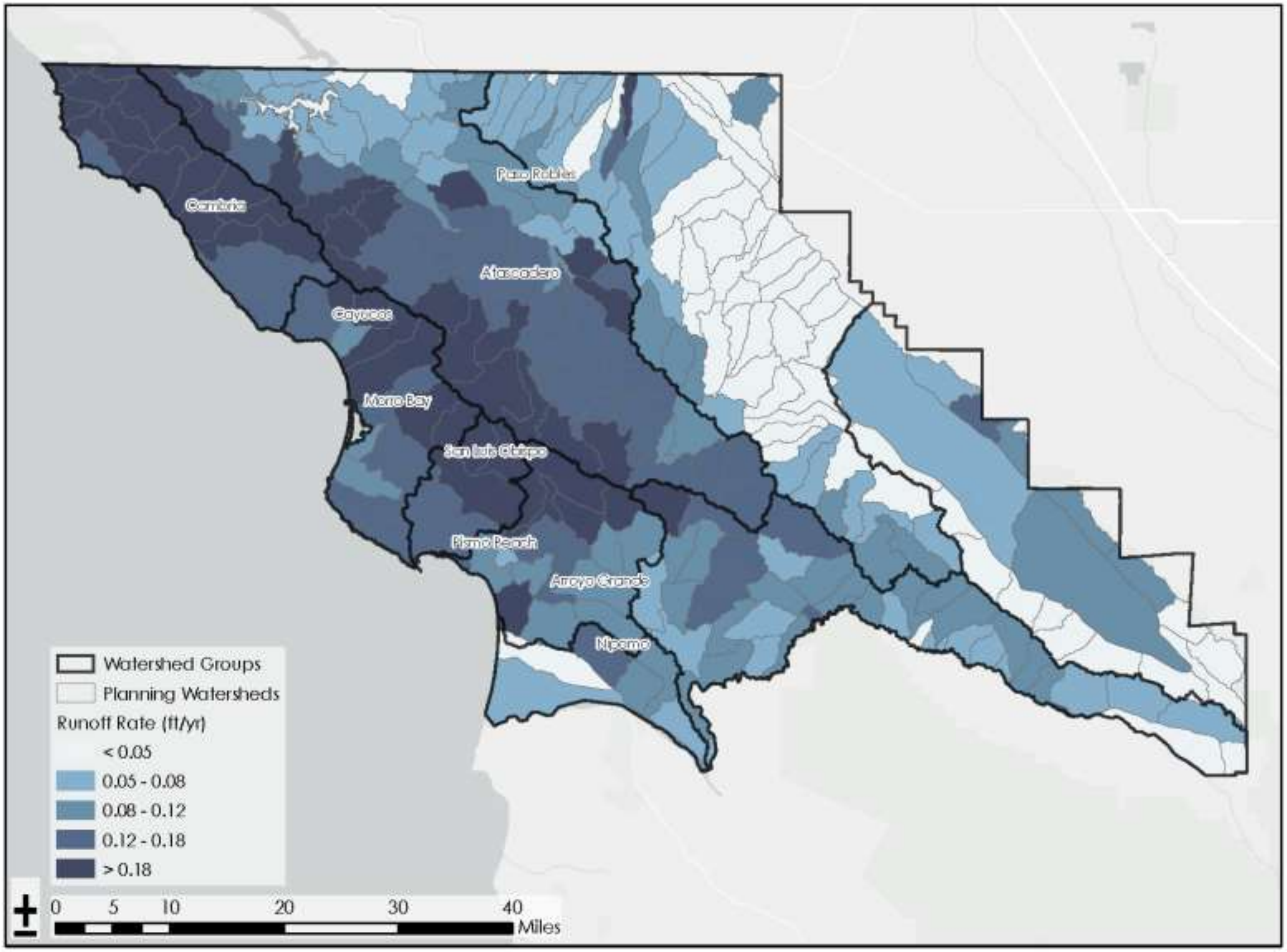

County of SLO
Runoff (ft/yr)
≤0.000
≤0.070
≤0.180
≤0.310
≤1.160
N
0 2.5 5 10 15 20 Miles
Paso Robles
Atascadero
Cambria
Morro Bay
San Luis Obispo
Rismo Beach
Grover Beach
Arroyo Grande
Santa Maria
Orcutt
SAN LUIS OBISPO
Cambria Pines
San Simeon State Park
Baywood-Los Osos
Baywood Park
Morro Bay State Park
Port San Luis
0 1 2 Miles

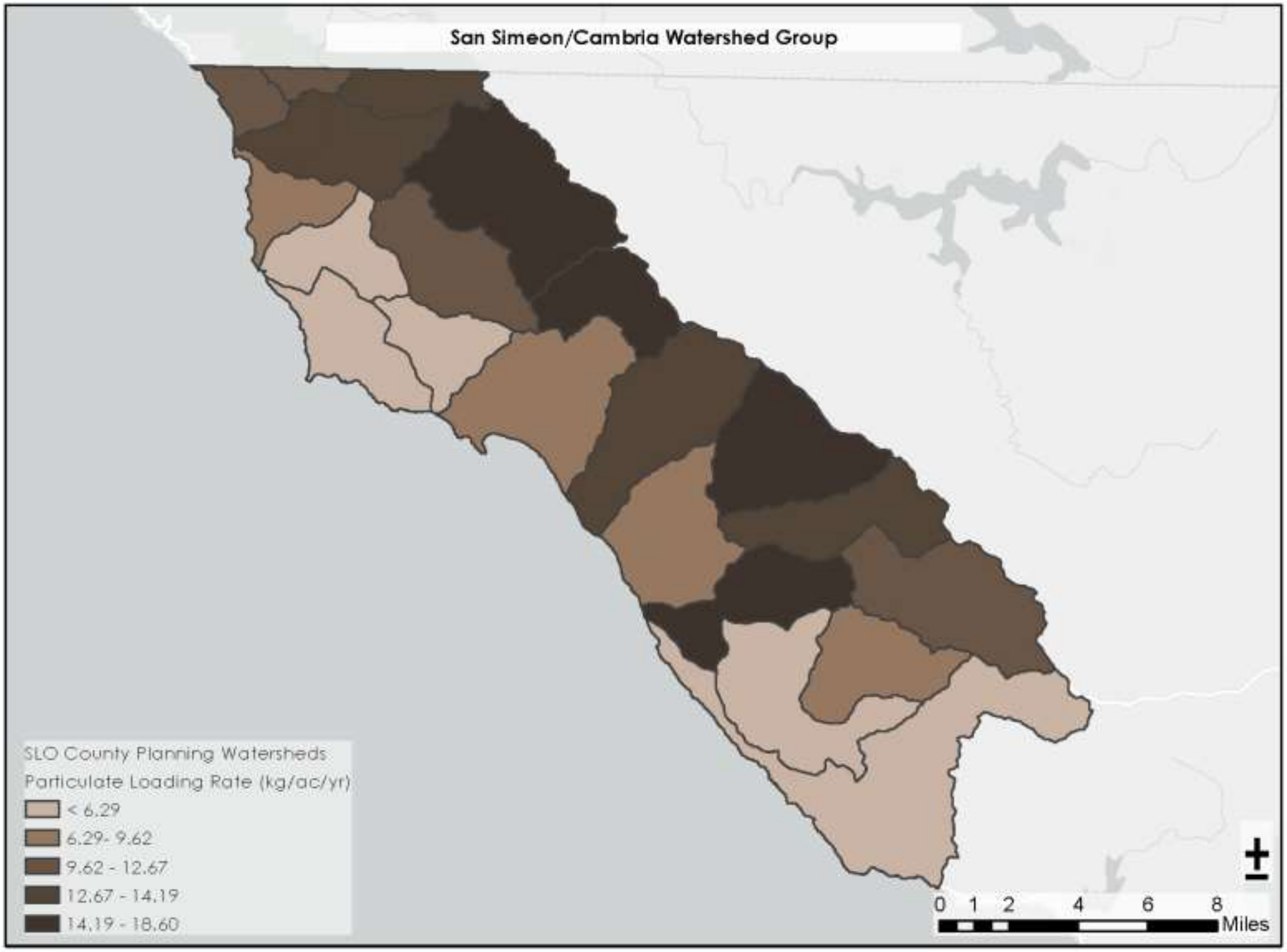

County of SLO
Particulates (T/ac/yr)
≤0.000
≤0.010
≤0.020
≤0.030
≤0.140
N
0 2.5 5 10 15 20
Miles
Paso Robles
Atascadero
Morro Bay
San Luis Obispo
Pismo Beach
Grover Beach
Arroyo Grande
Santa Maria
Orcutt
SAN LUIS OBISPO
Cambria
Cayucos
Templeton
Creston
Santa Margarita
Eagle
Cambria Pines
Baywood Park
Baywood-Los Osos
Port San Luis
Avila Beach
Oceano
Nipomo
San Simeon State Park
Morro Bay State Park
Montana de Oro State Park
2 Miles
0
1

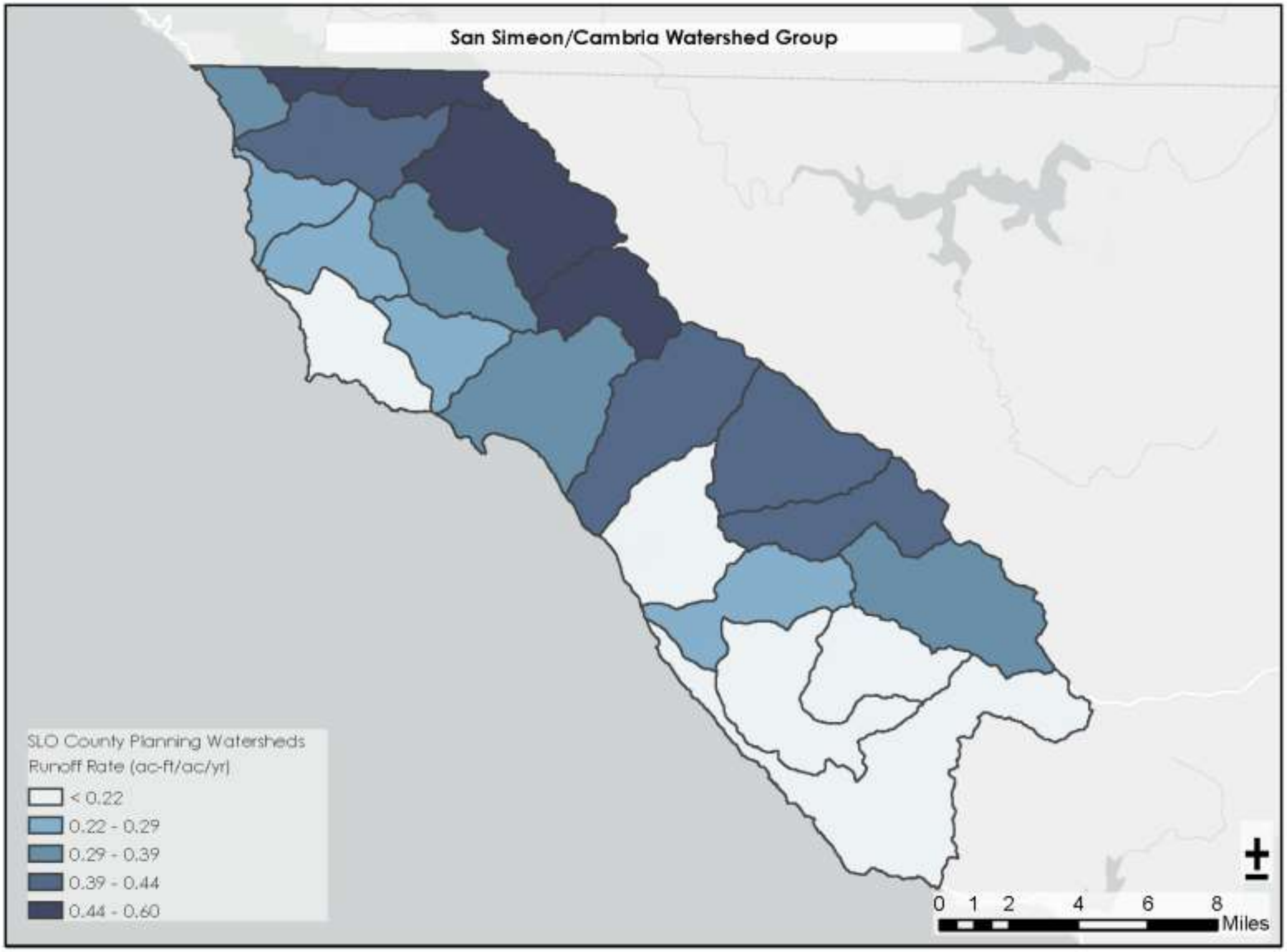
APPENDIX 3-A

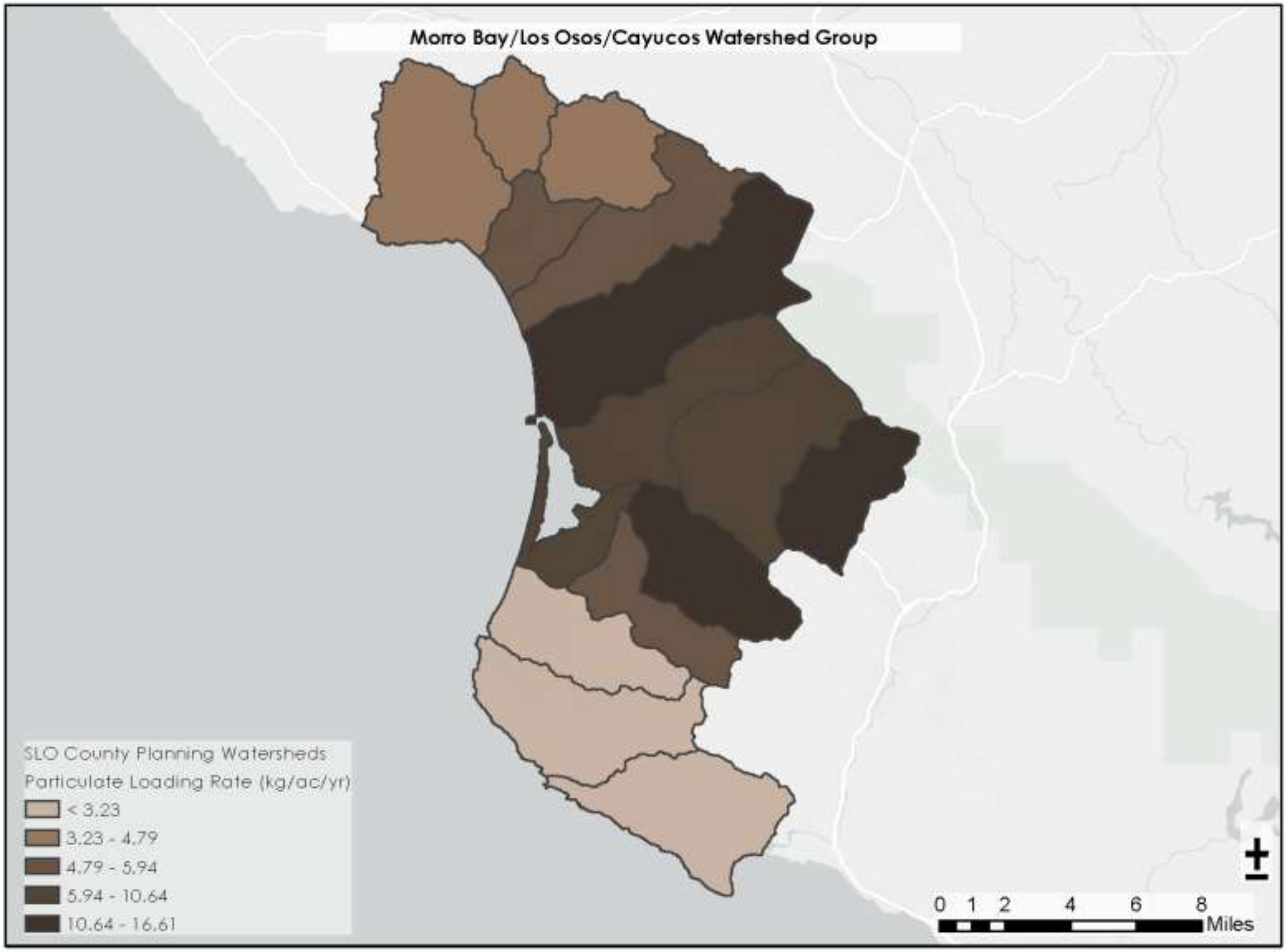
R-TELR Map Outputs


Paso Robles
Cambria
Atascadero
Cayucos
Morro Bay
San Luis Obispo
Pismo Beach
Arroyo Grande
Nipomo
Watershed Groups
Planning Watersheds
Particulate Loading Rate (kg/ac/yr)
<1.14
1.14 - 2.32
2.32 - 4.28
4.28 - 9.74
> 9.74
0 5 10 20 30 40
Miles

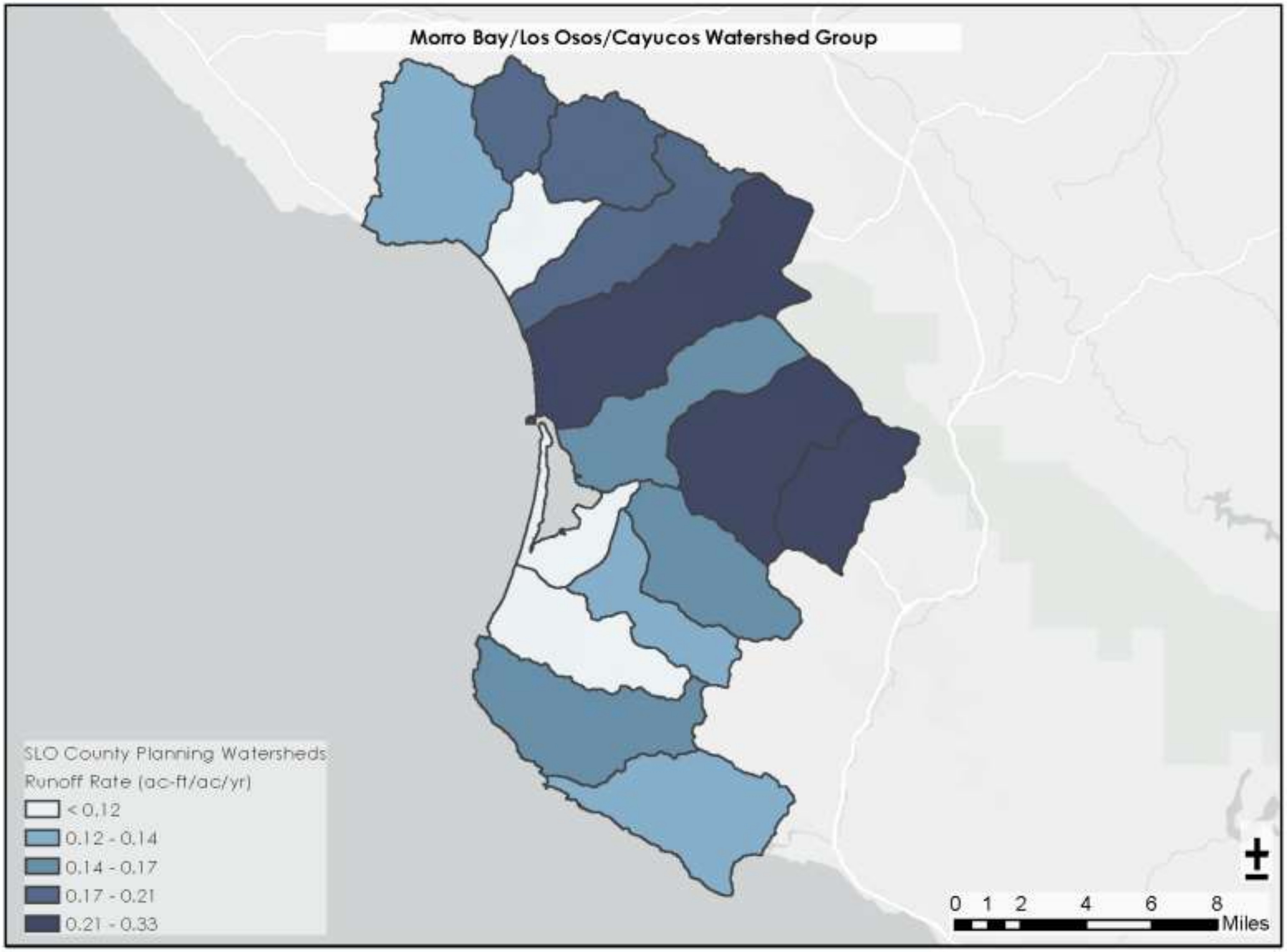

Paso Robles
Cambria
Atascadero
Cayucos
Morro Bay
San Luis Obispo
Pismo Beach
Arroyo Grande
Nipomo
Watershed Groups
Planning Watersheds
Runoff Rate (ft/yr)
< 0.05
0.05 - 0.08
0.08 - 0.12
0.12 - 0.18
> 0.18
0
5
10
20
30
40
Miles

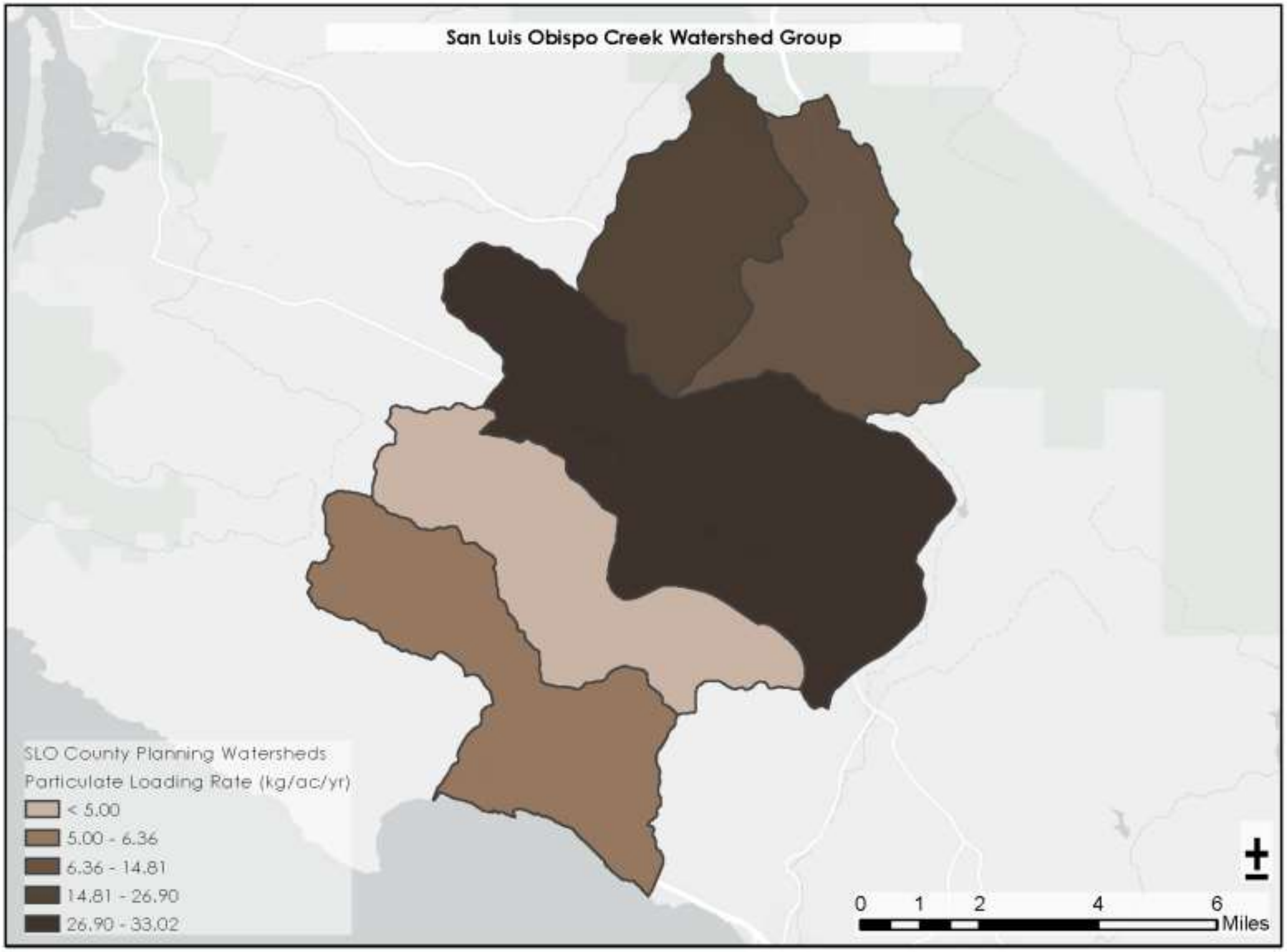

San Simeon/Cambria Watershed Group
SLO County Planning Watersheds
Particulate Loading Rate (kg/ac/yr)
< 6.29
6.29- 9.62
9.62 - 12.67
12.67 - 14.19
14.19 - 18.60
0 1 2 4 6 8
Miles

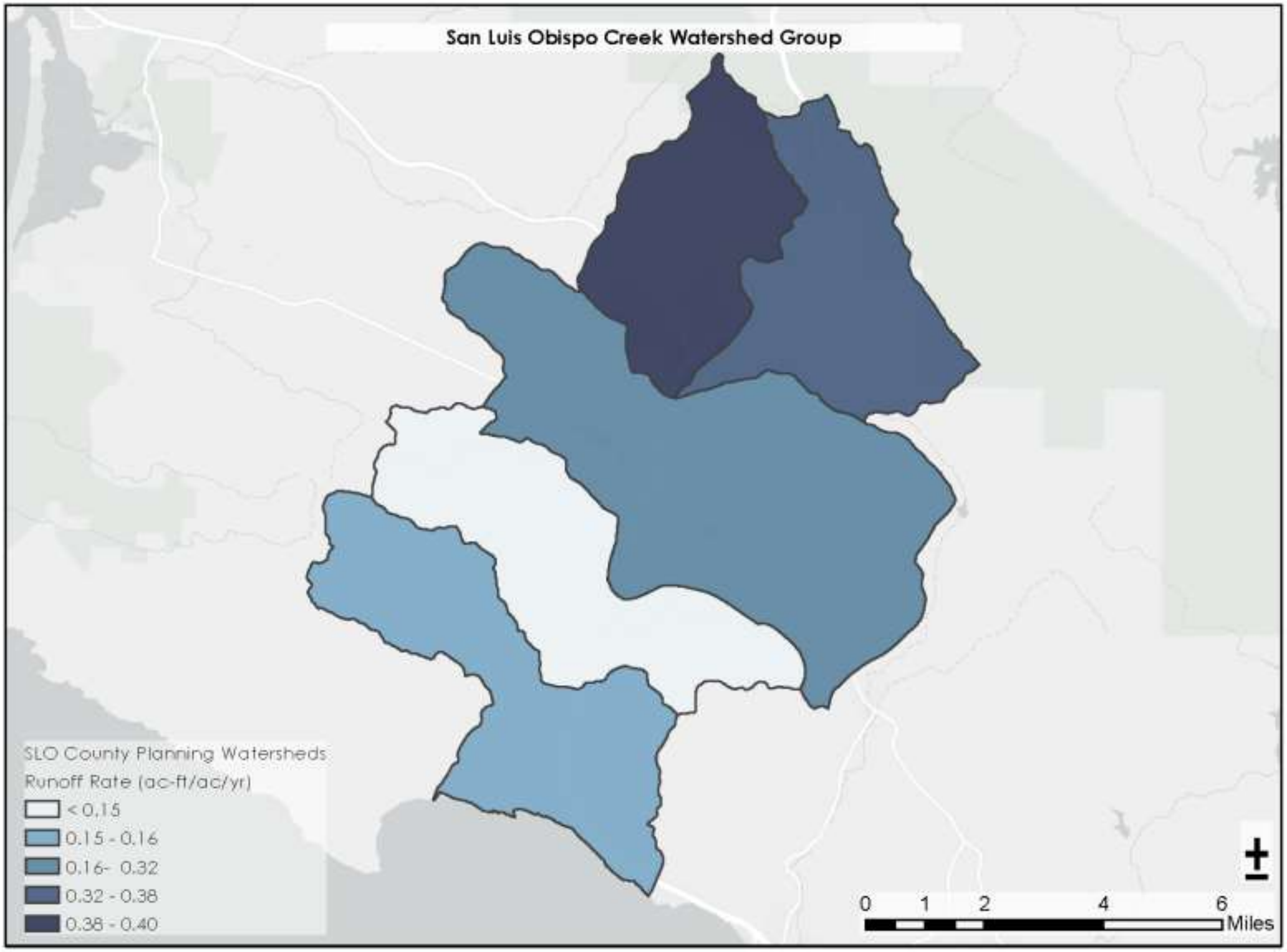

San Simeon/Cambria Watershed Group
SLO County Planning Watersheds
Runoff Rate (ac-ft/ac/yr)
< 0.22
0.22 - 0.29
0.29 - 0.39
0.39 - 0.44
0.44 - 0.60
0 1 2 4 6 8
Miles

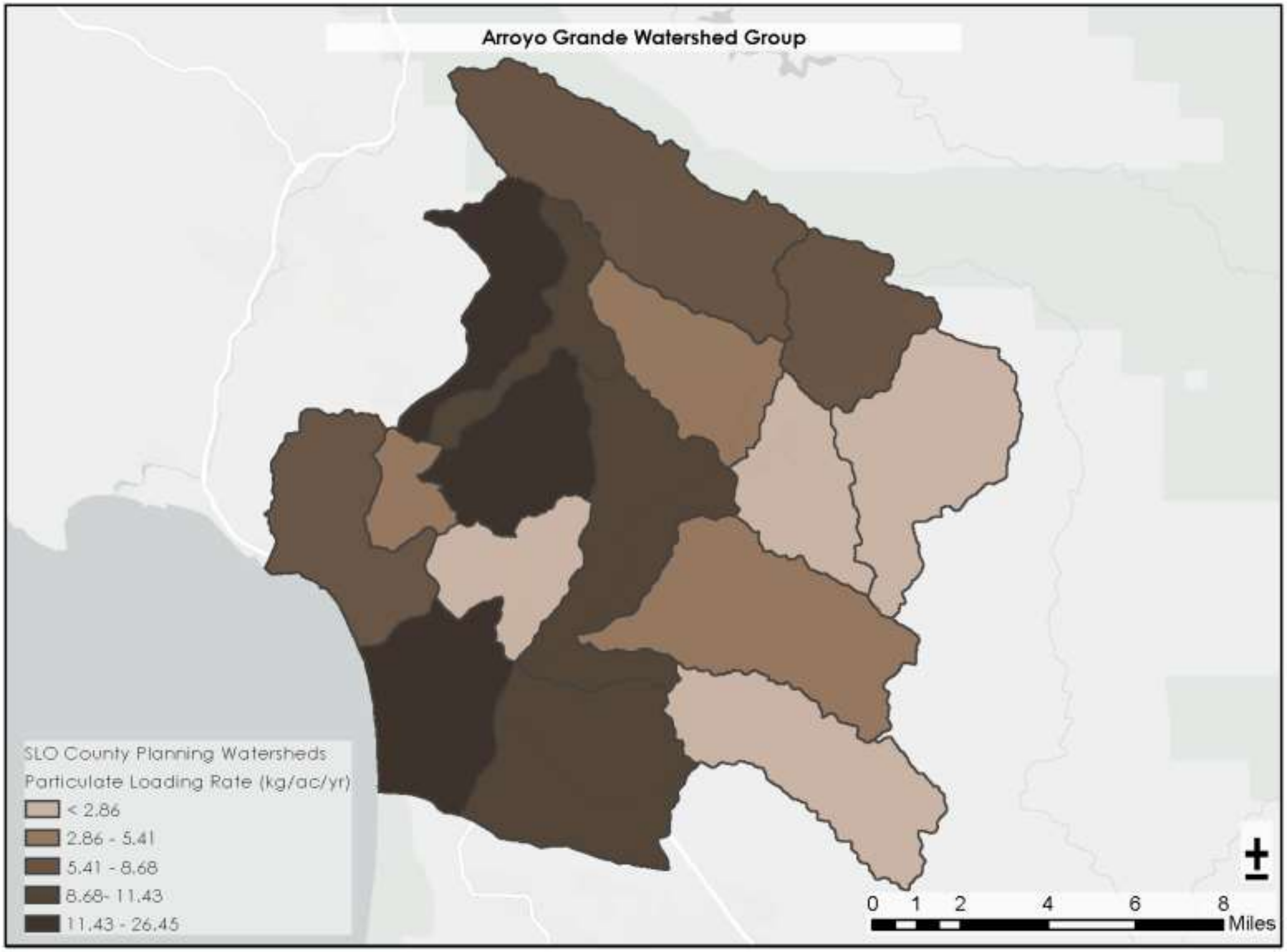


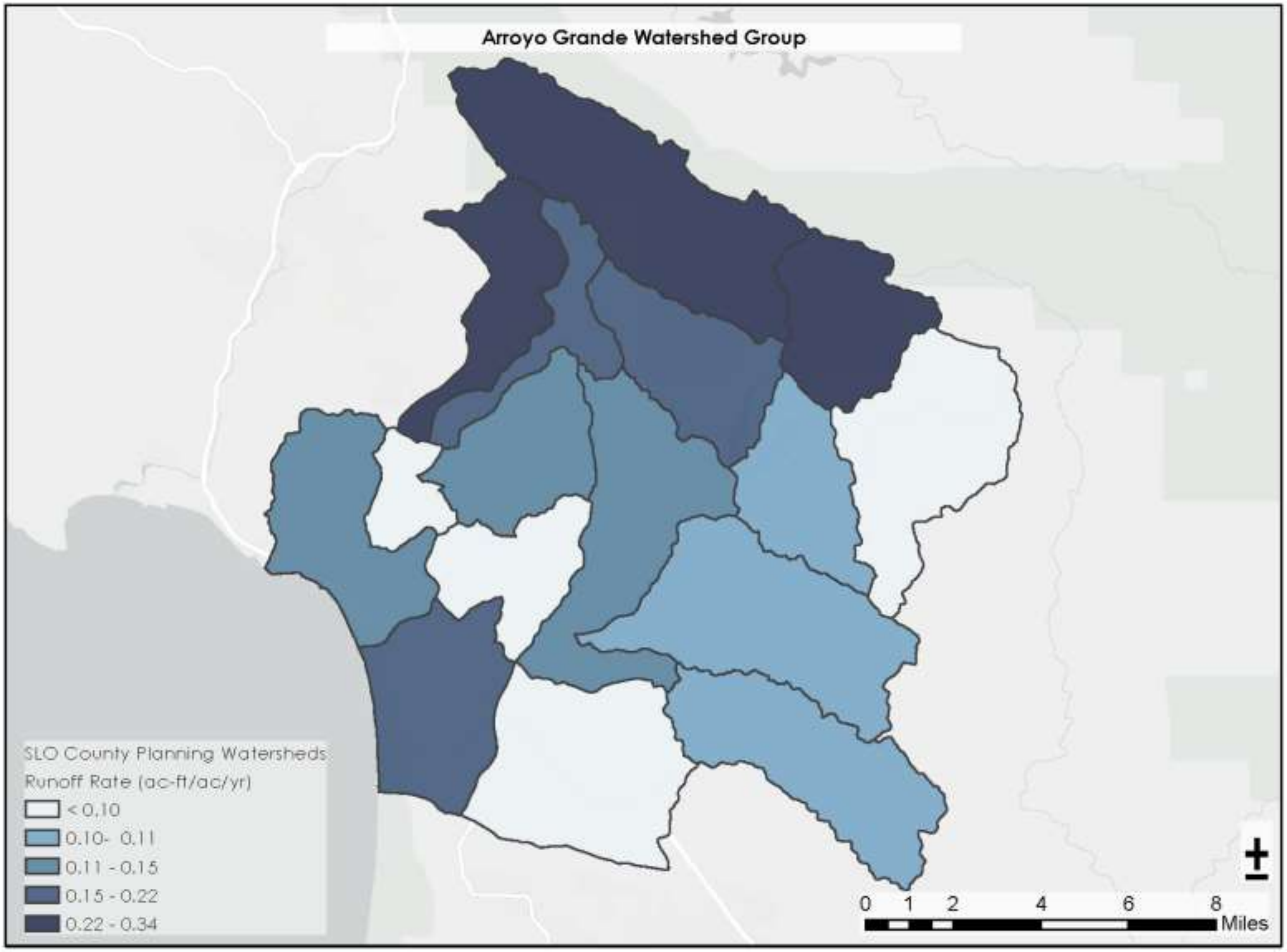
Morro Bay/Los Osos/Cayucos Watershed Group
SLO County Planning Watersheds
Particulate Loading Rate (kg/ac/yr)
< 3.23
3.23 - 4.79
4.79 - 5.94
5.94 - 10.64
10.64 - 16.61
0 1 2 4 6 8
Miles


Morro Bay/Los Osos/Cayucos Watershed Group
SLO County Planning Watersheds
Runoff Rate (ac-ft/ac/yr)
< 0.12
0.12 - 0.14
0.14 - 0.17
0.17 - 0.21
0.21 - 0.33
0 1 2 4 6 8
Miles

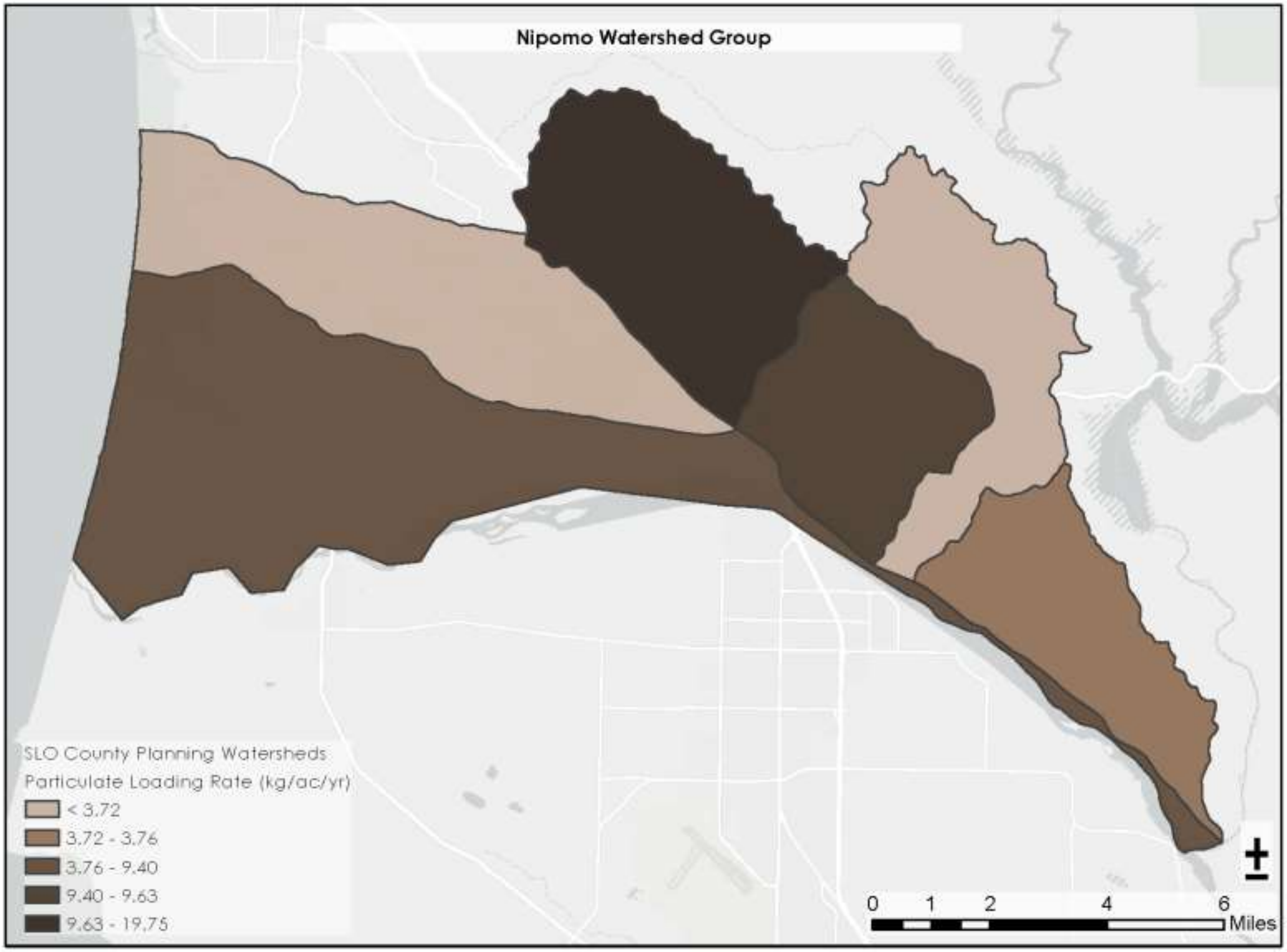

San Luis Obispo Creek Watershed Group
SLO County Planning Watersheds
Particulate Loading Rate (kg/ac/yr)
< 5.00
5.00 - 6.36
6.36 - 14.81
14.81 - 26.90
26.90 - 33.02
0 1 2 4 6
Miles

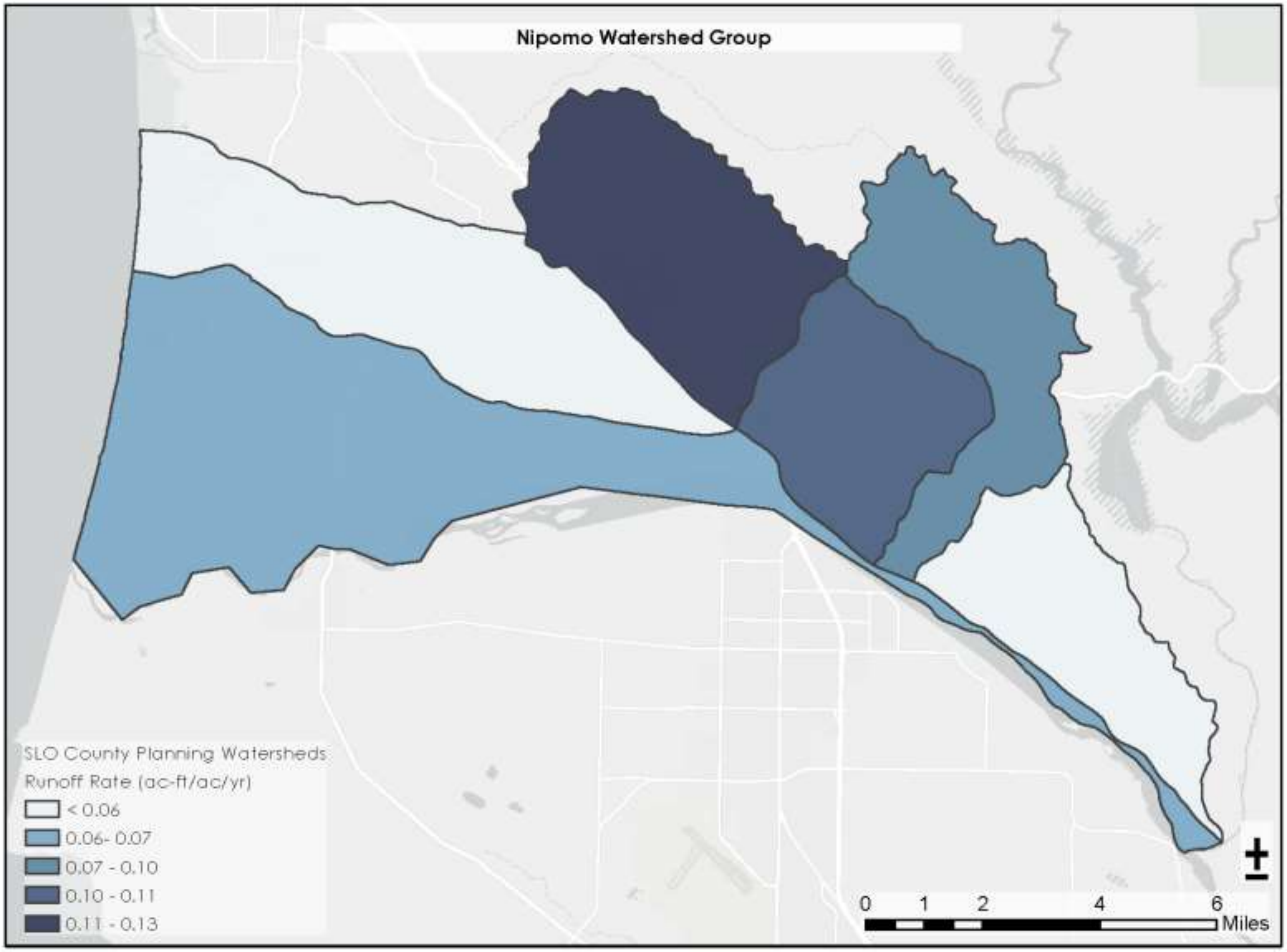

San Luis Obispo Creek Watershed Group
SLO County Planning Watersheds
Runoff Rate (ac-ft/ac/yr)
< 0.15
0.15 - 0.16
0.16- 0.32
0.32 - 0.38
0.38 - 0.40
0
1
2
4
6
Miles

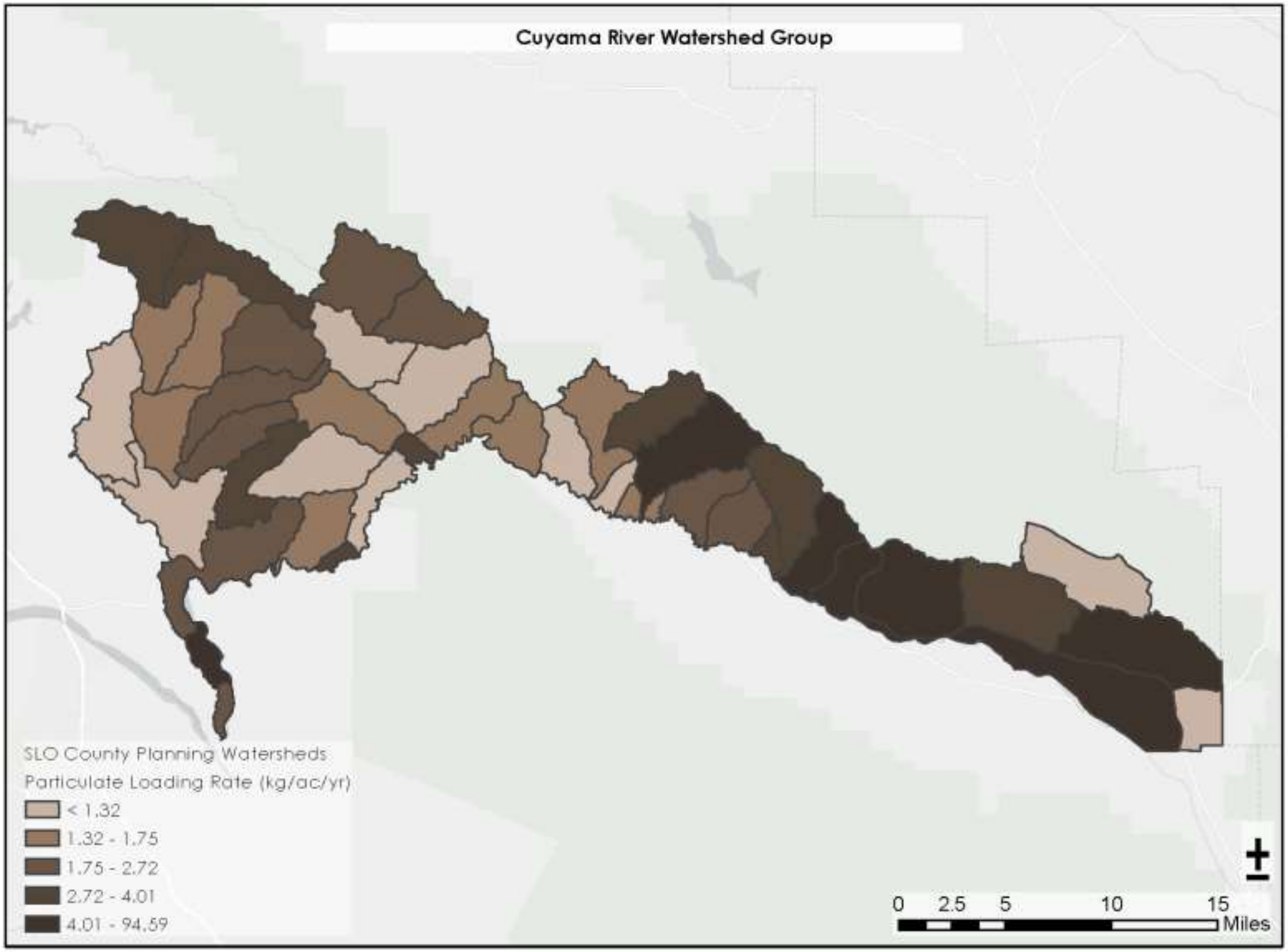

Arroyo Grande Watershed Group
SLO County Planning Watersheds
Particulate Loading Rate (kg/ac/yr)
< 2.86
2.86 - 5.41
5.41 - 8.68
8.68- 11.43
11.43 - 26.45
0 1 2 4 6 8
Miles

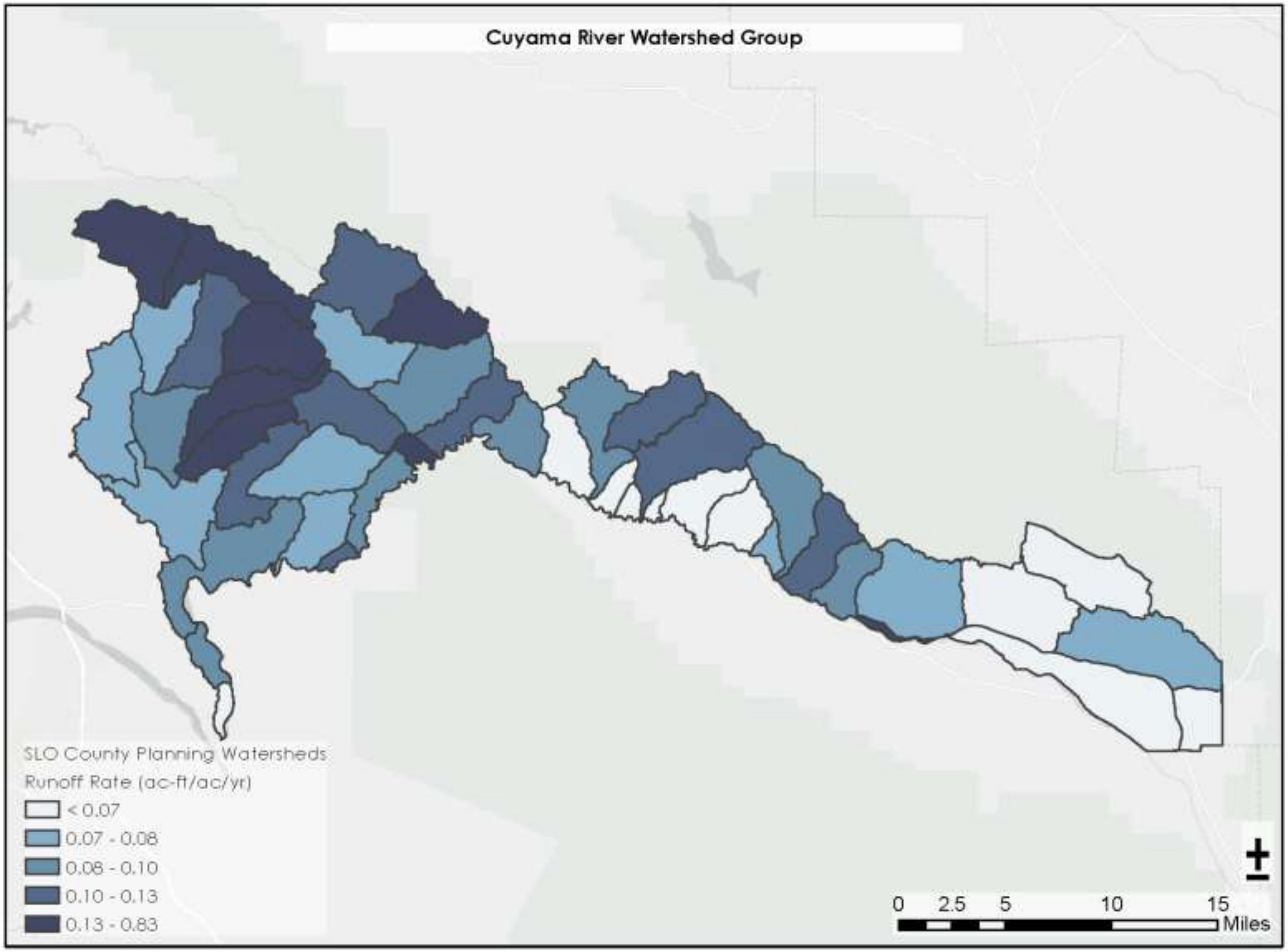


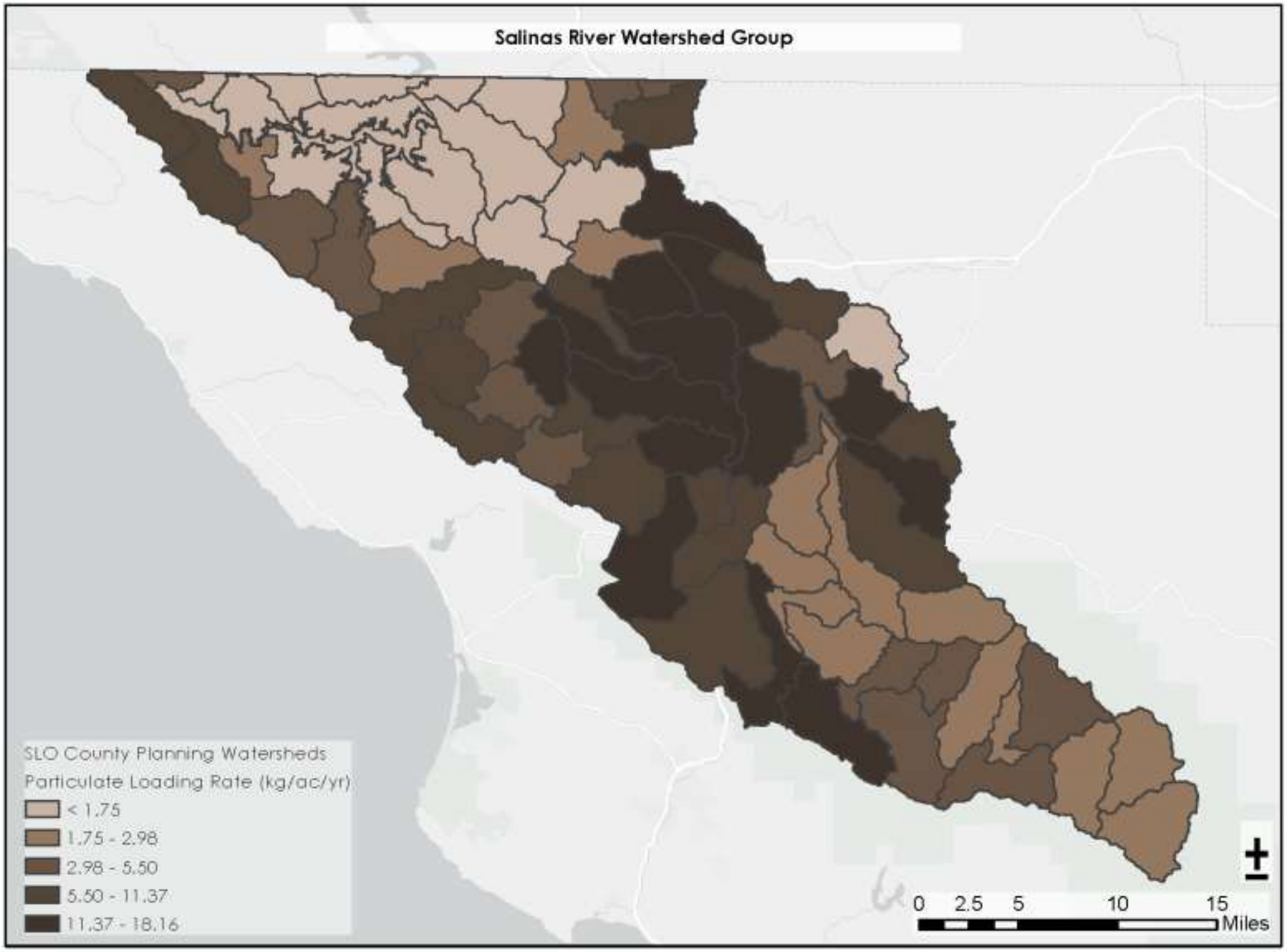
Arroyo Grande Watershed Group
SLO County Planning Watersheds
Runoff Rate (ac-ft/ac/yr)
< 0.10
0.10- 0.11
0.11 - 0.15
0.15 - 0.22
0.22 - 0.34
0 1 2 4 6 8
Miles

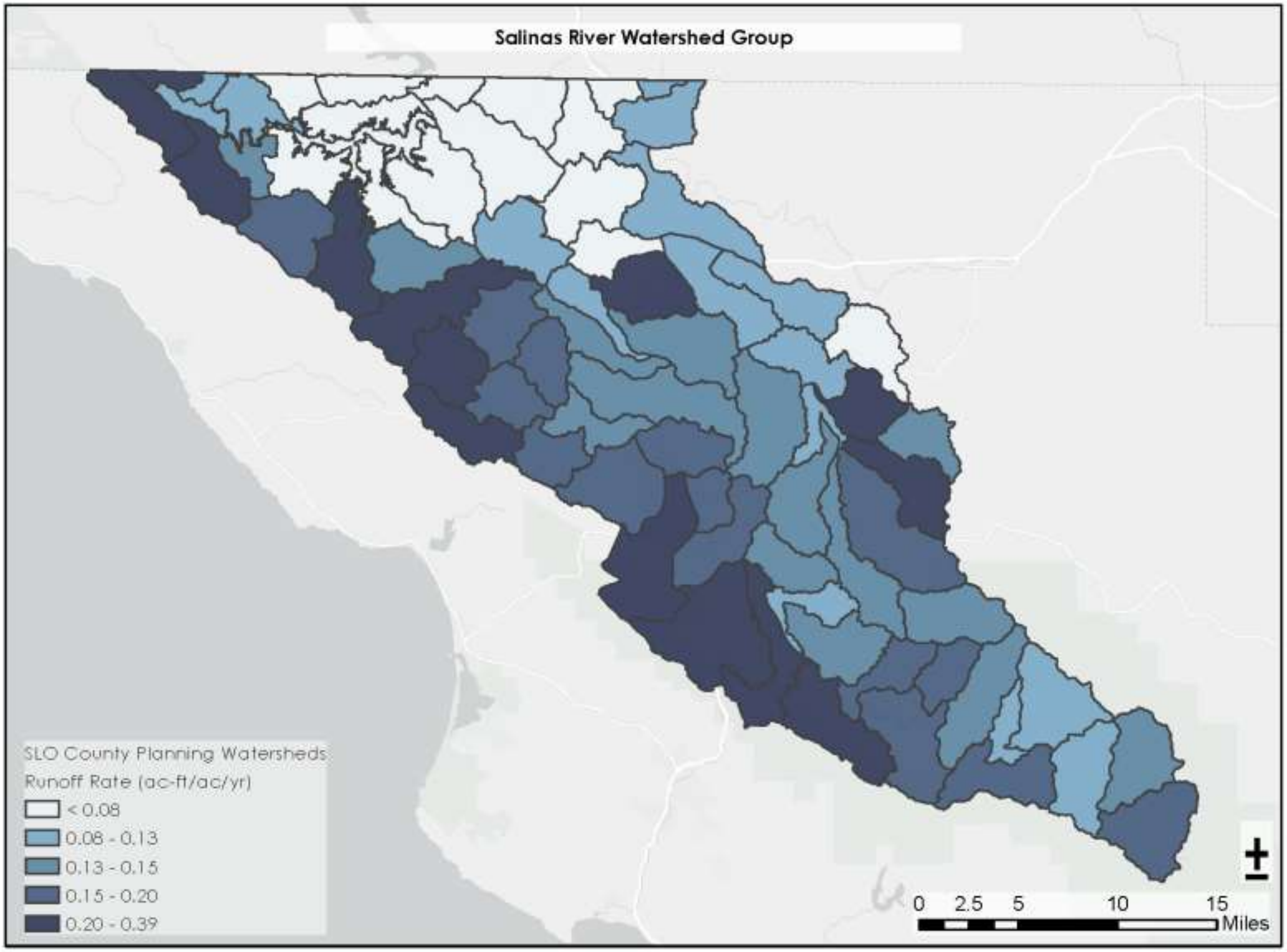

Nipomo Watershed Group
SLO County Planning Watersheds
Particulate Loading Rate (kg/ac/yr)
< 3.72
3.72 - 3.76
3.76 - 9.40
9.40 - 9.63
9.63 - 19.75
0 1 2 4 6
Miles

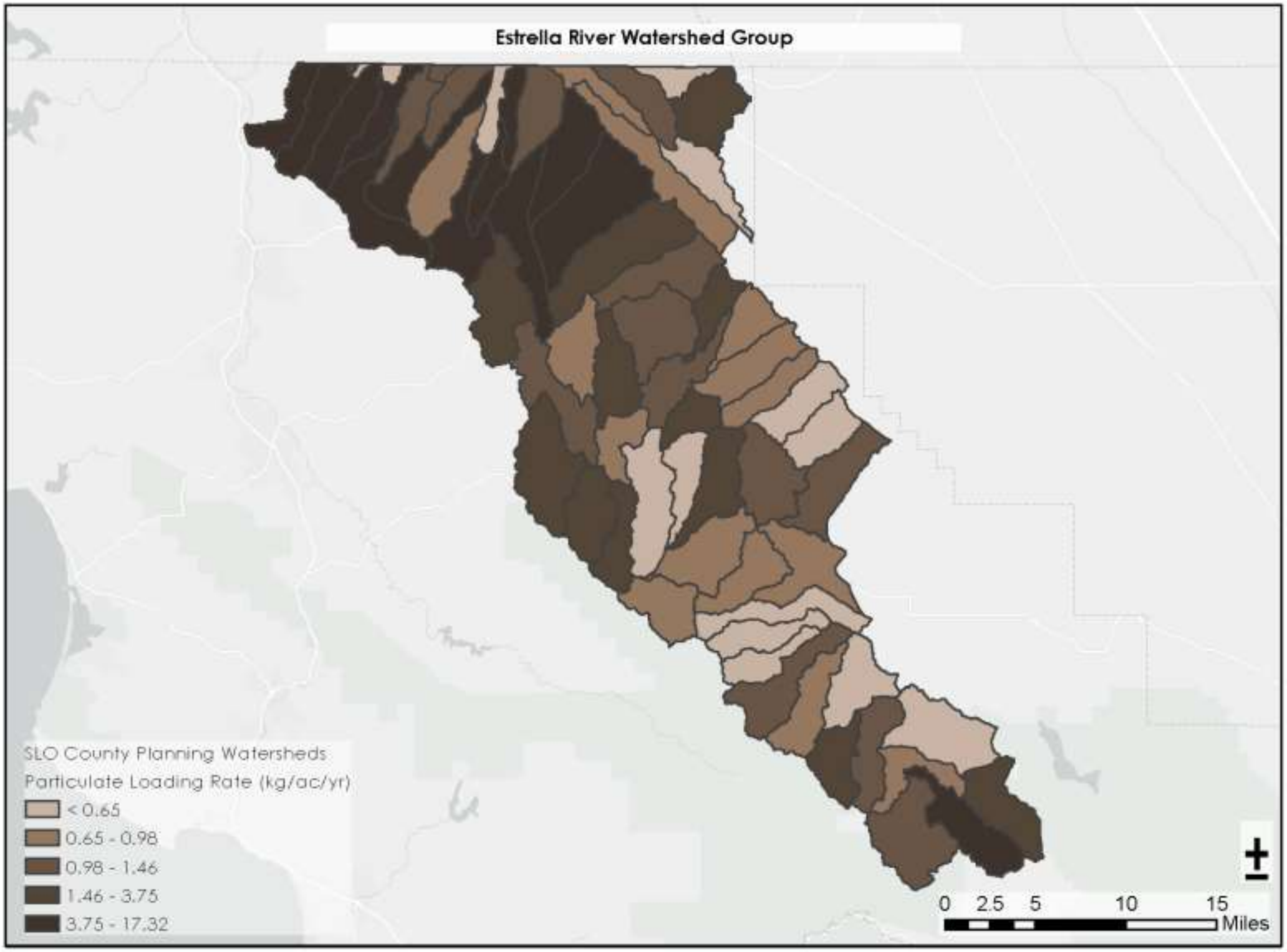

Nipomo Watershed Group
SLO County Planning Watersheds
Runoff Rate (ac-ft/ac/yr)
< 0.06
0.06- 0.07
0.07 - 0.10
0.10 - 0.11
0.11 - 0.13
0 1 2 4 6
Miles

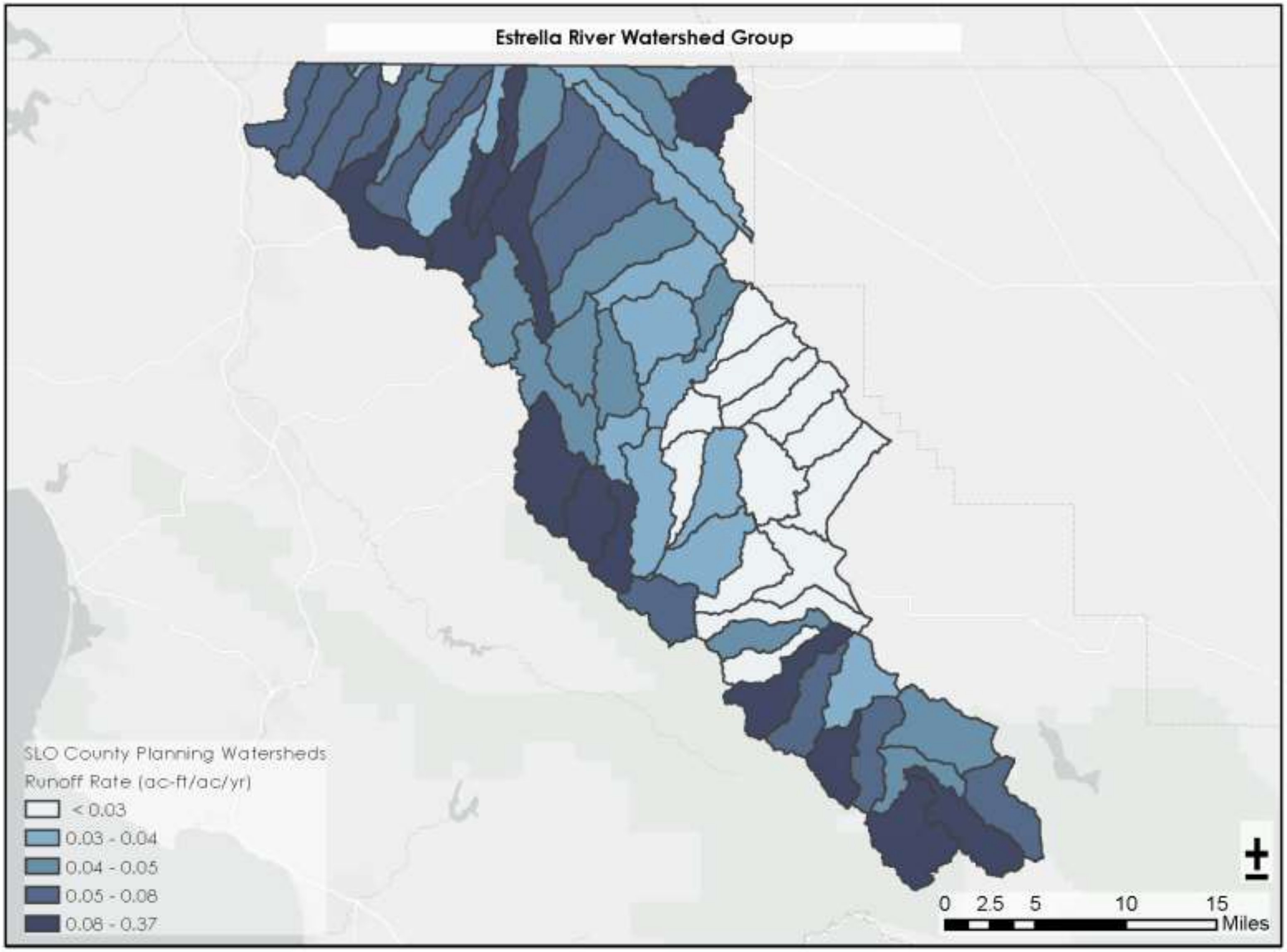

Cuyama River Watershed Group
SLO County Planning Watersheds
Particulate Loading Rate (kg/ac/yr)
< 1.32
1.32 - 1.75
1.75 - 2.72
2.72 - 4.01
4.01 - 94.59
0 2.5 5 10 15 Miles

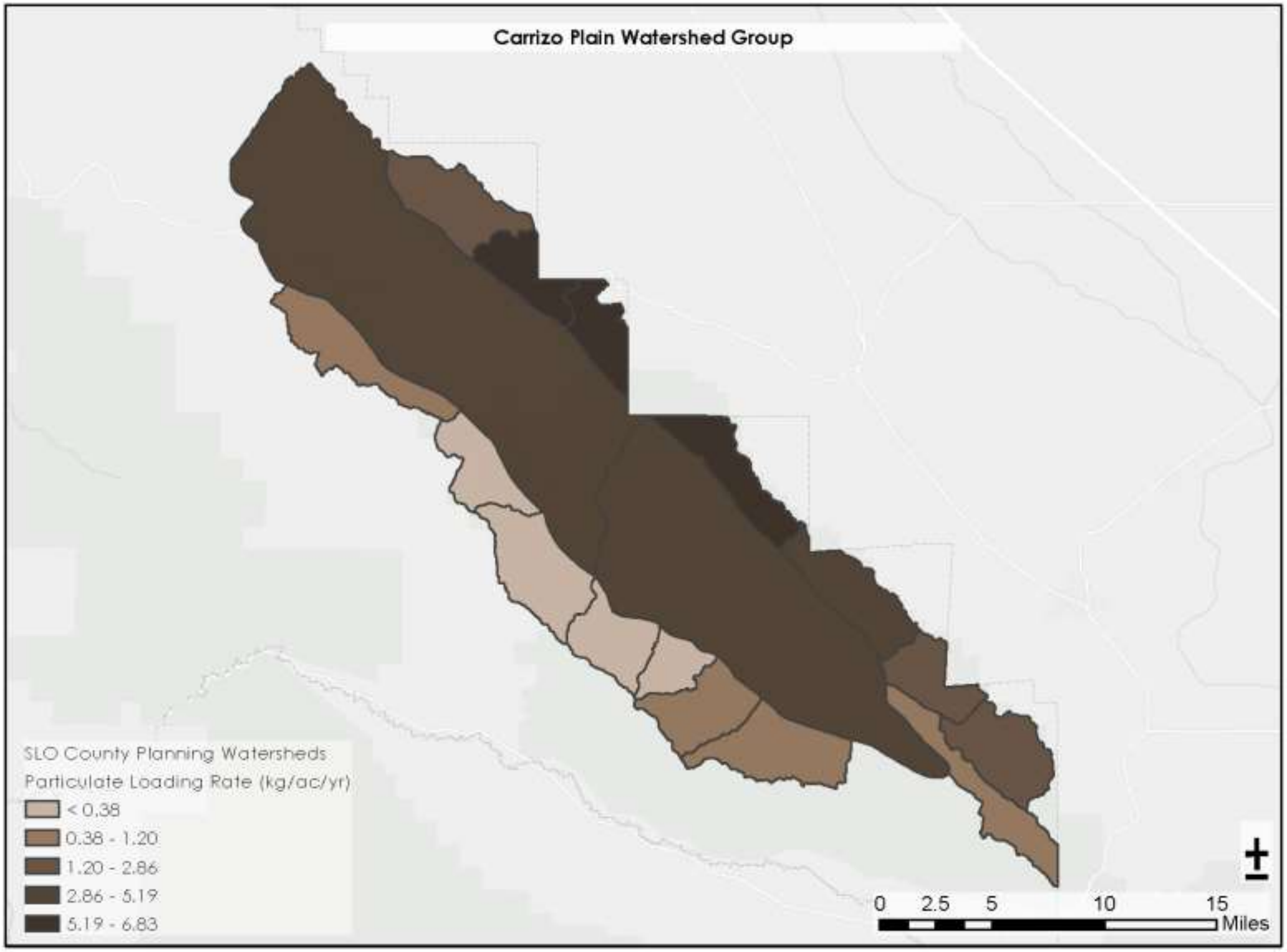

Cuyama River Watershed Group
SLO County Planning Watersheds
Runoff Rate (ac-ft/ac/yr)
< 0.07
0.07 - 0.08
0.08 - 0.10
0.10 - 0.13
0.13 - 0.83
0 2.5 5 10 15
Miles


Salinas River Watershed Group
SLO County Planning Watersheds
Particulate Loading Rate (kg/ac/yr)
< 1.75
1.75 - 2.98
2.98 - 5.50
5.50 - 11.37
11.37 - 18.16
0 2.5 5 10 15
Miles

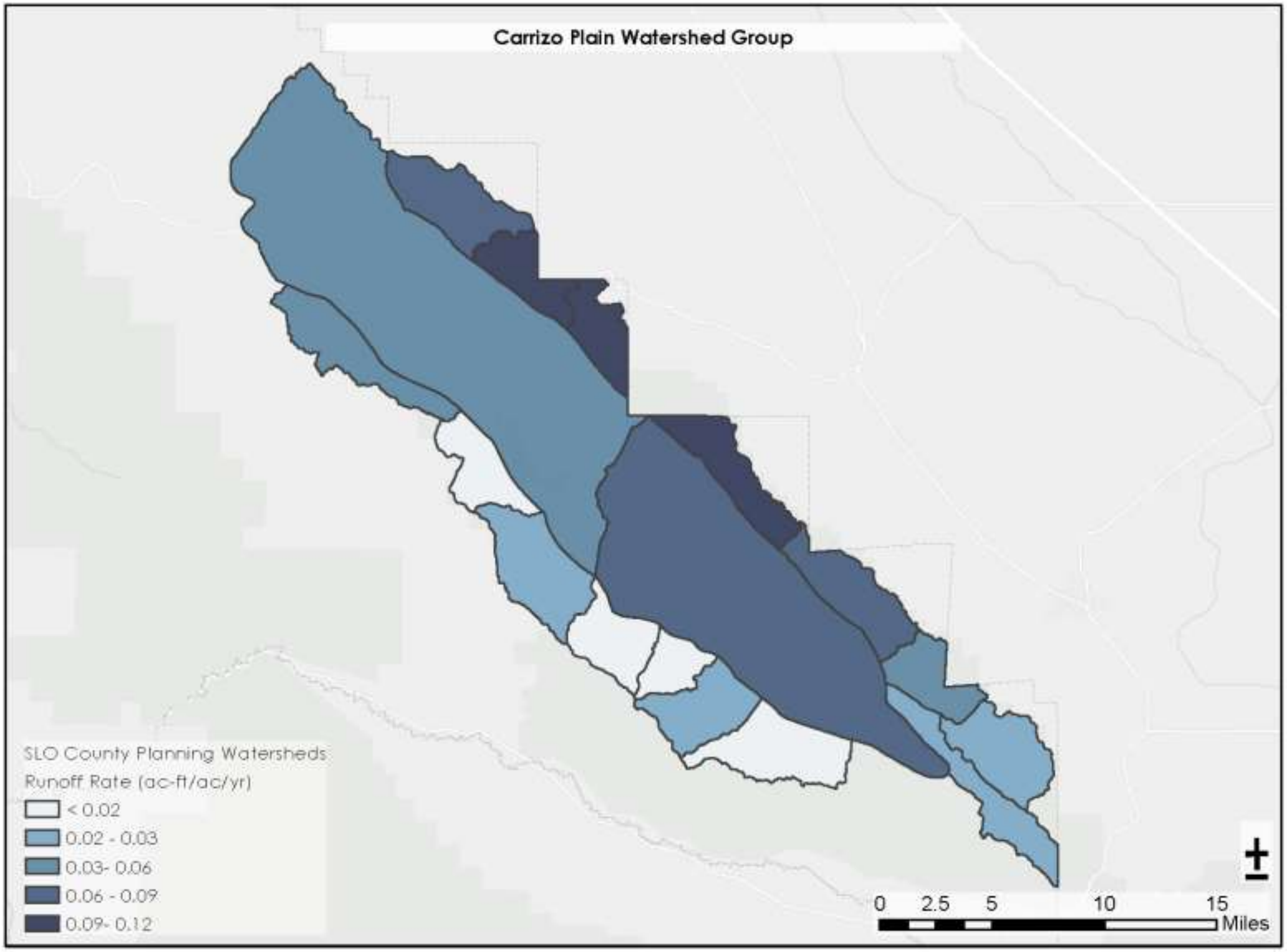

Salinas River Watershed Group
SLO County Planning Watersheds
Runoff Rate (ac-ft/ac/yr)
< 0.08
0.08 - 0.13
0.13 - 0.15
0.15 - 0.20
0.20 - 0.39
0 2.5 5 10 15
Miles


Estrella River Watershed Group
SLO County Planning Watersheds
Particulate Loading Rate (kg/ac/yr)
< 0.65
0.65 - 0.98
0.98 - 1.46
1.46 - 3.75
3.75 - 17.32
0 2.5 5 10 15
Miles


Estrella River Watershed Group
SLO County Planning Watersheds
Runoff Rate (ac-ft/ac/yr)
< 0.03
0.03 - 0.04
0.04 - 0.05
0.05 - 0.08
0.08 - 0.37
0 2.5 5 10 15
Miles



Carrizo Plain Watershed Group
SLO County Planning Watersheds
Particulate Loading Rate (kg/ac/yr)
< 0.38
0.38 - 1.20
1.20 - 2.86
2.86 - 5.19
5.19 - 6.83
0 2.5 5 10 15
Miles


Carrizo Plain Watershed Group
SLO County Planning Watersheds
Runoff Rate (ac-ft/ac/yr)
< 0.02
0.02 - 0.03
0.03- 0.06
0.06 - 0.09
0.09- 0.12
0 2.5 5 10 15
Miles

APPENDIX 3-B

Regional Runoff and Pollutant Loading Technical Approach

Introduction

This Appendix details the regional-scale modeling methods employed to support a metrics-based approach to stormwater project prioritization for the County of San Luis Obispo Stormwater Resource Plan (SWRP). It includes the purpose and rationale for the modeling approach selected; the technical elements that distinguish this regional application from the more detailed, urban-area application on which it is based, and sample outputs and their intended usage to fulfill the needs of this SWRP.

Model alignment with regional management needs

Models are used to integrate the best scientific understanding of hydrology and pollutant transport to extend the utility of existing data, supporting estimates of stormwater impacts in locations or time periods for which there are no data. The use of urban hydrology and pollutant models to inform both short and long-term stormwater programmatic planning decisions is common (e.g., Elliot and Trowsdale, 2007; Zoppou, 2001; Lee et al., 2012; Rossman, 2013; Voskamp and Van de Ven, 2015). A key decision point is determining which model to use among the alternatives available. Model selection should be guided chiefly via the intended use of model outputs and the necessary degree of model detail for the identified management purposes (Leavesley et al. 2002). Considerations for model selection typically include resources available, required process detail representation, time step, and spatial resolution. Typically, the least complex model that reliably meets the anticipated application is best (Chandler 1994, Rauch et al. 2002, Dotto et al. 2012), since development, input data, and computational costs tend to be less.

In addition to practical considerations, model selection has scientific implications that can affect the ability to serve management purposes (see US EPA, 2009). Relatively complex modeling alternatives tend to have high input data requirements and numerous “free” parameters that require user calibration. Often, only a few input variables may contribute significantly to the outputs (Li et al. 2014). Such over-parameterization commonly results in a high degree of uncertainty in the model outputs due to subjective decisions required during the calibration process (Beven 1989, Beven 2001) and because parameter values often vary over time and space (Hossain and Imteaz, 2016). Inclusion of extraneous model components or parameters that do not result in a measurable output response may improve simulation performance, but they can fortify a model against discerning changes in a catchment over time (Beven 2001, Nandakumar and Mein 1997) or for testing heuristic management scenarios (Freni et al. 2011). Even where good hydrological data are available, such models are probably only sufficient to support reliable calibration of models of very limited complexity (Jakeman and Hornberger 1993, Gaume et al. 1998).

For stormwater resource planning, information about *where* impacts are most acute, and so where reduction benefits can be maximized, is critical because landscape heterogeneity creates substantial variation in both of these factors. Since there are no long-term runoff data at drainage scales finer than regional watersheds (e.g., the entirety of the upper Salinas River watershed), approaches that rely strongly on calibration must lump landscape characteristics to that scale and thus provide very coarse spatial resolution. Such approaches often rely on Hydrologic Response Units (HRUs) to characterize this heterogeneity, but these HRUs are not generally contiguous in space, so the attributes that are location specific and contribute to runoff response within a drainage is not captured explicitly. Efforts to transition continuous simulation to spatially explicit grid-based calculations often suffer from difficulties associated with distributed parameter calibration (see Pignotti et al., 2017).

For stormwater planning purposes, hourly time-step estimates (often employed in continuous simulation models) may not be required to satisfy objectives; even annual time steps may often be sufficient. This also allows the use of decadal time-series, so that the model outputs bracket a wide range of plausible conditions, rather than having outputs tied to a shorter time period (albeit with finer time resolution) that is less likely to be representative of average long-term responses.

Detailed process representation of evapotranspiration, subsurface flow, stream hydraulics, and groundwater percolation are also not essential to meaningfully address most stormwater management questions and would also be impractical to apply throughout the entire region. Indeed, simpler approaches to hydrologic modeling have often shown comparable performance to more complex ones (e.g., Kokkonen et al. 2001; Perrin et al., 2001; Bormann and Diekkruger, 2003; Reed et al., 2004), particularly at annual time steps (Beck et al., 2017).

Recently developed decision support model alternatives

A full review of modeling approaches available is beyond the scope of this document, but suffice to say that there are many available that can be broadly classified as statistical, empirical, hydraulic, and hydrological that differ in their spatial and temporal resolution, functionality, water quality components, and accessibility (see Zoppou, 2017 for a recent review). Given the considerations detailed above, we begin with the bounding criteria that candidate models should provide (1) spatially explicit outputs via (2) relatively simple process representation on (3) annual time steps to efficiently (but adequately) satisfy stormwater management information needs. In addition, peer review, good documentation of how model equations are implemented, calibration procedures, and input data processing are required to provide transparency to model estimates used for decision making. Open source code is beneficial but not necessary to facilitate scrutiny by other experts, as long as the algorithms used in the model may be recreated based on readily available documentation. For example, computer code that controls user interfaces is not essential for detailed review, and it is relatively less accessible to most scientific or modeling experts.

Several simplified approaches have been recently developed in California to help communities comply with MS4 regulatory requirements, support stormwater resource planning and perform reasonable assurance analysis. These include the Stormwater Tool to Estimate Load Reductions (swTELR) developed in the Central Coast Region (Beck et al., 2017), the Regional Watershed Spreadsheet model developed for the San Francisco Bay Area (Wu et al., 2016), the Load Prioritization and Reduction model (LPR) developed for Santa Barbara County (Geosyntec, 2015), and the SBPAT model developed for the County of Los Angeles (Austin, 2010). Each of these are intended to be used as planning-level tools and share similar elements, differing primarily in their input data treatment and execution. For example, each of these models employ a volume–concentration approach to calculating pollutant loads, wherein loads are calculated as the product of runoff and empirically estimated land-use or land-cover-based pollutant concentrations. This approach includes the simplifying assumption that unit area runoff for homogeneous areas has a constant concentration of pollutants, rather than the dynamic approach employed in continuous simulation models such as HSPF and SWMM that allows concentrations to vary over time steps as short as an hour.

Although these simplified approaches all share an equivalent conceptual foundation, they have significant differences that can guide the choice of the most suitable application for this SWRP. For example, the SBPAT model (http://www.sbpat.net/index.html) is essentially a GIS-based interface that requires coupling with the EPA's SWMM. As such it requires the expertise and data requirements of that underlying continuous simulation model. There is no documentation of the model algorithms, assumptions, functionality, required data inputs, or calibration procedure provided on the model website; nor is there any listing of publications featuring SBPAT that have been peer reviewed.

By comparison, the Pollutant Load Prioritization and Reduction Model (LPR) provides a simplified runoff accounting mechanism, but it still requires calibration to observed data. This disallows estimates at finer spatial resolution than the calibration scale (e.g. region-scale watersheds), since errors in one part of a drainage may be cancelled out by errors in another part; resulting in a calibrated parameter set that reflects these cancelling effects, rather than optimal values for the individual locations. A distinct advantage of LPR is that it provides pollutant loading for 12 different pollutants, based primarily on event concentration data collected in Southern California (e.g., Stein et al., 2007). The Regional Watershed Spreadsheet Model has a similar approach, but it uses spatially distributed rainfall inputs and focuses specifically on loadings of PCBs and mercury. The RWSM uses land use and impervious cover input data and monitoring data to specify characteristic runoff concentrations (Lent et al., 2011). Adequate calibration of pollutant EMC coefficients has proved difficult in the Bay Area watersheds, however, being a persistent source of uncertainty as estimates are strongly dependent on choice of calibration data sets (Wu et al., 2017). Both LPC and RWSM use runoff ratios for generation of average annual runoff, which is a very simple approach that provides no variation of runoff response to different rainfall intensities or volumes (Lent et al., 2011). The RWSM model in particular is very well documented, the methods of implementation have been transparently communicated, and its developers have included critical assessment and identification of performance deficiencies.

Although both LPC and RWSM are credible alternatives for this SWRP, we believe that their advantages (and shortcomings) are largely shared by swTELR. As significant discriminator, however, is that communities throughout the County of San Luis Obispo have adopted and are actively using swTELR to support MS4 permit requirements. Therefore, the most compatible approach to regional modeling of runoff and pollutant loading that meets the objectives of this SWRP is a variation of swTELR that will ensure efficient integration of regional outputs with those from municipalities and urbanized areas of the County that have already been developed. TELR has the additional advantage of using the National Resource Conservation Service Curve Number method (NRCS-CN) for runoff generation (USDA-NRCS, 1986), which provides variation of runoff response to different rainfall volumes. This contrasts to the single-value runoff ratio method used in RWSM and LPC. This means that swTELR produces outputs that characterize the shape of the rainfall probability distribution more completely than can be accomplished with a single value, which can only represent the central tendency of that distribution. Similar to the other approaches described, swTELR does not provide outputs for a particular year but instead returns average annual response. This is adequate for management modeling objectives as defined for this plan and has been judged generally acceptable for stormwater management planning (Lent et al., 2011).

The original version of swTELR was developed for use in urban environments and has some shortcomings for use as a regional tool. Given the alignment of the model with the management objectives and its potential for seamless integration with the region's existing investment in more detailed stormwater modeling, however, we believe that the optimal solution is to borrow the runoff and routing algorithms from TELR and modify them appropriately for regional application. This also allows the adoption of useful elements from other modeling approaches as appropriate.

Regional application of TELR

Initial development of swTELR was in predominantly urbanized catchments covering approximately 100 acres (Beck et al., 2017). Its prior validation also emphasized urban-area applications, and so evaluating the accuracy and utility of the results for broader scale application is also necessary. These topics are addressed in turn.

Limitations of swTELR

Several limitations of swTELR have already been documented for swTELR (2NDNATURE, 2016) but do not necessarily provide barriers to use in regional applications. The NRCS Curve Number method (NRCS-CN) (USDA-NRCS, 1986) used in swTELR is a well-tested method, but it includes no detailed representation of physical hydraulic or soil processes and has shown mixed performance when compared with measured data (e.g., Hawkins, 1984). The NCRS-CN method does not consider rainfall intensity or duration, only total rainfall volume, and it assumes a uniform curve number to characterize runoff response for each land-use area. Confidence in the method, however, is provided by the fact that much more sophisticated and widely used models, such as the Soil Water Assessment Tool (SWAT), also employs curve numbers for runoff generation and can show comparable performance to other methods (e.g., King et al., 1999). The NRCS-CN method employed in swTELR strikes a middle ground of complexity between the simplest approaches, such as the use of single-value runoff ratios (Wu et al., 2017), and more complex continuous simulation models. Runoff routing and temporary storage in swTELR is represented only as a single parameter in the time-of-concentration calculations for stormwater movement towards centralized BMPs, so there is no explicit way to represent storage in the form of ponding. There is also no explicit representation of antecedent hydrologic conditions that may affect subsurface water movement, although the range of antecedent conditions is included in the curve number specification for each cover type. While these factors are important for predicting hourly hydrographs and flood forecasting, they have limited relevance for a regional planning application that considers only average annual responses.

Estimates of particulate pollutant loading in swTELR use total suspended solids (TSS) as a surrogate parameter, based on reviews of compiled data in the International National Stormwater BMP Database (http://www.bmpdatabase.org/index.htm) and the literature. Results are expressed in units of tons per acre per year. Extension to other pollutants, which is commonly done by many other such models, requires specifying runoff concentrations for those pollutants. This ought to be done with great caution, since even TSS, which is among the most often measured constituents, shows highly variable estimates for individual land uses and land cover types. Incorporation of other pollutants compounds what is already a substantial source of uncertainty; their inclusion in other models provides a false degree of precision for discerning loading response amongst individual constituents. Thus, extension of swTELR functionality to include additional pollutants is not a priority for this application (nor should it be for other such modeling efforts).

The primary modifications that have been made to apply swTELR at a regional scale application (*Regional TELR*; hereafter "*R-TELR"*) are:

- Development of distributed rainfall inputs for the entire County
- Land-cover-based curve number specification in undeveloped areas
- Changes to runoff generation algorithms suitable for larger spatial scales
- Land-cover-based runoff concentrations suitable for larger spatial scales
- Incorporation of slope effects into the runoff and TSS loading calculations
- A simplified flow network to accommodate a more extensive drainage network

Given the availability of spatial datasets at the 30-meter pixel scale resolution, runoff generation can be calculated to match the scale of variation of those inputs. This requires processing of very large raster data sets, which is performed with functions written in the R Statistical programming language (https://www.r-project.org/) and Model Builder in ArcGIS Pro from ESRI (https://www.esri.com/en-us/home). Each step of the spatial modeling process is fully documented below; results are output in raster layers that are used for interim validation at each step of the processing.

Development of distributed rainfall inputs

Within urbanized areas, swTELR is driven by precipitation measurements from local rain gages (usually within an MS4 boundary), but the regional scale requires rainfall inputs in areas that are often far from rainfall gauge measurements. The PRISM interpolated rainfall data sets produced by Oregon State University (http://prism.oregonstate.edu/) provides a very good solution to estimate precipitating across the entire landscape. The PRISM climate group compiles climate observations from a wide range of monitoring networks, applies robust quality control and spatial interpolation techniques, and provides climate data at various spatial/temporal resolutions covering the period from the year 1895 to the present. The standard products available from the PRISM Group (e.g., monthly mean values) were not adequate since TELR requires several percentile values from a 30+ year rainfall record to specify precipitation inputs. Instead, a program was created using functions written in R to acquire the appropriate PRISM historical raster layers for each year for the period 1981-2016 and perform a series of raster data processing steps. After the 35-year sequence is acquired (12,775 raster layers), they were stacked so that each 4 km^2 pixel represents a time series of values for that grid cell. From these layers, percentile values that describe the shape of the precipitation data distribution were calculated for each pixel and these values were used to drive runoff generation in Regional TELR.

Initial validation showed good correspondence between TELR inputs from local gauge data downloaded from the Western Regional Climate Center (https://wrcc.dri.edu/) and the PRISM-calculated percentile values (12.5, 50, 85, 95) for 15 Central Coast cities, with slightly lower estimates from the PRISM data (see Figure 3C-1). To correct the consistent bias towards underprediction of precipitation values form the interpolated PRISM data, a linear regression model was fit to these data to specify the bias correction via the equation shown in Figure 3C-1.

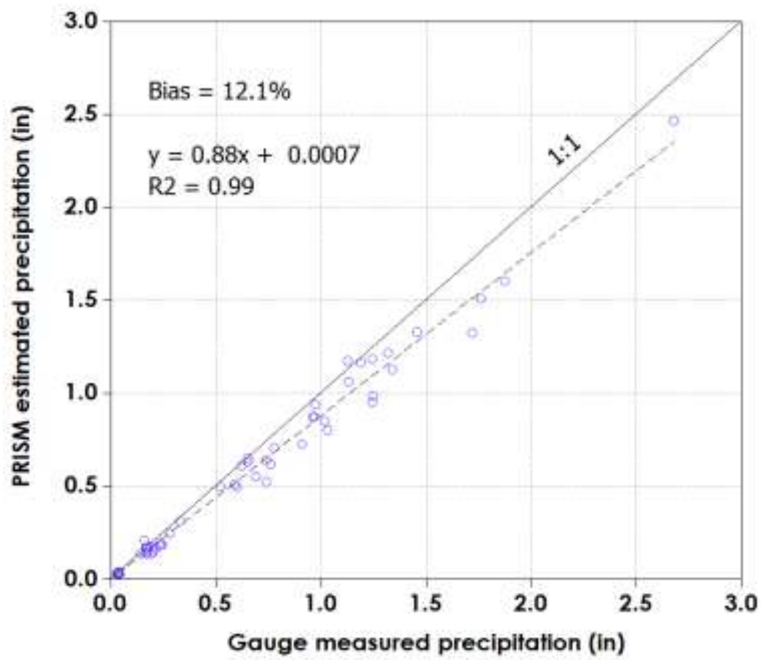


Figure 3C-1. Correspondence between calculated percentile values for WRCC rain gauges and PRISM interpolated data for 15 Central Coast Cities.

Changes to runoff generation algorithms

The NRCS-CN method represents storage as an *initial abstraction*, which incorporates all losses before runoff begins, including water retained in surface depressions, water intercepted by vegetation, evaporation, and infiltration. Runoff does not begin until the initial abstraction has been exceeded. The initial abstraction is variable across the landscape but is highly correlated to the curve number (NRCS-USDA-1986). A value of to 5% was used in swTELR, as research indicates that this is most appropriate value for urbanized areas (Woodward et al., 2003; Lim et al., 2006; Shi et al., 2009), especially for the less-permeable hydrologic soil groups C and D (Jiang, 2001). This affects calculation of the maximum potential soil moisture retention after runoff begins, and in swTELR was adjusted based on model fitting reported in the hydrologic literature (Hawkins et al., 2002; Lim et al., 2006). For R-TELR, the initial abstraction is set to 20% and the maximum soil moisture retention after runoff begins is returned to the original calculation method. Both of these components are implemented as originally specified in USDA-NRCS (1986).

Land-cover based curve number speciation in undeveloped areas

Higher runoff curve numbers generate more runoff per unit amount of rainfall. In urban environments, the curve number is determined in swTELR via the soil type and the amount of impervious coverage, with curve numbers increasing linearly with additional imperviousness. This method is less applicable to more rural areas, where there is usually very little impervious coverage and so other factors are more important for determining runoff generation, such as the nature of the vegetation cover (e.g., forest vs grassland). For example, in development of the RWSM, Lent et al. (2011) tested specification of runoff ratios using both percent impervious and NLCD land cover data and found variable performance depending on factors such as rainfall amounts, slope, and imperviousness. Following from this example, R-TELR adopts a two-branched spatial data processing approach, wherein the method of curve number depends on the level of impervious cover. For pixels with > 5% impervious cover (usually urbanized areas), R-TELR employs the same method as swTELR for specifying curve numbers based on NRCS soil class and percent impervious cover. Outside of urbanized areas we used the NRCS soil classes in conjunction with the National Land Cover Dataset (NLCD), with corresponding USDA-reported land cover-based curve numbers (USDA, 1986) to specify curve number values (Table 3C-1; e.g., Eslinger et al., 2012). In natural landscapes we expect soil and vegetation storage to be more important factors dictating runoff response than in urbanized environments, and the curve-number specification method reflects this understanding.

Table 3C-1. NLCD Land Cover and USDA starting curve numbers for NRCS soil types before adjustments for impervious coverage (USDA, 1986). CRCs are median values reported in 35 separate stormwater quality studies and the National Stormwater Quality Database (NSQD, 2015; http://www.bmpdatabase.org/nsqd.html).

NLDC Land Cover	NLCD Category#	USDA Cover Type	NRCS Soil Type CN			
			A	B	C	D
Developed, Hi-Intensity	24	Commercial and Business	89	92	94	95
Developed, Medium-Intensity	23	1/8 Acre Residential	77	85	90	92
Developed, Low Intensity	22	1/4 Acre Residential	61	75	83	87
Developed, Open Space	21	Open Space, Fair Condition	49	69	79	84
Cultivated Crops	82	Row Crops	67	78	85	89
Pasture/Hay	81	Open Space, Good Condition	39	61	61	80
Barren Land (Rock/Sand/Clay)	31	Fallow	77	86	91	94
Grasslands/Herbaceous	71	Pasture, Grassland, Range	30	58	71	78
Shrublands/Scrub	52	Brush	30	48	65	73
Forest (Deciduous/Evergreen/Mixed)	41, 43, 43	Woods	30	55	70	77
Wetlands (Woody/Emergent Herbaceous)	90, 92	-	0	0	0	0
Open Water	11	-	0	0	0	0

Land Cover based runoff concentrations

R-TELR requires specification of characteristic runoff concentrations (CRC) to land uses beyond those that can be classified as urban development. Similar to swTELR, R-TELR employs a simple volume-concentration approach, wherein

*Pollutant Load (mass/time) = stormwater runoff (volume/time) * pollutant concentration (mass/volume)*

This approach ignores the event-specific dynamics that depend on rainfall duration and intensity that have been linked to variations in pollutant concentrations throughout an event. For example, algorithms to represent pollutant build-up and wash-off over time are common in continuous simulation models (Freni et al., 2009; 2011; Mannina and Viviani, 2010; Hossain and Imteaz, 2016), which has been shown to improve pollutant modeling performance in some cases (Wang et al., 2011). An important disadvantage, however, is that parameters for these calculations are difficult to identify with precision or validate with sampling (Freni et al., 2009). While Monte Carlo sampling of the parameter space can improve parameter identifiability and (Strecker et al., 1990; Wagener and Kollat 2007; Freni et al., 2011), high degrees of uncertainty frequently persist in model outputs when calibration is required, even when performance is improved (Beven, 1989; Petrucci and Bonhomme, 2014). Other researchers have found that pollutant accumulation and generation on event time scales is extremely difficult to predict and that similar seasonal or annual results could be obtained using constant concentrations (Sage et al., 2015). At the average annual scale, these effects are substantially less important than the drainage inputs and runoff volumes for explaining pollutant loads (Lee and Bang, 2000; Brezonik and Statelmann, 2002).

As in swTELR, the R-TELR pollutant loading module only pertains to particulate pollutants, as informed by total suspended solids (TSS) results. Particulate pollutant loading is used as the proxy measure for other pollutants, since entrainment and transport processes are similar for all particulates and large proportions of pollutants such as metals are often bound to particulate matter in runoff (Loganathan et al., 2013; Chen and Chang, 2014; Herngren et al., 2005; Sartor et al., 1972; Kayhanian et al., 2012). Strong correlations have been observed between particulates such as TSS and other water-quality constituents, including total organic carbon, nutrients, heavy metals, oil and grease (Kayhanian et al., 2012). The assumption of correspondence between particulates and other pollutants has been tested directly through targeted sampling programs that include TSS and a suite of other pollutants (2NDNATURE 2010a, 2010b, 2014; 2NDNATURE and nhc 2012, 2014), although we acknowledge that these experiments were done in primarily urbanized drainages. We expect TSS to be a less useful proxy for non-conservative constituents, such as nitrogen, that have different fate and transport properties. An alternative approach would be to use the Revised Universal Soil Loss Equation (RUSLE) to calculate sediment yields, but other researchers have found poor correspondence between measurements and RUSLE estimates at the watershed scale and have specifically recommend against using it as a planning tool (Boomer et al., 2008).

Similar to swTELR, R-TELR employs *characteristic runoff concentrations* (CRC's), which are defined as the expected average annual pollutant concentration generated from a land use in a particular condition across a range of event types (nhc et al., 2010). While similar to event mean concentration (EMC) values commonly applied in stormwater modeling (e.g., Butcher, 2003), CRCs are intended to be an annual volume-weighted average of EMC values. Outside of MS4s, land-cover types other than 'developed' usually dominate watersheds, and so this wider array of land cover types is captured by associating the full range of NLCD types with individual CRCs, analogous to how CRCs are specified for urban land uses. A literature search identified the best CRC values based on past measurements of Total Suspended Solids (TSS) for different land cover types. Table 3C-2 lists the median values for each land cover type obtained from a number of independent studies. For generation of particulate pollutant loads, R-TELR used the median value for each land cover type listed in Table 3C-2.

Table 3C-2. Rural land cover types and associated TSS measurements from various researchers. Median values reported, unless otherwise indicated. CUL = Cultivated, PAS = Pasture, Bar = Barren, GRA = Grasslands, SHB = Shrubland, FOR = Forest, WTL = Wetland.

Study	Rural Land Cover TSS (mg/L)						
	CUL	PAS	BAR	GRA	SHB	FOR	WTL
Adamus and Bergman, 1995	107	55	70	55	11	11	19
USGS, 2006	190						
Ackerman and Schiff, 2003	1191						
Tiefenthaler, et al. 2008	88						
Stein et al. 2007	112						
Tetra Tech, 2010 (mean)	355						
Line et al. 2002		143				113	
Line, 2015		422					
Line et el, 2016		350					
Bartley and Speirs, 2010	3104	259				26	
Packet, et al., 2009	612						
Jarvelein, 2014	580	40		40	40	40	
Line, 2003		65					

As previously noted, measured runoff concentrations show high variance within individual land cover types, and some land cover types have few measurements available. While our current literature search is not exhaustive, it should be noted that other approaches often rely on only a single source for specifying concentration values (e.g., Eslinger et al., 2012). For R-TELR we calculated the median TSS values for each land cover type, which helps reduce the effects of extreme values when characterizing central tendency. CRCs for urban land-use types used in swTELR are based on 23 literature studies, along with analysis of the National Stormwater BMP Database that includes thousands of individual measurements from hundreds of individual studies. For R-TELR, we binned each of the urban land-uses into one or more of the NLCD and calculated median values for each of those urban land uses (Table 3C-3).

Table 3C-3. Median concentration values for used for R-TELR CRCs. COM = commercial, IND = industrial, SFR = single family residential, MFR = multi-family residential, OTH = other HTR = high traffic road, MTR =moderate traffic road, LTR = low traffic road.

NLDC Land Cover	Class #	swTELR Urban Land Use	CRC (mg/L)
Developed, Hi-Intensity	24	HTR, MTR, IND, COM, MFR	104
Developed, Medium-Intensity	23	MTR, LTR, SFR, OTH	99
Developed, Low Intensity	22	LTR, SFR, OTH	88
Developed, Open Space	21	OTH	15
Cultivated Crops	82		355
Pasture/Hay	81		143
Barren Land (Rock/Sand/Clay)	31		70
Grasslands/Herbaceous	71, 72		48
Shrublands/Scrub	51, 52		26
Forest Deciduous/Evergreen/Mixed	41, 42, 43		33
Wetlands (Woody/Emergent Herbaceous)	90. 95		19

Incorporation of slope effects

Slope has a more important effect on runoff generation and subsequent pollutant loading in natural landscapes compared the urbanized environments where much of the cover is impervious surfaces. Runoff generation is affected by reduction of the initial abstraction (Fox et al., 1997; Chaplot and Bissonnais, 2003), a decrease in infiltration, and a reduction of the recession time of overland flow (Evett and Dutt, 1985). The NRCS-CN does not take slope into account because it was developed in cultivated landscapes, where slopes are generally less than 5%. Experiments on steeply sloping plots indeed show that they yield considerable more runoff (Sharma, 1986). Given the conceptual logic for incorporation of a slope parameter to the NRCS-CN method, a number of approaches to modification have been reported in the literature (Williams, 1995; Huang et al., 2006, Huang; Strehmel et al., 2014). While none of these have yet have been incorporated into the continuous simulation SWAT model, which also use the NRCS-CN, citing some mixed performance results (e.g., Ebrahimian et al., 2012), their potential for improving runoff and pollutant loading estimates is recognized in the recent model update documentation (USDA-NRCS, 2017).

Here, we employ the empirical method developed by Huang et al. (2006), who studied the effect of slope on runoff volumes under simulated rainfall for 11 years to modify the existing standard NRCS-CN method for land slope. They developed a slope adjusted CN empirical equation as follows:

$$CN_{2\alpha} = CN_2 \, \frac{322.79 + 15.68(\alpha)}{\alpha + 323.52}$$

…where CN_2 is the NRCS handbook for average moisture condition, $CN_{2\alpha}$ is the adjusted CN for a given slope, and A is slope ($m \cdot m^{-1}$) between 0.14 and 1.4 (14-140%). Slope was calculated using a 30-meter pixel resolution digital elevation model (DEM) for San Luis Obispo County and the slope tool in ArcGIS

Pro. Slopes greater than 14% are within the domain of this CN adjustment and are shown in Figure 3C-2, with the steepest slopes generally occurring in the Southern Santa Lucia Mountains just east of the City of San Luis Obispo.

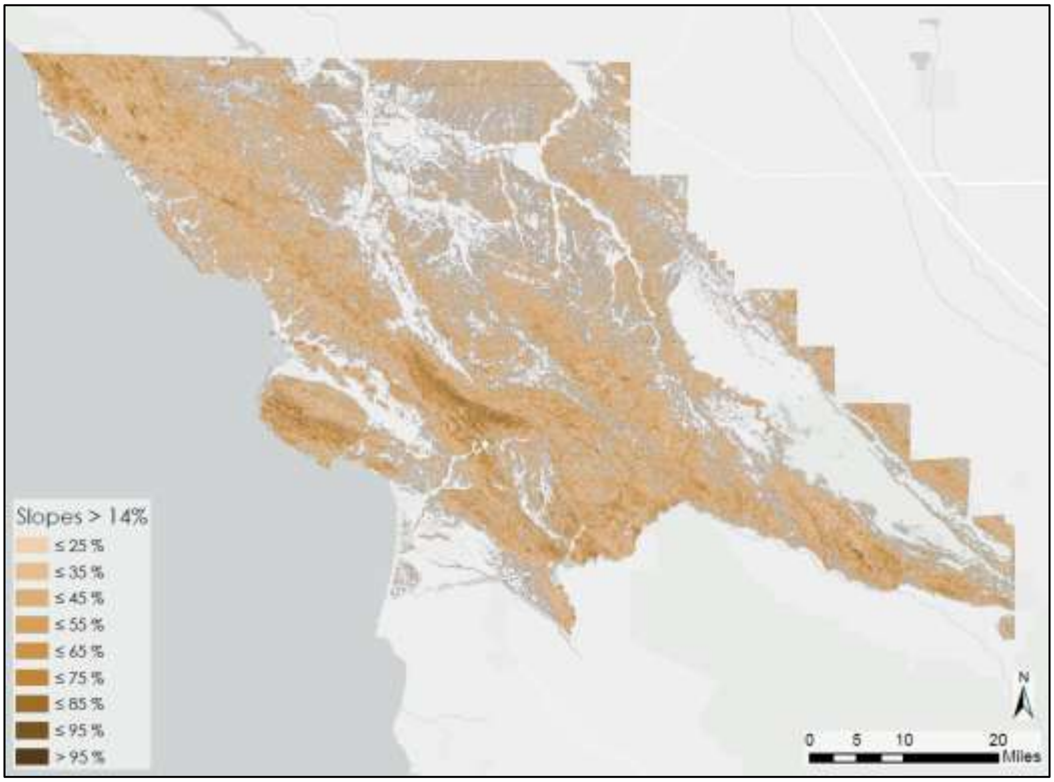


Figure 3C-2. Calculated slope from 30-m DEM for SLO County used for adjustment of curve numbers.

Thus, curve number calculated for each pixel in R-TELR were adjusted to incorporate the influence of slope on runoff generation throughout the County. The net result will be somewhat greater runoff generation and pollutant loading in these areas than would have occurred without this slope adjustment.

Simplified routing and spatial aggregation scale

Although the calculations in R-TELR are made at the 30-m pixel scale, they can be aggregated to larger areas, such as the CalWater "Planning Watershed" scale CalWater (v.2.2.1) (approximately 10,000 acres), for hydrologic routing (if required) and integration with other spatial datasets used to identify stormwater opportunities. Runoff outputs are shown at their full 30-m resolution in Figure 3C-3 with the Planning Watersheds overlaid. The highest average annual runoff values occur in densely urbanized areas with high proportions of impervious cover, such as the City of San Luis Obispo, and mountainous areas such as the Santa Lucia Range that tend to receive more rainfall and/or have steeper slopes. The gridded pattern than can be seen in Figure 3C-3 is due to PRISM rainfall grid, which at 4 km is much coarser than the NRCS Soils and NLCD land cover and impervious datasets (30 m).

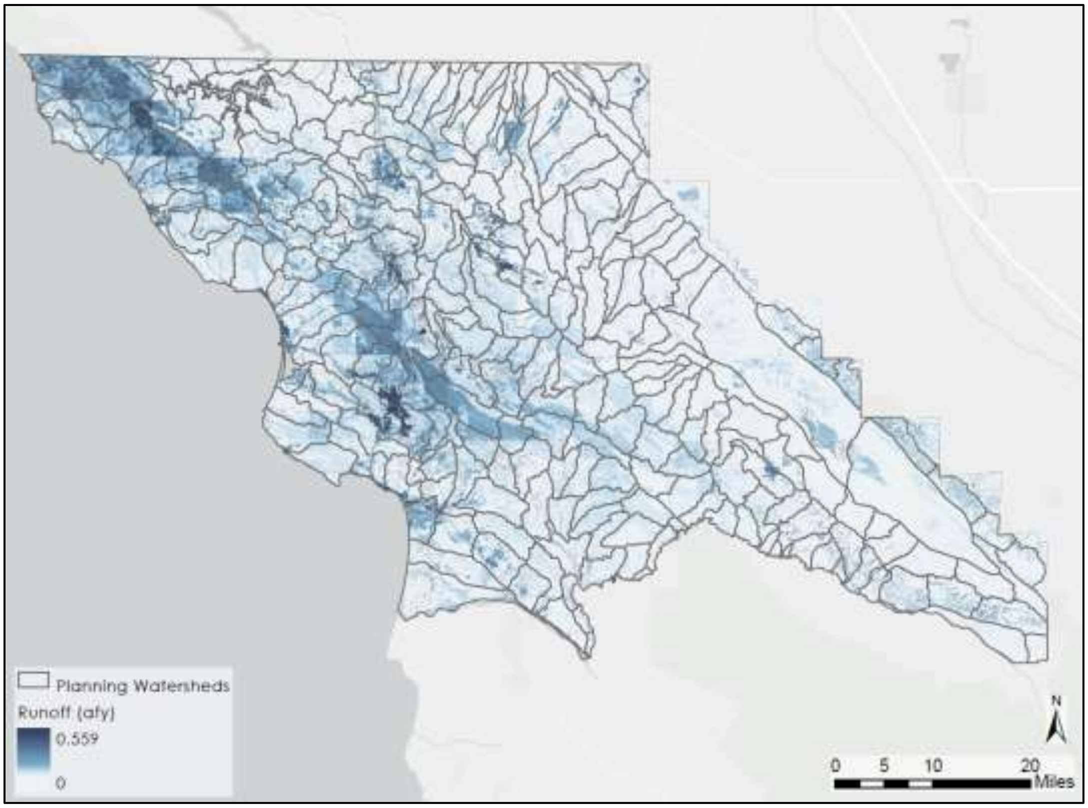


Figure 3C-3. Spatially distributed average annual runoff throughout the County, expressed in acre-feet per year per 30-m pixel.

These results can be aggregated into larger polygons to show area-normalized runoff and particulate loading (see Figure 3C-4 and Figure 3C-5 for the Salinas Watershed Group). These outputs are calculated for each of the Watershed Groups separately to illustrate relative runoff and pollutant loading impacts within each Watershed Group, and also for each Planning Watershed within the County collectively. Darker Planning Watersheds illustrate relatively higher estimated runoff and pollutant loading per unit drainage area, indicating higher potential for receiving water impacts. As anticipated, Planning Watersheds with high levels of human disturbance show greater runoff and pollutant loading. Those Planning Watersheds in the Upper Salinas that contain substantially urbanized areas, such as the City of Atascadero, show the greatest relative runoff volumes. Cultivated areas between Atascadero and Paso Robles include Planning watershed that fall into the highest pollutant loading category.

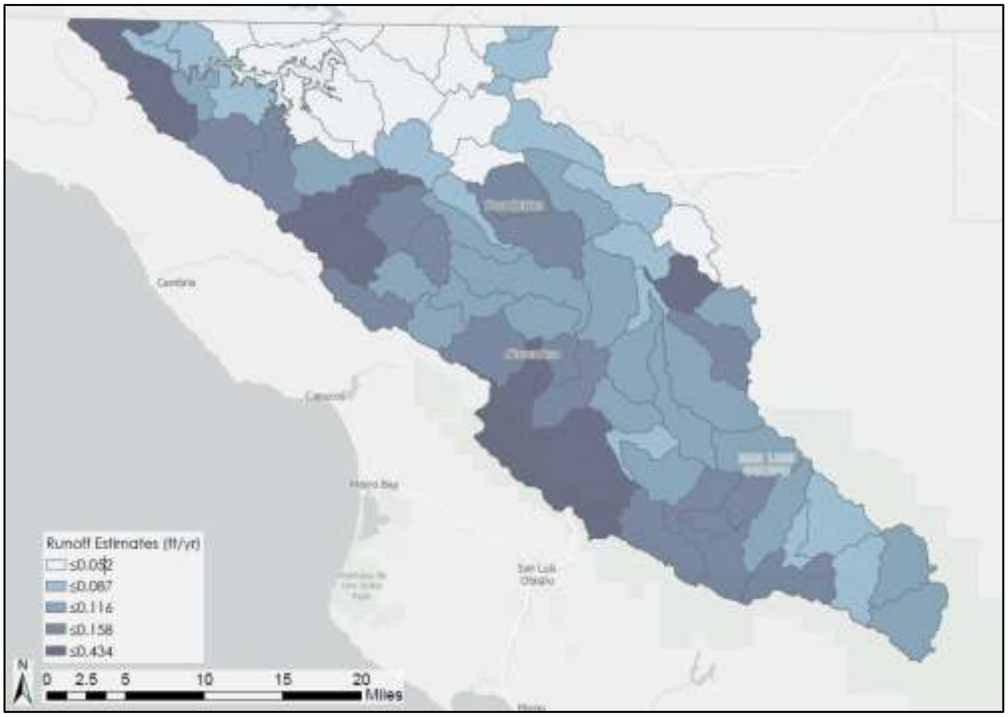


Figure 3C-4. Runoff estimates from R-TELR aggregated to the Planning Watershed scale for the Salinas Watershed Group.

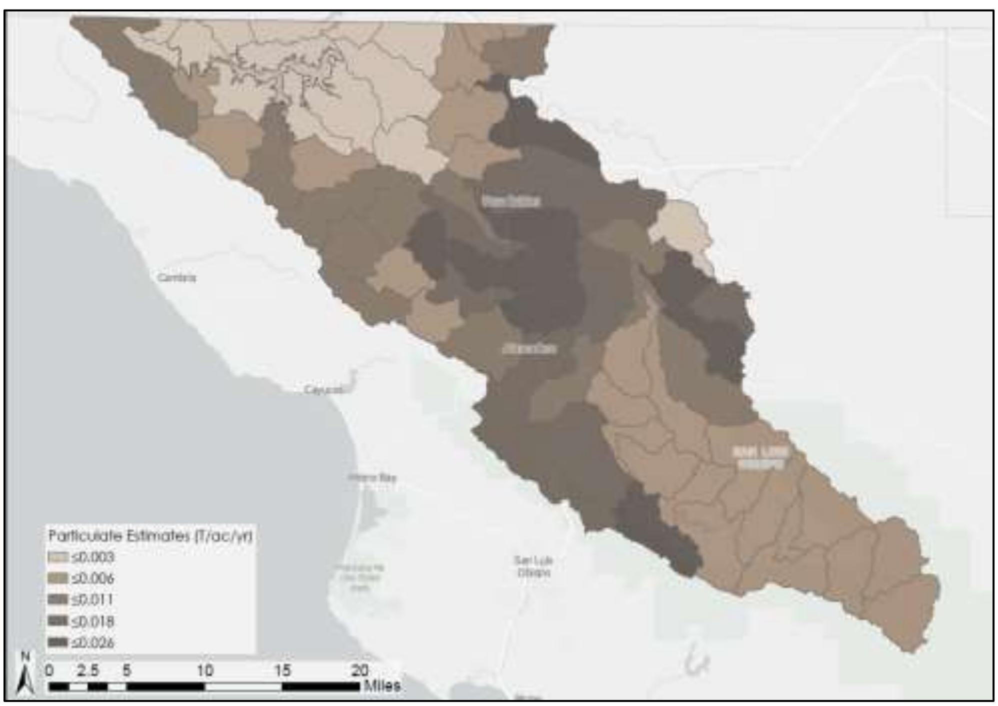


Figure 3C-5. Particulate pollutant loading estimated from R-TELR aggregated to the Planning Watershed scale for the Salinas Watershed Group.

In urbanized areas of the County with MS4 NPDES permits (shown as gray areas in Figure 3C-6), runoff and pollutant modeling using swTELR has been completed at the urban catchment scale (approximately 100 acres). Via swTELR, runoff is routed sequentially downstream from one catchment to the next. Since these urban catchment boundaries depend primarily on the stormwater infrastructure and urban hardscape, there is often poor alignment between these drainages and CalWater Planning Watersheds (see Figure 4). Consequently, runoff and pollutant modeling were performed separately at these two spatial scales and then combined to identify opportunities at these two nested spatial drainage scales. In this manner, projects located within a high priority Planning Watershed and also a high priority urban catchment would receive the highest opportunity score relative to these model-based metrics.

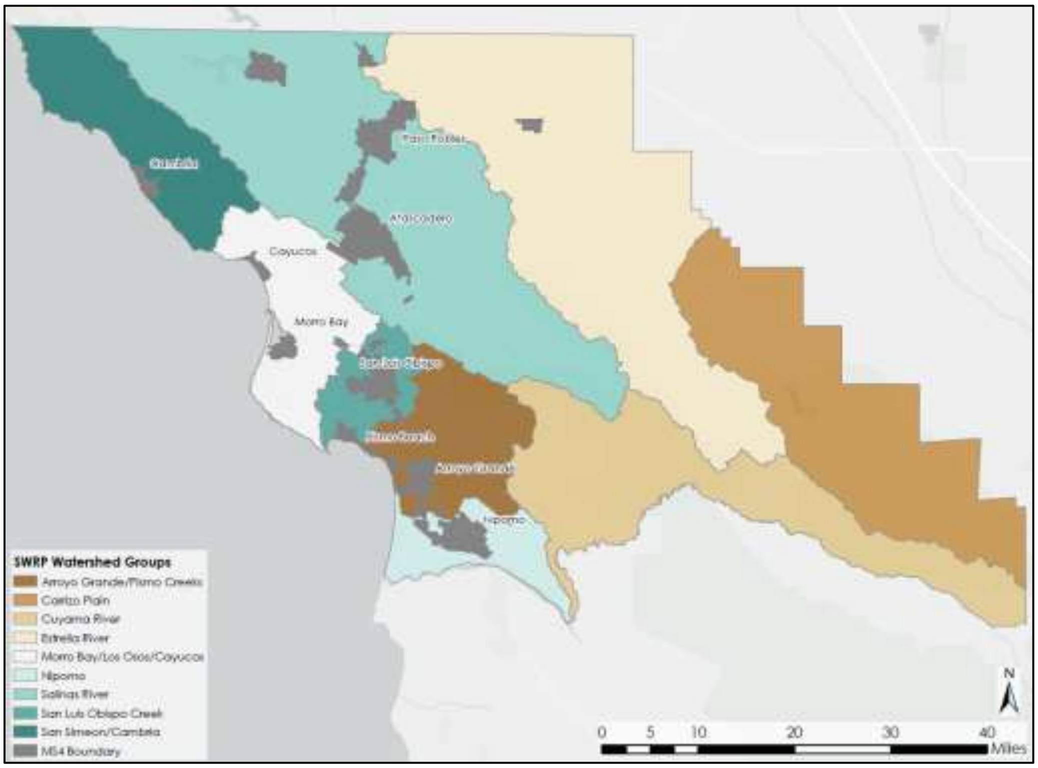


Figure 3C-6. Watershed Groups and MS4 areas within the County.

R-TELR Runoff Verification

Since TELR was developed and validated in primarily urbanized watersheds, full validation in watersheds with mostly undeveloped land-cover types has not yet been performed. Comparisons with the swTELR outputs primarily urbanized catchments shows good correspondence with no systematic bias and only random scatter that is primarily due to the distributed rainfall inputs and more granular soils data used in R-TELR (see Figure 3C-7). Outside of the urbanized catchments, where much of the area has impervious cover of < 5%, estimates from swTELR and R-TELR diverge more markedly, primarily due to NLCD land-cover-based curve number specification in these areas. This effect can be seen as data points that fall farthest below the 1-to-1 line, indicating much lower runoff predictions for R-TELR than for swTELR. Comparisons with swTELR outputs provide confidence that the runoff generation algorithms are working as intended, but it still does not provide direct evidence of R-TELR model accuracy, which requires comparisons with measured data. The fact that the runoff generation algorithms used in R-TELR have been tested in many regional-scale applications as part of other modeling platforms (e.g., USDA SWAT), provides a good deal of confidence that the estimates may as reliable as any other model that functions on similar time and spatial scales. Nonetheless, comparison with measured data is a valuable exercise to determine the usefulness of estimates in a decision-making context (e.g., Wu et al., 2016).

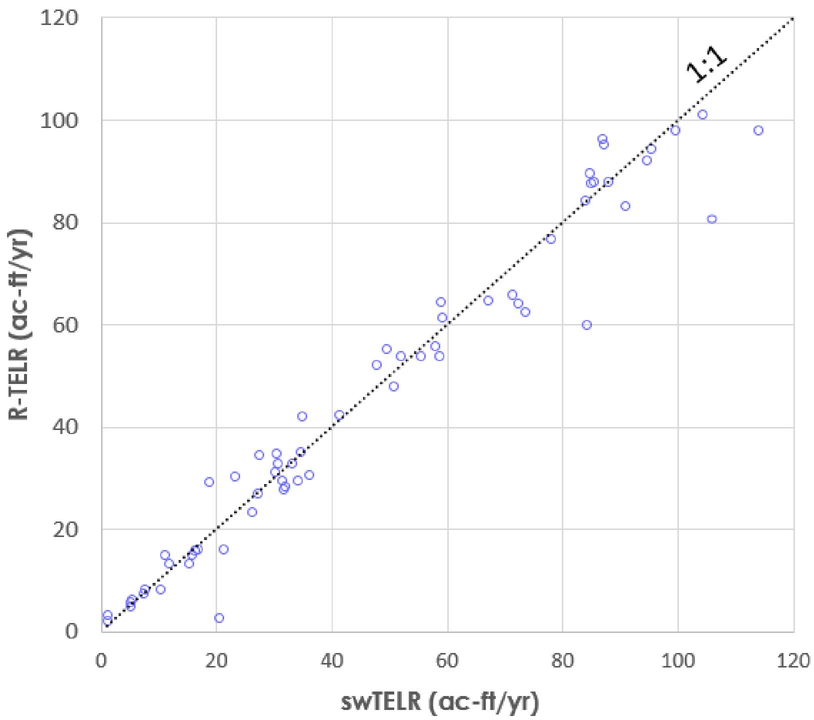


Figure 3C-7. Validation experiment results comparing swTELR outputs with those of R-TELR for 63 urban catchments within the City of Watsonville.

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APPENDIX 3-C

A Comprehensive Listing of Stormwater Management Techniques

STORMWATER CONTROL MEASURE Type/Sub-Type	**Description**	
Parcel-Scale Projects	*Parcel-scale SCMs, sometimes referred to as decentralized SCMs, can be located on private or public parcels and typically manage runoff from the parcel only. They can be effective on a project by project basis but must be evaluated for their benefit on a wider local or regional scale due to feasibility challenges associated with long-term O&M, site constraints, and performance.*	• Morro Bay State Park Permeable Parking Lot • Stormwater Rewards Rebate Program • Arroyo Grande Old Town Bioretention and Permeable Pavement
Cistern	Above or below-ground container used to collect and store stormwater for use as irrigation or if treated for additional uses.	
Biofiltration or bioretention	Small-scale engineered landscape areas that capture and treat stormwater. Can be designed to convey to the underground storm system via perforated pipe and/or to infiltrate into native soils.	
Infiltration Trench or Drywell	Shallow aggregate filled trench that collects and infiltrates stormwater.	
Impervious Surface Reduction/Disconnection	The practice of disconnecting stormwater conveyance to redirect from tightlines and/or impervious surfaces and then routing to low impact development (LID) features or uncompacted green spaces.	
Soil Amendments	Adding compost into existing soils to enhance infiltration and runoff reduction.	
Trees	Tree canopies provide surface area that captures rain from which it evaporates, roots take up water and create conditions in soil that promote infiltration.	

STORMWATER CONTROL MEASURE Type/Sub-Type	Description	
Pervious Pavement	Pavement material that allows infiltration of stormwater; can be used for driveways, patios, low-traffic roadways and alleys, etc.	
Neighborhood-Scale Projects	*Neighborhood-scale SCMs typically address stormwater runoff from adjacent properties and the street right-of-way. Ownership and O&M responsibility is generally by the municipality. SCM types tend to be scaled versions of the parcel-scale and regional SCM types. Stormwater design at the neighborhood scale often must take into consideration volume management for water quality objectives, flood control, and overall improvement to the flow regime.*	• 2nd Street Baywood Green Street • Oceano Drainage Improvement Project • Upper Spring Street LID Project • Atascadero Sunken Gardens Stormwater Capture • El Camino Real Greenstreets Project – Downtown Corridor • Pismo Preserve Roads Improvement Project • Embarcadero Surf Project • Embarcadero Boat Wash Project
Cistern	See above.	
Biofiltration or Bioretention	See above.	
Tree Planting	See above.	
Multi-use Online Detention Basin	Generally large basins that capture stormwater from many acres. Often designed primarily for peak flow management, with some opportunity for water-quality improvement.	
Multi-use Online Retention Basin	Generally large basins that capture stormwater from many acres. Designed to achieve a broader range of flow attenuation beyond just peak flow management, including infiltration and water-quality improvement.	

STORMWATER CONTROL MEASURE Type/Sub-Type	**Description**	
Capture and Use	Rerouting stormwater to support other uses, such as to irrigate crops, recharge GW, or improve WWTP efficiency	
Valley Gutters	Conventional stormwater conveyance used to route stormwater runoff.	
Curb and Gutter	Conventional stormwater conveyance used to route stormwater runoff.	
Impervious Surface Reduction (e.g., road diet)	See above.	
Settling Basin (sediment chamber, forebay, etc.)	A structural feature incorporated at the inlet of a basin or bioretention/biofiltration facility to provide an area for sediment capture and removal.	
Permeable Pavement	See above.	
Drywell	Underground, aggregate filled porous chamber that allows runoff to enter and infiltrate in the ground.	
Biofilter/Drywell	May include two-part design systems that combine biofiltration pre-treatment that conveys to an underground, aggregate-filled drywell or proprietary systems that provide filter cartridges or media attached to a drywell infiltration unit.	
Trash Capture Devices	Devices such as insert filters and retractable screens.	
Media Filters	Sand or other media filters, proprietary products such as those by Contech, Filterra, etc.	
Subterranean Storage/Infiltration	Engineered below-ground repositories filled with aggregate or proprietary structural storage systems that are designed to detain and convey or infiltrate runoff.	

STORMWATER CONTROL MEASURE Type/Sub-Type	Description	
Regional-Scale Projects	*Regional-scale SCMs manage stormwater from multiple blocks/acres. In the past, basins were primarily designed for flood control (peak flow management). Newer basins are often designed to include water quality and hydromodification control performance. Significant volumes of Capture-and-Use for irrigation water supply, etc. are often best achieved with Regional-Scale SCM types. Similarly, this scale is most suitable for creation of public/wildlife open spaces such as wetlands, and/or for educational purposes.*	• Ocean Infiltration Basins • Mountain Springs Sedimentation Basin • San Juan Storm Water Infiltration Project (?) • Cloisters Project
Multi-use Online Basin (Retention and/or Detention)	See above; depending on performance objectives.	
Capture and use	See above.	
Tree Planting	See above.	
Regional Subsurface Storage (proprietary)	Underground storage containers such as vaults and cisterns.	
Subterranean Storage/ Infiltration Gallery	See above.	
Storm Drain Extension to Existing Storm Drain	Conventional stormwater conveyance.	
New Storm Drain System to New Multi-use Basin	Conventional stormwater conveyance.	
Receiving Water Protection / Enhancement / Restoration	Direct modification of existing water feature to improve ecological, aesthetic, and/or public health-and-safety conditions. Also can encompass acquisition of surrounding land to maintain existing conditions.	• San Simeon Creek Road Flooding Remediation (San Simeon Creek) • Santa Rosa Creek Floodplain & Wetland Retention Plan

APPENDIX 4-A

Description and Rationale
Metrics Used to Assess Stormwater Management Benefits

Introduction

The quantitative metrics used to score identified stormwater projects and Focus Areas have been selected to measure the needs and opportunities presented by the Planning Watershed under consideration, and (for projects) the ability to achieve benefits within the four categories identified by the 2015 *Guidelines* (Water Quality, Water Supply, Flood Management, and Environment). The fifth benefit category, Community, is rated only with nonquantifiable metrics, given the qualitative nature of its criteria.

Application to identified projects

Projects must meet the basic criterion for that category to be considered under the subsidiary criteria. For each category, the basic criterion is as follows:

- Water Quality: must remove pollutants from stormwater or dry weather runoff via chemical, physical, and/or biological processes
- Water Supply: must reduce net municipal or agricultural consumption through direct reuse or aquifer recharge of stormwater runoff
- Flood Management: must reduce runoff rates or volumes of stormwater runoff
- Environment: must restore/protect watershed and/or ecological processes impacted by stormwater or dry weather runoff

These articulate the underlying intent of a stormwater resource plan—to identify projects and programs that preserve, restore, or enhance watershed processes to yield a broad suite of water quality benefits and support beneficial uses.

All proposed projects are assumed to meet the fundamental requirements of all stormwater resource plans (namely, address stormwater or dry-weather flows and achieve more than one main benefit). The projects are also assumed to be feasible given site requirements for the identified project type. Following this screening, project benefits are quantified for each of the benefit categories through the evaluation and scoring of four to six metrics, whose maximum values sum to 10 for each category. These metrics were selected to be measurable for projects at a relatively early stage of siting and design, and which collectively address the importance of the problem(s) being addressed and the potential effectiveness of the project to address them. Scores are either assigned on a "yes/no" basis (i.e., full value or 0 value, denoted in the list below as 1/0, 2/0, etc.) or as a proportional variable that can range continuously from 0 to its maximum value (denoted by 0→1, 0→2, etc.).

The total score for each benefit category (0 to 10 for each) is multiplied by a weighting factor that has been assigned by the Technical Advisory Group, reflecting the locally determined relative importance of each category. These weightings total 100%, and so the sum of the weighted benefit-category scores is a final value for project, based on its quantified metrics, that can range from 0 to 10.

Application to Focus Area identification

A subset of the project-related criteria, as described in Chapter 4, are also used to score the stormwater opportunities and needs of individual Planning Watersheds, also as segregated by the four benefit categories. The rationale for each individual metric's inclusion for this application is the same as articulated below for project scoring.

Metrics and Rationale by Benefit Category (project-only metrics in brown font)

Water Quality

- Uses treatment of the 85% 24-hr storm (2/0): Treatment of the 85% 2-hour storm is a standard criterion for many stormwater regulations, nationwide, and is specified for NPDES MS4 permits throughout California's Central Coast, including San Luis Obispo County. The exact volume varies by location, but within the County it commonly includes about 60% of the total annual rainfall.
- Uses treatment of the 95% 24-hr storm volume from the contributing catchment for design (1/0): Meeting this higher standard of treatment volume, beyond that required by most existing regulations, increases the captured volume by about one-third (thus the chosen point value).
- Treats dry-weather flows (1/0): Improvements to dry-weather flows are likely to have a disproportionate benefit on downstream receiving waters, which are likely flowing at lower rates during periods of no rain.
- Sensitive downstream receiving water (WMZs 1, 2, 3, 5, 6, 8, or 9) (2/0): In this context, a "sensitive" receiving water is either a stream or a wetland, where impacts to water quality are likely to be more significant than to higher-volume rivers or nearshore receiving waters.
- Treats specific TMDL or 303(d)-listed pollutants in downstream receiving water (2/0): Where an identified water-quality impairment already exists, projects that help to reduce the loading are presumably more valuable.
- Located in high TELR-predicted pollutant loading catchment (0→2): The net benefit of a project is a function not only of its effectiveness but also the magnitude of the problem it is addressing. Because direct monitoring of the inflow is virtually never available, the TELR-predicted loading of Total Suspended Solids is used as a surrogate measure of the likely relative loading of all pollutants. The scoring for this is scaled, with "0" for the catchment with lowest loading, County-wide (= 0 tons/acre/yr), and "1" for that with the highest loading (662 tons/acre/yr). Loadings in all other catchments are assigned their scores as continuous proportions between these two extremes.

Water Supply

- Designed to infiltrate or otherwise reuse water (1/0): This is a fundamental requirement of this category; it is likely to be achieved by virtually all projects.
- Projected quantity of water infiltrated or otherwise reused (0→3): As a complement to the prior metric, this can only be determined by those projects that have proceeded sufficiently far in design to calculate this metric. Lacking any broadly accepted standards for how much infiltrated water is "enough," this metric is scaled from the smallest (0; no additional points) to the largest (33 acre-ft/yr; 3 additional points) facilities identified in the current round of projects for this plan.
- Overlies infiltration-favorable WMZ (WMZs 1, 2, 4, 5, 8) (2/0): These areas are most likely to provide suitable sites for infiltration, the most likely approach to improving water supply from stormwater management SCMs.
- In current supply-limited area (scaled, ground subsidence from 0 to maximum value) (0→3): Existing areas of recognized groundwater overdraft represent a key criterion for developing new supplies (and/or reduced consumption). As a consistent, previously compiled metric throughout San Luis Obispo County, the magnitude of ground subsidence is used as a measure of non-equilibrium groundwater pumping. The scoring for this is scaled, with "0" for the catchment with lowest identified subsidence (i.e., 0), County-wide, and "3" for that with the highest subsidence (2.5 feet). Reported subsidence in all other catchments are assigned their scores as continuous proportions between these two extremes. Planning Watersheds overlying the three identified groundwater basins of critical overdraft in the County (Los Osos Valley, Cuyama Valley, Paso Robles Valley) (See Chapter 3) in whole or in part are also assigned the maximum value regardless of subsidence.
- In projected future supply-limited area (scaled, groundwater dependence index) (0→1): This element acknowledges the importance of anticipated future shortages in water supply based on groundwater availability, the source most directly affected by stormwater management. The scoring for this is scaled based on the groundwater dependent index (Howard and Merrifield 2010) associated with its Planning Watershed (scaled 0 to 1 for the minimum [0.3] to maximum [8.5] values, County-wide). Reported values in all other catchments are assigned their scores as continuous proportions between these two extremes. Planning Watersheds overlying the three identified groundwater basins of critical overdraft are also assigned the maximum value regardless of subsidence.

Flood Management

In our judgment, simplified modeling tools are too crude and inaccurate to credibly evaluate the "true" benefit of most stormwater projects on existing or projected flooding problems. The metrics therefore emphasize the presence of existing flood hazards, the effectiveness of the project relative to its contributing catchment area, and the overall magnitude of upstream runoff.

- Designed to infiltrate or otherwise detain water (1/0): Although other approaches can achieve flood-management objectives (e.g., a piped bypass system), the listed approaches are more likely to produce multiple benefits from stormwater management.
- Quantity of water infiltrated or otherwise detained, as determined by the facility volume (0→3): Not every identified project will be at a point in its design to quantify this benefit. Those that are receive a scaled score, with 0 for the lowest value (0 ac-ft/yr) and 3 for the highest value (25 ac-ft/yr) amongst all currently identified projects, County-wide, included in this Plan. Quantities for all other projects are assigned their scores as continuous proportions between these two extremes.
- Addresses existing flooding and/or sedimentation risks to public property and/or human health and safety (4/0): This is the key criterion for any flood-hazard reduction program or project—is there an existing problem that the project is targeting?
- TELR-predicted runoff in catchment (scaled, minimum to maximum runoff) (0→2): This scoring makes use of a readily available, objective measure of the relative significance of upstream runoff quantity. The scoring for this is scaled, with "0" for the catchment with lowest unit-area runoff quantity, County-wide (0.3 ft/yr), and "2" for that with the highest runoff quantity (5848 ft/yr). Quantities for all other projects are assigned their scores as continuous proportions between these two extremes.

Environment

- Designed to infiltrate the 85% 24-hr storm volume from the contributing catchment (2/0): In general, the loss of infiltration is the single most critical alteration of watershed processes accompanying the generation of stormwater runoff by human activity. Using this criterion follows the precedent of the other benefit categories to quantify the environmental benefits of restoring this watershed process.
- Creates/protects wetland, in-stream, or riparian habitat (0→2): Although not necessarily a component of projects that manage stormwater or dry-weather flows, any such action would increase the environmental benefits. This metric is scaled across a range of lengths/areas (depending on the type of project), whose limits are based on general experience with the range of such projects commonly implemented across the region. Amongst the current list of projects in this Plan, these values range from 0 to 1,050 feet for linear restoration projects, and 0 to 60 acres for the area-based restoration projects.
- Number of at-risk aquatic animal species (from EnviroAtlas) (0→2): EnviroAtlas (https://www.epa.gov/enviroatlas) provides a USEPA-compiled inventory of at-risk aquatic species at the spatial scale of Planning Watersheds, which allows a quantitative rating of the potential environmental benefits of successful stormwater management.

  The EnviroAtlas dataset includes analysis by NatureServe of species that are Imperiled (G1/G2) or Listed under the U.S. Endangered Species Act (ESA) by 12-digit Hydrologic Units (HUCs). Results are provided for the total number of Aquatic Associated G1-G2/ESA species, the total number of Wetland Associated G1-G2/ESA species, the total number of Terrestrial Associated G1-G2/ESA species, and the total number of Unknown Habitat Association G1-G2/ESA species in each HUC12. EnviroAtlas (https://www.epa.gov/enviroatlas) allows the user to interact with a web-based, easy-to-use, mapping application to view and analyze multiple ecosystem services for the contiguous United States. The dataset is available as downloadable data (https://edg.epa.gov/data/Public/ORD/EnviroAtlas) or as an EnviroAtlas map service. Additional descriptive information about each attribute in this dataset can be found in its associated EnviroAtlas Fact Sheet (https://www.epa.gov/enviroatlas/enviroatlas-fact-sheets).

The scoring for this is scaled, with "0" for the catchments lacking any identified at-risk species, County-wide, and "2" for that with the highest number (5 species). Quantities in all other catchments are assigned their scores as continuous proportions between these two extremes.

- Length of identified critical steelhead habitat within catchment (0→3). As a critical, ESA-listed species with complete dependence on adequate streamflow and suitable habitat, impacts to this species is one of them most direct potential effects of multi-benefit stormwater management projects. The scoring for this is scaled, with "0" for the catchments lacking any identified habitat, County-wide, and "3" for that with the greatest length (over 27 miles, in Santa Rosa Creek). Quantities in all other catchments are assigned their scores as continuous proportions between these two extremes. The data are obtained from http://www.westcoast.fisheries.noaa.gov/maps_data/endangered_species_act_critical_habitat.html; Endangered Species Act Critical Habitat GIS shapefiles from NOAA West Coast Fisheries, as of March 2018.

- TELR-predicted runoff in catchment (scaled, minimum to maximum runoff) (0→1): As above, this readily available and objective measure of relative upstream runoff quantity should correlate with net environmental benefits. The scoring for this is scaled, with "0" for the catchment with lowest unit-area runoff quantity, County-wide (0.3 ft/yr), and "1" for that with the highest runoff quantity (5848 ft/yr). Quantities in all other catchments are assigned their scores as continuous proportions between these two extremes.

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APPENDIX 4-B

Identified Project and Program Descriptions

Project/ Program Name	TAC AREA	Project/ Program Location	Project/ Program Type	Status	Summary
San Simeon Creek Road Flooding Remediation (planning through design and construction)	No. 1	San Simeon Creek Road has a low area that floods, which is about 550 feet east of Van Gordon Creek Road.	Channel restoration	Planning/Design Phase	Project would assess the flow channel of Van Gordon Creek and its associated culverts due to the creek channel overflowing its western bank onto State Parks property during heavy rainfall. The main Van Gordon Creek flow channel would be cleared of debris and severely corroded or undersized culverts would be replaced to allow flow from a 100-year return frequency storm to pass without flooding. The low point of the roadway may be increased in elevation to improve upon drainage along the roadway shoulders.
Santa Rosa Creek Floodplain & Wetland Retention Plan	No. 1		Watershed based	Planning/Design Phase	Increase the flood retention in the upper and middle reaches of Santa Rosa Creek to increase percolation and reduce flood risk. Based on percolation potential, approximately 19,000 acres with high and medium potential for groundwater recharge were identified.
Santa Rosa Creek Streamflow Enhancement	No. 1		Watershed reach scale	Planning/Design Phase	The approaches to enhance dry season flows in Santa Rosa Creek are: 1) capturing and retaining water in the watershed from winter storms, and 2) reducing the amount of water being utilized (i.e. consumptive use): capture and recharge of peak wet season flow, increased water conservation, and greywater systems for non-potable water.
Capture and Reuse of Storm Water	No. 2	9th and El Morro	Regional CIP	Conceptual Phase	The District would like to redistribute the storm water to the Los Osos Waste Water Treatment Plant to supplement their recycled water program.

Bioreactor Installation in Morro Bay Watershed	No. 2	Various locations in Morro Bay watershed	Watershed reach scale	Conceptual Phase	Sub-watersheds (e.g., Warden Creek) within the Morro Bay watershed have elevated nitrate levels. Bioreactors could be implemented to capture agricultural run-off and treat elevated nitrates at multiple locations in the watershed.
Various Projects, Camp San Luis Obispo	No. 2	Camp San Luis Obispo	Groundwater recharge, flood management, water quality, rain capture	Conceptual Phase	Camp San Luis Obispo is proposing several stormwater management projects for implementation throughout the installation.
2nd Street Baywood Green Street Project	No. 2	2nd Street in Baywood/Los Osos at Baywood Pier	Green Street	Conceptual Phase	The concept design integrates stormwater management, improves pedestrian safety, and is consistent with the community's planning effort. Conceptual Design available at: https://www.centralcoastlidi.org/project-details.php?id=3
Embarcadero Surf Project	No. 2	Embarcadero at terminal end of Surf St.	constructed project-Biofiltration LID	Concept Design	A raised planter box biofiltration SCM would provide water quality treatment, public seating and urban greening improvement on the waterfront. Runoff would be routed into the SCM, infiltrated through bioretention soil media with treated runoff exiting the SCM via an underdrain.
Cloisters Project	No. 2	Cloisters Community Park	constructed project-Infiltration Basin		The green infrastructure project opportunity includes modification of the existing swale to improve detention, infiltration and water quality treatment by creating a series of infiltration cells that slow and hold water. Excess flows would be conveyed to the existing wetland. Significant stormwater management is provided at a low cost ($6.50 per square foot).
Embarcadero Boat Wash Project	No. 2	South end of Embarcadero near the Boat Wash Station	constructed project - biofiltration LID (dry and weather runoff)	Concept Design	Runoff would be routed into biofiltration SCM, infiltrated through bioretention soil media with treated runoff exiting the SCM via an underdrain to the existing piped stormwater conveyance system. The existing inlet also receives stormwater runoff from the north. This project option only addressed the DMA that includes the boat wash area.

Morro Bay State Park Marina Parking Lot LID	No. 2		LID Retrofit	Planning/Design Phase	This project would support the planning and installment of stormwater pollution prevention infrastructure at this waterfront location.
Meadow Park Capture and Use	No.3	Meadow Park, City of San Luis Obispo	Capture and reuse	Concept Design	A StormTrap system (or other proprietary system) would be installed, with stormwater runoff routed to the system. Additionally, the design includes an irrigation component so that captured stormwater can be used to irrigate the park
Mitchell Park Bioretention	No.3	Mitchell Park, City of San Luis Obispo	constructed project-Biofiltration LID	Concept Design	The Mitchell Park Bioretention Project will manage stormwater runoff from the surrounding residential neighborhood. This project will capture and infiltrate approximately 25% of the 85th percentile, 24-hour storm event from the contributing 4 acres.
Higuera Widening Project	No.3	Vicinity of Higuera and Broad streets, City of San Luis Obispo	constructed project-Biofiltration LID	Concept Design	A variety of road-widening, convenyance-improvement, and biofiltration project elements along this arterial in the southern part of the city.
Stormwater Infiltration basins	No. 4	various locations within Oceano	LID New	Planning/Design Phase	Storm water infiltration basins are being pursued as part of the Oceano CSD's Low Impact Development efforts. In addition, the District is considering an LID storm water recharge for its parking lot.
Pismo Preserve Roads Improvement Project	No. 4	80 Mattie road, Pismo Beach CA	BMP Implementation	Conceptual Phase	The Land Conservancy would like to improve the drainage features on the dirt roads at Pismo by using modern BMPs for dirt road design, including out sloping roads, rolling dips and armoring drainage features.
Corbett Creek Floodplain and Stream Restoration	No. 4	456 Carpenter Canyon Rd, APN # 007 791 032	BMP Implementation	Planning/Design Phase	Component 1 of the project is to design, permit, and implement a floodplain sediment basin. Component two is to design and draft permits for a channel restoration project along 4200 ft of stream to restore the channel geometry thereby increasing flow volumes.

South Halcyon Green / Complete Street	No. 4	South Halcyon Road between US -1 and US-101	Green Street	Planning/Design Phase	The City of Arroyo Grande would like to evaluate improvements that address mobility (bike, pedestrian, vehicles, transit), urban greening, and stormwater management.
Oceano Drainage Improvement Project	No. 4	Incorporated are of Oceano, north of AG Creek along Hwy 1 near 13th Street and Paso Robles Street intersections	Regional CIP	Ready for Implementation	The proposed improvements for the project are designed to reduce the potential for flooding at the intersection of Highway 1 with 13th Street and Paso Robles Street. The Project consists of installing new storm drain facilities near and around the intersection of Highway 1 with 13th and Paso Robles Street, additional storm drain facilities within 15th street and Paso Robles Street intersection, a concrete sedimentation basin in the RV Storage Lot near Arroyo Grande Creek, a box culvert through the existing Arroyo Grande Creek levee and road side infiltration systems within the existing residential community.
Implementation Plan for the Oso Flaco Watershed	No. 5		BMP Implementati on Plan	Planning/Design Phase	The Alternatives Analysis and BMP Implementation Plan is a planning, monitoring and outreach project to develop an alternatives analysis and implementation plan to address groundwater and surface water pollution, agricultural and storm water runoff and conveyance issues.
Upper Spring Street LID	No. 7	Spring Street (24th Street to 36th Street)	Regional CIP	Conceptual Phase	The conceptual project will redevelop Spring Street to construct and incorporate bioretention features along the Spring street corridor from 24th Street to 36th Street.
Mountain Springs Sedimentation Basin	No. 7	Mountain Springs Road and Nacimiento Lake Road	Regional CIP	Planning/Design Phase	The proposed project is to construct a stormwater infiltration basin that will receive stormwater runoff from a 1,400-acre watershed area located n the western boundary of Paso Robles.
Montebello Oaks Basin Retrofit	No.7	Lat/Long: 35°38'21.86"N 120°40'36.01" W	Regional CIP	Conceptual Phase	The proposed project is to retrofit an existing basin and drainage outfall area, and to repair the basin to increase functionality and retrofit the outlet area to include an infiltration basin as well as features to arrest sediment, and peak flows to the receiving water.

Grand Canyon Basin Retrofit	No.7	Lat/Long: 35°37'16.75"N 120°39'20.01" W	Regional CIP	Conceptual Phase	Retrofit existing basin to encourage infiltration and mitigate peak flows within the watershed.
Melody Basin Retrofit	No.7	Lat/Long: 35°37'1.43"N 120°39'52.90" W	Regional CIP	Conceptual Phase	Retrofit the basin to include features that allow increased infiltration, increase wetland vegetation, and create a walking trail that allows better visibility and public use.
Niblick LID Drainage Retrofit	No.7	Lat/Long: 35°36'56.34"N 120°40'2.62"W	Regional CIP	Conceptual Phase	Retrofit an existing road side drainage that receives runoff from the surrounding urban landscape area.
Atascadero Sunken Gardens Stormwater Capture	No. 7	El Camino Real @ West Mall	Regional CIP	Conceptual Phase	. Project proposes roadway edge treatment improvements and underground infiltration chambers within the city-owned Sunken Gardens from approximately 18.7 acres of developed urban core.
El Camino Real Greenstreets Project	No. 7	El Camino Real - from Highway 41 to Traffic Way	Green Street	Conceptual Phase	Capture and treat storm water runoff for a 9-acre portion of downtown Atascadero. Project BMP components include on-street median or roadway edge vegetated swales, vegetated bulbouts, and larger planter retention basins.
San Juan Storm Water Infiltration Project	No. 8	San Juan Valley east of Shell Ck. Rd. and west of San Juan Rd.	Groundwater recharge	Conceptual Phase	A project to capture excess storm water and spread it for slow percolation into the groundwater on sandy open fields and vineyards.
Stormwater Rewards Rebate Program	All	County wide	LID Retrofit	Conceptual Phase	The Stormwater Rewards Rebate Program will provide cost-share rebates to landowners retrofitting their property with Low Impact Development practices that slow, spread, and sink stormwater runoff. Program will install BMPs such as rain gardens, cisterns, and vegetated swales, among others. Priority will be on highly impervious land uses. Outreach workshops will expand knowledge on LID implementation for landowners, installers and vendors.

Agricultural Water Management	All	County wide	Technical assistance and education	Conceptual Phase	Provide education, training, technical support, and capital funding to improve agricultural water management and irrigation efficiency: 1. Funding assistance for agricultural water meters and other irrigation system improvements. 2. Development of mobile applications for weather based irrigation scheduling. 3. Education, outreach and training for farmers on irrigation water management. 4. Conducting Irrigation system evaluations with the CSLRCD Mobile Irrigation Lab. 5. Funding for irrigation system improvements. 6. Funding for farm-scale sediment capture / stormwater infiltration BMPs. 7. Assist farmers with funding (grant or other) applications to replace inefficient pumps and motors.
County-wide Key Percolation Zone Study	All	Countywide program	County-wide planning	Ready for Implementation	Study will provide resource managers the ability to develop projects to improving groundwater conditions, identifying Key Percolation Zones in two pilot watersheds (Santa Rosa and San Luis Obispo creeks) and apply the methodology to the remaining 23 watersheds identified in the SLO Watershed Management Plan.
Earth Genius - Educational Programming	All	Any of 43 public elementary schools in the County.	Educational program	Ready for Implementation	One Cool Earth's Earth Genius program provides water-focused education and hands-on projects with real-world impacts at public elementary schools in San Luis Obispo County. The program works with schools year-round, reaching all students in the school with several interactions throughout the year, installing demonstration projects with students and completing standards-based curriculum.

APPENDIX 4-C

Identified-Project Scoring Sheets

The first two pages show the components of the individual Benefit Categories; the third page combines those individual scores into a weighted final sum. Note that the weighting factors are different for different Watershed Groups, and so the same individual scores for two different projects could yield different final sums.

				Water Quality							Water Supply						
Project Name	**TELR Catchment**	**TAC Area**	**CALWATER Number**	***Treats 85th***	***Treats 95th***	***Treats Dry Weather Flows***	***Sensitive DS RW Score***	***Impaired Waterbody Score***	***Particulates Rank Score***	***Total Water Quality Score***	***Q infiltrated or reused***	*Q inflitrated PCR*	***Q infiltrated Score***	***Infiltration Favorable Score***	***Supply Limited Area Score***	***Future Supply Limited Area Score***	***Total Water Supply Score***
San Simeon Creek Road Flooding Remediation		1	5958	0	0	0	0.6	2.0	1.6	**4.2**	0.0			0.4	1.9	0.8	**3.2**
Santa Rosa Creek Floodplain & Wetland Retention Plan		1	5994	0	0	0	2.0	0.0	1.7	**3.7**	0.0	0.6	1.9	0.4	1.8	0.8	**5.0**
Santa Rosa Creek Streamflow Enhancement		1	5994	0	0	0	2.0	0.0	1.7	**3.7**	0.0	0.9	2.6	0.4	1.8	0.8	**5.7**
Capture and Reuse of Storm Water. Conceptual Phase	LOS 14	2	6159	2	1	0	0.1	2.0	0.7	**5.8**	1.0			0.8	3.0	1.0	**5.8**
Bioreactor Installation in Morro Bay Watershed		2	6181	0	0	0	2.0	2.0	1.9	**5.9**	0.0			0.2	3.0	1.0	**4.2**
Camp San Luis Obispo Projects	SLF 2	2	6151	2	1	0	2.0	0.0	1.0	**6.0**	1.0	0.5	1.5	0.4	2.8	0.8	**6.5**
2nd Street Baywood Green Street Project	LOS 15	2	6159	2	0	0	0.1	2.0	0.5	**4.6**	1.0	0.4	1.1	0.8	3.0	1.0	**6.9**
Embarcadero Surf Project	MB3	2	6088	2	0	0	0.6	0.0	0.6	**3.2**	0.0			0.2	2.5	0.8	**3.4**
Cloisters Project	CP1	2	6088	2	0	0	0.6	0.0	0.3	**2.9**	0.0	1.0	3.0	0.2	2.5	0.8	**6.4**
Embarcadero Boat Wash Project (small)	MB6	2	6126	2	0	1	0.6	2.0	0.6	**6.2**	0.0			0.4	2.4	0.9	**3.8**
Embarcadero Boat Wash Project (large)	MB6	2	6126	2	0	1	0.6	2.0	0.6	**6.2**	0.0			0.4	2.4	0.9	**3.8**
Morro Bay State Park Marina Parking Lot LID	MB9	2	6126	2	0	0	0.6	2.0	0.2	**4.8**	0.0	0.4	1.1	0.4	2.4	0.9	**4.9**
Meadow Park Capture and Use	SLO 48	3	6196	0	0	0	2.0	2.0	0.9	**4.9**	1.0			0.4	2.6	1.0	**4.9**
Mitchell Park Bioretention	SLO 36	3	6196	2	1	0	2.0	2.0	0.9	**7.9**	1.0	0.6	1.7	0.4	2.6	1.0	**6.6**
Higuera Widening Project	SLO 37	3	6172	0	0	0	2.0	2.0	0.7	**4.7**	0.0			0.2	2.7	0.8	**3.7**
Stormwater Infiltration basins		4	6288	2	0	1	0.6	2.0	2.0	**7.6**	1.0	0.9	2.8	2.0	2.5	1.0	**9.3**
Pismo Preserve Roads Improvement Project	Pismo 12	4	6258	0	0	0	0.6	2.0	0.5	**3.1**	0.0			0.8	1.1	0.8	**2.8**
Corbett Creek Floodplain and Stream Restoration	AGF 7	4	6268	0	0	0	2.0	0.0	0.5	**2.5**	0.0			2.0	2.3	0.9	**5.2**
Oceano Drainage Improvement Project	OCE 6	4	6288	0	0	0	0.6	2.0	0.7	**3.3**	0.0			2.0	2.5	1.0	**5.5**
South Halycon Green / Complete Street		4	6288	0	0	0	0.6	2.0	2.0	**4.6**	0.0			2.0	2.5	1.0	**5.5**
Oso Flaco Watershed		5	6350	0	0	0	2.0	2.0	1.6	**5.6**	0.0			2.0	0.7	0.5	**3.2**
Upper Spring Street LID	PR 28	7	5937	2	0	0	0.2	2.0	0.5	**4.7**	1.0	0.8	2.4	0.8	3.0	1.0	**8.2**
Mountain Springs sedimentation basin		7	6142	0	0	0	2.0	0.0	0.9	**2.9**	0.0			0.0	1.2	0.8	**2.0**
Montebello Oaks Basin Retrofit	PR 38	7	5937	0	0	0	0.2	2.0	0.4	**2.5**	0.0			0.8	3.0	1.0	**4.8**
Grand Canyon Basin Retrofit	PR 74	7	5937	0	0	0	0.2	2.0	0.5	**2.7**	0.0			0.8	3.0	1.0	**4.8**
Melody Basin Retrofit	PR 71	7	5970	2	0	0	0.6	2.0	0.7	**5.3**	1.0	0.8	2.3	2.0	3.0	1.0	**9.3**
Niblick LID Drainage Retrofit		7	6142	0	0	0	2.0	0.0	0.9	**2.9**	0.0			0.0	1.2	0.8	**2.0**
Atascadero Sunken Gardens Stormwater Capture	AAC-16	7	6071	2	1	0	2.0	2.0	1.0	**8.0**	1.0	0.7	2.1	0.4	3.0	1.0	**7.5**
El Camino Real Greenstreets		7	6071	2	1	0	2.0	2.0	1.9	**8.9**	1.0	0.3	0.8	0.4	3.0	1.0	**6.2**
Toad Creek Basin 8A	TEM 27	7	5995	2	1	1	2.0	2.0	0.0	**8.0**	0.0			2.0	3.0	1.0	**6.0**
Toad Creek Basin 8B	TEM 36	7	5995	2	1	1	2.0	2.0	0.3	**8.3**	0.0			2.0	3.0	1.0	**6.0**
San Juan Storm Water Infiltration Project		8	5967	0	0	0	0.1	0.0	0.8	**1.0**	0.0			0.8	3.0	1.0	**4.8**

	Flood Management						Environmental						
Project Name	***Infiltrate/Detain Runoff***	*Quantity Infiltrated/Detained PCR*	***Quantity Infiltrated/Detained Score***	***Address Flooding Risks***	**Runoff Rank Score**	**Total Flood Management Score**	***Infiltrate 85th***	*Quantity Restored PCR*	***Quantity Resored Score***	***Steelhead Habitat Score***	***Number of At-Risk Aquatic Species Score***	***Runoff Rank Score***	**Total Environment Score**
San Simeon Creek Road Flooding Remediation	0			4	1.7	**5.7**	0	0	0.00	2.7	1.8	0.9	**5.4**
Santa Rosa Creek Floodplain & Wetland Retention Plan	0	0.89	2.67	4	1.7	**8.3**	0	6	2.00	2.7	1.8	0.8	**7.4**
Santa Rosa Creek Streamflow Enhancement	0	0.78	2.34	4	1.7	**8.0**	0	1.6	2.00	2.7	1.8	0.8	**7.4**
Capture and Reuse of Storm Water. Conceptual Phase	1	0.36	1.08	4	1.3	**7.4**	3	0	0.00	2.2	1.8	0.7	**7.7**
Bioreactor Installation in Morro Bay Watershed	0			0	1.6	**1.6**	0	0	0.00	0.0	1.9	0.8	**2.7**
Camp San Luis Obispo Projects	1	0.84	2.52	4	1.9	**9.5**	3	0.4	2.00	2.8	1.9	1.0	**10.7**
2nd Street Baywood Green Street Project	1	0.26	0.78	4	1.0	**6.7**	3	0	0.00	2.2	1.8	0.5	**7.5**
Embarcadero Surf Project	1	0.1	0.3	4	1.0	**6.3**	0	0	0.00	3.0	1.7	0.5	**5.2**
Cloisters Project	0	0.57	1.71	0	0.5	**2.2**	0	0	0.00	3.0	1.7	0.3	**5.0**
Embarcadero Boat Wash Project (small)	0	0	0	0	1.0	**1.0**	0	0	0.00	2.9	1.7	0.5	**5.1**
Embarcadero Boat Wash Project (large)	0	0.21	0.63	0	1.0	**1.6**	0	0	0.00	2.9	1.7	0.5	**5.1**
Morro Bay State Park Marina Parking Lot LID	1			0	0.3	**1.3**	0	0	0.00	2.9	1.7	0.1	**4.8**
Meadow Park Capture and Use	1	0.31	0.93	4	1.7	**7.6**	0	0	0.00	2.7	1.9	0.9	**5.4**
Mitchell Park Bioretention	1	0.15	0.45	4	1.7	**7.2**	3	0	0.00	2.7	1.9	0.9	**8.5**
Higuera Widening Project	0			0	1.2	**1.2**	0	0	0.00	2.7	1.9	0.6	**5.2**
Stormwater Infiltration basins	1	0.68	2.04	4	1.7	**8.8**	3	0	0.00	2.6	2.0	0.9	**8.4**
Pismo Preserve Roads Improvement Project	0			4	0.8	**4.8**	0	4	8.00	2.3	2.0	0.4	**12.7**
Corbett Creek Floodplain and Stream Restoration	0			4	0.8	**4.8**	0	0	0.00	0.0	2.0	0.4	**2.4**
Oceano Drainage Improvement Project	0			4	1.1	**5.1**	0	0	0.00	2.6	2.0	0.6	**5.1**
South Halycon Green / Complete Street	0			0	1.7	**1.7**	0	0	0.00	2.6	2.0	0.9	**5.4**
Oso Flaco Watershed	0			0	1.2	**1.2**	0	0	0.00	0.0	1.5	0.6	**2.0**
Upper Spring Street LID	1	0.47	1.41	4	0.8	**7.2**	3	0	0.00	2.5	0.0	0.4	**5.8**
Mountain Springs sedimentation basin	1	0.52	1.56	4	1.1	**7.7**	3	0	0.00	0.0	0.0	0.5	**3.5**
Montebello Oaks Basin Retrofit	0			0	0.7	**0.7**	0	0	0.00	2.5	0.0	0.4	**2.8**
Grand Canyon Basin Retrofit	0			0	1.0	**1.0**	0	0	0.00	2.5	0.0	0.5	**3.0**
Melody Basin Retrofit	1	0.73	2.19	0	1.2	**4.4**	3	0	0.00	2.3	0.0	0.6	**5.9**
Niblick LID Drainage Retrofit	0			0	1.1	**1.1**	0	0	0.00	0.0	0.0	0.5	**0.5**
Atascadero Sunken Gardens Stormwater Capture	1	0.57	1.71	4	1.8	**8.5**	3	0	0.00	2.6	1.6	0.9	**8.1**
El Camino Real Greenstreets	1	0.36	1.08	4	2.0	**8.0**	3	0.05	0.10	2.6	1.6	1.0	**8.3**
Toad Creek Basin 8A	1	1	3	4	0.0	**8.0**	3	0	0.00	2.4	0.9	0.0	**6.4**
Toad Creek Basin 8B	1	0.94	2.82	4	0.6	**8.4**	3	0	0.00	2.4	0.9	0.3	**6.6**
San Juan Storm Water Infiltration Project	0			0	0.6	**0.6**	0	0	0.00	0.0	0.0	0.3	**0.3**

	Watershed Group Scores								
Project Name	WG 1	WG 2	WG 3	WG 4	WG 5	WG 6	WG 7	WG 8	WG 9
San Simeon Creek Road Flooding Remediation	4.5								
Santa Rosa Creek Floodplain & Wetland Retention Plan	6.3								
Santa Rosa Creek Streamflow Enhancement	6.5								
Capture and Reuse of Storm Water. Conceptual Phase		6.3							
Bioreactor Installation in Morro Bay Watershed		3.8							
Camp San Luis Obispo Projects		7.7							
2nd Street Baywood Green Street Project		6.1							
Embarcadero Surf Project		4.4							
Cloisters Project		4.2							
Embarcadero Boat Wash Project (small)		4.3							
Embarcadero Boat Wash Project (large)		4.4							
Morro Bay State Park Marina Parking Lot LID		4.1							
Meadow Park Capture and Use			5.6						
Mitchell Park Bioretention			7.2						
Higuera Widening Project			3.8						
Stormwater Infiltration basins				8.5					
Pismo Preserve Roads Improvement Project				5.2					
Corbett Creek Floodplain and Stream Restoration				4.0					
Oceano Drainage Improvement Project				4.9					
South Halycon Green / Complete Street				4.5					
Oso Flaco Watershed					2.6				
Upper Spring Street LID							6.4		
Mountain Springs sedimentation basin							3.7		
Montebello Oaks Basin Retrofit							2.8		
Grand Canyon Basin Retrofit							2.9		
Melody Basin Retrofit							6.2		
Niblick LID Drainage Retrofit							1.7		
Atascadero Sunken Gardens Stormwater Capture							7.8		
El Camino Real Greenstreets							7.5		
Toad Creek Basin 8A							6.9		
Toad Creek Basin 8B							7.1		
San Juan Storm Water Infiltration Project								3.1	

APPENDIX 4-D

Average Annual Pollutant Load Reduction Estimates

Approach

The stormwater-related impacts associated with urban development are well documented and include a decline in downstream receiving water quality (Arnold and Gibbons, 1996; Holman-Dodds et al., 2003; USEPA, 2013). Higher peak flows and increased total stormwater runoff volumes result from the expansion of urban impervious cover that limits the infiltration of rainfall and enhances the entrainment and transport of sediment, nutrients, bacteria, metals, pesticides, and other chemicals derived from urban land uses (Grove et al. 2001, Tang et al. 2005, USEPA 2013).

To quantify the water-quality benefits of stormwater projects, average annual reductions of stormwater volume and pollutant loads were estimated for those projects that had sufficient concept design information to allow these calculations. Pollutant types quantified included Total Suspended Solids (TSS), Total Copper (Cu), Total Zinc (Zn), Nitrate (NO_3) and Fecal Coliform (FC). These pollutant types were selected due to their common presence in urban runoff; known risks to aquatic biota and/or human health; and/or are identified in regulatory Total Maximum Daily Load designations within San Luis Obispo County that likely include municipal sources (i.e., NO_3 and FC).

Because site-specific monitoring data are not available for precise quantification of loadings, urban stormwater literature and databases were reviewed to define characteristic pollutant concentrations for urban land uses. Data were selected based their credibility (e.g., robust sampling methods, stated assumptions, clarity of reporting); relevance to San Luis Obispo County (e.g., data indicates national trends, geographic proximity); and suitability for planning-level pollutant reduction estimates. The data sources used included:

1. Butcher, Jonathan, 2003. Buildup, washoff, and event mean concentrations. Journal of the American Water Resources Association, 39(6): 1521-1528. DOI: 10.1111/j.1752-1688.2003.tb04436.x
2. Los Angeles County Department of Public Works and Los Angeles Flood Control District, Stormwater Quality Summary Data 1994-2000 http://dpw.lacounty.gov/wmd/NPDES/wq_data.cfm
3. Northwest Hydraulic Consultants Inc. (nhc), Geosyntec Consultants, Inc., and 2NDNATURE, LLC. 2010. Pollutant Load Reduction Model. Available at https://www.enviroaccounting.com/TahoeTMDL/Program/Display/ForUrbanJurisdictions. Accessed in May to September 2015.
4. Pitt, R., A. Maestre and R. Morquecho. 2004. The National Stormwater Quality Database (NSQD, version 1.1). Paper presented at the World Water and Environmental Resources Congress, Salt Lake City, UT. http://rpitt.eng.ua.edu/Research/ms4/Paper/Mainms4paper.html; see also the National Stormwater Quality Database at http://www.bmpdatabase.org/nsqd.html.

5. Stein, Eric D., Tiefenthaler, Liesl L., and Schiff, Kenneth C. Southern California Coastal Water Research Project. Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watersheds and Land Uses of the Greater Los Angeles Area, California USA. Technical Report 510. March 2007.
6. U.S. EPA. United States Environmental Protection Agency. 1983. Results of the nationwide urban runoff program. PB84-185552. Washington, D.C.

Stormwater pollutant concentrations were usually reported by urban land uses as median values, and studies generally used similar land use types with slight differences in some cases (i.e., commercial, residential, industrial). For example, the data for total copper and total zinc from the Los Angeles County 1994-2000 data set included additional categories for residential and industrial land uses; those values were considered appropriate for inclusion as part of the calculation for representative concentrations. Some pollutants were not measured in all of the studies considered, such as nitrate (only available from Los Angeles County 1994-2000 and the National Stormwater Quality Database).

Determining a representative urban runoff concentration for Fecal Coliform was particularly challenging, given that there are fewer data available and they show high variation across studies within the same land use; different bacteriological indicators are often measured (e.g., Fecal Coliform, Escherichia coli, Total Coliform); and there is often inconsistency of reporting units (e.g., CFU, MPN). Another factor limiting relevant data availability is that Fecal Coliform is the current TMDL preference parameter for the Central Coast Water Board but is not the standard bacterial parameter used for TMDLs in California. Instead, E. coli is more typically used as it is thought to be a better indicator of risks to human health.

A representative TSS value was used that is consistent with the swTELR model, which employs characteristic runoff concentrations (CRCs) defined as the expected average annual pollutant concentration generated from a land use in a particular condition across a range of event types (nhc et al., 2010). While similar to event mean concentration (EMC) values commonly applied in stormwater modeling (e.g., Butcher, 2003), CRCs are intended to be an annual volume-weighted average of EMC values. We calculated the median TSS values for each land use, which helps reduce the effects of extreme values when characterizing central tendency compared to mean values. TSS values for urban land-use types used in swTELR are based on 23 literature studies, along with analysis of the National Stormwater BMP Database that includes thousands of individual measurements from hundreds of individual studies (NSQD, 2015; http://www.bmpdatabase.org/nsqd.html).

The various values of pollutant loadings are listed in Table 4D-1; the final values selected as representative for use in subsequent calculations are listed in Table 4D-2.

Table 4D-1. Median runoff TSS values from analysis of the NSQD and literature review for road and parcel land uses used in swTELR: High Traffic Roads (HTR), Moderate Traffic Roads (MTR), Low Traffic Roads (LTR), Industrial (IND), Commercial (COM), Multi-family residential (MFR), Single Family Residential (SFR), Other (OTH) (2NDNATURE, 2018).

Road Land Use TSS (mg/L)			Parcel Land Use TSS (mg/L)				
HTR	MTR	LTR	IND	COM	MFR	SFR	OTH
156	115	110	104	70	82	88	15

Table 4D-2. Data used for determination of representative urban runoff concentrations.

	Total Copper (ug/L)				Total Zinc (ug/L)				Nitrate (mg/L)		Fecal Coliform (CFU/100 ml)
	LA 1994-2000	LA 2001-2005	NSQD	NURP	LA 1994-2000	LA 2001-2005	NSQD	NURP	LA 1994-2000	NSQD	NURP
Land Use											
Commercial	22	17	17	29	192	156	150	226	2	0.62	
HD single R	11				66				2.1		
Multi R	12				89						
Mixed R	13				125					0.94	
Residential		18	12	33		103	73	135			
Transportation	39				218				1.8	1.55	
Light Industrial	21				366				2.4	0.48	
Industrial		33	22	27		550	210	154			
Mixed											21,000

For planning purposes, a single representative value for each pollutant parameter was established by calculating the median value among the land use types, within each data source, and then the average among the various data sources for those constituents with multiple entries (Table Z). Fecal Coliform was the exception to this methodology, given the data uncertainty described; the NURP "mixed" land use value was used (i.e., 21,000 CFU/100 ml).

Table 4D-3. Representative urban runoff concentrations used to estimate average annual pollutant reduction.

Constituent	Total Suspended Solids (mg/L)	Total Copper (ug/L)	Total Zinc (ug/L)	Nitrate (mg/L)	Fecal Coliform (CFU/100 ml)
Representative Urban Stormwater Runoff Concentration	96	20	155	1.4	21,000

Results

In total, 12 of the identified projects were judged to have sufficient design details to calculate average annual pollutant load reductions. Their results are tabulated at the end of this Appendix (Table 4D-4).

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Table 4D-4. Average annual pollutant load reduction, using the factors listed in Table 4D-3.

Project	Project Scale	SCM Type	Capture Area (sq.ft.)	Volume (T)reated and/or (I)nfiltrated	Annual Volume Treated and/or Infiltrated (ac-ft)	Annual Volume Treated and/or Infiltrated (cu.ft.)	Estimated Average Annual Pollutant Reduction				
							TSS (kg)	Total Copper (g)	Total Zinc (g)	Nitrate (kg)	Fecal Coliform (CFU)
Morro Bay Boat Wash, Option 1	neighborhood	biofiltration	126,600	T	4	153,300	417	87	673	6	9.00E+11
Morro Bay Boat Wash, Option 2	parcel	biofiltration	15,400	T	0	18,600	51	11	82	1	1.00E+11
Morro Bay Cloisters	regional	infiltration basin	14,312,100	T & I	33	1,455,600	3,957	824	6,389	58	9.00E+12
Morro Bay Embarcadero Surf	neighborhood	biofiltration	140,100	T & I	1	55,300	150	31	243	2	3.00E+11
Morro Bay State Park Marina	parcel	LID	63,300	T & I	2	75,700	109	93	253	3	5.00E+11
Paso Robles Spring Street Green Lite	neighborhood	green street bioretention	4,339,500	T & I	19	809,000	2,199	458	3,551	32	5.00E+12
Baywood 2nd Street	neighborhood	green street biofiltration	52,700	T & I	2	69,700	190	40	306	3	4.00E+11
Atascadero Sunken Gardens	neighborhood	infiltration gallery	627,300	T & I	15	632,300	1,719	358	2,775	25	4.00E+12
Paso Robles Montebello Oaks Basin	regional	basin retrofit									
Paso Robles Grand Canyon Basin	regional	basin retrofit									
Paso Robles Melody Basin	regional	basin retrofit									
Paso Robles Niblick LID	neighborhood	LID									

APPENDIX 4-E

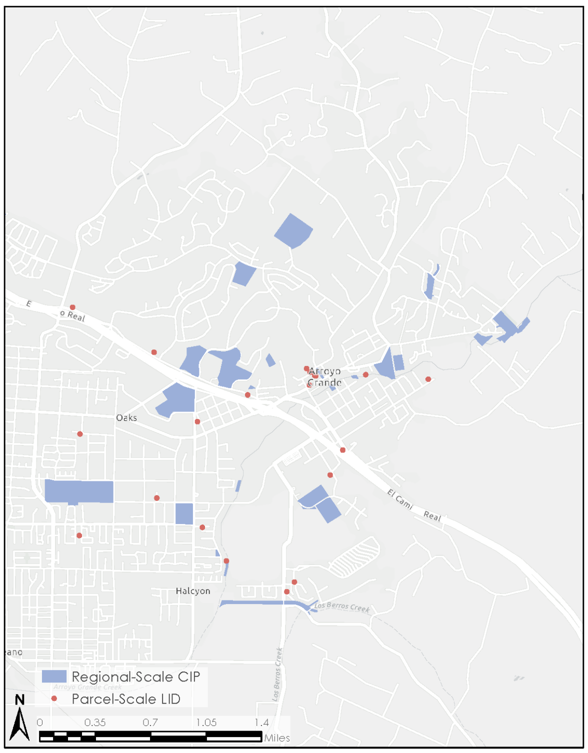
Quantitative Metric Scores for the CalWater Planning Watersheds

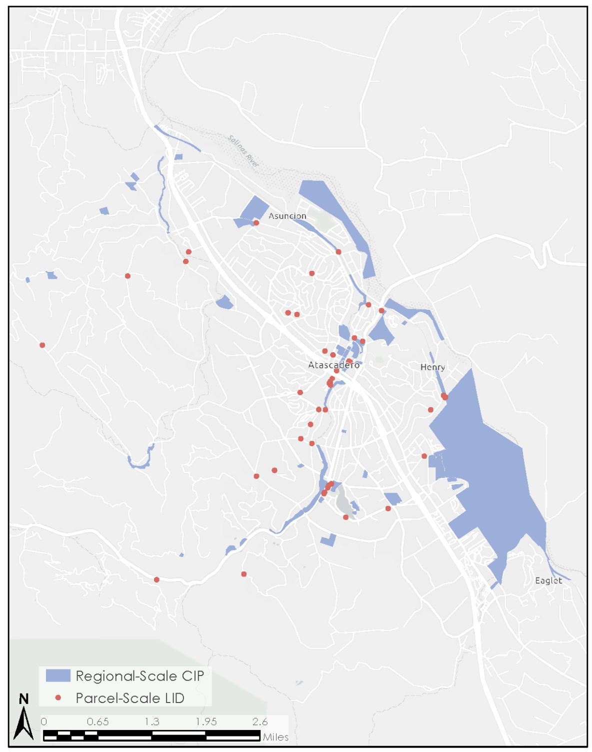
CALWATER	NAME	ACRES	*Total Water Quality Score*	*Total Water Supply Score*	Total Flood Management Score	Total Environment Score
5757	Upper Ranchito Canyon	278	2.0	6.0	0.0	0.0
5764	Upper Hog Canyon	720	2.0	6.0	0.0	0.0
5773	Upper Keyes Canyon	724	2.0	6.0	0.0	0.0
5774	W of Ranchito Canyon	178	2.0	6.0	0.0	0.0
5780	McKay	2215	3.1	6.0	0.2	2.4
5787	Cholame Valley	5716	3.1	6.0	0.4	1.6
5795	Lower Vineyard Canyon	977	2.2	6.0	0.1	0.0
5797	West Side Cholame Valley	3567	2.2	6.0	0.2	1.5
5800	Turtle Creek	1576	0.8	3.6	0.6	1.5
5803	Willow Springs Canyon	4422	2.3	6.0	0.4	0.2
5805	Pine Canyon	2878	2.1	6.0	0.1	0.1
5807	Red Rock Canyon	2626	2.1	3.2	0.1	1.5
5809	Upper San Carpoforo Creek	1055	2.8	0.9	0.7	4.1
5812	Lower Hog Canyon	5011	3.2	6.0	0.5	0.2
5814	Oro Fino Canyon	2440	0.1	4.0	0.1	0.1
5815	Gulch House Creek	1522	2.1	4.0	0.2	1.2
5816	Mahoney Canyon	6520	3.9	6.0	0.8	2.8
5820	Lower Ranchito Canyon	6683	4.0	6.0	0.8	0.4
5830	Upper Shimmin Canyon	6643	2.5	6.0	0.5	0.3
5831	Taylor Canyon	2977	3.4	6.0	1.4	1.7
5832	Nacimiento Ranch	7086	0.4	6.0	0.3	2.6
5833	Chris Flood Creek	3015	3.4	1.9	1.6	2.2
5834	Kavanaugh Creek	3108	0.6	2.4	0.3	0.1
5835	Lower San Jacinto Creek	5028	3.8	6.0	0.6	2.5
5836	Bee Rock Canyon	4062	2.2	2.8	0.4	0.2
5839	Camp Roberts	6423	1.0	6.0	0.5	0.2
5840	Mount Mars	2088	1.6	1.1	1.1	2.0
5841	Blue Point	7892	3.1	6.0	1.0	2.1
5842	Estrella	7410	4.1	6.0	0.8	0.4
5843	Lower Keyes Canyon	4910	4.3	6.0	0.4	0.2
5847	Freeman Canyon	7183	3.5	6.0	0.7	0.3
5848	Little Burnett Creek	6707	3.6	3.3	1.9	2.3
5850	Asbury Creek	7315	3.0	2.5	1.1	1.7
5851	Palo Prieto Canyon	10245	3.0	6.0	0.6	1.6
5853	Bud Canyon	9131	3.5	6.0	1.0	1.7
5854	Pebblestone	5772	0.3	2.9	0.5	0.3
5855	Lower San Carpoforo Creek	6858	3.7	1.2	1.9	5.2
5856	Burnett Creek	11477	5.9	2.5	2.0	5.1
5857	Mile 7 to 11 Nacimiento River	12240	2.9	4.6	1.0	3.1
5864	Sheep Camp Canyon	8764	2.8	6.0	0.5	0.3
5868	Nacimiento Reservoir	5626	2.3	3.5	0.0	3.1
5873	Snake Creek	11180	3.3	4.6	1.2	0.6
5874	Tobacco Creek	7428	3.6	3.8	1.8	2.1
5875	Arroyo de los Chinos	3196	1.5	1.5	1.3	2.3
5876	Lower Shimmin Canyon	3767	1.9	6.0	0.9	0.4
5879	Mile 9 to 11 Estrella River	8935	4.3	6.0	1.3	0.7
5881	S. Shore Nacimiento Res.	6359	2.6	2.1	0.8	0.4
5882	Wellsona	10687	4.3	6.0	1.4	3.3
5883	Dip Creek	5614	2.5	3.2	0.6	0.3
5884	Hopper Canyon	16291	3.9	6.0	1.4	2.1
5885	Gould Creek	3612	3.0	2.9	0.8	0.4
5886	E of Palo Prieto Canyon	5778	0.2	4.6	0.3	1.6
5887	Middle Arroyo de la Cruz	6781	5.6	2.9	1.9	5.4
5890	Lower San Marcos Creek	9652	2.9	6.0	0.8	3.1
5891	Lower Arroyo de la Cruz	4522	5.2	1.8	1.4	4.9
5892	Indian Creek	7960	3.8	6.0	1.0	0.5
5894	Wood Canyon	9661	4.0	6.0	1.5	0.7
5902	Upper Arroyo de la Cruz	5000	3.7	2.1	1.9	5.0
5903	Franklin Creek	9389	3.9	3.7	1.8	2.4
5909	Town Creek	8527	3.2	4.1	1.6	2.2
5910	Upper San Marcos Creek	8083	2.7	5.3	1.1	2.9
5912	Arroyo del Corral	5614	1.4	3.4	1.3	4.7
5915	Tucker Canyon	14035	1.5	6.0	0.9	1.7
5917	Oak Knoll Creek	4133	3.1	3.9	1.3	4.9
5919	Mustard Creek	5040	4.6	6.0	0.6	2.5
5922	Broken Bridge Creek	9710	2.2	3.9	1.9	5.5
5924	Lower Las Tablas Creek	7891	5.1	5.1	1.4	0.7
5925	Pico Creek	9709	5.9	3.8	1.9	5.5
5926	Huerto Creek	8693	3.8	6.0	1.4	0.7
5933	Union School	7859	3.7	6.0	1.0	0.5
5934	Upper San Simeon Creek	8426	5.8	2.8	1.9	4.7
5936	Gillis Canyon	8765	3.2	6.0	0.5	1.5
5937	Fern Canyon	7897	4.0	4.8	1.7	3.3
5944	Shed Canyon	9854	5.0	6.0	0.8	0.4
5945	Upper Las Tablas Creek	11727	5.6	3.7	1.9	2.5
5948	Golden Hill	4288	5.2	6.0	0.7	2.6
5951	Summit Creek	7429	3.3	5.0	1.6	3.4
5953	Hughes Canyon	4353	2.4	6.0	0.3	1.2
5955	Bethel School	5656	5.6	6.0	1.2	2.8
5958	Lower San Simeon Creek	7502	4.2	3.2	1.7	5.4
5962	Dry Canyon	6936	2.5	6.0	0.7	0.3
5963	Steiner Creek	6342	5.7	2.4	1.9	4.9
5965	Holland Canyon	5255	2.3	6.0	0.2	1.3
5967	West of Red Hills	10074	1.0	4.8	0.6	0.3
5970	Neals Spring	10308	4.5	6.0	1.7	3.2
5973	Sheepcamp Creek	5509	3.7	5.0	1.2	3.5
5974	McDonald Canyon	7060	2.3	6.0	0.5	0.3
5976	San Francisco Canyon	7535	3.5	3.4	1.8	4.3
5977	Geneseo	6324	3.1	6.0	0.8	0.4
5979	Tin Pan Canyon	6702	0.9	6.0	0.4	0.2
5981	Camata Canyon	7140	2.8	6.0	0.5	0.3
5982	Upper Santa Rosa Creek	9490	3.8	3.0	1.9	5.5
5986	Wilinson Canyon	7624	0.6	6.0	0.3	1.4
5989	El Pomar	11497	3.9	6.0	1.6	0.8
5993	Upton Canyon	9359	2.7	6.0	0.8	0.4
5994	Lower Santa Rosa Creek	6246	3.7	3.1	1.7	5.4
5995	Templeton	13180	6.0	6.0	1.8	4.3
5997	Jackson and Reinhert Ranch	5954	3.8	6.0	1.5	0.8
6001	Upper Paso Robles Creek	5762	3.0	3.7	1.3	4.7
6003	San Juan Ranch	5384	0.5	6.0	0.2	1.0
6008	N. of Creston	2785	2.7	6.0	0.4	0.2
6010	Lower Paso Robles Creek	5128	5.5	6.0	1.0	4.5
6011	Upper Green Valley Creek	5985	3.4	3.0	1.4	5.2
6013	Lower Green Valley Creek	8680	3.3	2.5	1.5	5.1
6014	Bellyache Spring	6283	2.2	6.0	0.2	1.3
6015	Cienega Creek	6980	3.4	3.0	1.7	4.9
6018	Ryan	5359	3.6	6.0	1.1	0.6
6019	Villa Creek	16596	2.2	3.1	1.8	5.7
6021	W. Branch Huer Huero Creek	8429	3.0	4.2	1.5	0.7
6028	Asuncion	6461	4.0	5.0	1.3	4.3
6030	Sandy Canyon	5963	2.2	6.0	0.2	1.2
6031	Santa Rita Creek	5413	2.9	3.9	1.2	4.7
6032	Lower Long Canyon	4018	2.4	6.0	0.1	0.1
6038	Grassy	7868	3.8	4.8	1.7	0.9
6039	Quail Water Creek	11513	3.4	4.8	1.5	0.8
6043	Graves Creek	9801	3.5	4.8	1.8	5.3
6046	Cottontail Creek	4189	2.9	2.3	1.1	2.3
6049	E. Branch Huer Huero Creek	14052	3.8	4.6	1.8	0.9
6050	Lower Shell Creek	4616	2.3	6.0	0.3	0.1
6051	Cayucos Creek	11526	2.1	2.7	1.6	5.6
6054	Mid. Branch Huer Huero Creek	8360	3.0	4.0	1.5	0.7
6056	Carnaza Creek	8763	1.3	5.0	0.5	1.3
6059	Cedar Canyon	9269	2.7	6.0	0.4	0.2
6064	Old Creek	6791	3.2	1.9	1.5	2.5
6066	French Camp	7742	3.0	6.0	0.4	0.2
6067	Henry	3649	3.5	4.8	0.9	4.2
6068	Camatta Creek	10031	2.4	6.0	0.6	0.3
6070	Upper Long Canyon	5292	2.2	6.0	0.2	0.1
6071	Hale Creek	12860	5.9	4.4	2.0	5.2
6073	Paloma Creek	7928	4.2	4.6	1.7	4.4
6077	Toro Creek	9839	5.5	2.1	1.8	5.5
6088	Morro Creek	18210	2.6	3.4	2.0	5.7
6089	Whale Rock Reservoir	4454	1.4	2.6	0.8	4.5
6090	Upper Shell Creek	6995	2.9	4.8	1.0	0.5
6095	Calf Canyon	5756	4.7	4.0	1.1	4.2
6096	Fernandez Creek	5337	2.6	6.0	0.9	0.4
6105	North of California Valley	9430	3.1	4.7	1.0	1.6
6106	Windmill Creek	9256	2.5	6.0	0.6	0.3
6110	Trout Creek	7926	3.7	4.8	1.8	5.4
6111	Santa Margarita Creek	16032	3.9	4.6	2.0	5.6
6112	La Panza Canyon	8965	2.5	6.0	0.3	0.2
6118	Wilson Canyon	8662	3.1	4.6	1.5	0.7
6119	La Panza Ranch	6912	2.4	5.0	0.3	0.2
6121	Moreno Creek	4078	4.7	2.1	0.8	4.0
6126	Morro Bay	10064	4.3	3.8	1.7	5.5
6128	Parkhill	8094	4.9	2.3	1.4	4.5
6135	Yaro Creek	9402	3.1	2.4	1.5	0.8
6136	East of Simmler	5747	3.3	5.1	1.0	1.5
6137	San Luisito Creek	12386	5.8	3.3	1.9	5.7
6141	McGinnis Creek	6692	2.4	6.0	0.7	0.3
6142	Alamo Creek	4581	2.9	2.0	1.1	0.5
6143	Pilitas Creek	5355	4.9	2.4	1.2	1.6
6144	San Diego Creek	5383	1.5	3.5	0.9	1.5
6145	Trujillo Creek	9866	3.3	4.2	1.4	0.7
6147	Placer Creek	6909	2.2	6.0	0.2	0.1
6151	Choro Resevoir	7313	3.8	4.0	1.8	5.6
6153	Rincon Creek	9960	3.9	2.7	1.8	2.3
6156	Willow Canyon	5502	2.2	4.8	0.3	0.2
6159	Mouth of Los Osos Creek	3861	3.5	4.8	0.6	4.4
6161	Pozo	2870	2.4	3.6	0.4	0.2
6162	Stenner Lake	7259	5.9	3.9	1.9	5.7
6164	East of Freeborn Mountain	9226	2.7	1.9	0.6	1.2
6166	Hay Canyon	8704	2.6	3.0	1.0	0.5
6170	Santa Margarita Lake	10564	3.8	2.8	1.8	2.2
6171	Beartrap Creek	4397	2.1	4.8	0.2	0.1
6172	Reservoir Canyon	7999	5.8	3.7	1.9	5.5
6174	Anderson Canyon	7458	2.2	1.2	0.5	0.2
6177	American Canyon	8229	2.9	5.1	1.4	0.7
6179	Piletas Canyon	7113	2.4	2.3	0.7	0.4
6181	Warden Lake	8805	5.9	4.2	1.6	2.7
6184	Douglas Canyon	8353	3.0	4.3	1.4	0.7
6188	Los Osos Creek	5967	5.3	4.4	1.1	5.1
6189	Big Falls Canyon	13819	3.8	5.5	2.0	2.7
6192	Old Cooper Ranch	7768	3.5	2.8	1.3	0.6
6193	Horse Mesa	8243	3.2	4.1	1.6	1.9
6196	Laguna Lake	18172	6.0	3.9	2.0	5.6
6200	Carrisa Ranch	10865	2.4	2.2	0.7	1.3
6202	Islay Creek	7920	2.9	4.8	1.2	5.3
6204	Rafael Creek	6674	2.5	1.7	0.6	0.3
6209	Coyote Hole	9612	3.2	4.9	1.7	0.8
6211	Rogers Creek	5705	2.7	3.5	1.0	0.5
6212	West Corral de Piedra Creek	5594	3.8	2.9	1.6	5.2
6213	Goodwin Ranch	6409	0.2	1.7	0.2	1.2
6214	East Corral de Piedra Creek	3800	3.4	3.3	1.1	4.9
6215	Salt Creek	9086	1.7	3.8	1.8	2.1
6219	Perfumo Canyon	9531	5.5	2.5	1.6	5.2
6220	Wittenberg Creek	6311	3.3	5.5	1.7	2.2
6221	Coon Creek	11024	1.8	3.8	1.8	5.6
6223	Sheep Creek	9538	3.0	6.0	1.5	0.8
6225	Stony Creek	7675	3.1	5.1	1.5	0.8
6227	Vasquez Creek	6647	1.7	1.9	1.6	2.5
6228	Wild Hog Creek	4961	2.2	1.6	0.4	0.2
6230	Turkey Camp Well	7802	3.0	2.1	0.7	1.4
6231	Sea Canyon	10131	4.2	3.0	1.7	5.7
6233	Barrett Creek	8317	3.3	4.8	1.3	0.6
6234	Arroyo Grande Creek	9969	3.0	5.0	1.3	2.1
6237	Tajea Flat	10914	2.8	4.0	1.3	0.7
6239	Kennel Creek	6375	2.9	6.0	1.3	0.7
6240	Lower Arroyo Seco	7140	2.8	5.0	1.1	1.6
6242	Canada Verde	6222	5.8	4.2	1.3	4.8
6243	Joaquin Canyon	5964	2.6	5.0	0.7	1.7
6244	Guaya Canyon	10285	5.8	4.0	1.6	5.3
6245	Clapboard Canyon	5801	2.9	3.2	0.9	2.1
6246	Painted Rock	10485	0.4	1.4	0.3	1.1
6247	Pecho Creek	10520	1.8	2.7	1.6	2.8
6251	Cochora Ranch	8630	3.4	2.4	1.1	0.6
6253	Alamo	7081	2.4	4.6	0.7	1.3
6256	Upper Arroyo Seco	7972	3.0	4.8	1.5	0.7
6258	Lower Pismo Creek	7836	4.1	2.8	1.3	5.0
6259	Upper Pismo Creek	2329	4.5	3.7	0.2	4.5
6260	Branch Creek	9417	2.7	6.0	1.2	1.5
6262	Huasna Creek	10139	2.8	5.0	1.0	2.0
6268	Carpenter Canyon	4952	2.8	5.2	0.6	2.3
6269	Carizo Canyon	6758	2.7	6.0	0.9	1.4
6271	Simm	6723	2.1	1.6	0.1	1.1
6272	Brown Canyon	5332	3.2	4.8	0.8	0.4
6274	Tarspring Creek	11779	5.6	4.1	1.5	4.6
6275	Carrie Creek	6597	2.9	5.1	1.2	1.8
6277	Saltos Canyon	6005	2.9	6.0	0.9	1.4
6279	Little Jolo Creek	6970	2.6	4.5	1.1	1.6
6280	Taylor Canyon	10137	3.4	6.0	1.4	1.7
6283	Gypsum Canyon	4832	2.7	4.4	0.6	0.3
6284	Deer Canyon	6165	2.6	4.3	0.9	1.4
6285	South of Chorchora Ranch	5885	2.8	2.2	0.4	0.2
6286	Sycamore Creek	4687	2.6	4.4	0.5	0.2
6287	Cottonwood Spring	4016	2.0	1.0	0.1	0.0
6288	Cienega Valley	7550	4.6	5.5	1.7	5.4
6290	Haystack Canyon	5623	2.7	5.0	1.1	1.9
6291	Lower Alamo Creek	6122	4.9	3.7	0.9	1.7
6293	Upper Alamo Creek	8378	4.4	3.3	0.9	1.6
6294	Goat Spring	7714	2.3	1.2	0.3	0.2
6295	Los Berros Canyon	9332	4.8	5.4	1.4	4.8
6296	Morales Canyon	7255	3.2	6.0	0.9	0.5
6297	Clear Creek	1189	2.5	2.6	0.2	1.1
6298	Los Berros Creek	10686	5.8	5.0	1.4	5.2
6300	Railpen Canyon	9408	2.7	5.0	1.0	2.0
6301	Elkhorn Scarp	8157	2.6	6.0	0.3	0.2
6302	Miranda Canyon	1746	2.1	4.2	0.1	1.1
6303	Rice Ranch	3612	2.4	2.8	0.5	1.3
6306	Pearson Spring	4848	3.2	6.0	0.4	0.2
6308	Beam Flat	8672	2.8	2.4	0.4	0.2
6310	Abbot Canyon	9933	2.3	1.5	0.2	0.1
6311	Morales Canyon Oil Field	4513	3.1	4.6	0.5	0.2
6312	Moon Canyon	1503	2.2	4.4	0.1	1.1
6314	Nipomo Valley	10899	6.0	5.2	1.6	2.6
6315	Post Canyon	5435	3.4	4.2	0.8	0.4
6319	Chimney Canyon	5323	3.2	2.9	0.7	1.4
6323	Suey Creek	8500	5.2	5.2	1.2	2.0
6326	Black Lake Canyon	13726	2.0	5.5	0.9	2.2
6327	Twitchell Reservoir	10161	3.5	3.5	1.2	2.0
6328	Lawson Spring	8980	2.1	2.1	0.1	0.0
6329	Lower Schoolhouse Canyon	1309	2.4	4.4	0.1	0.1
6340	Sulfur Canyon	11095	2.1	4.2	1.2	0.6
6341	Lower Aliso Canyon	3947	3.2	4.4	0.6	0.3
6344	Upper Schoolhouse Canyon	2	0.3	6.0	0.0	0.0
6346	Padrones Canyon	10449	3.3	6.0	1.0	0.5
6349	Buckhorn Canyon	816	2.2	2.2	0.1	0.0
6350	Nipomo Creek	7560	5.6	3.2	1.2	2.0
6355	Santa Maria Valley	23552	4.2	4.9	1.7	2.7
6366	Quail Canyon	11986	3.5	4.8	1.2	0.6
6369	Cuyama Valley	12911	3.6	4.0	0.7	0.4
6371	Canada de los Coches	1956	0.9	3.7	0.3	1.5
6374	South of Twitchell Reservoir	7617	3.7	4.1	0.7	1.7
6384	Stubblefield Road	3774	4.1	6.0	0.1	0.0

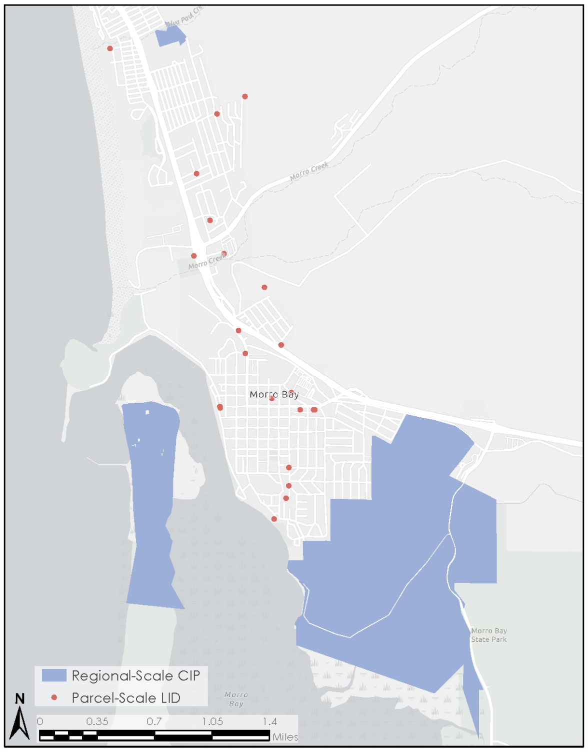
APPENDIX 4-F

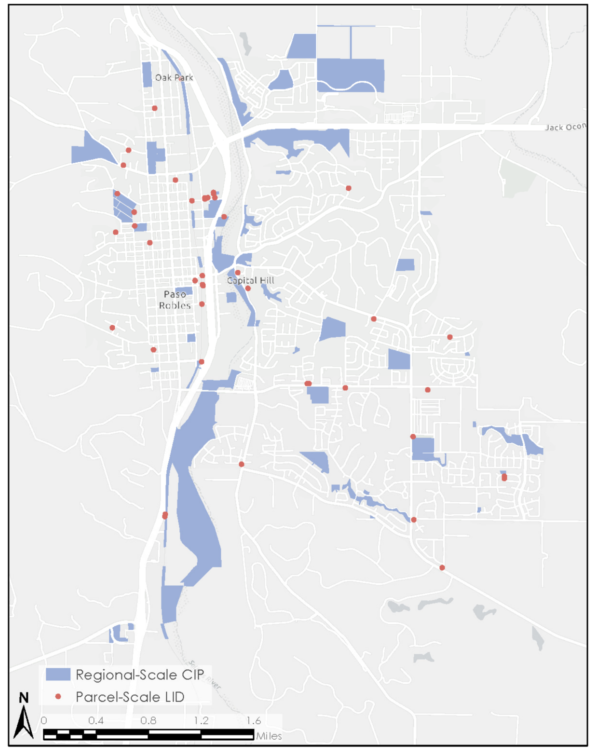
Public Parcels in Municipalities that Meet Minimum Screening Requirements

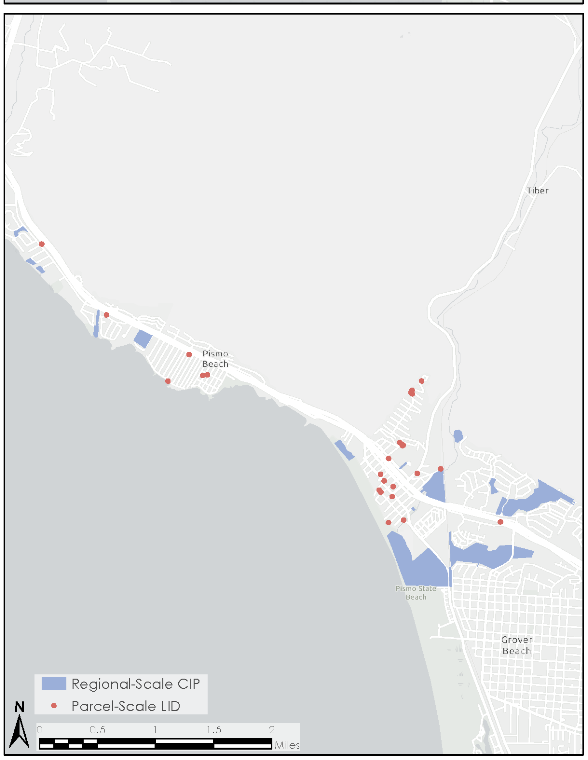
On the following maps covering the municipalities of San Luis Obispo County, blue polygons identify the public parcels that meet the criteria for Regional- and Neighborhood-scale CIPs (public land; any NLCD category except 22, 23, 24; within WMZ 1, 2, 4, 5, 8; slope <10%; acres > 0.25). The red dots identify the public parcels that meet the criteria for parcel-scale LID treatments (public land, acres <0.25; too small to outline at map scale). Tables of the parcels displayed on these maps are provided on the pages following the map sheets.

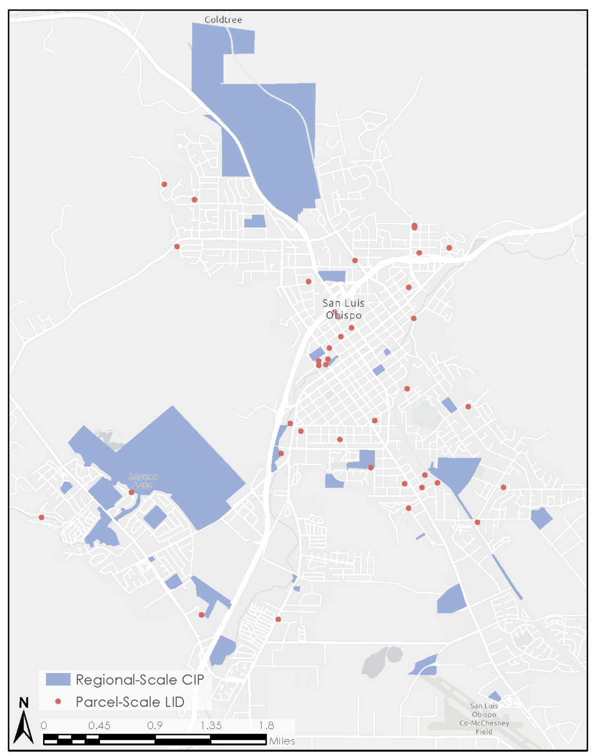





Morro Bay
Regional-Scale CIP
Parcel-Scale LID
N
0 0.35 0.7 1.05 1.4
Miles


Oak Park
Capital Hill
Paso Robles
Regional-Scale CIP
Parcel-Scale LID
N
0 0.4 0.8 1.2 1.6
Miles


Tiber
Pismo Beach
Grover Beach
Regional-Scale CIP
Parcel-Scale LID
N
0 0.5 1 1.5 2
Miles


Coldtree
San Luis Obispo
Regional-Scale CIP
Parcel-Scale LID
N
0 0.45 0.9 1.35 1.8
Miles

<u>Prospective Regional- and Neighborhood-Scale CIP parcels within municipalities</u>. Those that are also located in the high-priority Planning Watersheds (see Figure 4-4), reflecting the highest combination of potential need and opportunity, are highlighted and appear at the top of this table.

APN	County Use Code	County Use Code Definition	NLCD Landcover Value	NLCD Landcover Definition	Slope (%)	Watershed Management Zone	Acres	CalWater Watershed Number	MS4
006-087-003	850	Vacant Government	21	Developed, Open Space	0.2	1	1.7	6298	Arroyo Grande
006-095-027	857	Government	21	Developed, Open Space	0.8	1	8.2	6298	Arroyo Grande
006-095-028	857	Government	71	Grassland	2.1	1	8.9	6298	Arroyo Grande
006-442-021	857	Government	21	Developed, Open Space	0.5	1	0.4	6288	Arroyo Grande
006-445-026	857	Government	21	Developed, Open Space	0.2	1	0.8	6288	Arroyo Grande
006-571-031	857	Government	82	Cultivated Crops	1.0	1	0.8	6288	Arroyo Grande
007-011-003	857	Government	71	Grassland	1.6	1	1.1	6288	Arroyo Grande
007-011-040	857	Government	21	Developed, Open Space	3.8	2	7.1	6288	Arroyo Grande
007-011-045	857	Government	21	Developed, Open Space	2.5	1	13.2	6288	Arroyo Grande
007-011-049	857	Government	21	Developed, Open Space	5.5	1	0.5	6288	Arroyo Grande
007-011-051	850	Vacant Government	21	Developed, Open Space	2.0	1	1.5	6288	Arroyo Grande
007-182-001	857	Government	21	Developed, Open Space	3.5	1	0.3	6288	Arroyo Grande
007-492-010	857	Government	21	Developed, Open Space	0.8	1	0.6	6288	Arroyo Grande
007-501-024	857	Government	21	Developed, Open Space	2.8	1	0.4	6244	Arroyo Grande
007-511-001	857	Government	21	Developed, Open Space	2.5	2	7.4	6244	Arroyo Grande
007-511-026	857	Government	21	Developed, Open Space	0.6	1	0.5	6244	Arroyo Grande
007-522-005	857	Government	21	Developed, Open Space	1.2	1	3.3	6244	Arroyo Grande
007-761-025	857	Government	82	Cultivated Crops	0.3	1	1.9	6244	Arroyo Grande
007-762-024	857	Government	21	Developed, Open Space	0.5	1	8.5	6244	Arroyo Grande
007-762-040	857	Government	21	Developed, Open Space	0.2	1	2.6	6244	Arroyo Grande
007-784-069	857	Government	71	Grassland	2.4	2	8.5	6288	Arroyo Grande
007-787-005	820	School	21	Developed, Open Space	2.6	1	9.8	6288	Arroyo Grande
007-821-068	857	Government	21	Developed, Open Space	2.7	1	0.5	6244	Arroyo Grande
007-821-069	857	Government	21	Developed, Open Space	2.9	2	3.5	6244	Arroyo Grande
075-011-053	857	Government	81	Pasture, Hay	0.3	1	5.1	6288	Arroyo Grande
075-393-007	850	Vacant Government	71	Grassland	0.5	1	1.2	6298	Arroyo Grande
077-111-065	857	Government	21	Developed, Open Space	0.8	1	21.5	6288	Arroyo Grande
077-121-004	854	Government - Recreational	21	Developed, Open Space	0.2	1	36.7	6288	Arroyo Grande
077-255-070	850	Vacant Government	21	Developed, Open Space	0.1	1	0.7	6288	Arroyo Grande
077-283-002	857	Government	21	Developed, Open Space	0.4	1	8.8	6288	Arroyo Grande
028-011-001	861	Water Co	95	Emergent Herbaceous Wetlands	0.3	4	24.5	6028	Atascadero
028-081-007	860	Public Utility	21	Developed, Open Space	0.7	4	0.4	6028	Atascadero
028-101-004	860	Public Utility	21	Developed, Open Space	0.9	1	2.7	6028	Atascadero
028-121-001	861	Water Co	71	Grassland	0.7	4	23.6	6067	Atascadero
028-131-001	861	Water Co	21	Developed, Open Space	0.3	4	9.6	6067	Atascadero
028-201-005	861	Water Co	21	Developed, Open Space	1.2	1	2.3	6071	Atascadero
028-201-010	860	Public Utility	21	Developed, Open Space	0.9	1	1.6	6071	Atascadero
028-215-021	857	Government	21	Developed, Open Space	6.2	4	1.2	6067	Atascadero
028-221-004	857	Government	21	Developed, Open Space	6.7	4	1.0	6067	Atascadero
028-221-007	861	Water Co	21	Developed, Open Space	8.5	1	29.8	6067	Atascadero
028-241-026	860	Public Utility	71	Grassland	0.0	4	1.7	6067	Atascadero
028-341-009	857	Government	21	Developed, Open Space	1.1	1	0.3	6071	Atascadero
028-413-014	860	Public Utility	71	Grassland	1.4	4	8.0	6067	Atascadero
028-421-001	857	Government	71	Grassland	0.3	4	137.7	6067	Atascadero

029-091-040	854	Government - Recreational	21	Developed, Open Space	0.9	1	11.1	6071	Atascadero
029-104-002	857	Government	21	Developed, Open Space	0.9	1	4.3	6071	Atascadero
029-104-003	857	Government	21	Developed, Open Space	2.5	1	2.6	6071	Atascadero
029-105-040	857	Government	21	Developed, Open Space	3.2	1	4.3	6071	Atascadero
029-332-005	857	Government	21	Developed, Open Space	0.8	1	3.7	6071	Atascadero
029-333-001	857	Government	21	Developed, Open Space	0.5	1	0.9	6071	Atascadero
029-334-001	857	Government	21	Developed, Open Space	0.5	1	0.7	6071	Atascadero
029-335-001	857	Government	21	Developed, Open Space	0.5	1	2.2	6071	Atascadero
029-336-001	857	Government	21	Developed, Open Space	0.2	1	1.0	6071	Atascadero
029-345-001	857	Government	21	Developed, Open Space	0.4	1	1.0	6071	Atascadero
029-346-001	857	Government	21	Developed, Open Space	0.5	1	1.8	6071	Atascadero
029-361-003	820	School	21	Developed, Open Space	0.5	1	3.6	6071	Atascadero
029-363-048	851	Government - Office	21	Developed, Open Space	2.7	1	1.7	6071	Atascadero
030-201-010	857	Government	21	Developed, Open Space	0.2	1	3.0	6071	Atascadero
030-371-014	857	Government	21	Developed, Open Space	1.6	1	3.6	6071	Atascadero
030-381-007	860	Public Utility	21	Developed, Open Space	0.5	1	1.3	6067	Atascadero
030-441-021	861	Water Co	21	Developed, Open Space	8.6	2	3.3	6067	Atascadero
031-052-017	850	Vacant Government	21	Developed, Open Space	0.2	1	0.8	6071	Atascadero
031-222-011	857	Government	21	Developed, Open Space	1.2	1	4.1	6071	Atascadero
031-282-001	857	Government	21	Developed, Open Space	0.6	1	0.7	6071	Atascadero
031-291-012	857	Government	21	Developed, Open Space	0.4	1	4.6	6071	Atascadero
031-351-002	857	Government	21	Developed, Open Space	0.5	1	9.2	6071	Atascadero
031-361-020	857	Government	21	Developed, Open Space	0.7	1	0.3	6071	Atascadero
031-362-003	857	Government	21	Developed, Open Space	0.6	1	5.0	6071	Atascadero
034-434-018	860	Public Utility	21	Developed, Open Space	4.1	4	0.6	6073	Atascadero
045-311-018	860	Public Utility	71	Grassland	1.5	4	1.3	6073	Atascadero
045-311-019	860	Public Utility	71	Grassland	1.1	4	2.5	6073	Atascadero
045-323-001	857	Government	21	Developed, Open Space	0.3	1	23.1	6073	Atascadero
045-332-012	820	School	21	Developed, Open Space	0.8	1	1.9	6073	Atascadero
045-461-001	857	Government	21	Developed, Open Space	3.1	1	208.2	6067	Atascadero
045-461-002	857	Government	21	Developed, Open Space	1.7	1	566.1	6067	Atascadero
045-461-003	857	Government	21	Developed, Open Space	1.3	1	39.2	6067	Atascadero
045-461-005	860	Public Utility	21	Developed, Open Space	6.7	4	18.2	6067	Atascadero
045-461-006	860	Public Utility	21	Developed, Open Space	2.1	4	5.7	6073	Atascadero
045-471-001	857	Government	21	Developed, Open Space	8.3	2	2.6	6067	Atascadero
045-481-001	857	Government	21	Developed, Open Space	1.8	1	7.6	6067	Atascadero
045-481-002	857	Government	21	Developed, Open Space	3.4	2	2.8	6067	Atascadero
045-481-003	857	Government	21	Developed, Open Space	2.3	1	11.8	6067	Atascadero
049-011-003	861	Water Co	95	Emergent Herbaceous Wetlands	0.3	4	105.3	6028	Atascadero
049-033-036	854	Government - Recreational	82	Cultivated Crops	3.1	4	5.7	6028	Atascadero
049-033-061	860	Public Utility	21	Developed, Open Space	2.1	4	9.9	6028	Atascadero
049-041-010	820	School	21	Developed, Open Space	2.2	1	3.2	6028	Atascadero
049-043-005	860	Public Utility	21	Developed, Open Space	1.3	1	6.5	6010	Atascadero
049-062-006	850	Vacant Government	21	Developed, Open Space	1.0	4	36.2	6028	Atascadero
049-082-001	860	Public Utility	71	Grassland	1.8	1	3.3	6043	Atascadero
049-082-004	857	Government	52	Shrub, Scrub	1.6	1	1.8	6043	Atascadero
049-091-001	860	Public Utility	21	Developed, Open Space	2.0	1	1.2	6043	Atascadero
049-092-006	857	Government	21	Developed, Open Space	1.1	1	1.1	6043	Atascadero
049-092-008	857	Government	21	Developed, Open Space	2.0	1	1.0	6043	Atascadero
049-112-006	857	Government	21	Developed, Open Space	2.0	4	11.2	6028	Atascadero
049-132-010	857	Government	21	Developed, Open Space	1.0	1	3.7	6043	Atascadero
049-172-009	860	Public Utility	52	Shrub, Scrub	2.1	1	3.3	6043	Atascadero
049-191-004	857	Government	21	Developed, Open Space	1.3	1	0.3	6043	Atascadero

049-212-011	857	Government	71	Grassland	1.4	1	2.6	6043	Atascadero
049-231-002	860	Public Utility	42	Evergreen Forest	9.7	2	4.2	6043	Atascadero
050-173-021	861	Water Co	21	Developed, Open Space	5.3	2	4.4	6043	Atascadero
050-181-002	860	Public Utility	71	Grassland	5.2	2	1.3	6043	Atascadero
054-031-007	857	Government	71	Grassland	1.4	1	9.5	6043	Atascadero
054-085-016	820	School	21	Developed, Open Space	4.6	2	1.3	6071	Atascadero
054-151-029	860	Public Utility	21	Developed, Open Space	1.2	1	1.6	6071	Atascadero
054-152-001	857	Government	21	Developed, Open Space	1.0	1	6.6	6071	Atascadero
054-221-002	857	Government	21	Developed, Open Space	0.7	1	5.3	6071	Atascadero
054-241-021	857	Government	21	Developed, Open Space	1.2	1	9.7	6071	Atascadero
054-271-006	857	Government	43	Mixed Forest	1.6	1	1.7	6043	Atascadero
055-022-009	857	Government	21	Developed, Open Space	0.7	1	3.6	6043	Atascadero
055-031-017	857	Government	90	Woody Wetlands	1.5	1	3.7	6043	Atascadero
055-161-003	857	Government	21	Developed, Open Space	1.9	1	2.0	6071	Atascadero
055-161-004	857	Government	21	Developed, Open Space	4.9	2	4.1	6071	Atascadero
055-201-007	861	Water Co	21	Developed, Open Space	2.0	2	0.8	6071	Atascadero
056-191-016	857	Government	21	Developed, Open Space	0.7	1	12.0	6071	Atascadero
056-231-023	820	School	21	Developed, Open Space	1.3	1	2.1	6071	Atascadero
056-312-016	857	Government	21	Developed, Open Space	3.4	1	0.5	6071	Atascadero
056-322-017	857	Government	21	Developed, Open Space	1.4	1	0.4	6071	Atascadero
056-322-018	857	Government	21	Developed, Open Space	2.3	1	0.5	6071	Atascadero
056-322-023	857	Government	21	Developed, Open Space	4.0	1	3.0	6071	Atascadero
056-441-001	857	Government	21	Developed, Open Space	0.9	1	0.9	6071	Atascadero
056-441-002	857	Government	21	Developed, Open Space	1.0	1	2.4	6071	Atascadero
008-021-017	860	Public Utility	21	Developed, Open Space	0.8	4	2.9	5937	Paso Robles
008-031-025	857	Government	21	Developed, Open Space	2.5	4	7.6	5937	Paso Robles
008-072-003	860	Public Utility	21	Developed, Open Space	0.3	4	4.8	5937	Paso Robles
008-081-037	860	Public Utility	21	Developed, Open Space	0.4	4	0.6	5937	Paso Robles
008-101-005	820	School	21	Developed, Open Space	0.7	4	1.8	5937	Paso Robles
008-102-012	820	School	21	Developed, Open Space	2.1	4	3.6	5937	Paso Robles
008-102-014	820	School	21	Developed, Open Space	1.3	4	8.2	5937	Paso Robles
008-175-001	860	Public Utility	21	Developed, Open Space	1.3	4	0.6	5937	Paso Robles
008-202-001	857	Government	71	Grassland	7.5	4	1.8	5937	Paso Robles
008-202-002	857	Government	71	Grassland	6.2	4	1.2	5937	Paso Robles
008-204-001	857	Government	71	Grassland	7.8	4	1.1	5937	Paso Robles
008-205-001	857	Government	21	Developed, Open Space	4.4	4	0.3	5937	Paso Robles
008-205-002	857	Government	21	Developed, Open Space	6.2	4	0.7	5937	Paso Robles
008-206-001	857	Government	71	Grassland	6.6	4	2.9	5937	Paso Robles
008-206-002	857	Government	71	Grassland	7.0	4	0.7	5937	Paso Robles
008-207-001	857	Government	21	Developed, Open Space	7.2	4	0.9	5937	Paso Robles
008-208-001	857	Government	21	Developed, Open Space	8.0	4	3.7	5937	Paso Robles
008-208-002	857	Government	43	Mixed Forest	6.3	4	0.8	5937	Paso Robles
008-211-001	857	Government	21	Developed, Open Space	1.7	4	2.3	5937	Paso Robles
008-211-003	857	Government	21	Developed, Open Space	0.8	4	1.0	5937	Paso Robles
008-248-001	860	Public Utility	21	Developed, Open Space	1.8	4	1.4	5937	Paso Robles
008-251-002	857	Government	21	Developed, Open Space	0.9	4	0.4	5937	Paso Robles
008-254-002	850	Vacant Government	71	Grassland	0.9	4	7.0	5937	Paso Robles
008-262-006	857	Government	21	Developed, Open Space	0.7	4	3.2	5937	Paso Robles
008-297-003	857	Government	21	Developed, Open Space	0.6	4	2.9	5937	Paso Robles
008-327-016	860	Public Utility	21	Developed, Open Space	0.9	4	1.0	5937	Paso Robles
008-361-026	857	Government	21	Developed, Open Space	2.6	4	0.5	5937	Paso Robles
009-054-002	857	Government	21	Developed, Open Space	1.5	4	7.7	5937	Paso Robles
009-101-001	853	Government - Library	21	Developed, Open Space	0.3	4	4.6	5937	Paso Robles
009-116-008	850	Vacant Government	21	Developed, Open Space	2.1	4	3.2	5937	Paso Robles

009-204-001	857	Government	21	Developed, Open Space	0.4	4	2.1	5937	Paso Robles
009-253-006	857	Government	21	Developed, Open Space	2.5	4	0.5	5937	Paso Robles
009-253-007	857	Government	21	Developed, Open Space	1.6	4	0.5	5937	Paso Robles
009-291-027	860	Public Utility	21	Developed, Open Space	2.1	4	1.9	5937	Paso Robles
009-302-001	850	Vacant Government	21	Developed, Open Space	0.4	4	31.7	5970	Paso Robles
009-311-019	857	Government	21	Developed, Open Space	0.4	1	11.5	5970	Paso Robles
009-314-046	857	Government	21	Developed, Open Space	0.2	1	0.5	5970	Paso Robles
009-401-018	857	Government	21	Developed, Open Space	2.7	4	1.2	5937	Paso Robles
009-401-040	850	Vacant Government	21	Developed, Open Space	2.7	4	0.4	5937	Paso Robles
009-401-042	850	Vacant Government	71	Grassland	2.5	1	3.2	5937	Paso Robles
009-484-035	857	Government	21	Developed, Open Space	1.3	1	0.6	5970	Paso Robles
009-486-005	850	Vacant Government	21	Developed, Open Space	1.4	1	2.6	5970	Paso Robles
009-486-006	850	Vacant Government	21	Developed, Open Space	1.3	1	2.7	5970	Paso Robles
009-486-027	850	Vacant Government	21	Developed, Open Space	3.0	1	0.4	5970	Paso Robles
009-486-049	850	Vacant Government	21	Developed, Open Space	1.9	1	0.3	5970	Paso Robles
009-486-051	857	Government	21	Developed, Open Space	1.2	1	1.5	5970	Paso Robles
009-486-053	857	Government	71	Grassland	1.2	1	0.5	5970	Paso Robles
009-511-001	857	Government	21	Developed, Open Space	1.9	4	1.2	5937	Paso Robles
009-511-002	857	Government	21	Developed, Open Space	4.3	4	9.1	5937	Paso Robles
009-516-001	850	Vacant Government	21	Developed, Open Space	3.8	1	0.3	5937	Paso Robles
009-517-012	857	Government	21	Developed, Open Space	6.2	4	1.9	5937	Paso Robles
009-561-051	854	Government - Recreational	21	Developed, Open Space	2.2	1	15.8	5937	Paso Robles
009-561-052	820	School	21	Developed, Open Space	0.4	1	13.7	5937	Paso Robles
009-591-019	857	Government	21	Developed, Open Space	2.8	1	3.8	5937	Paso Robles
009-610-030	850	Vacant Government	21	Developed, Open Space	0.5	1	0.7	5937	Paso Robles
009-611-044	820	School	82	Cultivated Crops	0.9	1	11.5	5970	Paso Robles
009-631-001	857	Government	81	Pasture, Hay	0.9	4	18.0	5948	Paso Robles
009-631-020	850	Vacant Government	95	Emergent Herbaceous Wetlands	0.4	4	35.2	5970	Paso Robles
009-631-021	860	Public Utility	21	Developed, Open Space	0.7	4	0.3	5970	Paso Robles
009-631-023	860	Public Utility	21	Developed, Open Space	0.7	4	5.8	5948	Paso Robles
009-701-086	857	Government	21	Developed, Open Space	0.2	1	3.7	5970	Paso Robles
009-701-087	857	Government	21	Developed, Open Space	0.1	1	1.0	5970	Paso Robles
009-749-032	850	Vacant Government	21	Developed, Open Space	0.3	1	0.5	5970	Paso Robles
009-751-017	857	Government	21	Developed, Open Space	1.3	1	3.6	5970	Paso Robles
009-756-005	854	Government - Recreational	21	Developed, Open Space	0.3	1	2.6	5970	Paso Robles
009-756-006	850	Vacant Government	21	Developed, Open Space	0.7	1	2.8	5970	Paso Robles
009-756-008	857	Government	21	Developed, Open Space	0.0	1	1.6	5970	Paso Robles
009-761-001	857	Government	21	Developed, Open Space	0.5	4	0.3	5970	Paso Robles
009-761-044	854	Government - Recreational	21	Developed, Open Space	0.6	4	21.8	5970	Paso Robles
009-761-083	854	Government - Recreational	21	Developed, Open Space	6.9	1	11.3	5970	Paso Robles
009-781-051	857	Government	21	Developed, Open Space	0.8	1	3.7	5970	Paso Robles
009-783-067	857	Government	21	Developed, Open Space	2.4	1	4.1	5970	Paso Robles
009-789-001	850	Vacant Government	21	Developed, Open Space	1.0	1	0.5	5970	Paso Robles
009-792-054	857	Government	21	Developed, Open Space	0.4	1	3.9	5970	Paso Robles
009-811-009	850	Vacant Government	95	Emergent Herbaceous Wetlands	0.8	4	89.4	5970	Paso Robles
009-811-010	860	Public Utility	21	Developed, Open Space	5.6	1	2.5	5970	Paso Robles

009-811-011	860	Public Utility	21	Developed, Open Space	4.1	4	9.9	5970	Paso Robles
009-813-008	850	Vacant Government	21	Developed, Open Space	0.7	4	4.8	5970	Paso Robles
009-814-008	850	Vacant Government	21	Developed, Open Space	0.5	4	3.9	5970	Paso Robles
009-831-020	850	Vacant Government	21	Developed, Open Space	2.7	1	1.1	5948	Paso Robles
009-831-028	850	Vacant Government	82	Cultivated Crops	1.3	1	1.0	5948	Paso Robles
009-831-029	850	Vacant Government	82	Cultivated Crops	1.6	1	3.1	5948	Paso Robles
009-831-030	850	Vacant Government	82	Cultivated Crops	0.8	1	1.0	5948	Paso Robles
018-091-002	857	Government	71	Grassland	2.8	4	7.1	5937	Paso Robles
018-091-009	857	Government	21	Developed, Open Space	1.9	4	17.8	5937	Paso Robles
025-361-006	860	Public Utility	21	Developed, Open Space	3.9	1	6.9	5937	Paso Robles
025-366-026	820	School	71	Grassland	1.2	1	1.3	5937	Paso Robles
025-390-001	850	Vacant Government	82	Cultivated Crops	1.5	1	22.5	5937	Paso Robles
025-392-013	850	Vacant Government	71	Grassland	2.4	1	6.9	5937	Paso Robles
025-392-019	857	Government	52	Shrub, Scrub	3.7	1	50.6	5937	Paso Robles
025-396-068	820	School	82	Cultivated Crops	0.9	4	11.3	5937	Paso Robles
025-501-014	850	Vacant Government	21	Developed, Open Space	0.9	4	4.8	5937	Paso Robles
025-520-046	857	Government	21	Developed, Open Space	4.7	4	5.4	5937	Paso Robles
025-526-017	850	Vacant Government	71	Grassland	2.7	1	1.5	5937	Paso Robles
025-534-026	850	Vacant Government	21	Developed, Open Space	2.9	1	0.4	5970	Paso Robles
025-541-009	854	Government - Recreational	21	Developed, Open Space	7.1	4	17.1	5937	Paso Robles
040-091-054	860	Public Utility	21	Developed, Open Space	1.3	1	1.6	5948	Paso Robles
007-070-007	820	School	31	Barren Land	3.9	2	19.1	6268	Arroyo Grande
007-192-026	851	Government - Office	21	Developed, Open Space	2.4	1	0.5	6268	Arroyo Grande
065-149-026	857	Government	21	Developed, Open Space	1.1	1	10.2	6088	Morro Bay
066-371-001	857	Government	52	Shrub, Scrub	4.1	1	69.3	6126	Morro Bay
066-381-003	857	Government	21	Developed, Open Space	3.8	1	778.0	6126	Morro Bay
066-401-001	857	Government	31	Barren Land	1.0	4	203.4	6159	Morro Bay
066-411-001	857	Government	71	Grassland	2.1	4	6.2	6126	Morro Bay
073-171-027	857	Government	95	Emergent Herbaceous Wetlands	0.3	1	19.3	6126	Morro Bay
025-410-004	820	School	82	Cultivated Crops	0.3	1	79.3	5926	Paso Robles
005-041-006	857	Government	21	Developed, Open Space	4.8	4	0.5	6258	Pismo Beach
005-055-012	857	Government	21	Developed, Open Space	3.7	4	6.2	6258	Pismo Beach
005-091-003	857	Government	21	Developed, Open Space	0.9	1	0.3	6258	Pismo Beach
005-091-009	850	Vacant Government	21	Developed, Open Space	1.1	1	13.9	6258	Pismo Beach
005-102-014	857	Government	21	Developed, Open Space	2.2	1	0.4	6258	Pismo Beach
005-143-008	857	Government	21	Developed, Open Space	0.6	1	0.3	6258	Pismo Beach
005-241-015	857	Government	21	Developed, Open Space	0.4	4	81.7	6258	Pismo Beach
005-241-072	860	Public Utility	21	Developed, Open Space	0.5	1	2.0	6258	Pismo Beach
005-242-045	857	Government	95	Emergent Herbaceous Wetlands	1.1	1	53.2	6258	Pismo Beach
005-271-003	857	Government	21	Developed, Open Space	1.5	1	6.6	6258	Pismo Beach
005-271-019	857	Government	71	Grassland	3.6	1	4.0	6258	Pismo Beach
005-281-024	857	Government	21	Developed, Open Space	4.6	2	36.7	6258	Pismo Beach
005-281-025	857	Government	21	Developed, Open Space	2.9	1	3.5	6258	Pismo Beach
005-282-062	857	Government	21	Developed, Open Space	5.8	2	4.7	6258	Pismo Beach
005-385-055	850	Vacant Government	71	Grassland	4.1	2	2.9	6258	Pismo Beach
010-051-002	857	Government	21	Developed, Open Space	3.4	1	2.2	6231	Pismo Beach
010-051-011	857	Government	21	Developed, Open Space	1.2	1	1.6	6231	Pismo Beach

010-142-012	854	Government - Recreational	21	Developed, Open Space	5.3	4	0.7	6231	Pismo Beach
010-142-025	854	Government - Recreational	21	Developed, Open Space	5.7	4	0.7	6231	Pismo Beach
010-144-024	850	Vacant Government	21	Developed, Open Space	4.8	4	1.4	6231	Pismo Beach
010-221-009	820	School	21	Developed, Open Space	3.0	4	8.7	6231	Pismo Beach
010-551-048	857	Government	21	Developed, Open Space	2.6	4	1.9	6231	Pismo Beach
060-491-033	857	Government	21	Developed, Open Space	6.1	1	4.8	6258	Pismo Beach
001-031-028	854	Government - Recreational	21	Developed, Open Space	0.7	1	10.1	6162	San Luis Obispo
002-411-002	820	School	21	Developed, Open Space	1.0	1	4.5	6162	San Luis Obispo
002-423-006	857	Government	21	Developed, Open Space	0.8	1	1.3	6172	San Luis Obispo
002-446-029	857	Government	21	Developed, Open Space	0.4	1	1.1	6172	San Luis Obispo
003-543-001	854	Government - Recreational	21	Developed, Open Space	0.5	1	3.0	6172	San Luis Obispo
003-682-042	851	Government - Office	21	Developed, Open Space	2.0	1	4.9	6196	San Luis Obispo
003-711-025	857	Government	21	Developed, Open Space	0.9	1	3.7	6196	San Luis Obispo
004-251-056	857	Government	71	Grassland	5.3	1	7.6	6196	San Luis Obispo
004-261-085	850	Vacant Government	21	Developed, Open Space	0.5	4	3.5	6196	San Luis Obispo
004-271-032	857	Government	21	Developed, Open Space	0.9	4	1.7	6196	San Luis Obispo
004-291-007	857	Government	95	Emergent Herbaceous Wetlands	0.3	4	7.5	6196	San Luis Obispo
004-291-008	857	Government	95	Emergent Herbaceous Wetlands	0.1	4	51.9	6196	San Luis Obispo
004-401-031	857	Government	21	Developed, Open Space	0.3	4	11.6	6196	San Luis Obispo
004-422-035	857	Government	21	Developed, Open Space	0.3	1	0.8	6196	San Luis Obispo
004-431-009	820	School	21	Developed, Open Space	0.2	1	0.9	6196	San Luis Obispo
004-431-028	857	Government	21	Developed, Open Space	0.2	1	5.2	6196	San Luis Obispo
004-451-013	857	Government	11	Open Water	0.3	4	28.3	6196	San Luis Obispo
004-451-019	857	Government	21	Developed, Open Space	1.4	4	9.2	6196	San Luis Obispo
004-451-021	857	Government	21	Developed, Open Space	0.9	4	14.8	6196	San Luis Obispo
004-511-018	857	Government	21	Developed, Open Space	0.4	1	5.2	6196	San Luis Obispo
004-591-010	857	Government	21	Developed, Open Space	8.4	1	0.7	6196	San Luis Obispo
004-822-045	857	Government	21	Developed, Open Space	0.2	1	3.7	6196	San Luis Obispo
004-831-005	857	Government	21	Developed, Open Space	0.7	1	10.3	6196	San Luis Obispo
004-852-024	857	Government	21	Developed, Open Space	2.9	1	0.3	6196	San Luis Obispo
004-853-022	850	Vacant Government	71	Grassland	1.6	1	1.1	6196	San Luis Obispo
004-861-005	857	Government	21	Developed, Open Space	1.3	1	39.8	6196	San Luis Obispo
004-871-005	854	Government - Recreational	71	Grassland	3.3	4	316.5	6196	San Luis Obispo
004-951-014	854	Government - Recreational	21	Developed, Open Space	1.3	1	2.8	6196	San Luis Obispo
004-962-022	850	Vacant Government	21	Developed, Open Space	1.1	1	1.9	6196	San Luis Obispo
052-031-001	857	Government	21	Developed, Open Space	0.8	1	9.0	6162	San Luis Obispo
052-252-001	857	Government	21	Developed, Open Space	1.2	1	7.4	6162	San Luis Obispo
052-252-014	857	Government	21	Developed, Open Space	0.8	1	2.8	6162	San Luis Obispo
052-601-003	857	Government	21	Developed, Open Space	2.8	1	1.6	6162	San Luis Obispo
053-051-072	854	Government - Recreational	21	Developed, Open Space	0.0	1	0.8	6196	San Luis Obispo
053-061-054	860	Public Utility	21	Developed, Open Space	0.6	1	3.8	6196	San Luis Obispo
053-084-043	860	Public Utility	21	Developed, Open Space	0.4	1	0.8	6196	San Luis Obispo
053-111-058	854	Government - Recreational	21	Developed, Open Space	0.6	1	25.4	6196	San Luis Obispo
053-141-012	857	Government	21	Developed, Open Space	0.2	1	18.7	6196	San Luis Obispo
053-152-006	850	Vacant Government	82	Cultivated Crops	0.2	1	9.2	6196	San Luis Obispo
053-152-009	850	Vacant Government	82	Cultivated Crops	0.1	1	13.0	6196	San Luis Obispo
053-212-019	854	Government - Recreational	21	Developed, Open Space	0.7	1	3.1	6196	San Luis Obispo

053-231-038	854	Government - Recreational	71	Grassland	1.5	1	23.5	6196	San Luis Obispo
053-246-041	857	Government	21	Developed, Open Space	1.7	4	3.4	6196	San Luis Obispo
053-252-081	850	Vacant Government	21	Developed, Open Space	0.2	1	1.0	6196	San Luis Obispo
053-412-009	850	Vacant Government	21	Developed, Open Space	0.6	1	2.6	6196	San Luis Obispo
073-341-026	857	Government	82	Cultivated Crops	2.2	1	541.3	6162	San Luis Obispo
076-382-006	857	Government	21	Developed, Open Space	0.2	1	12.6	6196	San Luis Obispo
076-532-028	860	Public Utility	21	Developed, Open Space	1.6	1	11.6	6196	San Luis Obispo

Prospective Parcel-Scale LID sites in municipalities. Those located that are also located in the high-priority Planning Watersheds (see Figure 4-4), reflecting the highest combination of potential need and opportunity, are highlighted and appear at the top of this table.

APN	County Use Code	County Use Code Definition	NLCD Landcover Value	NLCD Landcover Definition	slope (%)	Watershed Management Zone	Acres	CalWater Watershed Number	MS4
006-085-023	857	Government	23	Developed, Medium Intensity	0.4	1	0.17	6298	Arroyo Grande
006-085-024	857	Government	23	Developed, Medium Intensity	0.4	1	0.12	6298	Arroyo Grande
006-095-010	857	Government	23	Developed, Medium Intensity	0.4	1	0.23	6298	Arroyo Grande
006-153-005	857	Government	23	Developed, Medium Intensity	0.4	1	0.12	6288	Arroyo Grande
006-391-033	857	Government	23	Developed, Medium Intensity	0.9	1	0.11	6288	Arroyo Grande
006-444-011	857	Government	21	Developed, Open Space	0.2	1	0.05	6288	Arroyo Grande
007-183-008	857	Government	22	Developed, Low Intensity	2.4	1	0.14	6288	Arroyo Grande
007-191-041	857	Government	22	Developed, Low Intensity	7.6	2	0.10	6288	Arroyo Grande
007-191-042	857	Government	21	Developed, Open Space	8.8	1	0.04	6288	Arroyo Grande
007-192-060	857	Government	23	Developed, Medium Intensity	2.0	1	0.09	6288	Arroyo Grande
007-192-065	857	Government	22	Developed, Low Intensity	3.5	1	0.10	6288	Arroyo Grande
007-192-073	857	Government	22	Developed, Low Intensity	3.5	1	0.07	6288	Arroyo Grande
007-501-033	857	Government	21	Developed, Open Space	4.3	1	0.17	6244	Arroyo Grande
007-571-010	857	Government	21	Developed, Open Space	0.7	1	0.02	6244	Arroyo Grande
007-595-006	857	Government	21	Developed, Open Space	0.5	1	0.06	6298	Arroyo Grande
007-771-012	855	Government - Yards	22	Developed, Low Intensity	0.7	1	0.08	6288	Arroyo Grande
007-787-017	857	Government	23	Developed, Medium Intensity	2.1	1	0.11	6288	Arroyo Grande
077-131-018	857	Government	23	Developed, Medium Intensity	0.4	1	0.13	6288	Arroyo Grande
077-192-018	857	Government	22	Developed, Low Intensity	0.1	1	0.11	6288	Arroyo Grande
077-252-084	850	Vacant Government	23	Developed, Medium Intensity	0.7	1	0.19	6288	Arroyo Grande
028-081-008	860	Public Utility	22	Developed, Low Intensity	1.0	4	0.13	6028	Atascadero
028-152-001	857	Government	22	Developed, Low Intensity	1.1	10	0.01	6028	Atascadero
028-213-001	857	Government	22	Developed, Low Intensity	0.1	1	0.00	6071	Atascadero
028-215-022	857	Government	22	Developed, Low Intensity	5.6	4	0.24	6071	Atascadero
028-413-007	857	Government	21	Developed, Open Space	0.7	1	0.20	6067	Atascadero
028-413-015	860	Public Utility	21	Developed, Open Space	0.5	1	0.19	6067	Atascadero
028-413-016	860	Public Utility	71	Grassland/Herbaceous	0.5	1	0.04	6067	Atascadero
029-105-020	857	Government	22	Developed, Low Intensity	1.8	1	0.05	6071	Atascadero
029-105-039	857	Government	22	Developed, Low Intensity	2.7	1	0.18	6071	Atascadero
029-224-001	857	Government	21	Developed, Open Space	4.4	1	0.01	6043	Atascadero
029-234-001	857	Government	21	Developed, Open Space	4.3	1	0.01	6071	Atascadero
029-324-001	857	Government	22	Developed, Low Intensity	0.8	1	0.01	6071	Atascadero
029-341-020	850	Vacant Government	23	Developed, Medium Intensity	2.3	1	0.10	6071	Atascadero

029-361-046	850	Vacant Government	21	Developed, Open Space	0.5	1	0.19	6071	Atascadero
029-361-047	850	Vacant Government	23	Developed, Medium Intensity	0.1	1	0.10	6071	Atascadero
030-072-001	857	Government	21	Developed, Open Space	1.6	4	0.01	6067	Atascadero
030-193-001	851	Government - Office	23	Developed, Medium Intensity	0.2	1	0.11	6071	Atascadero
030-193-002	857	Government	22	Developed, Low Intensity	0.5	1	0.19	6071	Atascadero
030-343-001	857	Government	23	Developed, Medium Intensity	0.9	1	0.01	6071	Atascadero
030-343-002	857	Government	22	Developed, Low Intensity	0.9	1	0.09	6071	Atascadero
030-343-003	857	Government	22	Developed, Low Intensity	0.9	1	0.10	6071	Atascadero
030-523-001	857	Government	22	Developed, Low Intensity	1.7	1	0.03	6071	Atascadero
031-026-001	857	Government	21	Developed, Open Space	2.8	1	0.10	6071	Atascadero
031-044-001	857	Government	21	Developed, Open Space	1.5	1	0.05	6071	Atascadero
031-126-001	857	Government	22	Developed, Low Intensity	1.1	1	0.08	6071	Atascadero
031-143-001	857	Government	21	Developed, Open Space	1.7	1	0.05	6071	Atascadero
031-203-001	857	Government	21	Developed, Open Space	0.7	1	0.04	6071	Atascadero
031-212-001	857	Government	21	Developed, Open Space	2.9	2	0.11	6071	Atascadero
031-361-005	854	Government Recreational	22	Developed, Low Intensity	0.6	1	0.21	6071	Atascadero
031-361-011	854	Government Recreational	21	Developed, Open Space	0.5	1	0.22	6071	Atascadero
031-361-022	857	Government	21	Developed, Open Space	0.8	1	0.24	6071	Atascadero
031-371-014	820	School	22	Developed, Low Intensity	1.2	1	0.24	6071	Atascadero
031-372-011	857	Government	22	Developed, Low Intensity	1.1	1	0.09	6071	Atascadero
031-381-023	857	Government	21	Developed, Open Space	2.9	1	0.02	6071	Atascadero
049-112-010	857	Government	22	Developed, Low Intensity	3.4	4	0.06	6028	Atascadero
049-191-008	857	Government	21	Developed, Open Space	1.8	1	0.03	6043	Atascadero
049-191-014	860	Public Utility	71	Grassland/Herbaceous	3.2	1	0.06	6043	Atascadero
050-131-007	857	Government	21	Developed, Open Space	3.0	2	0.16	6043	Atascadero
050-321-009	857	Government	21	Developed, Open Space	3.2	1	0.08	6043	Atascadero
054-133-001	857	Government	71	Grassland/Herbaceous	4.8	2	0.07	6071	Atascadero
054-211-001	857	Government	21	Developed, Open Space	1.3	1	0.04	6071	Atascadero
055-321-006	857	Government	21	Developed, Open Space	7.2	1	0.08	6071	Atascadero
056-262-011	857	Government	22	Developed, Low Intensity	1.2	1	0.09	6071	Atascadero
056-402-011	857	Government	43	Mixed Forest	12.2	5	0.10	6071	Atascadero
008-061-005	857	Government	22	Developed, Low Intensity	1.7	4	0.22	5937	Paso Robles
008-072-002	860	Public Utility	22	Developed, Low Intensity	0.3	4	0.21	5937	Paso Robles
008-091-021	857	Government	22	Developed, Low Intensity	4.4	4	0.17	5937	Paso Robles
008-171-008	820	School	23	Developed, Medium Intensity	1.3	4	0.17	5937	Paso Robles
008-183-001	857	Government	22	Developed, Low Intensity	0.6	4	0.16	5937	Paso Robles
008-183-002	857	Government	23	Developed, Medium Intensity	0.6	4	0.19	5937	Paso Robles
008-184-001	857	Government	21	Developed, Open Space	0.7	4	0.17	5937	Paso Robles
008-207-002	857	Government	21	Developed, Open Space	10.7	4	0.14	5937	Paso Robles
008-211-002	820	School	22	Developed, Low Intensity	2.6	4	0.17	5937	Paso Robles
008-213-016	857	Government	21	Developed, Open Space	10.2	4	0.13	5937	Paso Robles
008-247-021	860	Public Utility	22	Developed, Low Intensity	0.7	4	0.12	5937	Paso Robles
008-251-006	857	Government	21	Developed, Open Space	1.0	4	0.12	5937	Paso Robles
008-251-008	857	Government	21	Developed, Open Space	0.9	4	0.18	5937	Paso Robles
008-251-009	857	Government	21	Developed, Open Space	0.9	4	0.18	5937	Paso Robles
008-261-002	857	Government	21	Developed, Open Space	0.6	4	0.14	5937	Paso Robles
008-271-007	857	Government	21	Developed, Open Space	5.0	4	0.02	5937	Paso Robles
008-307-008	857	Government	23	Developed, Medium Intensity	0.7	4	0.16	5937	Paso Robles
008-329-006	860	Public Utility	23	Developed, Medium Intensity	0.6	4	0.18	5937	Paso Robles
008-344-001	857	Government	21	Developed, Open Space	4.0	4	0.23	5937	Paso Robles
009-046-003	857	Government	23	Developed, Medium Intensity	0.4	4	0.07	5937	Paso Robles
009-048-008	860	Public Utility	23	Developed, Medium Intensity	0.5	4	0.10	5937	Paso Robles
009-105-007	860	Public Utility	23	Developed, Medium Intensity	0.5	4	0.05	5937	Paso Robles

009-121-071	857	Government	21	Developed, Open Space	2.0	4	0.19	5937	Paso Robles
009-156-012	860	Public Utility	23	Developed, Medium Intensity	0.6	4	0.14	5937	Paso Robles
009-251-003	857	Government	22	Developed, Low Intensity	3.5	4	0.14	5937	Paso Robles
009-291-026	860	Public Utility	21	Developed, Open Space	0.4	4	0.10	5937	Paso Robles
009-311-031	857	Government	21	Developed, Open Space	0.2	1	0.09	5970	Paso Robles
009-321-001	857	Government	23	Developed, Medium Intensity	0.5	1	0.11	5970	Paso Robles
009-471-034	857	Government	22	Developed, Low Intensity	0.1	1	0.02	5970	Paso Robles
009-511-003	857	Government	21	Developed, Open Space	3.0	1	0.13	5937	Paso Robles
009-521-007	857	Government	23	Developed, Medium Intensity	3.4	4	0.05	5937	Paso Robles
009-562-045	857	Government	22	Developed, Low Intensity	1.4	1	0.21	5937	Paso Robles
009-633-031	852	Government - Fire Dept	21	Developed, Open Space	2.4	4	0.09	5970	Paso Robles
009-691-034	857	#N/A	22	Developed, Low Intensity	0.8	1	0.16	5970	Paso Robles
009-691-035	857	#N/A	21	Developed, Open Space	0.8	1	0.15	5970	Paso Robles
009-776-021	857	#N/A	23	Developed, Medium Intensity	0.7	4	0.06	5970	Paso Robles
009-789-072	850	#N/A	23	Developed, Medium Intensity	0.7	1	0.03	5970	Paso Robles
009-789-073	850	#N/A	22	Developed, Low Intensity	0.7	1	0.03	5970	Paso Robles
009-811-005	857	Government	22	Developed, Low Intensity	2.0	4	0.06	5970	Paso Robles
009-860-001	850	Vacant Government	22	Developed, Low Intensity	1.5	1	0.25	5970	Paso Robles
009-862-022	850	Vacant Government	21	Developed, Open Space	0.6	1	0.13	5970	Paso Robles
025-398-072	857	Government	22	Developed, Low Intensity	0.6	1	0.06	5937	Paso Robles
025-533-058	850	Vacant Government	22	Developed, Low Intensity	3.5	1	0.20	5937	Paso Robles
053-500-002	857	Government	21	Developed, Open Space	2.0	9	0.23	6219	San Luis Obispo
065-220-011	857	Government	21	Developed, Open Space	0.7	1	0.22	6088	Morro Bay
066-025-001	857	Government	22	Developed, Low Intensity	1.1	4	0.01	6088	Morro Bay
066-066-019	856	Government Post Office	23	Developed, Medium Intensity	1.2	4	0.21	6088	Morro Bay
066-071-034	857	Government	23	Developed, Medium Intensity	0.7	4	0.06	6088	Morro Bay
066-073-009	851	Government - Office	23	Developed, Medium Intensity	0.8	4	0.15	6126	Morro Bay
066-075-007	857	Government	24	Developed High Intensity	1.1	4	0.09	6126	Morro Bay
066-075-021	851	Government - Office	24	Developed High Intensity	1.1	4	0.16	6126	Morro Bay
066-187-006	857	Government	22	Developed, Low Intensity	2.4	4	0.05	6126	Morro Bay
066-225-027	857	Government	23	Developed, Medium Intensity	3.9	4	0.06	6126	Morro Bay
066-225-028	857	Government	22	Developed, Low Intensity	2.7	4	0.03	6126	Morro Bay
066-251-014	857	Government	22	Developed, Low Intensity	3.0	4	0.09	6126	Morro Bay
066-321-007	857	Government	24	Developed High Intensity	1.1	4	0.13	6126	Morro Bay
066-321-008	857	Government	23	Developed, Medium Intensity	1.2	4	0.07	6126	Morro Bay
066-332-008	857	Government	23	Developed, Medium Intensity	0.2	1	0.06	6088	Morro Bay
068-159-016	857	Government	23	Developed, Medium Intensity	4.1	3	0.16	6088	Morro Bay
068-168-022	850	Vacant Government	22	Developed, Low Intensity	1.6	4	0.24	6088	Morro Bay
068-251-001	857	Government	71	Grassland/Herbaceous	6.9	10	0.13	6088	Morro Bay
068-258-010	857	Government	22	Developed, Low Intensity	5.6	10	0.07	6088	Morro Bay
068-262-042	857	Government	23	Developed, Medium Intensity	1.1	4	0.16	6088	Morro Bay
068-291-010	857	Government	23	Developed, Medium Intensity	0.2	1	0.03	6088	Morro Bay
068-321-012	857	Government	22	Developed, Low Intensity	0.3	4	0.05	6088	Morro Bay
068-401-002	857	Government	81	Pasture/Hay	4.9	10	0.08	6088	Morro Bay
005-023-011	857	Government	22	Developed, Low Intensity	4.2	10	0.05	6258	Pismo Beach
005-031-017	857	Government	22	Developed, Low Intensity	5.5	10	0.10	6258	Pismo Beach
005-036-010	857	Government	22	Developed, Low Intensity	4.2	10	0.01	6258	Pismo Beach
005-041-022	857	Government	21	Developed, Open Space	5.4	9	0.05	6258	Pismo Beach
005-071-001	857	Government	23	Developed, Medium Intensity	0.4	4	0.17	6258	Pismo Beach
005-074-012	860	Public Utility	23	Developed, Medium Intensity	1.3	4	0.11	6258	Pismo Beach
005-076-021	857	Government	23	Developed, Medium Intensity	1.1	4	0.24	6258	Pismo Beach
005-131-006	820	School	23	Developed, Medium Intensity	1.4	4	0.16	6258	Pismo Beach

005-134-001	851	Government - Office	23	Developed, Medium Intensity	1.0	4	0.18	6258	Pismo Beach
005-161-034	857	Government	22	Developed, Low Intensity	0.2	4	0.04	6258	Pismo Beach
005-163-002	857	Government	23	Developed, Medium Intensity	0.3	1	0.04	6258	Pismo Beach
005-181-014	851	Government - Office	23	Developed, Medium Intensity	0.6	4	0.09	6258	Pismo Beach
005-181-035	857	Government	23	Developed, Medium Intensity	0.8	4	0.08	6258	Pismo Beach
005-213-034	857	Government	22	Developed, Low Intensity	3.9	2	0.09	6258	Pismo Beach
005-222-027	857	Government	22	Developed, Low Intensity	8.2	9	0.12	6258	Pismo Beach
005-223-001	857	Government	22	Developed, Low Intensity	9.5	1	0.14	6258	Pismo Beach
005-223-002	857	Government	23	Developed, Medium Intensity	6.2	1	0.21	6258	Pismo Beach
005-242-068	850	Vacant Government	22	Developed, Low Intensity	1.5	1	0.03	6258	Pismo Beach
005-271-013	857	Government	22	Developed, Low Intensity	0.9	1	0.01	6258	Pismo Beach
010-141-041	854	Government Recreational	22	Developed, Low Intensity	3.4	4	0.12	6231	Pismo Beach
010-261-061	851	Government - Office	23	Developed, Medium Intensity	1.3	4	0.06	6258	Pismo Beach
010-302-001	857	Government	23	Developed, Medium Intensity	3.8	4	0.09	6258	Pismo Beach
010-341-009	857	Government	23	Developed, Medium Intensity	1.0	4	0.18	6258	Pismo Beach
010-342-001	857	Government	23	Developed, Medium Intensity	1.1	4	0.16	6258	Pismo Beach
010-511-023	857	Government	23	Developed, Medium Intensity	2.0	4	0.20	6231	Pismo Beach
001-023-033	854	Government Recreational	21	Developed, Open Space	0.6	1	0.13	6162	San Luis Obispo
001-141-027	857	Government	22	Developed, Low Intensity	1.1	1	0.25	6172	San Luis Obispo
001-205-012	857	Government	22	Developed, Low Intensity	1.3	1	0.25	6162	San Luis Obispo
001-235-015	857	Government	22	Developed, Low Intensity	1.2	1	0.22	6172	San Luis Obispo
002-313-020	857	Government	22	Developed, Low Intensity	1.8	1	0.01	6162	San Luis Obispo
002-323-008	857 332	#N/A	23	Developed, Medium Intensity	0.9	1	0.15	6172	San Luis Obispo
002-327-003	860	Public Utility	23	Developed, Medium Intensity	1.1	1	0.15	6172	San Luis Obispo
002-412-003	857	Government	23	Developed, Medium Intensity	1.1	1	0.10	6162	San Luis Obispo
002-412-012	857	Government	22	Developed, Low Intensity	1.0	1	0.20	6172	San Luis Obispo
002-412-016	857	Government	22	Developed, Low Intensity	0.6	1	0.21	6172	San Luis Obispo
002-413-010	820	School	22	Developed, Low Intensity	1.7	1	0.21	6162	San Luis Obispo
002-421-020	857	Government	22	Developed, Low Intensity	0.6	1	0.12	6172	San Luis Obispo
002-482-012	857	Government	21	Developed, Open Space	0.4	1	0.15	6196	San Luis Obispo
003-571-019	857	Government	22	Developed, Low Intensity	2.0	1	0.06	6196	San Luis Obispo
003-644-014	857	Government	23	Developed, Medium Intensity	0.9	1	0.18	6196	San Luis Obispo
003-703-002	857	Government	22	Developed, Low Intensity	2.4	3	0.03	6196	San Luis Obispo
003-721-048	820	School	23	Developed, Medium Intensity	0.6	1	0.20	6196	San Luis Obispo
003-736-014	857	Government	22	Developed, Low Intensity	1.0	1	0.16	6196	San Luis Obispo
004-272-049	857	Government	22	Developed, Low Intensity	2.2	4	0.11	6196	San Luis Obispo
004-573-003	857	Government	22	Developed, Low Intensity	2.4	1	0.16	6196	San Luis Obispo
004-582-001	857	Government	23	Developed, Medium Intensity	1.5	1	0.13	6196	San Luis Obispo
004-741-004	854	Government Recreational	22	Developed, Low Intensity	0.2	1	0.18	6196	San Luis Obispo
004-822-010	857	Government	21	Developed, Open Space	1.0	1	0.08	6196	San Luis Obispo
004-912-064	857	Government	22	Developed, Low Intensity	0.9	1	0.00	6196	San Luis Obispo
004-951-022	850	Vacant Government	21	Developed, Open Space	1.1	3	0.22	6196	San Luis Obispo
004-951-024	850 200	#N/A	21	Developed, Open Space	1.6	3	0.15	6196	San Luis Obispo
052-115-001	820	School	23	Developed, Medium Intensity	2.0	3	0.11	6162	San Luis Obispo
052-115-002	820	School	23	Developed, Medium Intensity	2.0	3	0.11	6162	San Luis Obispo
052-115-003	820	School	22	Developed, Low Intensity	2.0	3	0.20	6162	San Luis Obispo
052-133-011	857	Government	21	Developed, Open Space	4.4	9	0.00	6172	San Luis Obispo
052-205-003	860	Public Utility	22	Developed, Low Intensity	0.9	1	0.16	6162	San Luis Obispo
052-231-009	857	Government	21	Developed, Open Space	0.9	3	0.03	6162	San Luis Obispo
052-351-043	857	Government	22	Developed, Low Intensity	1.1	1	0.08	6196	San Luis Obispo
052-482-013	857	Government	22	Developed, Low Intensity	1.9	3	0.05	6162	San Luis Obispo
052-512-011	857	Government	21	Developed, Open Space	4.9	9	0.08	6162	San Luis Obispo

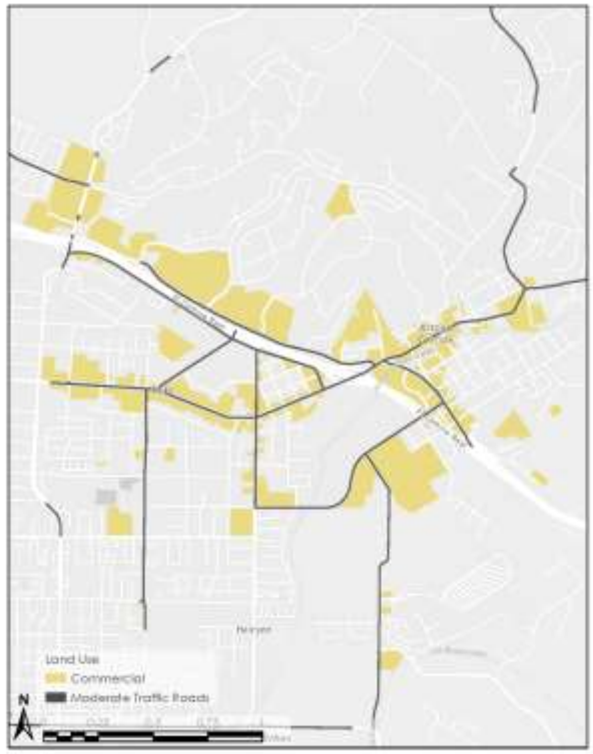
053-071-025	850	Vacant Government	21	Developed, Open Space	1.2	1	0.23	6196	San Luis Obispo
053-151-038	850 035	#N/A	21	Developed, Open Space	0.1	1	0.14	6196	San Luis Obispo
053-212-012	860	Public Utility	21	Developed, Open Space	2.5	1	0.06	6196	San Luis Obispo
053-251-012	857	Government	23	Developed, Medium Intensity	0.2	1	0.02	6196	San Luis Obispo

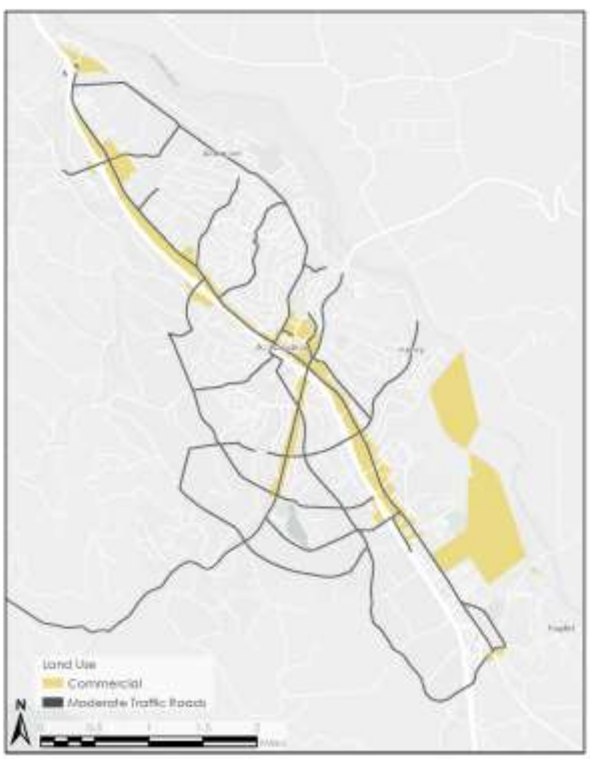
APPENDIX 4-G

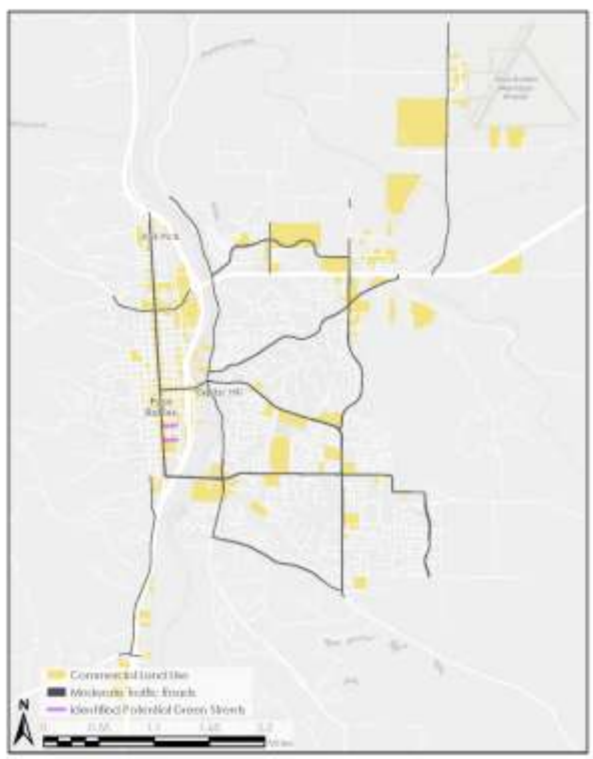
Potential and Identified Green Streets

The following maps identify streets that meet basic criteria for Green Street retrofitting (minor or other arterial, near or adjacent to commercial land uses, less than 10% hillside gradient). For three municipalities that have already explored these opportunities in detail (Morro Bay, San Luis Obispo, and Paso Robles), specific segments are highlighted on their respective map. Also included is a table that lists *all* of the mapped road segments.


Land Use
Commercial
Moderate Traffic Roads
N


Land Use
Commercial
Moderate Traffic Roads
N


Land Use
Commercial
Moderate Traffic Roads
N


Commercial Land Use
Moderate Traffic Roads
Identified Potential Green Streets
N

City/Road	Road Segment Lengths (ft)
Arroyo Grande	**12,321**
Barnett St	1,493
Barrnett St	167
Branch St	46
Brisco Rd	240
Corbett Canyon Rd	147
Courtland St	12
Crown Hill St	14
E Branch St	1,153
el Camino Real	1,216
Grand Ave	2,103
Huasna Rd	110
N Halcyon Rd	473
S Elm St	874
S Halcyon Rd	659
The Pike	23
Traffic Way	887
Valley Rd	627
W Branch St	1,993
Atascadero	**19,992**
Atascadero Ave	959
Capistrano Ave	461
Curbaril Ave	592
del Rio Rd	683
E Front St	455
el Camino Real	9,819
Lewis Ave	188
Mercedes Ave	569
Morro Rd	2,035
Portola Rd	427
San Anselmo Rd	969
San Benito Rd	96
San Jacinto Ave	228
Santa Barbara Rd	497
Santa Rosa Rd	325
Santa Ysabel Ave	380
Traffic Way	798
Viejo Camino	490
W Front Rd	22
Morro Bay	**6,928**
Beach St	369
Cabrillo Hwy	4
Embarcadero	716
Kern Ave	9
Main St	2,283
Morro Bay Blvd	1,430
Morro Rd	793
Quintana Rd	150
S Bay Blvd	237
Pismo Beach	**12,988**
A Ave	8
Bello St	523
Cabrillo Hwy	1,827
Five Cities Dr	983
Frontage Rd	3,384
Hinds Ave	337
James Way	1,242
N 4th St	470
Price Canyon Rd	809
Price St	2,471
Shell Beach Rd	362
Shell Beach St	511

City/Road	Road Segment Lengths (ft)
Paso Robles	**38,657**
13th St	1,432
24th St	1,150
Airport Rd	1,606
Buena Vista Dr	820
Cedarwood Dr	0
Creston Rd	5,149
Dallons Dr	2,976
Golden Hill Rd	4,243
Green Valley Rd	27
Linne Rd	842
Niblick Rd	2,438
Paso Robles Rd	377
River Oaks Dr	1,240
River Rd	1,039
S River Rd	1,424
S Vine St	452
Sherwood Rd	1,374
Spring St	8,153
State Hwy 46	1,359
Union Rd	2,487
San Luis Obispo	**31,974**
Broad St	3,668
Buena Vis	85
Buena Vista Ave	158
Cabrillo Hwy	1,517
California Blvd	1,613
Dalidio Dr	119
el Camino Real	19
Foothill Blvd	1,410
Grand Ave	551
Higuera St	2,760
Johnson Ave	1,865
Laurel Ln	826
Los Osos Valley Rd	2,275
Madonna Rd	2,062
Marsh St	1,836
Monterey St	1,759
Orcutt Rd	583
Osos St	724
Palm St	10
Prado Rd	1,156
Prefumo Canyon Rd	6
S Higuera St	2,008
San Luis Dr	505
Santa Barbara St	757
Santa Rosa St	736
South St	667
Tank Farm Rd	1,369
Toro St	118
Vachell Ln	551
Walnut St	155

APPENDIX 4-H

Qualitative Metric Results and Cost for Identified Project and Programs

- ● more than 3 identified attributes, or all "primary" criteria met
- ⊙ 2-3 identified attributes
- ○ 0 or 1 identified attribute
- "Primary" TAC-identified criteria (dark blue shading)
- "Secondary" TAC-identified criteria (light blue shading)

Project	COMMUNITY	Provides habitat, urban greening, open space to DACs	Enhances/creates recreational and public use areas	Provides public education	Provides urban greening (aesthetic, shading, air quality, livability)	Provides community involvement	PROJECT READINESS	O&M funding secured	Funding is committed	Project site secured	Benefits quantified	Near-construction-ready design complete	PROJECT VALUE AND PERFORMANCE	Projects located on public land (State Board Priority)	Cost <$50k or feasible w/o external funding	Supports regulatory compliance	Quantified reductions in pollutants or volume are significant	Efficient O&M (< 1/year)	ENVIRONMENT (non-water resource)	Offers climate change resiliency	Protects / increases native vegetation	GHG emission reduction	Provides a carbon sink	Reduces heat island effect	COORDINATION & COLLABORATION	Meets multiple agency objectives	Funding is leveraged	Public/stakeholder engagement	Supports broader effort (e.g, link in contiguous wildlife corridor)	Identified in prior plan or planning process	ESTIMATED COST
San Simeon Creek Road Flooding Remediation (planning through design and construction)	○		x				○						○					x	●	x	x				●	x	x				$100,000
Santa Rosa Creek Floodplain & Wetland Retention Plan	⊙			x		x	⊙			x	x		⊙		x		x	x	●	x	x	x	x		●	x	x		x	x	$166,000
Santa Rosa Creek Streamflow Enhancement	⊙			x		x	⊙		x	x	x		⊙				x	x	●	x	x	x	x		●	x	x		x	x	$631,000
Capture and Reuse of Storm Water. Conceptual Phase	○						○			x			●	x		x	x	x	○	x					●	x	x		x		$200,000
Bioreactor Installation in Morro Bay Watershed	⊙	x		x		x	○						⊙		x	x	x		○						⊙	x		x		x	$50,000
Various Projects	⊙		x	x			⊙			x	x		○	x					○		x				○	x					unknown
2nd Street Baywood Green Street Project	●	x	x	x	x	x	⊙			x	x		⊙	x		x	x		●	x	x	x	x	x	●	x		x	x	x	$525,000
Embarcadero Surf Project	●	x	x	x	x	x	⊙			x	x		⊙	x		x	x		●	x	x	x	x	x	⊙	x		x			$106,000
Cloisters Project	●	x	x	x		x	⊙			x	x		●	x		x	x	x	●	x	x				⊙	x		x	x		$608,000
Embarcadero Boat Wash Project- Small DMA	●	x	x	x	x	x	⊙	x		x	x		●	x	x	x			●	x	x	x	x	x	⊙	x		x			$33,000
Embarcadero Boat Wash Project - Large DMA	●	x	x	x	x	x	⊙			x	x		⊙	x		x	x		●	x	x	x	x	x	⊙	x		x			$243,000
Morro Bay State Park Marina Parking Lot - Stormwater Pollution Management through Low Impact Development Techniques - Planning Phase	●	x	x	x	x	x	⊙			x	x		⊙	x		x			●	x	x	x	x	x	⊙	x		x	x		$1,350,000
Meadow Park Stormwater Capture and Use	⊙			x		x	⊙			x	x		⊙	x		x	x		○	x					○	x					$595,000
Mitchell Park Bioretention	⊙		x	x			⊙			x	x		●	x	x				●	x	x				○	x					$50,000
Higuera Widening Project	○	x					○						○						○						○						unknown
Stormwater Infiltration basins	●	x		x	x	x	○						○						○						○		x				unknown
Pismo Preserve Roads Improvement Project	⊙		x	x		x	○						⊙		x	x	x		●	x	x				⊙	x		x			20,000
Corbett Creek Floodplain and Stream Restoration Project	○					x	○						○						●	x	x				⊙	x	x				unknown
South Halcyon Green / Complete Street	●	x	x	x	x		⊙			x			⊙	x		x			●	x	x				○	x					unknown
Oceano Drainage Improvement Project	⊙	x		x			○						○						○						○		x				$6.4M
On-farm BMP implementation to decrease sediment transport to Oso Flaco Watershed	○						○						○						○						○						unknown
Upper Spring Street Low Impact Development Project	●	x	x	x	x	x	⊙			x	x		⊙	x		x	x		●	x	x	x	x	x	○	x					$1,800,000
Mountain Springs infiltration basin	●	x	x	x	x	x	○						○						○			x			○	x					$250,000
Montebello Oaks Basin Retrofit	⊙		x		x		○						⊙	x		x			○		x				○		x				$150,000
Grand Canyon Basin Retrofit	⊙		x		x		○						⊙	x		x			○		x				○						$150,000
Melody Basin Retrofit	⊙		x		x		○				x		⊙	x		x			○		x				○						$200,000
Niblick LID Drainage Retrofit	○				x		○						○			x			○						○						$27,000
Atascadero Sunken Gardens Stormwater Capture	⊙		x	x	x		⊙			x	x		⊙	x		x	x			x					●	x	x				$1,500,000
El Camino Real Greenstreets Project - Downtown Corridor	●	x	x	x	x		○			x			⊙	x		x			●		x	x	x	x	⊙	x	x				$1,500,000
San Juan Storm Water Infiltration Project	⊙	x		x			○						○			x			●	x	x				●	x	x				$250,000
Stormwater Rewards Rebate Program	●	x		x	x	x	○				x		○				x		●	x	x	x	x	x	⊙	x		x			$264,000
Region wide Key Percolation Zone Study	⊙	x				x	○						○						⊙	x					○		x				$56,000
Earth Genius - Educational Programming	●	x	x	x	x	x	⊙		x	x			●	x	x	x			●	x	x	x			●	x	x	x			$5,000 - $15,000 per elementary school, per year