Criteria Development for the

Gabilan Creek Watershed Turbidity TMDL

Using USEPA Methods

John.Inman@waterboards.ca.gov

[1. Introduction 1](#_Toc80863190)

[2. Stream Classification 2](#_Toc80863191)

[2.1. Existing Classification Systems 2](#_Toc80863192)

[2.2. Stream Classification for Gabilan Creek Turbidity TMDL 4](#_Toc80863193)

[3. Criteria Development 7](#_Toc80863194)

[3.1. Using Least Impacted Reaches 7](#_Toc80863195)

[3.2. Using General Population of Reaches 9](#_Toc80863196)

[3.3. Using Published Values 9](#_Toc80863197)

[4. Conclusion 10](#_Toc80863198)

[5. References 10](#_Toc80863199)

[Appendix A—Classified Monitoring Stations 12](#_Toc80863200)

# Introduction

The purpose of this document is to describe the methods used to develop turbidity criteria for the Total Maximum Daily Loads for Turbidity in the Gablian Creek Watershed, Monterey County California (Gabilan Creek Turbidity TMDL).

The methods presented here are based on two documents published by The United States Environmental Protection Agency (USEPA). While these documents are nominally intended for the development of nutrient criteria, they also “provide methodologies for developing nutrient criteria for four primary variables (total nitrogen, total phosphorus, chlorophyll *a*, and ameasure of turbidity.” *Nutrient Criteria Technical Guidance Manual* (USEPA, 2000a) provides a general overview of stream classification and criteria development; *Ambient Water Quality Criteria Recommendations, Rivers and Streams in Nutrient Ecoregion III* (USEPA, 2000b) provides a detailed framework for criteria development and some region-specific criteria recommendations.

Criteria development can be thought of as a two-step process comprising stream classification and class-specific criteria development. Each step entails making decisions with some degree of subjectivity. *These decision points are italicised throughout the text and should be reviewed.*

# Stream Classification

Due to natural variation in the attributes that contribute to turbidity, no single criterion is appropriate for all waterbodies. Therefore, stream classification is employed to group streams with comparable attributes. According to USEPA (2000a), “[c]lassifying rivers and streams reduces the variability of stream-related measures (e.g., physical, biological, or water quality attributes) within classes and maximizes variability among classes.” This allows for the development and application of criteria that balance flexibility (accounting for natural variation) and scalability (avoiding redundant site-specific criteria for similar waterbodies).

USEPA (2000a) does not provide a comprehensive framework for stream classification. Instead it identifies the attributes that should be considered for stream classification and describes pre-existing classification systems that can be applied to some of these attributes. Attributes that may be considered for stream classification include climate, geology, substrate features, slope, canopy cover, retention time of water, discharge and flow continuity, system size, and channel morphology.

Many of these attributes overlap with one another and specific stream classification frameworks will not include every attribute in this list. The final set of attributes used will depend on regional applicability, data availability, and the desired balance of flexibility and scalability. Also, including too many attributes may result in stream classes with too few member. One case study presented in the USEPA (2000a) document arbitrarily set the minimum number of streams in each class at three.

## Existing Classification Systems

There are a number of preexisting classification systems that can be used for some of these attributes.

Ecoregional classification was developed by USEPA for evaluating and managing natural resources (USEPA, 1987). It is based on geology, soils, geomorphology, dominant land uses, and natural vegetation and results in distinct geographically contiguous units. The classification system comprises four hierarchically nested levels corresponding with continental (Level I), subcontinental (Level II), regional (Level III), and sub-regional (Level IV) spatial scales. GIS data of ecoregional boundaries are available for download (USEPA, 1987).

Rosgen classification is used primarily in stream restoration contexts. It is based on channel slope, cross-sectional shape, pattern (e.g. braided), landform, entrenchment ratio, width/depth ratio, sinuosity, and channel materials. While Rosgen classification may be applied on a stream by stream basis, there is no GIS data of region 3 streams that includes Rosgen classifications. However, Rosgen break points for slope (0.5%, 2%, 4%, 10%) have been incorporated into other stream classification systems and could be applied to regional streams via the National Hydrography Dataset (NHD), which includes slope data and is available for download (USGS, 2019) and on Water Board servers.

Strahler stream order classification can be used for stream monitoring and assessment. It is based on the sequential ordering of streams within a drainage network---headwaters are first order streams, a merger of two first order streams results in second order streams, a merger of two second order streams results in third order streams, and so on. Stream order can be used as a rough surrogate for system size and landscape setting. This system has the disadvantage that disparities in hydrological conditions may exist among same order streams since numerous lower order streams may enter a higher order stream without changing the stream order. This may be checked by comparing stream order to (estimated) flow data. NHD includes both stream order and flow estimates and is available for download (USGS, 2019) and on Water Board servers.

Cowardin classification is used by USFWS to map and inventory wetland habitat (USFWS, 1979). Not all wetlands are streams, and not all streams are wetlands, however, Cowardin classification is applicable to streams that are less than 2 meters deep as well as deepwater habitats. The classification scheme comprises five “systems”, of which only the “Riverine” system is applicable to stream classification (Figure 1). The riverine system is based on tidal influence, flow regime, watershed placement, and substrate, though it has the disadvantage that the classification attributes are not fully crossed at every level. For example, the “subsystem” level classifies wetlands by watershed placement (upper and lower) and flow regime (intermittent and perennial) but there is no “high intermittent” subsystem. This may be addressed by applying custom subsystems manually as necessary. Most stream reaches in Region 3 have been assigned Cowardin codes; this data is included in the National Wetlands Inventory (NWI) and is available for download (USFWS, 2019) and on Water Board servers.

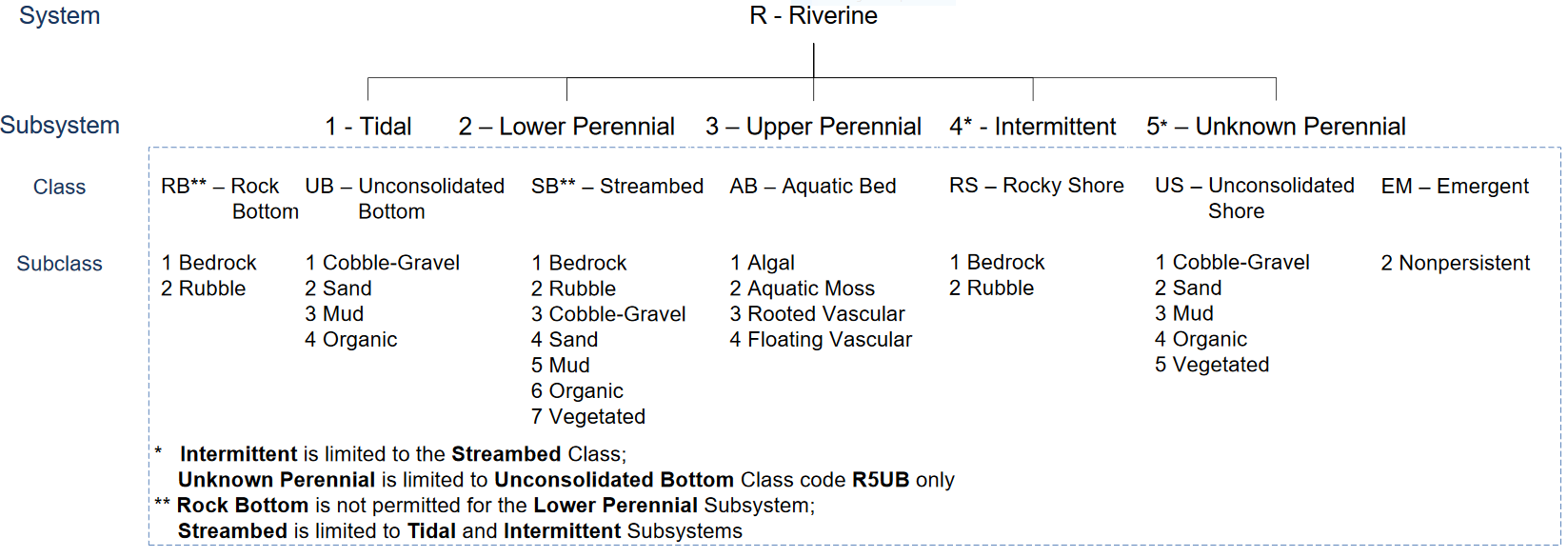


Figure 1. The Cowardin riverine system.

## Stream Classification for Gabilan Creek Turbidity TMDL

For the purposes of this project *we classified streams by system size, substrate features, and slope*. We chose these attributes because they are sources of natural variation in turbidity, data with these attributes are readily available for region 3 streams, and the resulting stream classes have a sufficient number of members.

*To capture system size we used stream order from the NHD*. To reduce the number of resulting stream classes (and increase membership in each class) *we further aggregated stream order* into “headwater streams” (stream orders 1–3) and “medium streams” (stream orders 4–6) (ThoughCo., 2019).

To capture substrate features we used the “class” level of the Cowardin codes from the NWI. To reduce the number of resulting stream classes (and increase membership in each class) *we further aggregated class substrate* into “unconsolidated” (comprising UB, SB, RS, and US), “rock” (comprising RB), and “vegetated” (AB and EM).

*To capture slope we used again used the “class” level of the Cowardin codes* from the NWI, translating the labels “lower” to “low” and “upper” to “high” to refer top low-slope and high-slope streams, respectively. Cowardin reference material does not define the break point between high and low slope. If necessary, classification of slope could use slope data from NHD with Rosgen break points instead.

To a certain extent other attributes such as climate and geology are captured by the fact that we are restricting the analysis to region 3 streams, almost all of which are all located within ecoregion 11.1.1 (though a few in the Santa Cruz Mountains are in ecoregion 7.1.8). The attributes of retention time, canopy cover, flow continuity, and channel morphology were not used. *Further classification using these attributes, especially flow continuity since it is included in the Cowardin codes, could be employed if necessary.*

We classified all reaches for which we had turbidity data by these attributes. We downloaded all available turbidity data from the CEDEN database and curated this dataset by removing duplicate records and records with error-signaling quality assurance flags. Data-bearing reaches were identified as those associated with a monitoring station in the dataset. We extracted a list of unique monitoring stations and mapped them using GIS software. We joined each monitoring station with their corresponding reaches in the NHD and NWI datasets. Each join was manually checked to ensure monitoring stations were joined to the appropriate waterbodies.

The CEDEN pull contained data for 402 sites that were *not tidally influenced*. Of these, *42 were unable to be classified due to unavailable NHD or NWI data* *and should be reviewed*. Classification of the remaining 360 sites resulted in six stream classes: head-high-unconsolidated (n = 64), head-low-unconsolidated (n = 112), head-low-vegetated (n = 54), medium-high-unconsolidated (n = 33), medium-low-unconsolidated (n = 78), and medium-low-vegetated (n = 19). The sites addressed by the proposed TMDL (restoration sites) fell into one of three classes: head-low-unconsolidated (n = 6), head-low-vegetated (n = 1), or medium-low-unconsolidated (n = 5). Classified sites are shown in Figure 2. A table of all sites and their classifications is given in Appendix A.

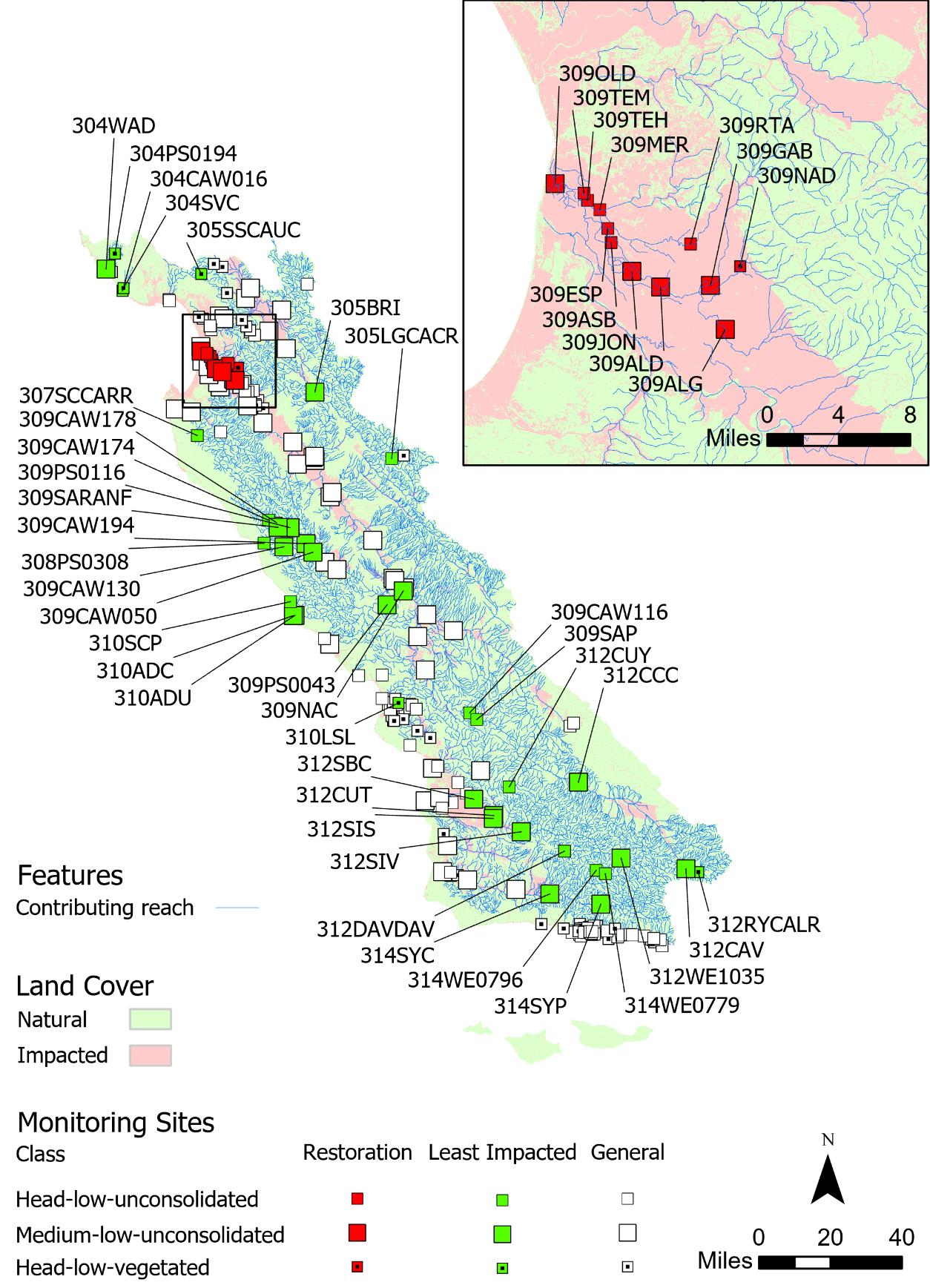


Figure 2. Region 3 Monitoring Stations.

# Criteria Development

USEPA (2000a) outlines three approaches to criteria development: using reference reaches, using predictive relationships (models), and using published thresholds. Modeling turbidity is a complex, resource-intensive, and error-prone approach that was not considered for this task.

A reference reach is “a least impacted waterbody within an ecoregion that can be monitored to establish a baseline to which other waters can be compared. Reference reaches are not necessarily pristine or undisturbed by humans” (USEPA, 2000a). USEPA (2000a) describes three approaches to using reference reaches that can be applied to development of turbidity criteria:

1. estimate turbidity value of a theoretical reference reach using best professional judgement,
2. determine the 75th percentile turbidity value of a population of least impacted reaches,
3. or determine the 5th to 25th percentile turbidity value of the general population of reaches.

The first approach using best professional judgement approach is not explored here.

## Using Least Impacted Reaches

For the second approach we developed a method for identifying least impacted reaches using the National Land Cover Dataset (NLCD). To identify human impact at the landscape scale *we reclassed the 11 NLCD land cover classes into two classes*: developed open space, developed (low intensity), developed (medium intensity), developed (high intensity), pasture/hay, and cultivated crops were reclassed as “impacted”; open water, barren (rock/sand/clay), shrub/scrub, grassland/herbaceous, woody wetlands, and emergent herbaceous wetlands were reclassed as “natural”. We associated each monitoring site with its corresponding reach in the NHD dataset and created stream networks for each of these sites by connecting them to all contributing reaches*, terminating with headwaters*. We used GIS software to create *15-meter buffers around each stream network*, superimpose these networks over the reclassified NLCD raster, and calculate the proportion of impacted land use within each network. *Least impacted reaches were defined as those whose stream networks had an impact value of less than or equal to the 25th percentile.*

This procedure resulted in a population of 90 potential reference sites with stream classes of head-high-unconsolidated (n = 27), head-low-unconsolidated (n = 11), head-low-vegetated (n = 7), medium-high-unconsolidated (n = 22), medium-low-unconsolidated (n = 20), and medium-low-vegetated (n = 3). Proposed turbidity criteria developed by this method are presented in Table 1.

**Table 1. Summary of proposed criteria.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Proposed Turbidity Criteria (NTU) | | |
| Stream Class | L. Impact | General | Published |
| All Seasons Data |  |  |  |
| Head-low-unconsolidated | 1.6 | 1.0 | 1.9 |
| Head-low-vegetated | 2.5 | 0.7 | 1.9 |
| Medium-low-unconsolidated | 3.9 | 1.5 | 1.9 |
| Wet Season Data |  |  |  |
| Head-low-unconsolidated | 2.0 | 1.0 | — |
| Head-low-vegetated | 3.3 | 0.8 | — |
| Medium-low-unconsolidated | 6.5 | 1.7 | — |
| Dry Season Data |  |  |  |
| Head-low-unconsolidated | 0.7 | 0.9 | — |
| Head-low-vegetated | 2.2 | 0.6 | — |
| Medium-low-unconsolidated | 2.4 | 1.4 | — |

## Using General Population of Reaches

For the third approach we took the 25th percentile turbidity value of all monitoring sites for which we had data as described in Section 2.2. Proposed turbidity criteria developed by this method are presented in Table 1.

## Using Published Values

The USEPA (2000b) publishes proposed criteria to be used as a starting point when the preferred methods described above are not used. The recommended turbidity criteria for ecoregion 11.1.1 (labelled “Level III Ecoregion 6” in USEPA, 2000b) is 1.9 NTU (Table 1).

# Conclusion

Criteria based on the most preferred method of using (the 75th percentile of the) least impacted streams were similar to the published value, varying by class, suggesting these values are reasonable estimates of turbidity or regional streams in their “natural condition”. Criteria based on the (25th percentile of the) general population of streams were generally lower than those based on least impacted streams. This suggests either that the central coast region has a higher proportion of less impacted streams than the regions where USEPA developed these approaches, or that the threshold at which we determine which streams are “least impacted” is too high.

The results presented in Table 1 are the product of a series of decisions, each of which should be discussed and reviewed. Specifically, consensus should be built around the points italicized throughout the text. As a consensus is built around these questions, this method of developing turbidity criteria may be used to develop criteria for other turbidity TMDLS in our region, as well as criteria for other pollutants such as nitrogen, phosphorus, and chlorophyll *a*.

# References

ThoughtCo., 2019. *Stream Order---A classificatin of the Rank of Streams and Rivers.* [Online]   
Available at: https://www.thoughtco.com/what-is-stream-order-1435354

USEPA, 1987. *Ecoregions.* [Online]   
Available at: https://www.epa.gov/eco-research/ecoregions

USEPA, 2000a. *Nutrient Criteria Technical Guidance Manual.* [Online]   
Available at: https://www.epa.gov/sites/production/files/2018-10/documents/nutrient-criteria-manual-rivers-streams.pdf

USEPA, 2000b. *Ambient Water Quality Criteria Recommendations, Rivers and Streams in Nutrient Ecoregion III.* [Online]   
Available at: https://www.epa.gov/sites/production/files/documents/rivers3.pdf

USFWS, 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* [Online]   
Available at: https://www.fws.gov/wetlands/Documents/Classification-of-Wetlands-and-Deepwater-Habitats-of-the-United-States.pdf

USFWS, 2019. *National Wetlands Inventory.* [Online]   
Available at: https://www.fws.gov/wetlands/

USGS, 2019. *National Hydrography.* [Online]   
Available at: https://www.usgs.gov/core-science-systems/ngp/national-hydrography

**Appendix A—Classified Monitoring Stations**

Table A-1. Monitoring sites classified by size, gradient, and substrate.

| Station Code | Station Name | Class |
| --- | --- | --- |
| 304APS | Aptos Creek at Nisene Marks Park Road | head-high-unconsolidated |
| 304BEP | Bear Creek at Elks Park | head-high-unconsolidated |
| 304BH9 | Boulder Creek at Highway 9 | head-high-unconsolidated |
| 304BRA | Branciforte Creek at Water Street | head-high-unconsolidated |
| 304CAW016 | San Vicente Creek at Davenport | head-low-vegetated |
| 304CAW081 | Soquel Creek ~0.2mi above Laurel Glen Rd. | head-high-unconsolidated |
| 304CAW153 | Scott Creek ~4mi below Little Basin | head-high-unconsolidated |
| 304GAZ | Gazos Creek Lagoon at Highway 1 | head-high-unconsolidated |
| 304PS0018 | Lompico Creek | head-high-unconsolidated |
| 304PS0194 | East Waddell Creek ~0.7mi below Opal Cr. | head-low-vegetated |
| 304PS0253 | San Lorenzo River ~0.4mi above McGaffigan Rd. | head-high-unconsolidated |
| 304PS0274 | Zayante Creek above Grahm Hill Rd | head-high-unconsolidated |
| 304RIV | San Lorenzo River at Crossing Street | medium-high-unconsolidated |
| 304SCM | Scott Creek upstream Big Creek residences | head-high-unconsolidated |
| 304SL9 | San Lorenzo River at Highway 9 | head-high-unconsolidated |
| 304SLB | San Lorenzo River at Big Trees Road | medium-high-unconsolidated |
| 304SLE | San Lorenzo Upstream Bear Creek | head-high-unconsolidated |
| 304SOK | Soquel Creek at Knob Hill Parking Lot | head-low-vegetated |
| 304SOQ | Soquel Creek Lagoon at RR Trussels | head-low-unconsolidated |
| 304SOU | Soquel Creek at Soquel Creek Road | head-high-unconsolidated |
| 304SPC236 | Sempervirens Creek above Hwy 236 | head-high-unconsolidated |
| 304SVC | San Vicente Creek at the gate at the end of San Vicente Creek Road | head-low-vegetated |
| 304WAD | Waddell Creek Lagoon at Highway 1 | medium-low-unconsolidated |
| 304WDCAH1 | Waddell Creek ~1.8mi above Hwy 1 | medium-high-unconsolidated |
| 304WE1096 | Scott Creek ~0.7mi above Mill Creek | head-low-vegetated |
| 304ZAY | Zayante Creek at Graham Hill Road | head-high-unconsolidated |
| 305ACR | San Juan creek @ 1st St and Christopher Ranch | head-low-vegetated |
| 305BRI | San Benito River, Bridge downstream Willow Creek | medium-low-unconsolidated |
| 305CAN | Carnadero Creek upstream of Pajaro River | medium-low-vegetated |
| 305CAR | Carnadero Creek at Private property access | medium-low-vegetated |
| 305CAW049 | Pacheco Creek ~1.3mi above South Fork | head-low-unconsolidated |
| 305CAW097 | Bodfish Creek ~0.45mi below Whitehurst Rd. | head-low-vegetated |
| 305CAW161 | Uvas Creek ~0.4mi below Thomas Rd | medium-low-unconsolidated |
| 305CCUSGS | Clear Creek at USGS gauge and Oak Flat Camp | head-low-vegetated |
| 305CHE | Llagas Creek @ Chesbro Reservoir | head-low-vegetated |
| 305CHI | Pajaro River at Chittenden Gap | medium-low-vegetated |
| 305COR | Salsipuedes Creek downstream of Corralitos Creek | medium-low-vegetated |
| 305HAR | Harkins Slough at Harkins Slough Road | head-low-vegetated |
| 305LEA | Llagas Creek at Leavesley Road | medium-low-unconsolidated |
| 305LGCACR | Laguna Creek | head-low-unconsolidated |
| 305LGCBRC | Llagas Creek above Baldy Ryan Cyn. Cr. | head-high-unconsolidated |
| 305LLA | Llagas Creek at Bloomfield Avenue | medium-low-vegetated |
| 305MUR | Pajaro River at Murphy's Crossing | medium-low-unconsolidated |
| 305MVR | San Juan Creek @ Mission Vineyard Rd near Hwy 156 | head-low-unconsolidated |
| 305OAK | Llagas Creek @ Oak Glen Avenue | head-low-vegetated |
| 305PAC | Pacheco Creek at San Felipe Road | medium-low-unconsolidated |
| 305PAJ | Pajaro River at Betabel Road | medium-low-vegetated |
| 305PES | Pescadero Creek NE of Chittendon @ RR tracks | head-low-vegetated |
| 305PJP | Pajaro River at Porter/Main | medium-low-vegetated |
| 305PRR | San Juan Creek @ Prescott Rd | head-low-vegetated |
| 305PS0034 | Pajaro River | medium-low-unconsolidated |
| 305PS0057 | Pajaro River above Millers Canal | medium-low-vegetated |
| 305SBH | San Benito River at Hollister near 156 | medium-low-unconsolidated |
| 305SJA | San Juan Creek @ Anzar Rd | head-low-vegetated |
| 305SJN | San Juan Creek at Anzar Rd for RWB3 Site | head-low-vegetated |
| 305SSCAUC | Swanson Creek above Uvas Cr. | head-low-vegetated |
| 305STL | Struve Slough at Lee Road | head-low-vegetated |
| 305THU | Pajaro River at Thurwachter Bridge | medium-low-vegetated |
| 305TRE | Tres Pinos Creek @ Southside Rd | medium-low-unconsolidated |
| 305UVA | Uvas Creek at Bloomfield Avenue | medium-low-vegetated |
| 305UVCASC | Uvas Creek above Swanson Cyn. Cr. | head-high-unconsolidated |
| 305WCS | Watsonville Creek (aka Corncob Canyon) at Elkhorn Rd/Hudson Lndg | head-low-unconsolidated |
| 305WE0883 | Little Arthur Creek ~1mi W Redwood Retreat Rd. | head-high-unconsolidated |
| 306CAR | Carneros Creek in Los Lomas @ Blohm Rd | head-low-unconsolidated |
| 306-CARNE-31 | Carneros Creek at Johnson Road | head-low-unconsolidated |
| 306-CARNE-32 | Carneros Creek at mid entry to wetland | head-low-unconsolidated |
| 306-CARNE-33A | Carneros Creek- Sill Road, road flow | head-low-unconsolidated |
| 306-CARNE-36 | Carneros Creek at Blohm Road | head-low-unconsolidated |
| 306-CORNC-31 | Corn Cob Canyon Creek/Watsonville Creek | head-low-unconsolidated |
| 306WAC | Watsonville Creek @ Elkhorn Rd | head-low-unconsolidated |
| 307-CARME-31 | Carmel River at Cachuaga Community Center | medium-high-unconsolidated |
| 307-CARME-33 | Carmel River at Rosie's Bridge | medium-high-unconsolidated |
| 307-CARME-36 | Carmel River at Schulte Road MBNMS | medium-low-unconsolidated |
| 307-CARME-366 | Carmel River @ Schulte Road - upstream | medium-low-unconsolidated |
| 307-CARME-38 | Carmel River at Hwy 1 MBNMS | medium-low-unconsolidated |
| 307CAW135 | Carmel River CAW135 | medium-low-vegetated |
| 307CE0094 | San Clemente Creek ~1.3mi above Black Rock Creek | head-high-unconsolidated |
| 307CMD | Carmel River @ Schulte Rd | medium-low-unconsolidated |
| 307CML | Carmel River at Highway 1 | medium-low-unconsolidated |
| 307CMN | Carmel River @ Nason Rd Community Park | medium-high-unconsolidated |
| 307CMRADC | Carmel River above Danish Cr. | medium-high-unconsolidated |
| 307CMU | Carmel River at Esquiline Road | medium-high-unconsolidated |
| 307PS0028 | Carmel River | medium-high-unconsolidated |
| 307PS0044 | Carmel River ~0.5mi below Paso Del Rio Rd. | medium-high-unconsolidated |
| 307SCCARR | San Clemente Creek ~0.5mi above Robinson Cyn. Rd. | head-low-unconsolidated |
| 307TUL | Tularcitos Creek @ Carmel Valley Rd | head-low-unconsolidated |
| 308BGC | Big Creek at Highway 1 | head-high-unconsolidated |
| 308BSR | Big Sur River at Andrew Molera foot bridge | medium-high-unconsolidated |
| 308BSU | Big Sur River at Peiffer Big Sur State Park USGS gauge | medium-high-unconsolidated |
| 308CAW055 | Garrapata Creek ~0.2mi below Joshua Creek | head-high-unconsolidated |
| 308GAR | Garrapata Creek at Private Property access (above Highway 1) | head-high-unconsolidated |
| 308LILPAL | Little Sur River ~1.7mi above Skinner Cr. | medium-high-unconsolidated |
| 308LIM | Limekiln Creek @ Limekiln State Park | head-high-unconsolidated |
| 308LSR | Little Sur River @ Hwy 1 | medium-high-unconsolidated |
| 308LSRASC | Little Sur River ~0.4mi above Skinner Cr. | medium-high-unconsolidated |
| 308LSU | Little Sur River @ Old Coast Rd | head-high-unconsolidated |
| 308MIL | Mill Creek @ Mill Creek Picnic Area | head-high-unconsolidated |
| 308MWCAH1 | McWay Creek ~0.4mi above Hwy 1 | head-high-unconsolidated |
| 308PS0156 | Skinner Creek ~0.2mi above Little Sur River | head-high-unconsolidated |
| 308PS0204 | Big Sur River ~1mi above Pfeiffer Redwood Cr. | medium-high-unconsolidated |
| 308PS0308 | Unnamed Trib. to Mill Creek ~0.8mi above Mainstem | head-low-unconsolidated |
| 308PWCAH1 | Prewitt Creek above Hwy 1 | head-high-unconsolidated |
| 308ROCBBQ | Rocky Creek ~1.7mi above Hwy 1 | head-high-unconsolidated |
| 308SAM | Salmon Creek upstream Hwy 1 | head-high-unconsolidated |
| 308SJC | San Jose Creek at Private Road Access (north of Point Lobos) | head-high-unconsolidated |
| 308WER325 | Little Sur River above Skinner Creek | medium-high-unconsolidated |
| 308WLO | Willow Creek at Highway 1 | head-high-unconsolidated |
| 309ALD | Salinas Reclamation Canal @ Boranda Rd | medium-low-unconsolidated |
| 309ALG | Salinas Reclamation Canal @ La Guardia | medium-low-unconsolidated |
| 309ALU | Salinas Reclamation Canal at Airport Rd | medium-low-unconsolidated |
| 309ANT | San Antonio River at Interlake Road Bridge | medium-low-unconsolidated |
| 309ARCBRC | Arroyo Seco below Rocky Creek | medium-high-unconsolidated |
| 309ARSARC | Arroyo Seco ~0.3mi above Rosevelt Cr. | head-high-unconsolidated |
| 309ASB | Alisal Slough @ White Barn | head-low-unconsolidated |
| 309ATS | Atascadero Creek Highway 41 | head-high-unconsolidated |
| 309AVR | Salinas Reclamation Canal @ Victor Rd | medium-low-unconsolidated |
| 309AXX | Salinas Reclamation Canal Storm Drain @ Airport Rd | medium-low-unconsolidated |
| 309BLA | Blanco Drain below Pump | medium-low-unconsolidated |
| 309CAW009 | Arroyo Seco Creek ~0.6mi above Piney Cr. | medium-high-unconsolidated |
| 309CAW050 | San Antonio River at Oro Fino Canyon | medium-low-unconsolidated |
| 309CAW116 | Toro Creek at Gaging Station | head-low-unconsolidated |
| 309CAW126 | Tassajara Creek ~0.3mi above Tassajara Hot Springs | head-high-unconsolidated |
| 309CAW130 | Nacimiento River 0.7mi above Slickrock Creek | medium-low-unconsolidated |
| 309CAW174 | San Antonio River NF above Carrizo Creek | head-low-unconsolidated |
| 309CAW178 | Rattle Snake Creek ~0.4mi above Pinal Creek | head-low-vegetated |
| 309CAW182 | San Antonio River ~1.4mi above Sam Jones Rd. | medium-low-unconsolidated |
| 309CAW194 | San Antonio River above Del Venturi Rd. | medium-low-unconsolidated |
| 309CCD | Chualar Creek west of Highway 101 | head-low-unconsolidated |
| 309CLCBVC | Chalone Creek | medium-low-vegetated |
| 309CRR | Chualar Creek @ Chualar River Rd | head-low-unconsolidated |
| 309DAV | Salinas River at Davis Road | medium-low-unconsolidated |
| 309DSA | Salinas River Cattlemen Road near San Ardo | medium-low-unconsolidated |
| 309ESP | Espinosa Slough upstream of Alisal Slough | head-low-unconsolidated |
| 309GAB | Gabilan Creek @ Independence Rd and East Boranda Rd | medium-low-unconsolidated |
| 309GRN | Salinas River Elm Road in Greenfield | medium-low-unconsolidated |
| 309HRT | Alisal Creek @ Hartnell Rd dogleg | medium-low-unconsolidated |
| 309JON | Salinas Reclamation Canal @ San Jon Rd | medium-low-unconsolidated |
| 309KNG | Salinas River @ Hwy 101 in King City | medium-low-vegetated |
| 309LAS1MI | Arroyo Seco Creek ~1.1mi below Tassajara Cr. | medium-high-unconsolidated |
| 309LOK | San Lorenzo Creek @ First St in King City | medium-low-unconsolidated |
| 309LOR | San Lorenzo Creek @ Bitterwater Rd east of King City | medium-high-unconsolidated |
| 309MER | Merrit Ditch upstream from Hwy 183 | head-low-unconsolidated |
| 309NAC | Nacimiento River at Highway 101 | medium-low-unconsolidated |
| 309NAD | Natividad Creek upstream from Salinas Reclamation Canal | head-low-vegetated |
| 309NAF | Nacimiento River above Ponderosa campground | head-high-unconsolidated |
| 309NOS | Chualar Creek @ Old Stage Rd (north branch) | head-low-vegetated |
| 309OLD | Old Salinas River at Monterey Dunes Way | medium-low-unconsolidated |
| 309POT | Old Salinas River @ Potrero Rd | medium-low-unconsolidated |
| 309PS0040 | Salinas River PS0040 | medium-low-unconsolidated |
| 309PS0043 | Nacimiento River ~2.5mi above Avery Rd. | medium-low-unconsolidated |
| 309PS0072 | Salinas River ~1.1mi above Hwy 101 | medium-low-unconsolidated |
| 309PS0116 | San Antonio River ~0.5mi above Bear Cyn. Cr. | medium-low-unconsolidated |
| 309PSO | Salinas River 13th Street in Paso Robles | medium-low-unconsolidated |
| 309QCW | Quail Creek west of Hwy 101 @ RR tracks | head-low-unconsolidated |
| 309QUA | Quail Creek at Potter Road crossing | head-low-unconsolidated |
| 309QUI | Quail Creek @ Hwy 101 | head-low-unconsolidated |
| 309RTA | Santa Rita Creek @ Santa Rita Creek Park | head-low-unconsolidated |
| 309SAC | Salinas River at Chualar River Road | medium-low-unconsolidated |
| 309SAG | Salinas River @ Gonzales River Rd Bridge | medium-low-unconsolidated |
| 309SALDDM | Salinas River downstream of Blanco Drain (100 feet below the inflatable dam) | medium-low-unconsolidated |
| 309SALUBD | Salinas River at Blaco Road (upstream of Blanco Dam) | medium-low-unconsolidated |
| 309SAN | San Antonio River @ Hwy 101 | medium-low-unconsolidated |
| 309SAP | Salinas River at High Mountain Lookout Road | head-low-unconsolidated |
| 309SARANF | San Antonio River | medium-low-unconsolidated |
| 309SAS | Salinas River @ Hwy 101 in Soledad | medium-low-unconsolidated |
| 309SAT | Salinas River at Highway 41 | medium-low-unconsolidated |
| 309SBC | Chualar Creek west side of Hwy 101 (south branch) | head-low-vegetated |
| 309SBR | Salinas River @ Hwy 1 | medium-low-unconsolidated |
| 309SDCMCC | Sandy Creek | head-high-unconsolidated |
| 309SEC | Arroyo Seco River @ Elm St | medium-high-unconsolidated |
| 309SED071 | Tassajara Creek - Horse Pasture Trail 71 | head-high-unconsolidated |
| 309SET | Arroyo Seco River at Thorne Road | medium-low-unconsolidated |
| 309SOS | Chualar Creek @ Old Stage Rd (south branch) | head-low-vegetated |
| 309-SRITA-34 | Santa Rita Creek at Russell Road | head-low-unconsolidated |
| 309-SRITA-36 | Santa Rita Creek at North Main Street and East Bolivar Street | head-low-unconsolidated |
| 309SSP | Salinas River @ Spreckels Gage | medium-low-unconsolidated |
| 309SUN | Salinas River upstream Nacimiento @ Bradley Rd | medium-low-unconsolidated |
| 309TEH | Tembladero Slough @ Haro | head-low-unconsolidated |
| 309TEM | Tembladero Slough @ Preston Rd | head-low-unconsolidated |
| 309TOP | Topo Creek @ Metz Rd | medium-low-unconsolidated |
| 309UAL | Salinas Reclamation Canal @ Old Stage Rd | head-low-unconsolidated |
| 309UQA | Quail Creek @ Old Stage Rd | head-low-unconsolidated |
| 309USA | Salinas River At Bradley Bridge | medium-low-unconsolidated |
| 309WLCATC | Willow Creek ~0.3mi above Trassajara Cr. | head-high-unconsolidated |
| 310ADC | Arroyo de la Cruz at Highway 1 | medium-low-unconsolidated |
| 310ADU | Arroyo de la Cruz 500m upstream from Highway 1 | medium-low-unconsolidated |
| 310AGB | Arroyo Grande at Bittle Park | medium-high-unconsolidated |
| 310AGF | Arroyo Grande at Fair Oaks Bridge | medium-low-vegetated |
| 310AGS | Arroyo Grande Creek @ Strother Park | medium-high-unconsolidated |
| 310APN | Pennington Creek upstream from horse corral | head-low-unconsolidated |
| 310ARG | Arroyo Grande Creek at 22nd Street | medium-low-unconsolidated |
| 310BER | Los Berros Creek @ Valley Rd | head-low-unconsolidated |
| 310CAN | Chorro Creek at Canet Road | head-low-unconsolidated |
| 310CAW176 | Chorro Creek ~3.5mi above San Luisito Creek | head-low-unconsolidated |
| 310CAW192 | San Luis Obispo Creek ~1.1mi above Reservoir Canyon Creek | head-high-unconsolidated |
| 310CAY | Cayucos Creek @ Cayucos Creek Rd | head-high-unconsolidated |
| 310CCC | Chorro Creek upstream from Chorro Flats | head-low-unconsolidated |
| 310CER | Chorro Creek above Ecological Reserve, ~0.3mi above San Luisito Creek | head-low-unconsolidated |
| 310CHD | Chorro Creek below Chorro Creek Dam | head-low-unconsolidated |
| 310CHO | Chorro Creek at Camp SLO | head-high-unconsolidated |
| 310CLK | Los Osos Creek Clark Valley Road | head-low-vegetated |
| 310CLV | Los Osos Creek 1.0 mi downstream from 310CLK | head-low-vegetated |
| 310COO | Coon Creek at Pecho Valley Road | head-high-unconsolidated |
| 310CPN | Pennington Creek @ bridge | head-low-unconsolidated |
| 310DAL | Dairy Creek lower limit | head-low-vegetated |
| 310DAM | Dairy Creek within Cattle exclosure | head-low-vegetated |
| 310DAU | Dairy Creek above Cattle Enclosure | head-low-unconsolidated |
| 310LBC | Los Berros Creek @ Century | head-low-unconsolidated |
| 310LPCBPC | Lopez Canyon Creek ~0.5mi below Potrero Cr. | head-high-unconsolidated |
| 310LSL | San Luisito Creek Lower | head-low-vegetated |
| 310LVR | Los Osos Creek Los Osos Valley Rd. | head-low-vegetated |
| 310MNO | San Bernardo Creek, Maino Ranch | head-low-vegetated |
| 310MOR | Morro Creek @ Lila Kaiser Park | head-low-unconsolidated |
| 310OLD | Old Creek at Cottontail Creek Road County Access Gate | head-low-unconsolidated |
| 310PCO | Pico Creek @ Hwy 1 | head-low-unconsolidated |
| 310PEN | Pennington Creek at Hwy 1 | head-low-unconsolidated |
| 310PIS | Pismo Creek above Highway 101, Frady Lane Bridge | head-high-unconsolidated |
| 310PRE | Prefumo Creek @ Calle Joaquin | head-low-vegetated |
| 310SBE | San Bernardo Creek @ Adobe Rd | head-low-vegetated |
| 310SCN | Stenner Creek at Nipomo Street | head-high-unconsolidated |
| 310SCP | San Carpoforo Creek @ Hwy 1 | head-low-unconsolidated |
| 310SLB | San Luis Obispo Creek at San Luis Bay Drive | head-low-unconsolidated |
| 310SLC | San Luis Creek at Cuesta Park | head-high-unconsolidated |
| 310SLD | Davenport Creek @ Broad St | head-low-vegetated |
| 310SLM | San Luis Obispo Creek @ Mission Plaza | head-high-unconsolidated |
| 310SLU | San Luisito Creek @ Adobe Rd | head-low-vegetated |
| 310SLV | San Luis Obispo Ck at Los Osos Valley Road | head-high-unconsolidated |
| 310SRO | Santa Rosa Ck at Moonstone Beach Drive | medium-high-unconsolidated |
| 310SRU | Santa Rosa Creek at Ferrassi Road | head-high-unconsolidated |
| 310SSC | San Simeon Creek at State Park foot bridge | medium-low-unconsolidated |
| 310SSU | San Simeon Creek at San Simeon Creek Road | medium-high-unconsolidated |
| 310SYB | Los Osos Creek @ Turri Rd no littering sign | head-low-unconsolidated |
| 310TCC | Toro Creek at Toro Creek Canyon Road Bridge | head-high-unconsolidated |
| 310TOR | Toro Creek upstream Hwy 1 | head-high-unconsolidated |
| 310TUR | Warden Creek @ Turi Road | head-low-unconsolidated |
| 310TWB | Chorro Creek at South Bay Boulevard | head-low-unconsolidated |
| 310UCR | Chorro Creek @ upper Chorro Creek Ecological Reserve | head-low-unconsolidated |
| 310UPN | Upper Pennington Creek | head-low-unconsolidated |
| 310USG | Arroyo Grande Creek @ old USGS gage | medium-low-vegetated |
| 310USL | San Luisito Creek Upper | head-high-unconsolidated |
| 310UWR | Warden Creek 1.5 mi upstream from Turri Rd | head-low-vegetated |
| 310VIA | Villa Creek upstream Hwy 1 | head-low-unconsolidated |
| 310WRP | Warden Creek @ Wetlands Restoration Preserve | head-low-vegetated |
| 311SLE | Soda Lake northeast culvert @ Seven Mile Rd | head-low-unconsolidated |
| 311SLN | Soda Lake North Tributary at Seven Mile Road | head-low-unconsolidated |
| 312ALA | Alamo Creek at Alamo Creek Road | medium-low-vegetated |
| 312CAV | Cuyama River at Highway 33 | medium-low-unconsolidated |
| 312CAW031 | Cuyama River ~1mi NE Carrizo Canyon Creek | medium-low-vegetated |
| 312CCC | Cuyama River below Cottonwood Canyon | medium-low-unconsolidated |
| 312CUT | Cuyama River below Twitchell @ White Rock Lane | medium-low-unconsolidated |
| 312CUY | Cuyama River downstream Buckhorn Rd | head-low-unconsolidated |
| 312DAVDAV | Davy Brown Creek below Munch Cyn. | head-low-unconsolidated |
| 312GVS | Green Valley @ Simas Rd | head-low-unconsolidated |
| 312GVT | Orcutt Creek at Brown Road | head-low-unconsolidated |
| 312HUA | Huasna River at School Road | medium-low-unconsolidated |
| 312MAB | Main St Ditch @ Bonita School | head-low-unconsolidated |
| 312MZCDBC | Manzana Creek ~0.5mi above Davy Brown Creek | medium-high-unconsolidated |
| 312NIP | Nipomo Creek at Highway 166 | head-low-unconsolidated |
| 312NIT | Nipomo Creek at Tefft Street | head-low-unconsolidated |
| 312ORC | Orcutt Creek at sand plant above Santa Maria River | head-low-unconsolidated |
| 312ORI | Orcutt Creek @ Hwy 1 | head-low-unconsolidated |
| 312ORN | Orcutt North Fork Tributary near sand plant | head-low-unconsolidated |
| 312PS0099 | Manzana Creek ~1.1mi below Davy Brown Cr. | medium-high-unconsolidated |
| 312RYCALR | Reyes Creek ~2.7mi above Lockwood Valley Rd. | head-low-vegetated |
| 312SBC | Santa Maria River at Bull Canyon Road | medium-low-unconsolidated |
| 312SIS | Sisquoc River At Santa Maria Mesa Road | medium-low-unconsolidated |
| 312SIV | Sisquoc River upstream Tepusquet at USGS gage | medium-low-unconsolidated |
| 312SMA | Santa Maria River above Estuary | medium-low-unconsolidated |
| 312SMI | Santa Maria River at Highway 1 | medium-low-unconsolidated |
| 312SQRABP | Sisquoc River ~2.3 mi above Big Pine Cyn. | head-high-unconsolidated |
| 312WE1028 | Sisquoc River ~0.8mi below Rattlesnake Canyon | medium-high-unconsolidated |
| 312WE1035 | Sisquoc River ~0.2mi below Big Pine Canyon | medium-low-unconsolidated |
| 313SAC | San Antonio Creek at VAFB RR bridge | medium-low-vegetated |
| 313SAE | San Antonio Creek at San Antonio Road East | medium-low-unconsolidated |
| 313SAI | San Antonio Creek at San Antonio Rd West | medium-low-unconsolidated |
| 313WE0899 | Shuman Creek Pt Sal Rd. ~1.4mi W Casmalia | head-low-vegetated |
| 314DDE | Canal Trib to Santa Ynez River @ W Central Ave | head-low-unconsolidated |
| 314MCM | Miguelito Creek mouth @ treatment plant | head-low-vegetated |
| 314SAL | Salsipuedes Creek @ Santa Rosa Rd | medium-high-unconsolidated |
| 314SYC | Santa Ynez River d/s Lake Cachuma at Highway 154 | medium-low-unconsolidated |
| 314SYF | Santa Ynez River at Floradale Rd | medium-low-vegetated |
| 314SYI | Santa Ynez River at Highway 101 | medium-low-unconsolidated |
| 314SYL | Santa Ynez River at Highway 246 | medium-low-unconsolidated |
| 314SYN | Santa Ynez River at 13th Street | medium-low-unconsolidated |
| 314SYP | Santa Ynez River at Paradise Road | medium-low-unconsolidated |
| 314WE0779 | Coche Creek ~1mi above WF Santa Cruz Creek | head-low-unconsolidated |
| 314WE0785 | Unnamed Creek ~0.2mi SE Santa Ynez River | head-low-unconsolidated |
| 314WE0796 | Santa Cruz Creek WF ~3mi above Coche Creek | head-low-unconsolidated |
| 315ABH | Arroyo Burro Creek at Hope Street | head-low-unconsolidated |
| 315ABU | Arroyo Burro at Cliff Drive | head-low-vegetated |
| 315ANN | Glenn Annie Creek at Los Carneros Road | head-low-unconsolidated |
| 315APC | Arroyo Paredon Creek at Via Real | head-high-unconsolidated |
| 315APF | Arroyo Paredon Creek at Foothill Bridge | head-high-unconsolidated |
| 315ARH101 | Arroyo Hondo ~0.5mi above Hwy 101 | head-high-unconsolidated |
| 315ATA | Atascadero Creek at Ward Drive | head-low-unconsolidated |
| 315ATU | Atascadero Creek @ Patterson Avenue | head-low-unconsolidated |
| 315BEF | Bell Creek @ Winchester Canyon Park | head-low-vegetated |
| 315BEL | Bell Ck on Bacara Resort Access Road | head-high-unconsolidated |
| 315CAP | El Capitan Creek below Highway 101 | head-high-unconsolidated |
| 315CAU | Carpinteria Creek at Highway 192 | head-low-unconsolidated |
| 315CRP | Carpinteria Creek at 8th Street foot bridge | head-low-unconsolidated |
| 315DOS | Dos Pueblos Canyon Creek at Highway 101 | head-low-vegetated |
| 315FMV | Franklin Creek @ Mountain View Ln | head-low-unconsolidated |
| 315FRC | Franklin Creek at 7th Street | head-low-unconsolidated |
| 315FRCMVD | Franklin Creek 300 feet below Meadow View Road | head-low-unconsolidated |
| 315FRCMVU | Franklin Creek 300 feet above Meadow View Road | head-low-unconsolidated |
| 315GAI | Canada de la Gaviota at Highway 1 | head-high-unconsolidated |
| 315GAN | Glenn Annie Creek upstream Cathedral Oaks | head-low-unconsolidated |
| 315GAV | Canada de la Gaviota at State Park entrance | head-high-unconsolidated |
| 315GBR | Glen Annie Creek @ Bishop Ranch Rd | head-low-vegetated |
| 315JAL | Jalama Creek at County Park at RR trussels | medium-high-unconsolidated |
| 315LCC | Los Carneros Creek at Calle Real | head-low-vegetated |
| 315LCR | Los Carneros Creek at Hollister Road | head-low-unconsolidated |
| 315MIS | Mission Creek at Montecito Street | head-low-unconsolidated |
| 315MIU | Mission Creek at Foothill Road | head-low-vegetated |
| 315MTC | Montecito Creek at Jamison Lane | head-low-unconsolidated |
| 315MYC | Maria Ynacio Creek @ Patterson Avenue | head-low-unconsolidated |
| 315RIN | Rincon Creek at Bates Road | head-low-unconsolidated |
| 315ROM | Romero Creek @ Jamison Lane | head-low-vegetated |
| 315RSB | Canada del Refugio above Highway 101 | head-low-vegetated |
| 315SCC | Sycamore Creek at Punta Gorda | head-low-unconsolidated |
| 315SJC | San Jose Creek @ Kellogg Boulevard | head-low-unconsolidated |
| 315SJH | San Jose Creek @ Hollister Road | head-low-unconsolidated |
| 315SMC | Santa Monica Creek @ Carpenteria Avenue | head-low-unconsolidated |
| 315SPC | San Pedro Creek above Holister Road | head-low-unconsolidated |
| 315TCI | Tecolote Creek @ Bacara Resort access Road | head-high-unconsolidated |
| 315TOR | Toro Canyon Creek at Via Real | head-low-unconsolidated |
| 315YSI | San Ysidro Creek @ Jamison Lane | head-low-unconsolidated |
| 317CHO | Cholame Creek At Bitterwater Road | medium-high-unconsolidated |
| 317CHO2 | Cholame Creek 500m Downstream of Bitterwater Rd. | medium-high-unconsolidated |
| 317ESE | Estrella River @ Estrella River Rd upstream Hwy 46 | medium-low-unconsolidated |
| 317EST | Estrella River @ Airport Rd | medium-low-unconsolidated |
| CMWCP00 | Carpinteria Creek at 8th Street | head-low-unconsolidated |
| CMWFK00 | Franklin Creek at Carpinteria Ave. | head-low-unconsolidated |
| CMWSM01 | Santa Monica Creek at Via Real | head-low-unconsolidated |
| GAB-VET | Gabilan Creek at Veteran's Park | medium-low-unconsolidated |
| GVWAT1 | Atascadero Creek at Ward | head-low-unconsolidated |
| GVWAT2 | Atascadero Creek at Patterson | head-low-unconsolidated |
| GVWAT3 | Atascadero Creek at Puente Drive | head-low-unconsolidated |
| GVWBL2 | Bell Creek at San Miguel Open Space | head-low-vegetated |
| GVWCG1 | Cieneguitas Creek at Nogal Drive | head-low-unconsolidated |
| GVWDV20 | El Encanto Creek at Devereux Slough | head-low-unconsolidated |
| GVWDV21 | El Encanto Creek (Phelps Ditch) above Ocean Meadows Golf Course | head-low-unconsolidated |
| GVWDV22 | El Encanto Creek (Phelps Ditch) at Phelps Rd. | head-low-unconsolidated |
| GVWDV24 | El Encanto Creek (Phelps Ditch) at Padova Park | head-low-vegetated |
| GVWDV25 | Tributary of El Encanto Creek (Phelps Ditch) at Evergreen Frisbee Course | head-low-vegetated |
| GVWGA1 | Glen Annie/Tecolotito Creek at Hollister Avenue | head-low-unconsolidated |
| GVWGA2 | Glen Annie/Tecolotito Creek at Cathedral Oaks | head-low-unconsolidated |
| GVWLC1 | Los Carneros Creek at Hollister | head-low-unconsolidated |
| GVWLC2 | Los Carneros Creek at Calle Rea | head-low-vegetated |
| GVWLV1 | Las Vegas Creek at La Goleta Road | head-low-vegetated |
| GVWMY1 | Maria Ygnacio Creek at Patterson | head-low-unconsolidated |
| GVWMY2 | Maria Ygnacio at Old San Marcos Road | head-low-vegetated |
| GVWSJ1 | San Jose Creek at Hollister Avenue | head-low-unconsolidated |
| GVWSJ2 | San Jose Creek at North Patterson Avenue | head-low-unconsolidated |
| GVWSP1 | San Pedro Creek near Hollister Avenue | head-low-unconsolidated |
| GVWSP3 | San Pedro Creek at Cathedral Oaks Road | head-low-vegetated |
| GVWTC1 | Tecolote Creek Lagoon | head-low-unconsolidated |
| GVWTC2 | Tecolote Creek at Vereda del Padre | head-high-unconsolidated |
| NAT-LAS | Natividad Creek at Las Casitas Drive | head-low-vegetated |