Section 1 - Data Compilation

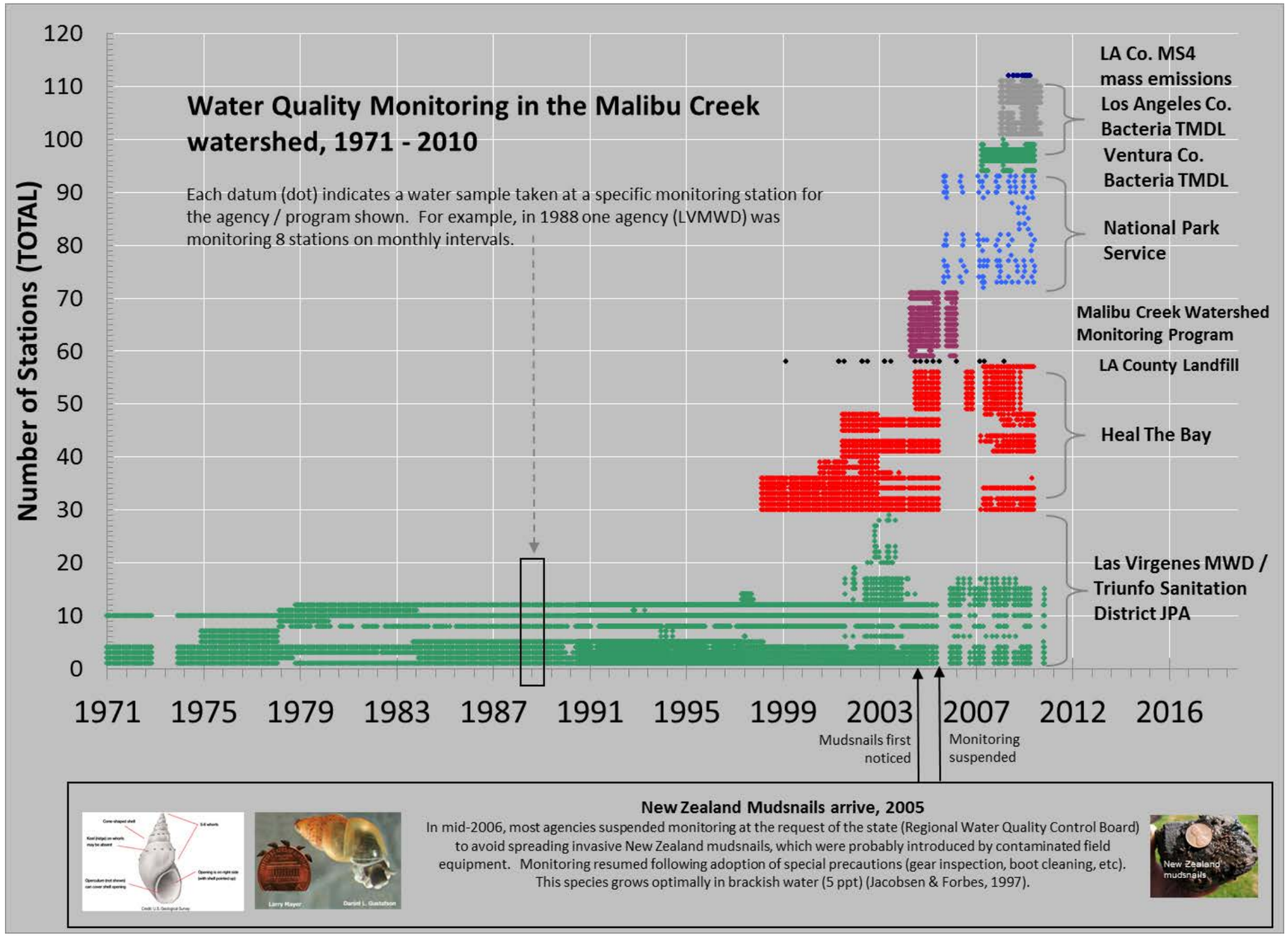
Monitoring program descriptions by agency / organization

Parameters monitored

Site locations & sampling frequencies

Period of record

Special note to readers: In the time series graphs in this section and those that follow, tick marks along the x-axis for each year usually line up with either 1/1 or 12/31 for the year shown, but sometimes indicate another month in that year. We highlight it here to avoid unnecessary confusion for readers attempting to determine precise datum dates from the time series graphs alone. For this purpose, we recommend viewing the raw data.



Monitoring programs in the Malibu Creek watershed, 1971 – 2010

OVERVIEW

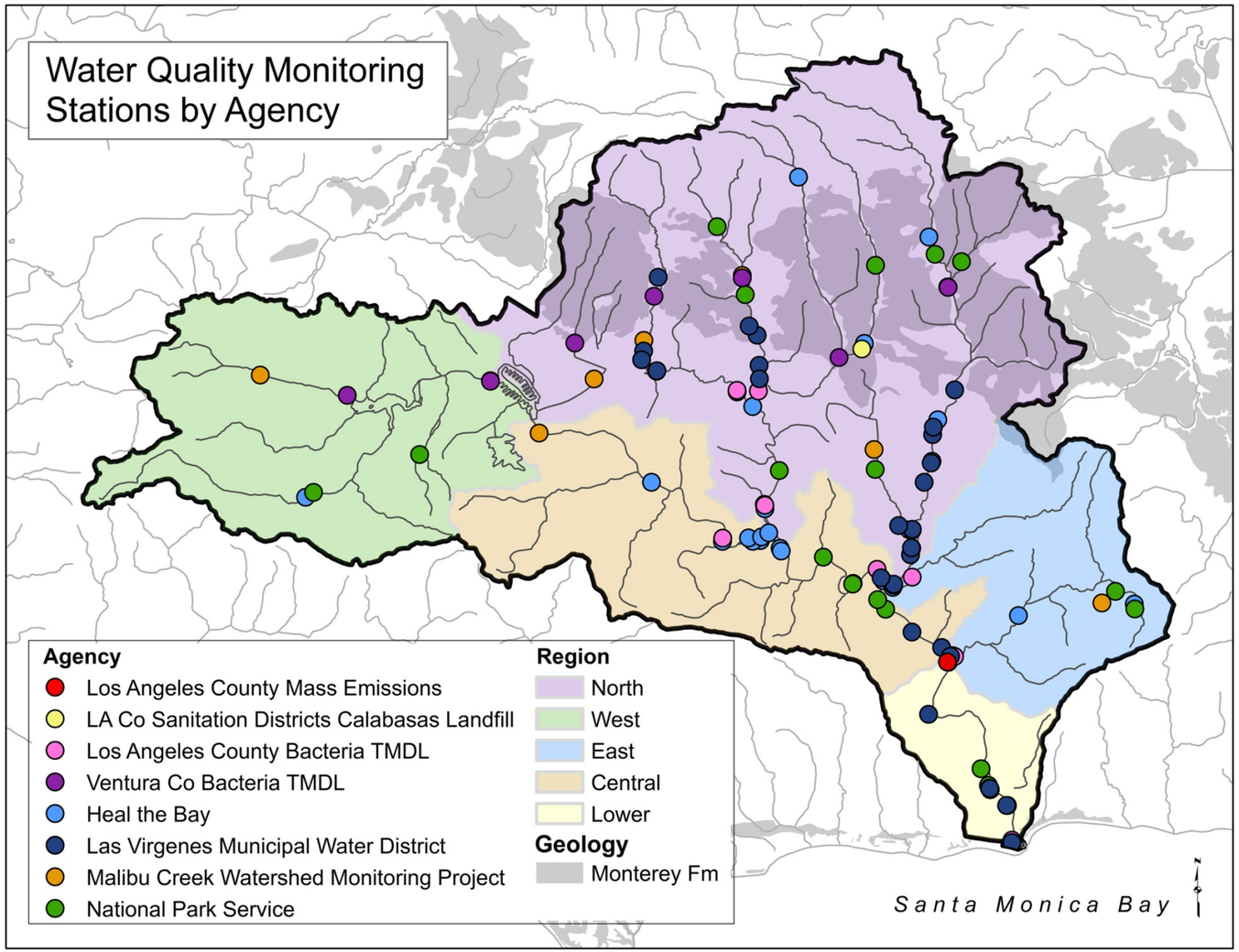
In the figure at left, each row of dots represents a specific sampling location monitored on the dates shown by their respective public agencies or organizations. Nearly all long-term data prior to 1998 were collected by the Las Virgenes Municipal Water District, pursuant to the Joint Powers Authority (JPA) Tapia Water Reclamation Facility (WRF) discharge permit. One consequence of this history is that the majority of historical data is geographically limited to downstream of the Tapia WRF, immediately above Tapia WRF, and lower Las Virgenes Creek.

It was not until the late 1990's that other agencies began monitoring in the upper watershed, including undeveloped lands that provide information on native water quality relatively unimpacted by human activities. Heal The Bay in particular focused on these historical "blind spots" in the watershed beginning in 1998, followed by the National Park Service in 2006. The since-completed Watershed-Wide Monitoring Program also focused on previously unmonitored areas. However, all three of these programs also included some sites also monitored by the LVMWD for over 30 years, providing a denser dataset for the lower watershed and an opportunity to compare results across programs.

Overall, our data compilation includes water quality information from over 100 sites from Malibu Creek and all of its major tributary streams, covering all land uses and geographic regions. In 2006, most programs suspended until new field procedures could be developed to avoid spreading invasive New Zealand mudsnails. Most programs also added and deleted monitoring stations according to each program's objectives, regulatory requirements and funding levels. For example, from 2003 – 04, LVMWD added additional stations in Las Virgenes Creek to assess potential impacts from its Rancho farm operations.

Special note to reviewers: In the time series graphs in this section and those that follow, tick marks along the x-axis for each year may line up anywhere between 1/1 or 12/31 for the year shown. For most purposes, including our findings, this difference is irrelevant, but we highlight it here to avoid unnecessary confusion for readers attempting to determine precise sampling dates from the graphs alone. For this purpose, we recommend viewing the raw data.

Data Compilation



Water quality data compiled for this report came from these monitoring locations and agencies

Following the adoption of Order No. R4-2010-0165, JPA staff worked with the Malibu Creek Watershed Council Technical Advisory Committee (TAC), the Malibu Creek Watershed Advisory Council, Heal the Bay and other stakeholders to identify agencies and stakeholders currently conducting water quality monitoring in the Malibu Creek watershed. We identified current staff contacts for each program, reviewed each program's goals and objectives (i.e. regulatory compliance, academic research), and determined the period of record, parameters tested, monitoring frequency and site locations for each dataset. We then compiled the data into a single Microsoft® Access® electronic file, and analyzed the combined dataset using Access queries and Microsoft Excel spreadsheets. We also entered site locations into the JPA's Geographic Information System using ESRI ® ArcMap™ 10.0 to enable us to overlay the results on geological maps, water distribution system locations, developed parcel density and other existing GIS layers. The compilation step was essentially complete by January 1, 2011, although staff continued to refine it as subsequent analyses revealed occasional data errors (described in the individual agency sheets).

The following pages describe our data sources in greater detail, organized by agency, describing each program's objectives and peculiarities with respect to sampling details, program objectives and geographic scope.

Maps and Tables - In the spot maps and tables that follow, the watershed is divided by color shading into five regions, each draining different percentages of the watershed's three principal geologic formations (see the geological map in the Natural Source Assessment section). The darker shading in the northernmost region of our spot maps throughout the report shows the extent of the Monterey / Modelo Formation, although smaller exposures, not shown, are also found along Mulholland Highway between Cornell and Las Virgenes Roads.

Natural Source Assessment - Early in our compilation, we noticed multiple compounds and parameters exceeded standards in an area geographically coincident with a geologic formation known to be enriched in these compounds. In Section 3 we provide a closer, more detailed look at the evidence for water quality impacts from this unusual geology.

Duplicative monitoring - We also analyzed the data to identify potentially duplicative efforts at geographically coincident sites, and provide some suggestions for further work to identify unintentional redundancies using standard statistical methods (Section 4).

The entire dataset compiled for the report is available from the authors**,** including the main Access database, Excel spreadsheets, tables and figures, ESRI formatted GIS data, ArcMap files, and other information used in the report.

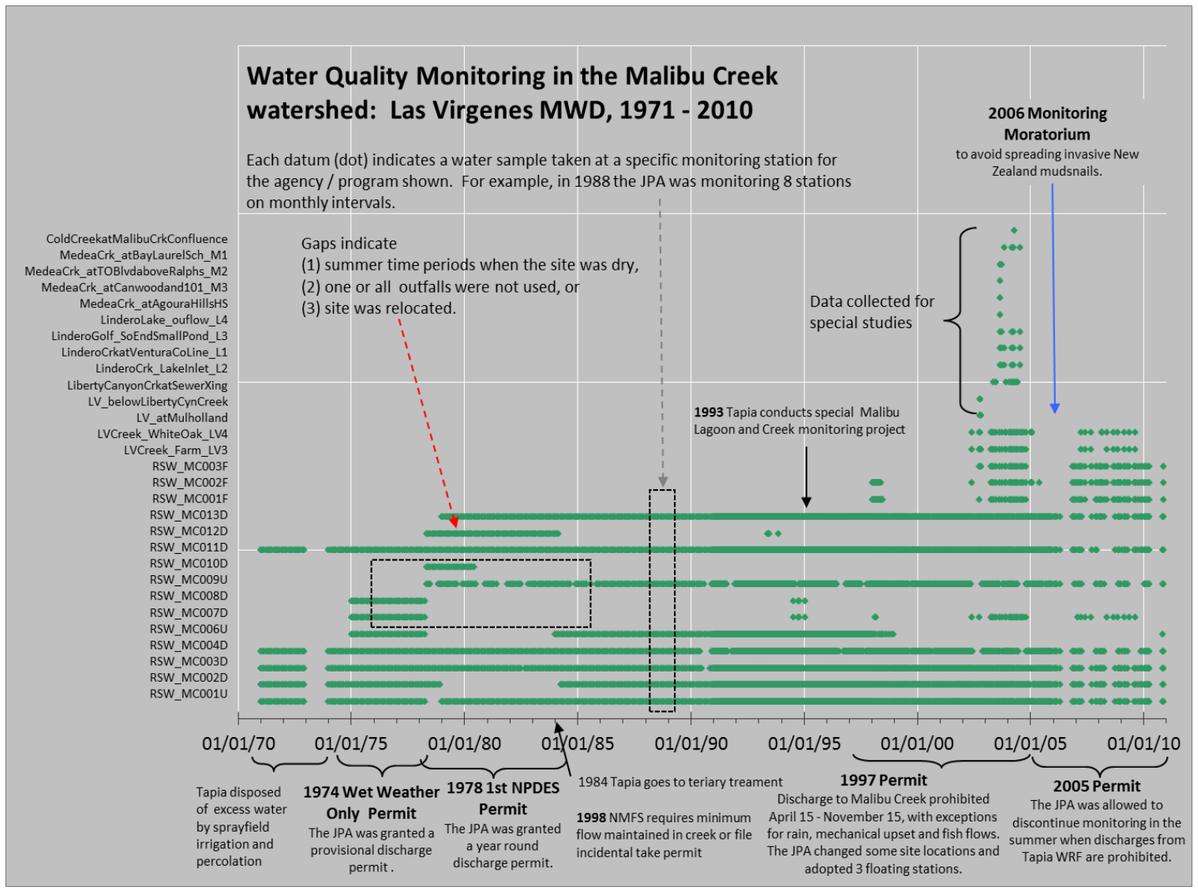
JPA

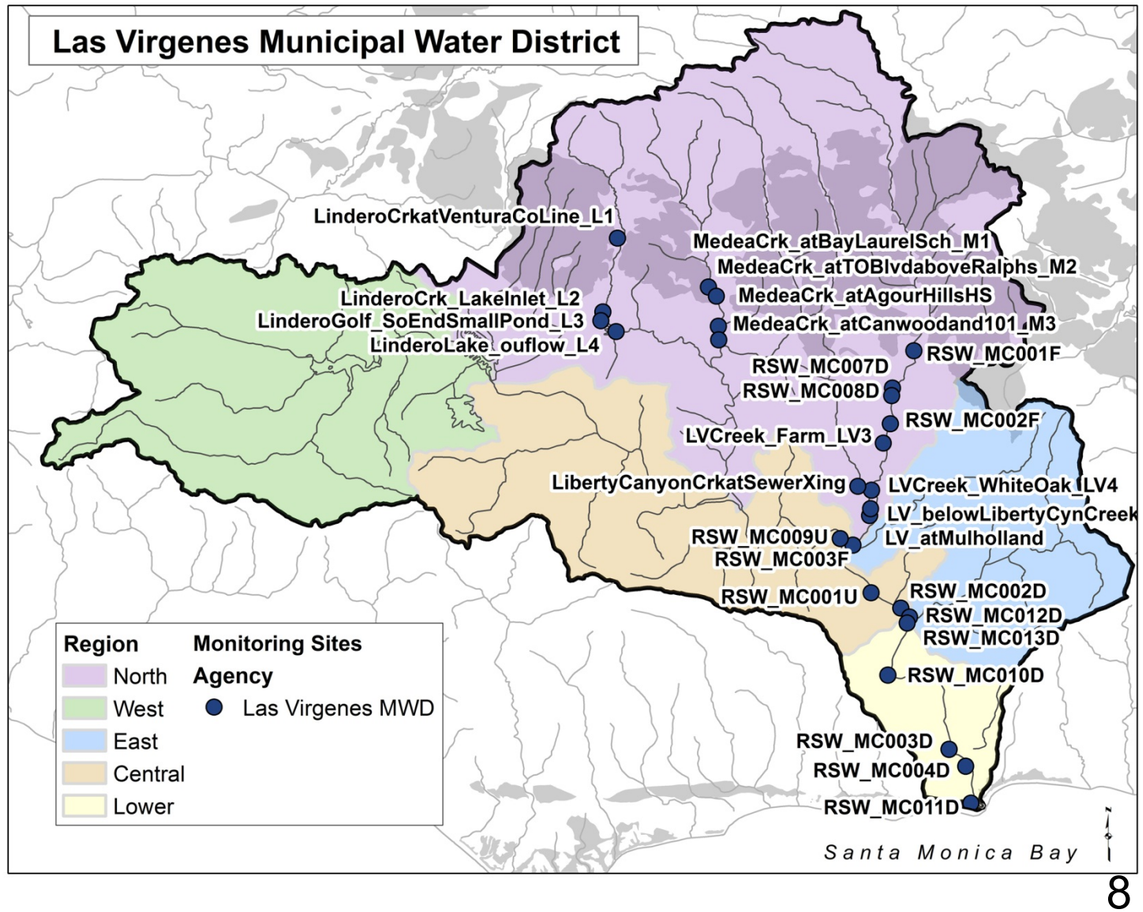
A closer look at monitoring conducted by the Joint Powers Authority of the Las Virgenes Municipal Water District / Triunfo Sanitation District (JPA)

The first creek monitoring efforts took place in the early 1970's along Las Virgenes and Malibu Creeks to monitor any impacts from early wastewater spray fields, and to ensure no spray field runoff entered Malibu Creek. In 1972 it became obvious that sprayfield disposal was not going to work for winter time flows. In 1974 a provisional wet season discharge permit was granted. It wasn't until 1978 that Tapia received its first year-round NPDES Discharge Permit. As part of that permit Tapia staff began monitoring nine creek sites weekly for bacteria and general physical parameters, monthly for nutrients and annually for metals and toxicity. The sampling site locations focused on discharge points to the local creeks and downstream impacts of discharge on water quality. After six years, the heavy metal monitoring requirement in the creek was dropped. Aside from this, the monitoring effort continued with little change for the next 20 years.

The 2005 NPDES permit renewal brought about the biggest change in the Tapia Discharge Monitoring Program. Three floating creek sites were added. The sampling frequency was dropped to monthly, but an extensive list of heavy metals and organic compounds were added to the routine monthly monitoring. These additions were to incorporate study results of the California Toxics Rule. Annual bio-assessment surveys were also added to check for impacts to aquatic life (see Bioassessment review in Section 2 under Aquatic Life).

The JPA has tested water quality in the Malibu Creek watershed at least 6,965 times.





Heal the Bay® Stream Team®

The Malibu Creek Watershed Stream Team is a citizen volunteer monitoring project designed to monitor and assess water chemistry, riparian habitat and benthic macroinvertebrate community structure throughout the Malibu Creek Watershed. This report considers only water chemistry monitoring from Heal the Bay. Heal the Bay conducts all training and supervision to insure that Stream Team protocols and procedures are precisely followed. Volunteers are trained and certified to conduct the water chemistry field analysis and to collect and transport samples to Heal the Bay's laboratory for further testing. Data is checked for accuracy and reliability at every event.

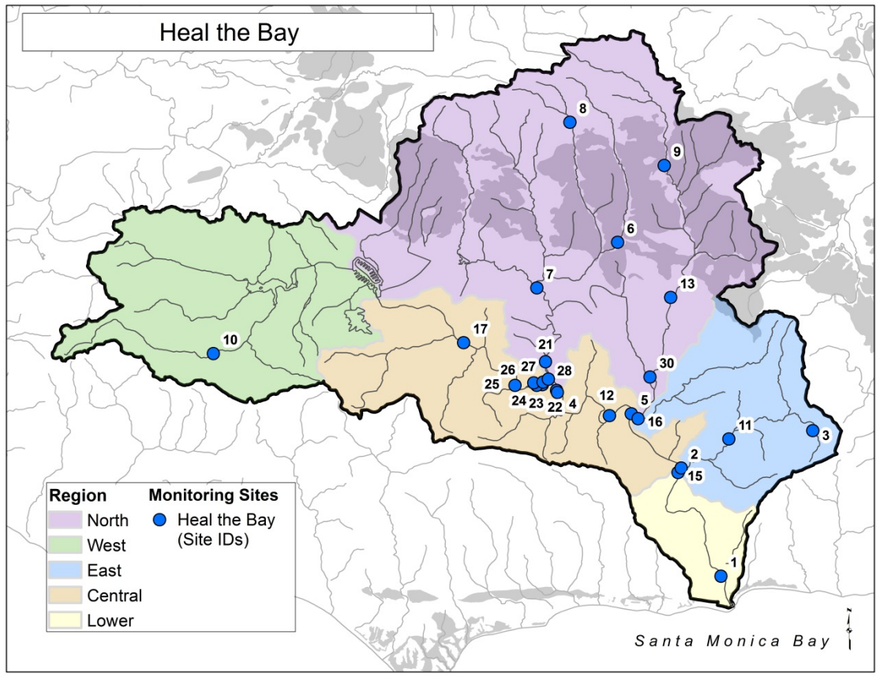
Monitoring objectives: Monitoring objectives are to establish baseline water quality information to ascertain current watershed water quality; observe trends in water quality; identify sources of pollution and impairments to beneficial uses; evaluate the effectiveness of restoration or best management practices (BMPs); and evaluate water quality relative to specific water quality criteria. Other Heal the Bay monitoring objectives relate to conditions other than water quality.

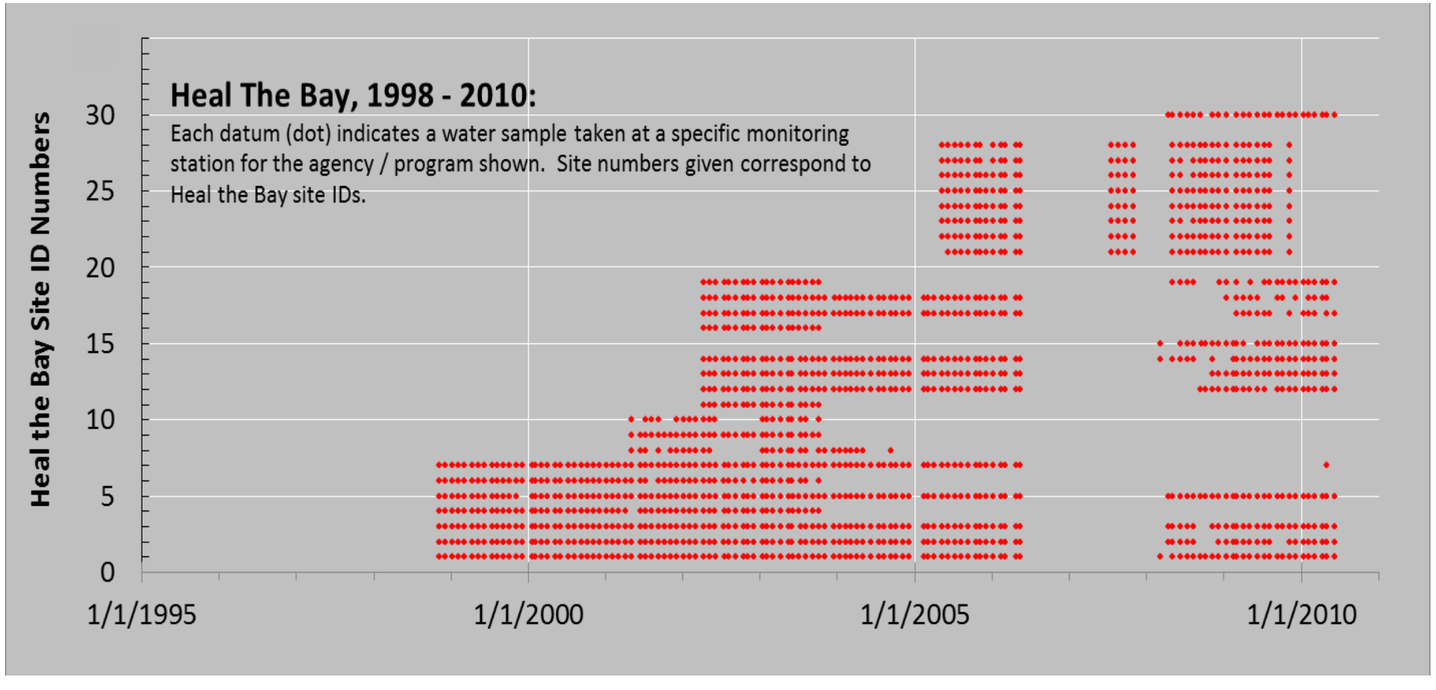
Sampling locations: Heal the Bay has sampled at a total of 27 sites within Malibu Creek watershed, and currently monitors 21 of those sites. Sites were added to the original seven from 1998 as the program expanded, including the addition of contract monitoring for the Malibou Lake Mountain Club. (Data from Malibou Lake Mountain Club collected prior to 1998 were provided in paper form, but there was not time to enter this data for this analysis). Some sites were also dropped from the program. Note: Heal The Bay has also sampled nearby coastal streams outside the Malibu Creek watershed (e.g. Lachusa Creek, Solstice Creek, etc.)

Sampling frequency and duration: Sampling has been collected monthly from November 1998 to present. Data received from this program ranges from December 1998 to June 2010.

Sampling parameters: Field water quality data collected include temperature, pH, dissolved oxygen, flow, specific conductance and turbidity. Laboratory data include nitrate and nitrite as N, phosphate as orthophosphate, ammonia as N, enterococcus, total coliform and *E. coli*. For this analysis, in order to compare data with other agencies, phosphate as orthophosphate was converted by molecular weight to phosphate as phosphorus.

This program provided over 10 years' of data from sites in areas never before monitored within the Malibu Creek watershed and nearby coastal streams, in both developed and undeveloped areas.





Los Angeles County

Sanitation Districts Calabasas Landfill Monitoring and Reporting Program

Water quality monitoring at Calabasas Landfill site CHES in the northern watershed tributary Cheeseboro Creek was required as part of the landfill's Waste Discharge Requirement from 2000 until 2009 when WDR No. 00-077 was superseded by WDR No. R4-2009-0088.

Monitoring objectives: The purpose of monitoring was to determine whether VOCs detected in groundwater monitoring wells were contaminating surface flow at Cheeseboro Creek.

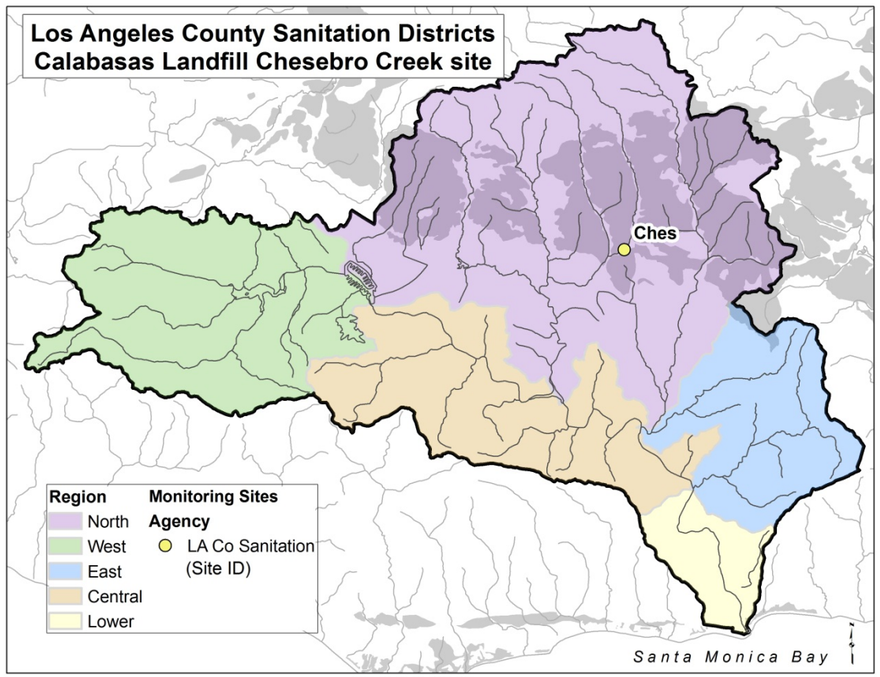
Sampling location: One site on Cheeseboro Creek, labeled CHES on the map.

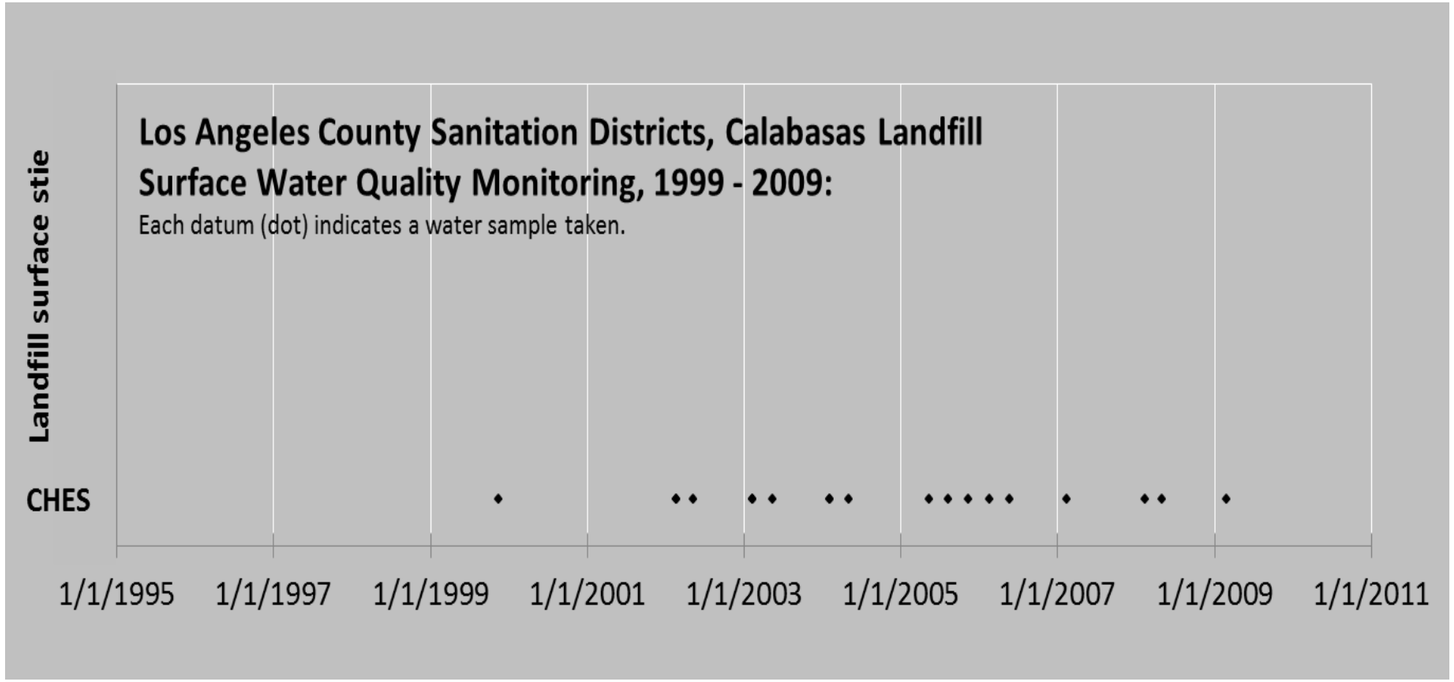
Sampling frequency and duration: Sampling was conducted quarterly from November 1999 through December 2009. Monitoring was discontinued when analyses of surface water and sediment from Cheeseboro Creek did not detect VOCs. A corrective action program was implemented for groundwater.

Sampling parameters: The focus of monitoring was on VOCs, resulting in data for ninety-eight VOCs, thirty-seven pesticides, herbicides and organophosphorus compounds; one hundred-five acid/base/neutral extractables, and 17 metals. In addition, general field parameters (pH, temperature, conductivity, dissolved oxygen, etc.), general laboratory parameters (alkalinity, hardness, BOD, individual ions, metals, etc.), and metal surrogate parameters (TDS, nitrate-nitrogen, sulfate and chloride) were collected.

Document sources: Waste Discharge Requirement Order No. 00-077, File No. 60-118, CI 4992. WDR Order No. R4-2009-0088.

This single site provided critical data on the levels of sulfate and other major ions in surface runoff directly downstream of the Monterey / Modelo Formation.





Malibu Creek Watershed Monitoring Program
(Multiple agencies)

The Malibu Creek Watershed Monitoring Program (MCWMP) was a cooperative effort aimed at determining baseline water quality throughout the watershed. Funding derived from a Proposition 13 grant and contributions from the County of Los Angeles and the Cities of Agoura Hills, Calabasas and Westlake Village. The City of Malibu and LVMWD contributed monitoring and staff time. A Technical Advisory Committee with members representing those listed above and the Cities of Thousand Oaks and Hidden Hills, Ventura County Flood Control District, Ventura County Watershed Protection District, Heal the Bay, Malibou Lake Mountain Club, Clean Lakes Inc., National Park Service, Caltrans, State Parks and the Resource Conservation District of the Santa Monica Mountains provided guidance in program development and execution.

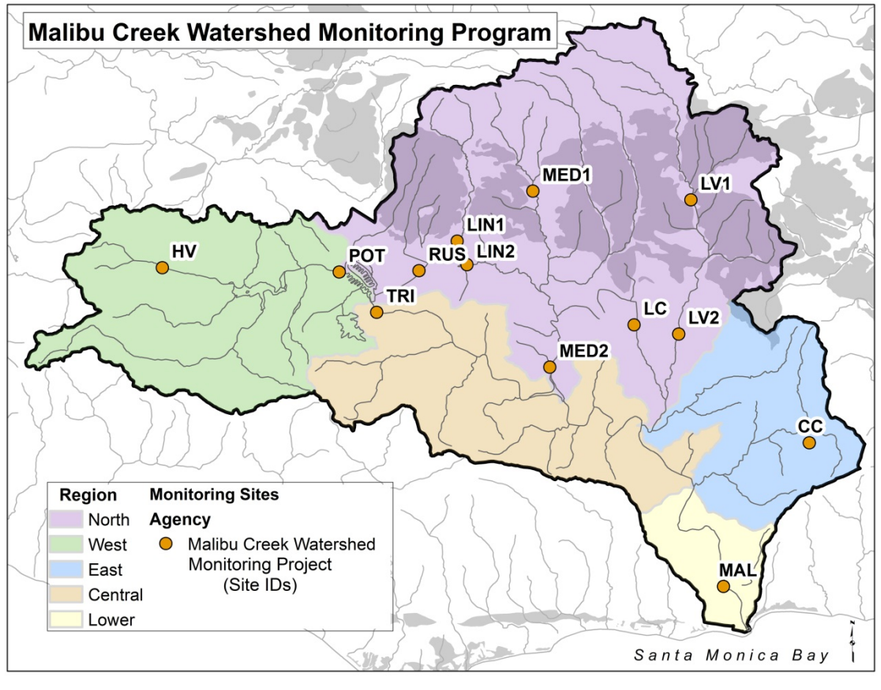
Monitoring objectives: The MCWMP was intended to provide information for the use of policy makers, regulatory agencies, and the public, through the collection of data on pollutants that impair beneficial uses of Malibu Creek and its tributary streams. These data were then used to create a baseline of stream water quality conditions throughout the watershed. “Hot spots” were identified as those sites with elevated nutrients and bacteria and were selected as sites to test for additional parameters.

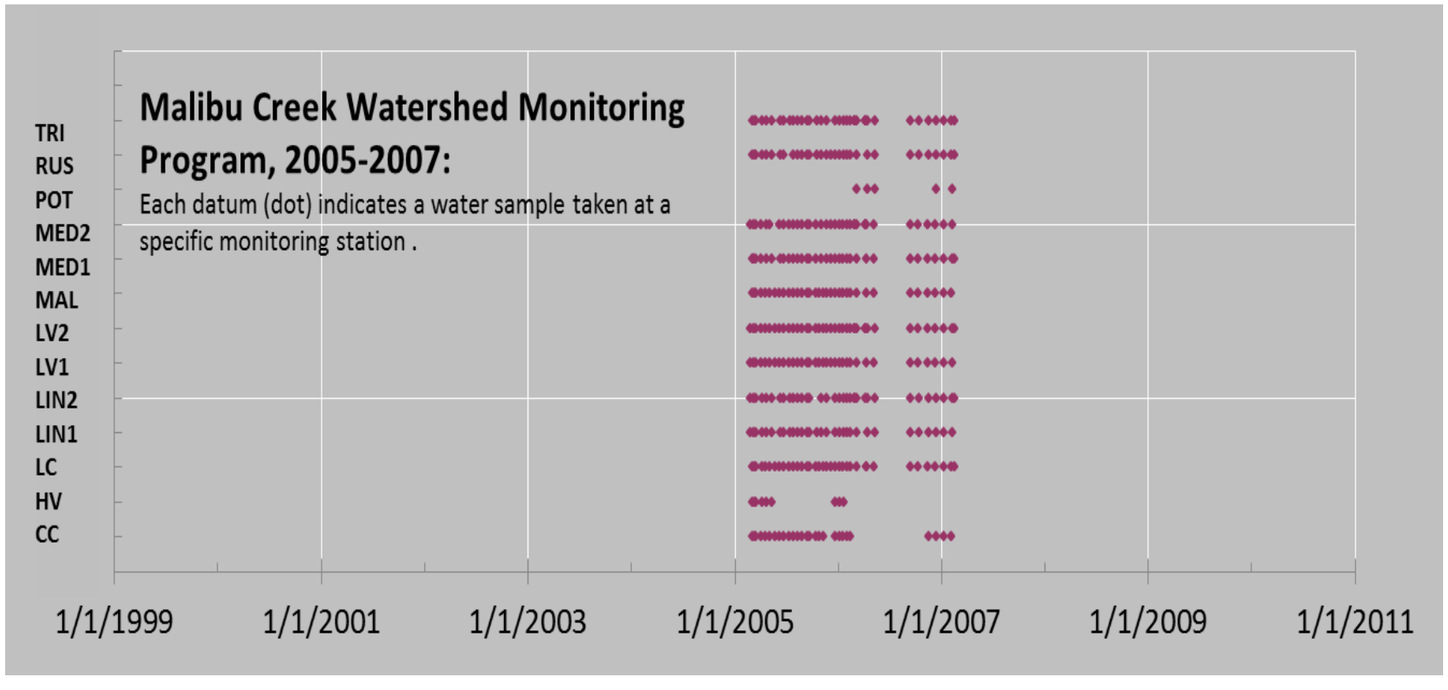
Sampling locations: Thirteen monitoring sites on ten streams were selected to represent a variety of land uses so that data collected would lead to a comprehensive picture of how pollutants are affecting the basic health and beneficial uses of the watershed.

Sampling frequency and duration: Sampling was conducted twice a month from February of 2005 through February 2006, with few exceptions, then monthly until February 2007. Four sites (LIN2, LV2, MED 2 and TRI) were tested twice during winter wet weather and seven sites (LC, LIN2, LV2, MED1, TRI-alt, HtB-4 and RUS) were tested once during dry weather as part of the Hot Spot testing.

Sampling parameters: Parameters were selected based on 303(d) listed pollutants in the watershed. Field data collected include dissolved oxygen (mg/L), flow (cfs), pH, salinity (ppt), specific conductivity, temperature and turbidity. Laboratory data include chlorophyll a, *E. coli, enterococcus,* fecal coliform, total coliform, ammonia, nitrate, nitrite, phosphate, total Kjeldahl nitrogen and total suspended solids. Hot spot testing parameters were drawn from the following EPA priority pollutants: trace metals, asbestos, cyanide, total hardness, acid extractable compounds, base/neutral extractable compounds, chlorinated pesticides, PCB congeners and polynucleic aromatic hydrocarbons.

Note: While data in final reports and Excel files appear to be accurate, the Access database posted as Appendix F, Part 3 on the City of Calabasas’ website for the Hot Spot testing data has errors. We verified or corrected data for only lead, mercury and selenium - the only Hot Spot parameters we analyzed. Some results appear to have been copied from percent recoverable values from QA/QC instead of the actual result.





National Park Service
MEDN Water Quality Monitoring Program

The National Park Service's Santa Monica Mountains National Recreation Area (SMM-NRA) conducts surface water monitoring in the Santa Monica Mountains through the federal *Stream Water Quality Monitoring in the Mediterranean Coast Network (MEDN)* program.

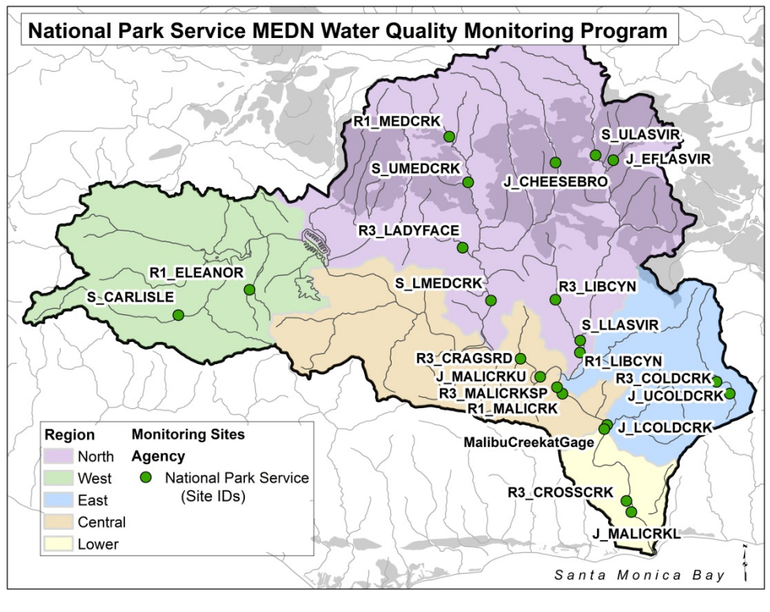
Monitoring objectives: The resource management objectives for the MEDN monitoring protocol include:
1. Maintain the quality of surface waters in the Santa Monica Mountains within the range of natural chemical and biological limits to meet applicable federal and state water quality criteria. *Justification: Waters that vary within their natural ranges can typically support healthy aquatic ecosystems and most beneficial uses.*
2. Advocate for the improvement in the quality of impaired waters within the SMM Resource Management Zone. *Justification: The NPS Government Performance and Results Act goal is 99.3% of streams and rivers managed by NPS will meet State and Federal water quality standards. Several water bodies within the SMM are impaired or flow into an impaired water body.*

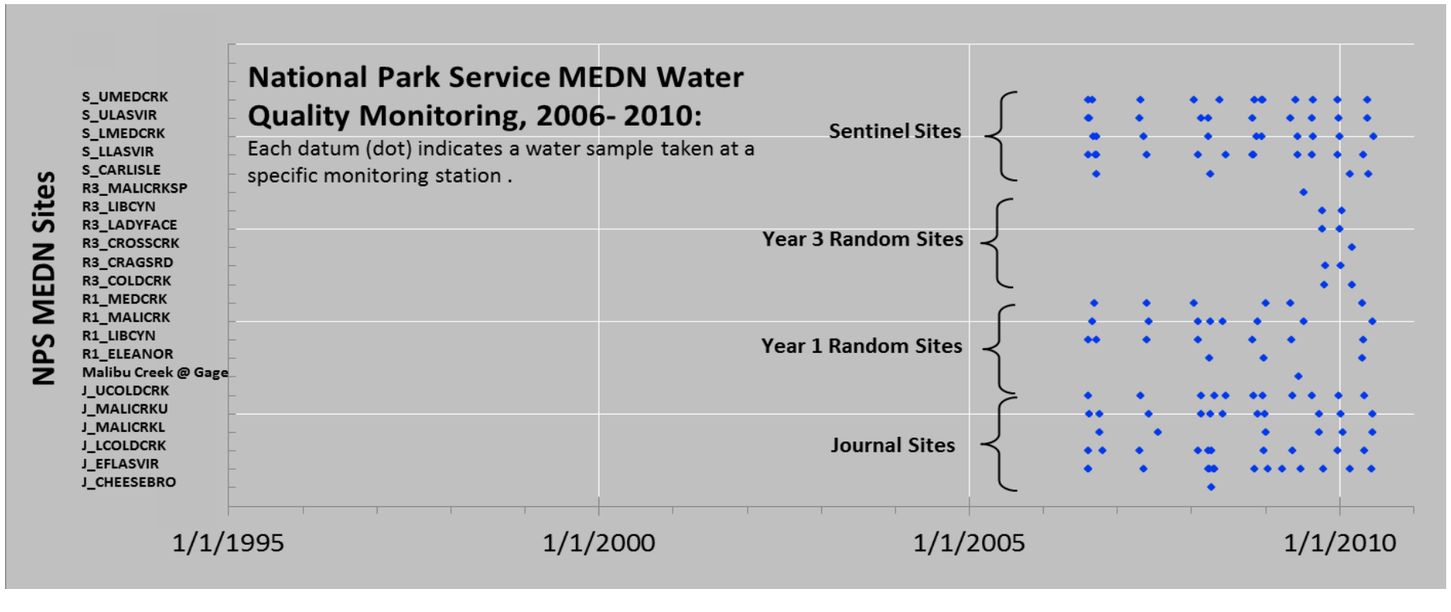
Sampling locations: The monitoring program is designed with 31 stations in three different grouping categories; this analysis includes data from 21 sites within the Malibu Creek watershed. Nine *Judgmental* sites are located where there are identified pollution sources or ecological concerns. These include stream reaches supporting endangered or threatened species or reaches known to be impacted or potentially impacted by pollutants (e.g. 303(d) listed sites). *Judgmental* sites are sampled three times each year and can be identified by the "J_" preceding the site name. *Sentinel* sites are located at long term amphibian monitoring locations and can be identified by the "S_" in site names. There are three groups of twelve *Random* sites selected using a stratified random selection process and including twelve long-term amphibian monitoring sites. These sites are designated with "R_" preceding the site name.

Sampling frequency and duration: Three samples are collected each year from each sampled site - all *Judgmental* sites, all *Sentinel* amphibian monitoring sites, and one group of *Random* sites. Random sites are sampled on a rotating basis such that each site will be monitored one of three years. The timing of the three annual samples is based on seasonal variation in hydrologic condition: winter samples will represent first flush events, mid- to late-spring samples will represent the end of the wet season, and summer sampling will represent low flows. Data received from this program begin August 2006 and end June 2010, though sampling has continued.

Sampling parameters: Three independent samples for laboratory analyses are collected at each site during each visit. Additionally, three independent determinations of pH, water temperature, dissolved oxygen, and conductivity are made at each visit to each site. Parameters for laboratory analysis include total suspended sediment, turbidity, chloride, nitrate, phosphate, phosphorus, total nitrogen, ammonia-N, bromide, fluoride and sulfate. Sampling of these final three were discontinued after June 15, 2008. The three independent measures per site visit were averaged for use in this analysis.

Document Source: Hibbs, B., J. L. Cameron, S. Hollinger,, & M. Merino, 2006. Stream Water Quality Monitoring in the Mediterranean Coast Network (MEDN), Version1.0. Natural Resources Technical Report NPS/MEDN/NRTR—2008/00?, 36 pp.





Ventura County

Bacteria TMDL Compliance Monitoring Program (multiple agencies)

The Ventura County Watershed Protection District (VCWPD) conducts Bacteria TMDL compliance monitoring in the Ventura County portion of Malibu Creek watershed on behalf of the following joint funding agencies: VCWPD, Ventura County and the City of Thousand Oaks.

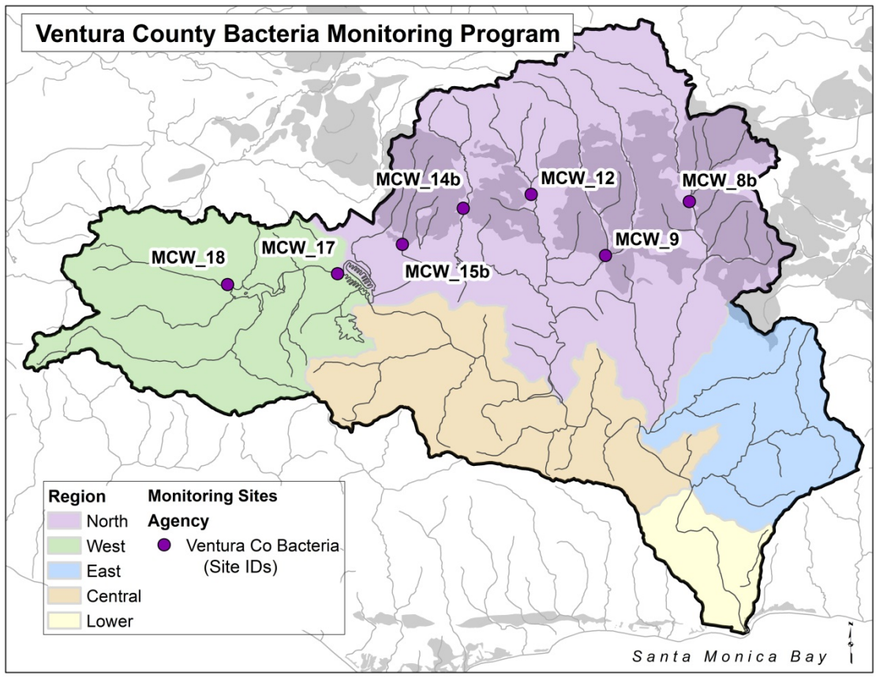
Monitoring objectives: Monitoring objectives are to (1) characterize the existing water quality as compared to water quality at a reference watershed or site (Stein and Yoon, 2007); (2) to measure compliance with the allowable number of exceedance days set forth by the TMDL; and (3) to provide data to support reevaluations when the TMDL is reconsidered. Numeric targets from the Bacteria TMDL used in this analysis include the single sample limits for marine waters (10,000 MPN/100mL for total coliform;) and for fresh waters (235 for *E. coli,* and 400 for fecal coliform). Geometric means and exceedance days were not considered for this report.

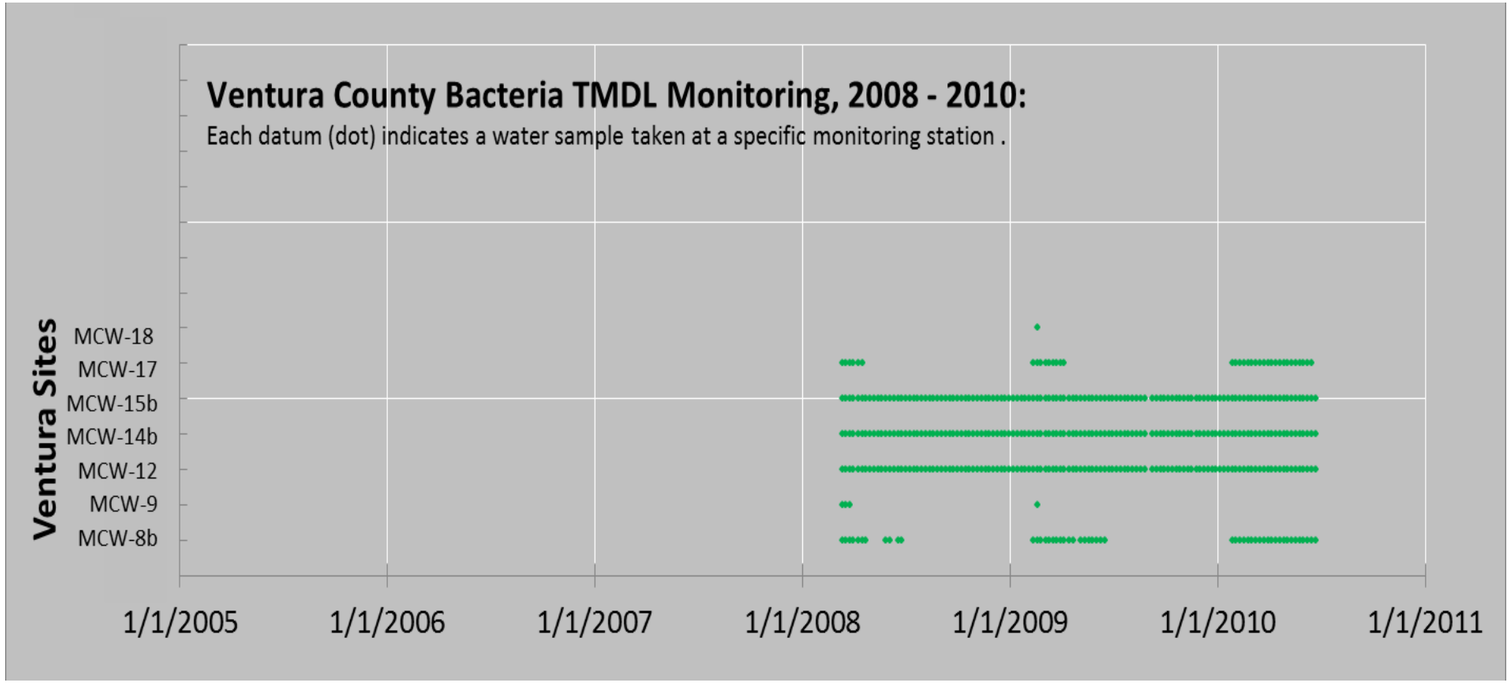
Sampling locations: Seven sites are sampled with at least one site in each subwatershed and in areas where frequent REC-1 use is known to occur. Ventura County bacteria TMDL monitoring sites are, like the Los Angeles County sites, prefixed with "MCW_". Ventura County sites are numbered 8b, 9, 12, 14b, 15b, 17, and 18.

Sampling frequency and duration: Sampling is conducted weekly on Tuesdays. Data received from this program ranges from March 2008 to June 2010.

Sampling parameters: Field data collected include dissolved oxygen (pct and mg/L), flow (cfs), pH, salinity (ppt), specific conductivity, temperature and turbidity. Laboratory data include *E. coli* and fecal coliform. Data was provided with the caveat that field data is collected with meters that are calibrated the morning of sampling, but aren't checked against anything else in the field.

Document source: Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring Plan, prepared by the Ventura County Watershed Protection District on behalf of the County of Ventura, Ventura County Watershed Protection District, and the City of Thousand Oaks, March 4, 2008





Malibu Creek Watershed - Los Angeles Bacteria Monitoring Program
(multiple agencies)

The Malibu Creek Watershed-Los Angeles Bacteria Monitoring Program is jointly funded by the County of Los Angeles, California Department of Transportation, and the Cities of Agoura Hills, Calabasas, Westlake Village, Malibu and Hidden Hills. The City of Agoura Hills manages a contract with Clean Lakes Incorporated, which runs the monitoring program. Monitoring is conducted according to the Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring Plan.

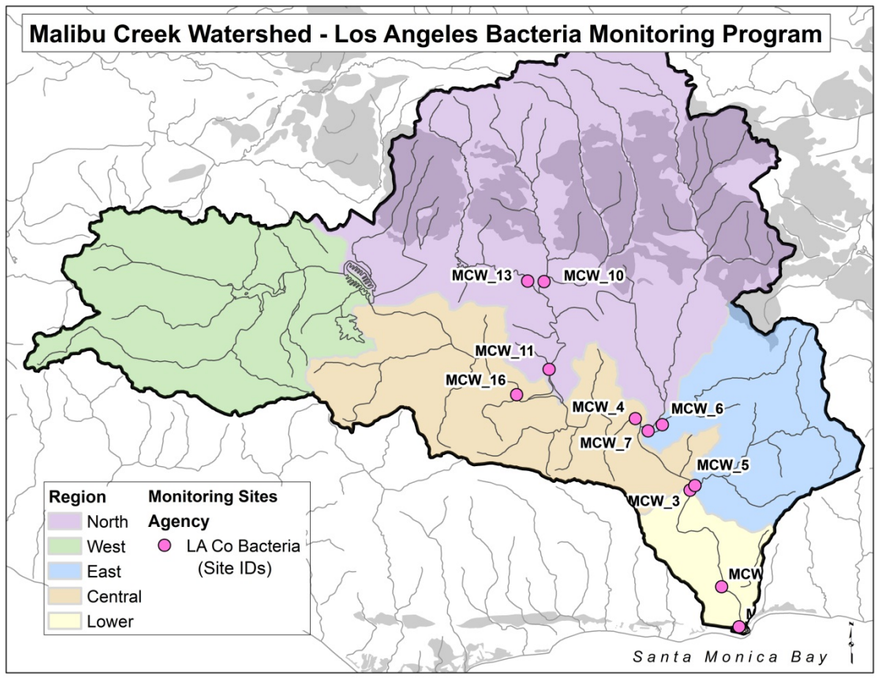
Monitoring objectives: Monitoring objectives are to (1) characterize the existing water quality as compared to water quality at a reference watershed or site; (2) to measure compliance with the allowable number of exceedance days set forth by the TMDL; and (3) to provide data to support reevaluations when the TMDL is reconsidered. Numeric targets from the Bacteria TMDL used in this analysis include the single sample limits for marine waters (10,000 mpn/100mL for total coliform; 400 for fecal coliform; 104 for enterococcus) and for fresh waters (235 for *E. coli*, and 400 for fecal coliform). Geometric means and exceedance days were not considered for this report.

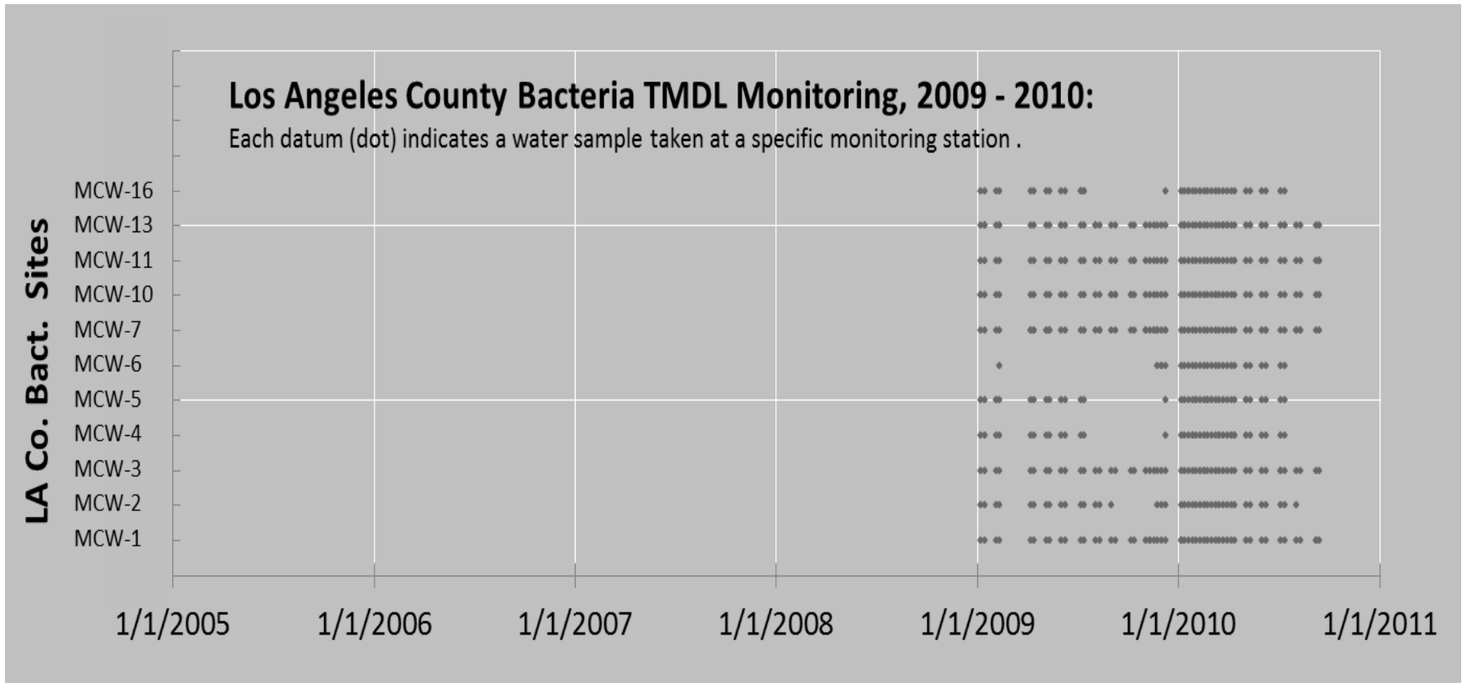
Sampling locations: Seven sites are sampled with at least one site in each subwatershed and in areas where frequent REC-1 use is known to occur. Los Angeles County bacteria TMDL monitoring sites are, like the Ventura County sites, prefixed with "MCW_". Los Angeles County sites are numbered 1, 2, 3, 4, 5, 6, 7, 10,11, 13 and 16.

Sampling frequency and duration: Sampling is conducted weekly. Data received from this program ranges from March 2008 to June 2010.

Sampling parameters: Data provided for this analysis and report include *E. coli*, fecal coliform, total coliform and enterococcus. Total coliform and enterococcus are only collected at MCW_1, the lagoon site.

Document source: Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring Plan, prepared by the County of Los Angeles Department of Public Works, submitted on behalf of Los Angeles County Flood Control District, County of Ventura, Ventura County Watershed Protection District, California Department of Transportation, Cities of Agoura Hills, Calabasas, Hidden Hills, Malibu, Thousand Oaks, and Westlake Village, September 5, 2007 version.





Los Angeles County

Municipal Separate Storm Sewer System (MS4) Monitoring and Reporting Program

Los Angeles County's mass emissions site S02 in lower Malibu Creek is required as part of their MS4 discharge permit.

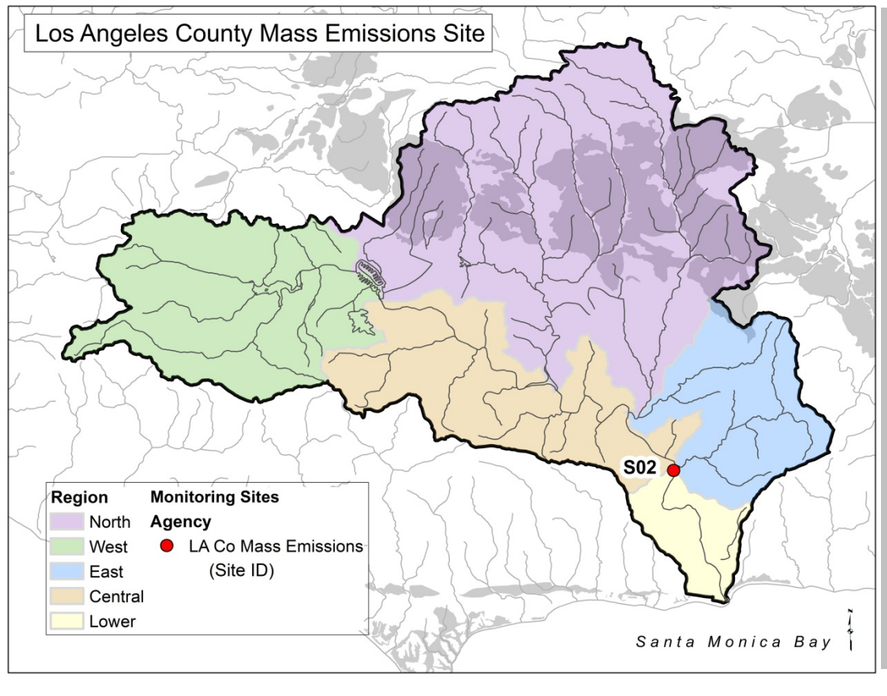
Monitoring objectives: Objectives stated in the Monitoring and Reporting section of the MS4 discharge permit are to assess regulatory compliance; measure and improve effectiveness of the Stormwater Quality Management Plan (SQMP); assess the chemical, physical, and biological impacts of receiving waters resulting from urban runoff; characterize storm water discharges; identify sources of pollutants; and assess the overall health and evaluate long-term trends in receiving water quality. Mass emissions testing, one of the several core monitoring tasks, is aimed at estimating the mass emissions from the MS4; assessing trends in mass emissions over time; and determining if the MS4 is contributing to exceedances of Water Quality Standards by comparing results to Basin Plan standards, the Ocean Plan, or the CTR and with emissions from other dischargers.

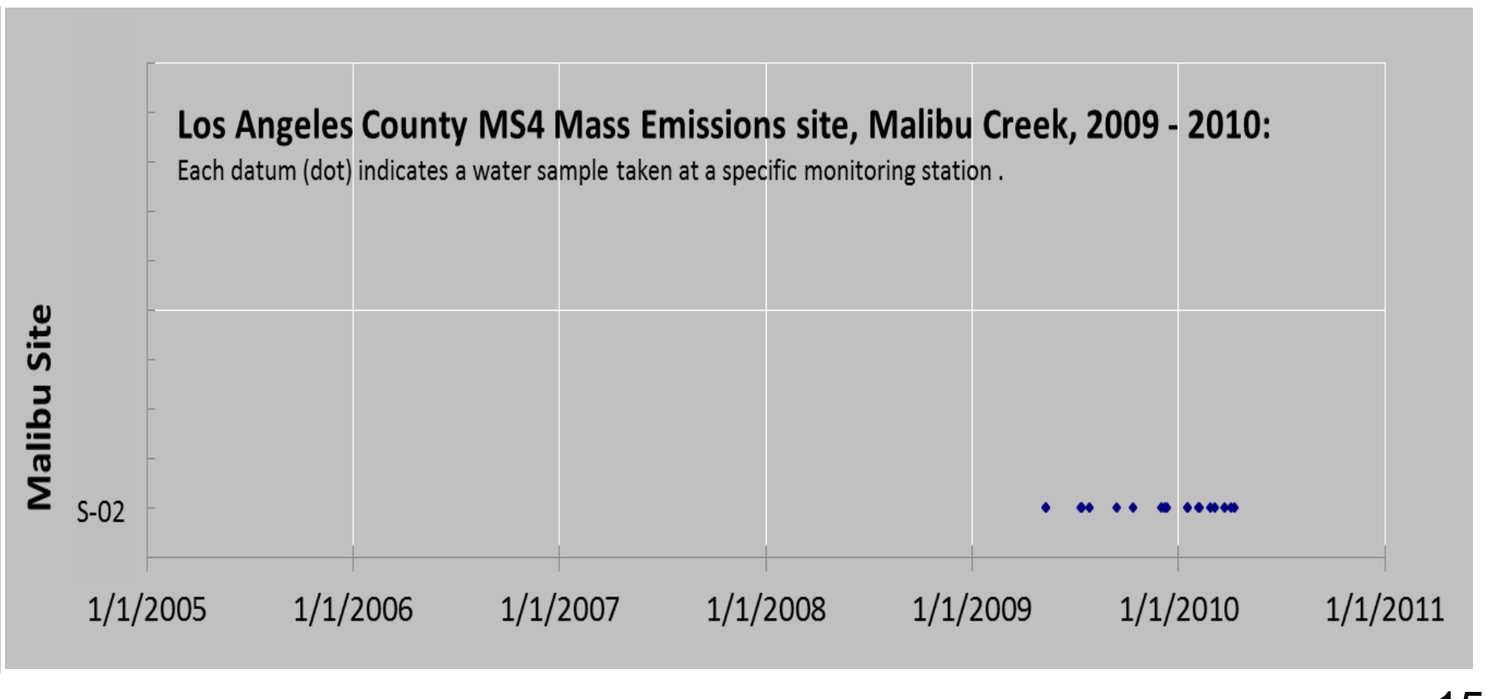
Sampling location: One of Los Angeles County's seven mass emissions stations is located in Malibu Creek. The site is located in lower Malibu Creek by Los Angeles County gage F130-R, just downstream from the confluence with Cold Creek. This easily accessible site is monitored by multiple agencies.

Sampling frequency and duration: The mass emissions station samples during the first storm event of the year and a minimum of two additional storm events per season along with a minimum of two dry weather samples per year. Furthermore, all rain events resulting in at least 0.25 inches of rainfall must be sampled and analyzed for total suspended sediment; this amount of rainfall triggers sampling by automatic samplers. Grab sampling is used for pathogen indicators, oil and grease.

Sampling parameters: Constituents required by the permit for analysis are listed in permit attachment U-1, and include conventional pollutants (e.g. oil and grease, physical parameters), bacteria, general chemical (e.g. minerals, TSS, TDS, BOD, etc.), metals, semivolatile organic compounds, chlorinated pesticides, polychlorinated biphenyls, organophosphate pesticides, and herbicides.

Document source: Revised Monitoring and Reporting Program, June 15, 2005, CI 6948, for Order No. 01-182 NPDES No. CAS004001, Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, and the incorporated Cities, except the City of Long Beach.





Water Quality in the Malibu Creek watershed – the State 303(d) list

What is the state 303(d) list? Section 303(d) of the Clean Water Act requires states, territories and authorized tribes to develop a list of water bodies for which designated beneficial uses are limited by poor water quality. The water bodies identified on this list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The Clean Water Act requires the state to establish priority rankings for these "303(d) listed" water bodies, and develop action plans, called Total Maximum Daily Loads (TMDL), to improve water quality. The table below summarizes the current state 303(d) listing information for the Malibu Creek watershed, including the current status of required TMDLs. **How is it done?** These state lists are updated about every two years, with specific listings being added or dropped depending on new information and water quality data submitted by monitoring agencies and organizations during the state data solicitation process. **How accurate is it?** As accurate as its underlying data. It is often difficult to reconstruct how a particular water body became listed for a particular pollutant for early listings, either because the original water quality data cannot be located or retrieved, or because the decision-making process for particular listings was not recorded in sufficient detail. Even where the listing process is well-documented (as it is for most recent listings), errors can result if the data used in the assessment do not represent actual conditions in the water body. Errors can result from seasonal bias (listing data collected in the winter, for example, with no summertime samples – see Sulfate), geographic bias (data limited to just a few locations within a large water body for example – see Eutrophication section), or errors in pollutant source determination (for example, where naturally elevated levels of a compound are assumed to be of human origin (see section on Natural Source Assessment). The data may also be outdated, with listings remaining unchanged through multiple listing cycles in the absence of newer data. Or, some other factor unrelated to the listed pollutant may be affecting the results (e.g. benthic macroinvertebrate assessment scores – see Section2). Thus an important function of our data analysis was to compile all data – historical and current – for the pollutants and streams in the most recent 303(d) list, compare those data against current water quality objectives, and make an independent assessment of water quality. In this sense, the state 303(d) list is the *starting point* for our analysis, allowing us to prioritize our efforts to focus on water quality problems that entail legally-mandated efforts at remediation in the absence of better information.

Our findings: ***Our analysis shows that about one-third of the listings in the current 303(d) list for the Malibu Creek watershed are due to natural sources*** **(marked with asterisks * in the table).** Pending TMDLs for these listings may be unnecessary, and completed TMDLs for these listings may require substantial revision. ***Our analysis also identified water quality problems that do not appear on the current 303(d) list, primarily for pollutants already listed for other streams.***

WATER QUALITY IN THE MALIBU CREEK WATERSHED - CURRENT STATUS

Source: California Integrated §303(d) Report (2010)

	POLLUTANT / IMPAIRMENT →	Algae*	Ammonia	Eutrophic*	Nutrients (Algae)*	Odor*	Scum/Foam-unnatural*	Organic Enrichment/Low Diss. Ox.*	Coliform Bacteria	Indicator Bacteria	Viruses (enteric)	Swimming Restrictions	Trash	Benthic Community Effects	Benthic-Macroinvertebrate Bioassessments*	Chloride*	DDT (Dichlorodiphenyltrichloroethane)	Fish Barriers (Fish Passage)	Invasive Species	Lead	Mercury	Mercury (tissue)	PCBs	pH	Sedimentation/Siltation	Selenium*	Specific Conductivity*	Sulfates*	Total Listings per Creek
	Proposed Regulatory Remedies →	NUTRIENT TMDL							BACTERIA TMDL				TRASH TMDL	TMDLs PENDING														
STREAMS	Las Virgenes Creek				x		x	x	x				x		x				x						x	x			9
	Lindero Creek Reach 1	x					x		x				x		x				x							x			7
	Lindero Creek Reach 2	x					x		x				x													x			5
	Malibu Creek				x		x		x				x		x			x	x						x	x		x	10
	Medea Creek Reach 1	x							x				x												x	x			5
	Medea Creek Reach 2	x							x				x		x				x						x	x			7
	Palo Comado Creek								x																				1
	Stokes Creek								x																				1
	Triunfo Canyon Creek Reach 1																		x	x					x				3
	Triunfo Canyon Creek Reach 2														x				x	x					x				4
LAKES	Lake Lindero	x		x		x							x			x										x	x		7
	Lake Sherwood	x	x	x				x														x							5
	Malibou Lake	x		x				x																					3
	Westlake Lake	x	x	x				x											x										5
BEACH	Malibu Beach									x							x												2
	Malibu Lagoon Beach (Surfrider)								x								x						x						3
LAGOON	Malibu Lagoon			x					x		x	x		x										x					6
	Total listings in the watershed	8	2	5	2	1	4	4	10	1	1	1	7	1	5	1	2	1	4	3	2	1	1	1	6	7	1	1	83

* Probable natural source (Monterey Formation)

How to read this table: To the right of each listed water body (e.g. Las Virgenes Creek) are columns for each of the water quality impairments / pollutants (e.g. trash, lead, mercury etc.). An "X" indicates that the state considers that water body to be impaired for the listed pollutant. Each listed impairment is sorted left to right according to the status of its legally mandated TMDL, showing completed TMDLs and TMDL's still pending. Note that one TMDL can address multiple, causally-related impairments (e.g. the Nutrient TMDL addresses 7 pollutants / impairments). Total listings are tallied in the last column and bottom row by water body and pollutant, respectively, providing a rough measure of overall water quality for each water body (last column) and the number of pollutants responsible (bottom row). Water bodies are organized by type in column one (e.g. streams, lakes, etc.). The map below shows the locations of the various listed water bodies in the watershed.