In cooperation with the California State Water Resources Control Board

Occurrence of Pesticides in Surface Water and Sediments from Three Central California Coastal Watersheds, 2008–09

Data Series 600

Cover: Photo of the Santa Maria River estuary near Guadalupe, California.

Back: Photo of a drainage ditch adjacent to strawberry fields near Watsonville, California.

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By Kelly L. Smalling and James L. Orlando

Prepared in cooperation with the California State Water Resources Control Board

Data Series 600

**U.S. Department of the Interior
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Contents

Abstract.....	1
Introduction.....	1
Purpose and Scope	2
Study Design.....	2
Regional Hydrologic Setting	2
Descriptions of Watersheds and Sampling Sites.....	4
Pajaro River Estuary Watershed	4
Salinas River Estuary Watershed.....	6
Santa Maria River Estuary Watershed.....	8
Pesticide Use.....	9
Procedures and Methods.....	11
Sampling Methods.....	11
Storm Sampling	11
Dry Season Sampling	12
Analytical Methods.....	12
Dissolved Pesticides	12
Sediment-Associated Pesticides	13
Instrumental Analysis for Pesticides.....	13
Method Detection Limits	14
Quality Assurance/Quality Control.....	15
Dissolved Pesticides	16
Sediment-Associated Pesticides	16
Sediment Organic Carbon and Nitrogen.....	16
Dissolved Organic Carbon.....	16
Results	16
Dissolved Pesticides	16
Sediment-Bound Pesticides	20
Sediment Organic Carbon and Nitrogen.....	22
Dissolved Organic Carbon.....	22
Water-Quality Parameters.....	22
Summary and Conclusions.....	23
Acknowledgments	23
References Cited.....	23
Tables 8–14.....	25

Figures

1. Map showing location of study area in the three central California coastal estuaries	3
2. Map showing aerial view of land cover and location of all sampling sites within the Pajaro River estuary watershed	6
3. Map showing aerial view of land cover and location of sampling sites within the Salinas River estuary watershed	7
4. Map showing aerial view of land cover and location of sampling sites within the Santa Maria River estuary watershed	8
5. Graph showing detection frequencies of dissolved pesticides, as a percentage of the total number of water samples by estuary	17
6. Graph showing detection frequencies of dissolved pesticides, as a percentage of the total number of samples by sampling period (storm versus dry) in the Pajaro, Salinas and Santa Maria River estuary watersheds, California, 2008–09.....	19
7. Graph showing frequency of detection for pesticides in bed sediments, as a percentage of the total number of samples by estuary watershed, Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.....	20
8. Graph showing frequency of detection for the pesticides in suspended sediments, as a percentage of the total number of samples in each estuary watershed, Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09	21
9. Graph showing frequency of detection of suspended sediment bound pesticides, as a percentage of the total number of samples by sampling period (storm versus dry season), Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.....	22

Tables

1. Sampling sites located in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.....	4
2. Total watershed area and area by major land-use types for sites sampled during the study.....	5
3. Top five crops by total weight of applied pesticides in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California	10
4. Applications of pesticides analyzed during the study reported by land-use setting	11
5. Method detection limits for dissolved pesticides in water	14
6. Method detection limits for pesticides associated with bed and suspended sediments.....	15
7. Maximum concentrations of dissolved pesticides by estuary and season (storm versus dry) in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09	18
8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.....	26
9. Dissolved pesticide and organic carbon concentrations measured in samples from the Salinas River estuary watershed, California, 2008–09.....	38
10. Dissolved pesticide and organic carbon concentrations measured in samples from the Santa Maria River estuary watershed, California, 2008–09.....	46
11. Bed sediment pesticides concentrations in samples from the major tributaries of the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09 ...	54
12. Suspended sediment pesticides concentrations in samples from the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.....	57
13. Percent organic carbon and nitrogen in suspended and bed sediment samples from the tributary sites in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.....	66
14. Discrete (single-point) and cross-sectional measurements for water-quality parameters at sampling sites in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09	67

Conversion Factors

SI to Inch/Pound

Multiply	By	To obtain
Length		
centimeter (cm)	0.3937	inch (in.)
millimeter (mm)	0.03937	inch (in.)
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
kilometer (km)	0.5400	mile, nautical (nmi)
meter (m)	1.094	yard (yd)
Area		
hectare (ha)	0.003861	square mile (mi ²)
square kilometer (km ²)	0.3861	square mile (mi ²)
Volume		
liter (L)	1.057	quart (qt)
liter (L)	0.2642	gallon (gal)
Flow rate		
cubic meter per second (m ³ /s)	35.31	cubic foot per second (ft ³ /s)
Mass		
kilogram (kg)	2.205	pound avoirdupois (lb)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$^{\circ}\text{F}=(1.8\times^{\circ}\text{C})+32$$

Vertical coordinate information is referenced to North American Vertical Datum of 1988 (NAVD 88).

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Altitude, as used in this report, refers to distance above the vertical datum.

Specific conductance is given in microsiemens per centimeter at 25 degrees Celsius (µS/cm at 25 °C).

Concentrations of chemical constituents in water are given either in milligrams per liter (mg/L), nanograms per liter (ng/L) or micrograms per liter (µg/L).

Abbreviations

°C/min	degrees Celsius per minute
dms	degrees, minutes, seconds
ft	feet
G	dimensionless ratio of acceleration due to centrifugal force divided by the acceleration due to gravity
g	gram
in.	inch
i.d.	inner diameter
L/min	liter per minute
lb	pound
mi	mile
min	minute
mg	milligram
mL	milliliter
N ₂	nitrogen gas
nd	not detected
ng/L	nanogram per liter
μA	microamp
μg/kg	microgram per kilogram
μL	microliter
μm	micrometer
μS/cm	microsiemens per centimeter
v/v	volume to volume

Acronyms

ASE	accelerated solvent extractor
CDPR	California Department of Pesticide Regulation
CCAMP	California Certified Agricultural Mediation Program
CCLEAN	Central Coast Long-term Environmental Assessment Network
DCM	dichloromethane
DOC	dissolved organic carbon
EI	electron ionization
FNU	formazine nephelometric unit
GC-ITMS	gas chromatograph/ion trap mass spectrometer
GF/F	glass fiber filter
GPC/HPLC	gel permeation chromatography/high pressure liquid chromatography
HCl	hydrochloric acid
LOD	limit of detection
MDL	method detection limit
MP	management practices

MS/MSD	matrix spike/matrix spike duplicate
OP	organophosphate pesticide
OCP	organochlorine pesticide
PAH	polycyclic aromatic hydrocarbon
PLE	pressurized liquid extraction
psi	pound per square inch
QA/QC	quality assurance/quality control
rpm	revolutions per minute
SPE	solid-phase extraction
SD	standard deviation
SIS	selective ion storage
SRM	standard reference material
SWAMP	Surface Water Ambient Monitoring Program
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

Occurrence of Pesticides in Surface Water and Sediments from Three Central California Coastal Watersheds, 2008–09

By Kelly L. Smalling and James L. Orlando

Abstract

Water and sediment (bed and suspended) were collected from January 2008 through October 2009 from 12 sites in 3 of the largest watersheds along California's Central Coast (Pajaro, Salinas, and Santa Maria Rivers) and analyzed for a suite of pesticides by the U.S. Geological Survey. Water samples were collected in each watershed from the estuaries and major tributaries during 4 storm events and 11 dry season sampling events in 2008 and 2009. Bed sediments were collected from depositional zones at the tributary sampling sites three times over the course of the study. Suspended sediment samples were collected from the major tributaries during the four storm events and in the tributaries and estuaries during three dry season sampling events in 2009.

Water samples were analyzed for 68 pesticides using gas chromatography/mass spectrometry. A total of 38 pesticides were detected in 144 water samples, and 13 pesticides were detected in more than half the samples collected over the course of the study. Dissolved pesticide concentrations ranged from below their method detection limits to 36,000 nanograms per liter (boscalid). The most frequently detected pesticides in water from all the watersheds were azoxystrobin, boscalid, chlorpyrifos, DCPA, diazinon, oxyfluorfen, prometryn, and propyzamide, which were found in more than 80 percent of the samples. On average, detection frequencies and concentrations were higher in samples collected during winter storm events compared to the summer dry season. With the exception of the fungicide, myclobutanil, the Santa Maria River estuary watershed exhibited higher pesticide detection frequencies than the Pajaro and Salinas watersheds.

Bed and suspended sediment samples were analyzed for 55 pesticides using accelerated solvent extraction, gel permeation chromatography for sulfur removal, and carbon/alumina stacked solid-phase extraction cartridges to remove interfering sediment matrices. In bed sediment samples, 17 pesticides were detected including pyrethroid and organophosphate (OP) insecticides, *p,p'*-DDT and its

degradates, as well as several herbicides. The only pesticides detected more than half the time were *p,p'*-DDD, *p,p'*-DDE, and *p,p'*-DDT. Maximum pesticide concentrations ranged from less than their respective method detection limits to 234 micrograms per kilogram (*p,p'*-DDE). Four pyrethroids (bifenthrin, λ -cyhalothrin, permethrin, and τ -fluvalinate) were detected in bed sediment samples, though concentrations were relatively low (less than 10 microgram per kilogram). The greatest number of pesticides were detected in samples collected from Lower Orcutt Creek, the major tributary to the Santa Maria River estuary. In suspended sediment samples, 19 pesticides were detected, and maximum concentrations ranged from less than the method detection limits to 549 micrograms per kilogram (chlorpyrifos). The most frequently detected pesticides were *p,p'*-DDE (49 percent), *p,p'*-DDT (38 percent), and chlorpyrifos (32 percent). During storm events, 19 pesticides were detected in suspended sediment samples compared to 10 detected during the dry season. Pesticide concentrations commonly were higher in suspended sediments during storm events than during the dry season, as well.

Introduction

Coastal estuaries are among the most ecologically important and critically threatened habitats in California. Less than 20 percent of the State's coastal wetlands remain, and many of these face threats from water-quality degradation. Along California's central coast, rivers in the three largest watersheds (the Pajaro, Salinas, and Santa Maria) drain to coastal estuaries that provide essential habitat for commercially and recreationally important marine fish species, threatened anadromous fish species, migratory birds, and other wildlife. These estuaries provide a number of beneficial uses, such as recreation and activities related to many fisheries, including spawning and salmonid migration corridors, and are biological habitats of special significance for a variety of rare, threatened, and endangered species.

Each of these watersheds contains year-round, intensively cultivated agricultural land that supports a \$3.5 billion/year industry, producing much of the nation's lettuce, artichokes, and crucifer crops (California Department of Pesticide Regulation, 2009). Runoff from irrigated agriculture constitutes a significant portion of river flow during most of the year. Studies have documented pesticide occurrence and biological effects from pesticides in the rivers and estuaries of the Pajaro (Hunt and others, 1999), Salinas (Anderson and others, 2003), and Santa Maria (Anderson and others, 2006).

Evidence of pesticide impacts has encouraged a number of diverse stakeholders to begin implementing farm management practices (MPs) to reduce pesticide concentrations and toxicity in agricultural runoff. Over the past decade, a variety of organizations, including farm watershed groups, the California Central Coast Regional Water Quality Control Board's Agricultural Waiver Program, the Monterey Bay National Marine Sanctuary Water Quality Protection Program, and the Resource Conservation Districts, have been working together to identify water-quality problems and to evaluate the effectiveness of individual farm-scale MPs to mitigate pesticide runoff. As the MPs begin to be used more widely, the next step likely will be to evaluate the effectiveness of MP implementation on a watershed-scale.

None of the monitoring programs in the region, including the Surface Water Ambient Monitoring Program (SWAMP), the Certified Agricultural Mediation Program (CCAMP), the Central Coast Long-term Environmental Assessment Network (CCLEAN), or Agricultural Waiver Monitoring, target the critical coastal estuaries that receive surface runoff from these large agricultural watersheds. This project is primarily designed to measure the current concentration of pesticides in these critical estuarine habitats. This information on concentrations of contaminants and exposure of biota to contaminants can be used as a baseline for future evaluations of watershed-scale effectiveness of agricultural MP implementation.

Purpose and Scope

This report describes the methods and procedures used to determine pesticide concentrations in 144 water and 90 sediment-bound samples collected from five sites in the Pajaro watershed, four sites in the Salinas watershed, and three sites in the Santa Maria watershed during 2008 and 2009. Water and sediment were analyzed for a suite of 68 and 55 pesticides, respectively. Concentrations of dissolved organic carbon and particulate organic carbon and nitrogen in bed sediment are also presented. Details of the analytical methods including appropriate citations are included. Specifically for this study, five new pesticides were added to surface water methods and two new pesticides were added to sediment methods. Information on these new pesticides is included in the tables.

Study Design

The objective of this project was to establish baseline pesticide concentrations in each estuary where MPs are being implemented to assist in detection of changes in pesticide concentrations over the next 2 decades as MPs change. The specific goals for this project were to measure current-use and legacy pesticide concentrations in the water, bed sediment, and suspended sediments in the estuaries and several major tributaries to each estuary. The primary focus was on the estuaries, but the tributaries were also sampled in close proximity to the estuaries to determine the types and concentrations of pesticides entering the estuary during storms and during pesticide applications. The two specific project objectives were (1) to measure the concentrations of pesticides in the water and sediment and (2) to qualitatively compare the suites of pesticides detected in the estuaries with those found in key adjacent tributaries that convey agricultural runoff into the estuaries.

Regional Hydrologic Setting

Three intensively farmed watersheds along California's Central Coast (the Pajaro, Salinas, and Santa Maria River estuary watersheds), extending from Monterey Bay in the north to near Point Conception in the South, were sampled during this study (*fig. 1*). The central coast landscape is characterized by a rugged coastline, relatively low mountain ranges parallel to the coast, and linear river valleys. Each watershed drains mountainous areas in California's Coast Range as well as valley agricultural lands extending to the coast. The watersheds are drained by single mainstem rivers that empty into small coastal estuaries. Flows in the mainstem rivers are highly variable, and lower reaches of all three rivers can be dry or ponded for part of the year. Tributaries that enter the lowest reaches of the rivers function essentially as agricultural drains. Also, all three estuaries are closed to the ocean by natural sand dunes periodically, though there is some exchange of water through the dunes. During much of the year these tributaries are the primary sources of fresh water to the estuaries.

The three watersheds share a Mediterranean climate, typified by warm to hot, dry summers and mild, wet winters. Temperatures are typically cooler near the coast (at least 10°C) and warmer inland, with onshore winds throughout much of the year. Average annual rainfall amounts are highest along the coast (18–40 in.), and decrease inland (4.5–12 in.). Most precipitation falls from January to March and coastal fog occurs in summer. In the more southerly Santa Maria watershed, mean annual temperatures are a few degrees higher and mean annual precipitation is slightly lower than in the Pajaro and Salinas watersheds, though the timing of precipitation is the same.

Figure 1. Location of study area in the three central California coastal estuaries.

Descriptions of Watersheds and Sampling Sites

Samples were collected from sites within the Pajaro, Salinas, and Santa Maria estuaries as well as from the major tributaries draining agricultural lands upstream of the estuaries. Within each estuary, water and bed sediment samples were collected from one station located near the estuary mouth and another station located at the upstream end of the estuary along the mainstem river channel. These “lower” and “upper” sites receive water from the upstream river/tributary watersheds as well as from lands not within

these watersheds. Each river/tributary site was located as close to its confluence with the estuary as feasible (*figs. 2–4*), and represents a distinct watershed (*table 1*). Watersheds were delineated using ArcGIS Desktop GIS software (Environmental Systems Research Institute, Redlands, CA). Initial watershed boundaries were taken from a preexisting dataset of national watershed boundaries (Natural Resources Conservation Service, 2009). The boundaries were then modified by digitizing the boundaries using high-resolution aerial photographs and detailed hydrography as a backdrop and matched to specific sampling sites.

Table 1. Sampling sites located in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.

[Horizontal datum: North American Datum 83 (NAD 83); vertical datum: North American Vertical Datum of 1988 (NAVD 88). **Abbreviations:** USGS, U.S. Geological Survey]

USGS station number	USGS station name	Common station name	Latitude	Longitude
365159121480801	Monterey drainage ditch near Watsonville	Monterey drainage ditch	36.86650	–121.80225
365200121485901	Watsonville Slough near Watsonville	Watsonville Slough	36.86680	–121.81656
365247121473301	Pajaro River below Thurwachter Road near Watsonville	Pajaro River below Thurwachter	36.87968	–121.79356
365140121480101	Pajaro River estuary near Watsonville	Pajaro River estuary upper	36.86111	–121.80028
365100121482901	Pajaro River estuary at mouth near Watsonville	Pajaro River estuary lower	36.85000	–121.80806
364154121440501	Blanco drain near Marina	Blanco drain	36.69858	–121.73494
363848121420801	Salinas River at Davis Road near Salinas	Salinas River at Davis Road	36.64676	–121.70222
364355121465601	Salinas River estuary near Castroville	Salinas River estuary upper	36.73194	–121.78222
364457121480501	Salinas River estuary at mouth near Castroville	Salinas River estuary lower	36.74917	–121.80139
345727120375401	Green Canyon Creek at Main Street near Guadalupe	Lower Orcutt Creek	34.95748	–120.63267
345742120384701	Santa Maria River estuary near Guadalupe	Santa Maria River estuary upper	34.96167	–120.64639
345811120385801	Santa Maria River estuary at mouth near Guadalupe	Santa Maria River estuary lower	34.96972	–120.64944

Pajaro River Estuary Watershed

The Pajaro River estuary watershed drains approximately 1,300 square miles (mi²) and includes 76,400 acres in agriculture (U.S. Geological Survey, 2001; *table 2*). Elevations within the watershed range from sea level to approximately 5,200 ft above sea level. The Pajaro River forms the border between Santa Cruz and Monterey Counties. Agriculture in the lower Pajaro River estuary watershed is concentrated near the cities of Watsonville, Aromas, and Pajaro. The main

tributaries to the lower river and estuary include Corralitos and Salsipuedes Creeks, Watsonville Slough, and agricultural discharges from the Beach Street ditch and the Monterey drainage ditch. In the lower Pajaro River and adjacent Watsonville Slough watersheds, several water bodies are currently listed as impaired by pesticides under the Clean Water Act 303(d), including Watsonville Slough and the lower Pajaro River (State Water Resources Control Board, 2002).

The Pajaro River estuary is narrow with manmade levees along nearly its entire length (*fig. 2*). A large sand spit forms the estuary's western boundary and completely cuts the estuary off from the sea under low-flow conditions, which primarily occur during the spring and summer. Water and sediment samples were collected from a site along the sand spit near the estuary mouth (Pajaro River estuary lower) and a second site located approximately 1 mile upstream (Pajaro River estuary upper). Three sub-watersheds were sampled within the Pajaro River estuary watershed: Monterey drainage ditch, Watsonville Slough, and Pajaro River below Thurwachter Road (*fig. 2*).

The Thurwachter Road site is located 1.5 mi upstream from the sampling site at the upper end of the Pajaro River estuary and 1.1 mi upstream of the Monterey drainage ditch outfall (*fig. 2*). Depending on flow conditions, this site can be tidally affected. This site represents the largest tributary watershed (1,270 mi²) sampled in the Pajaro River estuary system (*table 2*). Approximately 70,000 acres in this sub-watershed are devoted to agriculture and 26,000 acres are

primarily urban, representing 8.6 and 3.2 percent of the total sub-watershed area, respectively (*table 2*).

The Watsonville Slough sampling site is located 1.4 mi upstream from the lower Pajaro River estuary site, and is immediately downstream of the confluence with the Beach Street Drain, a major agricultural drain. When the estuary is open to the sea, this site experiences a wide tidal range and flow reversal. The watershed upstream of this site is about 23.4 mi² in size with 3,399 acres in agriculture and 4,260 acres of urban land use (*table 2*).

The smallest tributary watershed sampled was Monterey drainage ditch (4.0 mi²). The sampling site for this watershed is located at a culvert passing through the landward side of the levee separating the Pajaro River estuary from adjacent farmland. A flap gate on the estuary side of the levee prevents water from flowing into the Monterey drainage ditch from the estuary at high tide. This sub-watershed is predominantly agricultural, with 1,634 acres, or 64 percent, of the total watershed area farmed, whereas, 258 acres, or 10.1 percent, are urban land.

Table 2. Total watershed area and area by major land-use types for sites sampled during the study.

[The three estuary sites represent both the upper and lower estuary sites. Land use data from National Land Cover Database (U.S. Geological Survey, Multi-Resolution Land Characteristics Consortium, 2001). **Abbreviations:** mi², square miles]

Watershed	Watershed area (mi ²)	Urban land use (acres)	Percent-age of total watershed	Agricultural land use (acres)	Percent-age of total watershed	Undeveloped land use (acres)	Percent-age of total watershed
Monterey drainage ditch	4.0	258	10.1	1,634	64.0	662	25.9
Watsonville Slough	23.4	4,260	28.5	3,399	22.7	7,303	48.8
Pajaro River below Thurwachter Road	1,270.4	26,214	3.2	70,153	8.6	716,659	88.1
Pajaro River estuary (upper and lower)	1,300.4	30,826	3.7	76,393	9.2	725,038	87.1
Blanco drain	7.7	120	2.4	4,568	92.2	265	5.3
Salinas River at Davis Road	4,210.0	22,124	0.8	223,793	8.3	2,448,485	90.9
Salinas River estuary (upper and lower)	4,234.8	23,291	0.9	232,995	8.6	2,454,011	90.5
Lower Orcutt Creek	87.4	6,371	11.4	19,884	35.5	29,685	53.1
Santa Maria River estuary (upper and lower)	1,827.7	13,437	1.1	85,941	7.3	1,070,384	91.5

Figure 2. Aerial view of land cover and location of all sampling sites within the Pajaro River estuary watershed.

Salinas River Estuary Watershed

The Salinas River flows over 150 miles from its headwaters in San Luis Obispo County through the Salinas Valley, and enters the Monterey Bay National Marine Sanctuary at the Salinas River National Wildlife Refuge. The Salinas River Estuary watershed is the largest on the California Central Coast at just over 4,230 mi². The watershed contains nearly 233,000 acres of year-round, intensively cultivated agricultural land producing much of the nation's

salad greens, artichokes, and crucifer crops. In the Salinas River estuary watershed, multiple water bodies are currently listed as impaired by pesticides under Clean Water Act 303(d), including Blanco drain, Chualar and Quail Creeks, the lower and middle Salinas River, Salinas Lagoon, and Tembladero Slough (State Resources Water Control Board, 2002). The Salinas River estuary is long and narrow in shape, though wider than the Pajaro River estuary, and extends roughly from Highway 1 to the sea, where it is blocked by a wide sand spit (fig. 3). The lower estuary site (Salinas River estuary lower)

is located immediately landward of the sand spit, whereas the upper estuary site (Salinas River estuary upper) is located at the Highway 1 crossing, 1.7 mi upstream. Lower sections of the estuary are not leveed and the area landward of the sand spit contains a large lagoon and wetlands. Two river/tributary sites were sampled within the larger Salinas watershed.

Samples were collected from the Salinas River at the Davis Road Bridge, located approximately 8.9 river miles upstream of the upper estuary sampling site. The Davis Road Bridge is well upstream of any tidal influence, and during the summer and fall months it typically has very little flow. The watershed for this site is approximately 4,210 mi² with almost

223,800 acres of agricultural land and about 22,000 acres of urban development.

Samples were collected from Blanco drain, a major agricultural drain which receives field runoff from lands north of the Salinas River. The Blanco drain site was located at a culvert crossing Cooper Road in an area of intensive agriculture (*fig. 3*). Blanco drain empties into the Salinas River approximately 1.3 mi downstream from the sampling site. The Blanco drain watershed, at 7.7 mi² was the second smallest watershed sampled during the study, and had the most agricultural land, with over 92 percent of the total watershed area (*table 2*).

Figure 3. Aerial view of land cover and location of sampling sites within the Salinas River estuary watershed.

Santa Maria River Estuary Watershed

The Santa Maria River estuary watershed is south of the outlets of the Salinas and Pajaro watersheds, approximately 140 mi south of Monterey Bay, and drains approximately 1,830 mi² of land (*fig. 1*). The watershed includes the Cuyama and Sisquoc Rivers, which join to form the Santa Maria River. Discharges into the Santa Maria River estuary are dominated by Green Canyon Creek (referred to hereafter as Lower Orcutt Creek) and a drainage ditch that enters the river just upstream (*fig. 4*). The stretch of the Santa Maria River between the

Highway 1 crossing and the confluence upstream with the Sisquoc River is dry for most of the year. Downstream of Highway 1, the river has some year-round flow comprising primarily agricultural discharge. Both the lower Santa Maria River and Orcutt Creek are currently listed as impaired by pesticides under Clean Water Act 303(d) (State Water Resources Control Board, 2002).

The Santa Maria River estuary is landward of the Guadalupe Dunes, which block the river from entering the sea. Water collects behind the dunes and forms a large semicircular lagoon which fills until the water level reaches an elevation at

Figure 4. Aerial view of land cover and location of sampling sites within the Santa Maria River estuary watershed.

which it can overtop the beach dune barrier. Flow then erodes the beach dune barrier and the estuary drains over a period of hours to a few days. This filling and draining cycle occurred repeatedly during the course of the study. The lower estuary sampling site (Santa Maria lower) was located as close to the beach dune barrier as possible with the precise location varying slightly with changes in estuary size during the study. The upper estuary (Santa Maria River estuary upper) site was located approximately 0.5 mi upstream but also varied slightly in location with changes in estuary size.

Orcutt Creek, is the major tributary to the estuary, providing the majority of water to the estuary for most of the year. Samples were collected from Green Canyon Creek at Main Street near Guadalupe (Lower Orcutt Creek), approximately 0.3 mi upstream of the confluence with the Santa Maria River and 1.1 mi upstream of the upper estuary sampling site (*fig. 4*). Orcutt Creek drains approximately 87.4 mi² of land southeast of the Santa Maria River estuary. The creek drains roughly 20,000 acres of agricultural land as well as the southern portion of the city of Santa Maria, making urban development account for about 11 percent of the watershed (*table 2*).

Pesticide Use

Since 1990, the California Department of Pesticide Regulation (CDPR) has had a reporting system in place that requires pesticide applicators provide detailed information on pesticide use. Pesticide-use data reported by agricultural applicators contains the date and time of application, location of application to the section level as referenced by the public land survey system, pesticide product applied and amount, and the crop type to which it was applied. Pesticides applied by licensed applicators in urban settings (primarily for landscape maintenance and structural pest control) are reported with less detail, giving the product and amount applied, but only the month of application and the county in which the pesticide was applied. The CDPR reporting system does not contain information on pesticide applications made by homeowners using products purchased at retail stores. The CDPR has the most comprehensive pesticide reporting system in the nation, and this dataset is extremely valuable in assessing trends in pesticide use, changes in application patterns, and potential for environmental contamination. Pesticide application data for

the 2008 calendar year are shown in this report because they were the most recent data contained in the CDPR database.

Using the watershed boundaries shown in *figure 1*, pesticide use data for 2008 were analyzed spatially to determine the amounts of pesticides used in each basin. Amounts of pesticides used were determined only for compounds analyzed for this study, however many additional compounds are applied in each watershed. Watersheds often cross county boundaries, and drainage systems rarely follow section lines; therefore, individual pesticide applications were spatially weighted to better estimate the total pesticide use in an individual watershed. The portion of each section within a particular watershed was calculated and the percentage relative to the full section area was determined. Pesticide applications within each section were multiplied by the percentage of the area in a particular watershed to better approximate pesticide use in that watershed and to eliminate over-reporting of applications for adjacent watersheds. For example, if 50 percent of section 09N35W11S lies within the Orcutt Creek watershed, then all pesticide applications within that section were adjusted to 50 percent when reported for that watershed.

Pesticide-use data for most applications made in urban settings are reported by county only. To approximate the amount of this pesticide use by watershed, the watershed area falling within a county was determined, which was then divided by the total county area, and the resulting fraction was used as a multiplier for pesticide use in the county. This process was repeated for watersheds that span multiple counties.

Pesticides are applied to a wide variety of crops in the watersheds studied; however, the bulk of applications are made to only a few major crops. The top five crops receiving pesticides and the amounts of pesticides applied, in pounds, for each of the watersheds is listed in *table 3*. The two larger Salinas River watersheds (Salinas River at Davis Road and Salinas River estuary upper/Salinas River estuary lower) had substantially higher total amounts of pesticides applied than any of the other basins (*table 4*). A breakdown of agricultural pesticide applications per acre of agriculture in each basin shows they were highest in the four smallest watersheds: Watsonville Slough, 4.8 lbs/acre; Monterey drainage ditch, 3.6 lbs/acre; Lower Orcutt Creek, 3.6 lbs/acre; and Blanco drain, 3.3 lbs/acre (*table 4*).

Table 3. Top five crops by total weight of applied pesticides in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California

[Data from the pesticide use database for the 2008 calendar year (California Department of Pesticide Regulation, 2009). **Abbreviations:** lbs, pounds]

Watershed	1st	(lbs applied)	2nd	(lbs applied)	3rd	(lbs applied)	4th	(lbs applied)	5th	(lbs applied)
Monterey drainage ditch	Strawberry	3,073	Lettuce	2,469	Broccoli	104	Cauliflower	71	Celery	57
Watsonville Slough	Strawberry	12,484	Lettuce	2,230	Apple	414	Indoor greenhouse flowers	307	Nursery outdoor flowers	245
Pajaro River below Thur-wachter Road	Lettuce	27,702	Onion	9,945	Landscape maintenance	8,243	Strawberry	8,081	Grape	7,970
Pajaro River estuary (upper and lower)	Lettuce	32,754	Strawberry	26,160	Onion	9,945	Landscape maintenance	8,304	Grape	7,971
Blanco drain	Lettuce	8,279	Strawberry	2,409	Broccoli	1,954	Cauliflower	1,684	Celery	392
Salinas River at Davis Road	Lettuce	160,880	Grape	116,973	Broccoli	75,647	Cauliflower	17,577	Spinach	15,775
Salinas River estuary (upper and lower)	Lettuce	179,650	Grape	116,973	Broccoli	79,412	Cauliflower	20,528	Spinach	15,795
Lower Orcutt Creek	Strawberry	20,691	Broccoli	19,394	Lettuce	19,361	Celery	4,798	Cauliflower	2,232
Santa Maria River estuary (upper and lower)	Strawberry	67,864	Lettuce	45,845	Broccoli	44,649	Carrot	15,104	Grape	13,699

Table 4. Applications of pesticides analyzed during the study reported by land-use setting.[Data from the pesticide use database for the 2008 calendar year (California Department of Pesticide Regulation, 2009). **Abbreviations:** lbs, pounds]

Watershed	Registered agricultural pesticide application (lbs)	Registered urban pesticide application (lbs)	Total pesticides applied in 2008 (lbs)	Percentage of pesticides from urban applications	Agricultural land use (acres)	Pounds applied per agricultural acre
Monterey drainage ditch	5,953	12	5,965	0.20	1,634	3.6
Watsonville Slough	16,470	142	16,612	0.85	3,399	4.8
Pajaro River below Thurwachter Road	102,316	14,426	116,742	12.36	70,153	1.5
Pajaro River estuary (upper and lower)	128,252	14,590	142,842	10.21	76,393	1.7
Blanco drain	15,027	22	15,049	0.15	4,568	3.3
Salinas River at Davis Road	461,006	10,245	471,251	2.17	223,793	2.1
Salinas River estuary (upper and lower)	499,453	10,317	509,770	2.02	232,995	2.1
Lower Orcutt Creek	72,441	426	72,867	0.58	19,884	3.6
Santa Maria River estuary (upper and lower)	238,499	9,101	247,600	3.68	85,941	2.8

Procedures and Methods

Sampling Methods

Sampling for water, bed, and suspended sediment, was conducted in the three estuaries between January 2008 and October 2009. A total of 15 sampling events took place in each estuary; 4 storm events and 11 dry season events. Sample collection procedures varied by site, and between storm and dry season events, based on hydrologic conditions. During each sampling event, stream discharge was measured at each tributary site where flow was not tidally affected, following established U.S. Geological Survey protocols (Rantz and others, 1982). Additionally, basic water-quality parameters (temperature, specific conductance, pH, dissolved oxygen concentration, and turbidity) were measured at all sites during each sampling event using a multi-probe meter (YSI model 6920V2).

Storm Sampling

Storm sampling was initiated when greater than 0.5 in. of rain fell in the respective estuary watersheds within a 24-hour period, and flows within the smaller tributaries had increased above base flow. Two storm events were sampled in 2008 and two in 2009. Three of the storms were sampled in winter, but the last storm in 2009 was sampled in fall. Water

samples were collected from all sampling sites during storm events, but suspended sediment samples were only collected at the river/tributary sites. At the larger river sites (Salinas River at Davis Road, and Pajaro River below Thurwachter) storm samples were collected during the rising limb of the stream hydrograph. At the remaining river/tributary sites storm samples were generally collected on the falling limb of the stream hydrograph.

During sampling large-volume water samples were collected for isolation of sufficient quantities of suspended material for sediment-associated pesticide analyses. Samples were collected from multiple, equally spaced points and multiple depths along a stream transect, or from one point using a high-volume peristaltic pump fitted with Teflon tubing. Transect samples were collected from three sites, Pajaro River below Thurwachter, Salinas River at Davis Road, and Lower Orcutt Creek. Single point samples were collected from the smaller tributaries (Blanco drain and Monterey drainage ditch) and in areas where transect samples were not feasible (Watsonville Slough). The collected water was pumped into pre-cleaned 20-L stainless steel soda kegs that were rinsed three times with site water prior to sampling. The total volume of water collected at each site ranged from about 400 to 1,000 L, depending on suspended-sediment concentrations. The objective was to process a sufficient volume of water to obtain at least 20 grams of suspended sediment for each site.

Following collection, each large-volume water sample was pumped through a continuous-flow centrifuge (GEA Westphalia Separator, Inc, Northvale, New Jersey) operated at 9,500 G at the rate of 2 L/min to segregate the liquid and solid phases, and concentrate suspended sediments (>0.3 microns) to make a slurry. The centrifuge flow rate is based on a study of particle trapping efficiency (Horowitz and others, 1989) which found 2 L/min using the centrifuge to be within the optimum range for particle trapping efficiency. The water exiting the centrifuge represents the liquid phase, and was collected directly into 1-L pre-cleaned glass bottles to be analyzed for dissolved pesticides. The sediment slurry remaining in the centrifuge bowls was transferred to 0.5-L pre-cleaned glass jars and shipped on ice to the U.S. Geological Survey Organic Chemistry Laboratory in Sacramento, California (Sacramento Laboratory). In the laboratory the sediment slurry was further dewatered using a Sorvall RC-5B high-speed refrigerated centrifuge (Sorvall, Newport Pagnell, Buckinghamshire, England) operating at 16,210 G (or 10,000 revolutions per minute) and stored frozen until analysis. All water samples were extracted within 48 hours of collection and all sediment samples remained frozen for no longer than 1 year prior to extraction and analysis.

Dry Season Sampling

Eleven non-storm or dry season sampling events took place from April through November in each of the three estuary watersheds to represent the contribution of agricultural return waters to the estuaries throughout the local growing season. Water samples for dissolved and sediment-bound pesticides, as well as organic carbon, were collected at both the river/tributary and within estuary sites. Sampling techniques varied based on hydrologic conditions.

At the Pajaro River below Thurwachter site, depth-integrated samples were collected isokinetically across a transect using a U.S. DH-95 sampler, and following methods described in the USGS National Field Manual for the Collection of Water-Quality Data (U.S. Geological Survey, 2006). Water was collected in a pre-cleaned 1-L Teflon bottle at a minimum of five equally spaced points across the stream channel from a bridge at the site. Two verticals were sampled at each point along the transect with one Teflon bottle used to collect water for pesticide analysis and a second Teflon bottle, which used a slightly different cleaning procedure to eliminate potential methanol contamination, used to collect water for dissolved organic carbon (DOC) analyses. After completion of the sampling transect, the Teflon bottles were agitated for a minimum of 1 minute and the sample water was then poured into 1-L and 125 mL baked glass bottles for pesticide and DOC analyses, respectively.

Water samples collected at the remaining river/tributary sites (Monterey drainage ditch, Blanco drain, Lower Orcutt Creek, Watsonville Slough, and Salinas River at Davis Road) were collected by two methods, depending on flow and safety considerations. When flows were sufficient (typically when water depths exceeded 1 ft) samples were collected using a U.S. DH-81 and 1-L Teflon bottles at 3 to 5 equally spaced points across the channel depending on channel width (Wilde and others, 1998). When flows were low (water depths less than 1 ft), or where conditions were too dangerous to wade, water samples were collected by immersing sample bottles directly into the stream near the center of flow (dip sample). Dip samples collected from sites located within the three estuaries were obtained by wading out to a sufficient depth and immersing sample bottles. After collection, samples were transported on ice to the Sacramento Laboratory where they were stored at 4°C for up to 48 hours.

Bed sediment samples were collected three times during the study from each river/tributary site. Bed sediment was sampled in the middle (July) and at the end of the dry season in 2008 (October), and again at the end of the dry season in 2009 (October). Samples were collected from areas of active sediment deposition (backwaters or other low velocity zones on the stream channel margins) using a stainless steel scoop to sample the top 2-cm of bed material from multiple points within approximately a 1-m² area. Sediment was passed through a 4-mm mesh sieve into a pre-cleaned stainless steel bowl, homogenized, and transferred to 500-mL pre-cleaned glass jars. Samples were transported on ice to the Sacramento Laboratory where they were stored frozen until analysis.

Analytical Methods

Dissolved Pesticides

All water samples were separated or filtered using either the continuous flow centrifuge or pre-baked (450°C for 4 hours) 0.7-μm glass fiber filters (GF/F) (Whatman, Florham Park, New Jersey) to remove/separate suspended material. Filtered water samples were analyzed for a suite of 68 pesticides by extracting 1 L of sample water onto Oasis HLB solid-phase extraction (SPE) cartridges (6 cc, 500 mg, 60 μm, Waters Corporation, Milford, Massachusetts). All samples were spiked with ¹³C₃-atrazine, and diazinon diethyl-d₁₀ (Cambridge Isotopes, Andover, Massachusetts) as recovery surrogates. Following extraction, the SPE cartridges were dried, eluted with 12 mL of ethyl acetate, and reduced under nitrogen. After extraction, approximately 1 g of sodium sulfate (Na₂SO₄) was added to the sample bottles to remove any residual water, and the bottles were rinsed three times with dichloromethane (DCM). The bottle rinses were reduced

to 1 mL under nitrogen, and combined with the ethyl acetate fraction. The entire sample (bottle rinse plus SPE elution) was reduced to a final volume of 200 μ L for analysis. Deuterated polycyclic aromatic hydrocarbon (PAH) compounds were used as internal standards and included acenaphthene- d_{10} and pyrene- d_{10} . All sample extracts were analyzed by gas chromatography-ion trap mass spectrometry (GC-ITMS). Additional details are given in Hladik and others (2008).

The filter paper containing the suspended sediment was dried at room temperature overnight (in the dark), cut up using solvent rinsed scissors, and placed into a flask with 75 mL DCM. Prior to extraction, the filter paper was spiked with the recovery surrogate (phenoxy- ^{13}C - C_6 -*cis*-permethrin). The filter paper was extracted in a sonicator for 30 minutes and filtered (GF/F, 0.7 μ m). The extraction was repeated, and the two extracts were combined and reduced to 0.5 mL. The co-extracted sample matrix was removed using stacked SPE cartridges, and sulfur was removed using a gel permeation chromatography system (see Sediment-Associated Pesticides in this report). Complete details of the method can be found in Hladik and Kuivila (2009).

Sediment-Associated Pesticides

Sediment samples were extracted based on methods described in Smalling and Kuivila (2008) for a suite of 56 pesticides. Prior to extraction, sediment samples were spiked with trifluralin- d_{10} , ring- ^{13}C -*p,p'*-DDE and phenoxy- ^{13}C -*cis*-permethrin (Cambridge Isotopes, Andover, Massachusetts) as recovery surrogates. Wet sediments were homogenized with Na_2SO_4 using a solvent rinsed mortar and pestle, and extracted by pressurized liquid extraction (PLE) using a Dionex 200 (Sunnyvale, California) Accelerated Solvent Extractor (ASE). Samples were extracted three times with DCM at 100°C and 2,500 psi. Following extraction, sample extracts were dried over Na_2SO_4 and reduced to 0.5 mL using a Turbopap II (Zymark Corporation, Hopkins, Massachusetts). Sample matrix was removed using stacked pre-packed Carbon/Alumina SPE cartridges containing 500 mg of nonporous, graphitized carbon (Restek Corporation, Bellefonte, Virginia) and 500-mg alumina (Varian Inc, Palo Alto, California). The cartridges were washed in tandem with 10 mL of DCM prior to the addition of sample extracts. Compounds of interest were eluted off both SPE cartridges with 10 mL of DCM, and collected as fraction 1 (F1). The carbon SPE was removed, and the alumina SPE was eluted with 10 mL of ethyl acetate and DCM (50:50 v/v), and collected as fraction 2 (F2). Sulfur was removed from the F1 using a gel-permeation/high-performance liquid chromatography system (GPC/HPLC)

with DCM as the carrier solvent. Both fractions were kept separate and were each reduced to 200 μ L and analyzed for 55 pesticides (Smalling and others, 2005).

Instrumental Analysis for Pesticides

Water and sediment extracts (1 μ L injection volume) were analyzed for pesticides on a Varian Saturn 2000 (Walnut Creek, California, USA) GC-ITMS. Analyte separation on the GC-ITMS was achieved using a 30-m x 0.25-mm i.d., 0.25- μ m DB-5ms fused silica column (Agilent Technologies, Folsom, California) with helium as the carrier gas. The temperature of the splitless injector was held constant at 275°C. Because of the number of compounds and instrument limitations, samples were injected twice using two different temperature programs for the GC oven: a short (30 min) and a long (61 min) temperature gradient. The fungicides and OCPs were separated from the other compounds because of greater ease in setting selected ion storage (SIS) windows. The short temperature program was 80°C (hold 1 min) with an increase to 300°C at 10°C/min (hold 10 min). The long temperature program was 80°C (hold 0.5 min), increase to 120°C at 10°C/min, increase to 200°C at 3°C/min (hold 5 min), followed by a third increase to 219°C at 3°C/min, and a final increase to 300°C at 10°C/min (hold 10 min). The transfer line and ion trap temperatures were 280°C and 220°C, respectively. The MS was operated in electron ionization (EI) mode with an emission current of 15 μ A and no offset when run in full scan mode, and an emission current of 45 μ A with a multiplier offset of 300 volts when using SIS windows. Data were collected in full scan and SIS modes. Complete details of the analytical method are described in Crepeau and others (2000), LeBlanc and others (2004), and Smalling and Kuivila (2008).

Calibration of the GC-ITMS was achieved using calibration standards that spanned the linear range of instrument response. An eight-point calibration standard was developed with concentrations ranging from 0.025 to 5.0 ng/ μ L. Calibration curves were considered acceptable if the R^2 for each individual compound was greater than 0.995. The responses of the instrument was monitored every 6–8 samples with mid-level check standards. The instruments were considered to be stable if the recovery of the check standards were within the range of 80–115 percent of the nominal standard concentration. If environmental sample concentrations fell outside the linear range of the instrument, the samples were diluted appropriately and reanalyzed.

Method Detection Limits

Surface-water and sediment method detection limits (MDLs) were validated in previous studies (Hladik and others, 2008; Smalling and Kuivila, 2008) by using the EPA procedure described in 40 CFR Part 136 (U.S. Environmental Protection Agency, 1992). Water samples used to determine MDLs were collected in 2005 from the Sacramento River at Miller Park, and suspended sediment samples were collected in 2004 from the Cache Creek inflow to the settling basin near Woodland (USGS site identification number 384340121434401). The MDLs were calculated for each compound using the following equation:

$$MDL = S \times t(n-1, 1-\alpha = 0.99)$$

where

MDL = method detection limit ($\mu\text{g/kg}$),
 S = standard deviation of replicate samples,
 n = number of replicates, and
 t = value of Student's t statistic with
 6 degrees of freedom at a 99 percent
 confidence level.

MDLs for dissolved pesticides in surface water ranged from 0.9 to 12.1 ng/L (*table 5*) and from 0.6 to 3.6 $\mu\text{g/kg}$ in sediments (*table 6*). For several compounds MDLs were not available, so calculated limits of detection (LOD) were used

Table 5. Method detection limits for dissolved pesticides in water.

[Concentrations in nanograms per liter]

Compound	Method de- tection limit	Compound	Method detection limit	Compound	Method de- tection limit
Anilines		Organochlorines		Thiocarbamates	
3,4-DCA	8.3	Pentachloroanisole (PCA)	4.7	Butylate	1.8
3,5-DCA ¹	8.0	Pentachloronitrobenzene (PCNB)	3.1	Cycloate	1.1
Ethalfuralin	3.0	<i>p,p'</i> -DDE	4.1	EPTC	1.5
Pendimethalin	2.3	<i>p,p'</i> -DDD	3.6	Molinate	3.2
Propanil	10.1	<i>p,p'</i> -DDT	4.0	Pebulate	2.3
Trifluralin	2.1	Organophosphates		Thiobencarb	1.9
Azoles/triazoles		Chlorpyrifos	2.1	Triazines/triazones	
Cyproconazole	11.2	Diazinon ²	0.9	Atrazine	2.3
Fipronil	2.9	Malathion	3.7	Hexazinone	8.4
Fipronil desulfinyl	1.6	Methidathion	7.2	Prometryn	1.8
Fipronil sulfide	1.8	Methylparathion	3.4	Propyzamide ¹	5.0
Fipronil sulfone	3.5	Phosmet	4.4	Simazine	5.0
Metconazole	11.5	Pyrethroids		Strobilurins	
Myclobutanil	9.2	Allethrin	10.0	Azoxystrobin	9.3
Propiconazole	8.8	Bifenthrin	4.7	Trifloxystrobin	3.9
Tebuconazole	10.2	Cyfluthrin	5.2	Pyraclostrobin ¹	10.0
Tetraconazole	8.2	Cyhalothrin	2.0	Miscellaneous	
Triflumizole ¹	10.0	Cypermethrin	5.6	Chlorothalonil	12.1
Carbamates		Deltamethrin	3.5	Boscalid ¹	5.0
Carbaryl	6.5	Esfenvalerate	3.9	DCPA	2.0
Carbofuran ²	3.1	Fenpropathrin	4.1	Iprodione	8.7
Chloroacetanilides		τ -Fluvalinate	5.3	Methoprene	8.4
Alachlor	1.7	Permethrin	3.4	Napropamide	11.3
Metolachlor	1.5	Phenothrin	5.1	Oxyfluorfen	3.1
		Remethrin	5.7	Piperonyl butoxide	2.3
		Tetramethrin	2.9	Vinclozolin ¹	5.0

¹ Limit of detection (LOD) was used because method detection limit was not available.

² The compound was detected in unspiked water.

Table 6. Method detection limits for pesticides associated with bed and suspended sediments.

[Concentrations in micrograms per kilogram]

Compound	Method detection limit	Compound	Method detection limit	Compound	Method detection limit
Anilines		Organophosphates		Thiocarbamates	
3,4-DCA	2.5	Chlorpyrifos	2.0	Butylate	1.6
3,5-DCA ¹	3.0	Diazinon	2.0	Cycloate	1.0
Ethalfuralin	1.3	Disulfoton	1.9	EPTC	0.9
Pendimethalin	1.0	Malathion	1.1	Molinate	1.1
Trifluralin	1.7	Methidathion	2.9	Pebulate	1.4
Azoles/triazoles		Methylparathion	1.2	Thiobencarb	0.6
Fipronil	1.9	Phosmet	1.4	Triazines/triazones	
Fipronil desulfinyl	2.8	Pyrethroids		Atrazine	1.7
Fipronil sulfide	2.2	Allethrin	1.5	Hexazinone	1.2
Fipronil sulfone	1.1	Bifenthrin	2.2	Prometryn	2.8
Carbamates		Cyfluthrin	2.0	Propyzamide ¹	1.5
Carbaryl	1.8	λ -Cyhalothrin	2.4	Simazine	1.5
Carbofuran	1.5	Cypermethrin	2.6	Miscellaneous	
Chloroacetanilides		Deltamethrin	2.5	DCPA	2.5
Alachlor	1.0	Esfenvalerate	2.1	Methoprene	2.4
Metolachlor	1.3	Fenpropathrin	2.1	Napropamide	1.3
Organochlorines		τ -Fluvalinate	2.6	Oxyfluorfen	3.6
Pentachloroanisole (PCA)	1.4	Permethrin	1.0	Piperonyl butoxide	1.6
Pentachloronitro-benzene (PCNB)	1.2	Phenothrin	1.3		
<i>p,p'</i> -DDE	1.4	Resmethrin	1.9		
<i>p,p'</i> -DDD	1.4	Tefluthrin	1.1		
<i>p,p'</i> -DDT	1.3	Tetramethrin	1.4		

¹ Limit of detection (LOD) was used because method detection limit was not available.

instead. LODs were calculated as the amount of analyte in the spiked sample that produced a signal to noise ratio greater than three times the background signal. Analytes can be identified at concentrations less than the MDL or LOD with a lower confidence in the actual value; therefore, concentrations of compounds detected below the MDLs are reported as estimates and are presented in parentheses in the data tables.

Quality Assurance/Quality Control

Pesticide concentrations in water and sediments were validated against a comprehensive set of performance-based quality assurance/quality control (QA/QC) criteria including

field and laboratory blanks, replicates, laboratory matrix spikes, laboratory matrix spike replicated, certified reference material, and surrogate recovery compounds. All QC results met or exceeded guidelines established by the Surface Water Ambient Monitoring Program (SWAMP; State Water Resources Control Board, 2002). All environmental and QC data were reviewed by project staff and by the U.S. Geological Survey California Water Science Center Water-Quality Specialist. Results for the target constituents in environmental samples were of acceptable quality.

Dissolved Pesticides

Four field and four laboratory blanks were analyzed as part of established SWAMP criteria. No pesticides were detected in any of the field or laboratory blanks during the course of the study. Ring- $^{13}\text{C}_3$ -atrazine and diazinon diethyl- d_{10} were used as recovery surrogates to assess the efficiency of sample extraction. Mean recoveries, with standard deviation, of ring- $^{13}\text{C}_3$ -atrazine and diethyl- d_{10} diazinon for all samples analyzed, including QC samples, were 89 ± 12 percent and 95 ± 10 percent, respectively. Sample data were excluded if recovery was less than 75 percent; since all samples had recoveries greater than 75 percent, all data points were reported. Eight replicate field samples were analyzed and the relative percent differences ranged from 1 to 20 for all pesticides detected. Relative percent differences for all pesticides detected in replicate sample pairs ranged from 0.4 to 23.5. Twelve matrix spikes were analyzed in approximately 10 percent of all samples as part of the method validation. The recoveries of pesticides in the matrix-spiked samples ranged from 75–120 percent. Matrix-spike replicates were analyzed every 20 samples as part of the established SWAMP guidelines, and the relative percent differences ranged from 0.3 to 22, depending on the compound. Mean recoveries of the 35 compounds in USGS National Water Quality Laboratory's Schedule 2033 field spike mixture (National Water Quality Laboratory, Denver, Colorado) that were added to sample water as a certified reference material were 94 ± 13.8 percent with recoveries ranging from 70 to 125 percent.

Sediment-Associated Pesticides

Three laboratory blanks consisting of approximately 5 g baked sodium sulfate (Na_2SO_4) as a sediment substitute were analyzed with every batch of 18 samples. No pesticides were detected in any of the laboratory blank samples. Final method recoveries in spiked sediment ranged from 72 to 124 percent. Mean recoveries, with standard deviation, of trifluralin- d_{10} , ring- $^{13}\text{C}_{12}$ - p,p' DDE, and phenoxy- $^{13}\text{C}_6$ -*cis*-permethrin, used as recovery surrogates, were 91 ± 13 percent, 96 ± 12 percent, and 91 ± 11 percent, respectively. Of the compounds detected in the four laboratory replicate samples, relative percent differences ranged from 0.1 to 25. Four matrix spikes were analyzed and the recoveries ranged from 73 to 124 percent for all compounds. Three additional replicate field samples were analyzed as a matrix spike/matrix spike duplicate (MS/MSD) pairs to monitor for recovery compared to the respective unspiked field samples, and for variability between spiked samples, as part of established SWAMP guidelines. The recoveries for these MS/MSD pairs ranged from 75 to 110 percent and the relative percent differences ranged from 0.0 to 25. Standard Reference Material (SRM) 1941b, Organics in Marine Sediment (National Institute of Standard, Gaithersburg, Maryland) was chosen as an appropriate reference material since no standard reference material is available for the current-use pesticides. Mean recoveries

($\pm$ standard deviation) of p,p' -DDD and p,p' -DDE in SRM 1941b were 93 ± 5.6 and 103 ± 7.6 percent, respectively. Calculated concentrations for all compounds fell within the 95 percent confidence intervals for the certified values.

Sediment Organic Carbon and Nitrogen

Bed and suspended sediments were analyzed for organic carbon and nitrogen content using a Perkin Elmer CHNS/O analyzer (Perkin Elmer Corporation, Norwalk Connecticut). Acetanilide was used for instrument calibration. Before analysis, sediments were dried at 100°C for 3 hours. Dry, homogenized sediments were combusted at 925°C in silver boats after being exposed to concentrated hydrochloric acid (HCl) fumes in a desiccator for 24 hours to remove inorganic carbon.

Dissolved Organic Carbon

Filtered water samples were analyzed for dissolved organic carbon (DOC) by high-temperature catalytic combustion using a Shimadzu TOC-V_{CNS} total organic carbon analyzer (Shimadzu Scientific Instruments, Columbia, Maryland) according to a modified version of USEPA 415.3 (Potter and Wimsatt, 2005). The instrument was calibrated using potassium hydrogen phthalate standards prepared in organic free water with concentrations of the standard ranging from 0.0 to 4.0 mg/L. All standards, blanks and environmental samples were acidified prior to analysis using approximately four drops of concentrated sulfuric acid to lower the pH to approximately 1.9. The accuracy and precision of the measurements were within 5 percent as indicated by internal standards (potassium nitrate and caffeine), laboratory replicates, and matrix spikes (Bird and others, 2003)

Results

Dissolved Pesticides

A total of 31 pesticides were detected in 57 water samples collected from the Pajaro River estuary watershed, with concentrations ranging from less than the method detection limits to 36,030 ng/L. The detection frequencies ranged from 2 to 91 percent. The most frequently detected pesticides were azoxystrobin, boscalid, DCPA, diazinon, myclobutanil, and p,p' -DDE, each of which were detected in greater than 50 percent of the samples from the Pajaro River estuary watershed (fig. 5). The compounds with the highest maximum concentrations were boscalid, carbaryl, malathion, myclobutanil, and pyraclostrobin, each with a maximum concentration greater than 1,000 ng/L (table 7, 8 [table 8 at back of report]).

Figure 5. Detection frequencies of dissolved pesticides, as a percentage of the total number of water samples by estuary. Only compounds with a detection frequency of greater than 5 percent were included.

A total of 31 pesticides were detected in 48 water samples collected from the Salinas River estuary watershed (*table 9* at back of report), with detection frequencies as high as 94 percent and concentrations up to 4,550 ng/L (azoxystrobin). The most frequently detected pesticides were boscalid, DCPA, diazinon, prometryn, and propyzamide, each of which was detected in greater than 50 percent of the samples from the Salinas River estuary watershed (*fig. 5*). The compounds with the highest maximum concentrations were azoxystrobin, malathion, and myclobutanol, each with a maximum concentration greater than 1,000 ng/L (*tables 7, 9*).

A total of 29 pesticides were detected in 39 water samples collected from the Santa Maria River estuary watershed (*table 10* at back of report), with detection frequencies as high

as 95 percent (boscalid, chlorpyrifos and propyzamide) and concentrations up to 14,041 ng/L (propyzamide). The most frequently detected pesticides were azoxystrobin, boscalid, chlorpyrifos, DCPA, diazinon, malathion, napropamide, oxyfluorfen, *p,p'*-DDE, prometryn, propyzamide, pyraclostrobin, and trifluralin, each of which were detected in greater than 50 percent of the samples (*fig. 5*). The compounds with the highest maximum concentrations were boscalid, chlorpyrifos, malathion, propyzamide, and pyraclostrobin, each with a maximum concentration greater than 1,000 ng/L (*tables 7, 10*).

Table 7. Maximum concentrations of dissolved pesticides by estuary and season (storm versus dry) in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.[Concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. **Abbreviations:** ND, not detected]

Compound	Pajaro estuary		Salinas estuary		Santa Maria estuary	
	Storm	Dry	Storm	Dry	Storm	Dry
3,4-DCA	16.8	6.6	(8.0)	(4.7)	ND	(4.0)
3,5-DCA	ND	ND	(6.2)	ND	10.4	21.4
Azoxystrobin	694	181	4,550	20.2	890	114
Bifenthrin	ND	12.0	ND	(3.6)	ND	ND
Boscalid	36,000	569	667	108	1,530	639
Carbaryl	1,960	30.0	68.4	ND	193	ND
Chlorothalonil	ND	33.6	ND	(3.2)	(4.6)	(1.8)
Chlorpyrifos	31.0	33.8	70.6	38.6	1,080	234
Cycloate	ND	ND	ND	1.6	ND	3.3
DCPA	379	143	609	21.6	480	23.9
Diazinon	270	133	216	84.9	282	855
Ethalfuralin	ND	6.6	ND	ND	5.4	ND
Fipronil	4.8	(1.4)	9.2	(1.0)	3.2	ND
Fipronil sulfide	ND	ND	ND	ND	5.4	ND
Fipronil sulfone	ND	ND	ND	ND	8.2	ND
Hexazinone	ND	ND	ND	ND	806	ND
Iprodione	28.2	78.4	ND	ND	22.0	ND
Malathion	5,460	213	1,060	ND	401	1,310
Metolachlor	140	84.7	6.6	ND	ND	ND
Myclobutanil	2,650	308	1,344	117	407	83.8
Napropamide	146	26.6	ND	(0.4)	635	306
Oxyfluorfen	573	91.2	380	40.4	385	208
<i>p,p'</i> -DDD	4.4	(2.6)	5.4	4.3	6.7	(1.8)
<i>p,p'</i> -DDE	29.2	40.0	16.0	5.2	8.0	122
<i>p,p'</i> -DDT	9.2	ND	(1.6)	ND	ND	ND
Pendimethalin	104	61.3	82.3	ND	7.2	ND
Permethrin	ND	15.0	ND	7.8	ND	(0.8)
Piperonyl butoxide	ND	ND	60.8	ND	ND	ND
Prometryn	338	168	99.2	25.4	519	861
Propiconazole	242	34.4	ND	ND	159	52.5
Propyzamide	47.8	30.4	94.2	32.9	1,390	14,000
Pyraclostrobin	7,110	122	46.4	36.0	1,820	298
Simazine	96.2	18.7	23.0	243	ND	ND
Tetraconazole	ND	11.0	ND	(5.8)	ND	11.0
Trifloxystrobin	ND	86.4	ND	11.4	ND	ND
Trifluralin	5.2	21.4	(1.8)	11.8	20.8	453
Trilumizole	295	265	ND	ND	ND	ND
Vinclozolin	ND	40.6	ND	6.4	ND	ND

Thirty-eight pesticides were detected in the three Central Coast estuaries over the course of the study. The types of pesticides detected in each estuary watershed were similar; however, the frequency of detection and maximum pesticide concentrations differed between the three watersheds. For the majority of the pesticides, detection frequencies were higher in the Santa Maria River estuary compared to the other two estuaries (*fig. 5*). Boscalid, a carboxamide fungicide, was detected most frequently in all three estuaries (*fig. 5*) throughout the year. Myclobutanil, a triazole fungicide, was the only pesticide detected much more frequently in the Pajaro (78 percent) than in the Santa Maria and Salinas estuaries (40 and 42 percent, respectively; *fig. 5*). Eleven pesticides were at their maximum concentration in samples collected from the Pajaro and the Santa Maria estuaries, while only four were

detected at the highest concentration in samples collected from the Salinas (*table 7*).

Twenty-five pesticides were detected in samples collected from all 3 estuaries during storm events in 2008 and 2009, and 26 pesticides were detected in samples collected during the summer dry season (*fig. 6*). On average, detection frequencies and concentrations were higher for most compounds during the winter storm events as compared to the summer dry season (*fig. 6*). Fifteen of the 25 pesticides detected during the winter and fall storm sampling events were observed at their highest concentrations. Only four of the most frequently detected compounds were observed at their highest concentrations during the dry season: diazinon, *p,p'*-DDE, prometryn, and propyzamide, particularly in the Santa Maria River estuary (*table 7*).

Figure 6. Detection frequencies of dissolved pesticides, as a percentage of the total number of samples by sampling period (storm versus dry) in the Pajaro, Salinas and Santa Maria River estuary watersheds, California, 2008–09.

Sediment-Bound Pesticides

In 18 bed-sediment samples collected from the major tributaries within the 3 watersheds, 17 pesticides were detected (*table 11* at back of report). Maximum concentrations ranged from 1 to 234 µg/kg sediment dry weight (*p,p'*-DDE). *p,p'*-DDE, the persistent breakdown product of the legacy insecticide *p,p'*-DDT, was detected in 89 percent of the bed sediment samples from all three estuaries combined and at higher concentrations than the other pesticides (*fig. 7*, *table 11*). A total of ten pesticides were detected at least once in the three major tributaries of the Pajaro River estuary (Monterey drainage ditch, Pajaro River at Thurwatcher, and Watsonville Slough) with maximum concentrations ranging from less than 1 to 234 µg/kg dry weight. *p,p'*-DDD and *p,p'*-DDE were the only two compounds detected in more

than 50 percent of the samples from the Pajaro River estuary watershed (*fig. 7*). Eight pesticides were detected at least once in the Salinas River estuary watershed (Blanco drain and the Salinas River at Davis Road); with maximum concentrations ranging from 2.1 to 216 µg/kg dry weight (*table 11*). Five compounds were detected in more than 50 percent of the bed sediment samples from the Salinas River estuary watershed, including chlorpyrifos, DCPA, *p,p'*-DDD, *p,p'*-DDE, and *p,p'*-DDT (*fig. 7*). Of the 17 pesticides detected in bed sediment samples, 15 were detected in the major tributary of the Santa Maria River estuary watershed (Lower Orcutt Creek) and 8 were detected in every sample (*fig. 7*). Maximum concentrations of pesticides detected in Lower Orcutt Creek ranged from <1 to 80.8 µg/kg dry weight, and were lower than the other two watersheds (*table 11*).

Figure 7. Frequency of detection for pesticides in bed sediments, as a percentage of the total number of samples by estuary watershed, Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.

Nineteen pesticides were detected in suspended sediments collected from the three watersheds during four storm events in 2008 and 2009 and during three to four dry season events in 2009 (*table 12* at back of report). Maximum pesticide concentrations in the three watersheds ranged from <1 to 549 $\mu\text{g/kg}$ dry weight. For the Pajaro estuary watershed, 16 pesticides were detected with maximum concentrations ranging from 0.2 to 400 $\mu\text{g/kg}$ dry weight (*table 12*); no pesticide was detected more than 50 percent of the time, though *p,p'*-DDE and *p,p'*-DDT were detected most frequently (42 percent) and at the highest concentrations (*fig. 8*). For the Salinas River estuary watershed, 15 pesticides were detected in suspended sediment samples, with maximum concentrations ranging from 0.2 to 349 $\mu\text{g/kg}$ dry weight (*table 12*); no pesticide was detected in more than 50 percent of the samples, though *p,p'*-DDE was the most frequently detected (35 percent) while bifenthrin, a pyrethroid insecticide, was detected at the highest concentration (*fig. 8*, *table 12*). For the Santa Maria River estuary watershed, 15 pesticides were detected in suspended sediment samples, with maximum

concentrations ranging from 0.8 to 549 $\mu\text{g/kg}$ dry weight (*table 12*). In this watershed, four pesticides (chlorpyrifos, *p,p'*-DDE, *p,p'*-DDT, and trifluralin) were detected in more than 50 percent of the samples and at some of the highest concentrations found in the study (*fig. 8*, *table 12*).

Of the 19 pesticides detected in suspended sediment samples from the tributaries, all were detected in samples collected during the storm events, while only 10 were detected in samples collected during the dry season (*fig. 9*). While no pesticides were detected in more than 50 percent of the samples collected during the dry season, eight pesticides were detected in more than 50 percent of the storm samples. *p,p'*-DDE was the most frequently detected pesticide in suspended sediment samples collected during the storm and dry seasons (92 and 24 percent, respectively). Although, chlorpyrifos was not the most frequently detected pesticide, it was detected at the highest pesticide concentrations found in this study during the storm events as well as during the dry season.

Figure 8. Frequency of detection for the pesticides in suspended sediments, as a percentage of the total number of samples in each estuary watershed, Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09..

Figure 9. Frequency of detection of suspended sediment bound pesticides, as a percentage of the total number of samples by sampling period (storm versus dry season), Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09..

Sediment Organic Carbon and Nitrogen

Sediment organic carbon and nitrogen were measured to provide a dataset that can be used to better understand the source(s) of a sediment sample. The percentages of organic carbon and nitrogen in suspended sediments and bed sediment samples were similar. Percent organic carbon ranged from 1.23 to 4.27 in suspended sediment, and from 0.81 to 6.75 in bed sediment. Percent organic nitrogen ranged from 0.12 to 0.54 for suspended sediment, and from 0.03 to 0.53 in bed sediment (*table 13* at back of report). Organic carbon and nitrogen values in bed sediment showed no significant difference between the storm and dry seasons.

Dissolved Organic Carbon

DOC concentrations ranged from 0.4 to 17.0 mg/L in Pajaro River estuary samples, from 0.9 to 16.2 mg/L in samples from the Salinas River estuary, and from 3.8 to 41.4 mg/L in samples from the Santa Maria River estuary

(*tables 8–10*). Average DOC concentrations for each estuary were similar throughout all the sampling events; however, higher average DOC concentrations were observed during storm events (9.7 mg/L) than the summer dry season (5.6 mg/L). The average DOC concentrations were slightly higher in the tributaries (7.2 mg/L) than the estuaries (6.8 mg/L) throughout the year.

Water-Quality Parameters

Results from the analysis of water-quality parameters (temperature, specific conductance, pH, dissolved oxygen and turbidity) for each sampling event are shown in *table 14* (at back of report).

Summary and Conclusions

This project was designed to provide the California State Water Resources Control Board with data for an initial assessment and characterization of pesticides in three Central Coast watersheds. Currently, new farm management practices are being implemented in each watershed, so there is a need to establish baseline pesticide concentrations to determine the effects of these practices over the next several decades. In samples collected between January 2008 and October 2009, 38 different pesticides were detected in water and 22 pesticides were detected in sediments. The types of pesticides detected were similar between estuaries, and the maximum dissolved concentrations in water samples ranged from at or below method detection limits to 36,000 ng/L. Boscalid, a carboxamide fungicide, was not only the most frequently detected pesticide in all watersheds but was detected at the highest maximum concentration. Detection frequencies for most pesticides were higher in the Santa Maria River estuary watershed than the Pajaro and Salinas River estuary watersheds. A greater number of dissolved pesticides were detected during storm events than the dry season, and concentrations were often at their maximums during storm events as well. Maximum concentrations of pesticides in bed and suspended sediments ranged from less than their respective method detection limits to 234 and 549 µg/kg, respectively. In bed sediment samples collected from the three estuaries, *p,p'*-DDE, the aerobic breakdown product of *p,p'*-DDT, was detected most frequently, and was one of the only compounds detected in more than 50 percent of the samples. In suspended sediment samples, no compound was detected in more than 50 percent of the samples during the dry season, however eight pesticides were detected in more than 50 percent of the samples during storm events.

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Tables 8–14

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cycloate, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, hexazinone, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Dissolved		3,4-DCA [66584]	Azoxy- strobilin [66589]	Bifenthrin [65067]	Boscalid [67550]	Carbaryl [65069]	Chloro- thalonil [65071]	Chlorpy- rifos [65072]
				organic carbon (mg/L)	[00681]							
Monterey drainage ditch	01/06/2008	11:30	01/14/2008	6.9		16.8	11.8	ND	309	ND	ND	ND
Monterey drainage ditch	02/24/2008	12:00	03/04/2008	6.0		(5.6)	10.2	ND	160	ND	ND	7.0
Monterey drainage ditch	04/29/2008	11:20	05/19/2008	4.3		(2.6)	ND	ND	27.6	ND	ND	ND
Monterey drainage ditch	07/02/2008	11:30	07/08/2008	3.8		(2.4)	ND	ND	35.5	ND	ND	ND
Monterey drainage ditch	02/16/2009	13:20	03/31/2009	6.0		11.4	480	ND	1,490	ND	ND	3.2
Monterey drainage ditch	09/22/2009	11:30	09/28/2009	3.7		ND	ND	ND	27.1	ND	ND	ND
Monterey drainage ditch	10/14/2009	10:50	11/12/2009	10.5		ND	376	ND	36,000	ND	ND	11.2
Monterey drainage ditch	10/22/2009	11:00	11/12/2009	4.4		ND	(3.7)	ND	199	ND	ND	ND
Monterey drainage ditch	10/28/2009	08:55	11/12/2009	3.4		ND	ND	ND	131	ND	ND	ND
Watsonville Slough	01/07/2008	17:00	01/14/2008	10.3		9.4	14.2	ND	290	ND	ND	ND
Watsonville Slough	02/26/2008	07:45	03/04/2008	13.0		ND	67.4	ND	649	1,961	ND	ND
Watsonville Slough	04/29/2008	13:00	05/19/2008	8.9		(4.4)	30.1	ND	133	ND	ND	ND
Watsonville Slough	07/02/2008	12:20	07/08/2008	7.8		(6.6)	(6.2)	ND	56.4	ND	ND	ND
Watsonville Slough	02/16/2009	09:15	03/31/2009	8.7		8.4	144	ND	663	ND	ND	31.0
Watsonville Slough	09/22/2009	10:15	09/28/2009	0.7		ND	ND	ND	15.0	ND	ND	ND
Watsonville Slough	10/14/2009	10:15	11/12/2009	17.0		ND	694	ND	5,530	ND	ND	ND
Watsonville Slough	10/22/2009	10:15	11/12/2009	7.7		ND	26.6	ND	540	ND	ND	ND
Watsonville Slough	10/28/2009	10:35	11/12/2009	6.7		ND	11.6	ND	253	ND	ND	ND

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfuralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Dissolved				Azoxy- strobilin [66589]	Bifenthrin [65067]	Boscalid [67550]	Carbaryl [65069]	Chloro- thalonil [65071]	Chlorpy- rifos [65072]
			Analysis date (mm/dd/yyyy)	organic carbon (mg/L) [00681]	3,4-DCA [66584]							
Pajaro River below Thurwachter	01/06/2008	09:45	01/14/2008	12.0	ND	ND	ND	ND	24.2	ND	ND	ND
Pajaro River below Thurwachter	02/25/2008	14:30	03/04/2008	8.8	ND	ND	ND	ND	22.4	ND	ND	ND
Pajaro River below Thurwachter	04/29/2008	10:35	05/19/2008	4.3	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	07/02/2008	10:50	07/07/2008	3.6	ND	(3.4)	ND	ND	11.8	ND	ND	ND
Pajaro River below Thurwachter	02/17/2009	12:20	03/31/2009	6.1	ND	207	ND	ND	409	ND	ND	(1.8)
Pajaro River below Thurwachter	09/22/2009	12:45	09/28/2009	0.5	ND	ND	ND	ND	8.3	ND	ND	ND
Pajaro River below Thurwachter	10/14/2009	12:30	11/12/2009	9.8	ND	35.8	ND	ND	653	ND	ND	ND
Pajaro River below Thurwachter	10/22/2009	11:50	11/12/2009	6.2	ND	(8.2)	ND	ND	75.0	ND	ND	ND
Pajaro River below Thurwachter	10/28/2009	10:40	11/12/2009	3.3	ND	12.8	ND	ND	69.3	ND	ND	ND
Pajaro River estuary upper	01/06/2008	08:00	01/14/2008	10.9	ND	ND	ND	ND	54.0	ND	ND	ND
Pajaro River estuary upper	02/25/2008	10:35	03/04/2008	7.4	ND	(5.2)	ND	ND	24.8	ND	ND	ND
Pajaro River estuary upper	04/02/2008	12:30	04/14/2008	4.9	ND	ND	ND	ND	ND	ND	ND	18.6
Pajaro River estuary upper	04/29/2008	11:05	05/19/2008	5.7	ND	10.4	ND	ND	23.0	ND	ND	ND
Pajaro River estuary upper	05/29/2008	12:15	07/08/2008	4.5	ND	10.6	12.0	14.6	14.6	ND	(0.8)	ND
Pajaro River estuary upper	07/02/2008	11:55	07/08/2008	10.0	(4.0)	13.6	ND	67.4	67.4	ND	ND	ND
Pajaro River estuary upper	08/12/2008	13:15	08/19/2008	4.8	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	09/10/2008	10:40	11/06/2008	8.1	ND	(6.4)	ND	ND	63.6	30.0	ND	ND
Pajaro River estuary upper	10/08/2008	14:00	11/06/2008	8.7	ND	21.4	ND	ND	54.4	ND	ND	ND
Pajaro River estuary upper	02/17/2009	10:40	03/31/2009	5.6	ND	173	ND	ND	497	ND	ND	(2.0)
Pajaro River estuary upper	09/09/2009	09:15	09/28/2009	0.6	ND	ND	ND	ND	9.6	ND	ND	ND
Pajaro River estuary upper	09/22/2009	11:15	09/28/2009	0.6	ND	ND	ND	ND	22.1	ND	ND	ND
Pajaro River estuary upper	10/14/2009	10:50	11/12/2009	10.9	ND	24.2	ND	ND	828	ND	ND	ND
Pajaro River estuary upper	10/22/2009	11:00	11/12/2009	8.2	ND	13.7	ND	ND	110	ND	ND	ND
Pajaro River estuary upper	10/28/2009	08:25	11/12/2009	7.5	ND	21.2	ND	ND	110	ND	ND	ND

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cycloate, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfuralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfenyl, fipronil sulfide, fipronil sulfone, hexazinone, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Dissolved organic carbon (mg/L) [00681]	3,4-DCA [66584]	Azoxy- strobin [66589]	Bifenthrin [65067]	Boscalid [67550]	Carbaryl [65069]	Chloro- thalonil [65071]	Chlorpy- rifos [65072]
Pajaro River estuary lower	01/06/2008	08:50	01/14/2008	10.0	ND	ND	ND	32.9	ND	ND	ND
Pajaro River estuary lower	02/25/2008	09:58	03/04/2008	6.5	ND	(8.8)	ND	50.0	19.2	ND	ND
Pajaro River estuary lower	04/02/2008	11:00	04/14/2008	4.7	(2.0)	ND	ND	4.2	ND	ND	33.8
Pajaro River estuary lower	04/29/2008	12:15	05/19/2008	3.5	ND	(6.0)	ND	23.2	ND	ND	ND
Pajaro River estuary lower	05/29/2008	10:00	07/08/2008	5.4	ND	68.6	8.8	52.0	ND	33.6	7.4
Pajaro River estuary lower	07/02/2008	12:50	07/08/2008	2.0	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	08/12/2008	12:50	08/19/2008	5.1	ND	ND	ND	14.0	ND	ND	ND
Pajaro River estuary lower	09/10/2008	14:00	11/06/2008	7.1	ND	ND	ND	13.6	ND	ND	ND
Pajaro River estuary lower	10/08/2008	14:30	11/06/2008	8.9	ND	ND	ND	24.8	ND	ND	ND
Pajaro River estuary lower	02/17/2009	11:40	03/31/2009	6.8	ND	181	ND	461	ND	ND	4.0
Pajaro River estuary lower	09/09/2009	08:40	09/28/2009	0.4	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	09/22/2009	10:30	09/28/2009	0.4	ND	(3.8)	ND	9.1	ND	ND	ND
Pajaro River estuary lower	10/14/2009	09:50	11/12/2009	10.9	ND	38.4	ND	569	ND	ND	ND
Pajaro River estuary lower	10/22/2009	15:30	11/12/2009	1.2	ND	ND	ND	11.2	ND	ND	ND
Pajaro River estuary lower	10/28/2009	09:30	11/12/2009	4.8	ND	13.6	ND	80.0	ND	ND	ND

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cyclofluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	DCPA [65076]	Diazinon [65078]	Fipronil [66604]	Iprodione [66617]	Malathion [65087]	Metolachlor [65090]	Myclobu- tanil [66632]	Naprop- amide [65092]
Pajaro River below Thurwachter	01/06/2008	09:45	01/14/2008	379	156	4.8	ND	ND	140	25.6	ND
Pajaro River below Thurwachter	02/25/2008	14:30	03/04/2008	187	219	(1.2)	ND	ND	23.6	15.4	ND
Pajaro River below Thurwachter	04/29/2008	10:35	05/19/2008	9.6	27.0	ND	ND	ND	ND	(7.6)	ND
Pajaro River below Thurwachter	07/02/2008	10:50	07/07/2008	ND	16.2	ND	ND	ND	ND	(6.8)	ND
Pajaro River below Thurwachter	02/17/2009	12:20	03/31/2009	10.6	32.6	ND	ND	ND	14.6	222	ND
Pajaro River below Thurwachter	09/22/2009	12:45	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/14/2009	12:30	11/12/2009	ND	ND	ND	ND	510	ND	289	ND
Pajaro River below Thurwachter	10/22/2009	11:50	11/12/2009	4.9	ND	ND	ND	ND	18.4	45.6	ND
Pajaro River below Thurwachter	10/28/2009	10:40	11/12/2009	2.1	ND	ND	ND	ND	ND	63.3	ND
Pajaro River estuary upper	01/06/2008	08:00	01/14/2008	187	149	ND	15.3	ND	95.5	30.5	ND
Pajaro River estuary upper	02/25/2008	10:35	03/04/2008	75.2	131	(1.8)	ND	ND	14.2	12.2	ND
Pajaro River estuary upper	04/02/2008	12:30	04/14/2008	ND	9.6	ND	ND	ND	ND	ND	(0.8)
Pajaro River estuary upper	04/29/2008	11:05	05/19/2008	7.6	30.2	ND	ND	ND	ND	19.6	ND
Pajaro River estuary upper	05/29/2008	12:15	07/08/2008	6.4	35.8	ND	(5.0)	ND	ND	11.8	(4.2)
Pajaro River estuary upper	07/02/2008	11:55	07/08/2008	ND	15.8	ND	ND	ND	ND	27.4	ND
Pajaro River estuary upper	08/12/2008	13:15	08/19/2008	ND	30.2	ND	ND	ND	ND	9.2	ND
Pajaro River estuary upper	09/10/2008	10:40	11/06/2008	(0.6)	9.2	ND	ND	ND	ND	24.6	ND
Pajaro River estuary upper	10/08/2008	14:00	11/06/2008	ND	ND	ND	6.6	ND	ND	69.6	ND
Pajaro River estuary upper	02/17/2009	10:40	03/31/2009	13.8	44.6	ND	ND	ND	7.8	244	ND
Pajaro River estuary upper	09/09/2009	09:15	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	09/22/2009	11:15	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/14/2009	10:50	11/12/2009	ND	ND	ND	ND	357	ND	263	ND
Pajaro River estuary upper	10/22/2009	11:00	11/12/2009	39.6	15.5	ND	ND	ND	30.6	82.0	ND
Pajaro River estuary upper	10/28/2009	08:25	11/12/2009	15.0	ND	ND	ND	ND	ND	93.8	ND
Pajaro River estuary lower	01/06/2008	08:50	01/14/2008	143	133	ND	ND	ND	84.7	27.5	ND

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfuralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	DCPA [65076]	Diazinon [65078]	Fipronil [66604]	Iprodione [66617]	Malathion [65087]	Metolachlor [65090]	Myclobu- tanil [66632]	Naprop- amide [65092]
Pajaro River estuary lower	02/25/2008	09:58	03/04/2008	34.8	90.2	(1.4)	ND	ND	8.0	30.2	ND
Pajaro River estuary lower	04/02/2008	11:00	04/14/2008	ND	46.4	ND	ND	12.4	ND	ND	(1.6)
Pajaro River estuary lower	04/29/2008	12:15	05/19/2008	2.0	ND	ND	ND	ND	ND	12.6	ND
Pajaro River estuary lower	05/29/2008	10:00	07/08/2008	13.4	28.2	ND	23.6	16.8	ND	ND	26.6
Pajaro River estuary lower	07/02/2008	12:50	07/08/2008	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	08/12/2008	12:50	08/19/2008	ND	ND	ND	ND	ND	ND	(6.8)	ND
Pajaro River estuary lower	09/10/2008	14:00	11/06/2008	ND	ND	ND	ND	ND	ND	(6.2)	ND
Pajaro River estuary lower	10/08/2008	14:30	11/06/2008	ND	ND	ND	ND	ND	ND	10.0	ND
Pajaro River estuary lower	02/17/2009	11:40	03/31/2009	29.6	61.4	ND	78.4	43.2	ND	308	ND
Pajaro River estuary lower	09/09/2009	08:40	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	09/22/2009	10:30	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/14/2009	09:50	11/12/2009	49.7	ND	ND	30.3	213	ND	232	ND
Pajaro River estuary lower	10/22/2009	15:30	11/12/2009	ND	ND	ND	ND	ND	ND	(4.4)	ND
Pajaro River estuary lower	10/28/2009	09:30	11/12/2009	3.0	ND	ND	ND	ND	ND	57.0	ND

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cycloate, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Oxy- fluorfen [65093]	<i>p,p'</i> -DDD [65094]	<i>p,p'</i> -DDE [65095]	<i>p,p'</i> -DDT [65096]	Pendi- methalin [65098]	Permethrin [65099]	Prometryn [65103]	Propi- conazole [66643]
Monterey drainage ditch	01/06/2008	11:30	01/14/2008	199	ND	9.8	ND	ND	ND	ND	ND
Monterey drainage ditch	02/24/2008	12:00	03/04/2008	85.4	4.4	12.4	9.2	ND	ND	ND	ND
Monterey drainage ditch	04/29/2008	11:20	05/19/2008	ND	(2.6)	4.6	ND	ND	(1.0)	ND	ND
Monterey drainage ditch	07/02/2008	11:30	07/08/2008	ND	(2.0)	(3.1)	ND	ND	ND	ND	ND
Monterey drainage ditch	02/16/2009	13:20	03/31/2009	573	ND	29.2	ND	ND	ND	ND	183
Monterey drainage ditch	09/22/2009	11:30	09/28/2009	ND	ND	(3.0)	ND	ND	ND	ND	ND
Monterey drainage ditch	10/14/2009	10:50	11/12/2009	134	ND	25.8	ND	ND	ND	ND	242
Monterey drainage ditch	10/22/2009	11:00	11/12/2009	13.3	ND	7.1	ND	ND	ND	ND	ND
Monterey drainage ditch	10/28/2009	08:55	11/12/2009	6.0	ND	4.2	ND	ND	ND	ND	ND
Watsonville Slough	01/07/2008	17:00	01/14/2008	164	ND	13.2	ND	ND	ND	ND	ND
Watsonville Slough	02/26/2008	07:45	03/04/2008	124	ND	8.8	ND	ND	ND	ND	ND
Watsonville Slough	04/29/2008	13:00	05/19/2008	ND	ND	(1.8)	ND	ND	ND	ND	ND
Watsonville Slough	07/02/2008	12:20	07/08/2008	ND	ND	(1.0)	ND	ND	ND	ND	ND
Watsonville Slough	02/16/2009	09:15	03/31/2009	116	ND	8.6	ND	ND	ND	ND	ND
Watsonville Slough	09/22/2009	10:15	09/28/2009	ND	ND	ND	ND	ND	ND	7.4	ND
Watsonville Slough	10/14/2009	10:15	11/12/2009	ND	ND	14.2	ND	ND	ND	96.7	ND
Watsonville Slough	10/22/2009	10:15	11/12/2009	ND	ND	6.0	ND	ND	ND	ND	ND
Watsonville Slough	10/28/2009	10:35	11/12/2009	ND	ND	(1.6)	ND	ND	ND	ND	ND

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Oxy- fluorfen [65093]	<i>p,p'</i> -DDD [65094]	<i>p,p'</i> -DDE [65095]	<i>p,p'</i> -DDT [65096]	Pendi- methalin [65098]	Permethrin [65099]	Promethryn [65103]	Propi- conazole [66643]
Pajaro River below Thurwachter	01/06/2008	09:45	01/14/2008	146	ND	ND	ND	104	ND	338	ND
Pajaro River below Thurwachter	02/25/2008	14:30	03/04/2008	145	ND	(2.2)	ND	3.8	ND	97.2	ND
Pajaro River below Thurwachter	04/29/2008	10:35	05/19/2008	ND	ND	(0.4)	ND	ND	4.4	8.8	ND
Pajaro River below Thurwachter	07/02/2008	10:50	07/07/2008	ND	ND	ND	ND	ND	ND	7.4	ND
Pajaro River below Thurwachter	02/17/2009	12:20	03/31/2009	48.6	ND	(4.2)	ND	ND	ND	38.0	ND
Pajaro River below Thurwachter	09/22/2009	12:45	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/14/2009	12:30	11/12/2009	ND	ND	(3.3)	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/22/2009	11:50	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/28/2009	10:40	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	01/06/2008	08:00	01/14/2008	112	ND	(2.5)	ND	58.3	ND	180	ND
Pajaro River estuary upper	02/25/2008	10:35	03/04/2008	94.2	ND	(2.8)	ND	ND	ND	54.0	ND
Pajaro River estuary upper	04/02/2008	12:30	04/14/2008	ND	ND	30.4	ND	ND	ND	ND	ND
Pajaro River estuary upper	04/29/2008	11:05	05/19/2008	ND	ND	(1.0)	ND	ND	ND	11.8	ND
Pajaro River estuary upper	05/29/2008	12:15	07/08/2008	ND	ND	3.4	ND	ND	15.0	25.0	ND
Pajaro River estuary upper	07/02/2008	11:55	07/08/2008	ND	ND	ND	ND	ND	ND	ND	12.4
Pajaro River estuary upper	08/12/2008	13:15	08/19/2008	ND	ND	ND	ND	ND	ND	9.0	ND
Pajaro River estuary upper	09/10/2008	10:40	11/06/2008	ND	ND	7.0	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/08/2008	14:00	11/06/2008	ND	ND	ND	ND	ND	ND	ND	34.4
Pajaro River estuary upper	02/17/2009	10:40	03/31/2009	63.2	ND	3.6	ND	ND	ND	40.8	ND
Pajaro River estuary upper	09/09/2009	09:15	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	09/22/2009	11:15	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/14/2009	10:50	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/22/2009	11:00	11/12/2009	ND	ND	ND	ND	ND	ND	12.7	ND
Pajaro River estuary upper	10/28/2009	08:25	11/12/2009	ND	ND	ND	ND	ND	ND	4.6	ND
Pajaro River estuary upper	01/06/2008	08:50	01/14/2008	91.2	ND	(2.2)	ND	61.3	ND	168	ND
Pajaro River estuary lower	02/25/2008	09:58	03/04/2008	65.6	ND	(2.6)	ND	ND	ND	42.6	ND

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cycloate, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfuralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfenyl, fipronil sulfide, fipronil sulfone, hexazinone, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Oxy- fluorfen [65093]	<i>p,p'</i> -DDD [65094]	<i>p,p'</i> -DDE [65095]	<i>p,p'</i> -DDT [65096]	Pendi- methalin [65098]	Permethrin [65099]	Prometryn [65103]	Propi- conazole [66643]
Pajaro River estuary lower	04/02/2008	11:00	04/14/2008	ND	ND	40.0	ND	ND	ND	ND	ND
Pajaro River estuary lower	04/29/2008	12:15	05/19/2008	ND	ND	(0.6)	ND	ND	ND	ND	ND
Pajaro River estuary lower	05/29/2008	10:00	07/08/2008	82.0	ND	18.4	ND	ND	3.4	35.2	ND
Pajaro River estuary lower	07/02/2008	12:50	07/08/2008	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	08/12/2008	12:50	08/19/2008	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	09/10/2008	14:00	11/06/2008	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/08/2008	14:30	11/06/2008	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	02/17/2009	11:40	03/31/2009	74.6	ND	3.6	ND	ND	ND	43.6	ND
Pajaro River estuary lower	09/09/2009	08:40	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	09/22/2009	10:30	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/14/2009	09:50	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/22/2009	15:30	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/28/2009	09:30	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfuralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Propyza- mide [67706]	Pyraclo- strobil [66646]	Simazine [65105]	Tetra- conazole [66654]	Trifloxy- strobil [66660]	Trifluralin [65108]	Triflumizole [67753]	Vinclozolin [67763]
Monterey drainage ditch	01/06/2008	11:30	01/14/2008	5.6	ND	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	02/24/2008	12:00	03/04/2008	(3.4)	ND	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	04/29/2008	11:20	05/19/2008	ND	ND	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	07/02/2008	11:30	07/08/2008	ND	ND	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	02/16/2009	13:20	03/31/2009	47.8	475	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	09/22/2009	11:30	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	10/14/2009	10:50	11/12/2009	ND	7110	ND	ND	ND	ND	69.8	ND
Monterey drainage ditch	10/22/2009	11:00	11/12/2009	ND	57.5	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	10/28/2009	08:55	11/12/2009	ND	42.9	ND	ND	ND	ND	ND	ND
Watsonville Slough	01/07/2008	17:00	01/14/2008	9.6	ND	ND	ND	ND	ND	ND	ND
Watsonville Slough	02/26/2008	07:45	03/04/2008	ND	ND	12.4	ND	ND	ND	ND	ND
Watsonville Slough	04/29/2008	13:00	05/19/2008	ND	ND	ND	(2.0)	ND	ND	ND	ND
Watsonville Slough	07/02/2008	12:20	07/08/2008	12.6	ND	ND	ND	ND	ND	ND	ND
Watsonville Slough	02/16/2009	09:15	03/31/2009	ND	ND	ND	ND	ND	ND	ND	ND
Watsonville Slough	09/22/2009	10:15	09/28/2009	ND	ND	ND	ND	ND	(0.4)	ND	ND
Watsonville Slough	10/14/2009	10:15	11/12/2009	ND	892	ND	ND	ND	ND	295	ND
Watsonville Slough	10/22/2009	10:15	11/12/2009	(4.7)	122	ND	ND	ND	ND	ND	ND
Watsonville Slough	10/28/2009	10:35	11/12/2009	ND	84.8	ND	ND	ND	ND	ND	ND

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5–DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cycloate, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfuralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Propyza- mide [67706]	Pyraclo- strobil [66646]	Simazine [65105]	Tetra- conazole [66654]	Trifloxy- strobil [66660]	Trifluralin [65108]	Triflumizole [67753]	Vinclozolin [67763]
Pajaro River below Thurwachter	01/06/2008	09:45	01/14/2008	21.8	ND	ND	ND	ND	5.2	ND	ND
Pajaro River below Thurwachter	02/25/2008	14:30	03/04/2008	36.4	ND	ND	ND	ND	2.4	ND	ND
Pajaro River below Thurwachter	04/29/2008	10:35	05/19/2008	6.6	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	07/02/2008	10:50	07/07/2008	(4.4)	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	02/17/2009	12:20	03/31/2009	10.4	ND	96.2	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	09/22/2009	12:45	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/14/2009	12:30	11/12/2009	ND	32.5	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/22/2009	11:50	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/28/2009	10:40	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	01/06/2008	08:00	01/14/2008	14.0	ND	21.8	ND	ND	3.8	ND	ND
Pajaro River estuary upper	02/25/2008	10:35	03/04/2008	22.2	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	04/02/2008	12:30	04/14/2008	17.0	10.8	ND	9.4	ND	7.0	ND	ND
Pajaro River estuary upper	04/29/2008	11:05	05/19/2008	7.8	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	05/29/2008	12:15	07/08/2008	13.4	ND	ND	(1.0)	ND	ND	ND	ND
Pajaro River estuary upper	07/02/2008	11:55	07/08/2008	(4.0)	ND	ND	ND	ND	ND	265	ND
Pajaro River estuary upper	08/12/2008	13:15	08/19/2008	ND	ND	ND	(1.8)	ND	ND	ND	ND
Pajaro River estuary upper	09/10/2008	10:40	11/06/2008	ND	ND	ND	ND	ND	(0.8)	ND	ND
Pajaro River estuary upper	10/08/2008	14:00	11/06/2008	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	02/17/2009	10:40	03/31/2009	13.8	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	09/09/2009	09:15	09/28/2009	ND	ND	ND	ND	ND	(0.4)	ND	ND
Pajaro River estuary upper	09/22/2009	11:15	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/14/2009	10:50	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/22/2009	11:00	11/12/2009	ND	ND	ND	ND	ND	(0.2)	ND	ND
Pajaro River estuary upper	10/28/2009	08:25	11/12/2009	ND	14.8	ND	ND	ND	(0.4)	ND	ND
Pajaro River estuary upper	01/06/2008	08:50	01/14/2008	11.2	ND	18.7	ND	ND	3.2	ND	ND

Table 8. Dissolved pesticide and organic carbon concentrations measured in samples from the Pajaro River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,5-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cycloate, cyfluthrin, λ-cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, propanil, resmethrin, tebuconazole, tetramethrin, τ-fluvalinate, thiobencarb, and trifluralin. **Abbreviations:** hh:mm, hours minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Propyza- mide [67706]	Pyraclo- strobil [66646]	Simazine [65105]	Tetra- conazole [66654]	Trifloxy- strobil [66660]	Trifluralin [65108]	Triflumizole [67753]	Vinclozolin [67763]
Pajaro River estuary lower	02/25/2008	09:58	03/04/2008	8.6	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	04/02/2008	11:00	04/14/2008	27.4	13.6	ND	11.0	ND	21.4	ND	ND
Pajaro River estuary lower	04/29/2008	12:15	05/19/2008	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	05/29/2008	10:00	07/08/2008	30.4	41.6	ND	(6.0)	86.4	(1.8)	ND	40.6
Pajaro River estuary lower	07/02/2008	12:50	07/08/2008	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	08/12/2008	12:50	08/19/2008	(2.2)	ND	ND	(1.6)	ND	ND	ND	ND
Pajaro River estuary lower	09/10/2008	14:00	11/06/2008	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/08/2008	14:30	11/06/2008	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	02/17/2009	11:40	03/31/2009	22.4	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	09/09/2009	08:40	09/28/2009	ND	ND	ND	ND	ND	(0.4)	ND	ND
Pajaro River estuary lower	09/22/2009	10:30	09/28/2009	ND	ND	ND	ND	ND	(0.6)	ND	ND
Pajaro River estuary lower	10/14/2009	09:50	11/12/2009	ND	31.6	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/22/2009	15:30	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/28/2009	09:30	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND

Table 9. Dissolved pesticide and organic carbon concentrations measured in samples from the Salinas River estuary watershed, California, 2008–09.

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, alletlithrin, atrazine, butylate, carbosulfan, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, esfenvalerate, fenpropathrin, fipronil disulfide, fipronil sulfide, hexazinone, iprodione, metconazole, methidathion, methoprene, methyparathion, molinate, pebulate, pentachloroisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propiconazole, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb and trifluralin. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Dissolved organic carbon (mg/L) [00681]	3,4-DCA [66584]	3,5-DCA [67536]	Azoxystrobin [66589]	Bifenthrin [65067]	Boscalid [67550]	Carbaryl [65069]	Chloro- thalonil [65071]
Blanco drain	01/05/2008	16:00	01/14/2008	9.2	(8.0)	ND	18.6	ND	127	ND	ND
Blanco drain	02/24/2008	09:00	03/04/2008	4.8	(4.6)	ND	ND	ND	43.8	ND	ND
Blanco drain	04/29/2008	09:00	05/19/2008	6.5	(3.7)	ND	ND	ND	17.9	ND	ND
Blanco drain	07/02/2008	08:05	07/08/2008	6.7	(4.7)	ND	ND	ND	70.7	ND	ND
Blanco drain	02/15/2009	16:30	03/31/2009	6.3	(5.8)	ND	ND	ND	190	ND	ND
Blanco drain	09/22/2009	15:20	09/28/2009	6.1	ND	ND	ND	ND	26.2	ND	ND
Blanco drain	10/14/2009	14:50	11/12/2009	16.2	ND	ND	4,550	ND	667	ND	ND
Blanco drain	10/22/2009	14:25	11/12/2009	6.9	ND	ND	ND	ND	108	ND	ND
Blanco drain	10/28/2009	16:30	11/12/2009	6.8	ND	ND	(5.9)	ND	90.4	ND	ND
Salinas River at Davis Road	01/07/2008	09:15	01/14/2008	7.0	ND	ND	ND	ND	19.6	ND	ND
Salinas River at Davis Road	02/25/2008	09:45	03/04/2008	3.7	ND	ND	ND	ND	22.0	ND	ND
Salinas River at Davis Road	04/29/2008	08:35	05/19/2008	3.9	ND	ND	ND	ND	9.2	ND	ND
Salinas River at Davis Road	07/02/2008	07:30	07/08/2008	4.3	ND	ND	ND	ND	5.4	ND	ND
Salinas River at Davis Road	02/17/2009	14:20	03/31/2009	11.5	ND	ND	ND	ND	148	ND	ND
Salinas River at Davis Road	09/22/2009	16:10	09/28/2009	7.7	ND	ND	ND	ND	29.2	ND	ND
Salinas River at Davis Road	10/14/2009	14:15	11/12/2009	9.7	ND	ND	ND	ND	117	ND	ND
Salinas River at Davis Road	10/22/2009	14:00	11/12/2009	6.1	ND	ND	ND	ND	33.8	ND	ND
Salinas River at Davis Road	10/28/2009	15:40	11/12/2009	5.3	ND	ND	ND	ND	29.8	ND	ND
Salinas River estuary upper	01/05/2008	13:28	01/14/2008	4.6	ND	ND	(2.4)	ND	(4.2)	ND	ND
Salinas River estuary upper	02/25/2008	08:15	03/04/2008	3.3	ND	ND	ND	ND	59.0	ND	ND
Salinas River estuary upper	04/02/2008	13:45	04/14/2008	3.5	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	04/29/2008	09:45	05/19/2008	5.1	ND	ND	10.8	(3.6)	22.6	ND	(3.2)
Salinas River estuary upper	05/29/2008	14:00	07/08/2008	6.0	ND	ND	(1.8)	ND	13.0	ND	(1.4)

Table 9. Dissolved pesticide and organic carbon concentrations measured in samples from the Salinas River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, estenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, iprodione, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propiconazole, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb and triflumizole. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Dissolved							Chloro- thalonil [65071]
				organic carbon (mg/L) [00681]	3,4-DCA [66584]	3,5-DCA [67536]	Azoxystrobin [66589]	Bifenthrin [65067]	Boscalid [67550]	Carbaryl [65069]	
Salinas River estuary upper	07/02/2008	08:45	07/08/2008	6.6	(3.4)	ND	ND	ND	30.8	ND	ND
Salinas River estuary upper	08/12/2008	14:15	08/19/2008	7.8	ND	ND	ND	ND	39.2	ND	ND
Salinas River estuary upper	09/10/2008	08:10	11/06/2008	6.4	ND	ND	ND	ND	21.6	ND	ND
Salinas River estuary upper	10/13/2008	14:30	11/06/2008	6.4	ND	ND	ND	ND	18.8	ND	ND
Salinas River estuary upper	02/17/2009	13:00	03/31/2009	5.6	(4.2)	ND	ND	ND	290	68.4	ND
Salinas River estuary upper	09/09/2009	11:50	09/28/2009	1.6	ND	ND	ND	ND	21.2	ND	ND
Salinas River estuary upper	09/22/2009	14:15	09/28/2009	1.6	ND	ND	ND	ND	21.0	ND	ND
Salinas River estuary upper	10/14/2009	13:45	11/12/2009	7.9	ND	ND	44.2	ND	40.6	ND	ND
Salinas River estuary upper	10/22/2009	13:20	11/12/2009	9.7	ND	ND	18.0	ND	94.1	ND	ND
Salinas River estuary upper	10/28/2009	16:35	11/12/2009	9.9	ND	ND	(7.3)	ND	61.4	ND	ND
Salinas River estuary lower	01/05/2008	14:13	01/14/2008	3.9	ND	ND	(4.0)	ND	18.6	ND	ND
Salinas River estuary lower	02/25/2008	16:10	03/04/2008	3.4	ND	ND	ND	ND	28.8	ND	ND
Salinas River estuary lower	04/02/2008	14:15	04/14/2008	2.9	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	04/29/2008	14:05	05/19/2008	1.6	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	05/29/2008	14:40	06/19/2008	4.2	ND	ND	(2.2)	ND	7.6	ND	(3.0)
Salinas River estuary lower	07/02/2008	09:30	07/08/2008	6.2	ND	ND	ND	ND	11.4	ND	ND
Salinas River estuary lower	08/12/2008	15:00	08/19/2008	6.4	ND	ND	ND	ND	11.8	ND	ND
Salinas River estuary lower	09/10/2008	08:50	11/06/2008	6.0	ND	ND	ND	ND	10.6	ND	ND
Salinas River estuary lower	10/13/2008	13:35	11/06/2008	14.4	ND	ND	ND	ND	17.0	ND	ND
Salinas River estuary lower	02/17/2009	12:30	03/31/2009	6.6	ND	(6.2)	ND	ND	178	(5.6)	ND
Salinas River estuary lower	09/09/2009	11:10	09/28/2009	0.9	ND	ND	ND	ND	12.4	ND	ND
Salinas River estuary lower	09/22/2009	15:00	09/28/2009	1.9	ND	ND	ND	ND	9.8	ND	ND
Salinas River estuary lower	10/14/2009	14:30	11/12/2009	7.5	ND	ND	ND	ND	9.2	ND	ND
Salinas River estuary lower	10/22/2009	14:00	11/12/2009	9.6	ND	ND	20.2	ND	45.5	ND	ND
Salinas River estuary lower	10/28/2009	14:10	11/12/2009	8.9	ND	ND	(8.9)	ND	48.0	ND	ND

Table 9. Dissolved pesticide and organic carbon concentrations measured in samples from the Salinas River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, iprodione, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propiconazole, resmethrin, tetramethrin, τ -fluvalinate, thiobencarb and triflumizole. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Chlorpyrifos [65072]	Cycloate [65073]	DCPA [65076]	Diazinon [65078]	Fipronil [66604]	Malathion [65087]	Metola- chlor [65090]	Myclo- butanil [66632]
Blanco drain	01/05/2008	16:00	01/14/2008	11.6	ND	122	105	ND	ND	ND	ND
Blanco drain	02/24/2008	09:00	03/04/2008	14.6	ND	52.8	123	ND	ND	ND	9.6
Blanco drain	04/29/2008	09:00	05/19/2008	ND	ND	21.6	19.2	ND	ND	ND	(4.3)
Blanco drain	07/02/2008	08:05	07/08/2008	ND	ND	6.6	84.9	ND	ND	ND	ND
Blanco drain	02/15/2009	16:30	03/31/2009	8.0	ND	38.6	13.8	ND	ND	ND	ND
Blanco drain	09/22/2009	15:20	09/28/2009	(0.8)	1.6	11.0	8.0	ND	ND	ND	ND
Blanco drain	10/14/2009	14:50	11/12/2009	5.2	ND	41.0	ND	ND	1064	ND	1,344
Blanco drain	10/22/2009	14:25	11/12/2009	3.7	ND	18.8	ND	ND	ND	ND	12.4
Blanco drain	10/28/2009	16:30	11/12/2009	ND	ND	19.2	ND	ND	ND	ND	(8.8)
Salinas River at Davis Road	01/07/2008	09:15	01/14/2008	8.2	ND	301	25.6	ND	ND	ND	ND
Salinas River at Davis Road	02/25/2008	09:45	03/04/2008	28.0	ND	143	59.8	ND	ND	ND	(8.8)
Salinas River at Davis Road	04/29/2008	08:35	05/19/2008	ND	ND	18.6	36.4	ND	ND	ND	ND
Salinas River at Davis Road	07/02/2008	07:30	07/08/2008	ND	ND	5.4	7.8	ND	ND	ND	ND
Salinas River at Davis Road	02/17/2009	14:20	03/31/2009	5.1	ND	85.1	ND	ND	ND	ND	ND
Salinas River at Davis Road	09/22/2009	16:10	09/28/2009	ND	ND	5.3	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/14/2009	14:15	11/12/2009	ND	ND	41.0	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/22/2009	14:00	11/12/2009	ND	ND	10.6	ND	(1.0)	ND	ND	14.6
Salinas River at Davis Road	10/28/2009	15:40	11/12/2009	ND	ND	6.5	ND	ND	ND	ND	22.5
Salinas River estuary upper	01/05/2008	13:28	01/14/2008	ND	ND	6.60	ND	ND	ND	ND	13.2
Salinas River estuary upper	02/25/2008	08:15	03/04/2008	70.6	ND	609	216	ND	ND	6.6	12.8
Salinas River estuary upper	04/02/2008	13:45	04/14/2008	21.2	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	04/29/2008	09:45	05/19/2008	ND	ND	21.4	72.8	ND	ND	ND	ND
Salinas River estuary upper	05/29/2008	14:00	07/08/2008	ND	ND	3.2	13.4	ND	ND	ND	ND

Table 9. Dissolved pesticide and organic carbon concentrations measured in samples from the Salinas River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfuralin, EPTC, estenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, iprodione, metconazole, methidathion, methoprene, methy/parathion, molinate, pebulate, pentachloroisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propiconazole, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb and trifluzinole. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Chlorpyrifos [65072]	Cycloate [65073]	DCPA [65076]	Diazinon [65078]	Fipronil [66604]	Malathion [65087]	Metola- chlor [65090]	Myclo- butanil [66632]
Salinas River estuary upper	07/02/2008	08:45	07/08/2008	ND	ND	3.4	25.8	ND	ND	ND	ND
Salinas River estuary upper	08/12/2008	14:15	08/19/2008	ND	ND	6.6	16.8	ND	ND	ND	(4.8)
Salinas River estuary upper	09/10/2008	08:10	11/06/2008	ND	ND	5.0	18.4	ND	ND	ND	ND
Salinas River estuary upper	10/13/2008	14:30	11/06/2008	ND	ND	(1.4)	18.4	ND	ND	ND	ND
Salinas River estuary upper	02/17/2009	13:00	03/31/2009	19.6	ND	411	109	9.2	ND	ND	122
Salinas River estuary upper	09/09/2009	11:50	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	09/22/2009	14:15	09/28/2009	ND	ND	9.0	10.9	ND	ND	ND	ND
Salinas River estuary upper	10/14/2009	13:45	11/12/2009	ND	ND	6.0	ND	ND	21.2	ND	ND
Salinas River estuary upper	10/22/2009	13:20	11/12/2009	ND	ND	21.4	ND	ND	ND	ND	48.9
Salinas River estuary upper	10/28/2009	16:35	11/12/2009	ND	ND	8.5	ND	ND	ND	ND	44.8
Salinas River estuary lower	01/05/2008	14:13	01/14/2008	ND	ND	18.6	ND	ND	ND	ND	20.4
Salinas River estuary lower	02/25/2008	16:10	03/04/2008	48.2	ND	404	48.6	ND	ND	ND	10.0
Salinas River estuary lower	04/02/2008	14:15	04/14/2008	38.6	ND	ND	13.4	ND	ND	ND	ND
Salinas River estuary lower	04/29/2008	14:05	05/19/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	05/29/2008	14:40	06/19/2008	ND	ND	2.4	16.6	ND	ND	ND	ND
Salinas River estuary lower	07/02/2008	09:30	07/08/2008	ND	ND	1.8	11.8	ND	ND	ND	ND
Salinas River estuary lower	08/12/2008	15:00	08/19/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	09/10/2008	08:50	11/06/2008	ND	ND	(1.2)	ND	ND	ND	ND	ND
Salinas River estuary lower	10/13/2008	13:35	11/06/2008	ND	ND	(1.4)	14.7	ND	ND	ND	ND
Salinas River estuary lower	02/17/2009	12:30	03/31/2009	(1.8)	ND	69.8	59.6	ND	ND	ND	79.0
Salinas River estuary lower	09/09/2009	11:10	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	09/22/2009	15:00	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/14/2009	14:30	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/22/2009	14:00	11/12/2009	ND	ND	5.9	ND	ND	ND	ND	117
Salinas River estuary lower	10/28/2009	14:10	11/12/2009	ND	ND	4.7	ND	ND	ND	ND	57.1

Table 9. Dissolved pesticide and organic carbon concentrations measured in samples from the Salinas River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, hexazinone, iprodione, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propiconazole, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb and triflumizole. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Naprop- amide [65092]	Oxyfluorfen [65093]	p,p' -DDD [65094]	p,p' -DDE [65095]	p,p' -DDT [65096]	Pendi- methalin [65098]	Permethrin [65099]	Piperonyl butoxide [65102]
Blanco drain	01/05/2008	16:00	01/14/2008	ND	380	ND	7.4	ND	ND	ND	ND
Blanco drain	02/24/2008	09:00	03/04/2008	ND	104	5.4	8.4	(1.6)	ND	ND	ND
Blanco drain	04/29/2008	09:00	05/19/2008	ND	ND	4.3	5.2	ND	ND	ND	ND
Blanco drain	07/02/2008	08:05	07/08/2008	ND	40.4	(1.6)	3.7	ND	ND	ND	ND
Blanco drain	02/15/2009	16:30	03/31/2009	ND	74.8	ND	12.6	ND	ND	ND	ND
Blanco drain	09/22/2009	15:20	09/28/2009	ND	ND	ND	(3.4)	ND	ND	ND	ND
Blanco drain	10/14/2009	14:50	11/12/2009	ND	22.2	ND	16.0	ND	ND	ND	60.8
Blanco drain	10/22/2009	14:25	11/12/2009	ND	9.3	ND	4.7	ND	ND	ND	ND
Blanco drain	10/28/2009	16:30	11/12/2009	ND	5.7	ND	(2.4)	ND	ND	ND	ND
Salinas River at Davis Road	01/07/2008	09:15	01/14/2008	ND	23.2	ND	(1.2)	ND	ND	ND	ND
Salinas River at Davis Road	02/25/2008	09:45	03/04/2008	ND	48.8	ND	6.8	ND	ND	ND	ND
Salinas River at Davis Road	04/29/2008	08:35	05/19/2008	ND	ND	ND	ND	ND	ND	4.4	ND
Salinas River at Davis Road	07/02/2008	07:30	07/08/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	02/17/2009	14:20	03/31/2009	ND	ND	ND	(0.4)	ND	82.3	ND	ND
Salinas River at Davis Road	09/22/2009	16:10	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/14/2009	14:15	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/22/2009	14:00	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/28/2009	15:40	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	01/05/2008	13:28	01/14/2008	ND	9.0	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	02/25/2008	08:15	03/04/2008	ND	67.2	ND	3.6	ND	ND	ND	ND
Salinas River estuary upper	04/02/2008	13:45	04/14/2008	(0.4)	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	04/29/2008	09:45	05/19/2008	ND	ND	ND	(1.8)	ND	ND	7.8	ND
Salinas River estuary upper	05/29/2008	14:00	07/08/2008	ND	ND	ND	ND	ND	ND	ND	ND

Table 9. Dissolved pesticide and organic carbon concentrations measured in samples from the Salinas River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfenyl, fipronil sulfide, fipronil sulfone, hexazinone, iprodione, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propiconazole, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb and triflumizole. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Naprop- amide [65092]	Oxyfluorfen [65093]	<i>p,p'</i> -DDD [65094]	<i>p,p'</i> -DDE [65095]	<i>p,p'</i> -DDT [65096]	Pendi- methalin [65098]	Permethrin [65099]	Piperonyl butoxide [65102]
Salinas River estuary upper	07/02/2008	08:45	07/08/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	08/12/2008	14:15	08/19/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	09/10/2008	08:10	11/06/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/13/2008	14:30	11/06/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	02/17/2009	13:00	03/31/2009	ND	272	ND	(1.2)	ND	ND	ND	ND
Salinas River estuary upper	09/09/2009	11:50	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	09/22/2009	14:15	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/14/2009	13:45	11/12/2009	ND	ND	ND	(2.8)	ND	ND	ND	ND
Salinas River estuary upper	10/22/2009	13:20	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/28/2009	16:35	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	01/05/2008	14:13	01/14/2008	ND	27.8	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	02/25/2008	16:10	03/04/2008	ND	47.0	ND	(2.2)	ND	ND	ND	ND
Salinas River estuary lower	04/02/2008	14:15	04/14/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	04/29/2008	14:05	05/19/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	05/29/2008	14:40	06/19/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	07/02/2008	09:30	07/08/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	08/12/2008	15:00	08/19/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	09/10/2008	08:50	11/06/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/13/2008	13:35	11/06/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	02/17/2009	12:30	03/31/2009	ND	46.4	ND	(0.6)	ND	ND	ND	ND
Salinas River estuary lower	09/09/2009	11:10	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	09/22/2009	15:00	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/14/2009	14:30	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/22/2009	14:00	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/28/2009	14:10	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND

Table 9. Dissolved pesticide and organic carbon concentrations measured in samples from the Salinas River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethalfluralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, iprodione, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propiconazole, resmethrin, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb and trifluralin. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Prometryn [65103]	Propyza- mide [67706]	Pyralo- strobilin [66646]	Simazine [65105]	Tetracon- azole [66654]	Trifloxyst- robin [66660]	Trifluralin [65108]	Vinclozolin [67763]
Blanco drain	01/05/2008	16:00	01/14/2008	99.2	14.8	ND	ND	ND	ND	ND	ND
Blanco drain	02/24/2008	09:00	03/04/2008	10.2	26.2	ND	ND	ND	ND	ND	ND
Blanco drain	04/29/2008	09:00	05/19/2008	25.4	(4.7)	ND	ND	ND	ND	ND	ND
Blanco drain	07/02/2008	08:05	07/08/2008	9.1	13.4	ND	ND	ND	ND	ND	ND
Blanco drain	02/15/2009	16:30	03/31/2009	11.6	(4.8)	ND	ND	ND	ND	ND	ND
Blanco drain	09/22/2009	15:20	09/28/2009	20.8	ND	ND	ND	ND	ND	(1.2)	ND
Blanco drain	10/14/2009	14:50	11/12/2009	68.6	26.2	46.4	ND	ND	ND	ND	ND
Blanco drain	10/22/2009	14:25	11/12/2009	18.6	8.7	(9.8)	ND	ND	ND	(0.2)	ND
Blanco drain	10/28/2009	16:30	11/12/2009	21.8	9.8	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	01/07/2008	09:15	01/14/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	02/25/2008	09:45	03/04/2008	ND	28.4	ND	23.0	ND	ND	(1.2)	ND
Salinas River at Davis Road	04/29/2008	08:35	05/19/2008	5.2	14.6	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	07/02/2008	07:30	07/08/2008	ND	6.8	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	02/17/2009	14:20	03/31/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	09/22/2009	16:10	09/28/2009	ND	ND	ND	ND	ND	ND	(1.0)	ND
Salinas River at Davis Road	10/14/2009	14:15	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/22/2009	14:00	11/12/2009	ND	ND	ND	217	ND	ND	ND	ND
Salinas River at Davis Road	10/28/2009	15:40	11/12/2009	ND	ND	ND	243	ND	ND	ND	ND
Salinas River estuary upper	01/05/2008	13:28	01/14/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	02/25/2008	08:15	03/04/2008	2.4	94.2	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	04/02/2008	13:45	04/14/2008	ND	9.6	(8.2)	ND	(4.4)	ND	4.6	ND
Salinas River estuary upper	04/29/2008	09:45	05/19/2008	4.4	16.6	ND	ND	(3.4)	11.4	ND	6.4
Salinas River estuary upper	05/29/2008	14:00	07/08/2008	6.0	9.6	ND	ND	ND	ND	ND	ND

Table 9. Dissolved pesticide and organic carbon concentrations measured in samples from the Salinas River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, ethafluralin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, iprodione, metconazole, methidathion, methoprene, methylparathion, molinate, pebulate, pentachloroisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propiconazole, resmethrin, tebuconazole, tetramethrin, thiobencarb and trifluralin. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Prometryn [65103]	Propyza- mide [67706]	Pyralo- strobilin [66646]	Simazine [65105]	Tetracon- azole [66654]	Trifloxyst- robin [66660]	Trifluralin [65108]	Vinclozolin [67763]
Salinas River estuary upper	07/02/2008	08:45	07/08/2008	14.4	13.2	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	08/12/2008	14:15	08/19/2008	ND	13.0	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	09/10/2008	08:10	11/06/2008	ND	8.4	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/13/2008	14:30	11/06/2008	4.8	(3.2)	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	02/17/2009	13:00	03/31/2009	21.2	61.2	ND	ND	ND	ND	(1.8)	ND
Salinas River estuary upper	09/09/2009	11:50	09/28/2009	12.5	ND	ND	ND	ND	ND	(0.6)	ND
Salinas River estuary upper	09/22/2009	14:15	09/28/2009	13.1	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/14/2009	13:45	11/12/2009	9.0	11.8	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/22/2009	13:20	11/12/2009	18.0	32.9	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/28/2009	16:35	11/12/2009	10.9	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	01/05/2008	14:13	01/14/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	02/25/2008	16:10	03/04/2008	ND	39.0	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	04/02/2008	14:15	04/14/2008	ND	14.4	36.0	ND	ND	ND	11.8	ND
Salinas River estuary lower	04/29/2008	14:05	05/19/2008	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	05/29/2008	14:40	06/19/2008	ND	8.4	ND	ND	(5.8)	ND	ND	ND
Salinas River estuary lower	07/02/2008	09:30	07/08/2008	9.6	14.6	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	08/12/2008	15:00	08/19/2008	3.0	6.2	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	09/10/2008	08:50	11/06/2008	ND	5.4	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/13/2008	13:35	11/06/2008	ND	6.87	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	02/17/2009	12:30	03/31/2009	9.0	41.8	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	09/09/2009	11:10	09/28/2009	6.1	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	09/22/2009	15:00	09/28/2009	10.9	ND	ND	ND	ND	ND	(0.8)	ND
Salinas River estuary lower	10/14/2009	14:30	11/12/2009	ND	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/22/2009	14:00	11/12/2009	9.9	17.0	10.3	ND	ND	ND	ND	ND
Salinas River estuary lower	10/28/2009	14:10	11/12/2009	8.9	12.2	ND	ND	ND	ND	ND	ND

(Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, cyfluthrin, λ -cyhalothrin, cypermethrin, cypro-
pentachloronitrobenzene (PCNB), phenothrin, phosmet, propanil, *p,p'*-DDT, piperonyl butoxide, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA),
vinmeclozolin. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Dissolved organic carbon (mg/L) [00681]	3,4-DCA [66584]	3,5-DCA [67536]	Azoxy- strobin [66589]	Boscalid [67550]	Carbaryl [65069]	Chloro- thalonil [65071]	Chlorpy- rifos [65072]
Lower Orcutt Creek	01/05/2008	08:15	01/14/2008	15.4	ND	10.4	890	411	ND	ND	57.4
Lower Orcutt Creek	02/22/2008	17:35	03/04/2008	9.5	ND	ND	128	193	ND	ND	24.4
Lower Orcutt Creek	04/28/2008	12:30	05/19/2008	5.9	ND	ND	52.8	132	ND	ND	34.2
Lower Orcutt Creek	07/01/2008	12:30	07/08/2008	9.1	ND	ND	40.2	639	ND	ND	26.8
Lower Orcutt Creek	02/07/2009	07:50	02/13/2009	11.3	ND	ND	829	1,530	193	(4.6)	1,080
Lower Orcutt Creek	09/23/2009	12:10	09/28/2009	5.3	ND	ND	11.2	248	ND	ND	138
Lower Orcutt Creek	10/15/2009	10:10	11/12/2009	6.8	ND	ND	47.3	440	77.6	ND	180
Lower Orcutt Creek	10/21/2009	13:35	11/20/2009	3.9	ND	ND	19.4	249	ND	ND	142
Lower Orcutt Creek	10/29/2009	14:50	01/14/2010	6.2	ND	ND	24.4	215	ND	ND	234
Santa Maria River estuary upper	01/05/2008	09:15	01/14/2008	41.4	ND	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	02/22/2008	16:45	03/04/2008	8.8	ND	ND	109	139	ND	ND	18.8
Santa Maria River estuary upper	04/01/2008	10:50	04/14/2008	6.4	(1.8)	ND	ND	34.2	ND	ND	10.0
Santa Maria River estuary upper	04/28/2008	11:30	05/19/2008	5.8	ND	ND	47.7	74.1	ND	ND	42.2
Santa Maria River estuary upper	05/28/2008	13:30	07/08/2008	7.5	ND	21.4	ND	245	ND	(1.2)	29.4
Santa Maria River estuary upper	07/01/2008	11:40	07/08/2008	7.7	ND	11.2	45.4	297	ND	ND	39.0
Santa Maria River estuary upper	08/11/2008	15:35	08/19/2008	6.3	ND	ND	20.4	167	ND	ND	218
Santa Maria River estuary upper	09/11/2008	10:20	11/06/2008	4.5	ND	ND	11.0	135	ND	ND	150
Santa Maria River estuary upper	10/09/2008	15:20	11/06/2008	8.2	ND	ND	20.4	139	ND	ND	66.6
Santa Maria River estuary upper	02/07/2009	10:20	02/13/2009	10.4	ND	ND	596	1,070	ND	ND	552
Santa Maria River estuary upper	09/09/2009	11:45	09/28/2009	5.1	ND	ND	(8.3)	130	ND	ND	75.0
Santa Maria River estuary upper	09/23/2009	11:20	09/28/2009	5.6	ND	ND	(8.8)	228	ND	ND	128
Santa Maria River estuary upper	10/15/2009	09:50	11/12/2009	7.3	ND	ND	60.0	562	74.1	ND	155
Santa Maria River estuary upper	10/21/2009	12:40	11/12/2009	3.8	ND	ND	18.1	247	ND	ND	122
Santa Maria River estuary upper	10/29/2009	13:15	11/12/2009	5.1	ND	ND	21.6	181	ND	ND	205

Table 10. Dissolved pesticide and organic carbon concentrations measured in samples from the Santa Maria River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, bifenthrin, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, iprodione, metconazole, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propanil, *p,p'*-DDT, piperonyl butoxide, resmethrin, simazine, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, trifloxystrobin, trifluzinazole and vinclozolin. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Dissolved					Chloro- thalonil [65071]	Chlorpy- rifos [65072]
				organic carbon (mg/L) [00681]	3,4-DCA [66584]	3,5-DCA [67536]	Azoxy- strobin [66589]	Boscalid [67550]	Carbaryl [65069]	
Santa Maria River estuary lower	01/05/2008	10:00	01/14/2008	38.6	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	02/22/2008	16:10	03/04/2008	7.3	ND	ND	76.4	125	ND	9.6
Santa Maria River estuary lower	04/01/2008	10:10	04/14/2008	7.6	(4.0)	ND	ND	35.0	ND	20.0
Santa Maria River estuary lower	04/28/2008	10:30	05/19/2008	6.9	ND	ND	45.2	83.7	ND	38.1
Santa Maria River estuary lower	05/28/2008	10:30	07/08/2008	6.3	ND	ND	114	306	ND	11.2
Santa Maria River estuary lower	07/01/2008	10:30	07/08/2008	7.5	ND	17.6	50.7	313	ND	16.4
Santa Maria River estuary lower	08/11/2008	14:15	08/19/2008	7.4	ND	ND	29.0	204	ND	53.4
Santa Maria River estuary lower	09/11/2008	09:30	11/06/2008	5.6	ND	ND	16.2	154	ND	87.4
Santa Maria River estuary lower	10/09/2008	13:05	11/06/2008	6.8	ND	ND	27.7	94.2	ND	23.0
Santa Maria River estuary lower	02/07/2009	09:45	02/13/2009	7.3	ND	ND	218	225	ND	386
Santa Maria River estuary lower	09/09/2009	11:00	09/28/2009	7.1	ND	ND	(8.9)	192	ND	6.6
Santa Maria River estuary lower	09/23/2009	10:20	09/28/2009	7.3	ND	ND	9.5	168	ND	21.7
Santa Maria River estuary lower	10/15/2009	09:00	11/12/2009	6.9	ND	ND	58.4	595	43.1	90.4
Santa Maria River estuary lower	10/21/2009	11:40	11/12/2009	4.4	ND	ND	16.3	209	ND	95.1
Santa Maria Roiver estuary lower	10/29/2009	10:15	11/12/2009	5.9	ND	ND	25.4	201	ND	189

Table 10. Dissolved pesticide and organic carbon concentrations measured in samples from the Santa Maria River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, bifenthrin, butylate, carbofuran, cyfluthrin, λ-cyhalothrin, cypermethrin, cyproconazole, deltamethrin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfuryl, iprodione, metconazole, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propanil, *p,p'*-DDT, piperonyl butoxide, resmethrin, simazine, tebuconazole, tetramethrin, τ-fluvalinate, thibencarb, trifloxystrobin, triflumizole and vinclozolin. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Cycloate [65073]	DCPA [65076]	Diazinon [65078]	Ethalfuralin [65082]	Fipronil sulfide [66604]	Fipronil sul- fone [66613]	Hexazinone [65085]
Lower Orcutt Creek	01/05/2008	08:15	01/14/2008	ND	480	145	ND	ND	ND	ND
Lower Orcutt Creek	02/22/2008	17:35	03/04/2008	ND	38.8	53.8	ND	ND	ND	ND
Lower Orcutt Creek	04/28/2008	12:30	05/19/2008	ND	14.2	458	ND	ND	ND	ND
Lower Orcutt Creek	07/01/2008	12:30	07/08/2008	ND	2.8	616	ND	ND	ND	ND
Lower Orcutt Creek	02/07/2009	07:50	02/13/2009	ND	459	282	ND	ND	ND	806
Lower Orcutt Creek	09/23/2009	12:10	09/28/2009	ND	15.6	15.4	ND	ND	ND	ND
Lower Orcutt Creek	10/15/2009	10:10	11/12/2009	ND	44.7	31.8	ND	ND	ND	ND
Lower Orcutt Creek	10/21/2009	13:35	11/20/2009	ND	21.0	5.3	ND	ND	ND	ND
Lower Orcutt Creek	10/29/2009	14:50	01/14/2010	ND	9.2	855	ND	ND	ND	ND
Santa Maria River estuary upper	01/05/2008	09:15	01/14/2008	ND	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	02/22/2008	16:45	03/04/2008	ND	30.8	30.6	5.4	3.2	8.2	ND
Santa Maria River estuary upper	04/01/2008	10:50	04/14/2008	ND	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	04/28/2008	11:30	05/19/2008	ND	12.6	432	ND	ND	ND	ND
Santa Maria River estuary upper	05/28/2008	13:30	07/08/2008	ND	6.0	524	ND	ND	ND	ND
Santa Maria River estuary upper	07/01/2008	11:40	07/08/2008	ND	3.0	584	ND	ND	ND	ND
Santa Maria River estuary upper	08/11/2008	15:35	08/19/2008	ND	7.6	56.8	ND	ND	ND	ND
Santa Maria River estuary upper	09/11/2008	10:20	11/06/2008	ND	6.2	110	ND	ND	ND	ND
Santa Maria River estuary upper	10/09/2008	15:20	11/06/2008	ND	4.0	22.6	ND	ND	ND	ND
Santa Maria River estuary upper	02/07/2009	10:20	02/13/2009	ND	201	163	ND	ND	ND	604
Santa Maria River estuary upper	09/09/2009	11:45	09/28/2009	ND	17.3	ND	ND	ND	ND	ND
Santa Maria River estuary upper	09/23/2009	11:20	09/28/2009	3.3	13.8	15.6	ND	ND	ND	ND
Santa Maria River estuary upper	10/15/2009	09:50	11/12/2009	ND	47.5	34.3	ND	ND	ND	ND
Santa Maria River estuary upper	10/21/2009	12:40	11/12/2009	ND	15.4	5.7	ND	ND	ND	ND
Santa Maria River estuary upper	10/29/2009	13:15	11/12/2009	ND	7.4	303	ND	ND	ND	ND
Santa Maria River estuary lower	01/05/2008	10:00	01/14/2008	ND	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	02/22/2008	16:10	03/04/2008	ND	22.0	8.2	ND	ND	ND	ND

Table 10. Dissolved pesticide and organic carbon concentrations measured in samples from the Santa Maria River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, bifenthrin, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, iprodione, metconazole, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propanil, *p,p'*-DDT, piperonyl butoxide, resmethrin, simazine, tebuconazole, tetramethrin, τ -fluralinate, thionecarb, trifloxystrobin, trifluzinone, and vinclozolin. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Malathion [65087]	Myclobutanil [66632]	Naprop- amide [65092]	Oxyfluorfen [65093]	<i>p,p'</i> -DDD [65094]	<i>p,p'</i> -DDE [65095]	Pendi- methalin [65098]	Perme- thrin [65099]
Lower Orcutt Creek	01/05/2008	08:15	01/14/2008	84.0	42.4	426	302	ND	7.2	ND	ND
Lower Orcutt Creek	02/22/2008	17:35	03/04/2008	ND	68.6	132	269	ND	(1.8)	ND	ND
Lower Orcutt Creek	04/28/2008	12:30	05/19/2008	10.2	(8.2)	22.8	106	ND	(2.6)	ND	ND
Lower Orcutt Creek	07/01/2008	12:30	07/08/2008	1,310	ND	306	59.0	ND	(1.6)	ND	ND
Lower Orcutt Creek	02/07/2009	07:50	02/13/2009	401	407	634	385	ND	8.0	ND	ND
Lower Orcutt Creek	09/23/2009	12:10	09/28/2009	ND	ND	109	109	ND	ND	ND	ND
Lower Orcutt Creek	10/15/2009	10:10	11/12/2009	88.0	ND	155	73.9	ND	3.9	ND	ND
Lower Orcutt Creek	10/21/2009	13:35	11/20/2009	20.8	ND	151	80.0	ND	(3.5)	ND	ND
Lower Orcutt Creek	10/29/2009	14:50	01/14/2010	32.3	83.8	24.8	48.5	ND	(3.3)	ND	ND
Santa Maria River estuary upper	01/05/2008	09:15	01/14/2008	ND	ND	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	02/22/2008	16:45	03/04/2008	ND	53.0	224	255	ND	5.6	7.2	ND
Santa Maria River estuary upper	04/01/2008	10:50	04/14/2008	32.4	ND	(1.6)	ND	ND	110	ND	ND
Santa Maria River estuary upper	04/28/2008	11:30	05/19/2008	16.0	(6.3)	20.9	91.6	ND	(2.8)	ND	(0.8)
Santa Maria River estuary upper	05/28/2008	13:30	07/08/2008	168	ND	ND	102	ND	(2.8)	ND	ND
Santa Maria River estuary upper	07/01/2008	11:40	07/08/2008	223	ND	174	70.4	(1.8)	3.6	ND	ND
Santa Maria River estuary upper	08/11/2008	15:35	08/19/2008	ND	ND	ND	208	ND	4.4	ND	ND
Santa Maria River estuary upper	09/11/2008	10:20	11/06/2008	13.0	ND	163	204	ND	(3.2)	ND	ND
Santa Maria River estuary upper	10/09/2008	15:20	11/06/2008	22.0	ND	46.8	135	ND	(3.2)	ND	ND
Santa Maria River estuary lower	02/07/2009	10:20	02/13/2009	232	285	449	223	ND	6.0	ND	ND
Santa Maria River estuary lower	09/09/2009	11:45	09/28/2009	ND	ND	34.8	15.9	ND	ND	ND	ND
Santa Maria River estuary lower	09/23/2009	11:20	09/28/2009	ND	ND	88.3	68.5	ND	(2.1)	ND	ND
Santa Maria River estuary lower	10/15/2009	09:50	11/12/2009	118	18.0	143	66.3	6.7	7.3	ND	ND
Santa Maria River estuary lower	10/21/2009	12:40	11/12/2009	11.7	ND	137	58.1	ND	(2.9)	ND	ND
Santa Maria River estuary lower	10/29/2009	13:15	11/12/2009	40.2	53.0	31.3	40.8	ND	(2.9)	ND	ND

Table 10. Dissolved pesticide and organic carbon concentrations measured in samples from the Santa Maria River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, bifenthrin, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, iprodione, metconazole, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propanil, *p,p'*-DDT, piperonyl butoxide, resmethrin, simazine, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, trifloxystrobin, trifluzinole and vinclozolin. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Malathion [65087]	Myclobutanil [66632]	Naprop- amide [65092]	Oxyfluorfen [65093]	<i>p,p'</i> -DDD [65094]	<i>p,p'</i> -DDE [65095]	Pendi- methalin [65098]	Perme- thrin [65099]
Santa Maria River estuary lower	01/05/2008	10:00	01/14/2008	ND	ND	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	02/22/2008	16:10	03/04/2008	ND	43.8	202	218	ND	(3.4)	ND	ND
Santa Maria River estuary lower	04/01/2008	10:10	04/14/2008	75.6	(6.0)	(2.0)	ND	ND	122	ND	ND
Santa Maria River estuary lower	04/28/2008	10:30	05/19/2008	101	(4.7)	169	96.3	ND	(1.9)	ND	ND
Santa Maria River estuary lower	05/28/2008	10:30	07/08/2008	ND	ND	ND	58.2	ND	ND	ND	ND
Santa Maria River estuary lower	07/01/2008	10:30	07/08/2008	110	ND	ND	77.4	ND	(1.8)	ND	ND
Santa Maria River estuary lower	08/11/2008	14:15	08/19/2008	ND	ND	ND	124	ND	ND	ND	ND
Santa Maria River estuary lower	09/11/2008	09:30	11/06/2008	ND	ND	46.4	187	ND	(3.2)	ND	ND
Santa Maria River estuary lower	10/09/2008	13:05	11/06/2008	ND	ND	48.6	46.6	ND	ND	ND	ND
Santa Maria River estuary lower	02/07/2009	09:45	02/13/2009	47.6	21.6	635	277	ND	6.4	ND	ND
Santa Maria River estuary lower	09/09/2009	11:00	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	09/23/2009	10:20	09/28/2009	ND	ND	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	10/15/2009	09:00	11/12/2009	120	17.6	166	43.5	ND	(1.6)	ND	ND
Santa Maria River estuary lower	10/21/2009	11:40	11/12/2009	42.7	ND	99.8	40.2	ND	ND	ND	ND
Santa Maria River estuary lower	10/29/2009	10:15	11/12/2009	50.6	49.0	41.7	43.8	ND	(1.3)	ND	ND

Table 10. Dissolved pesticide and organic carbon concentrations measured in samples from the Santa Maria River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, bifenthrin, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, iprodione, metconazole, methidathion, methoprene, methyldiazinon, metolachlor, molinate, pebulate, pentachloroisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propanil, *p,p'*-DDT, piperonyl butoxide, resmethrin, simazine, tebuconazole, tetramethrin, τ -fluvalinate, thiobencarb, trifloxystrobin, triflumizole and vinclozolin. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Prometryn [65103]	Propico- nazole [66643]	Propyz- amide [67706]	Pyralo- strobin [66646]	Tetraconazole [66654]	Trifluralin [65108]
Lower Orcutt Creek	01/05/2008	08:15	01/14/2008	358	159	154	166	ND	5.0
Lower Orcutt Creek	02/22/2008	17:35	03/04/2008	17.6	ND	448	55.8	ND	6.8
Lower Orcutt Creek	04/28/2008	12:30	05/19/2008	658	ND	221	71.0	(1.0)	(1.6)
Lower Orcutt Creek	07/01/2008	12:30	07/08/2008	410	ND	5,750	ND	ND	(1.8)
Lower Orcutt Creek	02/07/2009	07:50	02/13/2009	519	110	867	1,390	ND	20.8
Lower Orcutt Creek	09/23/2009	12:10	09/28/2009	49.0	ND	204	ND	ND	14.6
Lower Orcutt Creek	10/15/2009	10:10	11/12/2009	276	56.5	255	93.7	ND	12.9
Lower Orcutt Creek	10/21/2009	13:35	11/20/2009	34.1	37.3	40	104	ND	4.1
Lower Orcutt Creek	10/29/2009	14:50	01/14/2010	47.1	52.5	16.5	298	ND	5.6
Santa Maria River estuary upper	01/05/2008	09:15	01/14/2008	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	02/22/2008	16:45	03/04/2008	17.2	ND	1,390	44.6	ND	10.0
Santa Maria River estuary upper	04/01/2008	10:50	04/14/2008	313	17.2	202	43.6	(7.8)	376
Santa Maria River estuary upper	04/28/2008	11:30	05/19/2008	662	ND	247	61.9	ND	ND
Santa Maria River estuary upper	05/28/2008	13:30	07/08/2008	626	ND	939	76.6	ND	1.8
Santa Maria River estuary upper	07/01/2008	11:40	07/08/2008	453	ND	6,300	ND	ND	(1.0)
Santa Maria River estuary upper	08/11/2008	15:35	08/19/2008	364	20.8	448	84	11.0	ND
Santa Maria River estuary upper	09/11/2008	10:20	11/06/2008	106	ND	580	ND	ND	(0.4)
Santa Maria River estuary upper	10/09/2008	15:20	11/06/2008	132	16.4	71.2	ND	ND	ND
Santa Maria River estuary upper	02/07/2009	10:20	02/13/2009	361	112	586	1,560	ND	10.6
Santa Maria River estuary upper	09/09/2009	11:45	09/28/2009	113	ND	83.9	ND	ND	3.9
Santa Maria River estuary upper	09/23/2009	11:20	09/28/2009	60.2	ND	186	ND	ND	8.5
Santa Maria River estuary upper	10/15/2009	09:50	11/12/2009	321	95.1	301	105	ND	11.6
Santa Maria River estuary upper	10/21/2009	12:40	11/12/2009	33.0	15.0	43.3	61.1	ND	2.3
Santa Maria River estuary upper	10/29/2009	13:15	11/12/2009	35.5	33.4	16.5	123	ND	7.2

Table 10. Dissolved pesticide and organic carbon concentrations measured in samples from the Santa Maria River estuary watershed, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Pesticide concentrations are in nanograms per liter. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: alachlor, allethrin, atrazine, bifenthrin, butylate, carbofuran, cyfluthrin, λ -cyhalothrin, cypermethrin, cyproconazole, deltamethrin, EPTC, esfenvalerate, fenpropathrin, fipronil desulfinyl, iprodione, metconazole, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, propanil, *p,p'*-DDT, piperonyl butoxide, resmethrin, simazine, tebuconazole, tetramethrin, τ -fluvialinate, thiobencarb, trifloxystrobin, triflumizole and vinclozolin. **Abbreviations:** hh:mm, hours:minutes; mg/L, milligrams per liter; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Prometryn [65103]	Propico- nazole [66643]	Propyz- amide [67706]	Pyracl- strobin [66646]	Tetraconazole [66654]	Trifluralin [65108]
Santa Maria River estuary lower	01/05/2008	10:00	01/14/2008	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	02/22/2008	16:10	03/04/2008	16.2	ND	30.2	40.8	ND	(2.0)
Santa Maria River estuary lower	04/01/2008	10:10	04/14/2008	117	13.8	252	49.4	9.2	453
Santa Maria River estuary lower	04/28/2008	10:30	05/19/2008	691	ND	431	74.4	ND	ND
Santa Maria River estuary lower	05/28/2008	10:30	07/08/2008	ND	ND	4,000	ND	ND	ND
Santa Maria River estuary lower	07/01/2008	10:30	07/08/2008	861	ND	14,000	ND	ND	ND
Santa Maria River estuary lower	08/11/2008	14:15	08/19/2008	347	ND	767	ND	ND	ND
Santa Maria River estuary lower	09/11/2008	09:30	11/06/2008	169	ND	1,350	ND	ND	(0.8)
Santa Maria River estuary lower	10/09/2008	13:05	11/06/2008	123	ND	130	ND	ND	ND
Santa Maria River estuary lower	02/07/2009	09:45	02/13/2009	174	21.6	113	1,820	ND	5.8
Santa Maria River estuary lower	09/09/2009	11:00	09/28/2009	243	ND	229	ND	ND	(1.0)
Santa Maria River estuary lower	09/23/2009	10:20	09/28/2009	144	ND	322	ND	ND	2.3
Santa Maria River estuary lower	10/15/2009	09:00	11/12/2009	302	103	280	87.8	ND	9.4
Santa Maria River estuary lower	10/21/2009	11:40	11/12/2009	42.9	ND	61.4	17.1	ND	(1.2)
Santa Maria River estuary lower	10/29/2009	10:15	11/12/2009	68.3	36.0	21.7	131	ND	6.9

Table 11. Bed sediment pesticides concentrations in samples from the major tributaries of the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cycloate, cyfluthrin, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfluralin, fenpropathrin, fipronil, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pendimethalin, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, and thiobencarb. Abbreviations: hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	3,5-DCA [67538]	Bifenthrin [64151]	Carbaryl [64153]	Chlorpyrifos [81404]	λ-Cyhalothrin [64162]	DCPA [62905]
Monterey drainage ditch	07/02/2008	11:30	01/27/2010	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	10/30/2008	15:40	10/27/2009	ND	ND	5.8	ND	ND	ND
Monterey drainage ditch	10/28/2009	08:45	02/18/2010	ND	10.4	ND	(0.7)	ND	ND
Watsonville Slough	07/02/2008	12:20	10/27/2009	ND	ND	ND	ND	ND	ND
Watsonville Slough	10/29/2008	14:30	10/15/2009	19.4	ND	ND	ND	ND	ND
Watsonville Slough	10/28/2009	10:45	02/14/2010	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/29/2008	10:50	10/15/2009	(4.8)	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	07/02/2008	10:50	10/27/2009	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/28/2009	09:55	02/18/2010	ND	ND	ND	ND	ND	ND
Blanco drain	07/02/2008	08:05	02/14/2010	ND	ND	ND	ND	ND	(2.3)
Blanco drain	10/30/2008	08:20	01/27/2010	ND	ND	ND	(1.5)	ND	(2.2)
Blanco drain	10/28/2009	16:40	02/08/2010	ND	(2.1)	ND	5.0	ND	4.2
Salinas River at Davis Road	07/02/2008	07:30	02/08/2010	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/30/2008	08:50	10/15/2009	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/28/2009	15:45	02/08/2010	ND	ND	ND	4.3	ND	4.3
Lower Orcutt Creek	07/01/2008	12:30	02/08/2010	ND	ND	ND	14.5	(1.3)	(0.7)
Lower Orcutt Creek	10/15/2008	15:25	10/15/2009	ND	(0.2)	ND	43.7	ND	(0.8)
Lower Orcutt Creek	10/29/2009	14:50	02/08/2010	ND	ND	ND	51.8	(2.0)	(0.9)

Table 11. Bed sediment pesticides concentrations in samples from the major tributaries of the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cycloate, cyfluthrin, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfuralin, fenpropathrin, fipronil, dipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pendimethalin, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, and thiobencarb. Abbreviations: hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Diazinon [39571]	Napropamide [64164]	Oxyfluorfen [64165]	<i>p,p'</i> -DDD [39311]	<i>p,p'</i> -DDE [39321]	<i>p,p'</i> -DDT [39301]
Monterey drainage ditch	07/02/2008	11:30	01/27/2010	ND	ND	ND	46.2	234	30.0
Monterey drainage ditch	10/30/2008	15:40	10/27/2009	ND	83.5	22.6	7.8	ND	ND
Monterey drainage ditch	10/28/2009	08:45	02/18/2010	ND	ND	27.5	35.2	200	52.3
Watsonville Slough	07/02/2008	12:20	10/27/2009	ND	99.8	13.5	2.9	ND	ND
Watsonville Slough	10/29/2008	14:30	10/15/2009	ND	ND	ND	4.3	56.6	ND
Watsonville Slough	10/28/2009	10:45	02/14/2010	ND	ND	ND	2.6	24.9	ND
Pajaro River below Thurwachter	10/29/2008	10:50	10/15/2009	ND	ND	ND	2.1	9.5	ND
Pajaro River below Thurwachter	07/02/2008	10:50	10/27/2009	ND	ND	ND	2.8	11.8	ND
Pajaro River below Thurwachter	10/28/2009	09:55	02/18/2010	ND	ND	ND	12.3	37.9	32.9
Blanco drain	07/02/2008	08:05	02/14/2010	ND	ND	ND	47.7	205	30.0
Blanco drain	10/30/2008	08:20	01/27/2010	ND	ND	13.5	57.8	216	27.7
Blanco drain	10/28/2009	16:40	02/08/2010	ND	ND	15.7	33.9	137	31.1
Salinas River at Davis Road	07/02/2008	07:30	02/08/2010	ND	ND	ND	ND	5.1	1.5
Salinas River at Davis Road	10/30/2008	08:50	10/15/2009	ND	ND	ND	ND	1.5	ND
Salinas River at Davis Road	10/28/2009	15:45	02/08/2010	ND	ND	ND	1.5	12.1	6.8
Lower Orcutt Creek	07/01/2008	12:30	02/08/2010	(0.9)	7.2	38.2	15.0	62.1	28.5
Lower Orcutt Creek	10/15/2008	15:25	10/15/2009	(1.0)	4.2	60.2	17.3	80.8	32.7
Lower Orcutt Creek	10/29/2009	14:50	02/08/2010	ND	ND	43.8	15.2	68.0	21.1

Table 11. Bed sediment pesticides concentrations in samples from the major tributaries of the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4-DCA, alachlor, allethrin, atrazine, butylate, carbofuran, cycloate, cyfluthrin, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfuralin, fenpropathrin, fipronil, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, hexazinone, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pendimethalin, pentachloroisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, and thiobencarb. **Abbreviations:** hh:mm, hours:minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Permethrin [64168]	Promethrin [78688]	Propyzamide [67708]	τ -Fluvalinate [65114]	Trifluralin [62902]
Monterey drainage ditch	07/02/2008	11:30	01/27/2010	ND	ND	ND	ND	ND
Monterey drainage ditch	10/30/2008	15:40	10/27/2009	ND	ND	ND	ND	ND
Monterey drainage ditch	10/28/2009	08:45	02/18/2010	2.7	ND	ND	ND	ND
Watsonville Slough	07/02/2008	12:20	10/27/2009	ND	ND	ND	ND	ND
Watsonville Slough	10/29/2008	14:30	10/15/2009	ND	ND	ND	ND	ND
Watsonville Slough	10/28/2009	10:45	02/14/2010	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/29/2008	10:50	10/15/2009	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	07/02/2008	10:50	10/27/2009	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/28/2009	09:55	02/18/2010	ND	ND	ND	ND	ND
Blanco drain	07/02/2008	08:05	02/14/2010	ND	ND	ND	ND	ND
Blanco drain	10/30/2008	08:20	01/27/2010	ND	ND	ND	ND	ND
Blanco drain	10/28/2009	16:40	02/08/2010	7.1	ND	ND	ND	ND
Salinas River at Davis Road	07/02/2008	07:30	02/08/2010	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/30/2008	08:50	10/15/2009	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/28/2009	15:45	02/08/2010	4.8	ND	ND	ND	ND
Lower Orcutt Creek	07/01/2008	12:30	02/08/2010	7.4	(2.8)	12.2	(1.4)	(0.2)
Lower Orcutt Creek	10/15/2008	15:25	10/15/2009	1.5	ND	ND	ND	(0.4)
Lower Orcutt Creek	10/29/2009	14:50	02/08/2010	2.1	ND	ND	(1.9)	2.5

Table 12. Suspended sediment pesticides concentrations in samples from the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4-DCA, alachlor, allethrin, atrazine, butylate, carbaryl, carbofuran, cycloate, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfuralin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, λ -cyhalothrin, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, τ -fluvalinate, and thiobencarb. **Abbreviations:** hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	3,5-DCA [67537]	Bifenthrin [63415]	Chlorpyrifos [65120]	Cyfluthrin [65122]	DCPA [65124]	Diazinon [65126]
Monterey drainage ditch	01/06/2008	11:30	10/09/2009	ND	2.6	ND	ND	(0.4)	ND
Monterey drainage ditch	02/24/2008	12:00	10/09/2009	(2.1)	3.1	(1.6)	ND	ND	ND
Monterey drainage ditch	02/16/2009	13:20	01/27/2010	ND	9.1	(1.8)	ND	(2.1)	4.7
Monterey drainage ditch	09/22/2009	11:30	12/02/2009	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	10/14/2009	10:50	12/02/2009	ND	145	ND	ND	ND	ND
Monterey drainage ditch	10/22/2009	11:00	01/06/2010	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	10/28/2009	08:55	01/06/2010	ND	ND	ND	ND	ND	ND
Watsonville Slough	01/07/2008	17:00	10/09/2009	11.8	(1.2)	(0.3)	ND	(0.8)	ND
Watsonville Slough	02/26/2008	07:45	10/09/2009	(3.2)	7.7	(0.3)	ND	(0.5)	ND
Watsonville Slough	02/16/2009	09:15	01/27/2010	ND	ND	ND	ND	ND	ND
Watsonville Slough	09/22/2009	10:15	12/02/2009	ND	ND	ND	ND	ND	ND
Watsonville Slough	10/14/2009	10:15	12/02/2009	ND	224	ND	ND	ND	ND
Watsonville Slough	10/22/2009	10:15	01/06/2010	ND	ND	ND	ND	ND	ND
Watsonville Slough	10/28/2009	10:35	01/06/2010	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	01/06/2008	09:45	10/09/2009	ND	(0.5)	ND	ND	4.5	ND
Pajaro River below Thurwachter	02/25/2008	14:30	10/09/2009	ND	(0.5)	ND	ND	2.8	ND
Pajaro River below Thurwachter	02/17/2009	12:20	01/27/2010	ND	ND	2.1	ND	(2.2)	ND
Pajaro River below Thurwachter	09/22/2009	12:45	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/14/2009	12:30	12/02/2009	ND	23.3	ND	ND	ND	ND
Pajaro River below Thurwachter	10/22/2009	11:50	01/06/2010	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/28/2009	10:40	01/06/2010	ND	ND	ND	ND	ND	ND
Pajaro estuary upper	09/09/2009	09:15	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro estuary upper	09/22/2009	11:15	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro estuary upper	10/14/2009	10:50	12/02/2009	ND	8.8	ND	ND	1.8	ND
Pajaro estuary upper	10/22/2009	11:00	01/06/2010	ND	ND	ND	ND	ND	ND
Pajaro estuary upper	10/28/2009	08:25	01/06/2010	ND	ND	ND	ND	7.5	ND

Table 12. Suspended sediment pesticides concentrations in samples from the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4-DCA, alachlor, allethrin, atrazine, butylate, carbaryl, carbofuran, cycloate, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfuralin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, λ -cyhalothrin, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, τ -fluvalinate, and thionbencarb. **Abbreviations:** hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	3,5-DCA [67537]	Bifenthrin [63415]	Chlorpyrifos [65120]	Cyfluthrin [65122]	DCPA [65124]	Diazinon [65126]
Pajaro River estuary lower	09/09/2009	08:40	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	09/22/2009	10:50	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/14/2009	09:50	12/02/2009	ND	ND	ND	ND	25.5	ND
Pajaro River estuary lower	10/22/2009	15:30	01/06/2010	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/28/2009	09:30	01/06/2010	ND	ND	ND	ND	ND	ND
Blanco drain	01/05/2008	16:00	10/09/2009	(1.1)	(0.5)	2.5	ND	6.0	ND
Blanco drain	02/24/2008	09:00	01/27/2010	ND	2.6	7.4	ND	19.0	ND
Blanco drain	02/15/2009	16:30	01/27/2010	ND	ND	5.7	6.0	8.9	ND
Blanco drain	09/22/2009	15:20	12/02/2009	ND	ND	ND	ND	ND	ND
Blanco drain	10/14/2009	14:50	12/02/2009	ND	349	ND	ND	ND	ND
Blanco drain	10/22/2009	14:25	01/06/2010	ND	ND	ND	ND	ND	ND
Blanco drain	10/28/2009	16:30	01/06/2010	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	01/07/2008	09:15	10/09/2009	ND	ND	2.7	ND	11.4	ND
Salinas River at Davis Road	02/25/2008	09:45	01/27/2010	ND	ND	28.6	ND	55.7	2.1
Salinas River at Davis Road	02/17/2009	14:20	01/27/2010	ND	ND	18.2	ND	23.7	ND
Salinas River at Davis Road	09/22/2009	16:10	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/14/2009	14:15	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/22/2009	14:00	01/06/2010	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/28/2009	15:40	01/06/2010	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	09/09/2009	11:50	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	09/22/2009	14:15	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/14/2009	13:45	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/22/2009	13:20	01/06/2010	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/28/2009	16:35	01/06/2010	ND	ND	ND	ND	ND	ND

Table 12. Suspended sediment pesticides concentrations in samples from the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4-DCA, alachlor, allethrin, atrazine, butylate, carbaryl, carbofuran, cycloate, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfluralin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, λ -cyhalothrin, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, τ -fluvalinate, and thiobencarb. **Abbreviations:** hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	3,5-DCA [67537]	Bifenthrin [63415]	Chlorpyrifos [65120]	Cyfluthrin [65122]	DCPA [65124]	Diazinon [65126]
Salinas River estuary lower	09/09/2009	11:10	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	09/22/2009	15:00	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/14/2009	14:30	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/22/2009	14:00	01/06/2010	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/28/2009	14:10	01/06/2010	ND	ND	ND	ND	ND	ND
Lower Orcutt Creek	01/05/2008	09:15	10/09/2009	ND	(0.8)	11.7	ND	15.7	ND
Lower Orcutt Creek	02/22/2008	17:35	10/09/2009	(1.1)	ND	2.1	ND	(1.3)	ND
Lower Orcutt Creek	02/07/2009	07:50	02/08/2010	ND	ND	549	ND	155	4.3
Lower Orcutt Creek	09/23/2009	12:10	12/02/2009	ND	ND	86.7	ND	ND	ND
Lower Orcutt Creek	10/15/2009	10:10	12/02/2009	ND	ND	48.2	ND	5.4	ND
Lower Orcutt Creek	10/21/2009	13:35	01/06/2010	ND	ND	45.5	ND	ND	ND
Lower Orcutt Creek	10/29/2009	14:50	01/06/2010	ND	ND	375	ND	ND	30.9
Santa Maria River estuary upper	09/08/2009	11:45	12/02/2009	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	09/23/2009	11:20	12/02/2009	ND	ND	190	ND	ND	ND
Santa Maria River estuary upper	10/15/2009	09:50	12/02/2009	23.9	ND	52.0	ND	6.6	ND
Santa Maria River estuary upper	10/21/2009	12:40	01/06/2010	ND	ND	51.9	ND	ND	ND
Santa Maria River estuary upper	10/29/2009	13:15	01/06/2010	ND	ND	133	ND	ND	ND
Santa Maria River estuary lower	09/08/2009	11:00	12/02/2009	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	09/23/2009	10:20	12/02/2009	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	10/15/2009	09:04	12/02/2009	ND	ND	43.2	ND	9.6	ND
Santa Maria River estuary lower	10/21/2009	11:40	01/06/2010	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	10/29/2009	10:15	01/06/2010	ND	ND	112	ND	ND	ND

Table 12. Suspended sediment pesticides concentrations in samples from the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4-DCA, alachlor, allethrin, atrazine, butylate, carbaryl, carbofuran, cycloate, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfluralin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, λ -cyhalothrin, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbufthylazine, tetramethrin, τ -fluvalinate, and thiobencarb. **Abbreviations:** hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Fenpropathrin [65131]	Fipronil [66605]	Hexazinone [65133]	Napropamide [65139]	Oxyfluorfen [63468]	<i>p,p'</i> -DDD [63124]
Monterey drainage ditch	01/06/2008	11:30	10/09/2009	ND	ND	ND	ND	29.0	11.2
Monterey drainage ditch	02/24/2008	12:00	10/09/2009	ND	ND	ND	ND	ND	4.4
Monterey drainage ditch	02/16/2009	13:20	01/27/2010	31.3	ND	ND	ND	138	88.9
Monterey drainage ditch	09/22/2009	11:30	12/02/2009	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	10/14/2009	10:50	12/02/2009	284	ND	ND	ND	41.0	67.2
Monterey drainage ditch	10/22/2009	11:00	01/06/2010	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	10/28/2009	8:55	01/06/2010	ND	ND	ND	ND	ND	ND
Watsonville Slough	01/07/2008	17:00	10/09/2009	ND	ND	ND	6.9	17.0	7.9
Watsonville Slough	02/26/2008	07:45	10/09/2009	ND	(0.2)	ND	ND	14.7	7.3
Watsonville Slough	02/16/2009	09:15	01/27/2010	ND	ND	ND	ND	ND	ND
Watsonville Slough	09/22/2009	10:15	12/02/2009	ND	ND	ND	ND	ND	ND
Watsonville Slough	10/14/2009	10:15	12/02/2009	ND	ND	ND	ND	ND	ND
Watsonville Slough	10/22/2009	10:15	01/06/2010	ND	ND	ND	ND	ND	ND
Watsonville Slough	10/28/2009	10:35	01/06/2010	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	01/06/2008	09:45	10/09/2009	ND	ND	ND	ND	3.7	(1.3)
Pajaro River below Thurwachter	02/25/2008	14:30	10/09/2009	ND	ND	ND	ND	10.9	(1.3)
Pajaro River below Thurwachter	02/17/2009	12:20	01/27/2010	ND	ND	ND	ND	50.6	105
Pajaro River below Thurwachter	09/22/2009	12:45	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/14/2009	12:30	12/02/2009	ND	ND	ND	ND	ND	39.0
Pajaro River below Thurwachter	10/22/2009	11:50	01/06/2010	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwachter	10/28/2009	10:40	01/06/2010	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	09/09/2009	09:15	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	9/22/2009	11:15	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/14/2009	10:50	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/22/2009	11:00	01/06/2010	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/28/2009	08:25	01/06/2010	ND	ND	ND	ND	ND	ND

Table 12. Suspended sediment pesticides concentrations in samples from the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4-DCA, alachlor, allethrin, atrazine, butylate, carbaryl, carbofuran, cycloate, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfuralin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, λ -cyhalothrin, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, τ -fluvalinate, and thiobencarb. **Abbreviations:** hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Fenpropathrin [65131]	Fipronil [6605]	Hexazinone [65133]	Napropamide [65139]	Oxyfluorfen [63468]	<i>p,p'</i> -DDD [63124]
Pajaro River estuary lower	09/09/2009	08:40	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	09/22/2009	10:50	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/14/2009	09:50	12/02/2009	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/22/2009	15:30	01/06/2010	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/28/2009	09:30	01/06/2010	ND	ND	ND	ND	ND	ND
Blanco drain	01/05/2008	16:00	10/09/2009	ND	ND	ND	ND	123	14.1
Blanco drain	02/24/2008	09:00	01/27/2010	ND	ND	ND	ND	63.2	61.6
Blanco drain	02/15/2009	16:30	01/27/2010	ND	ND	ND	ND	58.0	67.7
Blanco drain	09/22/2009	15:20	12/02/2009	ND	ND	ND	ND	ND	ND
Blanco drain	10/14/2009	14:50	12/02/2009	ND	ND	ND	ND	ND	ND
Blanco drain	10/22/2009	14:25	01/06/2010	ND	ND	ND	ND	ND	ND
Blanco drain	10/28/2009	16:30	01/06/2010	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	01/07/2008	09:15	10/09/2009	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	02/25/2008	09:45	01/27/2010	ND	ND	ND	ND	39.4	7.7
Salinas River at Davis Road	02/17/2009	14:20	01/27/2010	ND	ND	ND	ND	23.1	8.1
Salinas River at Davis Road	09/22/2009	16:10	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/14/2009	14:15	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/22/2009	14:00	01/06/2010	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/28/2009	15:40	01/06/2010	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	09/09/2009	11:50	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	09/22/2009	14:15	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/14/2009	13:45	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/22/2009	13:20	01/06/2010	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/28/2009	16:35	01/06/2010	ND	ND	ND	ND	ND	ND

Table 12. Suspended sediment pesticides concentrations in samples from the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4–DCA, alachlor, allethrin, atrazine, butylate, carbaryl, carbofuran, cycloate, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfluralin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, λ -cyhalothrin, malathion, methidathion, methoprene, methoxyphenol, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, τ -fluvalinate, and thiobencarb. **Abbreviations:** hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	Fenpropathrin [65131]	Fipronil [6605]	Hexazinone [65133]	Napropamide [65139]	Oxyfluorfen [63468]	<i>p,p'</i> -DDD [63124]
Salinas River estuary lower	09/09/2009	11:10	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	09/22/2009	15:00	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/14/2009	14:30	12/02/2009	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/22/2009	14:00	01/06/2010	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/28/2009	14:10	01/06/2010	ND	ND	ND	ND	ND	ND
Lower Orcutt Creek	01/05/2008	09:15	10/09/2009	ND	ND	ND	3.1	69.2	12.9
Lower Orcutt Creek	02/22/2008	17:35	10/09/2009	ND	ND	ND	ND	24.5	1.4
Lower Orcutt Creek	02/07/2009	07:50	02/08/2010	ND	ND	7.6	49.8	302	61.7
Lower Orcutt Creek	09/23/2009	12:10	12/02/2009	ND	ND	ND	ND	30.0	ND
Lower Orcutt Creek	10/15/2009	10:10	12/02/2009	ND	ND	ND	ND	62.7	27.2
Lower Orcutt Creek	10/21/2009	13:35	01/06/2010	ND	ND	ND	ND	ND	ND
Lower Orcutt Creek	10/29/2009	14:50	01/06/2010	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	09/08/2009	11:45	12/02/2009	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	09/23/2009	11:20	12/02/2009	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	10/15/2009	09:50	12/02/2009	ND	ND	ND	ND	68.5	ND
Santa Maria River estuary upper	10/21/2009	12:40	01/06/2010	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	10/29/2009	13:15	01/06/2010	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	09/08/2009	11:00	12/02/2009	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	09/23/2009	10:20	12/02/2009	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	10/15/2009	09:04	12/02/2009	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	10/21/2009	11:40	01/06/2010	ND	ND	ND	ND	ND	ND
Santa Maria River estuary lower	10/29/2009	10:15	01/06/2010	ND	ND	ND	ND	ND	ND

Table 12. Suspended sediment pesticides concentrations in samples from the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4–DCA, alachlor, allethrin, atrazine, butylate, carbaryl, carbofuran, cycloate, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfluralin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, λ -cyhalothrin, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, τ -fluvalinate, and thiobencarb. **Abbreviations:** hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	<i>p,p'</i> -DDE [63125]	<i>p,p'</i> -DDT [63126]	Pendi- methalin [65142]	Permethrin [65143]	Prometryn [04010]	Propyz- amide [67707]	Trifluralin [04019]
Monterey drainage ditch	01/06/2008	11:30	10/09/2009	64.0	38.3	ND	1.4	ND	ND	ND
Monterey drainage ditch	02/24/2008	12:00	10/09/2009	27.1	18.9	ND	1.4	ND	ND	ND
Monterey drainage ditch	02/16/2009	13:20	01/27/2010	400	305	ND	ND	ND	2.0	ND
Monterey drainage ditch	09/22/2009	11:30	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	10/14/2009	10:50	12/02/2009	281	341	ND	17.1	ND	ND	ND
Monterey drainage ditch	10/22/2009	11:00	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Monterey drainage ditch	10/28/2009	08:55	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Watsonville Slough	01/07/2008	17:00	10/09/2009	41.4	19.7	ND	ND	ND	ND	ND
Watsonville Slough	02/26/2008	07:45	10/09/2009	39.4	18.8	ND	ND	ND	ND	ND
Watsonville Slough	02/16/2009	09:15	01/27/2010	ND	ND	ND	ND	ND	ND	ND
Watsonville Slough	09/22/2009	10:15	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Watsonville Slough	10/14/2009	10:15	12/02/2009	164	129	ND	ND	ND	ND	ND
Watsonville Slough	10/22/2009	10:15	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Watsonville Slough	10/28/2009	1035	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwacher	01/06/2008	09:45	10/09/2009	9.1	3.8	7.6	(0.8)	ND	ND	(0.2)
Pajaro River below Thurwacher	02/25/2008	14:30	10/09/2009	7.6	3.7	ND	1.1	ND	ND	(0.2)
Pajaro River below Thurwacher	02/17/2009	12:20	01/27/2010	247	316	ND	ND	ND	ND	ND
Pajaro River below Thurwacher	09/22/2009	12:45	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwacher	10/14/2009	12:30	12/02/2009	189	206	ND	ND	ND	ND	ND
Pajaro River below Thurwacher	10/22/2009	11:50	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Pajaro River below Thurwacher	10/28/2009	10:40	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	09/09/2009	09:15	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	09/22/2009	11:15	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/14/2009	10:50	12/02/2009	53.9	52.8	ND	ND	ND	ND	0.68
Pajaro River estuary upper	10/22/2009	11:00	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary upper	10/28/2009	08:25	01/06/2010	ND	ND	ND	ND	ND	ND	ND

Table 12. Suspended sediment pesticides concentrations in samples from the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4-DCA, alachlor, allethrin, atrazine, butylate, carbaryl, carbofuran, cycloate, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfluralin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, λ -cyhalothrin, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, τ -fluvalinate, and thibencarb. **Abbreviations:** hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	p,p' -DDE [63125]	p,p' -DDT [63126]	Pendi- methalin [65142]	Permethrin [65143]	Prometryn [04010]	Propyz- amide [67707]	Trifluralin [04019]
Pajaro River estuary lower	09/09/2009	08:40	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	09/22/2009	10:50	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/14/2009	09:50	12/02/2009	59.7	51.9	ND	ND	ND	ND	1.3
Pajaro River estuary lower	10/22/2009	15:30	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Pajaro River estuary lower	10/28/2009	09:30	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Blanco drain	01/05/2008	16:00	10/09/2009	62.5	20.9	ND	5.5	ND	ND	ND
Blanco drain	02/24/2008	09:00	01/27/2010	232	43.0	ND	6.6	ND	ND	ND
Blanco drain	02/15/2009	16:30	01/27/2010	250	44.2	ND	6.4	(1.0)	ND	ND
Blanco drain	9/22/2009	15:20	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Blanco drain	10/14/2009	14:50	12/02/2009	140	165	ND	49.8	ND	ND	ND
Blanco drain	10/22/2009	14:25	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Blanco drain	10/28/2009	16:30	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	01/07/2008	09:15	10/09/2009	1.7	ND	ND	(0.6)	ND	ND	ND
Salinas River at Davis Road	02/25/2008	09:45	01/27/2010	48.6	29.2	2.5	5.7	ND	2.3	(0.2)
Salinas River at Davis Road	02/17/2009	14:20	01/27/2010	58.9	38.1	ND	4.1	ND	ND	ND
Salinas River at Davis Road	09/22/2009	16:10	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/14/2009	14:15	12/02/2009	75.9	ND	ND	295	ND	ND	ND
Salinas River at Davis Road	10/22/2009	14:00	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Salinas River at Davis Road	10/28/2009	15:40	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	09/09/2009	11:50	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	09/22/2009	14:15	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/14/2009	13:45	12/02/2009	64.1	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/22/2009	13:20	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary upper	10/28/2009	16:35	01/06/2010	ND	ND	ND	ND	ND	ND	ND

Table 12. Suspended sediment pesticides concentrations in samples from the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are USGS National Water Information System (NWIS) parameter codes. Concentrations are micrograms per kilogram. Results in parenthesis () are below method detection limits and are estimates. The following compounds were analyzed but were not detected in any samples: 3,4-DCA, alachlor, allethrin, atrazine, butylate, carbaryl, carbofuran, cycloate, cypermethrin, deltamethrin, disulfoton, EPTC, esfenvalerate, ethalfluralin, fipronil desulfinyl, fipronil sulfide, fipronil sulfone, λ -cyhalothrin, malathion, methidathion, methoprene, methylparathion, metolachlor, molinate, pebulate, pentachloroanisole (PCA), pentachloronitrobenzene (PCNB), phenothrin, phosmet, piperonyl butoxide, resmethrin, simazine, tefluthrin, terbutylazine, tetramethrin, τ -fluvalinate, and thioencarb. **Abbreviations:** hh:mm, hours minutes; mm/dd/yyyy, month/day/year; ND, not detected]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Analysis date (mm/dd/yyyy)	p,p' -DDE [63125]	p,p' -DDT [63126]	Pendi- methalin [65142]	Permethrin [65143]	Prometryn [04010]	Propyz- amide [67707]	Trifluralin [04019]
Salinas River estuary lower	09/09/2009	11:10	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	09/22/2009	15:00	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/14/2009	14:30	12/02/2009	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/22/2009	14:00	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Salinas River estuary lower	10/28/2009	14:10	01/06/2010	ND	ND	ND	ND	ND	ND	ND
Lower Orcutt Creek	01/05/2008	09:15	10/09/2009	65.4	36.5	ND	6.5	(1.8)	ND	(0.5)
Lower Orcutt Creek	02/22/2008	17:35	10/09/2009	7.6	2.2	ND	1.4	ND	ND	(0.2)
Lower Orcutt Creek	02/07/2009	07:50	02/08/2010	208	233	ND	29.4	ND	13.8	9.8
Lower Orcutt Creek	09/23/2009	12:10	12/02/2009	117	28.3	ND	ND	ND	ND	ND
Lower Orcutt Creek	10/15/2009	10:10	12/02/2009	144	38.4	ND	9.1	ND	ND	2.9
Lower Orcutt Creek	10/21/2009	13:35	01/06/2010	112	36.4	ND	ND	ND	ND	4.5
Lower Orcutt Creek	10/29/2009	14:50	01/06/2010	151	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	09/08/2009	11:45	12/02/2009	92.1	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	09/23/2009	11:20	12/02/2009	260	ND	ND	ND	ND	ND	ND
Santa Maria River estuary upper	10/15/2009	09:50	12/02/2009	154	37.2	ND	ND	ND	ND	4.1
Santa Maria River estuary upper	10/21/2009	12:40	01/06/2010	148	ND	ND	ND	ND	ND	5.1
Santa Maria River estuary upper	10/29/2009	13:15	01/06/2010	194	63.0	ND	ND	ND	ND	5.1
Santa Maria River estuary lower	10/21/2009	11:40	01/06/2010	ND	ND	ND	ND	ND	ND	7.2
Santa Maria River estuary lower	10/29/2009	10:15	01/06/2010	52.7	ND	ND	ND	ND	ND	ND

Table 13. Percent organic carbon and nitrogen in suspended and bed sediment samples from the tributary sites in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.

[Abbreviations: hh:mm; hour:minute; mm/dd/yyyy, month/day/year]

Common station name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Sediment type	Percent organic carbon	Percent organic nitrogen
Monterey drainage ditch	01/06/2008	11:30	Suspended	3.4	0.4
Monterey drainage ditch	02/24/2008	12:00	Suspended	2.8	0.3
Monterey drainage ditch	07/02/2008	11:30	Bed	3.0	0.3
Monterey drainage ditch	10/30/2008	15:40	Bed	1.7	0.2
Monterey drainage ditch	02/16/2009	13:20	Suspended	2.9	0.3
Monterey drainage ditch	10/28/2009	08:45	Bed	2.4	0.2
Watsonville Slough	01/07/2008	17:00	Suspended	3.9	0.5
Watsonville Slough	02/26/2008	07:45	Suspended	4.0	0.5
Watsonville Slough	07/02/2008	12:20	Bed	6.8	0.5
Watsonville Slough	10/29/2008	14:30	Bed	2.7	0.3
Watsonville Slough	02/16/2009	09:15	Suspended	4.2	0.5
Watsonville Slough	10/28/2009	10:45	Bed	4.7	0.5
Pajaro River below Thurwachter	01/06/2008	09:45	Suspended	2.9	0.4
Pajaro River below Thurwachter	02/25/2008	14:30	Suspended	3.4	0.4
Pajaro River below Thurwachter	07/02/2008	10:50	Bed	1.5	0.1
Pajaro River below Thurwachter	10/29/2008	10:50	Bed	0.8	0.1
Pajaro River below Thurwachter	02/17/2009	12:20	Suspended	3.8	0.4
Pajaro River below Thurwachter	10/28/2009	09:55	Bed	5.1	0.3
Blanco drain	01/05/2008	16:00	Suspended	3.7	0.5
Blanco drain	02/24/2008	09:00	Suspended	3.6	0.4
Blanco drain	07/02/2008	08:05	Bed	2.8	0.3
Blanco drain	10/30/2008	08:20	Bed	3.2	0.4
Blanco drain	02/15/2009	16:30	Suspended	3.4	0.4
Blanco drain	10/28/2009	16:40	Bed	3.9	0.3
Salinas River at Davis Road	01/07/2008	09:15	Suspended	1.9	0.2
Salinas River at Davis Road	02/25/2008	09:45	Suspended	2.1	0.2
Salinas River at Davis Road	07/02/2008	07:30	Bed	2.3	0.2
Salinas River at Davis Road	10/30/2008	08:50	Bed	1.4	0.2
Salinas River at Davis Road	02/17/2009	14:20	Suspended	2.4	0.2
Salinas River at Davis Road	10/28/2009	15:45	Bed	4.6	0.0
Lower Orcutt Creek	01/05/2008	09:15	Suspended	1.2	0.1
Lower Orcutt Creek	02/22/2008	17:35	Suspended	3.6	0.4
Lower Orcutt Creek	07/01/2008	12:30	Bed	1.5	0.1
Lower Orcutt Creek	10/15/2008	15:25	Bed	1.3	0.1
Lower Orcutt Creek	02/07/2009	07:50	Suspended	4.3	0.4
Lower Orcutt Creek	10/29/2009	14:50	Bed	1.8	0.1

Table 14. Discrete (single-point) and cross-sectional measurements for water-quality parameters at sampling sites in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.

[Numbers in brackets are U.S. Geological Survey National Water Information System (NWIS) parameter codes. **Abbreviations:** hh:mm, hour:minute; mg/L, milligram per liter; mm/dd/yyyy, month/day/year; NA, not analyzed; FNU, Formazin Nephelometric Unit; °C, degree Celsius; µS/cm, microsiemens per centimeter]

Common site name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Temperature (°C) [00010]	Specific conductance (µS/cm) [00094]	Turbidity (FNU) [61028]	pH (standard units) [00400]	Dissolved oxygen (mg/L) [00300]
Monterey drainage ditch	01/06/2008	11:30	10.8	1,550	30.9	7.6	11.0
	02/24/2008	12:00	12.2	1,348	176	7.4	8.1
	04/29/2008	11:20	18.7	1,884	NA	8.5	14.6
	07/02/2008	11:30	18.1	1,890	NA	8.5	7.8
	02/16/2009	13:20	13.2	1,226	212	8.2	10.4
	09/22/2009	11:30	17.9	1,116	1.1	7.9	11.2
	10/14/2009	10:50	16.6	1,488	145	7.2	NA
	10/22/2009	11:00	16.7	3,566	2.8	7.8	NA
	10/28/2009	08:55	11.7	2,043	0.8	8.0	7.9
Watsonville Slough	01/07/2008	17:00	10.7	10,575	20.0	6.2	7.9
	02/26/2008	07:45	11.8	1,407	204	6.9	4.9
	04/29/2008	13:00	21.3	1,559	NA	8.3	13.1
	07/02/2008	12:20	23.5	10,960	NA	7.7	10.0
	02/16/2009	09:15	9.4	1,724	73.0	8.3	11.1
	09/22/2009	10:15	19.1	25,000	25.3	7.5	13.7
	10/14/2009	10:15	16.0	2,846	57.4	7.0	NA
	10/22/2009	10:15	16.3	14,670	110	7.6	NA
	10/28/2009	10:35	13.8	23,130	120	8.6	5.9
Pajaro River below Thurwachter	01/06/2008	09:45	10.4	360	550	7.5	10.0
	02/25/2008	14:30	11.8	527	198	7.4	5.2
	04/29/2008	10:35	NA	NA	NA	NA	NA
	07/02/2008	10:50	21.1	15,210	NA	8.1	11.5
	02/17/2009	12:20	9.9	608	NA	8.4	13.1
	09/22/2009	12:45	21.3	31,230	NA	8.5	12.5
	10/14/2009	12:30	16.0	297	NA	8.6	4.0
	10/22/2009	11:50	17.2	6,567	NA	8.7	5.1
	10/28/2009	10:40	17.7	39,600	10.8	7.2	1.5
Pajaro River estuary upper	01/06/2008	08:00	9.9	496	NA	8.8	11.6
	02/25/2008	10:35	11.7	1,321	NA	8.3	12.7
	04/02/2008	12:30	13.6	1,218	NA	8.9	11.6
	04/29/2008	11:05	NA	NA	NA	NA	NA
	05/29/2008	12:15	22.9	4,537	NA	8.9	14.7
	07/02/2008	11:55	20.3	12,000	NA	7.3	7.8
	08/12/2008	13:15	20.4	7,453	NA	8.6	2.0
	09/10/2008	10:40	20.1	16,440	NA	8.4	8.7
	10/08/2008	14:00	12.7	14,460	NA	8.4	8.1
	02/17/2009	10:40	10.1	1,166	NA	7.4	11.4
	09/09/2009	09:15	18.8	30,560	NA	9.0	6.5

Table 14. Discrete (single-point) and cross-sectional measurements for water-quality parameters at sampling sites in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are U.S. Geological Survey National Water Information System (NWIS) parameter codes. **Abbreviations:** hh:mm, hour:minute; mg/L, milligram per liter; mm/dd/yyyy, month/day/year; NA, not analyzed; FNU, Formazin Nephelometric Unit; °C, degree Celsius; µS/cm, microsiemens per centimeter]

Common site name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Temperature (°C) [00010]	Specific conductance (µS/cm) [00094]	Turbidity (FNU) [61028]	pH (standard units) [00400]	Dissolved oxygen (mg/L) [00300]
Pajaro River estuary upper— Continued	09/22/2009	11:15	19.3	25,270	NA	8.7	12.8
	10/14/2009	10:50	15.9	468	NA	8.7	5.1
	10/22/2009	11:00	16.3	11,000	NA	8.8	5.6
	10/28/2009	08:25	12.9	24,460	10.0	7.6	6.4
Pajaro River estuary lower	01/06/2008	08:50	10.0	1,736	NA	7.7	8.8
	02/25/2008	09:58	11.8	2,479	NA	8.3	11.6
	04/02/2008	11:00	13.6	5,449	NA	8.9	9.9
	04/29/2008	12:15	NA	NA	NA	NA	NA
	05/29/2008	10:00	20.0	25,920	NA	8.6	10.8
	07/02/2008	12:50	18.2	49,660	NA	7.5	6.6
	08/12/2008	12:50	22.0	NA	NA	NA	NA
	09/10/2008	14:00	21.2	38,110	NA	8.4	8.7
	10/08/2008	14:30	21.2	25,350	NA	9.0	12.8
	02/17/2009	11:40	10.6	2,208	NA	8.5	12.5
	09/09/2009	08:40	19.1	43,850	NA	9.0	6.7
	09/22/2009	10:30	18.2	40,370	NA	8.6	14.8
	10/14/2009	09:50	16.1	754	NA	8.8	5.4
	10/22/2009	15:30	16.3	49,750	NA	8.7	5.7
	10/28/2009	09:30	11.1	37,670	27.3	8.6	5.9
Blanco drain	01/05/2008	16:00	13.4	2,891	82.9	7.5	9.5
	02/24/2008	09:00	11.0	2,839	203	7.5	5.0
	04/29/2008	09:00	12.9	2,840	NA	8.3	12.9
	07/02/2008	08:05	15.9	2,740	NA	6.8	4.5
	02/15/2009	16:30	12.1	2,865	105	8.4	10.8
	09/22/2009	15:20	22.9	2,910	0.6	8.5	8.1
	10/14/2009	14:50	21.3	5,094	3.3	7.7	NA
	10/22/2009	14:25	21.5	5,103	15.4	8.2	NA
	10/28/2009	16:30	16.7	3,108	914	8.0	13.8
Salinas River at Davis Road	01/07/2008	09:15	9.2	323	306	7.2	13.9
	02/25/2008	09:45	10.7	367	468	7.2	4.8
	04/29/2008	08:35	12.4	1,455	NA	8.3	13.7
	07/02/2008	07:30	16.1	1,969	NA	5.7	4.3
	02/17/2009	14:20	9.8	26	NA	7.4	11.7
	09/22/2009	16:10	22.3	2,002	6.0	8.1	15.1
	10/14/2009	14:15	17.9	846	28.8	7.2	NA
	10/22/2009	14:00	18.0	2,581	1.2	7.7	NA
	10/28/2009	15:40	15.4	1,775	1.9	8.0	12.2

Table 14. Discrete (single-point) and cross-sectional measurements for water-quality parameters at sampling sites in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are U.S. Geological Survey National Water Information System (NWIS) parameter codes. **Abbreviations:** hh:mm, hour:minute; mg/L, milligram per liter; mm/dd/yyyy, month/day/year; NA, not analyzed; FNU, Formazin Nephelometric Unit; °C, degree Celsius; µS/cm, microsiemens per centimeter]

Common site name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Temperature (°C) [00010]	Specific conductance (µS/cm) [00094]	Turbidity (FNU) [61028]	pH (standard units) [00400]	Dissolved oxygen (mg/L) [00300]
Salinas River estuary upper	01/05/2008	13:28	11.0	6,621	NA	8.2	8.3
	02/25/2008	08:15	11.4	6,006	NA	8.3	12.1
	04/02/2008	13:45	14.2	1,140	NA	9.1	14.9
	04/29/2008	09:45	15.7	7,810	NA	8.8	11.8
	05/29/2008	14:00	22.3	21,150	NA	8.9	14.9
	07/02/2008	08:45	18.1	6,110	NA	7.7	6.2
	08/12/2008	14:15	22.1	20	NA	6.3	9.9
	09/10/2008	08:10	17.9	3,261	NA	8.5	7.9
	10/13/2008	14:30	14.8	5,637	NA	8.7	11.1
	02/17/2009	13:00	10.9	2,129	NA	8.9	12.9
	09/09/2009	11:50	21.9	11,000	NA	9.3	11.7
	09/22/2009	14:15	21.1	10,560	NA	9.0	11.8
	10/14/2009	13:45	20.1	7,036	NA	8.3	5.6
	10/22/2009	13:20	19.9	6,820	NA	9.1	8.9
	10/28/2009	16:35	15.8	10,750	NA	9.4	9.0
Salinas River estuary lower	01/05/2008	14:13	11.4	38,180	NA	7.9	11.1
	02/25/2008	16:10	11.3	8,799	NA	7.9	11.2
	04/02/2008	14:15	13.5	13,770	NA	8.5	10.5
	04/29/2008	14:05	16.9	48,020	NA	8.3	9.6
	05/29/2008	14:40	20.8	38,530	NA	8.7	9.2
	07/02/2008	09:30	15.2	18,530	NA	8.2	7.8
	08/12/2008	15:00	18.8	14,510	NA	8.9	10.5
	09/10/2008	08:50	15.1	19,000	NA	8.5	8.8
	10/13/2008	13:35	14.7	5,743	NA	8.7	11.2
	02/17/2009	12:30	11.1	4,408	NA	9.1	13.9
	09/09/2009	11:10	19.7	22,850	NA	9.3	9.1
	09/22/2009	15:00	21.3	12,840	NA	9.0	10.6
	10/14/2009	14:30	17.7	13,780	NA	9.1	9.1
	10/22/2009	14:00	18.5	12,430	NA	9.4	9.3
	10/28/2009	14:10	14.9	13,650	NA	9.2	8.1
Lower Orcutt Creek	01/05/2008	08:15	11.4	2,085	870	7.2	8.9
	02/22/2008	17:35	14.2	1,779	420	7.2	5.9
	04/28/2008	12:30	21.4	2,534	NA	8.1	10.0
	07/01/2008	12:30	NA	NA	NA	NA	NA
	02/07/2009	07:50	11.7	2,582	146	8.1	9.0
	09/23/2009	12:10	20.0	2,099	55.0	7.9	10.6
	10/15/2009	10:10	19.0	105	NA	8.9	6.6
	10/21/2009	13:35	20.9	2,671	NA	8.8	6.1
	10/29/2009	14:50	16.8	2,745	NA	8.3	7.1

Table 14. Discrete (single-point) and cross-sectional measurements for water-quality parameters at sampling sites in the Pajaro, Salinas, and Santa Maria River estuary watersheds, California, 2008–09.—Continued

[Numbers in brackets are U.S. Geological Survey National Water Information System (NWIS) parameter codes. **Abbreviations:** hh:mm, hour:minute; mg/L, milligram per liter; mm/dd/yyyy, month/day/year; NA, not analyzed; FNU, Formazin Nephelometric Unit; °C, degree Celsius; µS/cm, microsiemens per centimeter]

Common site name	Sample date (mm/dd/yyyy)	Sample time (hh:mm)	Temperature (°C) [00010]	Specific conductance (µS/cm) [00094]	Turbidity (FNU) [61028]	pH (standard units) [00400]	Dissolved oxygen (mg/L) [00300]
Santa Maria River estuary upper	01/05/2008	09:15	11.2	9,193	NA	7.2	3.4
	02/22/2008	16:45	15.0	2,021	97	7.2	5.4
	04/01/2008	10:50	15.1	3,202	NA	8.4	NA
	04/28/2008	11:30	21.3	2,630	NA	8.2	NA
	05/28/2008	13:30	26.2	2,567	NA	8.6	9.6
	07/01/2008	11:40	NA	NA	NA	NA	NA
	08/11/2008	15:35	23.0	2,737	NA	8.3	9.3
	09/11/2008	10:20	16.9	2,525	NA	8.3	40.6
	10/09/2008	15:20	21.3	2,986	NA	8.3	8.5
	02/07/2009	10:20	14.4	2,523	202	8.3	11.3
	09/08/2009	11:45	20.9	2,408	NA	9.1	9.1
	09/23/2009	11:20	20.8	2,936	NA	8.7	9.4
	10/15/2009	09:50	18.9	88	NA	8.9	6.8
	10/21/2009	12:40	21.6	2,526	NA	8.7	8.9
	10/29/2009	13:15	17.5	2,717	NA	8.9	7.2
Santa Maria River estuary lower	01/05/2008	10:00	11.3	30,110	NA	7.5	5.6
	02/22/2008	16:10	15.6	13,527	423	7.7	8.2
	04/01/2008	10:10	15.3	3,118	NA	8.56	NA
	04/28/2008	10:30	15.0	2,335	NA	8.0	11.8
	05/28/2008	10:30	17.4	5,714	NA	9.1	10.0
	07/01/2008	10:30	NA	NA	NA	NA	NA
	08/11/2008	14:15	20.8	7,015	NA	8.0	10.7
	09/11/2008	09:30	16.9	3,752	NA	8.4	11.7
	10/09/2008	13:05	18.7	3,882	NA	8.6	10.1
	02/07/2009	09:45	11.7	10,500	52.9	8.5	10.9
	09/08/2009	11:00	19.3	4,295	NA	9.0	9.8
	09/23/2009	10:20	18.9	4,879	NA	8.6	7.8
	10/15/2009	09:00	17.8	48	NA	8.8	6.5
	10/21/2009	11:40	17.6	9,158	NA	8.7	8.9
	10/29/2009	10:15	10.0	7,154	NA	8.9	6.8