

Item #5a



Guadalupe Small Tributaries Loads

Overview, Rainfall, Runoff, and Existing Contaminant
Concentration Data and Loads Estimates

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Collaborators
MLML, AXYX, AMS, Texas, USGS, and RSL

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Timeline

Start: Fall 2002

End: Fall 2005 (Pending funding)

Sampling: Winter (Nov-Apr) each year

Lab Analysis: Spring (Due July 1st) each year

Reporting: Summer (Due Oct 1st) each year

Geographic Location

Watershed facts

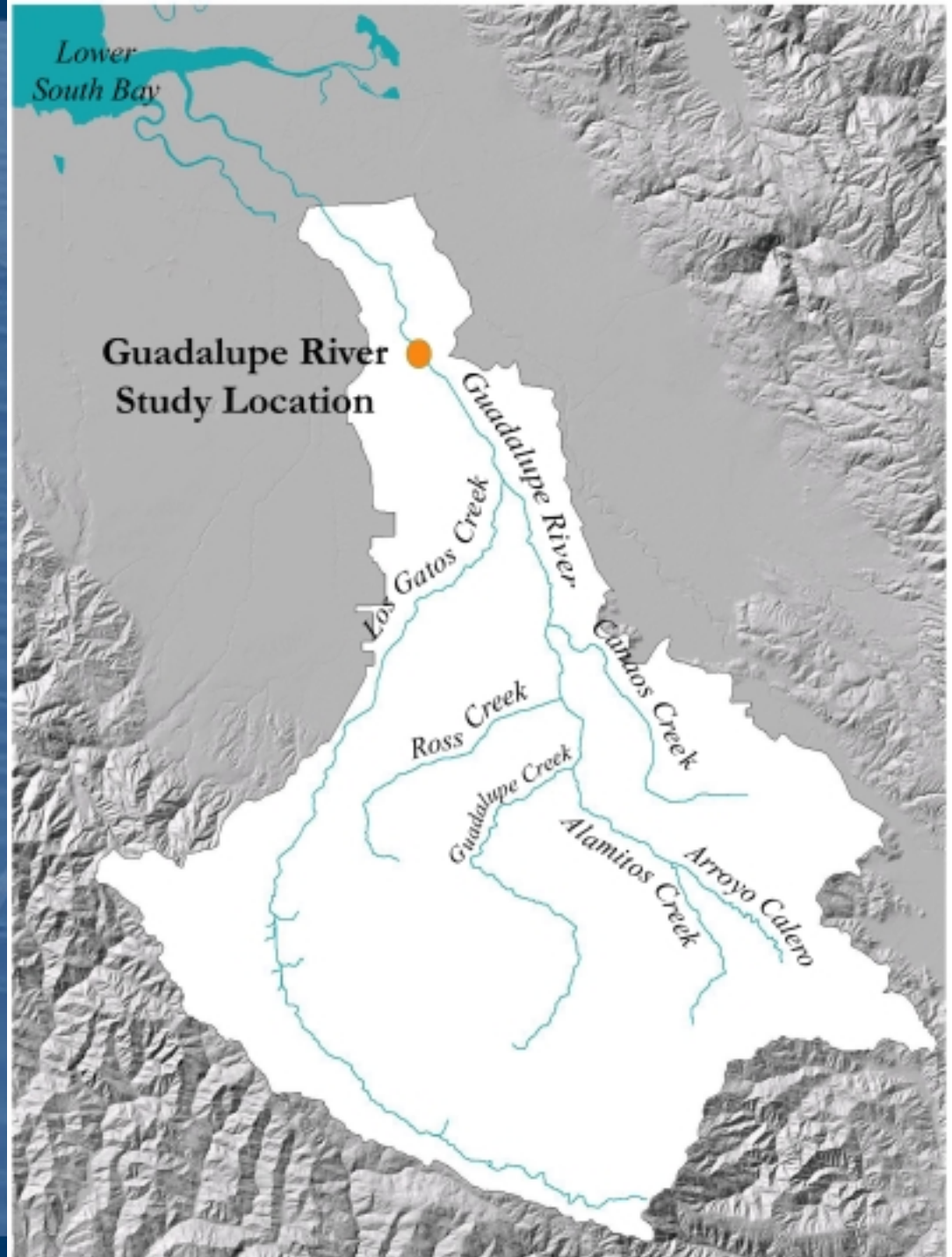
Area: 556 km² (200 mi²)

4th largest in Bay Area

5th largest Q

Subwatersheds: 5

Highest Point: Loma Prieta
(1,155 m [3,790 ft])





Sampling
Location



Sampling Outline

- USGS daily suspended sediment loads (Larry Freeman)
- Real time turbidity probe set at 15 minute intervals (Rand Eads)
- Water sampling for trace contaminants and cognates (Hg, TM, PCBs, OCs, SSC, DOC & POC) (SFEI)
- Laboratory analysis
 - a) Hg, TM, SSC: Mark Stevenson - Moss Landing
 - b) PCBs, OCs: Laurie Phillips - AXYS Labs Inc.
 - c) POC, DOC: Kenneth Davis – Applied Marine Sciences, Texas



San Jose Rainfall

General Description

- Measurement began in 1898
- MAP = 368 mm (14.5 in)
- Annual variation = 147 - 768 or ~5x
- Nov-Apr = 89% MAP
- Inter-annual 40 – 200% MAP

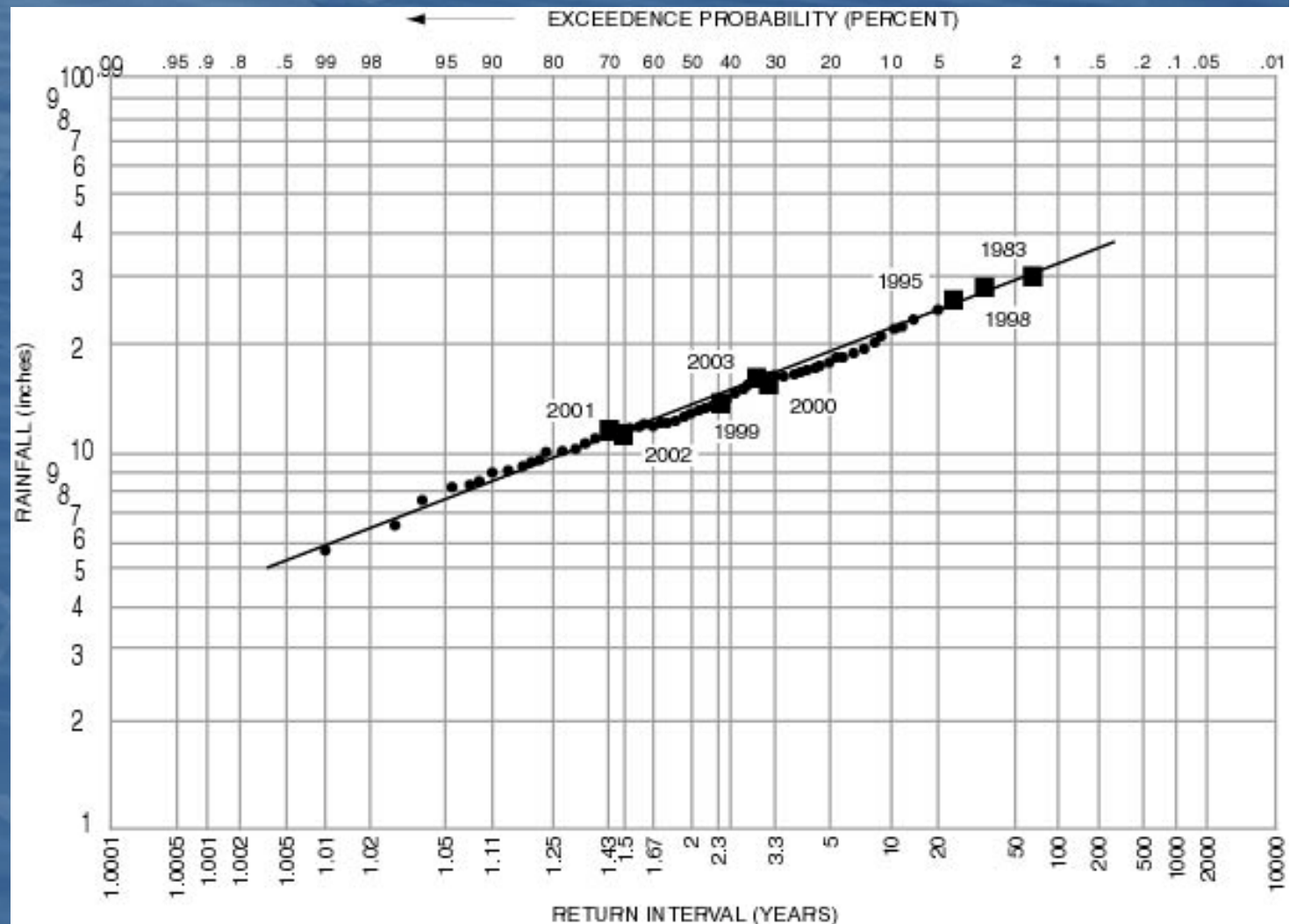
San Jose Water Year 2003 Rainfall



397 mm
(15.64 in)

103% of 30-year
normal

1:3 year return
interval





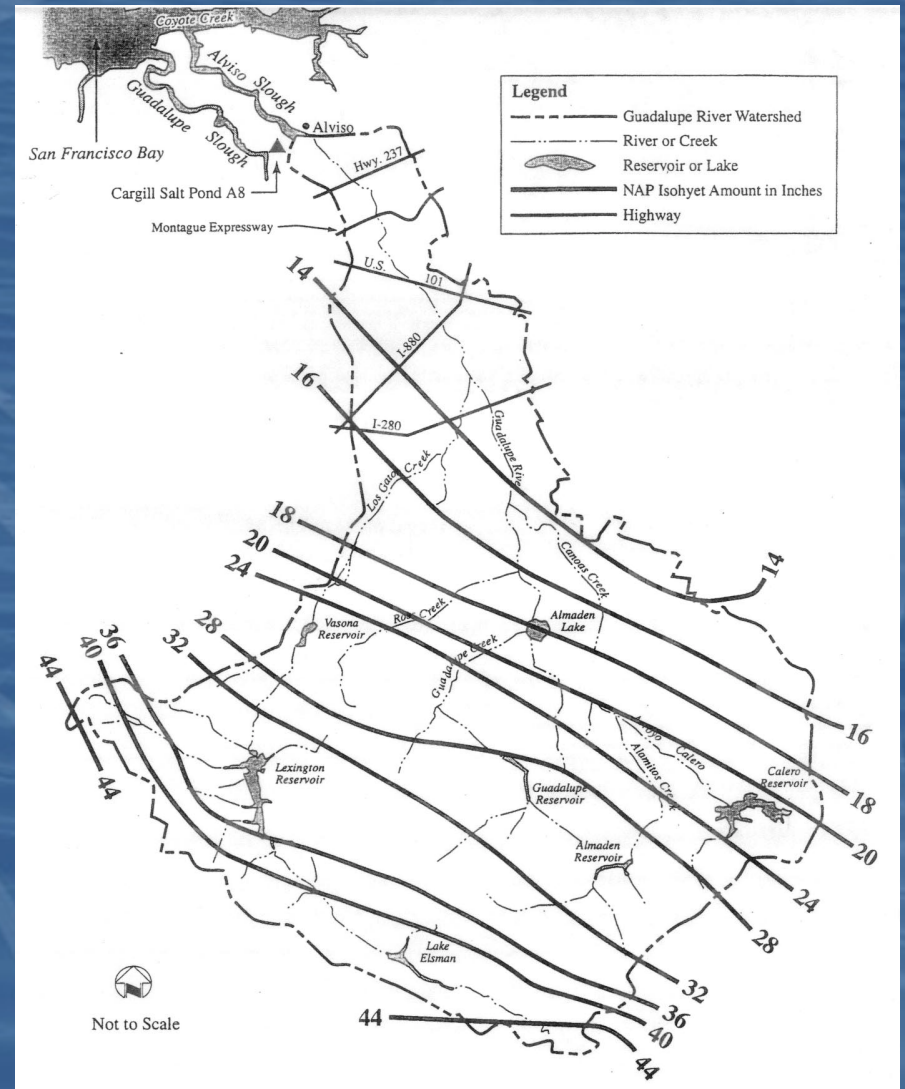
Rainfall Across the Watershed

Spatial MAP
350 - 1150 mm
(14 - 45 in)

Maximum recorded P at Loma
Prieta
~2000 mm (~80 in)

Alamitos and Guadalupe Creeks
collect rainfall from the high peaks
of Mt Loma Prieta and Umuñhum
and the adjacent ridges

Sources (USACE 2001)





Guadalupe R. Discharge

1930 - 2000

- MAR = 110 mm (42 Mm³ or 34,050 acre-feet)
- Annual variation = 1 - 638 mm (0.422 - 241 Mm³) or ~600x

1971 - 2000

- MAR = 147 mm (56 Mm³ or 45,503 acre-feet)
- Annual variation = 7 - 638 mm (2.7 - 241 Mm³) or ~88x



Sub-watershed MAR

(Note we have requested but at present we have not received Q information from the District – i.e. a better analysis will occur in the final report)

Los Gatos Ck.

- MAR estimated from the 1945-52 record
- 59 Mm³ or 105% of 1971-00 Guadalupe MAR

Ross Ck.

- MAR estimated from the 1962-69 record
- 4 Mm³ or 7% of 1971-00 Guadalupe MAR

Alamitos Ck.

- MAR estimated from the 1931-57 record
- 25 Mm³ or 45% of 1971-00 Guadalupe MAR
- Guadalupe Ck. ??
- Canaos Ck. ??

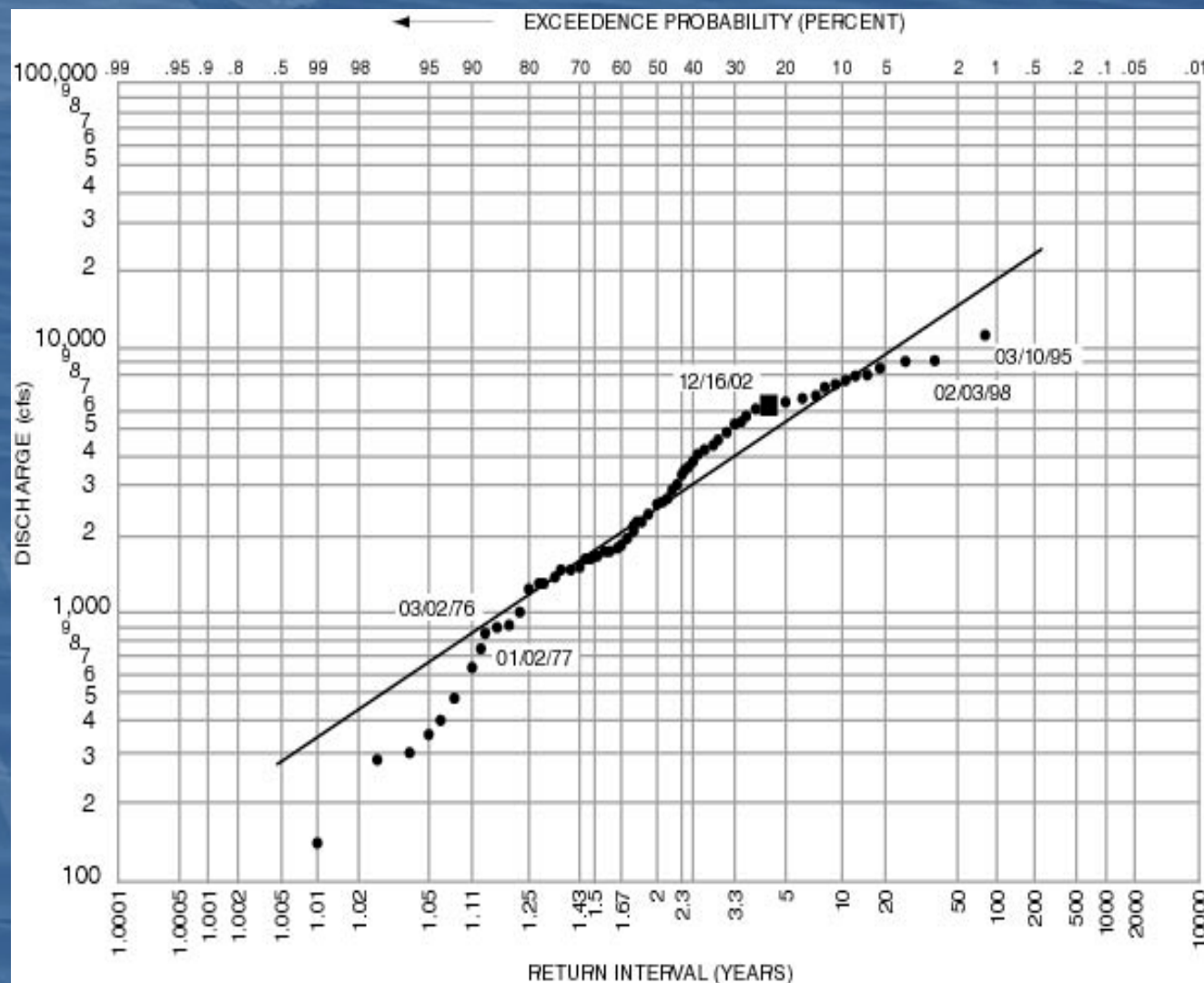


Discharge Water Year 2003

Peak Q
6,160 cfs
~1:6 year return

2003 Q
55 Mm³
(~60 cfs)
(~44,600 acre-feet)

97% of 30-year
normal





Existing Sediment Loads Estimates

Guadalupe River ~160 mi²

- Approximately 44% of the watershed is controlled by reservoirs that retain most sediment)
- Annual sediment load was estimated by USACE (1991) cited in USACE (2001) using data from “similar” drainages in the region with a range of 595 – 3,250 tons per mi² (average 2,100 tons per mi²). They assumed that only 50 mi² of the watershed was yielding sediment.

USACE estimate: 114,067 tons or 103,459 metric tonnes (Total sediment load)
Bed load 12,415 tonnes (12%)
Suspended load 91,044 tonnes (88%)

Coyote Creek near Gilroy 109 mi² (USGS 1962 - 70)

- 451 tons per mi²

San Francisquito Creek at Stanford 23 mi² (USGS 1962 - 69)

- 657 tons per mi²

Permanente Creek near Monte Vista ~3.9 mi² (USGS 1985 - 87)

- 4,680 tons per mi²



Existing Hg Concentration Data

Water column

- Thomas, Conaway, Steding et al., 2002 (Watershed)

Base flow 10/13/2000

17 cfs

0.019 – 0.086 $\mu\text{g/L Hg}_{\text{tot}}$

Storm flow 10/26/2000 /10/27/2000

35- 117 cfs

0.030 – 0.138 $\mu\text{g/L Hg}_{\text{tot}}$

- Leatherbarrow et al., 2002 (Alviso Slough)

Base flow

12 - 93 cfs

0.018 – 0.62 $\mu\text{g/L Hg}_{\text{tot}}$

Storm flow

253 - 478 cfs

0.06 – 0.73 $\mu\text{g/L Hg}_{\text{tot}}$

Watershed Bed sediment

- Thomas, Conaway, Steding et al., 2002

0.38 – 33 $\mu\text{g/g Hg}_{\text{tot}}$

Tetra Tech Inc. 2003 (Review)

<0.1 – 730 $\mu\text{g/g Hg}_{\text{tot}}$