

The Challenges in Designing an Effective Regional Watershed Sampling Program

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A Quick Overview

- 1) Outline management questions.
- 2) Outline an ideal study design.
- 3) Challenges.
- 4) Demonstrate NHD and its relevance to RMP.
- 5) Describe some priorities for the future.



Multiple Management Questions

- A. Source analysis
- B. Pathways and processes
- C. Bay TMDLs
- D. Watershed TMDLs
- E. Restoration / BMP design
- F. Trend analysis



Ideal Study Design

- Watershed classification.
- Conceptual models (mass balance and processes).
- Develop evaluation strategies.
- Establish a regional network of observation watersheds.
- Extrapolate to other watersheds.



Challenges

- 1) **Regional coordination of effort.**
- 2) Testing technical data-gathering approaches.
- 3) Designing the right spatial sampling approach.
- 4) Using sampling technologies that give comparable and consistent results.
- 5) Quality assurance of results.
- 6) Data and information management.
- 7) **Regional synthesis of data and results.**
- 8) Communication.



High-resolution National Hydrography Data Set (NHD) for the Bay Area

SFEI, USGS (funding partners: USACE, RWQCB, CALFED, SCVWD).

So what is it?

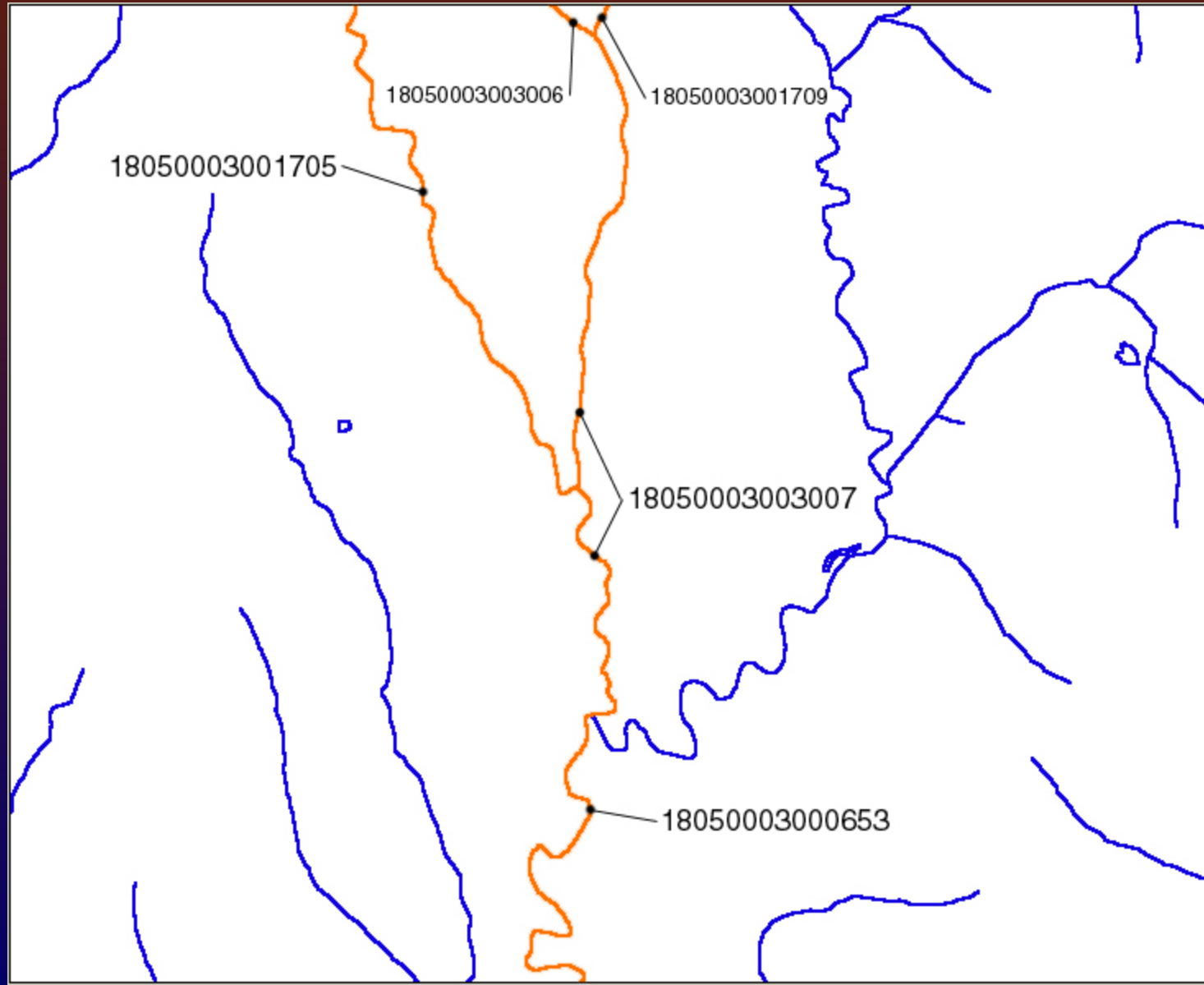
- ❖ USGS digital line graph (DLG) at 1:24k scale and the USEPA Reach File (RF3).
- ❖ A single contiguous user-friendly file.

High-resolution National Hydrography Data Set (NHD)\for the Bay Area

What are the benefits?

- 1) Improved understanding of hydrological routing.
- 2) Stream and watershed linkages between watershed management and BUs.
- 3) Information sharing by common codes and names.
- 4) Common base map for storing many layers of information (A relational spatial index to that information).

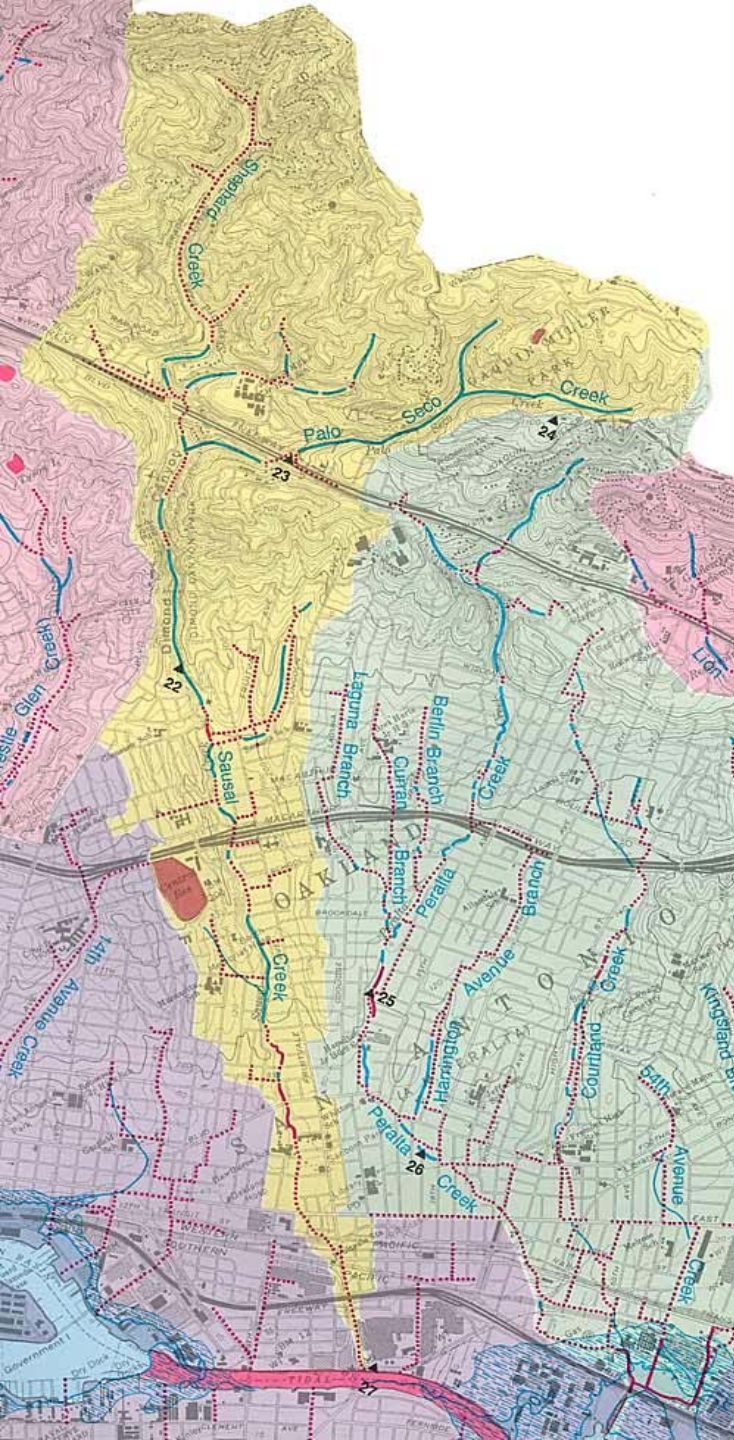
Bay Area NHD



Storm Drain Mapping

**Oakland Museum, William Lettis
& Associates, and SFEI.**

- Public education / schools and private sector.
- However also of regionally consistent quality suitable for improving the understanding of sources, pathways and loadings and managing pollutants of concern.




Sample Station Summary (STN0173)

Stream Name: Novato Creek

County: Marin

Watershed: Novato Creek Watershed

Location: from Hicks Valley Road bridge at Miwok Park, upstream 30 m

- **Name:** California roach (*Lavinia symmetricus*)
No of Fishes: 7
Collection Date: JUL-03-1997
Notes: No notes available
This is a native fish.
No photograph on record
- **Name:** Rainbow trout (*Oncorhynchus mykiss*)
No of Fishes: 12
Collection Date: JUL-03-1997
Notes: No notes available
This is a native fish.

- **Name:** Sacramento sucker (*Catostomus occidentalis*)
No of Fishes: 6
Collection Date: JUL-03-1997
Notes: No notes available
This is a native fish.
No photograph on record

Future Uses of the NHD Product

- ❖ Improved estimates of storm water loads to the bay.



Deciding Where to Sample

Sample in areas where we know:

- A substance of concern.
- Where there are clear possibilities for improved management or restoration.
- We can test for management effectiveness and learn most from the results (failure or trends).
- * Should prioritize the largest sources / pathways / loads or beneficial use impairments first.

Placing Local Stormwater Loads in Context.

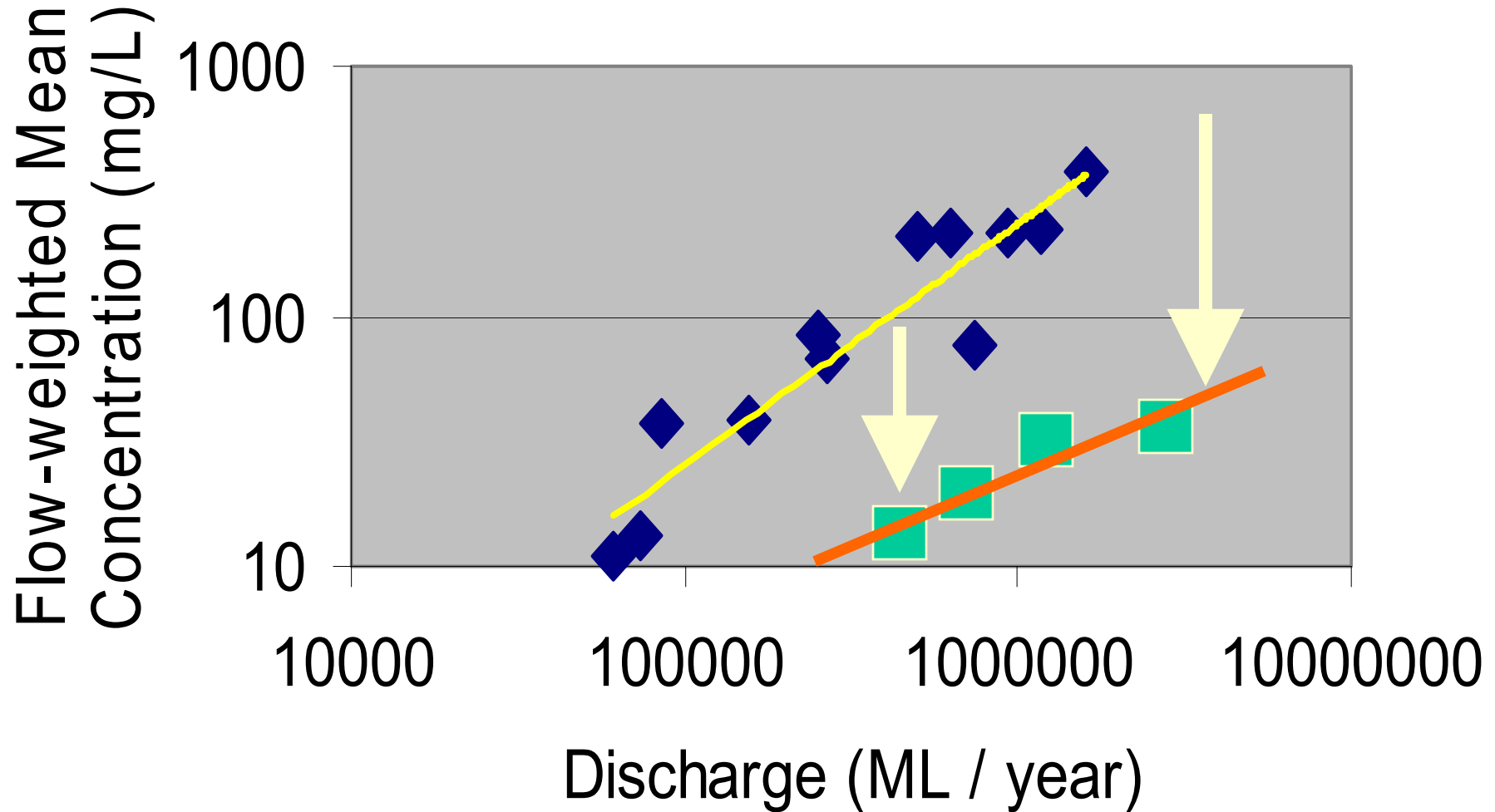
- ❖ About 90% of the discharge entering the Bay come from the Delta.
- ❖ About 85% of the discharge from the delta enters the Bay during the winter months.



Sediment Loads From the Delta During Large Resuspension Events

<u>Author</u>	<u>Average (M t/y)</u>
Smith (1963)	3.7
Schultz (1965)	4.9
USACE (1967)	4.5
Krone (1979)	3.35
Porterfield (1980)	3.8
Ogden Beeman (1992)	3.5
McKee 2001 in prep.	2.4±0.6 (1.3±0.3 - 3.0±0.7)

Methodologies to Sample Trends Over Time



Priorities for the Future

- 1) Finish and distribute a regionally consistent base map (NHD) for research, data management, and communication purposes.
- 2) Improve regional coordination and prioritization of watershed data collection (substances and locations).
- 3) Strengthen the process for data management and interpretation on a regional basis.

Some Things to Contemplate

Let us put our minds together
and see what life we can make
for our children.

Sitting Bull – Lakota Sioux

Continue to contaminate your own bed
and one night
you will suffocate in your own waste.

Chief Seattle (Sealth) - Suquamish