# San Gabriel River Regional Monitoring Program

## Development & Implementation of an Integrated Watershed-Wide Monitoring Program for the San Gabriel River (CA)

The Los Angeles and San Gabriel Rivers Watershed Council

THE LOS ANGELES & SAN GABRIEL RIVERS WATERSHED COUNCIL

# San Gabriel River Regional Monitoring Program


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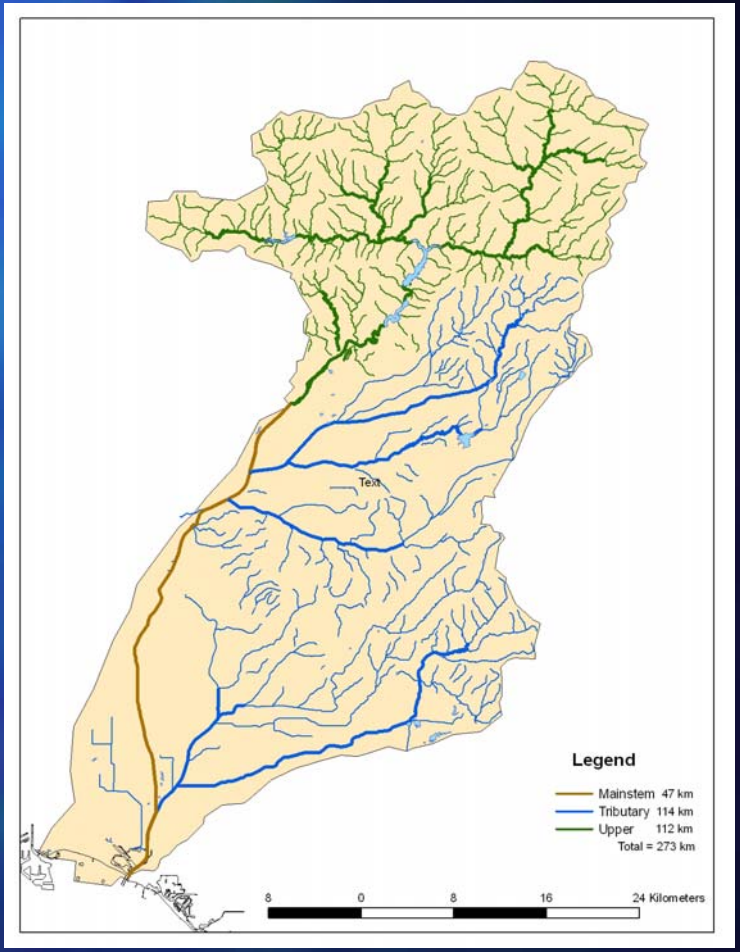
# San Gabriel River Regional Monitoring Program
## Watershed Description

- Watershed description
  - 1,900 $Km^2$
  - 54% undeveloped; all above Santa Fe Dam
  - ~2 million people

# San Gabriel River Regional Monitoring Program

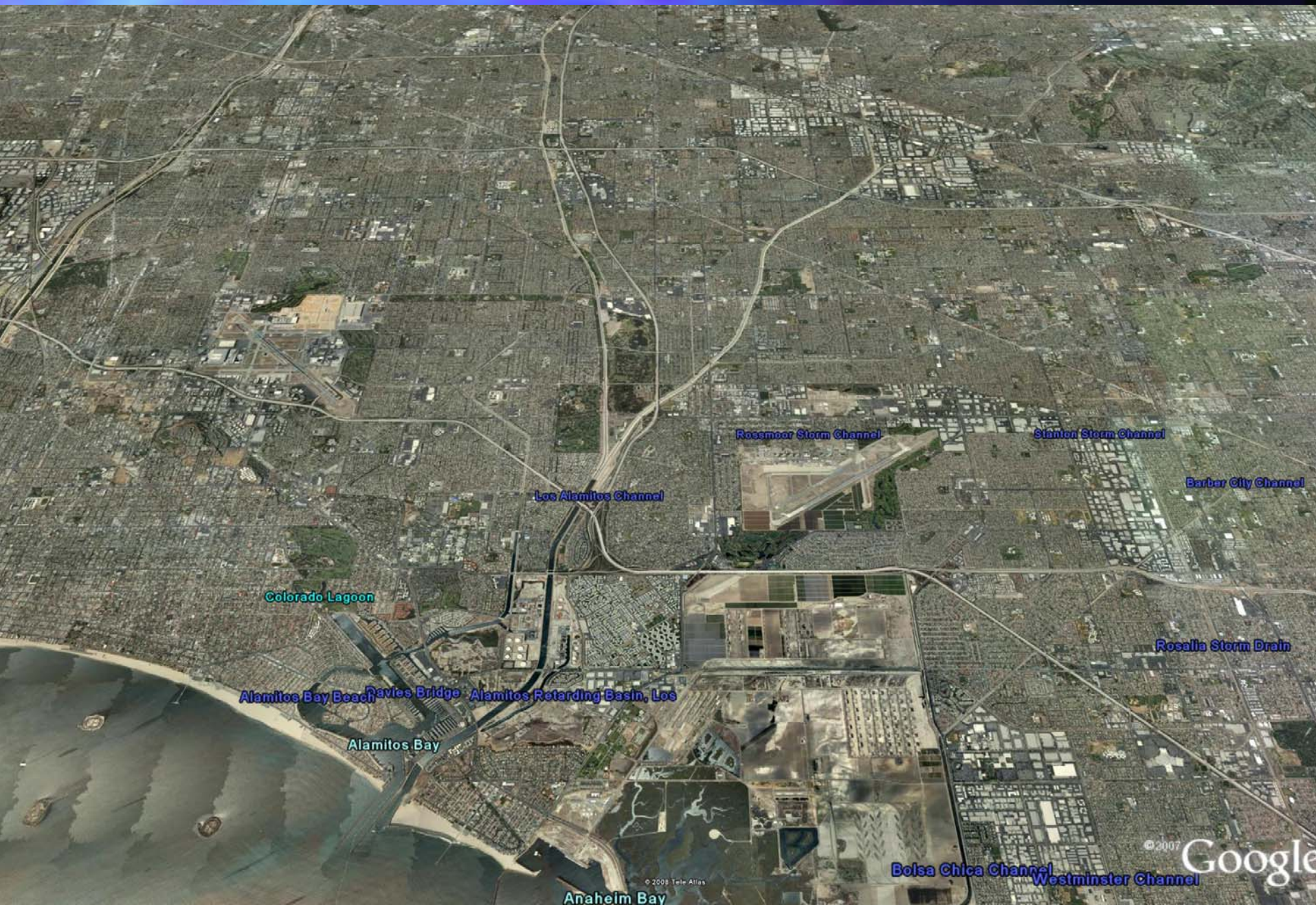
## Watershed Description

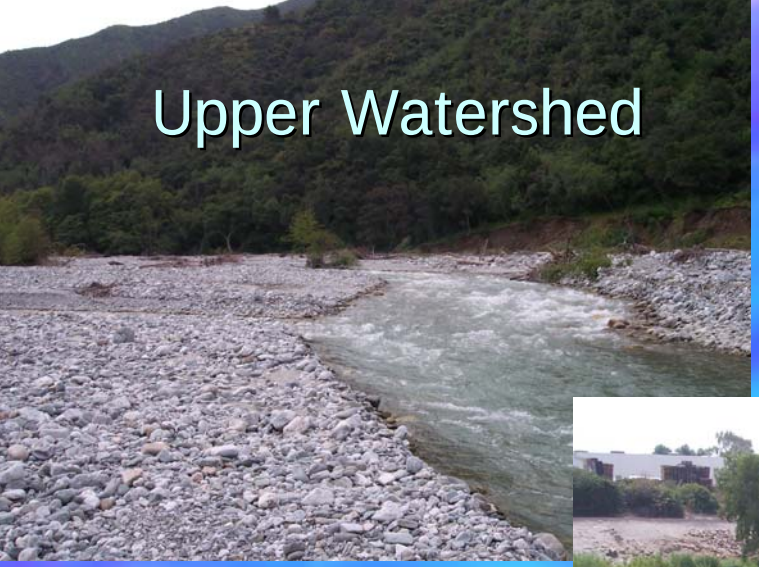
- Hydrology of upper and lower watershed disconnected
  - Upper watershed relatively pristine w/ series of dams
  - Lower watershed mostly channelized
- San Gabriel river discharges to ocean after passing through soft bottom estuary



# SGRRMP Upper & Lower Watershed

# SGRRMP Mainstem




Upper Watershed

Lower Watershed

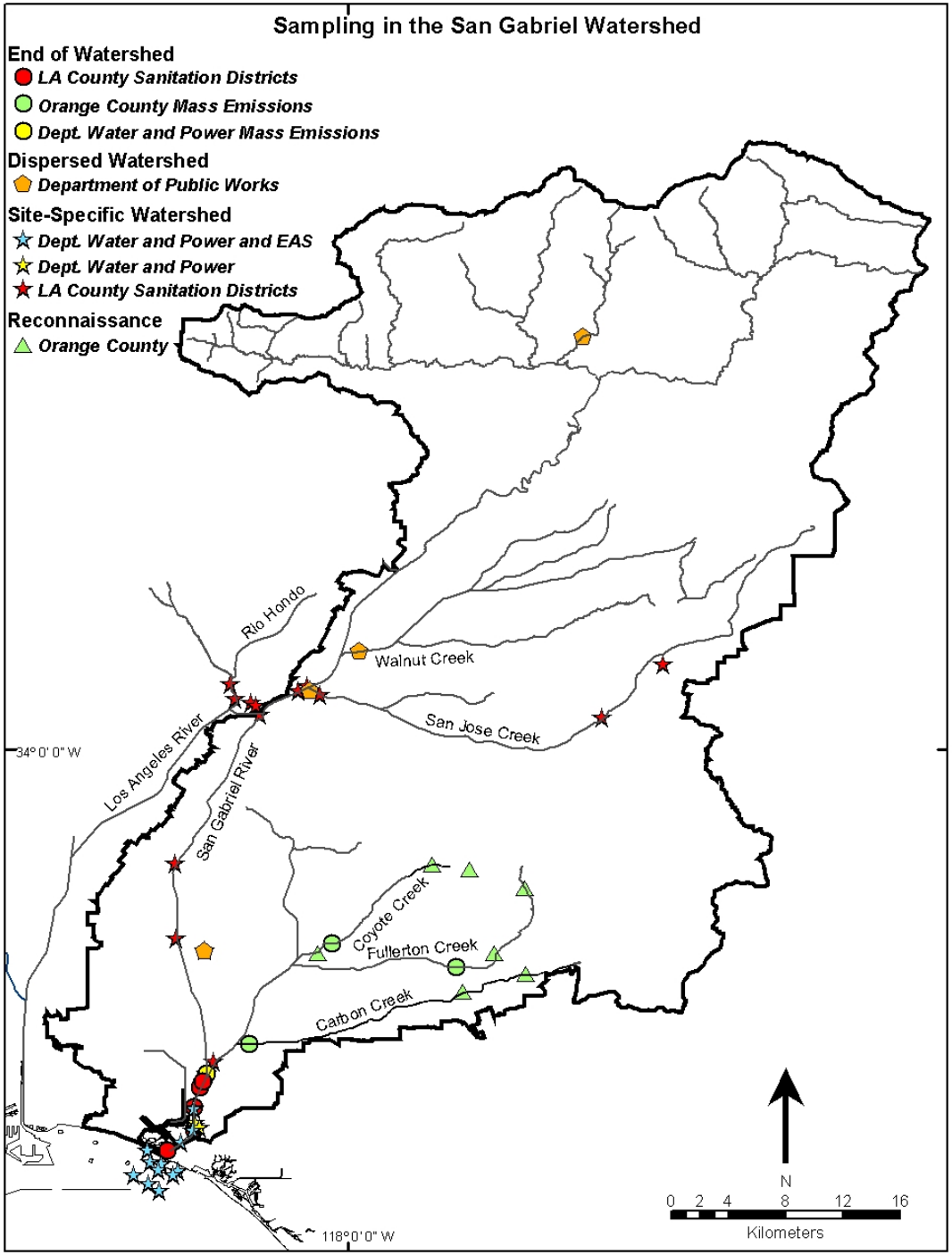
Mainstem

# San Gabriel River Regional Monitoring Program

## Problems with Existing Monitoring

- Lots of existing monitoring
  - 6 agencies
  - 3 citizen groups
- Programs were not coordinated on local, regional or State level
  - Limited data comparability
  - Lack of coordination on constituents sampled
  - No coordinated QA, IM, etc.
- Inefficiencies
  - Redundancies between monitoring programs
  - Majority of the watershed not monitored

# Existing Monitoring



# San Gabriel River Regional Monitoring Program

## Approach

1. Bring together watershed stakeholders
   - vested in water quality and ecosystem health
   - formed SGRRMP Workgroup
2. Compile an inventory of existing effort
3. Develop list of monitoring questions
4. Assess current ability to answer questions
5. Modify or create monitoring designs to effectively and efficiently answer questions
   - integrated designs

# San Gabriel River Regional Monitoring Program

## Stakeholders

- AES (generating station)
- City of Downey
- Friends of the San Gabriel River
- LA & SG Rivers Watershed Council
- Los Angeles County Sanitation Districts
- Los Angeles County Department of Public Works
- Los Angeles Department of Water and Power
- Los Angeles Regional Water Quality Control Board
- Orange County Stormwater Program
- Rivers and Mountains Conservancy
- San Gabriel Mountains Regional Conservancy
- Santa Ana Regional Water Quality Control Board
- SCCWRP
- US Army Corps of Engineers
- US EPA
- US Forest Service

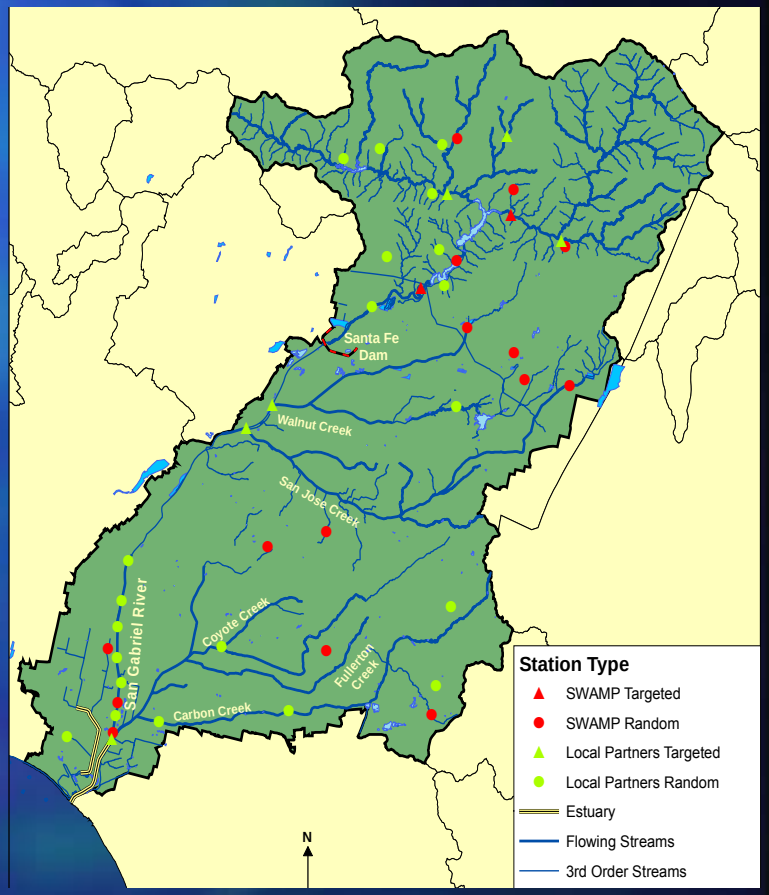
# San Gabriel River
# Regional Monitoring Program
## Monitoring Questions

1. What is the environmental health of streams in the overall watershed?
2. Are the conditions at areas of unique importance getting better or worse?
3. Are receiving waters near discharges meeting water quality objectives?
4. Are local fish safe to eat?
5. Is body-contact recreation safe?

# San Gabriel River Regional Monitoring Program

## Monitoring Design

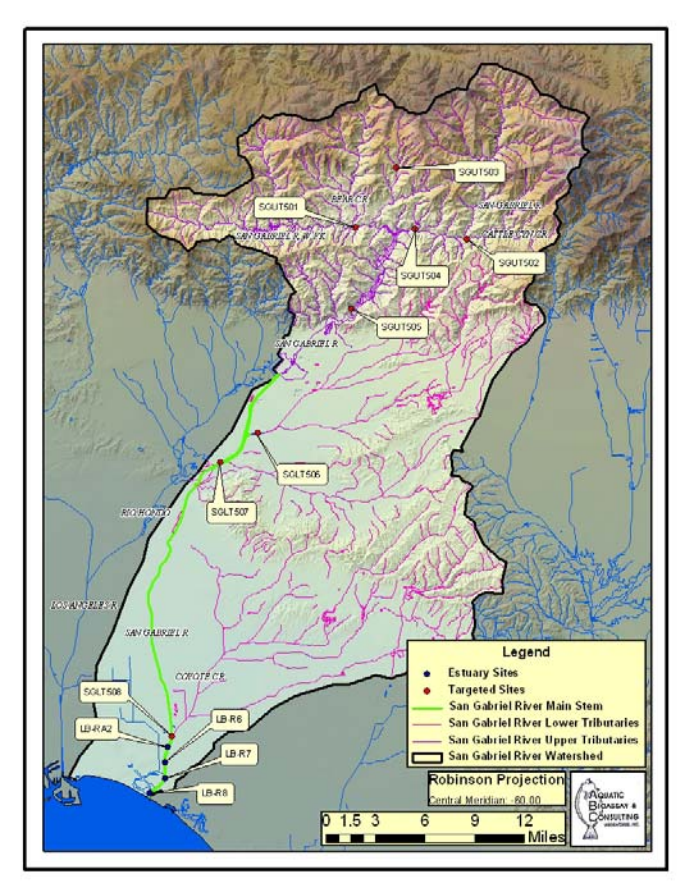
- Question 1: Stream Health?
  - Probability-based design
  - Random allocation of sites
  - Sites change each year
  - 30 sites in first year
  - 10 sites/year thereafter
  - 3 strata
    - Upper watershed
    - Lower watershed
    - Mainstem



# San Gabriel River Regional Monitoring Program

## Monitoring Design

- Question 2: Trends?
  - 12 fixed locations
    - 8 lower & upper watershed
    - 4 estuary locations
  - Monitored annually
  - High use &/or ecological value
    - Confluence points where tributaries meet mainstem
    - Pristine sites in upper watershed
  - Are management changes in the watershed are working?

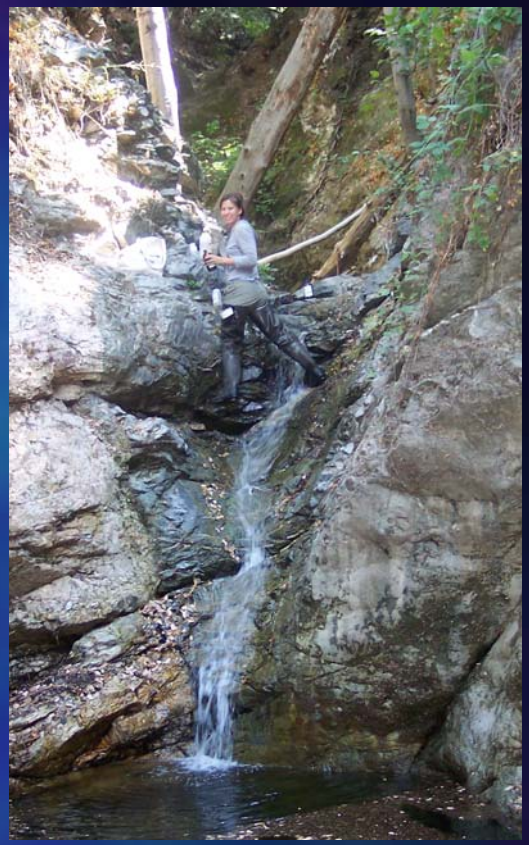


# San Gabriel River Regional Monitoring Program
## Monitoring Design

- Question 3: WQO's being met?
  - Focus primarily on regulated discharges
  - Traditional up / downstream comparisons for chemistry and toxicity
  - Downstream bioassessment monitoring
  - Design modified to:
    - reduce redundancy / improve efficiency
    - increase regional coordination

# San Gabriel River Regional Monitoring Program

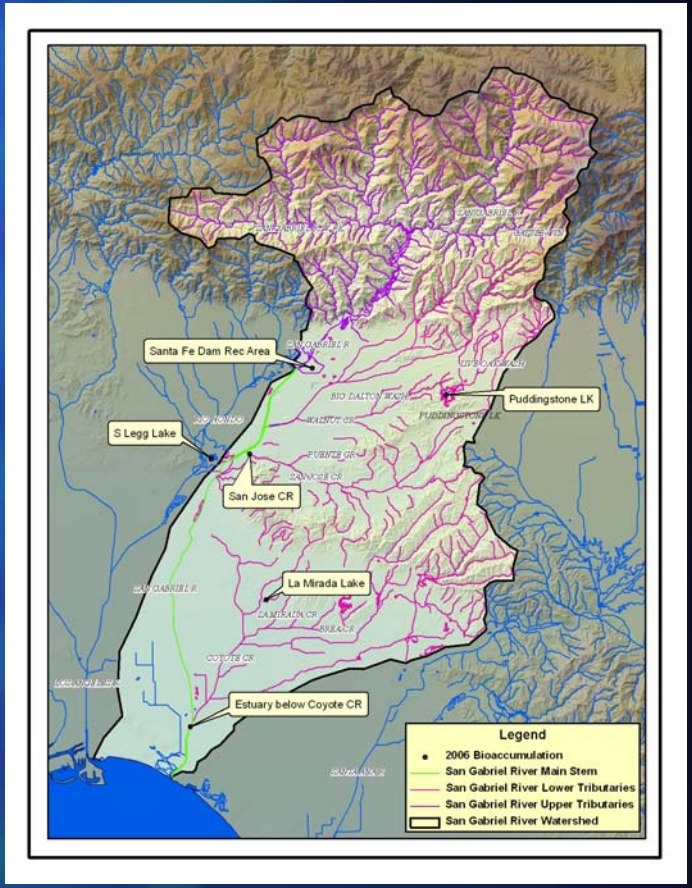
## Questions 1, 2, 3



- Monitoring based on TRIAD
  - Water chemistry
  - Bioassessment
  - Toxicity tests
- Includes physical habitat & CRAM

# San Gabriel River Regional Monitoring Program
## Monitoring Design

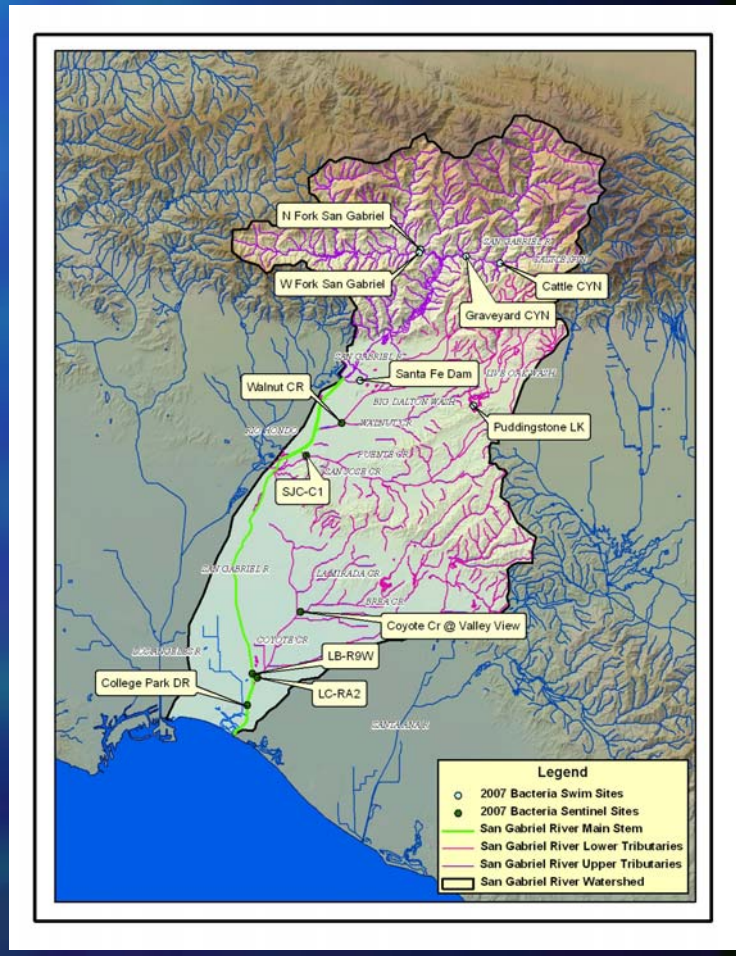
- Question 4: Safe to eat fish?
  - Focus on sites where sport fishing occurs
  - Focus on resident species
  - Focus on chemicals of known risk (OEHHA, EPA)
    - mercury, PCBs, DDT, arsenic, selenium
  - Pilot study (3 years) to establish long-term design
    - what are the current levels?
    - where will fish be collected?



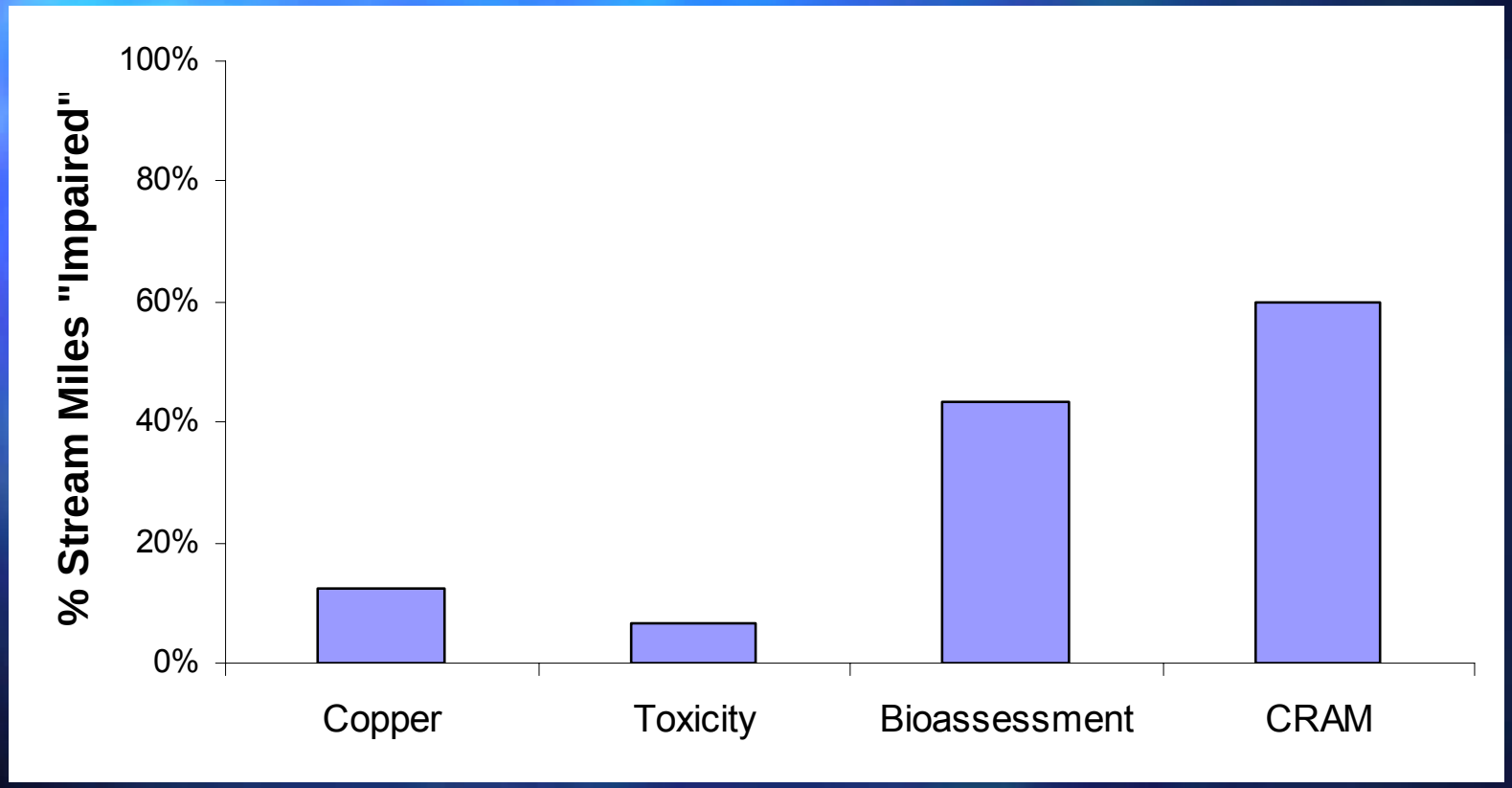
# San Gabriel River Regional Monitoring Program

## Monitoring Design

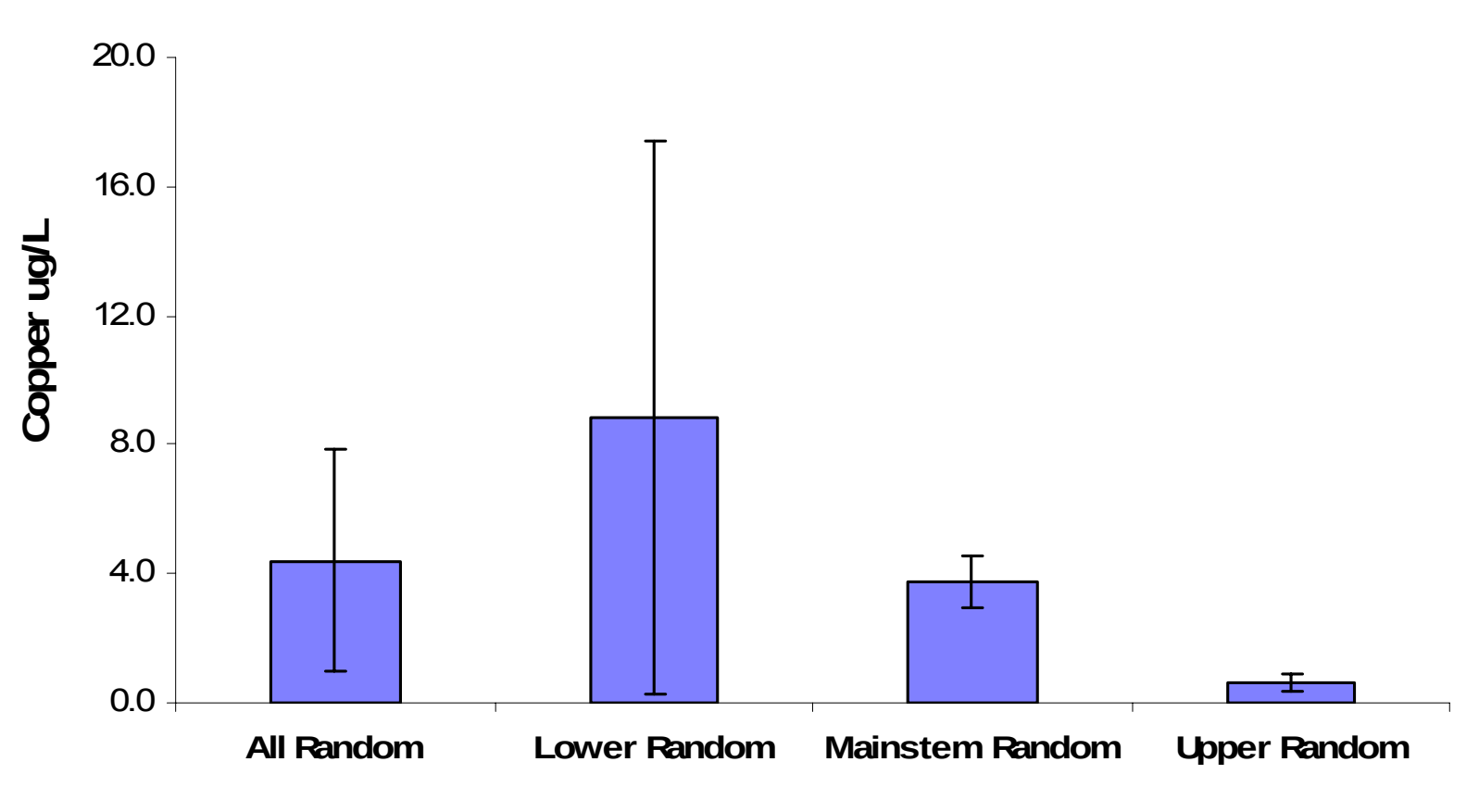
- Question 5: Safe to swim?
  - Focus on sites with heaviest recreational use
    - Puddingstone Lake
    - Santa Fe Dam
    - Upper Watershed
  - Adjust frequency relative to use and proximity to source(s)
  - Measure *E. coli* (MPN/100 mL)



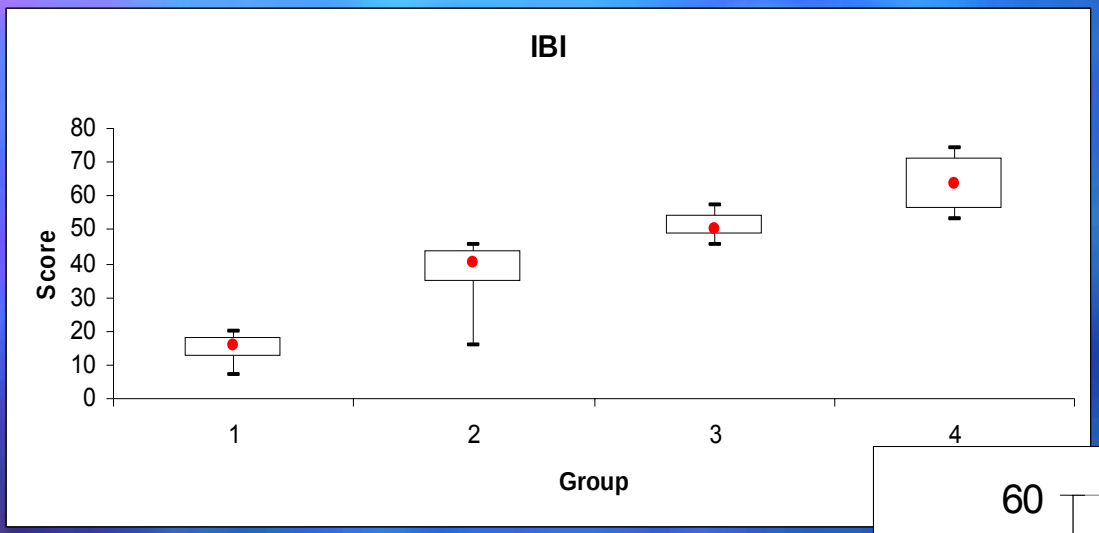
# Question 1: Stream Health
# % Stream Miles Impaired

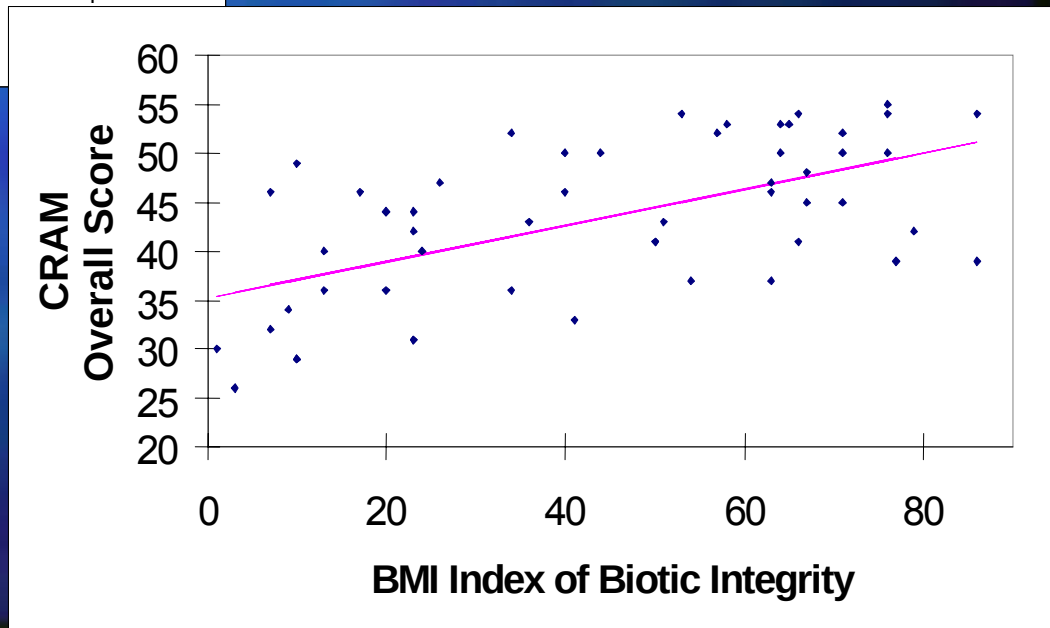


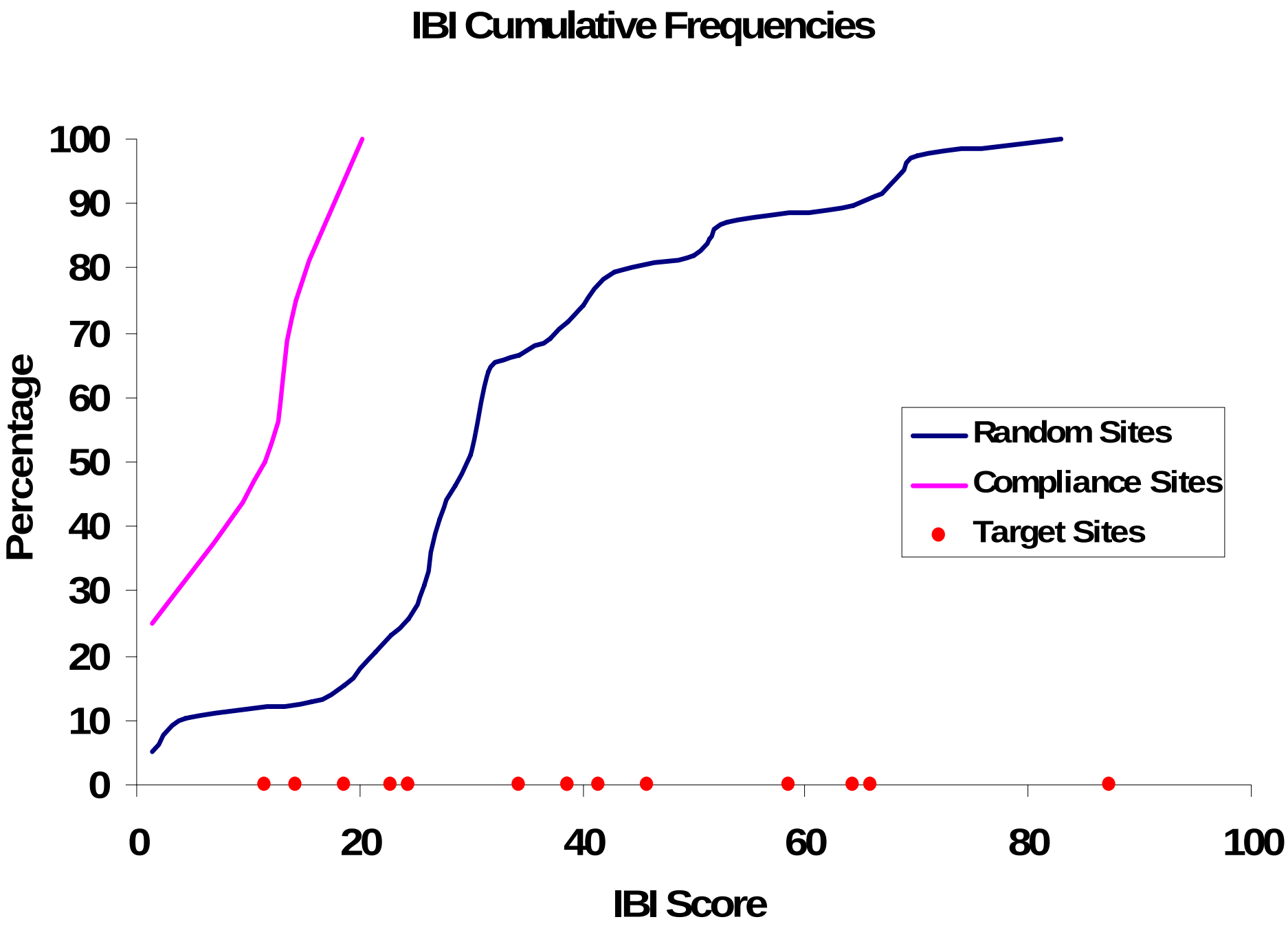
# Question 1: Stream Health Conditions Vary Across Strata



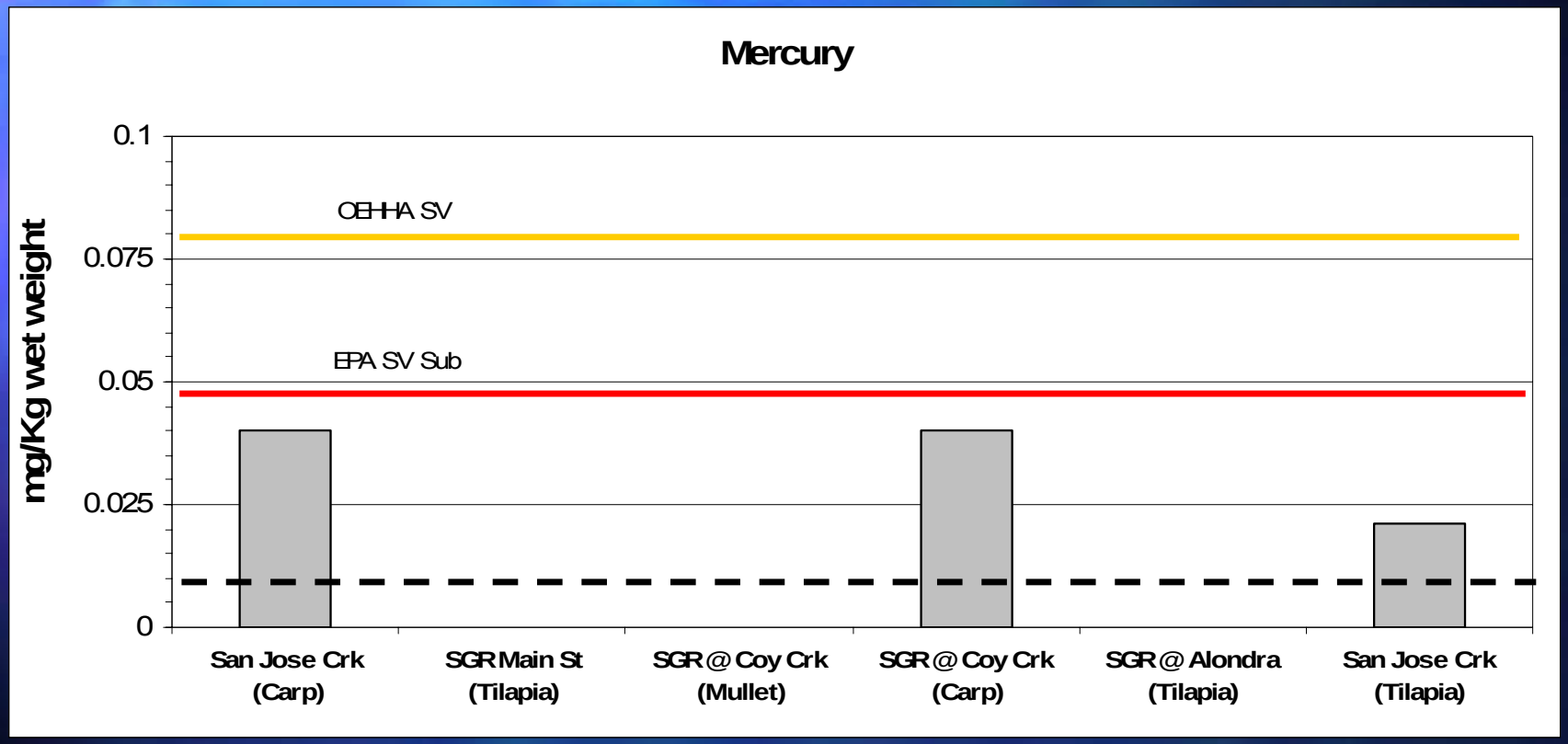
# Question 1: Stream Health Interpreting Stressors



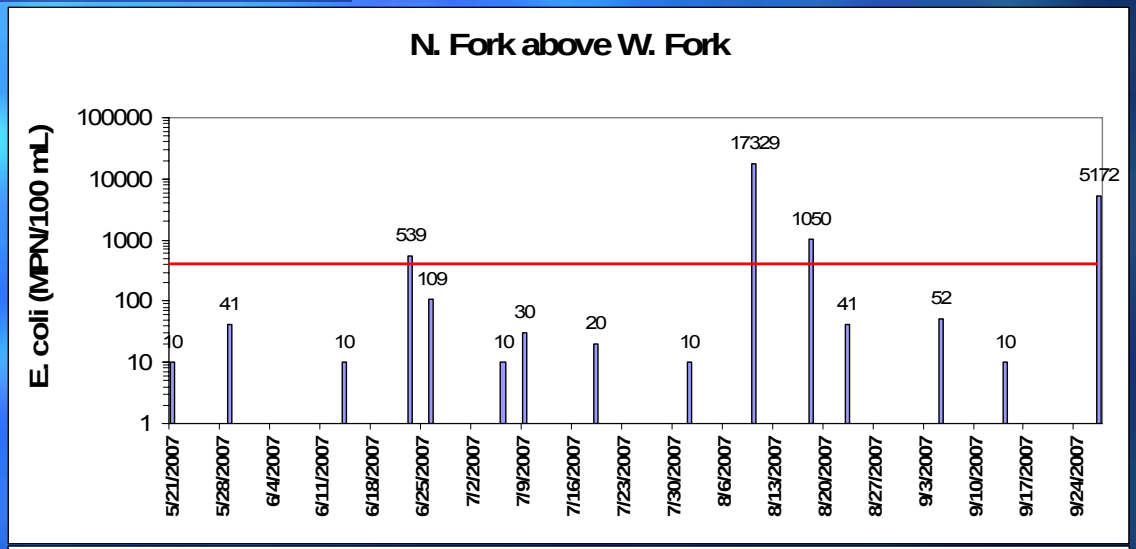



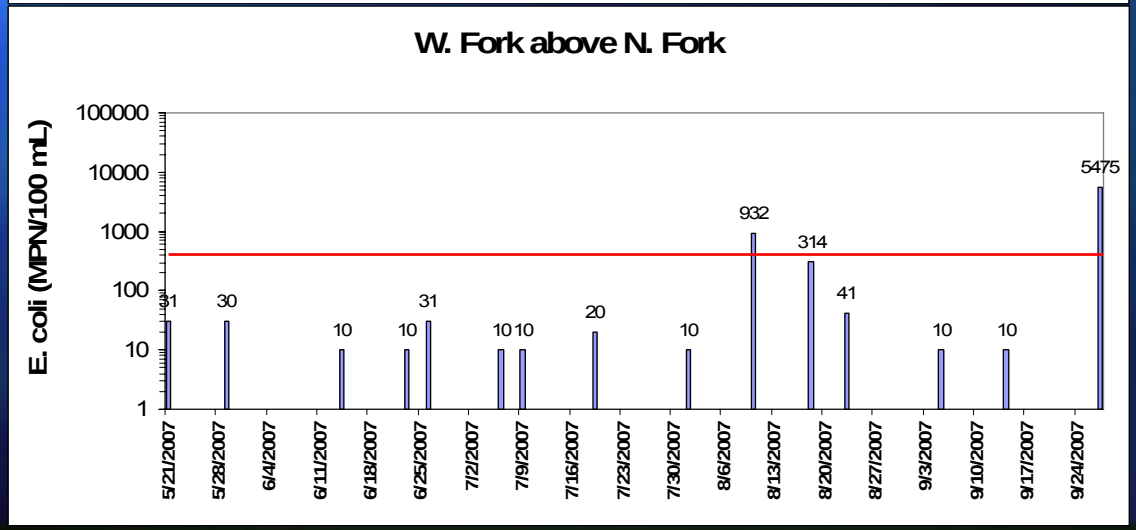

IBI Cumulative Frequencies
Percentage
100
90
80
70
60
50
40
30
20
10
0
0
20
40
60
80
100
IBI Score
Random Sites
Compliance Sites
Target Sites

# Question #4: Safe to eat fish?



# Question #5: Safe to swim?



# San Gabriel River Regional Monitoring Program

## Benefits of Integrated Collaborative Design

- 3 years of monitoring to date
- Ambient assessment provides context for compliance monitoring
- Multiple indicators provides more robust assessment
  - Ability to explore correlations and causative factors
  - Address a range of questions for a variety of audiences
- Shared data synthesis and interpretation
  - Collaborative, “State of the Watershed” report
  - Identification of “Special Studies”
  - Data submitted to SWAMP
- Increased efficiency
  - Reduced redundancy in sampling
  - Standardized methods

# Questions?