DEBRIS IN SOUTHERN CALIFORNIA: FROM THE RIVERS TO THE SEA

BACKGROUND

DEBRIS HAS BECOME A MANAGEMENT FOCUS

- Local Municipality Bans
  - Bag bans
  - Styrofoam bans
  - Cigarette bans
  - Straws
- TMDLs
- Statewide Trash Policy

LACK OF MONITORING

- No regional assessments
  - Local scale
  - Individual surveys lack common protocols
- Best data sets are non-quantative
  - Clean up days
  - Trash on the beach
- Most focus on large stuff

THREE HABITATS

- Rivers and Streams
- Ocean Seafloor Surface
- Ocean Seafloor Sediments

APPROACH TO RIVERS AND STREAMS

- 273 sites were surveyed from 2011-2013
- Stratified Random Design
- 100 foot swath
- All trash was counted and classified into categories

APPROACH TO SEAFLOOR SURFACE

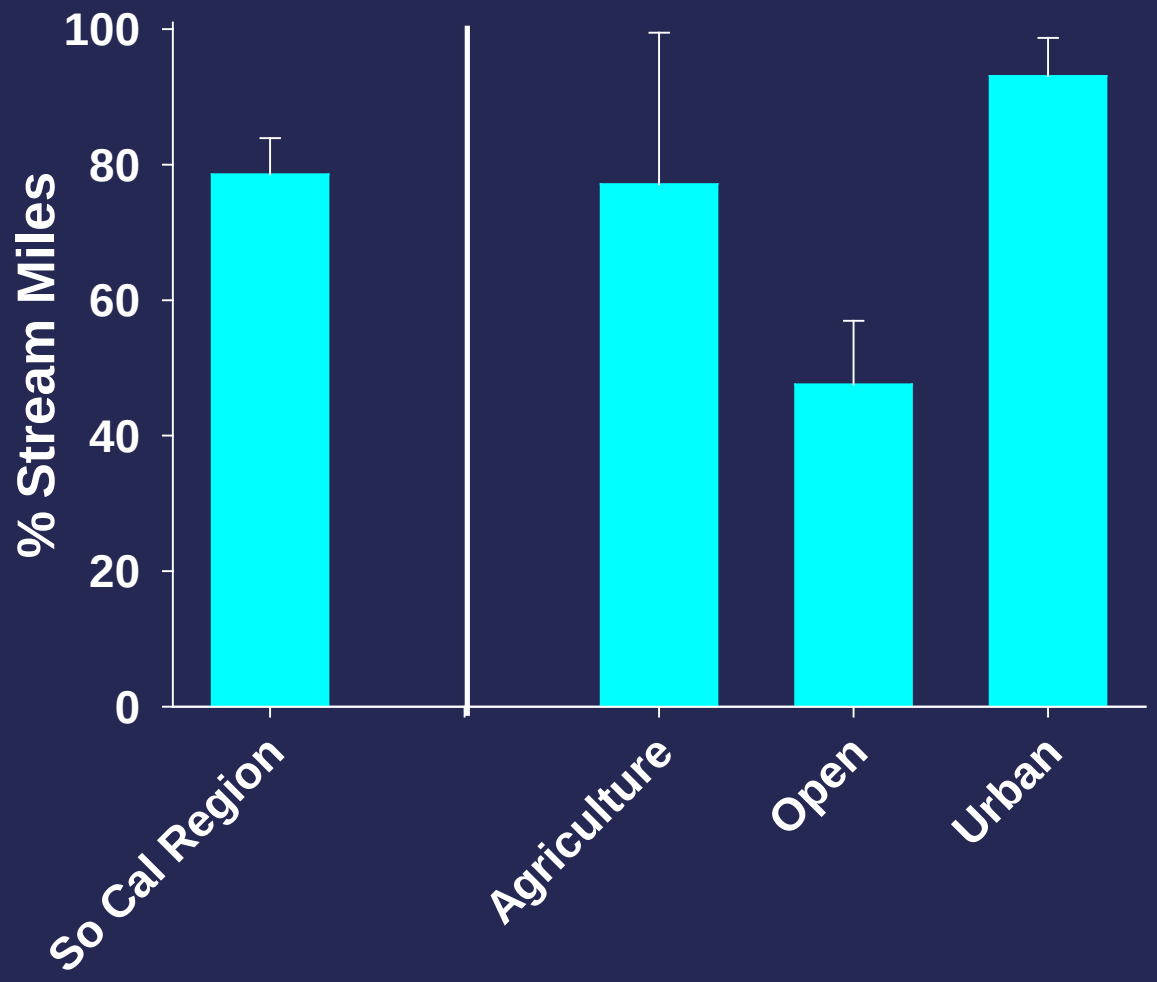
- 164 sites were surveyed by trawl
- Stratified Random Design
- Net with 3.8 cm body mesh and 1.3 cm cod-end mesh towed for 10 minutes
- Debris was categorized and enumerated

APPROACH TO SEAFLOOR SEDIMENT

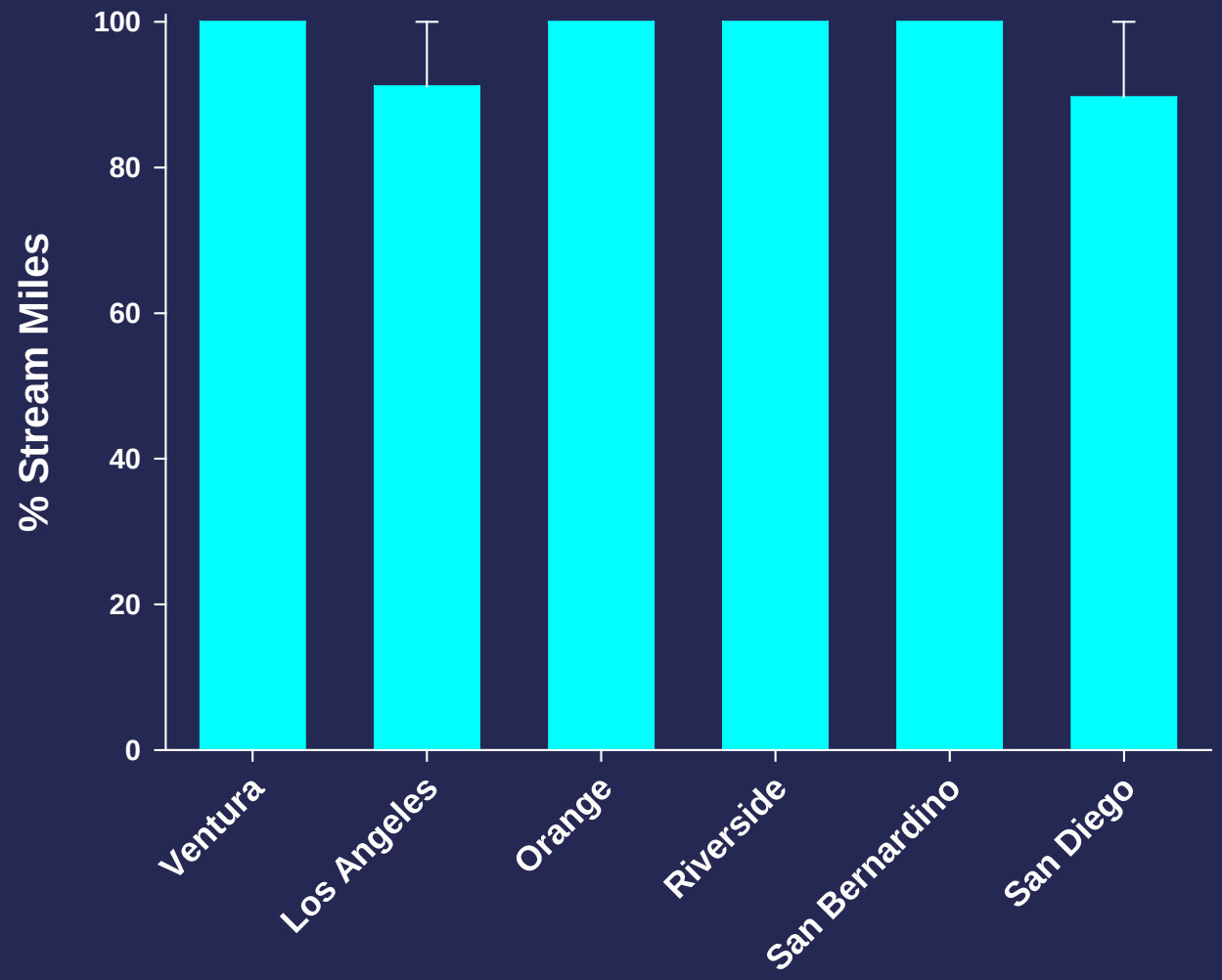
- 358 sites
- Stratified Random Design
- Sediment Grab

- Plastic debris between 1 and 4.75mm was enumerated

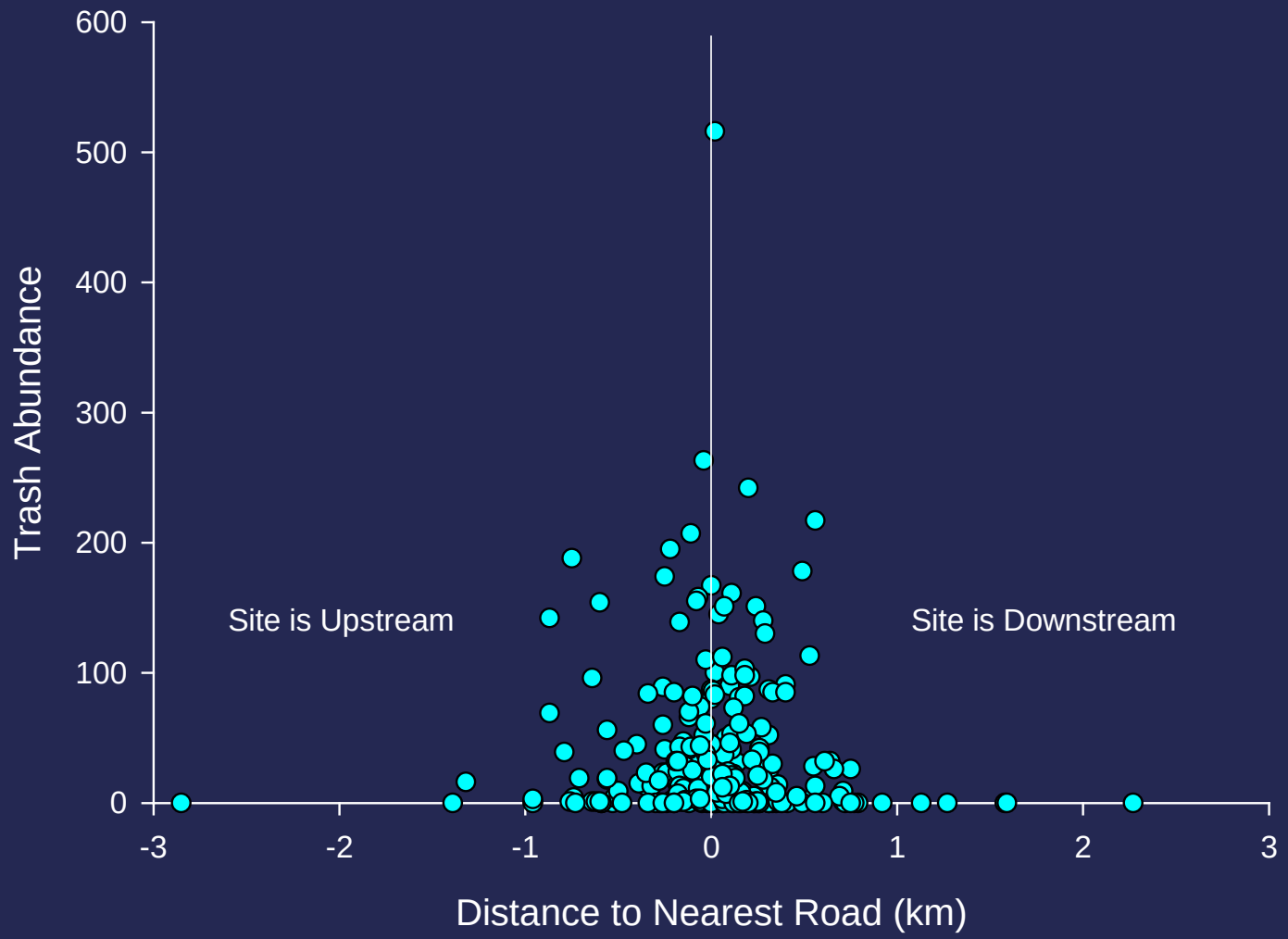
80% CHANCE OF FINDING DEBRIS IN A RIVER OR STREAM



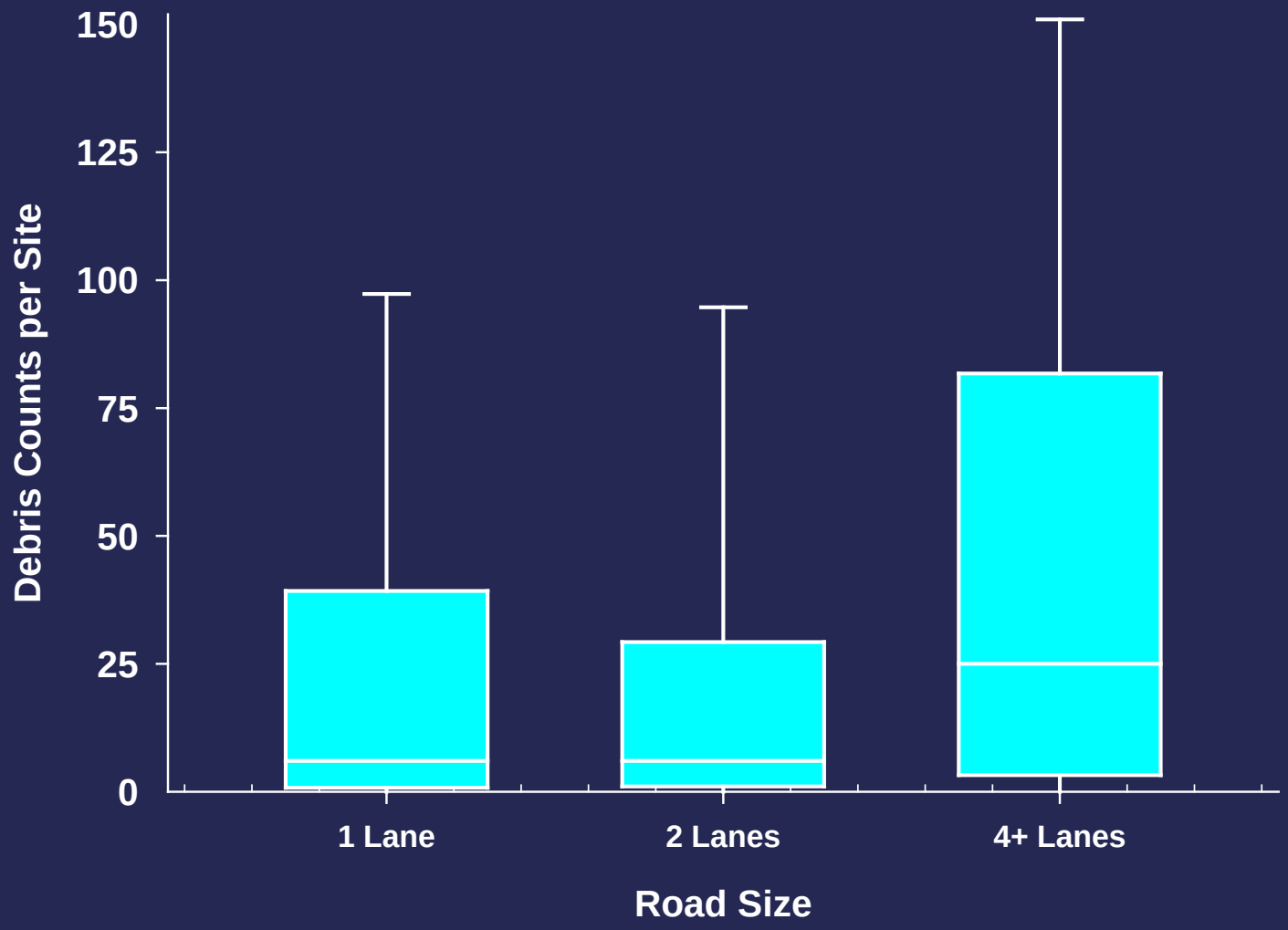
DEBRIS EVERYWHERE IN URBAN AREAS



HIGHER DEBRIS COUNTS CLOSER TO ROADS



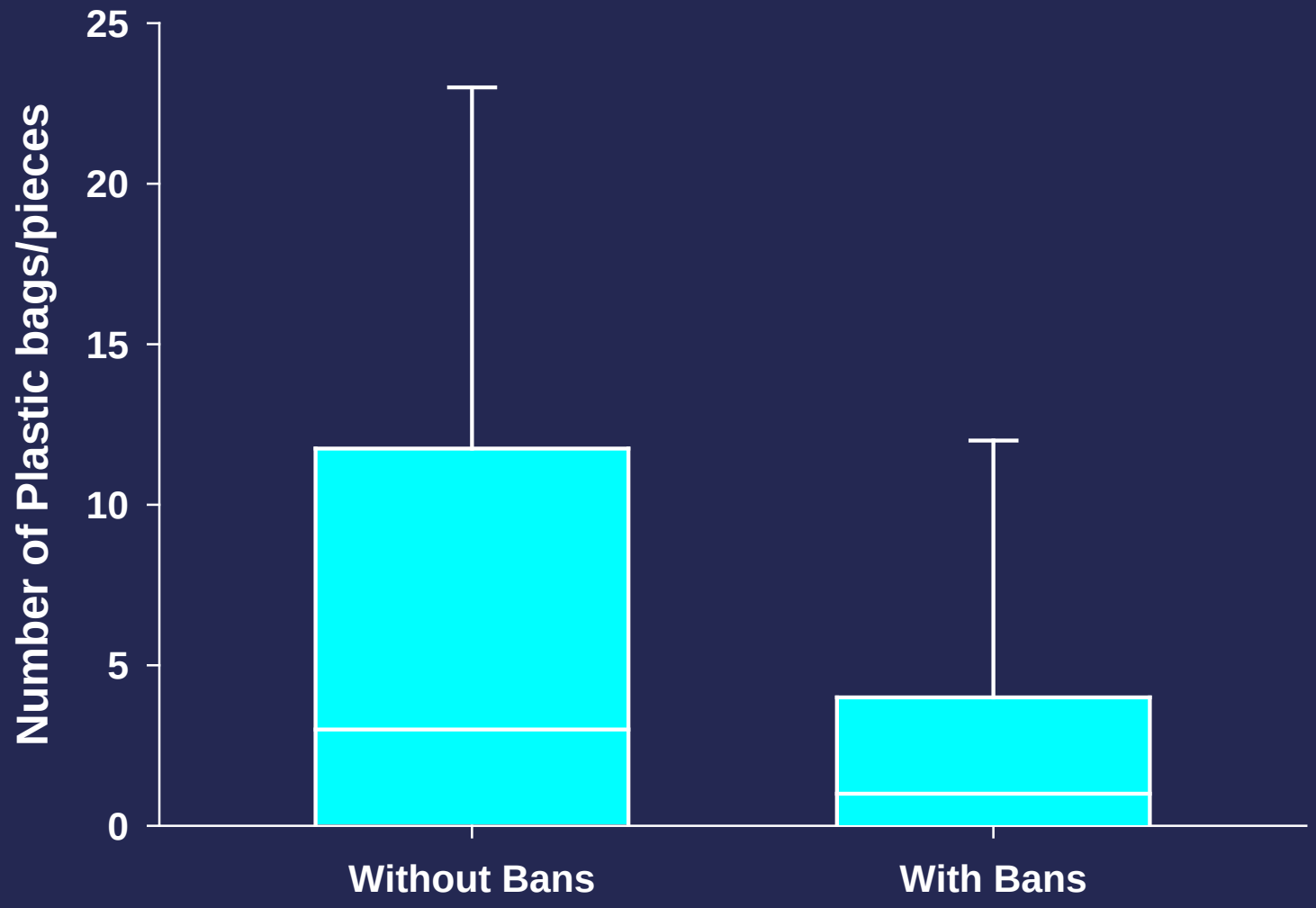
HIGHER DEBRIS COUNTS NEAR LARGER ROADS



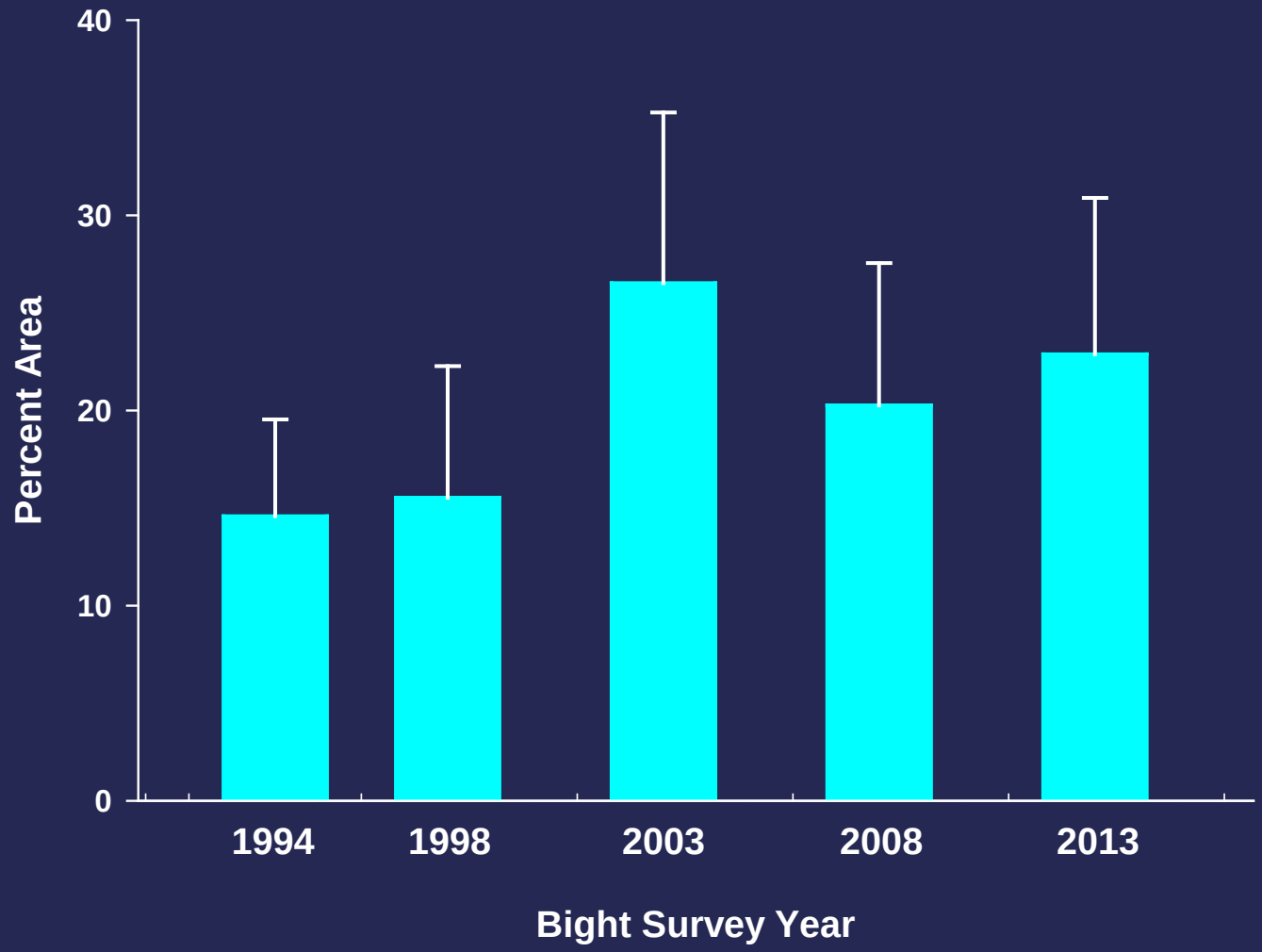
MOST PREVALENT ITEMS

Rank	Debris Item	% Total	% Cumulative
1	Wrappers	14.8	14.8
2	Bags	14.1	28.9
3	Fragments/pieces	9.0	37.9
4	Styrofoam pieces	8.8	46.6
5	Glass pieces	6.7	53.3
6	Sports balls	6.1	59.4
7	Cigarette Butts	5.3	64.7
8	Paper and cardboard	5.2	69.8
9	Plastic Bottles	3.7	73.5
10	Concrete/Asphalt debris	2.1	75.7

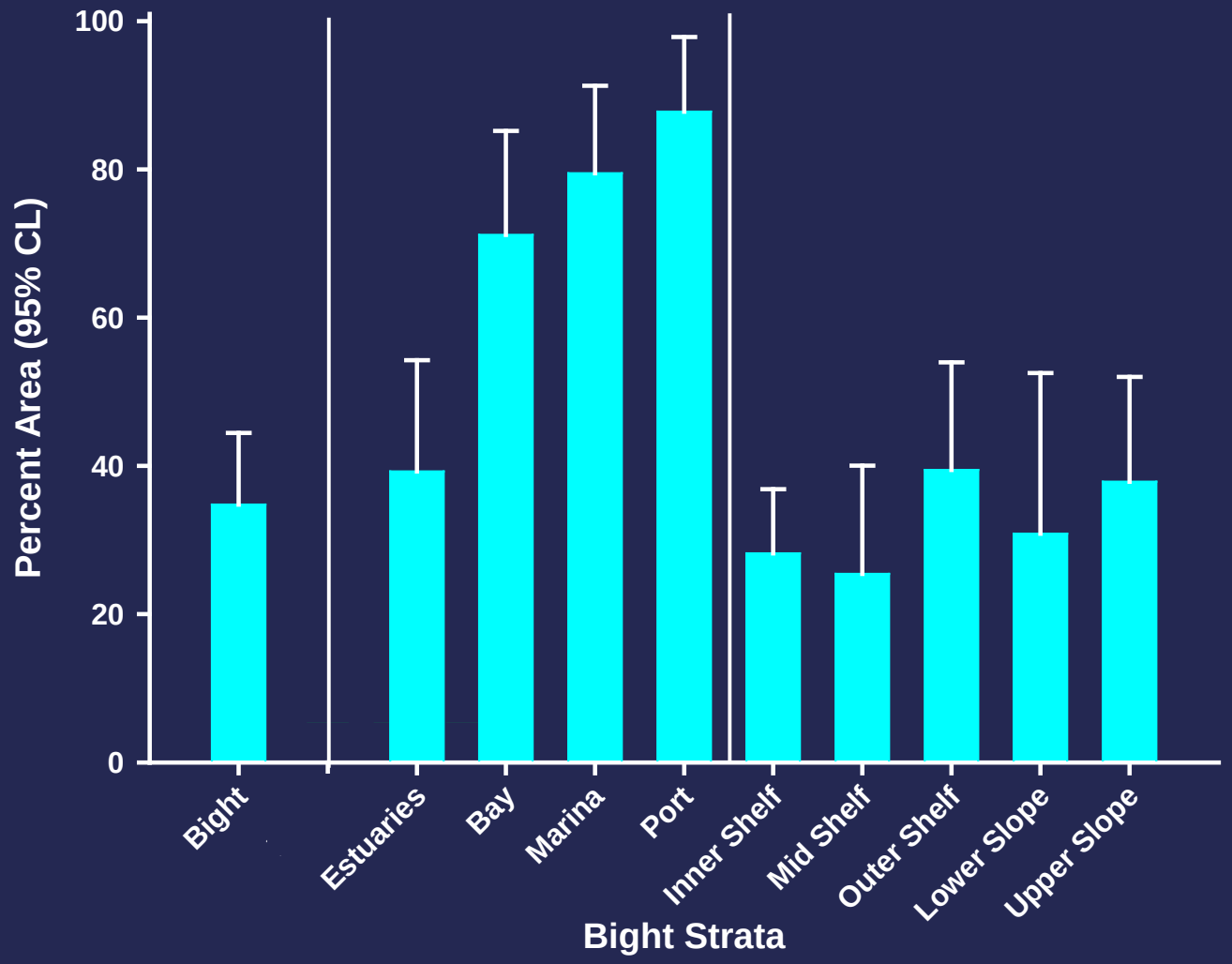
NUMBER OF BAGS/PIECES LOWER IN AREAS WITH BANS



BIGHT SEAFLOOR SURFACE DEBRIS NOT GETTING BETTER



HIGHEST CHANCE OF FINDING MICRO-PLASTICS IN SEAFLOOR SEDIMENTS IS IN THE EMBAYMENTS



BIGHT 13 FINAL THOUGHTS

- Provided the first regional assessment
- We now have standardized methods
  - 20+ organizations know how to measure debris in three habitats
- Baseline for the future

BIGHT 18 INTERESTS

- Trash in Rivers/Streams
- Continue trend data on epibenthic debris
- Microplastics
  - Wastewater
  - Rivers
  - Ocean
- Study plastic ingestion by mussels

California Trash Monitoring Methods Development and Validation: A Project Update

Shelly Moore
Southern California Coastal Water Research Project

Tony Hale
San Francisco Estuary Institute

Holly Wyer
California Ocean Protection Council

STATEWIDE STANDARDS FOR TRASH MONITORING METHODS PROJECT

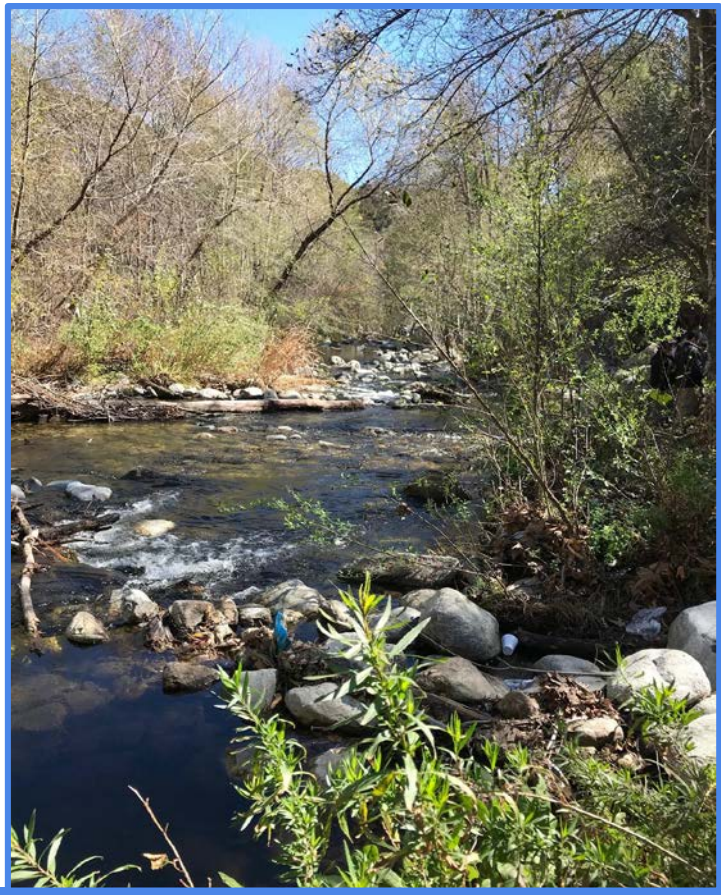
- **Funder:**
  - **Ocean Protection Council**
- **Project Leads:**
  - **Southern California Coastal Water Research Project (SCCWRP)**
  - **San Francisco Estuary Institute (SFEI)**
- **Partner Agency:**
  - **State Water Resources Control Board**

STATEMENT OF PROBLEM

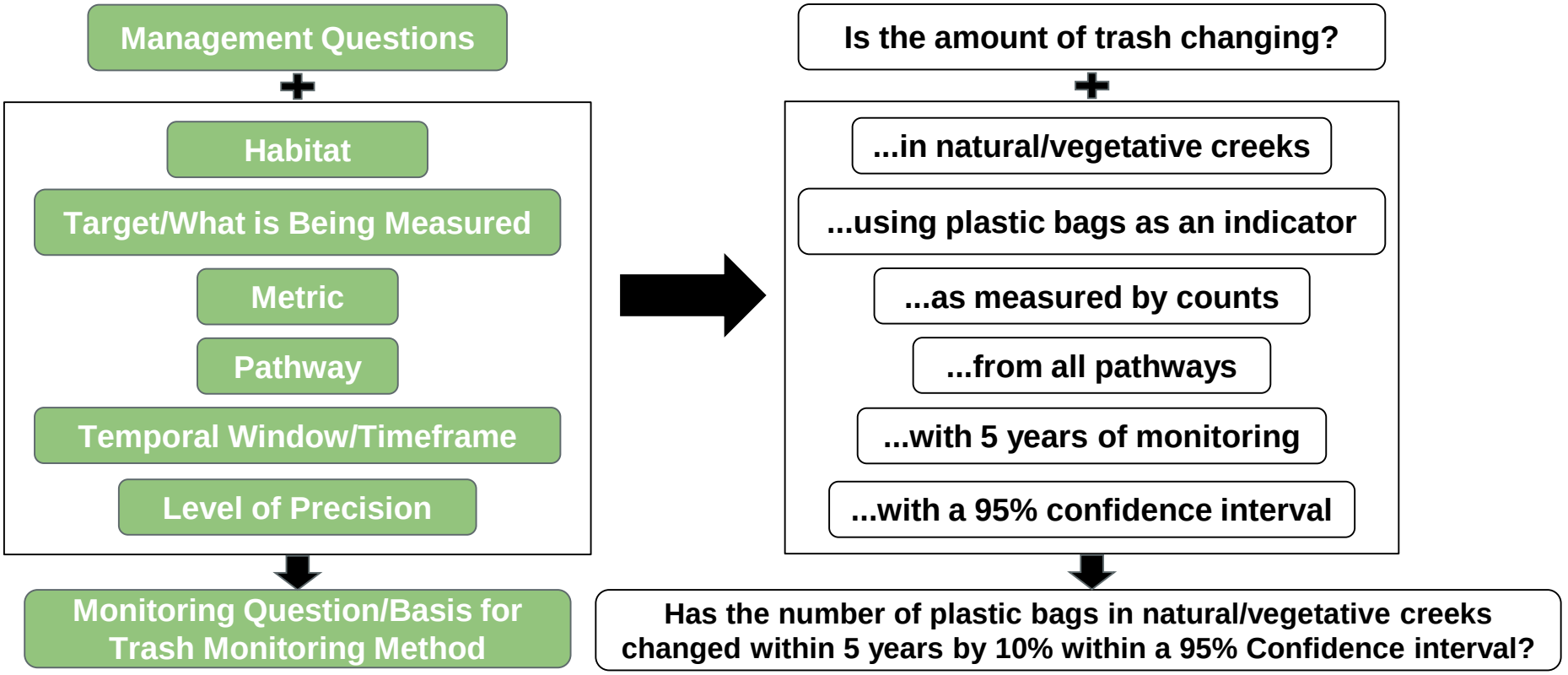
- Wide variety of considerations when monitoring trash
  - What are the management questions?
  - Which habitats are of concern?
  - What monitoring resources are available?
- Methods are developed independently of one another
- We recognize a need to identify/develop standardized monitoring methods to allow for optimum level of comparability spatially and temporally

STAKEHOLDER MEETING APRIL 2017

- Questions
  - How much trash is out there?
  - At what rate is it changing?
  - What are the sources of trash (how much does the source contribute)?
  - What are the most effective management actions?
  - What is the effect or cost of trash impacts?
- Habitats
  - Primarily interested in receiving waters
  - Applicable throughout California
- Methods of interest
  - Evaluate currently used methods
  - Investigate new innovative methods



TRANSLATING MANAGEMENT QUESTIONS INTO MONITORING SCIENTIFIC QUESTIONS



APPROACH

- Field test four methods
  - Qualitative
  - Quantitative
    - Counts
    - Volume
  - Unmanned Aerial Vehicles
- Bring together a Technical Advisory Committee of experts
- Involve Stakeholders
  - Inform and solicit feedback
  - Participate in field testing

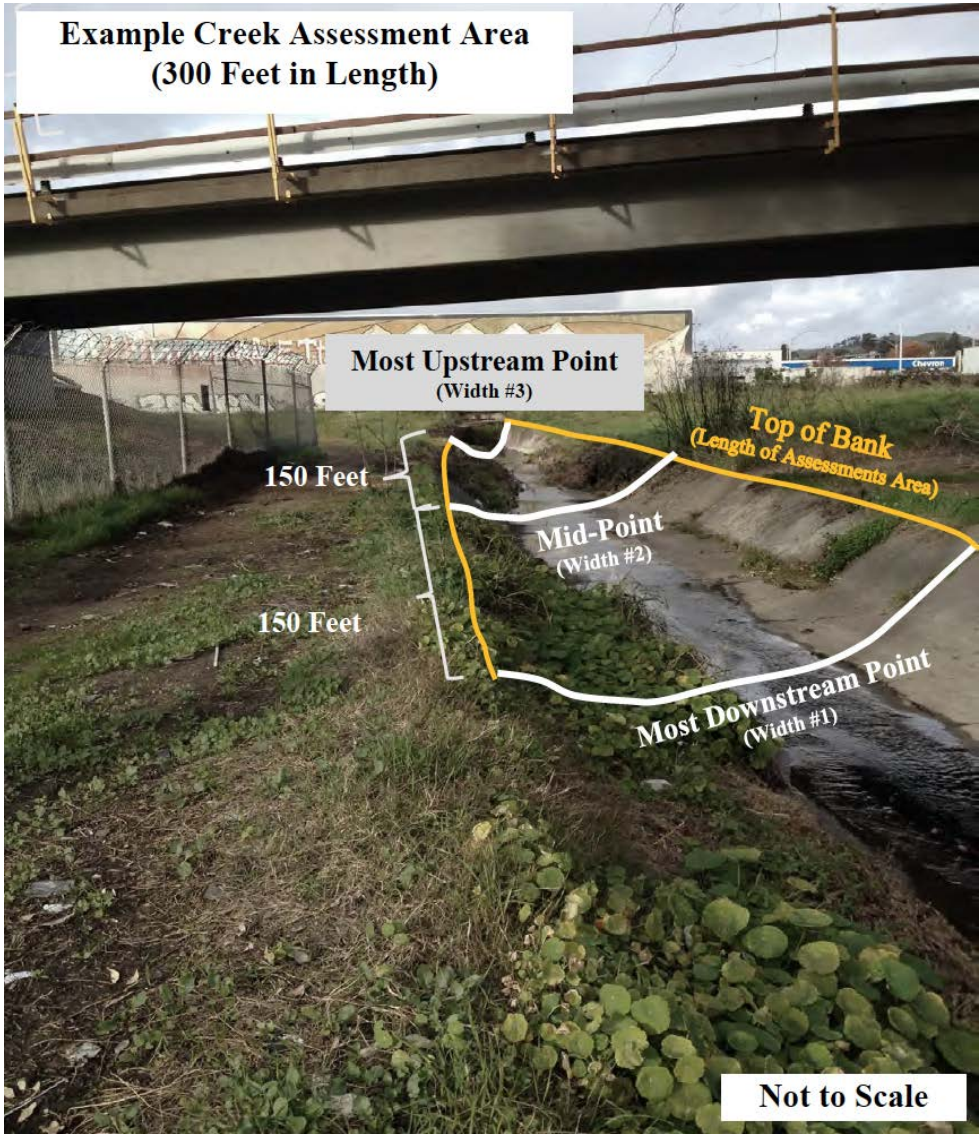


Photo taken from the BASMAA Receiving Water Trash Monitoring Program Plan for the San Francisco Bay Region.

PRODUCTS

- Playbook for Trash Monitoring
  - Standard Operating Procedures for each method
  - Includes information to help stakeholders choose their method
  - Recommends data management and analysis standards to allow for comparability
  - Usable by a variety of stakeholders

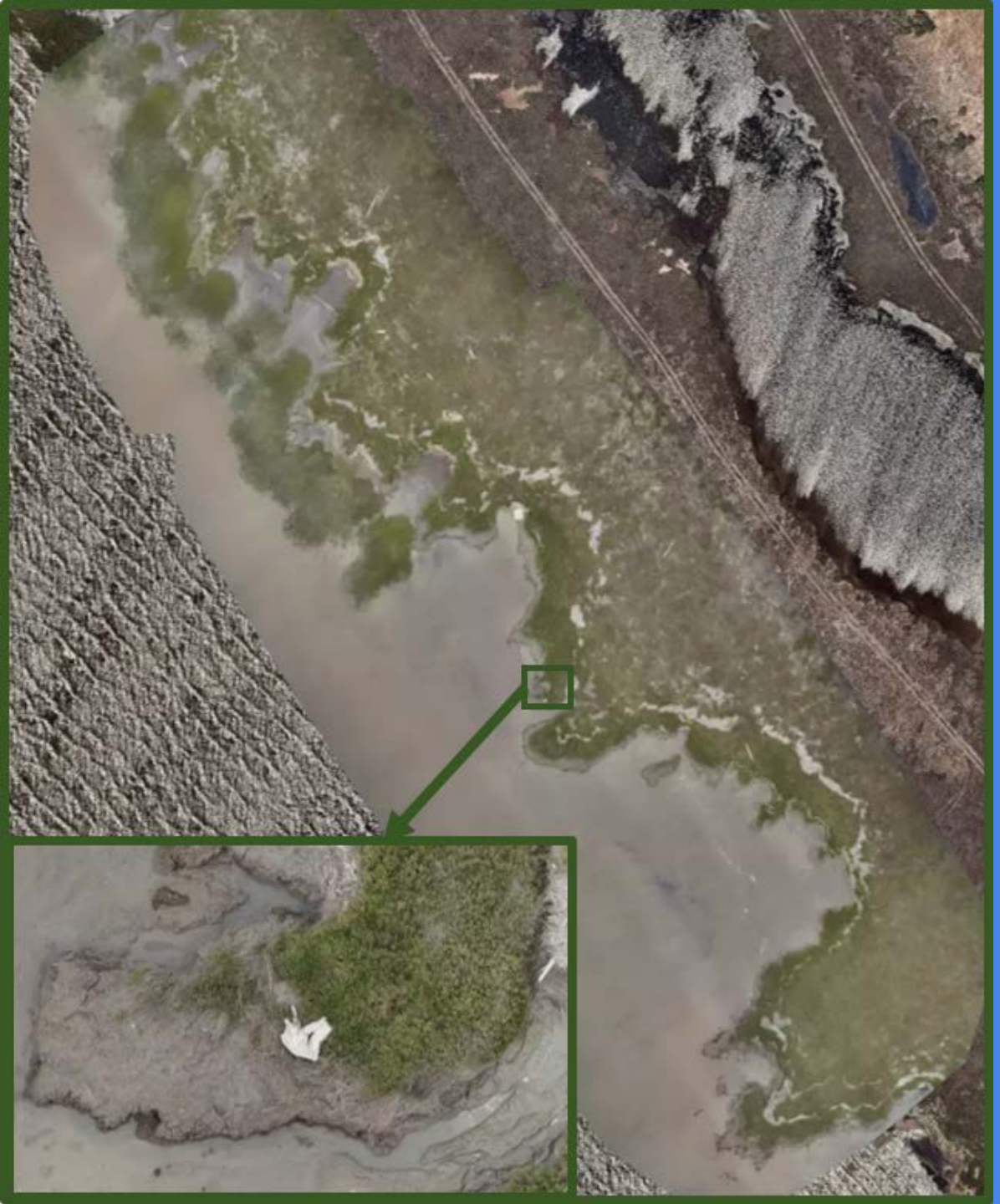
- Outreach and Training
  - Modules with instruction on each method
  - Meetings with a variety of stakeholders to share project information

COMPARISON TABLE / MATRIX

METHOD	MONITORING QUESTIONS	BIAS	REPEATABILITY	RESOURCES
A				$$$$$ 
B				$$$ 
C				$$ 
D				$ 

Current Status

- Trash Assessments
  - Approaching the conclusion of our first season of monitoring
- Novel method development
  - Assembled an image library
  - Beginning annotation work
  - Algorithm development will follow
- Communication
  - Continuing project outreach via meetings, website development, and newsletters



FOR MORE INFORMATION AND UPDATES

- Visit trashmonitoring.org
- Sign up for Newsletter
- Contact:
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  - Holly Wyer, OPC - Holly.Wyer@resources.ca.gov