

# San Diego Bay Debris Study

## Presentation at the Trash Amendment Monitoring Workshop

April 18, 2017

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Amec Foster Wheeler

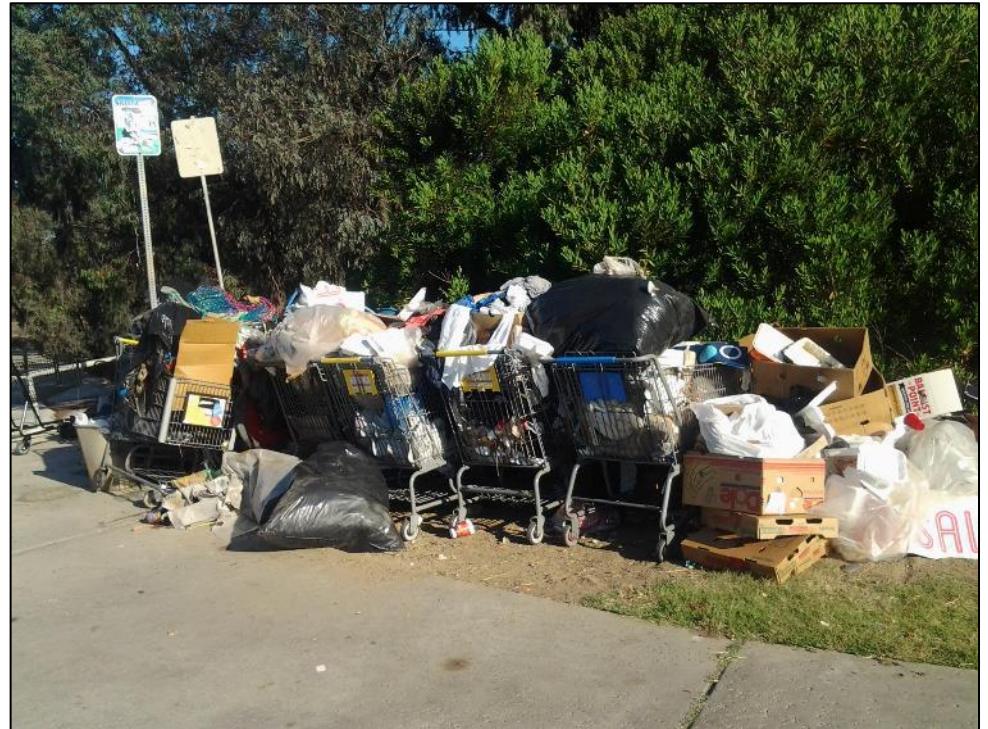




# Presentation Outline

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- 1) Project Review
- 2) Results
- 3) Lessons Learned



# Study Goals

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- ▶ Complete first comprehensive survey of bay and watershed receiving waters
  - ▶ (Apr 2014 to Oct 2016)
- ▶ Establish a baseline to assess against future changes
- ▶ Assist municipalities in prioritizing locations for future trash controls



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# Stakeholder Workgroup





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# Technical Advisors

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## **Dr. Sherry Lippiatt**

California Regional Coordinator at  
NOAA Marine Debris Program



## **Dr. Brock Bernstein**

Independent Consultant  
Program Design and Evaluation



## **Shelly Moore, M.S.**

Bight '13 Marine Debris  
Lead Scientist



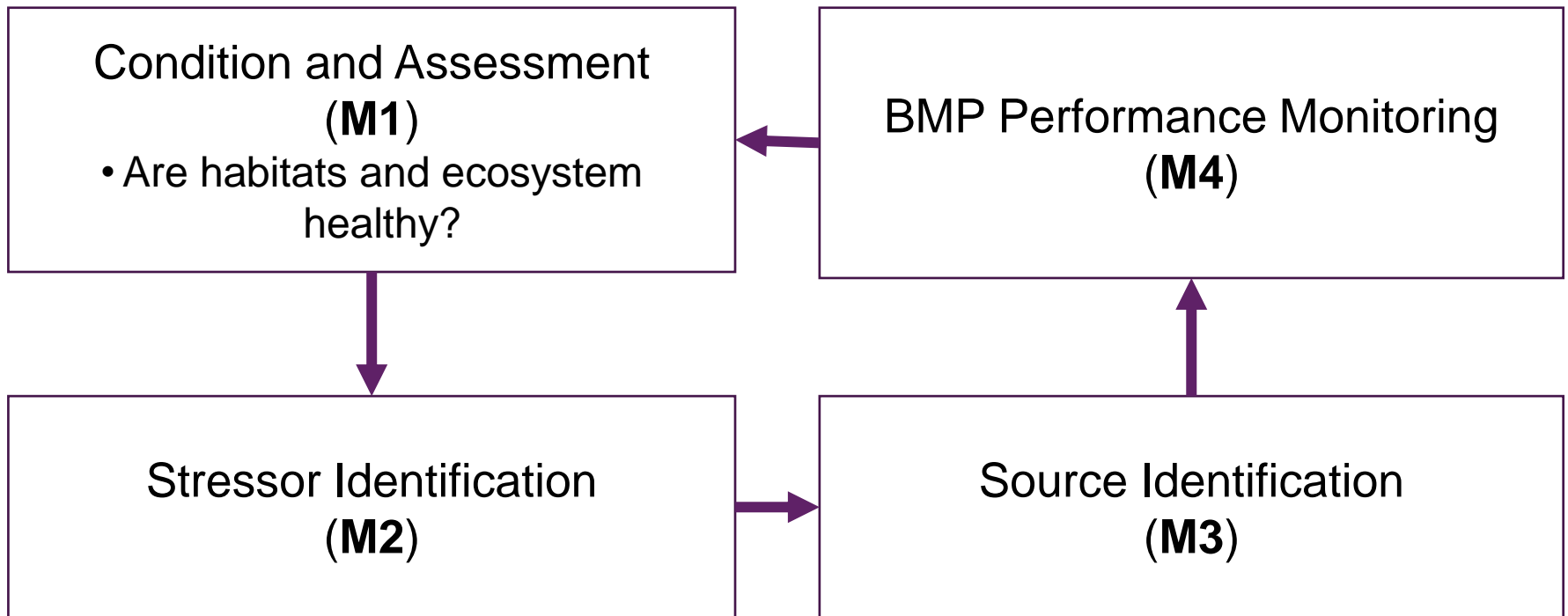


# Study Implementation Framework

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## San Diego Regional Board, Practical Vision 2013

### Water-Body Oriented Monitoring and Assessment Metrics (M)



# Study Questions

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- 1) *(Status) How do the quantities and types of debris in different habitats vary during dry and wet season?*
- 2) *(Transport) What types of riverine debris do wet weather flows transport to the bay?*
- 3) *(Fate) What species caught in the bay has ingested plastic pieces?*

# Study Design

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- ▶ Probabilistic and targeted based sites within key habitats of interest
- ▶ Pre- and post-storm surveys in open water, intertidal, and riverine habitats
- ▶ Continuous collection in bay to record seasonal variations



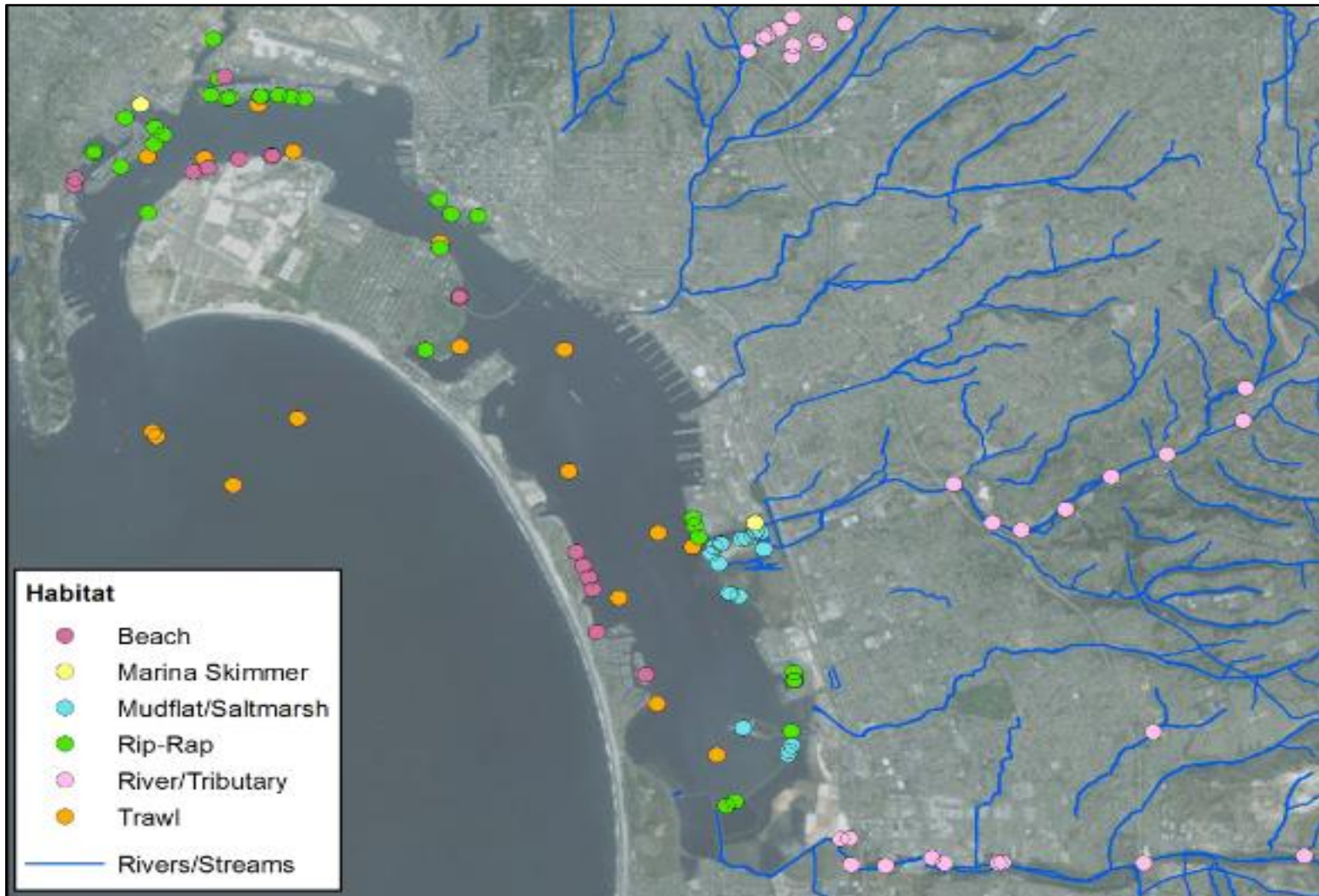
# Methods

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- ▶ Standard methods from:
  - ▶ (Riverine) SWAMP Rapid Trash Assessment
  - ▶ (Shoreline) NOAA Marine Debris Program
  - ▶ (Marina) Automated trash skimmers
  - ▶ (Open Water) So Cal Bight Program Trawls
  
- ▶ Trash type (e.g. plastic bags), count, and volume
  
- ▶ Debris sizes
  - ▶ macro-plastics(>25 cm),
  - ▶ meso-plastic (25 cm – 5 mm),
  - ▶ micro-plastic ( 5 mm – 0.35 mm)
  
- ▶ Tested alternative methods in small number of habitats



# Study Locations





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# Conditions Monitoring (M1): Bay

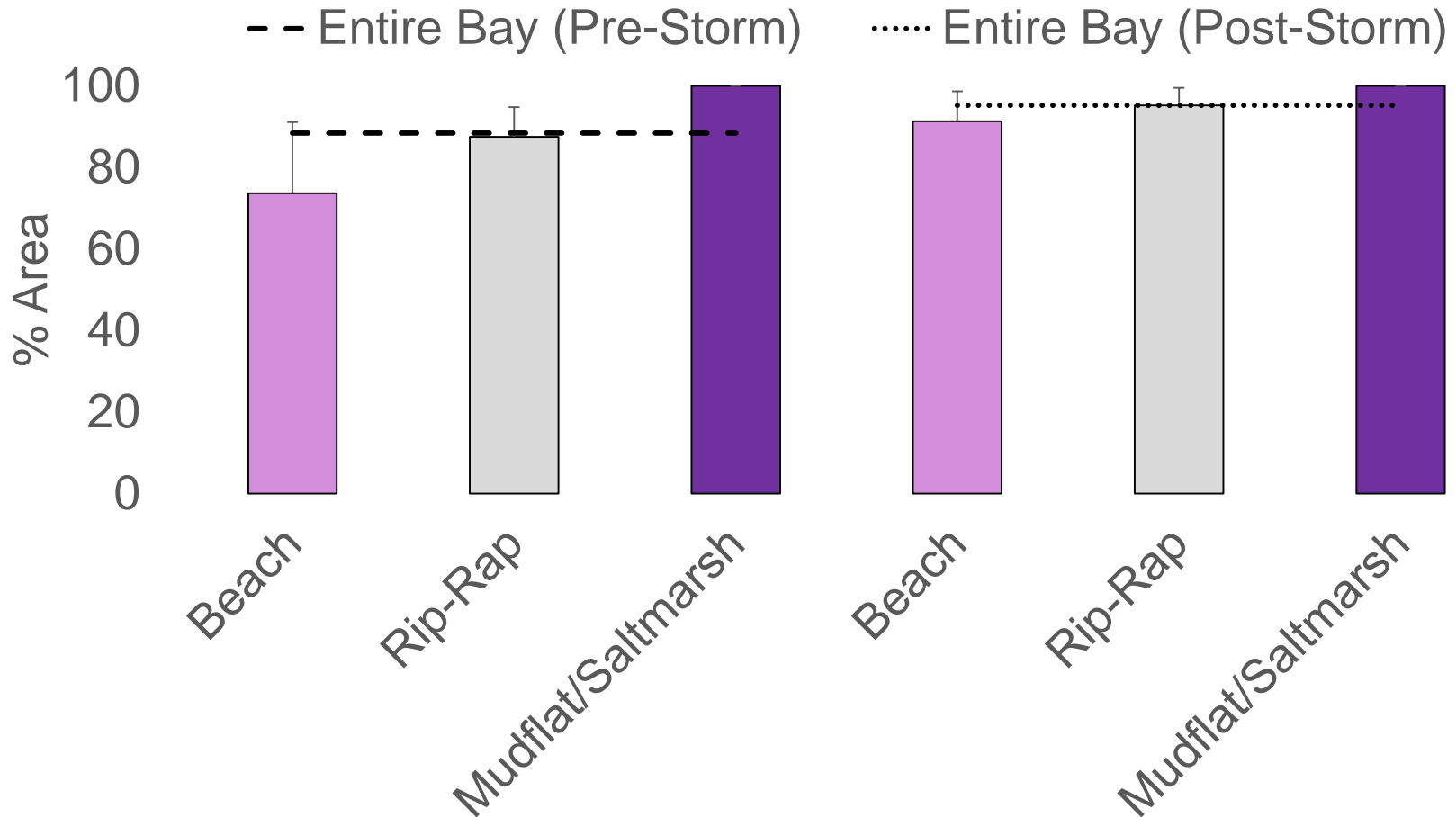


Paradise Marsh



# Trash Characterization within the Bay

## Percent Bay Area Covered by One or More Plastic Pieces





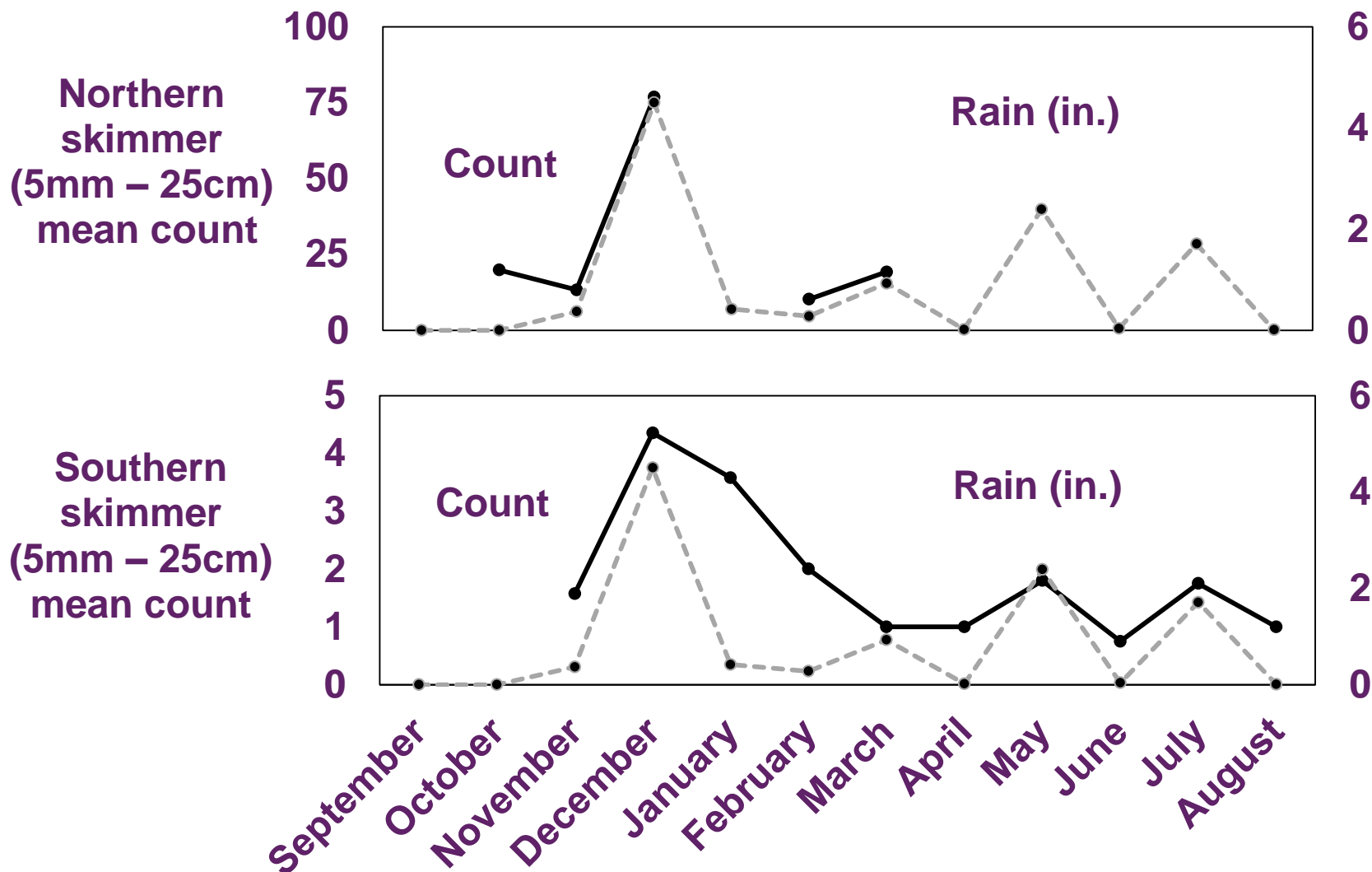
# Trash Characterization along Intertidal

## Highest debris amounts located along wrack line



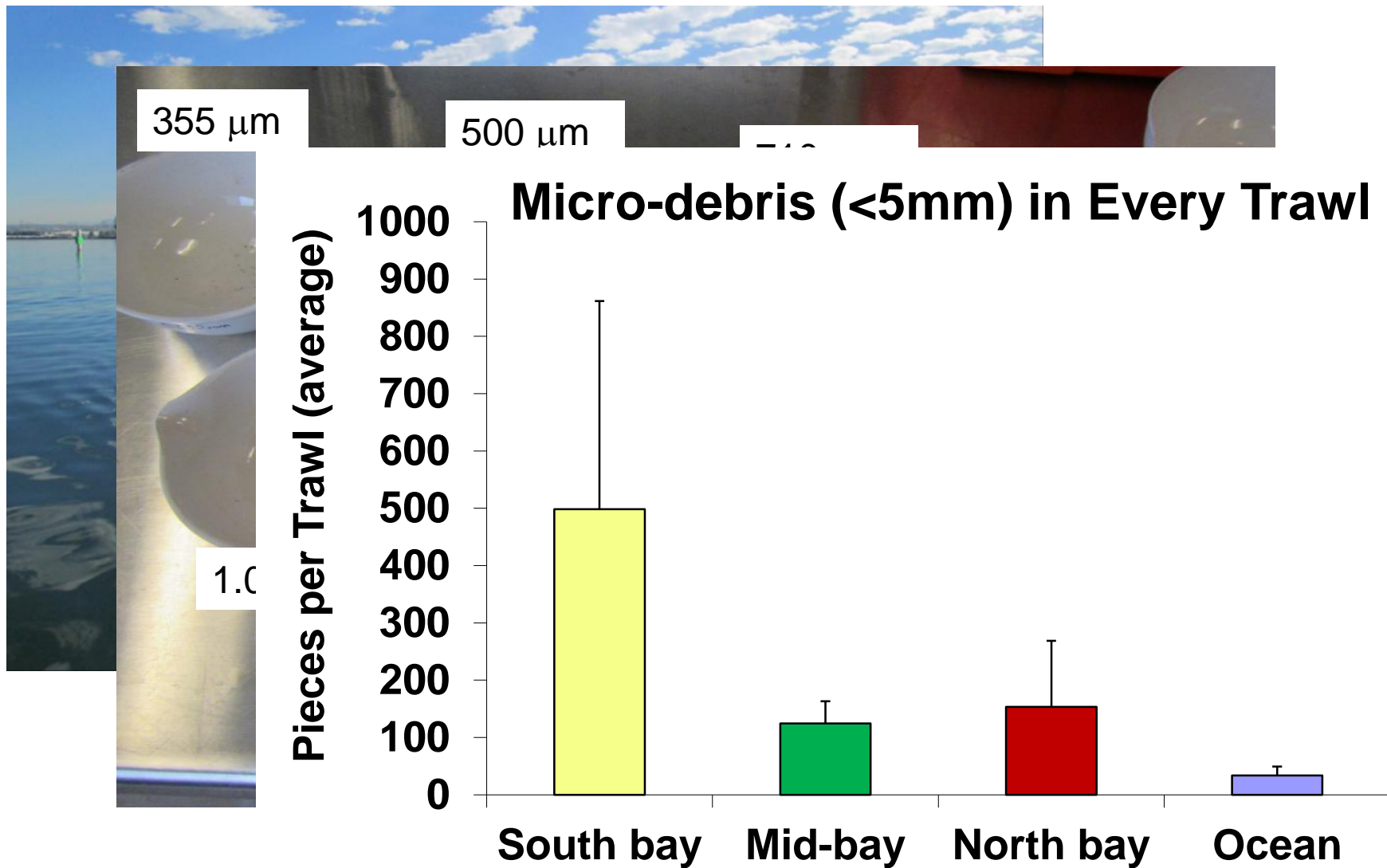


# Trash Characterization at Skimmers





# Trash Characterization on Open Water





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# Condition Monitoring (M1): Riverine

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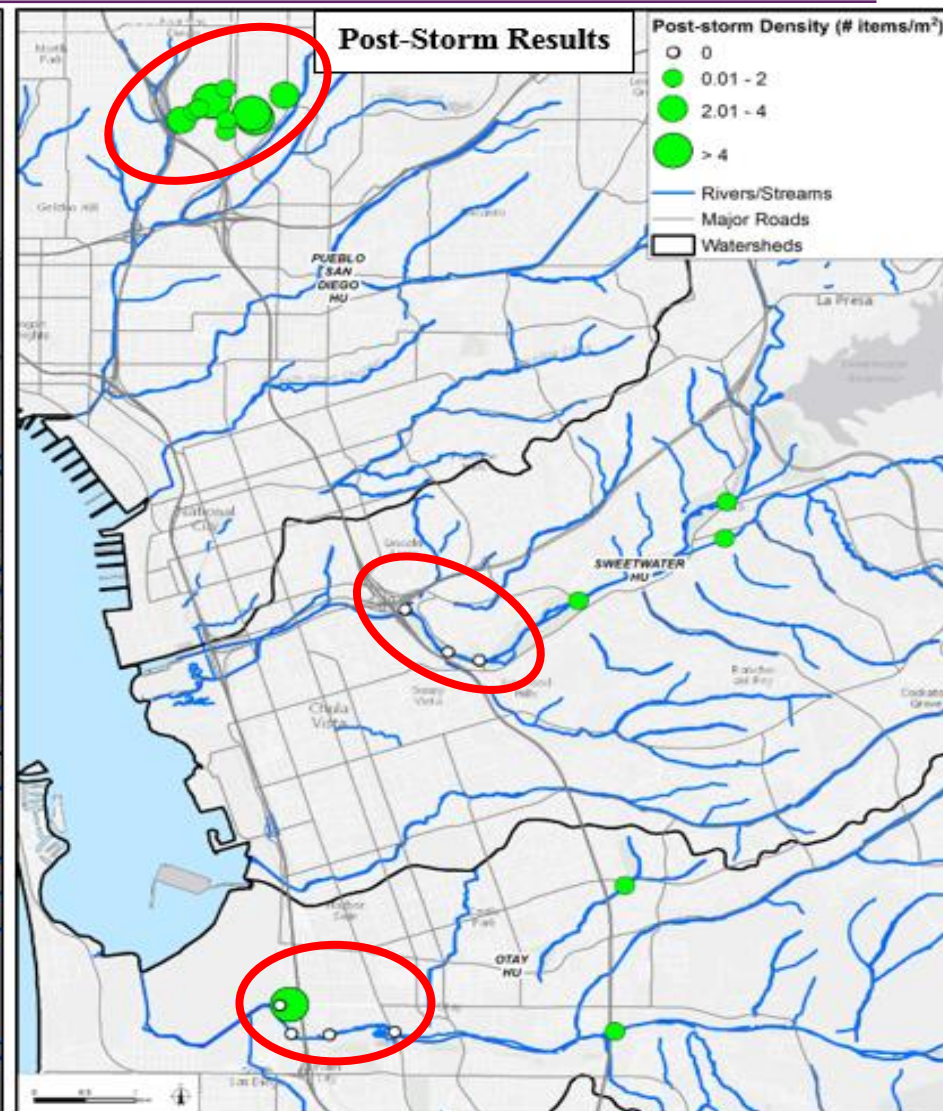
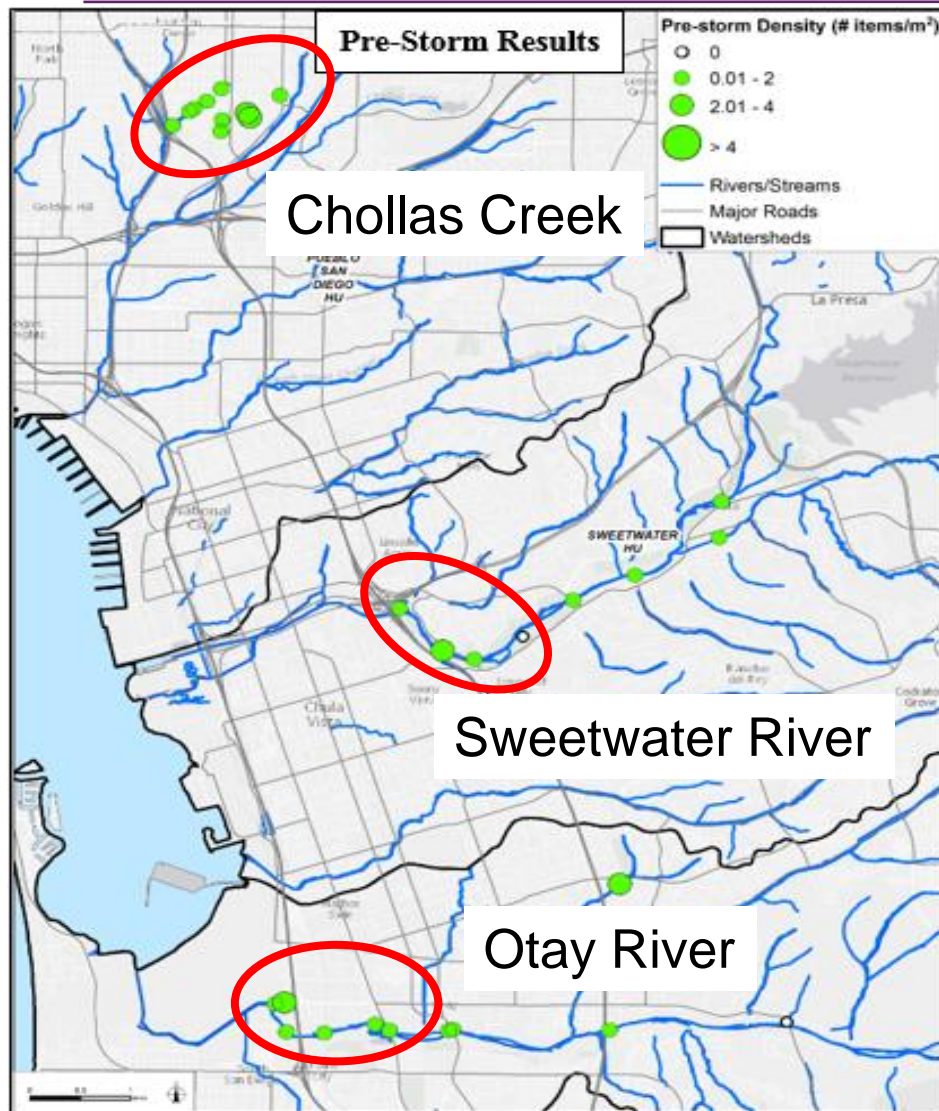


Chollas Creek





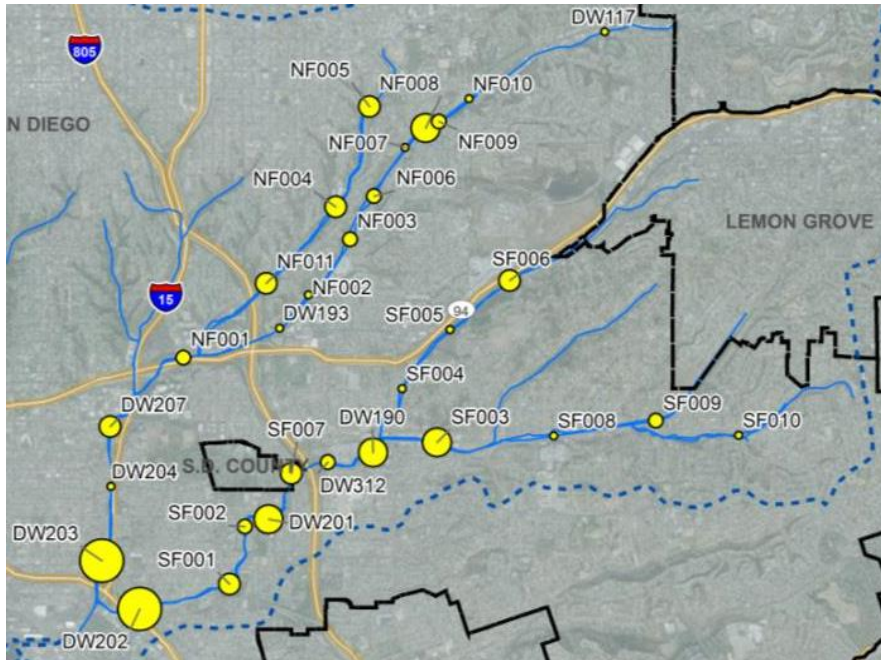
# Trash characterization and hot spot identification



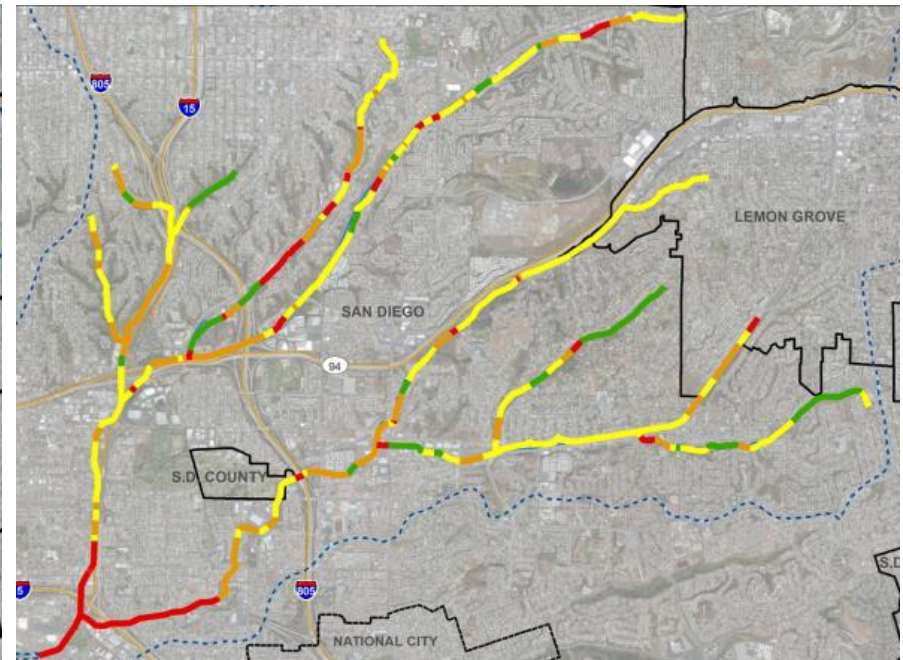
# Trash Characterization in Chollas Creek



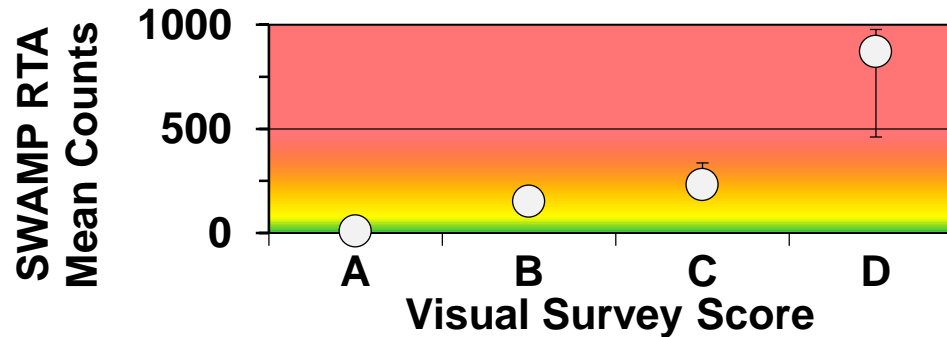
## Quantitative Survey



## Qualitative Survey



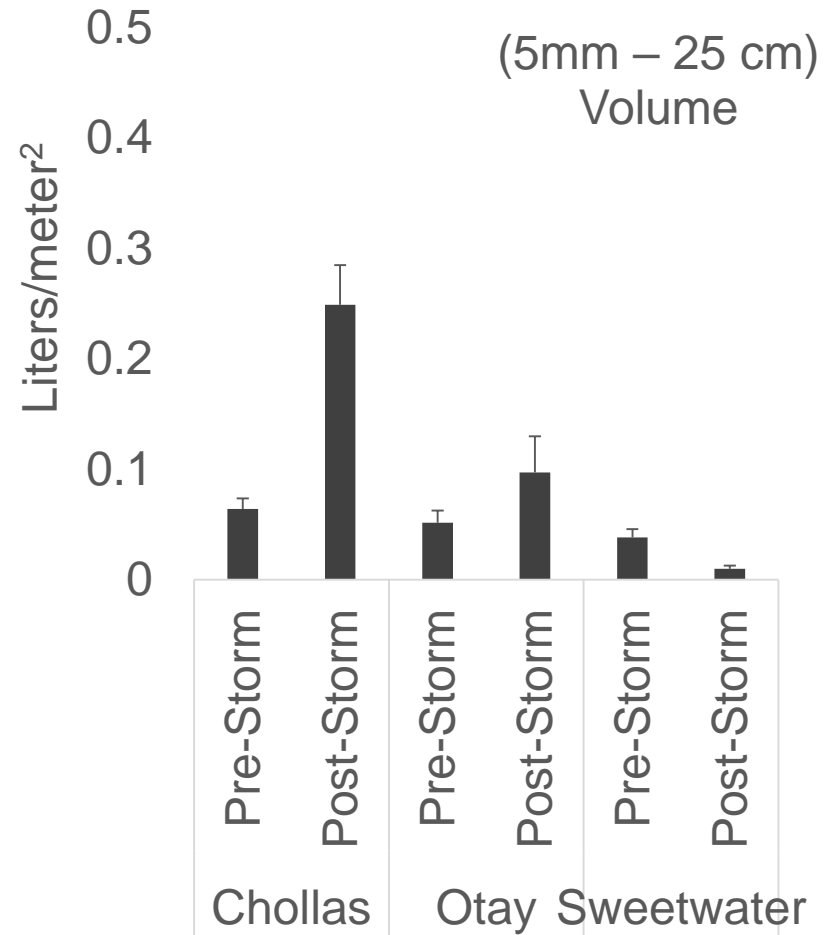
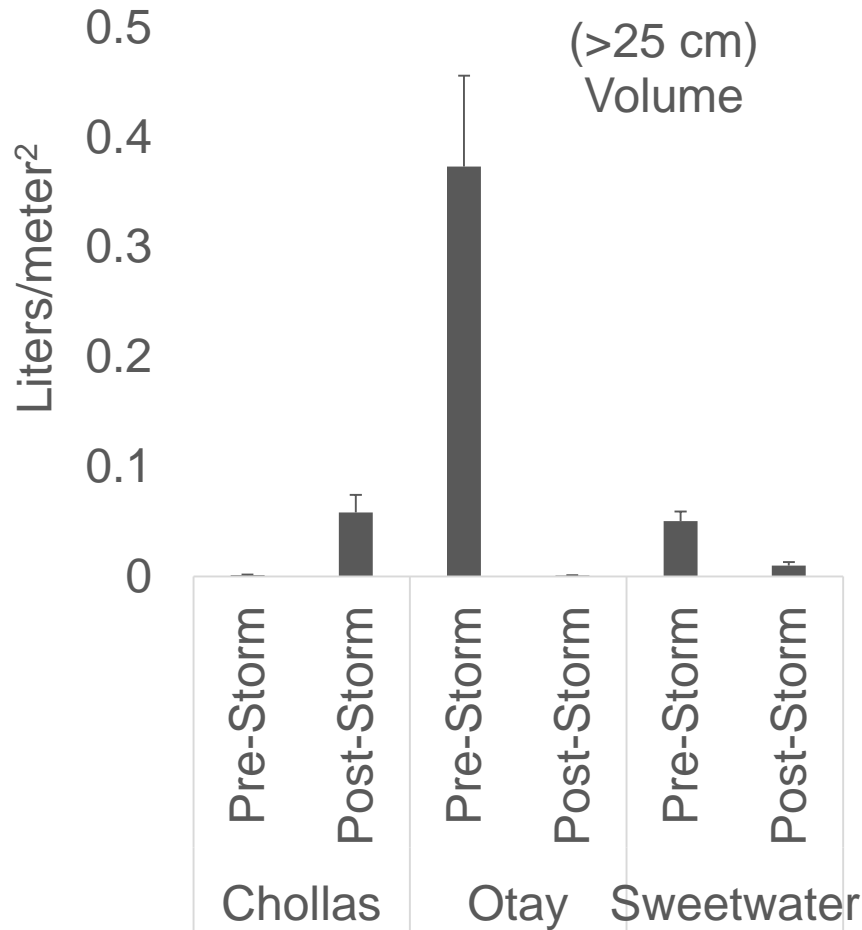
30 sites



28 miles

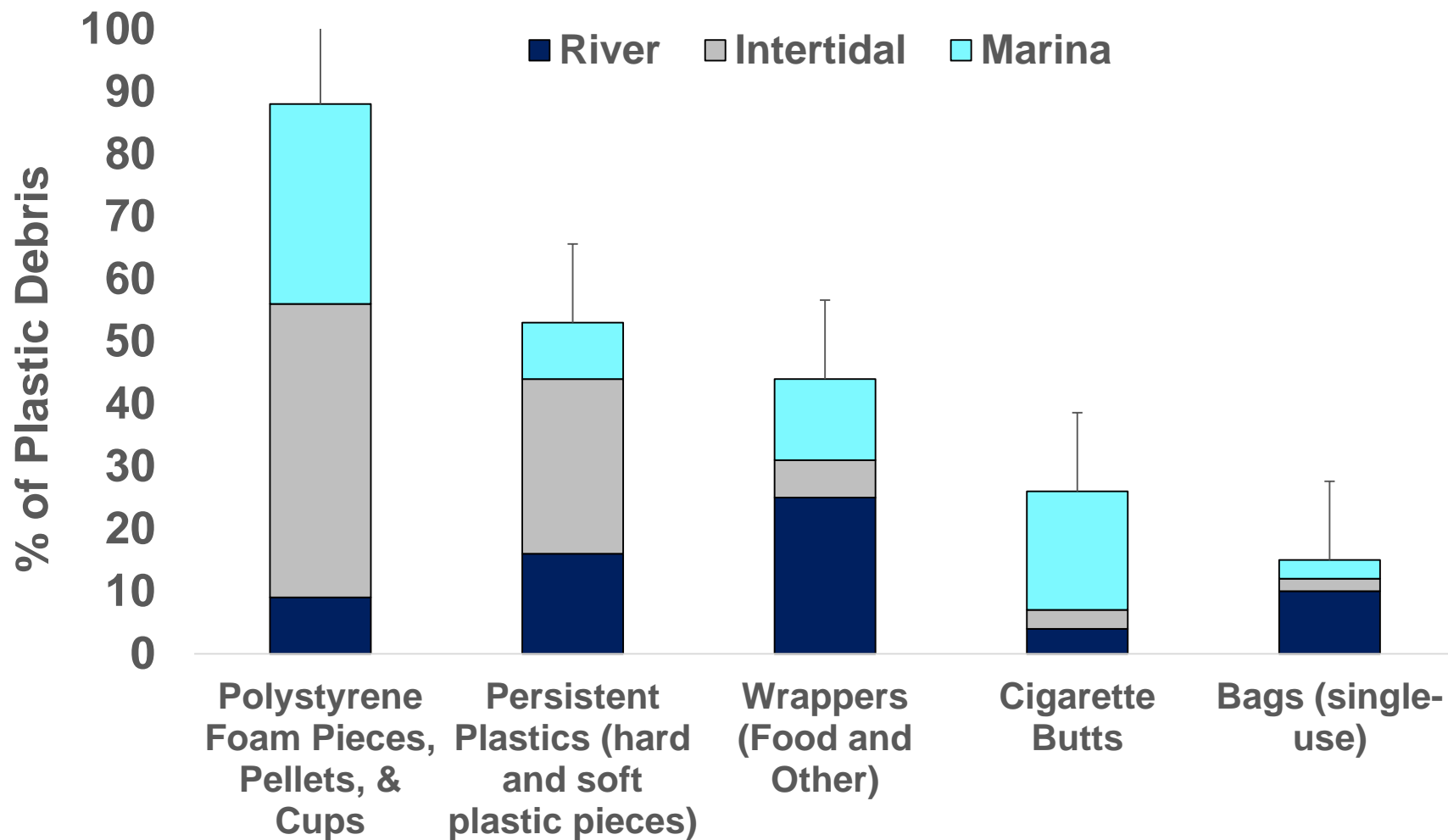


# Stressor Identification Monitoring (M2)





# Stressor Identification Monitoring (M2)

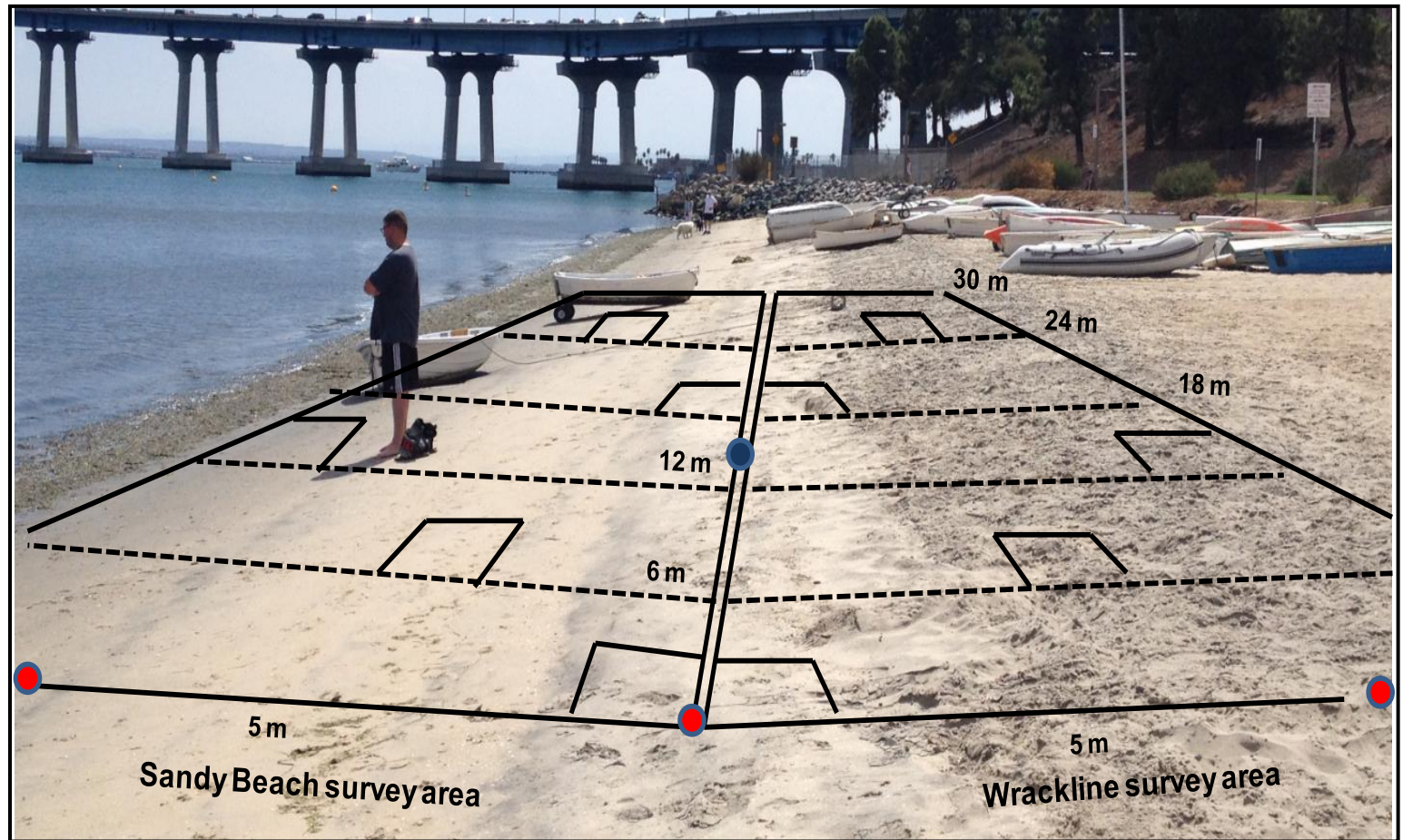


# Lessons Learned



# Lesson Learned 1.

Need to manage complexities of current methods and design tiered approaches for different end users.





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## Lesson Learned 2.

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Labor intensive methods makes surveys challenging and volunteers less likely to return





## Lesson Learned 3.

Rapid methods could improve representativeness and increase survey efficiency

Rapid Method (4x more)



Standard Method

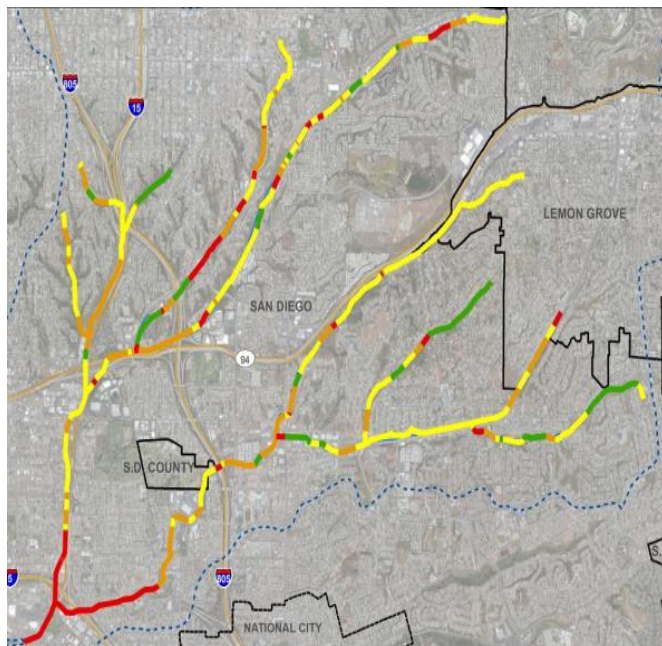






# Lesson Learned 4.

Qualitative survey improved assessments and increased management options



**Green  
(Clean)**  
3.85 miles (14.1%)

**Yellow  
(Few Pieces)**  
13.21 miles (48.5 %)

**Orange  
(Small to Moderate)**  
6.75 miles (24.8 %)

**Red  
(Moderate to High)**  
3.43 miles (12.6 %)



Illegal Dumping



Other Pathways



## Lesson Learned 5.

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Quantitative survey methods should be limited to countable key trash items



***Degraded polystyrene pieces were often too numerous to count***



# Project Scientists

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**Terra Miller-Cassman**, *Amec Foster Wheeler*

**Dr. Theresa Talley**, *California Sea Grant*

**Travis Pritchard**, *San Diego Coastkeeper*

**Chad Loflen**, *San Diego RWQCB*

**Heather Krish**, *City of San Diego*

**Christiana Boerger**, *US Navy*

Project Management, *SWAMP*

**Dr. Betty Fetscher**

**Dr. Lilian Busse**

# Questions

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## Contact Information

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