A Holistic Assessment of Trash in Watersheds

Scientific Studies Program

Fiscal Year 2026-2027

Watershed Area(s): All

Project Lead: Moore Institute for Plastic Pollution Research

Presenter Name: Dr. Win Cowger

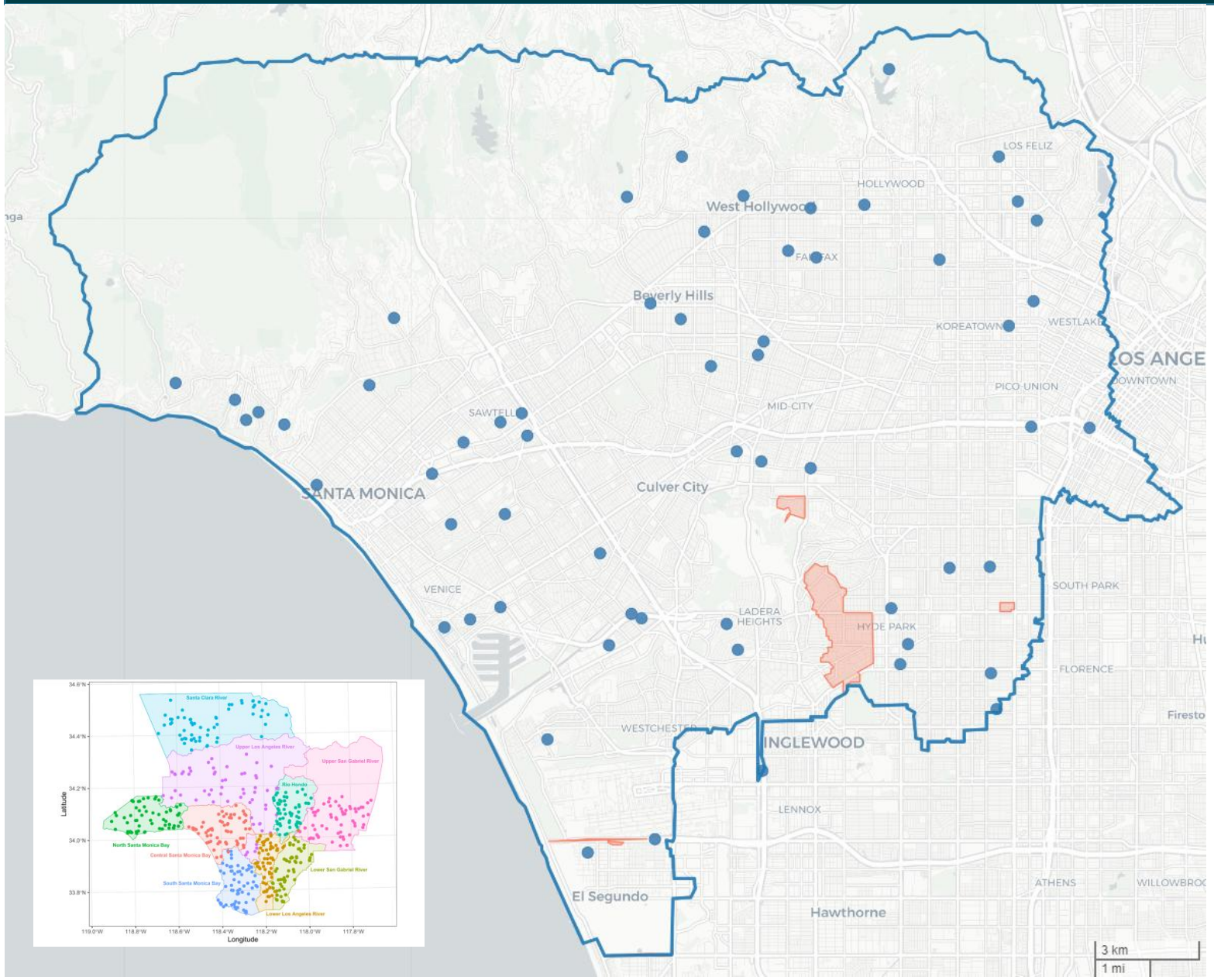
Study Overview

- Trash management and policies in California cost billions of dollars each year.
- A lack of harmonized trash data and analysis in LA County has caused challenges in effectively addressing the trash issue.

In this Scientific Study, The Moore Institute will:

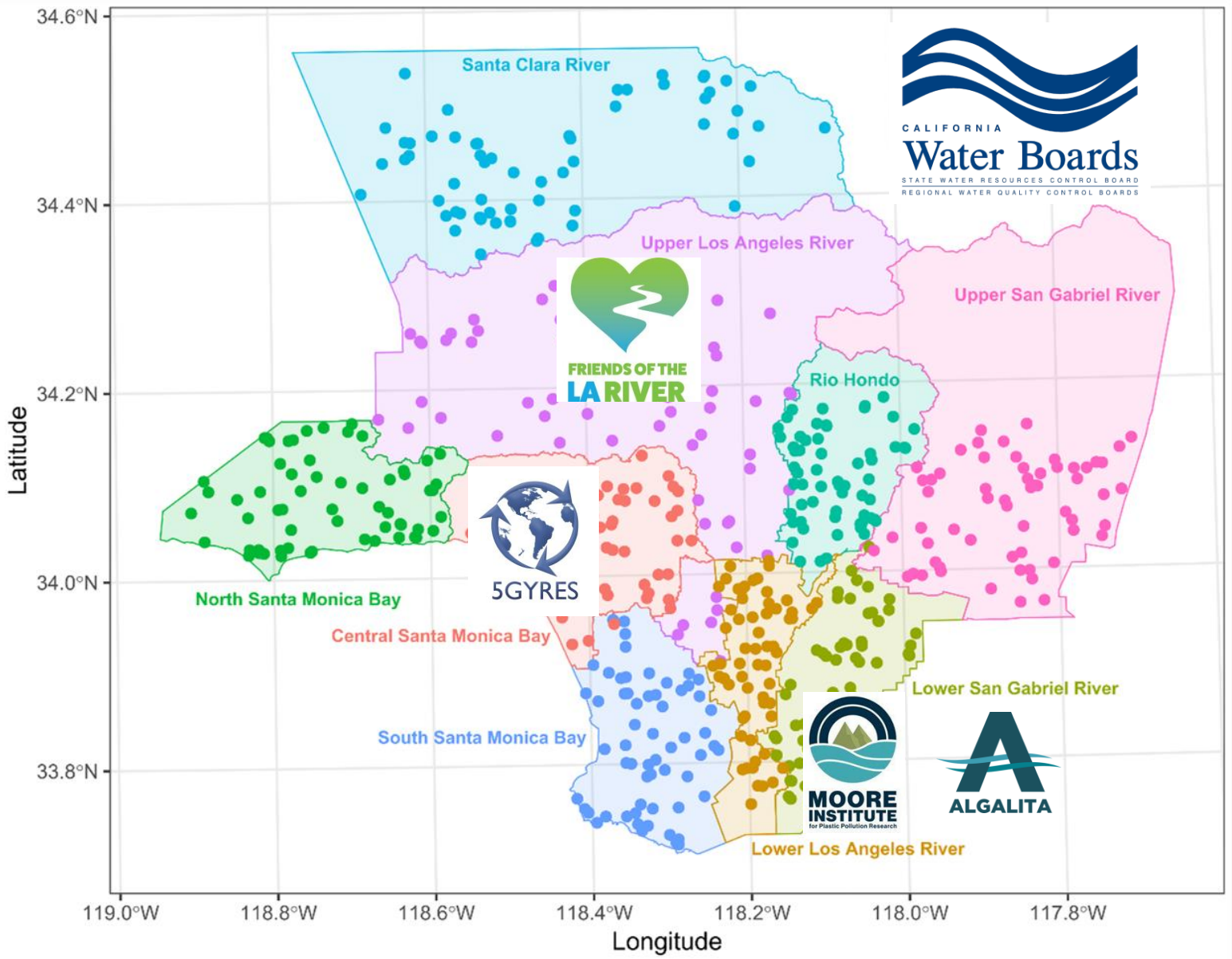
1. Measure roadside trash loading
2. Harmonize public trash data
3. Create watershed trash models and data portals
4. This 4 year plan costs $366k per participating WASC

Study Location



- 60 randomly assigned trash survey locations along roads in each WASC.
- Final sites will be determined by the technical advisory committee.

Study Team



- This is an LA County organization led and operated project with long term partners.
- Moore Institute: ELAP accredited nonprofit research group will lead research aspects.
- Algalita, FOLAR, and 5 Gyres: lead community engagement, dissemination, and education aspects.
- California Waterboard: advise on relevance to local and state policy and connect to other managers throughout the region.

Study Details: Problem Statement and Objectives

1. Roads are where trash enters the environment but we have little data there so we are going to focus new data collection on roads.

2. A significant amount of trash data exists, but it is not being compiled in a usable manner, therefore we will harmonize all public trash data sources into a single format.

3. No models exist for understanding all watershed trash transport processes, therefore we will develop a new model using data from 1 and 2.

4. Data and models alone often are not actionable for managers, so we will build a web portal.

Study Details: Methodology, Roadside Trash Data

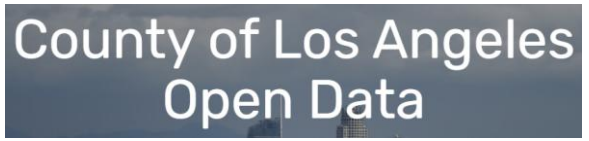
1. Survey all 60 sites 5 times per year.
2. During the survey, pick up all trash found at the site.
3. Record the count, material, morphology, brand, image, location, and the timestamp the trash was found.

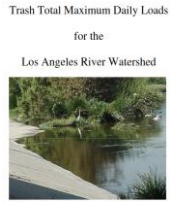
Study Details: Methodology, Public Data Aggregation

1. Search public archives for trash data.
2. Develop a list of potentially requestable trash datasets.
3. Harmonize all watershed trash data into a consistent format.

State

County



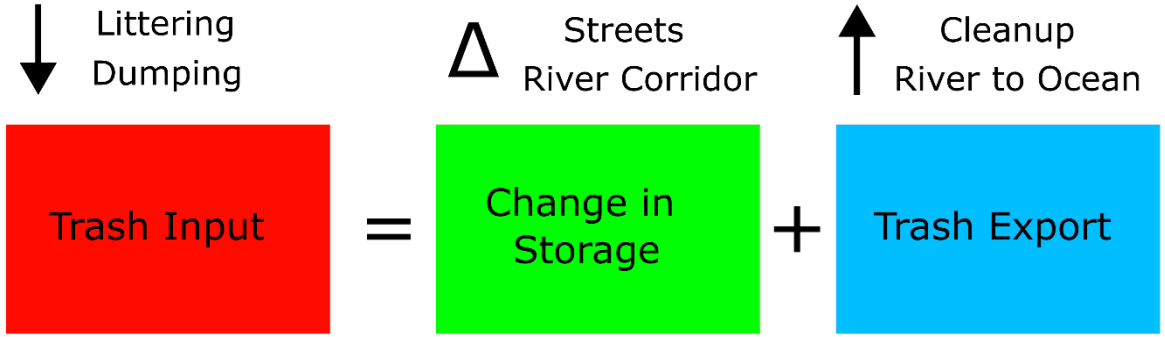


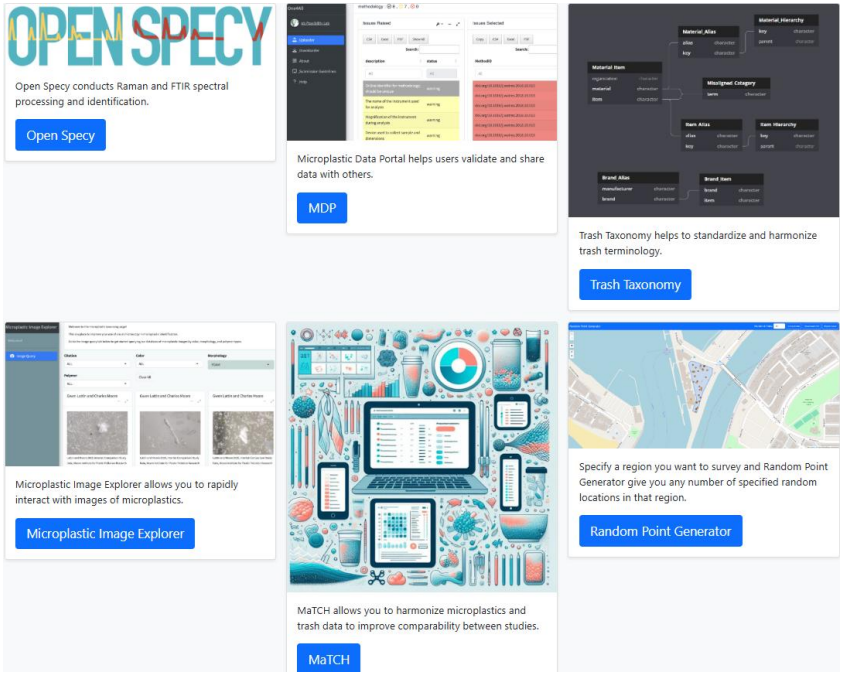
Community

Study Details: Methodology, Model Creation and Dissemination

1. Develop a model with previously described data to predict trash fluxes throughout the watershed and determine current gaps.

2. Create an online portal where community and managers can interact with study results to determine BMP locations, efficacy, and assess impact of other interventions.

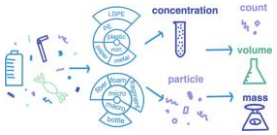




www.openanalysis.org

Study Details: Regional Collaboration and Similar Studies

We are actively publishing peer reviewed research on California trash including roadside trash in the Inland Empire (Cowger et al. 2021), and river trash in Pinole, CA and Riverside, CA (Cowger et al. 2022 and 2023).



We developed a novel framework for harmonizing trash data (Hapich et al., 2024).

We are currently leading the Trash Data Subcommittee of the California Water Quality Monitoring Council.

No other trash focused scientific studies have been funded by Safe Clean Water, but we will be tracking a road dust study and a river microplastic study as they are the most closely related. Watershed Planning has expressed a need at WASC Meetings to improve trash tracking for BMPs.

Cost & Schedule

Phase	Description	Cost	Completion Date
Pre-Study and Work Planning	Creating Advisory Board, conducting first site visits, aggregating available data	$111,667	06/30/2027
Study Implementation	Surveying sites, compiling requestable data	$227,333	06/30/2029
Post-Study	Report writing, dissemination of results	$53,667	06/30/2030
TOTAL		**$392,667**	**06/30/2030**

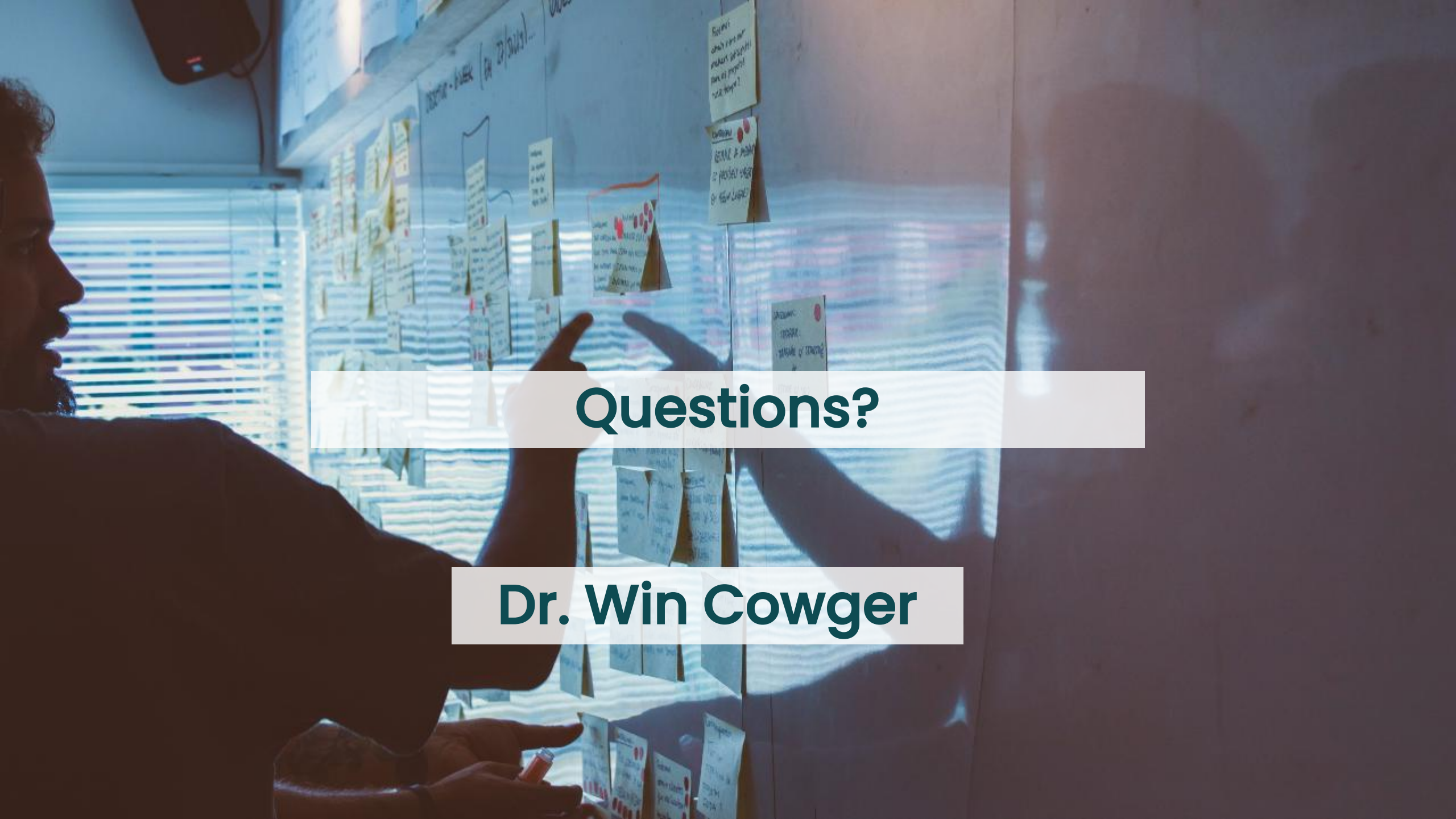
- Costs are per WASC
- Project from 2026-2030
- In-kind facility rent of $240,000 from Moore Institute is included in the cost estimate

Funding Request

WASC	Year 1	Year 2	Year 3	Year 4
CSMB	105,000	107,000	107,000	47,000
LLAR	105,000	107,000	107,000	47,000
LSGR	105,000	107,000	107,000	47,000
NSMB	105,000	107,000	107,000	47,000
RH	105,000	107,000	107,000	47,000
SCR	105,000	107,000	107,000	47,000
SSMB	105,000	107,000	107,000	47,000
ULAR	105,000	107,000	107,000	47,000
USGR	105,000	107,000	107,000	47,000
TOTAL	**945,000**	**963,000**	**963,000**	**423,000**

Summary of Benefits

- **Scientific:**
  - Harmonized geo-spatial dataset on litter accumulation rates across participating Watershed Areas.
  - Watershed mass balance model for litter.
  - 9 scientific presentations per participating Watershed Area.
  - 1-2 peer-reviewed manuscripts per participating WASC.
- **Management and Community:**
  - Data summary and management recommendations report delivered to each WASC to support local decision-making.
  - Development of a web application for management and public understanding of the results.
  - Two paid local young adult field crew members per participating WASC.
  - Wayfinder Society Action – an online training module in field research methodology deployed globally.
  - Social media release of major findings and coverage of the work.
  - Up to 5,400 lbs of litter removed from the streets of each participating Watershed Area.


Questions?
Dr. Win Cowger