# Next Gen Bioretention

## Towards Living & Adaptive Stormwater Systems for a Resilient Los Angeles County

Scientific Studies Program

Fiscal Year 2025-2026

Rio Hondo Watershed

TreePeople

Dustin Herrmann (Craig Doberstein, Igor Bronz)

# Study Overview

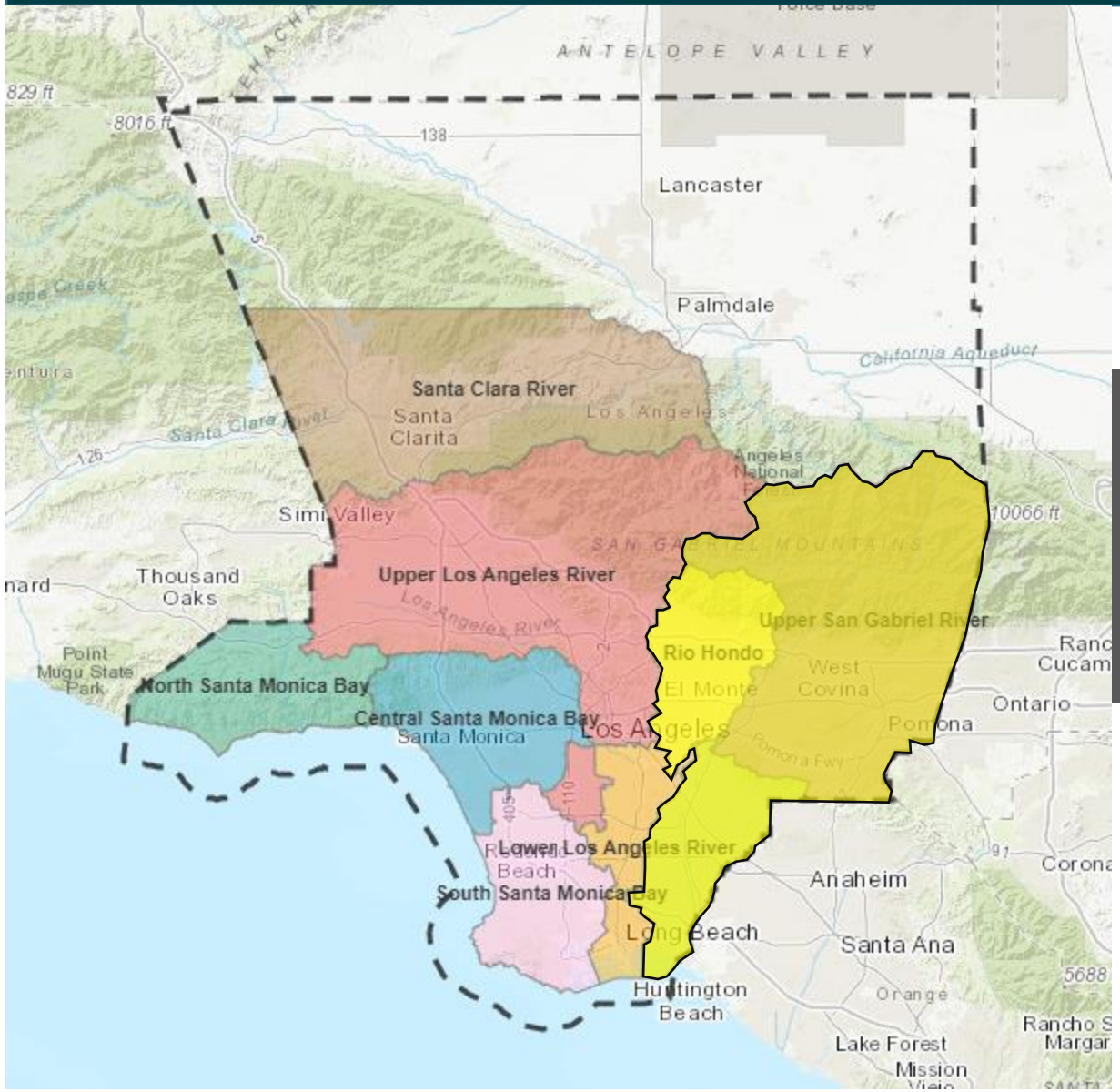
A study assessing existing systems and delivering modeled next-generation designs for resilient, multi-benefit bioretention systems.

Bioretention systems are one of **most powerful ways to capture**, **treat and convert** stormwater into ecological value.

This value is dependent on maintaining the system's proper and intended long-term function, which this study will **evaluate and optimize for LA.**

An optimized design framework that adapts to future ecological inputs and demands will be **worth millions in ecological and resilience value.**

# Study Location




## Proposed Study Areas:

- Rio Hondo Watershed
- Upper San Gabriel River Watershed
- Lower San Gabriel River Watershed

## Uniquely suited to bioretention:

- Intermediate population density
- Regionally moderate climate
- Critical importance of San Gabriel river to regional watershed health

**Note:** *We are proposing parallel studies within the Upper & Lower San Gabriel River watersheds.* ***While each study is individually valuable, performing this study in multiple watersheds will further strengthen the recommendations for each watershed.***

# Study Team

## TreePeople

**50-year history in shaping urban greening in the region**

**Role: Lead entity, study coordination, leadership**

**Dustin Herrmann, PhD** (*Principal Scientist*) – Ecologist with 16 years experience performing research and project management. Served as EPA research scientist investigating urban soil hydrology and subsurface modification techniques

**Igor Bronz** (*Research Senior Coordinator*) – Environmental engineer and hydrologist with 8 years' experience in nature-based design and environmental remediation

## Herrera

Science + Planning + Design

**20+ years as leaders in GI design, monitoring, & training**

**Role: Assessment, Design, & Ecology**

**Dylan Ahearn, PhD** (*Principal Scientist*) – Hydrologist with 20 years experience designing studies, collecting data, and conducting detailed pollutant loading assessments for over 100 stormwater treatment technologies of all types.

**Kate Forester** (*Principal Landscape Architect*) – 18 years experience in GI/NbS design and maximizing ecological function, developing design and maintenance standards, and LID/GI training.

## Council for Watershed Health

**26-years advancing the health and sustainability the region's watersheds**

**Role: Outreach, local expertise and guidance**

**Eileen Alduenda** (*Executive Director*) – Over 20 years experience collaborating with public agencies and nonprofit organizations in research, project design and implementation, and community education and engagement.

**Jason Casanova** (*Director of Planning*) – Over 15 years experience overseeing large-scale habitat restoration, green infrastructure, and technical assistance programs.

## Academic Partners & Consultants

**Dr. Daniel Hirmas** – Professor in the Department of Plant and Soil Science and the B.L. Allen Endowed Chair in Pedology, Texas Tech University

**Dr. Hoori Ajami** – Associate Professor of Groundwater Hydrology in the Department of Environmental Science, University of California - Riverside

**Jenny Saltonstall, L.Hg** – Hydrogeologist with 26 years of experience, including leading major long-term bioretention studies

**CommonStudio** – Creative firm that mixes art, science and engagement in urban landscapes; design consultant for final recommendations portion of bioretention study

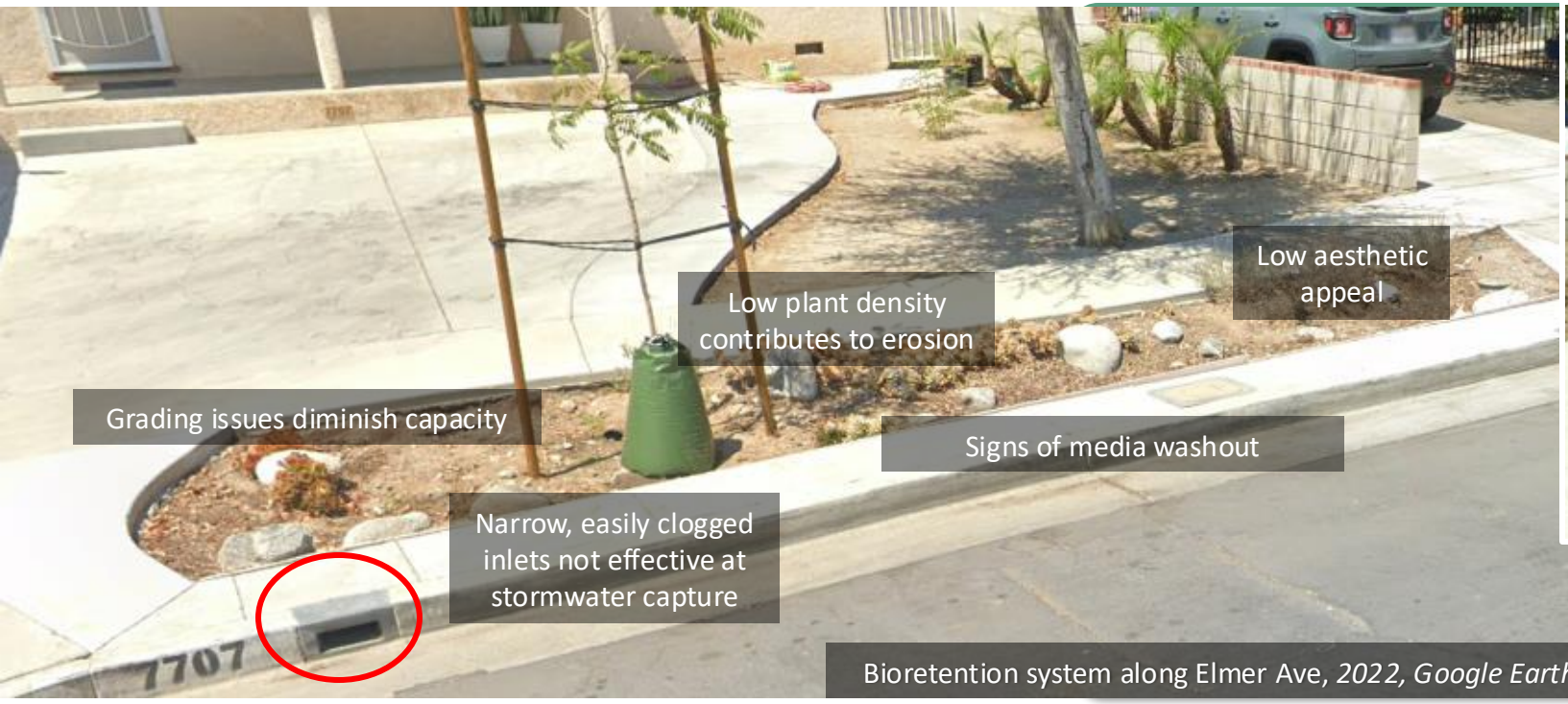
# Problem Statement

Lack of published data on bioretention health/performance in Rio Hondo watershed and region

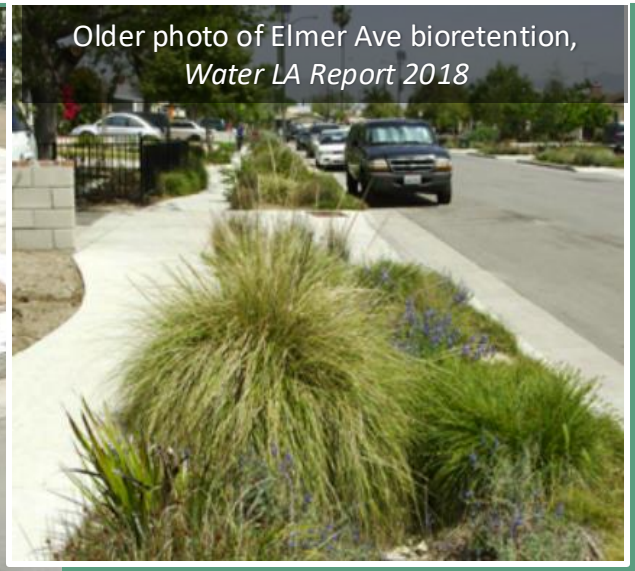
Assessment of system success/failure generally lacking and/or uncatalogued

Design frameworks lack regional customization

Current design standards have low tolerances for long-term ecological development




Bioretention system along Elmer Ave, *2022, Google Earth*

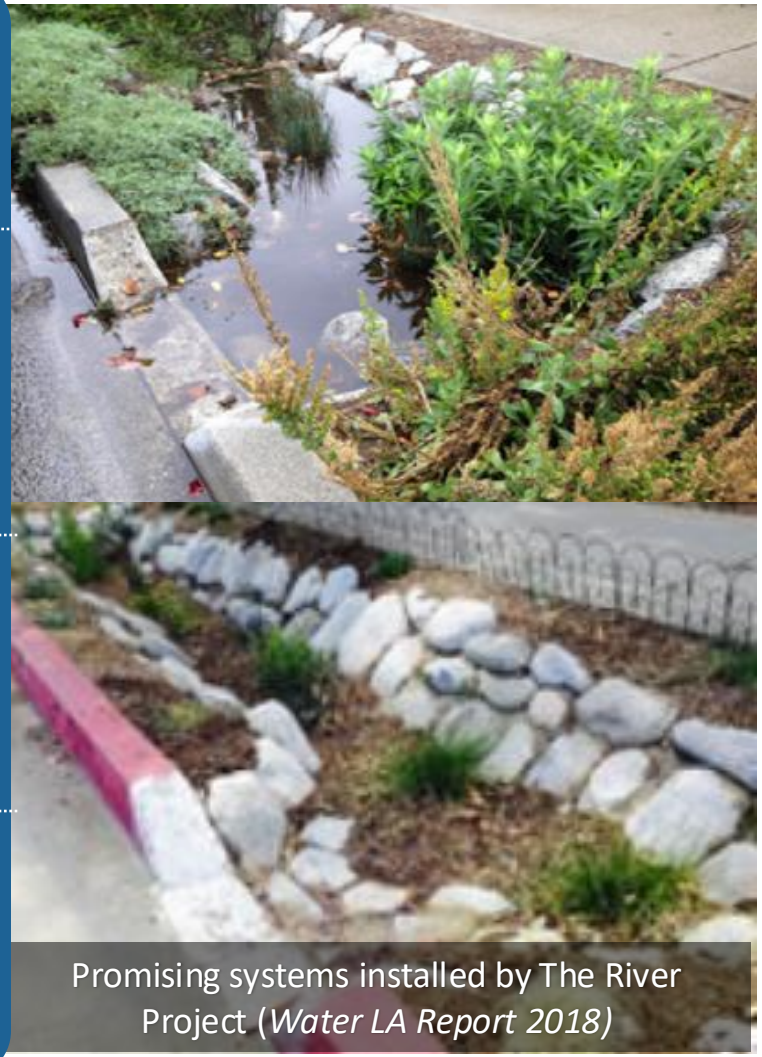


Older photo of Elmer Ave bioretention, *Water LA Report 2018*

**Many bioretention systems likely underperforming**

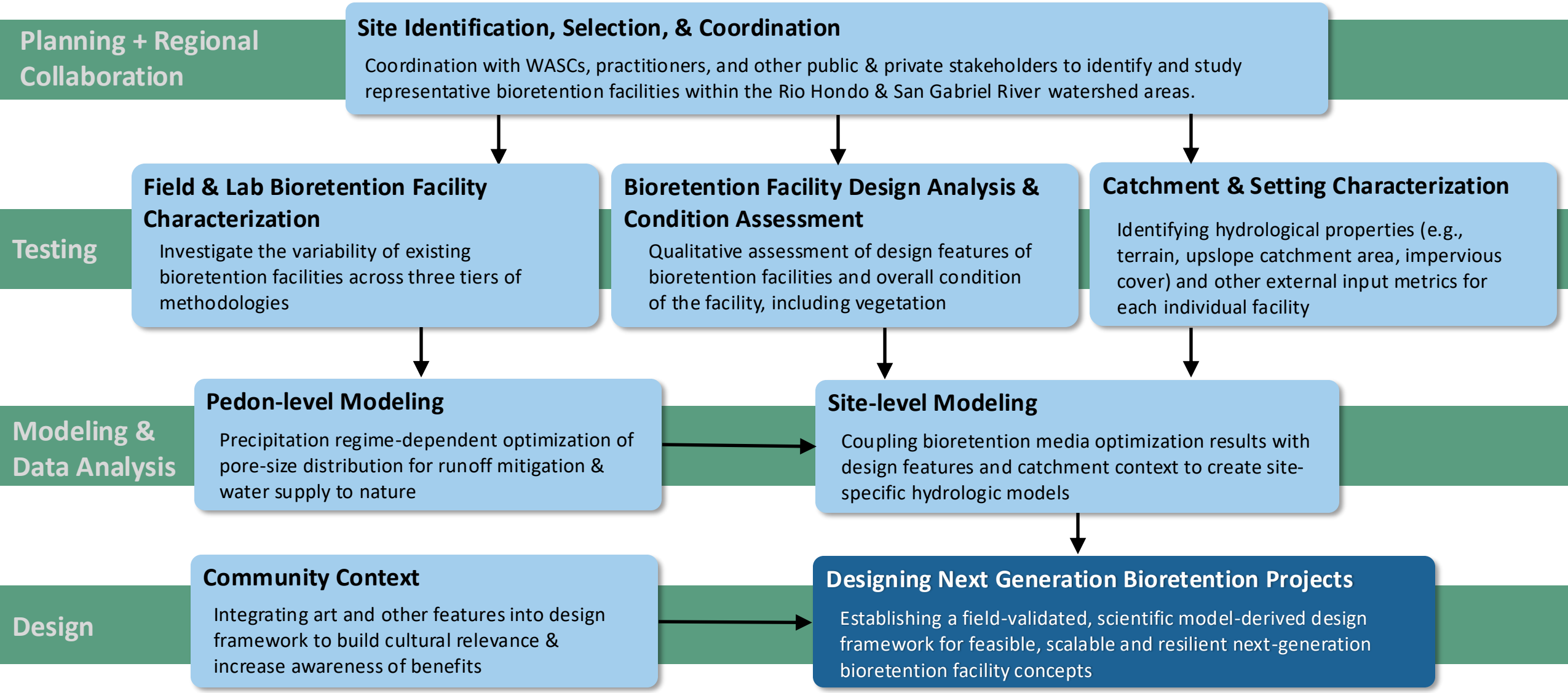
# Study Objectives & Goals

| | |
|---|---|
| 1 Conduct comprehensive field testing, surveying, and laboratory analyses... | ...to catalog bioretention system performance in Rio Hondo & San Gabriel watersheds |
| 2 Develop site-level hydrological models that incorporate ecological function... | ...to better understand needed design parameters for future climate conditions |
| 3 Establish a design framework validated by above findings... | ...to develop next-generation bioretention designs & retrofits that exceed performance benchmarks |
| 4 Explore strategies towards approaching bioretention systems as a community asset... | ...to build stewardship programs that assist with maintaining long term resilience, saving millions |



Promising systems installed by The River Project (*Water LA Report 2018)*

# Methodology & Collaborations



# Cost & Schedule

| Phase | Description | Cost | Completion Date |
|---|---|---|---|
| 1) Planning + Regional Collaboration | Outreach, engagement, and site selection | $41k | February 2026 |
| 2) 3-Tier Testing | Assessment of existing bioretention systems | $105k | July 2026 |
| 3) Modeling & Data Analysis | Hydrologic modeling of existing and future conceptual models of bioretention systems | $140k | February 2027 |
| 4) Next-Gen Design | Designs and concepts with ecological soundness and cultural relevance for the next generation of bioretention systems | $180k | December 2027 |
| **TOTAL** | | **$466k** | **December 2027** |

# Funding Request

| WASC | Year 1 | Year 2 | Total |
|---|---|---|---|
| LSGR | $227,807 | $238,441 | $466,248 |
| RH | $227,807 | $238,441 | $466,248 |
| USGR | $227,807 | $238,441 | $466,248 |
| **TOTAL** | **$683,421** | **$715,323** | **$1,398,744** |

# Summary of Benefits

## Increase water storage & supply

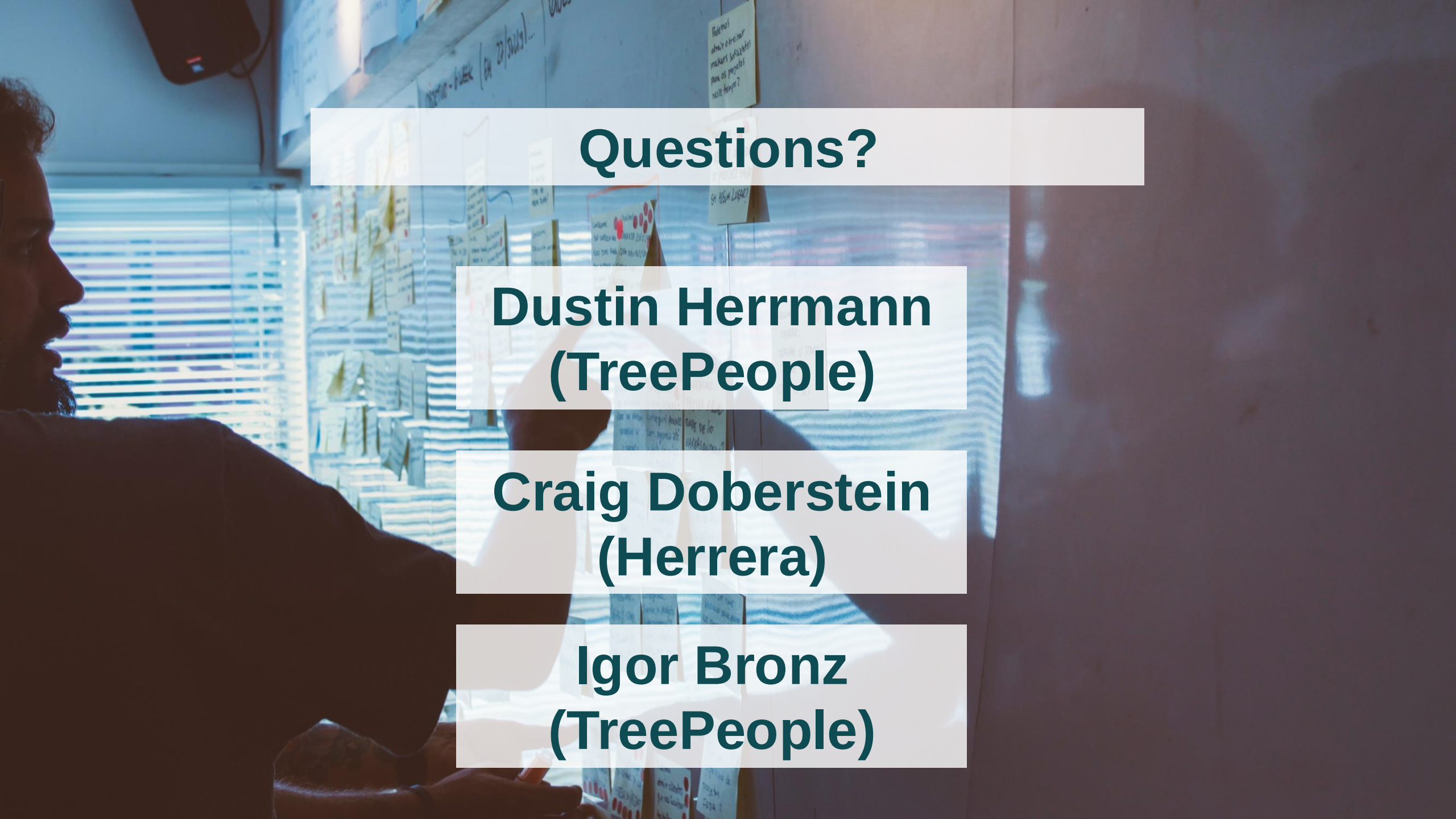
- Find modifications that protect and enhance the **capacity to infiltrate and store plant available water in the soil profile**
- Successful bioretention systems can **manage an impervious area 20x their footprint.**

## Improve water quality

- **Greater infiltration and storage of stormwater** prevents polluted runoff reaching downstream aquatic systems.
- Optimized bioretention soil media can be **specially formulated to target and transform pollutants into ecological resources**

## Enhance community investments

- **Aesthetics & Air Quality:** Dense vegetation improves air quality by capturing particulate matter while increasing aesthetic appeal
- **Urban Heat Island & Energy Efficiency:** Bioretention systems, due to their higher levels of plant-available water reduce heat islands through evapotranspiration
- **Biodiversity Corridors:** Bioretention systems provide places of refuge for pollinators and birds



# Questions?

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