Quantifying Community Flood Management Benefits of Watershed-Scale Stormwater Capture

Scientific Studies Program

Fiscal Year 2025-2026

Upper Los Angles River

Lead: San Gabriel Valley Council of Governments (SGVCOG)

Presenters: Turner Lott, SGVCOG; Brad Wardynski, Craftwater

Study Overview

Explores community flood improvement benefits of SCWP projects under climate change scenarios to enable river restoration alternatives

Nexus to Stormwater and Urban Runoff capture and pollution reduction:

- Identify if, where, and how water quality-focused projects could be designed to better manage flood risks
- Define performance measures to describe flood-related Community Investment Benefits from stormwater capture projects

- Upper Los Angeles River Watershed Area
- Pilot Subwatershed: Arroyo Seco

ARROYO SECO

Study Team

- Study Lead: **San Gabriel Valley Council of Governments**

- Study Developer: **Craftwater**

- Academic Collaborators:
  - **UCLA – Center for Climate Science (Dr. Ben Bass)**
  - **University of California – Irvine Flood Lab (Dr. Brett Sanders)**

THERE IS A LACK OF

STANDARDIZED METHODS FOR QUANTIFYING FLOOD IMPROVEMENTS

AND THERE IS A NEED TO EXPLORE

HOW SCWP PROJECTS COULD SUPPORT RESTORATION OF RIVER CHANNELS WHILE MANAGING FLOOD RISKS UNDER CHANGING CLIMATE CONDITIONS

preSIP Project Library

1. **Bookend Analysis: Coarsely Model Baseline and Potential Projects**

   - Characterize climate change implications
   - Contextualize <u>watershed-wide</u> potential using ULAR preSIP model

2. Peak Flow & Volume Benchmarks

3. Characterize Local & Regional Flooding Risks & Opportunities

4. Model Watershed Projects

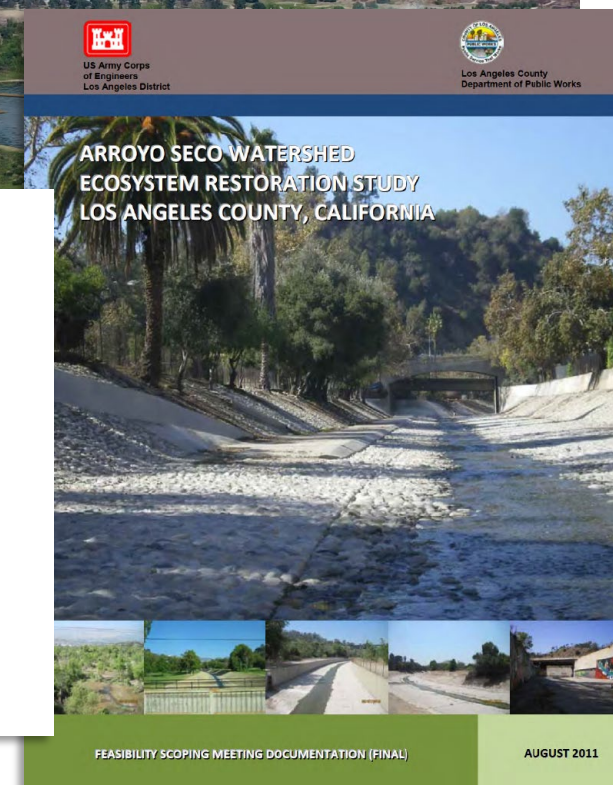5. Summarize Regional Flood Improvement Criteria, Tools, and Formulas

1. **Bookend Analysis: Coarsely Model Baseline and Potential Projects**

2. **Peak Flow & Volume Benchmarks**

    *   Synthesize design storms and targets from past studies for pilot subwatershed (Arroyo Seco)
    *   Adjust models using UCLA climate data
    *   Define clear metrics based on flow and volume
    *   Coordinate with LA County Flood Control District

3. Characterize Local & Regional Flooding Risks & Opportunities

4. Model Watershed Projects

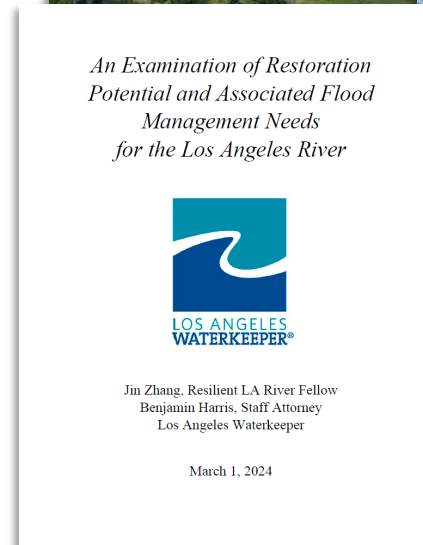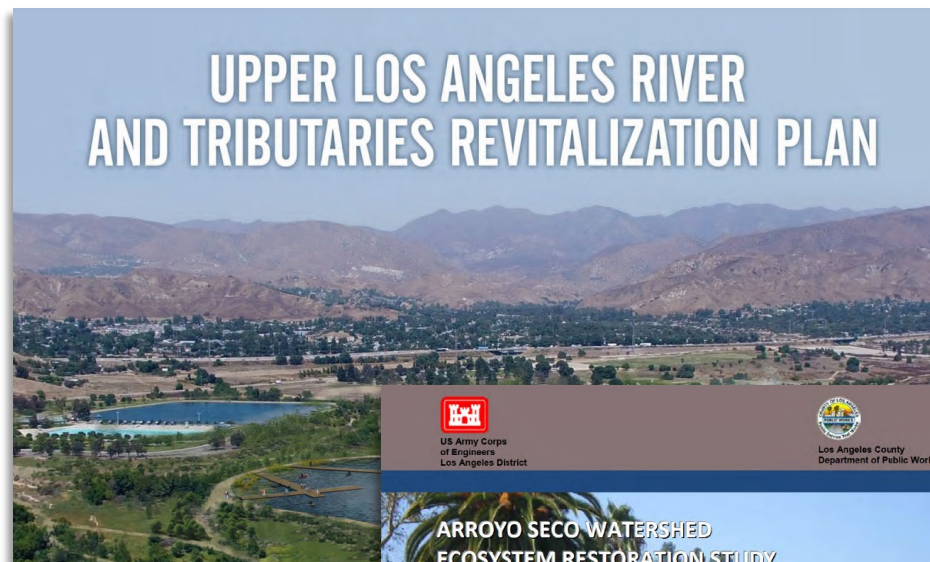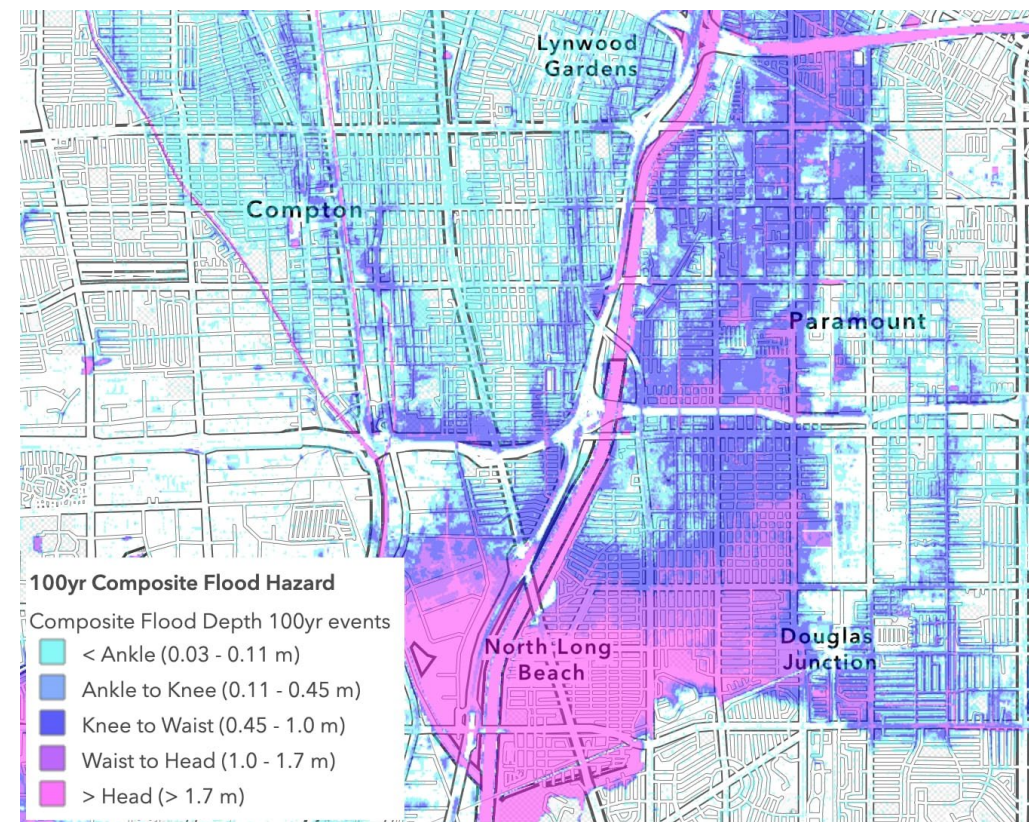5. Summarize Regional Flood Improvement Criteria, Tools, and Formulas

UPPER LOS ANGELES RIVER AND TRIBUTARIES REVITALIZATION PLAN

An Examination of Restoration Potential and Associated Flood Management Needs for the Los Angeles River

LOS ANGELES WATERKEEPER®

Jin Zhang, Resilient LA River Fellow
Benjamin Harris, Staff Attorney
Los Angeles Waterkeeper

March 1, 2024

US Army Corps of Engineers Los Angeles District

Los Angeles County Department of Public Works

ARROYO SECO WATERSHED ECOSYSTEM RESTORATION STUDY LOS ANGELES COUNTY, CALIFORNIA

FEASIBILITY SCOPING MEETING DOCUMENTATION (FINAL)

AUGUST 2011

UCI PRIMo Model

1. **Bookend Analysis: Coarsely Model Baseline and Potential Projects**

2. **Peak Flow & Volume Benchmarks**

3. **Characterize Local & Regional Flooding Risks & Opportunities**

   - Review Arroyo Seco hostspots in UCI's PRIMo model
   - Validate and supplement w/local data
   - Continue engaging Flood Control District and local storm drain operators

4. Model Watershed Projects

5. Summarize Regional Flood Improvement Criteria, Tools, and Formulas

100yr Composite Flood Hazard

Composite Flood Depth 100yr events
- < Ankle (0.03 - 0.11 m)
- Ankle to Knee (0.11 - 0.45 m)
- Knee to Waist (0.45 - 1.0 m)
- Waist to Head (1.0 - 1.7 m)
- > Head (> 1.7 m)

Credit: Brett Sanders, UCI

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1. **Bookend Analysis: Coarsely Model Baseline and Potential Projects**
2. **Peak Flow & Volume Benchmarks**
3. **Characterize Local & Regional Flooding Risks & Opportunities**
4. **Model Watershed Projects**
   - Develop and identify menu of additional watershed improvements in Arroyo Seco
   - Simulate hydrology from existing, planned, funded, and potential projects (from distributed, nature-based solutions to large, regional projects)
   - "Calibrate" preSIP watershed model w/ UCI PRIMo model
5. Summarize Regional Flood Improvement Criteria, Tools, and Formulas

Example Arroyo Seco Project
(San Rafael Stormwater Capture Project)

Study Details – **Methodology & Outcomes**

1. **Bookend Analysis: Coarsely Model Baseline and Potential Projects**

2. **Peak Flow & Volume Benchmarks**

3. **Characterize Local & Regional Flooding Risks & Opportunities**

4. **Model Watershed Projects**

5. **Summarize Regional Flood Improvement Criteria, Tools, and Formulas**

   - Summarize key drivers of potential flood improvement
   - Synthesize project design parameters, formulas, guidance, and tools to maximize flood improvements
   - Summarize channel restoration potential

Study Details – **Methodology & Outcomes**

1. **Bookend Analysis: Coarsely Model Baseline and Potential Projects**

   Phase 1: Bookend

2. **Peak Flow & Volume Benchmarks**

3. **Characterize Local & Regional Flooding Risks & Opportunities**

4. **Model Watershed Projects**

   Phase 2: Pilot

5. **Summarize Regional Flood Improvement Criteria, Tools, and Formulas**

6. **Watershed-Wide Analysis**
   (NEXT STEP; NOT INCLUDED IN THIS STUDY APPLICATION)

   Phase 3: Scale

Cost & Schedule

Phase	Description	Funding Request	Completion Date (Months After Funding Transfer)
1	Bookend Analysis	$70k	NTP+2 months
2A	Peak Flow & Volume	$60k	NTP+3 months
2B	Local & Regional Risks/Opportunities	$50k	NTP+4 months
2C	Model Baseline Pilot Watershed Projects	$70k	NTP+8 months
2D	ID and Model Additional Projects	$140k	NTP+8 months
2E	Regional Flood Criteria, Tools, Formulas	$80k	NTP+12 months
3	Watershed-Wide Analysis	TBD	TBD
TOTAL		**$470,000**	

- ✓ **Better quantify flood improvement benefits to communities from SCWP**

- ✓ **Better inform planning, siting, and design to reduce flood risk**

- ✓ **Better understand river restoration potential**

Questions?

Turner Lott
SGVCOG

Brad Wardynski
Craftwater