



# **A Collaborative Integrated Water Resources Approach for Watershed and Water Supply Improvements in North Orange County (OC), California**

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# North OC Watersheds



# Dry Weather Diversions to Sanitary Sewer

Diversion	Maximum Diversion (m <sup>3</sup> /s)	Drainage Area (m <sup>2</sup> )
OC Public Works Drop Inlet to OCSD	NA	471,957,424
Adams Street Pump Station	0.05	5,013,007
Upstream of Fairview Pump Station	NA	28,270,967
Yorktown Pump Station	0.005	15,044,384
Banning Pump Station	0.02	19,751,770
Hamilton Pump Station	0.02	476,815,763
Adams Pump Station	0.005	17,125,548
Flounder Pump Station	0.005	9,010,725
Atlanta Pump Station	0.03	7,587,233
Newland Pump Station	0.034	2,729,662
Indianapolis Pump Station	0.005	18,835,380
Meredith Pump Station	0.005	474,372,122
First Street Pump Station	NA	8,382,674

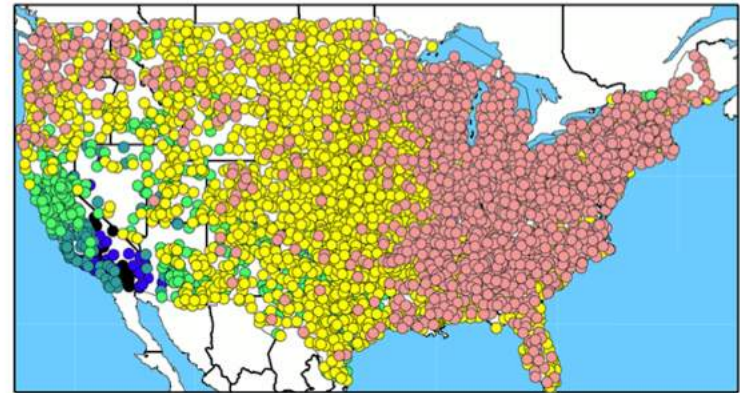
Source: OC Public Works and City of Huntington Beach, 2019

# Drivers for Collaboration

- Value of water in CA
- Integrated regional water management (IRWM) can solve more than 1 problem with one project
- Urban runoff as both a regulatory challenge and a potential water resource
  - Dry weather flows
  - Stormwater
- Multiple benefits

# The IRWM Challenge

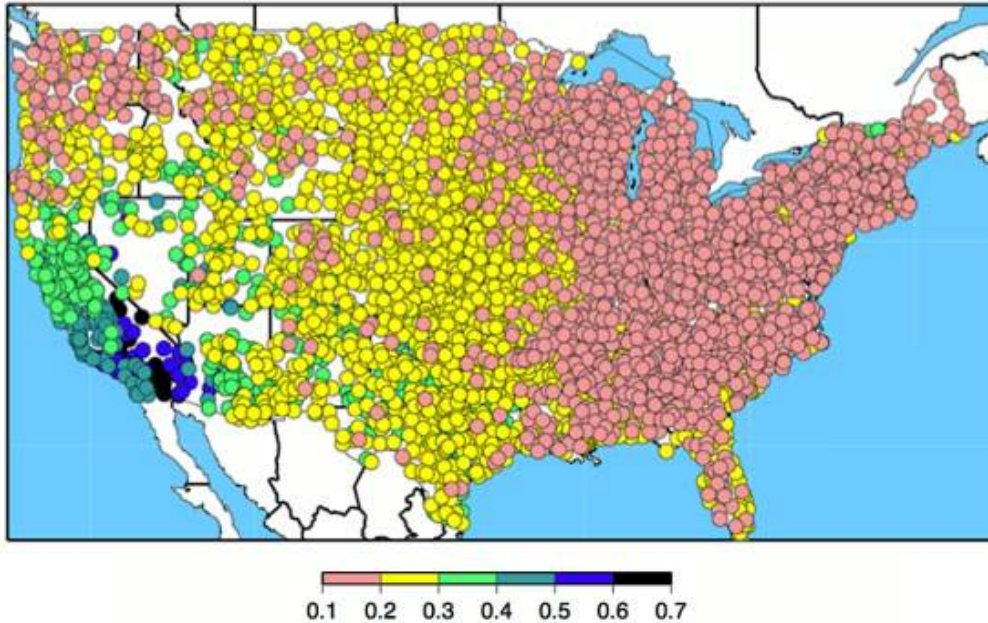
- Develop integrated watershed management strategies to address water quality compliance issues while providing other regional benefits (flood control, water resources, recreational, etc.)
- How to address stormwater...



0.1 0.2 0.3 0.4 0.5 0.6 0.7

Coefficient of variation for annual precipitation 1950-2008

# Variability of Annual Precipitation

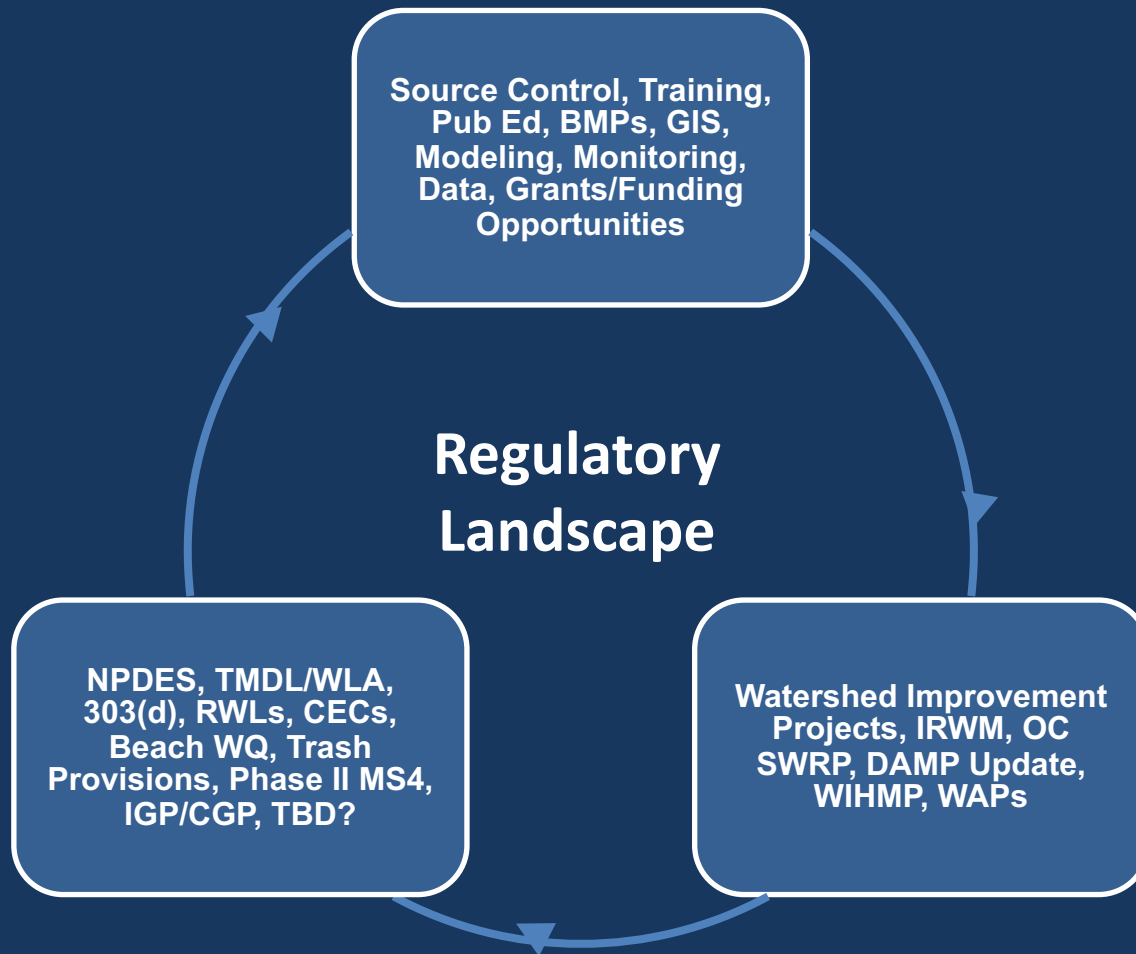


Coefficient of variation for annual precipitation 1950-2008

- Southern CA has the largest year to year precipitation variability in the US.
- Southern CA variability is on the order of half the annual average.
- The year to year variability in CA is largely caused by the wettest days (ARs).

Dettinger et al. 2011





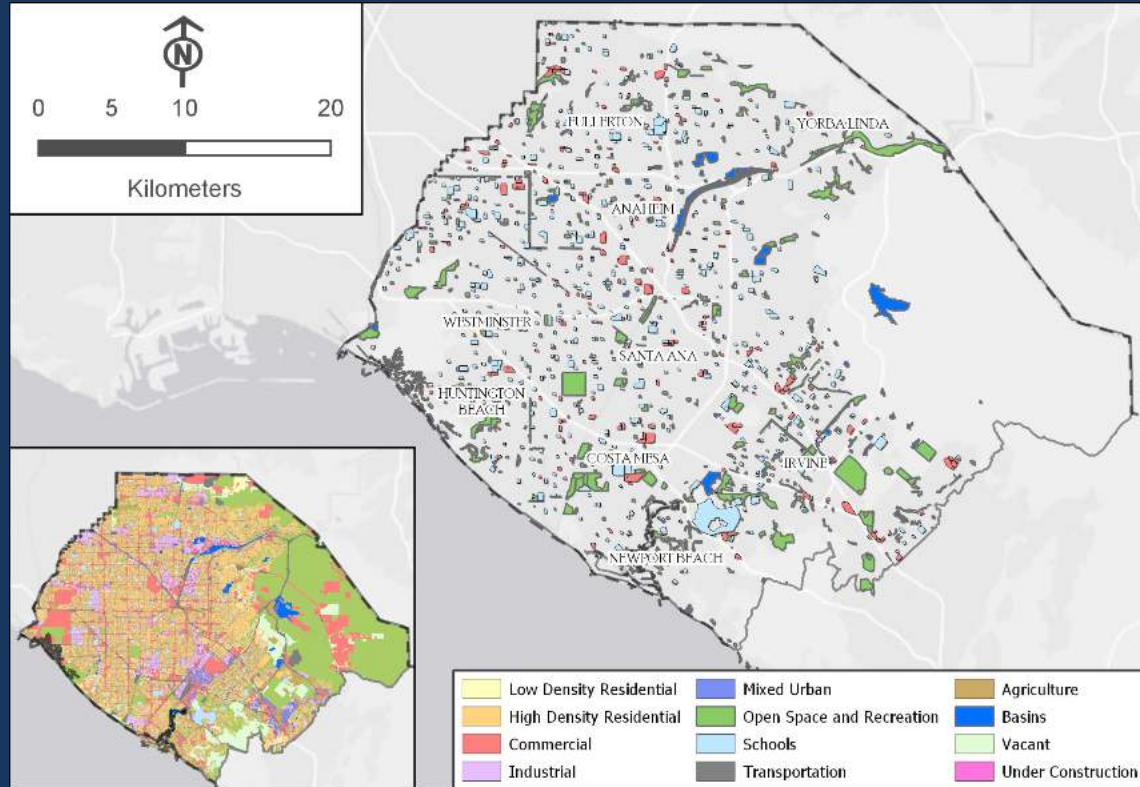




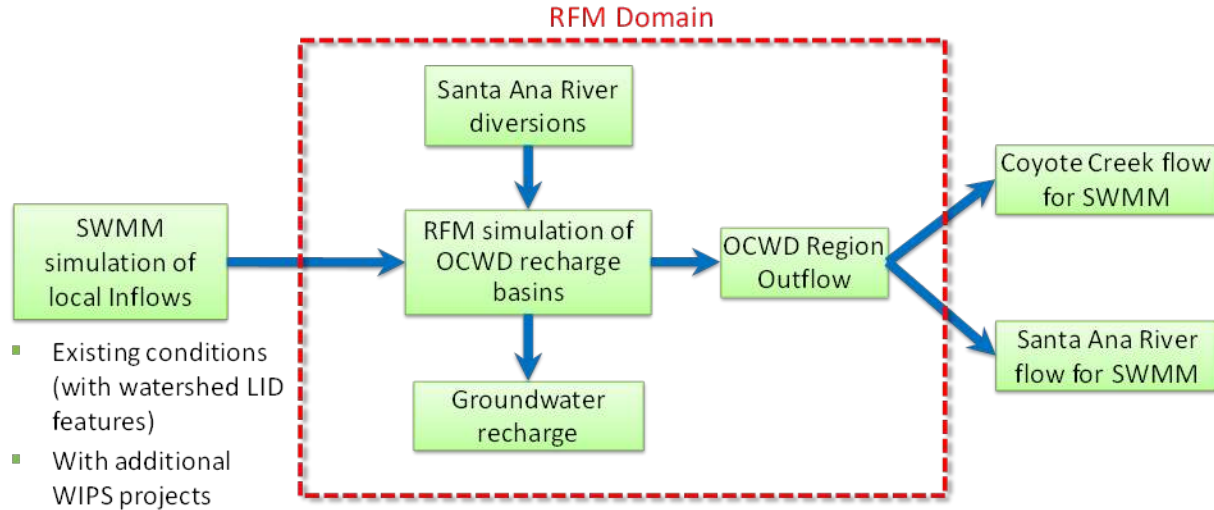
# Technical Approach

- Watershed Improvement Projects Subcommittee (WIPS)
- Conduct GIS analysis of watershed project opportunities
  - Identify potential constraints to capture and infiltrate runoff across North OC
  - Public property options
  - Future: private property options
- SWMM modeling for both water quality and groundwater recharge
- Collaboration and outreach between potential partner agencies
- Development of watershed improvement project options
  - Costs evaluation
  - Triple bottom line analysis/multiple benefits integration
  - Prioritization
- Explore funding approaches and strategies

# GIS Analysis of Watershed Project Opportunities

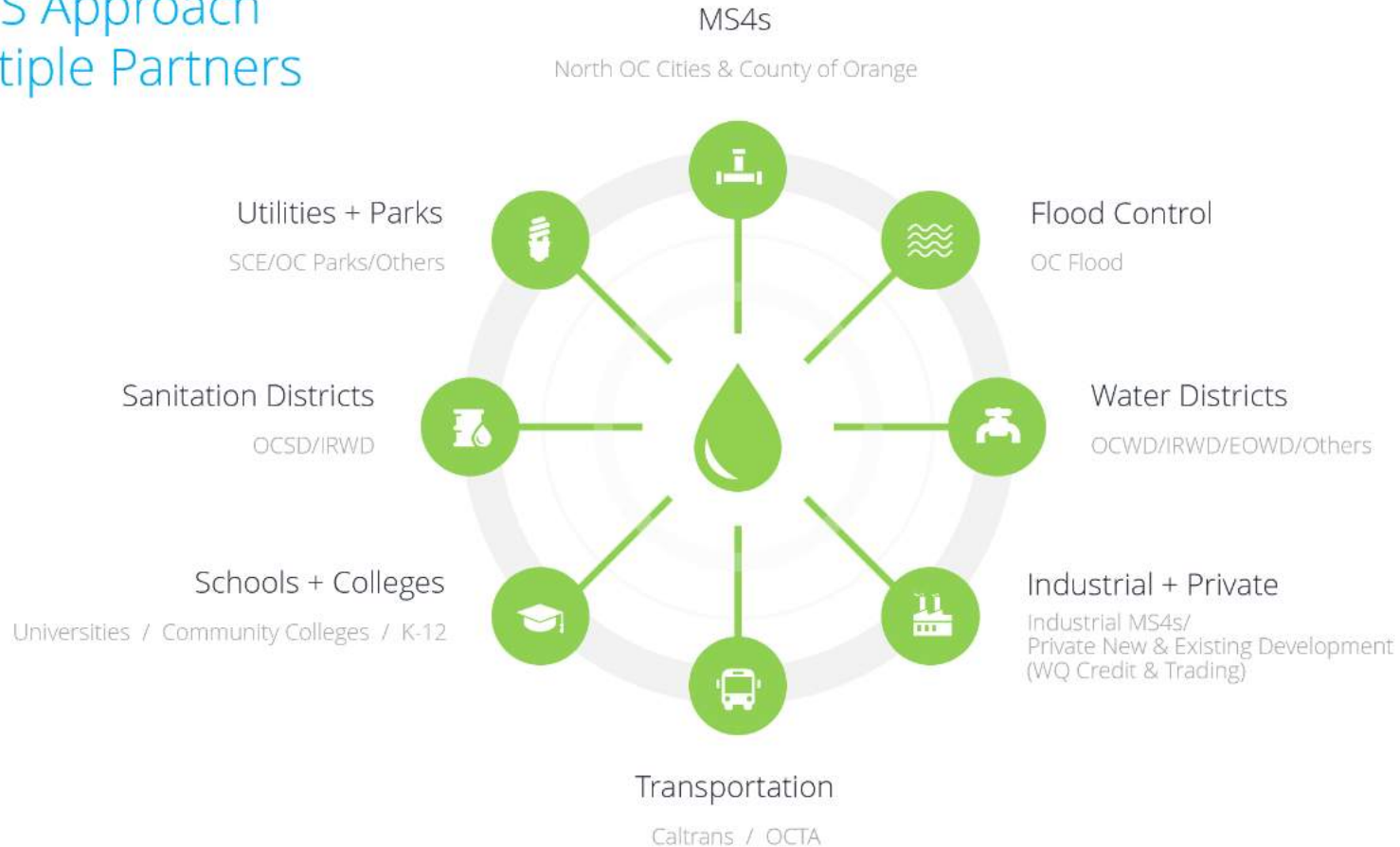


# SWMM and Recharge Facilities Model Connectivity

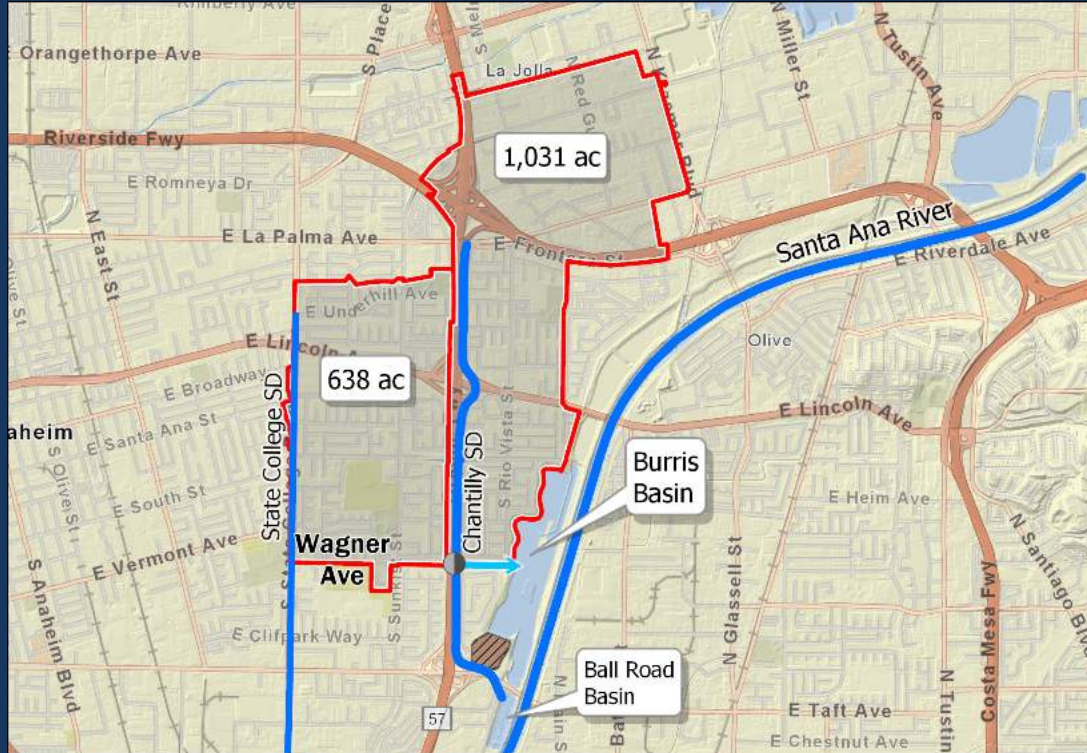


# WIPS Approach

## Multiple Partners



# Result: Multi-benefit Project Concept Example





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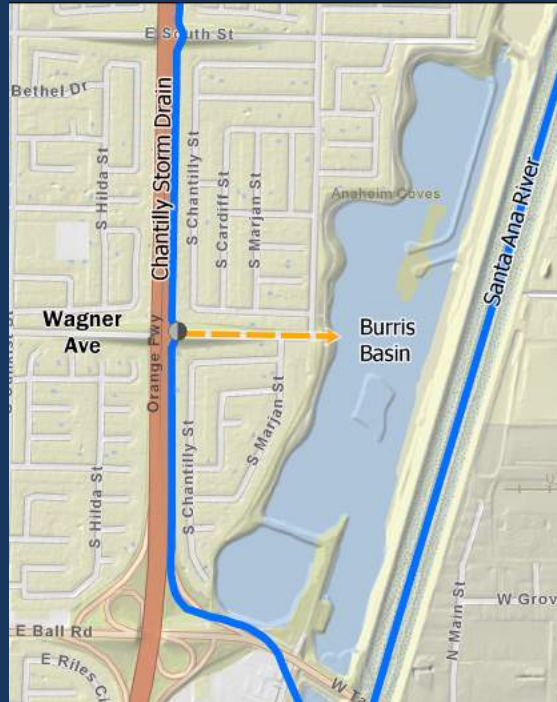
- Option 1

- Add diversion structure @ Wagner Avenue (Chantilly SD)
- Add gravity pipe to Burris Basin
- 85th% retention (645 AF/YR)
- Cost - \$725K (\$50/AF)

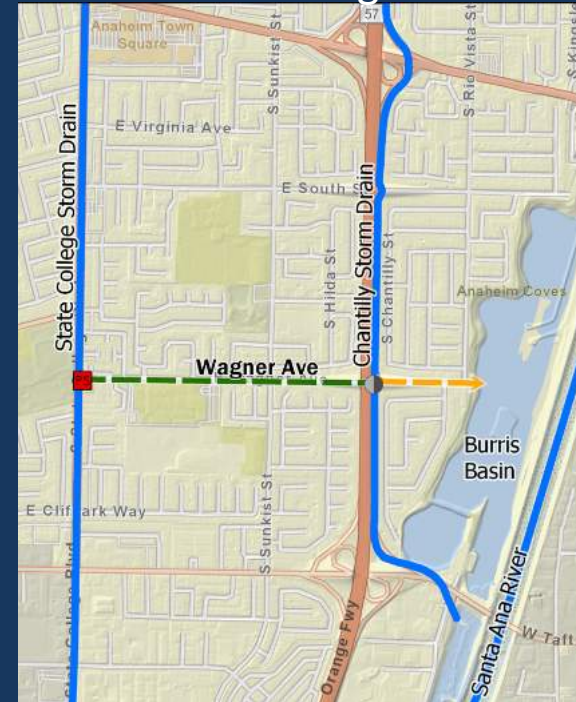
- Option 2

- Add diversion structures @ State College SD & Chantilly SD
- Add pump station & 4200' force main in Wagner Avenue
- Additional 640 acres of drainage
- Additional 400 AF/YR
- Cost - \$2.2 Million (\$100/AF)

Option 1: Chantilly SD Only



Option 2: Chantilly SD & State College SD



Local,  
Private Multi-  
benefit  
project





# Conclusions

- The agencies are establishing a collaborative, integrated water resources approach to identify, evaluate, and prioritize multi-benefit watershed improvement projects across North OC
- Regional GIS-based analysis has been successful in the identification and prioritization of potential project sites using various technical factors
- Modelling has been a valuable tool for maximizing stormwater capture for recharge purposes at OCWD sites, such as the Burris Basin
- Future collaboration opportunities are anticipated