



Interjurisdictional Project Success Stories

Difficulties and Lessons Learned

Chesapeake Bay Program Trading and Offsets Workgroup Call
March 21, 2018

TETRA TECH

Objective

- Examine examples of real-world projects to learn about
 - Potential pitfalls and difficulties in working across jurisdictional lines to implement solutions to environmental issues
 - Factors that played into success
- Criteria
 - Any media (water, air, etc.,)
 - Multi- and/or Cross-jurisdictional stakeholders
 - Mature enough to have some implementation success
- Examples
 - Penobscot River Restoration, Maine
 - Los Angeles TMDL Enhanced Management Plan Implementation
- Background, issues, problem resolutions, questions



Penobscot River Restoration



Aerial photo by J.Royte/TNC/Lighthawk



Penobscot River Restoration - Synopsis

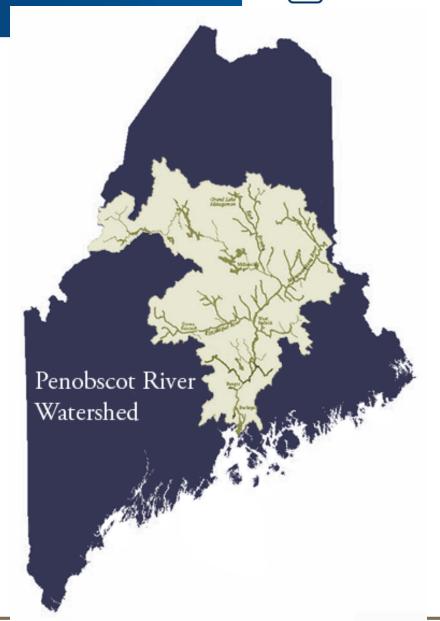
- A multi-stakeholder coalition worked to restore 11 species of sea-run fish to the Penobscot River, while maintaining energy production.
- At 2016 completion, two dams were purchased and removed, a fish passage was built around one and fish passage enhancements at four additional dams.





Penobscot River

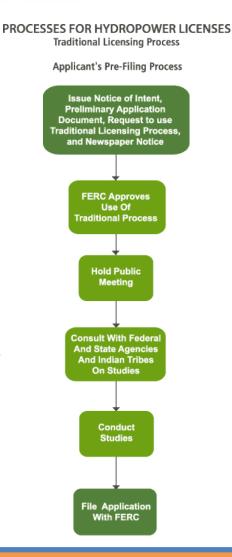
- Drains 8750 square mile watershed, empties into Penobscot Bay near the town of Bucksport.
- Penobscot Indians first known inhabitants
- Historic migratory fish runs
 - Atlantic salmon, shad, alewives
- Habitat altered by logging, industrialization, waste discharges and dams
 - 1834 Veazy Dam built
 - severe decline of the migratory runs



Applicant's Pre-Filing Process

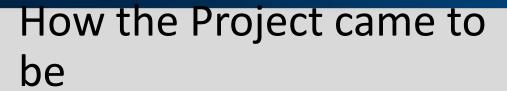
Catalyst for Restoration - Relicensing

- 1999 PPL purchased all the dams on the Penobscot
- Regulated by FERC, several were under relicensing negotiations
- FERC required to comply with NEPA and the CWA
- Licensing process allows for consolidating multiple licensing proceedings – Rare but used for Penobscot
- During settlement discussions,
 PPL was willing to include other dams not under review.





Environmental Review Document



- In 1999 PPL approached stakeholders to consider relicensing options related to its dams
- Penobscot Indian Tribe and stakeholders agreed to withhold opposition to continued dam operations at several sites
- PPL agreed to sell two dams (ultimately they were removed), decommission a third, and implement upgrades to fish passage capacity at four others
- 2004 Signed agreement between the Trust and PPL
- 2016 Project Completed



NEGOTIATION



Penobscot River Restoration Trust

Penobscot Indian Nation

PPL Corporation

USDOI Bureau of Fish

USDOI Wildlife Service

Bureau of Indian Affairs

Maine Department of Inland Fisheries and Wildlife

National Park Service

Black Bear LLC

Maine Department of Marine Resources

Maine State Planning Office

National Oceanic and Atmospheric Administration



Penobscot River Restoration Trust

- Non-profit created and charged with implementing key aspects of plan
 - Raise money
 - Purchased 3 dams in 2010 for \$24 million
 - Steward the restoration projects

PENOBSCOT RIVER RESTORATION TRUST















Restorati

Penobscot River Restoration Project Penobscot River Restoration Project

Balancing the Environment, Economy and Quality of Life in Maine's Largest Watershed

Howland

Penobscot River

Fisheries

West Enfield

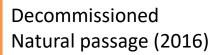
Dam

Piscataquis River ...

Energy

Medway Dam





Removed

2012

2013



This map includes actions authorized for the Penobscot River Restoration Trust and other signatories of the Lower Penobscot River Multiparty Settlement Agreement

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Great Works Dam Removal









Veazie Dam Removal

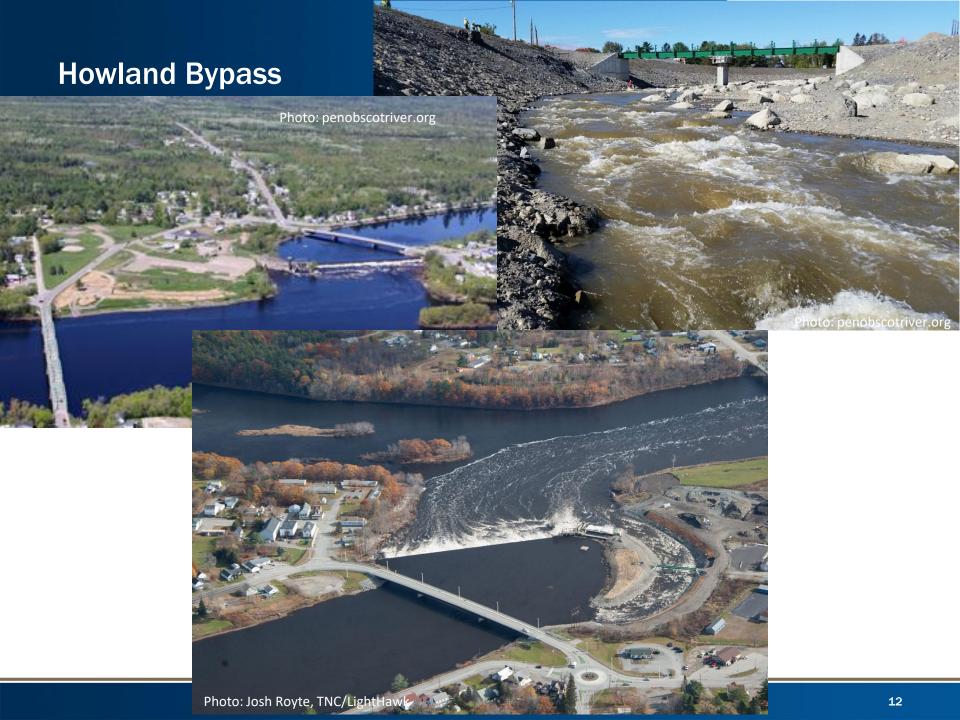








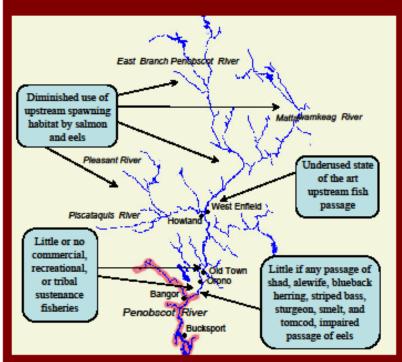
All Photos this page: penobscotriver.org

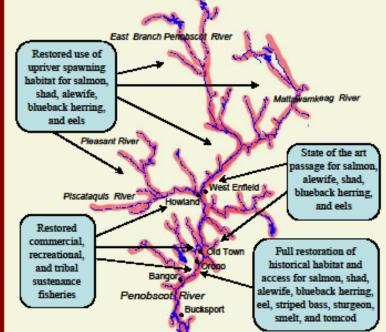


Penobscot River Restoration Project

Before and After Habitat Access







Existing Access for Sea-Run Fish Significantly Improved Access for Sea-Run Fish to Nearly 1,000 Miles

From penobscotriver.org

Results



- Prior to restoration
- Salmon endangered
- American shad nearly gone
- Blueback herring species of concern
- Shortnose sturgeon endangered
- Alewife species of concern
- Fisheries an economic disaster

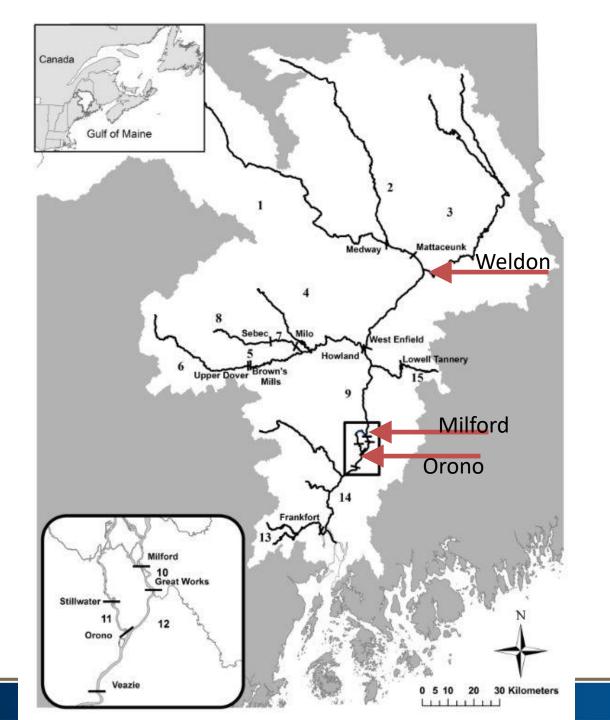
- After—(Aug. 2016 @ Milford)
- 287 mature Atlantic salmon
- 7,846 shad
- 1.26 million river herring
- 1,149 striped bass
- 3,833 sea lamprey
- No decrease in power generation



Trap Count Statistics - 2017

River	Trap Location	Am. Shad	Salmon (MSW)	Salmon (grilse)	River Herring	Striped Bass	Sea Lamprey	Trap Opened	Trap Closed
Penobscot	Weldon Dam	0	18	67	0	0	NC	May 1	Nov 10
Penobscot	Milford fish lift	3,868	531	309	1,256,061	1,603	953	April 24	Nov 15
Penobscot	Orono	0	8	1	100,976	2	871	April 24	Nov 15

ME Dept. of Marine Resources





Additional Results

Beyond fish access....

Whitewater races, festivals, tourism

More dependable food supply for fisheating birds and mammals

Increased herring populations may lead to improvement in commercial ocean ground fisheries

Energy production



Difficulties and Lessons

- Complex relicensing and regulatory process
- Multitude of stakeholders
- Funding requirements over \$60 million ultimately was raised to implement the restoration project from public and private sources
- Future management of multiple dams in single basin
 - https://lawreview.law.ucdavis.edu/issues/48/3/Articles/48-3_Owen-Apse.pdf
 - Using Penobscot River restoration project as an example, article analyzes how trading systems might facilitate better reconciliation of the positive benefits and negative impacts of dams.



Factors for Success

- Recent similar efforts for Edwards Dam on Kennebec River and Elwha and Glines Canyon Dams on west coast
- Potential for significant recovery of fisheries with restoration of access to the river
- Unique dam ownership situation
 - One owner of multiple dams, allowed for holistic viewpoint
 - Participants decided to concurrently evaluate all of PPL's dams in the lower Penobscot basin.
 - Opportunity to ID cost-effective ways to rehabilitate fisheries while retaining much of its hydropower
- Partners open to creative solution and acknowledging the benefit of tremendous ecological restoration benefits in exchange for enhanced power production elsewhere



Los Angeles TMDL Implementation

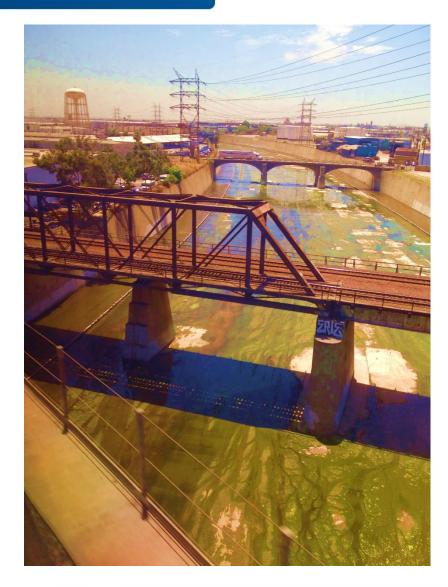
Enhanced Watershed Management Programs



Regional Drivers

Water Quality Impairments

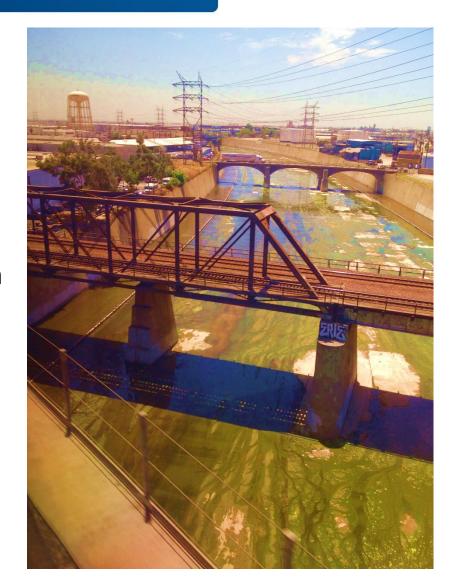






By the Numbers

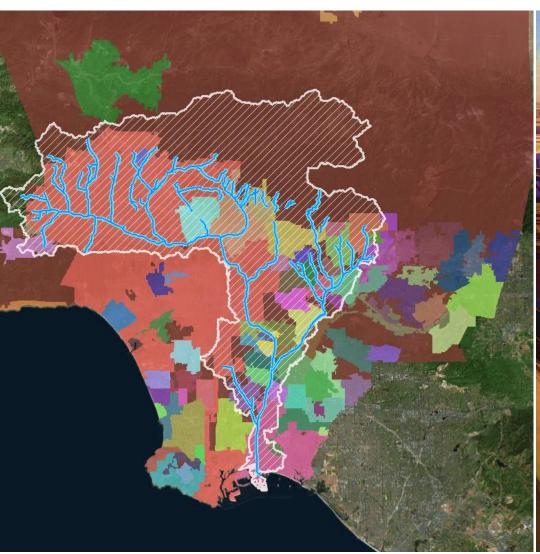
- Water Quality Impairments
 - 1,379 303(d)-listed impairments*
 - 75 TMDLs*
 - 88 cities, LA County, and LA County Flood Control District
 - 500 miles of open channel
 - 2,800 miles of underground storm drain
 - 120,000+ catch basins
 - 2.1M+ parcels

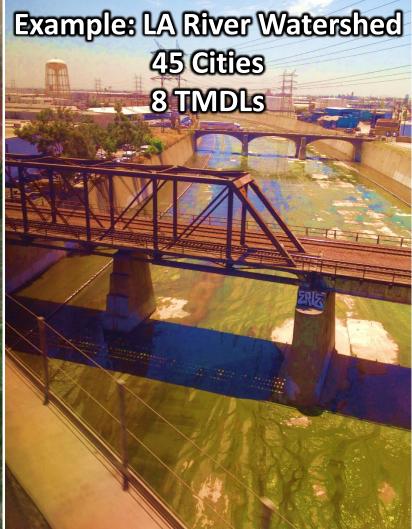


^{*}Los Angeles Region, includes Ventura County



By the Numbers





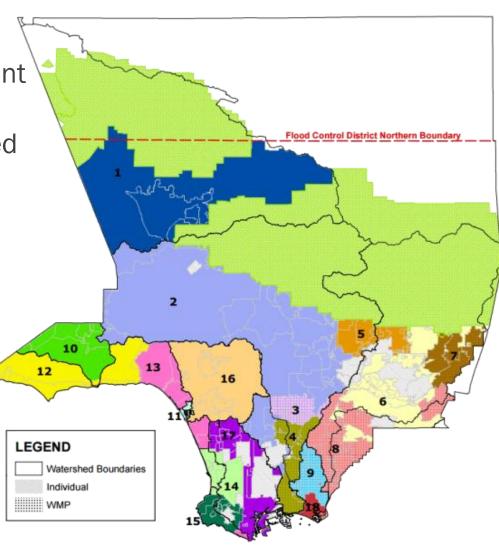


Regulatory Response

 MS4 Permit allowed development of Watershed Management Programs (WMPs) and Enhanced Watershed Management Programs (EWMPs)

 WMPs/EWMPs are voluntary interjurisdictional programs to improve water quality

 EWMPs focus on collaborative, multi-benefit projects (in exchange for time)

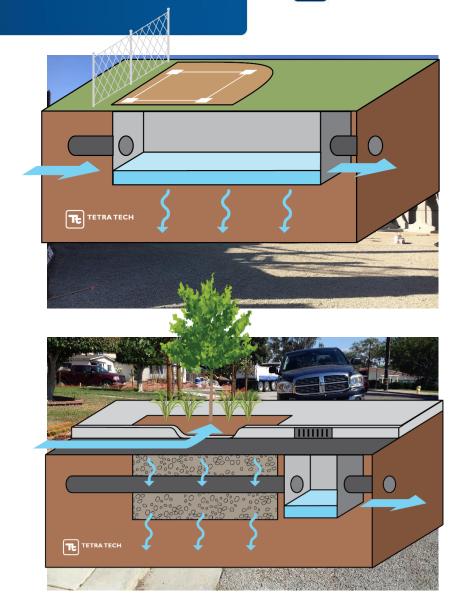




The Challenge

- EWMPs prescribed over \$20
 billion of green stormwater infrastructure retrofits

 (16,000+ ac-ft of BMPs)
- Operating in built out environment with limited, expensive real estate
- Current plans default to land acquisition for 80% of the solution





The Challenge

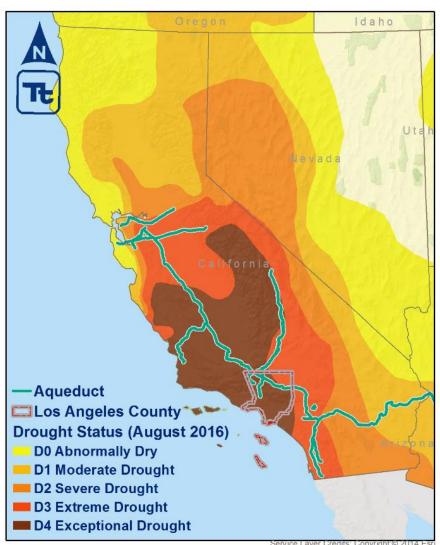




Other Regional Drivers for Collaboration

- Water Quality Impairments
- Prolonged Droughts



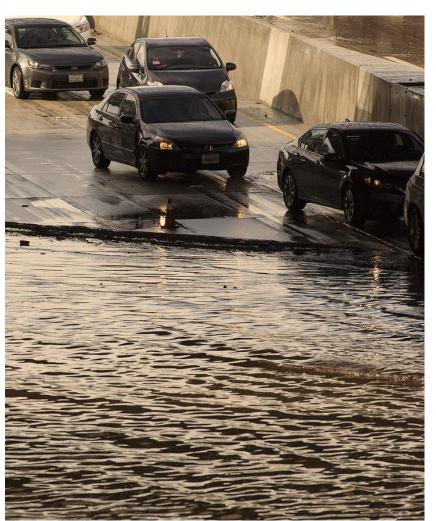




Other Regional Drivers for Collaboration

- Water Quality Impairments
- Prolonged Droughts
- More Frequent Flooding



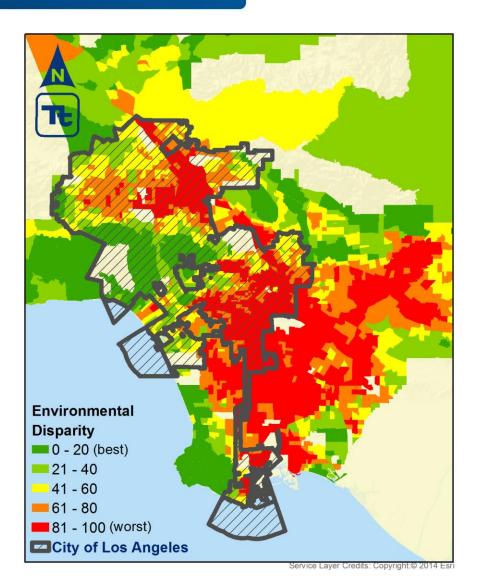


Brian van der Brug / Los Angeles Times



Other Regional Drivers for Collaboration

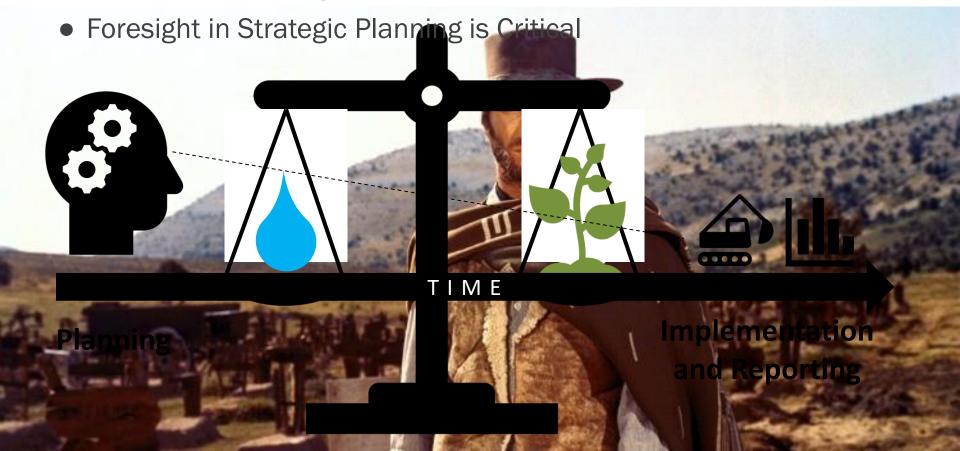
- Water Quality Impairments
- Prolonged Droughts
- More Frequent Flooding
- Environmental Justice
- Affordable Housing
- Climate Resiliency
- Aging Infrastructure





Lessons Learned and Challenges

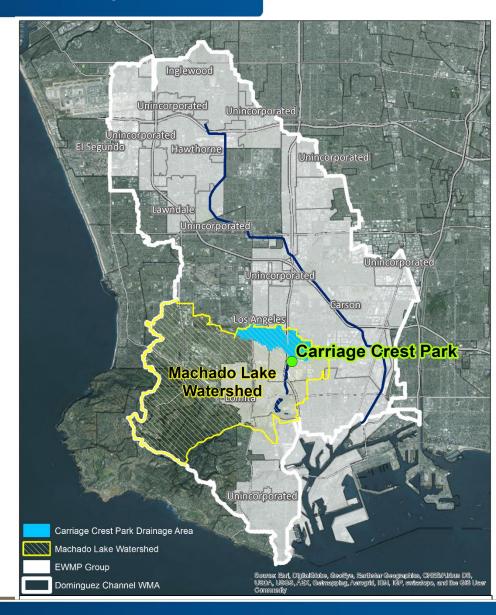
- LA County is the Wild West of Water Quality Trading
- All Water is Not Created Equally
- But Co-Benefits Might be Valued Equally



Case Study: Carriage Crest Park Stormwater Capture Project



- Dominguez Channel EWMP includes 8 Watershed Management Group members, 3 major receiving waters
- 23 square-mile drainage area to Machado Lake (8% of which drains to Carriage Crest drains)
- Regional project at Carriage
 Crest Park will reduce
 bacteria, nutrients, and
 other pollutants discharged
 to Machado Lake



Site Location and Context

- "Last line of defense" before Wilmington Drain
- Located adjacent to Joint Water
 Pollution Control
 Plant
- Infiltration is infeasible



Site Location and Context











CARRAIGE CREST PARK
STORMWATER CAPTURE PROJECT
EXISTING UTILITIES

CITY OF CARSON

Project No.: 135-01297-16021

Date: 12/9/2016

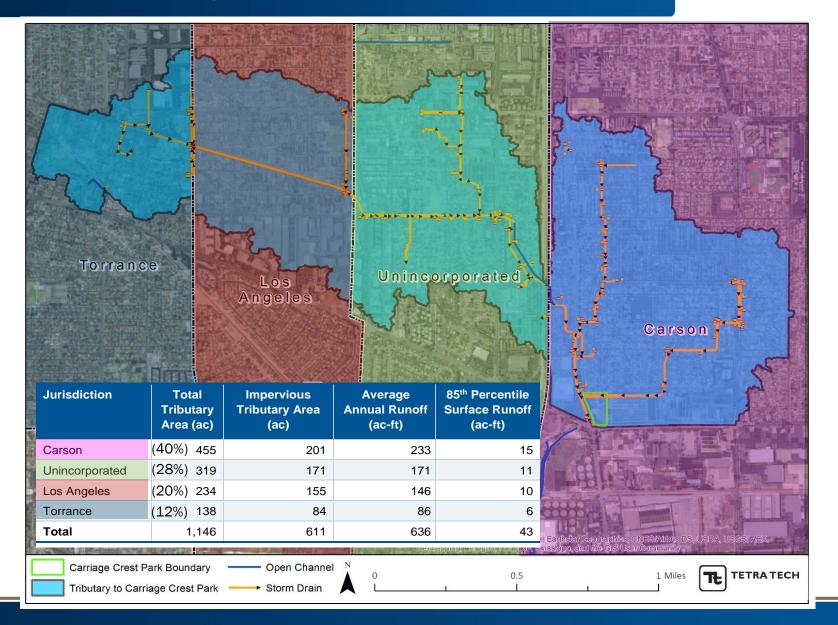
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Supplemental

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Benefits Spanning Jurisdictional Boundaries





Project Funding and Coordination



City of Carson entered into a Cooperative Implementation Agreement with Caltrans for \$13 Million

Caltrans Cooperative Implementation Credits: \$88k/compliance unit (i.e., per acre of ROW)

Sanitation Districts of LA County offered implementation services under SB 485

County of LA "buying into" project









Project Summary

Carson Water Capture Project at Carriage Crest Park

Drainage Area 1,146 acres

Contributing Drainage Area Carson, Unincorporated LA

County, City of LA, and Torrance

Water Quality BMP Volume 12.5 AF

Annual Volume Capture 481 AFY (average)

685 AFY (wet year)

BMP Opportunity Area (max) 4.8 acres

Storm Drain Diversion Rate 45 cfs

Sanitary Sewer Discharge Rate, 34 cfs **Dry and Wet Weather (max)**

Design Components







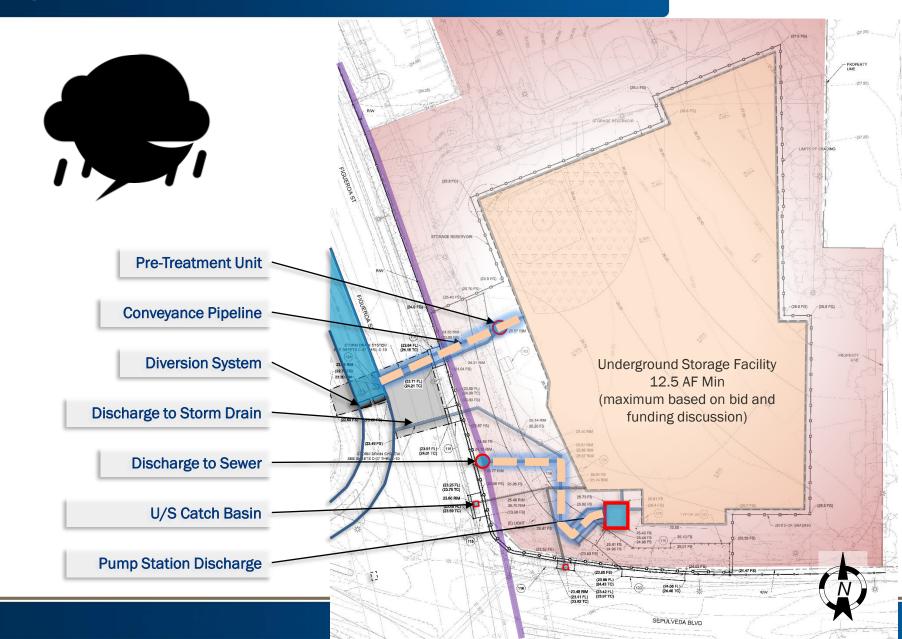






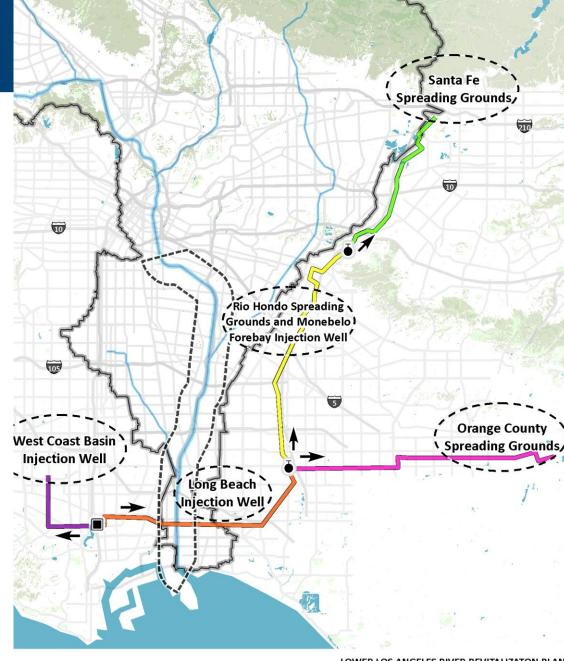
Design Operation





Integrated Watershed Management

- Sanitation Districts and Metropolitan Water
 District plan to construct advanced water
 treatment facility
- Plan to eventually generate 150 MGD to supply regional spreading grounds, injection wells





LOWER LOS ANGELES RIVER REVITALIZATON PLAN MWD PURIFIED WATER DISTRIBUTION SYSTEM (PROPOSED

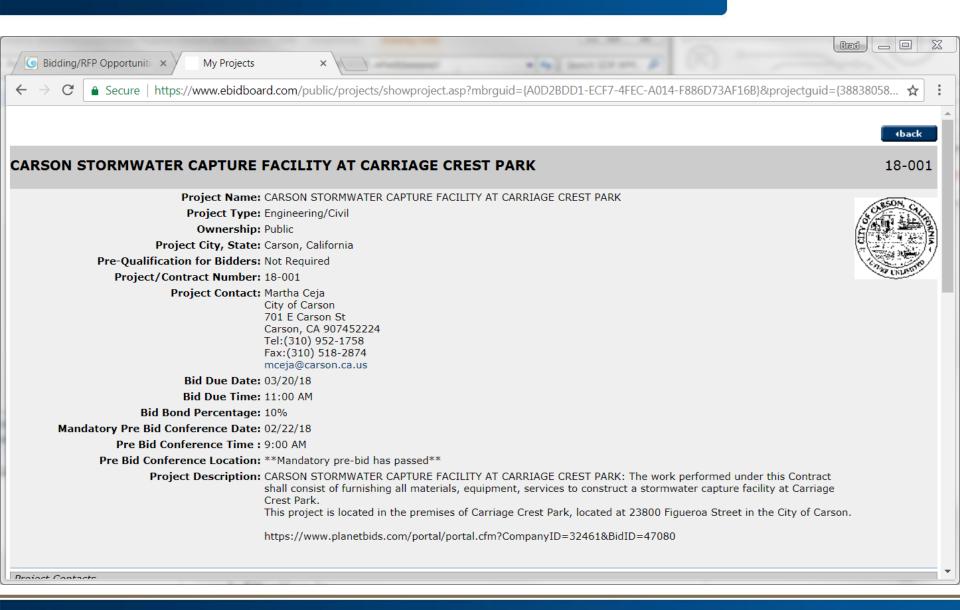






Project Status: Currently Out for Bids







Interjurisdictional Co-Funding of O&M

O&M Component	&M Component		Wet Year	
Active Control		\$58,000	\$58,000	
Channel Diversion a	nd Pretreatment	\$27,000	\$27,000	
Pump Station		\$38,000	\$38,000	
Storage		\$16,000	\$16,000	
Sampling		\$31,000	\$31,000	
Treatment Surcharge	е	\$158,000	\$215,000	
	ual O&M to Fully Manage v. Design Storm Volume	\$328,000	\$385,000	
Carson	(58% of runoff volume)	\$189,000	\$222,000	
Unincorporated	(42% of runoff volume)	\$139,000	\$163,000	

Co-funding is Negotiated, but Who is "Getting Credit" and How?



- EWMP focuses on managing bacteria as "limiting pollutant"
- EWMP uses subwatershed-scale runoff volume as a proxy for bacteria
- MS4 Permit alternative compliance pathway: 85th %-ile storm retention

Table 5.2: Dominguez Channel Watershed – Summary of volume managed and BMP capacity by

Contribution

Carsc Unincorp

Carso

jurisdiction for final compliance								
COMPLIANCE TARGETS: BMP PERFORMANCE GOAL		EWMP IMPLEMENTATION PLAN: APPROACH TO ACHIEVE COMPLIANCE TARGETS, SUBJECT TO ADAPTIVE MANAGEMENT (BMP capacity expressed in units of acre-feet)						
Jurisdiction	24-hour Volume Managed (acre-ft)	LID/Redevelopment	Green Streets	Regional BMPs (identified)	Additional BMPs (TBD)	Total BMP Capacity (acre-ft)		
Carson	231.7	24.9	59.5	17.7	100.3	202.6		
El Segundo	63.6	1.4	2.0	44.9	3.3	51.5		
Hawthorne	151.6	12.5	35.3	50.1	23.7	121.6		
Inglewood	96.5	4.1	44.1	5.2	20.4	73.8		
Lawndale	42.2	3.5	0.0	34.8	0.0	38.3		
Lomita	38.2	1.3	0.0	49.0	3.8	54.1		
Los Angeles	433.1	50.7	96.0	57.8	165.6	370.2		
Uninc. LA County	212.4	18.4	57.2	72.9	51.6	200.1		
Total	1,284.30	116.8	294.2	332.4	368.9	1,112.3		

ac-ft

Co-funding is Negotiated, but Who is "Getting Credit" and How?



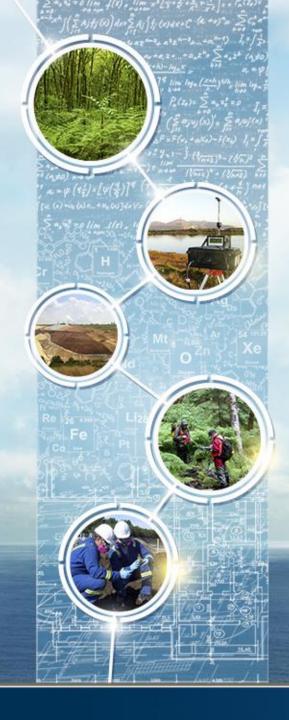
- Required special permission to use design storm volume to demonstrate compliance
- Now misalignment between plan and implementation
- Carson is managing runoff from 3 other jurisdictions, but "credit" is only being granted to those who pay
- Volume metrics are simple... but...
 - Eliminates some efficiencies of regional projects
 - All water is not created equal
 - e.g. using pollutant load as a metric, Carriage Crest Park may demonstrate compliance for tributary portions of all 4 jurisdictions





The Takeaways from Carriage Crest Park

- Cross-jurisdictional collaboration leveraged funding/assets to develop an efficient project
- Strategic compliance planning is important
- In Wild West, credit is assessed on a case-by-case basis through adaptive management
 - Permit interpretation breeds competition and collaboration between jurisdictions
 - Defining targets/credit at <u>watershed-scale</u> based on <u>long-term</u> <u>water quality</u> is most meaningful, measurable, achievable
- Continuous monitoring and control can streamline crediting and boost performance





Thank You for Your Time

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