



Helping River Sand Move to the Coast: The Santa Ana River Sand Management Project

KIM GARVEY, MOFFATT & NICHOL
JAMES VOLZ, COUNTY OF ORANGE

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Photo by OC Survey

Presentation Objective

- Highlight challenges and successes of a sediment beneficial re-use project

Lower Santa Ana River Overview

- Flood control channel for very large urban watershed in Southern California
- USACE facility, maintained by County of Orange
- Upstream Prado Dam and downstream discharge to ocean
- Currently, river delivers $\leq \sim 130,000$ cy per year of sediment to coastline (naturally)
- Prior to dam, river delivered up to 650,000 cy per year to coastline



Lower Santa Ana River



Photo by OC Survey

Lower Santa Ana River Sand Management Project Overview

- Periodic sediment removal required for flood control maintenance
- In 2016-2017, ~650,000 cubic yards removed (ironically same amount of sand delivered to coast on annual basis pre-dam)
- All sediment deemed to be beach quality sand
- Key first step of project was to allow for beneficial re-use of sediment on several local beaches



Sand Source and Receiver Site Locations



Lower Santa Ana River – Sand Source



Lower Santa Ana River – Sand Source



Beneficial Use Site: Newport Beach shoreline



Beneficial Use Site: Huntington Harbour Pocket Beaches



*Beneficial Use Site: State Beach -
Special Species Bird Habitat Protection*



Project Lessons Learned / Successes

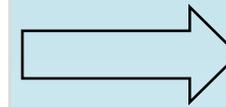
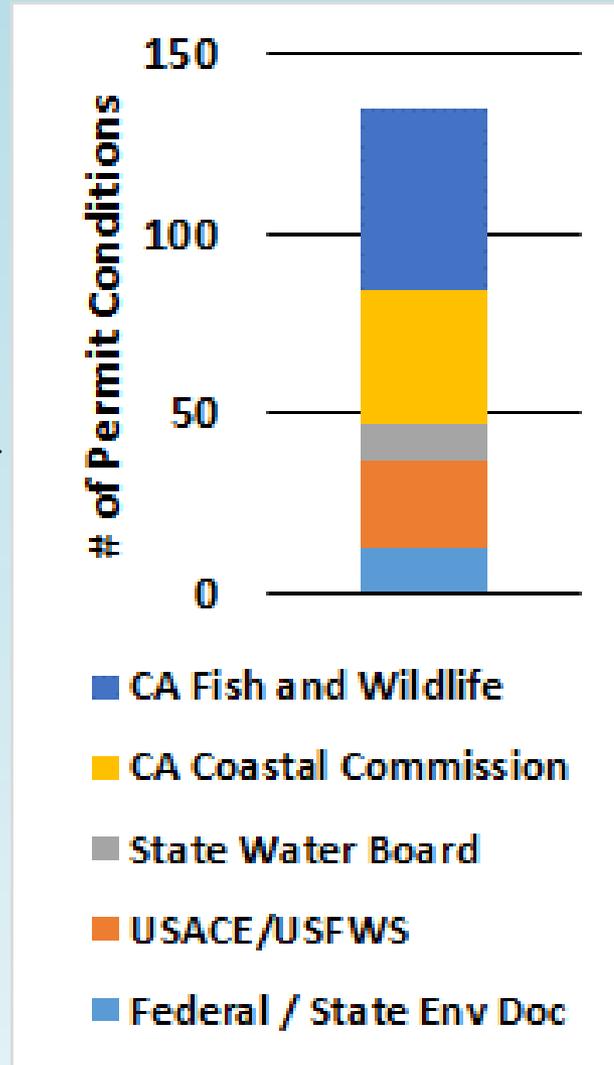
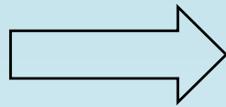
Challenge	Solution
Potential sand receiver sites did not have permits	Early project involvement of interested municipalities Inclusion of all potential receiver sites in County environmental doc and permit applications
Working in flood channel during winter storm months and in tidally-influenced river mouth	Early construction contractor involvement Additional contingency volume in permit application Nimble survey crew
Cobble, rock, vegetation, debris in river	Screen plant at river mouth site Clearing of vegetation prior to excavation

Project Lessons Learned / Successes (cont.)

Challenge	Solution
Public perception of sediment in urban river	“Sand” not “sediment” Upstream material not discharged directly onto dry beach area
Minimizing impacts to popular surfing area	Public outreach Recreational surf monitoring
Extensive (yet transitory) eelgrass within river	Eelgrass management plan in coordination with agencies
Federal and state permit acquisition timelines and plethora of conditions	Early construction contractor involvement Challenge continues.....

Environmental Review and Permits

~15 months to obtain permits and update environmental review documents



5 years of post-construction monitoring

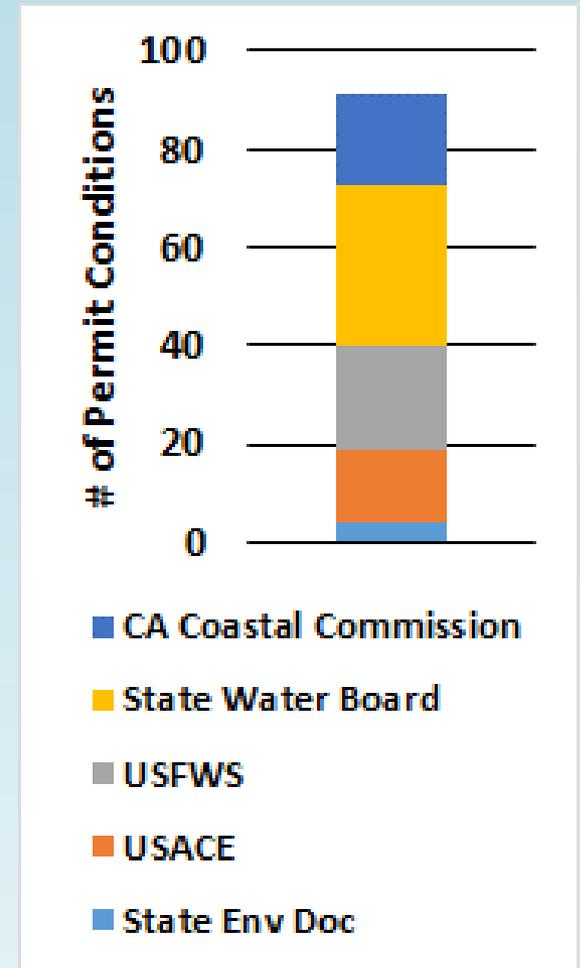
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Ongoing Santa Ana River Ocean Outlet Maintenance

- Separate set of permits and environmental docs
- Allows for up to 70,000 cy per event to be removed and placed on beaches
- Significant constraints and costs
 - Permits have to be renewed in 5 years
 - Biological windows and monitoring
 - Surf monitoring
 - Gaps in sand placement every 500 ft
 - Pre-construction, post-construction, and annual reporting for every event



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Summary

- Seek out and facilitate beneficial use applications
- Beneficial use can be most cost-effective solution
- Environmental documents, permit applications, and sediment characterization should include all possible dredge material use options
- Work with regulatory agencies for practical set of conditions / requirements

