Engineering With Nature
Case Examples of Practice

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U.S. Army Corps of Engineers

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Gloucester, MA

Current Projects

- Port of Los Angeles Maintenance Dredging
- Malibu Creek Ecosystem Restoration Study
- Port of Long Beach Deep Draft Navigation Study

Port of Los Angeles Maintenance Dredging

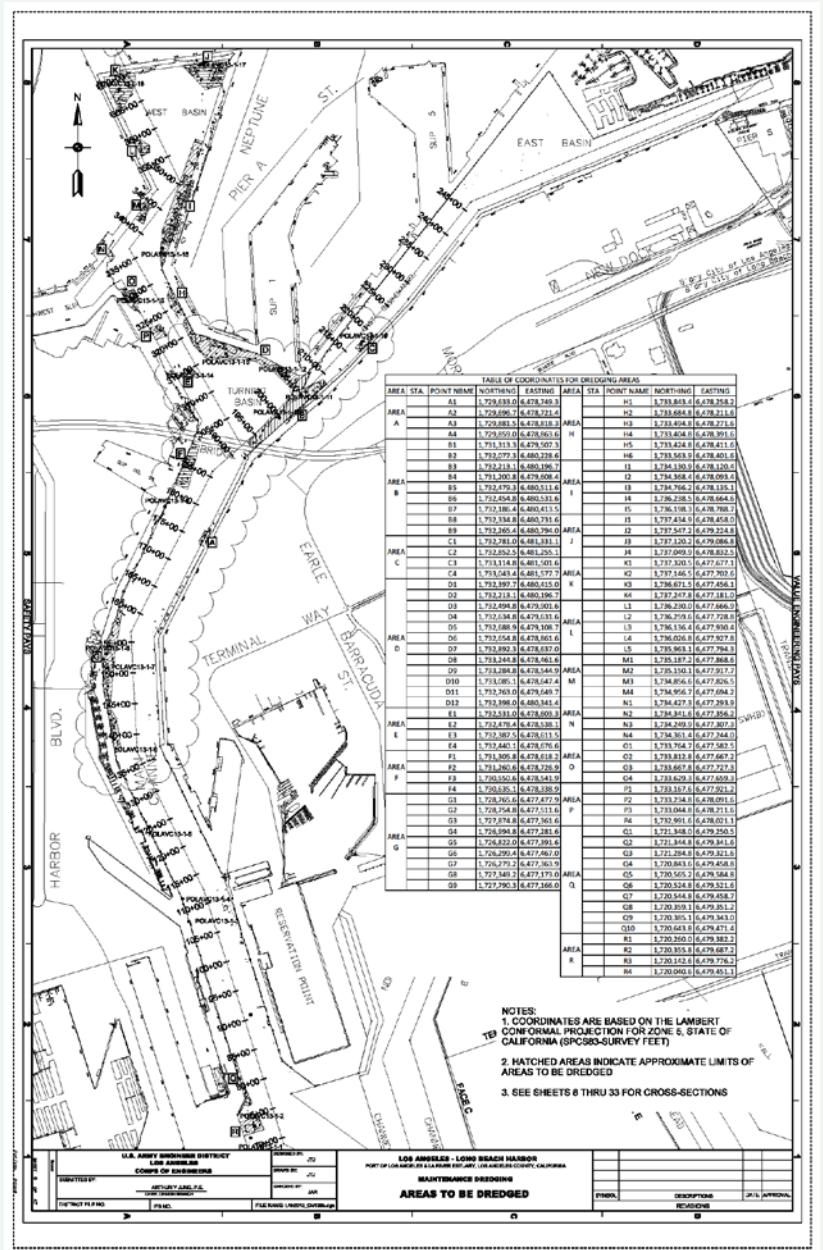
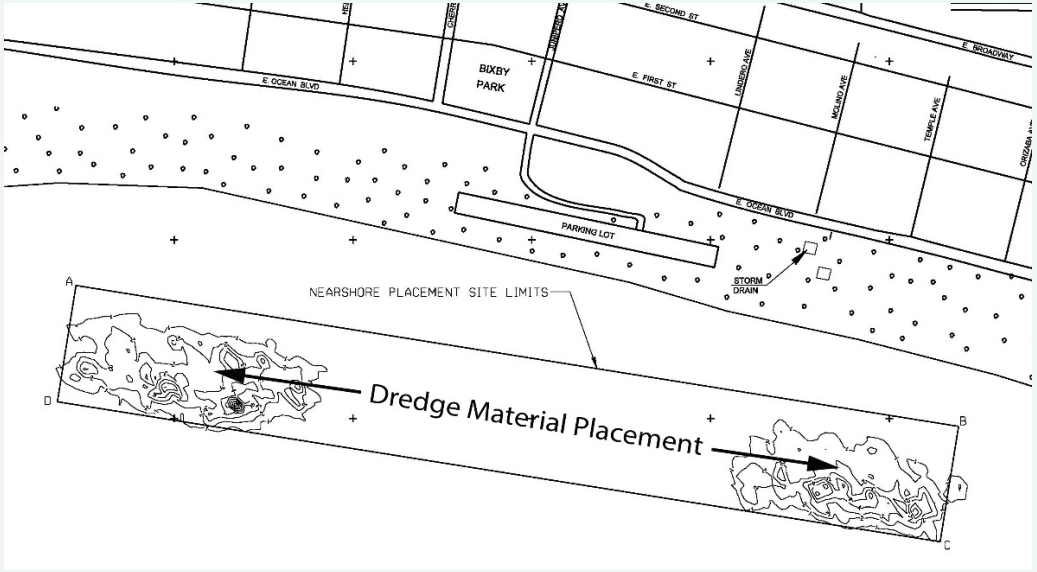


TABLE OF COORDINATES FOR DREDGING AREAS

AREA	STA.	POINT NAME	NORTHING	EASTING
AREA A		A1	1,729,633.0	6,478,749.3
		A2	1,729,696.7	6,478,721.4
		A3	1,729,881.5	6,478,818.3
		A4	1,729,950.0	6,478,963.6
AREA B		B1	1,731,313.3	6,479,507.3
		B2	1,732,077.3	6,480,228.6
		B3	1,732,218.1	6,480,196.7
		B4	1,731,200.8	6,479,608.4
		B5	1,732,479.3	6,480,511.6
		B6	1,732,454.8	6,480,531.6
		B7	1,732,186.4	6,480,411.5
		B8	1,732,334.8	6,480,731.6
		B9	1,732,265.4	6,480,794.0
AREA C		C1	1,732,781.0	6,481,331.1
		C2	1,732,852.5	6,481,255.1
		C3	1,733,114.8	6,481,501.6
		C4	1,733,043.4	6,481,577.7
AREA D		D1	1,732,397.7	6,480,415.0
		D2	1,732,218.1	6,480,196.7
		D3	1,732,494.8	6,479,901.6
		D4	1,732,634.8	6,479,631.6
		D5	1,732,688.9	6,479,308.7
		D6	1,732,654.8	6,478,661.6
		D7	1,732,892.3	6,478,637.0
		D8	1,733,244.8	6,478,681.6
		D9	1,733,284.8	6,478,544.9
		D10	1,733,085.1	6,478,047.4
		D11	1,732,763.0	6,479,049.7
		D12	1,732,398.0	6,480,341.4
AREA E		E1	1,732,531.0	6,478,603.3
		E2	1,732,479.4	6,478,538.1
		E3	1,732,387.5	6,478,611.5
		E4	1,732,440.1	6,478,676.6
AREA F		F1	1,731,305.8	6,478,618.2
		F2	1,731,260.6	6,478,726.9
		F3	1,730,550.6	6,478,141.9
		F4	1,730,635.1	6,478,336.9
AREA G		G1	1,728,765.6	6,477,477.9
		G2	1,728,754.8	6,477,511.6
		G3	1,727,874.8	6,477,363.6
		G4	1,726,994.8	6,477,281.6
		G5	1,726,822.0	6,477,391.6
		G6	1,726,290.4	6,477,467.0
		G7	1,726,271.2	6,477,363.9
		G8	1,727,349.2	6,477,171.0
		G9	1,727,790.3	6,477,166.0

AREA	STA.	POINT NAME	NORTHING	EASTING
AREA H		H1	1,733,843.4	6,478,358.2
		H2	1,733,684.8	6,478,211.6
		H3	1,733,404.8	6,478,271.6
		H4	1,733,404.8	6,478,391.6
		H5	1,733,424.8	6,478,411.6
		H6	1,733,563.9	6,478,401.6
AREA I		I1	1,734,130.9	6,478,120.6
		I2	1,734,368.4	6,478,093.6
		I3	1,734,766.2	6,478,135.1
		I4	1,736,238.5	6,478,664.6
		I5	1,736,198.1	6,478,788.2
		I6	1,737,434.5	6,478,458.0
AREA J		J1	1,737,547.2	6,479,224.8
		J2	1,737,120.2	6,479,086.8
		J3	1,737,049.9	6,478,832.5
		J4	1,737,320.5	6,477,677.1
AREA K		K1	1,737,146.5	6,477,702.6
		K2	1,736,671.5	6,477,456.1
		K3	1,737,247.8	6,477,181.0
		K4	1,736,230.0	6,477,666.0
AREA L		L1	1,736,259.6	6,477,728.8
		L2	1,736,136.4	6,477,930.4
		L3	1,736,026.8	6,477,927.8
		L4	1,735,963.1	6,477,794.3
		L5	1,735,187.2	6,477,868.6
AREA M		M1	1,735,150.1	6,477,917.7
		M2	1,734,856.6	6,477,826.5
		M3	1,734,956.7	6,477,694.2
		M4	1,734,427.3	6,477,393.9
AREA N		N1	1,734,341.6	6,477,356.2
		N2	1,734,249.9	6,477,307.3
		N3	1,734,361.4	6,477,244.0
AREA O		O1	1,733,764.7	6,477,583.5
		O2	1,733,812.8	6,477,667.2
		O3	1,733,667.8	6,477,727.3
		O4	1,733,629.3	6,477,659.3
AREA P		P1	1,733,317.6	6,477,921.2
		P2	1,733,234.8	6,478,091.6
		P3	1,733,044.8	6,478,211.6
		P4	1,732,901.6	6,478,021.1
AREA Q		Q1	1,721,348.0	6,479,350.5
		Q2	1,721,344.8	6,479,341.6
		Q3	1,721,284.8	6,479,321.6
		Q4	1,720,843.5	6,479,458.8
		Q5	1,720,565.2	6,479,584.8
		Q6	1,720,524.8	6,479,521.6
		Q7	1,720,544.8	6,479,458.7
		Q8	1,720,359.1	6,479,351.2
		Q9	1,720,305.1	6,479,343.0
		Q10	1,720,643.9	6,479,471.4
AREA R		R1	1,720,260.0	6,479,382.3
		R2	1,720,355.8	6,479,687.2
		R3	1,720,142.6	6,479,776.2
		R4	1,720,040.6	6,479,451.1



Most Significant Contributions

- Beneficial reuse of dredged materials
- Nearshore placement for the purposes of beach nourishment and eelgrass protection/enhancement

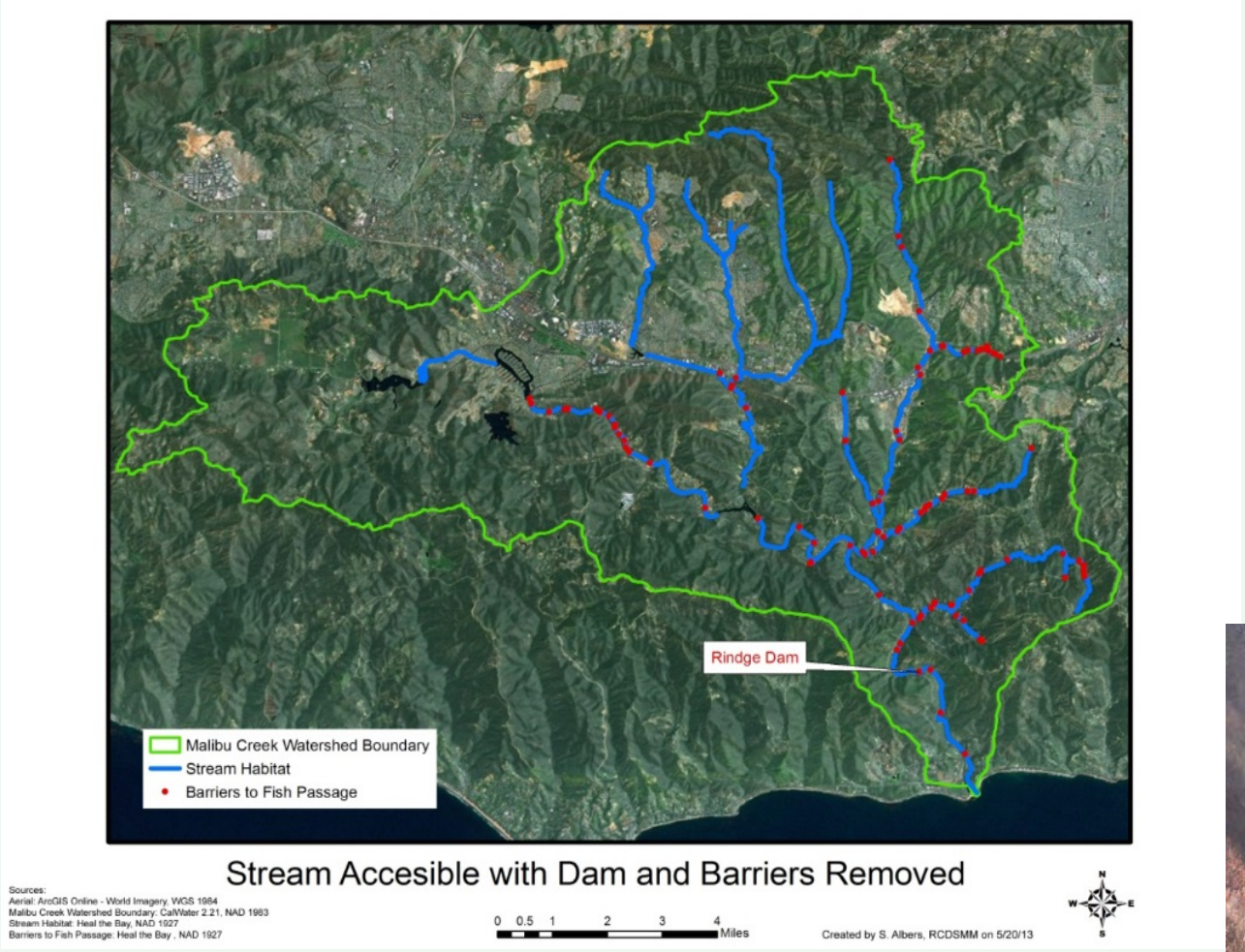
Challenges

- Identify nearshore-compatible sediments within the POLA
- Define areas of nearshore-compatible sediments in a dredgeable design
- Avoid impacts to existing eelgrass

Future Opportunities

- Identify protection of eelgrass as a beneficial reuse of dredged materials as purpose under Section 404 of the Clean Water Act

Malibu Creek Ecosystem Restoration Study



Most Significant Contributions

- Beneficial reuse of sands trapped behind a river dam that would otherwise flow to the sea

Challenges

- Segregating sand
- Transport and storage of sand
- Beach placement during off-season only
- Nearshore placement requires trucking and barging
- Traffic restrictions
- Surf grass concerns

Future Opportunities

- Allows use of inland source of sand for either beach placement or nearshore placement for purposes of nourishing beaches, removing built up sands from behind a large dam, and returning sands that, but for the dam, would have flowed to the placement area naturally.

Port of Long Beach Deep Draft Navigation Study

Most Significant Contributions

- Use of dredged material for benefits other than beach nourishment; in this case environmental restoration
- Use of dredged materials to refill historic (North and South Energy Island Borrow Pits) and recent (Surfside Borrow Pit) borrow pits

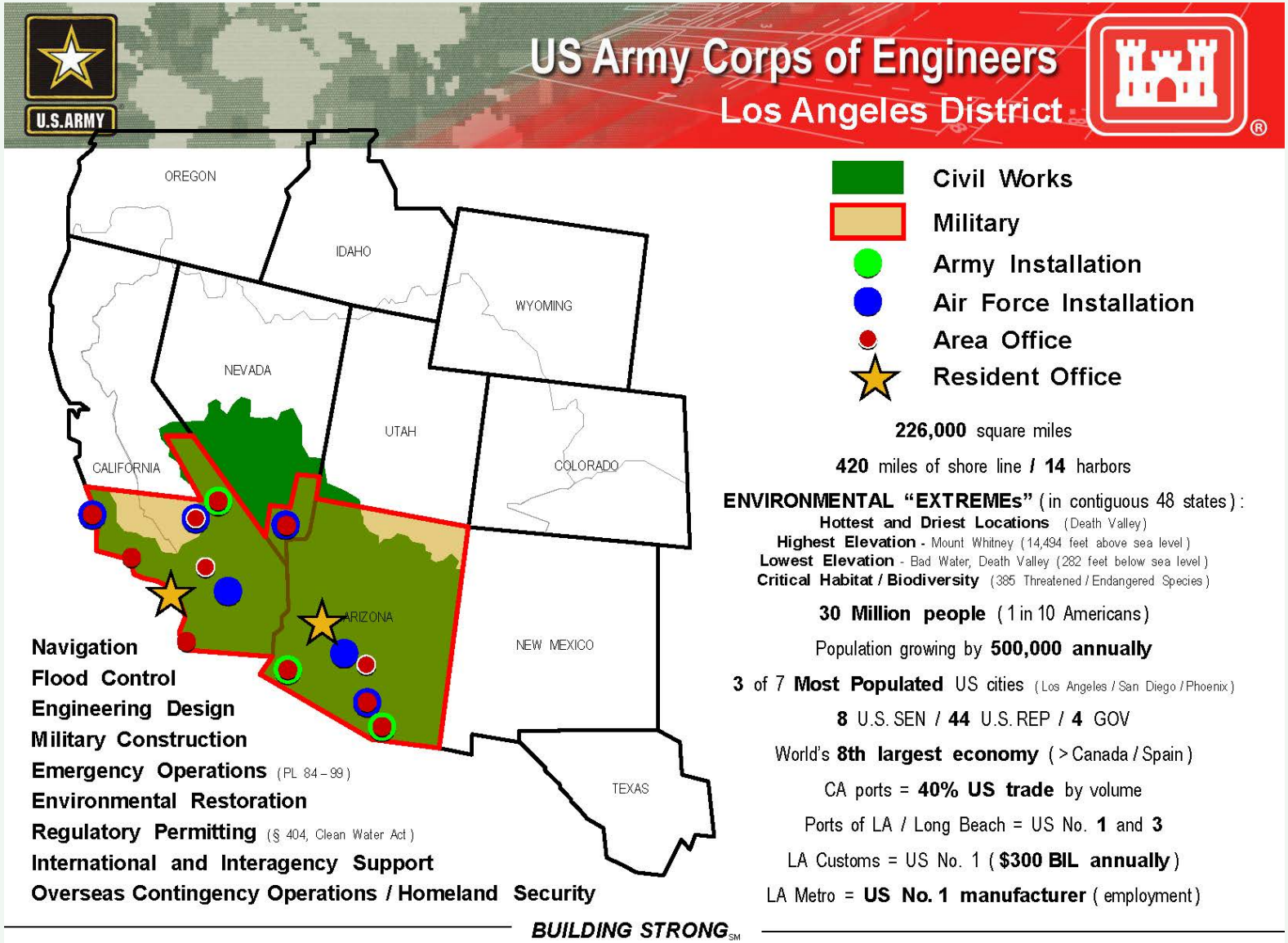
Challenges

- Obtain state and local approvals to use borrow pits, e.g. Coastal Commission
- USEPA review and concurrence for use and suitability of sediments

Future Opportunities

- Use of dredged materials for beneficial uses other than beach nourishment
- Add new dimensions to the term “beneficial reuse”
- Reduce “disposal” but still allow where appropriate

Questions?


U.S.ARMY
US Army Corps of Engineers
Los Angeles District
OREGON
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
CALIFORNIA
ARIZONA
NEW MEXICO
TEXAS
Civil Works
Military
Army Installation
Air Force Installation
Area Office
Resident Office
226,000 square miles
420 miles of shore line / 14 harbors
ENVIRONMENTAL "EXTREMEs" (in contiguous 48 states):
Hottest and Driest Locations (Death Valley)
Highest Elevation - Mount Whitney (14,494 feet above sea level)
Lowest Elevation - Bad Water, Death Valley (282 feet below sea level)
Critical Habitat / Biodiversity (385 Threatened / Endangered Species)
30 Million people (1 in 10 Americans)
Population growing by 500,000 annually
3 of 7 Most Populated US cities (Los Angeles / San Diego / Phoenix)
8 U.S. SEN / 44 U.S. REP / 4 GOV
World's 8th largest economy (> Canada / Spain)
CA ports = 40% US trade by volume
Ports of LA / Long Beach = US No. 1 and 3
LA Customs = US No. 1 ($300 BIL annually)
LA Metro = US No. 1 manufacturer (employment)
Navigation
Flood Control
Engineering Design
Military Construction
Emergency Operations (PL 84-99)
Environmental Restoration
Regulatory Permitting (§ 404, Clean Water Act)
International and Interagency Support
Overseas Contingency Operations / Homeland Security
BUILDING STRONG℠