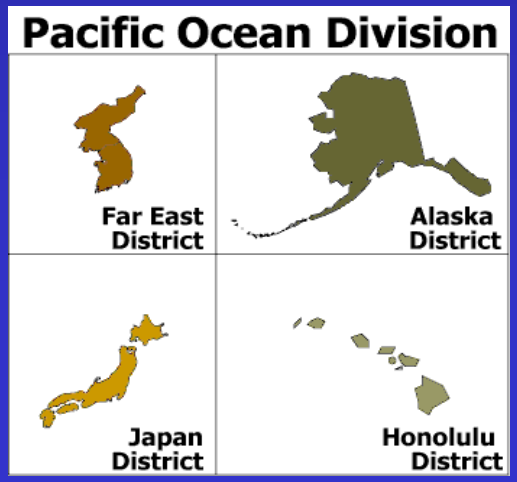
US Army Corps
of Engineers

Pacific Coast Navigation Community of Practice

Northwestern Division
South Pacific Division
Pacific Ocean Division



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Purpose of the Navigation Community of Practice

Programmatic, regional overview of the navigation business area.

Forum for Districts / Divisions to discuss and resolve issues.

Efficient execution of our navigation mission.

Provide regional expertise and cooperative problem solving.

Keep Division / District Commanders informed of issues and actions.

Identify and prioritize regional navigation R and D needs.

US Army Corps
of Engineers
Northwestern Division

Regional Dredging Initiative

Regional Dredging Contract Development

- Includes San Francisco, Portland, and Seattle.
- Postponed FY 04-07 because of funding shortages in Portland District, low dredge quantities in San Francisco, and until Columbia River Channel Improvements Complete.
- Scheduled for FY 08.

US Army Corps of Engineers
Northwestern Division

WEST COAST REGIONAL DREDGING CONTRACT

US Army Corps
of Engineers

Welcome FY 2006
Federal Dredging Program

Northwestern Division

Walla Walla District

Portland District

Seattle District

Pacific Ocean Division

Alaska District

Honolulu District

South Pacific Division

San Francisco District

Los Angeles District

US Army Corps
of Engineers

Los Angeles District

On-going Contracts

- Channel Islands Hbr.
- Santa Barbara Harbor
- Ventura Harbor
- Oceanside Harbor
- San Diego Harbor
- Port of Los Angeles
  Deepening
- Santa Ana River

US Army Corps of Engineers

Los Angeles District

Port of Los Angeles Main Channel Deepening

On-going Contract
7,000,000 Cubic Yards
Clam, Hopper, Pipeline Dredge
Disposal Type – Various

Contractor: L.A. Deepening Contractors, AJV

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FY05 Project Updates

Everett Harbor, Snohomish River

- Advertising now
- 300,000 CY downstream
- 150,000 CY upstream
- Clamshell & pipeline
- Disposal at Riverside upland site and PSR Superfund site or Port Gardner site

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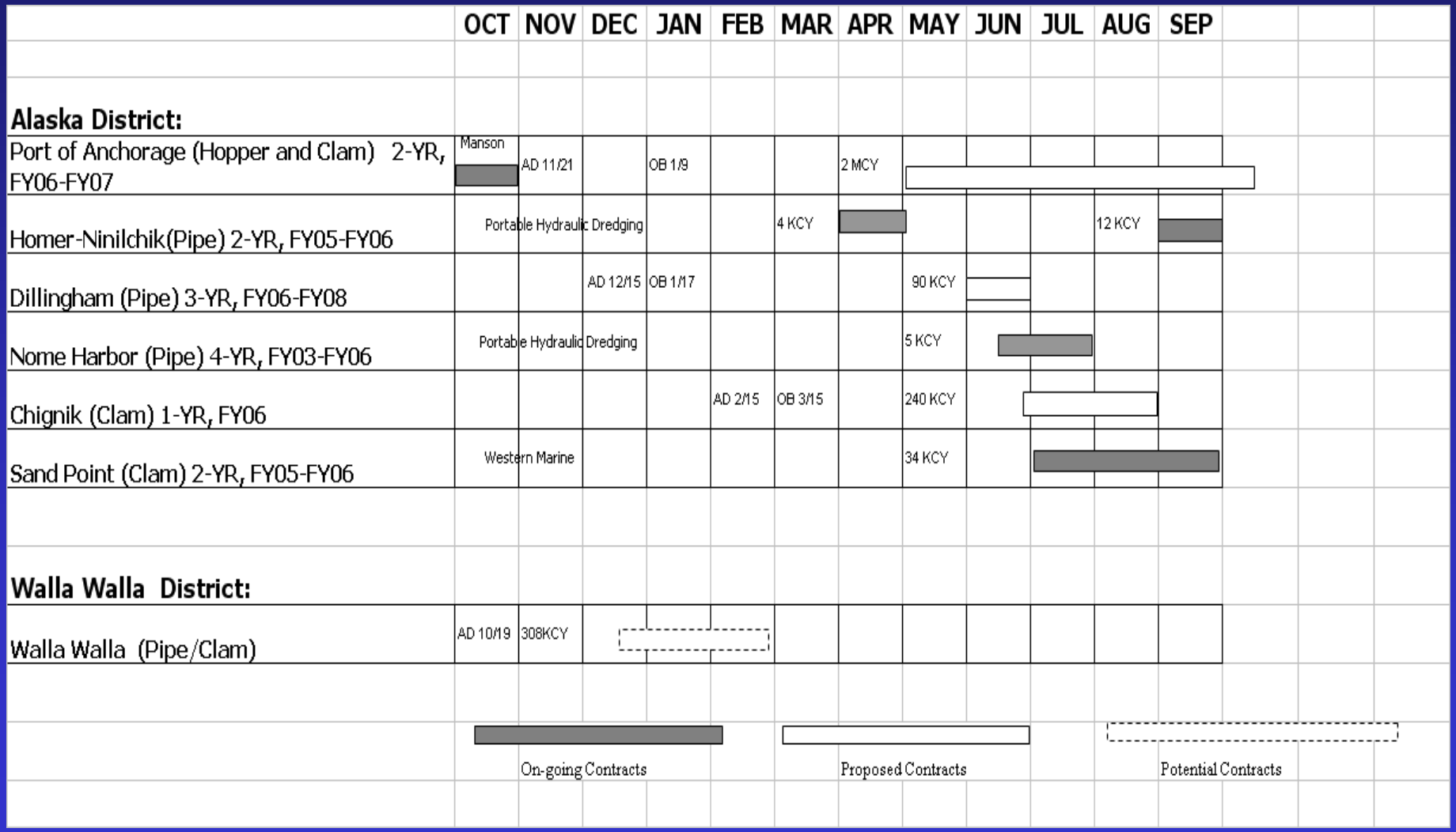
Nome Harbor Expansion

US Army Corps of Engineers

FY06 Dredging Schedule



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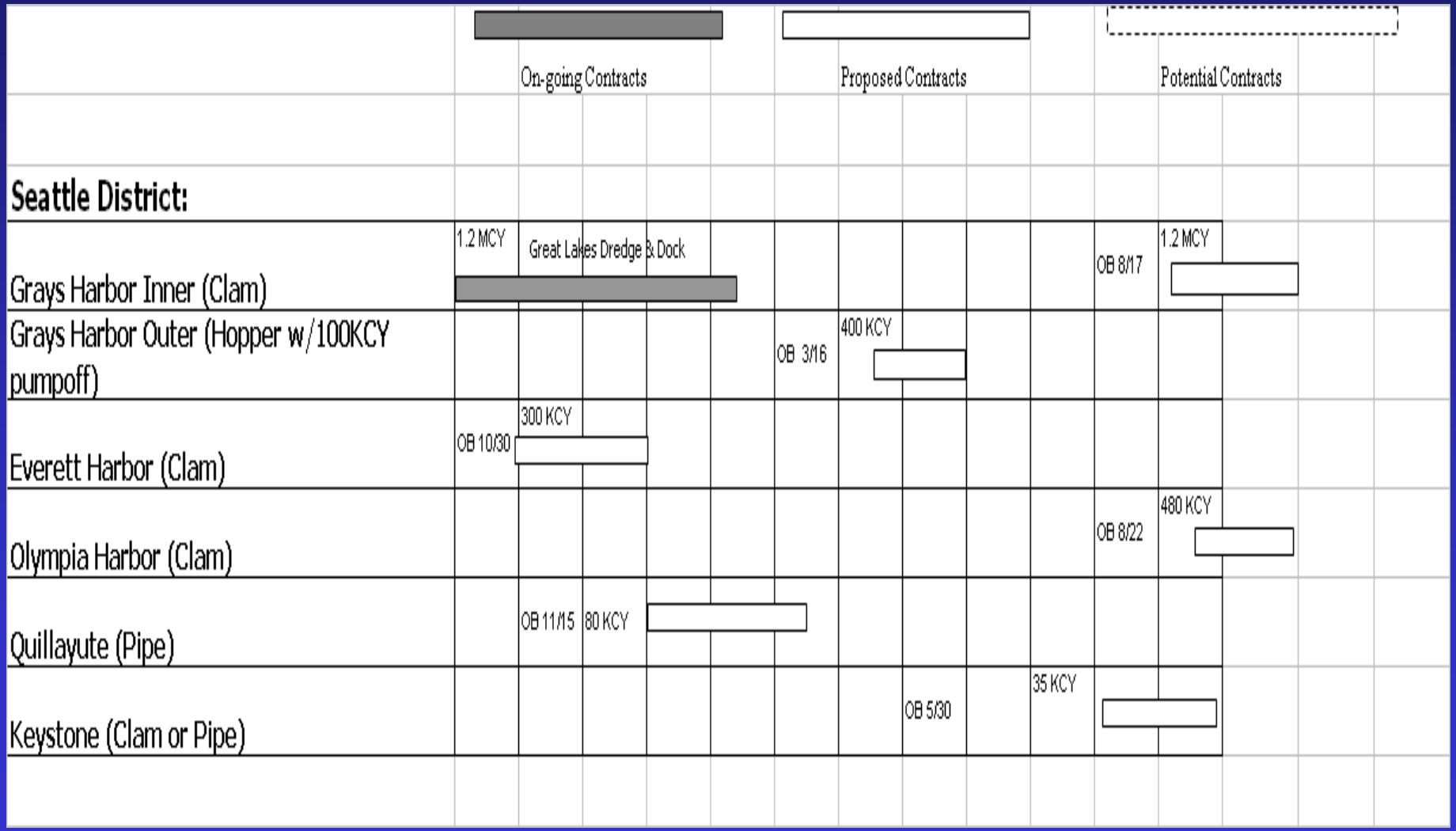
FY06 Dredging Schedule



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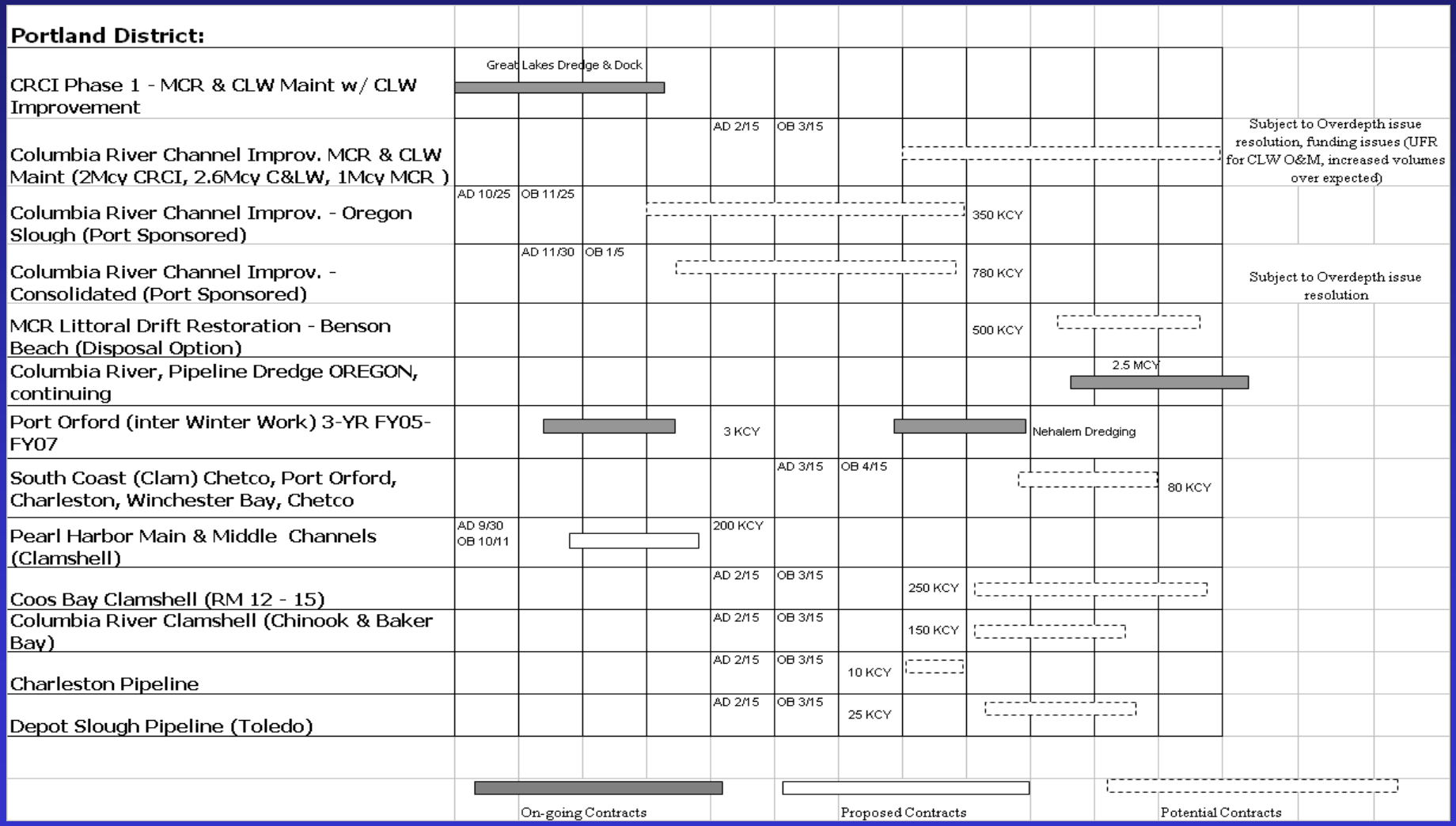
FY06 Dredging Schedule



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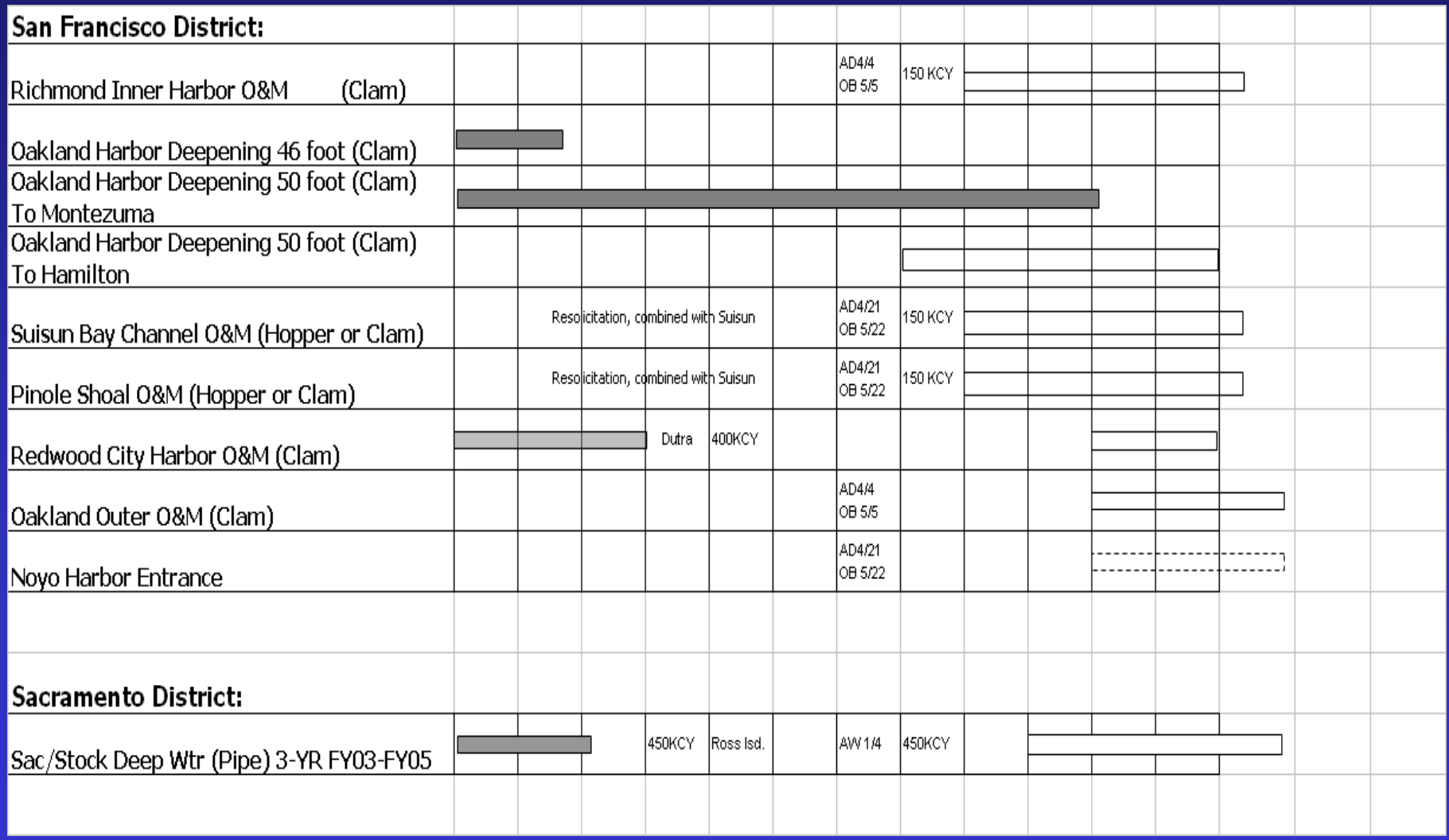
FY06 Dredging Schedule



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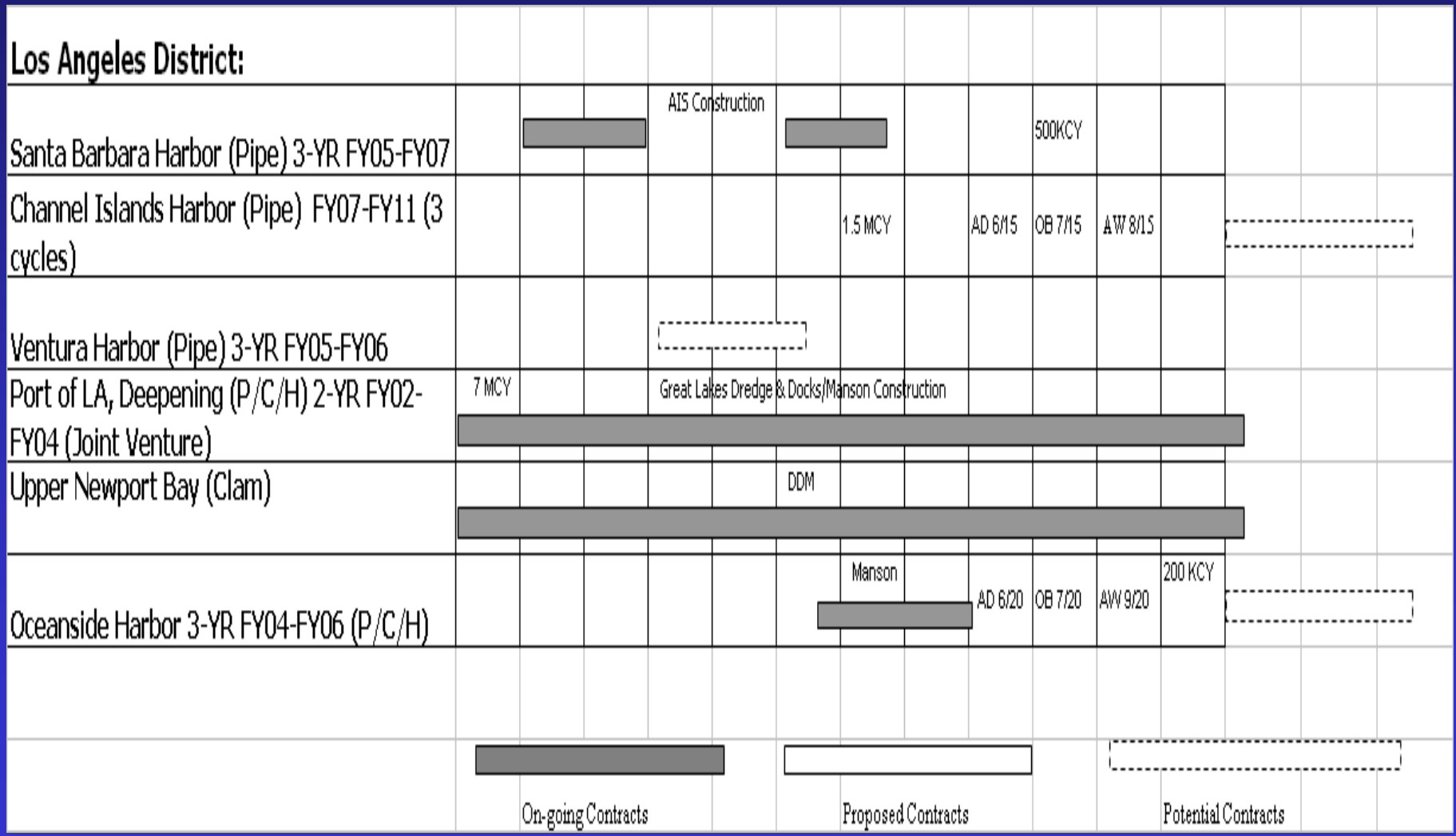
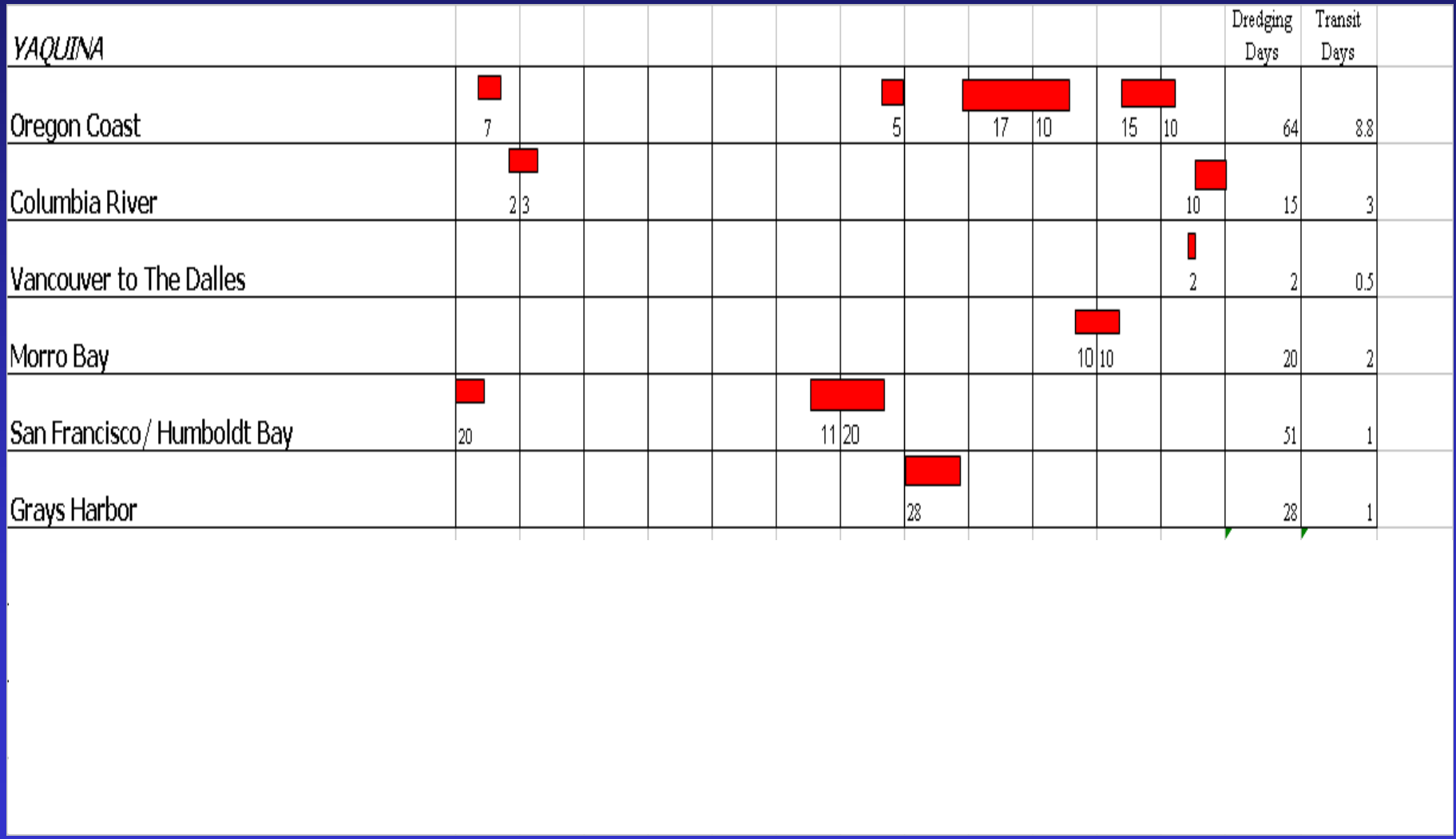
FY06 Dredging Schedule



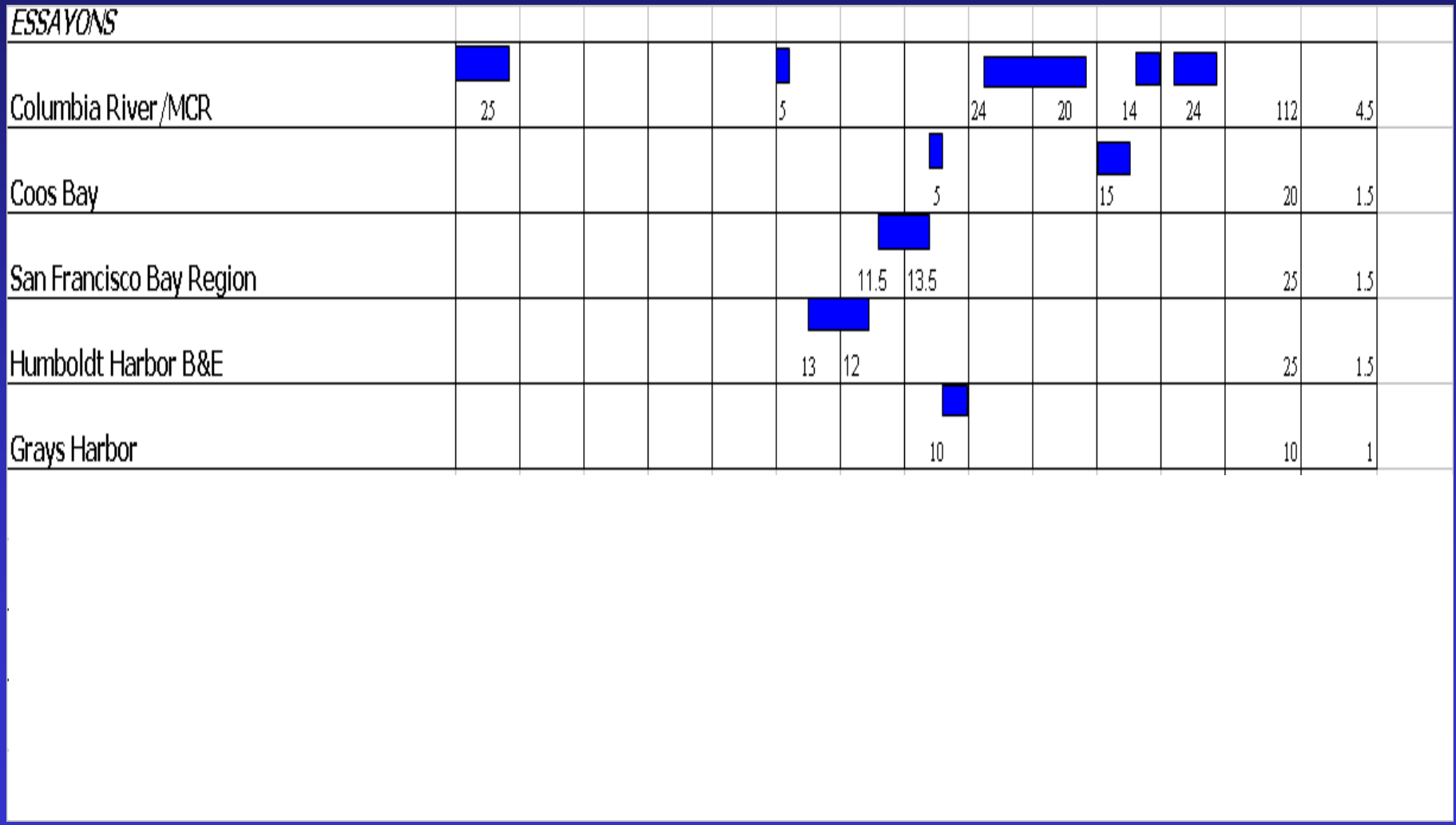
US Army Corps of Engineers

FY06 Dredging Schedule



US Army Corps of Engineers

FY06 Dredging Schedule



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of Engineers

South Pacific Division Boundaries

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Uniqueness of the Region

- More than one-seventh of the US population and four of the ten fastest growing states
- Diverse geography and climate requiring sensitivity to environmental stewardship
- Water management for flood control, agriculture, environment and human consumption pose unique challenges

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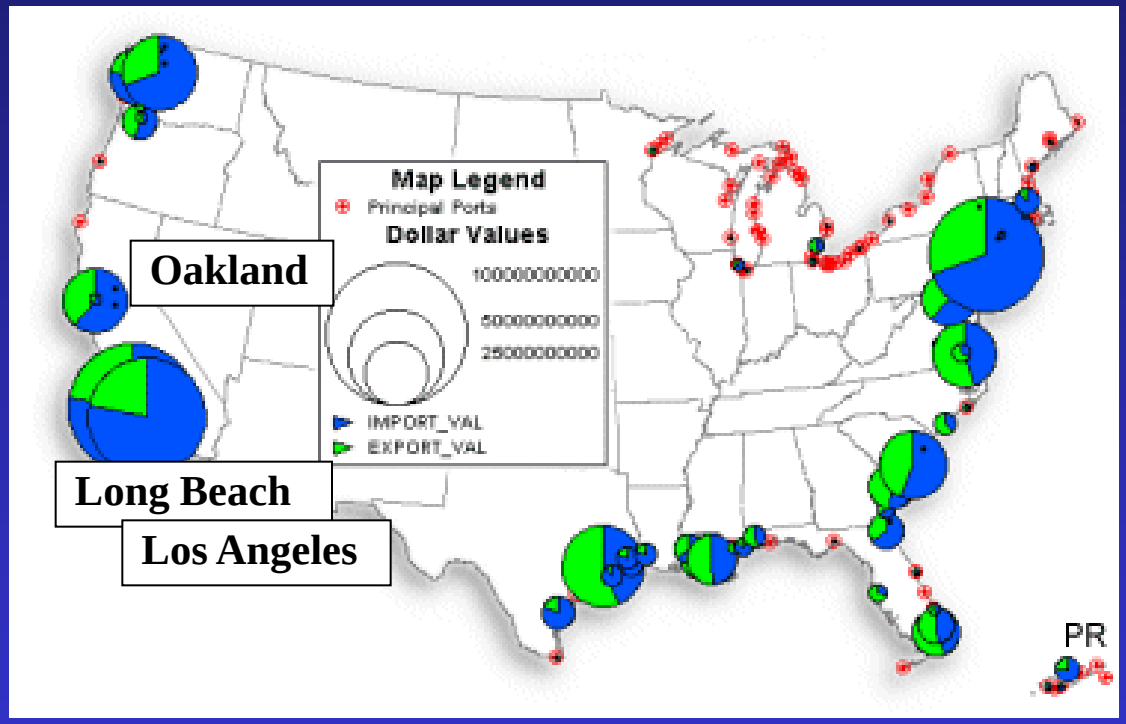
of Engineers

Navigation - SPD

- 5 major commercial ports (>40 ft. depth)
- 7 minor commercial ports (20-40 ft. depth)
- 15 small craft harbors
- Dredging dollars expended provide a high rate of return. $40 to $60M per year yields $192B in Commerce.



Value of Imports + Exports

Navigation - SPD

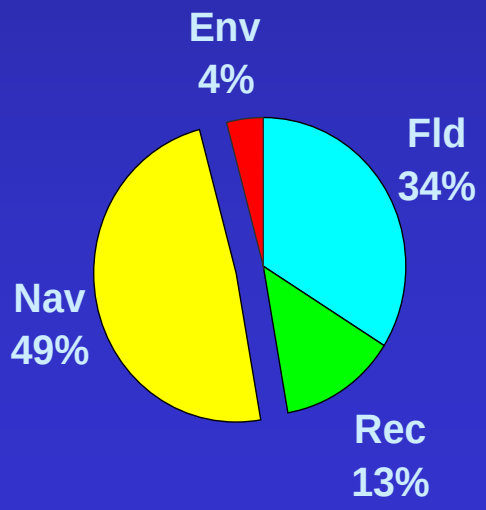
US Army Corps
of Engineers

Pier 400 - Port of LA

- 27 Ports & Harbors in California
- California ports are #1 in value shipped
- California ports are #3 in the US in tonnage
- 429 mi of navigation channels
- 35 mi of navigation structures
- Debris mission
- 10.0M cu yd dredged annually

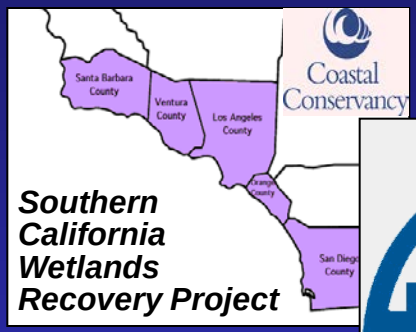
Port of Oakland

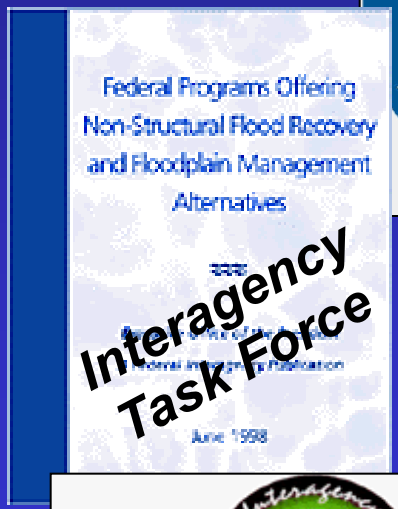
Ventura Harbor

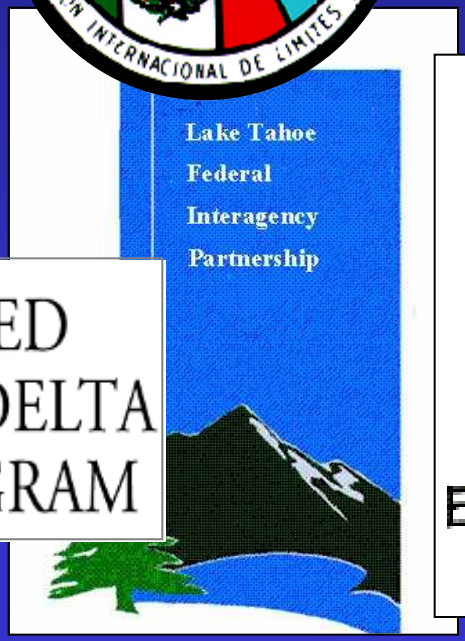


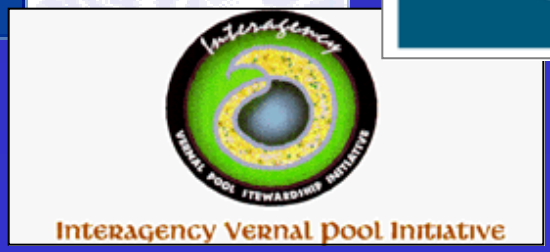
Multi-Agency Collaborative Endeavors

US Army Corps
of Engineers









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California Regional Sediment Management

… regulation and management of littoral, estuarine, and riverine sediment within the boundaries of a physical system where sediment exchange occurs naturally.

Regional sediment management recognizes that the physical system and embedded ecosystems respond beyond the space and time scales of individual projects, and that a proactive regional planning and engineering approach will produce significant cost savings and project benefits.

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California and RSM

Beach Quality Materials Dredged from Coastal Harbors are placed on Downcoast Shorelines

Although the term "regional sediment management (RSM)" is new, recognition of the regional nature of coastal processes and the regional influence of engineering works is not. The inter-relationship between coastal navigation projects and contiguous beaches became a Federal interest at least as early as the 1930s.

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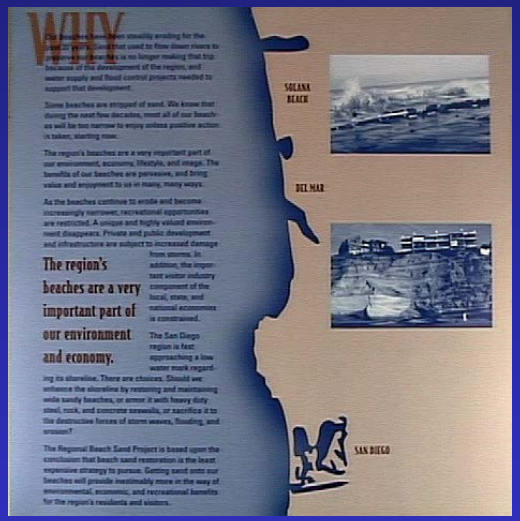
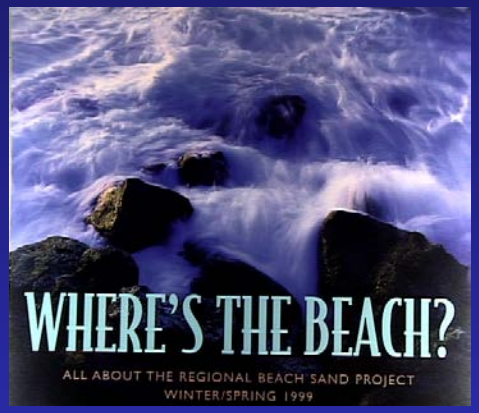
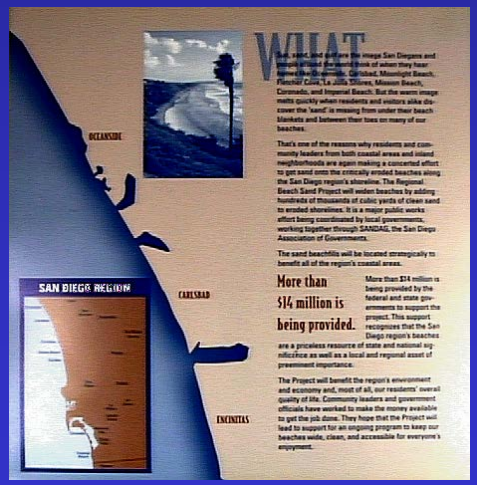
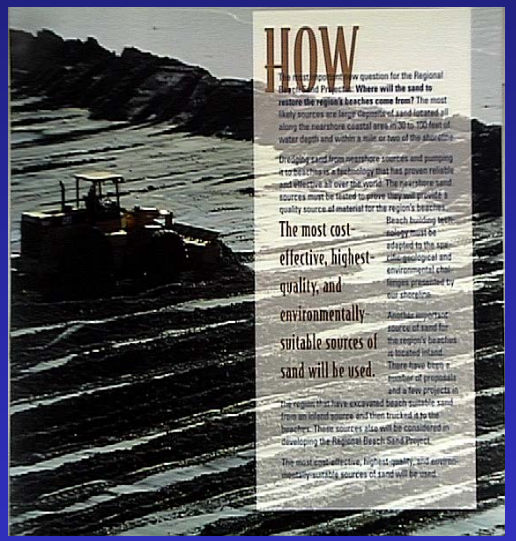
San Diego Regional Beach Sand Project









Beach Quality Materials Dredged from Offshore will be placed on County Shorelines

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Coastal Sediment Management Workgroup

- **Federal/State/Local Partnership to Address California's Coastal Needs Established in 1999.**
- **South Pacific Division & State Resources Agency.**
- **Leverage State & Federal Funds and Resources.**
- **Collaborate on Coastal Sediments Activities.**

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CSMW Participating Agencies

USACE

- South Pacific District
- Los Angeles District
- San Francisco District
- ERDC
- IWR

ADVISORY

- Cal Coast (local agencies)
- Minerals Management Service
- US Geological Survey
- US EPA
- NOAA

CA RESOURCES AGENCY

- Boating & Waterways
- Coastal Commission
- Coastal Conservancy
- Parks & Recreation
- State Lands Commission
- CA Geological Survey
- Department of Fish and Game
- Caltrans

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Sediment Management Activities

Actions that affect the *transport*, *erosion*, *removal*, and *deposition* of sediment in a region

- **Dredging and placement**
- **Building structures that divert or trap sediment**
- **Erosion protection structures or methods for riverbanks, shorelines, sea beds, and channel bottoms**
- **Habitat stabilization and restoration**
- **Sand and gravel mining for construction or other purposes**
- **Other**

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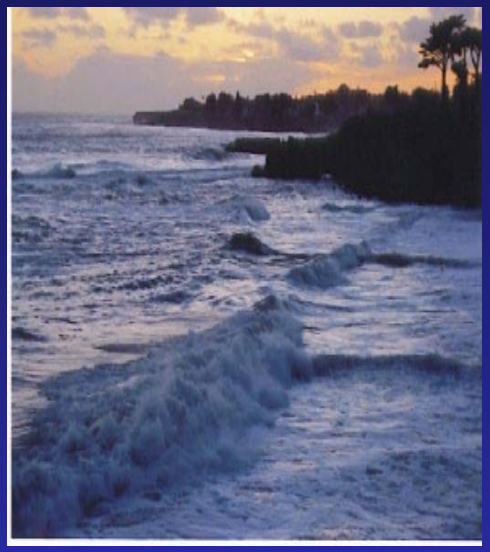
Mission



To facilitate regional approaches to protecting, enhancing and restoring California's coastal beaches and watersheds through federal, state and local cooperative efforts.

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Project Goals

- Prioritize Regional Sediment Management Needs.
- Streamline the regulatory process.
- Make information widely available.
- Coordinate beach and watershed efforts with Federal, State and Local stakeholders.

Plate 5.9 Pre-nourishment condition at North Carlsbad site, April 2001

Plate 5.10 Post-nourishment condition at North Carlsbad site, November 2001
(arrows point to approximately the same location on each photo)

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Ongoing Initiatives

- Literature Search
- Fate & Transport of Fines
- Regional Sediment Budgets
- Biological Impacts
- Implementation Strategy
- Policies, Procedures and Regulations Analysis
- Sand Compatibility and Opportunistic Use Templates

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Decision Support Tool for RSM

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Decision Support Tools

- Assist policy and decision makers, coastal managers, and engineers with powerful, but simple to use IMS applications.
- DSTs will be developed in coordination with stakeholder and technical users.
- DSTs are the building blocks for a Decision Support System

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Benefits of Regional Sediment Management

Cost Savings

- Reduced Rehandling of Material
- Extended Dredging Cycles
- Combined Equipment Mobilization and Demobilization of Linked Projects
- Sharing Information and reduction of duplication of efforts
- Collaborative leveraging of financial and manpower resources
- Improved Environmental Conditions

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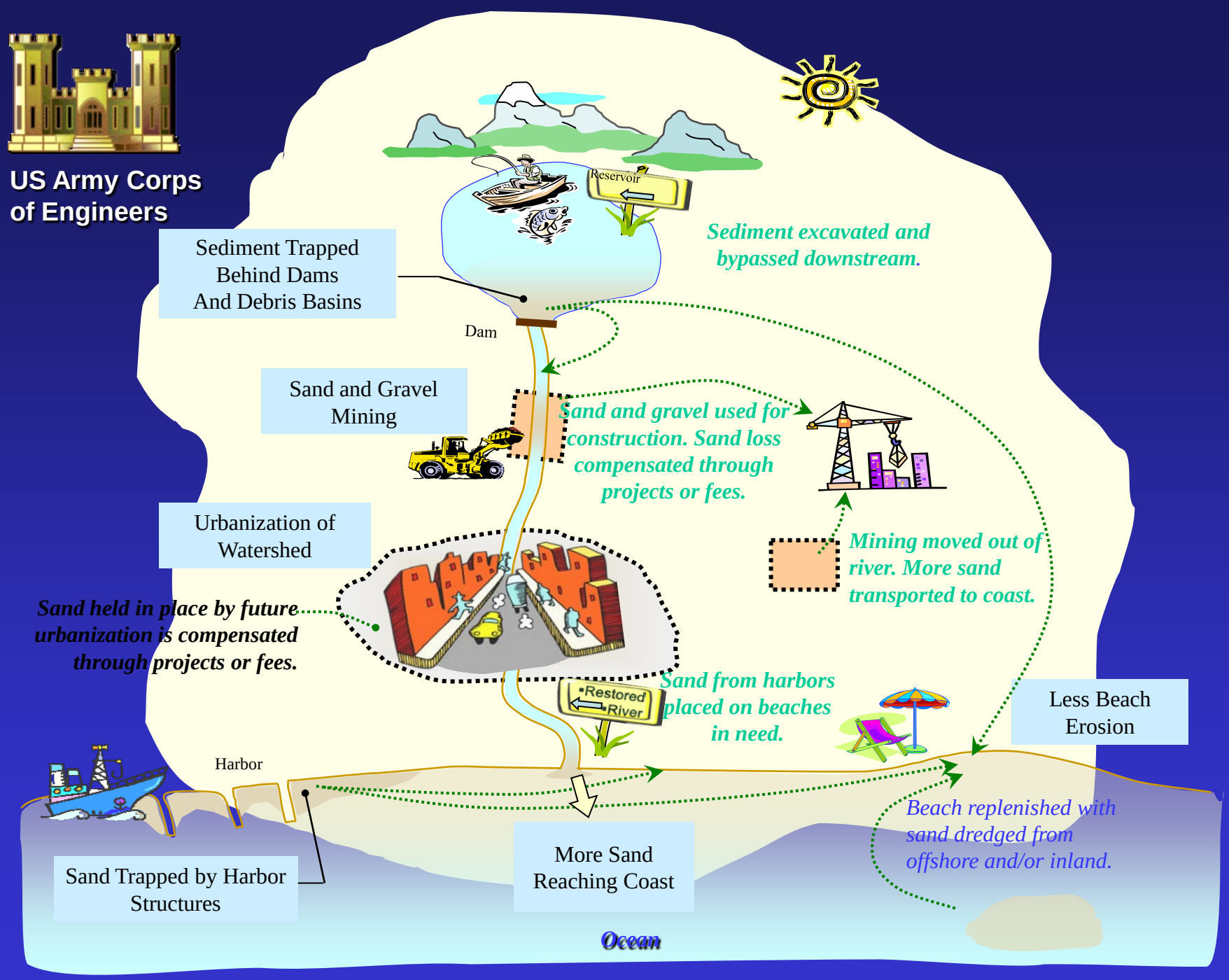
Additional Benefits of RSM

- Improved agency and interagency working relationship
- Reduce study costs and time
- Enhance support of environmental goals
- Potential to streamline regulatory process
- Shared regional scale data management systems, models and other tools.
- Greater consistency analysis between projects in a region.



Regional Sediment (Sand) Management

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http://dbw.ca.gov/csmw/

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Business Execution - Navigation

San Francisco

Sacramento

Los Angeles

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of Engineers

Navigation - San Francisco

- Humboldt Harbor
- Oakland Harbor
- 93 Miles of Channel
- 12.8 Miles of jetties/breakwaters
- 3,200,000 CY annual dredging
- 107,944,000 Commercial Tonnage
- 3 Debris boats
- 2 Survey boats

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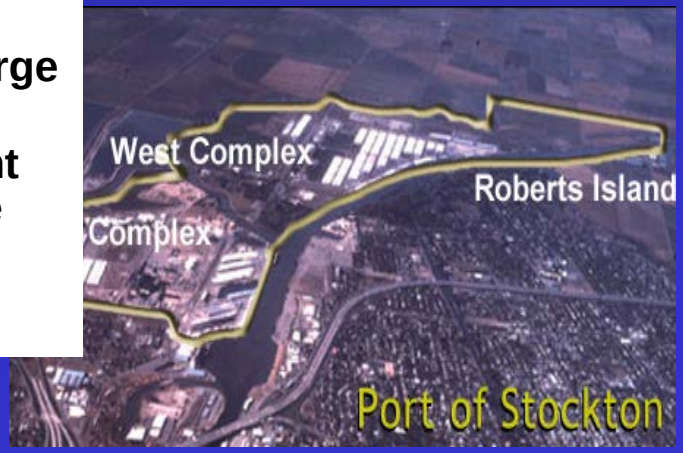
Navigation - Sacramento

- Sacramento Deepwater Ship Channel - 30 ft
- Stockton Deepwater Ship Channel - 35 ft
- Sacramento River Tributaries
- Sacramento Shallow Draft Project
- 303 miles of channel
- W.G. Stone Lock & Barge Canal
- Stone dike & revetment structure maintenance
- Annual commerce-5.4 million tons



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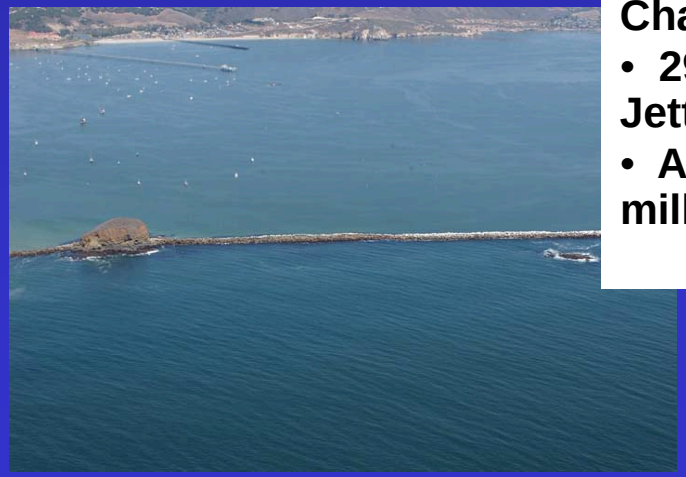
Navigation – Los Angeles

- 14 Harbors along the California Coast
- POLA 81 ft. Channel
- POLB 76 ft. Channel
- 5 Endangered Species
- 33 Miles of Navigation Channels
- 29 Rock Breakwaters and Jetties
- Annual commerce - 107 million tons



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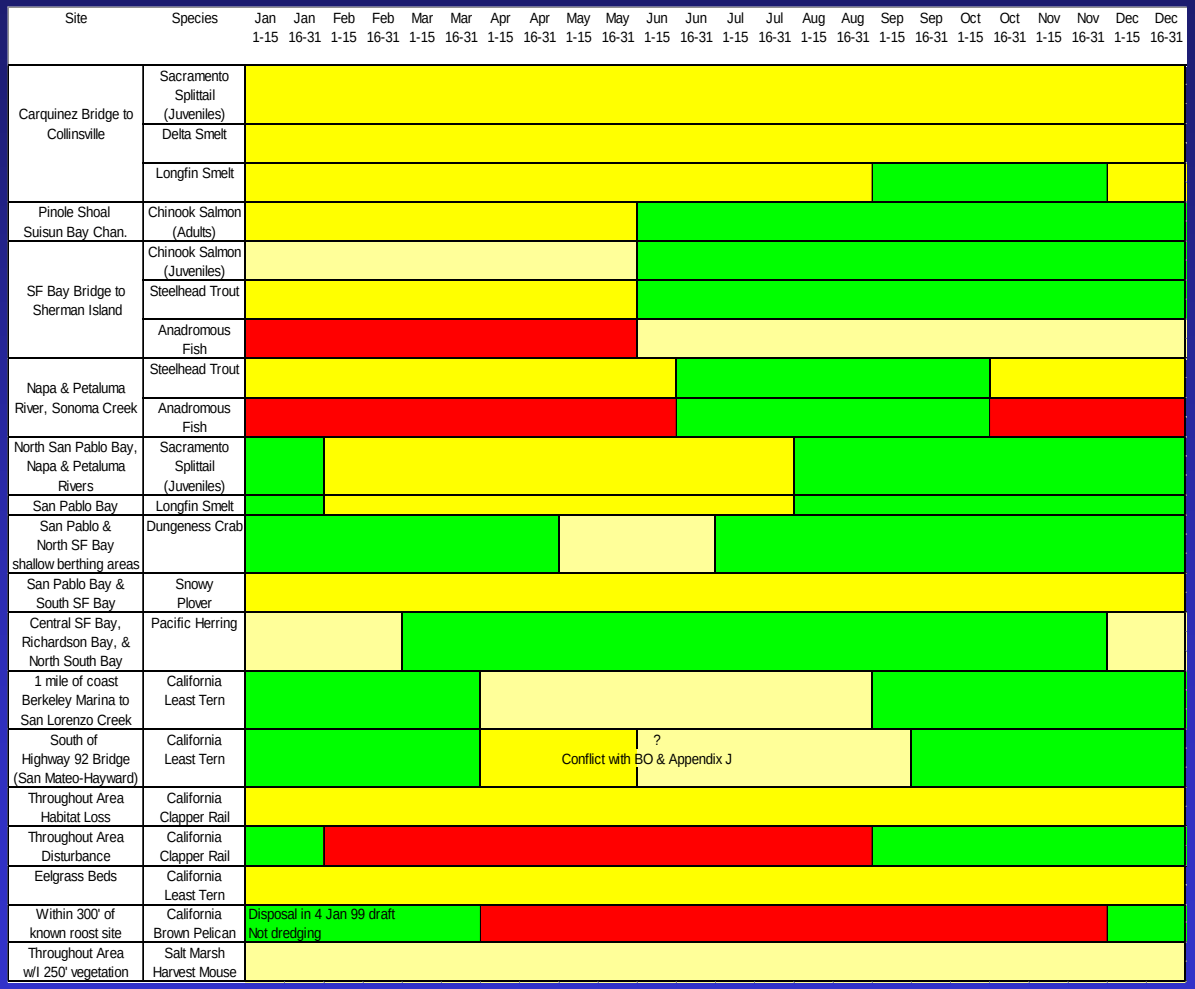
Navigation - Issues

- **Dredging**
  - contaminated/non-contaminated materials
  - environmental windows
- **Disposal**
  - site location
  - monitoring
  - environmental windows



No dredging

Consultation required

No restrictions

Dredging environmental windows by location

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Issues Affecting the SPD Region

Re-Programming in O&M

Overdredging

Environmental window impacts on dredging and disposal.

Water quality impacts on dredging and disposal methodologies.

Contaminated sediments dredging and disposal.

Costs of doing business is escalating rapidly.

Level of Service – expectations by the customer.

Future Port Requirements – Can we respond in a reasonable time ?

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Navigation
Where We Are Going

- Dredging of high use harbors must continue
- Partnering to solve dredging and disposal issues
  - LTMS, LA Region Contaminated Sediments Task Force, Coastal Sediment Management Workgroup
- Partnering benefits
  - promotes beneficial re-use of dredged materials
  - streamlined dredging permit process
- Impacts to costs
  - reduced contaminated material disposal costs
  - ocean disposal / beneficial re-use (100% increase), monitoring (30% to 50% increase), design costs increase
  - continue to strive for efficiencies and improvements

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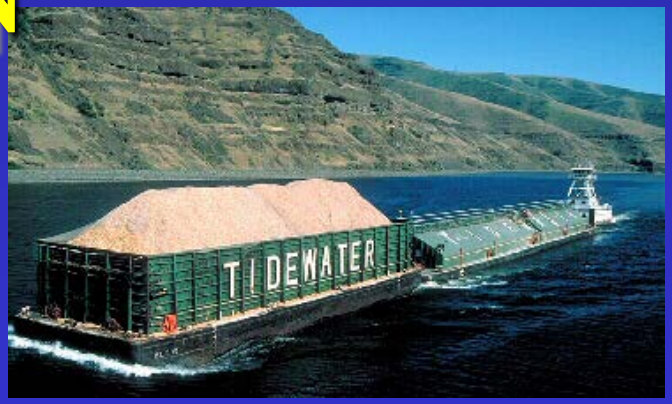
NORTHWESTERN DIVISION



Regional Interface

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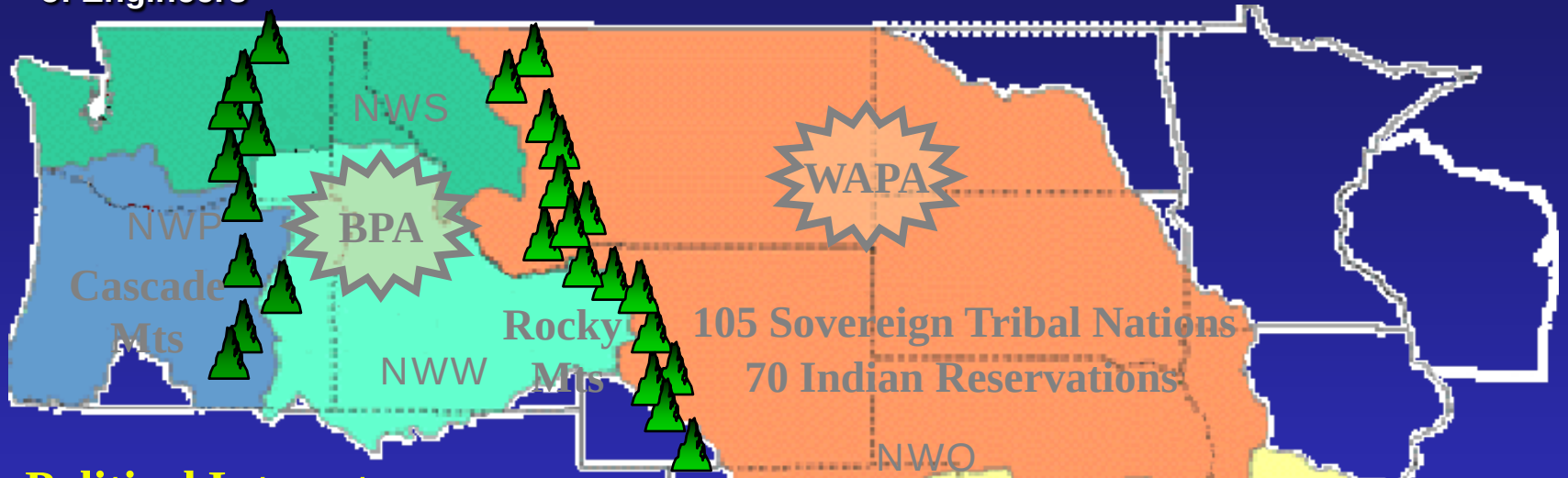

Political Interests

- 14 Governors
- 28 Senators
- 45 Congressional Districts

Federal Partners

USGS science for a changing world

U.S. Department of the Interior Bureau of Reclamation

United States of America 1892 Bureau of Indian Affairs

U.S. Fish & Wildlife Service Department of the Interior

Bonneville Power Administration

National Oceanic and Atmospheric Administration NOAA U.S. Department of Commerce

Forest Service US Department of Agriculture

National Park Service

EPA United States Environmental Protection Agency

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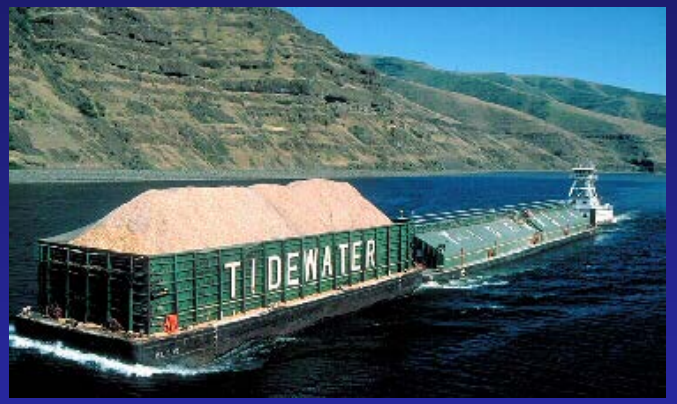
NWD Navigation Program

- 1724 Miles Inland Navigation
- 22 Deep Draft Harbors
- 20 Shallow Draft Harbors



- 10 Locks
- 16 Lock Chambers
- 7500 Dikes/Revetments
- 39 Miles Breakwaters & Jetties

- 2 Dredges
- Survey Boats
- 212 Work Boats
- U.S. Moorings
- Contract Dredging/Surveying

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FY 2006
Major Contract Work

- Columbia River Channel Improvement Project
  - Dredging, no rock
  - Mouth of Columbia River Interim Jetty Repair
  - South Jetty Interim Repair, 2-yr project major rehab in out years.
- Snake River Dredging Completed

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REGIONAL INITIATIVES

- REGIONAL DREDGING TEAM (RDT)
- REGIONAL SEDIMENT EVALUATION TEAM (RSET)
- REGIONAL SEDIMENT MANAGEMENT (RSM)
- REGIONAL DREDGING CONTRACT

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OBJECTIVES OF ALL COLLABORATIVE REGIONAL EFFORTS

CAPITALIZE ON POTENTIAL ECONOMIC BENEFITS

ID AND ELIMINATE BUREACRATIC OBSTACLES

IMPROVE RELATIONS WITH PARTNERS

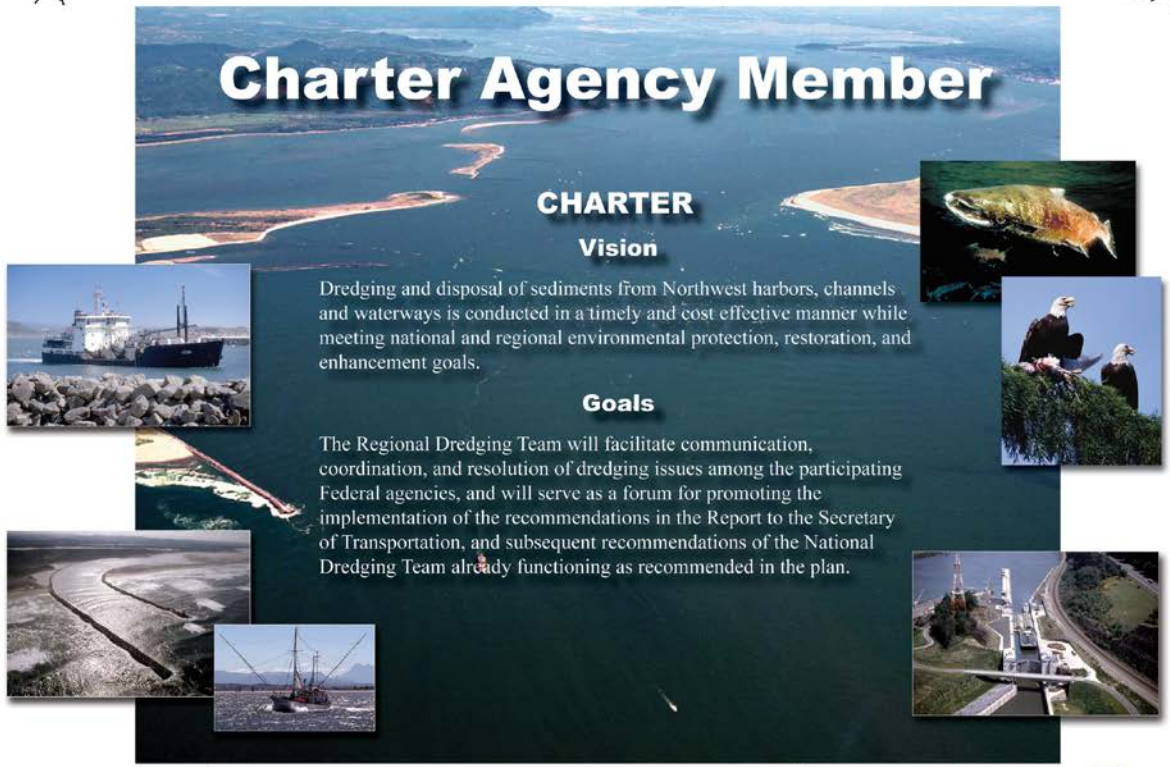
RESTORE AND MAINTAIN THE NATURAL SYSTEM

REGIONAL DREDGING TEAM

US Army Corps of Engineers

US Army Corps of Engineers®
Northwestern Division

Northwest Regional Dredging Team



David A. Fastabend
Brigidier General, U.S. Army
Division Engineer
U.S. Army Corps of Engineers
U.S. Department of Defense
Co-Chair

L. John Iani
Regional Administrator
Region 10
U.S. Environmental Protection Agency
Co-Chair

D. Robert Lohn
Regional Administrator
National Oceanic and Atmospheric Administration – Fisheries
U.S. Department of Commerce

David Allen
Regional Director
U.S. Fish and Wildlife Service
U.S. Department of Interior

Francis X. Johnston
Maritime Administration
U.S. Department of Transportation
Western Region

US Army Corps
of Engineers

REGIONAL DREDGING TEAM

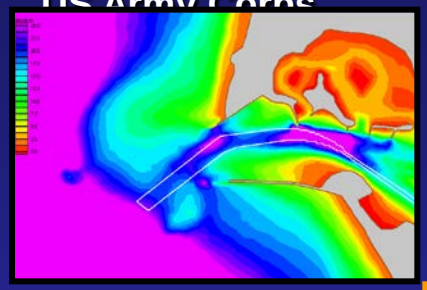
VISION

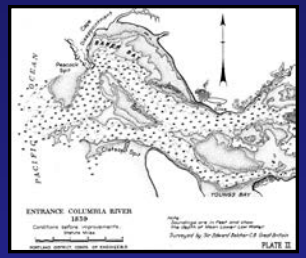
Dredging in Northwest harbors, channels, and waterways is conducted in a timely and cost effective manner while meeting national and regional environmental protection/restoration/enhancement goals

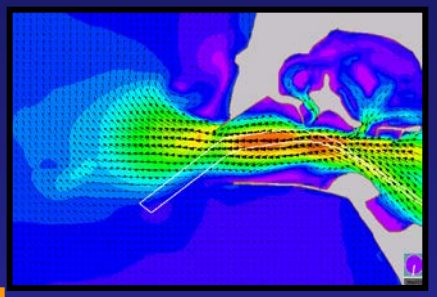
Regional Sediment Management

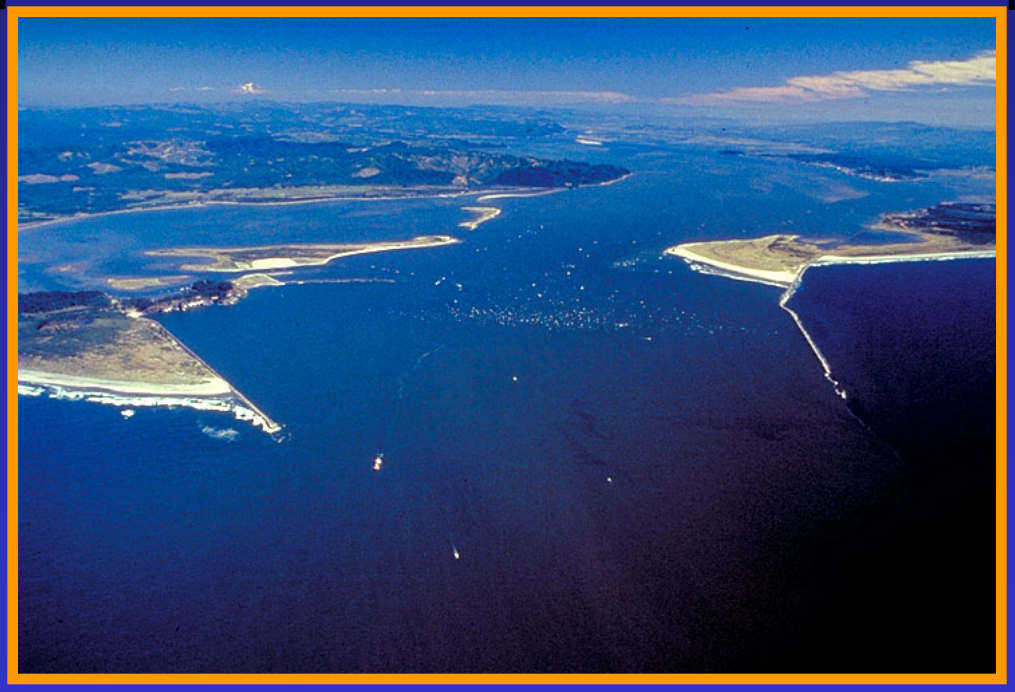
Mouth of the Columbia River, OR and WA

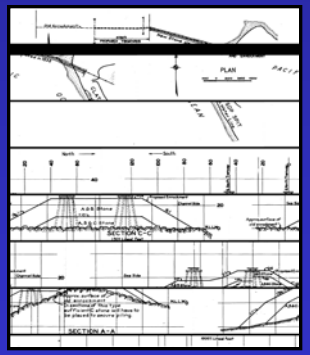
US Army Corps











Oregon and Washington, USA

US Army Corps of Engineers

Regional Sediment Management Activities

- Mouth of the Columbia R Littoral Cell
  - HQ RSM Funded from 2003-2005
  - 2005 work – Mega-transect data collection
  - 2006 – Regional March Workshop presented all work
- SW Washington Littoral Drift Restoration, 2005 and 2006 Congressional Addition
  - Placement Authority Required
- Nearshore Beneficial Use Site South of the South Jetty (LCSG)
  - 2006 Congressional Addition
  - Placement within cost of the MCR Project

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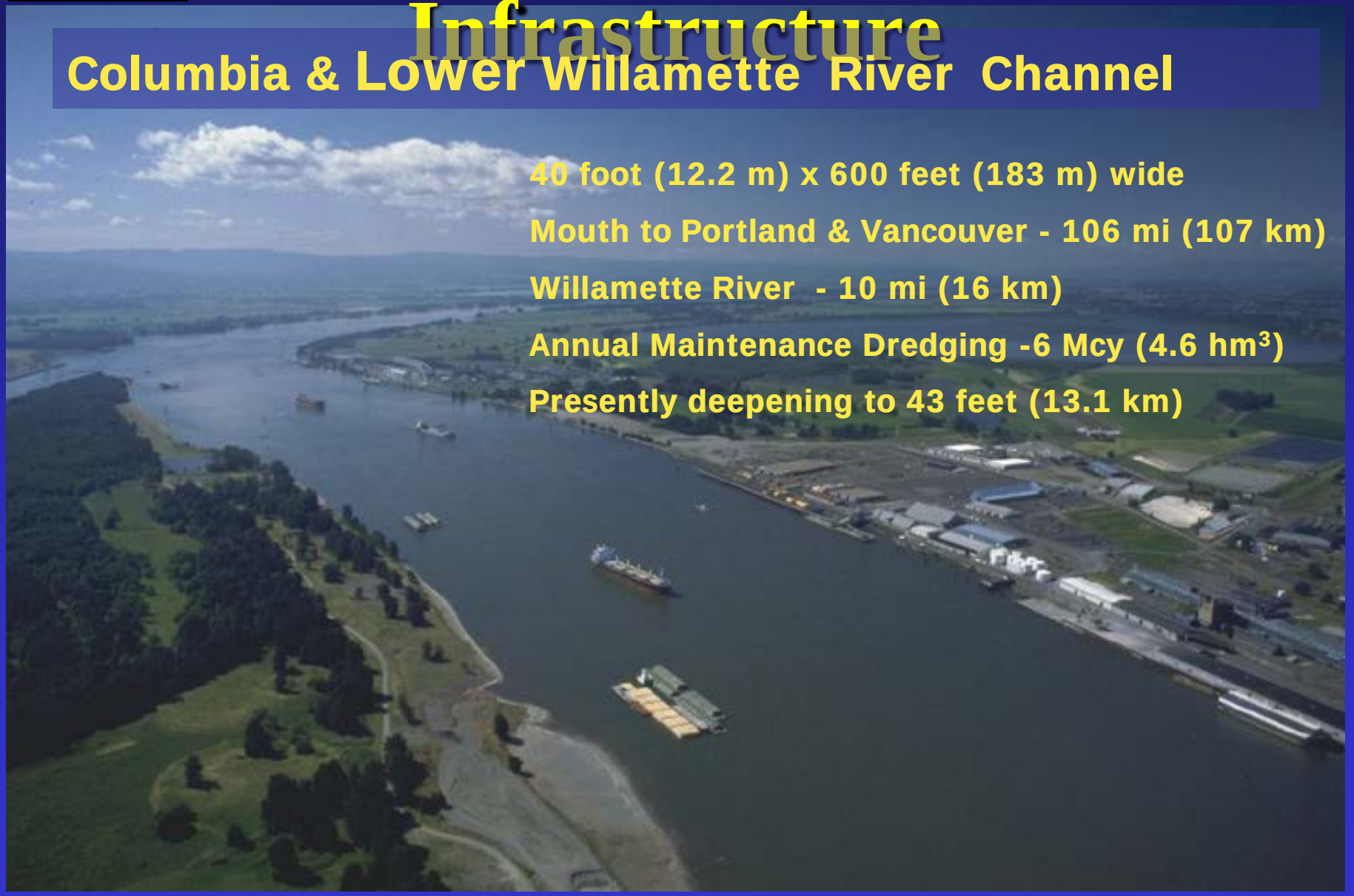
Columbia Snake River System

Federal Infrastructure

Federal Infrastructure

Columbia & Lower Willamette River Channel

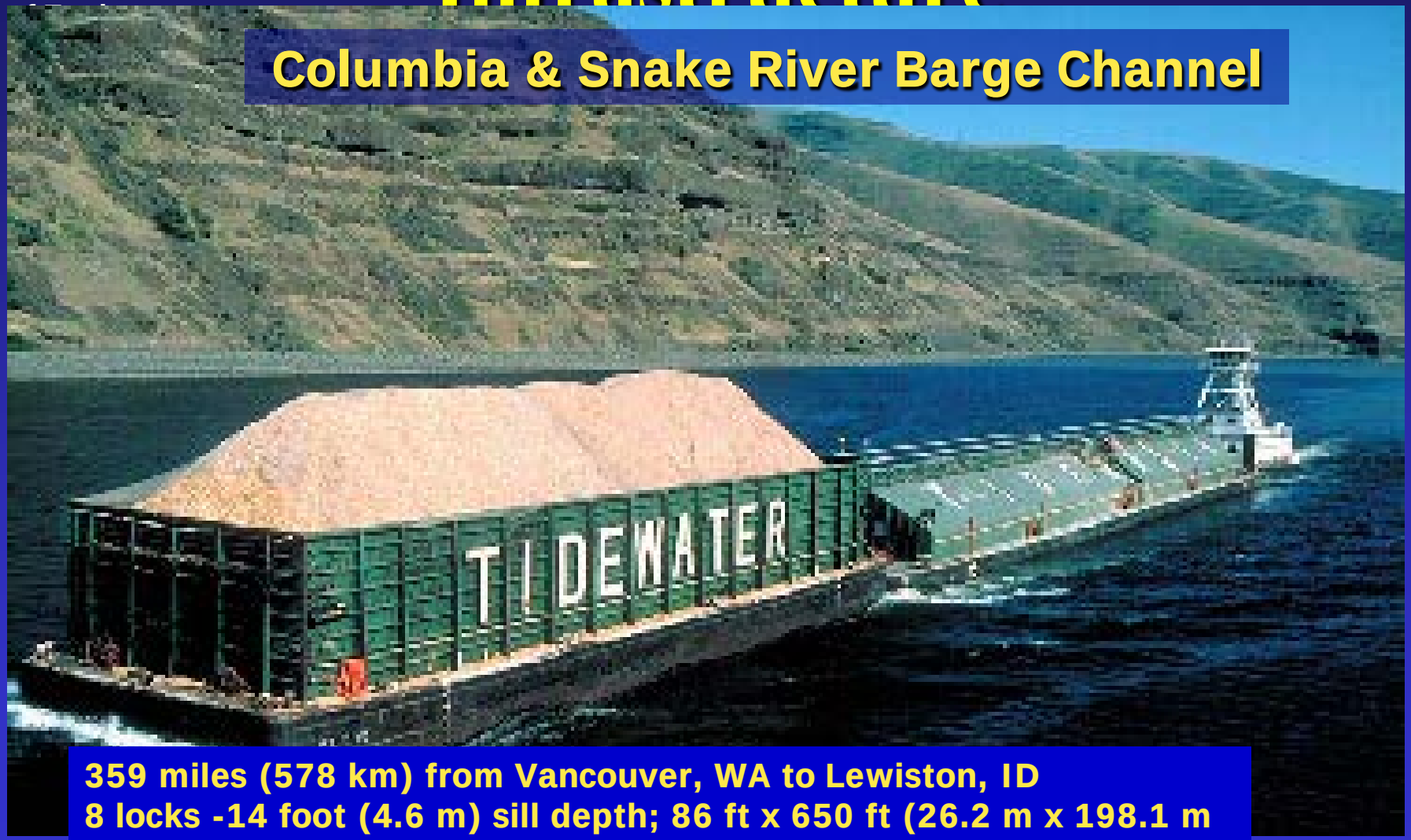


- 40 foot (12.2 m) x 600 feet (183 m) wide
- Mouth to Portland & Vancouver - 106 mi (107 km)
- Willamette River - 10 mi (16 km)
- Annual Maintenance Dredging -6 Mcy (4.6 hm^3)
- Presently deepening to 43 feet (13.1 km)

US Army Corps

Federal Infrastructure

Columbia & Snake River Barge Channel



359 miles (578 km) from Vancouver, WA to Lewiston, ID
8 locks -14 foot (4.6 m) sill depth; 86 ft x 650 ft (26.2 m x 198.1 m
Annual Dredging 200 kcy (15.3 dam^3)

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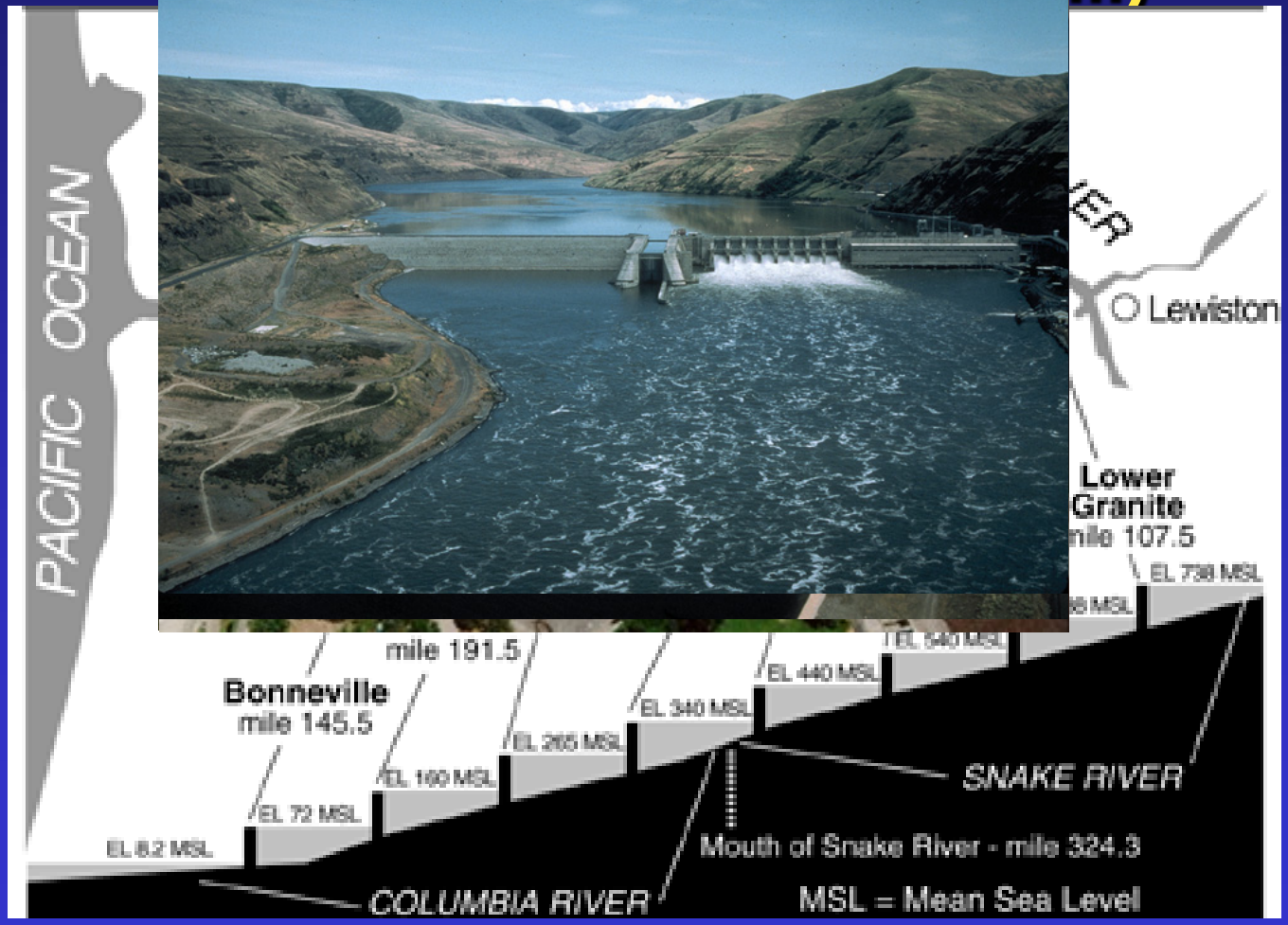
Federal Infrastructure

8 Locks through Multipurpose Dams
700 ft Vertical Lift (214 m)



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Columbia Snake River Dams
8 Multipurpose Projects

Power –Generation Cap. 10.3 MWatt

Navigation – 359 mi of barge channel

Flood Control - 534,000 AF

Irrigation –6.5 MAc land (26,304 km^2)

Recreation – Over 100 Camps, Parks
& Recreational Facilities

Environmental – Fish Passage Facilities

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Environmental Challenges

Dredging & Disposal Restrictions due to ESA fish in the Columbia – Snake River System

- **Lower Columbia Deep Draft Channel: Operational, Disposal, Timing**
- **Shallow Barge Channel: Operational, Timing, Delays;**
- **Snake River Dredging Delayed 3 years**

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UPSTREAM GATE REPAIR

Lock Gate Damage

Gate Guide Buckled

Buckled Beams

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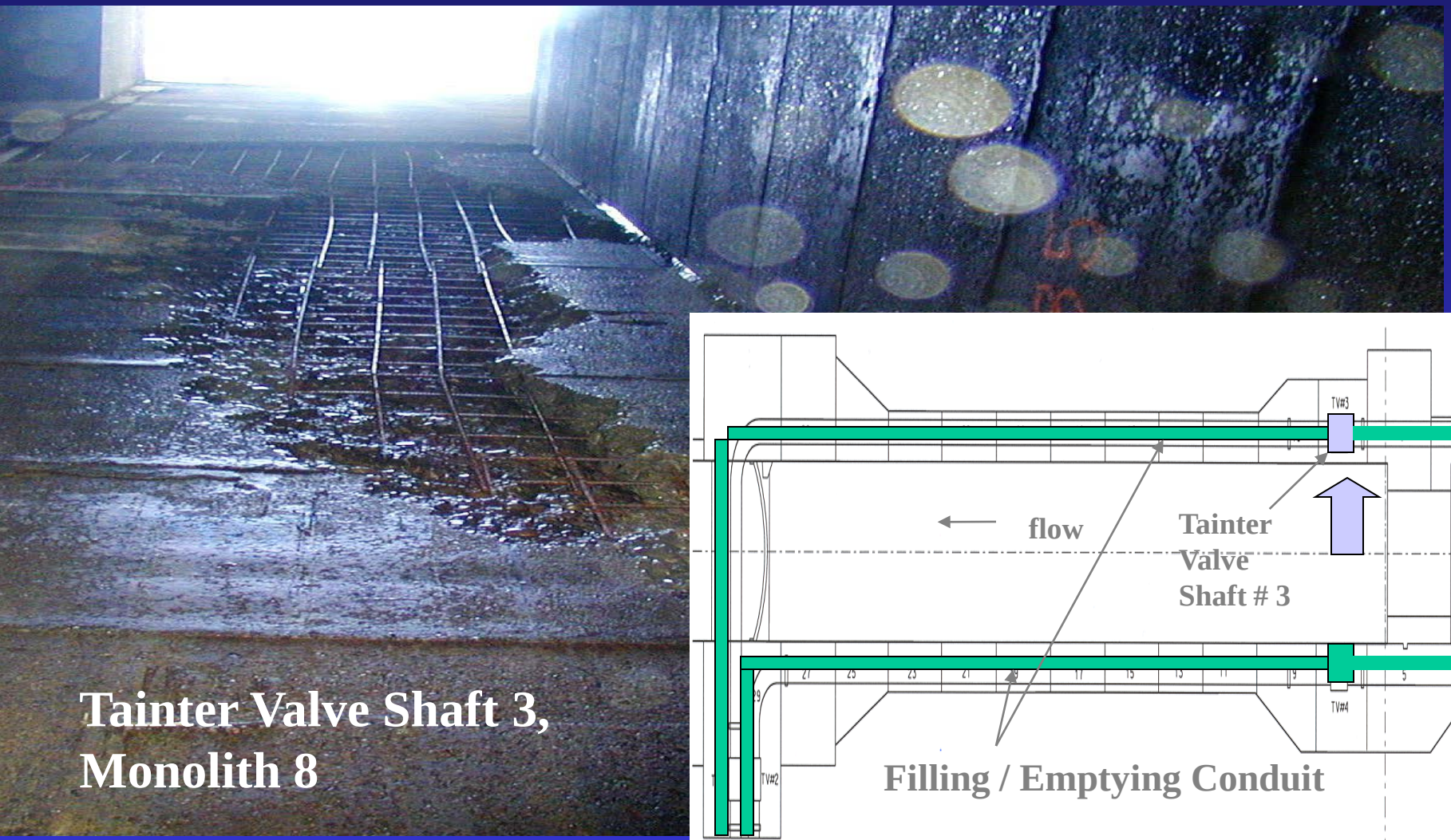
EMERGENCY REPAIRS

Navigation Lock



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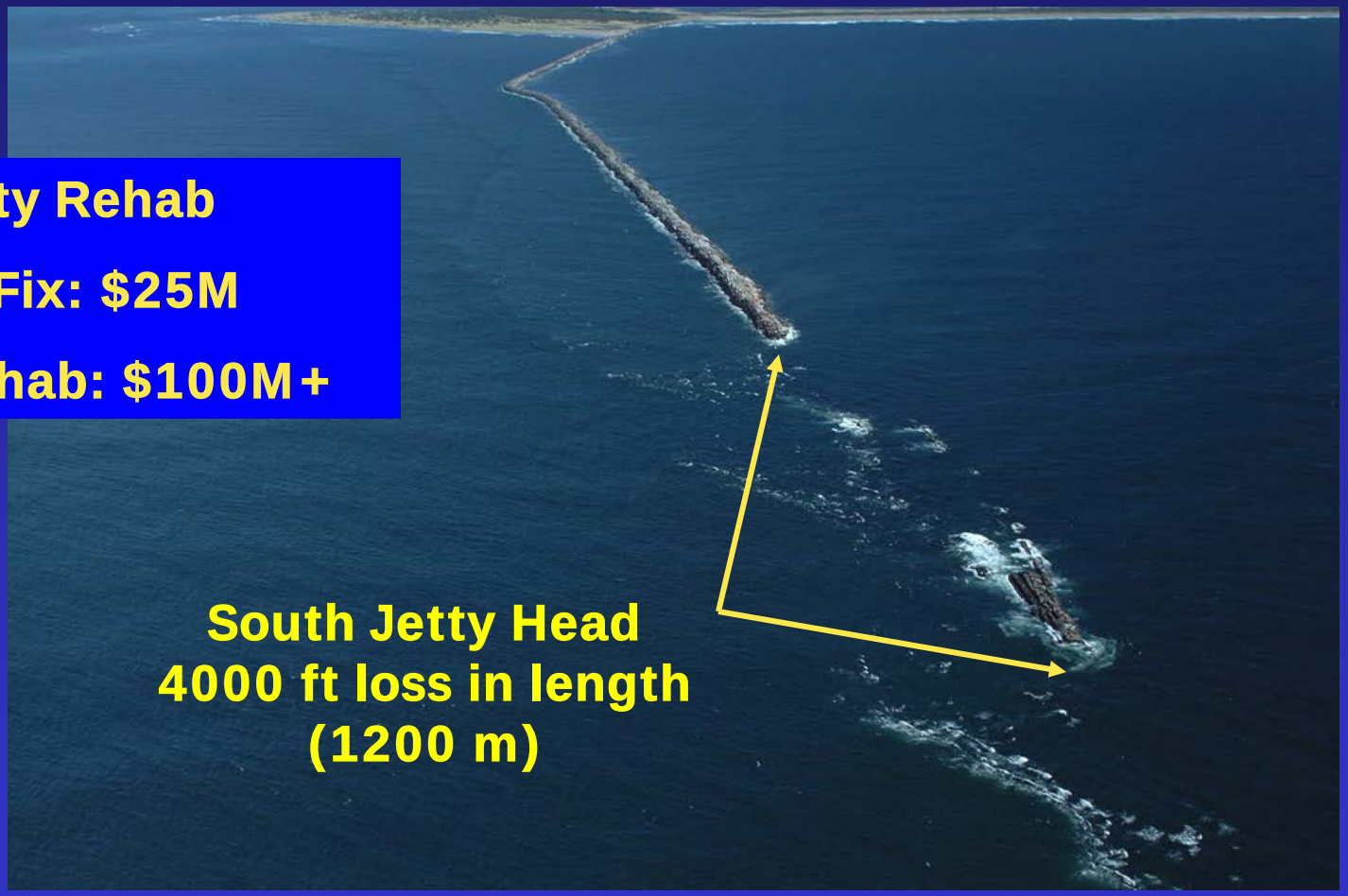
Infrastructure Challenges
Columbia Snake River System

MCR Jetty Rehab

Interim Fix: $25M

Total Rehab: $100M+



Infrastructure Challenges
Unplanned Expenditures

2003 – Coos Bay Jetty Breach – Emergency Winter Interim Repair
Final Repair Est.: $20M

2003 / 2004 – John Day Lock Failure – Emergency Repair to U/S Gate, Foundation, and Monolith - $16M

2005 Fern Ridge Dam – Active Failure Emergency Repairs $17M

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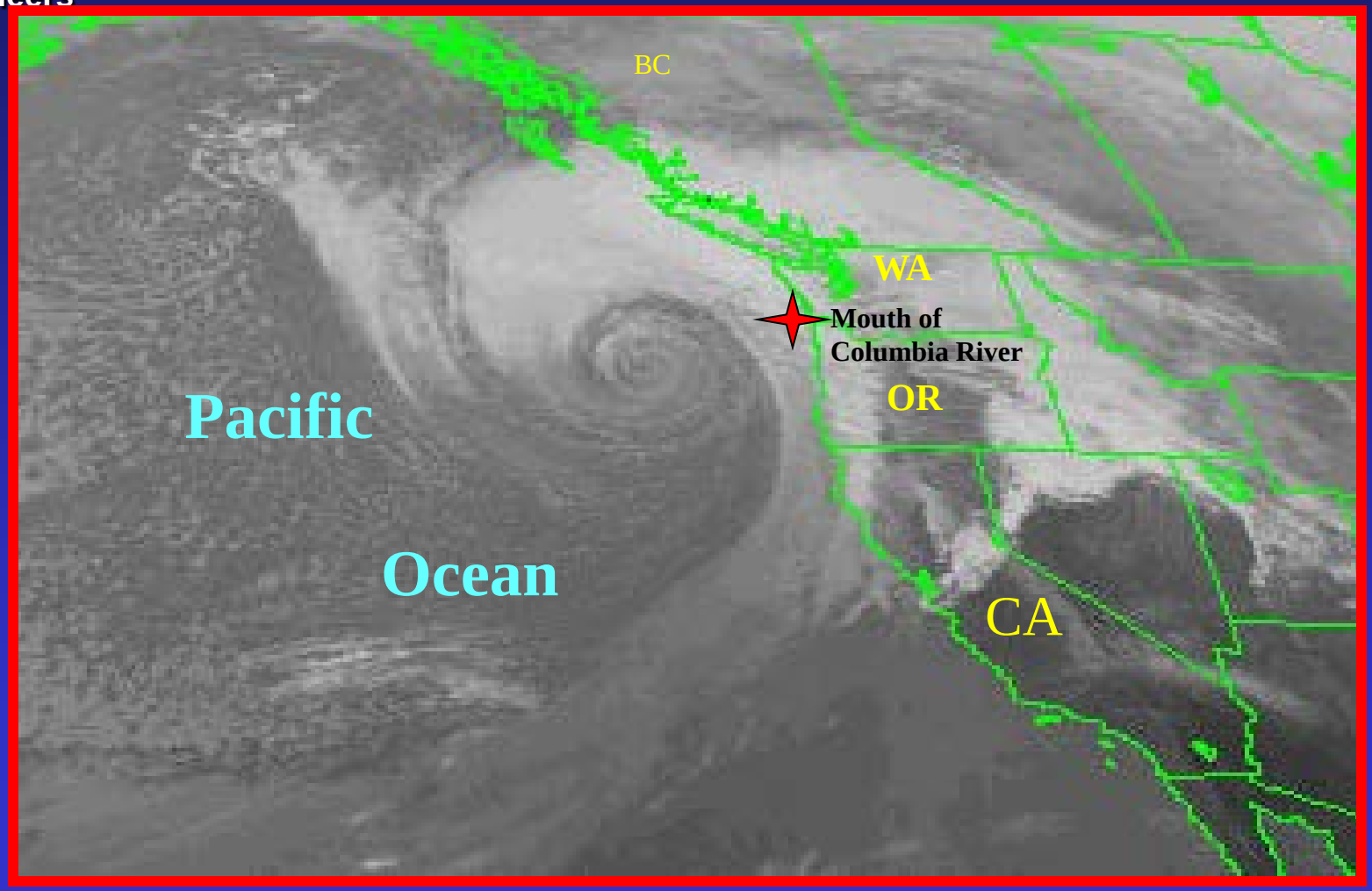
Portland District

US Army Corps of Engineers

Pacific Coast of United States

image courtesy of NOAA



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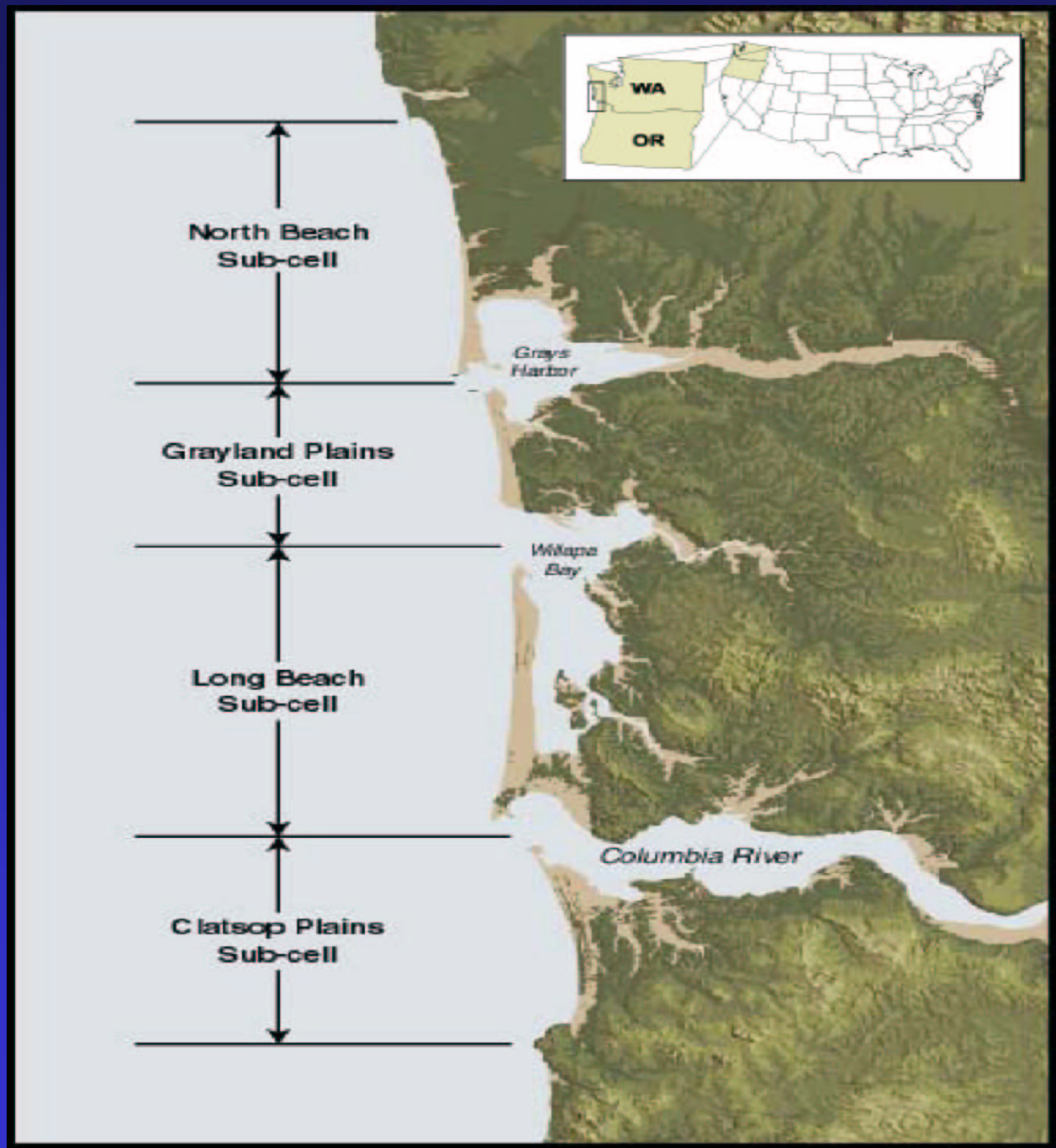
MCR Littoral Cell off the Oregon and Washington Coasts



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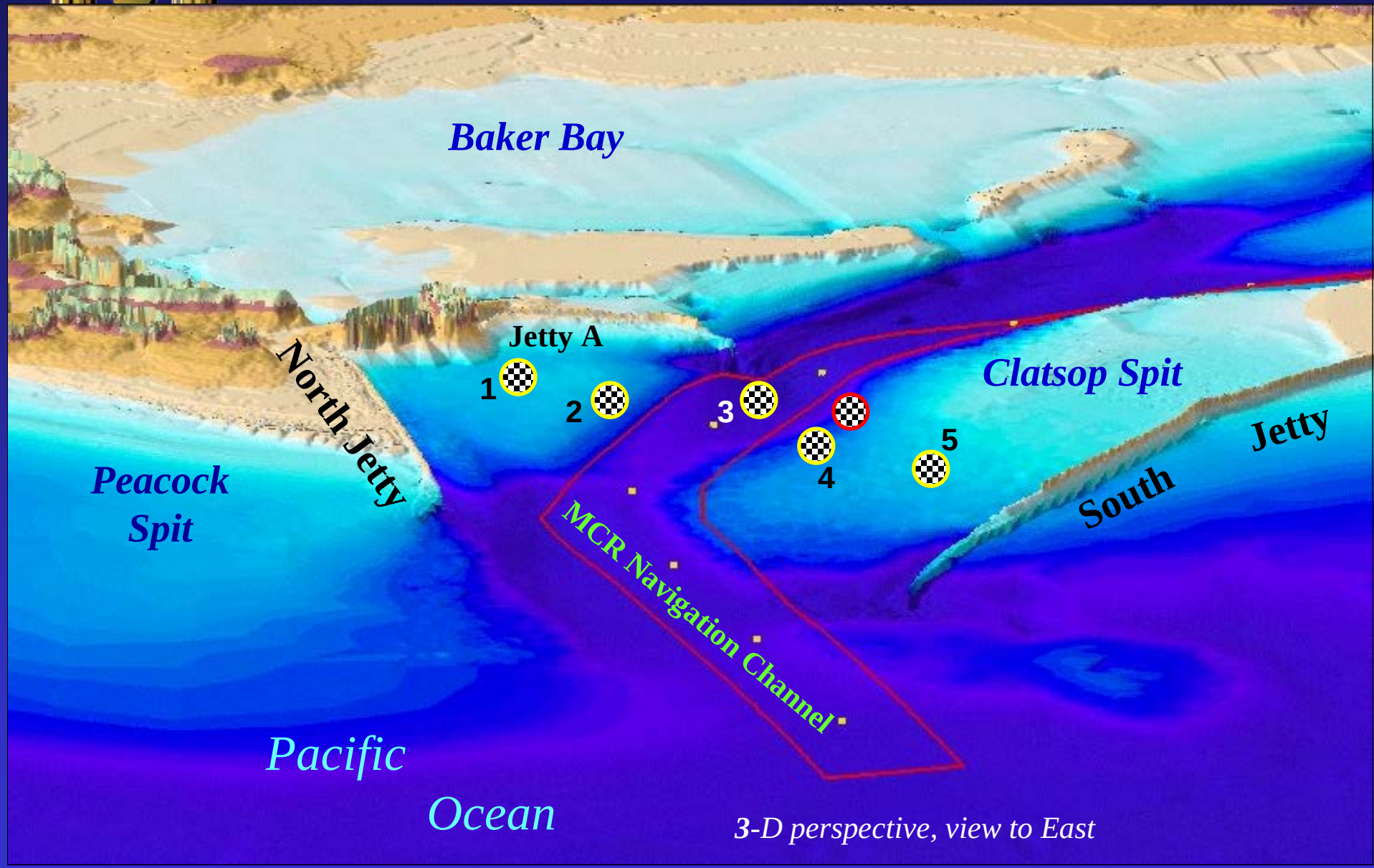
MCR LITTORAL CELL RSM MEGA-TRANSECT

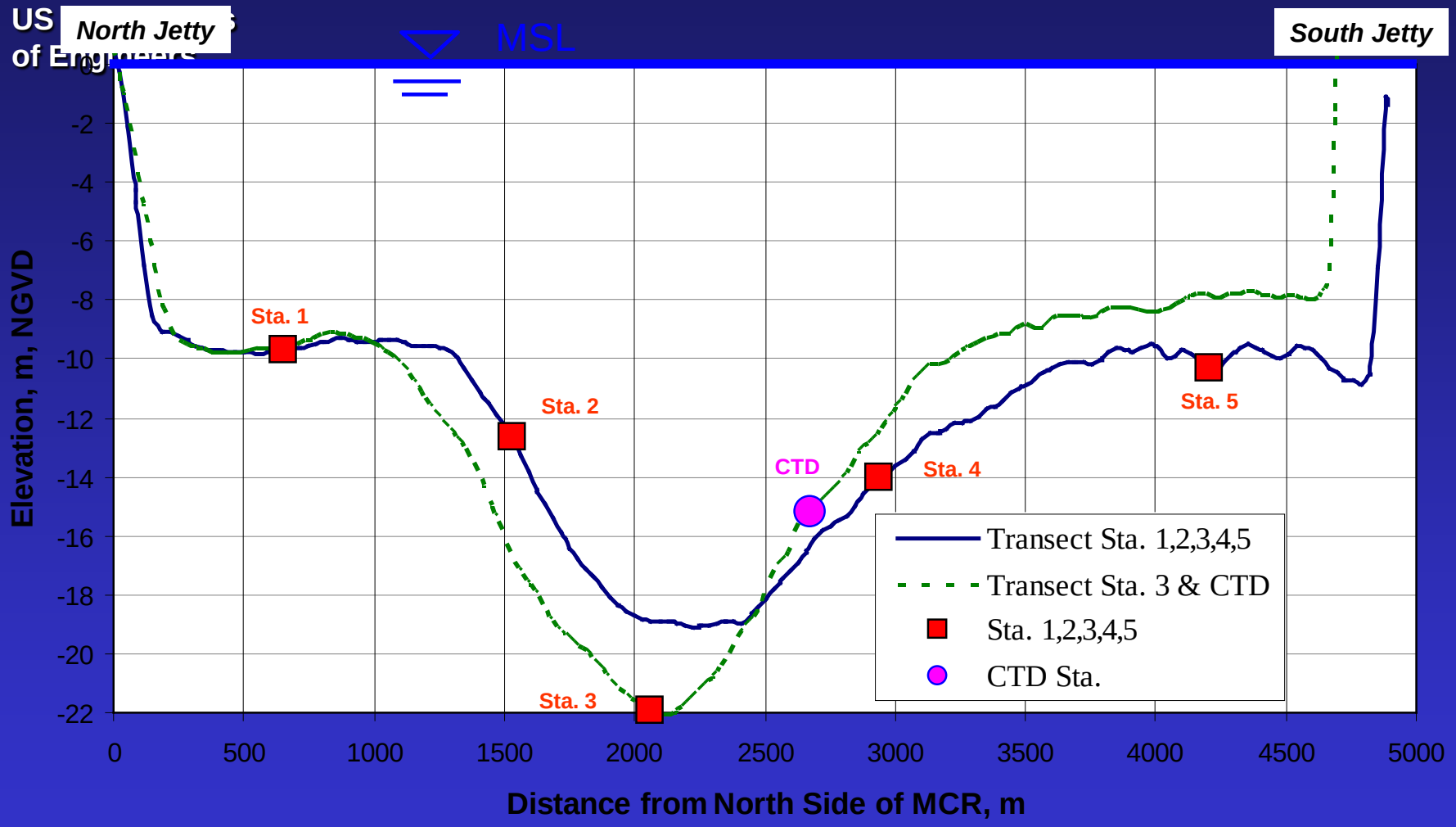
- Purpose: Collect wave, currents, suspended-bedload sediment, CTD, and tide between the MCR and C&LW and use data to feed existing models for better understanding of MCR sediment movement
- Rod Moritz, Corps Lead
- Guy Gelfenbaum, USGS – Menlo Park
- ERDC – Nick Krause
- Moffatt-Nichol
- Evans-Hamilton

MEGA-TRANSECT DATA COLLECTION at MCR Entrance 2 miles wide



Understand Sediment Transport Dynamics at MCR: Continuously Sample Waves, Currents, Sediment Transport, Temperature, Salinity

Cross-Section View Across MCR along Mega-Transect Area



View Upstream, Toward East

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Littoral Drift Restoration , SW Washington

Stakeholders: Coastal Communities

Similar Project to Benson Beach 2002 Placeme

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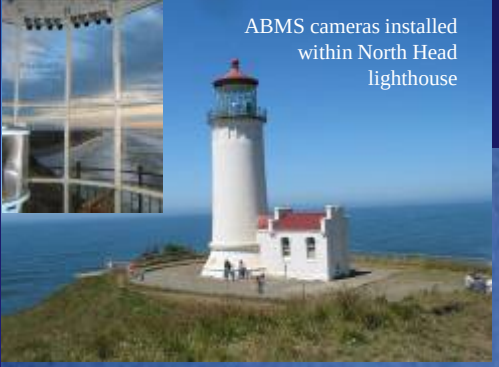
SW WASHINGTON LITTORAL DRIFT RESTORATION (BENSON BEACH) RSM

PURPOSE – Restore material to the littoral drift along the Washington Coast

- **2006 WORK**
  - **ARGUS CAMERA DATA COLLECTION**
  - **LONG TERM ENVIRONMENTAL CLEARANCES**
  - **INDEPENDENT TECHNICAL REVIEW**
  - **FUNDS EXCESS TO THIS YEAR'S NEEDS ARE PROGRAMMED FOR FY2007**

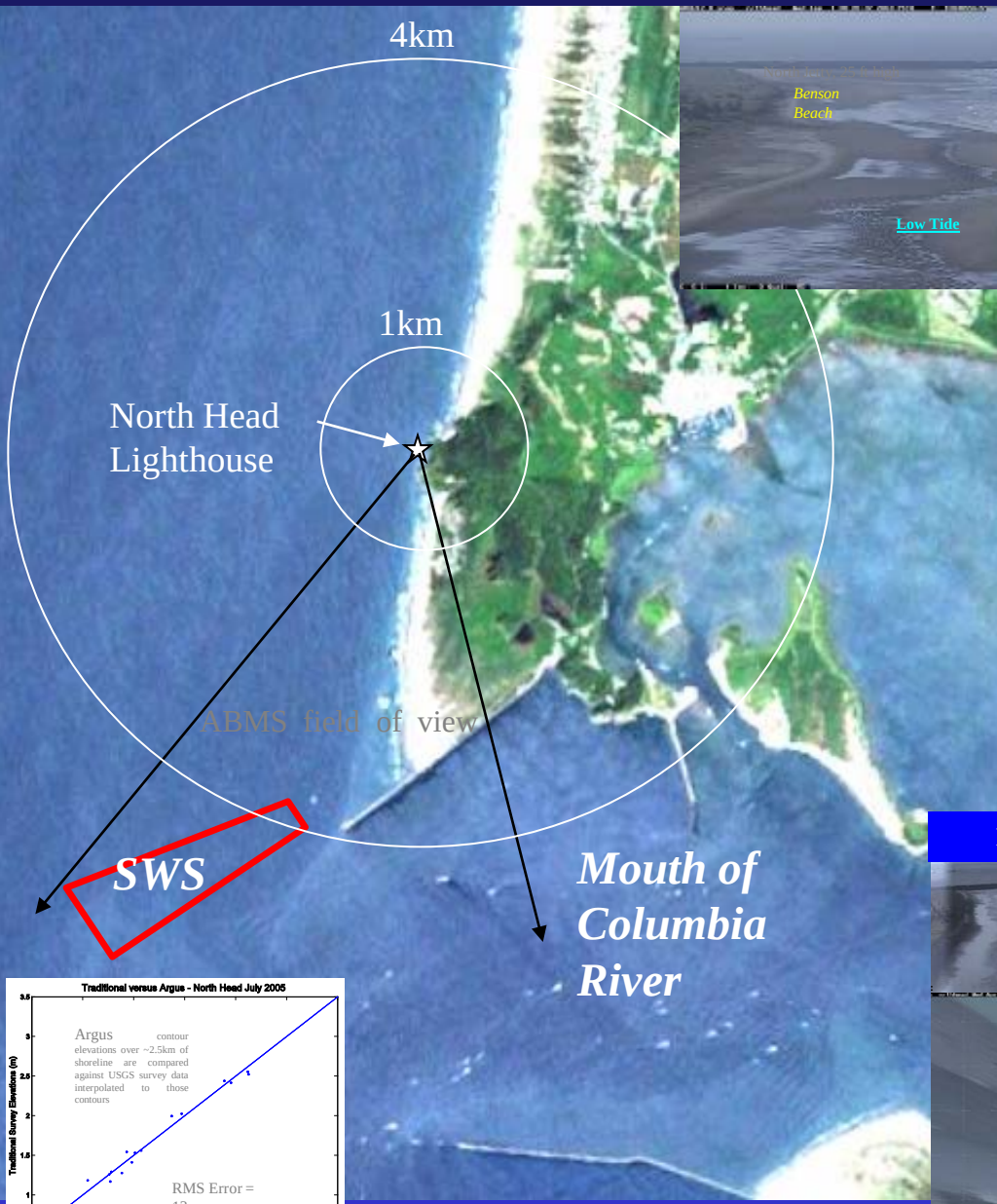
Argus Beach Monitoring at North Head, Washington

Contractor: NorthWest Research Associates (NWRA), with support from Washington Dept. of Ecology and USGS-Menlo Park



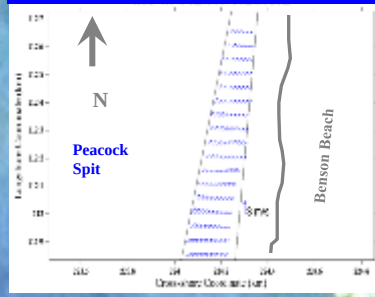
ABMS cameras installed within North Head lighthouse

Pacific Ocean



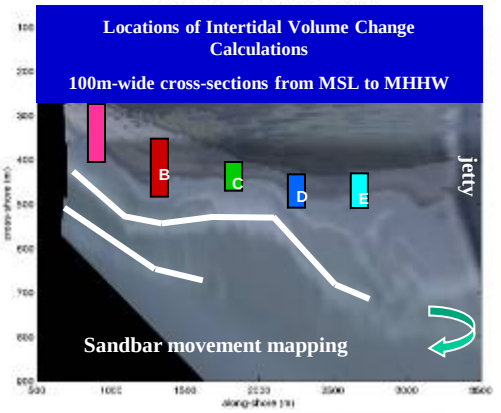
Intertidal Zone Surf\Swash Dynamics

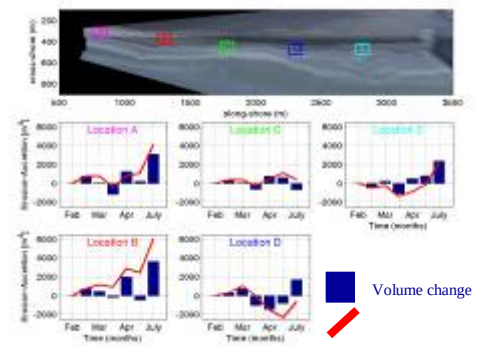
Surface Current Estimate Using ARGUS Imagery



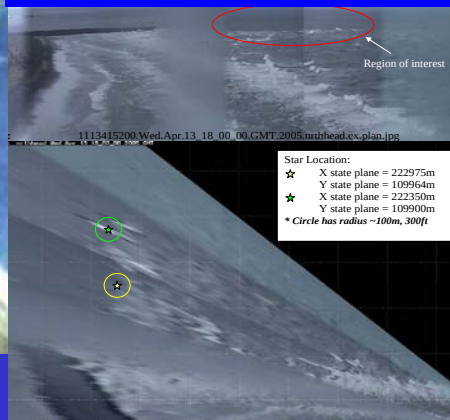
Locations of Intertidal Volume Change Calculations

100m-wide cross-sections from MSL to MHHW





Mapping of Breaking Waves




ARGUS2.0 snap nrthhead Wed Sep 1 08:20:47 2004 PST8 F: 1094055647
South Jetty
North Jetty, 25 ft high
Benson Beach
beach combers
Low Tide
C: 6 S: 1 Inc: 0 Qual: 80


ARGUS2.0 snap nrthhead Thu Dec 9 09:20:46 2004 PST8 F: 1102612846
25 ft wave
High Tide
C: 6 S: 1 Inc: 0 Qual: 80

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Nearshore Beneficial Use Site – S of S Jetty
Stakeholders– Lower Columbia Solutions Group Members

- Port of Astoria
- OR DLCD
- OR DSL
- OR DOGAMI
- Columbia River Channel Coalition
- Corps - RSM
- Port of Portland
- Port of Longview
- Port of Vancouver
- Port of Kalama
- Oregon Sea Grant
- Corps – MCR Project

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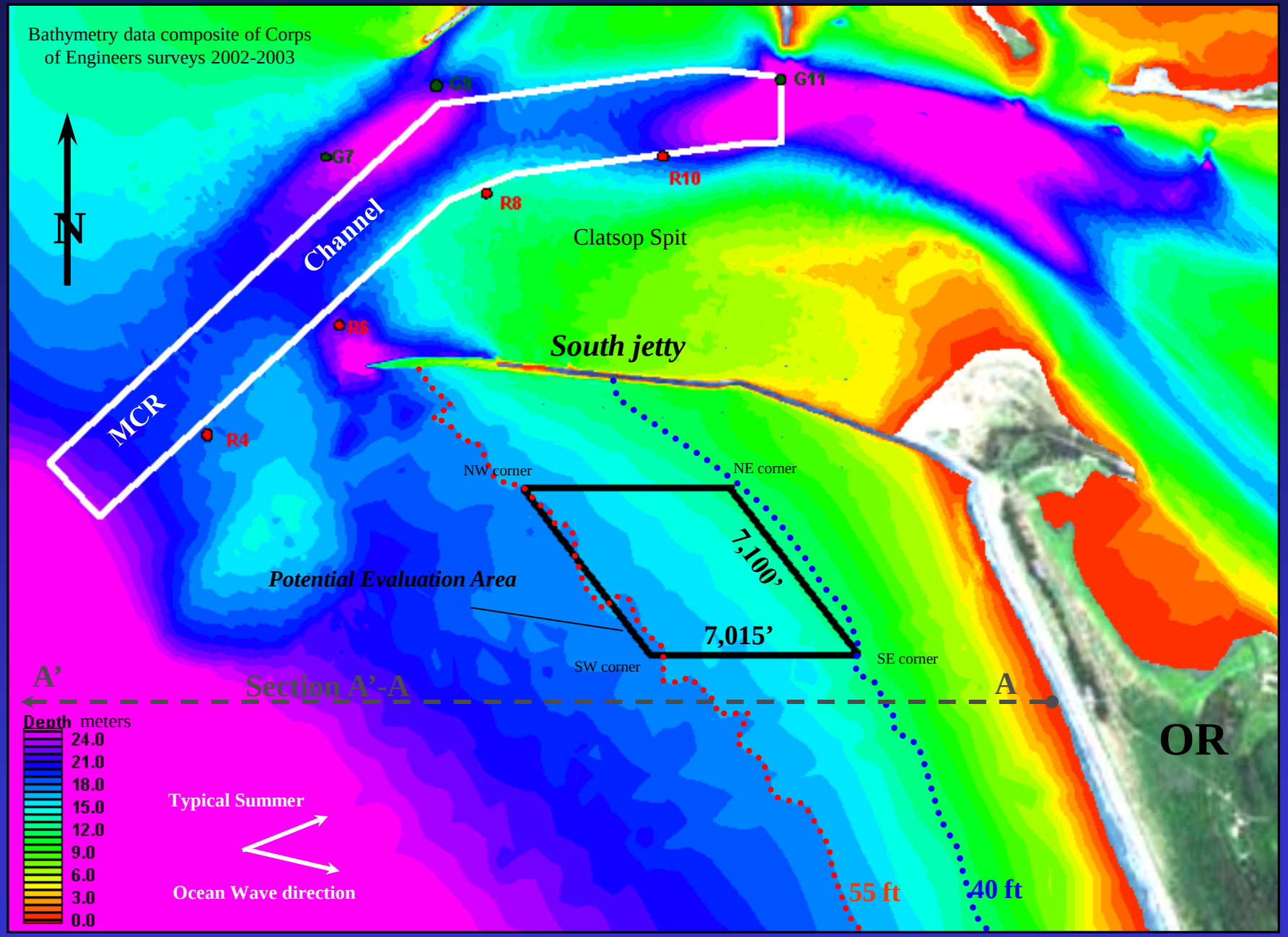
SOUTH JETTY, CLATSOP SPIT OR RSM

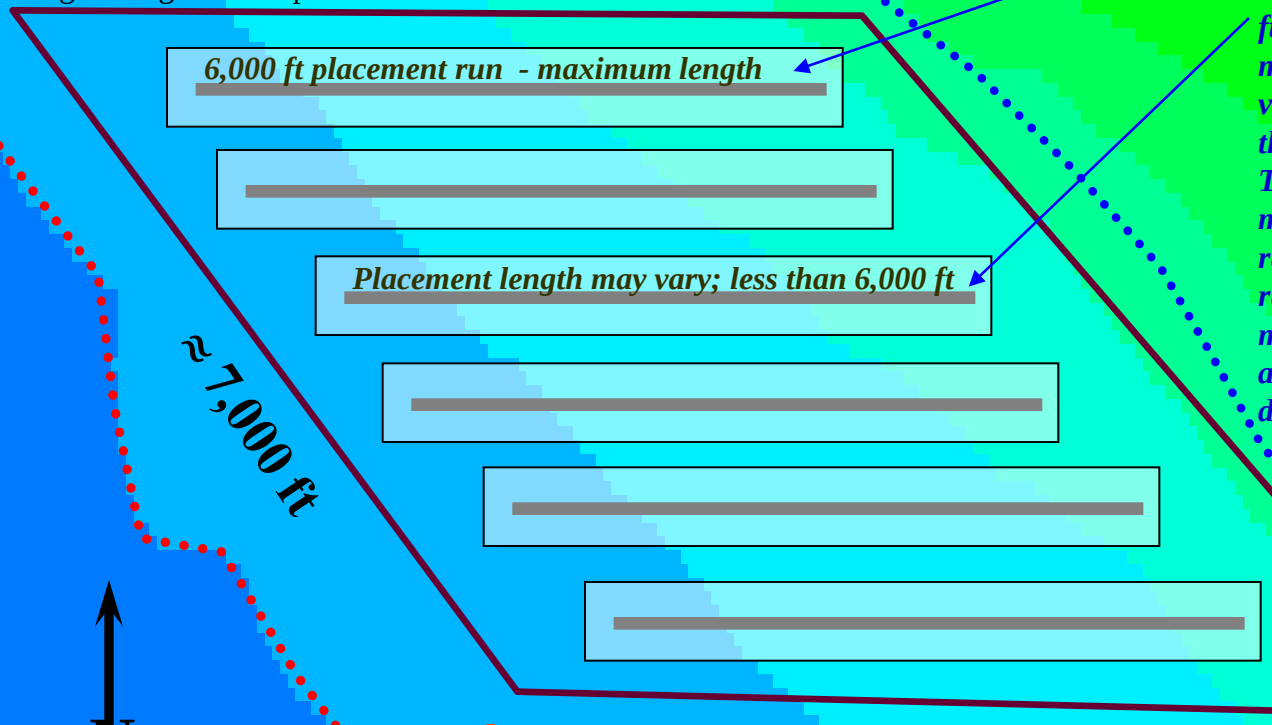
- Purpose: Protect the South Jetty from adverse wave conditions
- FY 2005 – 35,000 cyds placed via Corps Hopper Dredge for a research project with monitoring funded by 11 groups including RSM (EPA Section 102 permit)
- FY2006 – Congressional addition under RSM for razor clam study and wave and sediment fate modeling to increase understanding as group prepares for larger project.



"Nearshore Beneficial Use South of S Jetty Site"

Conducted 6 TEST DUMPS and Measured Bottom Deposition

Overall test site boundary based on area needed to perform six (6) non-overlapping test dumps. Various test dump scenarios are estimated to be 500 feet wide x 6,000 ft long, as shown by screened boxes.
A 500-ft buffer would be needed to prevent encroachment effects from neighboring test dumps.



South jetty

Potential Deposition Area for Enhanced Placement – Maximum length of each disposal run is to be 6,000 ft. Actual length of test dump disposal runs may be less than 6,000 ft; depending upon behavior of the material during disposal and natural variation in conditions that can effect the hopper dredge during disposal. The deposition rate of dredged material on the seabed will be reduced during the test dumps, by reducing the rate at which dredged material leaves the hopper dredge and/or by increasing vessel speed during disposal.

Test dumps would need to be run in East-West direction based on the need for the hopper dredge to maintain heading based on wave approach (hopper dredge typically needs to head into or follow the waves)

40 ft

Figure 3

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MCR RSM SUCCESSES AND CHALLENGES

- Excellent collaboration developed with stakeholder groups
- Superb support from scientific community and state and federal agency personnel at all levels
- Authority and/or incremental funding is needed for placement when it is over the cost of the existing project

Questions ?