

# **Columbia River Regional Sediment Management**

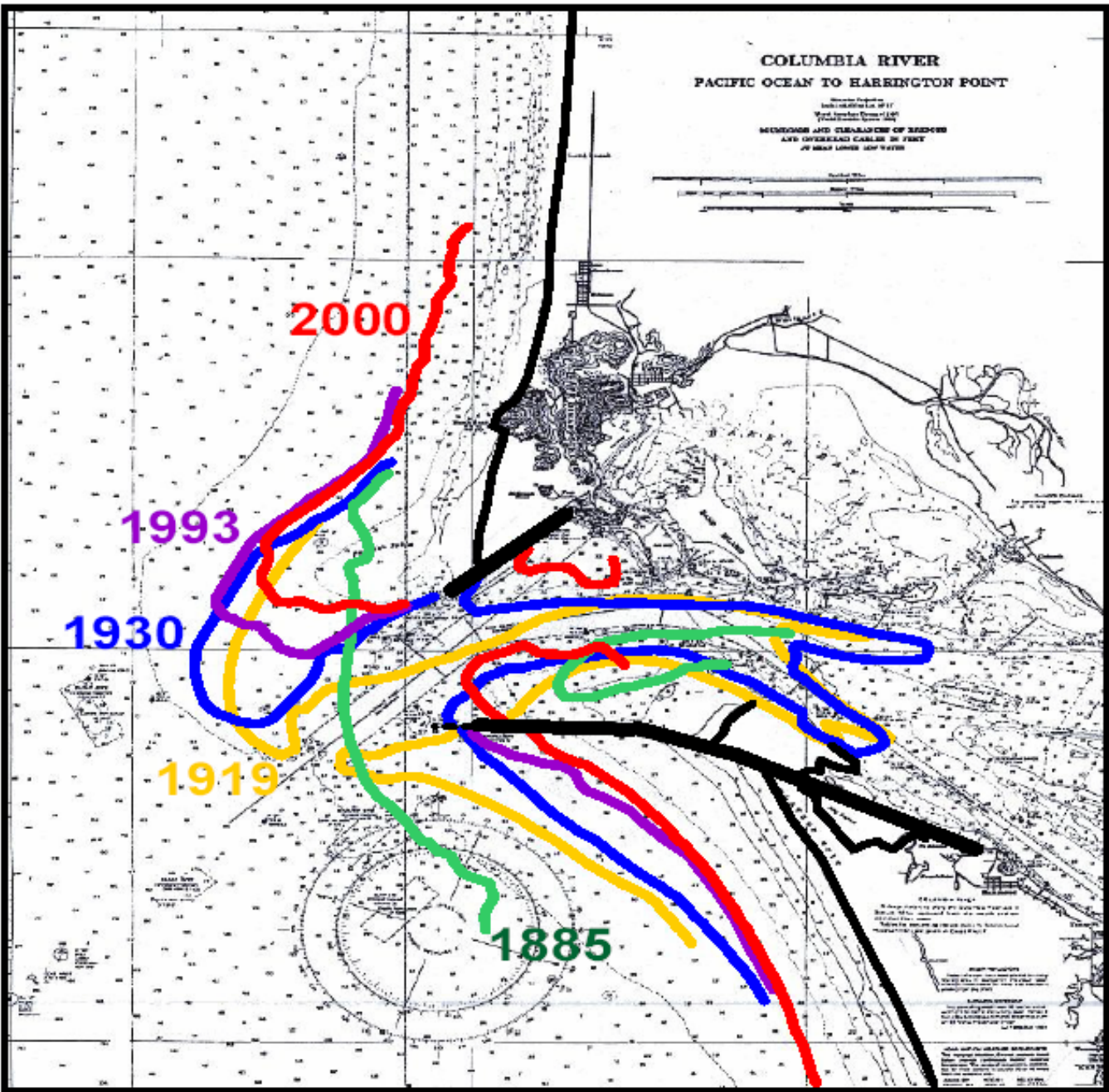
**West Coast Regional Coastal  
Management Meeting  
San Francisco  
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**Oregon Coastal Management Program**

# Regional Sediment Management History and Human Influences

- The Columbia River is the Primary Source of Sediment Supply for the Littoral System
- Jetty Construction Impacts-Mouth Migration; Deeper Channel; Broader and Shallower Intertidal Area Within The Estuary
- Construction of 11 Major Dams and 200 Minor Dams Limits Peak Flows and Sediment Transport
- Dams also Cut off Sediment Supply to the Coast
- Dredging and Disposal Activities Have Not Traditionally Considered Sediment as a Resource



During 1993 to 2000, the 40 ft contour on Peacock Spit receded landward at a rate 7x faster than during 1930 to 1993.

As the offshore shoals recede, the wave climate at will change

MCR jetties were built on tidal shoals 1885-1917 that are now eroding. Stability of jetties is compromised due to scour-based failure.

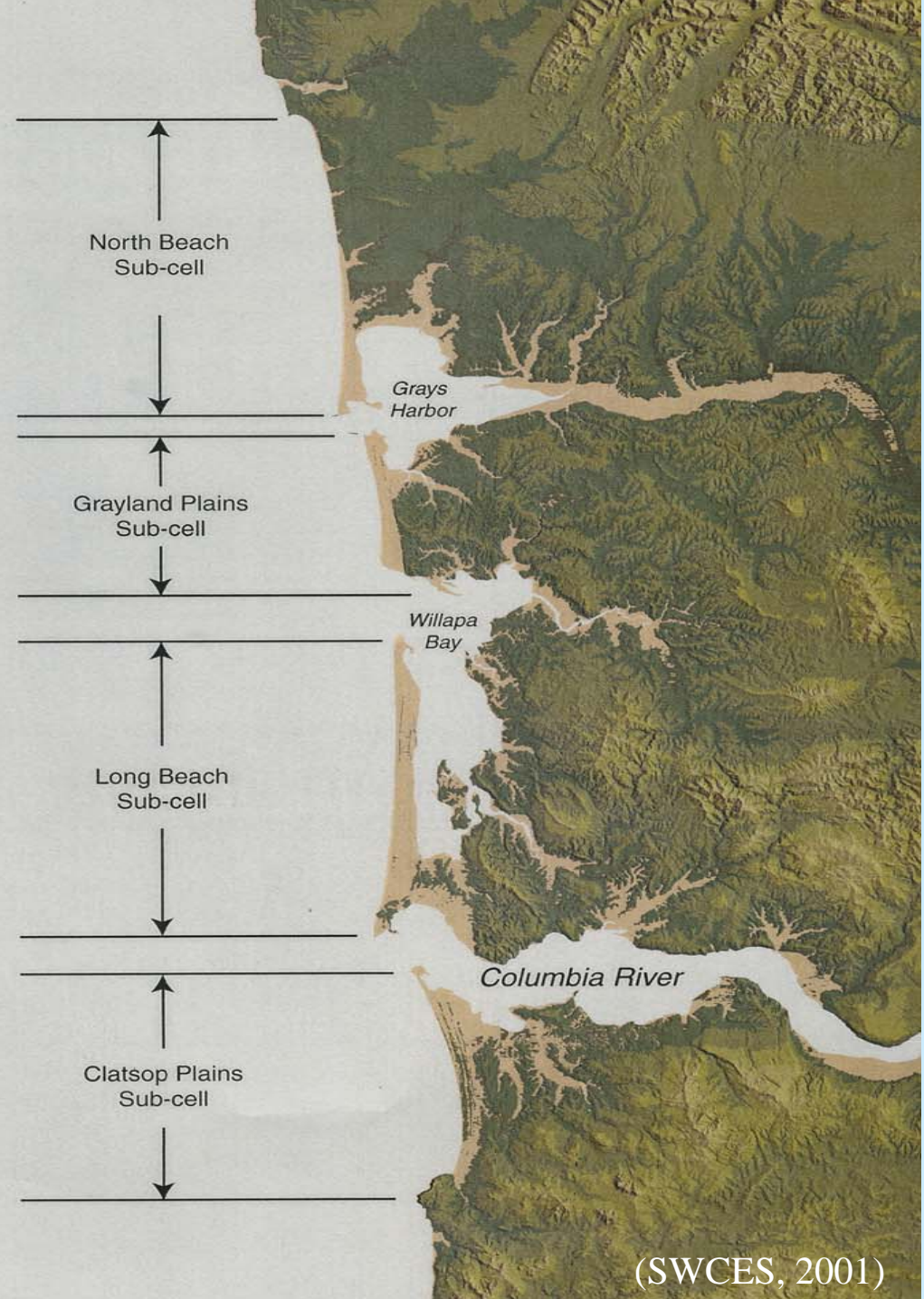


# COMPLEX REGULATORY ENVIRONMENT

- Multiple Navigation Projects
  - 40 Foot Navigation Channel Maintenance
  - 43 Foot Channel Improvement Project
  - Mouth of Columbia River Maintenance
  - Jetty Rehab and Reconstruction Projects
- Regional Economic/Environmental Impacts
- Multiple State and Federal Regulatory Authorities

# Columbia River Littoral Cell

- Shoreline divided into 4 sub-cells
- Beaches and barrier spits have evolved over the past 4-5000 years
- The primary sediment source has been the Columbia River (CR)
- CR estimated to have supplied ~20 million cubic meters of sediment per year



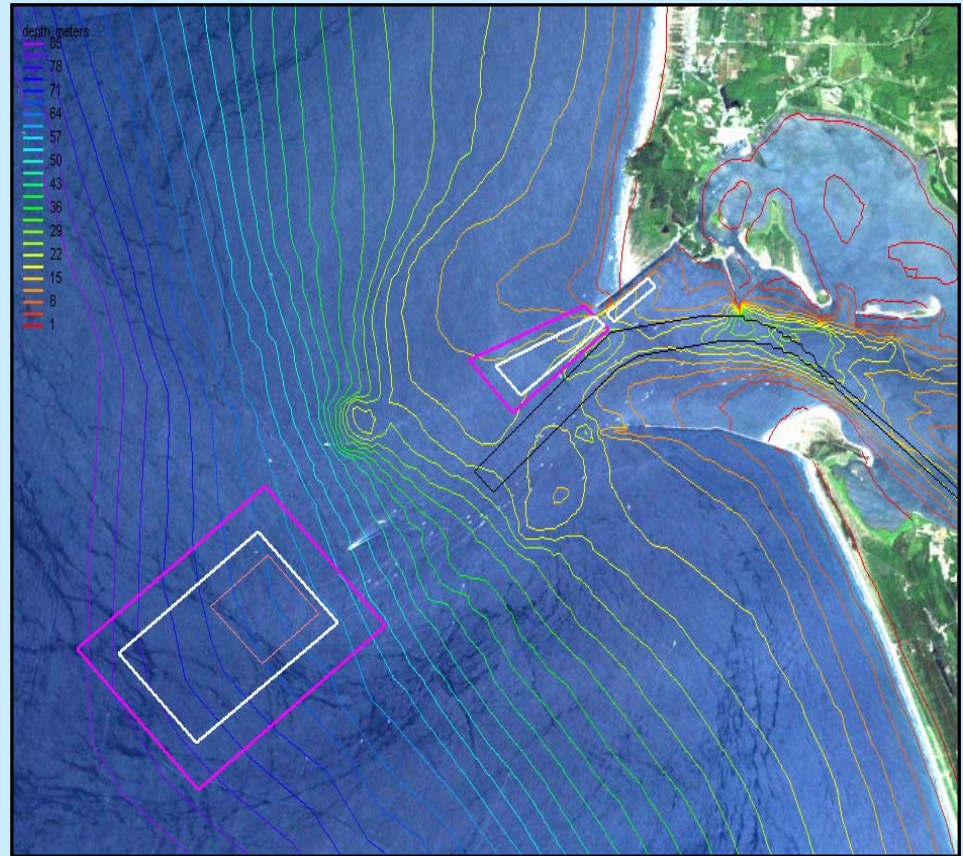
# Dredged Material Disposal

- Shallow Water Site
  - Dispersive
  - Safety Issues
  - Limited Capacity



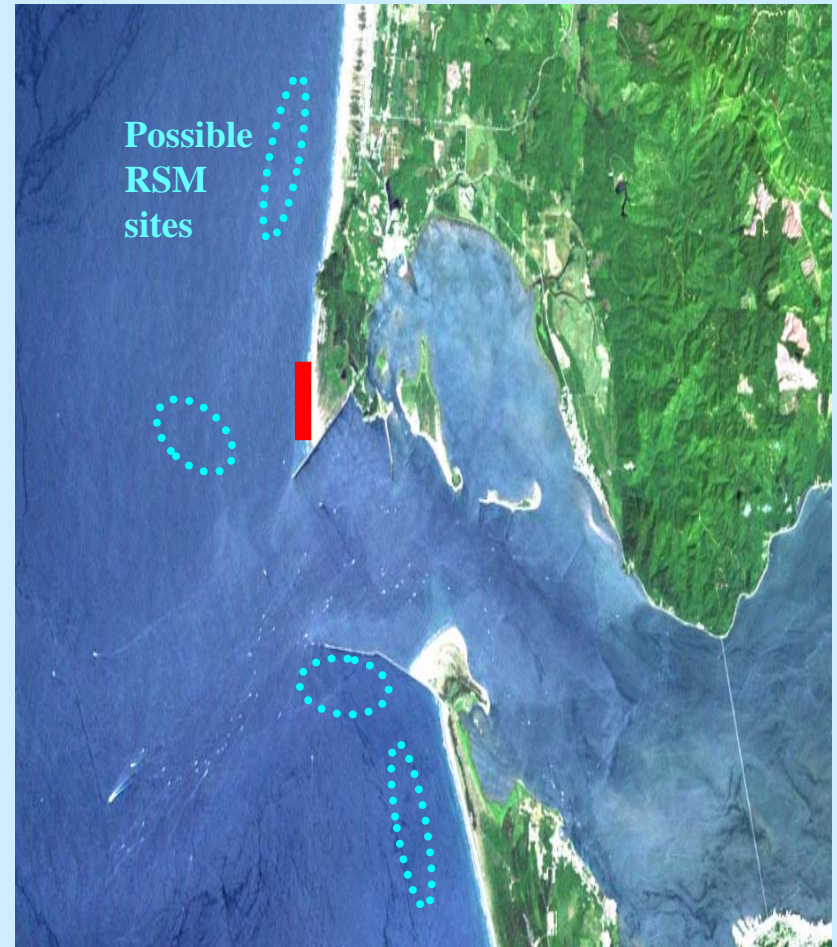
# Deepwater Disposal Site

- Study Costs Exceeded \$800,000.00
- Designed as a Contingency Site
- Monitoring Required
- Subject to EPA/Corps Site Management and Monitoring Plan



# Regional Sediment Management

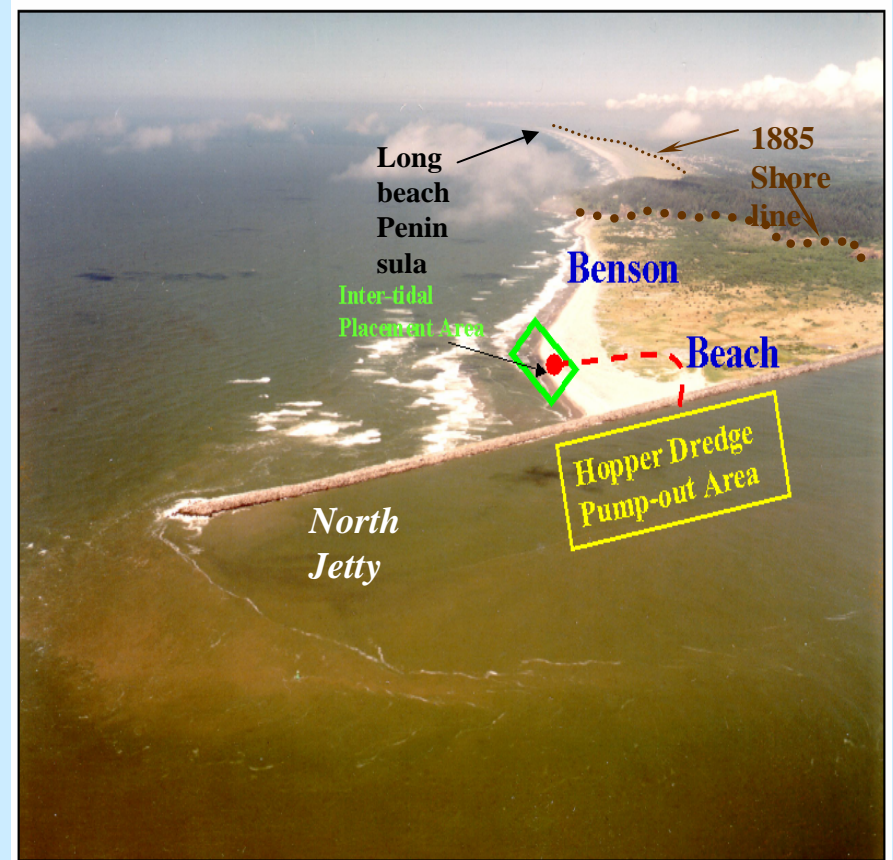
- Meet Disposal Needs
- Alternative to Deepwater Site
- Keep Sediment in Littoral System
- Stabilize Shoreline and Beaches
- Sustainable Activity
- Avoid/Minimize Environmental Impacts





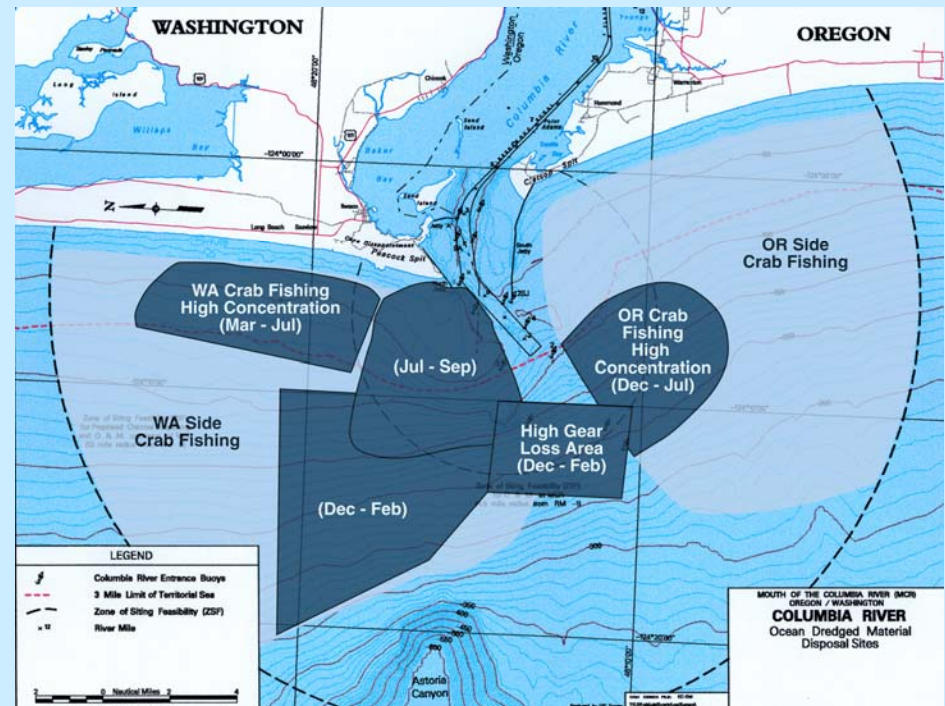
# Benson Beach Beach Nourishment Site

- Direct Beach Placement/Rehandling
- Pilot Project
- Cost Issues
- Sustainability and Impact Issues
- Strong Advocates with Long-Term Plans for Significant Volumes



# Crab Fishing Issues

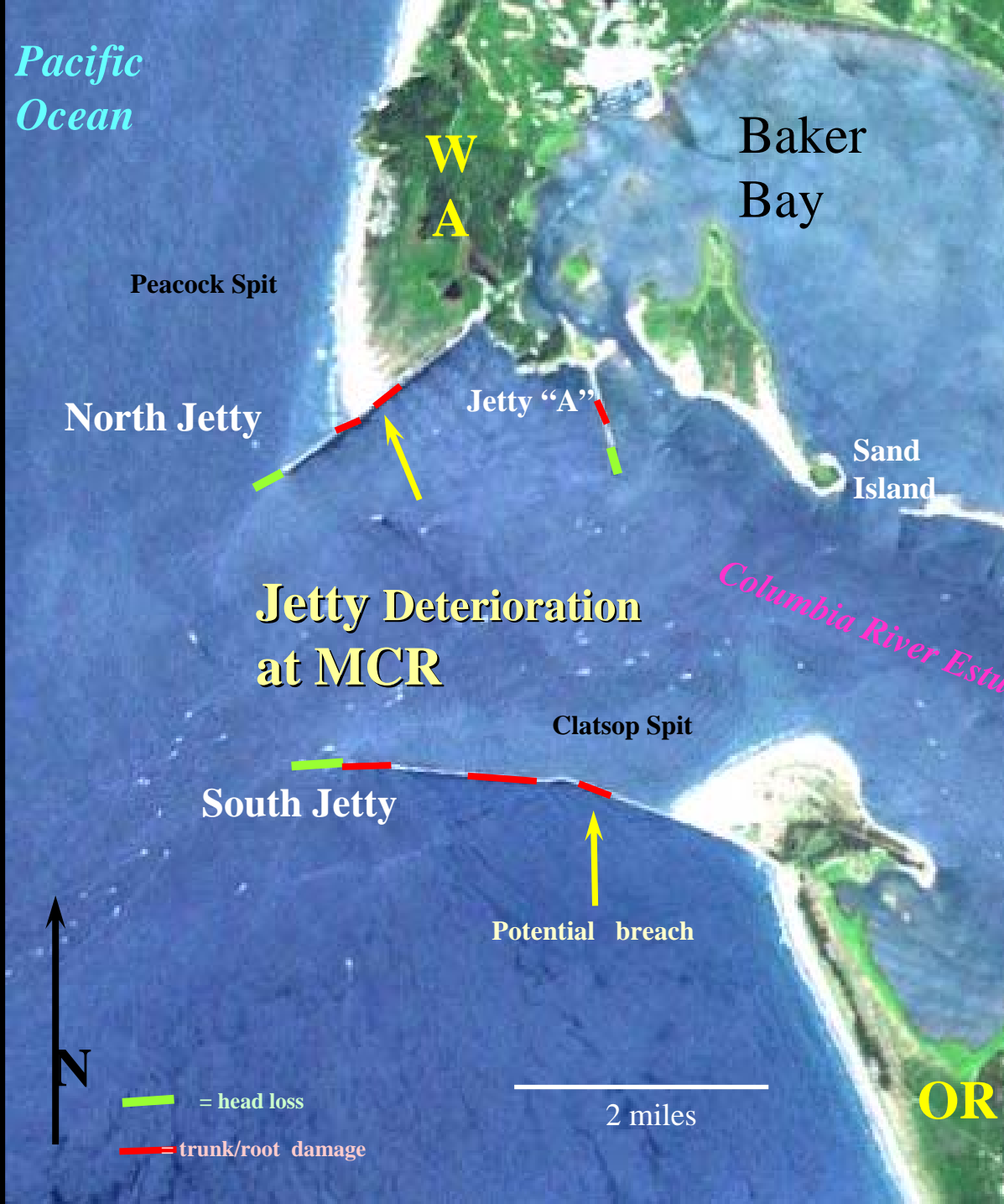
- August 15 Date (Site E)
- Safety Concerns-Wave Amplification (10%)
- Dredging/Disposal Impacts on Crab
- Mitigation for Crab Loss
- Benson Beach/Rainbow Spray Options
- Adequacy of Scientific and Technical Information



# Columbia River Jetties

## Results of Sediment Starved Littoral System

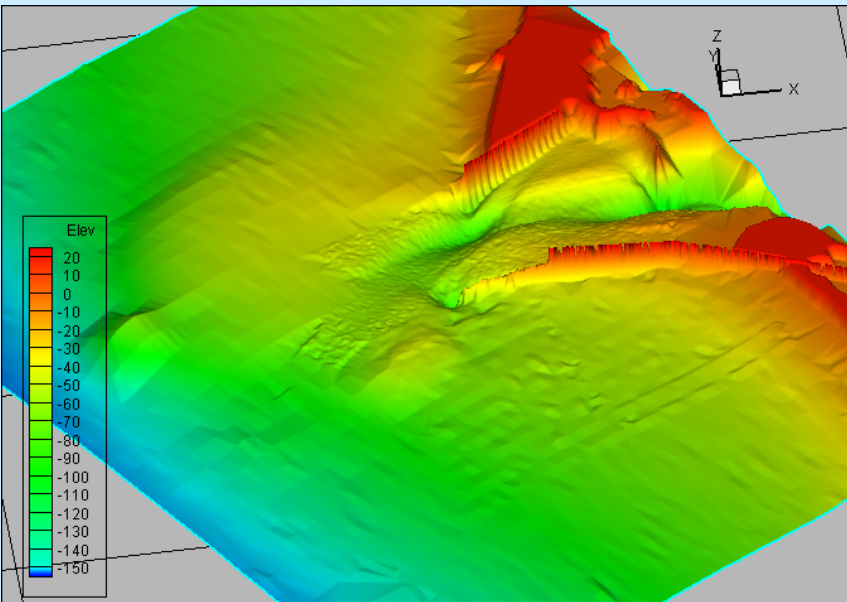
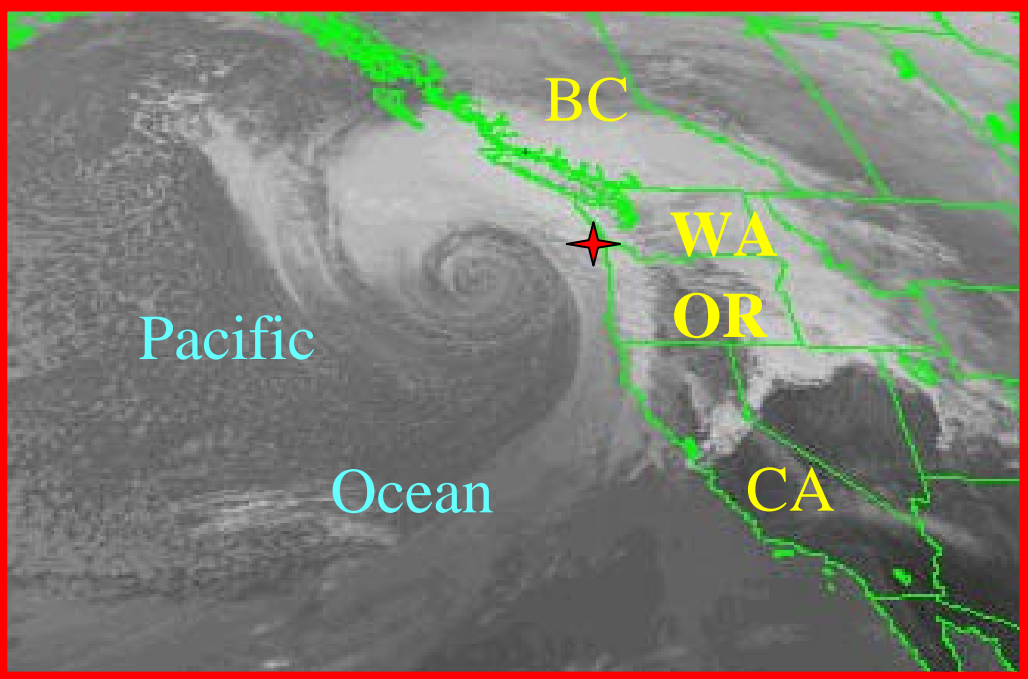
- Deepening of Nearshore Area
- Erosion/Undermining of Jetty's Base
- Increasing Wave Impacts and Possible Breach
- Increased Shoreline Erosion



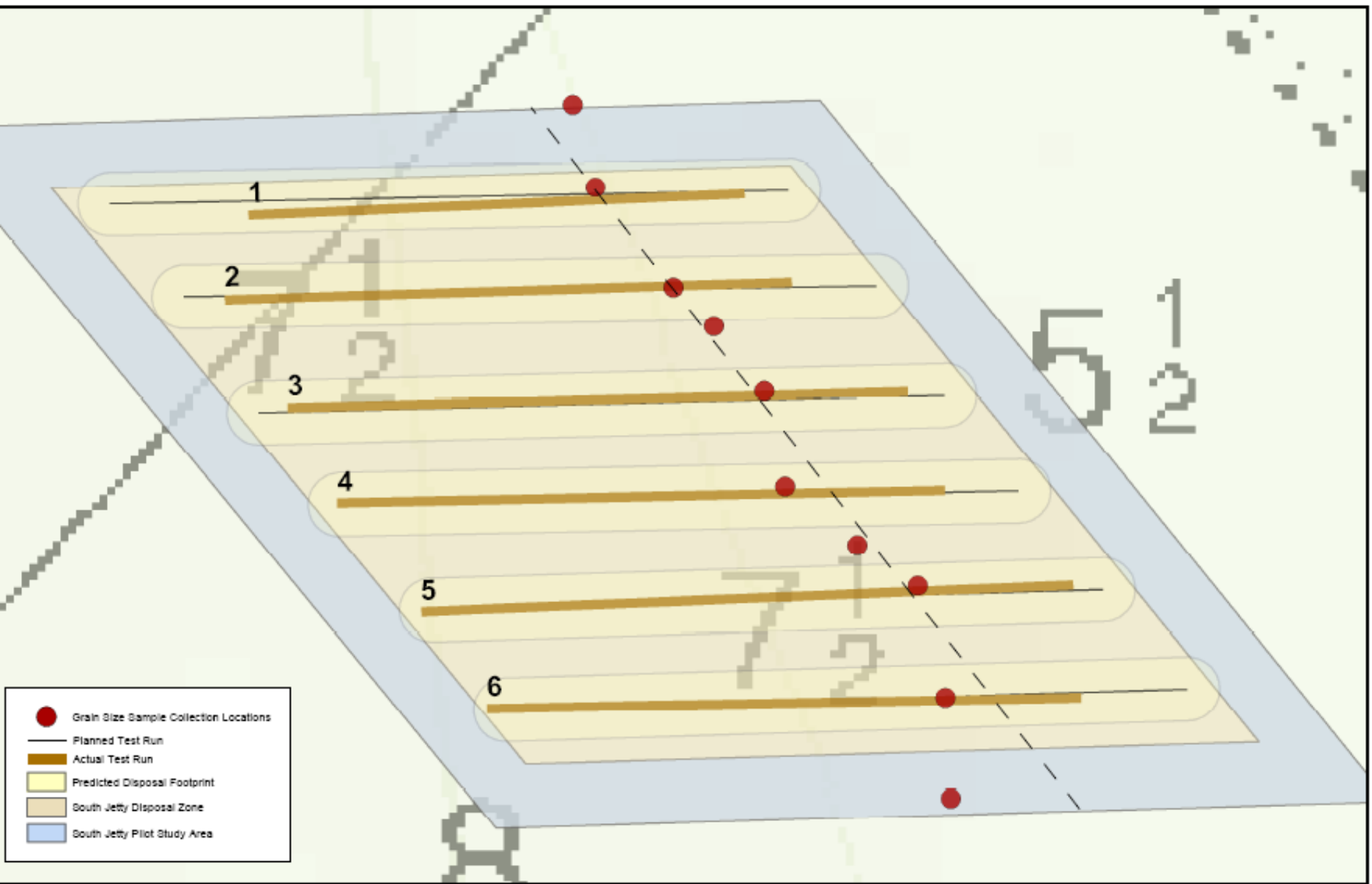
An aerial photograph of the South Jetty Head, a long, narrow, and dark structure extending from a coastline into the deep blue ocean. The structure is composed of what appears to be rocks or rubble. At the end of the main structure, there is a distinct break or gap, with a smaller, separate section of the structure further out in the water. The ocean is a deep, dark blue, and the sky is a clear, light blue. The coastline is visible in the upper part of the image, showing a thin strip of land with some vegetation.

**South Jetty Head -  
4000 ft loss in length**

# Jetty Issues and Impacts







Projection: UTM  
 Zone: 10  
 Units: meters  
 Datum: NAD83



Mouth of the Columbia River - South Jetty  
 Grain Size Sample Collection Locations







003.6



FEET  
FATH

MINIMUM DEPTH WARNING

3


DEPTH



BUZZER



ON  
OFF



# Results

## Displacement versus Distance

- Enhanced Disposal
- Relatively Uniform Layer
  - Speed 2-7.5 knots
  - 8-10 minute runs

A coastal landscape with a beach, water, and hills under a cloudy sky. The scene is overcast, with a greyish-blue sky and a calm body of water in the foreground. In the middle ground, there is a sandy beach leading to a line of green hills. Three prominent, rounded rock formations are visible in the distance. A small bird is flying in the sky above the hills.

# Results

- Sediment Profile Imaging (SPI)
  - Penetration Same for Native and Dredged Material
    - No discernable layer

# Summary

- **We suspect the layer is very thin**
- **MDFATE Modeling indicates Average Depth of 2.03 to 2.69 inches (4.8 inch maximum)**
- **The resultant habitat is indistinguishable from the original habitat**
- **Remaining questions:**
  1. **What is a sustainable management approach?**
  2. **Where does the material go after it is deposited?**
  3. **How do we document long-term effects of enhanced disposal?**
  4. **Can nearshore placement be done in a manner so as to protect the jetty?**