

Cumulative Effects Evaluation Process for Nationwide Permits

Seattle District

Meeting with Tribes and Agencies in Washington State

February 2, 2016

9:30-12:00



US Army Corps of Engineers
BUILDING STRONG[®]



Happy Groundhog Day



Updates

- HQ to release proposed NWP in March (not February)
- 60-day comment period for the Seattle District Regional Conditions (not 30)
- Received proposed language for Regional General Condition for culverts from NWIFC
- NOAA Biological Opinion
- Seattle District is proposing a Regional General Permit for aquaculture
- Highest Astronomical Tide
- Available for staff or leadership level G-to-G

News and Updates (left menu)

The screenshot shows the US Army Corps of Engineers website. The browser address bar displays <http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory.aspx>. The page header includes the US Army Corps of Engineers logo and a search bar. The main navigation menu contains links for HOME, ABOUT, BUSINESS WITH US, MISSIONS, LOCATIONS, CAREERS, MEDIA, LIBRARY, and CONTACT. The breadcrumb trail reads HOME > MISSIONS > CIVIL WORKS > REGULATORY.

The left sidebar features a 'Quick Links' menu with the following items:

- News and Updates
- Forms
- Public Notices
- Jurisdictional Determinations
- Permit Decisions/Appeals
- Emergencies
- Water Resources Development Act Sec. 214
- Regulatory Video Library

The main content area is titled 'REGULATORY BRANCH' and includes a 'Permit Guidebook' section with a red book icon and a 'Click here for permit information' link. Below this is a photograph of a stream in a forest. To the right of the photo is the 'Regulatory Program Goals' section, which states: 'To provide strong protection of the nation's aquatic environment, including wetlands; to enhance the efficiency of the Corps administration of the Regulatory Program to ensure that the Corps provides the regulated public with fair and reasonable decisions.' Below the photo is a 'Training Guide and Video' section with a red button labeled 'Permitting 101'. To the right of the photo is the 'Most Requested' section, which lists:

- JARPA (permit application form)
- Permit Application Drawings
- 2012 NWP User's Guide
- Wetland Resources
- Mitigation Resources
- SPIFs

2017 NWP Reissuance Process - Updates for Tribes in Washington State

The screenshot shows a web browser window displaying the Seattle District website. The browser's address bar shows the URL: <http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory/NewsandUpdates.asp>. The browser tabs include "Seattle District > Mi...", "Unknown Host", "Seattle District Regulatory...", "US Army Corps of Engine...", "Seattle District Regulatory...", "Corps of Engineers Financi...", "http--www.spd.usace.arm...", "Home - Regulatory", and "ECRB ESA Info".

The website header features the US Army Corps of Engineers logo and the text "SEATTLE DISTRICT". Below the logo is a search bar labeled "Search Seattle District". A navigation menu includes links for "ABOUT", "BUSINESS WITH US", "MISSIONS", "LOCATIONS", "CAREERS", "MEDIA", "LIBRARY", and "CONTACT".

The main content area is titled "NEWS AND UPDATES" and includes a sub-section "Electronic Permit Guidebook" with a red book icon and a link "Click here for permit information". Below this is a "Regulatory Quick Links" section with a list of links: "News and Updates", "Forms", "Public Notices", "Jurisdictional Determinations", "Permit Decisions/Appeals", and "Emergencies".

The "News and Updates" section contains a list of news items under the heading "2017 NWP Reissuance Process - Updates for Tribes in Washington State":

- 2012 NWP Biological Opinion from NMFS Update for Tribes PowerPoint Presentation
- Reissuance Schedule for Tribes and Agencies, 14 December 2015
- Meeting Agenda, 14 December 2015
- NWP Total Usage Handout
- Information Sheet for Tribal Meeting on 14 December 2015
- Informational PowerPoint Presentation, 14 December 2015
- List of 2012 NWP National and Regional Conditions

Other news items include "Updates on High Profile Projects (BP Cherry Point, Gateway Pacific Terminal, Millennium Bulk Terminals-Longview)" and "Latest Pre-Application Meeting Information and Documents".

Refresher

- NWPs are reissued every 5 years
- Expire in 2017
- Currently 50 NWPs
- 2 New NWPs for 2017: Living Shorelines & Low-head Dam Removal
- Seattle District issues enforceable regional conditions for NWPs
- Reissuance process includes cumulative effects analysis for each of the 52 NWPs

Meeting Objectives

1. Discuss requirements for cumulative effects analysis (CEA)
2. Describe how we evaluated cumulative effects for the 2012 NWP's
3. Describe current tools/strategies
4. Discuss areas of particular concern and useful resources and tools

Impact Evaluation

- HQ will write decision documents for all NWP's
- Seattle District will write supplemental decision documents for all NWP's focusing on regional conditions
 - These decision documents constitute the Environmental Assessment, 404(b)(1) Guidelines Evaluation, Public Interest Review, and Statement of Findings.

Regulatory NEPA CEA Framework

→ Based on 1997 CEQ Guidance

Considering Cumulative Effects

Under the National
Environmental
Policy Act



Council on Environmental Quality
Executive Office of the President

National Environmental Policy Act Definition:

- ▶ “*Cumulative impact* is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”
[40 CFR 1508.6]

Activities authorized by NWP's must cause only minimal adverse environmental effects when performed separately, and cause only minimal cumulative adverse effect on the aquatic environment.

Regulatory NEPA CEA Framework

Scoping

- Identify resource(s) of concern
 - Wetlands, streams, marine waters, etc.
- Geographic Scope
 - i.e., Washington, Puget Sound, WRIA/Watershed
- Temporal Scope

Regulatory NEPA CEA Framework

Describe Affected Environment

- Land use patterns (trends analysis)
 - e.g., development activities, ag., undeveloped lands
- Aquatic resources of concern
 - e.g., wetland acreage, streams
- Stressors directly and indirectly affecting the quantity and quality of the aquatic resources of concern
 - e.g., fill material in waters and wetlands, point source pollution, non-point source pollution, land use changes

Regulatory NEPA CEA Framework

Determine Environmental Consequences

- How will the proposed activity contribute to the cumulative effects occurring in the watershed?
 - Are they minor or significant contributions?
- Is mitigation required to reduce the permitted activity's contribution to cumulative effects in region?
 - ❖ Level of detail commensurate with anticipated impacts

404(b)(1) Guidelines of the Clean Water Act

40 CFR Section 230

Goal: To restore and maintain, the chemical, physical, and biological integrity of waters of the United States through the control of discharges of dredged or fill material.

- Contains substantive criteria used in evaluating discharges of dredged or fill material.

404(b)(1) Guidelines

Cumulative Effects: 40 CFR Section 230.11(g)

- Definition:

- ▶ “Cumulative impacts are the changes in an aquatic ecosystem that are attributable to the ***collective effect of a number of individual discharges of dredged or fill material***. Although the impact of a particular discharge may constitute a minor change in itself, the cumulative effect of numerous such piecemeal changes can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems.” [40 CFR 230.11(g)]

404(b)(1) Guidelines CEA

- Number of discharges in CEA review area
 - ▶ Number of §404 permit actions
 - ▶ Amount of authorized impacts
 - ▶ Amount of compensatory mitigation required

Why Assess Cumulative Effects?

In high value waters, division and district engineers can:

- 1) Prohibit the use of the NWP in those waters and require an individual permit or regional general permit.
- 2) Impose an acreage or linear foot limit on the NWP.
- 3) Lower the pre-construction notification threshold of the NWP to require pre-construction notification for NWP activities with smaller impacts in those waters.

4) Require pre-construction notification for some or all NWP activities in those waters.

5) Add regional conditions to the NWP to ensure that the individual and cumulative adverse environmental effects are minimal.

6) For those NWP activities that require pre-construction notification, add special conditions to NWP authorizations, such as compensatory mitigation requirements, to ensure that the adverse effects on the aquatic environment are minimal.

Headquarters NWP Final Decision Documents

The screenshot shows a web browser window displaying the US Army Corps of Engineers website. The browser's address bar shows the URL: <http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/NationwidePermits>. The website header features the US Army Corps of Engineers logo and the text "HEADQUARTERS". Below the logo is a search bar labeled "Search HQ USACE". A navigation menu includes links for "ABOUT", "BUSINESS WITH US", "MISSIONS", "LOCATIONS", "CAREERS", "MEDIA", "LIBRARY", and "CONTACT". A breadcrumb trail reads: "HOME > MISSIONS > CIVIL WORKS > REGULATORY PROGRAM AND PERMITS > NATIONWIDE PERMITS".

The main content area is divided into two sections:

2012 Nationwide Permit Information

- NOAA Fisheries Final Endangered Species Act Section 7 Consultation and Biological Opinion on USACE 2012 Nationwide Permits - November 24, 2014
- Amendments to the Nationwide Permit Program Regulations at 33 CFR part 330 - 28 January 2013
- 2012 Nationwide Permits Federal Register Notice (Corrections) - 21 September 2012
- 2012 Nationwide Permits Federal Register Notice (Correction) - 19 March 2012
- 2012 Nationwide Permits Federal Register Notice - 21 February 2012
- 2012 Nationwide Permits, Conditions, and Definitions, with corrections
- 2012 Nationwide Permits Summary
- 2012 Nationwide Permits Q's and A's
- 2012 Nationwide Permits Fact Sheet
- 2012 Nationwide Permits News Release
- 2012 Nationwide Permits Final Decision Documents

2007 Nationwide Permit Information

- 2007 Nationwide Permits
- 2007 Nationwide Permits Federal Registered Notice - 12 March 2007
- Final Decision Documents
- Correction Notice - 8 May 2007
- 2007 Nationwide permits, conditions, and definitions, with corrections

Nationwide Permit 13 - Bank Stabilization (Sections 10 and 404)

The screenshot shows the US Army Corps of Engineers website. The main content area is titled "Nationwide Permit Final Decision Documents" and contains a list of 26 permit categories. Permit 13, "Bank Stabilization (Sections 10 and 404)", is highlighted in blue. The list includes:

- Nationwide Permit 1. Aids to Navigation(Section 10)
- Nationwide Permit 2. Structures in Artificial Canals (Section 10)
- Nationwide Permit 3. Maintenance (Sections 10 and 404)
- Nationwide Permit 4. Fish & Wildlife Harvesting, Enhancement, and Attraction Devices (Sections 10 and 404)
- Nationwide Permit 5. Scientific Measurement Devices (Sections 10 and 404)
- Nationwide Permit 6. Survey Activities (Sections 10 and 404)
- Nationwide Permit 7. Outfall Structures and Associated Intake Structures (Sections 10 and 404)
- Nationwide Permit 8. Oil and Gas Structures on the Outer Continental Shelf (Section 10)
- Nationwide Permit 9. Structures in Fleeting and Anchorage Areas (Section 10)
- Nationwide Permit 10. Mooring Buoys (Section 10)
- Nationwide Permit 11. Temporary Recreational Structures (Section 10)
- Nationwide Permit 12. Utility Line Activities (Sections 10 and 404)
- Nationwide Permit 13. Bank Stabilization (Sections 10 and 404)
- Nationwide Permit 14. Linear Transportation Projects (Sections 10 and 404)
- Nationwide Permit 15. U.S. Coast Guard Approved Bridges (Section 404)
- Nationwide Permit 16. Return Water from Upland Contained Disposal Areas (Section 404)
- Nationwide Permit 17. Hydropower Projects (Section 404)
- Nationwide Permit 18. Minor Discharges (Sections 10 and 404)
- Nationwide Permit 19. Minor Dredging (Sections 10 and 404)
- Nationwide Permit 20. Response Operations for Oil and Hazardous Substances (Sections 10 and 404)
- Nationwide Permit 21. Surface Coal Mining Operations (Sections 10 and 404)
- Nationwide Permit 22. Removal of Vessels (Sections 10 and 404)
- Nationwide Permit 23. Approved Categorical Exclusions (Sections 10 and 404)
- Nationwide Permit 24. Indian Tribe or State Administered Section 404 Programs (Section 10)
- Nationwide Permit 25. Structural Discharges (Section 404)
- Nationwide Permit 26. (Reserved)
- Nationwide Permit 27. Aquatic Habitat Restoration, Establishment, and Enhancement Activities (Sections 10 and 404)

2012 NWP CEA for NWP 13

- To describe historical and current conditions and affected environment
 - ▶ Reviewed published references
 - Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) data
 - ▶ Researched online resources
 - ▶ Examined existing ORM data
 - Size, type of material, impacts, mitigation

2012 NWP CEA for NWP 13

- To identify stressors
 - ▶ Reviewed published references
 - PSNERP data
 - ▶ Researched online resources
 - ▶ Solicited, reviewed, and researched information received from public, resource agencies, and Tribes

2012 NWP CEA for NWP 13

- To identify future trends
 - ▶ Examined existing ORM data to project future trends
 - ▶ Researched online resources

2012 NWP CEA for NWP 13

- Cumulative effect analysis, discussion, and conclusions
 - ▶ To minimize individual and cumulative impacts, the Corps added Regional General Conditions 3 and 4 to all 2012 NWPs

2017 NWP CEA

- To describe historical and current conditions and affected environment
 - ▶ Review published references
 - ▶ Examine existing ORM data
 - Size, type of material, impacts, mitigation
 - ▶ Research online resources
 - New resources (i.e., GIS layers) since 2011
 - ▶ Utilize Cumulative Effects Assessment Tool, Puget Sound (PS Tool); Corps, Institute for Water Resources, 2013

2017 NWP CEA

PS Tool, 2013

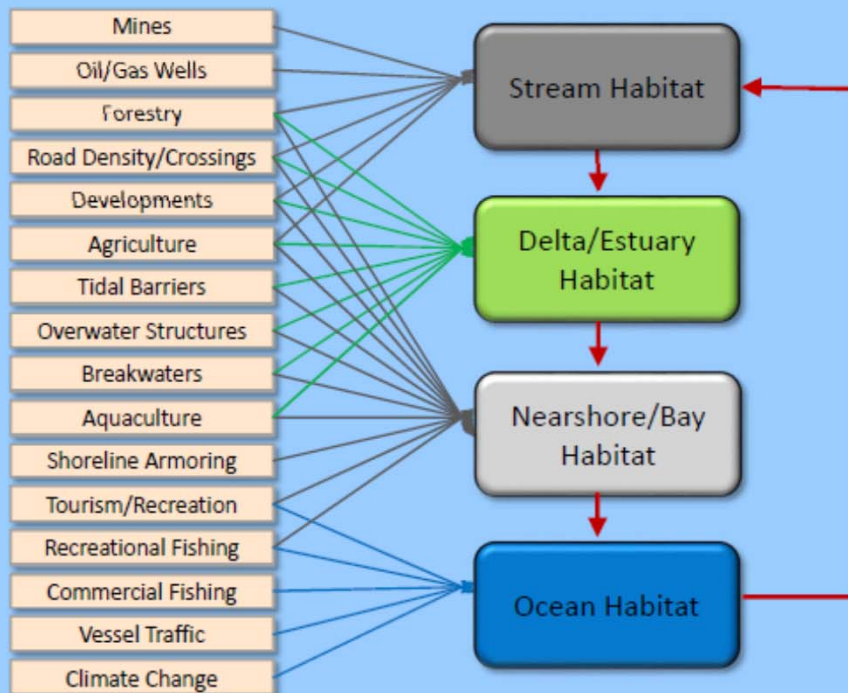
- provides an interface with available data that provides context to the cumulative effects problem for any watershed or shoreline in the Puget Sound region
- helps characterize conditions of watersheds, estuaries, and shorelines
- LIMITATIONS:
 - ▶ The tool itself does not prescribe specific outcomes, but provides information to help Regulatory project managers understand historic and current conditions and stressors.
 - ▶ Only limited to Puget Sound.
 - ▶ Static set of conditions and stressors.

2017 NWP CEA

- To describe historical and current conditions and affected environment

Cumulative Effects Analysis Tool for the Puget Sound Region of Washington

Start Screen



The Cumulative Effects Analysis (CEA) Tool for Puget Sound of Washington State revolves around the life history of salmon. Streams, estuaries, nearshore, and ocean habitat can be viewed as connected aquatic features through which the salmon life cycle propagates. Rather than considering these different aquatic habitats as one unit of assessment, it would be more appropriate to consider each aquatic habitat separately.




Within each habitat type, different types of stressors are expected. Clicking on each of the first three buttons directs the user to additional screens for habitat specific analysis with respect to the stressors. More detailed analysis for ocean habitat is not available, due to the vastness of that habitat type and the inability to characterize those stressors in the open ocean.

For additional information, contact Jae Chung at yong.j.chung@usace.army.mil.

Characterization of Puget Sound Nearshore/Bay Habitat

1/30/2016

Select a

SubBasin   
 ShoreUnit

Select Data Type



Geographic Feature

Feature Code	W09_02
Feature Name	WRIA09-Elliott Bay (Seattle, Duwamish DE
Shoreline Length (miles)	21.4
100-m Buffer Land (sq mi)	1.2

Wetlands Based on NWI (acres)

	Total	Disturbed
Estuarine/Marine Deepwater	576.0	0.0
Estuarine/Marine Wetland	54.9	0.0
FW-Forested/Shrub Wetland	0.3	0.3
FW-Emergent Wetland	1.6	0.9
FW-Pond	3.4	3.4
Lacustrine	0.0	0.0
Other	0.0	0.0
Riverine	0.0	0.0
Total	636.3	4.6

CCAP Aq Resources (ac)



	1992	1996	2001	2006
Unconsolidated Shore	46.7	46.7	46.7	46.7
Estuarine Herbaceous	15.3	15.3	15.3	15.3
Freshwater Woody	19.1	19.1	19.1	19.1
Freshwater Herbaceous	12.9	12.9	12.9	12.9
Freshwater Aquatic Bed	0.0	0.0	0.0	0.0
Estuarine Aquatic Bed	3.1	3.1	3.1	3.1
Open Water	467.7	467.7	467.7	467.7
Total	564.9	564.9	564.9	564.9

Shoreline Features

	Hist	Curr	% Chng
Shoreline Length (miles) (2009)	9.3	21.4	129.5
Bluff Backed Beach (miles) (2009)	4.2	0.0	-100.0

Presence of Plant Ecol. Resources

	Contin	Patchy	Tot Pres	% Pres
Saltmarsh (miles) (2001)	0.0	0.3	0.3	1.5
Eelgrass (miles) (2001)	0.0	0.2	0.2	1.1
Kelp (miles) (2001)	0.0	0.7	0.7	3.2

Presence of Forage Fish Spawning

	Present	% Pres
Smelt spawning (miles) (2008)	0.0	0.0
Sand lance spawning (miles) (2008)	0.0	0.0
Herring spawning (acres) (2009)	0.0	0.00

Presence of Protected Open Space

	Acres	%
Protected open space (acres) (2011)	0.0	0.00

Buffer Land Cover (%)



	1992	1996	2001	2006
Development	92.0	92.0	92.0	92.0
Developed Open Space	0.4	0.4	0.4	0.4
Cultivation	0.0	0.0	0.0	0.0
Pasture/Hay	0.0	0.0	0.0	0.0
Grassland/Herbaceous	1.6	1.6	1.6	1.6
Forested	2.0	2.0	2.0	2.0
Shrub	0.4	0.4	0.4	0.4
Barren	0.1	0.1	0.1	0.1
Unconsolidated Shore	0.8	0.8	0.8	0.8
Wetlands	2.8	2.8	2.8	2.8
Open Water	0.0	2.6	2.6	2.6
Impervious Cover			83.7	83.7

Population (#/sq mi)

	2000	2010	% Change
People	505.2	492.2	-2.6
Housing Units	232.7	315.1	35.4

Shoreline Stressors

Loss of shoreline length (%) (2008)	-129.5
Loss of bluff-backed beaches (%) (2008)	100.0
Artificial shorelines (%) (2008)	100.0
Armoring of shoreline (%) (2008)	100.6
Breakwater/jetties (%) (2006)	0.0
Nearshore fill (ac/mi shore) (1980)	62.34
Overwater structures (ac/mi shore) (2006)	10.97
Railroads w/i 25-m of shore (mi/mi shore) (2005)	0.03
Roads w/i 25-m of shore (mi/mi shore) (2007)	0.12
Tidal barriers (mi/mi shore) (2008)	0.64
Parcels (#/mi) (2007)	1.12
Industrial Facilities (#/mi shore) (2012)	6.13
NPDES/PCS Facilities (#/mi shore) (2011)	0.66
Timber Harvest Areas (ac/mi shore) (2012)	0.00

2017 NWP CEA

- To identify stressors
 - ▶ PS Tool, 2013
 - Helps to identify which stressors are critical
 - ▶ Receive information from public, resource agencies, and Tribes
 - Stressed waterbodies and aquatic resources
 - Specific NWP activities of concerns and specific reasons for concern
 - ▶ Review published references
 - ▶ Research online resources
 - ▶ LIMITATIONS: Corps does not have the time or resources to do extensive research of online resources and published references; we require input from resources agencies and Tribes to help us identify these resources for incorporation into assessments.

Assessment of Puget Sound Nearshore Habitat

1/30/2016

Elliott Bay (Seattle, Duwamish DELTA)

W09_02



Indicator Group	Current Condition	Literature?	Low Value	High Value	Current Score	Group Scores	Rescaled Score
Ecological Quality Indicators							
Bluff backed beach (%) (2009)	0.00		0.63	75.37	-1.00	-0.99	-1.00
Saltmarsh (weighted %) (2001)	0.76		0.00	49.17	-0.97		
Eelgrass (weighted %) (2001)	0.55		0.00	63.83	-0.98		
Kelp (weighted %) (2001)	1.60		0.00	62.68	-0.95		
Aquatic vegetation (ac/mi) (2006)	2.36		6.04	152.08	-1.00		
Sand lance spawning (%) (2008)	0.00		0.00	17.52	-1.00		
Smelt spawning (%) (2008)	0.00		0.00	34.31	-1.00		
Herring spawning (%) (2009)	0.00		0.00	46.73	-1.00		
Protected open space (%) (2011)	0.00		0.00	31.93	-1.00		
Shoreline Stressors							
Loss of shoreline length (%) (2008)	-129.49		-6.45	35.72	1.00	-0.20	-0.79
Loss of bluff-backed beaches (%) (2008)	100.00		-0.77	43.97	-1.00		
Artificial shorelines (%) (2008)	100.00		0.00	43.63	-1.00		
Armoring of shoreline (%) (2008)	100.57		0.62	79.18	-1.00		
Breakwater/jetties (%) (2006)	0.00		0.00	6.20	1.00		
Nearshore fill (ac/mi shore) (1980)	62.34		0.00	14.43	-1.00		
Overwater structures (ac/mi shore) (2006)	10.97		0.01	1.84	-1.00		
Railroads w/i 25-m of shore (mi/mi shore) (2005)	0.03		0.00	0.10	0.35		
Roads w/i 25-m of shore (mi/mi shore) (2007)	0.12		0.00	0.23	-0.07		
Tidal barriers (mi/mi shore) (2008)	0.64		0.00	0.52	-1.00		
Parcels (#/mi) (2007)	1.12		3.28	44.88	1.00		
Industrial facilities (#/mi shore) (2012)	6.13		0.00	1.74	-1.00		
NPDES/PCS facilities (#/mi shore) (2011)	0.66		0.00	0.22	-1.00		
Timber harvest areas (ac/mi shore) (2012)	0.00		0.00	2.09	1.00		
Agriculture (%) (2006)	0.00		0.00	19.91	1.00		
Population (#/sq mi) (2010)	492.21		15.27	1278.81	0.25		
Impervious cover (%) (2006)	83.72		0.74	30.32	-1.00		

Current Score of Ecological Quality Indicators: Red Score of -1.00 indicates the ecological quality of resource in watershed has been degraded compared to other areas in PS.

Current Score of Stressors: Red Score of -1.00 indicates the specific watershed has been degraded by the particular stressor

2017 NWP CEA for NWP 13

- To identify future trends
 - ▶ Examine existing ORM data to project future trends
 - ▶ Research online resources
 - ▶ Research published references
 - ▶ LIMITATIONS: Corps does not have the time or resources to do extensive research of online resources and published references; we require input from resources agencies and Tribes to help us identify these resources for incorporation into assessments.

2017 NWP CEA for NWP 13

- Cumulative effect analysis, discussion, and conclusions
 - ▶ To minimize individual and cumulative impacts, the Corps will retain Regional General Conditions 3 and 4 to all 2012 NWPs and may add additional Regional Conditions
 - Corps requests input from resource agencies and Tribes on need for specific regional conditions to minimize individual and cumulative impacts

Regional Data Review Tools

- IWR Viewer
 - ▶ Institute for Water Resources
 - ▶ Developed by the Corps with EPA funding
 - ▶ Internal use by USACE currently
 - ▶ Most GIS layers publicly available
- ORM data mapped in Google Earth
 - ▶ High resolution
 - ▶ Can apply filters to answer specific questions
 - ▶ Subject to data entry.

IWR Viewer

- Tool allows quick display of environmental data relevant to a cumulative impact review.
- New layers can be added with additional funding and need.
- Meta Data information in a single location

Available Layers

- Watershed Boundaries
 - ▶ HUC 8, WRIA, Puget Sound Action Areas
- Infrastructure
 - ▶ Dams, Levees, Shoreline Components
- USACE Regulatory Permits
 - ▶ NWP, RGP, LOP, Standard Permits
 - ▶ Most Recent Update in 2014

IWR Viewer Example 1

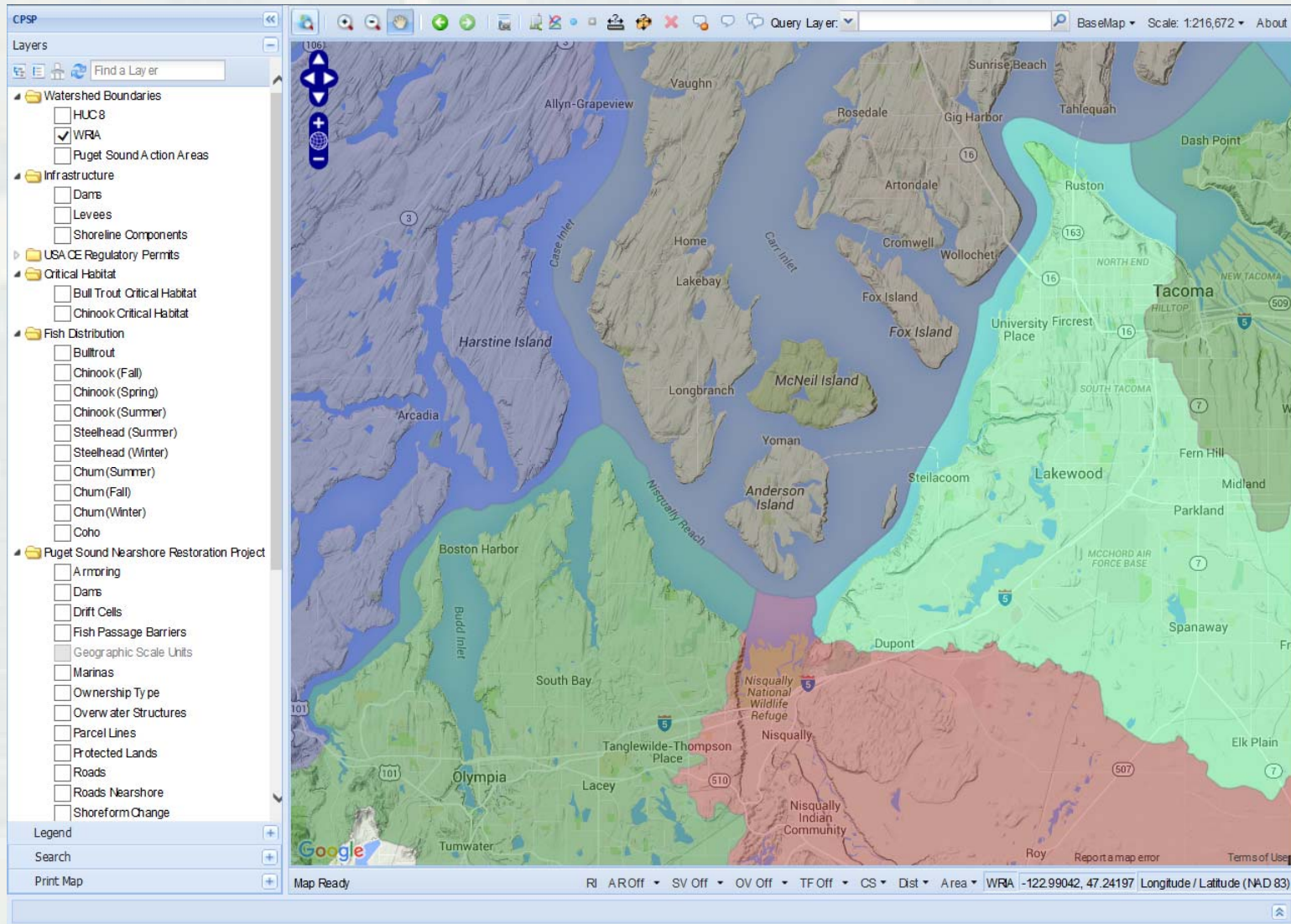
The screenshot displays the IWR Viewer application interface. The main window shows a map of the Puget Sound region, including areas like Tacoma, Lakewood, and Olympia. The map is overlaid with various data layers, such as Watershed Boundaries, Infrastructure, and Fish Distribution. The interface includes a Layers panel on the left, a search bar, and a status bar at the bottom. The status bar shows the current location as WRA -123.02269, 47.26014 Longitude / Latitude (NAD 83).

Layers Panel:

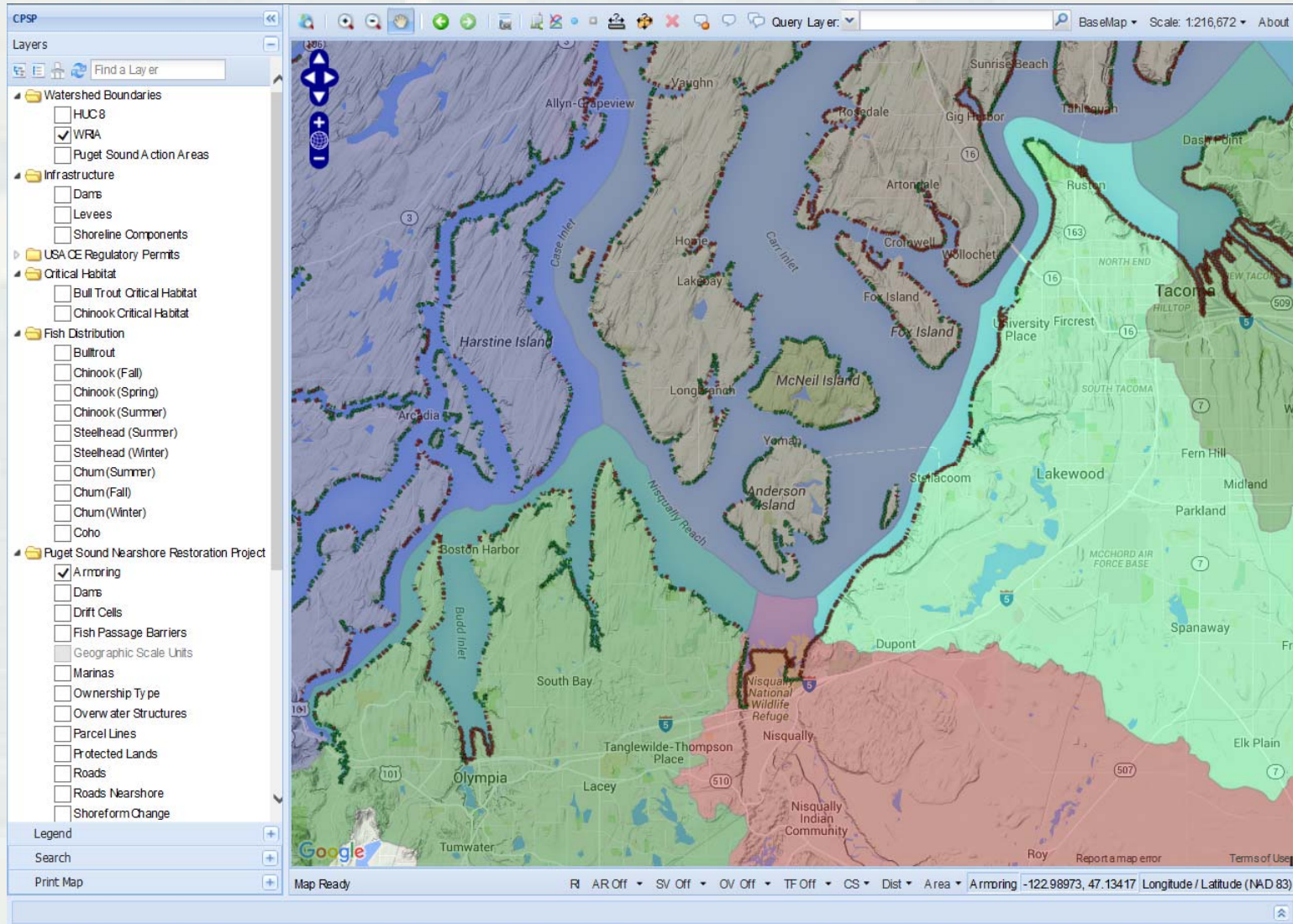
- Watershed Boundaries
 - HUC 8
 - WRA
 - Puget Sound Action Areas
- Infrastructure
 - Dams
 - Levees
 - Shoreline Components
- USA CE Regulatory Permits
- Critical Habitat
 - Bull Trout Critical Habitat
 - Chinook Critical Habitat
- Fish Distribution
 - Bulltrout
 - Chinook (Fall)
 - Chinook (Spring)
 - Chinook (Summer)
 - Steelhead (Summer)
 - Steelhead (Winter)
 - Chum (Summer)
 - Chum (Fall)
 - Chum (Winter)
 - Coho
- Puget Sound Nearshore Restoration Project
 - Armoring
 - Dams
 - Drift Cells
 - Fish Passage Barriers
 - Geographic Scale Units
 - Marinas
 - Ownership Type
 - Overwater Structures
 - Parcel Lines
 - Protected Lands
 - Roads
 - Roads Nearshore
 - Shoreform Change

Status Bar: RI AROff SV Off OV Off TF Off CS Dist Area WRA -123.02269, 47.26014 Longitude / Latitude (NAD 83)

IWR Viewer Example 1



IWR Viewer Example 1



IWR Viewer Example 1

The screenshot displays the IWR Viewer software interface. The main window shows a map of the Nisqually River watershed, with various colored overlays representing different data layers. The map includes labels for roads (e.g., 56th Ave NE, 41st Ave NE, 31st Ave NE), parks (Toimie State Park), and reserves (Nisqually Reach Aquatic Reserve, Nisqually National Wildlife Refuge). The interface includes a 'Layers' panel on the left with a tree view of data layers, a 'Legend' panel at the bottom left, and a 'Search' panel. The status bar at the bottom shows the current layer is 'Armoring' and provides coordinates: -122.75181, 47.12308 Longitude / Latitude (NAD 83).

Layers Panel:

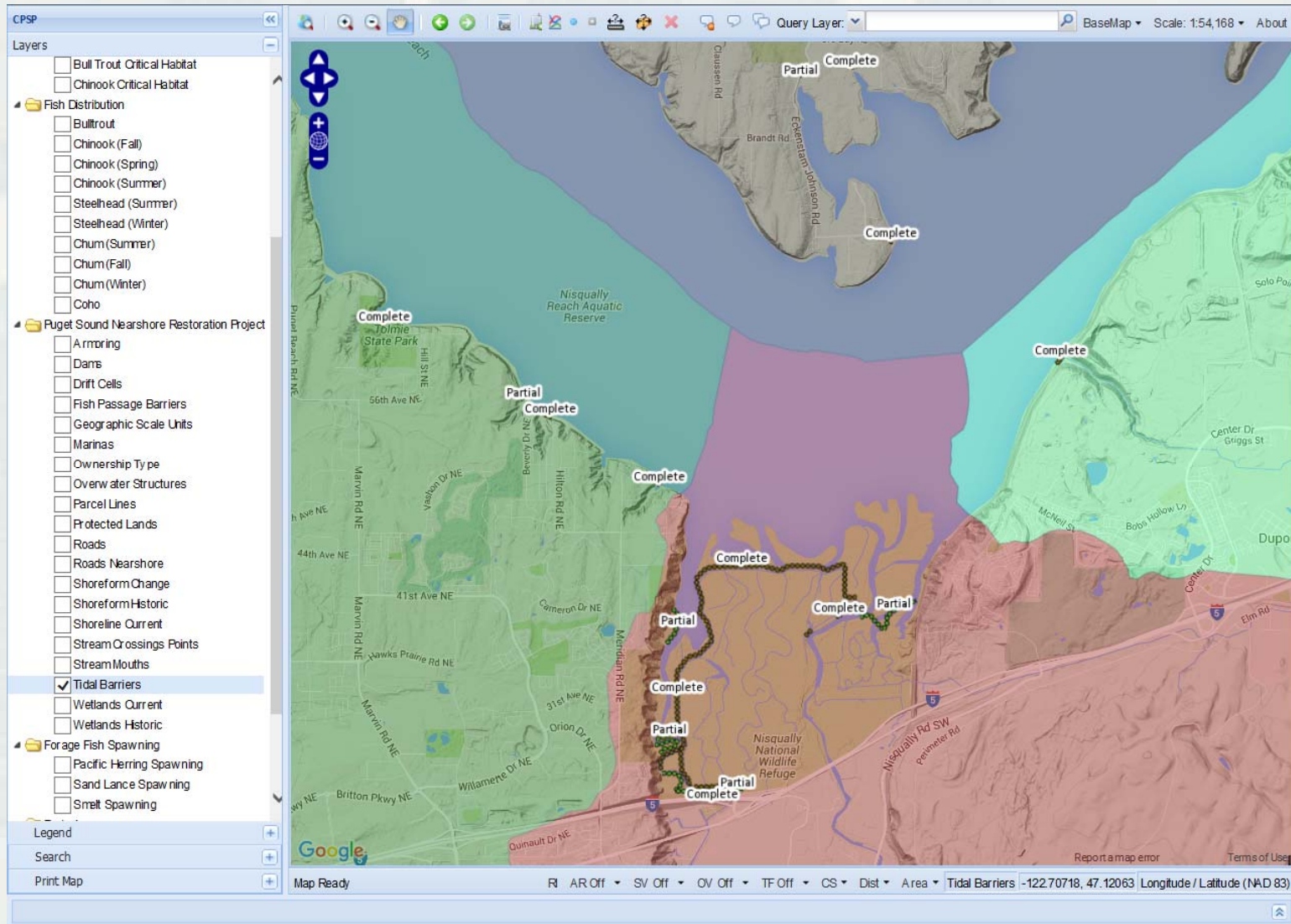
- Bull Trout Critical Habitat
- Chinook Critical Habitat
- Fish Distribution
 - Bulltrout
 - Chinook (Fall)
 - Chinook (Spring)
 - Chinook (Summer)
 - Steelhead (Summer)
 - Steelhead (Winter)
 - Chum (Summer)
 - Chum (Fall)
 - Chum (Winter)
 - Coho
- Puget Sound Nearshore Restoration Project
 - Armoring
 - Dams
 - Drift Cells
 - Fish Passage Barriers
 - Geographic Scale Units
 - Marinas
 - Ownership Type
 - Overwater Structures
 - Parcel Lines
 - Protected Lands
 - Roads
 - Roads Nearshore
 - Shoreform Change
 - Shoreform Historic
 - Shoreline Current
 - Stream Crossings Points
 - Stream Mouths
 - Tidal Barriers
 - Wetlands Current
 - Wetlands Historic
- Forage Fish Spawning
 - Pacific Herring Spawning
 - Sand Lance Spawning
 - Smelt Spawning

Legend Panel:

- Legend
- Search
- Print Map

Status Bar: Map Ready | RI AR Off | SV Off | OV Off | TF Off | CS | Dist | Area | Armoring -122.75181, 47.12308 Longitude / Latitude (NAD 83)

IWR Viewer Example 1



IWR Viewer Example 2

The screenshot displays the IWR Viewer software interface. The main window shows a 3D topographic map of the Puget Sound region in Washington state, including areas like Seabeck, Crosby, Belfair, and Port Orchard. The interface includes a 'Layers' panel on the left with the following items:

- Chinook (Summer)
- Steelhead (Summer)
- Steelhead (Winter)
- Chum (Summer)
- Chum (Fall)
- Chum (Winter)
- Coho
- Puget Sound Nearshore Restoration Project
 - Armoring
 - Dams
 - Drift Cells
 - Fish Passage Barriers
 - Geographic Scale Units
 - Marinas
 - Ownership Type
 - Overwater Structures
 - Parcel Lines
 - Protected Lands
 - Roads
 - Roads Nearshore
 - Shoreform Change
 - Shoreform Historic
 - Shoreline Current
 - Stream Crossings Points
 - Stream Mouths
 - Tidal Barriers
 - Wetlands Current
 - Wetlands Historic
- Forage Fish Spawning
 - Pacific Herring Spawning
 - Sand Lance Spawning
 - Smelt Spawning
- Projects
 - Projects (pre-1995)
 - Projects (post-1995)
- Other
 - Eelgrass
 - Kelp

At the bottom of the interface, there is a 'Legend' section, a 'Search' field, and a 'Print Map' button. The status bar at the very bottom shows 'Map Ready', various tool icons, and coordinates: '-123.12637, 47.56928 Longitude / Latitude (NAD 83)'. The map itself shows various geographical features, roads (e.g., 101, 106, 302), and water bodies.

IWR Viewer Example 2

The screenshot displays the IWR Viewer software interface. The main window shows a 3D topographic map of the Puget Sound region in Washington state, including areas like Port Orchard Bay, Brownsville, and various smaller towns. The map is overlaid with several data layers, including roads, water bodies, and specific project areas. On the left side, there is a 'Layers' panel with a tree view. The 'Puget Sound Nearshore Restoration Project' is expanded, showing sub-layers like 'Armoring', 'Dams', 'Drift Cells', etc. The 'Wetlands Historic' layer is checked. Below the layers panel is a 'Legend' section. At the bottom of the window, there is a status bar showing the current map type as 'Wetlands Historic' and the coordinates as '-122.95128, 47.52154 Longitude / Latitude (NAD 83)'. The Google logo is visible in the bottom left corner of the map area.

Layers

- Chinook (Summer)
- Steelhead (Summer)
- Steelhead (Winter)
- Chum (Summer)
- Chum (Fall)
- Chum (Winter)
- Coho
- Puget Sound Nearshore Restoration Project**
 - Armoring
 - Dams
 - Drift Cells
 - Fish Passage Barriers
 - Geographic Scale Units
 - Marinas
 - Ownership Type
 - Overwater Structures
 - Parcel Lines
 - Protected Lands
 - Roads
 - Roads Nearshore
 - Shoreform Change
 - Shoreform Historic
 - Shoreline Current
 - Stream Crossings Points
 - Stream Mouths
 - Tidal Barriers
 - Wetlands Current
 - Wetlands Historic**
- Forage Fish Spawning**
 - Pacific Herring Spawning
 - Sand Lance Spawning
 - Smelt Spawning
- Projects**
 - Projects (pre-1995)
 - Projects (post-1995)
- Other**
 - Eelgrass
 - Kelp

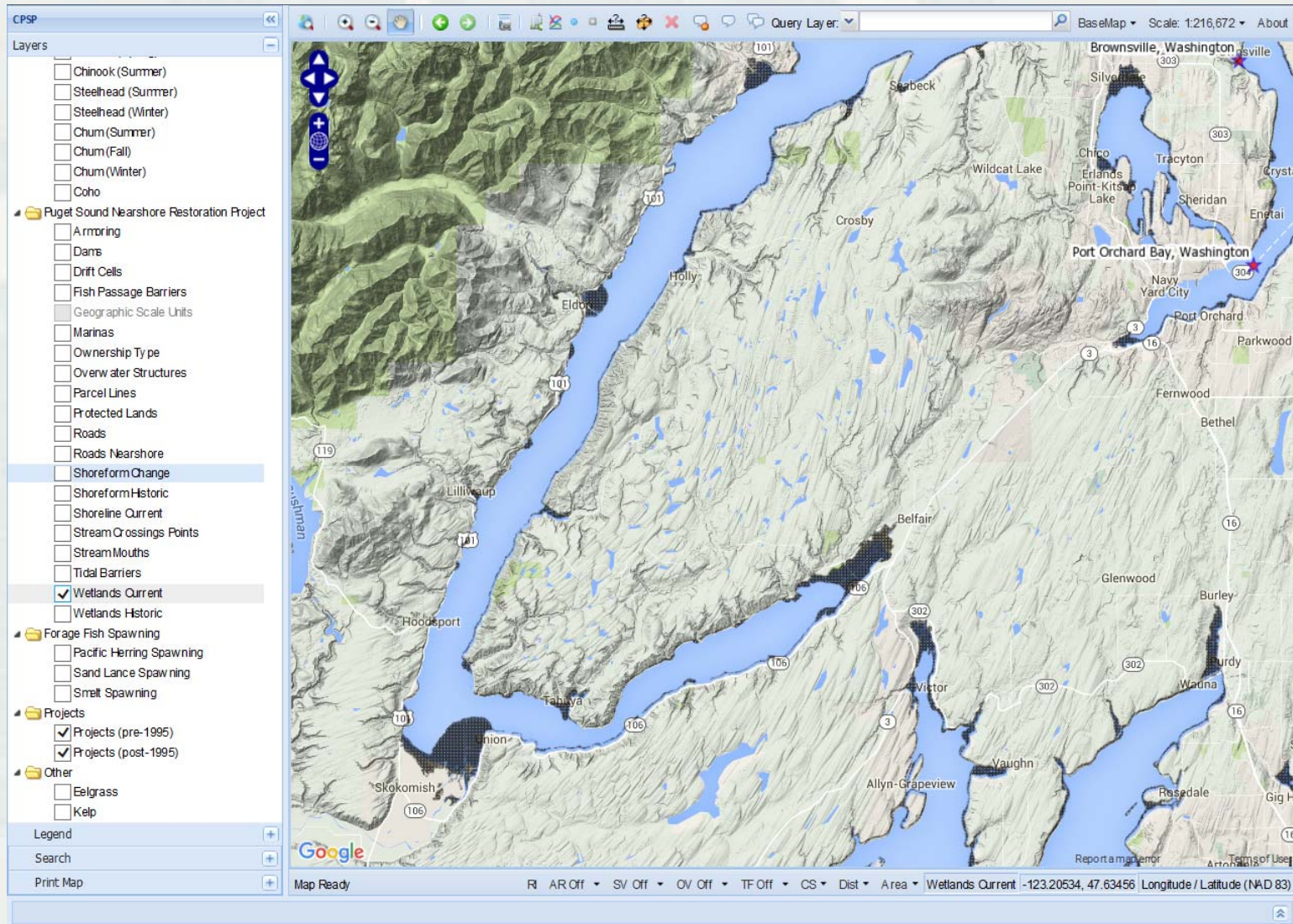
Legend

Search

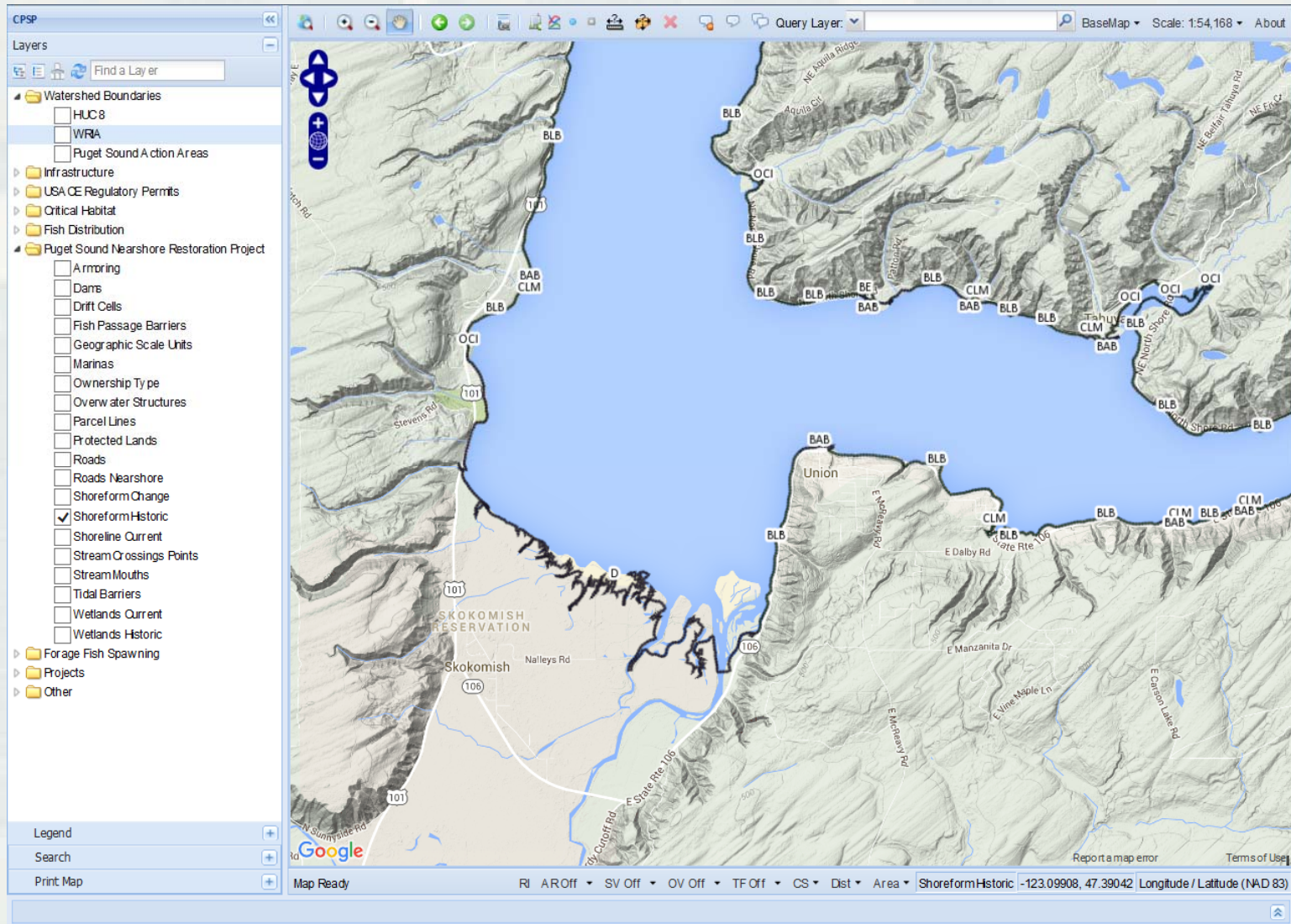
Print Map

Map Ready RI AR Off SV Off OV Off TF Off CS Dist Area **Wetlands Historic** -122.95128, 47.52154 Longitude / Latitude (NAD 83)

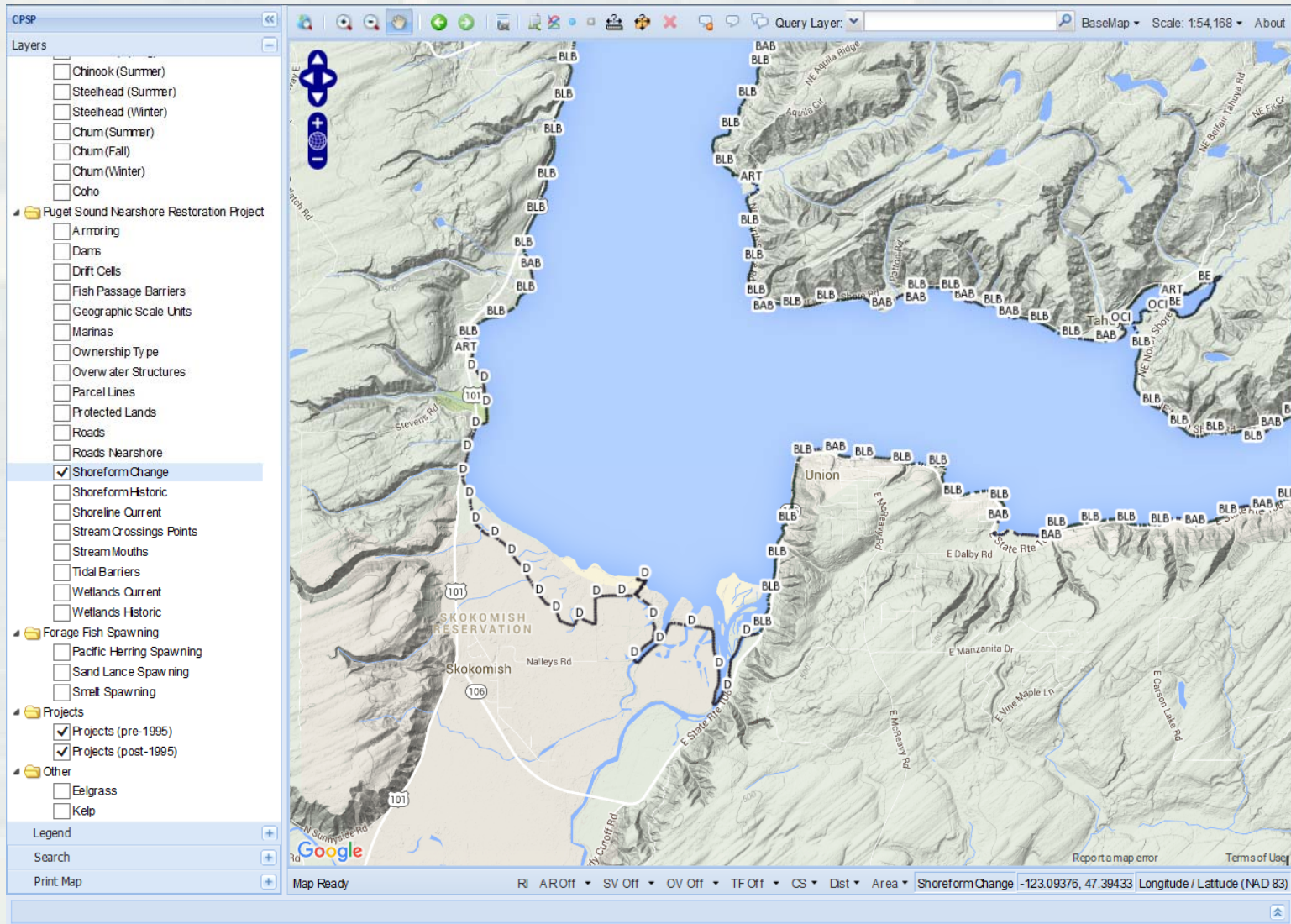
IWR Viewer Example 2



IWR Viewer Example 2



IWR Viewer Example 2



IWR Viewer Example 2

Shoreform Change_PSNERP_3.0

Metadata also available as

Frequently-anticipated questions:

- [What does this data set describe?](#)
 1. [How should this data set be cited?](#)
 2. [What geographic area does the data set cover?](#)
 3. [What does it look like?](#)
 4. [Does the data set describe conditions during a particular time period?](#)
 5. [What is the general form of this data set?](#)
 6. [How does the data set represent geographic features?](#)
 7. [How does the data set describe geographic features?](#)
- [Who produced the data set?](#)
 1. [Who are the originators of the data set?](#)
 2. [Who also contributed to the data set?](#)
 3. [To whom should users address questions about the data?](#)
- [Why was the data set created?](#)
- [How was the data set created?](#)
 1. [From what previous works were the data drawn?](#)
 2. [How were the data generated, processed, and modified?](#)
 3. [What similar or related data should the user be aware of?](#)
- [How reliable are the data: what problems remain in the data set?](#)
 1. [How well have the observations been checked?](#)
 2. [How accurate are the geographic locations?](#)
 3. [How accurate are the heights or depths?](#)
 4. [Where are the gaps in the data? What is missing?](#)
 5. [How consistent are the relationships among the data, including topology?](#)
- [How can someone get a copy of the data set?](#)
 1. [Are there legal restrictions on access or use of the data?](#)
 2. [Who distributes the data?](#)
 3. [What's the catalog number I need to order this data set?](#)
 4. [What legal disclaimers am I supposed to read?](#)
 5. [How can I download or order the data?](#)
- [Who wrote the metadata?](#)

IWR Viewer Example 2

- Metadata
 - ▶ Historic and current shoreforms in Puget Sound were independently delineated using Geographic Information System (GIS) techniques and image interpretation. These two data sets were then combined to provide a comparison of historic to current conditions.

Value	Definition
PL	Plunging Rocky Shoreline
RP	Rocky Ramp/Platform
PB	Pocket Beach
BLB	Bluff-backed Beach
BAB	Barrier Beach
BE	Barrier Estuary
BL	Barrier Lagoon
CLM	Closed Lagoon or Marsh
OCI	Open Coastal Inlet
D	Delta
ART	Artificial

IWR Viewer Example 2

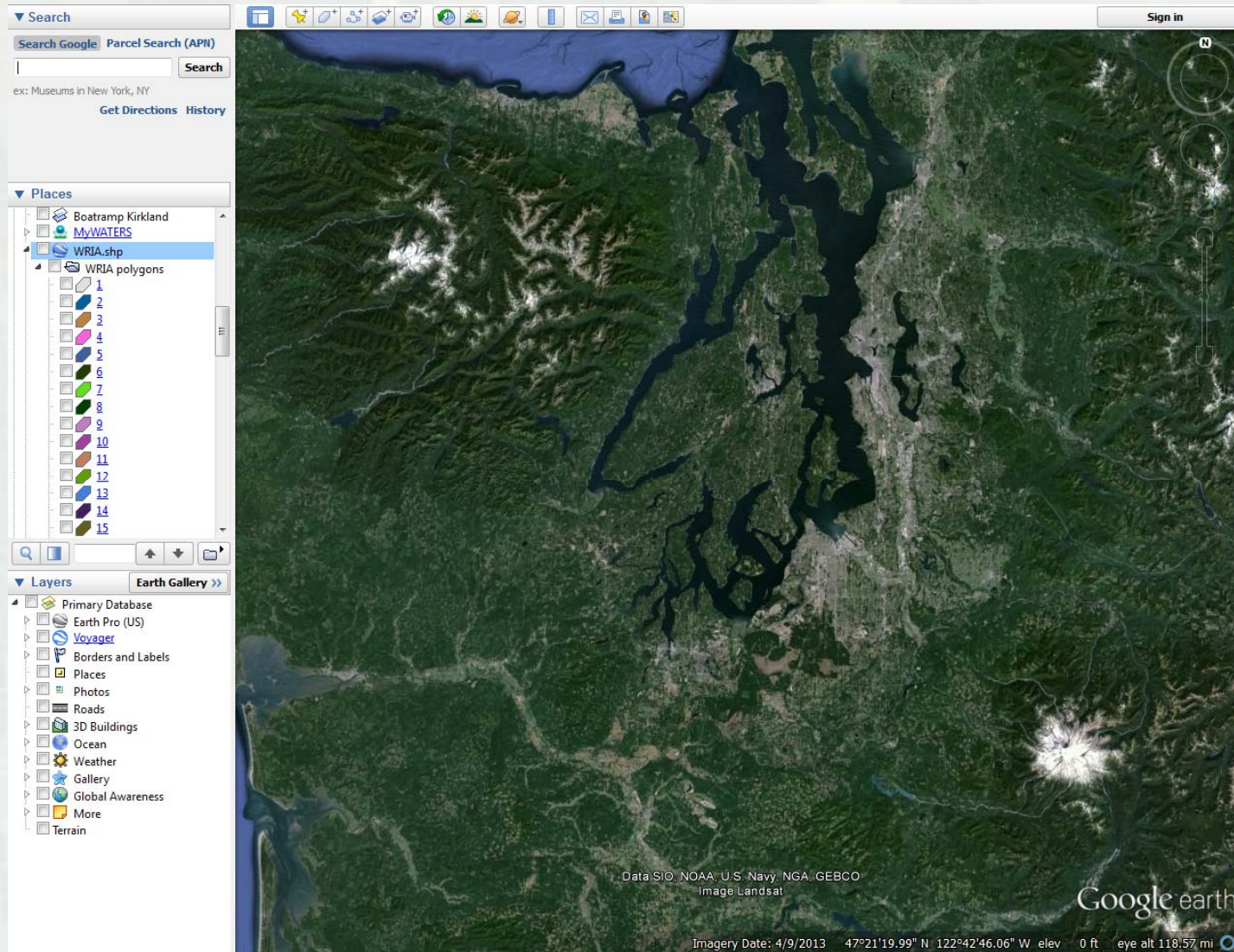
The screenshot shows the IWR Viewer interface. On the left is a 'Layers' panel with a tree view. The 'Shoreform Change' category is expanded and checked. Below it are 'Forage Fish Spawning' and 'Projects' categories. The 'Projects' category is also expanded, showing 'Projects (pre-1995)' and 'Projects (post-1995)' both checked. The 'Other' category is also expanded, showing 'Eelgrass' and 'Kelp' unchecked. The main map area displays a topographic map of the Skokomish Reservation with various coastal features labeled with codes. A legend table on the right defines these codes.

Value	Definition
PL	Plunging Rocky Shoreline
RP	Rocky Ramp/Platform
PB	Pocket Beach
BLB	Bluff-backed Beach
BAB	Barrier Beach
BE	Barrier Estuary
BL	Barrier Lagoon
CLM	Closed Lagoon or Marsh
OCI	Open Coastal Inlet
D	Delta
ART	Artificial

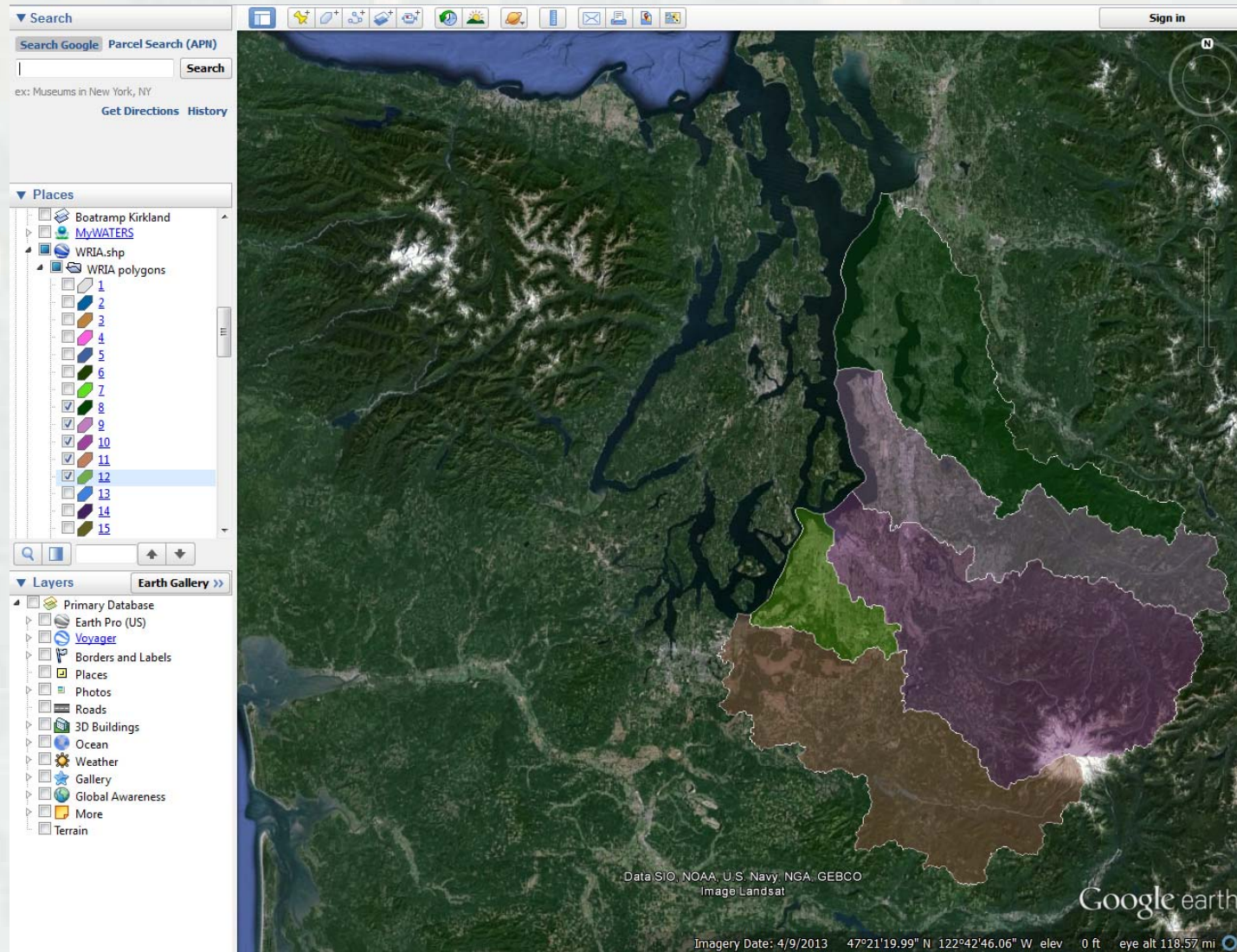
IWR Viewer: Other Layers

- Critical Habitat
 - ▶ Bull trout
 - ▶ Chinook
- Fish Distribution
 - ▶ Bull trout, Chinook (seasonal), Steelhead, Chum, Coho
- Forage Fish Spawning
 - ▶ Pacific herring, Sand lance, Smelt
- Eelgrass
- Kelp
- Puget Sound Nearshore Restoration Project
 - ▶ Armoring
 - ▶ Dams
 - ▶ Drift Cells
 - ▶ Fish Passage Barriers
 - ▶ Marinas
 - ▶ Overwater Structures
 - ▶ Protected Lands
 - ▶ Roads Nearshore
 - ▶ Stream Crossing Points

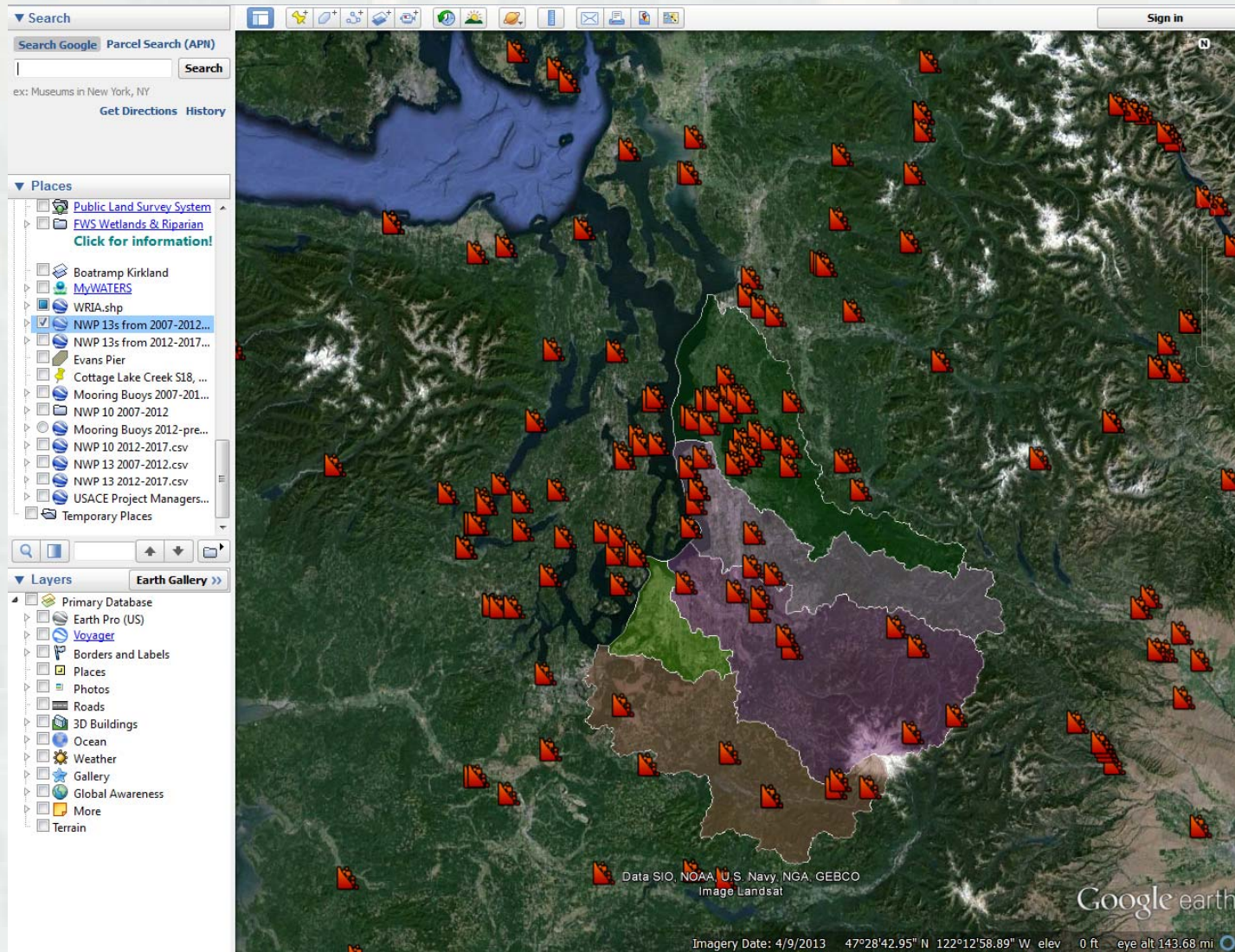
ORM Data in Google Earth



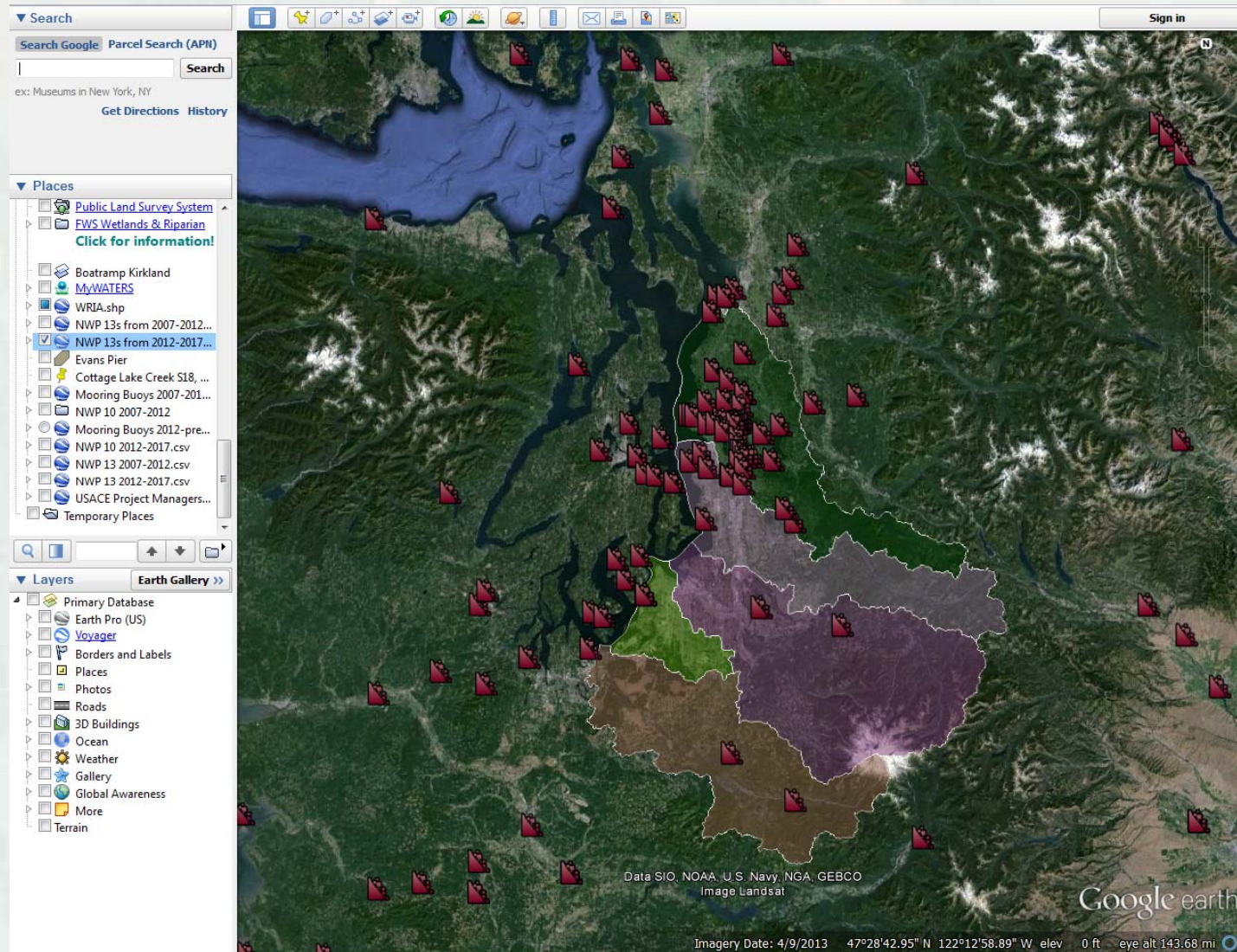
ORM Data in Google Earth



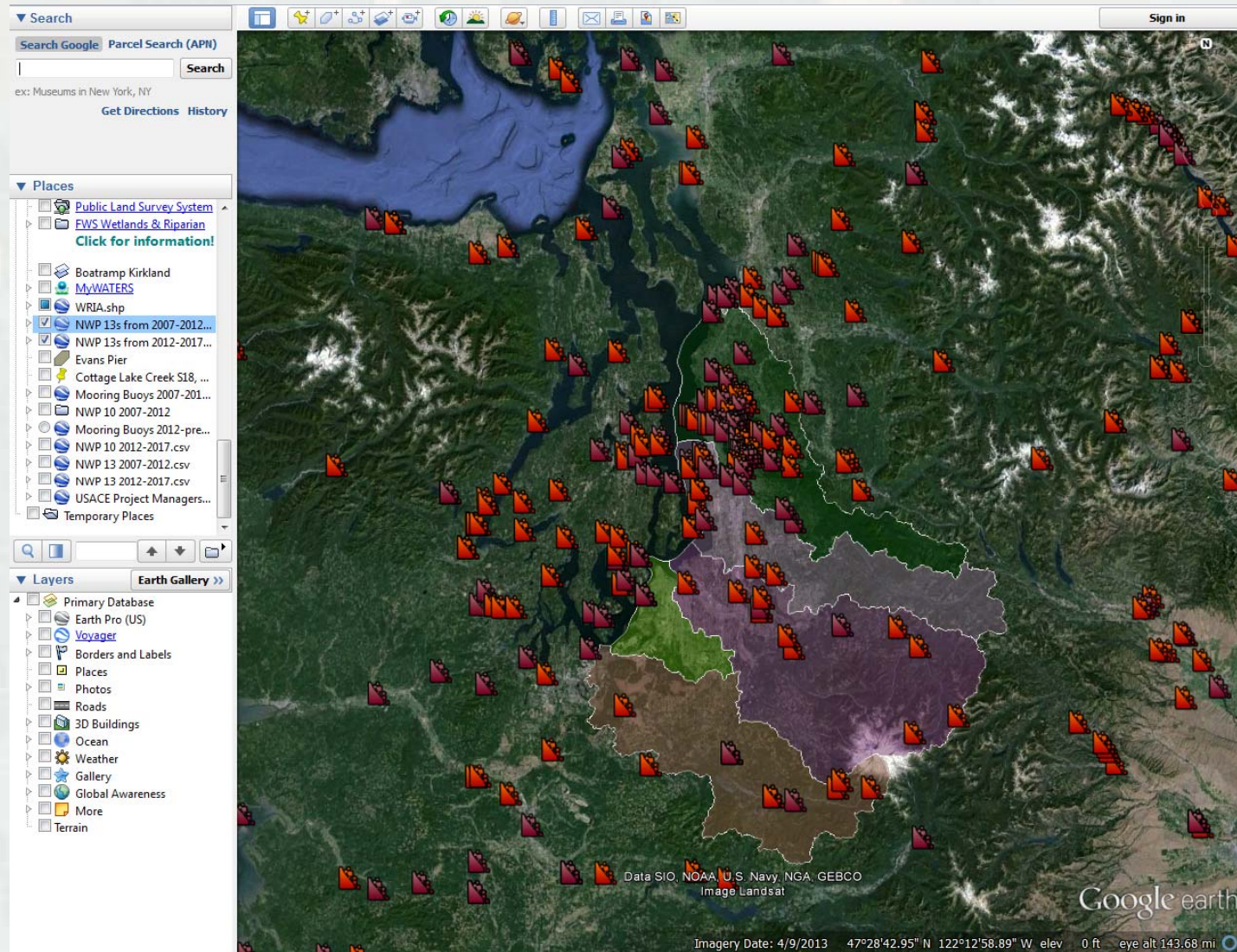
ORM Data in Google Earth



ORM Data in Google Earth



ORM Data in Google Earth



ORM Data in Google Earth

The screenshot displays the Google Earth interface with a map of a river system. Numerous orange tree icons are scattered across the map, representing ORM data points. A detailed information popup is open over one of these points, providing the following data:

Latitude	47.5653
Longitude	-122.348
DA Number	NWS-2006-00551
Description	-
Icon	272
Project Name	GENERAL RECYCLING OF WASHINGTON, LLC
Closure Method	Verified With Special Conditions
City	Seattle
County	King
GNIS Waterway	Duwamish Waterway
HUC8	17110013
HUC10	1711001303
HUC12	1.711e+11
Project Purpose	excavate a toe trench approximately 10 feet waterward from the top of the existing bank, filling the trench with rip rap rock and placing rip rap along the surface of the existing bank, removal of approximately 30 cubic yards of material
Folder Comments	ACTID: 200600551
Folder Description	excavate a toe trench approximately 1 feet waterward from the top of the existing bank, filling the trench with rip rap rock and placing rip rap along the surface of the existing bank and removal of approximately 30 cubic yards of material in the Duwamish Waterway
Finalized By	DIDENHOVER, VICKY
Date First Finalized	24-OCT-07 08:43:58.788082 PM +00:00
Source	RAMS

The interface includes a search bar at the top left, a 'Places' list on the left side, and a 'Layers' panel at the bottom left. The 'Layers' panel shows a 'Primary Database' layer selected. The bottom right corner of the map displays the Google Earth logo and coordinates: 47°34'10.71" N 122°19'56.03" W, with an elevation of 0 ft and an eye altitude of 30.44 mi.

ORM Data in Google Earth

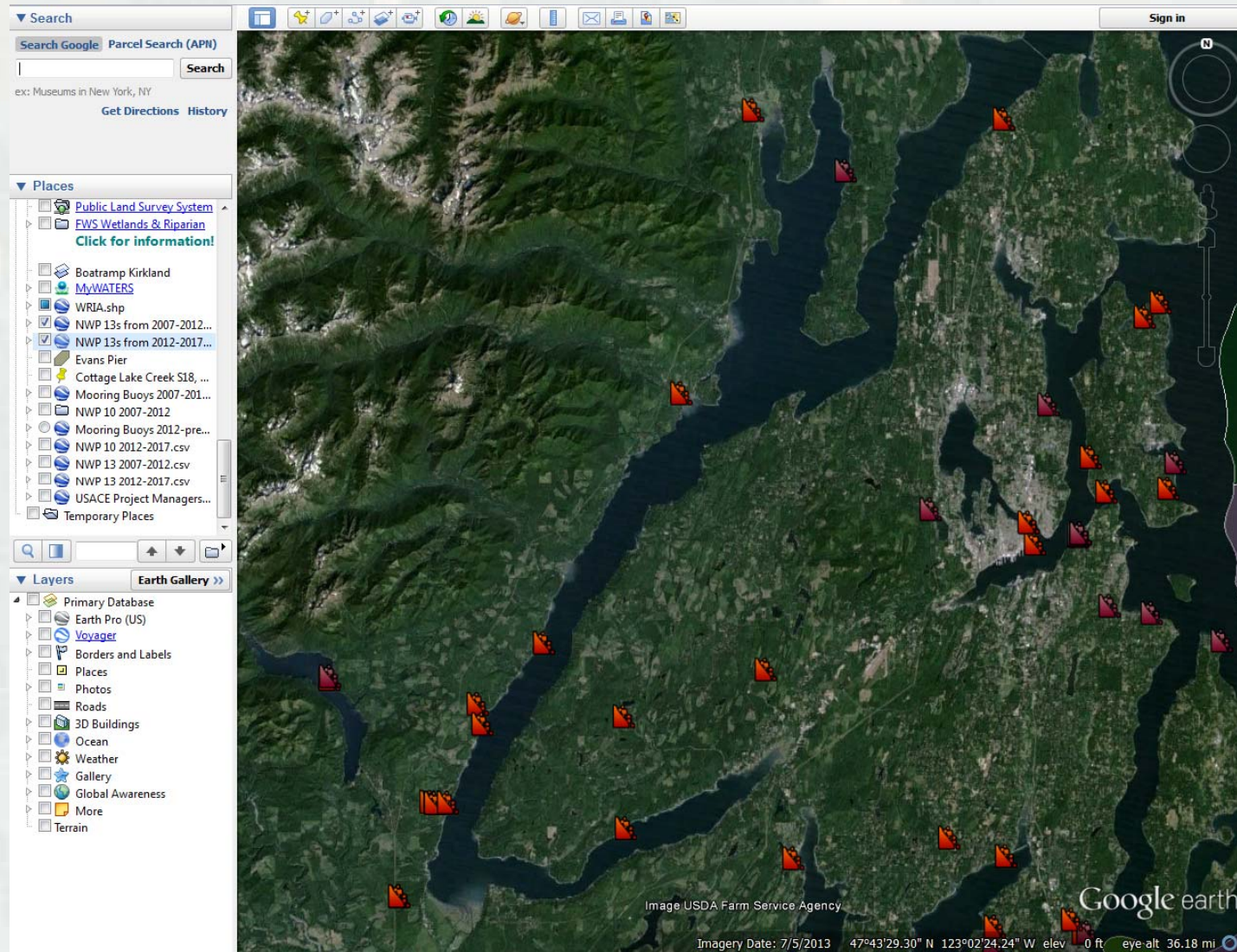
The screenshot displays the Google Earth interface with several key components:

- Search Panel:** Includes a search bar with "Search Google" and "Parcel Search (APN)" options, a search button, and a search history section with "ex: Museums in New York, NY" and "Get Directions History" links.
- Places Panel:** Lists various data layers, including "Public Land Survey System", "FWS Wetlands & Riparian", "Boatramp Kirkland", "MvWATERS", "WRJA.shp", "NWP 13s from 2007-2012...", "NWP 13s from 2012-2017...", "Evans Pier", "Cottage Lake Creek S18, ...", "Mooring Buoys 2007-201...", "NWP 10 2007-2012", "Mooring Buoys 2012-pre...", "NWP 10 2012-2017.csv", "NWP 13 2007-2012.csv", "NWP 13 2012-2017.csv", "USACE Project Managers...", and "Temporary Places".
- Layers Panel:** Shows standard Google Earth layers such as "Primary Database", "Earth Pro (US)", "Voyager", "Borders and Labels", "Places", "Photos", "Roads", "3D Buildings", "Ocean", "Weather", "Gallery", "Global Awareness", "More", and "Terrain".
- Map:** A satellite view of a region with a large purple-shaded area representing a city or urban area. Numerous red markers with small red triangles are scattered across the map, primarily in the green, non-urban areas.
- Bottom Panel:** Displays the "Google earth" logo and technical data: "Imagery Date: 6/8/2015", "47°29'54.19" N 122°19'35.99" W", "elev 0 ft", and "eye alt 28.55 mi".

ORM Data in Google Earth

- Total Projects for New Bank Stabilization authorized under NWP 13 2007-2012
 - ▶ 1
- Total Projects for New Bank Stabilization authorized under NWP 13 2012-Present:
 - ▶ 0

ORM Data in Google Earth



Collaboration

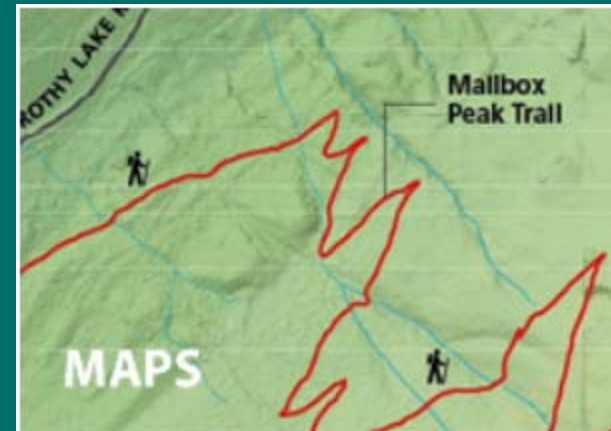
- Tribes
- State and Federal Resource Agencies
 - Environmental Protection Agency
 - National Marine Fisheries Service
 - U.S. Fish and Wildlife Service
 - Coast Guard
 - Department of Ecology
 - Department of Fish and Wildlife
 - Department of Natural Resources



WASHINGTON STATE DEPARTMENT OF
Natural Resources

Peter Goldmark - Commissioner of Public Lands

<http://www.dnr.wa.gov>



Select Find GIS Data

The screenshot shows the website header with the logo and name of the Washington State Department of Natural Resources, Commissioner Peter Goldmark. A search bar is present. The main navigation menu includes 'PROGRAMS AND SERVICES', 'ABOUT', 'MANAGED LANDS', and 'EMPLOYMENT'. Social media icons for Facebook, Twitter, YouTube, and RSS are also visible. The page content features the heading 'Available DNR GIS Data' and a sub-heading 'FIND WASHINGTON DEPARTMENT OF NATURAL RESOURCES (DNR) GEOGRAPHIC INFORMATION SYSTEMS (GIS) DATA'. Below this, there is a table of available GIS data categories.

Available GIS Data	
Aquatics	Habitat
Cadastral	Hydrography
Cadastral Jurisdiction Boundaries	Natural Heritage
Climatology	Soils
Forest Disturbance	Transportation
Forest Practices	Wildfire and Prevention
Geology	



Publically Available GIS Layers for Aquatic Lands

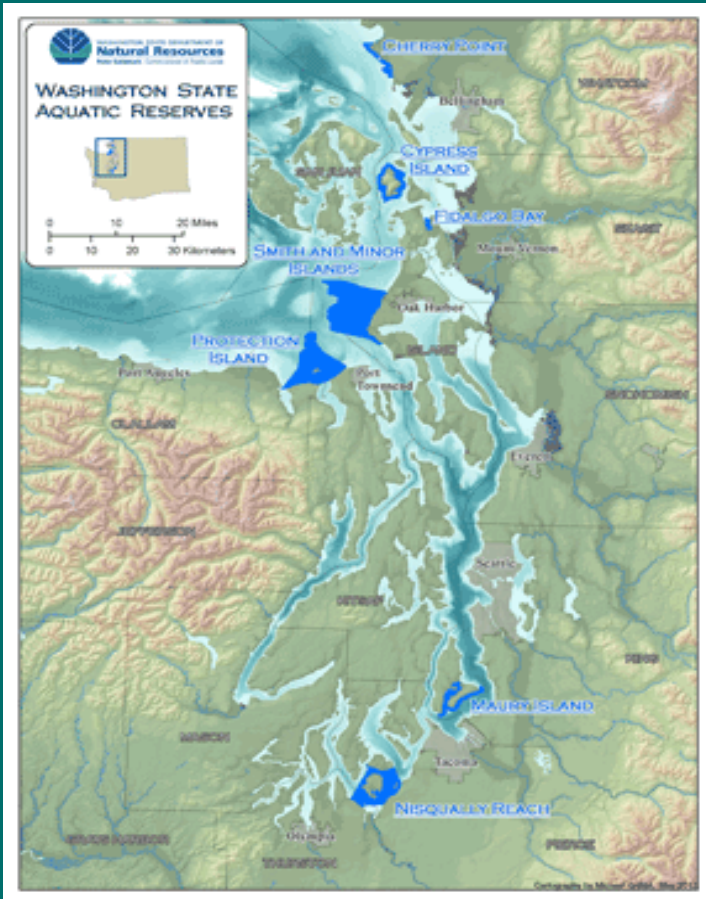
- Washington Marine Vegetation Atlas
<http://www.dnr.wa.gov/programs-and-services/aquatics/aquatic-science/washington-marine-vegetation-atlas>
- Marine Spatial Planning
<http://www.ecy.wa.gov/programs/sea/msp/>
- Aquatic GIS Layers (datasets)
 - Aquatic Land Ownership Boundaries (Statewide)
 - Aquatic Land Ownership Parcels (Statewide)
 - Aquatic Land Ownership Parcels (by County)
 - ShoreZone Inventory (nearshore habitat)
 - Skagit Co. Intertidal Habitat Inventory
 - Whatcom Co. Intertidal Habitat Inventory
 - USGS Lake/Reservoir Water Quality Samples of Washington
 - Kelp Monitoring Data
 - Over Water Structures (Lakes) on State Aquatic Lands
 - Over Water Structures (Rivers) on State Aquatic Lands
 - Over Water Structures (Marine) on State Aquatic Lands
 - Puget Sound Eelgrass Monitoring Dataset (SVMP) – Sites & Results
 - Puget Sound Eelgrass Monitoring Dataset (SVMP) – Central Puget Sound Transect Data
 - Puget Sound Eelgrass Monitoring Dataset (SVMP) – Hood Canal Transect Data
 - Puget Sound Eelgrass Monitoring Dataset (SVMP) – North Puget Sound Transect Data
 - Puget Sound Eelgrass Monitoring Dataset (SVMP) – San Juan Islands/Strait of Juan de Fuca Transect Data
 - Puget Sound Eelgrass Monitoring Dataset (SVMP) – Saratoga Passage/Whidbey Basin Transect Data

<http://www.dnr.wa.gov/GIS>



DNR Aquatics Programs

DNR Aquatic Reserves Program



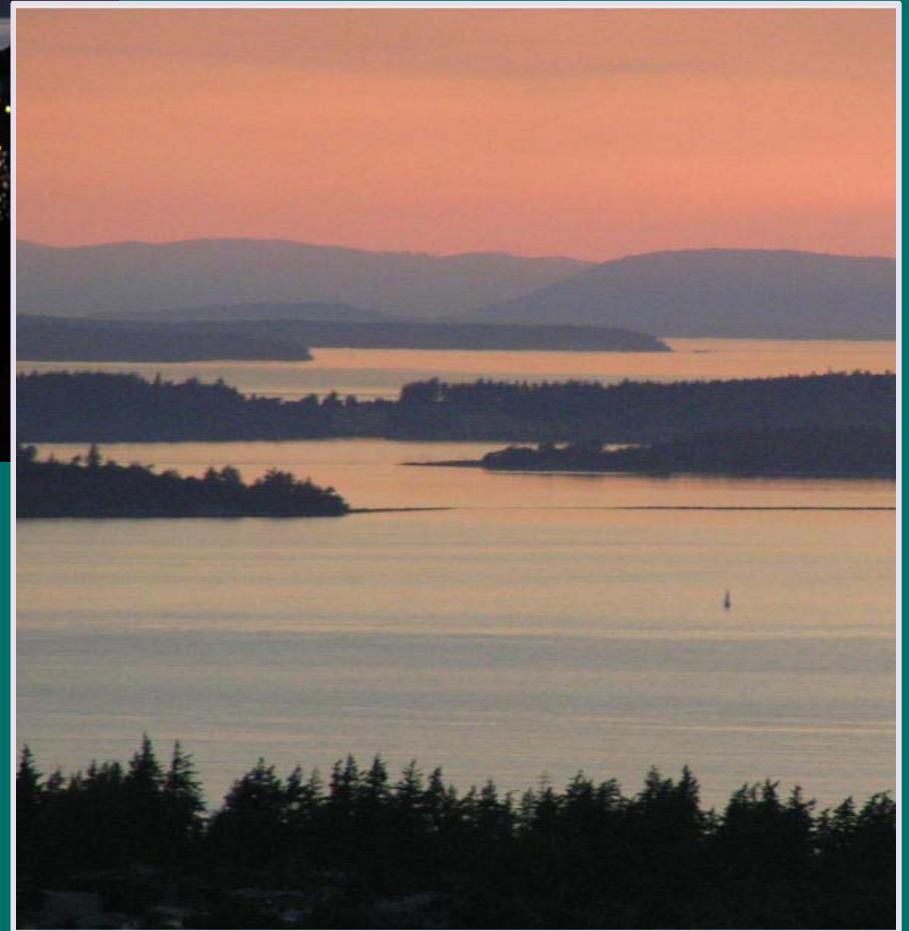
DNR Aquatic Restoration & Creosote Removal Program

Derelict Vessel Removal Program



Leasing State-owned Aquatic Lands

Habitat Stewardship Program



Cumulative Effects Analysis
Eastern Shore of Central Puget Sound
Washington



Final
February 7, 2014



US Army Corps
of Engineers®

Puget Sound Partnership

Hundreds of partners that plan, prioritize, and implement actions

State of the Sound “Annual Report”

- Summary of the current state of affairs that highlights priority work needed to advance recovery and protection efforts

2015 State of the Sound: Report on the Puget Sound Vital Signs



The National Coastal Condition Assessment (NCCA) is a national coastal monitoring program with rigorous quality assurance protocols and standardized sampling procedures designed to produce national and regional estimates of coastal condition.

The screenshot shows the EPA website for the National Coastal Condition Assessment. The browser address bar displays <http://www.epa.gov/national-aquatic-resource-surveys/ncca>. The page features the EPA logo and navigation tabs for 'Learn the Issues', 'Science & Technology', 'Laws & Regulations', and 'About EPA'. A search bar is located in the top right. The main content area is titled 'National Coastal Condition Assessment' and includes a breadcrumb trail: 'You are here: EPA Home » National Aquatic Resource Surveys » National Coastal Condition Assessment'. Below the title is a large image of a coastal scene with a lighthouse. A descriptive paragraph states: 'The National Coastal Condition Assessment (NCCA) is a national coastal monitoring program with rigorous quality assurance protocols and standardized sampling procedures designed to produce national and regional estimates of coastal condition.' Three featured sections are visible: 'What is the NCCA?' with a sunset image, 'NCCA Results' with an image of a person in a red life vest, and 'Explore the Data' with an image of red data containers. A list of links is provided at the bottom, including 'Background', 'Design', 'Indicators', 'Manuals', '2010 NCCA Results', 'National Coastal Condition Reports', and 'Download Data'.

EPA United States Environmental Protection Agency

Learn the Issues | Science & Technology | Laws & Regulations | About EPA

National Aquatic Resource Surveys National Coastal Condition Assessment

You are here: EPA Home » National Aquatic Resource Surveys » National Coastal Condition Assessment

National Coastal Condition Assessment

The National Coastal Condition Assessment (NCCA) is a national coastal monitoring program with rigorous quality assurance protocols and standardized sampling procedures designed to produce national and regional estimates of coastal condition.

- What is the NCCA?
- NCCA Results
- Explore the Data

- Background
- Design
- Indicators
- Manuals
- 2010 NCCA Results
- National Coastal Condition Reports
- Download Data

Need Qualitative and Quantitative Data to Support Regional Conditions

- Puget Sound Science Review
- Shoreline Master Program
- Watershed Plans
- Puget Sound Nearshore Ecosystem Restoration Project (Corps General Investigation)
- Encyclopedia of Puget Sound
- Threatened and Endangered Species Recovery Plans
- Land Use and Zoning (City or County)

Discussion



Till We Meet Again!

