Salish Sea Model Results Interactive Web Map

Overview + Tutorial

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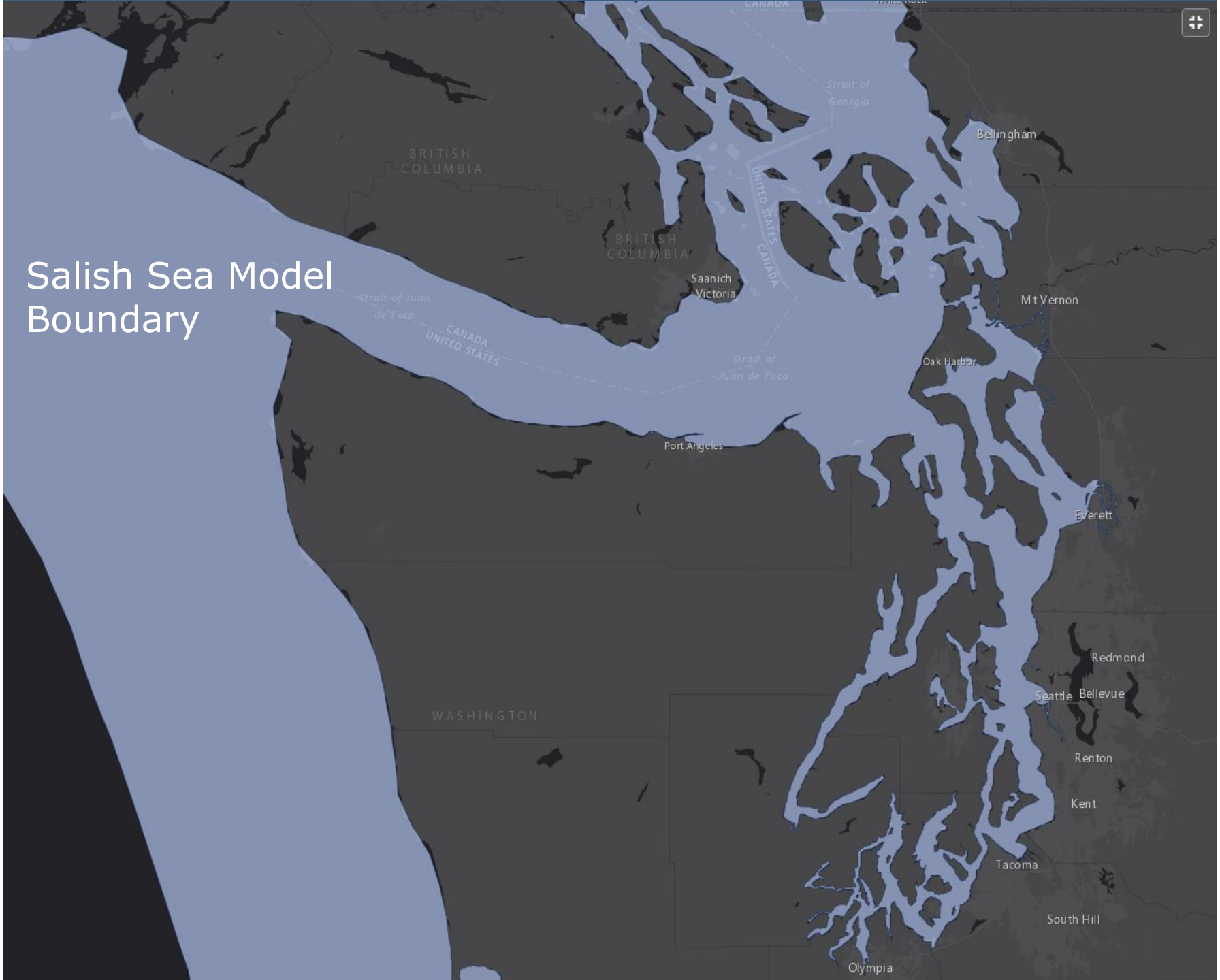
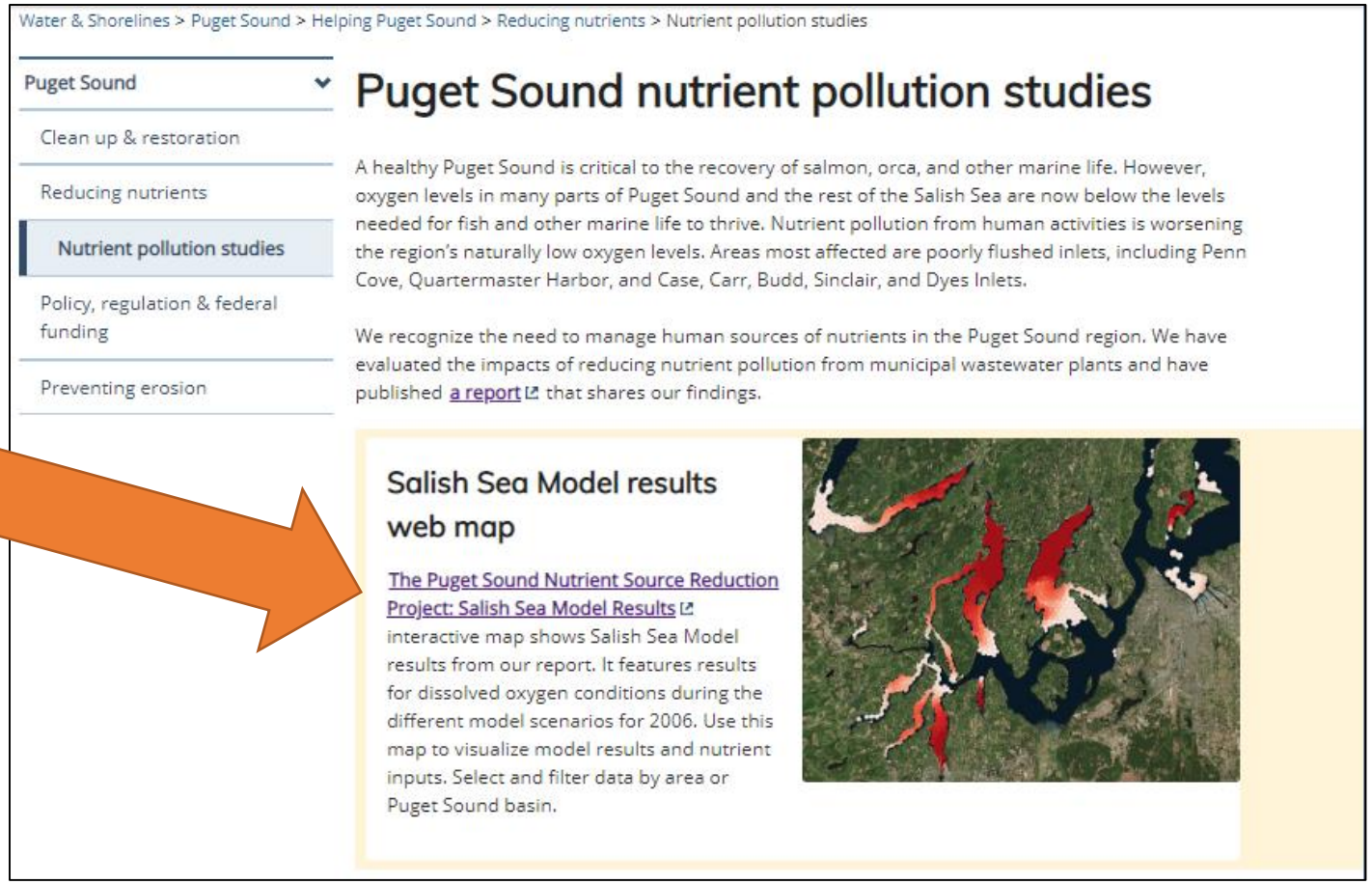
John Gala
Teizeen Mohamedali, P.E.

- **Communicate** model results from report
- Display information in **interactive** and **engaging** way
- Provide a tool to **access** and **download** model results

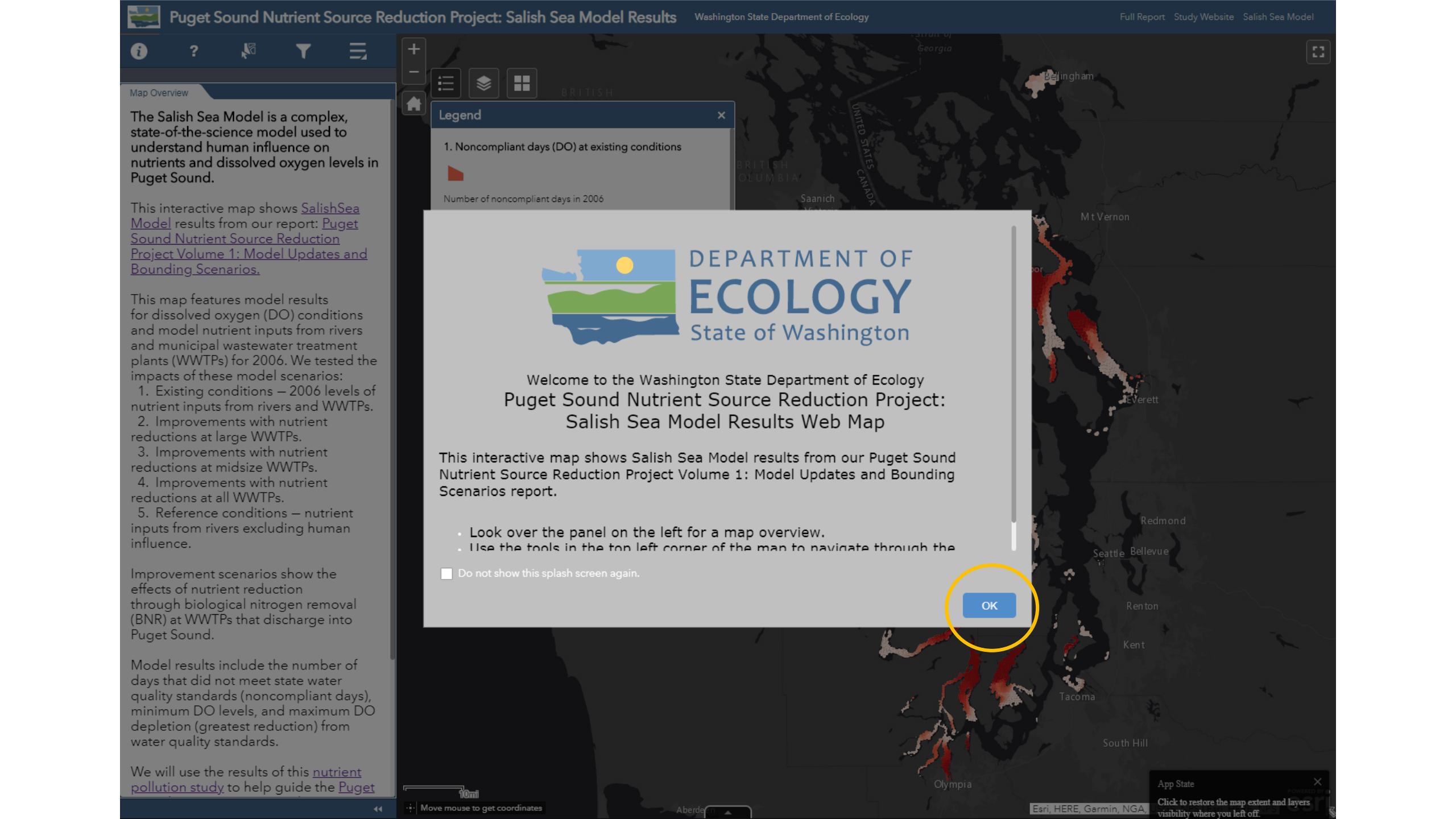

Salish Sea Model Boundary
BRITISH COLUMBIA
BRITISH COLUMBIA
Strait of Georgia
UNITED STATES
CANADA
Bellingham
Saanich
Victoria
Strait of Juan de Fuca
CANADA
UNITED STATES
Mt Vernon
Oak Harbor
Strait of Juan de Fuca
Port Angeles
Everett
Redmond
Seattle
Bellevue
WASHINGTON
Renton
Kent
Tacoma
South Hill
Olympia

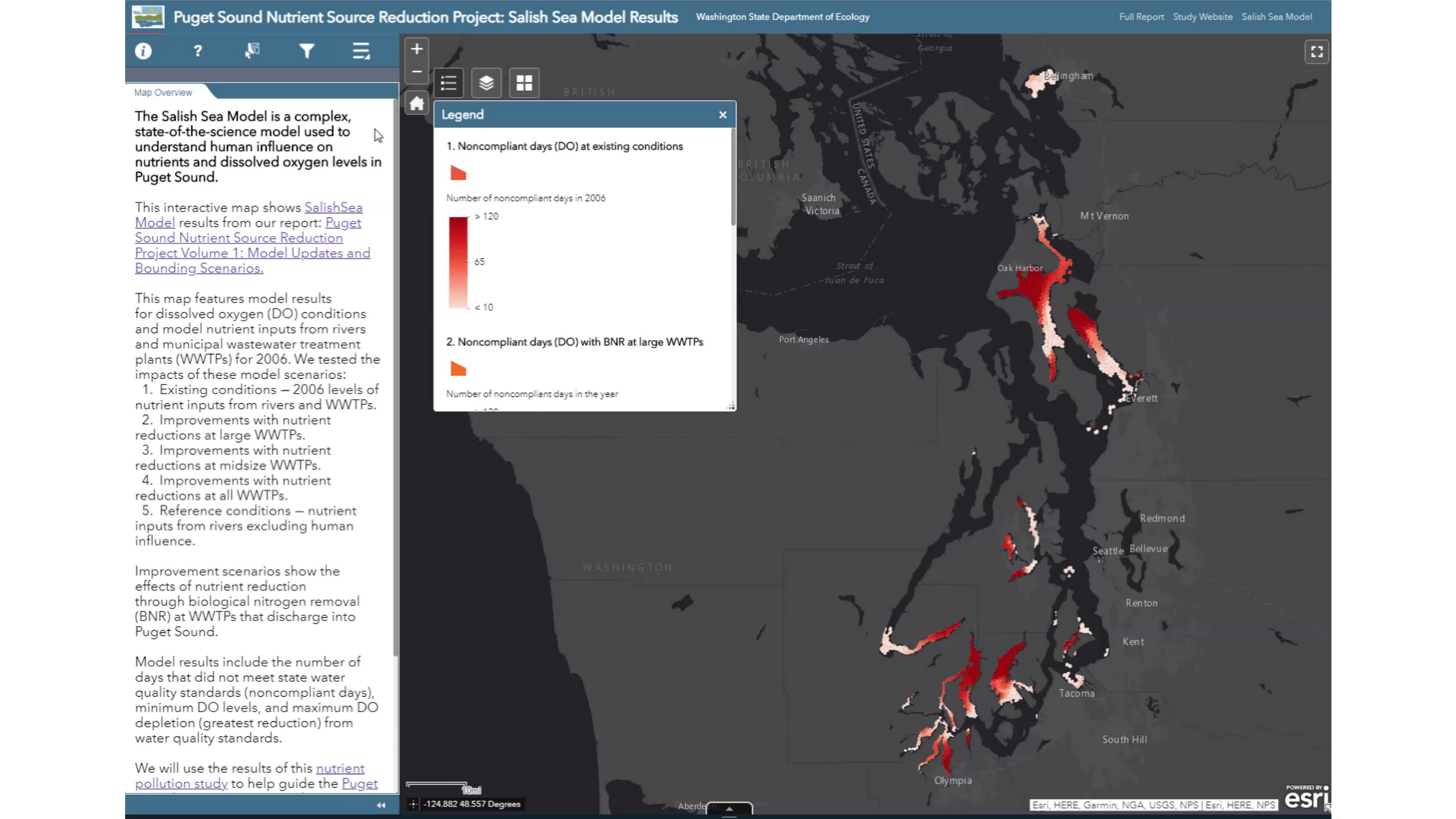
bit.ly/ssmresultsmap

ecology.wa.gov/nutrientstudies



Map overview and basic map functions


Puget Sound Nutrient Source Reduction Project: Salish Sea Model Results
Washington State Department of Ecology
Full Report
Study Website
Salish Sea Model
Map Overview
The Salish Sea Model is a complex, state-of-the-science model used to understand human influence on nutrients and dissolved oxygen levels in Puget Sound.
This interactive map shows SalishSea Model results from our report: Puget Sound Nutrient Source Reduction Project Volume 1: Model Updates and Bounding Scenarios.
This map features model results for dissolved oxygen (DO) conditions and model nutrient inputs from rivers and municipal wastewater treatment plants (WWTPs) for 2006. We tested the impacts of these model scenarios:
1. Existing conditions – 2006 levels of nutrient inputs from rivers and WWTPs.
2. Improvements with nutrient reductions at large WWTPs.
3. Improvements with nutrient reductions at midsize WWTPs.
4. Improvements with nutrient reductions at all WWTPs.
5. Reference conditions – nutrient inputs from rivers excluding human influence.
Improvement scenarios show the effects of nutrient reduction through biological nitrogen removal (BNR) at WWTPs that discharge into Puget Sound.
Model results include the number of days that did not meet state water quality standards (noncompliant days), minimum DO levels, and maximum DO depletion (greatest reduction) from water quality standards.
We will use the results of this nutrient pollution study to help guide the Puget
Legend
1. Noncompliant days (DO) at existing conditions
Number of noncompliant days in 2006
DEPARTMENT OF ECOLOGY
State of Washington
Welcome to the Washington State Department of Ecology
Puget Sound Nutrient Source Reduction Project: Salish Sea Model Results Web Map
This interactive map shows Salish Sea Model results from our Puget Sound Nutrient Source Reduction Project Volume 1: Model Updates and Bounding Scenarios report.
Look over the panel on the left for a map overview.
Use the tools in the top left corner of the map to navigate through the
Do not show this splash screen again.
OK
Bellingham
Mt Vernon
Everett
Redmond
Seattle
Bellevue
Renton
Kent
Tacoma
South Hill
Olympia
Saanich
10mi
Move mouse to get coordinates
Esri, HERE, Garmin, NGA,
App State
Click to restore the map extent and layers visibility where you left off.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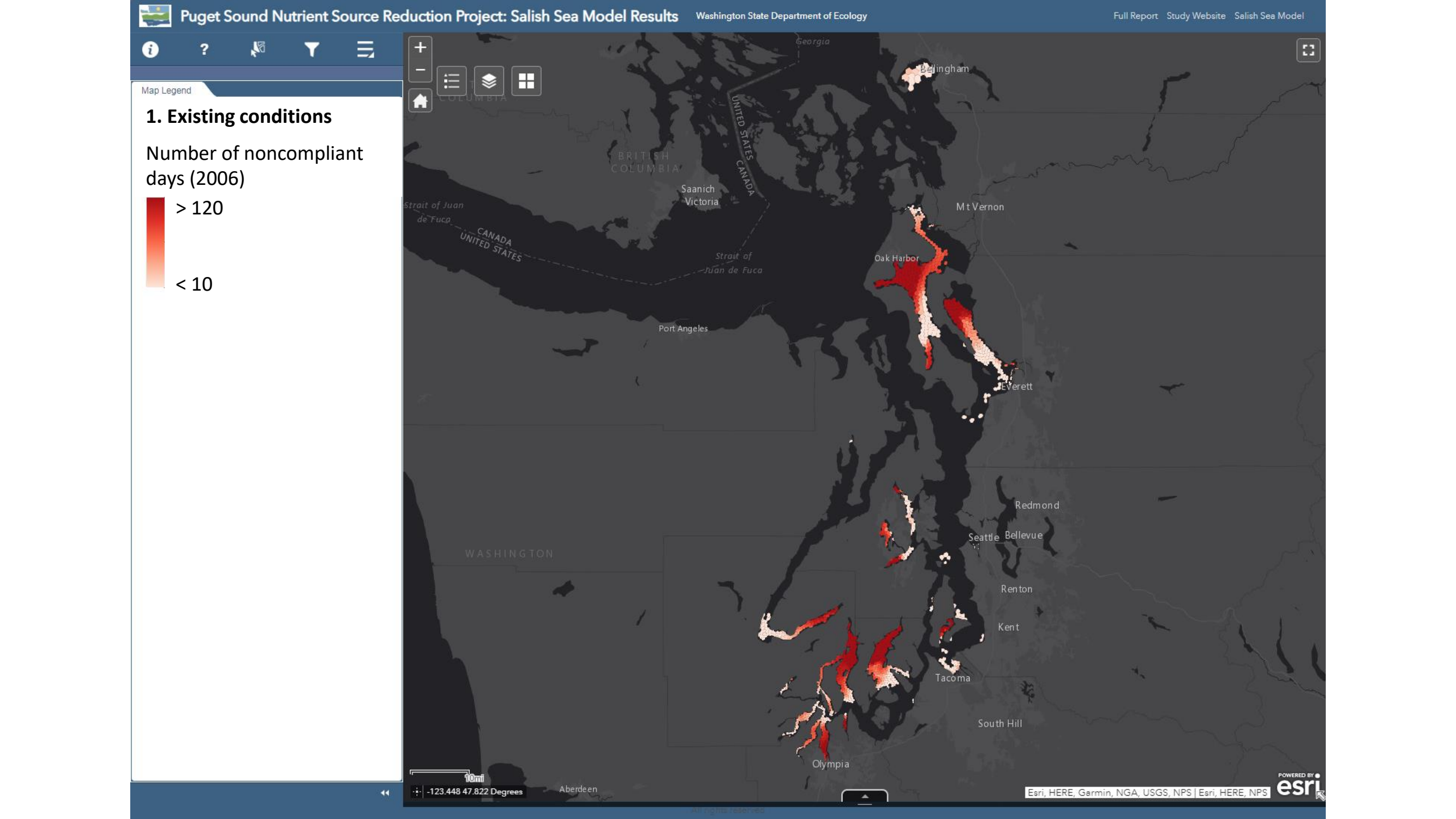
Improvement scenarios show the effects of nutrient reduction through biological nitrogen removal (BNR) at WWTPs that discharge into Puget Sound.
Model results include the number of days that did not meet state water quality standards (noncompliant days), minimum DO levels, and maximum DO depletion (greatest reduction) from water quality standards.
We will use the results of this nutrient pollution study to help guide the Puget
Legend
1. Noncompliant days (DO) at existing conditions
Number of noncompliant days in 2006
> 120
65
< 10
2. Noncompliant days (DO) with BNR at large WWTPs
Number of noncompliant days in the year
Bellingham
Saanich
Victoria
Mt Vernon
Oak Harbor
Port Angeles
Everett
Redmond
Seattle
Bellevue
Renton
Kent
Tacoma
South Hill
Olympia
Aberdeen
BRITISH COLUMBIA
UNITED STATES
CANADA
WASHINGTON
Strait of Juan de Fuca
10mi
-124.882 48.557 Degrees
Esri, HERE, Garmin, NGA, USGS, NPS | Esri, HERE, NPS
POWERED BY esri


Puget Sound Nutrient Source Reduction Project: Salish Sea Model Results
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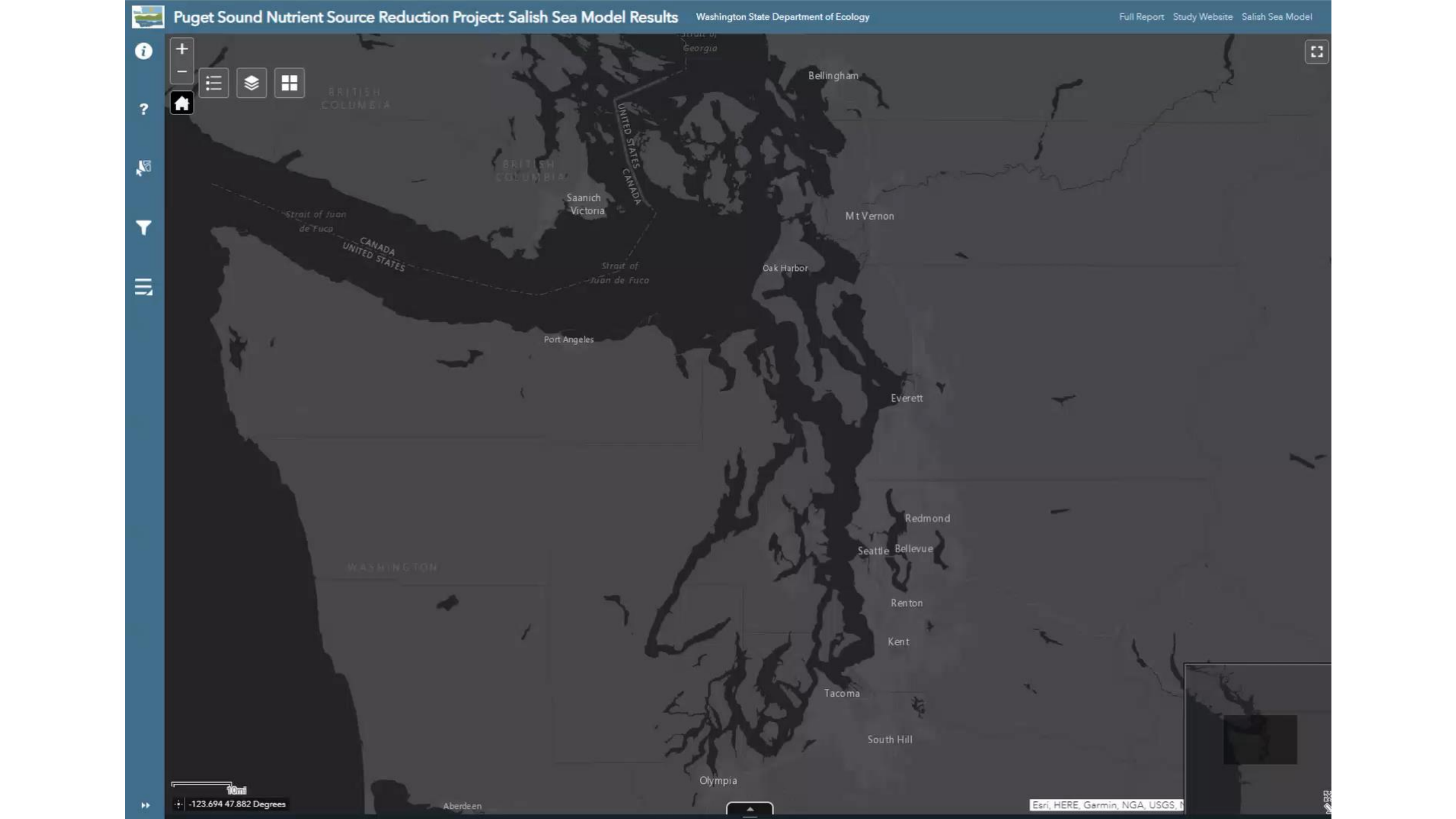
Salish Sea Model
Map Legend
1. Existing conditions
Number of noncompliant days (2006)
> 120
< 10
Georgia
Bellingham
BRITISH COLUMBIA
UNITED STATES
CANADA
Saanich
Victoria
Strait of Juan de Fuca
CANADA
UNITED STATES
Strait of Juan de Fuca
Mt Vernon
Oak Harbor
Port Angeles
Everett
Redmond
Seattle
Bellevue
WASHINGTON
Renton
Kent
Tacoma
South Hill
Olympia
Aberdeen
10mi
-123.448 47.822 Degrees
Esri, HERE, Garmin, NGA, USGS, NPS | Esri, HERE, NPS
POWERED BY esri

Accessing data using Attribute Table + Select Tool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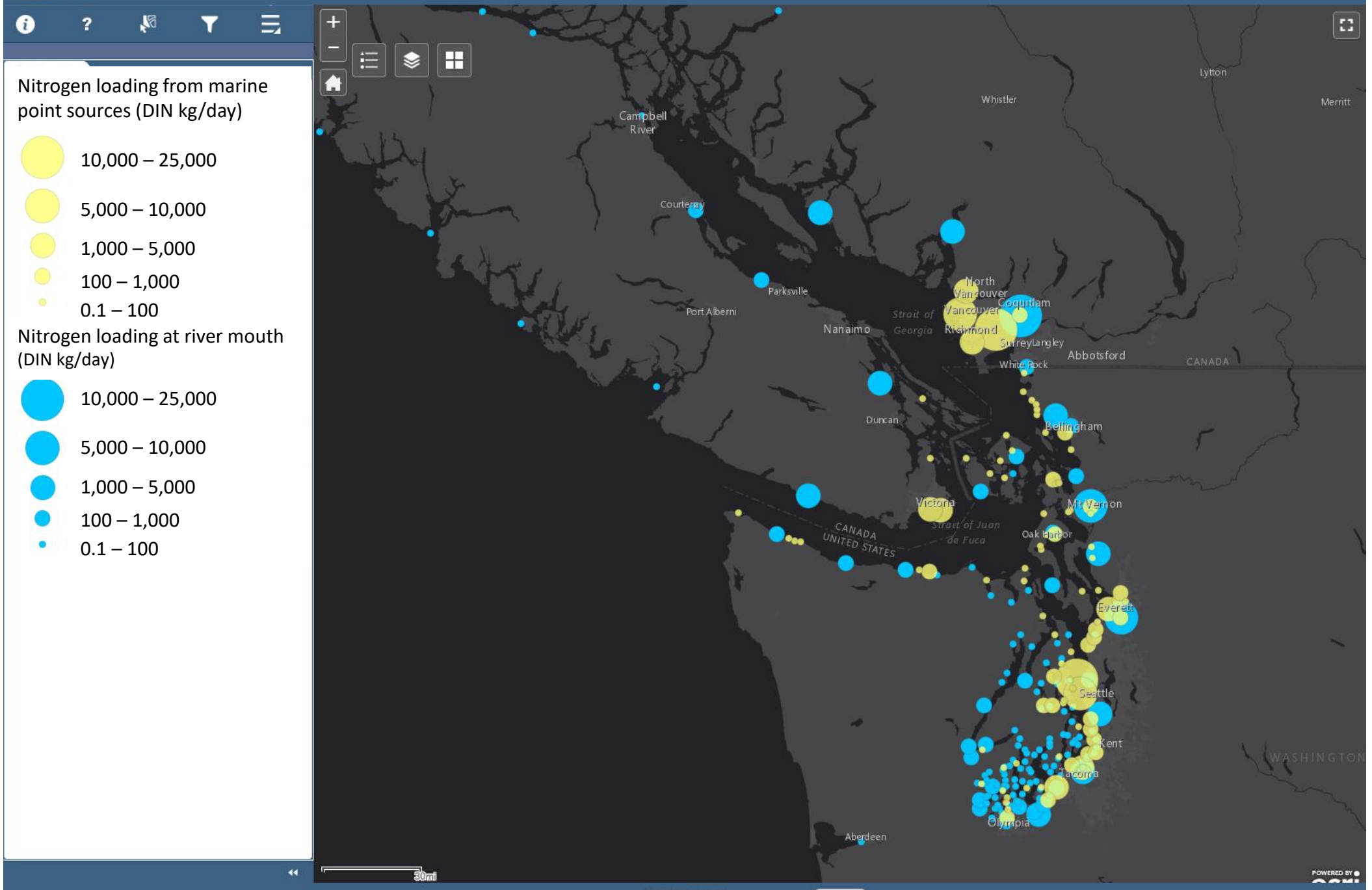
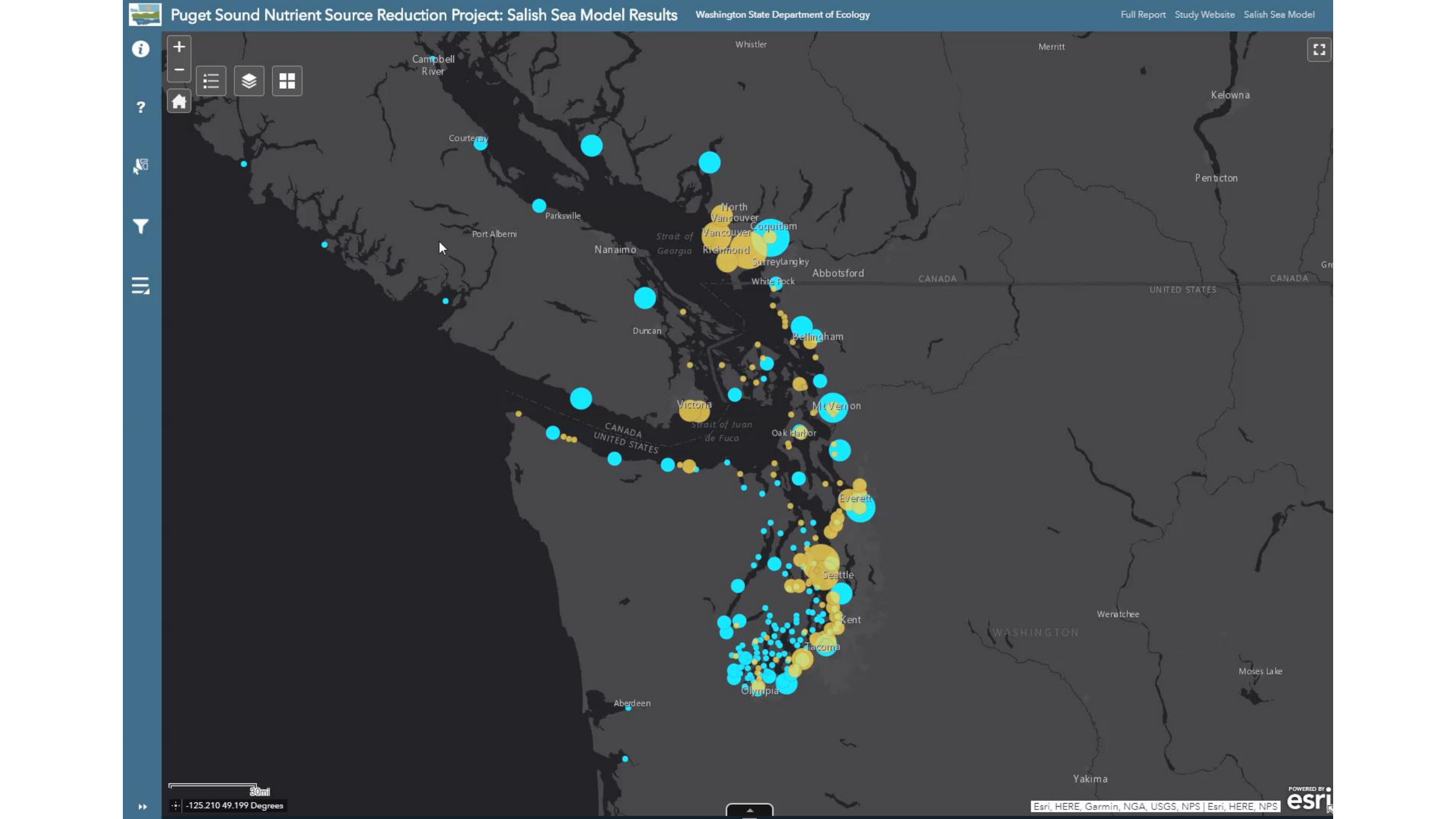
Salish Sea Model
Strait of Georgia
BRITISH COLUMBIA
UNITED STATES
CANADA
Bellingham
Saanich
Victoria
Strait of Juan de Fuca
CANADA
UNITED STATES
Mt Vernon
Oak Harbor
Strait of Juan de Fuca
Port Angeles
Everett
Redmond
Seattle
Bellevue
WASHINGTON
Renton
Kent
Tacoma
South Hill
Olympia
Aberdeen
10mi
-123.694 47.882 Degrees
Esri, HERE, Garmin, NGA, USGS,

Nutrient Loading Filter Tool


Nitrogen loading from marine point sources (DIN kg/day)
10,000 – 25,000
5,000 – 10,000
1,000 – 5,000
100 – 1,000
0.1 – 100
Nitrogen loading at river mouth (DIN kg/day)
10,000 – 25,000
5,000 – 10,000
1,000 – 5,000
100 – 1,000
0.1 – 100
Lytton
Whistler
Merritt
Campbell River
Courtenay
Parksville
Port Alberni
Nanaimo
Strait of Georgia
North Vancouver
Vancouver
Coquitlam
Richmond
Surrey
Langley
Abbotsford
White Rock
CANADA
Duncan
Bellingham
Victoria
Mt Vernon
Strait of Juan de Fuca
Oak Harbor
CANADA
UNITED STATES
Everett
Seattle
Kent
Tacoma
Olympia
Aberdeen
WASHINGTON
30mi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Salish Sea Model
Whistler
Merritt
Campbell River
Kelowna
Courtenay
Penticton
Parksville
North Vancouver
Vancouver
Coquitlam
Port Alberni
Nanaimo
Strait of Georgia
Richmond
Surrey
Langley
Abbotsford
White Rock
CANADA
UNITED STATES
Duncan
Bellingham
Victoria
Mt Vernon
Strait of Juan de Fuca
Oak Harbor
Everett
Seattle
Kent
Tacoma
Olympia
Aberdeen
Wenatchee
WASHINGTON
Moses Lake
Yakima
30mi
-125.210 49.199 Degrees
Esri, HERE, Garmin, NGA, USGS, NPS | Esri, HERE, NPS
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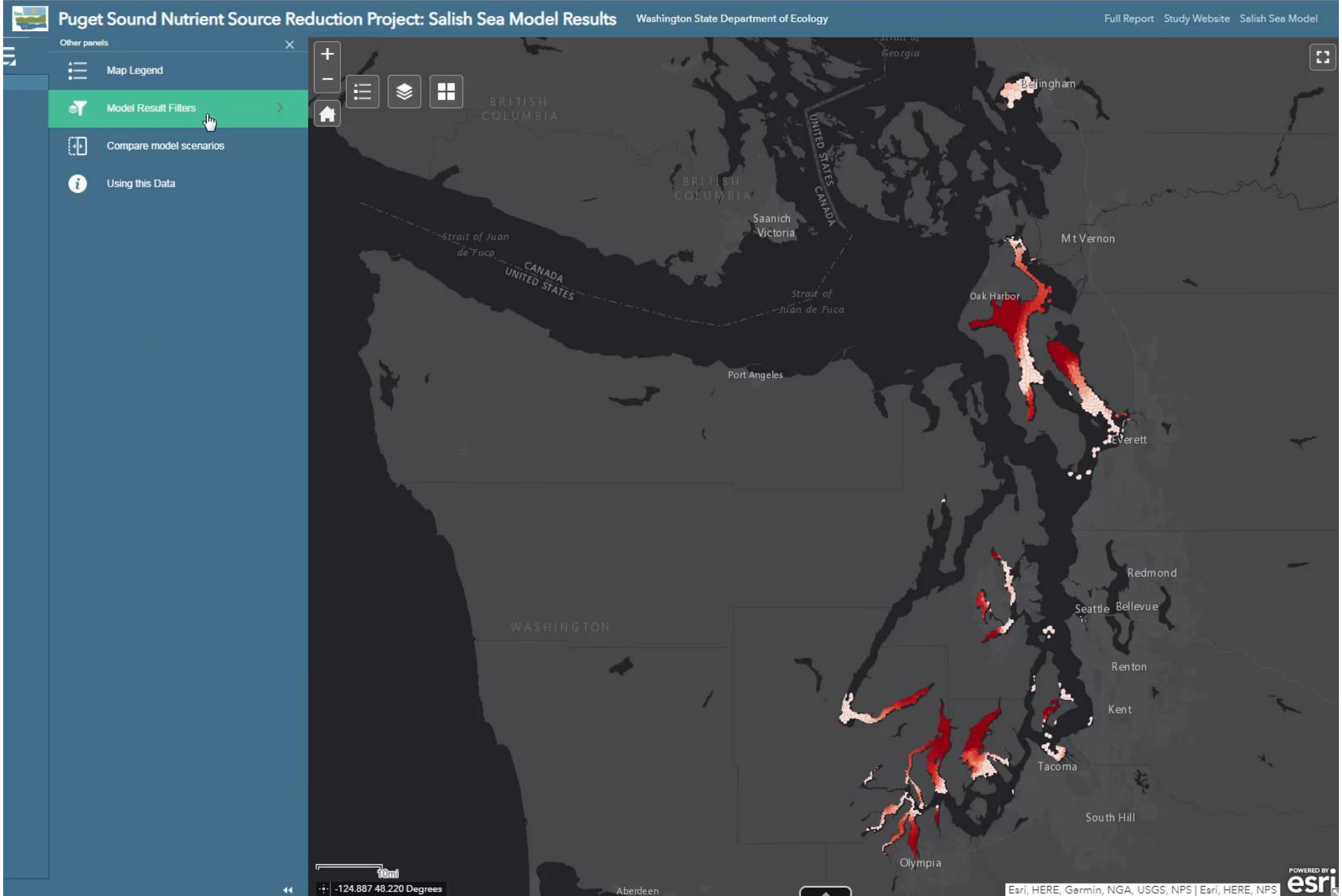
Model Results Filter Tool


Puget Sound Nutrient Source Reduction Project: Salish Sea Model Results
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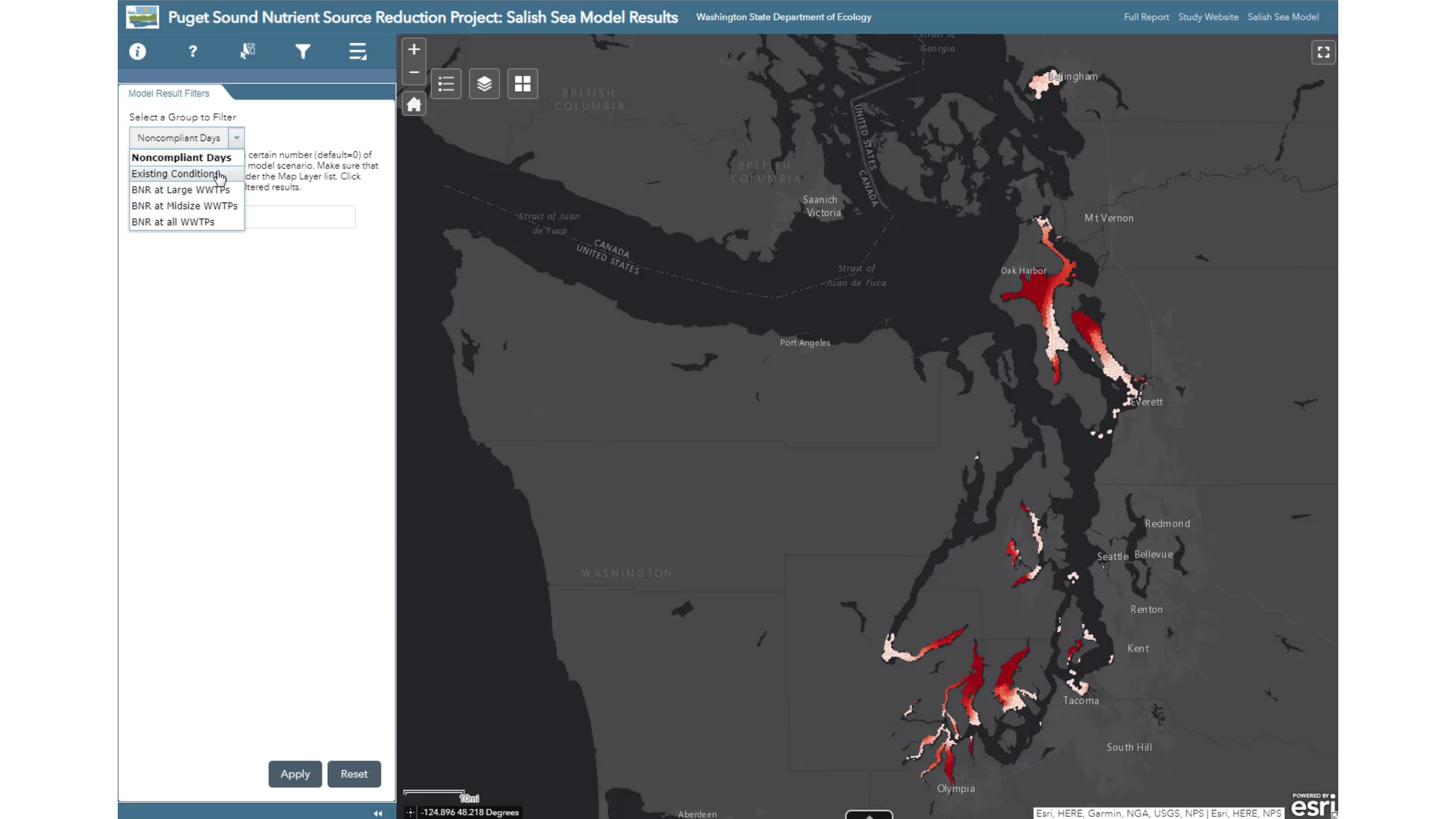
Study Website
Salish Sea Model
Other panels
Map Legend
Model Result Filters
Compare model scenarios
Using this Data
BRITISH COLUMBIA
Strait of Georgia
Bellingham
UNITED STATES
CANADA
Saanich
Victoria
Mt Vernon
Strait of Juan de Fuca
Oak Harbor
Port Angeles
Everett
Redmond
Seattle
Bellevue
WASHINGTON
Renton
Kent
Tacoma
South Hill
Olympia
Aberdeen
10mi
-124.887 48.220 Degrees
Esri, HERE, Garmin, NGA, USGS, NPS | Esri, HERE, NPS
POWERED BY esri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Salish Sea Model
Model Result Filters
Select a Group to Filter
Noncompliant Days
Noncompliant Days
Existing Conditions
BNR at Large WWTPs
BNR at Midsize WWTPs
BNR at all WWTPs
certain number (default=0) of
model scenario. Make sure that
der the Map Layer list. Click
ltered results.
Apply
Reset
BRITISH COLUMBIA
UNITED STATES
CANADA
Strait of Georgia
Strait of Juan de Fuca
Strait of Juan de Fuca
Bellingham
Saanich
Victoria
Mt Vernon
Oak Harbor
Port Angeles
Everett
Redmond
Seattle
Bellevue
Renton
Kent
Tacoma
South Hill
Olympia
Aberdeen
WASHINGTON
10mi
-124.896 48.218 Degrees
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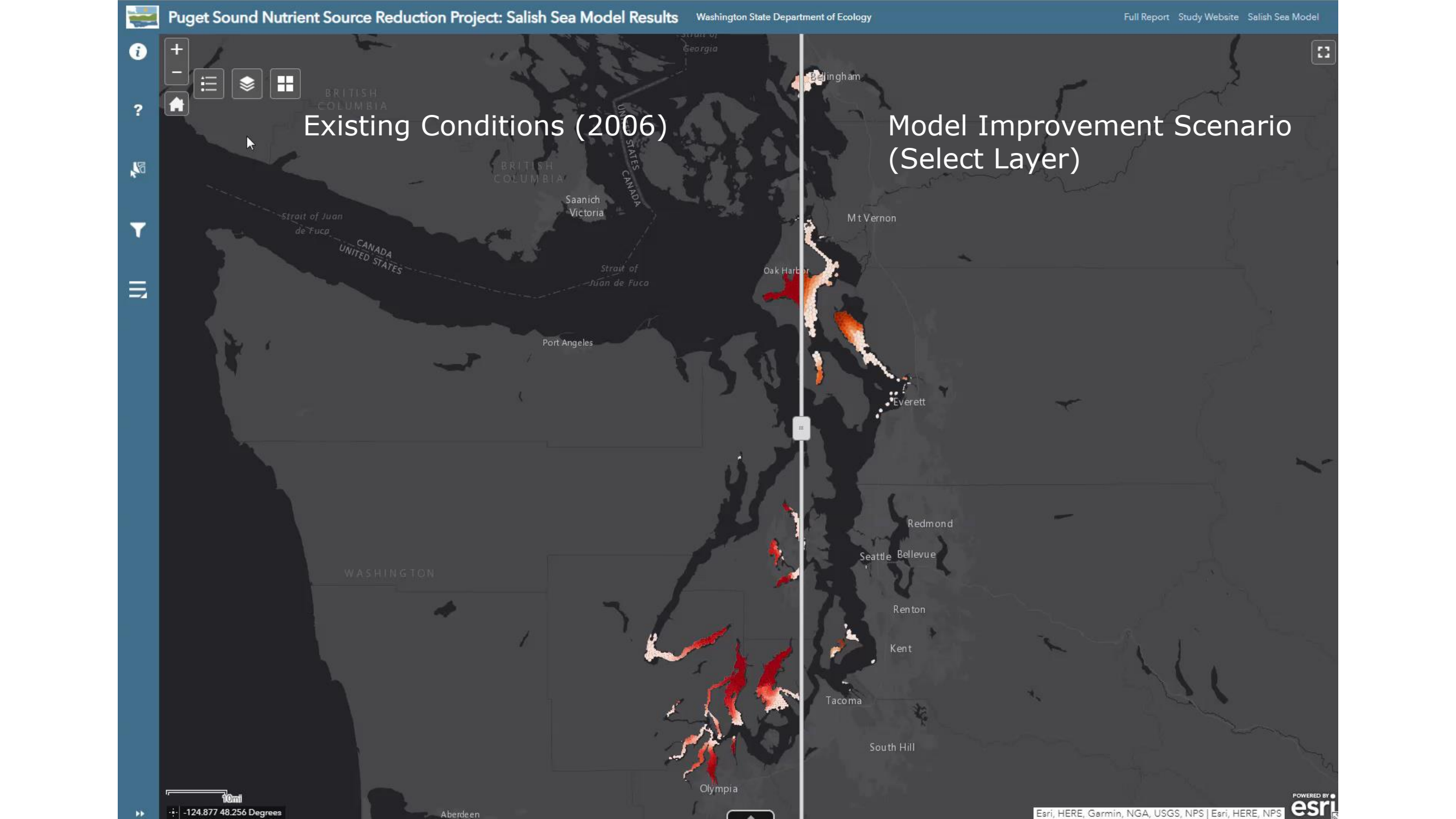
Compare Model Results Tool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Salish Sea Model
Existing Conditions (2006)
Model Improvement Scenario (Select Layer)
Strait of Georgia
Bellingham
BRITISH COLUMBIA
UNITED STATES
CANADA
Saanich
Victoria
Strait of Juan de Fuca
CANADA
UNITED STATES
Strait of Juan de Fuca
Mt Vernon
Oak Harbor
Port Angeles
Everett
Redmond
Seattle
Bellevue
WASHINGTON
Renton
Kent
Tacoma
South Hill
Olympia
Aberdeen
10mi
-124.877 48.256 Degrees
Esri, HERE, Garmin, NGA, USGS, NPS | Esri, HERE, NPS
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bit.ly/ssmresultsmap

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