Bringing Coastal Blue Carbon Home:

An opportunity assessment for the Snohomish estuary, Puget Sound

Keeley O'Connell
Senior Project Manager
EarthCorps
Seattle, WA

Project Goal and Steps

Goal: Develop step-by-step methodology for quantifying baseline carbon in tidal wetlands and offset value from wetland restoration

- Describe landscape setting from historic and greenhouse gas emission change estimates
- Conduct soil carbon sampling
- SLR assessment overlay with restoration scenario

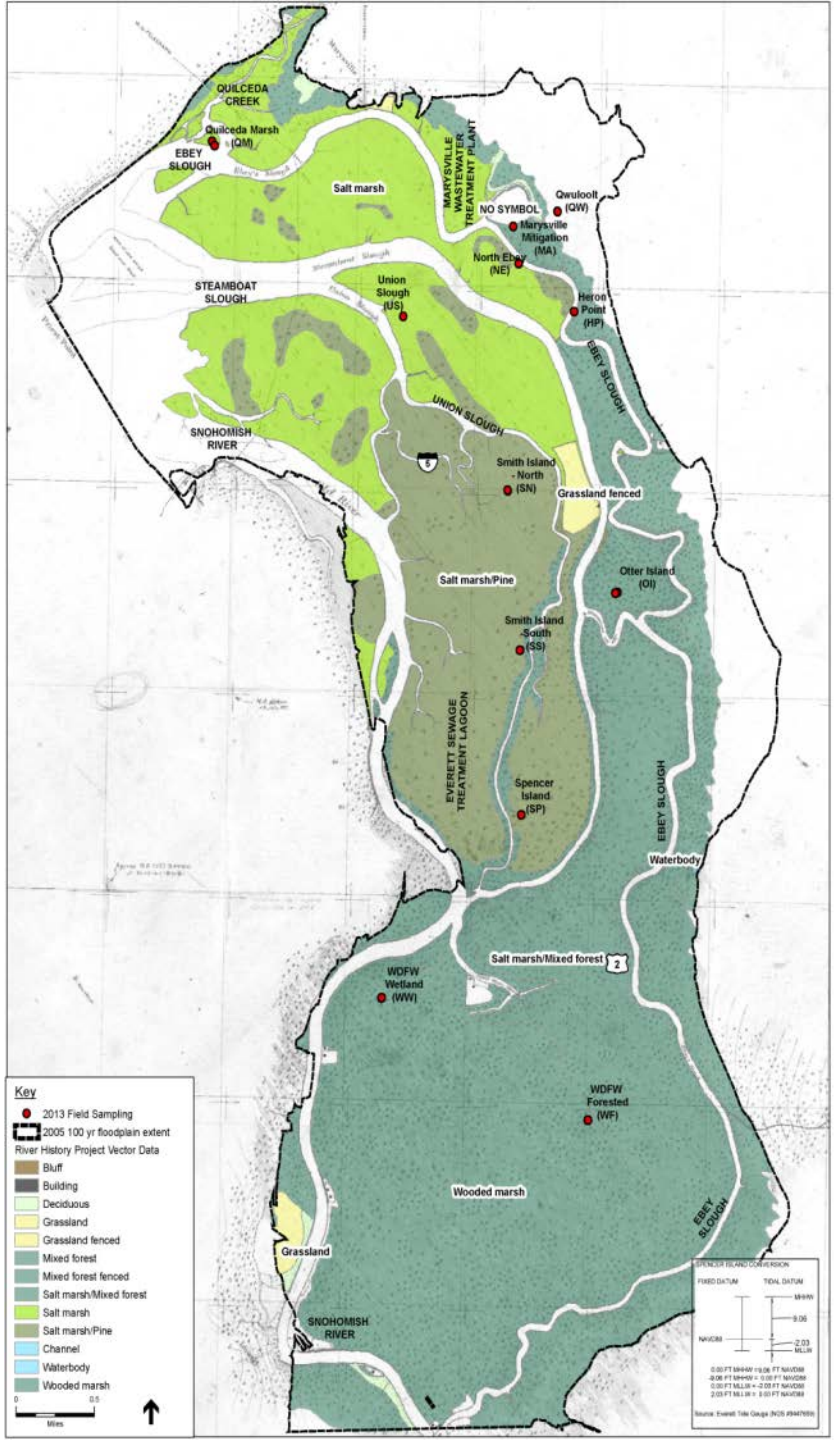
→ Demonstrate the potential of coastal blue carbon for achieving estuary restoration and protection goals

Why the Snohomish?

- Offers a continuum of wetland types
- Strong restoration potential with ongoing and proposed projects
- Significant body of data - SLR scenarios, land-use changes, historic data, site specific restoration plans

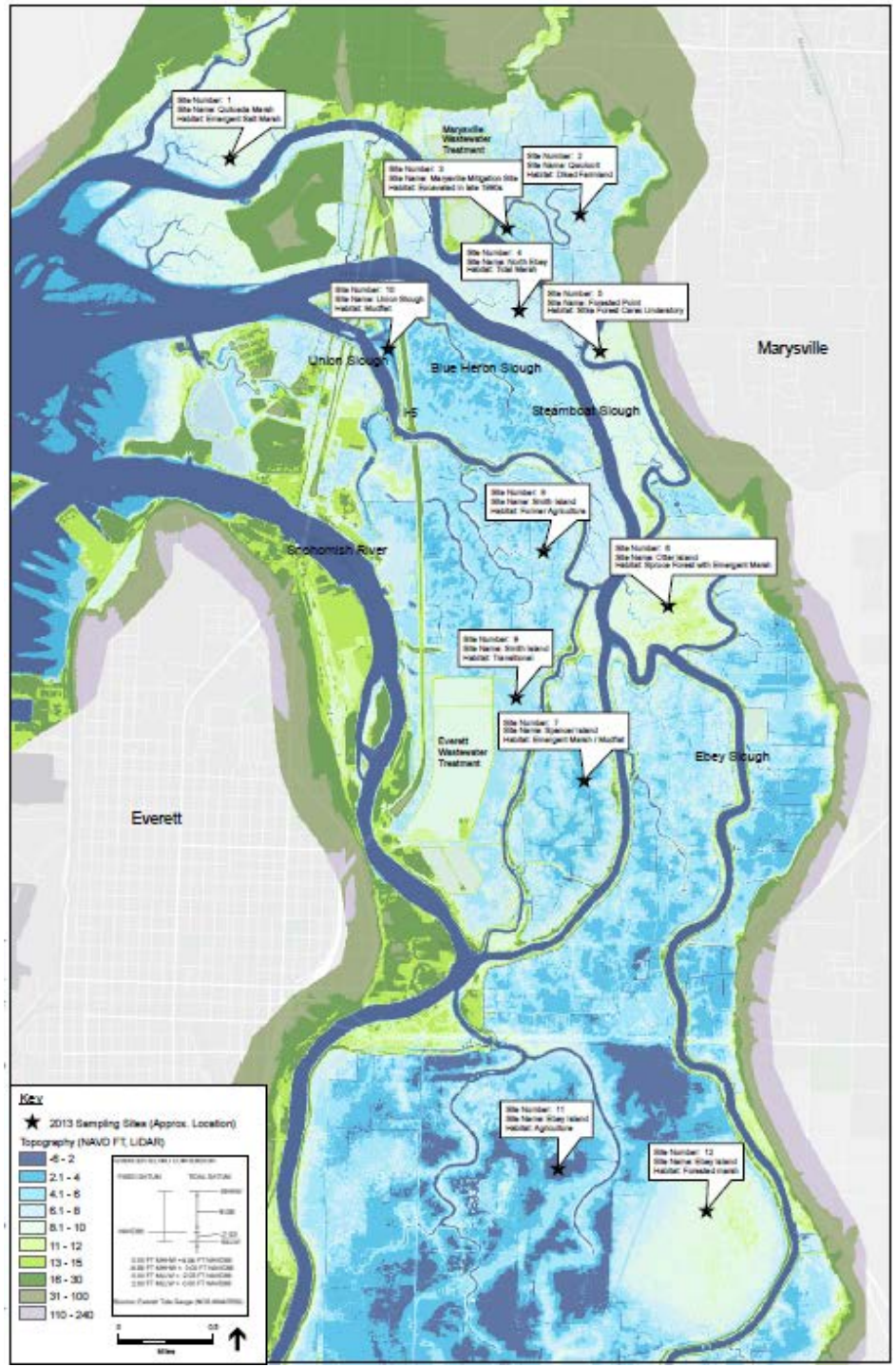
Snohomish estuary Historic conditions

- 3,950 ha tidal marshes
- Logged 1861-1903
- Diked and drained by 1930's



Snohomish estuary Current conditions

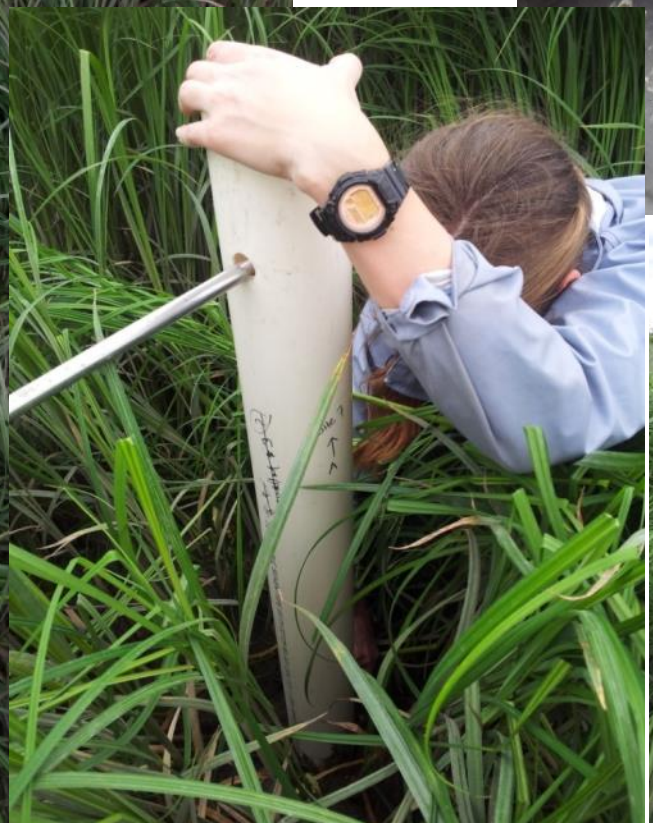
- 4,749 ha of drained wetlands
- 29% of wetland loss in Puget Sound
- 1,353 ha of restoration planned



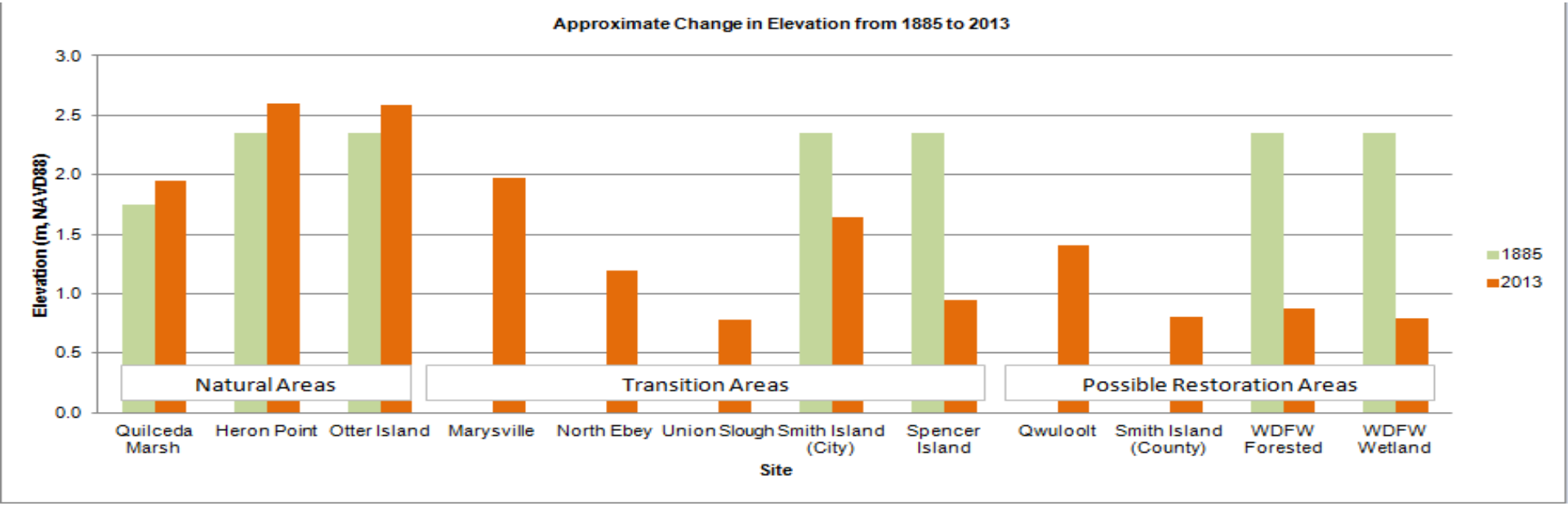

Natural


Transitional


Disturbed



Change in soil elevation



meters (m), NAVD88.

Future carbon budget

ESA PWA

Scenario	Elevation (m NAVD88)	Area (ha)	Soil Carbon Emissions (t C)	Forest Biomass Carbon Emissions (t C)	Total Emissions (t C)
HS1: Historic Wetland Drainage	2.6-3.3	4,749	1,707,775	2,811,654	4,519,429
FS1: Planned and Existing Restoration, Restore to Current Tidal Wetland Elevation (2.76 m)	0.9-2.76	1,353	-320,570	-	-320,570
FS2: Planned and Existing Restoration, Restore to Future Tidal Wetland Elevation (3.76 m)	2.76-3.76	1,594	-375,319	-	-695,889
FS3: Restore Entire Estuary to Current Tidal Wetland Elevation (2.76 m)	0.9-2.76	4,393	-1,224,827	-	-1,224,827
FS4: Restore Entire Estuary to Future Tidal Wetland Elevation (3.76 m)	2.76-3.76	5,258	-1,222,037	-	-2,446,864

Notes: Conservative goal of restoration is to return estuary to emergent tidal wetland elevation. Emergent and scrub-shrub tidal wetland biomass was indeterminate. For these reasons, forest biomass carbon emissions were not calculated for future scenarios. Far right column shows cumulative emissions for different scenarios. Negative numbers reflect carbon sequestration, or net carbon uptake.

Table 13 Summary of carbon emissions due to subsidence by site and state of restoration. The historic scenario (HS1) is the only scenario that includes forested tidal wetland biomass losses. Future restoration scenarios conservatively estimate carbon emissions with recovery of emergent tidal wetlands only.

Thank You

ESA
KBR
LightHawk
NOAA Office of Habitat Conservation
Western Washington University
The Wildlife Forever Fund
Boeing

Snohomish Land Managers
Snohomish County
Tulalip Tribes
City of Everett
City of Marysville
Port of Everett
Washington Department of Fish & Wildlife

More Info

www.estuaries.org/climate-change

COASTAL BLUE CARBON OPPORTUNITY ASSESSMENT
FOR THE SNOHOMISH ESTUARY
THE CLIMATE BENEFITS OF ESTUARY RESTORATION

Keeley O'Connell
keeley@earthcorps.org
206-322-9296 x213

Steve Emmett-Mattox
sem@estuaries.org
720-300-3139