

Using the Salish Sea Restoration Platform To Support Knowledge Sharing In Restoration Practice

Paul Cereghino

Thanks to
support from:



What Is The Role of Knowledge in Restoration?

Where does it come from?

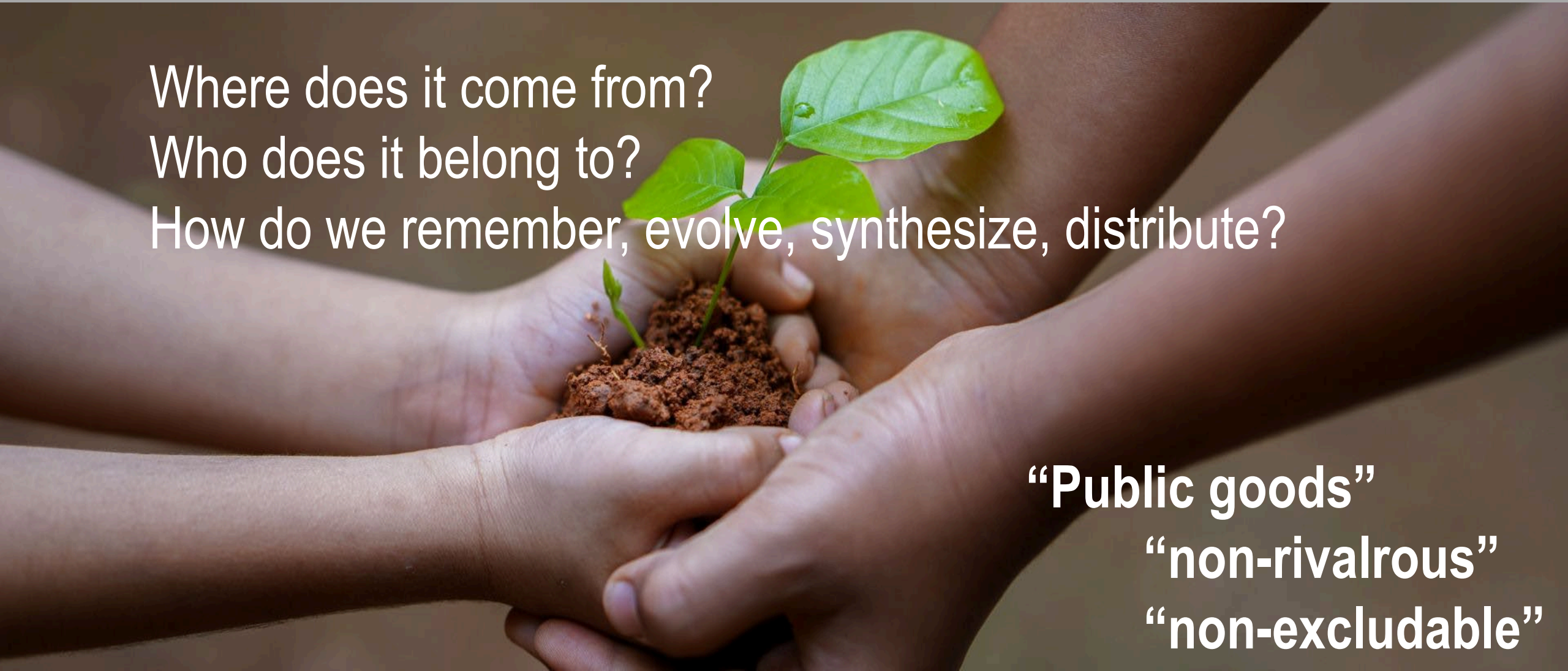
Who does it belong to?

How do we remember, evolve, synthesize, distribute?

“Public goods”

“non-rivalrous”

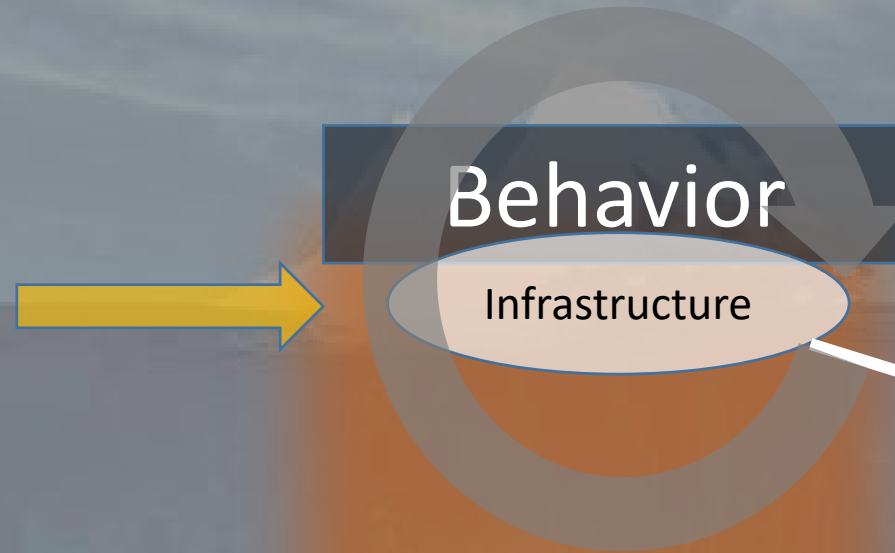
“non-excludable”





**Culturally
Constructed
Niche**

**“Knowledge
Network
Member”**



Behavior

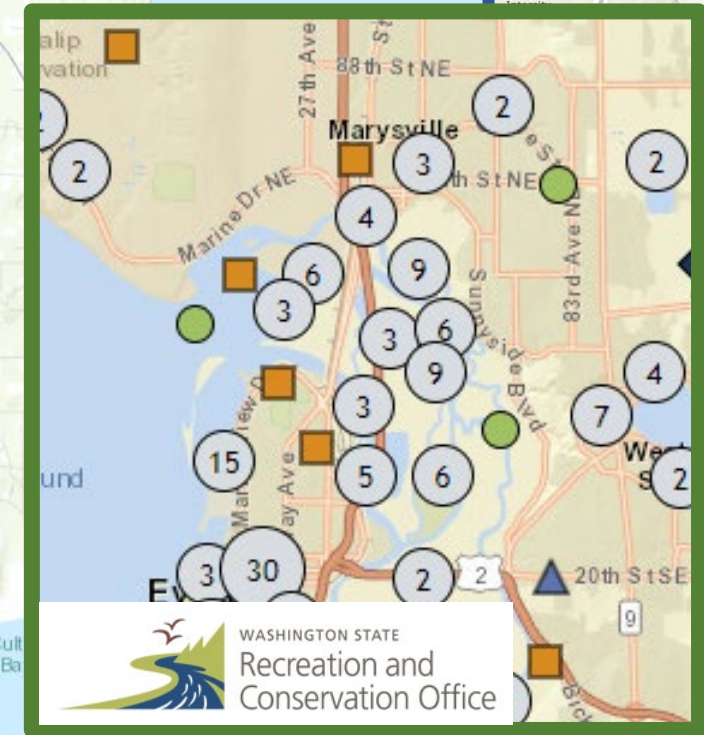
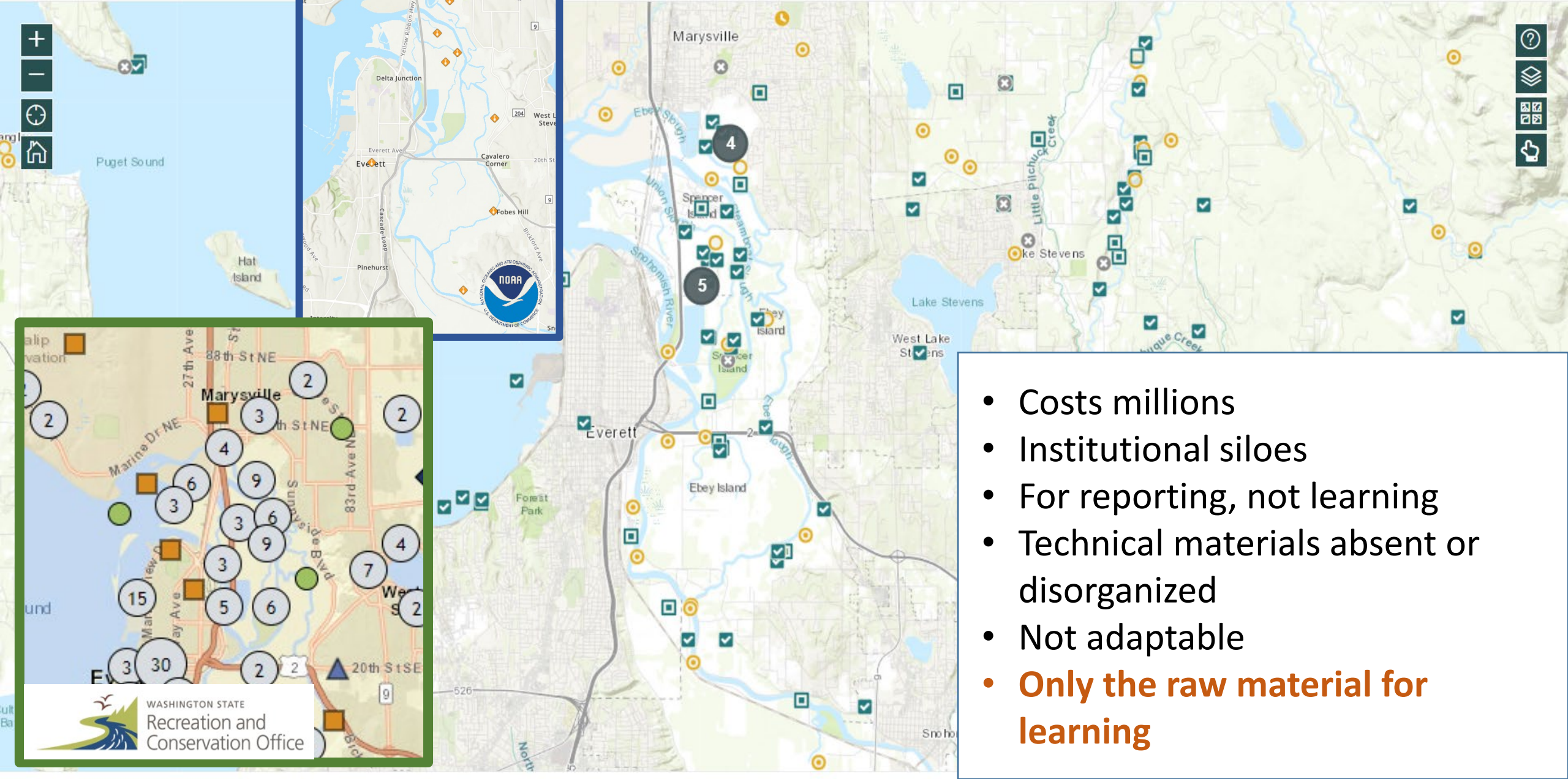
Infrastructure

**Cultural
Pattern**

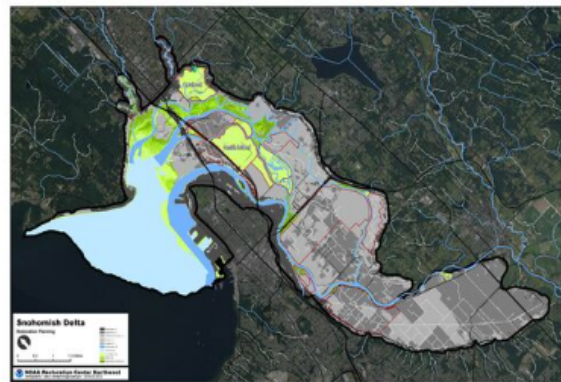
the basic physical and
organizational structures and
facilities needed for the
operation of a society or
enterprise



**How do we accelerate
the creation, storage and transfer
of comprehensive, detailed and coherent knowledge
of ecosystem stewardship
as a public good?**



Snohomish Delta



The Snohomish is one of the largest river delta sites in Puget Sound. Recovery of historical wetland area is a target of [Salmon Recovery](#) in the [Snohomish Watershed](#). Portions of the Estuary are in the [City of Everett](#) but most are in [Snohomish County](#). It is in usual and accustomed harvest areas of the [Tulalip Tribes of Washington](#) with portions within the tribal reservation. The lower delta is being modified under a series of large scale restoration projects including [Qwuloolt Restoration](#), [Smith Island Restoration](#), and [Blue Heron Mitigation Bank](#) among others. These projects are reestablishing a large area of tidal inundation in the saline mixing zone, and when complete will be the largest estuary restoration by area in Puget Sound. Upstream, freshwater tidal lands are in agricultural production, divided into diking districts such as [Marshlands](#) and [Ebey Island](#), and depend on diking and pumping to lower water tables. There is controversy over the loss of agricultural lands as [Snohomish County](#) works to increase [Snohomish Agricultural Resilience](#). [Sea Level Rise](#) effects may be important to long term planning. The Estuary is a study area of the [Snohomish Sustainable Lands Strategy](#).

Chronology

For sites with lots of ecosystem management activity, maintaining a chronology with links is a great way to organize information:

- 1990's - [Snohomish County](#) starts acquisition of estuary parcels allowing future work.
- 1994 - The initial [Spencer Island Restoration](#) in 1994 and the smaller [Marysville Mitigation Site](#) (17 acres) provides early restoration examples.
- 1994 - Formation of the Tulalip Landfill Natural Resource Trustees ([NOAA](#), [USFWS](#), [Tulalip Tribes](#), [WDOE](#)) to pursue damages for the period where the illegal Tulalip Landfill was leaching hazardous substances into Snohomish Estuary.
- 1999 - Tulalip Landfill Natural Resource Trustees propose settlement for damages, and beginning of acquisition to support the future [Qwuloolt Restoration](#)
- 2001 - Publication of [File:City of Everett 2001 snohomish estuary wetland salmon overlay.pdf](#) identifies and prioritizes salmon recovery opportunities in the delta. Project funded by [NOAA](#) through [GSRO](#) with technical assistance by E. Stockdale [Ecology](#) who later joins Snohomish County staff during Smith Island restoration. Identifies all sites mentioned below.
- 2001 - Initiation of [Puget Sound Nearshore Ecosystem Restoration Project](#) between [USACE](#) and [WDFW](#) to identify large scale restoration opportunities in Puget Sound. This orients USACE CAP resources towards large delta restoration.
- 2001 - Snohomish County acquires north tip of [Ebey Island](#) for anticipated [North Ebey Island Restoration](#)
- 2003 - On July 26 a section of dike on the North end of South Spencer Island caught on fire. Over a week the fire had spread to 800' of dike and was still smoldering until WDFW breached the dike to extinguish the fire. [Pcereghino](#) (talk)
- 2005 - Publication of Snohomish Recovery plan ([SBSRF 2005](#)) sets Snohomish Delta restoration target of 1,237 acres of restoration by 2015.
- 2005 - Construction of [Port of Everett's Union Slough Mitigation](#) with Pentec Environmental leading.
- 2007 - [Cereghino 2007](#) documents wetlands conditions as part of [Qwuloolt Restoration](#) feasibility.
- 2011 - [File:Rice 2011 DRAFT qwuloolt monitoring plan.pdf](#) establishes strategy of coordination among restoration projects to use project funding to support coordinated monitoring between [NOAA](#), [Tulalip Tribes](#), and [Snohomish County](#), with support from NOAA CRP funding.
- 2012 - [City of Everett](#) and [USACE](#) collaborate on the [Union Slough Restoration](#) (93 acres) providing city mitigation, and using [USACE](#) funds to expand the project area.
- 2014 - Initial excavation of channels at [Qwuloolt Restoration](#) in anticipation of future breach.
- 2015 - First Tides at [Qwuloolt Restoration](#) (354 acres, not including the 17 acre Marysville Mitigation) with a final push using a [USACE](#) agreement with [Tulalip Tribes](#)
- 2015 - Agreement between Snohomish County and City of Everett ([File:Snohomish County 2015 diking district 6 maintenance.pdf](#)) over continued maintenance of failed [Diking District 6](#)
- 2016 - Publication of [PSNERP](#) final feasibility report identifies [Spencer Island North Restoration](#), [Everett Riverfront Wetland Restoration](#), and [Quilceda Estuary Restoration](#) as early target for USACE CAP efforts, and defers [Everett Marshlands](#) and the [Snohomish Estuary Tributary Reconnection](#) for future investigation.
- 2016 - Untimely death of Casey Rice, the NOAA Scientist who championed coordinated restoration monitoring.
- 2018 - First tide at [Smith Island Restoration](#) (315 acres, with an additional 18 acres developed for [BNSF](#) mitigation) and enhancement of natural breach at [Mid-spencer Island Restoration](#) (added to Smith Island construction through reallocation of [NOAA](#) funding to complete design). This was the first project to be redesigned using Greg Hood's [Tidal Channel Reference Model](#)



River Delta

River delta sites occur at 16 locations where large river floodplains meet the sea

Most Recent Edits

- [File:Multi-scale benefits of estuary restoration for PS Chinook salmon ESRP webinar Final.pdf](#)

Salish Sea References

- [Watershed Characterization Mapper](#)
- [The Encyclopedia of Puget Sound](#)
- [PRISM Project Search](#)
- [Washington Coastal Atlas](#)
- [WDFW's Salmonscape Map](#)

Wiki Rules

- *Wiki text does not reflect the policy or opinion of any agency or organization*
- Please adhere to our [Social Contract](#) and [Style Guide](#)
- [Complain here](#), and be nice.



Google

- Presumes that content exists on internet
- You synthesize alone from scratch every time
- No social process



snohomish delta restoration



All Images News Maps Videos Shopping Forums More

Tools

 Washington Department of Fish and Wildlife (.gov)
<https://wdfw.wa.gov/estuary-restoration-projects/sno...>

Snohomish Estuary Project Prioritization

This project will assess feasibility and recommend how and where to advance ecosystem restoration on three properties.

 Salish Sea Restoration Wiki
https://salishsearestoration.org/wiki/Snohomish_Delta...

Snohomish Delta - Salish Sea Wiki

May 21, 2024 — 2005 - Publication of Snohomish Recovery plan (SBSRF 2005) sets Snohomish Delta restoration target of 1,237 acres of restoration by 2015.

 Washington Department of Fish and Wildlife (.gov)
<https://wdfw.wa.gov/about/advisory/seppag/PDF>

Snohomish Estuary Project Prioritization

2nd largest watershed in Puget Sound – 1,856 square miles. 1 of only 2 deltas that PSNERP Strategies Report recommends as "High Priority Restore". 25-50% of ...
28 pages

 Salish Sea Restoration Wiki
https://salishsearestoration.org/wiki/Snohomish_Delta...

Snohomish Delta Ecosystem Monitoring and Evaluation

Mar 15, 2024 — A long term research program to evaluate Chinook salmon use of estuarine habitats and response to restoration in the Snohomish Delta.

 Snohomish County (.gov)
<https://snohomishcountywa.gov/View/Snoho.../PDF>

Press Release - Parks and Recreation

Sep 20, 2023 — Snohomish County Celebrates 10 Years of Restoration Progress in Port Susan; More. Than 520 Acres of River Delta Restored. New online resource ...

 Qwuloolt Estuary Restoration
<https://www.qwuloolt.org/Content/Documents/PDF>

restoring 400 acres of in the snohomish river delta - tidal ...

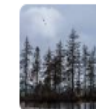
QWULOOLT RESTORATION. The Tulalip Tribes is leading the restoration of 400 acres of the Snohomish River Delta. Diked, drained, and developed for over a ...



 Everett Herald
<https://www.heraldnet.com/news/snohomish-river-cl...>

Snohomish River climate projects get \$21M federal boost

Aug 9, 2024 — Snohomish County plans to use \$16.7 million to restore 430 acres of tidal wetlands at Chinook Marsh. County staff spearheading restoration ...



Delta Rehabilitation Center

5.0 ★★★★★ 7 Google reviews

Rehabilitation center in Snohomish, Washington

Permanently closed

Address: 1705 Terrace Ave, Snohomish, WA 98290

Phone: (360) 568-2168

[Suggest an edit](#) · [Own this business?](#)

 Send to your phone

Send

Reviews

 "Love the residents here amazibg people love working here"

 "To the Welch family thank you for creating something truly amazing."

[View all Google reviews](#)

About this data

Scientific Literature?

- Often abstracted from place or practice
- Prohibitively expensive
- Difficult to access
- Limited synthesis

 National Library of Medicine
National Center for Biotechnology Information

Log in



Polycyclic PAH impact on health

Advanced Create alert Create RSS

User Guide

Search

Save Email Send to

Sort by: Best match

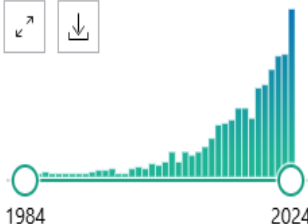
Display options

MY CUSTOM FILTERS

625 results

Page 1 of 63

RESULTS BY YEAR



1984 2024

PUBLICATION DATE

☐ 1 year

☐ 5 years

☐ 10 years

☐ Custom Range

TEXT AVAILABILITY

☐ Abstract

☐ Free full text

☐ Full text

ARTICLE ATTRIBUTES

☐ **Impact of Polycyclic Aromatic Hydrocarbon Accumulation on Oyster Health.**

1 Gan N, Martin L, Xu W.

Cite Front Physiol. 2021 Sep 10;12:734463. doi: 10.3389/fphys.2021.734463. eCollection 2021.

PMID: 34566698 **Free PMC article.** Review.

Share The negative effects of acidification and longer-term salinity changes appear to add onto that of **PAH** toxicity, while shorter-term salinity changes may induce mechanisms that reduce **PAH** exposure. ...In this review, the oyster is recognized as a model organism for th ...

☐ **Impact of consumption of repeatedly heated cooking oils on the incidence of various cancers- A critical review.**

2 Ganesan K, Sukalingam K, Xu B.

Cite Crit Rev Food Sci Nutr. 2019;59(3):488-505. doi: 10.1080/10408398.2017.1379470. Epub 2017 Oct 20.

PMID: 28925728 Review.

Share Repeatedly heated cooking oils (RCO) can generate varieties of compounds, including **polycyclic aromatic hydrocarbons (PAH)**, some of which have been reported as carcinogenic. ...Remarkable studies demonstrated that the **health** adverse effects of RCO and its coo ...

☐ **Indoor Exposure to Selected Air Pollutants in the Home Environment: A Systematic Review.**

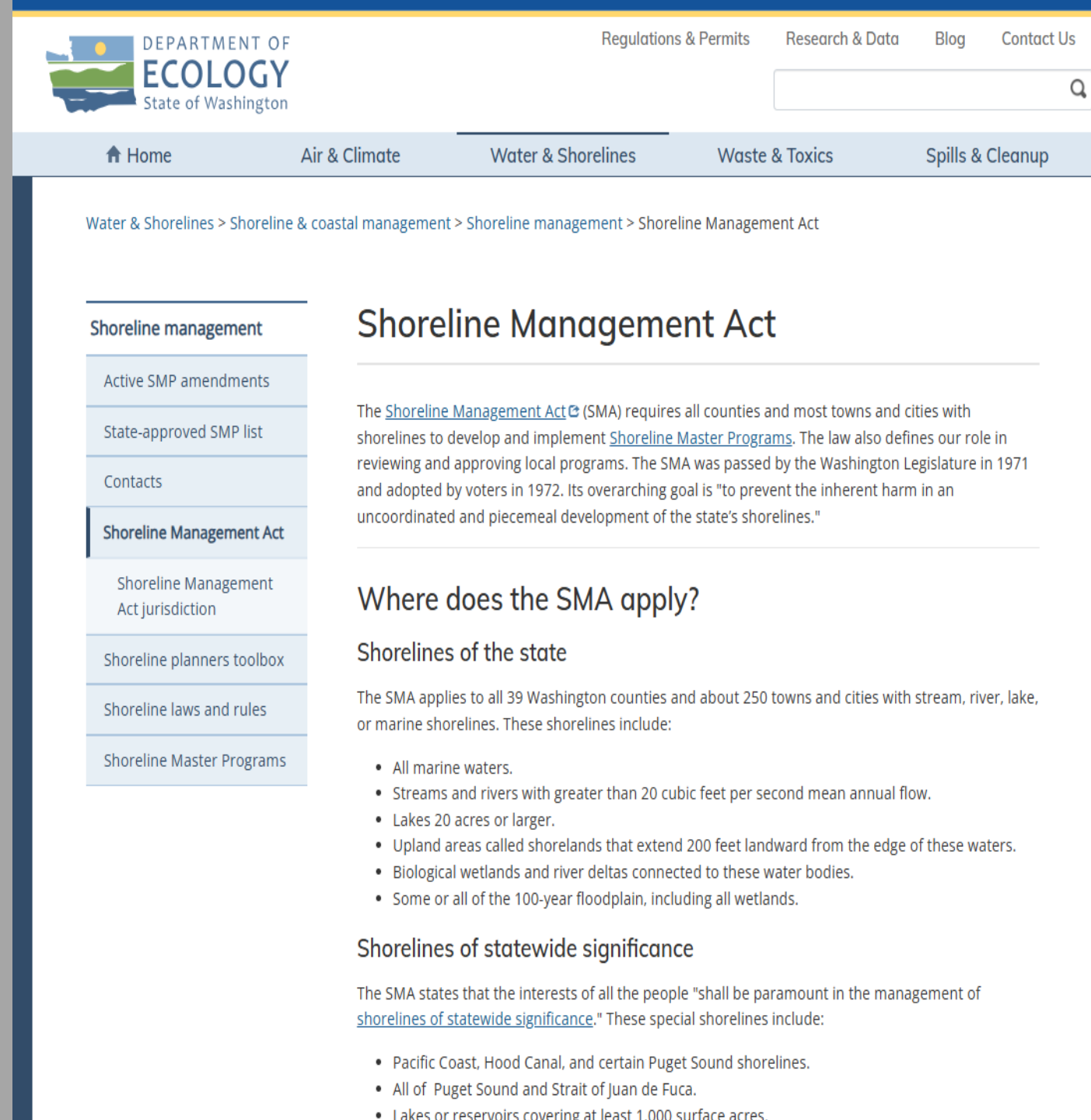
3 Vardoulakis S, Giagloglou E, Steinle S, Davis A, Smeuwenhoek A, Galea KS, Dixon K, Crawford JO.

Cite Int J Environ Res Public Health. 2020 Dec 2;17(23):8972. doi: 10.3390/ijerph17238972.

PMID: 33276576 **Free PMC article.**

Agency Websites?

- Strongly intermediated by caution
- Constrained by agency mandate and perspective
- Constrained by resources
- Changes with management



The screenshot shows the Washington Department of Ecology website. The header includes the department's logo and name, along with navigation links for Regulations & Permits, Research & Data, Blog, and Contact Us. A search bar is also present. The main navigation menu lists Home, Air & Climate, Water & Shorelines (which is highlighted), Waste & Toxics, and Spills & Cleanup. The breadcrumb trail indicates the current location: Water & Shorelines > Shoreline & coastal management > Shoreline management > Shoreline Management Act. A left-hand sidebar menu under 'Shoreline management' lists various links, with 'Shoreline Management Act' being the active page. The main content area features the title 'Shoreline Management Act' and a paragraph explaining the act's purpose and history. Below this, there are sections for 'Where does the SMA apply?' and 'Shorelines of the state', each followed by a list of specific areas covered by the act.

DEPARTMENT OF
ECOLOGY
State of Washington

Regulations & Permits Research & Data Blog Contact Us

Home Air & Climate **Water & Shorelines** Waste & Toxics Spills & Cleanup

Water & Shorelines > Shoreline & coastal management > Shoreline management > Shoreline Management Act

Shoreline management

- Active SMP amendments
- State-approved SMP list
- Contacts
- Shoreline Management Act**
- Shoreline Management Act jurisdiction
- Shoreline planners toolbox
- Shoreline laws and rules
- Shoreline Master Programs

Shoreline Management Act

The [Shoreline Management Act](#) (SMA) requires all counties and most towns and cities with shorelines to develop and implement [Shoreline Master Programs](#). The law also defines our role in reviewing and approving local programs. The SMA was passed by the Washington Legislature in 1971 and adopted by voters in 1972. Its overarching goal is "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines."

Where does the SMA apply?

Shorelines of the state

The SMA applies to all 39 Washington counties and about 250 towns and cities with stream, river, lake, or marine shorelines. These shorelines include:

- All marine waters.
- Streams and rivers with greater than 20 cubic feet per second mean annual flow.
- Lakes 20 acres or larger.
- Upland areas called shorelands that extend 200 feet landward from the edge of these waters.
- Biological wetlands and river deltas connected to these water bodies.
- Some or all of the 100-year floodplain, including all wetlands.

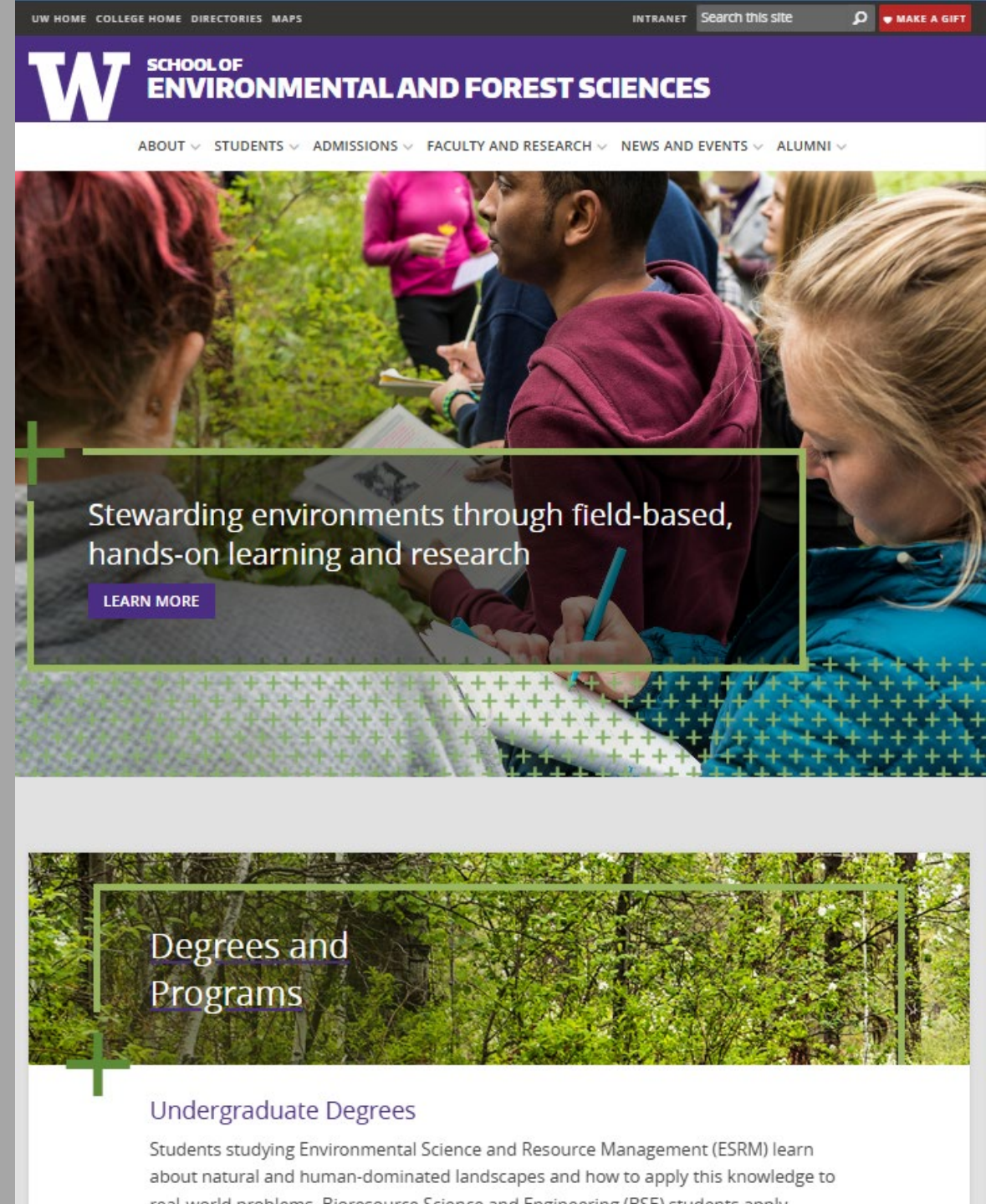
Shorelines of statewide significance

The SMA states that the interests of all the people "shall be paramount in the management of [shorelines of statewide significance](#)." These special shorelines include:

- Pacific Coast, Hood Canal, and certain Puget Sound shorelines.
- All of Puget Sound and Strait of Juan de Fuca.
- Lakes or reservoirs covering at least 1,000 surface acres.

Universities?

- In the business of selling knowledge, not giving it away.
- As cautious as public agencies.
- Often disconnected from social-ecological systems.



Wiki Wiki Web

- Increase knowledge exchange among practitioners
- Remove intermediation with transparency and version control
- Wikipedia (2001)
- MediaWiki Foundation
- Salish Sea Platform 2011



Why A Wiki?

- Data structure can be adapted by users...
- Reduces need for intermediation...
- Stable adaptable platform with minimal maintenance...
- Permanent archive...links don't break....
- Very searchable... always accessible
- Very low cost... \$2,400/year
- Extremely expandable...

The Platform

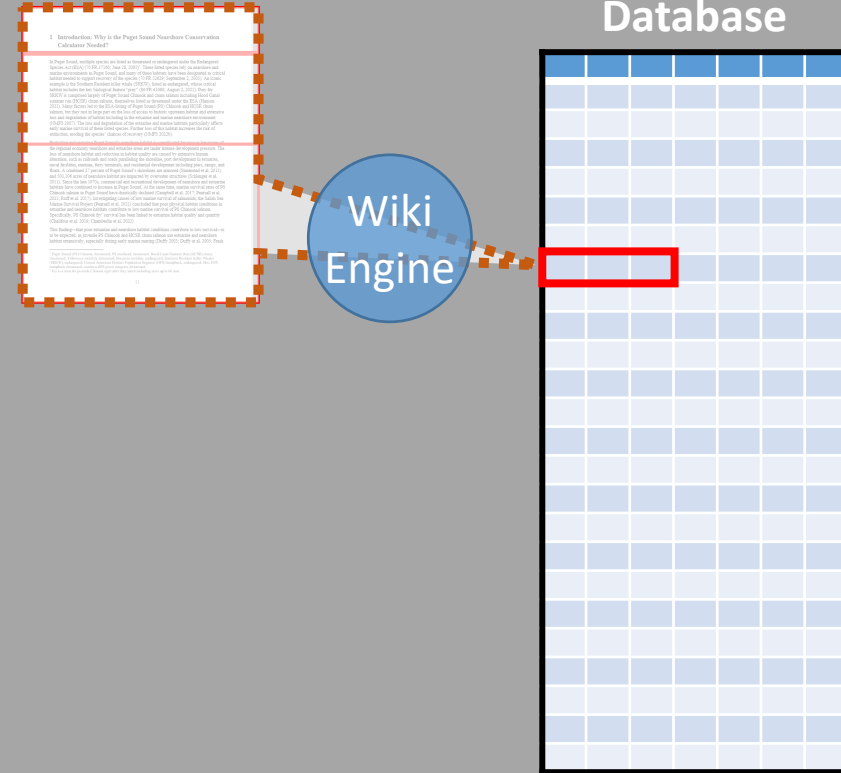
Public website

“Page” content is text data

Stored in a database

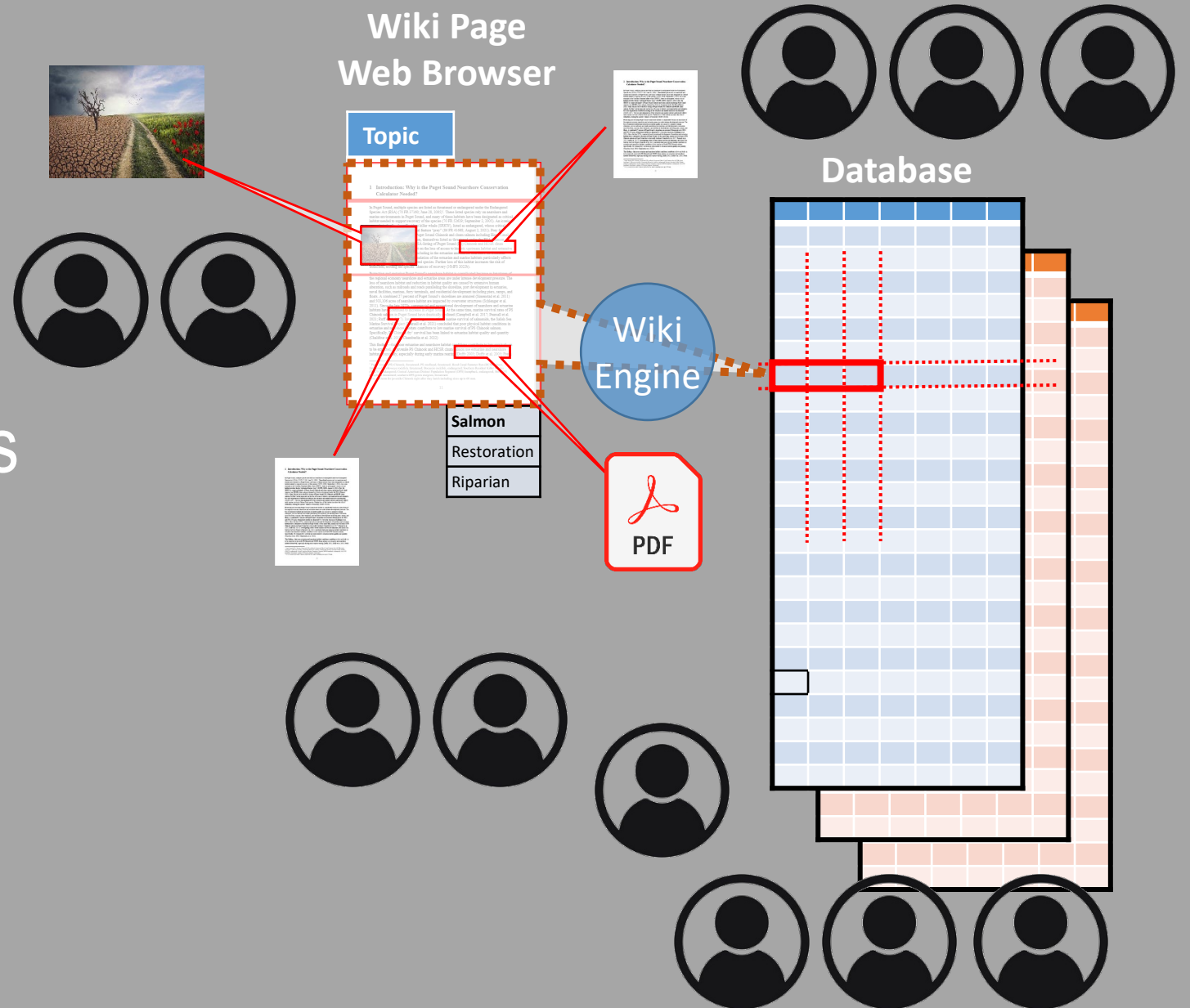
“Rendered” by a wiki engine

Wiki Page
Web Browser



The Platform

Easy linkage
Integrates media files
Images
PDFs
Multiple editors
Total version control



The Platform

Stewardship Circle
Operating Agreement
Special Role SER
Consent-based Governance
Can Add New Partners
Substantive Contribution

