OPENING UP THE DATA
Visualizing the effectiveness of Puget Sound restoration efforts

ODL — OPEN DATA LITERACY

AN OPEN DATA LITERACY CAPSTONE PROJECT: HTTPS://ODL.ISCHOOL.UW.EDU/

PROJECT DESCRIPTION

THE PROBLEMS WITH DATA

Lack of interoperability, dispersed data and **inconsistent data formats** are common and challenging issues across data and information science.

Curators of public data often are faced with the additional demand to reconcile open-data needs with proprietary data formats.

OUR SPECIFIC CHALLENGE

This project stems from our partners' need to evaluate and communicate **what's working to restore Puget Sound**.

Numerous publicly funded environmental restoration projects have been undertaken in the region, but connecting investments in these projects to co-located indicators of habitat viability has proved challenging because of many of the problems noted above.

OUR APPROACH

Our partners proposed development of an Effectiveness and Evaluation Tool (EET) to test and communicate what's working to restore Puget Sound by connecting restoration actions to outcomes (measurable indicators of habitat viability).

Based on the proposed methodology of EET, we leveraged **open, found data** and **open-source software tools** to build:

- A scalable, sustainable data processing pipeline
- An interactive, web-based visualization prototype

## THE PIPELINE: OPEN DATA + OPEN-SOURCE TOOLS

OPEN+OPEN

The fusion of open data and open-source tools is powerful, as it makes our work **accessible from end to end** and **able to be replicated** by anyone.

1. THE DATA

ACTIONS:
Restoration project data (WA Recreation and Conservation Office and WA Dept. of Ecology)

OUTCOMES:
Summer chum salmon data (WA Dept. of Fish and Wildlife)

Water quality data (WA Dept. of Ecology)
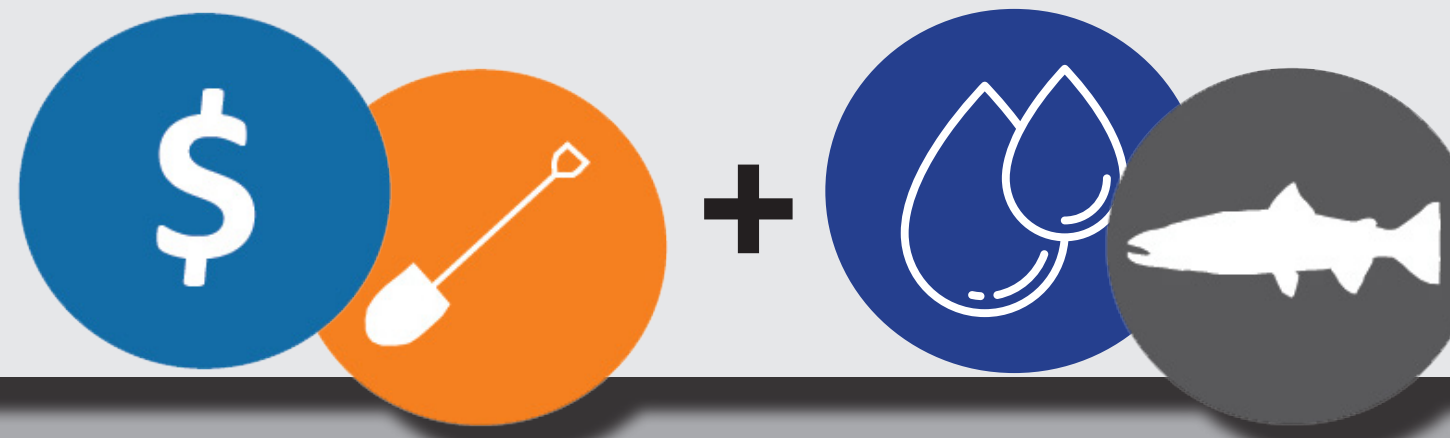
2. THE TOOLS

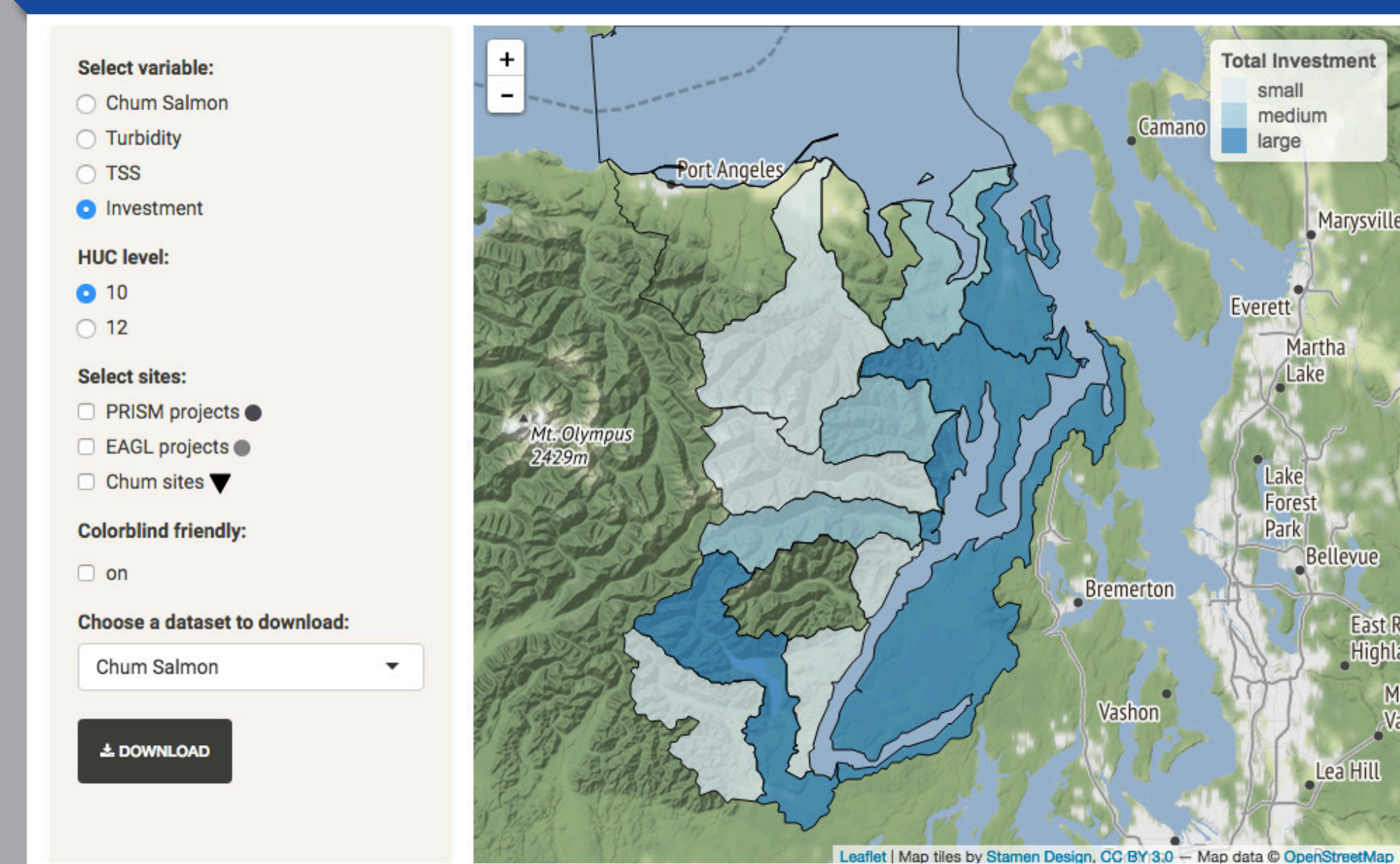**R** — We processed the varied data using the statistical programming language R.

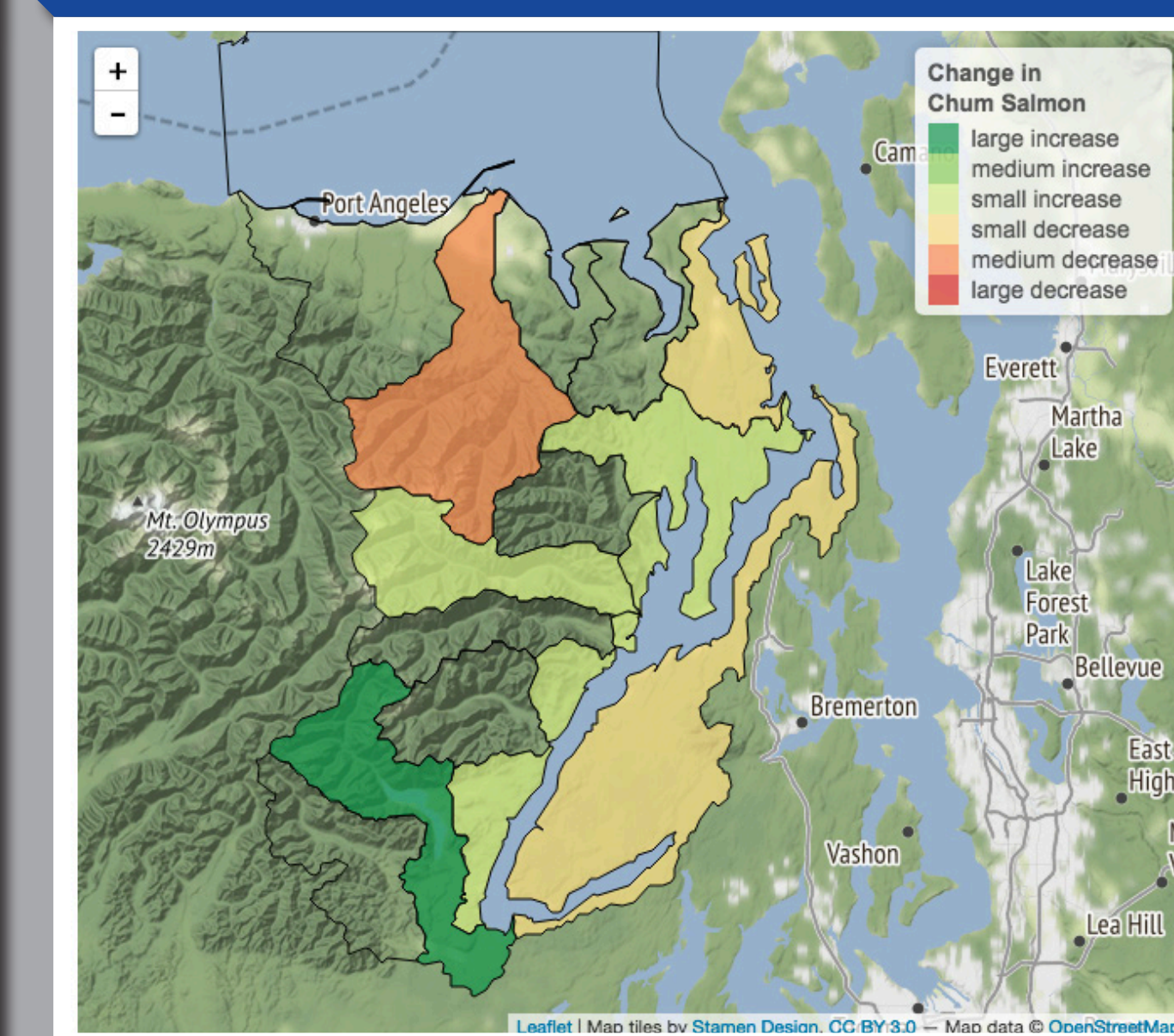**Leaflet** — We used OpenStreetMap and Leaflet to visualize connections in the data.

Shiny by RStudio — We created a Shiny web app to further extend the prototype's capabilities.

THE RESULT: INTERACTIVE

Select variable:
- Chum Salmon
- Turbidity
- TSS
- Investment

HUC level:
- 10
- 12

Select sites:
- PRISM projects
- EAGL projects
- Chum sites

Colorblind friendly: on

Choose a dataset to download: Chum Salmon

DOWNLOAD

Total Investment: small / medium / large

INFORMATIVE

Change in Chum Salmon: large increase / medium increase / small increase / small decrease / medium decrease / large decrease

WEB-BASED

Change in Turbidity: large decrease / medium decrease / small decrease / small increase / medium increase / large increase

PROJECT OUTCOMES & IMPACT

PROOF OF CONCEPT: We've shown our project partners that the **Open+Open concept is a viable pathway** for the Effectiveness and Evaluation Tool (EET).

KNOWLEDGE BUILT: We've helped our partners learn more about this data **and about what data they still need**.

BROADER IMPACT: We've demonstrated that open-source tools have great potential to **help curators of public data meet open-data needs**.

NEXT STEPS

REVIEW: The found data and statistical analyses used in our work will be fully vetted by our project partners and experts in the field.

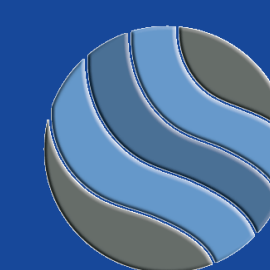**GROW:** Expand beyond the scope of this project, adding more data and more regions.

TRY IT OUT!

Explore **Opening Up the Data** (desktop, laptop, or tablet recommended):

https://ejclarke.shinyapps.io/capstone/

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PUGET SOUND PARTNERSHIP

WASHINGTON STATE Recreation and Conservation Office