

Effectiveness Monitoring Strategy for Pollution Control Plans

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Goals of Effectiveness Monitoring

To provide:

- a measure of progress
- feedback mechanism for adapting or refining: models, best management practices, nonpoint source plans, and permits.

Holistic Monitoring Strategy

❖ Monitoring Types:

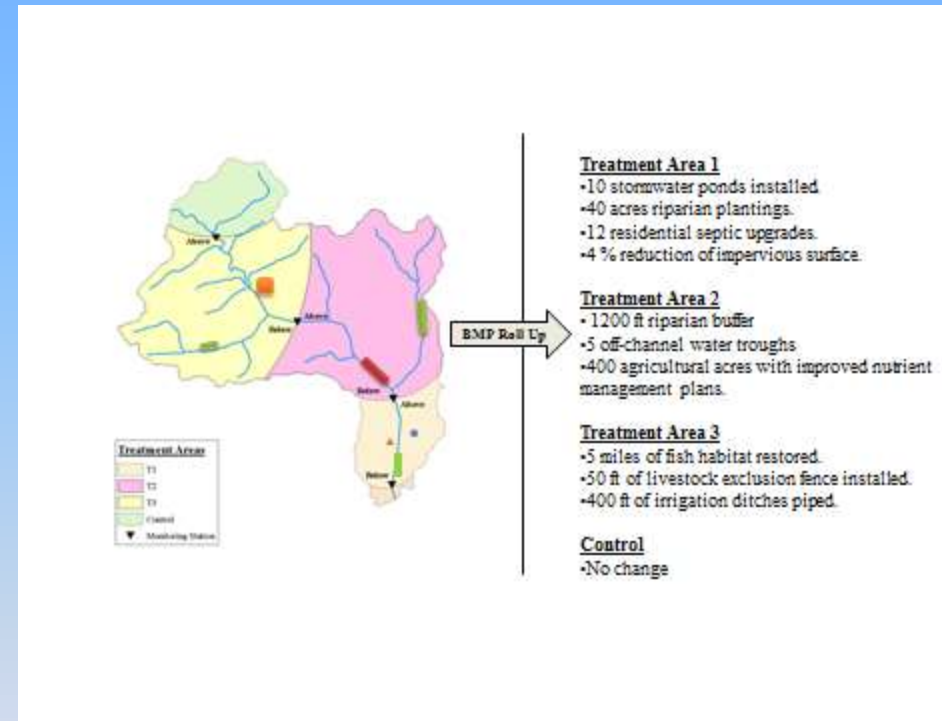
- **Ambient and continuous:** Water quality.
- **Watershed health:** Biological and habitat.
- **Land uses:** Changes over time.
- **BMP Monitoring:** What, where and when?

❖ Questions

- **Status:** How healthy is the watershed?
- **Source Identification:** What can be done to improve stream health?
- **Trends:** Are conditions improving over time?
- **Cause and Effect:** Are improvements linked to activities?

Watershed Study Design

- A multi-year sampling approach
- Leverage existing statewide monitoring programs
 - Consistency allows comparison of results between waterbodies statewide.
- Track all restoration activity
 - Projects support both water quality and salmon recovery efforts.
- Data driven adaptive management
- Implemented in “real time” through data review and web reporting.



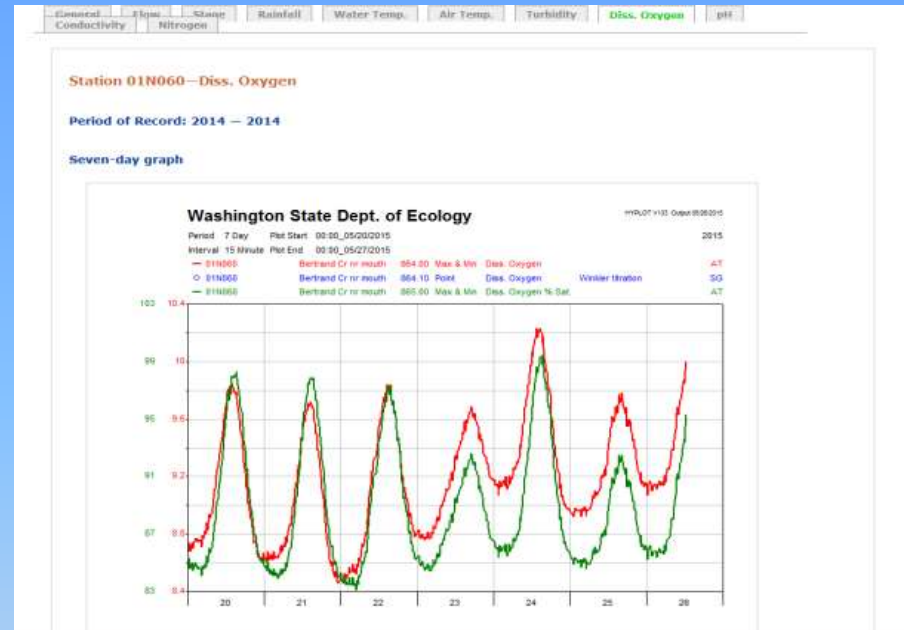
Parameters

Continuous Water Quality

- Nitrogen
- pH
- Dissolved oxygen
- Flow
- Temperature
- Turbidity
- Rainfall

Watershed Health Assessment

- Habitat
- Macroinvertebrates
- Periphyton



Water Quality

DO, pH, Temp, P, N, Cond, Cl,
Invert score, Fecal coliform,
Turbidity, Suspended solids

% Substrate by size, Embeddedness,

Sediment

Bed stability, Bank instability

Channel/
Floodplain
Structure

Fish cover by type, Pool area,
Depth, Width, Area,
Quantity of side-channels,

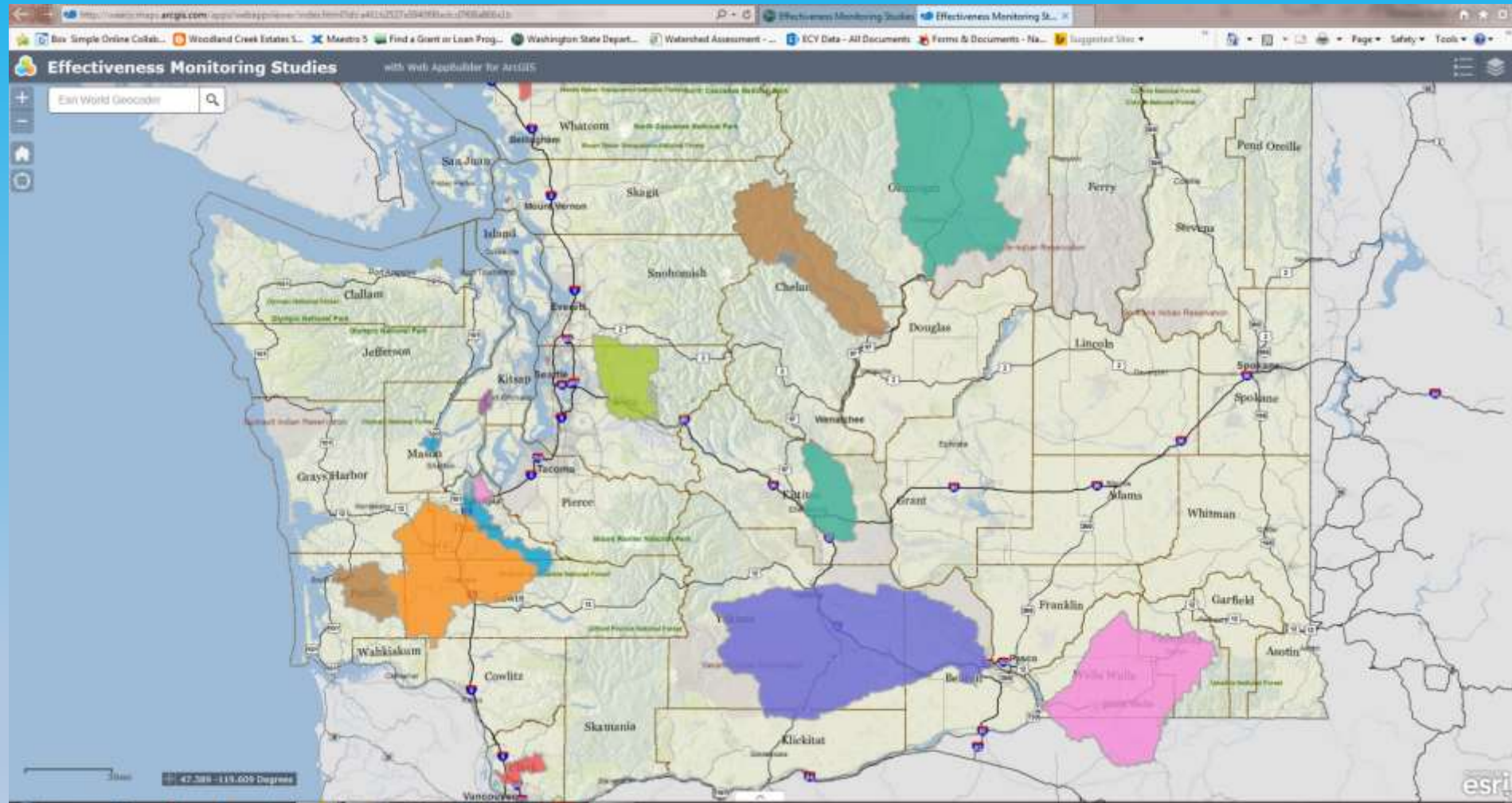
Wood pieces/km
Wood volume

Large
Woody
Debris

Riparian vegetation structure
Canopy cover
Riparian disturbance
by land use category

Riparian
Conditions

Effectiveness Monitoring Studies



Henderson Inlet 2006-2014

Project Goals:

Determine effectiveness of TMDL implementation activities

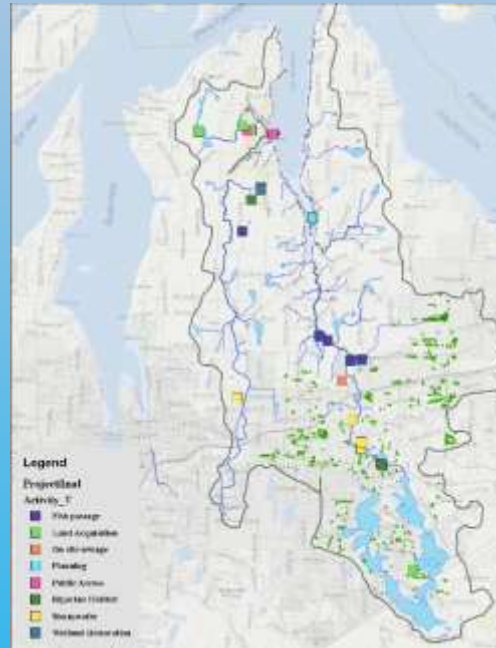
Ambient monitoring

- Fecal coliform

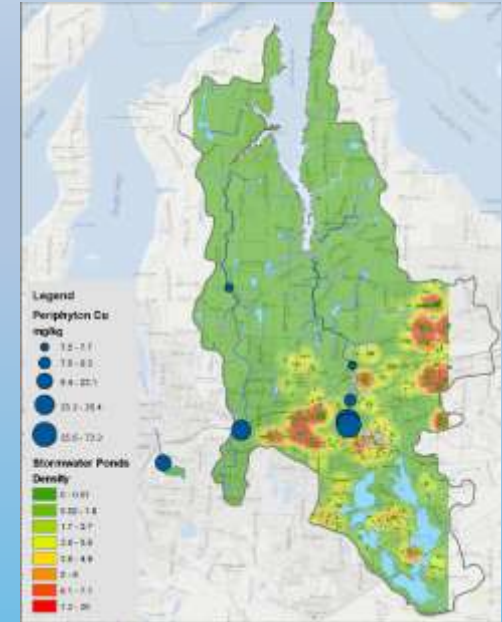
Watershed Health Monitoring

- Habitat
- Macroinvertebrates
- Periphyton

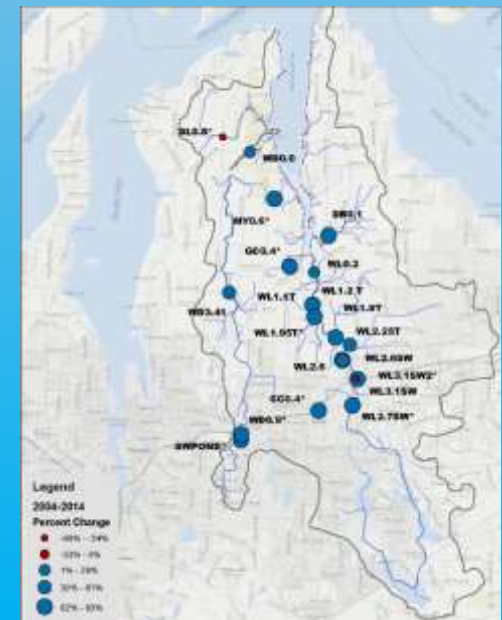
Actions



Periphyton Metals



Fecal coliform reductions



Response variables

Bertrand Creek Baseline 2013-2016

Project Goals:

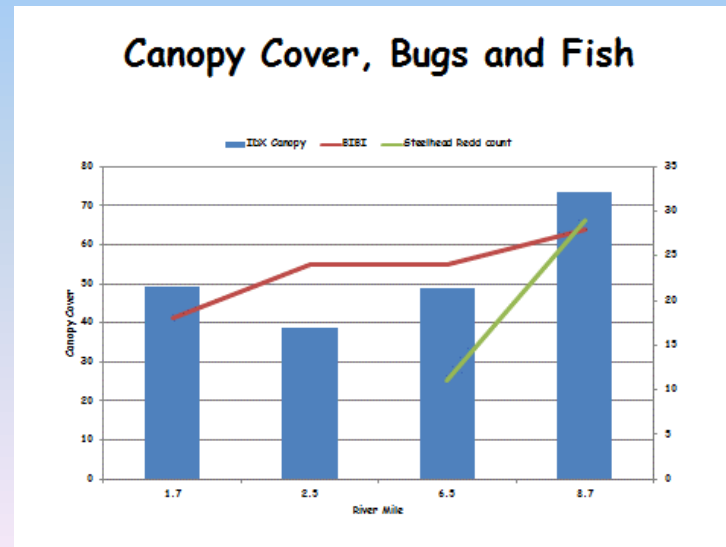
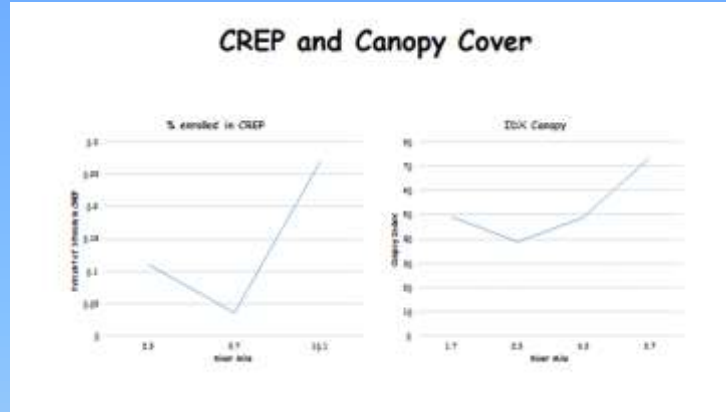
Determine effectiveness of changes in agricultural land use practices

Ambient and continuous monitoring

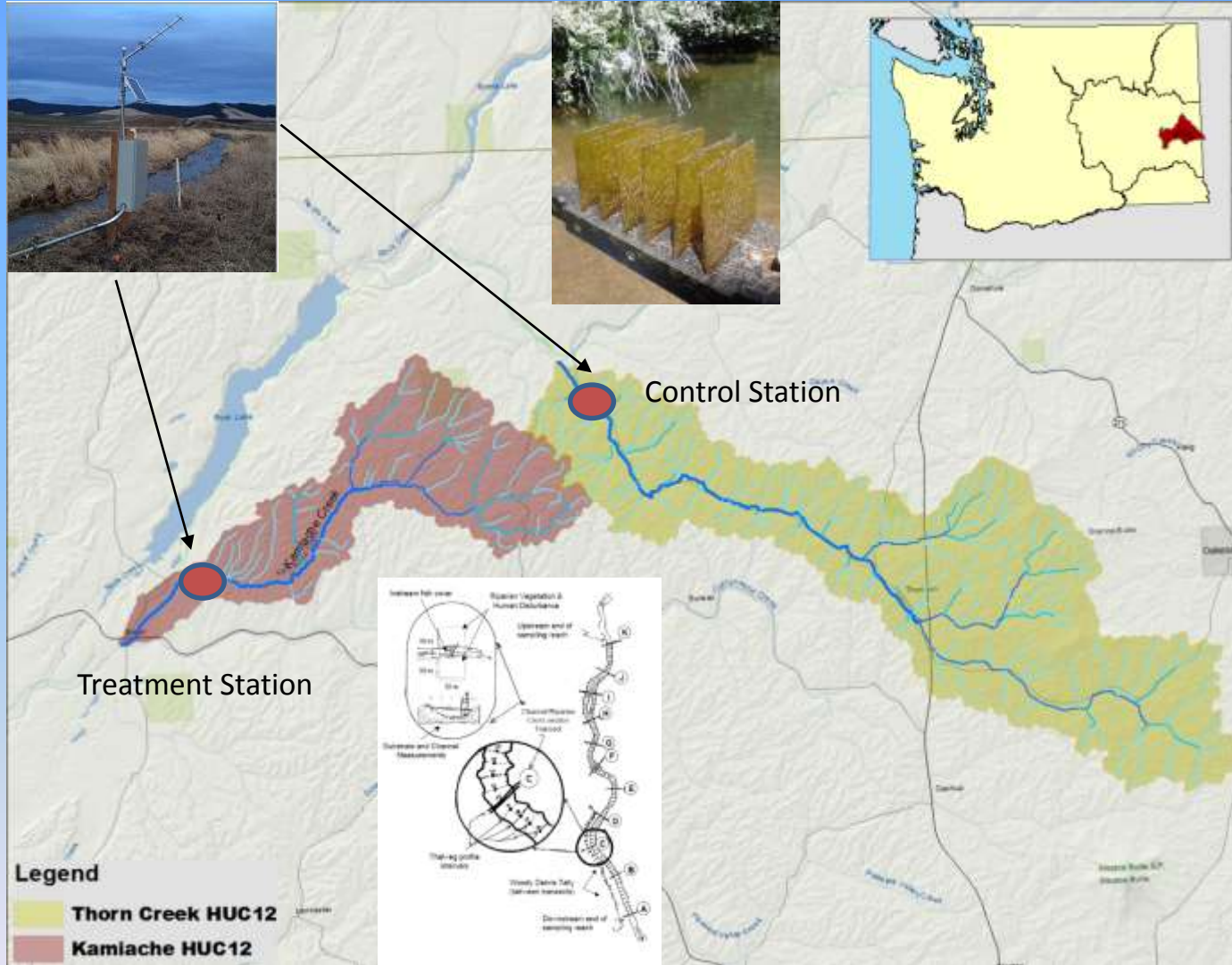
- Nutrient Load
- Sediment Load

Watershed Health Monitoring

- Habitat
- Macroinvertebrates
- Periphyton



Kamiache Creek 2016-



Project Goals:

Measure sediment and nutrient loads over time in response to changes in land use practices (till to no-till).

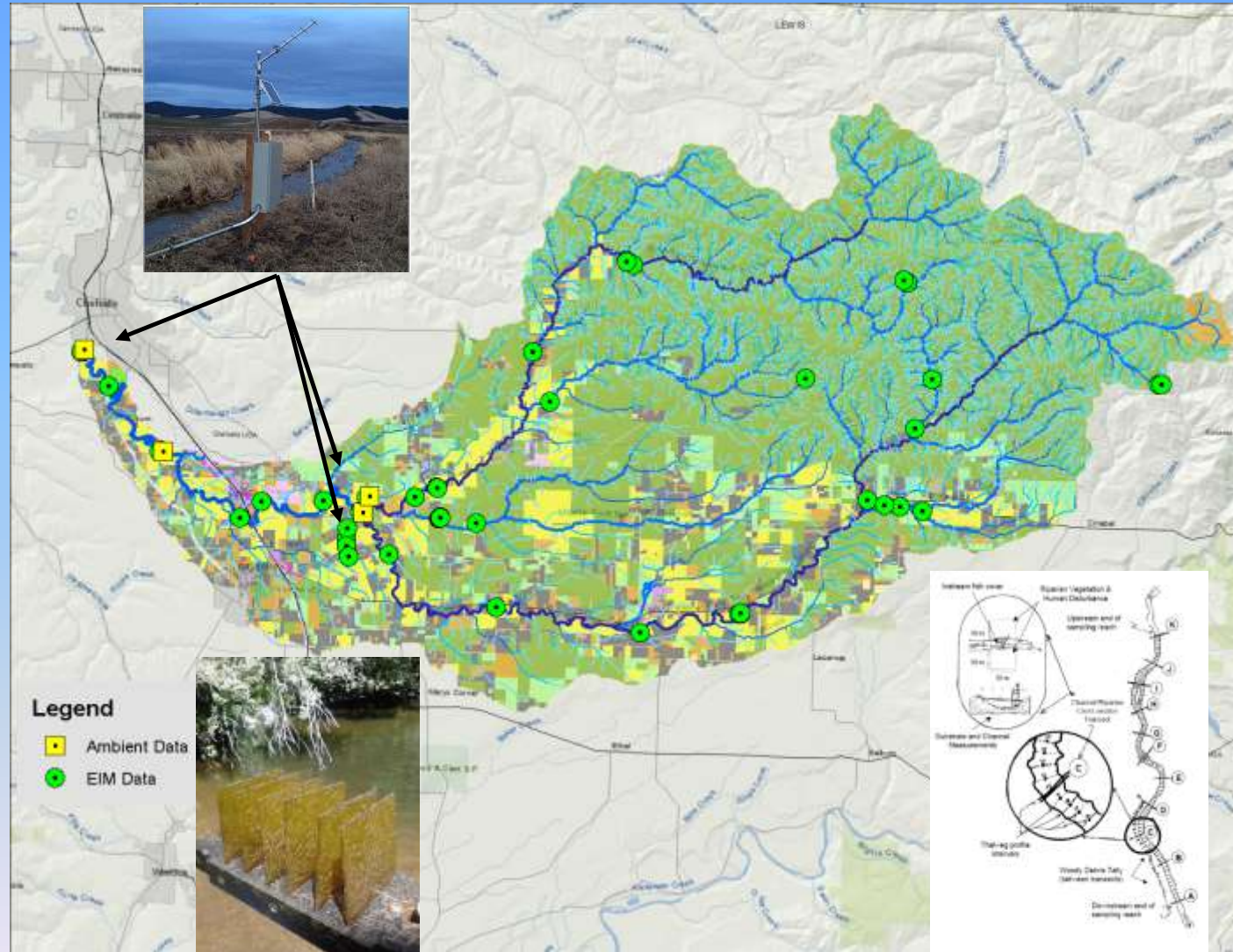
Ambient and continuous monitoring

- Nutrients
- Sediment
- Discharge
- Rainfall

Annual Watershed Health Monitoring

- Habitat
- Macroinvertebrates
- Periphyton
- Fish/amphibians

Newaukum River 2016-



Project Goals:

Support implementation of TMDL and other restoration activities...other

Ambient and continuous monitoring

- Nutrients
- Sediment
- Discharge
- Rainfall

Watershed Health Monitoring

- Habitat
- Macroinvertebrates
- Periphyton
- Fish/amphibians

Next Steps

Layers

- Pmetals
- Fecal reduction needed 2014
- Fecal % change from target
- Fecal 2014 results >
- NHD >
- HUC12 >

1. Build partnerships

- Connect with other monitoring efforts
- Partner with fish folks
- Develop monitoring plan

2. Tools for making informed decisions

- Data driven adaptive management
- Web reporting of results

Questions?

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