

Tribal-Focused Environmental Risk and Sustainability Tool:

Tribal-FERST



Presentation by EPA's Office of Research and Development
at the

2016 EPA STAR Tribal Program Review

RTP, NC

September 21, 2016

Acknowledgments

- Pleasant Point Passamaquoddy tribe
 - Urgent-VC Consultants
- United South and Eastern Tribes (USET)
- National EPA-Tribal Science Council
- EPA Tribal-FERST Development Team
 - Office of Research and Development (e.g., NERL, OSP, NRMRL)
 - Region 1 GIS and IT team
 - Office of Chemical Safety and Pollution Prevention (OCSP)
 - National Computing Center (NCC) and Office of Environmental Information (OEI)
 - Contractors through ORD, NCC, OEI

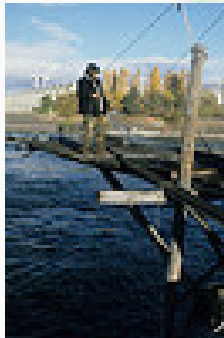
Background

- Tribes face unique environmental challenges, and seek accessible tools for assessing issues, data, and solutions
- Tribal-FERST concept originated from issues raised at tribal session of 2009 EPA cumulative risk workshop and further discussions at the National Tribal Science Forum in 2010
 - Tribal-specific sampling strategies
 - Representative dietary data collection
 - Physical and spiritual health
 - Relevant exposure pathways
 - Relevant activity data
 - Critical ecological services



What Is Tribal-FERST?

- A Web-based, geospatial environmental decision support tool designed to support tribes with best available human health and ecological science.
- A collaboration, an opportunity to link EPA research to tribal environmental needs through a collaborative partnership approach



Tribal-FERST Status and Highlights

- Included in EPA activities for White House Open Government initiative
- Beta version available to all tribes
(<https://www.epa.gov/healthresearch/tribal-focused-environmental-risk-and-sustainability-tool-t-ferst>)
- Public fact sheet available on EPA website
- Initial pilot ongoing with Pleasant Point Passamaquoddy Tribe in ME
- Collaborating with United South and Eastern Tribes (USET)
- Ongoing human health and eco. research to populate Tribal-FERST
- Tribal data inventory for Tribal-FERST developed by ORD and OCSP
- Key tool in EPA ORD's Sustainable and Healthy Communities (SHC) Research Program, Community Public Health project

A Collaborative Approach

➤ INTERNAL

- EPA Office of Research and Development (NERL, OSP, NRMRL)
- National EPA-Tribal Science Council
- OCSPS IO and Toxics Workgroup
- Regional Science Liaisons

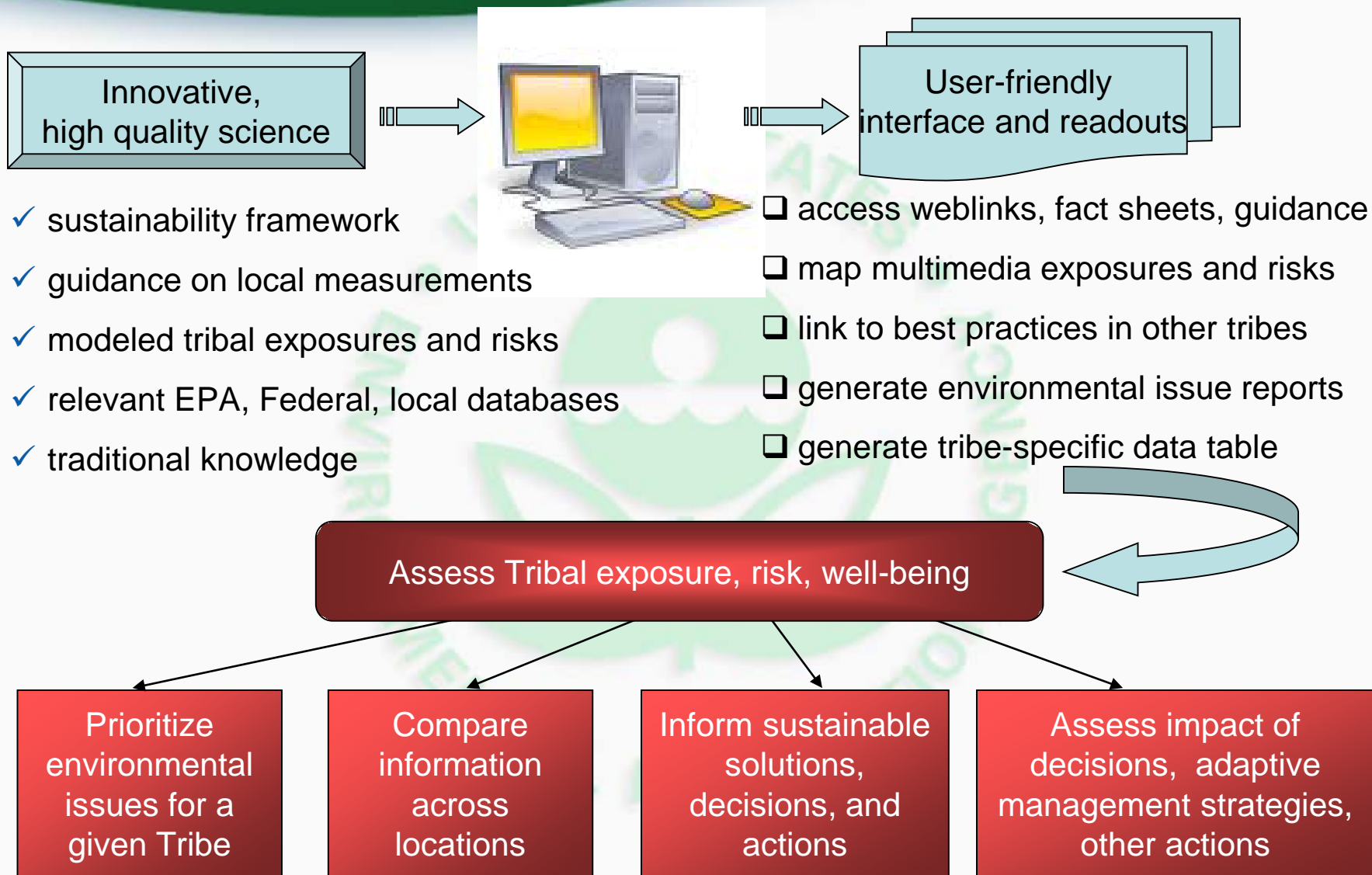
➤ EXTERNAL

- National EPA-Tribal Science Council
- National Tribal Science Forum
- United South and Eastern Tribes
- Passamaquoddy Pleasant Point ME Tribe; sustainability consultants
- Tribal Colleges and Universities
- National Tribal Toxics Committee
- Regional Tribal Operations Committee - Region 9

Tribal Stakeholder Feedback

- Requested feedback on Tribal-FERST prototype
 - Solicited collaborative input via Tribal Science Council
 - Received feedback from August 2011 through November 2011
 - Usability, accessibility, Tribal Inventory content
- Feedback incorporated in July 2012 Beta Version 1.0
 - Improved accessibility
 - Improved maps, including local data feature
 - Added tribal-specific links to pages and databases

Tribal-FERST



Planned Products

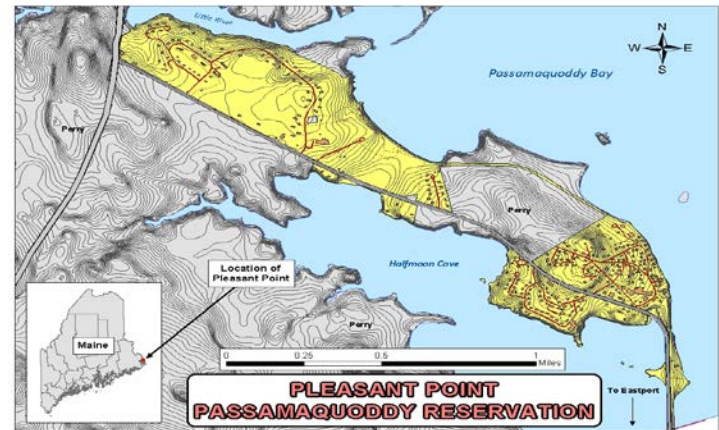
- **Methodology** to build capacity, match tribal issues with best available science
- User-friendly, science-based tribal environmental **decision support tool**
- National tribal **data inventory** to inform and populate Tribal-FERST
- Results from **pilot projects**
 - answers to questions of tribal interest for priority environmental issues
 - improved content and user interface based on pilot collaborators' feedback
 - *a phased pilot approach will be taken, based on available resources*

Tribal-FERST Pilot Approach

- Elicit tribal environmental issues and questions of concern
- Identify indicators of interest and available data sources
- Assess needs for data collection, analysis, modeling, mapping, research
- Collaboratively design, populate, and apply Tribal-FERST to answer the tribe's questions
- Enhance Tribal-FERST based on pilot lessons learned, to make the tool broadly applicable
- Generate Tribal-FERST reports and communicate findings

Pleasant Point Passamaquoddy Tribal Issues of Concern

- Sea level rise from climate change
- Solid waste management
- Subsistence diet
- Water quality: nonpoint source pollution in Tribal wetlands, drinking water
- Softwood forestry converting to hardwoods; sugar maples adversely impacted
- Impacts of invasive southern species on NorthEast Blueberry Co
- Health: mortality, asthma, CV disease, diabetes, cancer
- Indoor air: smoking, wood stoves, radon, mold, poor “home management”
- Ambient air pollution
- Energy: home energy (solar/green homes), energy self-sufficiency
- Acidification of ocean and impacts on shellfish



Example #1: Informing Adaptive Management Strategies Related to Climate Change

➤ Tribal concerns

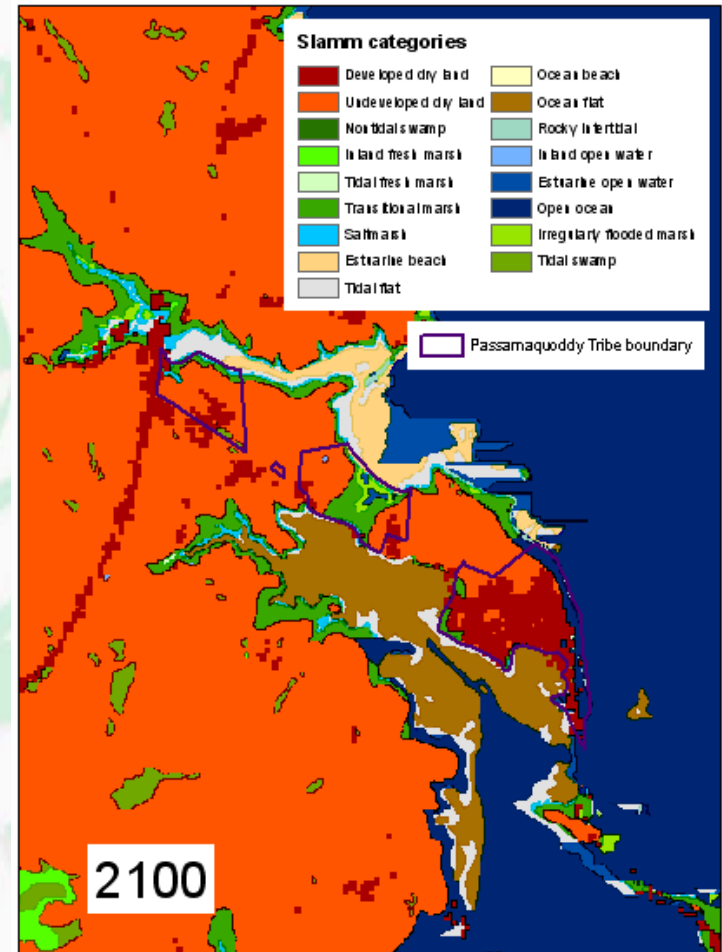
- Rising sea levels
- Beach erosion near Housing Authority Building, Treatment Plant
- Some homes exposed
- Incursion of salt water into sensitive tidal marshlands

➤ Tribal-FERST Science

- EPA/ORD modeling for rising sea level estimates
- Nationally available data from Atlas and other Federal sources
- Local data from public sources or tribal partners

Example Climate Change Modeling Results for Pleasant Point Passamaquoddy ME Tribe

- One possible future
- EPA ORD SLAMM (Sea Level Affecting Marshes Model) modeling
- Linkage between ORD National Atlas of Sustainability and Tribal-FERST
- Shows impacts of changes in land characterization due to climate change



Maps are about 3 miles x 3 miles, Projection UTM Zone 19
Modeling by EPA/ORD C. Erickson and D. Heggem

Example #2: Informing Risk Management Decisions Related to Traditional Diet

➤ Tribal Concerns

- heavy metals, dioxins, mercury exposures
- local marine food sources used for subsistence
- part of tribal cultural practices
- contaminants linked to health outcomes of concern to tribe: mortality, cancer

➤ Tribal-FERST Science

- ORD SHEDS Exposure Modeling
- Nationally available fish tissue concentration data
 - National Listing of Fish Advisories
 - EPA National Lakes Study
 - EPA National Rivers and Streams Assessment: many toxicants
 - USGS National Water-Quality Assessment Program: mercury
- Local data
 - Fish consumption survey
 - Hg, heavy metals analysis of mackerel, scallops, porpoise; Cd in Moose liver



Tribal-Focused Exposure and Risk Screening Tool

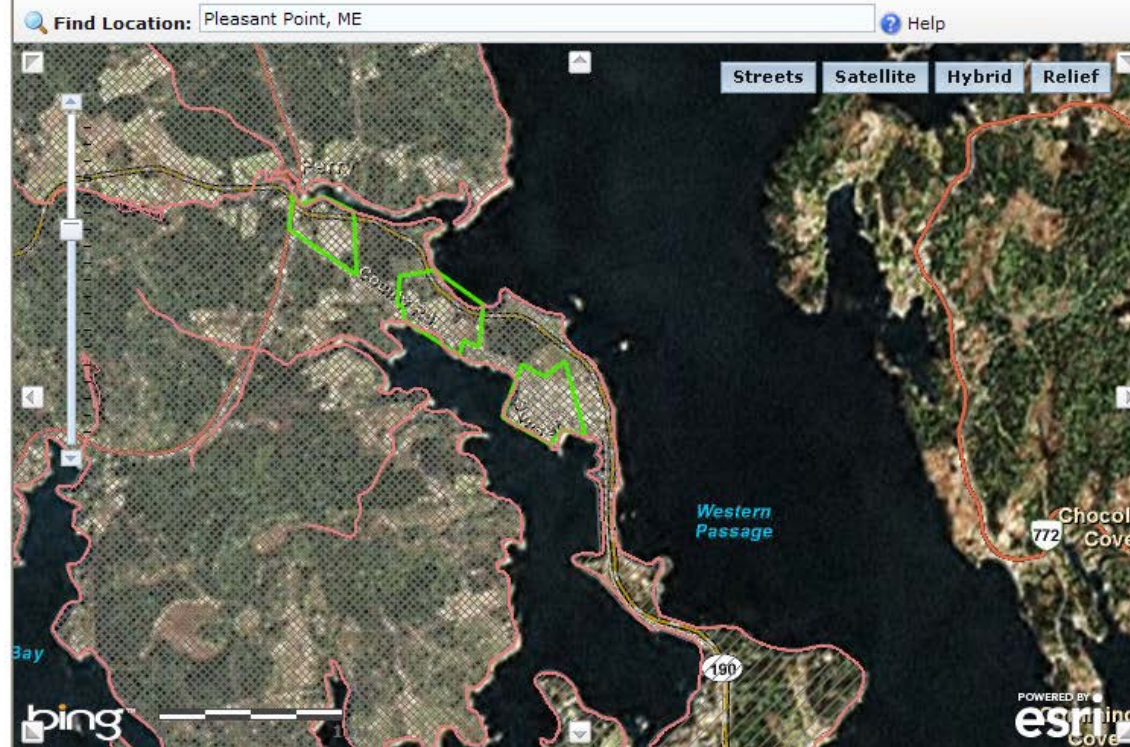
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You are here: [EPA Home](#) » [T-FERST](#) » View Exposure/Risk-Related Maps

To add your local data to the map, see the "Add Local Data" tab to the right of the map.

Example: [Local Maps](#) | [Methods for Measuring Local Exposures](#)



Menus Legend

Air Water **Food** Multimedia

- Fish Consumption Advisories
- Fish Tissue Samples

Please note that some layers are only visible when zoomed in to the local level. We are working to improve the table of contents to let you know how far in you have to zoom to see each layer. For now, if you turn on a layer and the map remains blank, try zooming in. We appreciate your patience and understanding.

View Demographic Data

U.S. Census 2000 Data by Tract

- Percent Minority
- Percent Below Poverty Level
- Percent Age Less Than 6 Years Old
- Percent Age Less Than 18 Years Old
- Percent Age Greater Than 64 Years Old
- Percent Housing Units Built Before 1950
- Percent 25 Years And Over With Less Than A High School Degree
- Percent 25 Years And Over With A High School Degree
- Percent Linguistically Isolated Households
- Population of American Indian and Alaskan Native
- Population of American Indian and Alaskan Native Below Poverty Level
- Tribal Census Tracts (Census 2000)

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View Health Data

Add Local Data

Fish consumption advisories and Tribal census tracts

Dietary exposure modeling (e.g., using EPA SHEDS-Dietary model), with local fish tissue concentrations and tribal fish consumption data as inputs, can inform tribal risk reduction decisions.

[Print As-Is](#)

T-FERST Home

USE T-FERST FOLLOWING COMMUNITY GUIDANCE

-- OR --

SELECT INDIVIDUAL OPTIONS:

Consider/Identify Environmental Issues

Access Factsheets for Issus of Concern

Visualize Exposure / Risk-Related Maps

Generate Environmental Issue Profiles

Prioritize Your community's Issues

Explore Potential Solutions

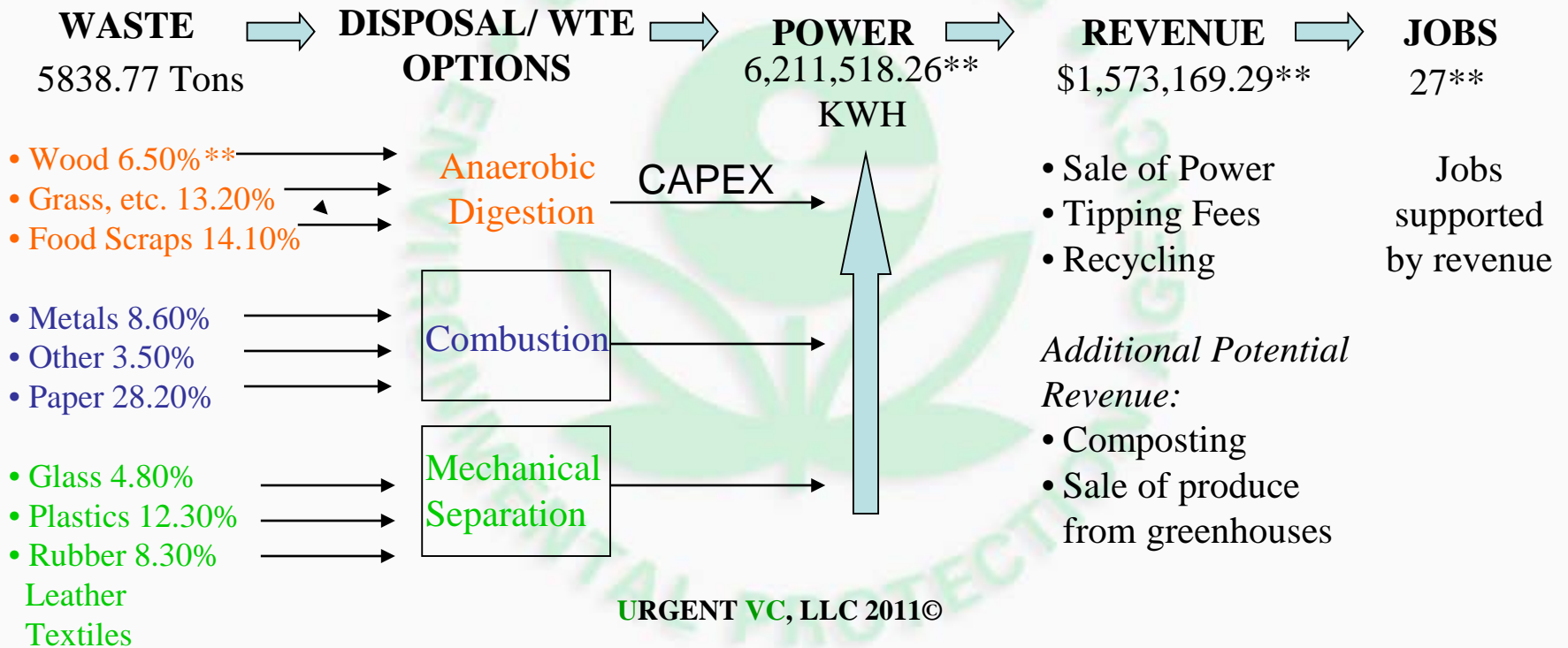
Access Other Community Tools

Provide Feedback / Contact US

About T-FERST

Example #3: Informing Solid Waste Decisions

- ORD working with Tribe and sustainability consultants to enhance waste management decision tool for Tribal-FERST

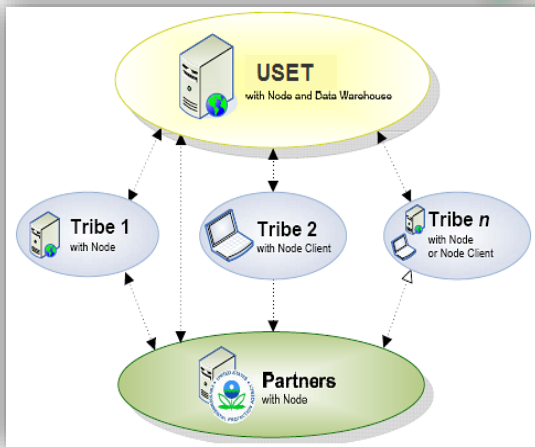


* Waste Management Logic Model developed for UVC Client

** All figures, based on annual tonnage, are accurate, as derived from industry sources

Example #4: Linking Tribal-FERST with USET Tribal Water Quality Database and Exchange Node

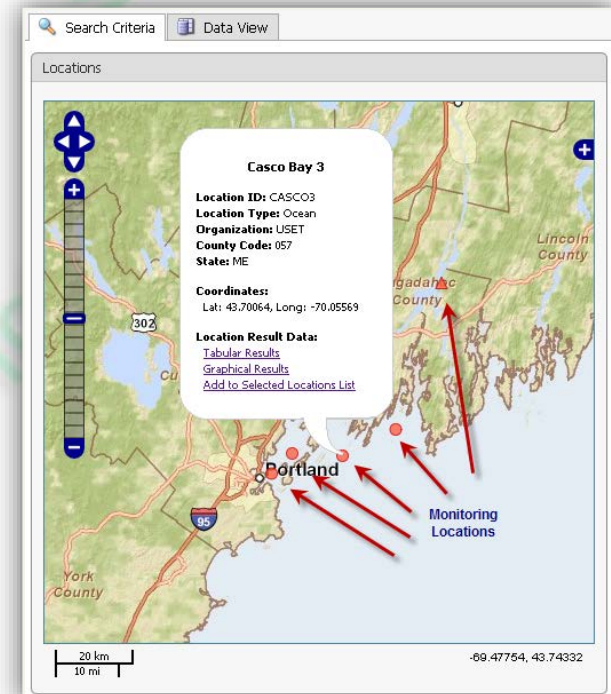
- Tools used by USET members to manage and submit water quality data to EPA STORET Warehouse and view in maps
- Uses series of nodes and node clients to store and share data
- Tribes in control of data sharing
- EPA supported



The screenshot shows the 'Activity Entry Form' interface. It contains several input fields for data entry, including:

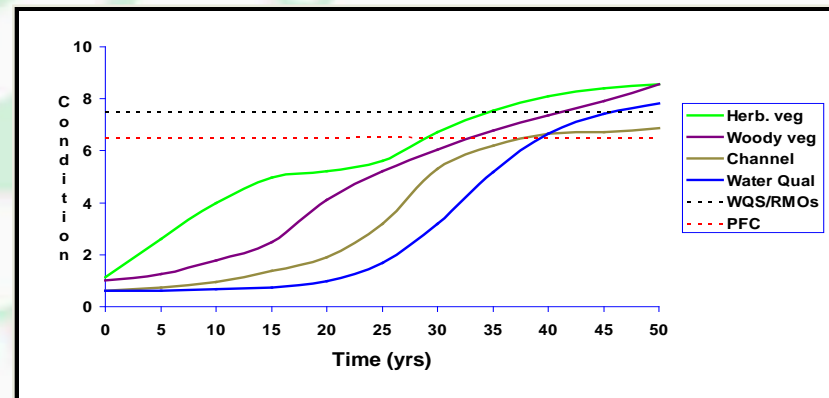
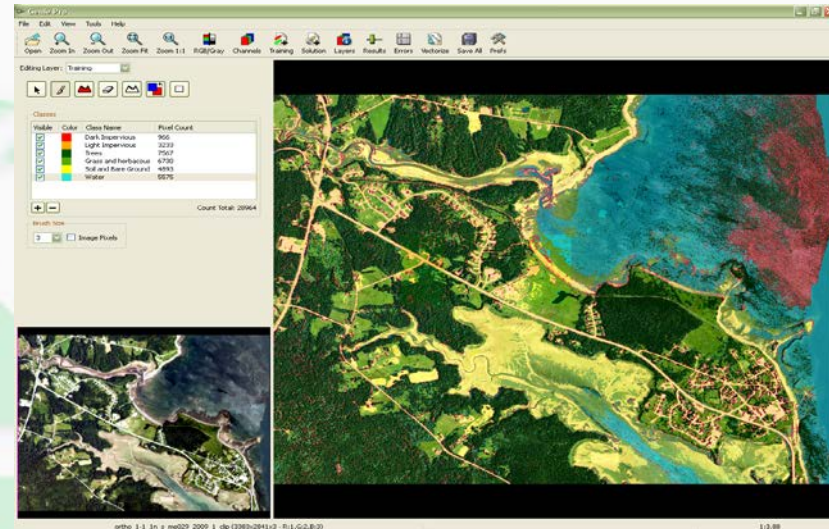
- Activity Identifier: BT 1.1
- Organization Identifier: EBCI
- Project Identifier: BT
- Monitoring Location Identifier: BT1
- Activity Type Code: Field Mon/Obs
- Activity Media Name: Water
- Activity Start Date: Monday, October 11, 2010
- Activity End Date: Enter (optional)
- Activity Start Time: Enter (optional)
- Activity End Time: Enter (optional)
- Activity Measure Value: Enter (optional)
- Sa Coll Method Identifier: Enter (optional)
- Sa Coll Equipment Name: Probe/Sensor
- Assemblage Sampled Name: Enter (optional)
- Share with Partners:

At the bottom, there are buttons for 'Update', 'Add/View Result', 'Reset', and 'Close'. A red asterisk indicates that red fields are required. Green arrows point to the search icon in the top right and the 'Add/View Result' button.



Other Examples Matching Tribal Needs with EPA Science

- What land use changes have occurred due to softwood forestry?
 - Remote sensing research
 - Atlas and Tribal-FERST linkage
- How has tribal land changed over time? How can vegetation patterns and water use be optimized?
 - Proper Functioning Condition (PFC) research (ORD-Region 9-Tribal collaborations)
 - Traditional Knowledge





Questions?