

Tribal-Focused Environmental Risk and Sustainability Tool:

Tribal-FERST



PRESENTERS:

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**NTTC Meeting
January 26, 2012**

Acknowledgments

- Passamaquoddy pilot collaborators and USET

- National EPA-Tribal Science Council

- EPA Tribal-FERST Development Team
 - Office of Research and Development (e.g., NERL, OSP)
 - Region 1 GIS and IT team
 - Office of Chemical Safety and Pollution Prevention (OCSPP)
 - National Computing Center
 - Contractors through EPA/NCC and EPA/ORD; U-VC Consultants

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 environmental decision support tool designed to equip tribes with the best available human health and ecological science.
- a collaboration, an opportunity for early tribal involvement and integration of unique tribal perspectives in a project that serves tribal needs
- draft prototype to solicit input available at: <https://cfpub.epa.gov/tferst>



Tribal-FERST

Innovative,
high quality science



User-friendly
interface and readouts

- ❑ access weblinks, fact sheets, guidance
- ❑ map multimedia exposures and risks
- ❑ link to best practices in other tribes
- ❑ generate environmental issue reports
- ❑ generate a tribe-specific indicator data table

- ✓ sustainability framework
- ✓ guidance on local measurements
- ✓ modeled tribal exposures and risks
- ✓ relevant EPA, Federal, local databases
- ✓ considering traditional knowledge for well-being

Assess Tribal exposure, risk, well-being

Prioritize
environmental
issues for a
given Tribe

Compare
information
across locations

Inform
sustainable
solutions,
decisions, and
actions

Assess impact of
decisions,
adaptive
management
strategies, other
actions

Planned Products

- ❖ A methodology to build capacity and match tribal issues with best available science
- ❖ A user-friendly, science-based tribal environmental decision support tool
- ❖ A national tribal data inventory to inform and populate Tribal-FERST
- ❖ Results from pilot project(s)
 - answers to questions of tribal interest for priority environmental issues
 - *a phased pilot approach will be taken, based on available resources*

EXAMPLE Tribal-FERST SCREENSHOTS



Tribal-Focused Exposure, Risk, and Sustainability Tool



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You are here: [EPA Home](#) » [T-FERST](#) » Access Factsheets for Issues of Concern



Access Factsheets for Issues of Concern

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Click on the hyperlinked issues below to view factsheets and web links currently available in T-FERST. These are organized by general information, sources, concentrations and exposures, risk and effects, and risk reduction categories.

Note: This initial list of issues is based on [EPA reports and community documents](#) and can be revised. Also, some of the concerns listed below appear under multiple categories.

-View Alphabetical List of Issues

- [1,3 Butadiene](#)
- [Acetaldehyde](#)
- [Acrolein](#)
- [Arsenic](#)
- [Asbestos](#)
- [Auto body Shops](#)
- [Benzene](#)
- [Brownfields](#)
- [Childhood Asthma](#)
- [Childhood Lead Poisoning](#)
- [Chromium](#)
- [Diesel Exhaust](#)
- [E.coli at Beaches](#)
- [Environmental Tobacco Smoke \(ETS\)](#)
- [Fine Particulates \(PM 2.5\)](#)
- [Fish Consumption](#)
- [Formaldehyde](#)
- [Hazardous Waste/Pharmaceuticals in Water](#)
- [Healthy Homes](#)
- [Land Use/Smart Growth](#)
- [Lead](#)
- [Mercury](#)
- [Methamphetamine Labs](#)
- [Microbes in Water](#)
- [Mobile Sources](#)
- [Mold](#)
- [Naphthalene](#)
- [Non-chemical Stressors \(Risk Modifying Factors\) TBD](#)
- [Outdoor Air - Near Roadway](#)
- [Ozone](#)
- [Polychlorinated biphenyls \(PCBs\)](#)
- [Polycyclic aromatic hydrocarbons \(PAHs\)](#)
- [Ports](#)
- [Radon](#)
- [Recreational Water Quality](#)
- [Residential Pesticides](#)
- [Runoff](#)
- [Schools](#)
- [Solid Waste Disposal/Recycling](#)
- [Stationary Sources](#)
- [Ultraviolet \(UV\) Radiation](#)

Do you have any input on the list of issues? Are there other fact sheets that can be included here?

T-FERST Home

USE T-FERST FOLLOWING COMMUNITY GUIDANCE

-- OR --

SELECT INDIVIDUAL OPTIONS:

View Draft Tribal Data and Information Inventory

Consider/Identify Environmental Issues

Access Factsheets for Issues of Concern

Visualize Exposure / Risk-Related Maps

Generate Environmental Issue Profiles

Prioritize Your Tribe's Issues

Explore Potential Solutions

Access Other Community Tools

Provide Feedback / Contact US

About T-FERST



Tribal-Focused Exposure, Risk, and Sustainability Tool



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View Draft Tribal Data Inventory

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A national Tribal data inventory is being compiled to inform the Tribal-Focused Exposure, Risk, and Sustainability Tool (T-FERST). The inventory will contain information from EPA and other Federal databases, and data available from EPA and tribal sponsored projects. Planned categories in the inventory include: weblinks to relevant agencies, programs, and websites; weblinks to and summary of data viewing and interpretation tools; weblinks on priority tribal environmental issues (e.g., fact sheets); summaries of tribal EPA Projects conducted, and available data; and guidance documents.

Below are links to the draft inventory spreadsheets, which will be reviewed and populated by interested collaborators, and provide specific information to include in future versions of T-FERST.

[Click Here for Tribal Data Inventory](#)

[Click Here for Inventory of Other Tribal Information](#)



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<https://cfpub.epa.gov/tferst/TribalData.cfm>
[Print As-Is](#)

Last updated on Wednesday, June 15, 2011

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Tribal-Focused Exposure, Risk, and Sustainability Tool



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You are here: [EPA Home](#) » [T-FERST](#) » Prioritize Your Tribe's Issues



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Prioritize Your Tribe's Issues

View Your Tribe's Data Table

* City is still under development.

	State	County	City *	Zip Code
Your Tribe	<input type="text" value="- Select State -"/>	<input type="text" value="- Select County -"/>	<input type="text" value="- Select City -"/>	<input type="text" value="04667"/>

How can the tribal data table be improved?

You may also specify reference community(ies); however, note that differences from one community to another do not necessarily mean that those are the most important issues for public health impact. For example, one issue can have a much greater health impact than another issue in the table for a given community

	State	County	City *	Zip Code
Reference Area (optional)	<input type="text" value="- Select State -"/>	<input type="text" value="- Select County -"/>	<input type="text" value="- Select City -"/>	<input type="text" value="04668"/>
Reference Area (optional)	<input type="text" value="- Select State -"/>	<input type="text" value="- Select County -"/>	<input type="text" value="- Select City -"/>	<input type="text"/>

*

* You can export your Tribal Data Table to Excel for entering your own additional issues/indicators, local data for these issues, and weighting factors

Access examples of risk ranking approaches

Below are links to resources for ranking the relative exposures and risks associated with different environmental issues. Inclusion of these in T-FERST does not necessarily imply endorsement of their use.

- [NACCHO's Protocol for Assessing Community Excellence in Environmental Health \(PACE-EH\) \(PDF\)](#) (111pp, 964KB, [About PDF](#)) [EXIT Disclaimer](#)
Task 10, "Rank The Issues", pp50-56.
- [CARE Detroit Best Practices](#)
- [CARE Pueblo Best Practices](#)

Are there examples of tribal risk ranking approaches that could be included here?

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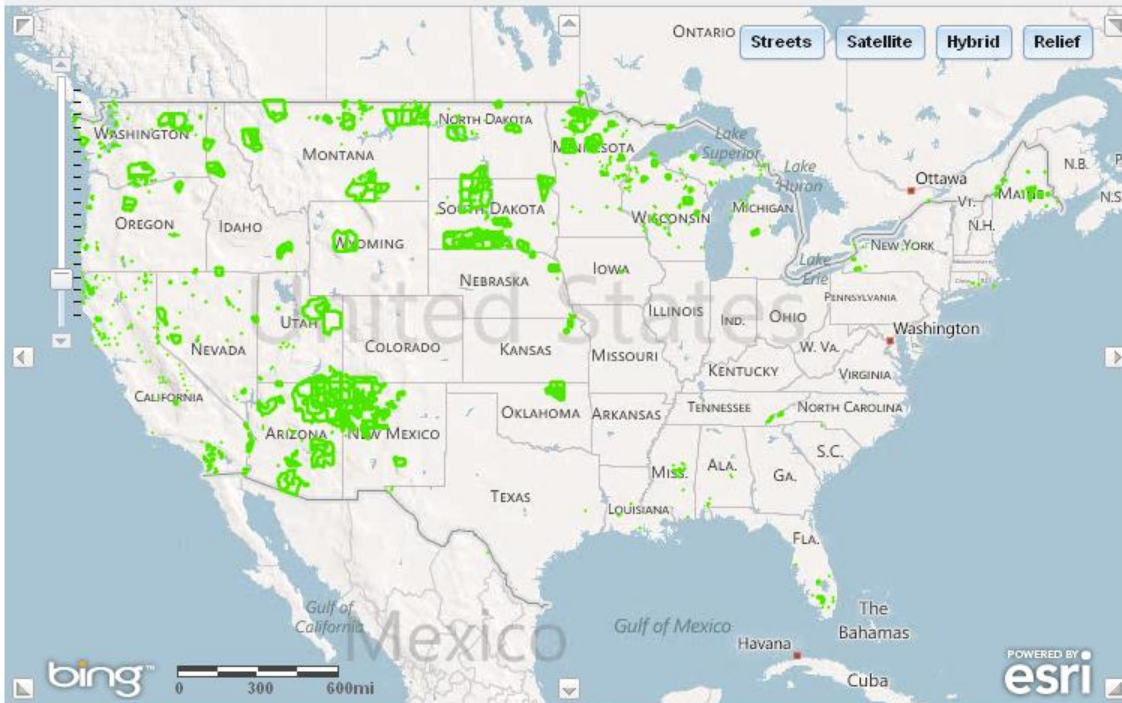


[Click here to email comments on this page](#)

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](#)

Find Location: Please enter a city, county, zip code, or address.



Menus Legend

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)

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 Health Data

Add Local Data

Link to Data Information

Quantitative data supplied by the [2005 National Air Toxics Assessment](#) (outdoor sources only)

* Note: 2005 NATA Acrolein estimates in southern CA have been revised since development of the T-FERST database/maps, and they will be updated in a future version of T-FERST. The most current data are available on the 2005 NATA website.

Return to [T-FERST Home](#)

Maps (under development) in the T-FERST prototype can allow the user to zoom in on your tribal location to view and overlay:

1. concentrations, risks, exposures, and sources of pollution;
2. demographic data at the US Census tract level; and
3. local data that can be added via a 'pushpin' tool. (but not saved in the T-FERST database)

Do you have any comments or suggestions on the maps or mapping interface?

- T-FERST Home
- USE T-FERST FOLLOWING COMMUNITY GUIDANCE
- OR --
- SELECT INDIVIDUAL OPTIONS:
- View Draft Tribal Data and Information Inventory
- Consider/Identify Environmental Issues
- Access Factsheets for Issues of Concern
- Visualize Exposure / Risk-Related Maps
- Generate Environmental Issue Profiles
- Prioritize Your Tribe's Issues
- Explore Potential Solutions
- Access Other Community Tools
- Provide Feedback / Contact US
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Tribal-Focused Exposure, Risk, and Sustainability Tool

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

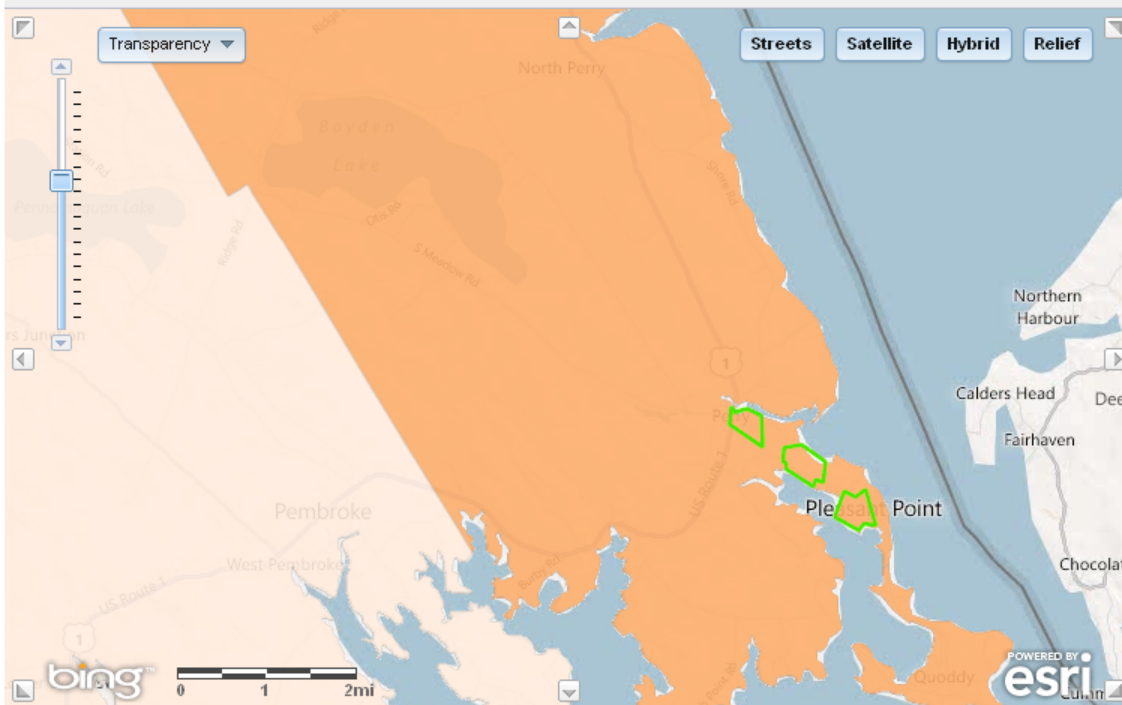


[Click here to email comments on this page](#)

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](#)

Find Location: ? Help



Menus Legend

View Concentrations, Exposures, and Risks

Please select an environmental issue to map:

- AIR
 - Cumulative Cancer Risk
 - Cumulative Non-Cancer Risk
 - Acetaldehyde
 - Acrolein*
 - Arsenic
 - Benzene
 - 1,3-Butadiene
 - Chromium
 - Diesel PM
 - Formaldehyde
 - Lead
 - Naphthalene
 - PAH
 - Estimated Concentration
 - Estimated Exposure
 - Estimated Cancer Risk

Estimated Cancer Risk (per Million)

- < 1
- 1 - 25

Quantitative data supplied by the [2005 National Air Toxics Assessment](#) (outdoor sources only)

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Prioritize Your Tribe's Issues

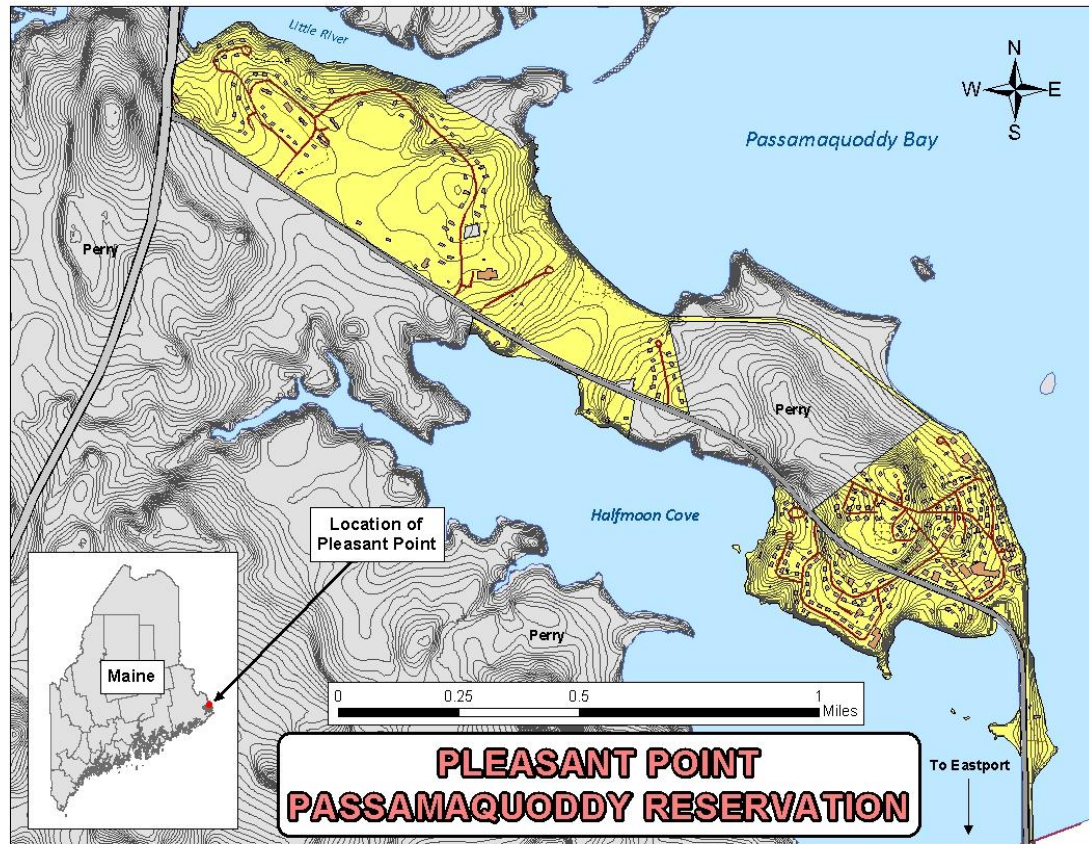
Explore Potential Solutions

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About T-FERST

Initial Tribal-FERST Pilot



http://www.wabanaki.com/location_map.htm

Example #1: *Matching Tribal Issue with Available Science*

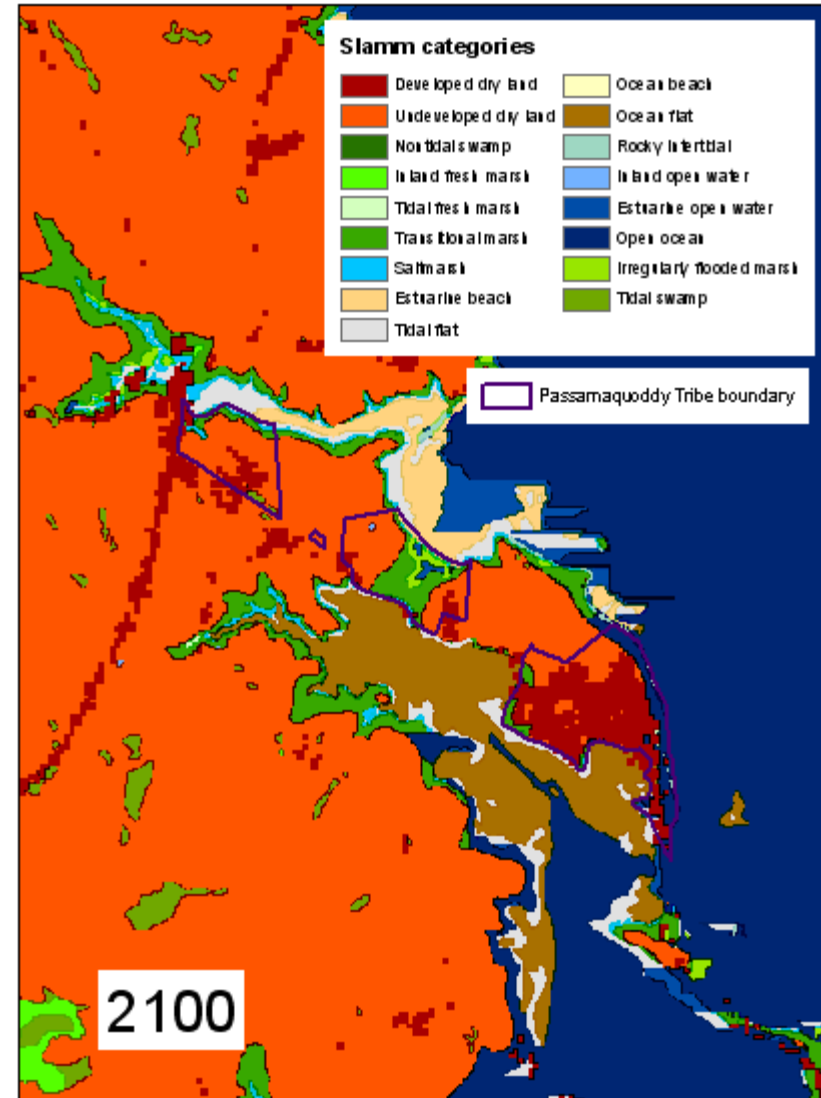
- Passamaquoddy Environmental Issue of Concern
 - Climate change:
 - Rising sea levels resulting in beach erosion especially near Housing Authority Building, Treatment Plant, some homes exposed, incursion of salt water into sensitive tidal marshlands
 - Nationally available data and models:
 - Rising sea level estimates, National Wetlands Inventory, National Digital Elevation Maps (USGS), National Landcover Database, NOAA tidal data
 - Local data
 - Geocoded locations of sites of concern
 - State or more locally assessed Digital Elevation Maps
 - Local identification of critical coastline features

Example Climate Change Modeling Results for T-FERST Consideration

EPA ORD SLAMM (Sea Level Affecting Marshes Model)
preliminary predictions



- One possible future
 - Tidal marshes are among the most susceptible ecosystems to climate change, especially accelerated sea level rise (SLR)
 - SLAMM simulates processes involved in wetland and shoreline changes during long-term sea level rise (up to yr 2100)
- Uses data layers from USGS, NWI (national wetlands inventory), national land cover data
- Tide inputs from NOAA Station (Eastport, ME)
- SLAMM default erosion and accretion rate
 - local data would be more accurate



NOTE: Model inputs and results can be refined.

Example #2:

Matching Tribal Issue with Available Science

- **Passamaquoddy Environmental Issue of Concern**
 - **Subsistence diets: heavy metals, dioxins, mercury exposures**
 - Local marine food sources used for subsistence and are part of tribal cultural practices
 - Contamination in these foods linked to health outcomes of concern to tribe: mortality, cancer
 - Nationally available fish tissue concentration data:
 - National fish consumption advisories
 - USGS National Water-Quality Assessment Program: mercury
 - EPA National Rivers and Streams Assessment: many toxicants
 - Local data
 - Fish consumption survey
 - Hg and heavy metals analysis of mackerel, scallops, porpoise, cadmium in Moose liver (Township study)



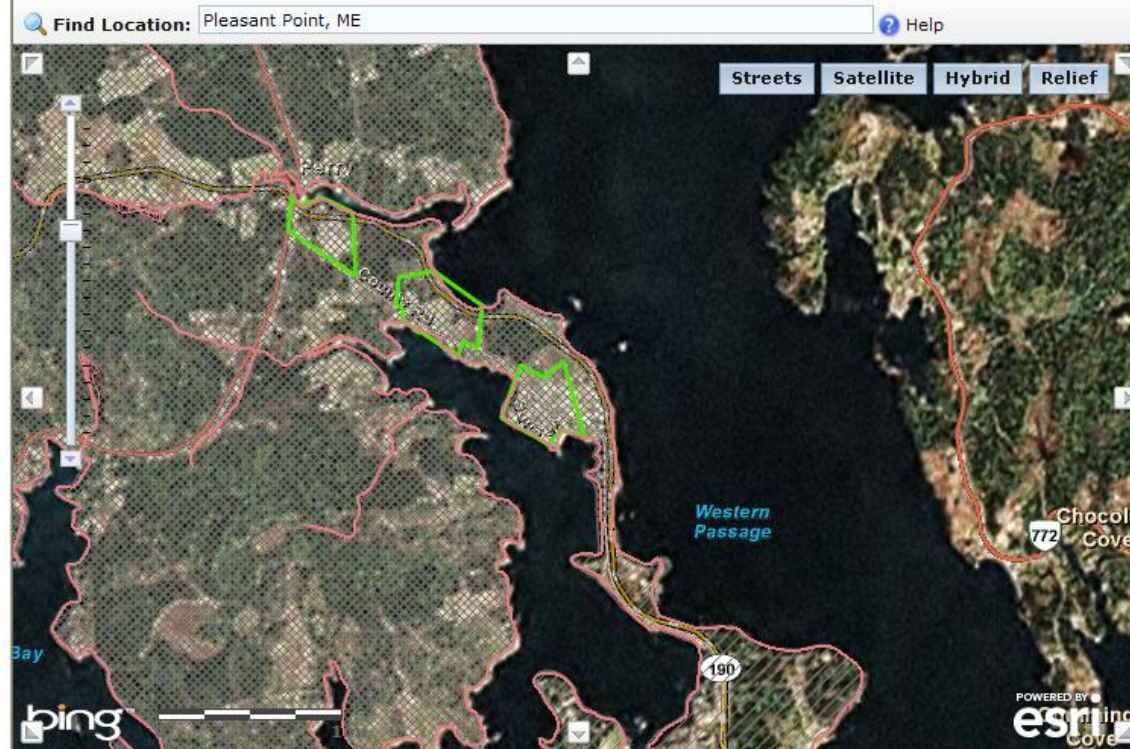
Tribal-Focused Exposure and Risk Screening Tool

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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

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U.S. Census 2000 Data by Tract

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- Percent Below Poverty Level
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- 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 population below poverty level

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.

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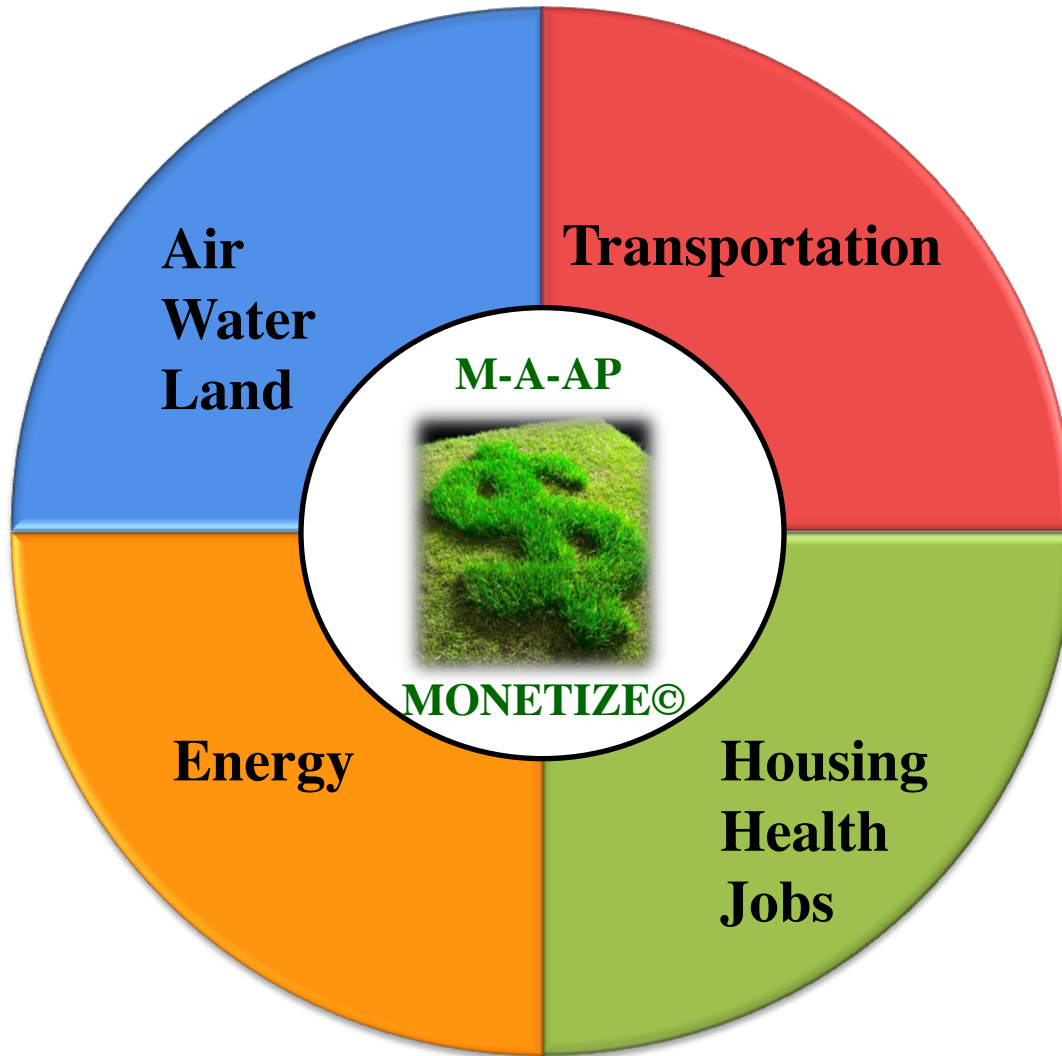
About T-FERST

Example #3:

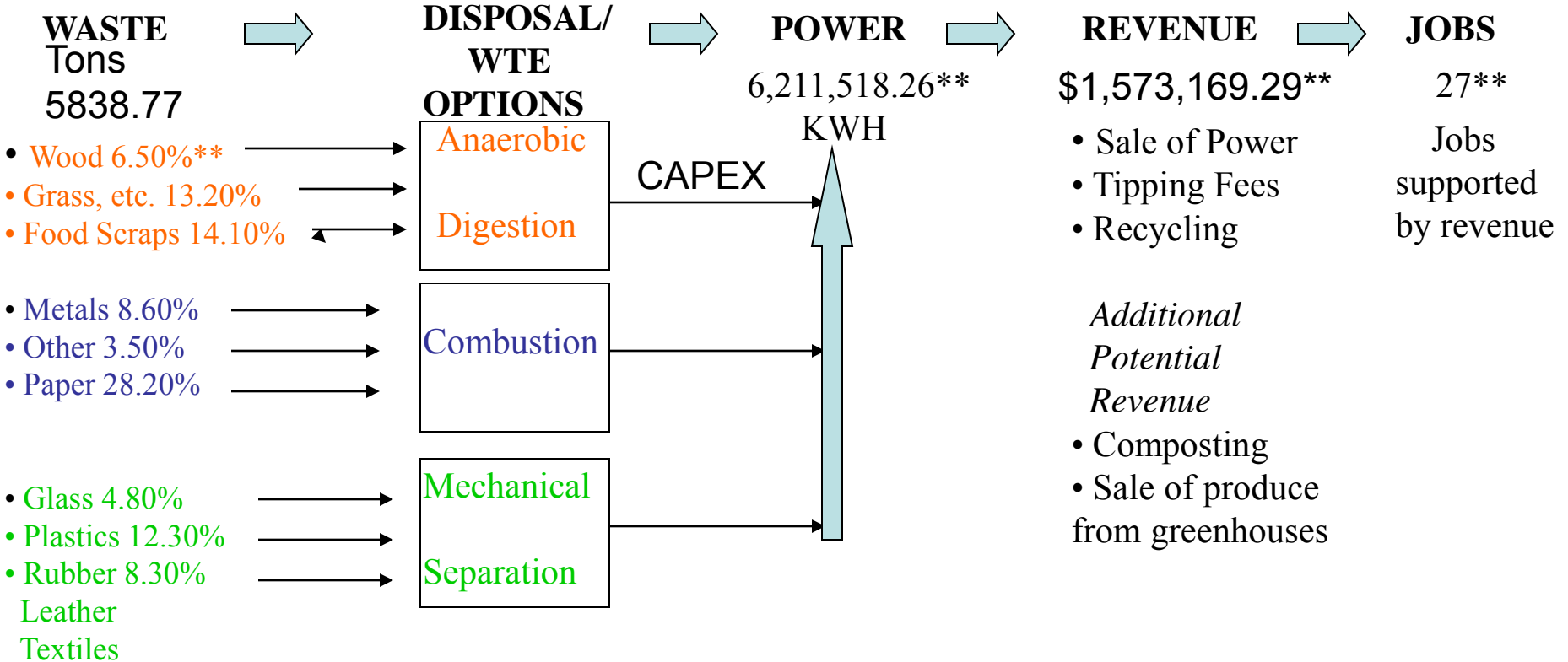
Matching Tribal Issue with Available Science

- Passamaquoddy Environmental Issue of Concern
 - Solid Waste
 - U-VC Consultants Methodology...

URGENT VC
SUSTAINABLE COMMUNITY CONSULTING



MONETIZING A SUSTAINABLE SOLUTION*



* **Waste Management Logic Model** developed for UVC Client

UVC-MONETIZING SUSTAINABLE SOLUTIONS-EXAMPLES

OPPORTUNITIES FOR SUSTAINABLE COMMUNITIES WITH CLEANTECH SOLUTIONS	POTENTIAL MONETIZED SUSTAINABLE SOLUTIONS	UVC TECHNICAL ASSISTANCE - Budget Analysis, - Municipal Comparison Mapping, - Best Practice Comparison Mapping, - Cost Savings Analysis and - Action Planning
RENEWABLE ENERGY AND POWER MANAGEMENT TECHNOLOGIES	GENERATE ENERGY CONSERVIE ENERGY PRODUCE NEW PRODUCTS, FOOD & RAW MATERIALS	-Waste to Energy: Sludge, Medical Waste, Solid Waste, Electronics, Organics -Community-scale renewable energy: Micro-Wind, Tidal & River Hydro, Solar -Clean tech commercial enterprise development (e.g. wood pellets etc.)
WASTE AND MATERIALS MANAGEMENT TECHNOLOGIES	WASTE TO ENERGY	-System repair innovation solution scan -System distribution solution scan -Flood Control solution scan
LOGISTICS AND TRANSPORTATION TECHNOLOGIES	IMPROVED COORDINATION OF SHIPPING AND TRANSIT SERVICES	-Software system solution scan -Key infrastructure solution scan
WATER AND AIR QUALITY MANAGEMENT AND MONITORING TECHNOLOGIES	IMPROVED WATER USAGE, WATER QUALITY AND AIR QUALITY	-Improved monitoring of water resources -Improved monitoring of air
SERVICES URGENT VC, LLC 2010©	MAP REGIONAL CO2 FOOTPRINT ATTRACT INNOVATIVE PROJECT FINANCING	-Create CO2 Trading Desk for Region and Monetize Savings -Create pooled services bids -Maximize Tax Credits, Bonds, -Impact Investing, Venture Capital and Loans

Sustainable Community Planning (SCP) Methodology



- ❑ **MAP** the community's sustainability profile, collect baseline data
- ❑ **ANALYZE** the data and identify sustainable improvements designed to reduce carbon impact and increase efficiency (energy, water and waste, etc.)
- ❑ **ACTION PLAN** to guide continuous, on-going, sustainable improvements to the three pillars of sustainability, **People, Planet, Profit\$**
- ❑ **MONETIZE**-turn sustainable solutions into revenue

Next Steps

- Provide Tribal-FERST url (<https://cfpub.epa.gov/tferst>) to all interested partners and stakeholders
 - compile comments and make changes based on feedback
- Solicit broad input on national tribal data inventory
 - assess which info available for inclusion in Tribal-FERST
- Compile and conduct research for priority tribal issues, and to support initial pilot(s)
- Populate/refine Tribal-FERST database and geospatial maps

NTTC Input and Feedback Welcome!



Disclaimer

Although this work was reviewed by EPA and approved for presentation, it may not necessarily reflect official Agency policy.

EXTRA SLIDES FOR QUESTIONS

Additional Passamaquoddy Environmental Issues of Concern

- Softwood forestry converting to hardwoods; sugar maples adversely impacted
- Impacts on NorthEast Blueberry Co (NEBCO) being invaded by southern grasses and insects
- Water quality: nonpoint source pollution in Tribal wetlands, drinking water
- Solid waste management
- Health: mortality, asthma, cardiovascular 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

Planned Products of T-FERST Project

Draft T-FERST Tribal Data Inventory

- National tribal data inventory being compiled by EPA OCSP and ORD
 - EPA and other Federal databases
 - data available from EPA tribal projects
- Categories
 - weblinks to agencies, programs, websites
 - weblinks to and summary of data viewing and interpretation tools
 - weblinks on priority tribal environmental issues (e.g., fact sheets)
 - summaries on tribal EPA Projects conducted, and available data
 - guidance documents
- Information compiled can be discussed, considered, and collected for inclusion in T-FERST

Planned Project Timeline

- June 2011: T-FERST prototype presented at annual TSC mtg; tribes will have access to provide feedback on tool design, mapping, and information needs; status and next steps for PPP pilot (Phase 1) project will be discussed
- September 2011: feedback from stakeholders and partners will be compiled and prioritized (based on available resources) to plan version 1; progress on Phase 1 pilot will continue
- June 2012: Phase 1 pilot and progress toward T-FERST version 1 will be presented at annual Tribal Science Forum; Phase 2 pilot(s) will be discussed, based on available resources
- September 2012: feedback from Phase 2 pilot(s) will be incorporated; T-FERST version 1 will be completed
- June 2013: Phase 2 pilot(s) and progress toward T-FERST version 2 will be presented at annual Tribal Science Forum or other key tribal meetings
- September 2013: feedback from pilots will be incorporated; T-FERST version 2 will be completed; future versions and tribal applications of T-FERST will be discussed

Initial Pilot Approach

- Elicit tribal environmental issues and questions of concern; identify indicators of interest and available data sources
 - What local data are available for priority issues?
 - What EPA and other databases are available for priority issues?
 - What information can be used to support the Passamaquoddy pilot, and what information can go in T-FERST?

- Assess needs and options for data collection, analysis, modeling, mapping, research
 - What data can be shared in a publically-accessible Web-based decision tool, and what data should not be shared?
 - What research or science (human health and ecological) is needed to fill in gaps for issues of concern?
 - How can sustainability methods be incorporated? linkage w/ U-VC efforts?

Initial Pilot Approach

□ Collaboratively design, populate, and pilot the T-FERST prototype to support the tribe's needs

- What should the user interface look like? How to revised the prototype T-FERST interface based on tribal input?
- How can we populate the tool with relevant tribal-specific data, weblinks, fact sheets, data, maps, guidance, best practices, other information (considering confidentiality)?
- How can we develop and apply T-FERST to answer questions of interest to the tribe?

□ Generate T-FERST reports and communicate findings

- ❖ How to best provide results and convey accessible information to answer questions of interest for priority tribal environmental issues?
- ❖ How to refine the tool and assess lessons learned for future pilots?

Data Metrics	Your Community 04667	National Average	Standard ¹	Data Info/Notes ¹	Reference Community 04668
Outdoor Air - Formaldehyde	0.5	1.7			0.5
Outdoor Air - Lead	0.0003	0.001			0.0003
Outdoor Air - Naphthalene	0.007	0.07			0.003
Outdoor Air - PAH	0.01	0.01			0.002
Outdoor Air - Near-Roadway (EPA Research Underway)					
Indoor Air - Radon (EPA Research Underway)					
Indoor Air - ETS (EPA Research Underway)					
Drinking Water - Arsenic (EPA Research Underway)					
Food - Methyl Mercury in Fish Consumption (EPA Research Underway)					
Multimedia- Childhood Lead Exposure					
Multimedia - Residential Pesticide Exposure					
Health Risk Estimates (in One Million)					
Cumulative Air Toxics Cancer Risk	15.7	49.8			15.6
Cumulative Air Toxics Non-Cancer Respiratory Risk (Hazard Quotient)	0.3	2.3			0.3
Cumulative Air Toxics Non-Cancer Neurological Risk (Hazard Quotient)	0.02	0.06			0.02
Outdoor Air - Acetaldehyde	1.4	3.3			1.6
Outdoor Air - Acrolein ²	0	0			0
Outdoor Air - Arsenic	0.3	1.3			0.3
Outdoor Air - Benzene	2.2	7.4			2.2
Outdoor Air - Butadiene	0.4	1.9			0.4
Outdoor Air - Chromium	0.09	1.4			0.1
Outdoor Air - Diesel PM	0	0			0
Outdoor Air - Formaldehyde	6.3	22.5			7.03
Outdoor Air - Lead	0	0			0
Outdoor Air - Naphthalene	0.2	2.3			0.1
Outdoor Air - PAH	1.2	1.5			0.3
Outdoor Air - Near-Roadway (EPA Research Underway)					
Indoor Air - Radon (EPA Research Underway)					
Indoor Air - ETS (EPA Research Underway)					
Drinking Water - Arsenic (EPA Research Underway)					
Food - Methyl Mercury in Fish Consumption (EPA Research Underway)					
Cumulative Health Risk: Lung Cancer (EPA Research Underway)					
Cumulative Health Risk: Asthma (EPA Research Underway)					
Cumulative Health Risk: Early neurotoxicity effects (EPA Research Underway)					
Health Content Areas (under development)					
Asthma				https://tracking.publichealth.maine.gov/	
Birth Defects				https://tracking.publichealth.maine.gov/	