WQX User Call
June 24, 2021

There were approximately 36 participants.
The next WQX User call is July 22, 2021 4th Thursday of month..

Agenda:

1. ORD Freshwater Explorer - Susan Cormier, ORD
2. WQX Project Status Report
    a) Frequent Questions about WQX webpage
    b) Quick Tips:
        i. Organizational-owned Sample Collection Methods
        ii. National Sample Collection Method / Context Registration
3. Water Quality Portal Project Status Report
    a) WQP download profiles workgroup meetings
    b) Report WQP Tool issues using URL: "Copy To Clipboard"
    c) Show Web Services Call appended with a new parameter option (&counts=no) may resolve certain WQP service timeouts / 405 Errors

1. ORD Freshwater Explorer - Susan Cormier, ORD

Susan used today's presentation to demonstrate the Freshwater Explorer and highlight what it is useful for. The Freshwater Explorer leverages data from the WQX. The interface is similar to Google Maps and allows users to layer the WQX data on top.
The **Freshwater** Ecosystems **Explorer** is a free and easy-to-use data platform providing up-to-date, high-resolution geospatial data showing the extent to which **freshwater** ecosystems change over time. EPA's Freshwater Explorer provides information on the status of water resources for networks of streams in the U.S. color-coded for measured freshness (e.g. low salt and mineral content). Users will be able to perform geographical searches and visualize background and measured data for water quality parameters. This combination of information is useful for states to work with communities and regulated entities to find the right balance of protection and use of fresh water.

The application is slated to be publicly released July 2021 and ORD needs testers. Contact Susan Comier if you are interested in being a beta tester, or if you want access to look at it.

2. Project Status Report

a) Frequent Questions about WQX webpage. Users should visit this page to find answers to frequently asked questions.

b) Quick Tips:

ii. Organizational-owned Sample Collection Methods/Context should be defaulted to the Organization Identifier

Reminder: The organizational owned SCM the context is either blank or if you supply SCM, it should be your Organization ID.

iii. National Sample Collection Method / Context are registered by WQX Staff upon request

If it is a national SCM, you must reference the national method that is in WQX. Please contact the help desk if you want to register a national method that is not in WQX.

3. Water Quality Portal Project Status Report

a) WQP download profiles workgroup meetings

Basic Physical/Chemical and Biological profile have been created by the workgroup. "Basic" meaning it is the minimum is returned to describe the samples. Advanced profiles will have detailed list of elements returned.

They have identified new profiles to include all of the WQX 3.0 elements from the WQX 3.0 schema. The WQP is not currently reporting all the WQX 3.0 elements. The WQP development team will work on the WQX 3.0 elements when recommendations from this workgroup are received.

The WQP team is redesigning the WQP interface. They will publish a redesigned application by the end of the summer which may coordinate with the new data profiles.

Anyone interested in joining this group should contact the WQX Help Desk.

b) Report WQP Tool issues using URL: "Copy To Clipboard"

This is a nice feature to save or share your query.

c) Show Web Services Call appended with a new parameter option (counts=no) may resolve certain WQP timeouts / 405 Errors

This may resolve timeout and 405 errors in the WQP. The performance tuning has fixed a lot of the issues with queries failing. Users should visit the portal to test out the performance. If queries still fail, users should try using the new parameter option of "&counts=no".

Querying the Characteristic group by "Not Assigned" it will return the characteristics that have not been assigned a characteristic group classification, i.e, biological, organic others, organic pesticides, PFAS – etc. Users who know what the classification should be for a characteristic(s) please ask the WQX Help Desk to assign the Characteristic Group to the characteristic(s). For example, all the PFAS elements in which there are 8000, you can query by the Characteristic Group. Adding things to the list will facilitate queries without listing a large number of query parameters.

- Characteristic (ZIP) | (XML)

WQX User Call:
U.S. EPA Freshwater Explorer

Susan Cormier, PhD
US EPA Office of Research and Development

June 24, 2021

The views expressed in this presentation are those of the author and do not necessarily reflect the policies of the U.S. Environmental Protection Agency

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Why?—to provide easier access and visualization of aquatic information

- Approach
  - Design an accessible and intuitive interface to visualize and explore water quality in a map format.
- Result
  - EPA's Freshwater Explorer exhibits a network of streams in the U.S color-coded for measured freshness (i.e., low salt and nutrient mineral content).
- Impact
  - This tool is useful for states to work with communities and regulated entities to find the right balance of protection and use of fresh water.

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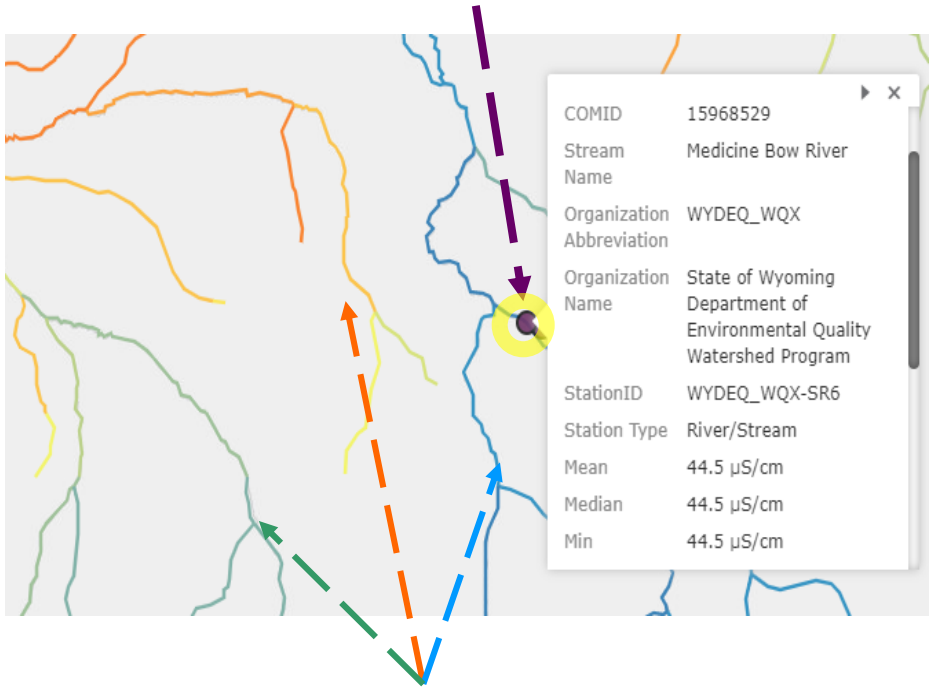
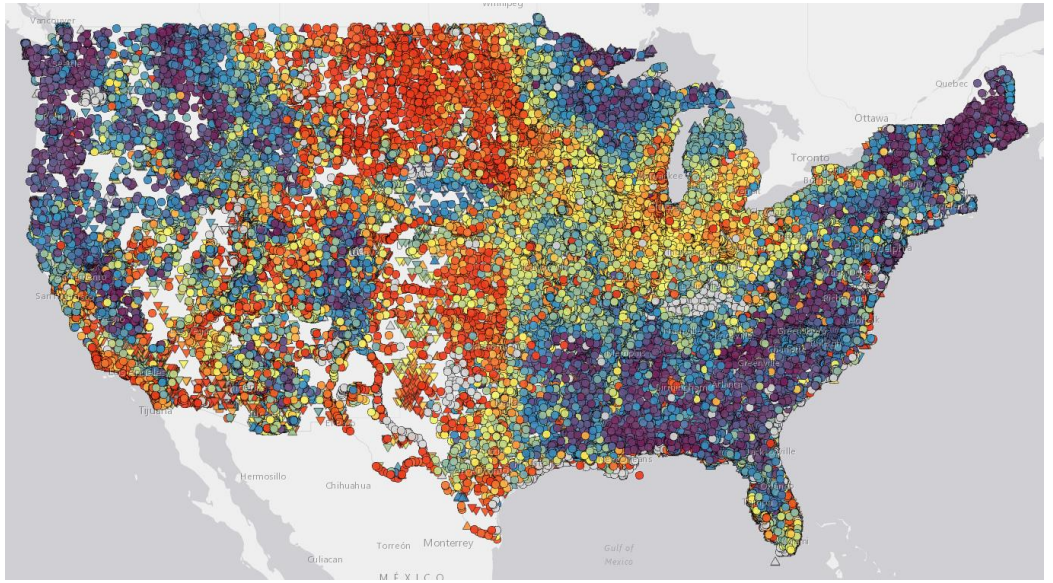
What it is

Site measurements shown as a dot

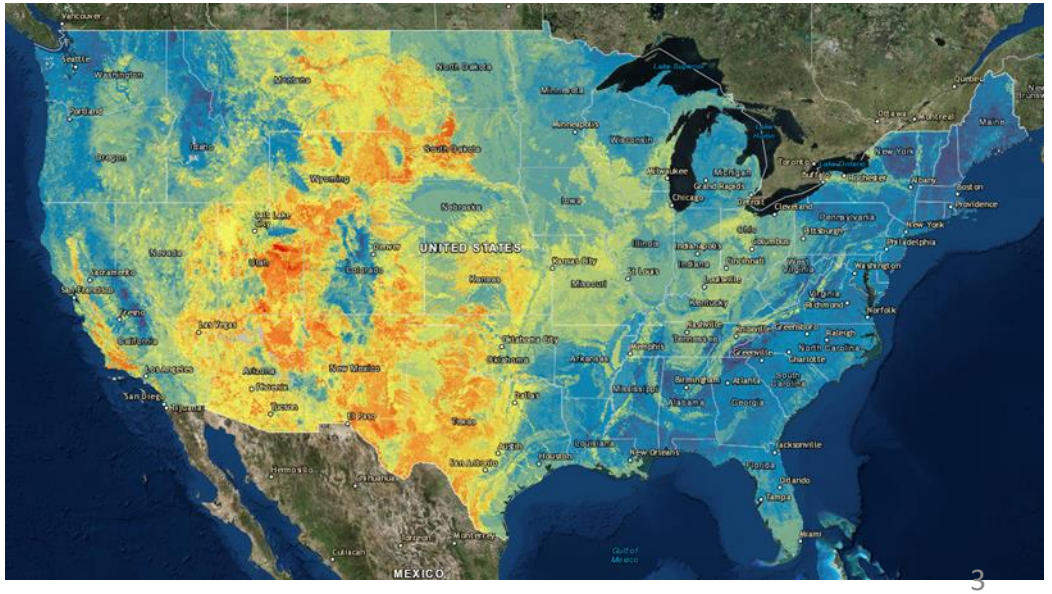


Background stream segments shown as colored network

Measured Site Data

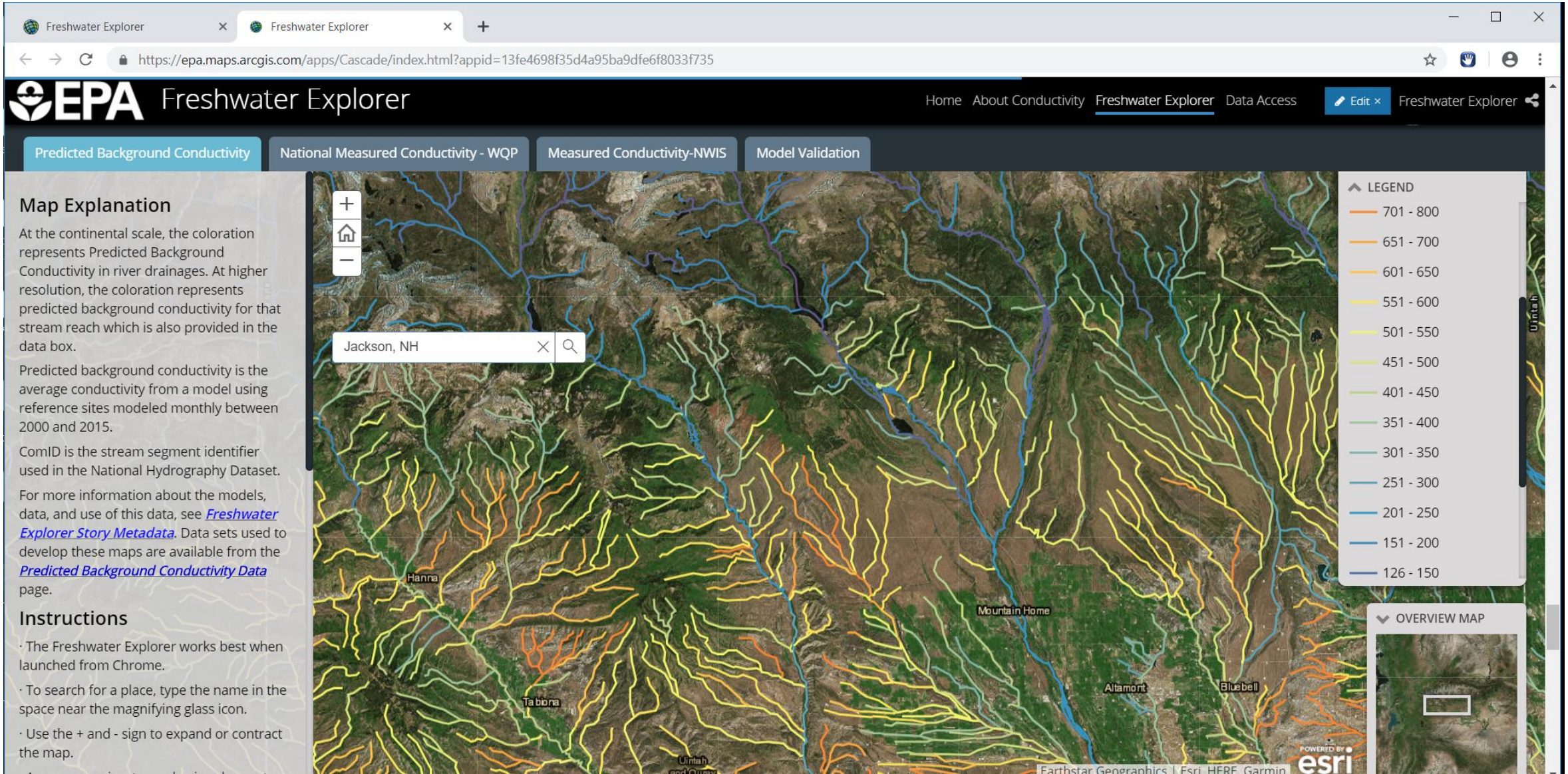


Predicted Background Reach Estimate

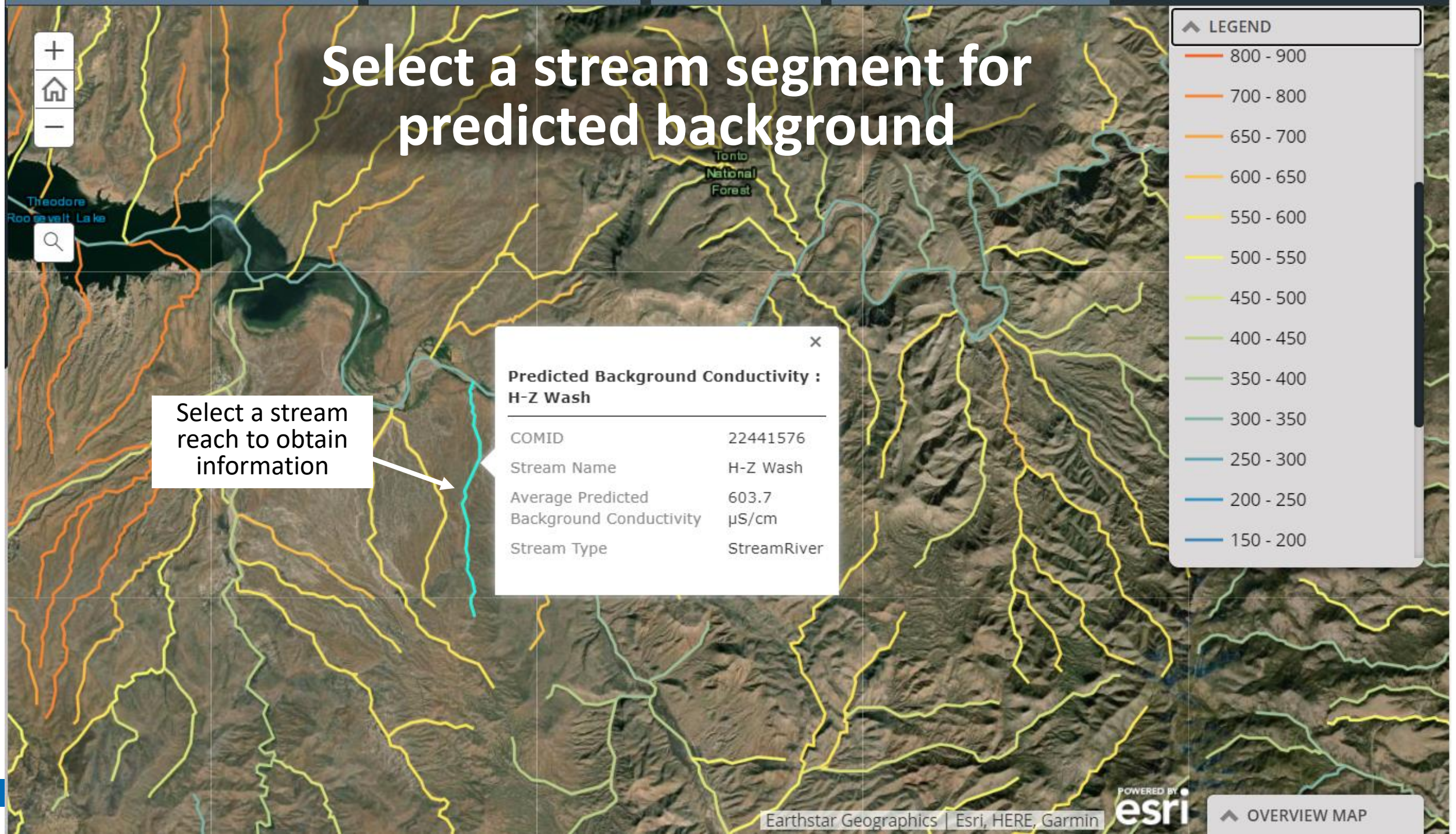


3

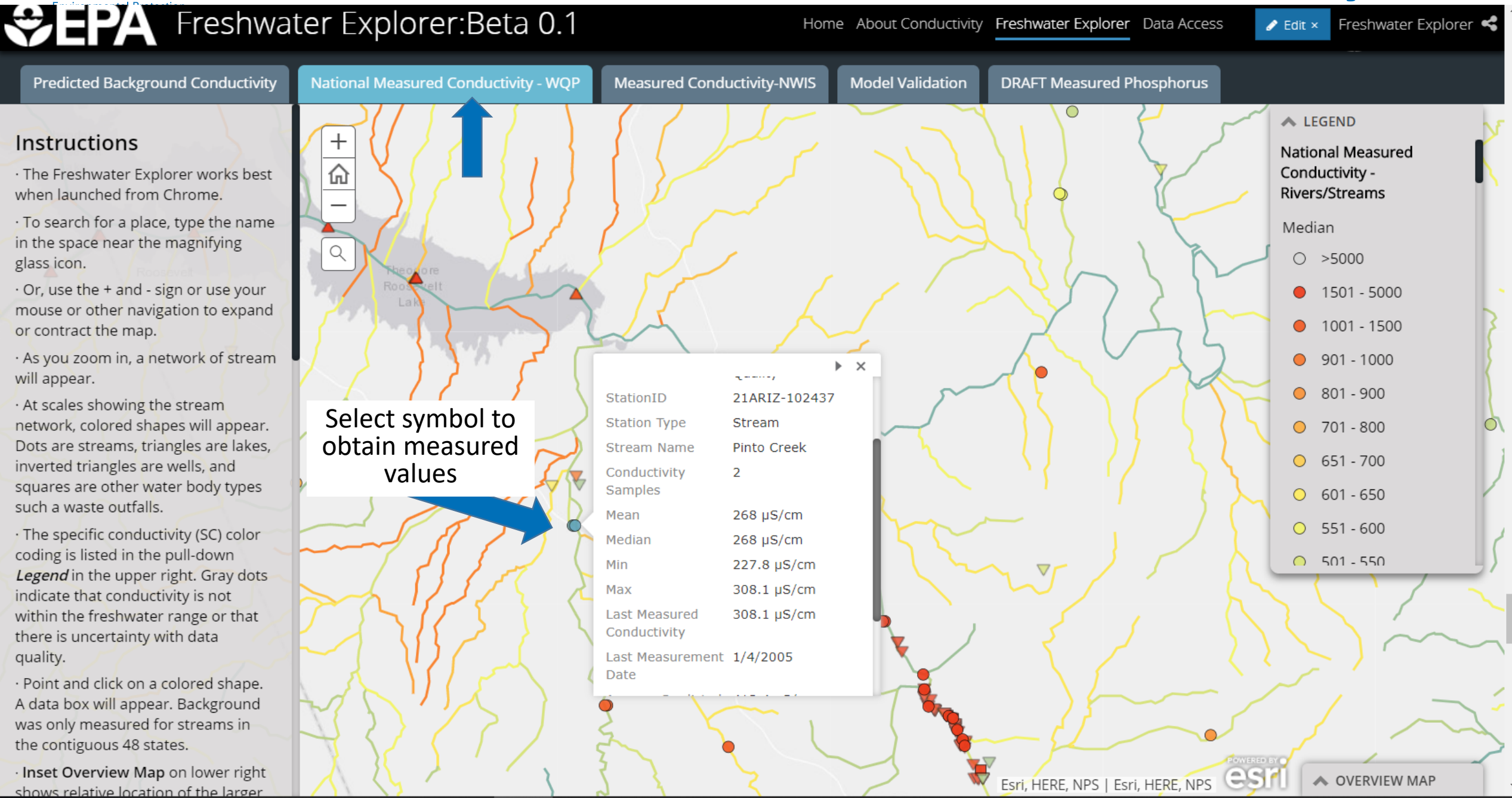
At higher resolution, watersheds change to stream network



Select a stream segment for predicted background



Switch to National Measured Conductivity



Access the data behind the Freshwater Explorer

Predicted Background Conductivity

National Measured Conductivity (EPA WQP)

National Measured Conductivity (NWIS)

The predictor variables were generated for each stream line within the National Hydrography Dataset Plus version 2 (NHDPlusV2) with algorithms and code from the StreamCat Dataset (ESRI 2012, Hill et al 2016). StreamCat data can be downloaded from https://www.epa.gov/national-aquatic-resource-surveys/streamcat.

PBC Link

EPA WQP Link

NWIS Link

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Water Quality Portal (WQP) Measured Conductivity Data: Clean-up process

Issue		Action Taken
Specific Conductivity (SC) values are positive and cannot be negative		Remove SC values ≤ 0
Ambiguous units (e.g., SC reported as NTU, or ^{o}C)		Remove SC values reported with units different from Siemens or mho
Dissimilar reporting units, cannot directly comparison among samples		Convert remaining SC values to µS/cm (e.g., values as mS/cm were multiplied by 1000)
Data reported as µS/cm but likely measured as mS/cm		Flag sites with SC values < 10 µS/cm as uncertain (gray circles)
Data reported as mS/cm but likely measured as µS/cm, brine or marine		Flag SC values > 5000 µS/cm (gray circles)

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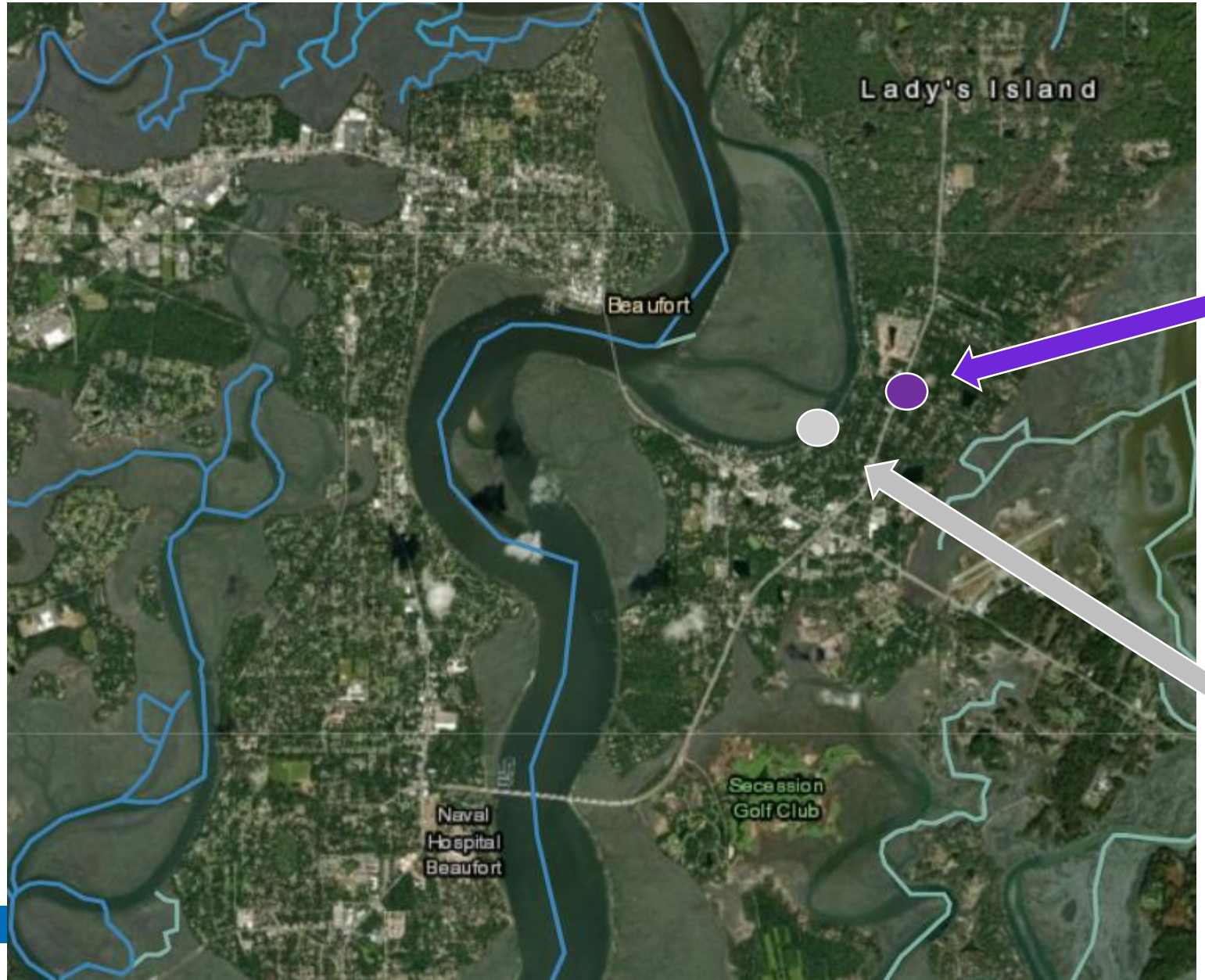
Check water body type: Local knowledge matters



Station Type	Stream
Mean	75 µS/cm
Median	70 µS/cm
Min	19 µS/cm
Max	152 µS/cm
Conductivity Samples	22
Last Measurement Date	9/18/2006
Last Measured Conductivity	33 µS/cm

Station Type	Estuary
Mean	53557.6 µS/cm
Median	51112 µS/cm
Min	45426 µS/cm
Max	69255 µS/cm
Conductivity Samples	13
Last	12/4/2007

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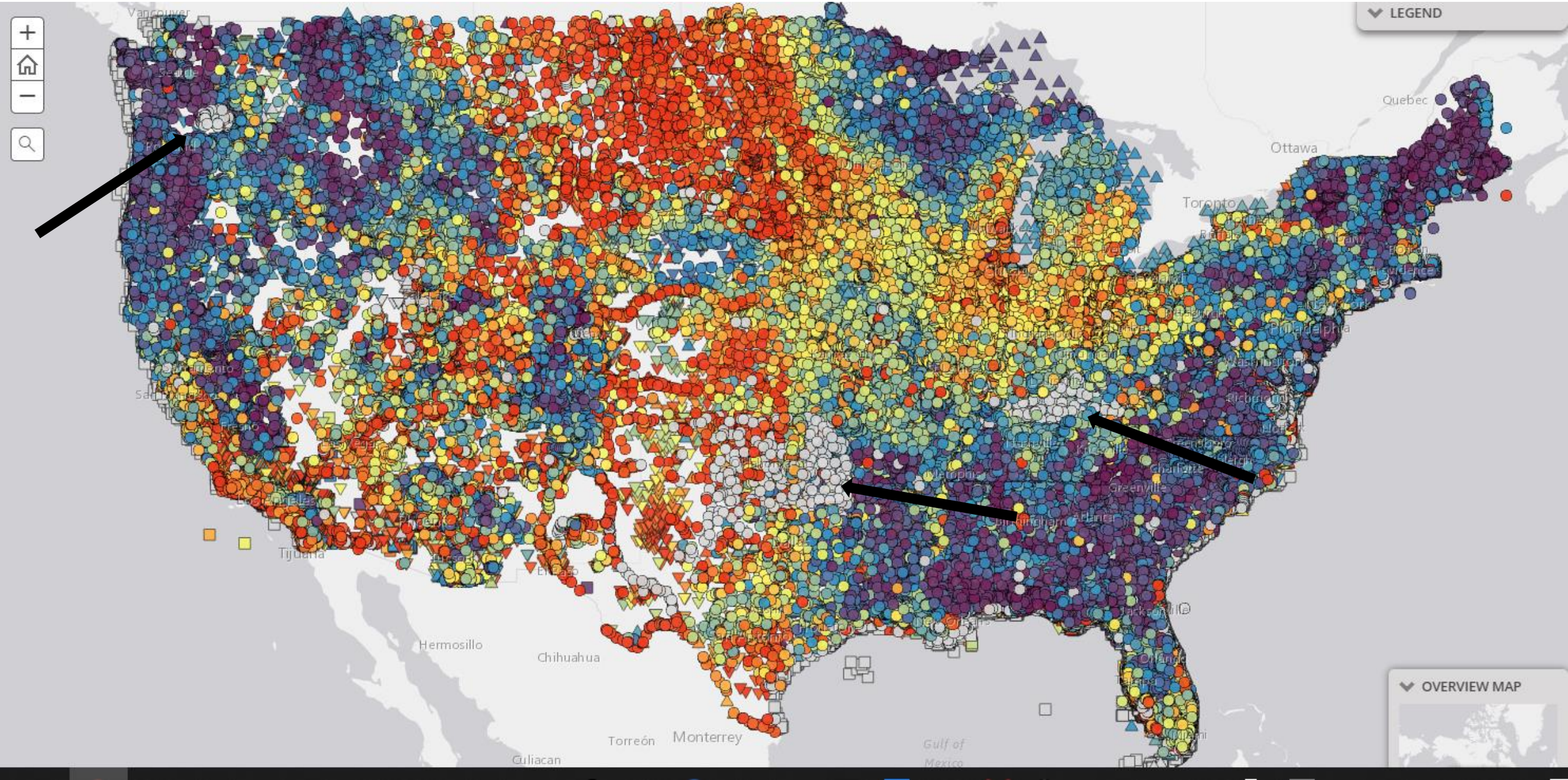
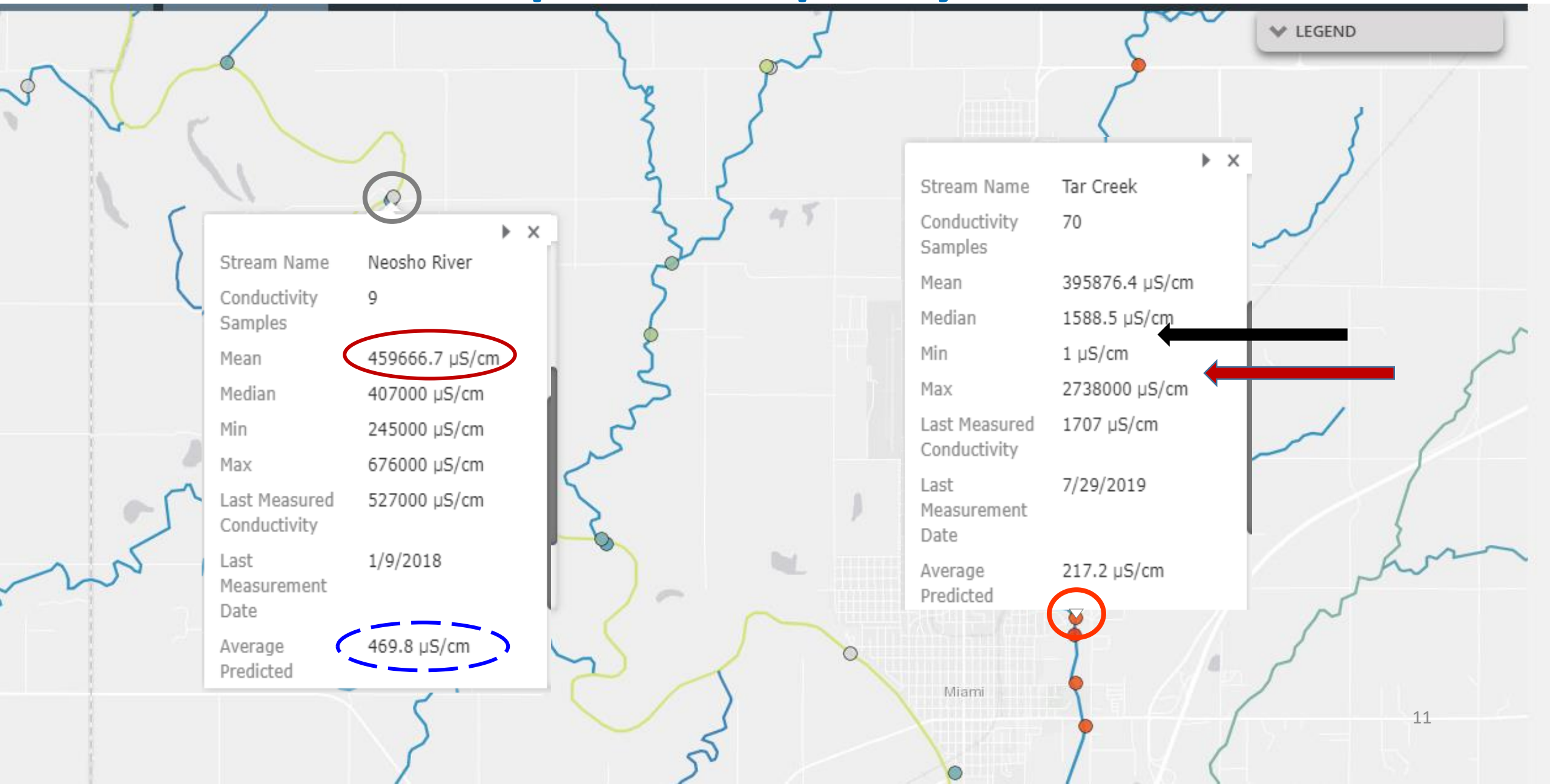
Data quality concerns appear gray



Example data quality concerns



Meth	CharacteristicName	ResultSampleFractior	ResultMeasureValue	ResultMeasure/Me ▲	MeasureQualifie
<Null>	Specific conductance	<Null>	0	<Null>	<Null>
<Null>	Conductivity	Total	101.8	mS/cm	<Null>
			105.1	mS/cm	<Null>
			93.2	mS/cm	<Null>
			114.7	mS/cm	<Null>
			92.3	mS/cm	<Null>
			108.9	mS/cm	<Null>
			123.4	mS/cm	<Null>
			135.5	mS/cm	<Null>
			111.4	mS/cm	<Null>
			168.6	mS/cm	<Null>
			165.7	mS/cm	<Null>
			152.3	mS/cm	<Null>
<Null>	Conductivity	Total	248.5	mS/cm	<Null>
<Null>	Conductivity	Total	211.2	mS/cm	<Null>
<Null>	Conductivity	Total	220.1	mS/cm	<Null>
<Null>	Conductivity	Total	175.2	mS/cm	<Null>
<Null>	Conductivity	Total	130.3	mS/cm	<Null>
<Null>	Conductivity	Total	172	mS/cm	<Null>
<Null>	Conductivity	Total	160.1	mS/cm	<Null>
<Null>	Conductivity	Total	152.4	mS/cm	<Null>
<Null>	Conductivity	Total	140.7	mS/cm	<Null>
<Null>	Conductivity	Total	290.2	mS/cm	<Null>
<Null>	Conductivity	Total	290.6	mS/cm	<Null>
<Null>	Conductivity	Total	311.8	mS/cm	<Null>
<Null>	Conductivity	Total	190	mS/cm	<Null>
<Null>	Conductivity	Total	160	mS/cm	<Null>

In this state data set, ~7500 entries mS/cm but clearly should be µS/cm

152 mS/cm equals 152,000 µS/cm

Uncertain entries appear as grey dots; contributors can correct in Water Quality Exchange

This state corrected the units.

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Example data pull identified for data quality concerns

Geographic State	Organization Formal Name	Samples	Stations	Min. Conductivity	Max. Conductivity	Mean Conductivity	Conductivity In Other Units	Conductivity Samples < 10	Conductivity Samples > 5000	Pontentially Excluded for Units	Potentially Excluded for Value
CA	Morongo Band of Mission Indians	488	27	211	1111	389.80	0	0	0	0%	0%
CA	Morongo Band of Mission Indians (CA)	194	19	212	1048	410.11	0	0	0	0%	0%
CA	Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation, California	57	1	0	1	0.33	0	52	0	0%	91%
CA	Pit River Tribe, California (includes XL Ranch, Big Bend, Likely, Lookout, Montgomery Creek and Roaring Creek Rancherias	4	4	0	0	0.00	0	4	0	0%	100%
CA	Quartz Valley Indian Community of the Quartz Valley Reservation of California	334	44	0	2	0.01	0	334	0	0%	100%
CA	Redding Rancheria, California	223	1	1	118	100.09	0	2	0	0%	1%
CA	Resighini Rancheria, California	259	6	0	484	77.99	0	147	0	0%	57%
CA	Round Valley Indian Tribes, Round Valley Reservation, California	112	14	1	4052	596.82	80	3	0	71%	3%
CA	Santa Ynez Band of Chumash Mission Indians of the Santa Ynez Reservation, California	255	5	0	1200	299.85	0	176	0	0%	69%
CA	Santa Ynez Chumash Environmental Office (California)	34	4	1	1	1.00	0	31	0	0%	91%
CA	Smith River Rancheria (California)	468	6	0	1	0.03	0	468	0	0%	100%
CA	Soboba Band of Luiseno Indians, California	7	2	0	0	0.00	0	7	0	0%	100%
CA	Table Mountain Rancheria of California	6	3	580	1100	858.33	0	0	0	0%	0%
CA	Tolowa Dee-ni Nation (Smith River Rancheria), California	989	9	0	22	0.17	0	979	0	0%	99%
CA	Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California	26	8	0	256	122.19	0	1	0	0%	4%
CA	Twenty-Nine Palms Tribal EPA	442	12	-73	4785	436.97	0	200	0	0%	45%
CA	Wiyot Tribe, California	1590	8	0	53	30.30	6	546	0	0%	34%
CO	Southern Ute Tribe	2115	50	0	3120	92.95	0	1724	0	0%	82%
CO	Ute Mountain Utes Tribe (Colorado)	572	81	0	15790	2628.91	0	23	81	0%	18%
FL	Seminole Tribe of Florida	2429	51	0	7023	467.98	125	131	1	5%	5%
IA	Meskwaki Department of Natural Resources	45		396	723	554.71	0	0	0	0%	0%
ID	CDA TRUST	336		0	1300	162.10	0	148	0	0%	44%
ID	Coeur D'Alene Tribe	2692		6	1390	78.82	0	12	0	0%	0%
ID	Kalispel Indian Community of the Kalispel Reservation	627		8	333	50.19	0	3	0	0%	0%
ID	Nez Perce Tribe	229		0	440	177.01	112	35	0	49%	15%
ID	Otoe Missouria Tribe of Oklahoma	54		100	1172	712.89	0	0	0	0%	0%
ID	Shoshone-Paiute Tribes of the Duck Valley Reservation, Nevada	242		75	397	232.48	0	0	0	0%	0%
ID	TRIBE	350		0	1410	452.77	0	13	0	0%	4%
IL	Shawnee Tribe	13		0	0	0.00	0	13	0	0%	100%
KS	Kaw Nation, Oklahoma	19		445	2040	1306.37	0	0	0	0%	0%
KS	Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas	140		101	3017	548.89	61	0	0	44%	0%

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For this group

- 17 data sets had easy fixes, just need to correct units.
- 22 data sets >90% error rate; that is, about 16% of data submitted by this group is excluded or highlighted in gray.
- 70% of data sets had some likely errors.

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Public release is expected in July 2021

We plan to take another data pull from the WQP prior to public release.

This is your chance to go check your data in WQX before we pull that data prior to public release.

Public release is expected in July 2021.

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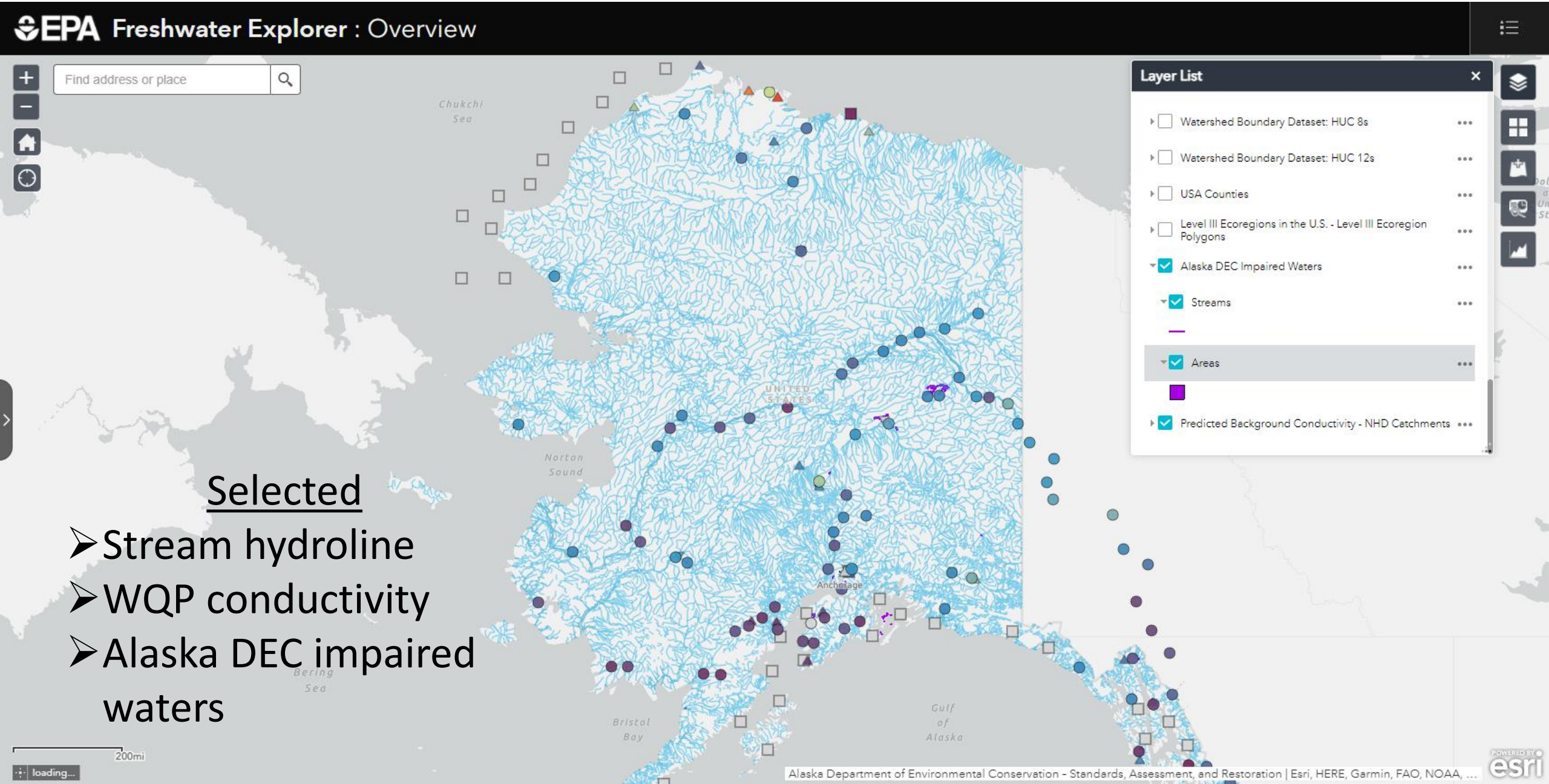
Expected later in 2021

Addition of total phosphorus measured data from WQX.

Ability to easily add other publicly available data.

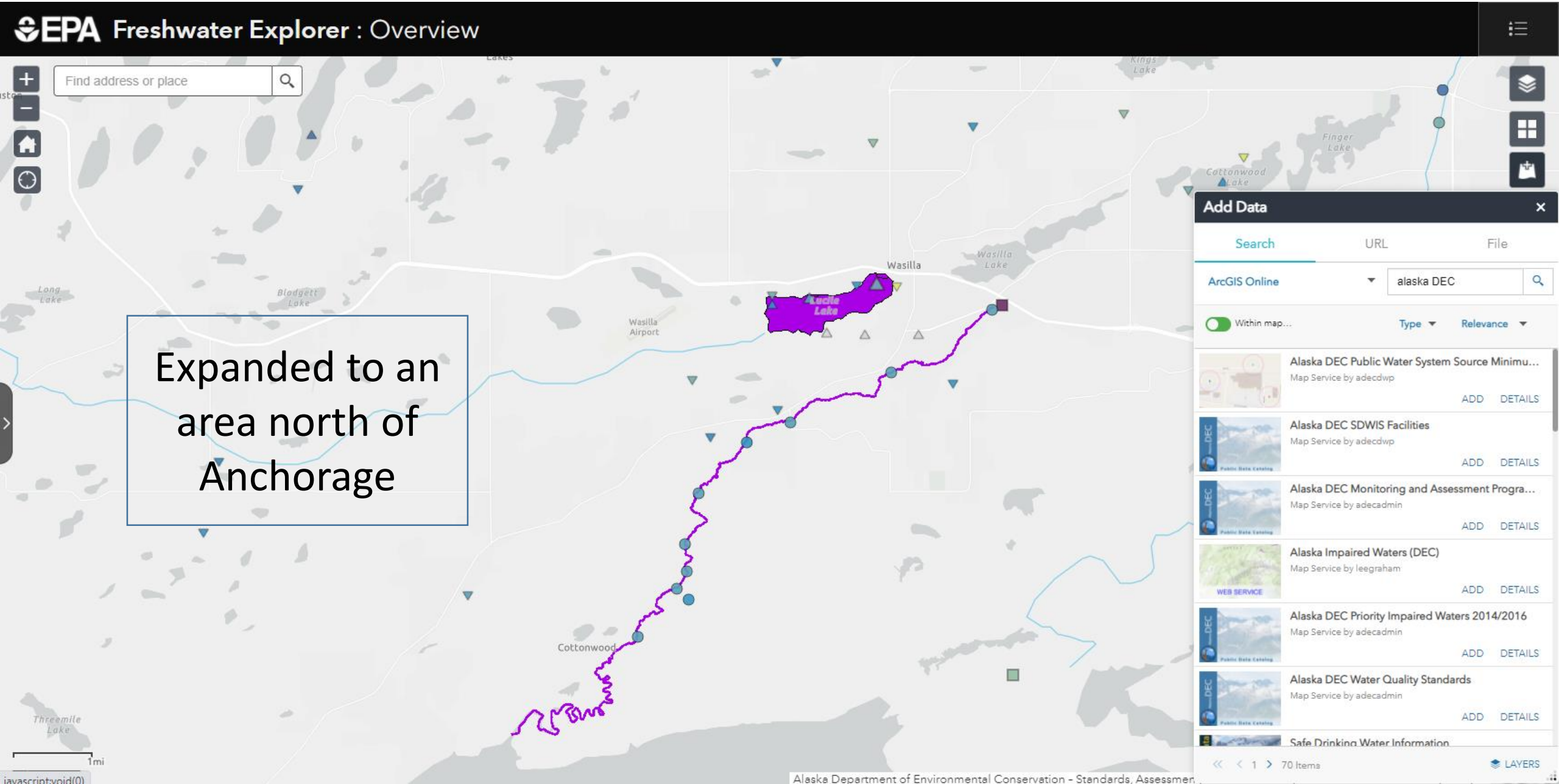
Example of capabilities with Freshwater Explorer Version 2



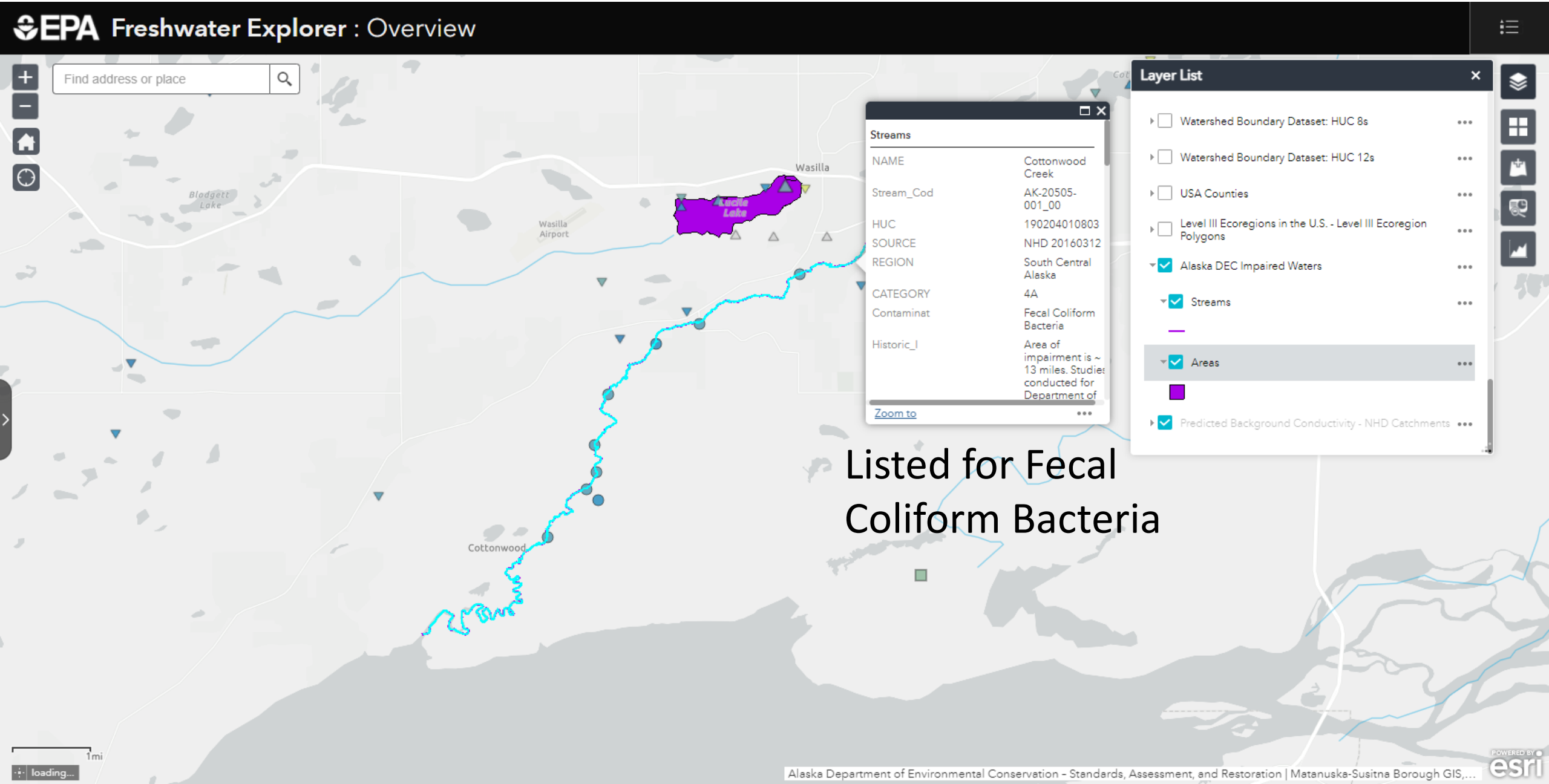
Selected

- Stream hydroline
- WQP conductivity
- Alaska DEC impaired waters

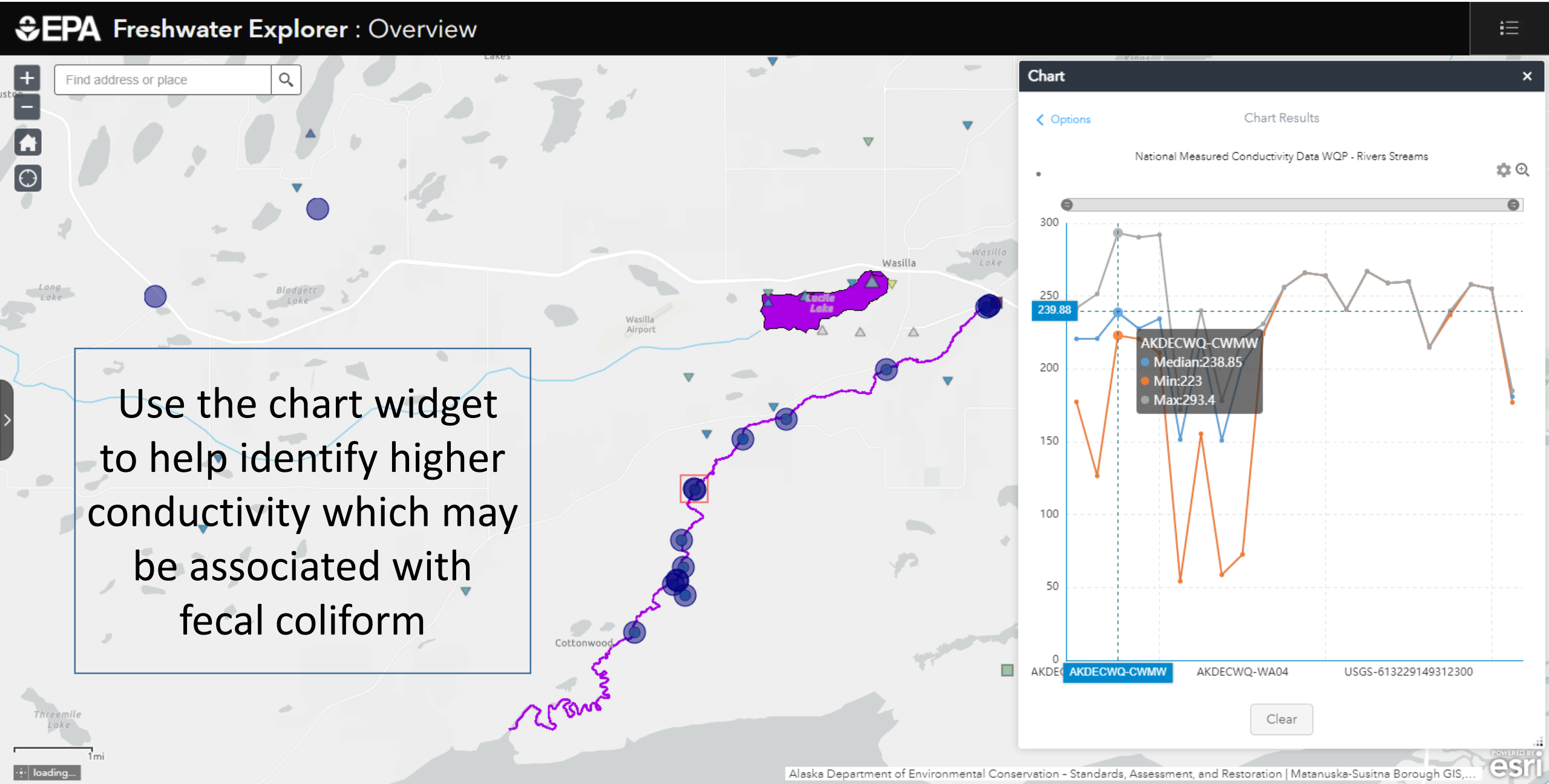
Example of capabilities with Freshwater Explorer Version 2



Example: Use pop-up box to get details on contaminant

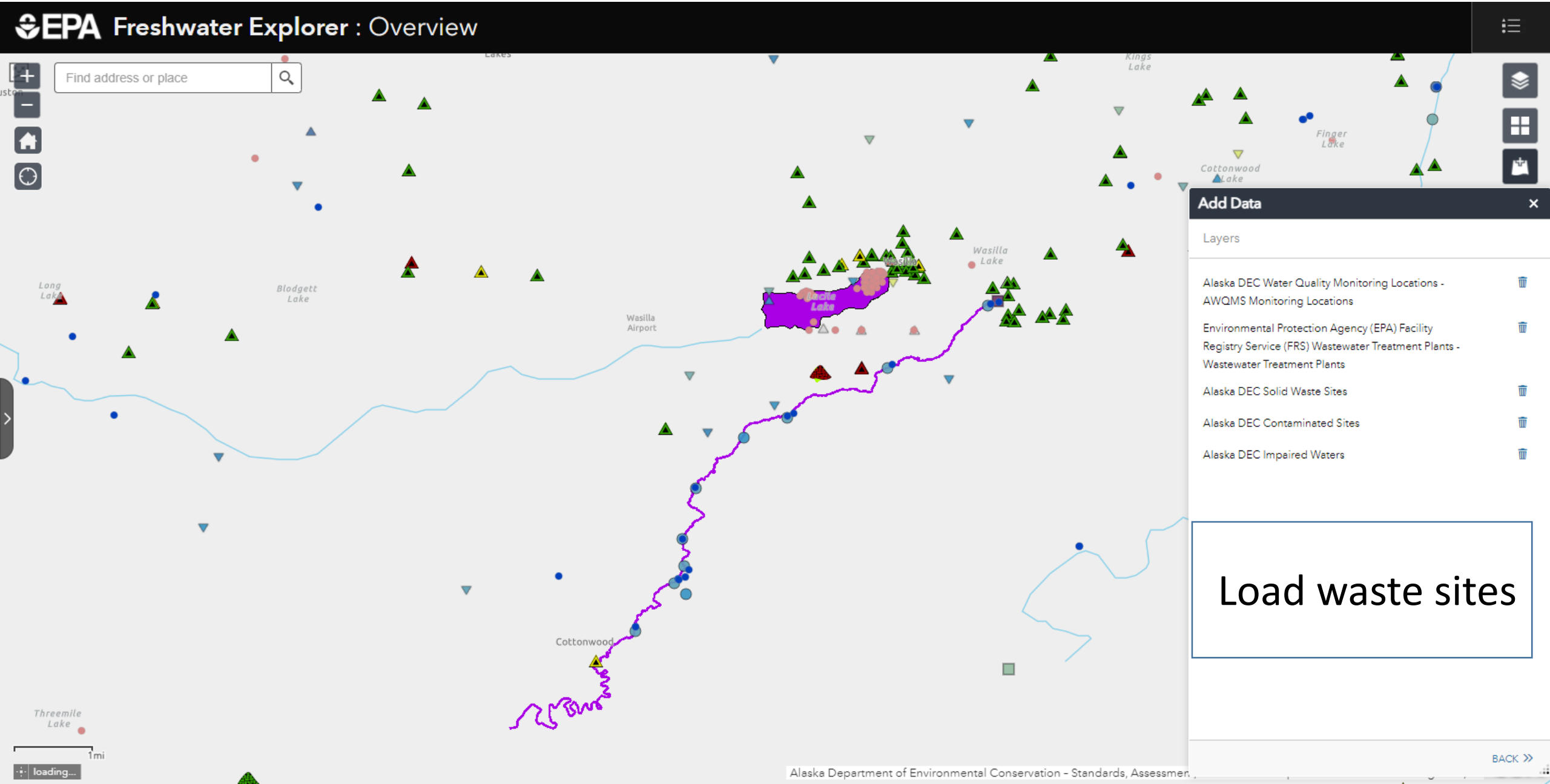


Example: Plot sites to identify increased conductivity

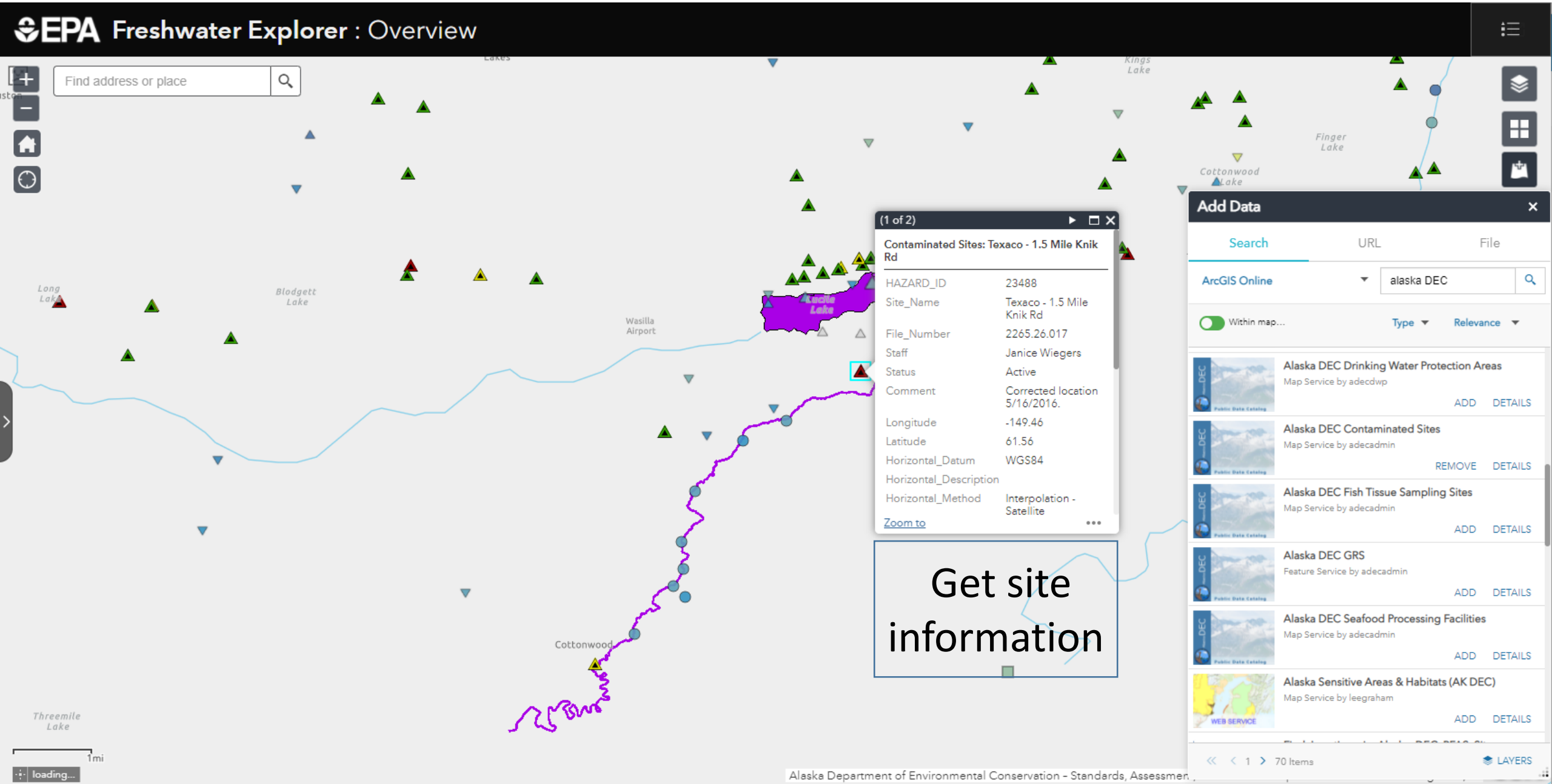


Use the chart widget to help identify higher conductivity which may be associated with fecal coliform

Example: Load Alaska DEC Contaminated Sites



Example: Pull up details on Alaska DEC Contaminated Sites



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Take Home Messages

- **EPA's Freshwater Explorer**
  - Assess areas of interest
  - Water Quality Exchange contributors can spot data integrity issues
  - Share watershed and regional stories
  - Background nutrient estimates and other capabilities will be added in 2021

Contact

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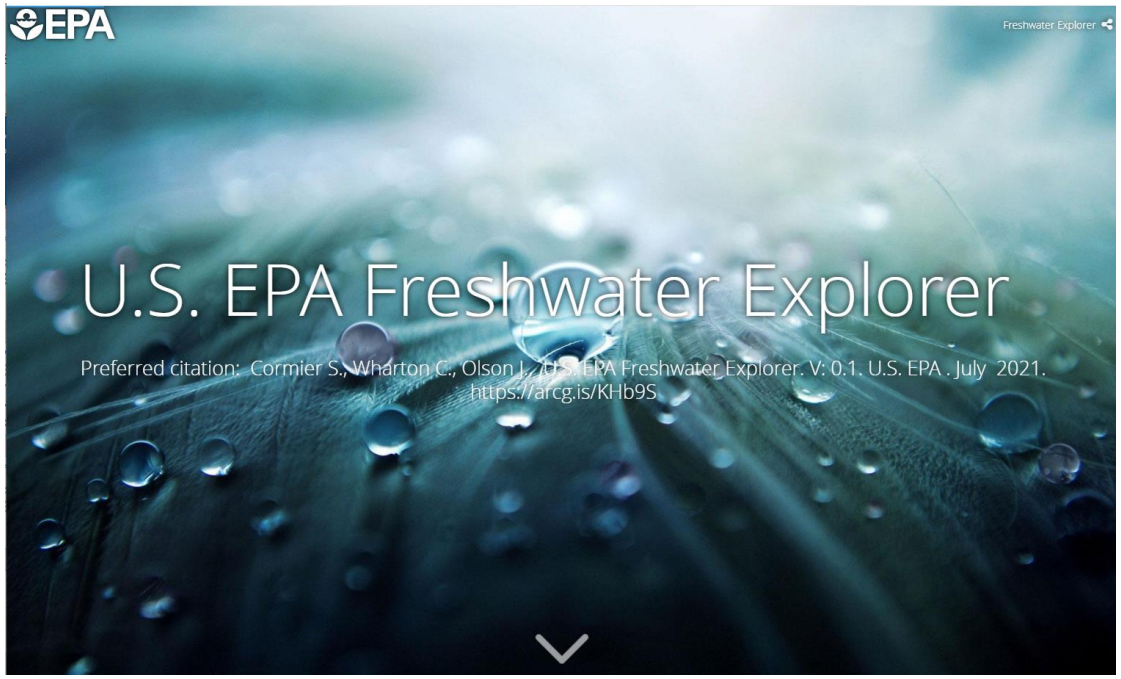

Contact me to obtain access to the tool and set up a password!

Acknowledgements:
Christopher Wharton, TetraTech, Inc.
John Olson, California State University-Monterrey

Preferred citation: Cormier S., Wharton C., Olson J. Freshwater Explorer: V: 0.1. U.S. EPA. July 2021.
https://arcg.is/KHb9S