WQX User Call
January 26, 2023

There were approximately 43 participants on the call.

Returning Attendees:

Bill Kramer (EPA)

Adam Griggs (EPA);

Shari Kondrup Brick Utilities

Shay Torres (Contractor to EPA)

Valarie Fields (Contractor tot EPA)

Jolene McQuillan (Montana DEQ)

Chris Neumiller (WA Ecology)

Steven Vu (EPA R7)

Cathy Anderson (TCEQ)

Candice Hopkins (USGS)

Cristina Mullin (EPA)

Elizabeth Smith (EPA R4)

Dawn Hintz (SRBC)

Jarma Bennett (CA State Water Resources Control Board)

Amber Bethe (AK DEC)

Elise Hinman (EPA ORISE)

Adam Fisher (EPA R2)

Jesse Boorman-Padgett (EPA HQ)

Lee Stanish (USGS)

Kayla Gower (WQX helpdesk contractor)

Rick Cooke (Gold Systems)

First-time Attendees:

Lynette Guevara (NMED) – lynette.guevara@env.nm.gov

Ben Frans (WA Ecology)   benf461@ECY.WA.GOV

 Agenda:
1. WQX Project Status Report (25 mins)
     - WQX/WQXWeb performance/updates (Kevin)
     - Characteristic Group Refinement: Discussion and user feedback

- ○ WQX Monthly User Tip (Adam) – Intro to using WQP web services in online data applications
  - ○ WQX questions/comments
2. WQP Status Report (10 mins)
   - ○ WQP general status report (Candice)
     - i. Updating web service guidance for WQP
     - ii.
   - ○ WQP questions/comments
3. Open Discussion
   - ○ Other topics/questions

Notes:

Welcome. We are trying out a new notes system during these meetings that is more in keeping with the practices of our other External User groups. Feel free to add your name to the attendance list so that we can have a better record of who is attending these meetings and receiving these updates.

1. **WQX Project Status Report**
   a. WQX/WQXWeb performance/updates

   The spring release for WQXWeb will bundle application and performance bug fixes for the current azure cloud deployment. There are several new features being deployed. Our current QAQC service reports, previously generated only during submission, are being made accessible via WQX Web via the Review menu. The QAQC reports will also now be available to produce on any previously submitted data. The QAQC reports are available for both Locations, and Results. There are also new reports available that will produce ALL WQX 3.0 schema entities. These will be made available in a queued download. These will be available for all schema levels, including: Locations, Projects, Activities, and Results, etc. We do not currently have a report for Project Location Weighting.

   We will also be releasing REST style Rest URLs for downloading reports based on the Transaction ID. The REST URL will not require CDX authentication, so it will be publicly accessible via the REST URL.

   - ● Q Steven R7 - Are the QAQC reports something that are already available? What will they look like? Answer: They are spreadsheet reports that will

include the data in a summary format, with indications of whether locations map correctly to the submitted assignments of county, state, country. For results, we compare typical ranges, result special characters, QAPP information, range checks (upper and lower thresholds), units, methods, units, fractions, and speciation.

- Q Chris (ECY) - How do these requests work in concert with the service? Answer: The QAQC reports are automatically generated after you submit. You can download these reports after submission.

b. **Characteristic Group Refinement: Discussion and user feedback**

Background: The WQX Team is currently exploring improvements and refinements to the Characteristic Group options and domain service. The Characteristic Groups are not a WQX submission field. Users only submit the Characteristic Name. We assign all of our registered Characteristics to Groups that are added to the data when passed to the Water Quality Portal. These groups help assist users in data discovery. Each CharacteristicName is currently assigned to a single group in a 1:1 relationship. Example groups include, PFAS, biological, metals, nutrients, etc.

Current issues:

1. Many Characteristics are currently Not Assigned.
2. There are incorrect assignments in the table.
3. The table currently only supports 1:1 relationships. All Characteristics can only be in one Group.

Example Use Case: A Group for rapid retrieval of HAB Characteristics

Harmful Algae Characteristics tend to stretch across the entirety of our sample schema, including chemical measures, indices, biological counts, tissue measurements, etc. How do we best serve up Groups within this context? We have found it difficult to stay within a 1:1 assignment as many measures may potentially apply to more than one group.

Goal: Try to implement a 1:many assignment without causing Portal disruption.

After some thought, our current proposed solution may include concatenated assignments where you could assign more than 1 group to a characteristic. We

wanted to get any feedback the group may have on moving toward concatenated group assignments. Example: 1:1|1:2|1:3| Biological|Algae, Cyanos, Periphyton, and Plants|Habitat

1. Cathy Anderson: In my experience, you can run into issues with the system processing the request if it is a large group, especially if you throw in a date range, and you can run into issues with processing the data on your local workspace. Would caution us on implementing a 1:many.
2. Chris Neumiller: These are useful, and this is a good idea, but suggest designing it in a way so we can move it to a table in the future easily. From chat: "Just make it so that you can eventually put it in a relationship table".

C. **Intro to using WQP web services in online data applications**

Adam: Live demo of using WQP web data services in various applications (Arc Online, Excel, googlesheets/LookerStudio

c. This is for the stations, results, and summary services (steps below)
   i. Using WQP UI, generate your query and copy the station web service
   ii. Paste the station web service into Arc Online within the map (easier but not limited) or hosted feature service, larger queries should use hosted feature service
   iii. When adding within the map, choose the file format to "A CSV file" and change zip=yes to zip=no in URL
   iv. New map viewer for Arc Online can support JSON and csv using both methods for bringing in data, but that is not true for past versions
   v. When adding layers, you can change the field type (string, numeric, etc)
   vi. Assign correct fields as the lat and long measures
   vii. Add data layer to map
       1. Now you can see all locations where data is available for your query.

Station Service:

Example: All locations with records for "Micropterus dolomieu" the smallmouth bass.

`https://www.waterqualitydata.us/data/Station/search?subjectTaxonomicName=M`

```
icropterus%20dolomieu&mimeType=csv&zip=no&providers=NWIS&providers=STEWARD
S&providers=STORET
```

Adding the WQP Services to Arc Online

There are many options when it comes to adding WQP web services to the Arc Online environment. This guidance is just an introduction for the most easily accessible functions and services. Generally, adding data directly to a map by either csv or geojson will be limited compared to a hosted feature service that establishes a connection to the WQP service. Also, there are differences between the Classic Map Viewer and the New Map Viewer, in that there is generally more functionality and compatibility in the New Map Viewer.

	A	B	C	D	E	F
1			Arc Online Classic		New Map Viewer	
2			Add in Map (Reference)	Hosted	Add in Map (Reference)	Hosted
3		csv	Works https://www.waterqualitydata.us/data/Station/search? countrycode=US&statecode=US%3A24&countycode=US%3A24%3A033&mimeType=csv &zip=no&providers=NWIS&providers=STEWARDS&providers=STORET	No option from map or Content window	Works https://www.waterqualitydata.us/data/Station/search? countrycode=US&statecode=US%3A24&countycode=US%3A24%3A033&mimeType=csv &zip=no&providers=NWIS&providers=STEWARDS&providers=STORET	Works https://www.waterqualitydata.us/data/Station/search? countrycode=US&statecode=US%3A24&countycode=US%3A24%3A033&mimeType=csv &zip=no&providers=NWIS&providers=STEWARDS&providers=STORET
4	Station service	geojson	No option - Geojson not listed as filetype in the add from web option	Works https://www.waterqualitydata.us/data/Station/search? countrycode=US&statecode=US%3A24&countycode=US%3A24%3A033&mimeType=geojson&zip=no&providers=NWIS&providers=STEWARDS&providers=STORET	Works https://www.waterqualitydata.us/data/Station/search? countrycode=US&statecode=US%3A24&countycode=US%3A24%3A033&mimeType=geojson&zip=no&providers=NWIS&providers=STEWARDS&providers=STORET	Works https://www.waterqualitydata.us/data/Station/search? countrycode=US&statecode=US%3A24&countycode=US%3A24%3A033&mimeType=geojson&zip=no&providers=NWIS&providers=STEWARDS&providers=STORET

Adding WQP Stations data from the Web (Classic Map viewer)

In your ArcGIS Online account, Open a Classic Map Viewer. On the left0hand-side, select the "Add" dropdown and select "Add Layer from Web". Select "A CSV File" from the file type dropdown and paste in the WQP Station Query URL that was generated by your search. Edit the URL zip instructions to read "mimetype=csv&zip=no" and click the "ADD LAYER" button. A pop-up will ask you to identify the latitude and longitude fields in the data. Scroll down the data fields to correctly identify "LatitudeMeasure" and "LongitudeMeasure" as the respective fields. Select "ADD LAYER" again and the stations should appear in the map.

*NOTE - This call will be too big to import directly into the classic map. QUeries of this size or larger may only be supported through a hosted feature service. Currently, hosting CSVs is only made possible through the New Map Viewer add layer button.
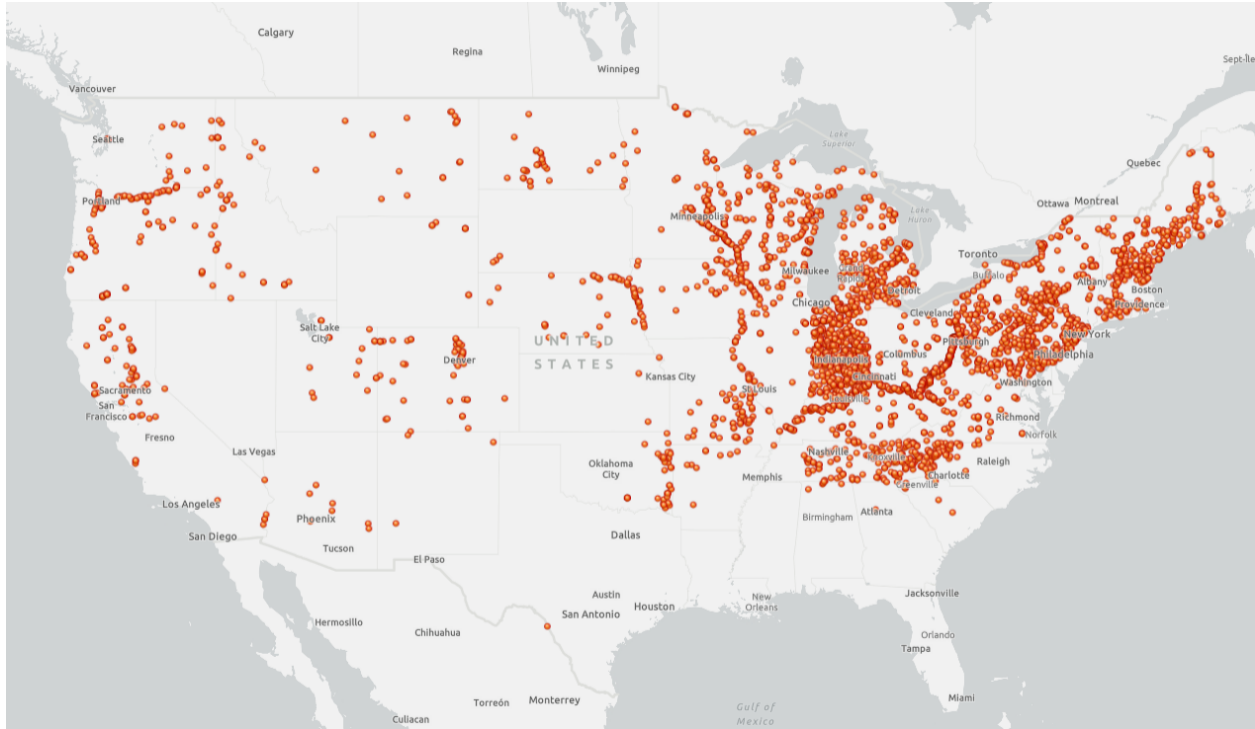
Adding WQP Stations data from the Web (New Map Viewer)

In your ArcGIS Online account, Open the Map Viewer. Under the layers tab, open the add dropdown and select "Add layer from URL". Paste the Station query you copied above into the URL field. You may add the layer as either a csv or GeoJSON but both should be imported as a non-zipped file. Edit the URL to read "mimeType=geojson&zip=no". Next, select the layer type as GeoJSON, then click next. You will be given the option of adding the layer to the map, or hosting the web layer in your content. For best results, larger queries should use the hosted feature layer option. Select "Add to Map". The stations you queried should appear on the map.

Result Service:

This time, let's import a Results service query into Excel.

Example: All nutrient data collected from Bedford County, Tennessee

WQP Query URL:
https://www.waterqualitydata.us/#statecode=US%3A47&countycode=US%3A47%3A003&characteristicType=Nutrient&mimeType=csv&dataProfile=narrowResult&providers=NWIS&providers=STEWARDS&providers=STORET

WQP Results Service URL:

https://www.waterqualitydata.us/data/Result/search?statecode=US%3A47&countycode=US%3A47%3A0
03&characteristicType=Nutrient&mimeType=csv&zip=yes&dataProfile=narrowResult&providers=NWIS&
providers=STEWARDS&providers=STORET

In Excel, we navigate to the Data tab of the ribbon and select "From Web" within the "Get & Transform
Data" section.
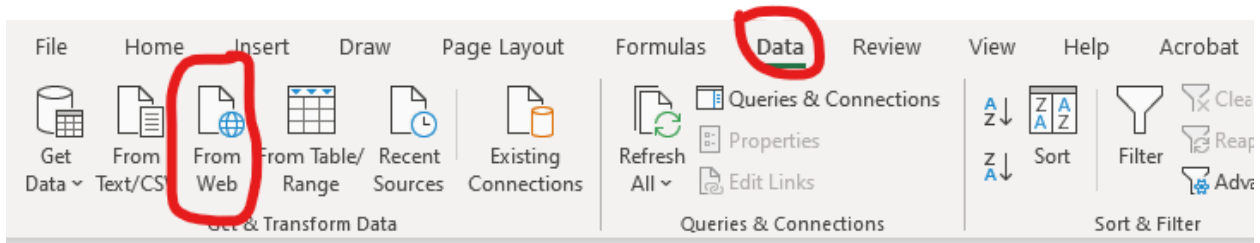
In the pop-up, simply paste in the Results URL copied from the portal and change the "zip=yes" to
"zip=no" and hit OK.
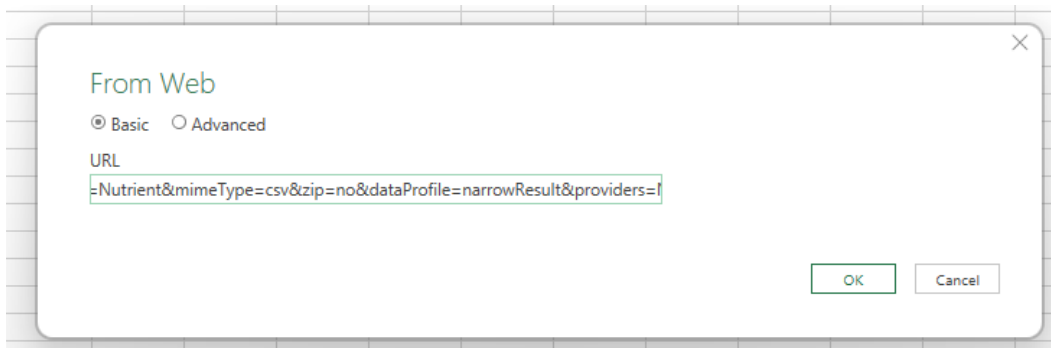
The data will be imported and parsed into the spreadsheet, ready for analysis.

Summary Service:

This time, let's test the services in Google products.

You can find the documentation for WQP web services here:

https://www.waterqualitydata.us/webservices_documentation/

Example: Summary service request to retrieve total counts from the most recent 5 years of *Nutrient* data from sites in Benton County, Arkansas in *GeoJSON* format, *zipped*:

```
https://www.waterqualitydata.us/data/summary/monitoringLocation/
search?countycode=US%3A05%3A007&characteristicType=Nutrient&zip=
yes&dataProfile=summaryMonitoringLocation&summaryYears=5&mimeTyp
e=geojson
```
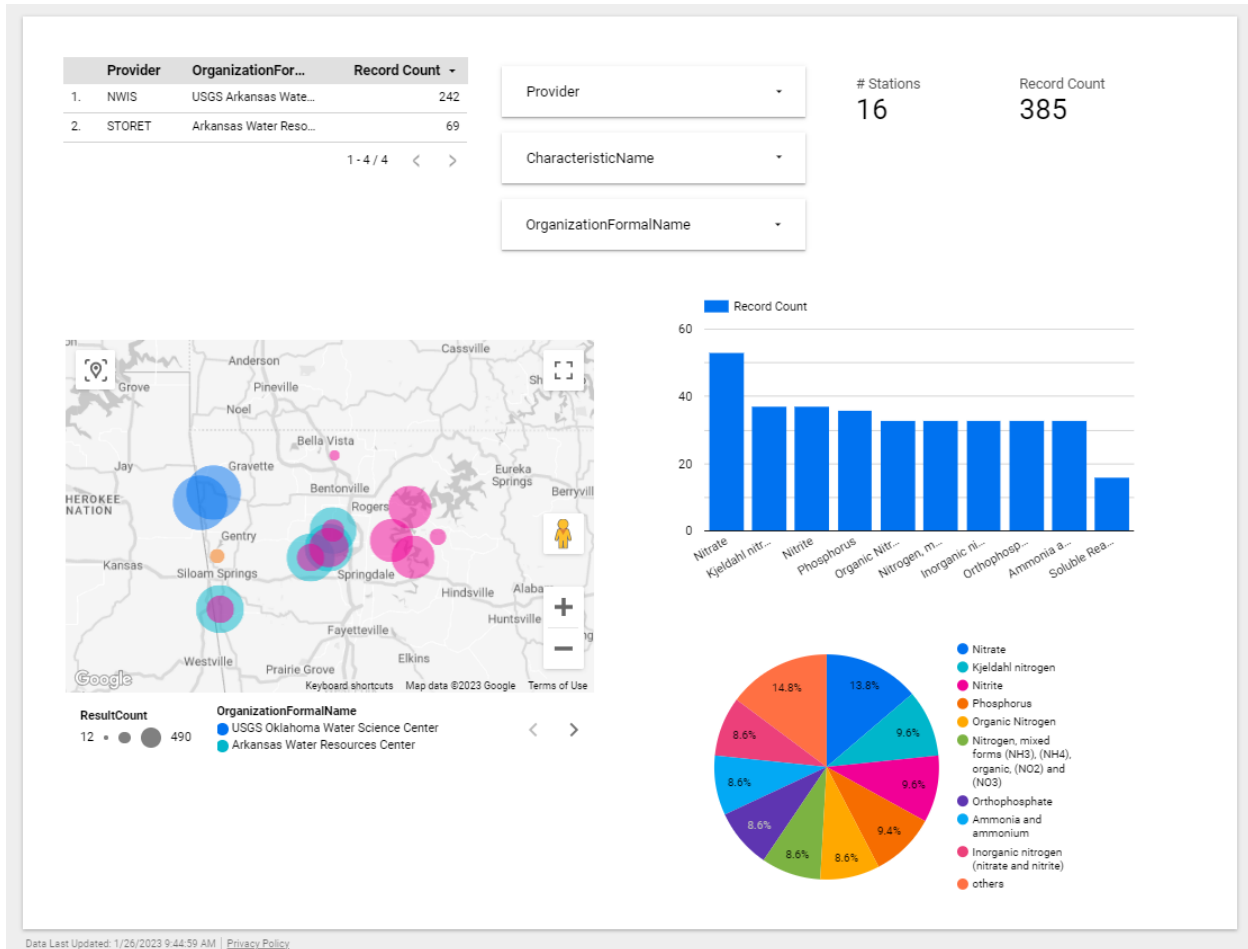
In googlesheets, we click into the first cell and insert a simple function =IMPORTDATA(). The function consists of the URL, the delimiter used, and a country code. We paste in the generated URL and switch the zip=yes to zip=no. See below:

```
=IMPORTDATA("https://www.waterqualitydata.us/data/summary/monitoringLocati
on/search?countycode=US%3A05%3A007&characteristicType=Nutrient&mimeType=cs
v&zip=no&dataProfile=periodOfRecord&summaryYears=5", ",", "en_US")
```


This data is now available for use in a variety of online data visualization applications.

4. **WQP Status Report (10 mins)** (Candice and Lee)

We will be adding new documentation for the web services soon. USGS is updating some of our reporting limit values and if you are a frequent user of USGS data, you may see that change as we are able to report additional reporting values.

The new dev team is not actively working on WQP at this time, it has been working on NEMI.

Any questions for the WQP Team?

Q - Mary Becker - Are there plans to migrate the old BioData database to WQP. Nope, there are not any current plans to update or revive the BioData database.

5. Wrap-up

- We will look into potentially putting together a web services training

- Google Looker Studio is a free-to-use online data visualization tool, Adam wrote guidance in the notes above on how to bring in data via all the applications he demo'd today
- HMW is also a demonstration of use of web services, we have WQP Monitoring Data pages with summary charts and tables for each station
- On the next call, we will get a presentation from the Massachusetts Bays National Estuary Partnership on their recent development of an R-Shiny based submission tool and shared WQXWeb import configuration strategy to support community science submissions to WQX web.

The next WQX/WQP User Call will be on the 4th Tuesday of February (Feb 23rd) at 12pm EST.