Water Quality Portal

NWQMC

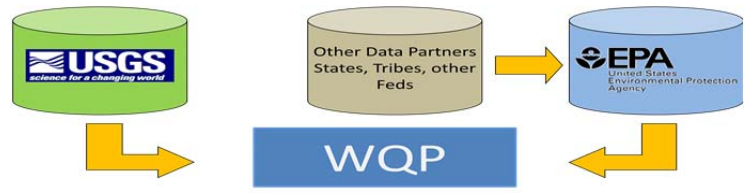
USGS science for a changing world

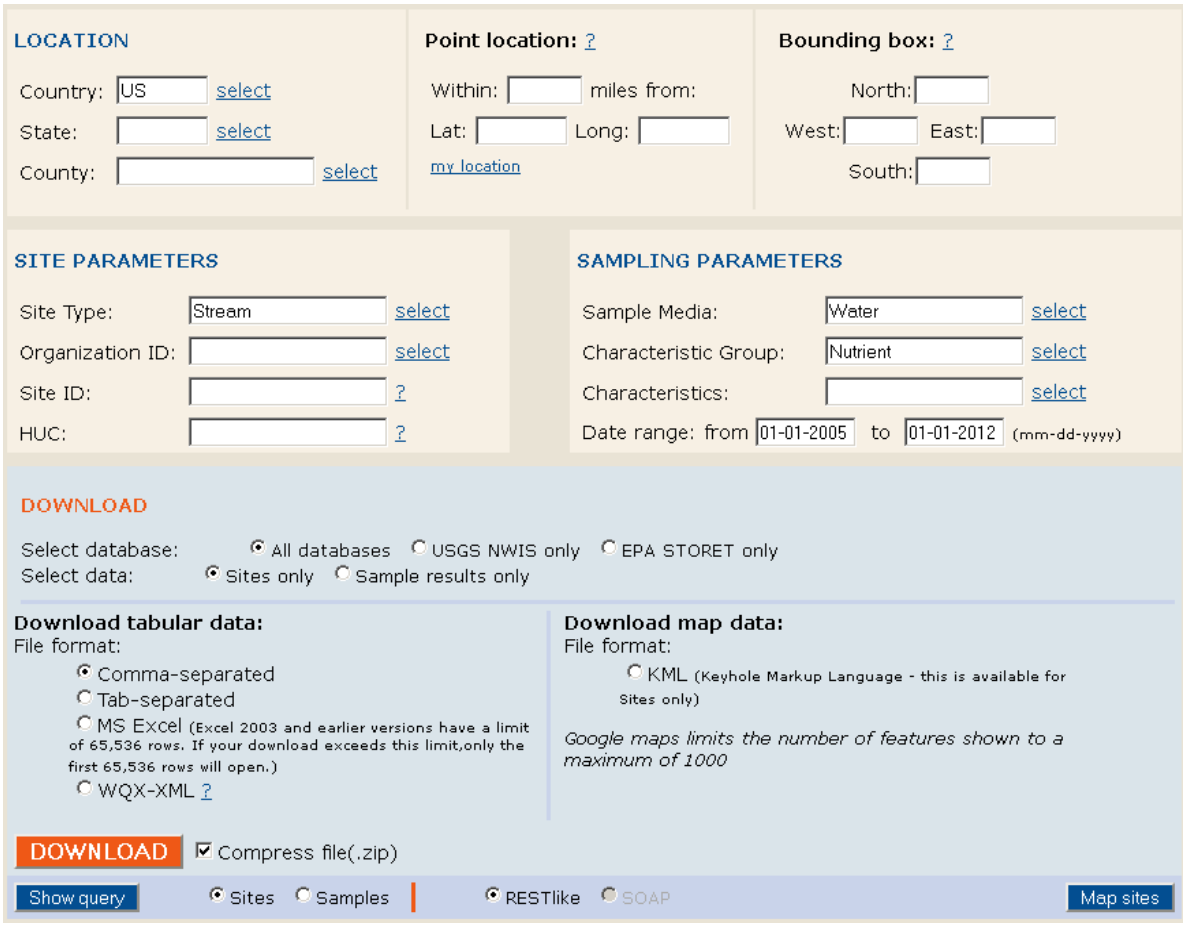
EPA United States Environmental Protection Agency

The Water Quality Portal (WQP) is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC).

The WQP integrates publicly available water-quality data from the USGS National Water Information System (NWIS) and the EPA STOrage and RETrieval (STORET) Data Warehouse.

www.waterqualitydata.us





Example Retrieval: Big Thompson Basin, Colorado

SITE PARAMETERS

Site Type:	Stream	select
Organization ID:		select
Site ID:		?
HUC:	10190006	?

SAMPLING PARAMETERS

Sample Media:	Water	select
Characteristic Group:	Nutrient	select
Characteristics:		select

Date range: from 10-01-2000 to 09-30-2004 (mm-dd-yyyy)

Retrieving and Selecting sites:

1. Download map data (KML file)
2. Open the file (in Google Earth)
3. Download “Sites only” data as a .csv file
4. Open the .csv file in Excel, save as a .xlsx file
5. Set column width
6. Apply the Excel data filter
7. Sort by (lat for Big T sites, since stream flows W to E)
8. Add column for downstream order
9. Deselect blanks in the “DS order” column
10. Save revised file

Working with the results:

1. Retrieve results as a .csv file
2. Open file in Excel, save as a .xlsx file
3. Set column width
4. Remove blank line between data from NWIS and data from STORET
5. Apply data filter
6. Hide columns with no data, a single value, or data of little utility
7. Add a column for downstream order
8. Using the filter, select each "MonitoringLocationIdentifier" identified in the revised site file and input the specified "DS order" number and "MonitoringLocationName" for all results
9. Clear the filter, save the revised file (1)

10. Select blanks in the "DS order" column; delete all the selected rows
11. Save the revised file (2)

12. Sort the data by site (DS order), date (ActivityStartDate), analyte (CharacteristicName), and fraction (ResultSampleFractionText)
13. Identify and delete duplicate samples (samples for the same analyte on the same date with duplicate site IDs; some duplicate calculated values, such as ammonia as NH4, phosphate as PO4; and some other calculated values of little interest, such as organic N)
14. Save the revised file (3)

15. Use the filter to select and delete rows with "ResultMeasure/MeasureUnitCode" that are not appropriate for the media of interest (for example, "mg/kg" for "Water"). Though not an issue with the BT data, this is common for USGS data on chemistry of suspended sediment.

16. Add a column for common analytes names
17. Use the filter to select "CharacteristicName" for similar (identical) analytes and fill in common name
18. Recheck for duplicates (e.g., when "Nutrient-nitrogen" and "Nitrate" are both reported for the same sample, they have the same result. Check the method; rename and retain/delete as needed)
19. Check methods (e.g., some "Orthohosphate" results are from EPA 365.4, which is for Total P; some of these are duplicate results for "Phosphorus". Rename and retain/delete as needed)
20. Re-sort the data by analyte (Analyte common name), site (DS order), and date (ActivityStartDate)
21. Save the revised file (4)

22. Rearrange some columns – move “ResultDetectionConditionText” and “DetectionQuantitationLimit---“ near “ResultMeasureValue”
23. Check for various units for same analyte. If found, add columns for “Value” and “Units”; copy “ResultMeasureValue” into the “Value” column or compute a values in the common units as needed. Fill in the “Units” column as appropriate.
24. Add a column for “Remark”. If “ResultDetectionConditionText” is “Not detected” or “*Non-detect”, or if “ResultMeasureValue” is zero, “put a “<” in the “Remark” column and copy “DetectionQuantitationLimitMeasure/MeasureValue” (with appropriate uints conversion, if needed) into the “Value” column.
25. Save the revised file (5)

26. Add a column for “Quantitation limit”; copy or convert the values in “DetectionQuantitationLimitMeasure/MeasureValue”, as was done for “Value” (above).
27. Add a column for “Value < QL?”. For all results with a quantitation limit, determine whether this limit is greater than the reported result, in “Value”.

Import and graph data in R:

1. Save the Excel file as csv. May rename columns to be valid in R by removing spaces or converting symbols to “_” or “.” The file BigT_results has been modified to convert some column names.
2. Start R by Clicking on .Rdata in Windows Explorer.
3. Open ImportBigT.r and run the script.
4. Create the left-censored data objects: Open MkLcens.r and run the script.
5. We’ll concentrate only on ammonia and nitrate plus nitrite.
6. Time-series plots of ammonia: Open TsPlotNH3.r and run the script.
7. Time-series plots of NO3 + NO2: Open TsPlotNO3.r and run the script.
8. Box plots for NO3 + NO2: Open BoxPlotNO3.r and run the script.