TADA 0.0.1 Reference Articles

Welcome to TADA: Tools for Automated Data Analysis!

lifecycle experimental

R-CMD-check passing

Tools for Automated Data Analysis, or TADA, is being developed to help States, Tribes (i.e., Tribal Nations, Pueblos, Bands, Rancherias, Communities, Colonies, Towns, Indians, Villages), federal partners, and any other Water Quality Portal (WQP) users (e.g. researchers) efficiently compile and evaluate WQP data collected from water quality monitoring sites. TADA is both a stand-alone R package, and a building block to support development of the TADA R Shiny application. We encourage you to read this package's LICENSE and README files (you are here).

- How to use TADA:
  - Function Reference
  - Example Workflow 1: Water Quality Portal Data Discovery and Cleaning (Beginner)
  - Example Workflow 2: 2023 Shepherdstown Training (Advanced)
- How to Contribute
  - We encourage stakeholders to test the functionality and provide feedback. Moreover, open source software provides an avenue for water quality data originators and users to develop and share code, and we welcome your contributions! We hope to build a collaborative community dedicated to this effort where TADA users and contributors can discover, share and build the functionality over time.
- More information on how TADA leverages the WQX QAQC Service
- More about the TADA Project

Installation

You must first have R and R Studio installed to use the TADA R Package (see instructions below if needed). You can install and load the most recent version of the TADA R Package on GitHub by running:

```
if(!"remotes"%in%installed.packages()){
install.packages("remotes")
}

remotes::install_github("USEPA/TADA", ref = "develop", dependencies = TRUE)
```

Tools for Automated Data Analysis (TADA)

Hillary Marler PhD

Water Data Integration Branch

EPA Office of Water

Reusable

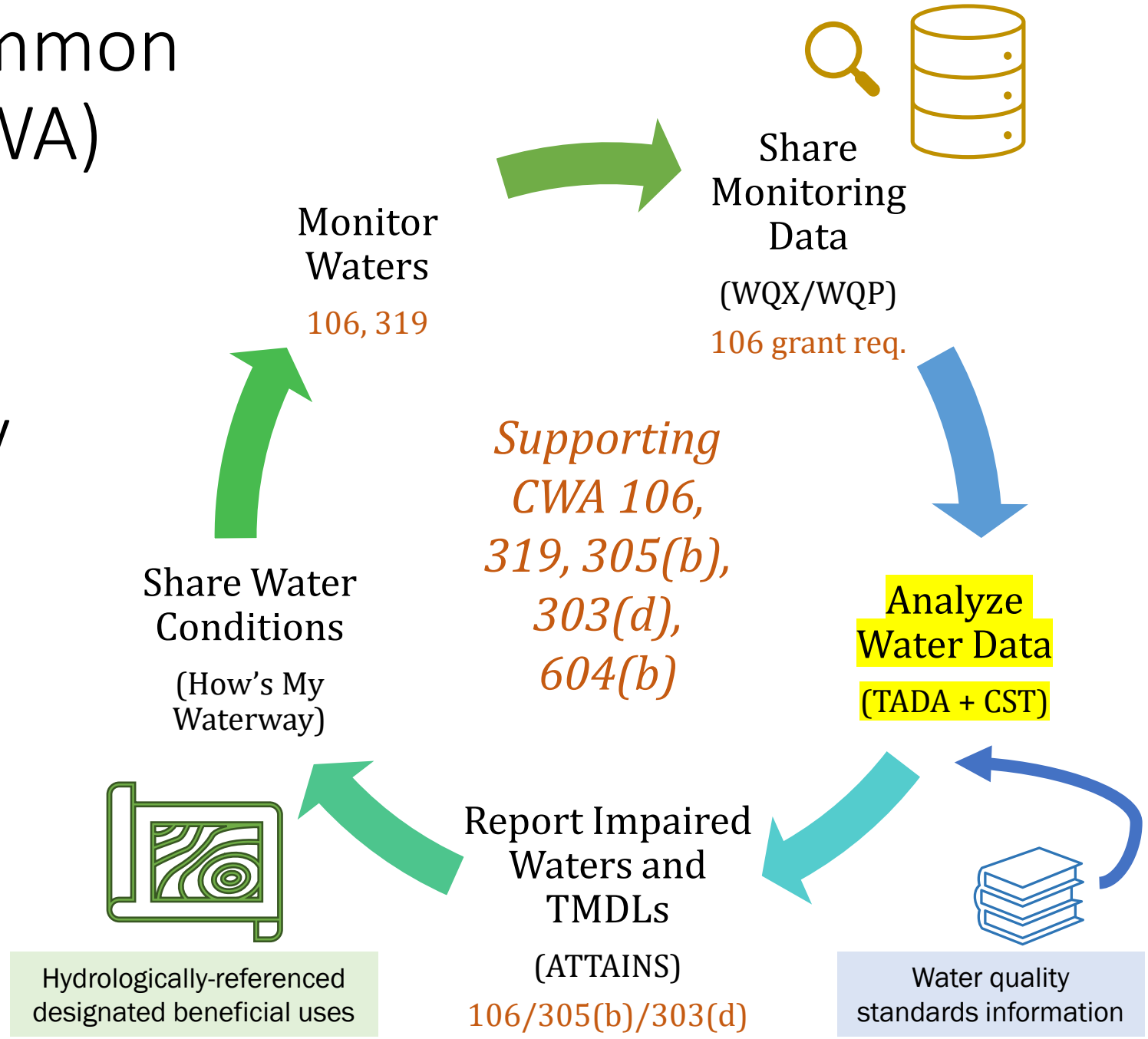
Interoperable

Accessible

Findable

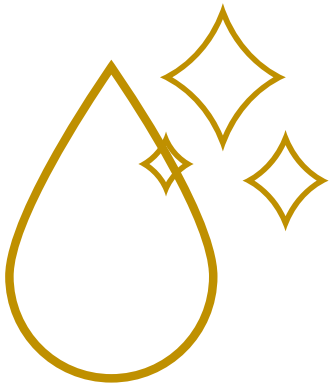
Helping Answer Common Clean Water Act (CWA) Questions

- Is my water safe?
- Does it meet water quality standards?
  - Aquatic Life
  - Drinking
  - Fishing
  - Recreation



TADA Vision

Discover, wrangle, and QC data



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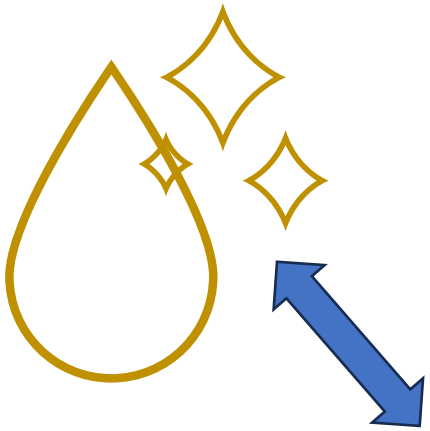
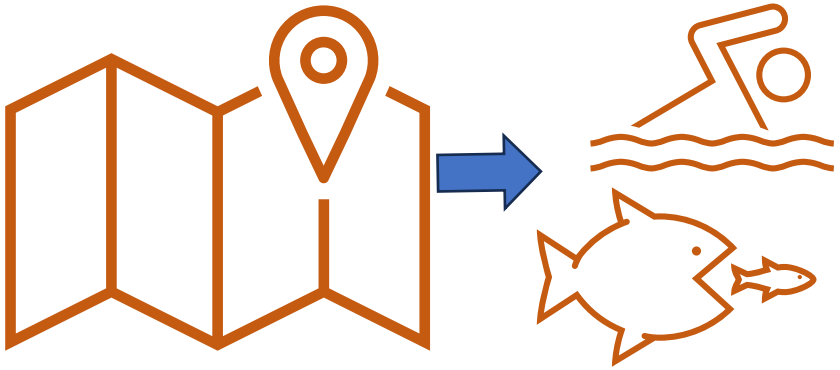


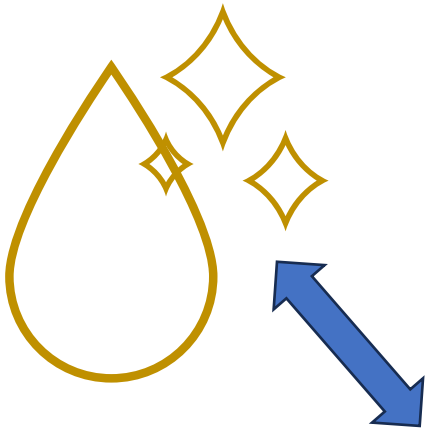
Assign beneficial uses



Assessment unit overlay with monitoring locations

TADA Vision

Discover, wrangle, and QC data



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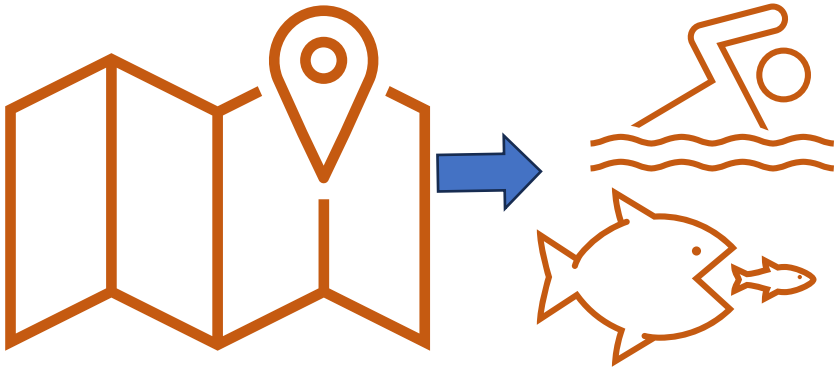

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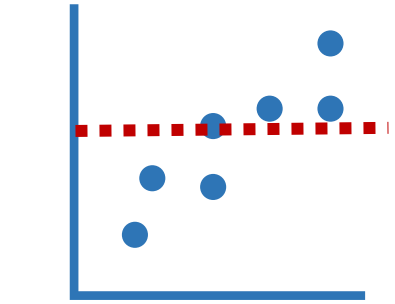


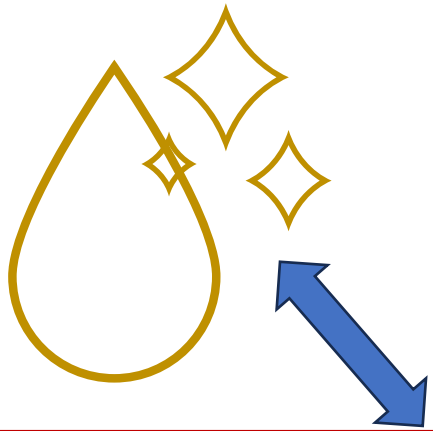
Beneficial uses determine numeric criteria used

Assessment methods guide impairment decisions based on:

- Period of record
- Aggregated measurements
- Frequency
- Duration
- Magnitude
- Season
- Correction factors
- Covariates
- Site-specific criteria

TADA Vision

Discover, wrangle, and QC data



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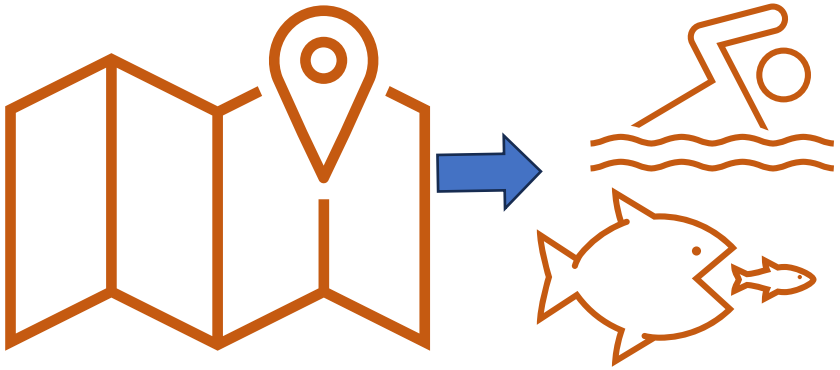

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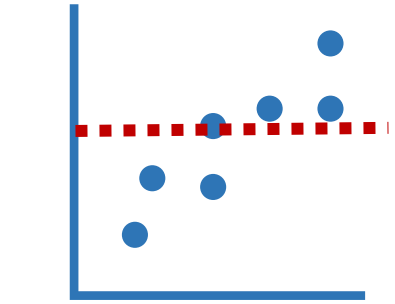

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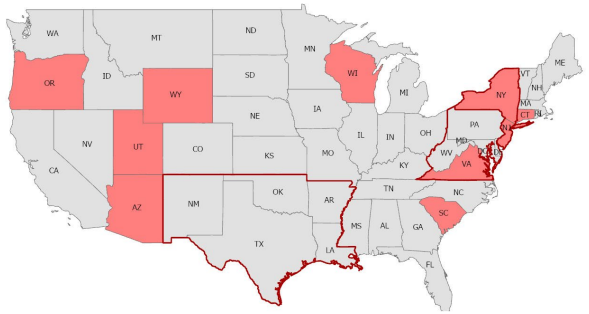
WQP TADA Working Group

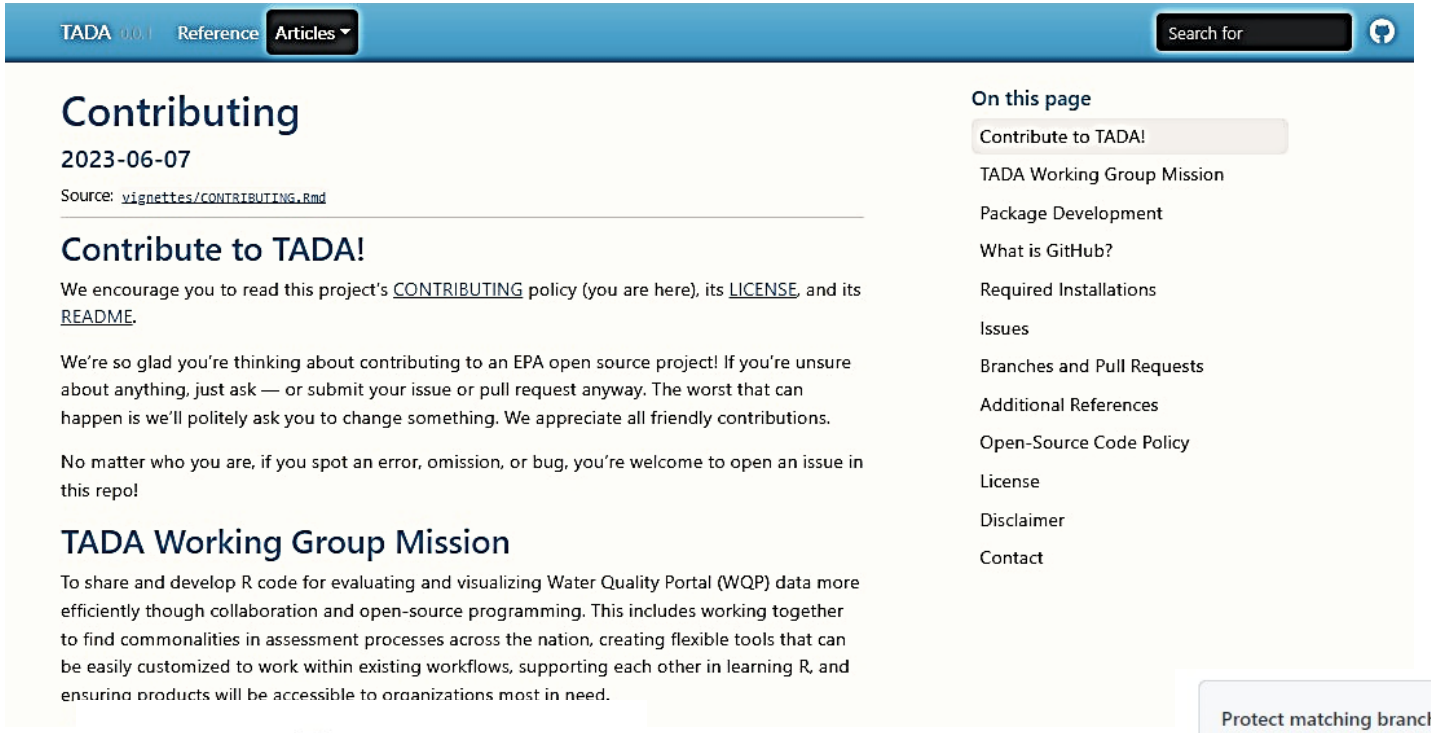
- Established in 2020
  - Built a community
  - Sharing examples from around the country
  - Extensive assessment process and methodologies discussions
  - Join us!

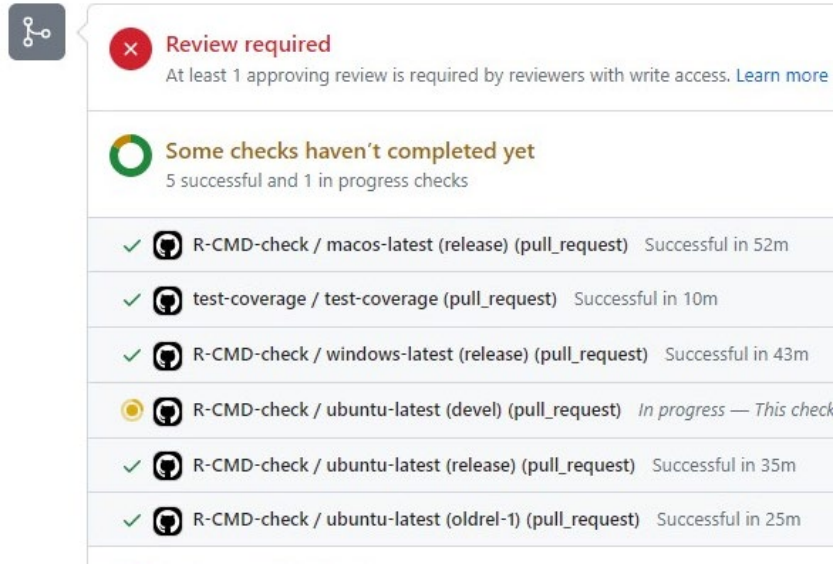


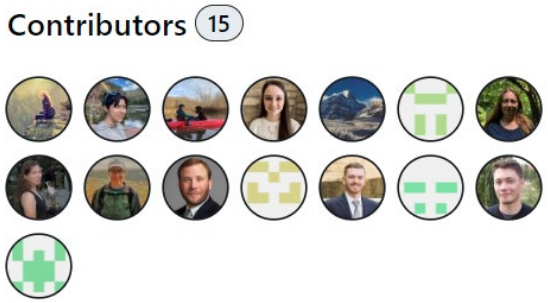
- Growing over time
- Currently meeting once every other month

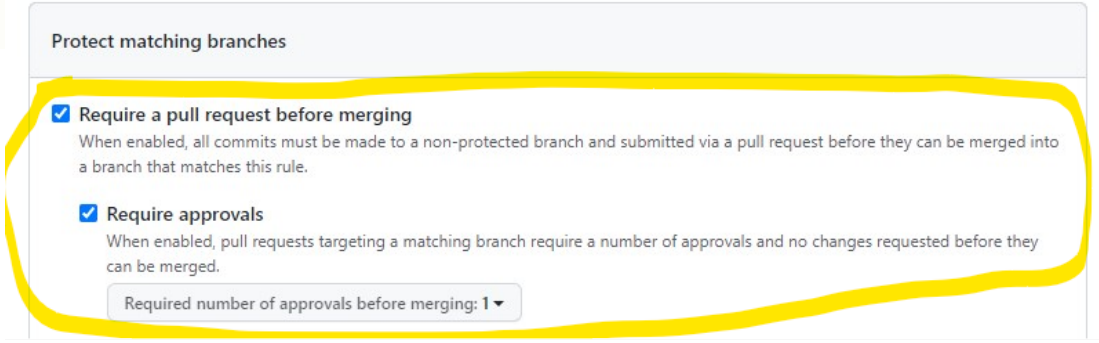
- EPA
  - HQ: WDIB, MAB, WB, OST, ORD, OECA, OLEM, ARD
  - Regions: 1, 2, 3, 6, 7, 8
- At least 1 State from each EPA Region
  - VA, WI, MA, SC, MT, UT, AZ, IL, WA, OR, KS, CT, CA, MN, OK, MO, NJ, IN, NY, AR, AK, LA, MD, GA, DC
- Tribal Nations from Regions 1, 6 and 8
  - Penobscot Nation, Ute Mountain Ute, Absentee Shawnee Tribe, Pueblo of Tesuque, Owens Valley Indian Water Commission, others early on (staff turnover)
- Federal Agencies/Universities/Other
  - USGS, TetraTech, Colorado State, Long Island Sounds Study, Oak Ridge National Laboratory

Involving users in the development process







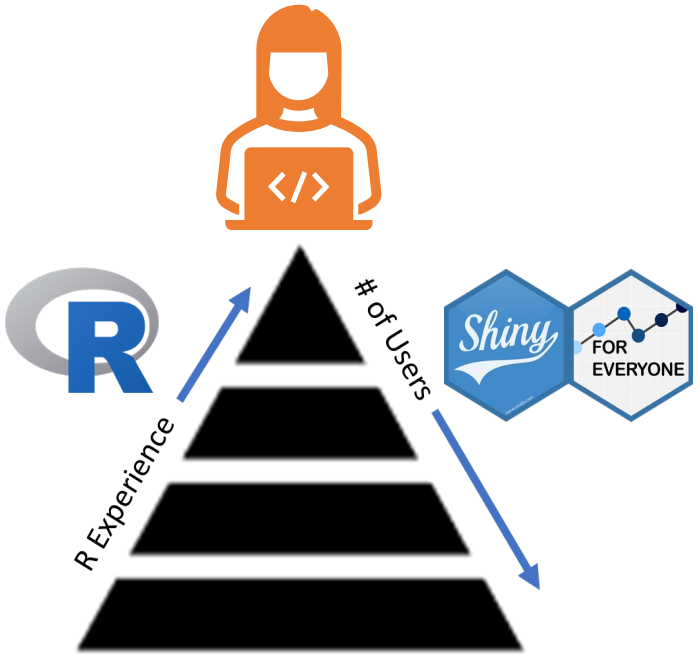


https://usepa.github.io/TADA/articles/CONTRIBUTING.html

TADA Products

- Different tools for different users
  - R Package (coders)
  - R Shiny Application (non-coders)
- User Guide on GitHub Pages
- EPA TADA Website
- R and R Shiny Learning Resources for Water Community, Collaborative Effort Between TADA Working Group & North American Lake Management Society (NALMS)
- Working Group SharePoint & inventory of open-source R code and WQP tools – please reach out to learn more!

"Serve as a hub for an open-source water quality community"



Working Group Mission

*To share and develop **R code** for evaluating and visualizing **WQP** data more efficiently though collaboration and open-source programming. This includes working together to find commonalities in assessment processes across the nation, creating flexible tools that can be easily customized to work within existing workflows, supporting each other in learning R, and ensuring products will be accessible to organizations most in need.*

R Package

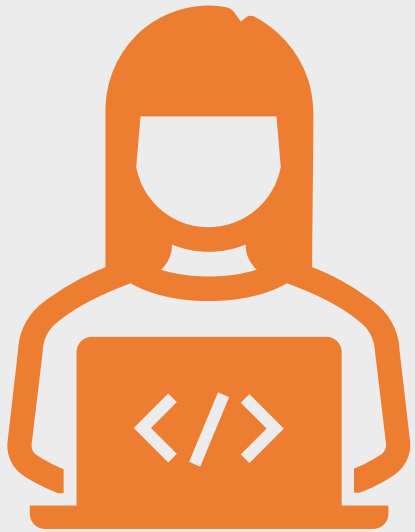
Data downloads
Data cleaning
Filtering
Normalizing

Analysis algorithms

- Focus on algorithms specific to WQP data
- Series of functions to assist common analysis processes
- Data is flagged but not automatically removed or modified
- Can be easily incorporated into existing tools or data processing methods
- Highly customizable
- Companion to **dataRetrieval** package

R Shiny User Interface

- R Shiny
  - Makes use of R package
- Guides user through process
- Interactive
  - data exploring
  - cleaning
  - graphing
  - etc.
- Web based



https://owshiny-dev.app.cloud.gov/tada-dev/

Thank you for listening!

And a BIG thank you to all our TADA contributors!

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