

## Request for Proposals: Groundwater Accounting Platform Technical Services

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### Background

The California Water Data Consortium (Consortium) is a 501(c)(3) non-profit organization founded in 2019 to support state agency implementation of the Open and Transparent Water Data Act (AB 1755, Dodd). The Consortium works actively with the state and partners to advance innovative projects that demonstrate the value of open and transparent water data. The Consortium is currently advancing several projects, including a Groundwater Accounting and Data Reporting Project. This project includes two components. The first component is a groundwater accounting and scenario planning platform designed to support local decision-making during drought and facilitate long-term groundwater sustainability planning under the Sustainable Groundwater Management Act (SGMA). The second project component, is the co-development of groundwater data reporting formats to reduce local agency reporting burdens, inform regulatory decisions by consolidating existing reporting datasets, increase data quality and consistency, and support local agency compliance with SGMA regulations.

### Project Background and Objectives

Groundwater provides between 40-60% of California's water supply. Despite its importance, groundwater resources remained largely unregulated until the passage SGMA in 2014. SGMA provides a statewide framework for the sustainable management of groundwater in all 515 alluvial groundwater basins throughout California. The legislation is driving a paradigm shift in how groundwater resources will be managed as local agencies transition from little to no management to a legal and regulatory system requiring comprehensive monitoring, planning, and implementation of management actions to achieve groundwater sustainability by 2040 or 2042. Owing to the prior voluntary nature of groundwater management, most local groundwater management agencies have limited data management infrastructure, often relying on paper records or excel sheets to manage their agency's data and develop water budgets. Consequently, there is now much work that needs to be done to better understand, track, and account for groundwater use across groundwater basins regulated under SGMA. Robust water tracking and accounting systems will serve as the foundation in advancing coordinated and well-informed decision-making as local agencies bring groundwater basins into sustainable conditions over the next two decades.

This project will expand the [Groundwater Accounting and Trading Platform](#), developed by Environmental Defense Fund (EDF), in partnership with Rosedale Rio-Bravo Water Storage District, to enhance the capacity of water managers across California to track water budgets, including water availability and use, and to leverage this information to assess and quantify the impacts and benefits of management actions through an easily accessible groundwater modeling decision-support tool. The platform will serve as an optional and freely available resource that groundwater sustainability agencies (GSAs) can leverage to help meet their sustainability requirements at a lower cost and in a manner that facilitates coordination and scaling across broad geographies. This work is advancing in partnership with EDF, the California

Department of Water Resources, State Water Resource Control Board, multiple water management agencies, and interested parties. The project includes robust engagement (led by the Consortium in partnership with EDF) to ensure platform adoption and use.

Project objectives include:

1. Developing an integrated groundwater accounting and scenario planning platform (Platform) that GSAs and other interested parties can use to support local decisions and scenario planning to achieve groundwater sustainability under SGMA.  
Achieving this objective will involve integrating two open-source software systems: the [Groundwater Accounting and Trading Platform](#), developed by EDF, in partnership with Rosedale Rio-Bravo Water Storage District, with the Groundwater Evaluation Toolbox (GET) developed by Olsson Engineering.
2. Integrating scenario planning software into the Platform to enable groundwater managers and interested parties to explore different management scenarios under SGMA.
3. Integrating relevant groundwater data into the Platform, including groundwater level, use, and well location data.

### Specific Project Tasks

The Consultant must successfully complete the following project tasks:

1. **Task 1** (Objectives 1,2,3): Support engagement, training, and outreach.

#### Task 1 Deliverables:

The Contractor will attend and support the Consortium and EDF at the following project meetings:

- **Virtual Public Meetings:** Support the California Water Data Consortium and EDF at two virtual public outreach meeting to raise awareness of Platform development, solicit feedback, and build relationships with water managers and interested parties.  
*Meeting Expectations:* The Contractor will, in coordination with the Consortium and EDF, develop slides and other material to support the meetings, and, where appropriate, co-present at the meetings, answer questions, and solicit feedback.
- **Virtual Trainings:** Conduct two virtual trainings at the conclusion of the project to highlight Platform functionality and use. These trainings will be open to the public.  
*Meeting Expectations:* The Contractor will run these trainings, in coordination with the Consortium and EDF. The Contractor will provide educational materials, training presentations, and follow up with participants following the trainings.
- **Quarterly Platform Working Group Meetings:** The Contractor will attend, provide updates on Platform development, and solicit feedback at on Platform design and feature development at 6 quarterly platform scaling meetings (2 hours in duration) for the duration of the project.  
*Meeting expectations:* In partnership with the Consortium and EDF, the Contractor will develop documents, slides, or other material to update meeting

participants on Platform development and solicit feedback. Contractor will document feedback and work with the project team to prioritize and integrate feedback into Platform development.

- **Quarterly Technical Working Group Meetings:** The Contractor will attend, provide updates on Platform development, and solicit feedback on Platform design and feature development at 6 quarterly Technical Working Group meetings (2 hours in duration) for the duration of the project.  
*Meeting expectations:* In partnership with the Consortium and EDF, the Contractor will develop documents, slides, or other material to update meeting participants on Platform development and solicit feedback. Contractor will document feedback and work with the project team to prioritize and integrate feedback into Platform development.
- **Outreach Material:** In partnership with the Consortium and EDF, the Contractor will develop outreach material about the Platform for electronic and in-person distribution. Outreach materials will provide an overview of the Platform, its functionality, and intended uses.

2. **Task 2 (Objective 2):** Integrate the State’s open-source Integrated Water Flow Model (IWFM) into the GET Engine. GET currently integrates with MODFLOW models. Task 2 will expand the GET Engine so it can also execute models using the IWFM. Integration of IWFM into the GET Engine must include testing with 2 pilot partners (to be determined by the Consortium) to ensure that GET can successfully integrate and run a variety of management scenarios using either IWFM or MODFLOW (See Tasks 5 and 6).

Task 2 Deliverables:

- GET (as integrated into the Groundwater Accounting and Scenario Planning Platform described under Task 5) can successfully differentiate between IWFM and MODFLOW input files and handle post-processing of IWFM output files to run a variety of management scenarios using either IWFM or MODFLOW.
- Model Output files are stored in the Platform and can be readily accessed by users with the appropriate authorization.

3. **Task 3 (Objective3):** Integrate and visualize public and local (from 2 pilot partners, to be decided by the Consortium) groundwater levels data into the Platform.

Task 3 Deliverables:

- Integrate public groundwater level data (from the California Natural Resource Agency Portal) using a REST API.

- Integrate groundwater level data from 2 pilot partners into the Platform. Local data must have password protection and allow different access authorizations to be assigned.
  - Develop a scalable process for integrating groundwater level data into the Platform.
  - Consistent with the Technical Working Group (working on data reporting format development), develop an API that includes the co-developed groundwater level data reporting format and develop and/or integrate functions or tools to crosswalk local groundwater level data with existing data reporting formats.
  - Develop tools within the Platform to visualize historical and current groundwater level data, including seasonal highs and lows for each principal aquifer in pilot partner regions, as well as hydrographs depicting long-term groundwater levels, historical highs and lows, and hydraulic gradients between principal aquifers.
4. **Task 4 (Objective 3):** Integrate public and local (from 1-2 pilot partners, to be decided by the Consortium) groundwater well locations and use data into the Platform.

Task 4 Deliverables:

- Integrate public groundwater well locations and use data from the California Natural Resource Agency Portal using a REST API.
  - Integrate groundwater use data from 1-2 pilot partners. These data may be metered or estimated using other methods. Local data must have password protection and allow different access authorizations to be assigned.
  - Develop a scalable process for integrating groundwater level data into the Platform.
  - Develop tools within the Platform to visualize well locations and use data. To ensure privacy concerns, water use data will be aggregated across users and groups.
  - Ensure well location and use data are accessible to the GET Engine to inform more spatially explicit modelling scenarios.
5. **Task 5 (Objectives 1 and 2):** Integrate the Groundwater Accounting and Trading Platform with GET.

Integration of these two open-source systems must include testing to ensure the transfer of information between systems, additional testing must be conducted with pilot partners to ensure functionality and the intuitive integration of GET into the existing Groundwater Accounting and Trading Platform.

Task 5 Deliverables:

A functional, tested, and intuitive Groundwater Accounting and Scenario Planning Platform that:

- Enables scenario planning using the updated GET Engine described in Task 2 and that includes REST API endpoints for custom scenario file uploads.
- Expands the accounting functionality of the Groundwater Accounting and Trading Platform to include groundwater data outlined in Task 3 and 4.
- Develop materials to support pilot partner meetings, including monthly pilot partners meetings and in-person workshops with pilot partners to understand, collaboratively prioritize, and integrate scenario planning functionalities useful to pilot partners.

### Final Project Outcomes

By the end of the project, water managers, GSA staff, and interested parties will be able to (using just their computer browser):

- View a map of their jurisdictional area, including available groundwater elevation and groundwater pumping data.
- Define and run management scenarios to better understand potential trade-offs, impacts and/or benefits associated with proposed management actions.
- Within each scenario, adjust the pumping rates across multiple management zones in their jurisdiction.
- Run numerical models that simulate management actions, and their impacts on groundwater levels.
- Receive email notifications when results of model runs are available.
- View and analyze model-run results for each scenario using charts, interactive maps, and data tables.
- Adjust scenarios and re-run models as necessary.
- Compare results across multiple model-runs or against a baseline model.

### Project Details

- This is a flat-rate, fixed fee contract for \$240,000 USD.
- This project is funded through the U.S. Bureau of Reclamation WaterSMART Applied Science grant R21AS00289 entitled, “Advancing an Open-Source Water Accounting and Scenario Planning Platform to Support the Successful Implementation of California’s Sustainable Groundwater Management Act”.
- The Contractor is expected to provide monthly progress reports and monthly invoices using Consortium provide reporting templates.

### RFQ and Project Timeline

- *RFQ Timeline:*
  - August 15th: Deadline to submit questions
  - August 22<sup>nd</sup>: Deadline to submit proposals
  - September 14th: Anticipated notification date to the RFP awardee
- *Project Timeline:*
  - This work is expected to start in early to mid-October, 2022 and must be completed within 14-months

Milestone / Task / Activity	Planned Start Date	Planned Completion Date
Support DWR's Integrated Water Flow Model	10/2022	02/2023
Integrate Groundwater Level Data	01/2023	04/2023
Integrate Groundwater Use & Well Location Data	03/2023	06/2023
Enable Scenario Planning and Visualizations using the GET Engine	06/2023	12/2023

#### Minimum Contracting Team Requirements

- Proposers must:
  - Certify that they are not currently under suspension or debarment by any state or federal government agency, and that neither Contractor or any of its proposed subcontractors are tax delinquent with the State of California.
  - Possess and provide a Unique Entity Identifier from the System for Award Management (SAM).
  - Have a minimum of five years of experience developing and working with open-source software and be able to provide examples of in-house software developed.
  - Experience working in California water management.
  - Experience developing software platforms or tools with stakeholder-driven processes.
  - Have extensive familiarity working with Microsoft Azure.
  - Ability and willingness to submit timely narrative and budget reports to meet Federal requirements, as this project is funded by the Bureau of Reclamation.
  - Comply with the Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended) and 43 CFR 18: Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.
  - Sign and submit a [Certification Regarding Lobbying](#) to the Consortium with their proposal.

- Contracting team will be selected based on the above criteria, as well as project team experience, expertise, and overall value.

Instructions for submission of proposals:

- Please submit proposals and Certification Regarding Lobbying via email to [amiller@cawaterdata.org](mailto:amiller@cawaterdata.org) no later than COB **Aug. 22<sup>th</sup>, 2022**.
- The Consortium anticipates conducting interviews and outreach to potential contracting teams the weeks of Aug. 22nd to Sept. 11th. Please have staff available to respond to requests during that time.
- A submission must include:
  - Description of the company and biographies for key personnel.
  - A narrative about the company and key personnel experience in this area of work.
  - A proposal narrative outlining approach and key personnel for each project task outlined above.
  - A description of 2 – 3 comparable projects including:
    - Project Scope
    - Key roles – explain specific team member contributions
    - Links to two or more open-source software platforms or tools developed in-house. Must clearly identify the role key personnel played in the development of each of each example provided.
    - At least one reference involved in software scoping and development for each example provided