

**Data for Water Decision Making in California: Stakeholder Working Group**

**Template for Use Case Development**

August 4, 2017

The goal of this document is to facilitate engagement with stakeholders interested in contributing to California water data and information systems.

**About the Stakeholder Working Group**

The Open and Transparent Water Data Act, AB 1755, presents an opportunity to improve water decision making and data provision in California.

The Stakeholder Working Group (SWG), which includes representatives from the Department of Water Resources (DWR), UC Water, and the California Council on Science and Technology (CCST), takes as its core principle the notion that in order for water data to be useful, it must be developed with decision-makers’ needs as the central organizing driver of data provision. It seeks to develop activities that bring this essential view into AB 1755 implementation and into the longer-term visioning and planning for California water data.

**Use cases: Assessing and understanding decision-makers’ data needs**

The Stakeholder Working Group seeks to develop a set of “use cases” that are intended to serve as a tool for a) assessing stakeholder data needs, and b) communicating those needs to technical developers. In this context, a use case is a short document that communicates the data needs for a particular decision by providing a set of answers to the question: *Who* needs *what type* of data, in *what form*, to make *what decisions*? Taken collectively, the set of use cases will be used to identify core data sources or sets where interoperability is particularly important. The set of use cases will also provide a way to better understand data gaps, including gaps in interoperability or accessibility.

The development of use cases necessarily involves decision-makers themselves, as they are uniquely positioned to answer these questions. Ultimately these use cases will inform specifications for dashboards or other user-oriented products, taking into account the realities of technical elements of database implementation. Above all, the use cases are intended to be responsive to stakeholder data needs, as well as useful for technical developers seeking to understand the data needs of system users.

**Process and next steps**

UC Water, DWR and CCST organized two stakeholder workshops (February and May 2017) that focused on engaging stakeholders and decision makers in the development of use cases to inform decision-driven data provision. UC Water is currently drafting a Stakeholder Working Group report that develops an argument for decision-driven data systems, along with a description of the process and lessons learned. The Stakeholder Working Group report will integrate the workshop-generated use cases with additional cases developed by other organizations. The goal is to publish a draft report by October 1, 2017 and a final report by December 1, 2017, in order to inform DWR’s AB 1755 strategic plan.

**Developing use cases**

We are currently seeking use cases from a variety of data users and decision makers who are interested in contributing to the development of decision-driven data provisioning for California water to include in this report. **We invite decision makers who engage with water-related data to submit use cases related to their own data needs and decision-making processes.**

This document includes a template and example to guide the development of use cases. The document also includes a blank use case template; definitions of terms; and an example of a use case: “Planning a groundwater recharge project under SGMA.”

There are several ways that interested stakeholders can contribute use cases:

1. Some organizations or individuals prefer to work independently to develop their own use cases based on their own knowledge or workflows, using the template below. These use cases can be incorporated into the process described above, which allows data needs to be highlighted at the state level.
2. The Stakeholder Working Group is also offering to engage with organizations on the development of use case topics. We can work with interested organizations to develop use cases via interviews and other exchanges.

If you are interested in submitting a use case or working with us to develop a use case, please be in touch (see contact information below). We will be able to consider use cases submitted by **September 1, 2017** for inclusion.

**Primary contacts**

For use case development: Alida Cantor (acantor@berkeley.edu) and Mike Kiparsky (kiparsky@berkeley.edu).

For general stakeholder engagement: Mike Kiparsky (kiparsky@berkeley.edu).

For technical requirements development: John Helly (hellyj@ucsd.edu)

**Blank example of use case template**

|  |  |
| --- | --- |
| **Objective** Decision, goal or desired action |  |
| **Description**Important context and background information |  |
| **Participants**The main decision-maker; also note other parties involved or affected |  |
| **Regulatory context**Legal, regulatory, and reporting requirements  |  |
| **Workflow**Progression of steps and specific actions taken by participants to accomplish objective |  |
| **Data sources** Existing data sources; data gaps. **Be as specific as possible** |  |
| **Data characteristics**Notes about type and form of data  |  |

**Additional comments:** Include notes on uncertainties, barriers and opportunities, etc.

**Definitions**

|  |  |
| --- | --- |
| **Objective** Decision, goal or desired action | The objective describes what the user is trying to accomplish. The objective is the goal or desired action on the part of the system user. Decisions may involve investment and policy decisions (longer-term); programmatic implementation (medium-term); or operational decisions (short term).  |
| **Description**Important context and background information | The description provides important context and background information that might help a reader understand the objective.  |
| **Participants**The main decision-maker; also note other parties involved or affected | The participants include the main actor(s) or decision-maker(s). Participants may also include other parties who may be involved in accomplishing the objective (in this case, note the main decision-maker).  |
| **Regulatory context**Legal, regulatory, and reporting requirements  | Regulatory context could include, for example, specific statutes or regulations; legal operational constraints; specific governmental agency programs or programs under development; reporting requirements; etc. May also include other boundaries: for example, fiscal boundaries, quarterly reporting requirements, etc. This is intended to provide additional context, information about constraints, and points of cross-reference.  |
| **Workflow**Progression of steps and specific actions taken by participants to accomplish objective | The workflow describes a progression of steps taken by the participants in order to accomplish the objective. The workflow should make clear the specific actions that are necessary to accomplish the objective.  |
| **Data sources** Existing data sources; data gaps. **Be as specific as possible** | Data sources include existing data sources as well as gaps. This section should describe the data sources that are already in use, along with additional sources that data users would like to see developed. Be as specific as possible in listing existing data sources that participants are familiar with or are already using. **(See table at the end of this document for example of data sources including links)** |
| **Data characteristics**Notes about type and form of data | Data form includes notes about the type, form, and format of data that would be most useful for making decisions. Anything peculiar about the data. *Examples: “Missing values are encoded using a text string "N/A" rather than a number or a period.” Or, “We use state plane coordinates for the map projection rather than UTM. We convert it from UTM using gdal.”* |

**Additional comments:**  Includes notes on uncertainties, barriers and opportunities, etc.

**Example use case: Planning a groundwater recharge project under the Sustainable Groundwater Management Act (SGMA)**

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| --- | --- |
| **Objective** Decision, goal or desired action | Objective: To avoid undesirable results including declining groundwater levels through the recharge of groundwater. Decision: When, where, and how to recharge groundwater? With what water?  |
| **Description**Important context and background information | Under SGMA, GSAs must achieve sustainability of the groundwater basins they manage by avoiding undesirable results[[1]](#footnote-1) that include the chronic lowering of groundwater levels. Managed Aquifer Recharge (MAR) is one tool GSAs can use[[2]](#footnote-2). MAR is the use of various methods such as infiltration basins or green infrastructure to actively increase the amount of water that enters an aquifer. MAR can offset reductions in groundwater levels by increasing storage of water.  |
| **Participants**The main decision-maker; also note other parties involved  | GSA water manager (primary decision-maker)Consultant (e.g., engineer assisting primary decision-maker) Local land use planner (may be consulted)SWRCB and DWR (interested in results of groundwater sustainability plan) |
| **Regulatory context**Legal, regulatory, and reporting requirements  | * Sustainable Groundwater Management Act – avoidance of Undesirable Results[[3]](#footnote-3)
* Funding for development and implementation of groundwater plans and projects[[4]](#footnote-4)
* Other regulatory contexts: for example, CEQA, NEPA, water rights issues, water quality issues
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| **Workflow**Progression of steps and specific actions taken by participants to accomplish objective | * The water manager must identify potential source(s) of water, and for each determine the quantity and timing of water available for recharge and its cost.
* To determine where the project should be located, the water manager must examine different options based on basin capacity and suitability of recharge areas; parcel data indicating available land and land values; and water quality implications based on current or past land use and the design of the project.
* To determine the best method for recharge, basin characteristics such as subsurface characteristics, soil types, topography, current and planned land use, and basin capacity must be taken into account.
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| **Data sources** Existing data sources; data gaps. **Be as specific as possible** | * Water availability data: Water rights information, precipitation data, projected flows, projections/forecasts of water availability. Specific sources include:
	+ DWR California Data Exchange Center datasets: “California Statewide Water Conditions” (includes information on precipitation, snowpack, runoff forecasts, river runoff, and reservoir storage)
		- Executive Update on Hydrologic Conditions in CA (03/31/2017; updated monthly)
		- 2017 WY Precipitation Summary
		- Reservoir Water Storage, by hydrologic region
	+ USGS Current Water Data for California: Daily Streamflow Conditions
	+ NOAA Precipitation Frequency Data Server (PFDS)
	+ CA Water Board Electronic Water Rights Information Management System (eWRIMs)
* Basin characteristics data: Soil types, basin capacity, subsurface characteristics, assimilative capacity, models of basin characteristics. Specific sources include:
	+ DWR Groundwater Basin Maps and Descriptions (Bulletin 118)
	+ USGS Groundwater Modeling: California Groundwater Model Archive
	+ UC Davis California Soil Research Lab Soil Agricultural Groundwater Banking Index (SAGBI) suitability index for groundwater recharge
* Land use data: Available land, water quality concerns from past land use history, historical data on land use (requires both temporal and spatial dimensions). Specific sources include:
	+ DWR Land Use Survey data (available at county scale; available years vary)
	+ USDA National Agricultural Statistics Service “Cropscape” Cropland Data Layer
	+ USGS Global Land Cover Characteristics Data Base, Version 2.0
	+ CA Department of Conservation Farmland Mapping and Monitoring Program, county-level data
* Data gaps: Water rights data may be incomplete or unavailable.

**SEE TABLE BELOW for list of data sources with links.**  |
| **Data characteristics**Notes about type and form of data | * In order to capture potential impacts of previous land uses, land use data must include both historical/temporal and spatial dimensions. This is important because groundwater basins may be contaminated by certain previous land uses.
* Map layers are helpful in capturing spatial dimensions of data, and for spatial analysis such as finding areas of overlap between various characteristics.
* Groundwater models (hydrologic models used to simulate and predict movement and use of water) may be required to make decisions in some cases, but not all. Existing groundwater models, such as those archived by the USGS[[5]](#footnote-5), may be useful in some cases, but in other cases existing models may be insufficient.
* Not all the required data is digitized, which presents problems for those seeking to access and use data.
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**Additional comments:**

* **Water budget as organizing principle:** The water budget should be considered as a straightforward model that can be the organizing principle for the data interactions between groundwater basins, sub-basins, GSA entities, etc.
	+ The water budget is influenced by land use, and thus managing water budgets requires land use data.
* **Notes on GSAs as decision makers:** The GSA is not a monolithic decision maker-- there is granularity to the GSA as a decision maker. SGMA provides an opportunity to rethink data needs and reporting requirements. Much of the water demand data is collected at the local level, which needs to be fed into the overall SGMA water budget to inform management decisions.
* **Uncertainties:** Uncertainties in this case include land use impacts on groundwater, as well as climate change and other uncertainties.

**Data sources table with access methods (URLs):**

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| --- | --- | --- | --- |
| Type of Data | Description of type of data | Data source description | Access Method |
| Groundwater | Groundwater basin maps | DWR Bulletin 118 basin boundaries | http://www.water.ca.gov/groundwater/bulletin118/gwbasins.cfm |
| Groundwater | Groundwater models | USGS Groundwater Modeling: California Groundwater Model Archive | https://ca.water.usgs.gov/sustainable-groundwater-management/california-groundwater-modeling.html |
| Groundwater | Groundwater recharge suitability | SAGBI (Soil Ag Groundwater Banking Index) suitability index | https://casoilresource.lawr.ucdavis.edu/sagbi/ |
| Land Use | Farmland maps | California Department of Conservation Farmland Mapping and Monitoring Program (county-level data) | http://www.conservation.ca.gov/dlrp/fmmp/Pages/county\_info.aspx |
| Land Use | Land use surveys | DWR Land Use Survey data (available at county scale; available years vary) | http://www.water.ca.gov/landwateruse/lusrvymain.cfm |
| Land Use | Land cover maps | USGS Global Land Cover Characteristics Data Base Version 2.0 | https://lta.cr.usgs.gov/glcc/globdoc2\_0 |
| Land Use | Agricultural land use | USDA National Agricultural Statistics Service Cropscape Cropland Data Layer | https://nassgeodata.gmu.edu/CropScape/ |
| Water | Precipitation | DWR CDEC 2017 WY Precipitation Summary | http://cdec.water.ca.gov/cgi-progs/precip/PRECIPSUM |
| Water | Hydrologic conditions | DWR CDEC Executive Update on Hydrologic Conditions in CA (03/31/2017; updated monthly) | http://cdec.water.ca.gov/cgi-progs/reports/EXECSUM |
| Water | Reservoir water storage | DWR CDEC reservoir storage by hydrologic region | http://cdec.water.ca.gov/cgi-progs/reservoirs/STORAGEW |
| Water | California Statewide Water Conditions | DWR CDEC information on precipitation; snowpack; runoff forecasts; river runoff; and reservoir storage | http://cdec.water.ca.gov/water\_cond.html |
| Water | Precipitation | NOAA Precipitation Frequency Data Server (PFDS) | http://hdsc.nws.noaa.gov/hdsc/pfds/ |
| Water | Water rights | SWRCB Electronic Water Rights Information Management System (eWRIMs) | http://www.waterboards.ca.gov/waterrights/water\_issues/programs/ewrims/index.shtml |
| Water | Streamflow | USGS California streamflow data | https://waterdata.usgs.gov/ca/nwis/rt |

1. CA Water Code § 10721 (x)(1) [↑](#footnote-ref-1)
2. For more information, see, for example: “Why we can’t just suck it up: The challenges of groundwater recharge in California.” Bea Gordon, March 31, 2017, Stanford Water in the West. <http://waterinthewest.stanford.edu/news-events/news-insights/why-we-cant-just-suck-it-challenges-groundwater-recharge-california> [↑](#footnote-ref-2)
3. CA Water Code § 10721 (x) [↑](#footnote-ref-3)
4. See “Water Quality, Supply, and Infrastructure Improvement Act of 2014 (AB 1471), commonly referred to as “Proposition 1. See also CA Water Code § 79771; CA Water Code § 79775; and “Proposition 1 Groundwater Grant Program Guidelines,” adopted by the State Water Board May 18, 2016. [↑](#footnote-ref-4)
5. See USGS Groundwater Modeling, California Groundwater Model Archive, available at <https://ca.water.usgs.gov/sustainable-groundwater-management/california-groundwater-modeling.html> [↑](#footnote-ref-5)