California Irrigation Management Information System (CIMIS) Expansion and Station Site Improvement Project

Proposition 4 Draft Guidelines

May 15, 2026

Background

CIMIS is a program unit within the Water Use Efficiency Branch (WUE), Division of Regional Assistance (DRA), Department of Water Resources (DWR) that provides statewide reference evapotranspiration (ETo) and weather data that are crucial for water conservation in agricultural and urban settings. CIMIS manages over 150 automated weather stations throughout the state and provides hourly, daily, and monthly data to over 80,000 primary registered users, and hundreds of thousands more secondary and non-registered users. These ground stations require the efforts of not only DWR staff, but coordination with hundreds of landowners, cooperators, and other private and government entities such as the State, federal, and local governments and universities.

CIMIS also provides spatially distributed ETo data, known as Spatial CIMIS, at a 2-km spatial resolution by combining satellite and ground station data. The spatial CIMIS provides an estimate of ETo for any point in California.

According to a 2019 UC Berkeley study, the use of CIMIS data saves about 2 million acre-feet of water per year (Zilberman et al., 2019). The total Gross Domestic Product (GDP) contributions of CIMIS data are estimated at $1.98-3.97 billion annually.

The Safe Drinking Water, Wildfire Prevention, Drought Preparedness, and Clean Air Bond Act of 2024 (Proposition 4) made $75 million available to DWR for projects that increase water conservation in agricultural and urban areas. Water conservation in agricultural (and outdoor urban) settings depends on accurate estimates of water requirements for crop production and landscape maintenance, respectively (Pub. Resources Code, § 91019). CIMIS provides data that irrigators need to determine crop/landscape water requirements, which enables them to apply the right amount of water at the right time. This conserves water and reduces water losses, increasing overall efficiency. Approximately $10 million of the $75 million is planned for the expansion of CIMIS stations network to areas that have spatial data gaps (5.47 million) and improvement of site conditions for existing stations ($3.40 million). The remaining balance ($0.86 million) will be used for program delivery.

CIMIS Network Expansion

CIMIS ETo data is mandated, needed, and requested in every agricultural and urban community in California. The distribution of the approximately 150 ground stations in the State reflects the proactive efforts and often monetary ability of local communities and landowners to provide irrigated grassy fields as station sites on a voluntary basis. This has

resulted in some areas having no CIMIS stations or having poorly maintained stations. In California's diverse climate, each station provides unique data covering a small fraction of the State's microclimates and resulting in significant spatial data gaps of ETo. A large portion of the Proposition 4 funds will be used to purchase equipment for new stations to be installed in areas with identified spatial data gaps.

Site Selection

Sites for new CIMIS stations will be selected based on existence of spatial ETo data gaps and suitability of the proposed site for CIMIS station. Another consideration for site selection will be future climate change induced risks, such as floods and wildfires.

Spatial Data Gaps

CIMIS has developed a map of spatial data gaps for representative ETo based on horizontal distances from existing CIMIS stations and differences in elevation. Figure 1 shows spatial data gaps superimposed on County maps and will be used in selecting sites for new CIMIS stations. Some current CIMIS stations do not report ETo because of site characteristics that have degraded.

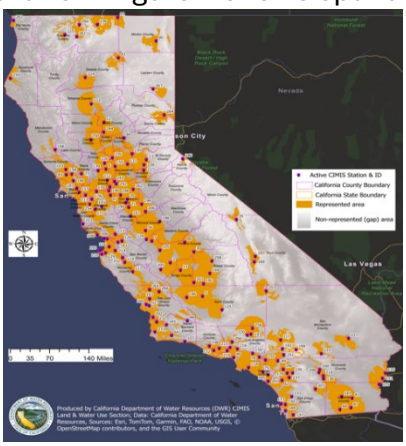

Figure 1. CIMIS Spatial Data Gaps

Station Siting Criteria

CIMIS station site selection is one of the most important decisions that must be made with care as it affects the accuracy, reliability, and representativeness of the collected data. A potential CIMIS station site has to meet all of the following criteria in order to be selected::

- Stations should be located centrally on flat ground surrounded by extensive open space in all directions. Topographic depressions and high points should be avoided. The ideal CIMIS station would have about 600-ft of well-watered cool season grass in all directions from the station equipment. Such ideal sites are hard to find in California, so CIMIS works to find the largest site available for the areas represented. Landowners and cooperators often sacrifice to find a site that can have a sufficient field size of irrigated grass and still not compromise data quality.
- A station should be situated within the region it is meant to represent. Avoid locating a station in a transition area between two regions of distinct microclimates.
- There should not be wind obstructions within 100 yards of the site. This distance should be 150 yards in the direction of the prevailing wind. A general rule of thumb is to keep obstructions away from a station at 10 times their height.
- There should be a long-term commitment to maintain the same land use in and around the site, to avoid moving the station in the future.

- Avoid placing a station in a field where there are frequent rotations of crops, because between crops the field will have bare soil.
- Avoid abrupt crop/vegetation changes (i.e. pasture to row crops) within 50 yards of site, or 100 yards upwind of site.
- Avoid roads within 50 yards of the site. Unpaved roads should be no closer than 100 yards upwind of the site.
- A station should be close to a water source for irrigating the cool season grass on which it stands. The grass should be well-watered and maintained at a height of 4 to 6 inches (see Figure 2). Such a station is called a reference site from which ETo can be calculated using standardized equations.
- Sites that are in the vicinity of nearby dwellings (no closer than 100 yards) are preferred to reduce risk of vandalism.

Figure 2 Typical reference CIMIS Station

Site Improvements for Existing Stations

Site conditions for CIMIS stations are critical for the accuracy of measured data and calculated ETo, leading to application of irrigation water in excess of what is needed. Scientific equations used to estimate ETo (from collected weather parameters) assume standardized well-watered cool-season grass that is regularly mowed and well maintained. Figure 2 represents a typical well maintained CIMIS station site.

Figure 3. A Stations that Needs Site Improvement

Lack of irrigated grass underneath CIMIS stations results in higher temperatures and lower humidity, thereby erroneously overestimating ETo. Although all CIMIS stations started with standard reference conditions, some of them have stopped maintaining the sites for various reasons (see Figure 3 for example). CIMIS would like to team up with property owners that host stations with poor site conditions to reinstall the grass and resume irrigation. Proposition 4 funds for improving existing CIMIS station conditions will be used to purchase all the hardware needed to upgrade the site whereas the landowner will be responsible for installation of irrigation systems and cool-season grass.

Entities and their Responsibilities

Parties involved in the installation and maintenance of CIMIS stations include DWR, landowners, and third-party cooperators. Duties and responsibilities of each party include the following:

Department of Water Resources

Responsibilities of DWR include:

1. Conducting preliminary activities to identify potential sites to locate new CIMIS stations or to improve existing sites
2. Requesting and receiving written permissions from the landowner (or property manager) to access and assess the potential site based on current State policy.
3. Meeting with landowners and cooperators at the potential station site and discussing the suitability of the site, responsibilities of each party, and how to complete the project
4. Making decisions on the suitability of the site
5. Preparing all the required paperwork, including the California Environmental Quality Act (CEQA) Notice of Exemption (NOE) and Land Use Agreement (LUA)
6. Purchasing equipment (for the station as well as for landscape maintenance) using the standard bidding process
7. Installing stations
8. Training cooperators and landowners on station maintenance procedures
9. Conducting data quality assurance (QA)/quality control (QC) and maintaining the archived data
10. Providing the collected and processed data to the public via CIMIS web site, Secure File Transfer Protocol (SFTP), and Application Programming Interface (API)

Landowner

Landowner responsibilities include:

1. Providing the property on which the station will be installed
2. A long-term commitment to maintain the same land use and access in and around the site
3. Providing access to the site
4. Providing water for irrigation. This could also be provided by a cooperator, such as a water agency
5. Allowing fencing around the station to minimize damage to the station, especially if the property is used for grazing
6. Signing any required State forms including access and land use agreement
7. Allowing regular access to DWR staff and cooperators to do regular maintenance work and emergency repairs.

Cooperator

A cooperator could be a water agency, farm advisor, researcher, and/or a private entity that is willing to assist with the regular maintenance and emergency repairs of CIMIS stations without compensation. Responsibilities of a cooperator include:

1. Signing any State forms including access and land use agreements
2. Participating in training that will be provided by DWR
3. Providing regular maintenance operations of station sensors and equipment
4. Mowing grass around the station to maintain at standard heights (4 to 6 inches), If agreed to on the land use agreement
5. Maintaining regular communication with CIMIS staff
6. Reporting data and other issues that may arise to DWR

Project Initiation

All equipment and sensors needed for the new CIMIS stations will be purchased and installed by DWR staff using Proposition 4 funds. Interested parties that meet the criteria listed above can, however, initiate new CIMIS station installation projects by contacting the CIMIS staff listed below. The Proposition 4 CIMIS station expansion and site improvement project will be implemented over the next 15 years. New CIMIS station installation projects can be initiated by DWR staff, a landowner, or a cooperator. The process for initiating the CIMIS expansion project by landowners or cooperators is as follows:

1. Call or email the CIMIS headquarters staff listed below and indicate your interest
2. Headquarters staff will acknowledge receipt of the request within three business days
3. Headquarters staff will gather preliminary information about the site from the landowner or cooperator and reach out to DWR Region Offices staff
4. Region Offices and Headquarters staff will coordinate with the landowner and\or cooperator for a site visit based on established State policy
5. DWR staff will jointly make a decision on the suitability of the site for CIMIS station based on established criteria and inform the landowner or a cooperator
6. If the site is suitable, next steps will be discussed
7. If the site is not approved, the landowner or cooperator will be informed of the reason for not accepting the proposed site
8. An alternative site may be proposed if the original site is rejected

CIMIS Contact Information

For more information on funding for new CIMIS stations or about CIMIS in general, please contact:

1. Ricardo Trezza (Ricardo.Trezza@water.ca.gov) (916) 902-7638
2. Cayle Little (Cayle.Little@water.ca.gov) (916) 654-6265
3.

References

Zilberman, D., Trilnick, I., Gordon, B., and Silver, J. 2019. Economic and Social Benefits of Using CIMIS Data. Report to the California Department of Water Resources, Contract #4600011079.