Landscape Water Budget Development

A key component in successfully completing the CLCA Water Management Certification Performance Program is implementing and following a Landscape Water Budget for a given landscape, or group of landscapes. This page describes the specific terms, conditions, parameters, and formula that need to be followed to achieve this requirement for certification.

The Landscape Water Budget standards for CLCA's Water Management Certification are in compliance with the standards set by the AB 325 California Model Water Efficient Landscape Ordinance. The crop coefficients used are the same as those provided by WUCOLS (Water Use Classification of Landscape Species: A Guide to the Water Needs of Landscape Plants by L.R. Costello and K.S. Jones, University of California Cooperative Extension, 1994) and other publications of the University of California Agricultural Extension Service.

Important water budget development conditions that pertain to the Performance Program include:

* Landscaped Area (LA) measurements are curb-to-curb only and only apply to planted, irrigated areas.
* Adjustments for site conditions are not allowed (such as prevailing wind, etc.)
* Non-irrigated planting areas cannot be included in the LA measurements.
* The surface area of water features supplied by the metered irrigation water source may be added to the turf landscaped area measurements.
* Effective rainfall is described as 30 percent of the precipitation in any month having more than one inch (1") of total precipitation. Effective rainfall is capped at 100 percent of reference evapotranspiration (ETo) for the month.
* Distribution Uniformity (DU) requirements are based upon the field study of water audits performed on over 7,800 sites by Gary Kah, Chris Willig, and Brent Mecham. DU measures how evenly water is applied across a landscape during irrigation.

Formulas and Parameters

The formula is: ETo times the Crop Coefficient, divided by the Irrigation System Coefficient, equals Required H20 (in inches), minus Effective Rainfall, equals Adjusted H20:
ETo x Crop Coefficient / Irrigation System Coefficient =
Required H20 (in inches) - Effective Rainfall = Adjusted H20.

The budget is monthly, and the total budget is the sum of 12 months.

As a result, the fixed parameters of the Landscape Water Budget are:

- ETo as determined by the closest compatible CIMIS station(s) or a blend of up to three nearby CIMIS stations
- Cool Season Turf crop coefficient: 0.8
- Annual Color crop coefficient: 0.8
- Warm Season Turf crop coefficient: 0.6
- Ground Cover / Shrubs crop coefficient: 0.6
- Shrubs (no ground cover) crop coefficient: 0.5
- Drought-tolerant Plant crop coefficient: 0.3
- Native Plant crop coefficient: 0.3
- Irrigation Distribution Uniformity - Spray: .55
- Irrigation Distribution Uniformity – Impact Heads: .5
- Irrigation Distribution Uniformity – Large Rotors: .6
- Irrigation Distribution Uniformity – Small Rotors: .5
- Drip Irrigation Uniformity: 0.7

Example of how a typical water budget is calculated:

Site Crop and Irrigation System Information

Total Site Square Footage	Age of Irrigation System
5000	1981 to 1990

Crop	Crop Coefficient	Square Feet	Sprinkler Type / %	Effective DU	Required/Budgeted Water	j	f	m	a	m	j	j	a	s	o	n
Cool Season Turf	0.80	1000	Impact Heads 100	0.500	Required (inches)	158.40	158.40	158.40	158.40	158.40	158.40	158.40	158.40	158.40	158.40	158.40
					Budgeted (HCF)	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00
Drought Resistant and Natives	0.30	1000	Drip Irrigation 100	0.700	Required (inches)	42.43	42.43	42.43	42.43	42.43	42.43	42.43	42.43	42.43	42.43	42.43
					Budgeted (HCF)	35.36	35.36	35.36	35.36	35.36	35.36	35.36	35.36	35.36	35.36	35.36
Shrubs and Ground Covers	0.60	1000	Large Rotors 100	0.600	Required (inches)	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00
					Budgeted (HCF)	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50
Annual Color	0.80	1000	Small Rotors 100	0.500	Required (inches)	158.40	158.40	158.40	158.40	158.40	158.40	158.40	158.40	158.40	158.40	158.40
					Budgeted (HCF)	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00
Warm Season Turf	0.60	1000	Small Rotors 100	0.500	Required (inches)	118.80	118.80	118.80	118.80	118.80	118.80	118.80	118.80	118.80	118.80	118.80
					Budgeted (HCF)	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00	99.00

On-Budget Performance

The Landscape Water Budget is the result of the above formula and the following parameters: Depending upon site conditions, the Landscape Water Budget may be more than 100 percent of ETo. However, regardless of the budgeted amount, on-budget compliance is capped at 100 percent of ETo. Irrigation upgrades may be necessary to meet this 100 percent budget.

There are two exceptions to the 100 percent of ETo requirement:

1. If a local jurisdiction requires landscape water consumption standards that are more demanding, the local standards will prevail.
2. New landscape sites must achieve 80 percent of ETo to be certified. A new landscape site is a site in which more than 50 percent of the landscape square footage was installed or its irrigation renovated after January 17, 2007.

Sites with Mixed-Use Meters

Applicants may submit sites that do not have a dedicated meter for the landscape. With these sites, the water manager may choose one of the following methods to calculate and monitor the water budget for the landscape.
1. Assume 70 gallons per person, per day for domestic use.
2. If irrigation is not done during the winter, deduct the average monthly winter usage from the average monthly non-winter usage. That figure can be used for monthly domestic usage and subtracted from the average monthly usage when the landscape is being irrigated.
3. Turn off the irrigation controller for a week and measure use. Do this twice and take an average. This is the preferable method.

Validation

CLCA has a validation process to ensure that submitted site information and water usage are accurate. The association reviews the irrigation map, square footage calculations, monthly meter readings, and year-end water bill. If this review results in questions about the accuracy of the information, a detailed audit is triggered. An audited water manager must do the following:
1. submit client water bills covering the most recent 12-month period; and
2. use Google Earth Pro to verify the area of enrolled property.

CLCA will then compare billed usage with reported usage and the originally submitted area with the audited area. If CLCA makes an unfavorable ruling after this review, the association will notify the water manager of that adverse ruling, and the water manager will have 30 days to re-measure the site and submit corrected data. The water budget will be recalculated, and if the results show that the site no longer meets the certification criteria, CLCA will rescind the water manager's certification. Beginning January 1, 2009, CLCA will require annual submittal of copies of water bills that provide meter reading information for each property in the program. CLCA also will review this information, which could trigger an audit as well.

Challenges

Challenges to the above water budget requirements will be handled on a case-by-case basis by the Program Manager.