



USER GUIDE

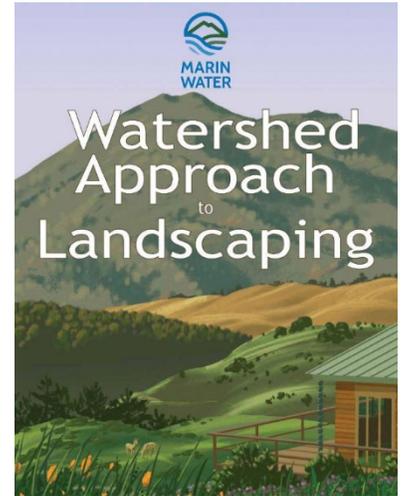
WEEKLY WATERING SCHEDULE

Introduction

The [Weekly Watering Schedule](#) (WWS) is a guide calculated to replenish the soil moisture lost during the previous week. It is not a forecast; if unseasonably hot or wet weather is expected, please adjust if needed for your garden. The Weekly Watering Schedule is updated every Friday during the irrigation season.

The WWS provides a recommended irrigation schedule for different types of plants and irrigation emission devices. Your irrigation system may differ from the assumptions used to create the schedule; adjust the times accordingly.

More information about landscaping in Marin County is available in Marin Water's [Watershed Approach to Landscaping handbook](#).



How to Use the Weekly Watering Schedule

The WWS provides everything you need to program a conventional irrigation controller for the changing weather patterns through the year. If you have a smart controller it will make these adjustments for you.

Find the plant and irrigation type that most closely resembles your system. Use the suggested watering schedules as a starting point and then adjust as needed. Every system and every landscape is unique and therefore may need more or less than what is suggested. Start with the recommended watering times and then adjust as necessary.

Option 1

Program your controller for July and use the watering index to adjust your controller each week using the seasonal adjustment feature on your controller.

Option 2

Use the schedules published to adjust your controller through the irrigation season.

Read on to learn more.

How to Program Your Irrigation Controller

Here are the basic parameters that most conventional controllers have in common:

Stations refer to irrigation valves or zones. Different controllers have different numbers of stations ranging from 1 for a hose-bib controller, to many for large commercial models.

Programs are individual schedules on your controller that are used to group stations with similar watering requirements together, e.g. program A for lawn, program B for shrubs and perennials, and program C for trees. Most residential controllers have 3-4 programs. Be careful to ensure that each station only has start times on one program.

Start time is the time of day that each program will begin. In Marin County, start times should be programmed to ensure that watering is completed before 9 a.m., or begins after 7 p.m. This helps to avoid evaporation from soil and leaf surfaces.

Cycles per day is the number of times each run time is operated. Most controllers provide multiple start times for each program to help reduce runoff by splitting the total daily run time into shorter periods. Provide 30-60 minutes between start times to allow water to infiltrate into the soil.

Run time is the length of time for each station that the controller will run for each program start time, e.g. a run time of 5 mins with 3 cycles per day will run for a total of 15 mins. See Run Time Example chart.

Days per week is the number of days in each week that watering is recommended. The maximum days per week for Marin County is 3.

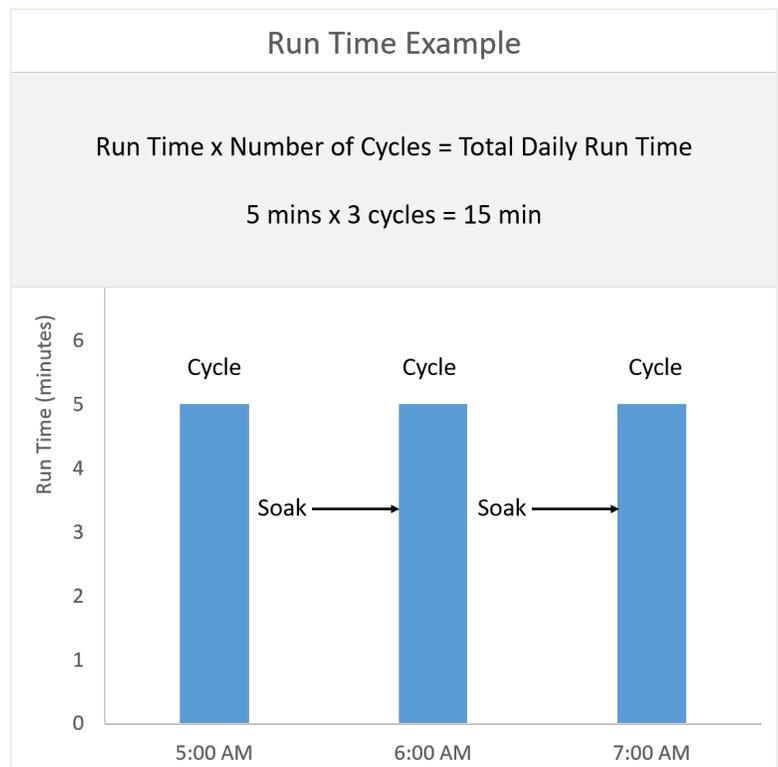
Total weekly run time is the product of run time, cycles per day, and days per week, e.g. a run time of 5 mins per day with 3 cycles per day operated 2 days per week will result in a total weekly run time of 30 mins.

Cycle and soak is another way to achieve multiple run times that some controllers have where the cycle time and soak period are specified.

Seasonal adjustment is a percentage adjustment that changes all of the run times in the controller. In Marin County, July is typically the hottest month of the year and would be programmed to 100%, whereas other months typically require less water. Seasonal adjustment is also referred to as the Watering Index, which is explained on the next page.

HELP PREVENT WATER WASTE

- Water before 9 a.m. or after 7 p.m.
- Water 3 days per week or less
- Do not water during, or within 48 hours of rainfall
- Cycle and soak with short run times separated by a 30-60 minutes interval to prevent runoff



Watering Index

The Watering Index is a tool for adjusting watering schedules for irrigation controllers that include a seasonal adjustment feature. This feature eliminates the need to change the watering times one-by-one for each irrigation valve, and permits the watering run times for all valves to be increased or decreased with just one adjustment. The Watering Index changes weekly to reflect the landscape’s changing need for water. Refer to the chart on the next page for a graphical representation.

To use the Watering Index:

1. Set your controller’s run times to those typical for the hottest time of year, which is usually July in Marin County. This represents a Watering Index of 100%. See typical July run times below.
2. Set your controller’s seasonal adjustment to the current published Watering Index.

Typical July Irrigation Schedules

Irrigation Type	Inland & Upland Zones				Coastal Zones			
	Run Time (Minutes)	Cycles Per Day	Days Per Week	Total Weekly Run Time (Minutes)	Run Time (Minutes)	Cycles Per Day	Days Per Week	Total Weekly Run Time (Minutes)
Sunset Zones 15 & 16								
Low Water Use Plants								
Drip emitters	18	3	1	54	19	2	1	38
Inline Drip	14	2	1	28	10	2	1	20
Micro Spray	6	3	1	18	7	2	1	14
Moderate Water Use Plants								
Drip emitters	16	3	2	96	16	2	2	64
Inline Drip	12	2	2	48	8	2	2	32
Micro Spray	8	2	2	32	6	2	2	24
High Water Use Plants (Lawn)								
Multi-stream	16	3	3	144	17	2	3	102
Rotor	15	2	3	90	11	2	3	66
Fixed Spray	7	3	3	63	7	2	3	42

Read on for an explanation of the terminology used in the table above.

Evapotranspiration

The WWS uses well established irrigation scheduling methodology based on reference evapotranspiration (ET_o), which is the water lost to the atmosphere through the combined processes of evaporation from soil and plant surfaces and transpiration through plant tissues for a reference crop of well-watered cool season turfgrass maintained at 4 to six inches tall, measured in inches.

Marin Water obtains ET_o data from a weather station located in the Pt San Pedro area of San Rafael. The weather station used is part of the [California Irrigation Management Information System](#) (CIMIS), which is a program operated by the California Department of Water Resources.

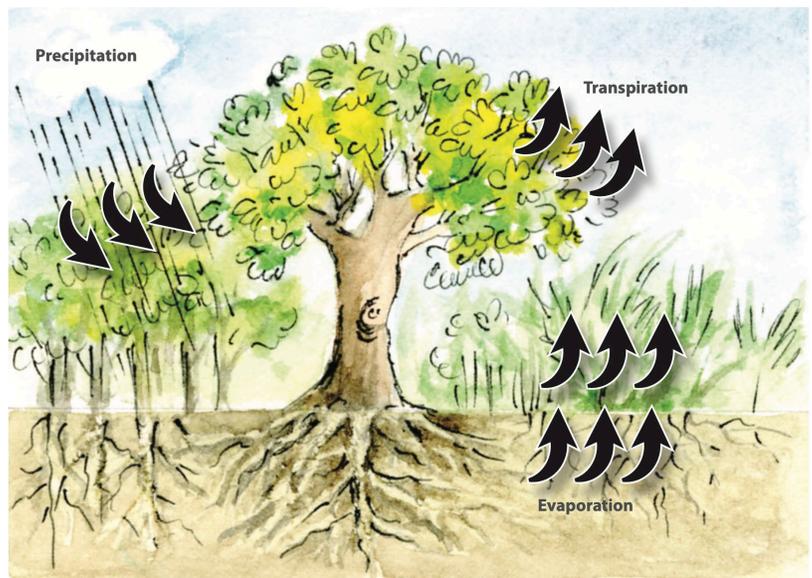
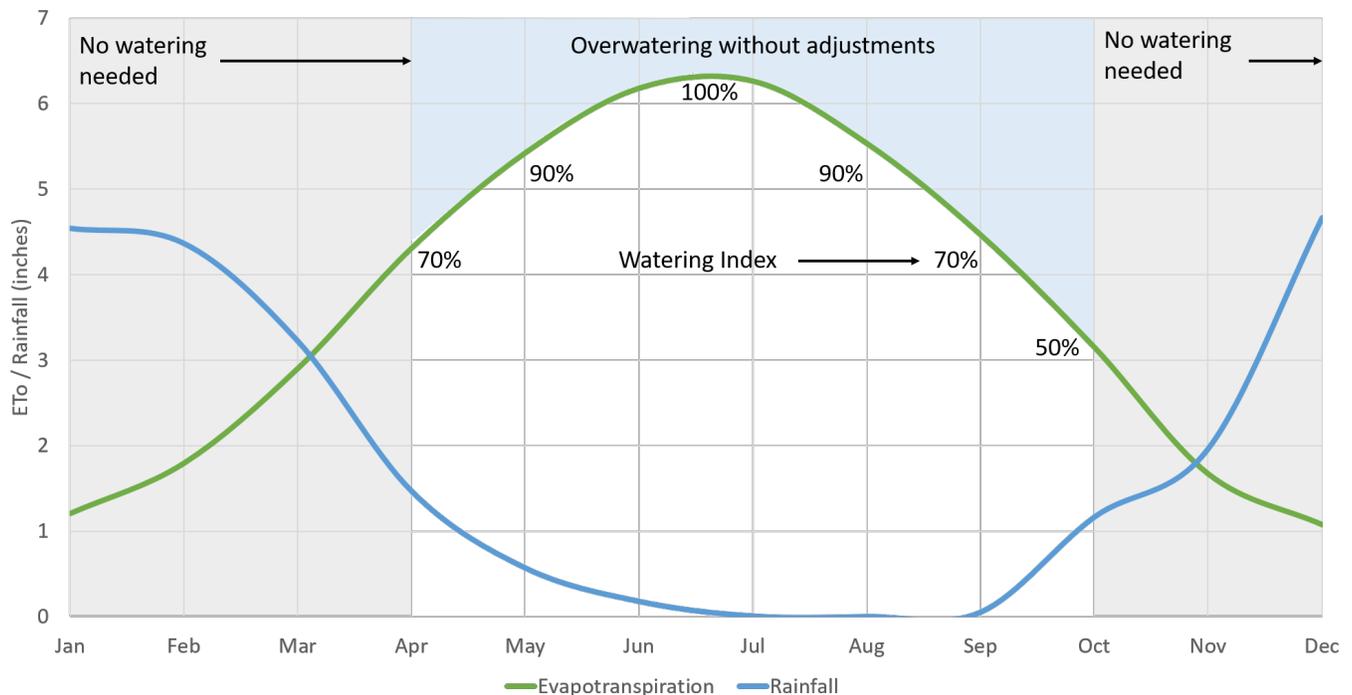


Image courtesy of Sonoma-Marín Saving Water Partnership

Weather patterns in Marin County normally result in supplemental irrigation being required from April to October. Seasonal rains and moisture stored in the soil typically mean that irrigation is not required from October to April, although extended dry periods may mean that occasional irrigation is needed during these times. The most significant opportunities to conserve water are in April and early May, and late August and September. The amount of irrigation needed is much lower than in June, July, and August.

Marin County Evapotranspiration & Rainfall

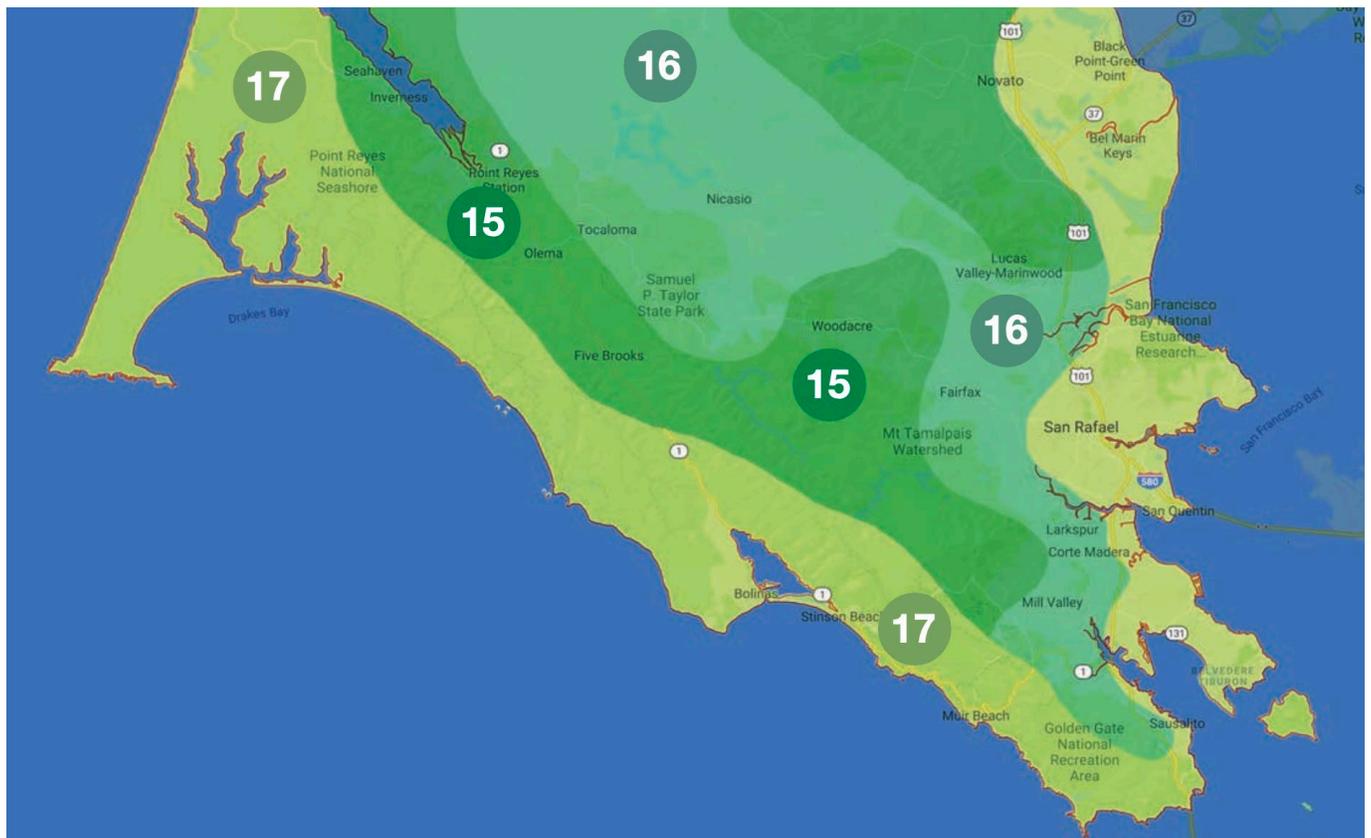


Marin County's Climate Zones

Marin County has variable climate and microclimate, and the run times provided in the WWS may need to be adjusted to reflect the climate or microclimate in your garden. The WWS is based on data for Sunset Zone 16 and is also applicable to Zone 15. An adjusted schedule is provided for Zone 17.

Sunset Climate Zones in Marin County

Sunset Climate Zone	Locations	Typical ETo (inches)	Typical Rainfall (inches)
Zone 15 – Upland	Fairfax, inland areas of San Rafael, Terra Linda, Lucas Valley, Novato, Mill Valley, Inverness, Point Reyes Station, Mill Valley hilltops	47	50
Zone 16 – Inland	San Anselmo, Lagunitas, Mill Valley, Ross, Kentfield, Larkspur	44	20
Zone 17 - Coast	Sausalito, Tiburon, Belvedere, Tomales, Bolinas, Corte Madera, eastern San Rafael, and Novato	33	33



Plant Type

Different plants have different water requirements. The categories used in the WWS are based on those provided by the [Water Use Classification of Landscape Species](#) (WUCOLS), a program of the California Department of Water Resources and the University of California Cooperative Extension.

Low water use plants use 10-30% of the water needed by cool season turf grass. Low water use plants include many California native and Mediterranean plants that are adapted to a summer-dry climate. Identifying characteristics include small leathery leaves, waxy or hairy leaves, and grey foliage. Succulents are also generally low water use.

Moderate water use plants use 40-60% of the water needed by cool season turf grass. Moderate water use plants include many traditional landscape plants such as Maples, Camellias, and Hydrangeas.

High water use plants need 80-100% of the water needed by cool season turfgrass. High water use plants include cool season turfgrass, many annuals, tropical plants, and vegetable gardens. High water use plants often have large soft leaves and/or large flowers.

Irrigation Type

Drip irrigation is the most common way to apply water to all kinds of plants including trees, shrubs, perennials, and even lawns.

- **Drip emitters** that are either inserted directly into distribution tubing or attached to ¼" spaghetti tubing. Drip emitters are used to apply water near to the root zone of each plant.
- **Inline drip** where emitters are embedded inside the tubing at regular spacing. Inline drip is used to apply water to the entire root zone of a group of plants, typically using a gridded layout.
- **Micro-sprays** put out a fine spray of water, and typically emit water at a faster rate than other drip irrigation.

Overhead spray is the most common way to apply water to lawns.

- **Multi-stream rotating sprinklers** apply rotating streams "fingers" of water. They offer the most uniform coverage and apply water more slowly than traditional fixed spray sprinklers, which results in less runoff. The larger water droplets that they put out are less prone to wind drift.
- **Fixed spray sprinklers** apply a fan of water. They typically apply water much more quickly than it can be absorbed by most soils, which often results in water waste due to runoff. They are also prone to misting when used with high water pressure.
- **Rotors** apply a single stream of water and are commonly used for covering large areas, such as sports fields and parks.

PLANT TYPE

Low



Moderate



High



IRRIGATION TYPE

Drip

Emitters



Inline



Micro-spray



Spray

Multi-stream



Fixed



Rotors



Images courtesy of Hunter Industries

Weekly Water Schedule Assumptions

Plant Factors

Plant Water Use	Plant Factor Normal conditions	Plant Factor Deficit irrigation	Plant Factor Drought conditions
Low	0.3	0.2	0.1
Moderate	0.5	0.4	0.3
High	0.8	0.6	0.4

Irrigation Type

Irrigation Type	Application Rate (inches per hour)	Irrigation Efficiency
Drip emitters	0.5	0.9
Inline drip	1.0	0.9
Bubbler / micro spray	1.5	0.9
Multi-stream	0.6	0.75
Rotor	0.5	0.7
Fixed spray	1.8	0.65