

# THE POWER OF WEATHER IN THE CLOUD



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## The benefits of cloud-based weather services versus local sensors

One could argue that an on-site weather station is the most accurate for determining the local weather. And there are conditions under which this would be true.

Unfortunately, those conditions are hardly ever met. And, for smart irrigation, there are benefits in cloud-based solutions that an on-site weather station could never provide. Here are some common misconceptions.

### **Myth 1** It's impossible for a computer model to be more accurate than an on-site weather station.

In theory this makes sense. Why depend on a computer model when you can get actual measurements on-site? But the on-site data is only as good as its sensors. The weather stations that drive the computer model are of industrial grade and drive mission critical applications, such as aviation. They cost far more and provide far better data and measure more things than would be feasible for an on-site weather station. They're also better maintained. An on-site station with a bird dropping on the solar radiation sensor would misreport the amount of sunshine and thereby

throw off the smart irrigation schedule that is based on it. At that point it becomes not-so-smart irrigation.

Plus, with a single point of measurement it is near impossible to predict the weather more than a few hours ahead. And therein lies a missed opportunity.

With a computer model of the weather that is based on many points of measurement, not only do we know what the weather currently is across the country, we can also detect where it is going. For instance, wind speed and direction tell us where the weather from one location will go and how fast.

The basics of smart irrigation are that if it rained yesterday, we don't need to irrigate today. The smartest of smart irrigation apply this same logic to the future: if it will rain tomorrow, we don't need to irrigate today. Unfortunately that logic is impossible with only an on-site weather station.

### **Myth 2** I don't need an on-site weather station, there is a nearby weather station I can use.

Have you ever seen it rain on only one side of the street? While broader weather patterns often cover more than a single zip code, weather can differ sufficiently on a street

level that a single nearby weather station is no longer accurate enough for smart irrigation. And, just as an on-site weather station, they are a single point of failure.

On the other hand, ETwater combines data from several cloud-based advanced weather information providers, including AccuWeather, whose granularity is to within 20 feet. This way ETwater can provide a hyper-local smart irrigation solution. Our model goes beyond the best site-specific weather data and is the only one to use zone-specific weather data.

**Myth 3 A national weather computer model is simply an averaging of different weather stations. The further away your location is from the nearest weather station, the less accurate it is.**

Maybe five years ago, this would hold true. Today it no longer does. While being further away from the nearest weather station does mean that on-the-ground measurements aren't local, today's weather sensing technologies have moved far beyond what we would consider a weather station. For instance, today's high resolution Doppler radar gives us a detailed view of where clouds are and how much rain they release, on a minute-by-minute interval. This information is so accurate that for large sites, we can not only see how much it rained, we can see it rained more in one zone than another.

**Myth 4 All smart irrigation does is adjusting the time between irrigation cycles based on the local temperature and rainfall.**

Yes and no. The primary variable with which the irrigation is adjusted for the weather is indeed the time between irrigation cycles. And both temperature and precipitation are important inputs into the evapotranspiration (ET) algorithm. But there are many more variables at play that dramatically enhance the algorithm's accuracy. Wind speed, relative humidity and solar radiation are important

contributors as well. And while solar radiation is traditionally hard to estimate, today we have detailed global solar radiation models based on time of day, cloud cover, location and day of the year, which are further augmented with solar panel output readings across the country.

ETwater uses the most advanced ET model, the Penman-Monteith model, with additional proprietary enhancements that increase our accuracy from daily to every 15 minutes.

Building the smartest of smart irrigation indeed requires some very smart people. Luckily for the rest of us, it's a matter of plug and save.



## FIND OUT MORE

To learn more about ETwater's smart irrigation services and find out what solution is best suited for you please give us a call.

### **ETwater**

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