



Brian Vinchesi, the 2009 EPA WaterSense Irrigation Partner of the Year, is president of Irrigation Consulting Inc., a golf course irrigation design and consulting firm headquartered in Pepperell, Mass., that designs irrigation systems throughout the world. He can be reached at bvinchesi@irrigationconsulting.com or 978/433-8972.

MORE OR LESS?

Over the last few years there's been discussion, some might say controversy, regarding whether our industry uses too much water because newer irrigation systems have too many sprinklers.

This has been fueled by Pinehurst's recent remodel and its decision to remove a large number of sprinklers and to go with what is basically a single-row fairway system. I've never bought into the less-sprinklers-is-a-good-thing premise, or that it's the easiest way to save water. I believe more sprinklers provide more control and provide greater overall efficiencies which save water. Throughout my career, my design premise has been "control is the key." So let's look at a well-documented example of adding sprinklers and saving water.

Essex County Club is an 18-hole course located in Manchester by the Sea (Manchester), Mass. Established in 1893, it was Donald Ross's second course. Ross was actually the pro at

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Essex CC at one time. It also hosted the first Curtis Cup, the Curtis sisters being club members. Essex is a links-style course located near, but not on, the ocean. Superintendent Eric Richardson started at Essex CC in 2007.

The club's first irrigation system was quick couplers. It was upgraded to an automatic system from 1989-

1991 utilizing mechanical controllers. The controllers were upgraded to solid state in 1995. The system Eric inherited didn't irrigate some areas of play, threw water on many of the fescue areas and had inconsistent sprinkler rotation speeds and unreliable controls. In 2008, Essex CC decided it was time to upgrade and planned for new irrigation and pump systems.

The existing system utilized 355 sprinklers to water the Par 70, 18-hole course, a practice facility, 11 grass and 10 clay tennis courts. The irrigation system operates from the beginning of May to the end of September. From 2002 to 2012, Essex CC received an average rainfall of 20.92 inches. In 2008 (old system), with 25.43 inches of rainfall (wet year), the irrigation system used 9,486,100 gallons of water. In 2007 (old system), with 16.05 inches of rainfall (dry year), the irrigation system used 14,723,100 gallons.

The new system, completed in spring 2011, consists of 1,100 valve-

in-head sprinklers, along with bunker spray zones and many other smaller blocked irrigation zones to keep the water off the fescues. Along with the course, practice facility and tennis courts, additional rough areas and the clubhouse and pool-area landscapes were irrigated. In 2011, the system's first year, with 26.62 inches of rainfall



Check out the iPad or iPhone version of this column to view a slideshow of Essex County Club.

(wet year); the system used 7,070,974 gallons of water. In 2012, with 18.75 inches of rainfall (dry year), the irrigation system used 11,892,660 gallons.

Doing the math, the new system added 745 large golf-course-type sprinklers to the system and reduced water use in the wet year by 2,416,126 gallons (25.5 percent) and in the dry year by 3,831,340 gallons (26 percent). Although Essex CC does not pay for water, groundwater is pumped into their irrigation pond and then out to the course through its new pump station, so electrical savings are realized. But having more sprinklers does not just save water. The added sprinklers allow targeted water applications and greater control of water placement.

Additionally, before the system was installed, Essex CC was spending \$20,000 a year in parts. And even with 1,000 hours of labor expended, the staff was not keeping up with repairs.

As many as 250 hours irrigation labor were spent in one week alone. The staff also spent 2,000 hours in 2007 hand watering.

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To understand the sort of issues we'll be dealing with, check out this study of subsidence in California's Coachella Valley (Enter on.doi.gov/145fYKX into your browser to read this study). The end result was a \$50 million pipeline that brings additional surface water from the Colorado River to Coachella Valley, the region that includes Palm Springs. The water comes into a reclamation plant where it's blended with recycled water to meet the summer demands of up to 50 golf courses that draw on the aquifer.

Another term splashed about at water conferences is "direct potable reuse." The availability of recycled water for irrigation may decline as new methods of treatment allow for more recycled water to go safely back into the water system for drinking. Here's an example from Texas (Enter nyti.ms/WTx8IF into your browser) and a demonstration project in San Diego (Enter bit.ly/bHkurf into your browser).

A leading irrigation consultant told me that such projects are, "a double-edged sword because yes, they increase supply, but advanced treatment means higher water rates for the membrane (reverse osmosis) operation and brine disposal infrastructure and operating costs. This process is just starting to gain traction in the industry."

All of which means that while you also might not like water, you need to know about it. Down to the last drop.

Okay. So what do I like about water?

I like that it comes in three forms: frozen, liquid, or gas.

That three-quarters of the earth's surface is covered in water, and that we are trying to find safe ways to harness its power.

In frozen form, it's ideal for skating, a key element of my second favorite sport – hockey, and the perfect complement to my post-round Grey Goose and tonic.

I like showering after a long day on the golf course, and especially at great clubs like Riviera, Merion, and Pine Valley where the showerheads are big and fully pressured.

One more thing to like about water: It keeps us healthy. Remember to stay hydrated, and to make sure your staff drinks enough water, too. Unlike golf courses, for us there is almost no such thing as too much water. **GCI**

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have a tremendous influence on irrigation decisions – we water smarter.

We tend to focus on applying water to golf courses to even out precipitation. But in a year like this, drainage systems can be important to good golf turf. During this year's Memorial Tournament, Jack Nicklaus was discussing a drainage project and concluded with, "Drier golf courses are more fun to play." He's right.

Water is obviously the most important factor in manag-

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sand topdressing, and the unorthodox use of the fairway rollers as a squeegee allowed the native soil golf course to bounce back from several inches of rain in just a day or two. It's important to point out these results didn't happen overnight. Many years of modified cultural practices were used in advance of the championship to ensure the course was playable if and when a major storm hit.

The bottom line? Many things can impact the playability and health of your golf course, and irrigation/moisture management is high on that list. While some of these practices can have a quick impact on moisture management, others require long-term planning and implementation before the practices pay off.

While we continue to increase our use of scientific instruments to help determine irrigation inputs, the overall process will continue to remain more of an art than an exact science. The turfgrass managers that fine tune irrigation and moisture management are usually the ones that make it through the most difficult of conditions. The superintendents who figure out how to combine the art with the science will likely continue to have the most success. **GCI**

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At the same time, irrigation and water management issues were taking 80 percent of Eric's time. With the new system, irrigation materials and labor repair costs dropped to \$2,500 annually and hand-watering hours dipped to 500 hours (50 percent less). The greens are now hand watered, which they were not previously, and accounts for the majority of the hand watering. This decrease in labor has allowed the staff to concentrate on other course improvements.

The new irrigation system has greatly improved the consistency of the course playability, not only on a hole-to-hole basis, but from a month-to-month basis throughout the golf season. It has also been a major factor in the aesthetics of this link-style course allowing it to be dry where and when it is supposed to be, which has brought out the original design intent. **GCI**

ing a golf course. Turf cannot live with either too little or too much. And water has become a national concern in the most recent decades. When I look back to watching my grandfather use a forked stick to dowse for spring water on his farm, to contemporary golf course irrigation considerations, I really do feel my age. That perspective, however, leads me to have a lot of confidence that our golf turf industry will continue the innovation needed to carefully use this precious national resource. **GCI**