

# After the storm

Flooding can cause devastation for golf courses and their communities. Richard Humphreys considers four examples of how clubs have responded and rebuilt stronger.

**T**he Royal Society, the world's oldest independent scientific academy, reports that flooding events are becoming more severe, more intense, and more damaging. And, according to the National Centers for Environmental Information, these disasters have cost US taxpayers more than \$850 billion since 2000

and are responsible for two-thirds of the cost from all natural disasters.

Golf facilities built on or near floodplains, next to bodies of water or in valleys, are at high risk from these catastrophes. But with the support of experts, clubs can build extra resilience to storm events, or rebuild better after disaster strikes.

**Seizing the chance to improve** “One of the most complex meteorological situations of the past 50-to-60 years,” is how Italy's civil protection agency described the events that transpired across the country in October and November 2018. Over seven days, a combination of severe storms



Photo: Verdura Resort

*The fifth (foreground) and twelfth greens on Verdura's East course were among those rebuilt after severe storms raged across Italy*

and heavy rain led to flooding and landslides in various regions, with devastating consequences.

The two golf courses designed by Kyle Phillips, ASGCA, at Verdura Resort, a European Tour host venue on Sicily's southern coast, felt the full force of the storms, with a levee that runs between the site and

the Verdura River breaching and the resulting floodwater causing widespread damage.

"On coastal sites we normally think of erosion as coming inward from the sea," says Phillips. "In this case, the erosion started inland and moved toward the sea. The breach occurred near the new tenth

tees, one kilometer from the sea, and quickly moved across 14 holes [seven holes on the East course, and seven on the West] and into sections of the resort buildings.

"The flood that hit the course in 2018 was obviously devastating, but we needed to approach it as an opportunity to make the golf experience even better."

With this mindset, Phillips altered the routing to incorporate all 14 damaged holes, plus four remodeled holes into a new East course configuration that more clearly defined the two courses, whilst preserving an equal number of coastal holes on each course. "The flood created new landforms and dramatic, eroded inlets near the coastline that have been incorporated into the new design," says Phillips.

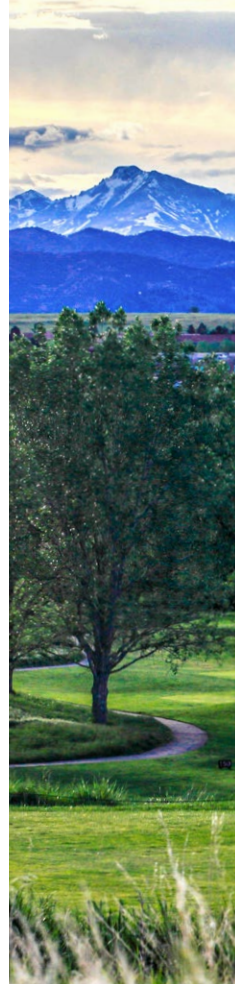
Phillips also made the most of new landscapes created by flooding. "The sixth is arguably now the prettiest hole on the property," he says. "The Mediterranean Sea runs the length of the right side and the view down the coastline goes on forever. The approach plays over a saltwater inlet carved out by the flood to a seaside green that sits on the southern tip of the property."

A new drainage burn was introduced to help prevent future flooding on the course. The burn also acts as a strategic element to the redesigned par-four third and par-five fourth holes.

The East course reopened in October 2021 to rave reviews. "To be rated among the world's elite



Photo: Norby Golf Design



Kevin Norby, ASGCA, rebuilt Coal Creek Golf Course in Colorado following a storm that ravaged the layout in 2013

golf resorts and Italy's best is an outstanding achievement for the resort and something that makes us all very proud," says Giacomo Battafarano, the general manager at Verdura.

## Reborn following a flood

In late 2013, a torrential rainstorm hit the north of Colorado, leading to flash floods that caused devastation across several cities, including Louisville.

The storm transformed the traditionally calm Coal Creek into a wild torrent of water that rose out of its banks and washed away roads, bridges and homes, as well as devastating the city's only golf course. In an interview with *Colorado Avid Golfer*, city of Louisville parks planner Allan Gill said: "This wasn't a 100-year flood. It was a 400- or 500-year event."

Prior to the flood, Kevin Norby, ASGCA, had drawn up a long-range master plan for the golf course, which had originally been laid out by ASGCA Past President Dick Phelps in 1990. "The primary concern at the time was new irrigation and addressing some agronomic issues with the greens," says Norby. "There was also a need to renovate bunkers, conduct tree removal, add forward tees and adjust bunker locations to address playability of the course for the modern golfer."

Then the storm hit.

"It was so intense and brought so much water that it carved new paths for the stream and undermined trees and roads," says Norby. "The storm left trees scattered across the course, damaged cart paths, washed out bridges and bunkers, damaged the irrigation system, and covered tees, fairways and greens with rock

and silt. With all this devastation, the golf course was forced to temporarily close."

The closure gave Norby, who has handled numerous post-storm golf course projects, the opportunity to reassess his master plan and incorporate new ideas for the repair work.

Norby explains that the Coal Creek storm occurred shortly after the Federal Emergency Management Agency (FEMA) had made changes to the funding of golf course repair. FEMA would previously only fund infrastructure replacement or repairs. But Coal Creek became the first course to receive federal funding for the re-establishment of turf as well, reducing the city's financial burden for the \$5.5 million project.

"The flood allowed the master plan improvements to



Photo: Chris Wheeler

be implemented quickly and completely rather than being implemented over time,” says Norby. “One of the primary concerns prior to the flood was how narrow the fairway corridors had become due to overgrown trees and brush along the stream banks.”

Norby was able to widen playing corridors, improve turf quality and enhance sightlines. “The stream banks were restored using rock and plantings and the irrigation booster pump was raised to minimize the potential of damage from future flooding,” he says.

Norby’s also oversaw the introduction of new tees, fairways and greens, a new irrigation system, cart paths and practice facilities.

He also proposed significant regrading, which introduced interesting undulation to previously flat fairways and green surrounds,

enhancing the strategy of the course, while also helping to protect it against the type of flooding seen in 2013. This proved invaluable when storms hit the site again, in May 2015. The regrading work, including newly introduced drainage

**“The flood was obviously devastating, but we needed to approach it as an opportunity to make the golf experience even better”**

and collection areas, prevented significant damage to the course.

Coal Creek survived one devastating flood and, with Norby’s help, was reborn with a robust design that proved capable of withstanding storms that followed,

while providing more enjoyment for the city’s residents.

### **Flying high after the storm**

When Hurricane Isabel hit Virginia in September 2003, the category five storm caused billions of dollars’ worth of damage across the state. Torrential rain, violent winds and devastating tidal surges damaged everything in Isabel’s path, including the 36-hole Eaglewood Golf Course at Langley Air Force Base.

A tidal surge around eight-to-ten-feet-high hit the property, resulting in the loss of over 300 trees, creating a host of surface and sub-surface drainage problems, and causing heavy damage to the turf on both the Eagle and Raptor courses, which had been laid out by Ed Ault in 1965.

After the storm passed, the base engaged Lester George, ASGCA, to assess the damage of both courses.

“Little did we know that the golf courses were used as one of the first bombing ranges in the world during the First World War,” says George. “After grading began, we quickly discovered unexploded ordnances (UXOs). We stopped

## DISASTER RECOVERY



Photos: George Golf Design

*Lester George, ASGCA, completely rebuilt Eaglewood Golf Course at Langley Air Force Base following the removal and disposal of unexploded ordnances*



to investigate and discovered over 16,000 pieces of UXO, including 500-pound bombs. We spent almost a year remediating [removing and exploding] the UXOs before work could continue.

“Some were blown up in place by the bomb squad and hazmat specialists, with the more potentially dangerous bombs disposed offsite.”

George outlined the pressing need to address soil contamination on the property. “It cannot be corrected by waiting it out,” he notes. “They are, and will be, the most costly to correct and, if left unrepaired, will cause long term turf and playability problems.”

The greens were also damaged beyond repair. “Native soil greens are characterized by inferior drainage qualities and poor turf growing medium and are doomed

once they are inundated with salt and other contaminants which have little chance of leaching out,” says George. “Poor turf quality will continue and will have a lasting effect on playability, which will reflect on the profitability of the course.”

George completely redesigned and rebuilt the golf facility, reducing the number of holes from 36 to

with hundreds of thousands of cubic yards of fill material, raising those areas from potential future flooding,” he says.

### Restoring a Jones classic

“It was the perfect storm,” recalls Gary Browning, ASGCA, when speaking about the circumstances that caused severe flooding to

**“The flood allowed the master plan improvements to be implemented quickly and completely”**

18 for commercial sustainability. “The bombing range portion of the golf course was rebuilt as an environmental restoration program site by covering the areas affected

Kananaskis and large parts of Calgary in June 2013. “The combination of 300 millimeters of rain landing on a heavy snowpack in the mountains caused an epic flood.”



*Gary Browning, ASGCA, says that since reopening in 2018 Kananaskis Country Golf Course has re-established its reputation as “a bona fide tourist attraction” with tee times highly sought after*



Usually a trickle, the Evan-Thomas Creek – which runs through the Kananaskis golf property – became a raging torrent, ripping through the club’s Lorette and Kidd courses (designed by ASGCA Past President Robert Trent Jones, Sr.). In total, all but four of Kananaskis’ 36 holes suffered significant damage.

Browning was struck by how hurt Kananaskis general manager Darren Robinson sounded when he called with news of the flooding. “I went out to Kananaskis the next day and I was just devastated by what I saw,” says Browning. “I described it once as mother nature delivering blunt force trauma to Kananaskis. It was the worst of the worst. There were holes that were completely unrecognizable.”

Thousands of trees were scattered across the course, between six to

eight feet of gravel, mud and debris was deposited on some fairways, and ponds were completely full of silt.

“The city of Calgary [50 kilometers east of Kananaskis] was also impacted by the flooding,” says Browning. “Numerous golf courses in the Calgary region were also terribly damaged.

“Kananaskis Country Golf Course is owned by the province of Alberta so it became a political hot potato as to whether public money should be used to rebuild it. It even became an election issue!” In the end, the Government of Alberta committed CAD\$18 million to rebuild the courses, with Browning installed as the project’s architect. Work was completed in 2018.

Browning says the overall look, feel and character of the courses remains relatively similar to Jones’s original,

but with some subtle changes “to take some of the teeth out”, making them a little less penal. “The courses are still a challenge – tough holes are great, but they can’t all be tough,” he adds. “It’s about enjoying the challenge, but also enjoying the victory. As a golf architect, you have to offer a little victory along the way – that’s what we’ve done. We made them a bit more playable.”

Various flood mitigation measures were introduced, including extensive berming along both the Evan-Thomas creek and Kananaskis River.

Browning says that since reopening in 2018, Kananaskis Country Golf Course has become “a bona fide tourist attraction” with tee times highly sought after and golfers from around the globe travelling to Alberta to play. ●