

# Battle Island Course Uses Data Collection to Optimize Management Practices



## Challenge

Battle Island State Park Golf Course wanted to quantify growth rate to determine the precise nutrient and water needs of the course's playing surfaces.

## Solution

Cornell and NYSP2I identified the optimal tools and methods to quantify and validate growth rate.

## Results

Eight months of growth rate data were collected, showing how management practices can be altered to mitigate the large effects rainfall have on growth.

## Battle Island State Park Golf Course

Battle Island State Park Golf Course (Battle Island) is an 18-hole public golf facility located in Fulton, NY managed by New York State Office of Parks, Recreation, and Historical Preservation. Battle Island provides affordable and accessible golfing experiences for residents of New York. This course would be characterized as a focused-operation, designed for golf with minimal resource use. The course is short in length but features a unique combination of small, undulated putting surfaces.

## Challenge

Understanding turfgrass growth rate is important for determining precise nutrient and water needs of the playing surfaces. In general, rapid growth rate would be good for high traffic areas but would lead to sub-optimal playing conditions where traffic stress is low. Also, rapid growth rate requires more mowing, leads to increased organic matter accumulation, and can often render the grass more susceptible to environmental and pest stress. Turfgrass managers have a variety of tools at their disposal to manipulate growth rate such plant growth regulators, fertilizer, and controlling soil moisture. These tools can be deployed based on observed growth rates, however, visually assessing growth rates is subjective and prone to inaccuracy. If growth rate can be measured, it allows for the improvement of playing conditions while simultaneously reducing inputs such as water and nitrogen fertilizer.

## Solutions

Growth rate is determined by regularly measuring clipping volume – the amount of grass removed during a mowing event. This practice has become more common recently as it has been correlated to improved turf performance. This technique simply requires

the mower operator to deposit clippings collected in mower buckets into a measuring container. The amount in the container is recorded and graphed on a rolling 5-day average to observe trends in daily growth rates. This practice was implemented at Battle Island for the 16th green during the 2021 season. The 16th green was chosen for its proximity to a structure which housed the measurement container and data recording sheet. Data were used to quantify growth rate and investigate the variability in growth rate.

## Results

Growth data were collected on the 16th putting surface and plotted in a graph (Figure 1). As expected, based on the presence of a native soil rootzone, growth was very active during the 2021 season. The shaded section of Figure 1 is considered the idealized growth rate producing optimal playing conditions. Growth rates on this playing surface remained consistent within the ideal range for the first half of the season. However, as persistent rainy conditions began in July, growth rates responded and would increase as much as 2-3x in the latter part of the season.

Consistent with previous research on putting surface growth, there were large increases in growth rate associated with heavy rain events. This effect was exacerbated by the native soil rootzone containing high levels of organic matter that is regularly mineralized by a vibrant soil microbial community. Mineralization is a process that releases nitrogen from organic matter into a plant-usable form and is accelerated when soil moisture is high. Due to high organic matter levels and increased water holding capacity of native soils, there is higher potential for increased growth following rain events.



Image: 16th hole at Battle Island where clipping volume was measured in 2021

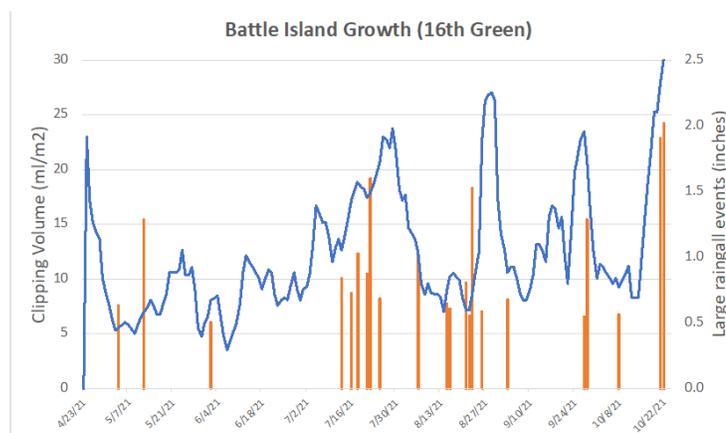


Figure 1: Battle Island growth graph

Several key management changes can be made based on this data to create more consistent growth and improved playing conditions. Organic matter reduction programs can be conducted that includes routine frequent hollow tine cultivation to amend the native soil with USGA specification sand. Increasing sand content will improve drainage and reduce OM available for mineralization. Additionally, plant growth regulator use can be adjusted to suppress growth surges more effectively. Finally, reducing nitrogen use, especially around rain events, will reduce mowing requirements, save resources, prevent pollution, and lead to improved playing conditions.

Several key management changes can be made based on this data to create more consistent growth and improved playing conditions. Organic matter reduction programs can be conducted that includes routine frequent hollow tine cultivation to amend the native soil with USGA specification sand. Increasing sand content will improve drainage and reduce OM available for mineralization. Additionally, plant growth regulator use can be adjusted to suppress growth surges more effectively. Finally, reducing nitrogen use, especially around rain events, will reduce mowing requirements, save resources, prevent pollution, and lead to improved playing conditions.

## Partners



## Battle Island State Park Golf Course

☎ (315) 593-3408  
 🌐 <https://parks.ny.gov/parks/battleisland>  
 🏠 4132, 2150 NY-48  
 Fulton, NY 13069

## For more information please contact us:

☎ 585-475-2512  
 @ nysp2i@rit.edu  
 🌐 rit.edu/nysp2i  
 🏠 111 Lomb Memorial Drive, Bldg 78  
 Rochester, NY 14623