



The Colorado Golf Carbon Project

By Mike Kenna

Golf courses provide many environmental benefits, such as wildlife habitat, soil erosion prevention, rain infiltration, and improved air quality. Turfgrass plants remove carbon dioxide from the air during photosynthesis, and a significant amount of the carbon removed from the air is stored within turfgrass soils. To examine carbon storage on golf courses more closely, the Colorado Golf Carbon Project was created by the Allied Golf Associations of Colorado, Colorado State University, and the US Department of Agriculture. The goal of this project is to determine the carbon footprint of golf courses in Colorado through evaluating energy consumption versus the amount of turfgrass carbon storage. This project also has a fundraising effort through the sale of the estimated carbon stored on golf course acreage in Colorado. The Broadmoor was one of the first golf facilities in Colorado to donate the carbon stored on its turfgrass acreage.

A detailed survey about energy use and management practices was sent to every golf course in Colorado. The survey asks for information, including fertilization practices, acreage types on the course (e.g., native areas, fairways, and putting greens), types of fuels used, electricity for irrigation pumping, and gallons of water for irrigation. The carbon stored in golf course soils will be estimated through DayCent, the newest version of the Century ecosystem model. This model measures the amount of

carbon stored in soils through historic and modern levels of soil organic carbon, and the software represents a milestone for soil science because it eliminates the costly and time-consuming lab procedures of measuring soil organic carbon.

In 2002, researchers Ronald Follett, US Department of Agriculture; and Yaling Qian, Colorado State University, collaborated on a study of soil organic carbon content of turfgrasses on golf courses in the front range of Colorado, and found that turfgrass stored up to one metric ton of carbon per acre per year for 25 to 30 years after turfgrass establishment. They will continue this work and hope that the Colorado Golf Carbon Project will provide further evidence of the benefits of golf course turfgrass. The research also will enable golf courses to further improve management practices and find new techniques to conserve energy. The researchers believe that turfgrass maintenance alone will be close to carbon neutral.

Is there any value in the carbon stored by turfgrass? If there is, can this value be assessed, quantified and marketed? Golfpreserves, a company formed to sell golf course carbon, believes the answer is yes. Golfpreserves presented a check of \$12,000 to the Golf Foundation of Colorado, representing carbon stored on 1,800 acres of turfgrass donated by golf courses participating in the Colorado Golf Carbon Project. The money is being used to help support the research being conducted by Colorado State University and the US Department of Agriculture, and the golf courses donating turfgrass acreage include the Broadmoor, Applewood, Breckinridge, and Eagle Ranch. The carbon certificates representing a total of 1,800 metric tons of carbon removed from the air and stored in the soil by turfgrass were purchased by Audubon Lifestyles, The Lawn Institute, Golfpreserves, The International Sustainability Council, Turf Feeding Systems, and the US Golf Association. While the money generated for research is

modest, it does demonstrate a model for generating funds and establishing a value on carbon of \$10 per metric ton.

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