

Golf Course Water Management Uses and Solutions

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Yes, golf needs and uses water

- Roughly 500 courses
- Average of 7.8 billion gallons per year
- .76% of all water consumed in the state
- Golf injects \$2.3 billion dollar economic
- 35,000 employed annually
- Golf is a big business, an industry

Yes, golf uses water

However the scientific turf manager uses his resources wisely and has improved tools to do so.

Water Use Has Changed Dramatically

- Automation



Water Use Has Changed Dramatically

- Efficient pump stations



Water Use Has Changed Dramatically

- Computerized or automated control systems



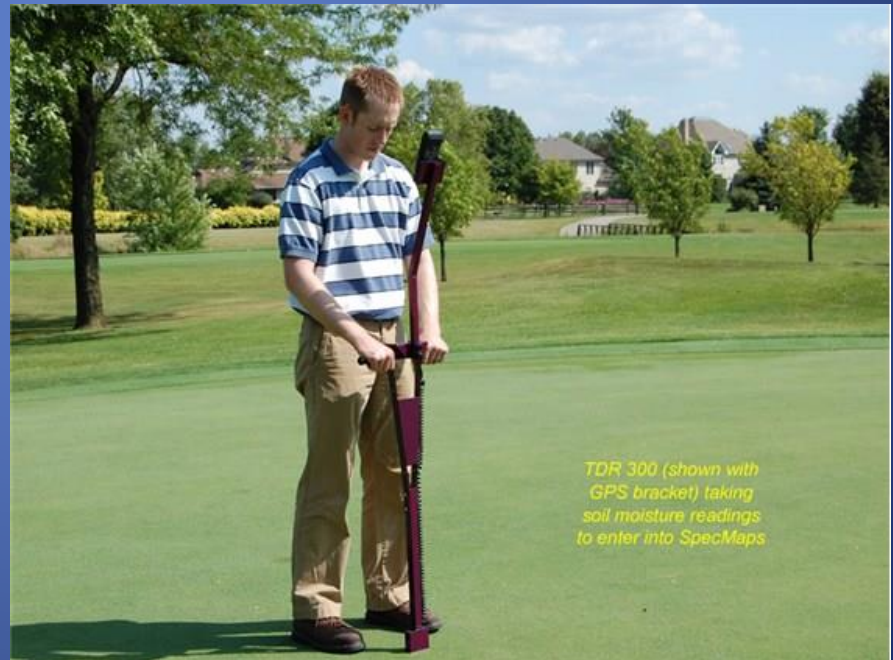
Water Use Has Changed Dramatically

- Low pressure, adjustable and efficient heads



Water Use Has Changed Dramatically

- Soil moisture sensors:
 - Manual for fine tuning



Water Use Has Changed Dramatically

- Weather stations that adjust irrigation based upon evapotranspiration
- Elaborate or simple
- Daily irrigation using 60% actual daily use



Water Use Has Changed Dramatically

- Wetting solution chemistries to make the water “wetter”



Water Use Has Changed Dramatically

- Drought stress tolerant turf varieties
 - UMN TROE Center, Dr. Brian Horgan and Dr. Eric Watkins
 - Industry TROE Center support over \$2 million in last 12 years



Water Use Has Changed Dramatically

- Firmer conditions/ player expectations



Water Use Has Changed Dramatically

- Professional golf course superintendents



Yes, golf needs and uses water.
Professional turf managers will
continue to provide optimum
playing conditions using finite
resources efficiently

Golf's Greatest Potential isn't
water savings.

Golf can be a SOLUTION to many
environmental challenges

**MINNESOTA'S GOLF COURSES:
YOUR COMMUNITIES' LARGEST RAIN GARDEN AND
POLLINATOR CORRIDOR**

The "great story" of environmental property management:
70,000 Acres of semi-managed wildlife corridor
30% or more of most course properties provide natural
and native habitat
Stormwater management
Groundwater recharge
Pollution abatement
Erosion control
Soil restoration
Carbon sequestration
Natural noise dampening
Oxygen generation
Glare and solar radiation suppression
Heat dissipation and temperature moderation



PHOTO CREDITS: Mike Knickel and Janie
Dezunson. Pollution abatement and water
conservation projects. Kang Wong.

The Community's Largest Rain Garden

- 70,000 acres of semi managed green space
- 30% of most courses out of play and native
- Stormwater management
- Pollution abatement
- Erosion control
- Soil restoration
- Carbon sequestration
- Natural noise dampening
- Oxygen generation
- Glare and solar radiation suppression
- Heat dissipation and temperature moderation
- Wildlife sanctuary
- Pollinator habitat

Oneka Ridge Golf Course



Pollution mitigation
Groundwater recharge
Storm water reuse
Groundwater
reduction

Annual Pollutant Reduction Estimates

Total Phosphorus	75 lbs/yr reduction = 12 ton algae
Infiltration	up to 32.5 million gallons
Groundwater Reduction	5 to 15 million gallons (up to 50% reduction)

All estimates are weather dependent

- Normal rainfall years = maximum usage
- Extreme low & high rainfall years = lower usage
- In 2014 ORGC used 3.9 million gallons from its 9.9 million total

Prestwick Golf Club



- Highway expansion project:
- Storm water capture,
- Pollution mitigation,
- Groundwater reduction
- Water reuse/irrigation
- Up to 15 mg annually

Eagle Valley Golf Club

Highway expansion project:

- Storm water capture,
- Pollution mitigation,
- Groundwater reduction
- Water reuse/irrigation
- Up to 22 mga



Oakdale Golf Club

Partnership with residents around Lake Allie to create a wastewater system (18,300 gpd) and supplement irrigation water.

Groundwater reduction



Gray water use at other golf destinations:

- The Meadows at Mystic Lake
- Izaty's Golf and Resort
- The Pines at Grandview Lodge – discontinued due to salt build up

Oak Glen Golf Course

- Buffer and stream restoration
- Environment enhancement
- Trout habitat enrichment
- Pollution mitigation
- Erosion control



- Watersheds are looking into using golf courses and campuses as stormwater destinations, pollution capture and water reuse. Rice Creek and CL/FL for example.
- Golf courses, with existing infrastructure, could become destinations for dewatering projects to reduce the spread of groundwater pollution.

- The more golf is reviewed, the greater the public potential beyond recreation and economic impact.

Yet according to statute, golf is a category 6, non-essential priority

- Low hanging fruit with regards to water appropriation permits and suspension
- The industry feels they will be targeted when a crisis occurs
- Golf appreciates that there is a “perception” problem
- Golf needs a plan to assure the public of golf’s environmental responsibility

A Simple Goal

- **Develop and adopt a comprehensive voluntary Golf Course Best Management Program, including a crisis water management plan, whereby courses would never lose complete access to water. The MGCSA would emulate the success of numerous other state associations.**

How do we get there?

- **Build Partnerships:**

- Minnesota Nursery and Landscape Association**

- Minnesota Turf and Grounds Foundation**

- UMN TROE Center and Dr. Horgan/Sam Bauer**

- UMN Water Resources Center**

- Environmental Initiative**

- Freshwater Society**

- Conservation Minnesota**

- MGA, CMAA, MPGA, MWGCOA**

- USGA**

- GCSAA**

- Bureau of Water and Soil Resources**

- MN Department of Natural Resources**

- MN Department of Agriculture**

- MN Pollution Control Agency**

- MN Department of Health**

Participate

- MDA Pesticide Review Committee
- MPCA Stormwater Strategic Planning Committee Turf Group
- MDA Pollinator Strategic Planning Committee
- DNR NE Groundwater Strategic Planning Committee, participant
- DNR Negative Impacts to Surface Waters Stakeholders Committee
- MDA Education and Promotion Team
- Attended Senate Committee Meetings relevant to the golf industry
- Sponsored several state agency meetings with the pursuit of the goal to create BMPs for golf courses in exchange for water access.

Current Status

- The DNR is very aware of Golf's interest in developing an Environmental Stewardship/ BMP/ Certification program with the opportunity for permit modifications so at the minimum there would be some water available to the course in times of crisis.
- Golf is a 2.3 billion industry and not considered non-essential by many individuals and communities.

Opportunities abound

