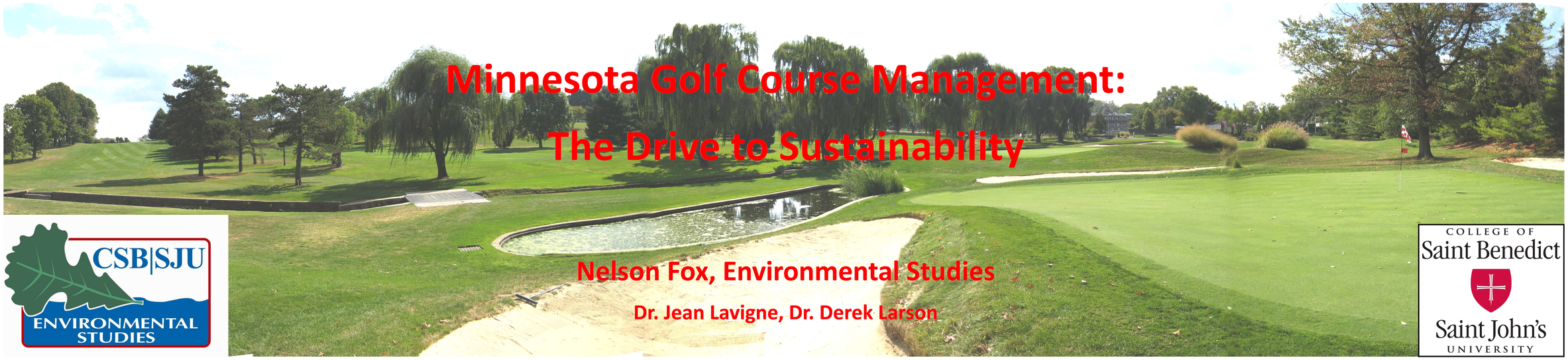

Minnesota Golf Course Management: The Drive to Sustainability

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Abstract

Golf is a $1.2 billion industry in MN. Golf courses generated over $527 million of total revenue in 2006, making golf courses the largest sector in the golf industry. As such, golf courses will remain fixtures in the Minnesota landscape. Golf courses use vast amounts of water and chemicals during routine maintenance to keep the turf green and strong. Chemical nutrients have been found to leech into and contaminate local community's water supplies, ultimately ending in a hypoxic zone in the Gulf of Mexico. Groundwater sources are continually being over-drafted and courses risk losing water rights to agricultural uses. Golf facilities must address how they can reduce their water and chemical use by implementing a combination of low-cost Best Management Practices (BMP's).

Best Management Practices: Water Use

Demand Management

-Reduce the total number of irrigated acres.

-Keep rough grass drier by limiting irrigation

-Replant rough grass areas with low-input native prairie grasses

-Turfgrass cultivation improves soil structure which reduces turfgrass water needs. Spiking, aerification, and topdressing relieve soil compaction, improving water infiltration.

Supply Management

-Replace full-circle irrigation heads with part-circle irrigation heads to limit watering to turfgrass areas only

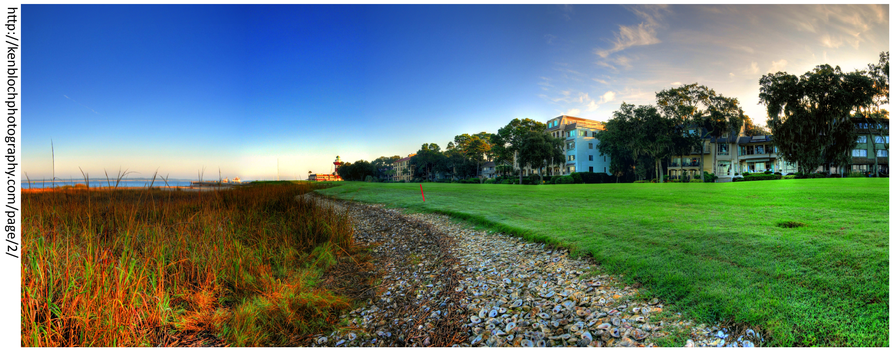
-Eliminate over-watering by irrigating on a basis of need as determined by Evapotranspiration (ET) rates or Volumetric Water Content (VWC) of the soil.

http://www.fuseitpiping.com

http://www.panoramio.com/picture/45941344/

Methods

By analyzing current course management practices, I found areas with the most potential for improvement in reducing chemical and water inputs. This provided a framework for determining the BMP's courses should implement to remain a viable part of the states economy. BMP's to be implemented were those that effectively reduced inputs at minimal cost.



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Best Management Practices: Chemical Use

Reducing Chemical Needs

-Test plant tissue to determine nutrient deficiencies before applying fertilizers.

-Use slow-release nitrogen fertilizers to maximize plant uptake and minimize leeching.

-Maintain soil pH levels at an optimum level, between 6.0 and 7.0, using soil amendments. Overly acidic or alkaline soils damage root structure causing nutrients to diffuse back into the soil.

Preventing Nutrient Loading

-Littoral shelves — wetland species planted around pond banks — reduce erosion from runoff and absorb nutrients (Nitrogen and Phosphorous) contained in runoff.

-Buffer zones should be established around ponds and extend 50 feet in all directions. Buffer zones often consist of native prairie grasses but can also be rough grass mowed at multiple intervals of increasing height.

Conclusion

A variety of BMP's can be implemented at very little cost to the course and in concert with other BMP's can result in significant reductions in water and chemical inputs while simultaneously improving the bottom line. Implementing BMP's is more a problem of will than economics. Giving courses a structured program to reduce environmental impacts through cooperation in certification programs such as Audubon's Cooperative Sanctuary Program can help courses set goals to work towards.