Watershed Characterization of Managed Turf

Rationale:

- Approximately 50,000,000 acres of turf in US.
- Turf is most in intensively managed landuse in the urban landscape.
- Turf rivals agricultural crops such as corn and soybeans as the primary landuse in several states.
- Public perception identifies managed turf, especially golf courses as significantly contributing to nonpoint source pollution.

Goal:

- Assess and characterize the environmental aspects of urban and golf course turf.

Objective: Quantify long-term watershed scale hydrology and water quality aspects of managed turf

Approach: Measure storm event and baseflow hydrology and water quality from three managed turf sites in three varying climatic regions on surface runoff and baseflow and collect water quality samples.

Findings:

- ✓ Discharge expressed as a fraction of rainfall is considerably greater compared to other land uses.
- ✓ Measured nitrate concentrations contributed by the courses are well below drinking water standards.
- ✓ Dissolved phosphorus concentrations generally exceed levels consistent with those known to lead to eutrophication.
- ✓ Pesticide concentrations were generally low although seasonal spikes have been measured.

Objective: Determine and quantify water quality contribution from different transport processes

Approach: Establish the partitioning of hydrology and water quality in baseflow, subsurface drainage and storm event runoff from managed turf by continuous measurement.

Findings:

- ✓ Hydrology of subsurface drainage is significantly linked to irrigation
- ✓ 20-60% of pollutants exiting the site are cycled through the subsurface drainage network

Objective: Relate hydrology and water quality findings to turf management and evaluate turfgrass Best Management Practices

Approach: Correlate nutrient and pesticide losses to fertility, pest and irrigation management

Findings:

- ✓ Approximately 15% of the applied nitrogen is captured in discharge waters
- ✓ Most significant phosphorus losses occur during turf dormancy
- ✓ Reducing phosphorus application and modifying the irrigation strategy suggests a decrease in phosphorus concentration

Cooperators: U.S. Golf Association, Spectrum Research Inc., Northland Country Club, Royal American Golf Links, Morris Williams Municipal Golf Course

For more information: Dr. Kevin W. King, Soil Drainage Research Unit, Columbus, OH 43210
Phone: (614) 292-9806 email: kevin.king@ars.usda.gov