

Better Build an Ark: When it Rains, What Superintendents Need to Know About Stormwater

By Michael Blankinship, Blankinship & Associates, Davis, CA

Introduction

Due to the unusually wet winter of 2011, runoff and stormwater management are important issues for superintendents and create questions like:

- What is eroding and where is the runoff going?
- Will my ponds overtop and if they do, where will that water go?
- If I have runoff, will anyone care?

Back Up Your BMPs

Your arsenal of best management practices (BMPs) to control erosion and stormwater runoff can range from the permanent (stormwater and sediment detention basins, culverts and drainage inlets leading to storm sewers, etc.) to temporary (sand bags, straw waddles, silt fences, trash pumps, generators, etc.) The idea is to have what you need and then some. If you need ideas on what works, the California Stormwater Quality Association (CASQA) is an excellent resource. Non-members have access to some useful BMP-related information at: <http://www.cabmphandbooks.com/>.

What is in Stormwater?

If you think that the only thing that comes off of your course is some silt, you are probably wrong. Results of a 6-year golf course stormwater study done in 2004 in Contra Costa County showed that although small and variable, nitrogen and phosphorous do leave golf courses when it rains (See description below). Don't be ignorant: golf course fertilizer, and in some cases pesticides, can end up in stormwater.

Common constituents of golf course stormwater runoff:

- Ammonia
- Nitrate
- Salt
- Water-soluble herbicides

Be careful of your fall fertilization program and use agronomically correct amounts that have a reasonable chance of soil incorporation before it rains. Use extreme caution with organic fertilizer that may not biodegrade sufficiently due to cooler fall soil temperatures that result in lower microbial activity necessary to generate the nitrate that is usable by turf. This organic material, if not degraded and incorporated, can end up in stormwater.

Although maybe unimportant to you, the quality of stormwater is important to state regulators and various environmental advocacy groups (DeltaKeeper, California Sportfishing Protection Alliance, Pesticide Action Network, etc.) Keep in mind that the latter have the ability to challenge you using the citizen lawsuit provision of the Clean Water Act.

The No-Brainer: Buffer Strips

There is no doubt: Buffer strips slow water flow, filter and allow for settling, and increase soil infiltration. These are all good things to prevent what you put on the course from getting where you don't want it. Buffer strips can be as prominent as an 8 foot tall wall of cattails around a pond or as subtle as raising the height of cut adjacent to a green's collar or fairway rough. You choose. Your only bad choice is not to use them.

Where Will All That Water Go?

Knowing where stormwater runoff will go a long way in determining what you do with it. For example, if your stormwater drains to a creek or stream that is fish-bearing, you need to be mindful that greens drainage should be diverted away from these creeks and streams. Why? Some fungicides and some pyrethroid-based insecticides are not particularly fish-friendly. For those with USGA or modified California greens, take advantage of your subsurface drains and develop depressions, swales or permeable soil nearby that can accommodate this drainage.

Plan for the Peak: Do You Have Enough Room?

The 25-year, 24-hour storm for the Bay Area is approximately four inches and the average annual rainfall is almost 20 inches. So although you think that your 5,000 sq. ft. green doesn't generate much water when it rains, a 25-year storm can generate over 13,000 gallons in a day. Drawing down ponds and making room by creating swales and depressions in fairways is good insurance against having water leave the course without your permission.

Stormwater Pollution Prevention Plans (SWPPPs)

If your construction project exceeds 1 acre, you need to develop a SWPPP and gain approval from the State Water Resources Control Board (SWRCB). More information can be found at: http://www.swrcb.ca.gov/water_issues/programs/stormwater/.

Although golf is largely exempt from stormwater regulation, your local city or county, or landlord may require that you have a SWPPP or equivalent. This may mean that you do water quality sampling, analysis and annual reporting.

Reasons to be vigilant during the storm season:

- Steep slopes
- Erodible soils
- Proximity to sensitive surfacewater
- Concerned neighbors

Housekeeping Rules: Washpads and Fuel Storage

Is your fuel storage in excess of 1,320 gallons and in something larger than 55 gallon drums? If so, you will need a Spill Prevention, Control and Countermeasures (SPCC) Plan. These plans call for secondary containment and structures and equipment to prevent a discharge in the event of a spill and are especially important to have in place during the stormwater season. Common SPCC plan elements often call for dikes, berms, retaining walls, curbs, culverts, gutters, weirs, booms, diversion ponds, and/or sorbent materials to prevent the release and mixing of fuel with stormwater. These plans are often required by local regulatory agencies referred to as Certified Unified Program Agencies (CUPAs).

If not kept up, washpads and equipment storage will be a problem when it rains. Clippings, dirt, oil and grease are things you want to keep out of stormwater, especially if it leaves the course. A little housekeeping goes a long way to preventing problems here.

2004 Golf Course Water Quality Study Results

Virtually all of the 150+ courses are in the greater San Francisco Bay area have a creek, stream, drainage, pond or lake on or near



Pond drawdown is a good stormwater BMP.

the course. Unfortunately, golf courses are widely perceived as contributing to water quality problems. An extensive 6-year study was completed that looked at differences in upstream vs. downstream surfacewater quality. Over 1,000 water quality measurements were made for nutrients and toxicity. Data on fertilizer and irrigation water use, mowing frequency, etc. were also collected.

Results suggest that impacts to surfacewater quality from golf courses, including nutrient input were, for the most part, not occurring. In general, courses with vegetated buffers had better downstream water quality. The study concluded that contrary to popular perception, golf course impacts to surfacewater do not appear significant. *(Continued)*



What not to do. No buffer strip between turf and surfacewater is asking for trouble.

SAND-BASED

**Bentgrass
Ryegrass
Bluegrass
Rye-Blue
Fine Fescue
Tall Fescue
Tifway II**

SOD

GREG DUNN
209/993-3329

RYAN FLAHERTY
209/993-5449
www.westcoastturf.com

Installation available

**Seashore
Paspalum**

**or your
custom
grown
variety!**

LOCALLY GROWN

**WEST COAST
TURF**

Life is short. Sod it!

Because no studies to date have been as focused, extensive or as scientifically robust, results of this ground breaking work can be used by parties interested in better understanding golf's relationship with water quality in adjacent streams and creeks

About the Author: Michael Blankinship has been a GCSAA member since 2001, is a DPR licensed pest control advisor and a California registered professional civil engineer. His Davis-based consulting firm solves problems related to permitting, compliance, water quality and natural resource management for golf course owners and operators throughout the Western U.S. Learn more at www.h2osci.com. Reach Mike at (530) 757-0941 or mike@h2osci.com.



Bank erosion left uncontrolled threatens bridges, roads and impacts water quality.



The collection of samples is sometimes needed to evaluate impacts, if any, to water quality.



Fairway infiltration from pond discharge is a good BMP.

HUSTLER®
TURF EQUIPMENT



**3 Year
Warranty**

INTRODUCTORY OFFER

\$29,000

MODEL 7700
WHILE SUPPLIES LAST

1500 GREENS MOWER ARRIVING IN JULY



**For Demo Call
(559) 280-4934**





Buffer strips, whether actual or planned, are a great water quality BMP.



Maintenance yards and washpads deserve good housekeeping during the storm season.



Subsurface drains provide excellent stormwater drainage.



What You've Been Looking for in an Organic and Organic Based Fertilizer... at the **RIGHT PRICE!**

- Slow Release Nitrogen and Variably Releasing Nitrogen Blends.
- Promotes Turf Density and Speeds Aeration Recovery.
- Enhances Soil Structure for Improved Disease Resistance.

Available in 50 lb. bags, 1 ton totes, and bulk

Available in Fine And Standard Grade

For more information visit our web site:
www.NatureTechFertilizers.com
 or call 209-394-1171