
BMP Best Management Practices
Where Leadership & Action Intersect
A Must Have: Written Best Management Practices Plans for Golf Facilities
J. Bryan Unruh, Ph.D., University of Florida, IFAS
GCSAA
USGA


J. Bryan Unruh, Ph.D.
University of Florida
• Professor of Environmental Horticulture at the University of Florida.
• Ph.D. – Iowa State University
• M.S. and B.S. – Kansas State University
• Research focuses on water quality (nutrient impairment) and quantity (drought), pest management, and new cultivar development.
• Results from his team's work are included in all three Florida turf industry Best Management Practice (BMP) manuals:
• Florida Friendly BMPs for Protection of Water Resources by the Green Industries
• BMPs for the Enhancement of Environmental Quality on Florida Golf Courses
• Water Quality/Quantity BMPs for Florida Sod
• Led his UF colleagues to develop the content for the GCSAA BMP Planning Guide and Template.
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Key Question:
Are golf courses good for the environment?
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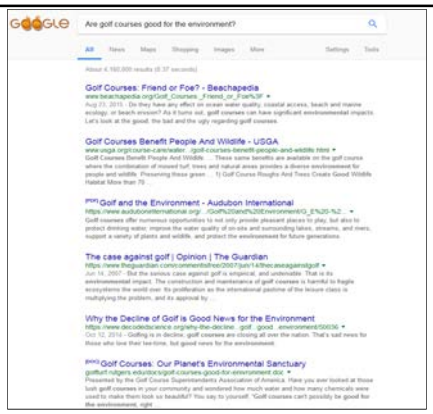

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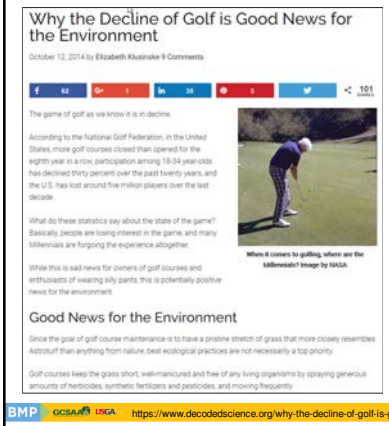
- A well-managed golf course provides substantial ecological and community benefits.
- Healthy turfgrass is an excellent filter that traps pollutants, preventing them from reaching groundwater supplies.
- Golf courses can serve as catch basins for residential and industrial runoff. In fact, golf courses are effective disposal sites for effluent wastewater.
- The trees and turfgrass on a golf course produce vast amounts of oxygen while cleansing the air of pollution and cooling the atmosphere.
- Golf courses provide community green spaces that offer not just recreational opportunities for people, but key sanctuaries and habitat for wildlife.
- Creating a golf course also is a good way to reclaim and restore an environmentally damaged site, like a landfill.

BMP GCSAA USGA *golfturf.rutgers.edu/docs/golf-courses-good-for-enivronment.doc*



BMP GCSAA USGA https://www.decodedscience.org/why-the-decline-of-golf-is-good-news-for-the-environment/50036

Instead of Killing Lawns, We Should Be Banning Golf

California is facing its worst drought in decades, so why is anyone playing golf in a desert?

"Golf courses are a huge problem," said Adam Keats of the Center for Biological Diversity, an environmental advocacy group. And part of that huge problem is the people who play it. "They're a wealthy elite that have no connection to want or lack," Keats, head of the center's California Water Law Project, told me over the phone. "Golfers live in a world of excess."

https://www.vice.com/en_us/article/yvqq5w/save-water-ban-golf-815

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Why Should Golf BMPs be Developed?

- Development and implementation of Best Management Practice (BMP) programs is one of the major tools for water quality improvement.
- BMPs are the shared language recognized by regulators, conservationists, engineers and others as the means to driving improvements.
- Because BMPs are recognized in federal and state TMDL policy as a major component of water-quality improvement plans, it is essential that the turf industry be proactive in developing and implementing BMPs related to turf management.

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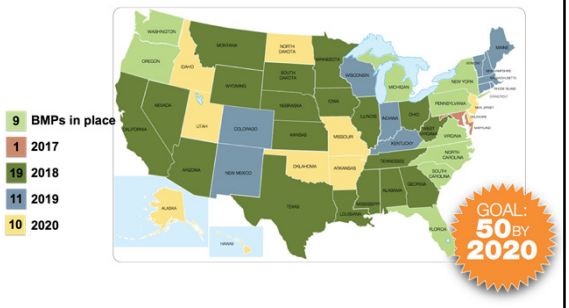
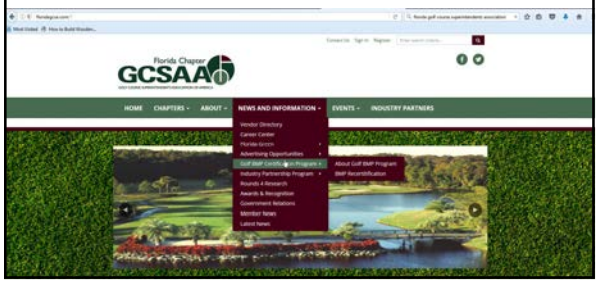
Golf Course BMPs



GCSAA

Facility Level BMP Adoption

It's one thing to have a book on the shelf – it's another thing to adjust your management practices.



Failing to plan is planning to fail. Alan Lakein

The Importance of Planning

Planning helps identify goals
Planning offers directions
Planning uncovers problems
Planning adds professionalism
Planning gives perspective

BMP GCSAA USGA http://dbhurley.com/importance-planning/

Quick Steps:

BMP Best Management Practices
Where Leadership & Action Intersect

- The tool allows you to quickly copy (clone) your state BMP manual accepting each BMP category or to go through each BMP category, section by section, incorporating information that is pertinent to your facility's needs.
  - If your state does not have a BMP manual completed, you will have to wait until it is completed.
    - If this is the case, download the print version of the GCSAA National BMP Planning Guide and Template.

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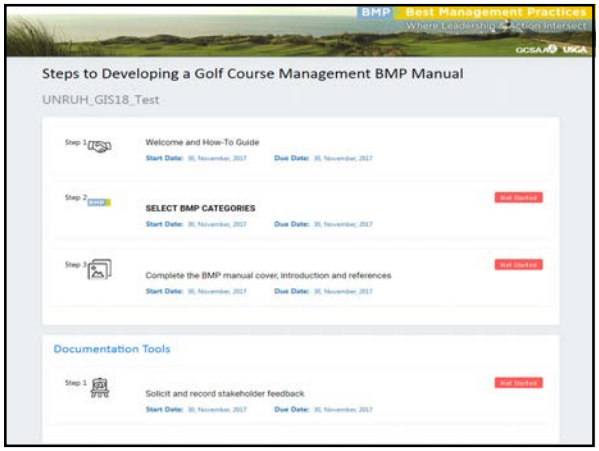

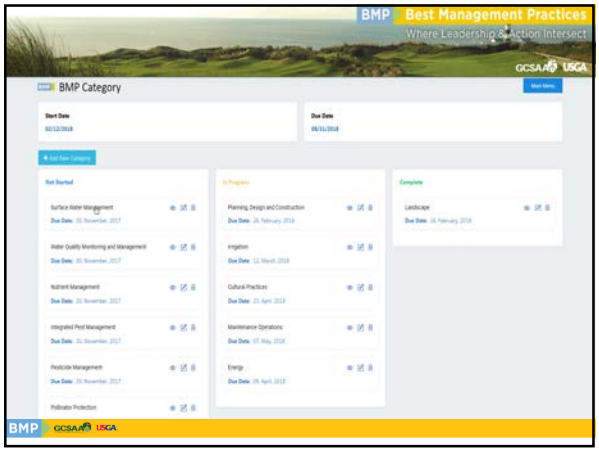

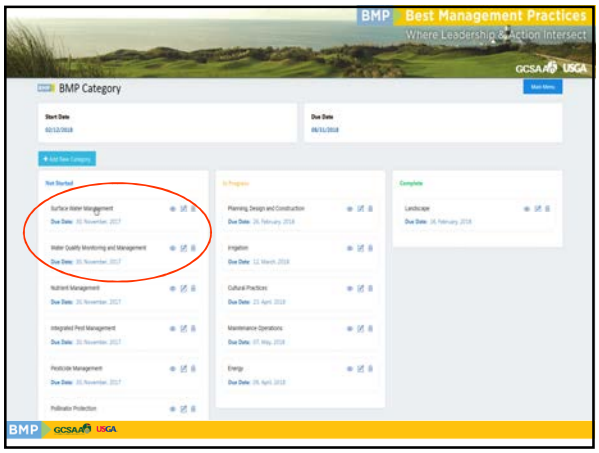

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Water Quality Challenges

- Concerns about water quality are related to **point and nonpoint source pollution**.

Photo Credit: https://www.pinterest.com/pin/196258496240199725/ http://blog.savatree.com/2014/09/particulars-nonpoint/

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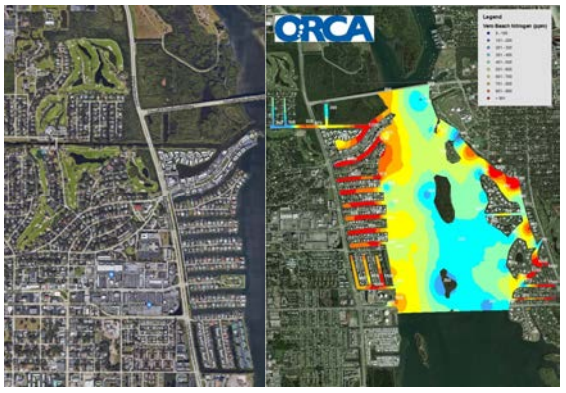

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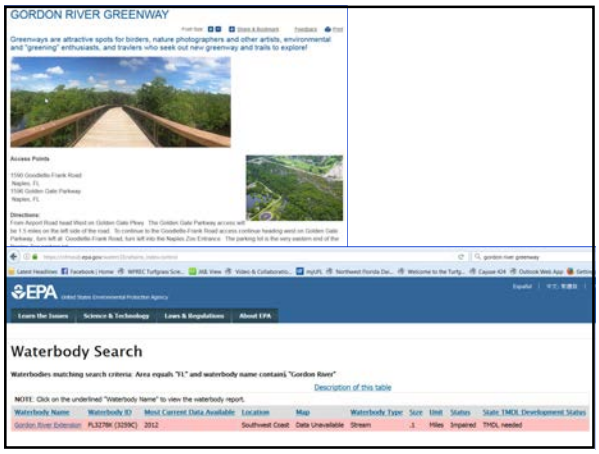
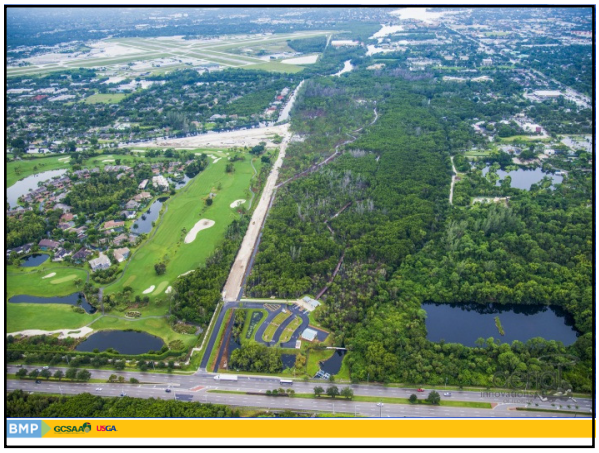

GORDON RIVER GREENWAY
Greenways are attractive spots for birders, nature photographers and other artists, environmental and "greening" enthusiasts, and travelers who seek out new greenway and trails to explore!
Access Points
Directions:
EPA
Waterbody Search
Waterbodies matching search criteria: Area equals "FL" and waterbody name contains "Gordon River"
Description of this table
NOTE: Click on the underlined "Waterbody Name" to view the waterbody report.
Waterbody Name
Waterbody ID
Most Current Data Available
Location
Map
Waterbody Type
Size
Unit
Status
State TMDL Development Status
Gordon River Extension
FL3278K (3259C)
2012
Southwest Coast
Data Unavailable
Stream
.1
Miles
Impaired
TMDL needed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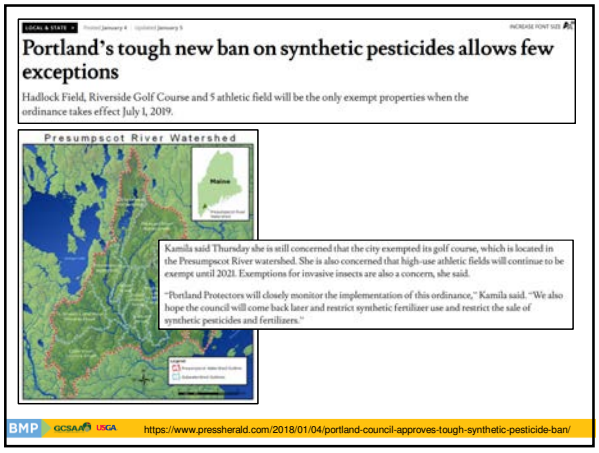
Portland's tough new ban on synthetic pesticides allows few exceptions
Hadlock Field, Riverside Golf Course and 5 athletic field will be the only exempt properties when the ordinance takes effect July 1, 2019.
Presumpscot River Watershed
Maine
Kamila said Thursday she is still concerned that the city exempted its golf course, which is located in the Presumpscot River watershed. She is also concerned that high-use athletic fields will continue to be exempt until 2021. Exemptions for invasive insects are also a concern, she said.
"Portland Protectors will closely monitor the implementation of this ordinance," Kamila said. "We also hope the council will come back later and restrict synthetic fertilizer use and restrict the sale of synthetic pesticides and fertilizers."
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https://www.pressherald.com/2018/01/04/portland-council-approves-tough-synthetic-pesticide-ban/

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Water Quality Challenges

- Nonpoint source pollution occurs as rainfall moves over the surface and through the ground picking up natural and man-made pollutants and then depositing them into lakes, rivers, wetlands, coastal waters and ground waters.
- In most states, nonpoint source pollution is the leading cause of water-quality problems that adversely affect drinking water supplies, recreation, and marine life and wildlife.

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Total Maximum Daily Loads (*TMDLs*)

- In 1972, the Clean Water Act (CWA) was passed by the United States Congress, and signed by President Richard M. Nixon.
- Section 303(d) of the Act requires States to establish Total Maximum Daily Loads (TMDLs) for impaired waters on a prioritized schedule.
- A TMDL is a pollution budget – a scientific calculation of the maximum amount of a pollutant that can be present in a body of water and still meet water-quality standards.

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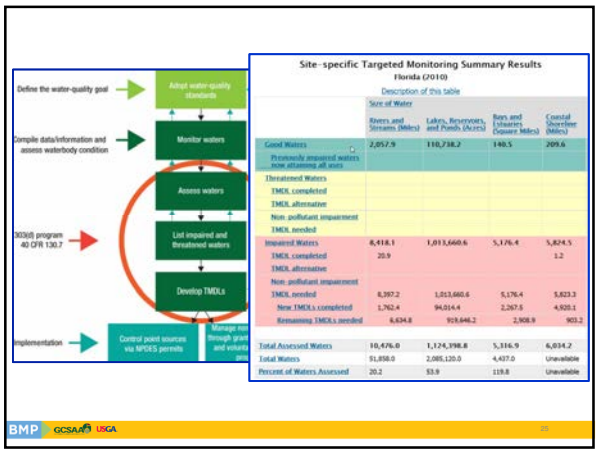
Define the water-quality goal
Adopt water-quality standards
Compile data/information and assess waterbody condition
Monitor waters
Assess waters
303(d) program 40 CFR 130.7
List impaired and threatened waters
Develop TMDLs
Implementation
Control point sources via NPDES permits
Site-specific Targeted Monitoring Summary Results
Florida (2010)
Description of this table
Size of Water
Rivers and Streams (Miles)
Lakes, Reservoirs, and Ponds (Acres)
Bays and Estuaries (Square Miles)
Coastal Shoreline (Miles)
Good Waters 2,057.9 110,738.2 140.5 209.6
Previously impaired waters now attaining all uses
Threatened Waters
TMDL completed
TMDL alternative
Non-pollutant impairment
TMDL needed
Impaired Waters 8,418.1 1,013,660.6 5,176.4 5,824.5
TMDL completed 20.9 1.2
TMDL alternative
Non-pollutant impairment
TMDL needed 8,397.2 1,013,660.6 5,176.4 5,823.3
New TMDLs completed 1,762.4 94,014.4 2,267.5 4,920.1
Remaining TMDLs needed 6,634.8 919,646.2 2,908.9 903.2
Total Assessed Waters 10,476.0 1,124,398.8 5,316.9 6,034.2
Total Waters 51,858.0 2,085,120.0 4,437.0 Unavailable
Percent of Waters Assessed 20.2 53.9 119.8 Unavailable
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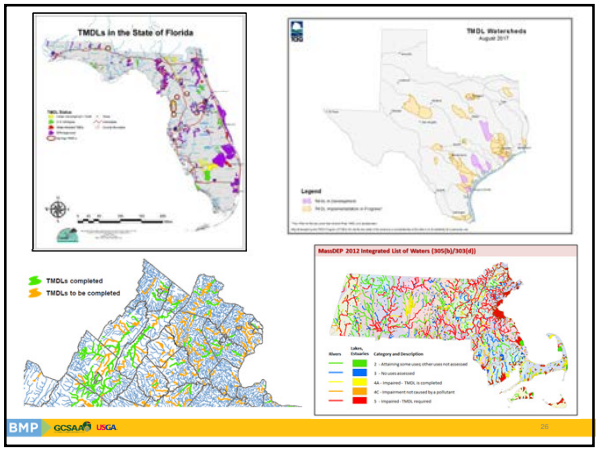
TMDLs in the State of Florida
TMDL Watersheds
August 2017
Legend
TMDLs completed
TMDLs to be completed
MassDEP 2012 Integrated List of Waters (305(b)/303(d))
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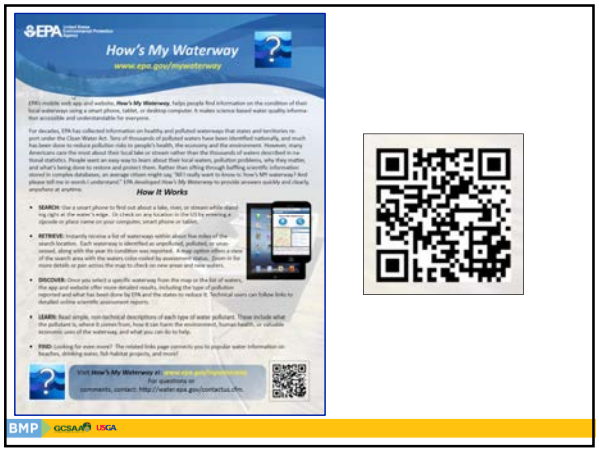
EPA
How's My Waterway
www.epa.gov/mywaterway
How It Works
SEARCH:
RETRIEVE:
DISCOVER:
LEARN:
FIND:
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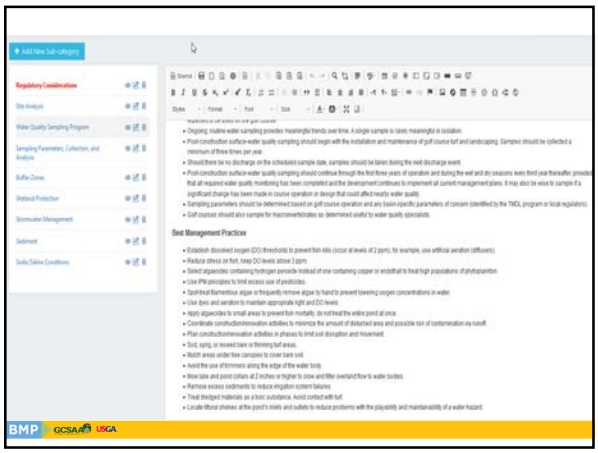
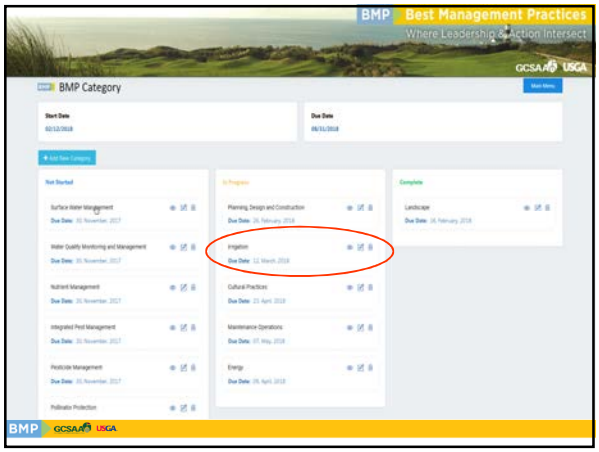
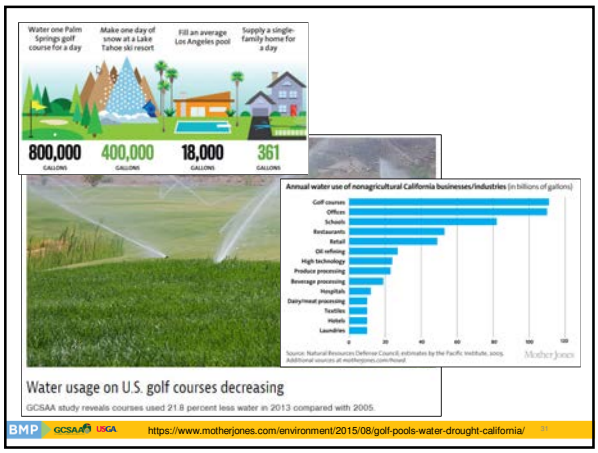




Water usage on U.S. golf courses decreasing

GCSAA study reveals courses used 21.8 percent less water in 2013 compared with 2005.

BMP GCSAA USGA https://www.motherjones.com/environment/2015/08/golf-pools-water-drought-california/


Water one Palm Springs golf course for a day
Make one day of snow at a Lake Tahoe ski resort
Fill an average Los Angeles pool
Supply a single-family home for a day
800,000 GALLONS
400,000 GALLONS
18,000 GALLONS
361 GALLONS
Annual water use of nonagricultural California businesses/industries (in billions of gallons)
Golf courses
Offices
Schools
Restaurants
Retail
Oil refining
High technology
Produce processing
Beverage processing
Hospitals
Dairy/meat processing
Textiles
Hotels
Laundries
Mother Jones
Water usage on U.S. golf courses decreasing
GCSAA study reveals courses used 21.8 percent less water in 2013 compared with 2005
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https://www.motherjones.com/environment/2015/08/golf-pools-water-drought-california/


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Irrigation
Water Management Approaches
BMP
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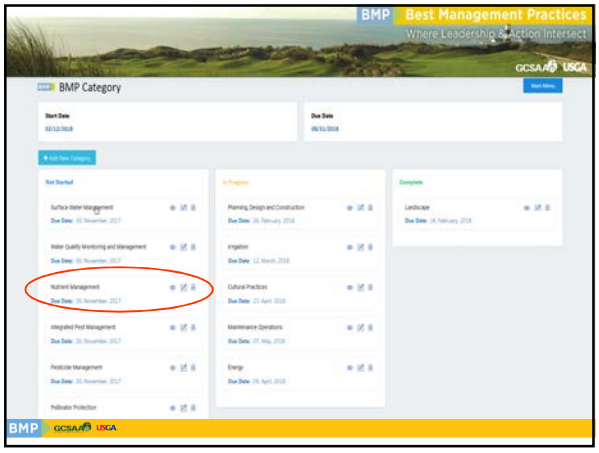
BMP Best Management Practices
Where Leadership & Action Intersect
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BMP Category
Start Date
Due Date
Not Started
In Progress
Complete
Surface Water Management
Water Quality Monitoring and Management
Nutrient Management
Integrated Pest Management
Pesticide Management
Pollinator Protection
Planning, Design and Construction
Irrigation
Cultural Practices
Maintenance Operations
Energy
Landscape
BMP
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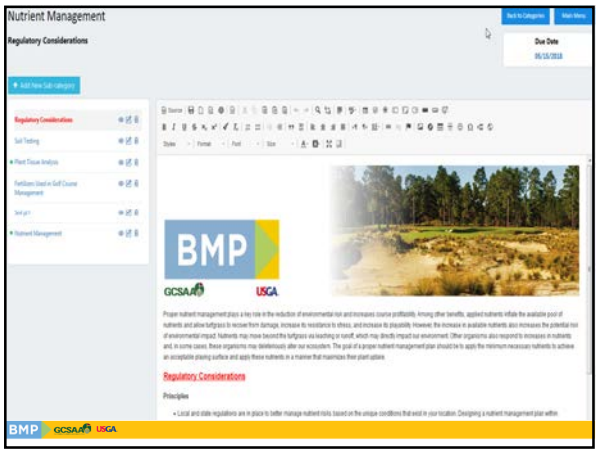
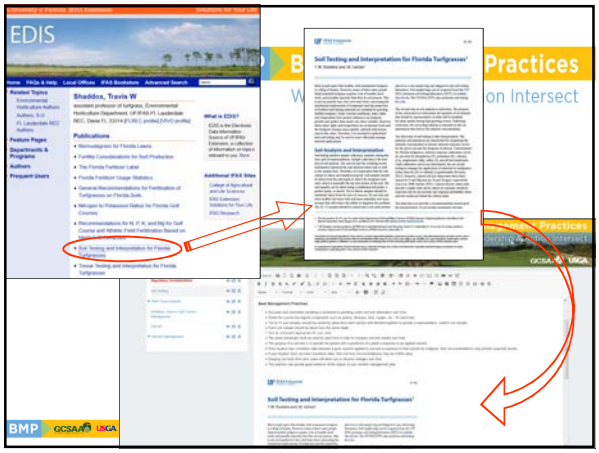

Nutrient Management
Regulatory Considerations
BMP
GCSAA
USGA
Regulatory Considerations
Principles


EDIS
Practices
on Intersect
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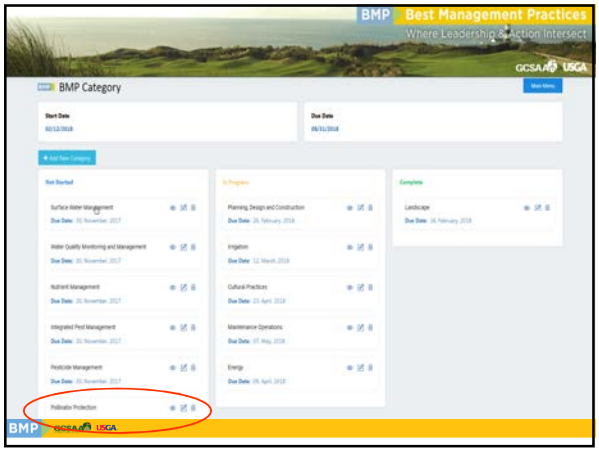
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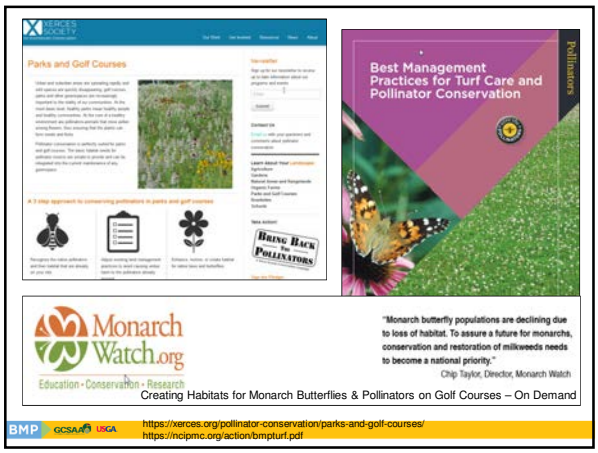
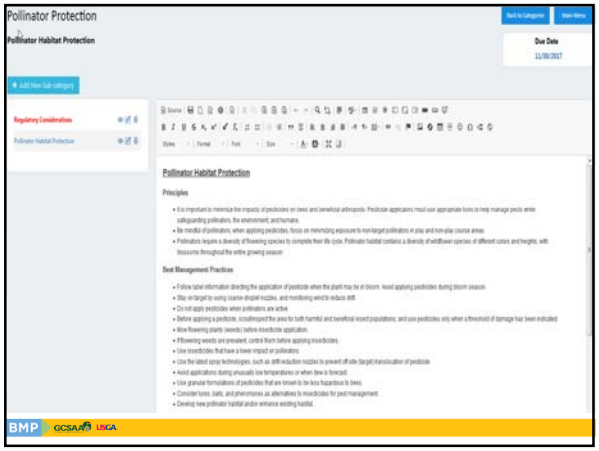
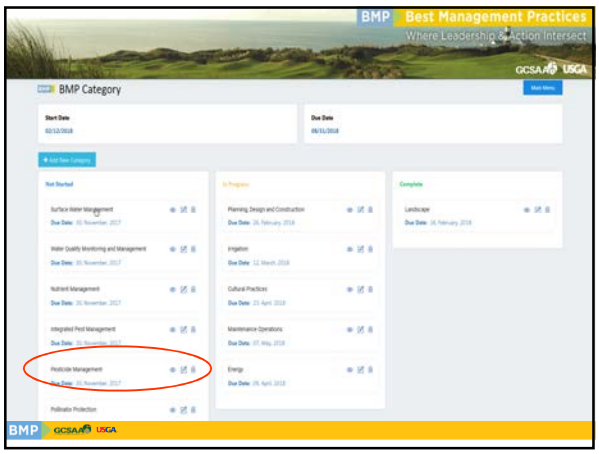


Creating Habitats for Monarch Butterflies & Pollinators on Golf Courses – On Demand

https://xerces.org/pollinator-conservation/parks-and-golf-courses/
https://ncipmc.org/action/bmpturf.pdf






PartnerOne Environmental
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Spotlight: Pollution Exposures at Golf Courses
Posted on January 30, 2017
By Michelle Huitt, Assistant Vice President
With more than 15,000 golf courses covering approximately 1.7 million acres of land in the United States, these facilities can pose a significant risk to our environment. Golf courses typically have aboveground storage tanks with capacities of 550 gallons or less, which means that the tanks are not regulated by the states and do not require Financial Assurance. The tanks serve a variety of purposes, including storing diesel for the golf carts, as well as herbicides and pesticides used to maintain the grounds. Golf courses also contain various ponds and water features which require maintenance, and can also carry harmful contaminants throughout the property. Storage facilities onsite holding chemicals and fertilizers are also cause for concern. All of these scenarios are highlighted further below.
Herbicide and pesticide storage and use
One exposure that is unique to golf courses is the storage and application of herbicides and pesticides which require proper certification of all employees engaged in applying these substances. Although the new generation of pesticides are much safer then those used in the past, there is still a significant exposure anytime chemicals come into contact with soils and groundwater.
New updates!
Check out our latest updates!
READ MORE
Contact Info
New Agents: (855) 596-2157
Existing Agents: (800) 596-0172
Fax: (434) 979-8964
Email: p1info@p1enviro.com
Website: www.p1enviro.com
Latest News
3 Aspects of Terrorism to Address with Your Site Pollution Clients
By R. Ivy Riggs, CPCU, ASLI, AIS For those who work in the insurance industry,
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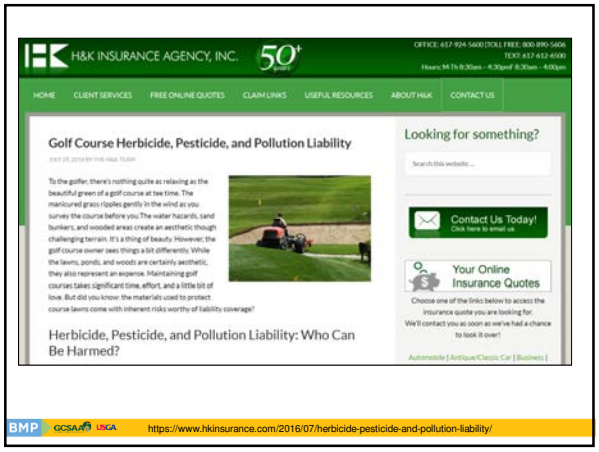
https://p1enviro.com/recent-activity/spotlight-pollution-exposures-at-golf-courses/


H&K INSURANCE AGENCY, INC.
50+ years
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TEXT: 617-612-6500
Hours: M-Th 8:30am - 4:30pm | F 8:30am - 4:00pm
HOME
CLIENT SERVICES
FREE ONLINE QUOTES
CLAIM LINKS
USEFUL RESOURCES
ABOUT H&K
CONTACT US
Golf Course Herbicide, Pesticide, and Pollution Liability
To the golfer, there's nothing quite as relaxing as the beautiful green of a golf course at tee time. The manicured grass ripples gently in the wind as you survey the course before you. The water hazards, sand bunkers, and wooded areas create an aesthetic though challenging terrain. It's a thing of beauty. However, the golf course owner sees things a bit differently. While the lawns, ponds, and woods are certainly aesthetic, they also represent an expense. Maintaining golf courses takes significant time, effort, and a little bit of love. But did you know: the materials used to protect course lawns come with inherent risks worthy of liability coverage?
Herbicide, Pesticide, and Pollution Liability: Who Can Be Harmed?
Looking for something?
Contact Us Today!
Click here to email us
Your Online Insurance Quotes
Choose one of the links below to access the insurance quote you are looking for. We'll contact you as soon as we've had a chance to look it over!
Automobile | Antique/Classic Car | Business |
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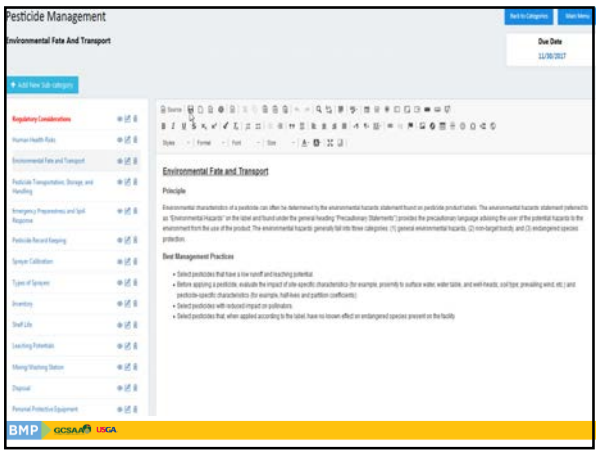
https://www.hkinsurance.com/2016/07/herbicide-pesticide-and-pollution-liability/


Pesticide Management
Environmental Fate And Transport
Due Date
11/30/2017
+ Add New Sub-category
Regulatory Considerations
Human Health Risks
Environmental Fate and Transport
Pesticide Transportation, Storage, and Handling
Emergency Preparedness and Spill Response
Pesticide Record Keeping
Sprayer Calibration
Types of Sprayers
Inventory
Shelf Life
Leaching Potentials
Mixing/Washing Station
Disposal
Personal Protective Equipment
Environmental Fate and Transport
Principle
Best Management Practices
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Pesticide Selection BMPs

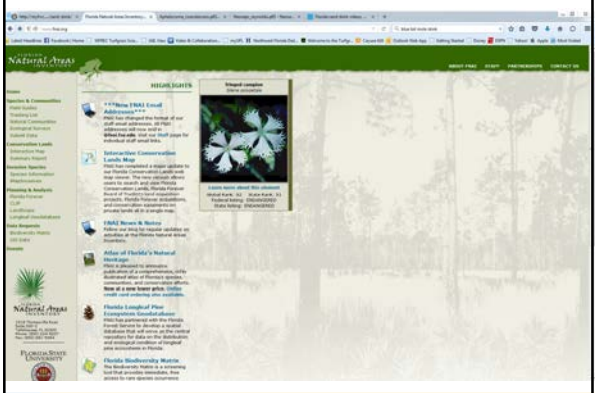
When selecting pesticides, recognize that pesticide product selection should be made based on a number of important factors including:

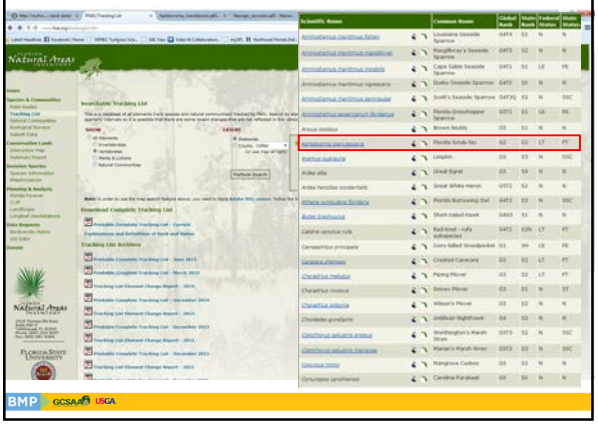
1. Product effectiveness.
2. Pesticides with minimal impact on non-target species.
3. Minimization of pest resistance.
4. Consider possible toxicological risk associated with pesticide exposure.
5. Evaluation of pesticide and site characteristics affecting off-site movement of chemicals.

Selection Based on Impacts on Beneficial, Threatened or Endangered Species

Golf courses and green space offer prime opportunity for wildlife – often including species that are beneficial, threatened, or endangered.

- Know what you have!
  - Florida Natural Areas Inventory (www.fnai.org)





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Selection Based on Impacts on Beneficial, Threatened or Endangered Species

Refer to your pesticide label's **Environmental Hazards** section for toxicity information.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds, fish, aquatic and estuarine (tidewater dwelling) invertebrates. Do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high water mark. Runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Cover, incorporate or clean up granules that are spilled. Do not contaminate water when disposing of equipment washwater or rinsate.

FOR BROADCAST APPLICATIONS:

Do not apply within 15 feet of bodies of fresh water: lakes, reservoirs, rivers, permanent streams, marshes, natural ponds, and commercial fishponds. A 15 feet buffer of uniform groundcover must exist between application zone and bodies of freshwater (uniform ground cover is defined as land which supports vegetation of greater than 2 inches throughout).

Do not apply within 60 feet of estuarine bodies of water. Estuarine water bodies are brackish, tidal water such as bays, mouths of rivers, salt marshes, and lagoons.

In order to reduce risk to birds, ensure that the application is spread evenly over the treatment area.

Florida Applications:

Do not use this product within 500 feet of areas occupied by the threatened Florida scrub jay, blue tail mole skink, or by sand skink. In addition, for the protection of the threatened bluetail mole skink and sand skink, apply only to turf grass and allow at least a 30-foot untreated buffer of turf grass when adjacent to scrub habitat (i.e. xeric upland) in the following counties: Highlands, Lake, Marion, Orange, Osceola, Polk, and Putnam. For guidance consult the Florida Department of Agriculture and Consumer Services.

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Pesticide Selection BMPs

When selecting pesticides, recognize that pesticide product selection should be made based on a number of important factors including:

1. Product effectiveness.
2. Pesticides with minimal impact on non-target species.
3. Minimization of pest resistance.
4. Consider possible toxicological risk associated with pesticide exposure.
5. Evaluation of pesticide and site characteristics affecting off-site movement of chemicals.

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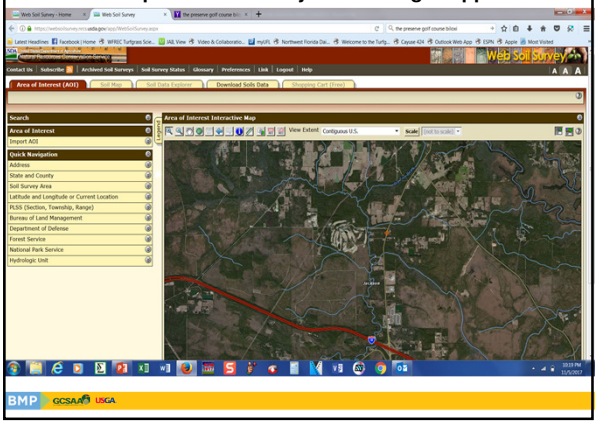
http://websoilsurvey.nrcs.usda.gov/app/

http://websoilsurvey.nrcs.usda.gov/app/



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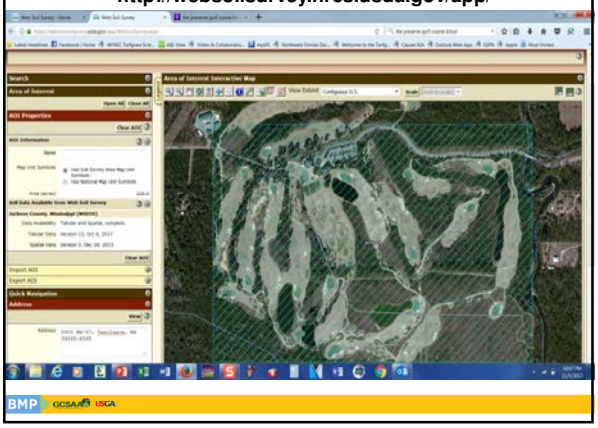

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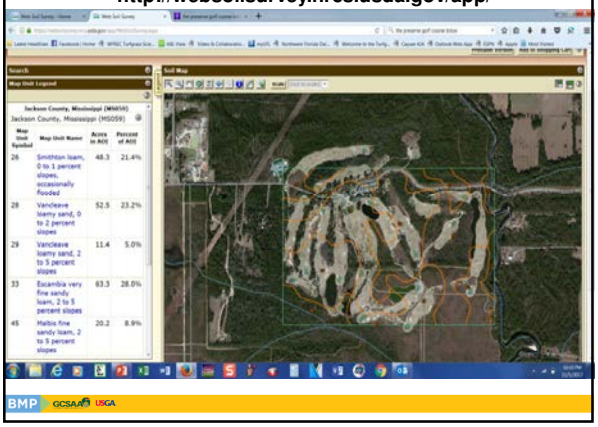

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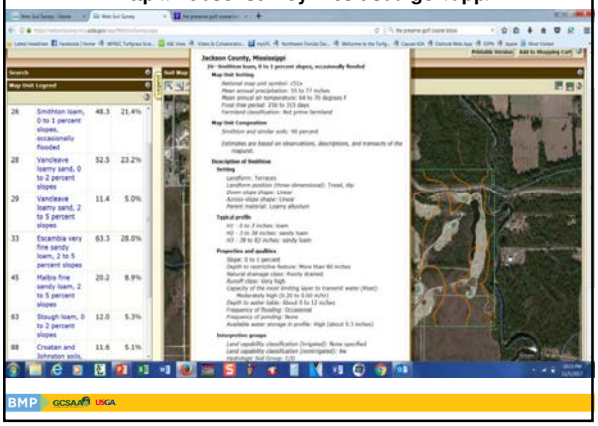

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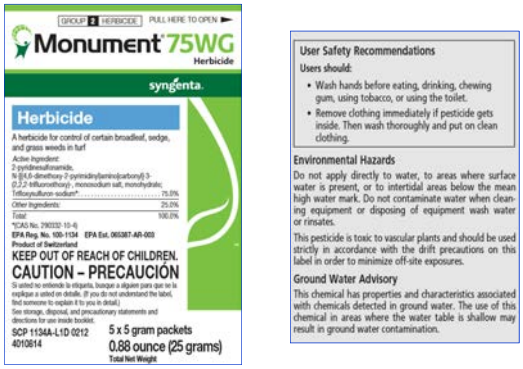

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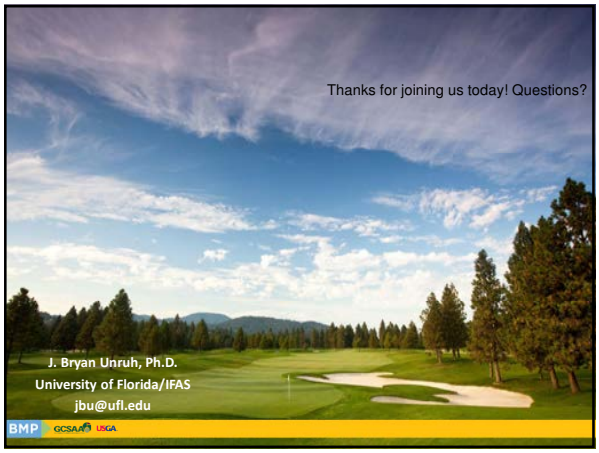
Failing to plan is planning to fail. Alan Lakein

The Importance of Planning

Planning helps identify goals
Planning offers directions
Planning uncovers problems
Planning adds professionalism
Planning gives perspective

BMP GCSAA USGA http://dbhurley.com/importance-planning/



Upcoming Webinars

Apr. 4 @ 10 a.m.
Standard & Unconventional Ways to Avoid Disease Woes on Warm-Season Fairways and Tees
with Lee Miller, Ph.D.

Apr. 5 @ 10 a.m.
Workplace Harassment: What has the last 12 months taught us?
with Kerri Reisdorff

Apr. 18 @ 9 a.m.
Manejo de malas hierbas en céspedes de campos de golf
with Diego Gómez de Barreda Ferraz, Ph.D.

GCSAA Times listed are Central U.S.