

product can be safely applied can greatly aid the IPM plan formulation process. Information obtained from computer simulations of chemical treatments such as LEACHM can provide estimates which otherwise could not be obtained unless expensive on-site studies were completed. More and more, this type of information is being requested by regulatory or other groups which influence how areas may be managed in the future. In order to insure that a turf manager continues to have all necessary tools to combat a potential or existing problem, it is essential that pertinent questions receive the proper attention and be satisfactorily addressed.

#### Modeling Today and Tomorrow

Considerable time and effort are currently being devoted to developing

more sophisticated and comprehensive modeling systems with yet unrealized precision. The development of modeling systems is an evolutionary process which is always giving rise to superior products. This is not to say that the models we have today are inefficient or inaccurate. In reality, today's models are "state of the art" and are representative of the best technologies currently available.

As stated in Table 1, the software for each of the three more complex models is readily available. The CREAMS/GLEAMS model is available at no cost from USDA Research Labs in Tifton, Georgia. Similarly, the PRZM model is available from the USEPA. LEACHM, however, must be purchased from its authors at Cornell University (contact person: Dr. John Hutson, (607) 755-7631).

All three models can be used by anyone with an IBM-compatible PC, available site-specific input data, the time necessary to formulate accurate input files, and a general working knowledge of computer operation. The models are generally user-friendly and are accompanied by detailed explanatory literature. In order to assure accurate results, however, significant time must be invested by the user during the familiarization process. It is this initial time investment that limits the usefulness to today's turf managers for stimulating their own site-specific program. However, once the initial time investment is made, and after the user becomes accustomed to using a particular model, modification of input data allows for the simulation of an infinite number of management practices as long as the user has confidence in the data he is using.

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## ON COURSE WITH NATURE

# Working Within the Quagmire of Wetland Regulation!

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by NANCY P. SADLON

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**H**ISTORICALLY, wetlands have been considered wastelands, but now they are recognized for providing environmental and economic benefits, including wildlife and fish habitat, shoreline and erosion control, flood protection, improved water quality, storm water management, aquifer recharge, and valuable recreation areas. Wetlands are protected by law, and golf courses are required more frequently than ever to file wetland permit applications. Though the wetland regulatory process is complicated, a few basics can introduce you to the process.

#### How to Recognize Wetlands on the Golf Course

When analyzing the golf course to determine if a wetland environment

exists, there are three basic things to look for:

1. **Water** at or near the surface.
2. **Saturated soils** that often (but not always) display gray-green colors.
3. **Plants** that are typically water tolerant.

These three simple indicators represent the basics for the layman to identify areas of wetland concern on the golf course. It is important to recognize that when analyzing these parameters, it is often necessary to look below the surface (at an average depth of 0-18") to determine the presence or absence of water or saturated soils. Wetlands *do not* have to exhibit all three parameters to meet the regulatory regulations (as is the case with many drained farm lands),

nor are all three indicators always present throughout the year. These basics to wetland identification are not sufficient guidelines for do-it-yourself wetland delineation. They are presented to help the golf course superintendent recognize the potential for wetland existence on the golf course and the need to consult a local expert.

Complete delineation of wetlands to meet regulatory requirements has become a detailed, scientific process that requires the expertise of an experienced wetland consultant.

#### Why Are Wetlands Such a Big Issue on Golf Courses?

Many golf courses deal with wetland regulations. By their very nature, many



*Whitefish Lake Golf Club, Whitefish, Montana.*

golf courses are located in areas where water is available to provide a source for irrigation, play a part as a water feature in course design, or provide scenic beauty. This source of water, by definition, is responsible for the wetland environment.

The term “wetlands” means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” (1979 Clean Water Act, Sec. 404 — 33 CFR328.3(b); 1984)

This definition is found in Section 404 of the Clean Water Act, which has been the federal government’s primary tool for protecting and regulating wetlands. Federal legislation has given the Army Corps of Engineers (ACOE) authority to establish a permit system which regulates dredging and filling in waters of the United States, which includes wetlands.

### Who Regulates Wetlands?

Regional differences in wetland development regulations are a result of complex federal and state laws. With the exception of Michigan, all states fall

under the jurisdiction of the EPA, the federal wetland permit process, and the ACOE. The wetland permitting process becomes more complex when the state wetland offices become involved in reviewing wetland impacts on water quality. This state review process is built into the ACOE permit process and is responsible for allowing states to incorporate their specific regional requirements.

Many states have enacted or are currently developing inland and coastal wetlands laws and policies. Often, state wetland permit programs are more stringent than the ACOE permit program by involving wetland value classification and buffer requirements. If your golf course is located in a state listed on the accompanying chart, contact your state agency if you believe you will impact wetlands as a result of proposed golf course renovations or operations. If your state is *not* listed, contact the ACOE Washington office at (202) 372-0571 and ask for your state’s regional office number.

### What About the Proposed 1992 Changes to Wetland Legislation?

Wetlands protection has been at the forefront of the political news, with the Bush Administration’s support of a “No

Net Loss” wetland policy. Proposed changes for wetland deination procedures (Congressional vote currently pending) incorporate revisions that have kept wetland protection in the news. Two of the controversial proposed revisions include:

Current Wetland Regulation	Proposed Wetland Regulation Change
15-day saturation definition	21-day saturation definition
All wetlands considered same value	Wetland classification system identifying wetlands of different values (high and low values)

A change from a 15- to a 21-day saturation duration would likely result in millions of acres (up to 30 million, according to some estimates) no longer meeting the wetlands definition, leaving these areas unprotected. This could be a big asset to golf courses with areas no longer considered wetlands, relieving them of many wetland regulation restrictions, permit processing costs, and time delays. The negative effect of the change would be felt by those golf courses that qualify as having wetlands, based on a 21-day saturation definition. They would be involved in a potentially more difficult wetland delineation process and a longer permit processing time delay. Production of new delineation manuals, training programs and guidelines will undoubtedly delay implementation of the new wetland definition laws.

Golf courses classified with high-value wetlands will bear the burden of stringent permit requirements (probably more restrictive than current Federal regulations) if the proposed changes in wetland classification are passed. Many states, such as New Jersey, Pennsylvania, and Michigan, currently evaluate wetlands for value classifications and impose regulations accordingly. The more highly valued wetland is often protected by larger buffer areas and has other restrictions associated with it. Sometimes this can represent a hardship on the maintenance program used in buffer areas on the golf course. The positive side of the new regulations, as far as golf courses are concerned, is that low-value wetland areas, such as ditches or man-made detention ponds, would receive more lenient treatment, and the time delays and costs associated with the permit process would likely be reduced.

### State Wetland Regulations

Alabama	Department of Environmental Management	(205) 271-7389
Alaska	Department of Environmental Conservation Department of Environmental Quality	(907) 465-5260
California	California Coastal Commission Wetlands Task Force	(408) 479-3511
Connecticut	Department of Environmental Protection Division of Inland Water Resource Management	(203) 566-7280
Delaware	Department of Natural Resources & Environmental Control	(302) 739-4691
Florida	Department of Environmental Regulation Division of Water Management	(904) 488-0130
Georgia	Department of Natural Resources Coastal Resources Division — Marsh & Beach Section	(912) 264-7218
Hawaii	Coastal Zone Management Program	(808) 587-2875
Louisiana	Department of Natural Resources Coastal Management Division	(504) 342-7591
Maine	Department of Environmental Protection Division of Natural Resources	(207) 289-2111
Maryland	Department of Natural Resources Water Resources Administration Non-Tidal Wetlands Division	(301) 974-3841
Massachusetts	Department of Environmental Protection Division of Resource Protection	(617) 292-5695
Michigan	Department of Natural Resources Land & Water Protection Division	(517) 335-2694
Minnesota	Department of Natural Resources Protected Waters & Wetlands Permit Program	(612) 296-4800
Mississippi	Department of Wildlife Fisheries & Parks Coastal Management Section	(601) 385-5860
New Hampshire	Department of Environmental Services Wetlands Bureau	(603) 271-2147
New Jersey	Department of Environmental Protection & Energy Land Use Regulation Element	(609) 633-6755
New York	Department of Environmental Conservation Division of Fish & Wildlife	(518) 457-9713
North Carolina	Department of Environment, Health & Natural Resources Division of Coastal Management	(919) 733-2293
Oregon	Division of State Lands	(503) 378-3805
Pennsylvania	Department of Environmental Resources Division of Rivers & Wetlands Conservation	(717) 541-7803
Rhode Island	Department of Environmental Management Division of Groundwater & Freshwater Wetlands	(401) 277-6820
South Carolina	Coastal Council	(803) 744-5838
Vermont	Department of Environmental Conservation Water Quality Division	(802) 244-6951
Virginia	Marine Resources Commission Habitat Management Division	(804) 247-2200
Washington	Department of Ecology Shorelands & Coastal Zone Management Program	(206) 459-6790
Wisconsin	Department of Natural Resources Bureau of Water Regulation & Zoning	(608) 266-7360