ENGINEERS AND WETLAND SCIENTISTS FACE CHALLENGES WITH REGULATORY CHANGES TO THE CLEAN WATER ACT

TECHNOLOGY TO PLAY A KEY ROLE IN SOLUTIONS

By Lee Lance and Jeremy Schewe

Wetland construction

THIS YEAR'S CHANGES to the Clean Water Act have made the already-challenging work of scientists and engineers in water planning and management exponentially more difficult.

Questions abound, from jurisdictional issues to definitions and classifications, as a result of the "Navigable Waters Protection Rule," which, among other things, removes federal protections from ephemeral waterways (temporary bodies of water created by rain or snow).

Further complicating the picture is the fact that wetlands assessment work has traditionally been done manually and can be painstakingly tedious. In the past, scientists have had few new technologies at their disposal, and thus work was typically completed using low-tech methods (think clipboards and pens). This led to obvious challenges; work was time-consuming and adjusting for, for example, new regulations, was very difficult.

Over the years, more tools and resources have emerged to help scientists tackle these challenges, and there is no doubt that technology will play a critical role in the future of wetland assessment work.

The "Navigable Waters Protection Rule" Explained

In January of this year, the "Navigable Waters Protection Rule" was finalized to redefine "Waters of the United States" (WOTUS). The rule establishes four categories of waters that are to be federally regulated and specifies twelve categories of water that are excluded from federal protections, including ephemeral features, groundwater, and waste treatment systems.

The rule further defines "adjacent wetlands" as "wetlands that are meaningfully connected to other jurisdictional waters, for example, by directly abutting or having regular surface water communication with jurisdictional waters" (Source: U.S. Environmental Protection Agency). In short, certain wetlands and streams that were previously protected by the Clean Water Act are no longer jurisdictional.

While these changes, some argue, may confer certain benefits to some stakeholders, they are likely to make the overall regulatory picture more complex in most places. In response to federal changes, for example, some states have promulgated their own regulations and protections or are planning to do so. California, for instance, has enacted its own rules. This, some in our industry have pointed out, may lead to confusion; certain bodies of water are now regulated under the jurisdiction of the state and not the federal government, and some may fall under both. Such disparities increase not only the potential for confusion but also the likelihood of costly mistakes. Further, other states may not be fully prepared to adequately replace the regulatory frameworks established previously by the federal government.

Broadly speaking, what is changing as a result of the current regulatory climate is the question of who has jurisdiction over certain waters – the federal government, states, or landowners. The fundamental need for accurate and timely wetlands assessment remains the same to ensure sound and optimal planning and engineering outcomes, and the need for technology to help navigate these changes is even greater as a result.

Other Emerging Challenges

Sudden Regulatory Changes

As well as the regulatory changes mentioned above, there is potential for further change as governing bodies react to various developments and market changes. For example, very recently, the EPA announced a sweeping relaxation of environmental protection rules in response to the coronavirus pandemic.

The move, a result of an influx of requests from businesses for a relaxation of regulations as they face layoffs, personnel restrictions, and other problems relating to the outbreak, will undoubtedly impact the jobs of scientists and engineers in the field. How profoundly remains to be seen. However, the job of wetlands assessment must continue; as any structural engineer knows, building on an unstable ground on or near wetlands without proper assessment, planning, and mitigation, can spell disaster.

Extreme Weather

A rise in extreme weather is impacting landscapes. Excessive rainfall in some areas is causing erosion as well as the emergence of new ephemeral waterways. Other areas are experiencing unusual droughts. Hotter than average temperatures are impacting wetlands and waterways, threatening ecosystems, and causing instability and unpredictability.

These changes impact and complicate every facet of wetland science, including hydrology (specific geomorphology in the landscape, standing water, ground saturation, or underground water that is moving very close to the surface can indicate a wetland); vegetation assessment (identifying vegetation is core to the work of identifying and delineating wetland borders); soil sampling (soil classification is also central to wetlands work. Scientists probe the soil to a certain depth– typically at least 24 inches– to study layering to determine whether a soil might be aerobic or anaerobic or would be an upland soil or a wetland soil).

Advances and Solutions

The work of several organizations is helping wetland scientists meet these challenges. From the time it was founded in 1969, the Environmental Systems Research Institute (Esri) has focused on applied computer mapping and spatial analysis to help land-use planners and land resource managers make informed decisions. Over the years, Esri has developed many of the GIS mapping and spatial analysis methods now in use around the world.

Today, GIS is giving scientists the ability to map digital layers to help solve a wide variety of problems (the recently announced Esri resources to help real-time mapping associated with the Coronavirus pandemic is just one example). In the future, GIS technology integrated into the "Internet of Things," technologies will help scientists understand and address problems using the language of mapping.

Wetland delineation

The US Army Corps of Engineers' 1987 Wetlands Delineation Manual is the federal guide for identifying and delineating wetlands. Formed in 1964, the USACE's Hydrologic Engineering Center (CEIWR-HEC) has helped to institutionalize the field of hydrologic engineering through the development of various software platforms and the introduction of the Corps Water Management System (CWMS), a real-time forecasting and decision-support system.

The Role of Technology

Technology that brings advances, such as those from Esri and USACE, to scientists in the field is more critical than ever, given the challenges facing them. The Ecobot platform, for example, is designed by a wetlands scientist for use by others in the industry to significantly reduce the time it takes for delineation work while improving accuracy.

Ecobot, an Esri Emerging Business Partner, provides on-demand access to a vast library of reference materials and auto-calculates required worksheets used to determine if a parcel of land contains wetlands. The technology anticipates frictions that occur in the field and provides solutions, from addressing lack of internet connectivity (everything that must be done in the field can be done without a data connection) to simplified navigation for users with muddy hands. Ecobot monitors all regulatory bodies impacting wetlands, assimilating updates to applications, forms and more, to more easily, electronically generate the necessary, regionally-specific USACE reports.

As the industry faces growing challenges, the need to equip scientists with tools to reduce workloads and enable real-time decision-making is greater than ever. The net result of technology in wetlands delineation work can be significant; from time savings to reduced errors and a reduction in the risk of site revisits, and so confers a competitive edge to engineering firms as well as ensures proper maintenance and protection of wetlands.

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