ADAPTING THE NWI FOR PRELIMINARY ASSESSMENT OF WETLAND FUNCTIONS

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BACKGROUND

The U.S. Fish and Wildlife Service (FWS) has produced large-scale National Wetlands Inventory (NWI) maps for about 90% of the coterminous U.S. and 30% of Alaska. Almost 40% of the former maps (11% of the latter) are digitized, making them available for integration with other data sets for watershed planning and other purposes. Wetlands are classified according to the FWS's official wetland classification system (Cowardin et al. 1979) which separates wetlands into groupings based on physical, biological, and chemical characteristics. The system emphasizes vegetation and hydrology, but also includes modifiers for describing soils, salinity, and certain impacts, such as drainage and impoundment. This system has been useful for describing vegetation, hydrology, soils, and other physical attributes of wetlands. Despite its value for inventory purposes, the system does not separate wetlands from a hydrogeomorphic standpoint which is important for determining certain wetland functions (e.g., water quality renovation and flood storage). For example, the palustrine forested wetland classification includes floodplain wetlands, isolated depressional wetlands, and sloping wetlands, with no provision for separating these distinct types.

A hydrogeomorphic (HGM) classification for wetlands has recently been developed (Brinson 1993). HGM emphasizes hydrologic and geomorphic controls influencing many wetland functions. In general terms, this classification focuses on the location of a wetland in a watershed (its geomorphic setting), its sources of water, and its hydrodynamics. A series of geographically based models or "function profiles" for various wetland types are being created for use in functional assessment. The classification is designed for on-site application and requires significant field effort for model development. Once HGM models are constructed, there should be a broader understanding of the range in performance of selected functions by different wetland types. These profiles will permit comparison of specific wetlands to known standards or the range of known functions for similar types in a particular geographic area.

Since the FWS system is the basis for wetland mapping across the country and has recently been adopted as the federal data standard, it would be beneficial to develop additional modifiers to be able to apply the results of HGM profiles to mapped wetlands. Future NWI mapping could include HGM-type modifiers to facilitate preliminary assessments of potential functions of mapped wetlands.

MERGING HGM WITH COWARDIN

To bridge the gap between these two diverse classification systems and to facilitate watershed-wide wetland functional assessment in Massachusetts, a set of descriptors was devised that can be applied by remote sensing and/or map reading (Tiner 1995). Descriptors for landscape position and landform were created for enhancing information on existing and future National Wetlands Inventory maps. These descriptors would assist map users in better understanding the functions of mapped wetlands. Also when applied during the photointerpretation phase, the descriptors could be shown on future NWI maps and

incorporated into the national wetland map digital database for varied applications. While HGM models are being developed, there is sufficient knowledge of the relationships between these wetland characteristics and wetland functions to make some general interpretations.

Landscape position modifers describe the relationship between a wetland and an adjacent waterbody. Five landscape position are identified: Lotic (along rivers and streams), Lentic (in lakes and lake basins), Terrene (for isolated or essentially isolated wetlands with minimal stream flow), Estuarine (in estuaries), and Marine (along the ocean). The latter two categories are equivalent to their FWS counterparts. Lotic wetlands are further separated by river/stream gradients following the HGM approach (high, middle, and low gradients), with the addition of a tidal gradient to cover freshwater tidal reaches. Rivers are split from streams on the basis of channel width: linear drainageways (represented by a single line on a 1:24,000 topographic map) are considered streams, whereas two-lines (polygonal) channels are rivers. Although HGM doesn't require this, there may likely be some difference in wetland function related to channel size.

Landform is the shape or physical form of the wetland. Numerous categories of landorm have been developed for the Northeast including: basin, slope, river channel, floodplain, interfluve, fringe, delta, bay, barrier island, barrier beach, Carolina bay, headland, and island. These landforms may be further described by modifiers such as throughflow, inflow, outflow, fringe, island, fringe-overwash, fringe-bay, and floating.

CURRENT APPLICATIONS

The landscape position and landform descriptors have been used experimentally for describing wetlands in selected areas in Maryland, Massachusetts, and New York. Mapping conventions and an artificial key have been drafted to ensure consistent classification. The results to date have provided meaningful information for performing preliminary assessments of some functions of potential wetland restoration sites in the Neponset and Otter River watersheds in Massachusetts. Additional watershed application of these modifiers has been proposed for Massachusetts and New York. The FWS also hopes to evaluate the use of this approach coupled with general assessments of potential fish and wildlife habitat to begin answering questions on the significance of wetland losses detected by local wetland trend studies. This may provide the public with a better sense of the consequences of wetland destruction in particular areas. It is emphasized that this approach is in development and its full application is not realized. While the approach is being tested in the Northeast, the NWI Project intends to test its applicability nationwide if funding can be secured. This will require expanding the descriptors to cover unique conditions that do not occur in the Northeast. The NWI is confident that the use of these types of descriptors will augment the Project's efforts to provide useful information on the characteristics of the nation's wetlands.

REFERENCES

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Tiner, R. 1995. A Landscape and Landform Classification for Northeast Wetlands (Operational Draft). U.S. Fish and Wildlife Service, Ecological Services (NWI), Region 5, Hadley, MA

The Association of State Wetland Managers
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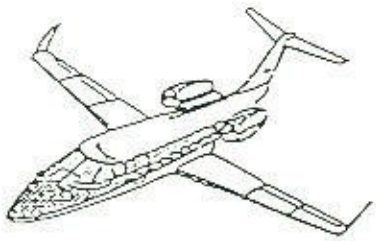
The Future of Wetland Assessment:

Applying Science Through The Hydrogeomorphic Assessment Approach and Other Approaches



ABSTRACTS

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