

User Notes for  
National Wetlands Inventory Maps  
of Eastern Virginia\*

U.S. Fish and Wildlife Service  
Region 5  
Habitat Resources  
Newton Corner, MA 02158

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\*This report covers the following 1:100,000 map areas: Eastville 1, 2, 3;  
Norfolk NE; Richmond NE, NW, SE, SW; Washington NW, SE, SW.

## Introduction

The U.S. Fish and Wildlife Service, Office of Habitat Resources is conducting an inventory of the wetlands of the United States using conventional aerial photointerpretation techniques. All wetlands are classified according to the Service's new system - Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 1979). The National Wetlands Inventory (NWI) is establishing a wetland data base, in both map and computer forms for the entire country. The present emphasis is on map production and in the future, wetland data will be digitized to create an automated wetland data base, as funding becomes available. The NWI information will serve to identify the current status of U.S. wetlands and can be used as a reference point from which future changes in wetlands can be evaluated. Final National Wetlands Inventory maps can be ordered from the Eastern Mapping Center - NCIC, U.S. Geological Survey, 536 National Center, Reston, VA 22092. Other information, including a topical brief about the NWI program, can be obtained by contacting the Regional Wetland Coordinator, U.S. Fish and Wildlife Service, One Gateway Center, Newton Corner, MA 02158.

## Subject Area

Wetland maps have been prepared for eastern Virginia. This area includes the following 1:100,000 map areas: Eastville 1, 2, 3; Norfolk NE; Richmond NE, NW, SE, SW; Washington NW, SE, SW. Most of this area falls within the Coastal Plain, although the western most section lies within the Piedmont. According to Bailey (1978), the entire area occurs in the Southeastern Mixed Forest Province.

## Map Preparation

Two series of wetland maps were produced: (1) large-scale (1:24,000) series and (2) small-scale (1:100,000) series. The National Wetlands Inventory employs conventional aerial photointerpretation techniques, i.e. high-altitude photography, to map wetlands and deepwater habitats. Wetlands were identified on aerial photographs based on vegetation, visible hydrology, and geography in accordance with the Fish and Wildlife Service's wetland definition and classification system (Cowardin et al. 1979). There is a margin of error inherent in the use of aerial photographs. Thus, a detailed on-the-ground survey may result in revision of the wetland boundaries. Maps should therefore be used to locate the presence of wetlands and not to identify precise boundaries between wetlands and uplands.

Outlined below are relevant data about the wetlands inventory for eastern Virginia.

## Contractor for Photo Interpretation

Massachusetts Remote Sensing Project  
Department of Forestry and Wildlife Management  
University of Massachusetts  
Amherst, Massachusetts 01003

## Photography Used

The aerial photography used to annotate the wetlands was 1:80,000 black and white panchromatic. The specific dates for the photography in each 1:100,000 mapping unit are outlined below. For the Dismal Swamp area of Virginia (Norfolk NE 1:100,000) false color infrared photography at a scale of 1:62,500 was used as collateral data. This was obtained on loan from the U.S. Geological Survey. Spring and winter 1978 black and white panchromatic photography (scale 1:80,000) was used as collateral data in some areas, but was not used as the principal photo data source due to poor quality. Specific photography used in a given area is listed on each large-scale NWI map.

### 1:100,000 Mapping Unit      Dates of B&W Panchromatic 1:80,000 Scale Photography

Washington NW	3/2/77	3/9/77	3/16/77
Washington SW	3/2/77	3/9/77	3/26/77
	4/5/72	3/16/77	3/24/77
Washington SE	3/25/77	11/18/77	4/29/78
	3/22/78	4/6/73	
Richmond NW	4/20/74	4/7/76	3/28/77
Richmond SW	4/20/74		
Richmond NE	4/6/73	4/15/73	
Richmond SE	3/24/73	4/6/73	4/15/73
Norfolk NE	3/24/73	4/3/73	4/6/73
	4/15/73		
Eastville 1	4/19/78	3/23/78	11/18/77
Eastville 2	11/18/77	3/23/78	
Eastville 3	4/1/78		

### Field Checking (approximately 6 weeks)

Dates - March 20-23, 1979  
April 9-13, 1979  
June 4-13, 1979  
August 13-17, 1979  
September 10-14, 1979  
December 10-14, 1979

### Collateral Data Used

U.S. Geological Survey Topographic Maps  
U.S.D.A. Soil Conservation Service Soil Surveys  
Virginia Institute of Marine Science Tidal Wetland Surveys  
National Oceanic Survey Nautical Charts  
Gammon, P. and V. Carter. 1979. Vegetation Mapping with Seasonal Color Infrared Photographs. Photogrammetric Eng. and Remote Sensing. Vol. 45(1): 87-97.

### Environmental Atlas of the Potomac Estuary

### Photointerpretation Problems

Photointerpretation of wetlands in Virginia presented a few problems that had to be addressed. These problems and their solutions are discussed below.

1. Determination of the boundary between the Riverine (freshwater) and Estuarine (brackish water) systems. Where salinity information was not available for coastal rivers and streams, the Virginia Institute of Marine Science (VIMS) Tidal Marsh Inventories were used to determine ecological system breaks. When a predominance of fresh water species, such as Jewelweed (Impatiens capensis), was noted, the break was made between the Estuarine and Riverine/Palustrine systems. Where VIMS information was not available, the photo-interpreter looked for non-halophytic woody vegetation encroaching into the marsh as signs of greater freshwater influence.
2. Delineation of Tidal Flats. The photo-flights used were not tide coordinated, so accurate delineation of intertidal flats could not be made directly from the photography. National Oceanic Survey Nautical Charts and U.S.C.S. topographic maps were the prime data sources for determining extent of tidal flats.
3. Dark "wet looking" signatures in upland forests. Many areas that appeared wet on the imagery were found to be upland with a dense understory of American Holly (Ilex opaca). Close attention was paid to the texture of the signature and the topographic position as well as to soil survey information in examining the photography.
4. Dark Photography. Some of the photography was unusually dark making class and subclass determinations difficult. Field checking was intensified in these areas to obtain as much field data as possible to aid interpretation.
5. Flooding. Flooding conditions on some of the photography obscured emergent vegetation. Field checks and use of collateral photography where available were the primary means of resolving this.
6. Identification of Aquatic Beds. Aquatic beds were not visible on the early spring imagery. They were classified as aquatic bed only where field checks or collateral data verified it. Otherwise they were mapped as the "open water" class.
7. Interdunal Wetlands. Identification of many interdunal wetlands was difficult because wax myrtle (Myrica cerifera) is found in both wet and dry situations in the dunes. It was a very dark signature giving the appearance of wetness. Areas with no visible interspersions of sand and with visible ponding were delineated as wetland.
8. Riverine Tidal vs. Riverine Lower and Upper Perennial. Where specific head of tide information was lacking, the break between tidal and non-tidal riverine subsystems was approximated by consulting contours on USCS topographic maps. In limited cases bridge abutments and other features were examined in the field for evidence of tidal flooding.

### Wetland Communities

The Fish and Wildlife Service is preparing a list of wetland plants (i.e. hydrophytes) to help identify wetlands. A tentative regional list is now available for distribution. In the future, the Service plans to develop a list of the Nation's wetland plant communities. At this time, however, such information is not available.

Table 1 represents a list of major wetland plant communities observed during inventory work in eastern Virginia. Map symbols are also given; they reflect dominant vegetative life-form and water regimes (i.e. the degree of flooding and/or soil saturation).

### Hydric Soils

The presence of undrained hydric soil is one of the three major criteria used to define wetlands (Cowardin et al., 1979). The U.S.D.A. Soil Conservation Service is preparing a list of hydric soils to accompany the Fish and Wildlife Service's wetland classification system. Table 2 is a draft list of hydric soils. For specific information regarding hydric soils in Virginia, contact the State Soil Scientist, U.S.D.A. Soil Conservation Service, P.O. Box 10026, Richmond, VA 23240.

Table 1. Examples of wetland plant communities in coastal Virginia.

Note: This list is obviously not comprehensive, but is limited to actual field observations. Scientific plant names generally follow Gray's Manual of Botany (1970).

<u>Map Symbol</u>	<u>Dominance Types</u>	<u>Plant Common Name</u>	<u>Water Regime</u>
E2EM5N	<u>Spartina alterniflora</u> (tall form)	Smooth Cordgrass	Regularly Flooded
E2EM5P	<u>Spartina patens</u>	Marsh Hay	Irregularly Flooded
	<u>Distichlis spicata</u>	Salt Grass	
	<u>Salicornia</u> spp.	Glassworts	
	<u>Juncus roemerianus</u>	Needlerush	
	<u>Spartina alterniflora</u> (short form)	Cordgrass	
	<u>Spartina cynosuroides</u>	Big Cordgrass	
	<u>Scirpus olynei</u>	Three-square	
	<u>Typha angustifolia</u>	Cattail	
	<u>Phragmites australis</u>	Reed	
	<u>Scirpus robustus</u>	Three-square	
E2EM5P6	<u>Typha angustifolia</u>	Cattail	Irregularly Flooded
	<u>Acnida cannabina</u>	Water Hemp	
	<u>Hibiscus moscheutos</u>	Rose Mallow	
E2SS1P	<u>Iva frutescens</u>	Hightide Bush	Irregularly Flooded
	<u>Baccharis halimifolia</u>	Sea Myrtle	
E2SS3P	<u>Myrica cerifera</u>	Wax Myrtle	Irregularly Flooded
E2FO4P	<u>Pinus taeda</u>	Loblolly Pine	
	(with salt marsh grasses as understory)		
PABII	<u>Nuphar variegatum</u>	Yellow Pond Lily	Permanently Flooded
	<u>Nymphaea odorata</u>	White Water Lily	
	Lemnaceae	Duckweeds	
	<u>Brasenia schreberi</u>	Watershield	
PEM2F	<u>Leersia orzoides</u>	Rice Cutgrass	Semi-Permanently Flooded
	<u>Peltandra virginica</u>	Arrow Arum	
	<u>Sparganium</u> sp.	Burreed	
	<u>Hibiscus</u> sp.	Mallow	
PEM5E	<u>Typha latifolia</u>	Cattail	Seasonally Flooded
	<u>Typha angustifolia</u>	Cattail	
	<u>Juncus</u> spp.	Rushes	
	<u>Carex</u> spp.	Sedges	
	<u>Scirpus</u> spp.	Bulrushes	
	<u>Panicum virgatum</u>	Switchgrass	
	<u>Scirpus cyperinus</u>	Woolgrass	
	<u>Leersia orzoides</u>	Rice Cutgrass	

Table 1 (CONTINUED)

<u>Map Symbol</u>	<u>Dominance Types</u>	<u>Plant Common Name</u>	<u>Water Regime</u>
PF15B	<u>Juncus effusus</u>	Soft Rush	Saturated
PF31E	<u>Alnus spp.</u>	Alder	Seasonally Flooded and Saturated
	<u>Cornus spp.</u>	Dogwoods	
	<u>Salix spp.</u>	Willows	
	<u>Rosa palustris</u>	Swamp Rose	
PF31F	<u>Cephalanthus occidentalis</u>	Buttonbush	Semi-Permanently Flooded
PF33C	<u>Myrica cerifera</u>	Wax Myrtle	Seasonally Flooded
PF01E	<u>Acer rubrum</u>	Red Maple	Seasonally Flooded and Saturated
	<u>Nyssa sylvatica</u>	Black Gum	
	<u>Nyssa aquatica</u>	Water Gum	
	<u>Salix nigra</u>	Black Willow	
PF01/4C	<u>Fraxinus pennsylvanica</u>	Ash	Seasonally Flooded
	<u>Pinus taeda</u>	Loblolly Pine	
	<u>Acer rubrum</u>	Red Maple	
PF01B	<u>Liquidambar styraciflua</u>	Sweet Gum	Saturated
	<u>Acer rubrum</u>	Red Maple	
PF01A	<u>Platanus occidentalis</u>	Sycamore	Temporarily Flooded
	<u>Quercus spp.</u>	Oaks	
	<u>Acer rubrum</u>	Red Maple	
	<u>Betula nigra</u>	River Birch	
	<u>Acer negundo</u>	Box Elder	
	<u>Liriodendron tulipifera</u>	Tulip Poplar	
PF02Z	<u>Taxodium distichum</u>	Cypress	Permanently Flooded/Intermittently Exposed
PF04B	<u>Pinus taeda</u>	Loblolly Pine	Saturated
PF05/EM1E	Dead trees w/emergents		Seasonally Flooded and Saturated

Table 2. Preliminary List of Hydric Soils for the State of Virginia.

SOIL SERIES	TAXONOMY	SOIL SERIES	TAXONOMY
Acredale*	<i>Typic Ochraqualfs</i>	Lumbee*	<i>Typic Ochraquults</i>
Albano*	<i>Typic Ochraqualfs</i>	Meggett*	<i>Typic Albaqualfs</i>
Argent*	<i>Typic Ochraqualfs</i>	Melvin*	<i>Typic Fluvaquents</i>
Atkins*	<i>Typic Fluvaquents</i>	Muckalee	<i>Typic Fluvaquents</i>
Axis	<i>Typic Sulfaquents</i>	Myatt*	<i>Typic Ochraquults</i>
Backbay*	<i>Histic Fluvaquents</i>	Nawney	<i>Typic Fluvaquents</i>
Baile*	<i>Typic Ochraquults</i>	Nimmo*	<i>Typic Ochraquults</i>
Bayboro	<i>Umbric Paleaquults</i>	Osier	<i>Typic Psammaquents</i>
Belhaven	<i>Terric Medisaprists</i>	Othello*	<i>Typic Ochraquults</i>
Bethera*	<i>Typic Paleaquults</i>	Pamlico	<i>Terric Medisaprists</i>
Bibb	<i>Typic Fluvaquents</i>	Pamlico, Poned	<i>Terric Medisaprists</i>
Bladen*	<i>Typic Albaquults</i>	Partlow*	<i>Typic Ochraquults</i>
Bladen, Poned	<i>Typic Albaquults</i>	Pasquotank*	<i>Typic Haplaquepts</i>
Blago	<i>Typic Umbraquults</i>	Plummer*	<i>Grossarenic Paleaquults</i>
Bohicket	<i>Typic Sulfaquents</i>	Plummer, Poned	<i>Grossarenic Paleaquults</i>
Chastain	<i>Typic Fluvaquents</i>	Pocaty	<i>Typic Sulfihemists</i>
Chickahominy*	<i>Typic Ochraquults</i>	Pocomoke	<i>Typic Umbraquults</i>
Coxville*	<i>Typic Paleaquults</i>	Pooler	<i>Typic Ochraquults</i>
Croton*	<i>Typic Fragiaquults</i>	Pooler, Poned	<i>Typic Ochraquults</i>
Deloss	<i>Typic Umbraquults</i>	Portsmouth	<i>Typic Umbraquults</i>
Dorovan	<i>Typic Medisaprists</i>	Pouncey*	<i>Typic Albaquults</i>
Duckston	<i>Typic Psammaquents</i>	Pungo	<i>Typic Medisaprists</i>
Dunning	<i>Fluvaquentic</i>	Purdy*	<i>Typic Ochraquults</i>
	<i>Haplaquolls</i>	Rains*	<i>Typic Paleaquults</i>
Elbert*	<i>Typic Ochraqualfs</i>	Rappahannock	<i>Terric Sulfihemists</i>
Elkton*	<i>Typic Ochraquults</i>	Roanoke*	<i>Typic Ochraquults</i>
Fallsington*	<i>Typic Ochraquults</i>	Roanoke, Poned	<i>Typic Ochraquults</i>
Forestdale*	<i>Typic Ochraqualfs</i>	Robertsville*	<i>Typic Fragiaquults</i>
Hatboro	<i>Typic Fluvaquents</i>	Toddstav*	<i>Typic Ochraquults</i>
Hyde	<i>Typic Umbraquults</i>	Tomotley*	<i>Typic Ochraquults</i>
Johnston	<i>Cumlic Humaquepts</i>	Torhunta	<i>Typic Ochraquults</i>
Kinkora*	<i>Typic Ochraquults</i>	Toxaway	<i>Cumlic Humaquepts</i>
Kinston	<i>Typic Fluvaquents</i>	Weeksville	<i>Typic Humaquepts</i>
Leaf*	<i>Typic Hydraquents</i>	Wehadkee	<i>Typic Fluvaquents</i>
Levy	<i>Typic Hydraquents</i>	Weston*	<i>Typic Ochraquults</i>
Lickdale*	<i>Humic Haplaquepts</i>	Worsham*	<i>Typic Ochraquults</i>

\* Requires site evaluation to determine whether soil is wetland.

Literature Cited

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