

# **SOME USES OF NATIONAL WETLANDS INVENTORY MAPS AND DIGITAL MAP DATA IN THE NORTHEAST**

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December 1996



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## ACKNOWLEDGMENTS

The following individuals provided information used in this report:

Gail Baker (Canaan Valley NWR), Steve Breeser (Lake Umbagog NWR), Dave Edelstein (LIFO), Mickey Hayden (DBEP), Cherry Keller (CBFO), William Koch (Great Swamp NWR), Charlie Kulp (PAFO), Tony Leger (RO), Wende Mahaney (MEFO), Karen Mayne (VAFO), Kevin Moody (NYFO), Sherry Morgan (NYFO), Dave Putnam (PAFO), Erica Richline (EPFO), Eric Schrading (NJFO), Greg Sepik (Moosehorn NWR), John Stasko (Back Bay NWR), Paul Steblein (RO), Don Tiller (Iroquois NWR), Ralph Tiner (RO), Bill Tolin (WVFO), Chris Victoria (CBFO), Lois Winter (GOMP), Bob Zepp (CBFO).

Pam Dansereau (RO) coordinated this effort and is primarily responsible for assembling its contents. Karen Gallant and Paula Botch (RO) prepared the final report.

We also wish to thank all the agencies that provided financial support for making NWI maps, digital data, and other wetland data (especially wetland trends data) available to the public.

## INTRODUCTION

This brief report was compiled from information provided by Ecological Services Field Offices (including Estuary Project Offices), individual National Wildlife Refuges, and the Region 5 Office of the U.S. Fish and Wildlife Service. It contains a listing of the types of uses of National Wetlands Inventory (NWI) maps and digital map data in the Northeast. While focusing on Service uses, the list also includes some references to uses by other agencies that may be of particular interest. The list should not, however, be considered an exhaustive compilation of such uses as no attempt was made to survey all users of NWI data. To attempt to undertake such a survey would be a monumental undertaking. In fact, now that NWI digital data are available through the Internet (accessed using URL - <http://www.nwi.fws.gov>), it is not possible to identify all potential users.<sup>1</sup> This summary should provide some insight into the varied applications that are possible. If users would like to submit additional information on their applications, we would be happy to add them to the list. If you are interested in providing such information, please forward a brief summary to the National Wetlands Inventory Project, Attention: Ralph Tiner at U.S. Fish and Wildlife Service, 300 Westgate Center Drive, Hadley, Massachusetts 01035-9589 (cc:mail = [Ralph\\_Tiner@mail.fws.gov](mailto:Ralph_Tiner@mail.fws.gov)). This report also lists cooperating agencies who have provided funds to produce NWI maps and digital NWI map data.

Appendix A presents a list of other NWI digital data users. Appendix B provides copies of some letters from Service personnel expressing the value of digital data.

## USES OF NWI MAPS

Many Service offices still lack GIS technology and, therefore, rely on hard-copy NWI maps. The following is an annotated listing of NWI map uses by Service field stations responding to a November 1995 request for information on this topic. Besides the typical use of NWI maps in reviewing federal projects and applications for federal permits (Clean Water Act and Rivers and Harbors Act), there are many other uses. Some of the other map uses include refuge planning (including land acquisition), comprehensive resource management planning, environmental impact statements, facility and corridor siting, oil spill contingency planning, potential wetland restoration site identification, natural resource inventories, wildlife surveys, assessment of damaged resources from Superfund sites, and land appraisals. For wetland restoration, NWI maps identify many wetlands that are impacted by human activities such as ditching and impoundment, while some maps even identify Phragmites-dominated coastal wetlands that may be suitable for tidal flow restoration. These wetlands may have potential for wetland restoration. Some field offices noted that the public frequently visits their offices to consult and/or make copies of NWI maps. This gives the Service an

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<sup>1</sup>Between July 28, 1994 and October 1995, more than 103,000 NWI maps (nationwide) were accessed via the NWI World Wide Web server. This saved users almost \$1 million.

opportunity to make the public aware of its concerns re: fish and wildlife habitat before permit applications are filed. The Service's refuge program has found NWI maps to be particularly valuable for land acquisition and appraisal for expanding refuge lands and for assessing value of existing Service lands for payments in lieu of taxes.

### *Ecological Services' Use of NWI Maps*

#### NEW YORK:

- NWI maps are routinely used by ES personnel for reviewing Section 10 and Section 404 federal permit applications.
- The New York Field Office estimates that they consult NWI maps about 40 times per week for a host of projects ranging from federal wetland permit reviews to other project reviews (e.g., FERC, Farm Bill, and NRDA).
- The New York Field Office directs permit applicants to review NWI maps when planning various projects.
- The Long Island Field Office used NWI maps to locate potential wetland restoration sites (presumably looking for Phragmites-dominated tidal or formerly tidal wetlands on NWI maps) and for identifying wetland habitats for special projects.

#### NEW JERSEY:

- The New Jersey Field Office uses NWI maps for Section 10 and Section 404 federal permit reviews and for related enforcement activities.
- They also use them to review New Jersey Land Use Regulation wetland permit applications.
- NWI maps are used for Section 7 consultations to identify potential suitable endangered species habitat.

#### PENNSYLVANIA:

- The Eastern Pennsylvania Field Office uses NWI maps for Clean Water Act permit reviews and for enforcement actions.

#### MARYLAND/DELAWARE:

- The Chesapeake Bay Field Office uses NWI maps "on a daily basis" for permit and project reviews.
- They note that the public frequently visits their office to review NWI maps when considering projects, developments, road construction, etc.

- They also use NWI maps for special projects.

#### VIRGINIA:

- The Virginia Field Office uses NWI maps "all the time" for permit and project reviews.
- They also note that the public constantly comes into their office to view and make copies of NWI maps for specific project areas.

#### *Refuges' Use of NWI Maps / Specific Uses*

- Back Bay NWR uses NWI maps for land acquisition, planning, analysis of proposed development impacts, and resolution of interagency conflicts.
- Bombay Hook NWR used NWI maps for identifying wetlands for installing wood duck boxes.
- Canaan Valley NWR uses NWI maps for land acquisition.
- Chincoteague NWR uses NWI maps for habitat protection planning on Virginia's Eastern Shore, land acquisition, and for wetland restoration planning.
- Great Swamp NWR uses NWI maps for environmental assessment, planning, GIS applications, and wildlife biology research.
- Iroquois NWR uses NWI maps for refuge cootyping, wildlife studies (grassland, birds, aquatic food areas, and black tern), and wetland restoration planning.
- Lake Umbagog NWR uses NWI maps to assist towns with planning and for refuge land acquisition and habitat mapping.
- Ohio River Islands NWR uses NWI maps for identification of critical habitats for food acquisition and review of permit applications.
- Rachel Carson NWR uses NWI maps for locating reference points for marsh restoration projects and for habitat/survey route planning.
- Silvio O. Conte NFWR uses NWI maps for site assessment/planning and for EIS preparation.
- Sunkhaze NWR uses NWI maps for environmental assessments, planning, and land acquisition.
- Wallkill NWR uses NWI maps for refuge planning and acquisition.

## USES OF NWI DIGITAL DATA

The following is an annotated listing of uses of NWI digital data in the Northeast. Uses are arranged by state. Several field offices have not yet used NWI digital data for various reasons including lack of equipment, lack of GIS training, lack of digital data in their geographic area, and lack of knowledge of various applications for such data. Among the offices in this category are: Maine, New York, Pennsylvania, Southwestern Virginia, Virginia, and West Virginia. These offices are, for the most part, making good use of conventional NWI maps.

### *Ecological Services' and Other Agency Use of NWI Digital Data*

#### CONNECTICUT:

- Consulting firms use NWI data to complete their radius map reports for environmental assessments.

#### DELAWARE:

- Digital NWI data are being used by Service biologists to model wetland-dependent vertebrates for the Gap Analysis Project in Delaware.
- Digital NWI data were used in the development of species distribution maps for fish and wetland-dependent species for the Delaware Bay Estuary Project's (DBEP) Significant Habitats Project. These maps and datasets are currently being used in oil spill response programs and in planning and permit activities by the Corps of Engineers.
- Digital NWI data were used by the DBEP to create a map showing seasonally flooded and seasonally saturated wetlands that would be subject to reduced protection or no protection under the Clean Water Act Reauthorization Bill (H.R. 961). This map was provided to DOI Secretary Babbitt to use as a reference in discussions concerning this proposed legislation.
- The DBEP used digital NWI data to create a map showing the distribution of wetlands in the Delaware Bay watershed, for publication in the Comprehensive Conservation and Management Plan for the Delaware Estuary Program.
- The DBEP is currently using digital NWI data to identify wetland inclusions within more general land cover types, as part of a GIS analysis of habitat changes in the Blackbird Creek National Estuarine Research Reserve.
- The DBEP has processed digital NWI data by joining the digital quads and grouping wetlands using a simplified classification scheme based on the system, subsystem, and class. This has helped make them easier to use and display, while still maintaining the original NWI wetland codes. The DBEP has responded to many requests from

universities, state agencies, other federal agencies, and private organizations for the processed digital NWI data. In fact, the University of Delaware has requested the Estuary Program's processed NWI data for inclusion on their World Wide Web server.

- The Regional Office used NWI digital data to compile wetland and deepwater habitat statistics for inclusion in a FWS state wetland report entitled, "Wetlands of Delaware" which was published in 1985. Statistics were generated on a county basis.
- The Regional Office used NWI digital data to prepare a map and report on the distribution of common reed (Phragmites australis) in Delaware for the State Division of Fish and Wildlife. The information is being used to develop a statewide Phragmites management (control) plan.

#### MAINE:

- NWI digital data are used in ongoing work with the U.S. Coast Guard to incorporate important fish and wildlife habitat issues in Oil Spill Response Plans for coastal Maine. NWI digital data have been submitted to the group to ensure that wetland considerations are fully addressed in the Response Plans.
- NWI digital data are a key component in the Gulf of Maine Estuary Project's (GOMP) ability to identify/protect high value wildlife habitats in the Merrymeeting Bay/Lower Kennebec Focus Area. The specific report catalyzed a series of local, state, and federal habitat protection initiatives that have already led to the protection of nearly 700 acres of high value habitat.
- NWI digital data were used by the GOMP in the identification of high value fish and wildlife habitats in the lower 15 towns of the Casco Bay watershed. Information is being used to prioritize high value areas that merit protection and stimulate local action in protecting important sites.
- Digital data are being used by the GOMP for the Casco Bay/Sheepscot Bay Habitat Modeling Study. This report will identify and map critical fish and wildlife habitat and highlight current and potential threats to important marine habitats.
- NWI digital data have been used by the GOMP to identify high value coastal Maine nesting islands. This habitat protection effort has identified over 250 federally significant nesting islands. NWI data will aid in the attempt to strengthen public support for habitat protection and increase the likelihood of success in habitat protection grant applications.
- Digital data were used by the GOMP to identify high value wildlife habitats in Cobscook Bay. This internationally valuable watershed is the focus of a broad-based study being conducted by a host of researchers. NWI data are being used to identify important freshwater and intertidal wetlands; it will also provide important baseline information and will be used for monitoring change over time.

- Lee Island Coastal Wetland Grant -- NWI digital data provided critical and readily available information that was crucial to completing GOMP's grant application and receipt of funding to acquire and protect this valuable 117-acre island in 1995.
- Hog Island Coastal Wetland Grant -- NWI digital data provided critical and readily available information that was crucial to completing GOMP's grant application to protect this valuable 30-acre island surrounded by 160 acres of intertidal wetlands. Hog Island was the Region's top priority for acquisition funding in 1996.
- The GOMP has produced a computer-generated colored map of the wetlands of Machias Bay for resource planning and public information.
- Salt Bay Farm wetland restoration -- located next to the Damariscotta River estuary, this 9-acre site is being restored. NWI digital data were helpful in identifying, mapping, and planning the restoration.
- NWI digital data are being used by the GOMP to develop landcover classification maps, including wetland features, in the seven Maine rivers that harbor native populations of Atlantic salmon.
- The National Park Service (NPS) used NWI digital data to compile acreage statistics for wetlands and deepwater habitats for Acadia National Park. The data, plus NWI maps, served as the foundation for a NPS report entitled, "The Wetlands of Acadia National Park and Vicinity" which was published in 1994.
- The Maine Land Use Regulation Commission is using NWI digital data to produce wetland guidance maps that are used to help identify regulated wetlands in the state's unorganized townships.
- The State of Maine is using NWI digital data to aid in developing a resource management strategy for Northern Forest Lands; they have contributed substantial funds to digitize existing NWI maps.

#### MARYLAND:

- Digital NWI data are being used by Service biologists to model wetland-dependent vertebrates for the Gap Analysis Project in Maryland.
- Digital NWI data were used by the Chesapeake Bay Field Office (CBFO) to develop a GIS database for both the Choptank and Chester River Basins in order to execute an examination of watershed land usage and water quality impacts.
- NWI digital data were added to an existing GIS database of forest cover and bird survey information for Prince George's County by the CBFO, enabling field staff to quantify the relationship between forest area, forest interior birds, and the percent of the forest tract that is forested wetland.

- NWI digital data were used by the CBFO in the creation of a frequency distribution of the sizes of palustrine forested wetlands in Maryland, enabling the field staff to evaluate a community model for forested wetlands, and to assess implications for proposed changes in policy in the regulations of wetlands.
- The FWS used NWI digital data to aid in analyzing wetland trends in selected areas within the state as part of a larger study of Chesapeake Bay watershed wetland trends. The results of this effort are being used by federal and state agencies to improve wetland conservation and management in the state and watershed.
- The U.S. Geological Survey used NWI digital data to perform a comparison of the effectiveness of different sources of remote sensing for mapping wetlands on the Wango quadrangle on the Lower Eastern Shore.
- The CBFO used NWI digital data to compile acreage statistics on wetlands and deepwater habitats for evaluating the potential effect of proposed state wetland regulations on each county. The state subsequently passed the Nontidal Wetlands Protection Act; availability of NWI wetland acreage statistics facilitated communication to Maryland residents about the scope and effect of the proposed law.
- Statewide NWI digital data were used to compile wetland and deepwater habitat acreage statistics for inclusion in the FWS's state wetlands report entitled, "Wetlands of Maryland" which was published in 1995. Data were generated for counties, physiographic regions, and major watersheds (U.S. Geological Survey hydrologic units). Digital database was also used by the FWS to aid in preparing a state wetland map published in 1994.

#### MASSACHUSETTS:

- NWI digital data are used in ongoing work with the U.S. Coast Guard to incorporate important fish and wildlife habitat issues in Oil Spill Response Plans for coastal Massachusetts. NWI digital data has been submitted to the group to ensure that wetland considerations are fully addressed in the Response Plans.
- The Trustees for the Natural Resources Damage Settlement of the Charles George Landfill are using NWI digital data in combination with hydric soil digital data to identify potential sites for wetland restoration in the Town of Tyngsboro. This work (being accomplished by the New England Field Office and Massachusetts Executive Office of Environmental Affairs) was initiated in response to a recent Natural Resources Damages Settlement involving the Charles George Landfill site.
- NWI digital data for the Neponset watershed is being used by the U.S. Army Corps of Engineers and the State of Massachusetts to identify the extent of wetlands in the watershed, to identify potential wetland restoration sites, and to contribute to preparation of a wetland restoration plan for the watershed.

- The State of Massachusetts' Wetlands Restoration and Banking Program plans to use NWI digital data to develop watershed-based wetland restoration plans. The NWI digital data will serve as the basis for identifying existing wetlands, reporting the current wetland acreage, and for identifying and aiding in evaluation of potential wetland restoration sites.
- The National Biological Service has funded digitization of NWI maps in the Connecticut River watershed (Connecticut, Massachusetts, New Hampshire, and Vermont). Targeted uses of these data include wetland restoration planning in the watershed and planning for the Conte National Fish and Wildlife Refuge System.
- NWI digital data were used to help identify and display degraded tidal wetlands for the North Shore. An atlas of tidally restricted marshes has been prepared by the State's Wetlands Restoration and Banking Program with technical support for the Natural Resources Assessment Group at the University of Massachusetts and from the U.S. Fish and Wildlife Service's NWI Program.

#### NEW HAMPSHIRE:

- NWI digital data are used in ongoing work with the U.S. Coast Guard to incorporate important fish and wildlife habitat issues in Oil Spill Response Plans for coastal New Hampshire. NWI digital data has been submitted to the group to ensure that wetland considerations are fully addressed in the Response Plans.
- NWI digital data were used by the GOMP to identify high value fish and wildlife habitats in Great Bay. This study is just beginning and will be used to prioritize high value areas that merit protection and catalyze local action to protect important sites.

#### NEW JERSEY:

- Digital wetland data were used by the New Jersey Field Office to determine the feasibility of using a desktop geographic information system to support Section 7 Consultations in New Jersey.
- Digital NWI data are being used by Service biologists to model wetland-dependent vertebrates for the Gap Analysis Project in New Jersey.
- The FWS used NWI digital data to analyze wetland trends in the Absecon Creek watershed in Atlantic County.
- The FWS used NWI digital data to produce wetland and deepwater habitats for the FWS's state wetlands report entitled, "Wetlands of New Jersey" which was published in 1985.
- The FWS used NWI digital data to analyze wetland trends in Cape May County. A report has been published. The U.S. Environmental Protection Agency (EPA) is using

this information for resource planning in Delaware Bay.

#### NEW YORK:

- The New York City Department of Environmental Protection is using NWI digital data to identify wetlands for evaluating various regulation scenarios under consideration for protecting water supplies in their major watersheds. These data have also been used to compile statistics on wetland and deepwater habitat acreages in each watershed for inclusion in a public information booklet on wetlands of New York City's watersheds. Computer-generated maps showing the location of these resources were included in the report.
- The Adirondack Park Agency is using NWI digital data for resource planning and management and as an aid in administering state wetland protection regulations.
- The Saratoga National Park is planning to use NWI digital data for natural resource management purposes in the Park. The data will also be used to generate a map of the Park's wetlands and deepwater habitats for information and education.
- U.S. EPA Region II is using NWI digital data for natural resource planning and assessment in particular for Superfund site work.
- NWI digital data will be used to assist in conducting a wetlands trends analysis of the Peconic Bay watershed in eastern Long Island. These data will be used by federal and state natural resource agencies to develop a watershed strategy for improving wetland protection.
- NWI digital data are being generated for the Lake Champlain watershed for resource planning by the New York Department of Environmental Conservation. These data will be incorporated in the Lake Champlain Basin Program's GIS database.

#### PENNSYLVANIA:

- NWI data were used for a transportation planning project by the Department of Transportation.
- The FWS used NWI digital data to aid in analyzing wetland trends in selected areas within the Susquehanna River drainage as part of a larger study of Chesapeake Bay watershed wetland trends. The results of this effort are being used by federal and state agencies to improve wetland conservation and management in the state and watershed.

#### VERMONT:

- The State of Vermont has used NWI digital data as well as hard-copy NWI maps to identify environmentally sensitive areas for statewide planning and resource

management. NWI maps are used to identify "class two wetlands" (wetlands so significant that they merit protection under Vermont Wetland Rules) for the state wetland regulatory program. NWI wetlands and any unmapped wetlands contiguous to them as given this special status for protection.

#### VIRGINIA:

- The FWS used NWI digital data to aid in analyzing wetland trends in selected areas within the state as part of a larger study of Chesapeake Bay watershed wetland trends. The results of this effort are being used by federal and state agencies to improve wetland conservation and management in the state and watershed.
- The State of Virginia used NWI digital data to prepare a report on wetlands of Virginia published by the Division of Soil and Water Conservation. The report did not cover the entire state, but focused on areas where NWI digital data and maps were available.
- The CBFO is using NWI digital data, plus other digital data (land use/land cover), to evaluate wetland and land cover trends in the Chickahominy watershed in the greater Richmond area. Besides analyzing trends, the data will be used to assess how changes in various land cover types are affecting bird populations.

#### WEST VIRGINIA:

- The State of West Virginia will be using NWI digital data to aid in resource management and conservation.
- The FWS used NWI digital data to prepare summary reports (technical and nontechnical) on West Virginia's wetlands. Data were presented on a county- and watershed- (U.S. Geological Survey hydrologic unit) basis. A computer-generated map of the state's wetlands was also produced for inclusion in these reports.

#### *Refuge Use of NWI Digital Data*

There are more than 50 refuge units in Region 5. The Region's GIS Lab/Realty Mapping Program has been digitizing the refuge boundaries and packaging the new information with existing geographic data for use by refuge managers and Regional program staff. NWI is one of the highest priority data layers.

Wetland cover information has been used in a number of applications by Refuges and Wildlife staff, as follows:

1. Land currently owned by the FWS is periodically appraised by Realty staff for calculating value for revenue sharing to local governments. Part of the appraisal calculations is based on covertype. NWI data is used to calculate the acreage of land owned that is wetland type (see letter in Appendix B).

2. NWI data are used in two facets of land acquisition for the National Wildlife Refuge System. First, tracts of land under consideration for purchase are ranked higher if a significant portion of the parcel is wetland. Second, an appraisal of the parcel also considers the acres of wetland.
3. Covertypes maps (upland and wetland) are being developed for all refuges. Where NWI maps and digital data are available, the wetland information is used as an aid in photointerpretation to develop a current detailed vegetation map, and to monitor vegetation changes.
4. If a current/comprehensive covertypes map is not available for a refuge, NWI maps/data are used in developing and implementing management plans for a refuge. This varies between refuges, but applications include wetland restorations, wildlife inventory, public use, and facilities management.
5. The following refuges have used NWI digital data for varied GIS applications:
  - Moosehorn NWR (covertyping)
  - Petit Manan NWR (covertyping)
  - Iroquois NWR (refuge covertyping, wildlife studies, and wetland restoration planning)
  - Rachel Carson NWR (marsh restoration planning)
  - Chincoteague NWR (habitat protection planning for Eastern Shore, land acquisition, and wetland restoration planning)
  - Great Bay NWR (New Hampshire Watershed Project and modeling critical wildlife habitat)

(NOTE: This is not an exhaustive list of Refuge use on NWI digital data in the Region; it is simply a list of stations reporting on the use of such data.)

## NWI MAP AND DIGITAL DATA COOPERATORS

Many agencies have provided funds to support the production of NWI maps, digital data, and various wetland reports for the Northeast. A list of cooperators follows:

### Federal Agencies

- U.S.D.A. Natural Resources Conservation Service (Maine Office) - maps and local report
- U.S. Environmental Protection Agency, Region I - maps, local wetland trends study, and state report (Rhode Island)
- U.S. EPA, Region II - maps, digital data, local trends studies, and local report
- U.S. EPA, Region III - maps, digital data, and regional/local wetland trends studies
- U.S. Army Corps of Engineers, New England Division - local wetland trends study
- U.S. Army Corps of Engineers, New York District - maps
- U.S. Army Corps of Engineers, Philadelphia District - maps
- National Park Service, North Atlantic Region - maps, digital data, and local reports
- Federal Aviation Administration (Atlantic City Technical Center) - maps, digital data, local wetland trends study, and local report
- U.S. Army - maps, digital data, and local reports
- U.S. Navy - maps and digital data
- U.S. Air Force - maps and digital data
- U.S. Geological Survey, Biological Resources Division - digital data

### State Agencies

- Maine Dept. of Conservation, Land Use Regulation Commission - maps and digital data
- Maine Geological Survey - maps
- Maine Office of GIS - digital data
- Vermont Dept. of the Environment - maps
- Connecticut Dept. of Environmental Protection - maps and state report
- New York Dept. of Environmental Conservation - maps, digital data, and local report
- Adirondack Park Agency - maps and digital data
- New Jersey Dept. of Environmental Protection - digital data
- Pennsylvania Dept. of Environmental Resources, Coastal Zone Program - maps, digital data, local wetland trends study, and wetland monitoring project
- Pennsylvania Dept. of Environmental Resources, Division of Rivers and Wetlands Conservation - statewide report
- Maryland Dept. of Natural Resources, Tidewater Administration and Water Resources Administration - maps, digital data, local trends studies, and state wetland report
- Delaware Dept. of Natural Resources and Environmental Control - maps, digital data, and state report
- Virginia Council on the Environment - maps and digital data
- Virginia Dept. of Conservation and Restoration, Division of Soil and Water Conservation - maps and digital data
- West Virginia Division of Natural Resources, Wildlife Resources Section - digital data and state report

## Other Agencies and Organizations

- New York City Department of Environmental Protection - maps, digital data, and local report
- New England Interstate Water Pollution Control Commission - maps, digital data, and local report



## APPENDIX A

List of NWI Digital Data Customers as of September 1994  
(Does not include individuals/organizations who access such data through Internet)



Users who have received NWI digital data on tape in Region 5:

Gene D. McDonough  
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Clayton NJ 08312

Dave Lounsbury  
NYC Dept. of Environmental Protection  
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Shokan NY 12481

U.S. Fish & Wildlife Service  
P.O. Box 544  
70 Collingstown Road  
Barnegat NJ 08005

Paul Domino  
Parsons Brinckerhoff Quade Douglas  
One Penn Plaza  
New York NY 10119

Barbara Dibeler  
NYC Dept. of Environmental Protection  
Ben Nesin Lab  
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Pennsylvania Electric Co.  
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Johnstown PA 15907

William Hansen  
Hunter College, Dept. of Geography  
Remote Sensing & Spatial Analysis Lab  
695 Park Avenue  
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Harrisburg PA 17107-8551

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1770 Lincoln Hwy East  
Lancaster PA 17602

Dennis Lewis  
Law Environmental Inc.  
750 E. Park Drive, Suite 200  
Harrisburg PA 17111

Paul Hayes  
York Co. Planning Commission  
100 W Market Street  
York PA 17401

Meg Wilkinson  
Lancaster County Planning Commission  
50 N Duke Street  
P.O. Box 3480  
Lancaster PA 17603-1881

Pamela Siminitz  
Roy F. Weston, Inc.  
EMIS, Bldg. 4-2  
Westchester PA 19380

Elizabeth Pecora  
Enviroscience, Inc.  
155 Stoney Run Road  
Dillsburg PA 17019

Donald R. Williams  
U.S.G.S.  
WRD  
1000 Liberty Avenue, Rm 2204  
Pittsburgh PA 15222

Barry J. Schoch  
KCI Technologies, Inc.  
3220 Tillman Drive, Ste 215  
Bensalem PA 19020-2083

Penn State University  
Dept of Agronomy (RLD1)  
116 ASI Blvd  
University Park PA 16802

Gloria A. Masterson  
Geo Decisions Inc.  
118 Boalsburg Road  
Lemont PA 16851

Aura Stauffer  
Gannet Flemming  
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Room GE-310  
Camp Hill PA 17011

Mark Sither  
USA Topo. Engrg. Center  
ATTN: CETEC-GL  
Telegraph & Leaf Roads  
CUDE Bldg. #2592  
Fort Belvoir VA 22060-5546

Jonathan Berger  
Expert Info Systems, Inc.  
1622 Locust Street  
Philadelphia PA 19103

Paul Kopsick  
Ecology and Environmental, Inc.  
1700 North Moore Street, Suite 1105  
Arlington VA 22209

Arthur Spingarn  
EPA - Region III  
841 Chesnut Building  
Philadelphia PA 19107

Roger Jenkins  
S.A.I.C.  
Mail Stop 2-2-2  
1710 Goodridge Drive  
McLean VA 22102

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RISC  
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21 South 5th Street  
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LMSC C3I Systems Division  
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Fairfax VA 22033-3321

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9201 Forest Hill Avenue  
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J. Michael Flagg  
Virginia Dept. of Conserv. & Recreation  
Div. of Soil & Water Conservation  
203 Governor Street  
Suite 206  
Richmond VA 23219-2094

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Reclamation Technology  
5926 Ambassador Way  
Alexandria VA 22310

Ecomaps Program  
Dept of Environmental Quality  
202 North 9th Street  
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Kearneysville WV 25430

Charlie Yuill  
West Virginia University  
1138 Ag-Science Bldg.  
Morgantown WV 26506-6108



## **APPENDIX B**

Letters Expressing the Value of NWI Digital Data  
to Some Service Programs





# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
300 Westgate Center Drive  
Hadley, Massachusetts 01035-9589

In Reply Refer To:  
FWS/R-5/RE

MAR 13 1996

Memorandum

To: Regional Wetland Coordinator (N/ES)

From: Realty Officer

Subject: National Wetlands Inventory Information and Assistance as a Critical Component of Land Protection in Region 5

National Wetlands Inventory is a very important resource for Realty. NWI has successfully assisted our organization, and will continue to be of great use to us. We utilize the wetlands data in various manners. Realty appraisers require wetland data and acreages when appraising tracts to be purchased, or incorporated into the National Wildlife Refuge System. NWI data continue to assist us in our revenue sharing process. Merging wetland data to our existing refuge boundaries, using Geographic Information System technology, enables us to generate more accurate acreages for wetlands and uplands for an entire refuge. This aids us in determining land value for various types of land uses within refuge boundaries. This method has helped us avoid land value conflicts with taxing authorities and makes our reports much more credible. In several instances, the ability to show wetland losses over a period of time in a given area has assisted us in the acquisition of property for the protection and preservation of wildlife habitat.

The Land Acquisition Planning section has utilized NWI on a variety of projects. They have provided wetland delineations on aerial photos, as well as wetland inventory maps and information. The LAP team regularly utilized the NWI publications and library. The reports generated by NWI have provided Realty with important information on wetland losses in specific areas. This information, together with periodic updates, helps our staff make informed decisions regarding the need to protect specific properties. This ensures that limited funds are allocated to areas with the highest possible resource values, that are most threatened with loss in the future.

*Cynthia D. Leger*

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October 13, 1995

To: Glenn Smith, Assistant NWI Coordinator

From: Lois Winter, Outreach Specialist, Gulf of Maine Coastal Ecosystems Program

Subject: Use of NWI Digital Data

This memo is in response to your request for information on how we use NWI data.

The Gulf of Maine Coastal Ecosystems Program focuses on protecting economically, recreationally and ecologically important coastal resources throughout the Gulf of Maine watershed. We compile and share biological data, including NWI data, with many organizations. Using existing NWI data, along with other scientific data, biological expertise and computer mapping and database management capabilities, we analyze data and identify important fish and wildlife habitat. In addition, we offer technical assistance and direct interested organizations -- including local land trusts -- to funding opportunities that promote fish and wildlife habitat protection. In the past two years, our office has played a key role in identifying and protecting more than 1,000 acres of high value fish and wildlife habitat and leveraging over \$3 million worth of habitat protection funding.

NWI data is a key component of all our analyses that identify high value fish and wildlife habitat throughout the Gulf of Maine coastal regions of Massachusetts, New Hampshire and Maine. Top priority projects that our office is engaged in have not only benefited, but have required access to NWI data. Those projects are listed below:

1) Identification/Protection of High Value Wildlife Habitats in Merrymeeting Bay/Lower Kennebec Focus Area: This report catalyzed a series of local, state and federal habitat protection initiatives that have already led to the protection of nearly 700 acres of high value habitat. An additional 700 acres are likely to be protected through a North American Waterfowl Management Plan grant. NWI provided critical data in identifying valuable waterfowl habitat in this study.

2) NWI Trends Analysis have been completed for four regions in MA, NH and ME. The Trends Analysis have been distributed widely and identify the current status of wetlands, highlight changes over a ten-year time period, point out areas where existing regulations were not followed, and identify potential areas for wetland restoration. The dynamic nature of wetland systems demands that NWI continue to be updated in order to provide timely and dependable information. Moreover, the trends analysis requires that data be gathered over a

consistent and comparable time period.

- 3) Identification of High Value Fish and Wildlife Habitats in Casco Bay, Maine: This study is identifying high value wildlife habitats in the lower 15 towns of the Casco Bay watershed. Information is being used to prioritize high value areas that merit protection and catalyze local action to protect important sites.
- 4) Casco Bay/Sheepscot Bay Habitat Modeling Study: This report will identify and map critical fish and wildlife habitat and highlight current and potential threats to important marine habitats.
- 5) Identification of High Value Fish and Wildlife Habitats in Great Bay, New Hampshire: This study is just beginning, and will be identifying high value wildlife habitats. Information will be used to prioritize high value areas that merit protection and catalyze local action to protect important sites.
- 6) Identification of High Value Coastal Maine Nesting Islands: This habitat protection effort has identified over 250 federally significant nesting islands. NWI data is now being incorporated into our analysis in order to identify freshwater and saltwater wetlands of value to wildlife. NWI data will provide supporting data to strengthen public support for habitat protection and to increase the likelihood of success in our habitat protection grant applications.
- 7) Lee Island Coastal Wetland Grant: NWI data provided critical and readily available information that was crucial in completing our grant application and receiving funding to acquire and protect this valuable 117 acre island in 1995.
- 8) Hog Island Coastal Wetland Grant: NWI data provided critical and readily available information that was crucial in completing our grant application to protect this valuable 30 acre island surrounded by 160 acres of intertidal wetlands. Currently, Hog Island is the Region's top priority for acquisition funding in 1996.
- 9) Salt Bay Farm wetland restoration: Located next to the Damariscotta River estuary, this nine acre site is being restored. NWI data was helpful in identifying, mapping and planning the restoration.
- 10) Identification of high value wildlife habitats in Cobscook Bay, Maine: This internationally valuable watershed is the focus of a broad-based study being conducted by a host of researchers. We are using NWI data, along with Landsat satellite imagery, to identify important freshwater and intertidal wetlands. This data will provide important information in identifying and protecting important habitats. It will also provide important baseline information and will be used for monitoring change over time.
- 11) NWI data, along with Landsat satellite imagery, is being used to develop a landcover classification maps, including wetland features, in the seven rivers in Maine that harbor native populations of Atlantic salmon. Identifying current landcover types is a first step in

identifying threats and recommending habitat protection measures.

12) Oil Spill Response Plans: We work with other USFWS offices and the U.S. Coast Guard to incorporate important fish and wildlife habitat issues in Oil Response Plans for coastal Massachusetts, New Hampshire and Maine. We have submitted NWI data to the group to ensure that wetland considerations are fully addressed in the Response Plans.

In short, access to timely NWI data is an integral part of all of our work. NWI field work and digitizing dramatically enhance our efficiency and our ability to identify and protect high value wildlife habitat throughout the Gulf of Maine coastal region.

Lois Winter

✓

**U. S. Department of the Interior**  
**FISH AND WILDLIFE SERVICE**

Delaware Bay Estuary Project  
2610 Whitehall Neck Road  
Smyrna, DE 19977  
302-653-9152

October 11, 1995

TO: Glenn Smith, Assistant NWI Coordinator

FROM: Mickey Hayden, Delaware Bay Estuary Project

SUBJECT: Use of NWI Digital Data

The Delaware Bay Estuary Project has used NWI digital data in a variety of projects. The following are some of the applications that relied heavily on NWI digital data.

- We use digital NWI data in developing species distribution maps for fish and wetlands-dependent species for our Significant Habitats Project. Using a description of habitat requirements and life history, we are essentially modelling the habitat using NWI where possible, then having the resulting maps reviewed by resource experts. These maps and datasets are currently being used in oil spill response programs and in planning and permit activities by the Corps of Engineers.
- Digital NWI data is being used, where appropriate, to model wetlands-dependent vertebrates for the Gap Analysis Project for Maryland, Delaware and New Jersey. The procedure is very similar to that described above.
- DBEP provided processed NWI data to the New Jersey Field Office as part of a pilot project to determine the feasibility of using a desktop geographic information system to support Section 7 Consultations.
- Used digital NWI to create a map showing seasonally flooded and seasonally saturated wetlands that would be subject to reduced protection or no protection under H.R. 961. This map was provided to DOI Secretary Babbitt to use as a reference in discussions concerning this proposed legislation.
- Used digital NWI to create a map showing the distribution of wetlands in the Delaware Bay watershed, for publication in the Comprehensive Conservation and Management Plan for the Delaware Estuary Program.
- Currently using digital NWI to identify wetland inclusions within more general land cover types, as part of a GIS analysis of habitat changes in the Blackbird Creek National Estuarine Research Reserve.

- We processed the digital NWI data by joining the digital quads and grouping wetlands using a simplified classification scheme based on the system, subsystem and class. This has helped make them easier to use and display, while still maintaining the original NWI wetlands codes. We have responded to many requests from universities, state agencies, other federal agencies and private organizations for the processed digital NWI data. In fact, the University of Delaware has requested our processed NWI data to serve on their World Wide Web server, and we will be sending those files next week.

I hope this information is of some help in formulating your response to the Washington request. Please let me know if you need further information.

✓  
CHES BAY

Author: Chris Victoria at SHA-CBES  
Date: 10/11/95 2:57 PM  
Priority: Normal  
TO: Pam Dansereau at SHA~MAIN2  
Subject: NWI data usage

----- Message Contents -----

CBFO currently has an on-going project in the Chester and Choptank River watersheds. These watersheds are subject to heavy agricultural usage. The project involves looking at the relationship between living resources, water quality and land use. The purpose of the study is to determine which of the small streams in each watershed deliver the highest nutrient loads and then target those subwatersheds--in a cooperative effort with local, state, and federal partners--for best management practices and habitat restoration. In order to execute an examination of watershed land usage, a GIS database has been developed for both the Choptank and Chester River basins. A critical part of this database is the wetlands datalayer provided by NWI.

If you have any questions, please contact me at (410) 573-4556.

Sincerely,  
Chris Victoria

✓

---

Author: Cherry Keller at 5HA-CBES  
Date: 10/12/95 10:50 AM  
Priority: Normal  
TO: Pam Dansereau at 5HA~MAIN2  
Subject: USE OF NWI DATA

----- Message Contents -----

The Chesapeake Bay Field Office has used NWI digital data as follows:

1. NWI data was added to an existing GIS data of forest cover and bird survey information for Prince George's Co. MD. Analysis by NBS researcher Deanna Dawson enabled us to quantify the relationship between forest area, forest interior birds, and the percent of the forest track that is forested wetland.
2. NWI conducted some analyses of their digital data for the Field Office. They produced a frequency distribution of the sizes of Palustrine Forested Wetlands in Maryland. This enabled the Field Office to evaluate a community model for Forested Wetlands, and to assess implications for proposed changes in policy in the regulations of wetlands.

Contact Cherry Keller, 410-573-4532 for further information.

Author: R5ES\_NJFO at SHA~MAIN1  
Date: 10/13/95 9:32 AM  
Priority: Normal  
Receipt Requested  
TO: Pam Dansereau at SHA~MAIN2  
Subject: Use of NWI Digital Data

----- Message Contents -----

The New Jersey Field Office currently uses NWI digital data to assist us in our review of federal projects and private projects that require federal permits (Section 10, Section 404). In addition we use NWI digital data for our Section 7 Consultations. Eric Schradling, NJFO

Memo from S.O. Conte NFWR

The Silvio O. Conte NFWR has copies of all the NWI maps covering the Connecticut watershed area, and has informed other organizations of their existence and availability. We use them when we are examining a particular site. The paper maps were of limited usefulness to us during our planning process, due to scale of our area (7.2 million acres ) and therefore the sheer number of maps involved. Most of our data analysis was done by GIS because of the scale of the project, and unfortunately, no digitized NWI maps were available. Data from interpreted maps, taken from NWI reports, were summarized in our Environmental impact statement. Published trend reports were also used.

Page 1/1

Author: Bob L Zepp at SHA-CBES  
Date: 11/8/95 11:26 AM  
Priority: Normal  
TO: Pam Dansereau at SHA~MAIN2  
Subject: NWI MAP USE @ CBFO

----- Message Contents -----

PAM

Biologists at CBFO use NWI paper maps on a daily basis for permit and project review. The public frequently comes to the office to view the maps for projects, developments, roads, etc. in their community. Occassionally, we order mylar copies for creating overlays on special projects or subjects.

Bob Zepp

ORDER MAPS

Author: R5ES\_NJFO at 5HA~MAIN1  
Date: 11/7/95 1:57 PM  
Priority: Normal  
Receipt Requested  
TO: Pam Dansereau at 5HA~MAIN2  
Subject: From Eric Schradling

----- Message Contents -----

Dear Pam:

The New Jersey Field Office uses NWI hardcopy maps for Section 404 and New Jersey Land Use Regulation Program Wetland permit reviews. We also use NWI maps for Section 404 and Section 10 enforcement actions and Federal Project review. NWI maps are also used during Section 7 consultations pursuant to the ESA and in determining potentially suitable habitat for endangered species.

Hope this information is helpful.

Eric  
11-7-95

Pam,

NYFO utilizes hard copy NWI maps on a daily basis. Among the various programs, we estimate that NWI maps are consulted on about 30 to 35 separate occasions per week. This is distinct from the cases where a map or set of maps are used routinely during a project (e.g., FERC/hydro, NRDA, or Farm Bill). These uses are more difficult to quantify, but are likely in the range of four to six maps weekly for each project, which may last from six weeks to 18 months. We guesstimate that this usage works out to five maps per week on a continual basis. Our total use (number of consultations) of NWI maps averages 35 to 40 instances per week.

Additionally, in Federal Activities correspondence (404 permits, ESA, WRP, FERC, Railroads, etc.) this office routinely directs applicants to review NWI maps of their proposed project area for the possible occurrence of wetlands. It is difficult to determine the amount of indirect usage of NWI maps that these referrals amount to, but it is likely that this is about 2/3 of our in-house use, or 25 instances per week.

Thanks, Kevin Moody

Post-It™ brand fax transmittal memo 7671		# of pages * 1
To	FAM DANSEHEAD	
Co.	USEWS	
Dept.	ROS-ES	
Fax #	413 253 8480	
From	KEVIN MOODY	
Co.	NYFO	
Phone #	607 753-8339	
Fax #	" " 9699	

## MEMORANDUM

DATE: March 13, 1996

FROM: Gregory Breese, Acting Project Leader  
Delaware Bay Estuary Project

SUBJECT: NWI digital data

TO: Ralph Tiner, R5 NWI Coordinator

As we discussed on the telephone, our office has used digital NWI data frequently over the last four years, and have found it to be critical to the work we do in identifying the distribution of species across a multi-state watershed. Attached is a memo we sent to your office this past fall detailing some of our work with digital NWI data.

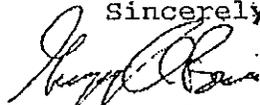
I would just like to add that without NWI digital data, these projects would not have been feasible. NWI digital data provided us with a consistent data set that was independent of state boundaries, and of sufficient detail to allow reasonable interpretation and use.

The end results of these analyses utilizing NWI digital data will be more accurate and easily understood information for FWS biologists and other stakeholders to use in a proactive responsible way that identifies viable alternatives for economic growth while at the same time providing for habitat protection/restoration, Endangered Species recovery planning, and more effective protection of sensitive living resources from oil spills.

The only shortcomings from our perspective are that there isn't enough of it available to cover our entire area of interest.

Enclosed are several maps illustrating our use of NWI digital data.

Sincerely,

  
Gregory A. Breese  
acting Project Leader

**U. S. Department of the Interior**  
**FISH AND WILDLIFE SERVICE**

Delaware Bay Estuary Project  
2610 Whitehall Neck Road  
Smyrna, DE 19977  
302-653-9152

October 11, 1995

TO: Glenn Smith, Assistant NWI Coordinator  
FROM: Mickey Hayden, Delaware Bay Estuary Project  
SUBJECT: Use of NWI Digital Data

The Delaware Bay Estuary Project has used NWI digital data in a variety of projects. The following are some of the applications that relied heavily on NWI digital data.

- We use digital NWI data in developing species distribution maps for fish and wetland dependent species for our Significant Habitats Project. Using a description of habitat requirements and life history, we are essentially modelling the habitat using NWI where possible, then having the resulting maps reviewed by resource experts. These maps and datasets are currently being used in oil spill response programs and in planning and permit activities by the Corps of Engineers.
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- We processed the digital NWI data by joining the digital quads and grouping wetlands using a simplified classification scheme based on the system, subsystem and class. This helped make them easier to use and display, while still maintaining the original NWI wetlands codes. We have responded to many requests from universities, state agencies, other federal agencies and private organizations for the processed digital NWI data. In fact, the University of Delaware has requested our processed NWI data to serve on their World Wide Web server, and we will be sending those files next week.

I hope this information is of some help in formulating your response to the Washington request. Please let me know if you need further information.

3/14/96

Memo from: Chesapeake Bay Program (3/14/96)

National Wetland Inventory data is used by the Chesapeake Bay Program (CBP) (specifically the Wetlands Workgroup) as the fundamental Basin-wide coverage to develop goals, set priorities, ascertain trends, and quantify changes in wetlands throughout the drainage basin. NWI maps are still used by federal, state, and local government agencies as the initial screen to determine whether wetlands may be present in any given area. Increasingly, NWI digital data is used in land management applications requiring a geographic information system.

In addition, the National Wetland Inventory staff are the recognized source of information that the Chesapeake Bay Program relies upon to quantify (inventory) and assess the status and trends of wetlands in the drainage basin. NWI staff provides unique expertise in the development of status and trend sampling protocol, statistical reliability, and credibility that CBP requires as key components to undertake a basin-wide status and trends analysis. In 1994 NWI completed a status and trends assessment for the CBP, having summarized not only general trends (indicating continued losses), but highlighting "hot spot" regions suffering heavy losses. This has provided a platform for CBP members, and the FWS Chesapeake Bay/Susquehanna River Ecosystem Management Team to refocus actions on how to alleviate those serious problems.

CBP has committed funds to assure full processing and digitizing of NWI data basin-wide to serve as the baseline upon which future losses and gains will be measured. The task is nearing completion. Without NWI leadership, the task of measuring attainment of CBP's "no-net-loss" goal (and long-term goal of "net-gain") of wetland function and acreage will be nearly impossible, thus compromising abilities to improve and adjust regulatory programs, outreach efforts, long-term watershed scale planning efforts, and the like. In simple terms, diagnosing the patient will be prohibited, thereby jeopardizing any potential for meaningful corrective actions. The CBP has very strong support by Maryland, Virginia, and Pennsylvania. As States push for taking over wetlands management via "assumption" of the 404 program, or through Statewide general permits, inventory and monitoring become a crucial element in maintaining integrity of those potential changes.

The National Wetland Inventory digital data is of great use to FWS in leveraging access to other forms of digital data on habitats and living resources. These data layers are becoming increasingly important as agencies are pressed to deliver timely and high quality work products in a government-wide downsizing atmosphere. NWI consistently plays out as our most valuable commodity in horse-trading with others.

The Chesapeake Bay Field Office is in the process of conducting aerial surveys of *Phragmites* in Coastal Chesapeake Bay to monitor its invasion and to target habitat restoration projects. To target areas for restoration, we are overlaying the distribution and abundance of *Phragmites* on NWI digital data to perform a cost benefit analysis to determine where controlling small patches of *Phragmites* now may save large amounts of coastal marshes. Without NWI digital data this analysis would be

impossible, as will many future projects. The use of digital data is at an infant stage and the commitment of the Service to not only providing digital data, but to updating coverages should be maintained. The wetlands data will always be the essential layer FWS relies upon in protecting and restoring trust resources.

UNITED STATES GOVERNMENT

# memorandum

U.S. FISH AND WILDLIFE SERVICE

CHINCOTEAGUE NATIONAL WILDLIFE REFUGE

P.O. BOX 62

CHINCOTEAGUE,

VIRGINIA 23336

TO: Regional Director, Hadley, MA (ES)  
ATTN: Pam Dansereau

FROM: Acting Refuge Manager, Chincoteague NWR, VA DATE: 11/08/95

SUBJECT: NWI Digital Data & Map Uses

NWI Digital Data and Maps are currently being used for Habitat Protection Planning on the Eastern Shore of Virginia. The project is headed by Bill Zinni (RO-RE) with input by Chincoteague NWR and Eastern Shore of VA NWR staff.

NWI Digital Data will be useful as an additional data layer for the GIS spatial analysis at Chincoteague NWR and Eastern Shore of VA NWR.

The NWI data will be useful in ascertaining new acquisitions and for Partners in Wildlife projects in Accomack and Northampton counties.

*digital*

Author: R5RW`RWB` at SHA~MAIN1  
Date: 11/7/95 7:59 AM  
Priority: Normal  
TO: Pam Dansereau at SHA~MAIN2  
Subject: Re: NWI Digital Data & Map Uses

----- Message Contents -----

Pam,

We have used NWI digital data for developing cover-type maps of refuges - these include Moosehorn (both units), Rachel Carson, and Petit Manan NWRs. These data were included as a coverage in a GIS developed for these refuges. We also will be using NWI digital data to develop a GIS for the Great Bay, New Hampshire watershed project. These data, in part, will be used to develop a model of priority wildlife species and critical habitat.

Hope this helps.

Greg Sepik

UNITED STATES GOVERNMENT  
memorandum

DATE: November 3, 1995

REPLY TO:  
ATTN OF: William Koch, Refuge Manager  
SUBJECT: Great Swamp NWR, Basking Ridge, NJ  
NWI Map Use

TO: Pam Dansereau

Great Swamp NWR uses NWI maps for several of the purposes that you stated in your memo i.e., environmental assessments, planning purposes, GIS applications and wildlife biology research. The refuge utilizes hardcopy versions of the maps, however, we would like to have the digital version for refuge use. The refuge will be setting up for GIS capabilities by installing Arc View next week.

---

Author: R5RW IRQNRW at SHA~MAIN1  
Date: 11/3/95 3:02 PM  
Priority: Normal  
TO: Pam Dansereau at SHA~MAIN2  
Subject: NWI Digital Data & Map Uses

----- Message Contents -----

Pam,

Iroquois NWR used NWI digital data and maps for the following:

- GIS application (refuge coertyping)
- Habitat/wildlife refuge studies (grassland bird study, aquatic food web study, black tern graduate research project)
- Wetland restoration projects (Partners for Wildlife and on-refuge projects)

Don V. Tiller

Author: R5RW WRNWR at SHA~MAIN1  
Date: 11/3/95 1:58 PM  
Priority: Normal  
TO: Pam Dansereau at SHA~MAIN2  
Subject: NWI Digital Data & Map Uses

----- Message Contents -----

Pam:

This may be a second response to your message. I'm not sure if the first one, which was never completed, came through to you or not.

Wallkill River NWR has used NWI maps to determine presence of wetlands within our refuge acquisition boundary, primarily to help us determine if lands we are interested in acquiring are wetlands. This information is used by us in map form. Refuges and Wildlife in the RO has digitized some of the NWI map information for the very same purpose, and used it for land acquisition efforts at Wallkill. Check with Paul Steblein and/or Will Waldron.

We have also used the NWI maps to determine what kind of wetlands we have on the refuge. Specifically, we were looking for the presence of coniferous wetlands. The NWI maps were helpful in this regard (although we will not know until a couple of months from now if the maps are all that accurate - they may have missed some small coniferous wetlands.)

Hope this helps.

Take care. Give my regards to all.

United States Government

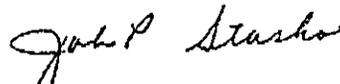
MEMORANDUM U.S. Fish and Wildlife Service

**To:** Pam Dansereau, RO - ES, Hadley, MA  
**From:** Refuge Manager, Back Bay NWR, VA  
**Subject:** National Wetlands Inventory Use Summary  
**Date:** November 8, 1995

In response to your request for a summary of our use of National Wetlands Inventory (NWI) data and maps, the following is provided. Back Bay National Wildlife Refuge (BBNWR) has used NWI maps and/or data during the past 5 - 10 years for the following purposes:

1. Land Acquisition - Appraisals for wetland/non-wetland properties under purchase agreement for addition to BBNWR.
2. BBNWR management planning purposes
3. Analyzing development issues and impacts within and adjacent to BBNWR; including resolution of interagency (City, State and Federal) conflicts.

Should there be any further questions, feel free to contact me, Deputy Manager McCauley or Refuge Wildlife Biologist Gallegos, at 804-721-2412/2637.

  
John P. Stasko



