The National Hydrography Dataset (NHD)

U.S. Geological Survey
U.S. Environmental Protection Agency
U.S. Department of Agriculture Forest Service
U.S. Department of Interior’s National Park Service
Bureau of Land Management
What is NHD

National Hydrography Dataset (NHD)

– combined dataset

– provides seamless hydrographic data for the United States "The National Map"

– contains information about surface water features
  lakes, ponds, streams, rivers, springs wells
How Maine’s NHD developed

Maine Office of GIS (MEGIS) partnered with U.S. Geological Survey (USGS)

USGS / MEGIS grant project goal:

enhance Maine's 1:24,000 hydrography data to create high-resolution NHD
Description of Data

**NHDinGEO**

NHD data in ESRI geodatabase format

6 main feature classes

- NHDFlowline
- NHDWaterbody
- NHDPoint
- NHDArea
- NHDLine
- HYDRO_NET

**Figure 6. Flow relations illustrating in, out, network start, and network end directions.**

A common identifier value of "0" represents a null entry.
Hydrography Feature Classes

**NHDFlowline**
- main linear network of surface water drainage streams
- artificial paths connectors
- pipelines shorelines.
Hydrography Feature Classes

*NHDWaterbody*
hydrographic waterbody features:
- lakes, ponds,
- swamps, marshes
- floodways & floodplains

*NHDPPoint*
hydrographic landmark features:
- gaging station,
- rock,
- spring/seep
- waterfall

[Map of Maine Waterfalls]
Hydrography Feature Classes

**NHDArea**
hydrographic landmark features:
- sea/ocean
- stream/river

**NHDL**
linear hydrographic landmark features:
- dams
- bridges, gates

**HYDRO_NET**
geometric network for flow navigations

*Event tables are also included for point, line and area events.*
Characteristics of the National Hydrography Dataset

Unique reach codes:
- networked features
- isolated water bodies

structured to accommodate higher resolution data

“A reach is a continuous piece of surface water with similar hydrologic characteristics - such as a stretch of stream between two confluences”
Attributes in NHD

FCode & Ftype

codes that contain information as to the type of feature

Geographic Names Information System (GNIS)

Federally recognized name of a feature

Defines the location of the feature:
state,
county,
USGS topographic map
geographic coordinates
Attributes in NHD

Misc attributes contain:
- elevation
- area
- length
- feature update dates
NHD Applications

linked water related data through “reaches”

enable analysis and display of
data in upstream and downstream order

NHD-based network analysis with other data:

- soils
- land use
- population

Understanding & display of affects

Figure 10. Sequencing flow relations along transport and coastline reaches.

(A common identifier value of "0" represents a null entry.)

Identifying level paths through the drainage network:

Main points:
- A level path is a sequence of transport reaches that traces the main stem for a given flow of water.
- Stream level identifies the main path to which a transport reach belongs.
- The delta level identifies main paths of water flow among flow relations.
Example: **Linear Transport Reach**

```
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<th>Description</th>
<th>Program System ID</th>
<th>Reach ID</th>
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<th>End Position</th>
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</tbody>
</table>
```
The Value of NHD to Maine

comprehensive hydrographic coverage modeling and analytical capabilities
- cause and affect relationships
enhanced cartographic applications
“local to national” function & relevance
Maine’s Move to NHD

- Tracking pollution discharges
- Applying the Impaired Waters Rule
- Locating fish and aquatic animal habitats
- Better define drainage catchments
- Emergency management (Flooding/Hurricane)
- Tracking upstream/downstream interaction
- Enhance stream classifications
- Stream Level/Stream Order
- Apply event locations
Why use NHD?

Compliment to State & Federal water management programs

“one stop” system / interstate

Ease of Data Sharing:
only attribute data tables that contain the spatial linkages need to be shared
Why use NHD?

EPA reference to Total Maximum Daily Load (TMDL) data on NHD hydrography

TMDL and 303d (water quality limited) streams referenced against NHD data

Georeference
- of fisheries data
- water quality information
The NHD Stewardship role

- Built, used & maintained
- Knowledge of local hydrography
- Requirements for precise & current data
- Maine has signed a stewardship agreement with the USGS for this purpose
What’s in Store for NHD in Maine

Watershed Boundary Dataset (WBD) integration

Local resolution hydrography data
Getting Started

The NHD Tutorial Series

- **NHD Quickstart** - The "NHD Quickstart" is a condensed reference document to help users obtain and view NHD data, and navigate the NHD Flow Path.
  - *Adobe PDF Format* (121KB)

- **NHDinGEO Tasks** - The "NHDinGEO Tasks for ArcGIS 8.3 and Higher" is an in-depth reference document which describes how to use the NHD with ESRI's ArcGIS system.
  - *Adobe PDF Format* (139KB)
Obtaining NHD data

*NHD data will be stored and kept current in the MEGIS SDE database.*

Nationwide NHD available for download

NHD Viewer
http://nhdgeo.usgs.gov/viewer.htm
Questions?

http://nhd.usgs.gov