

**NEW** ***NHD Tools for the Evaluation of  
Watershed Condition  
and Management Performance***

**National Water Quality Monitoring Council (NWQMC)  
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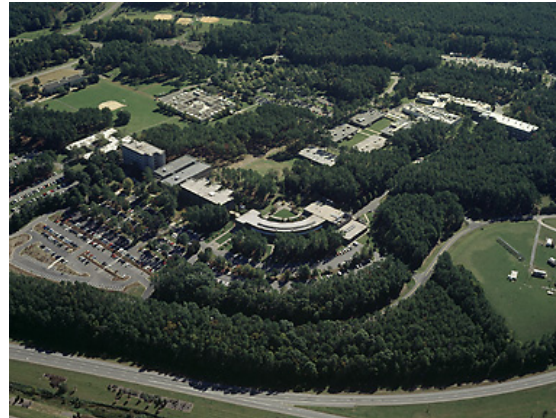
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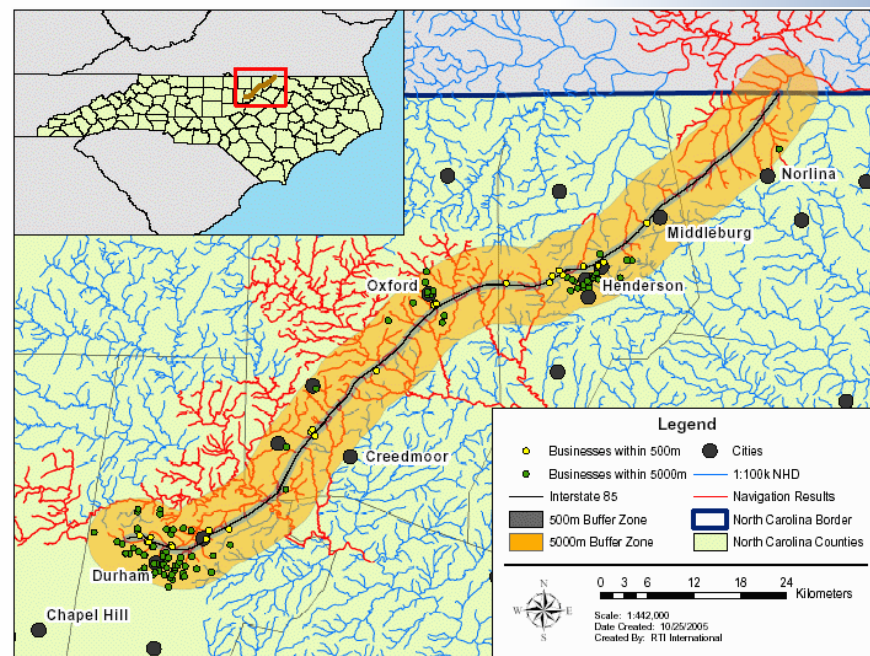
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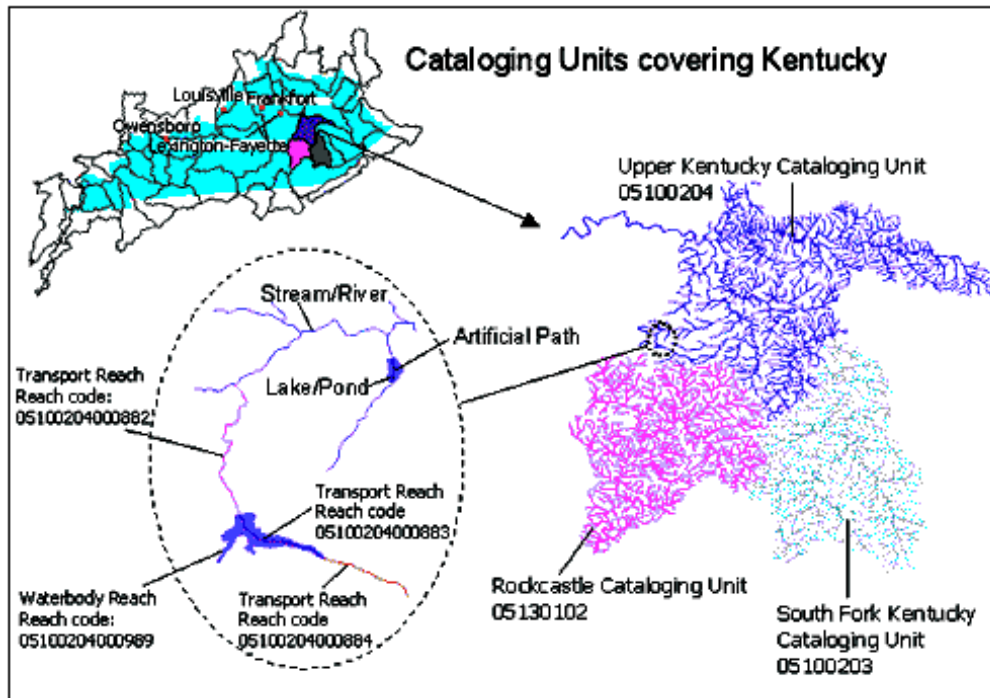


# Presentation Outline

- Overview of NHD and the New NHDPlus
- Upstream/Downstream Navigation Approaches Based on Points, Outlets and Natural Watershed Units
- Building Upstream/Downstream Management Envelopes using Administrative Units, Management Corridors, and other User-defined Areas of Investigation
- Applications for New NHD and NHDPlus-based Tools

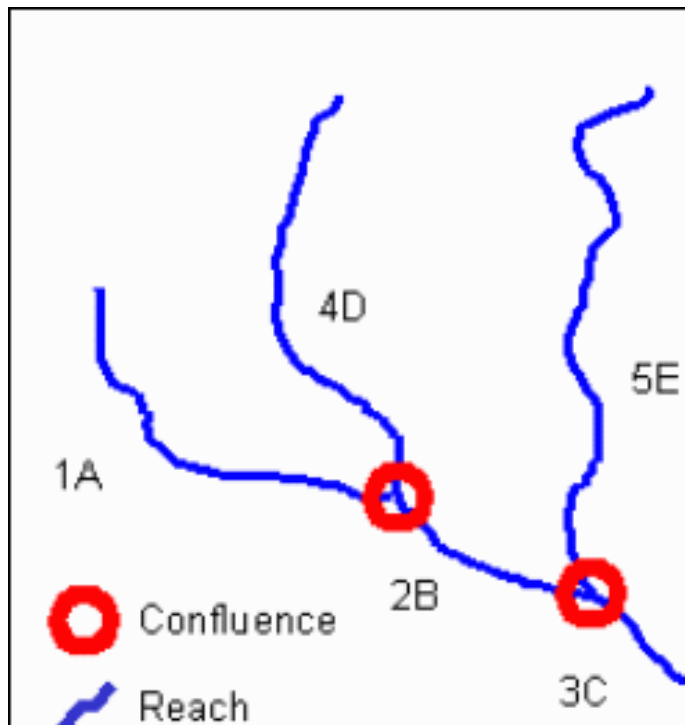


# National Hydrography Dataset (NHD)



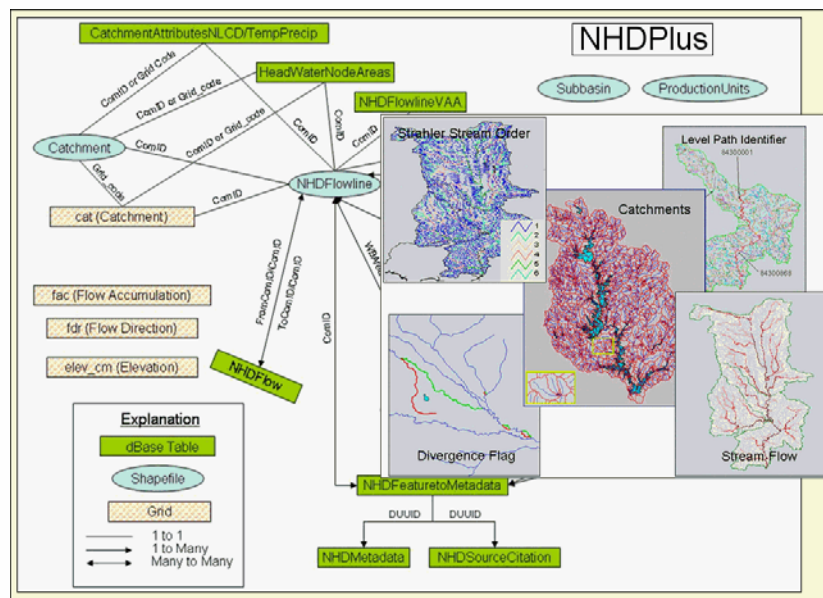
The NHD is a digital spatial data system based on surface water features such as lakes, ponds, streams, and rivers

# The National Hydrography Dataset: A Framework for Upstream/Downstream Analysis



- Surface water features form "reaches" (drains or flowpaths)
- NHD reaches become part of surface water drainage networks
- Network linkages can be used as part of upstream and downstream analyses

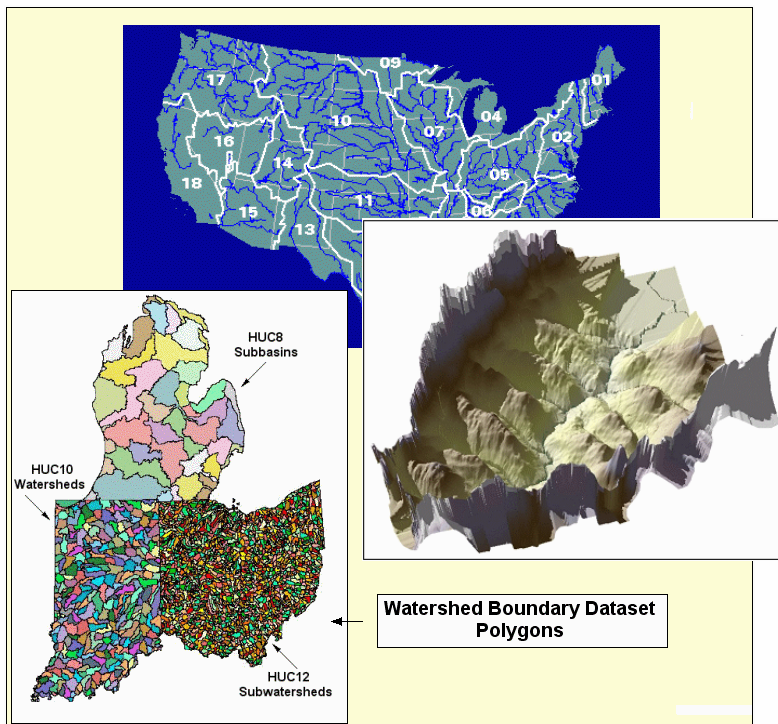
# NHDPlus: Provides Enhancements to the Standard National Hydrography Dataset



- Improves the utility of the NHD in applications
- Includes facilities to model water flow and time of travel through the NHD network
- Provides a set of **catchments** polygons for each NHD flowpath
- Can tie datasets or GIS layers related to landscape features (e.g., the National Land Cover Dataset) to the NHD stream network

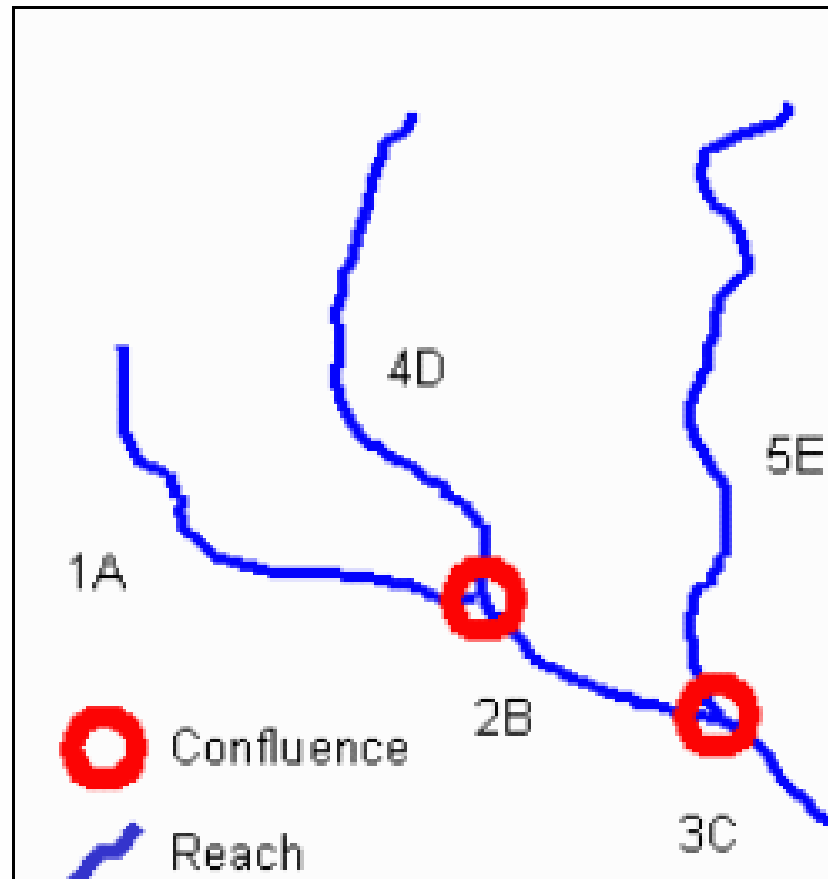


# NHD Catchments Aggregate to Match the HUC8/HUC10/HUC12 Polygons in the Watershed Boundary Dataset (WBD)

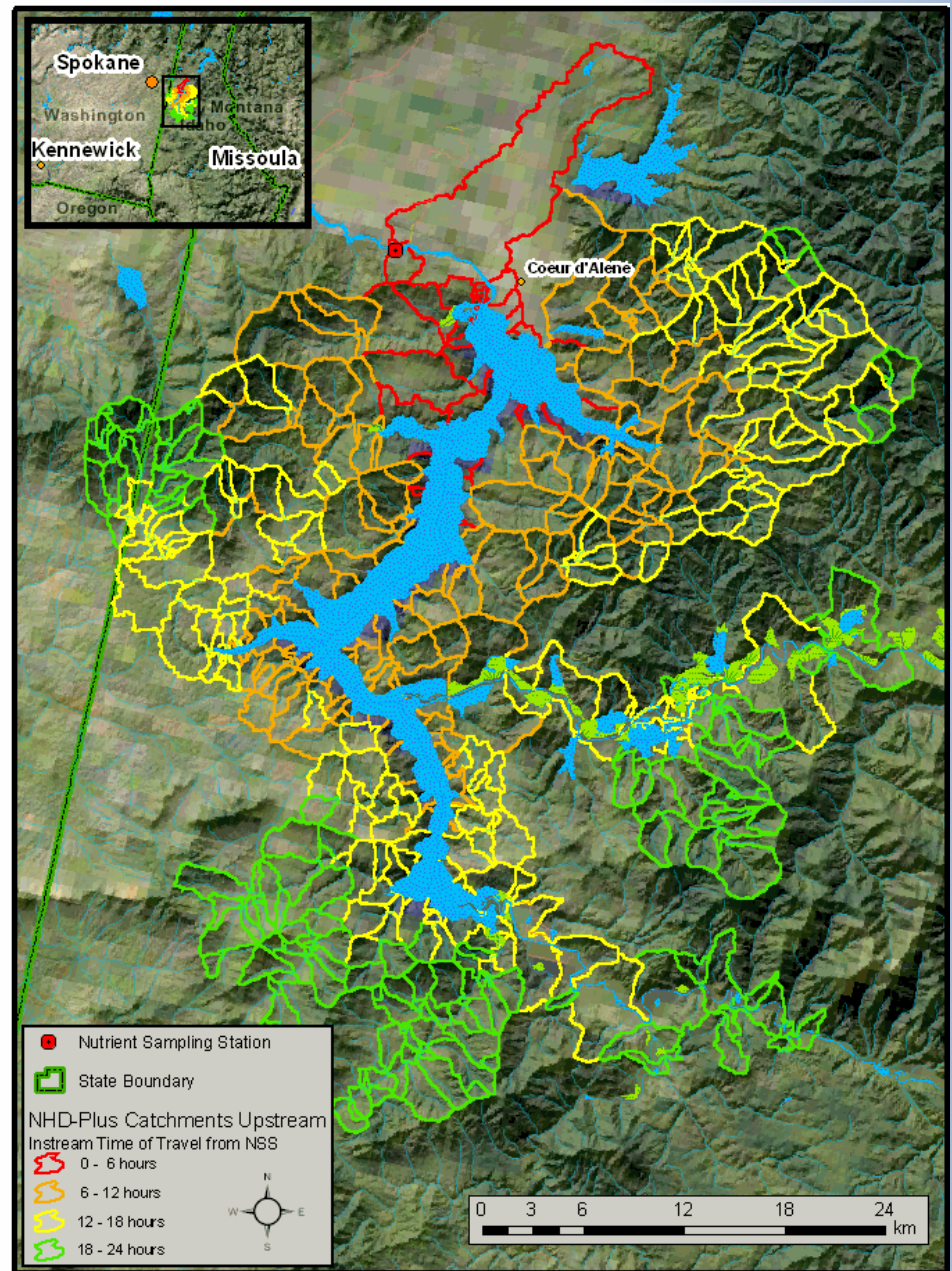


- NHD catchments apply the “New England Method” from the USGS New England SPARROW initiative
- Involves burning NHD flowpath information into the National Elevation Dataset (NED)
- Provides compatibility between NHD network flowpaths and hypsography information from Digital Elevation Models (DEMs)

# “Conventional” NHD and NHDPlus Analyses Navigating from Network Points of Interest

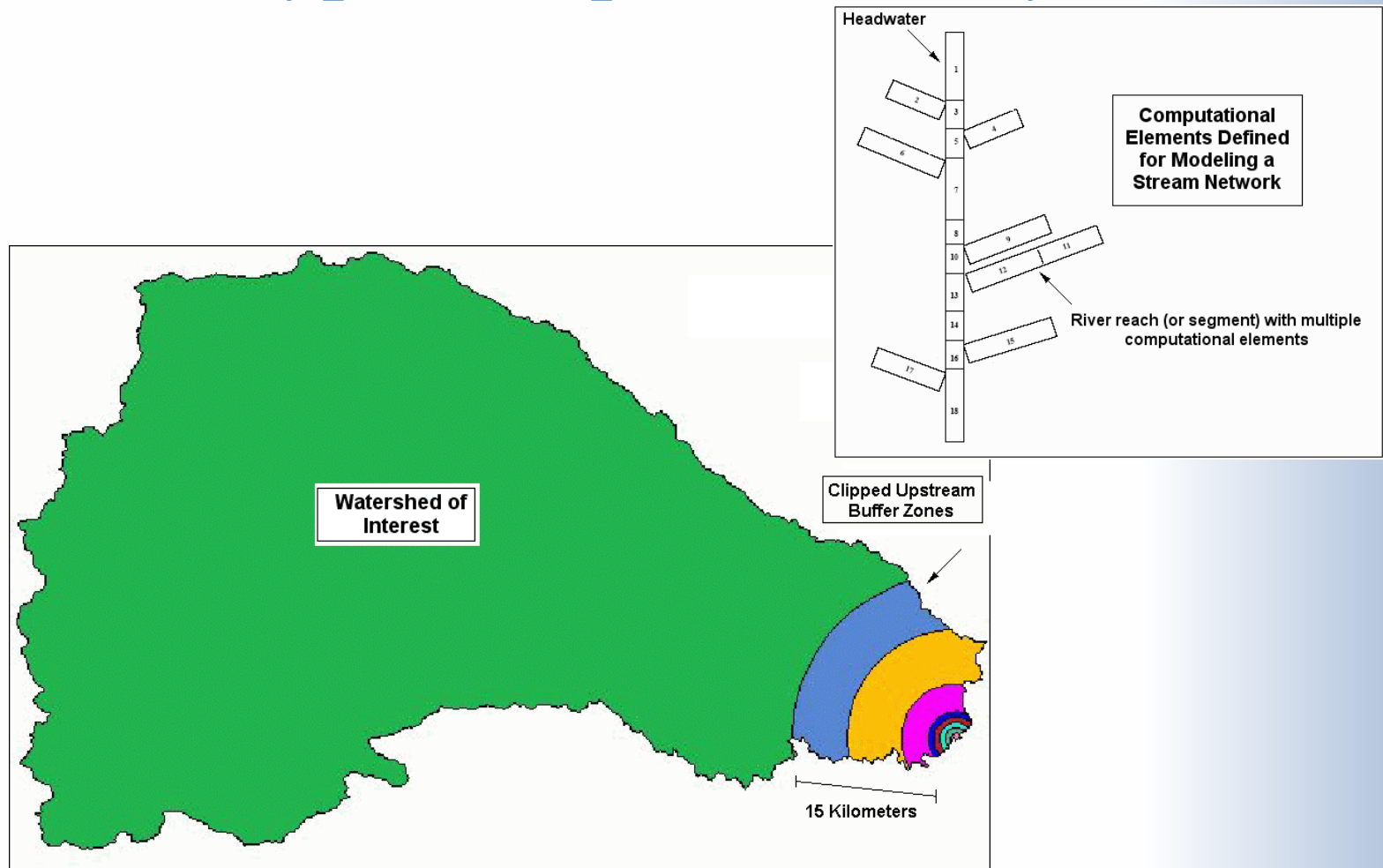


NHDPlus upstream  
navigation to select  
custom time-of-travel  
watershed units based  
on flowpath  
catchments

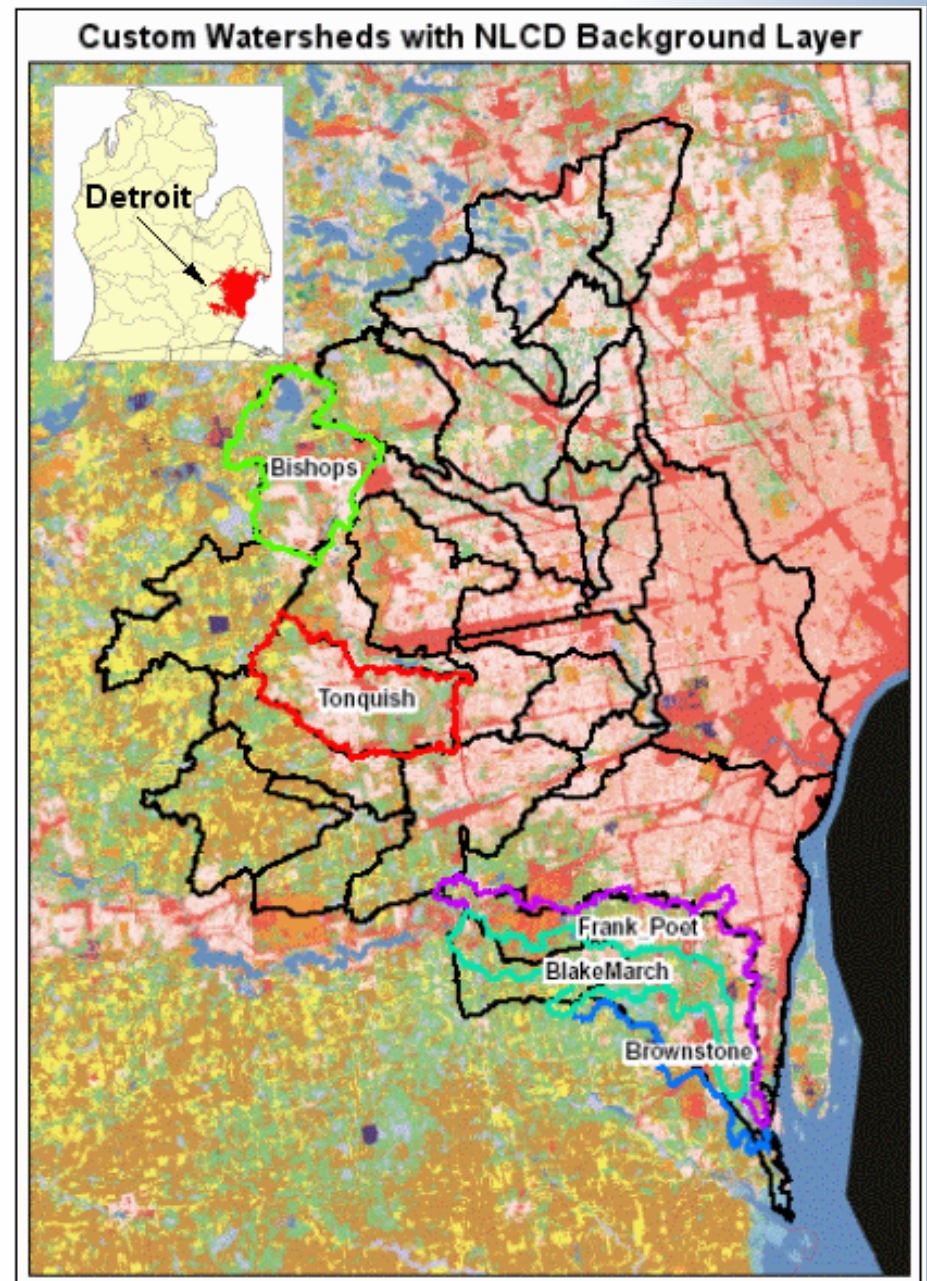




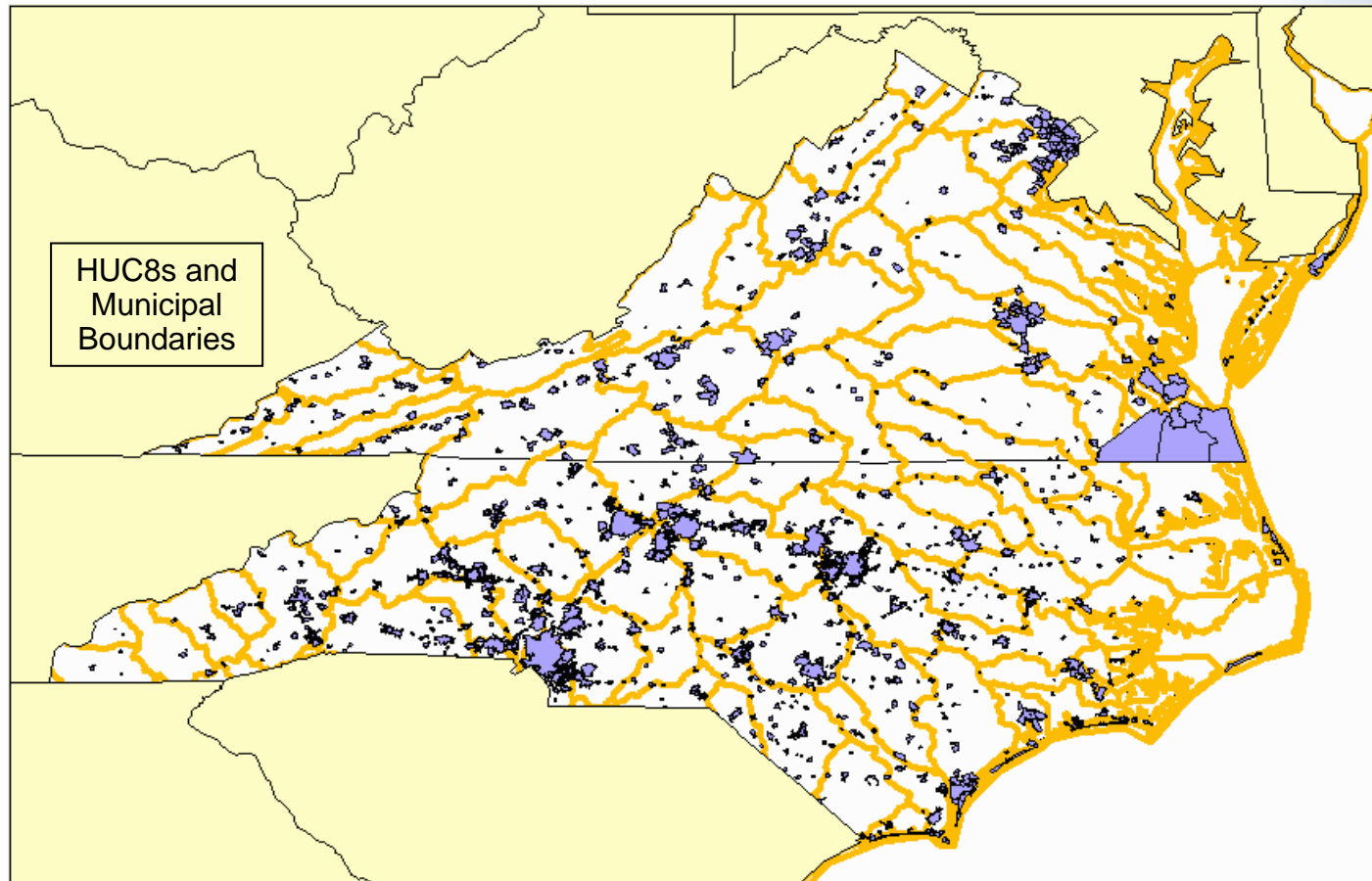
# NHD-based tools can simplify common types of upstream analyses



Custom watersheds  
can provide the  
framework for data  
mining, land cover  
analysis, and basic  
“landscape” models

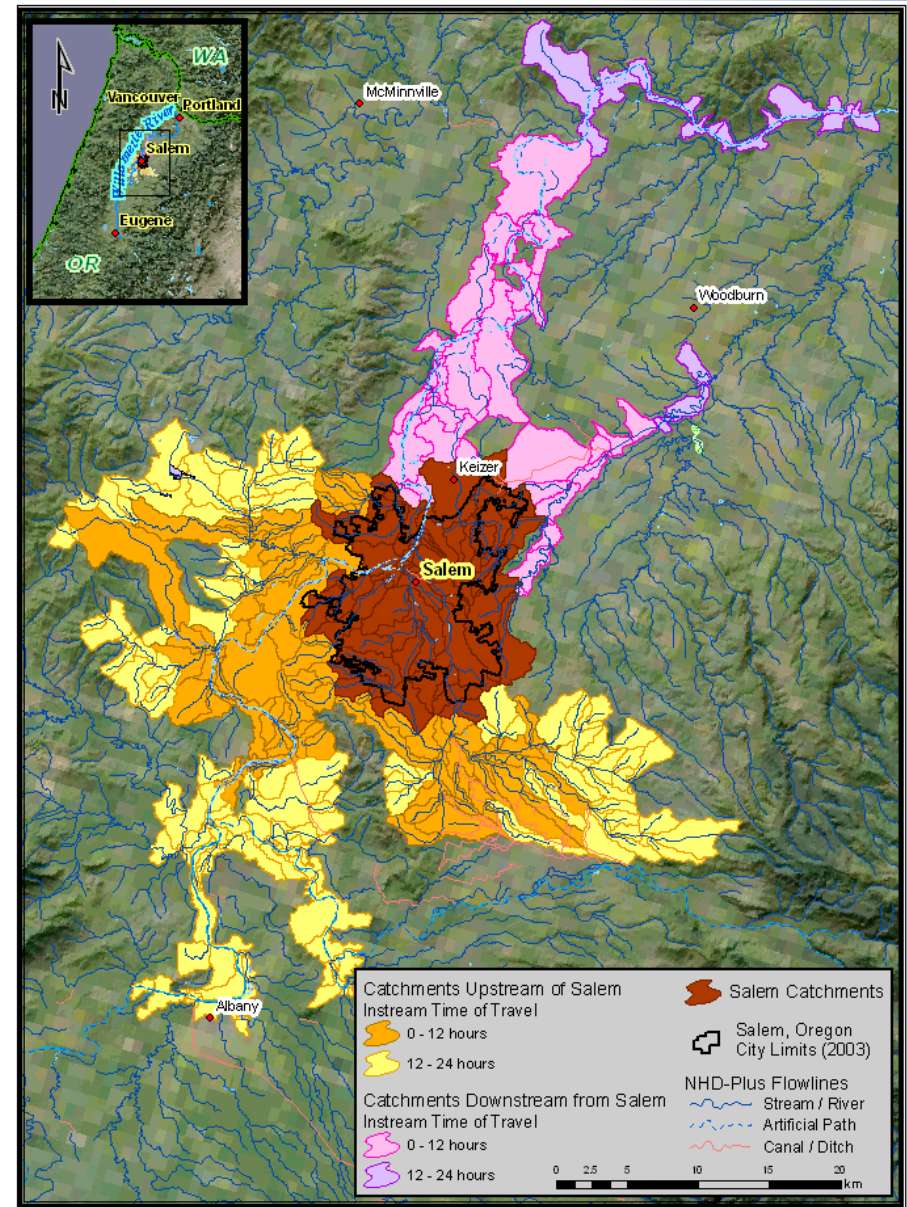


# Building Management Envelopes using Administrative Units, Management Corridors, and Other User-defined Areas of Investigation

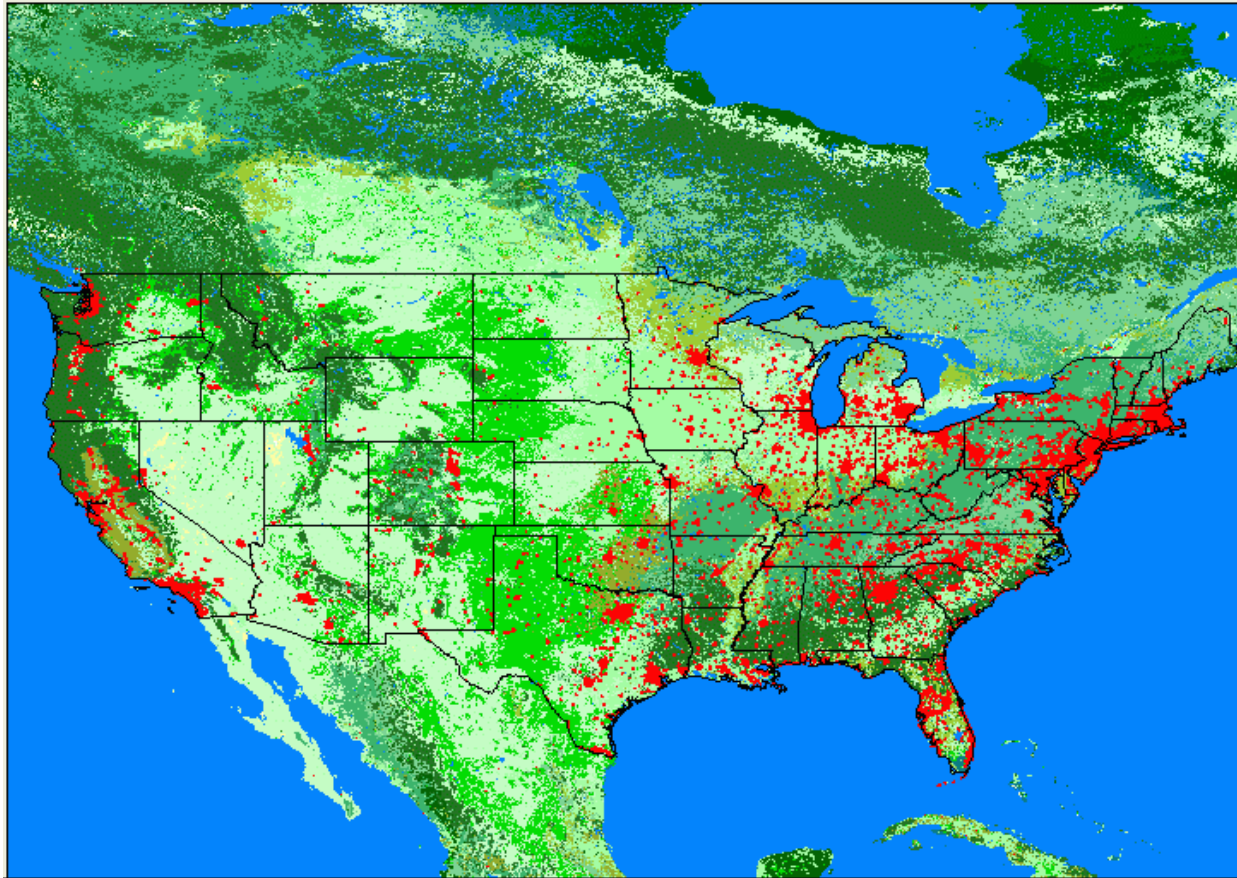




# Example of NHDPlus-based time-of-travel watershed envelopes for Salem, Oregon

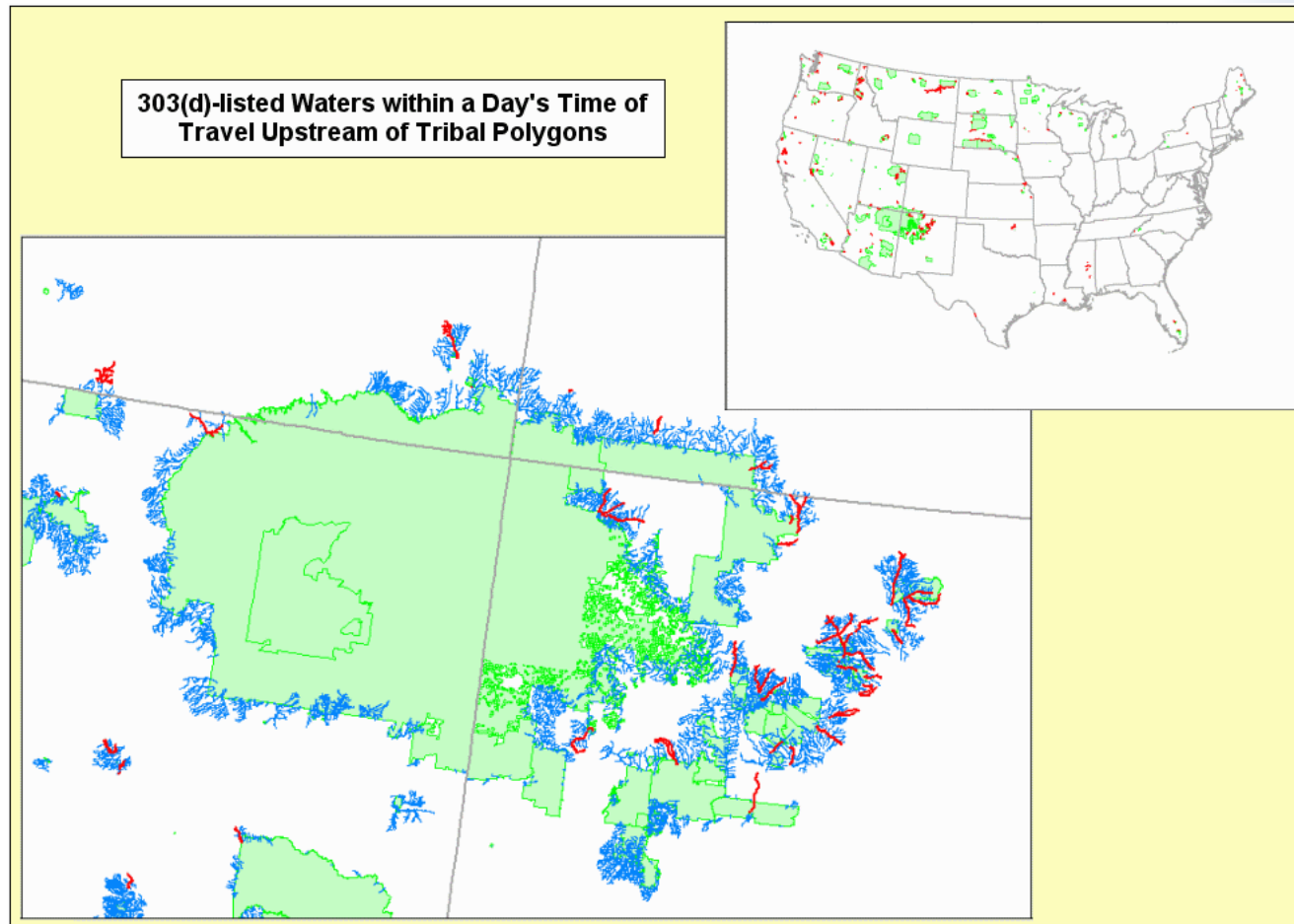


# Applicability in development of indicators and analysis systems for urban stormwater management programs

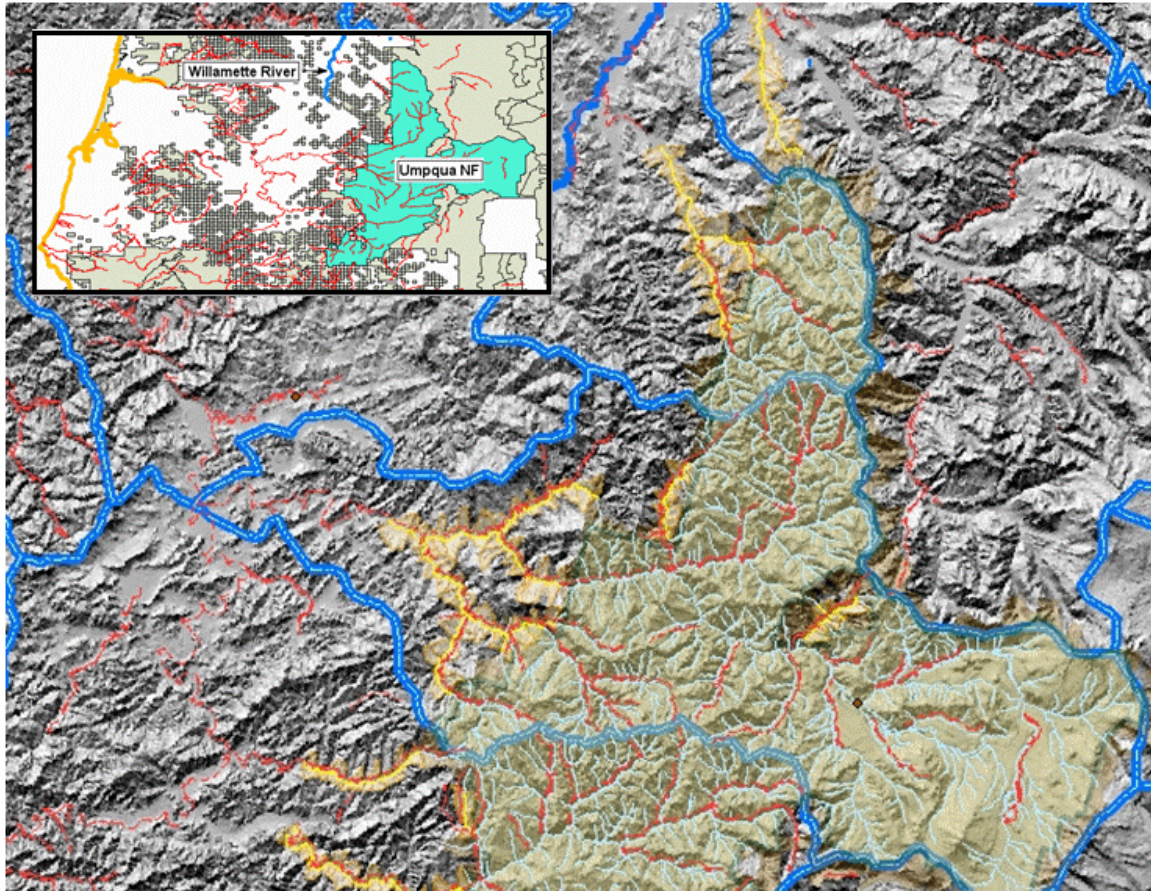




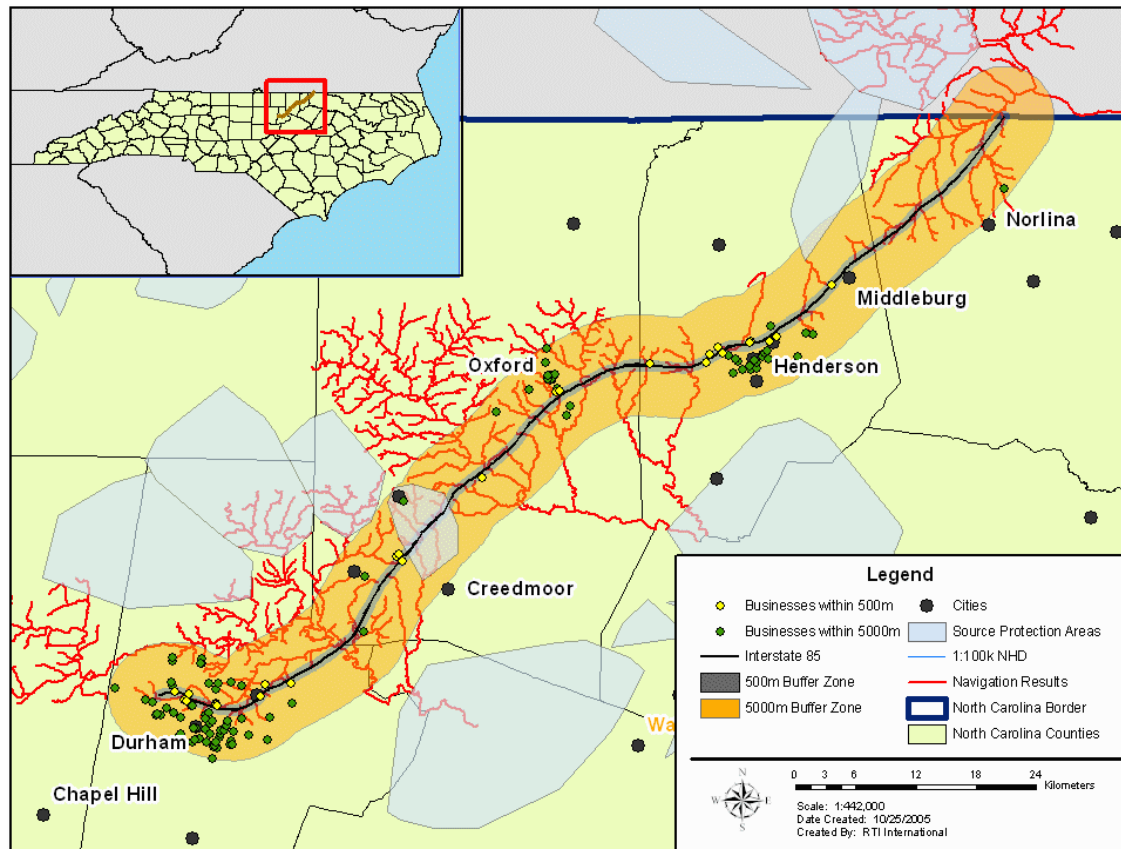
# NHD analyses to identify 303(d)/TMDL issues upstream of Tribal lands



# 303(d)/TMDL issues related to Federal Lands (Umpqua National Forest in Oregon)

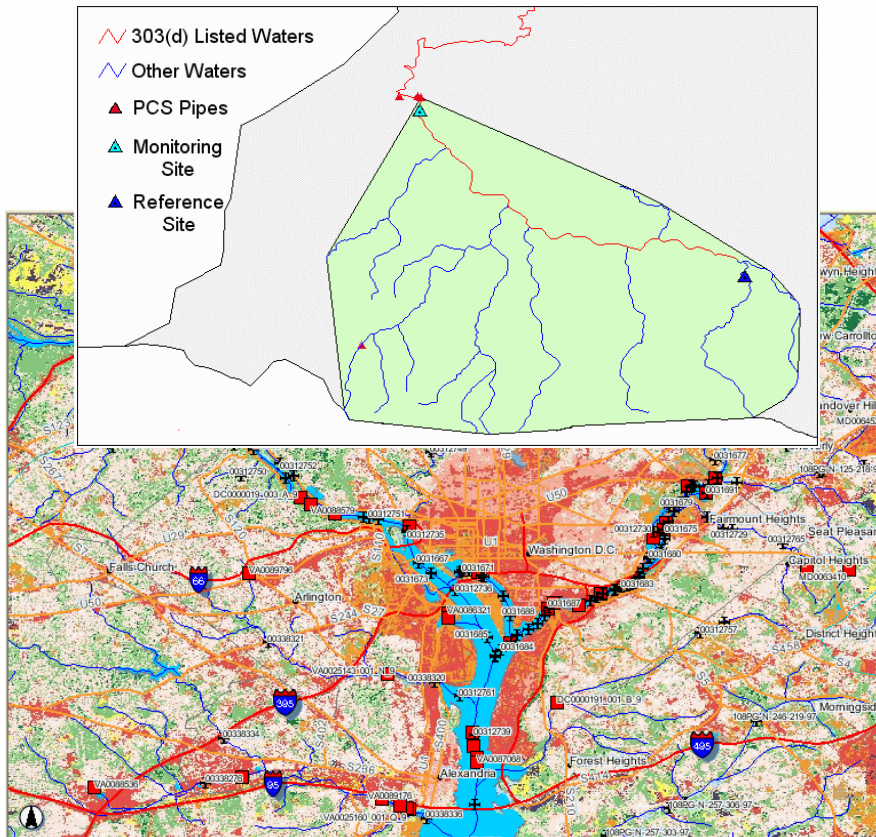


# Highway corridor analysis relating 303(d)-listed waters, drinking water Source Protection Areas, and underground storage tank locations



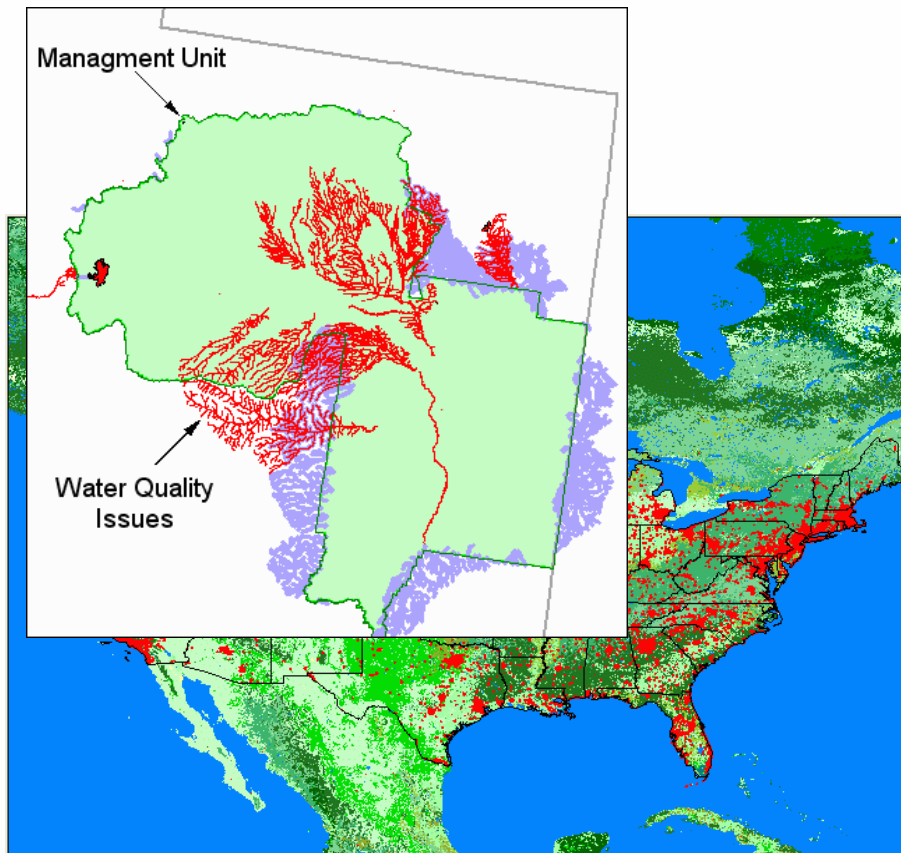


# Applications for New NHD and NHDPlus-based Tools



- Allows rapid delineation of flowpath networks for **custom watershed polygons**
- Facilitates data mining for “on-NHD” information for entities georeferenced to the NHD
- Custom polygons facilitate rapid processing of “off-NHD” GIS point, line or polygon information
- Provides new facilities for processing raster (gridded) data layers
- Provides a foundation for statistical analyses, modeling, and decision support systems

# Applications for New NHD and NHDPlus-based Tools



- Generate upstream-downstream **watershed envelopes for non-watershed management units**
- These units include: cities, military bases, tribal lands, parks, wildlife refuges, National Forests, corridors along highways, or zones associated with natural disasters (e.g., Katrina)
- NHD-tools facilitate developing watershed-based assessment, management , and performance indicator systems for non-watershed administrative units



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