North Carolina Department of Cultural Resources

State Historic Preservation Office

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MEMORANDUM

To: State, Federal, and Local Planning Agencies
Environmental Review Consultants
Preservation Professionals

From: Peter Sandbeck, Deputy State Historic Preservation Officer
State Historic Preservation Office

Subject: **Historic Preservation Office Web Mapping Services**

(For more information and support for these services, contact Michael Southern, HPO GIS coordinator, michael.southern@ncdcr.gov , 919-807-6586)

The State Historic Preservation Office (HPO) is pleased to announce the availability of web mapping services (WMS) for historic property and district locations (point and boundary vector data) and our complete collection of hand-marked USGS maps (raster data). *Archaeological site data is not included in these services.*

These services are intended for use with ArcMap. While Google Earth and ArcGIS Explorer (free data reader from ESRI) can also read WMS data, our experiments thus far with GE and ArcGIS Explorer have had mixed results. Users are invited to experiment with other data readers, but we do not provide support for them.

The vector data services pull from the live data in our ArcSDE geodatabase. This means that the services provide data current as of our most recent post and reconciliation, which is made daily. We add new data and edit existing data every day. While WMS vector data does not have all the functionality of shapefiles, when they are used with our USGS map services you can see everything from your location that you could see in a visit to our map room. They make it unnecessary to download and install regular shapefile updates or to install 10 Gb of USGS raster data locally on your system.

Instructions for installing and using a WMS follow at the end of the services list. Please note that spaces in the WMS addresses are all underscore marks. Also see the symbology chart at the end of this memo..

Metadata: Descriptions of data sources, data status, and data disclaimers by county are found at http://www.hpo.ncdcr.gov/gis/CountyDisclaimers.html

Property and District Data (vector data) Each service contains both points (location of key feature) and boundaries for those features for which it is possible to draw an accurate or meaningful boundary. Thus all features have a point, and some of the features also have a boundary. For districts, the point is the centroid or near-centroid of the district. Boundaries are frequently based all or in part on tax parcels.

http://gis.ncdcr.gov/ArcGIS/services/NC_National_Register/MapServer/WMSServer
Blue points and boundaries. All current listings in the **National Register of Historic Places** (Approximately 2,750). Boundaries are drawn for 2,000 of the listings based on official nomination maps. Many early listings did not have defined boundaries and it is not possible to draw a meaningful boundary.

http://gis.ncdcr.gov/ArcGIS/services/NC_Study_List/MapServer/WMSServer
Green points and boundaries. Entries on the **Study List** for potential nomination to the National Register that have been mapped so far (about 90% of the 4,300 entries statewide). Relatively few have boundaries drawn. Study List boundaries are by definition "for study," and thus tentative.

http://gis.ncdcr.gov/ArcGIS/services/NC_Determined_Eligible/MapServer/WMSServer
Orange points and boundaries. **Determinations of Eligibility** (non-archaeological) that have been mapped so far (about 90% of 1,000 statewide). DOE boundaries are drawn from official DOE reports where possible. We are slowly working through old DOE reports to identify more boundaries, but this is a work in progress.

http://gis.ncdcr.gov/ArcGIS/services/NC_Surveyed_Only/MapServer/WMSServer
Yellow-brown points. Properties **surveyed**, mostly in rural areas, that have not received any type of historic designation. Rural survey points have been plotted for approximately one third of the state (about 20,000 points). Most of these are plotted from our USGS scans and have not been vetted. But they are at least as accurate as the original USGS markings, and we have corrected many locations based on high resolution NC OneMap aerials and Google Street View.

http://gis.ncdcr.gov/ArcGIS/services/NC_Local_Landmarks_Districts/MapServer/WMSServer
Purple points and boundaries. **Locally designated landmarks** (about 1,100) and **locally zoned historic districts** (about 60 of 100 total). Many landmarks also have NR, SL, or DOE designations, but are mapped as separate points at the same location. Coverage is not complete for the entire state, and not all of this data has been vetted or edited.

http://gis.ncdcr.gov/ArcGIS/services/NC_Base_Data/MapServer/WMSServer
This service provides NCDOT numbered roads, county boundaries, municipal boundaries, the USGS index grid, and NC congressional districts.

Points for designated sites are labeled with the HPO survey site number, the property or district name, and the year that the site received its designation. Boundaries are not labeled since they would only duplicate the point labels, and every boundary has an associated point.

USGS Maps (raster data). These are scans of the 1,500 hand-marked paper USGS maps generated in over 30 years of National Register and survey programs. We are no longer marking new designations on these maps. Used in conjunction with the vector layers, they give users all the data they would see at the guest work station in our map room.

The services are organized alphabetically by county, and alphabetically by quad name within each county group. Thus the first service contains the quads for counties Alamance through Burke. Quads that overlap two or more counties will appear in all of the counties for which they contain data markings. When you install one of these services, you can limit your installation to the quads within a single county, or a single quad within a county.

http://gis.ncdcr.gov/ArcGIS/services/USGS_Statewidewms_A-B/MapServer/WMSServer

http://gis.ncdcr.gov/ArcGIS/services/USGS_Statewidewms_C-E/MapServer/WMSServer

http://gis.ncdcr.gov/ArcGIS/services/USGS_Statewidewms_F-H/MapServer/WMSServer

http://gis.ncdcr.gov/ArcGIS/services/USGS_Statewidewms_I-L/MapServer/WMSServer

http://gis.ncdcr.gov/ArcGIS/services/USGS_Statewidewms_M-O/MapServer/WMSServer
http://gis.ncdcr.gov/ArcGIS/services/USGS_Statewidewms_P-S/MapServer/WMSServer

http://gis.ncdcr.gov/ArcGIS/services/USGS_Statewidewms_T-Y/MapServer/WMSServer

Limitations: A WMS service for vector data has limitations:

- *Projection:* To make the services work for our web mapping application, we are using the WGS 1984 Web Mercator Auxiliary Sphere projection. While the data should read in a host map with the data frame set to any projection, the symbols and labels may be somewhat pixilated. The ideal appearance will be achieved if the data frame of your host map is also set to Web Mercator.
- *Search and select*: You cannot search and select features delivered by a WMS as you can when you own the shapefiles. Thus you can't select and report features within an APE polygon you have on your computer. But you can see everything within it and export your own maps with the points and boundaries included.
- *Identify tool*: The identify tool returns the attributes for the top feature class only. That means if you want to see the attributes for a feature class further down the list, you have to cut off all the WMS features above it.
- *Exporting jpegs and printing*: A vector WMS does a strange thing when printed from ArcMap or exported to a jpeg. The higher the resolution, the lower the size of the points and labels, and at higher resolutions (above 200 dpi) the points and labels become barely legible. The optimum resolution for exporting seems to be 110-130 dpi, though this may vary depending on your local system.

Installing a WMS in ArcMap

- With ArcMap open to the map to which you want to add the data, click on the Add Data icon (black plus sign in the yellow diamond)
- Navigate to Catalog if you are not already there, and click on "GIS Services" in the list under Catalog.
- Click on "Add WMS Server"
- In the next window, enter the URL listed above for the service you want to install in the URL box at the top of the window, starting with http:// . *Please note that spaces in the WMS addresses are all underscore marks.*
- In the same window, click "Get Layers." The feature classes in the WMS should appear in the window.
- Click OK at the bottom of the window.
- In the next window, click "Add"
- In the next window, click on the name of the WMS to select it and click "Add" again.
- Another window may appear telling you that the coordinate system of the data source you are targeting isn't the same as your map. That's OK. Just click "Close."

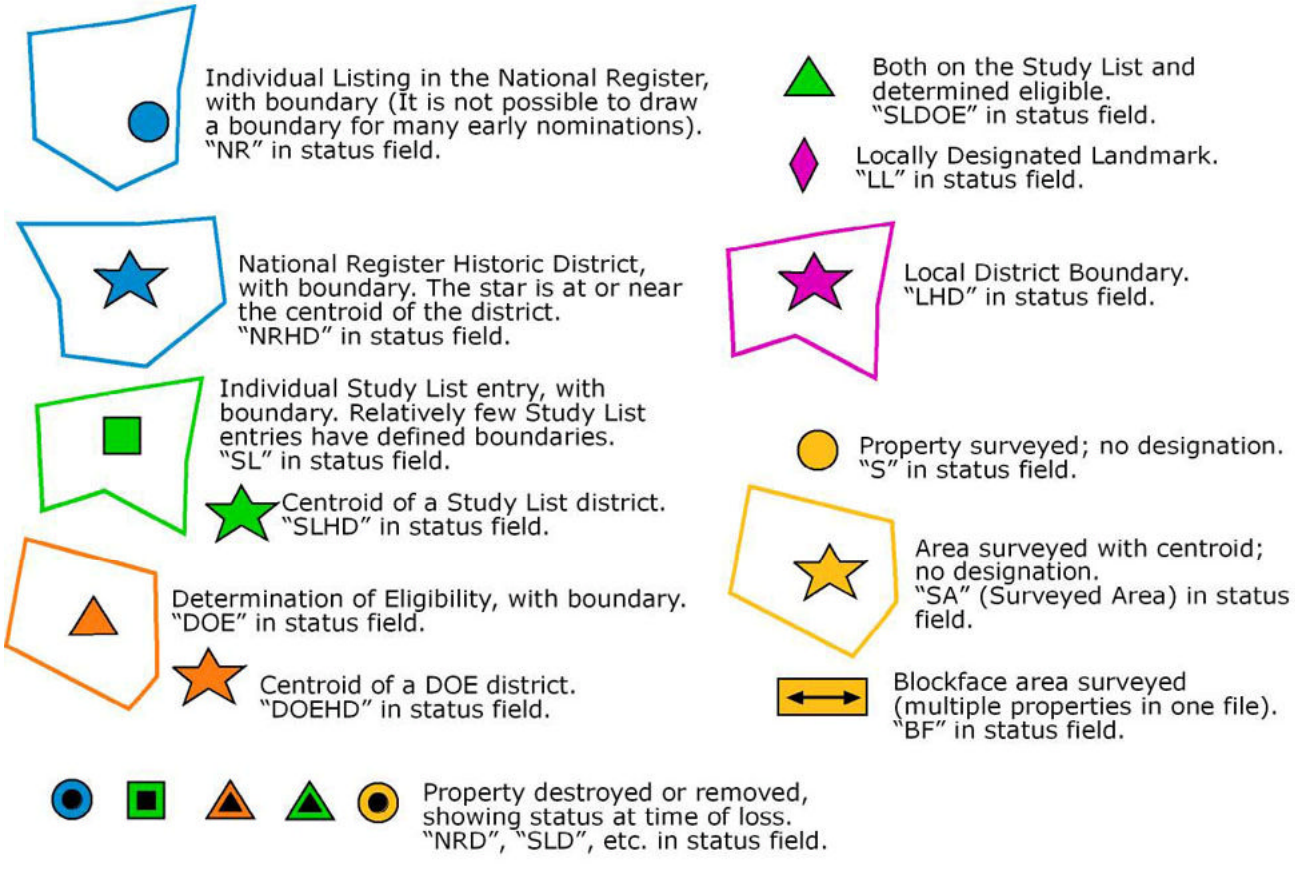
The feature classes/raster sets in the service should appear somewhere in your table of contents. It may or may not be fully expanded. The vector services include county boundaries and the USGS grid as a convenience to users.

When installing a USGS set, you may select the whole set, a single county within the set, or a single quad within the county to load in your map. You do this by double-clicking twice on the service name in the Add Data window to expand it to the next level to select the county, and double-clicking the county name to select a particular quad within a county. The installation will be limited to your selection.

Each of the USGS sets includes the labeled USGS grid to enable you to quickly identify the quad for your area.

When a USGS set is installed, the first few quads in the top county in that group are selected to be displayed. This appears to be something that all WMS services for raster data upon installation. You can shut them off and collapse the group to create one line in your table of contents.

HPO GIS and WMS Symbology



WA0182 Forestville Baptist Church 1984

Labels show the HPO site number, site name, and year it received its designation as indicated by its color and shape.

WH0460 W.W. Mizell Farm 2004 1997

Sites that are both SL and DOE show both years (SL year first).

SK0377 Tom and Lucy Smith House 1988

A surveyed property (no designation) shows the year surveyed. If there are two years shown, the second is the year of a survey update.