National Weather Service
Standards Description Document

SHP - Shapefiles

Part I - Mission Connection

1. <u>Standards Description</u>- The National Oceanic and Atmospheric Administration's (NOAA) <u>Policy on Partnerships in the Provision of Environmental Information</u> commits NOAA and NOAA's National Weather Service (NWS) to the use of open standards:

> "To advance the environmental information enterprise, NOAA will provide information in forms accessible to the public as well as underlying data in forms convenient to additional processing, to the extent practicable and within resource constraints. NOAA will make its data and products available in internet-accessible, vendor-neutral form and will use other dissemination technologies, e.g. satellite broadcast, NOAA Weather Radio, and wireless, as appropriate. Information will comply with recognized standards, formats, and metadata descriptions to ensure data from different observing platforms, databases, and models can be integrated and used by all interested parties."

Much of NWS data are geographic in nature. Offering NWS data in a standard, open, and mature geospatial format provides users a graphical method to display geographic data.

Shapefiles are a geospatial vector data format for geographic information systems software. Shapefiles spatially describe points, polygons, polylines. A "shapefile" commonly refers to a collection of files with ".shp", ".shx", ".dbf", and other extensions on a common prefix name (i.e., "lakes.*").

Shapefiles were developed and are regulated by ESRI as a (mostly) open specification for data interoperability among ESRI and other software products and represent a standard that is mature and appropriate to adopt as an NWS standard.

2. <u>Purpose/Intended Use</u> – Data in shapefiles allows Geographic Information System (GIS) users to display and use potentially life-saving and property damage reduction information from the NWS in a more efficient and user-friendly manner. The SHP file formats are used by client software applications. Shapefiles will be disseminated primarily via Internet.

3. <u>Audience</u> – The current audience for shapefile data consists of large volume users of observed/forecast/warning information, utilities, emergency managers,

businesses/industry, academia, and any others who wish to decode and explore various potential applications of the NWS digital data.

4. Presentation Format - The files required by the GIS software are contained within the SHP which describe points, polygons, and polylines to define geographic locations or areas (e.g., forecast areas, warning images). The shapefile uses the world file reference information provided for each of the images to plot the image overlay.

5. Feedback Method - User feedback is extremely important in our effort to improve the quality and usefulness of products and services. For general questions regarding NWS products posted in shapefiles, please email:

NWS Webmaster at **w-nws.webmaster@noaa.gov**

Technical questions regarding specific products in shapefiles should be addressed to the contact points identified in the Product Description Document for that specific product.

**Part II - Technical Details of Standard
Format and Science Basis** - The technical description for shapefiles is posted at: http://www.esri.com/library/whitepapers/pdfs/shapefile.pdf

A "Shapefile" is actually a set of files. The actual shapefile relates specifically to files with the ".shp" extension; however this file alone is incomplete for distribution, as it depends on the other supporting files. Three individual files are mandatory and these store the core data. There are optional individual files which store primarily index data to improve performance. Each individual file should conform to the MS DOS 8.3 naming convention (8 character filename prefix, fullstop, 3 character filename suffix such as shapefil.shp) in order to be compatible with past applications.
Mandatory files :

1. .shp - the file that stores the feature geometry
2. .shx - the file that stores the index of the feature geometry
3. .dbf - the database of attributes

Optional files :

1. .sbn and .sbx - store the spatial index of the features
2. .fbn and .fbx - store the spatial index of the features for shapefiles that are read-only
3. .ain and .aih - store the attribute index of the active fields in a table or a theme's attribute table

4. .prj - the file that stores the coordinate system information, using well-known text
5. .shp.xml - metadata for the shapefile
6. .atx - attribute index for the .dbf file in the form of <shapefile>.<columnname>.atx (ArcGIS 8 and later)