

GIS Notes

Information for Mississippi's GIS User Community

Frequently Asked Questions (FAQ): MDEM Aerial Orthoimagery

Nel Ruffin

What is MDEM?

MDEM (pronounced "em-dem") is an acronym for the Mississippi Digital Earth Model. MDEM will be an up-to-date, highly detailed, computerized map of the State of Mississippi similar to and coordinated with the National Map being compiled at the federal level by the United States Geological Survey (USGS).

What is MDEM aerial orthoimagery?

Orthoimagery removes distortion inherent in aerial photography and other remotely sensed images through the processes of orthorectification and georeferencing. Orthorectification removes displacement of features caused by sensor orientation and distortion due to elevation differences in terrain. Georeferencing spatially aligns the imagery to coordinates in a geographic reference system.

What software can be used to view MDEM orthoimagery?

The MDEM Image Viewer is a free software product that is simple to install and use and is designed specifically for use with MDEM orthoimagery. The MDEM Image Viewer was developed by Dr. Scott A. Samson of Mississippi State University's GeoResources Institute and may be downloaded at no cost from the website of the *Coordinating Council for Remote Sensing and Geographic Information Systems* (<http://www.giscouncil.ms.gov>) or the website of the *Mississippi Automated Resource Information System* (MARIS) (<http://www.maris.state.ms.us>).

Where can MDEM orthoimagery be obtained?

The original GeoTiff imagery and MrSid imagery are distributed directly to county governments. Anyone may download mosaics in MrSid Generation 3 imagery from the website of the *Coordinating Council for Remote Sensing and Geographic Information Systems* (<http://www.giscouncil.ms.gov>). MrSid Generation 2 mosaic imagery from the website of the *Mississippi Automated Resource Information System* (MARIS) (<http://www.maris.state.ms.us>).

When was MDEM orthoimagery collected?

The aerial imagery was acquired in the winter of 2005-2006. All images were collected during the "leaf-off season" in order to see buildings and other man-made objects on the surface of the Earth.

What is the resolution of MDEM orthoimagery?

The resolution of an image determines how much detail has been captured and/or provided. Orthoimagery at a resolution of 2 feet will be available for the entire state, with even finer resolution for some areas. Mississippi's southernmost six counties (Pearl River, Stone, George, Hancock, Harrison and Jackson) are being provided at 1-foot resolution. Some communities will be available at 6-inch resolution.

How does the resolution of MDEM orthoimagery correspond to map scale?

The 2-foot resolution for the entire state is at a linear scale of 1:4,800 (1 inch = 400 feet). The scale of the 1-foot resolution is 1:2,400 (1 inch = 200 feet). Scale of the 6-inch resolution imagery is 1:1,200 (1 inch = 100 feet).

What map projection is applied to MDEM orthoimagery?

Mississippi State Plane Coordinate System, North American Datum of 1983 (NAD83), in linear units of feet.



What image format is used to deliver MDEM orthoimagery?

The original imagery is in the GeoTiff format. County mosaics made from the original GeoTiffs are in MrSID format (Generation 2 and Generation 3).

What is the "GeoTIFF" image format?

GeoTiff is a popular imagery format used for aerial and satellite image data. Geographic data is embedded in the imagery to make it compatible with geographic information systems and associated geographic data.

What is the "MrSID" image format?

MrSID (Multi-resolution Seamless Image Database) is a proprietary image format that supports a high degree of image compression with minimal loss of data quality. MrSid images are currently available in "Generation 2" and "Generation 3" formats. The primary difference between the two formats is the capability of Generation 3 MrSid imagery to create files larger than 2 gigabytes (GB).

Is the MDEM Image Viewer the only software capable of viewing the orthoimagery?

Some no-cost image viewers with more extensive general functionality can be downloaded from the Internet; however, few of them are compatible with the MrSid Generation 3 image format. Geomatica® FreeView by PCI Geomatics (<http://www.pcigeomatics.com/products/freeview.html>) will read GeoTiff and MrSid Generation 2 and Generation 3 image formats. Generation 2 imagery may be read by ESRI's ArcExplorer (<http://www.esri.com/arcexplorer>) and Leica Geosystems' Viewfinder (<http://gi.leica-geosystems.com/LGISub2x288x0.aspx>).

All commercial GIS software packages available through the State Expressed Product List (EPL) are fully compatible with all image formats described above. This includes ESRI and MapInfo software products.

Who acquired the orthoimagery?

EarthData (<http://www.earthdata.com>) collected the aerial imagery. Dewberry (<http://www.dewberry.com>) provided quality assurance and quality control (QA/QC).

Will MDEM provide other data layers?

The seven framework layers comprising MDEM are the standard components of digital maps used by the geographic information system (GIS) community throughout the U.S. and in other countries:

- Geodetic control* provides a common reference system for establishing the coordinate positions of all geographic data. Benchmarks are established to help provide geodetic control.
- Orthoimagery* corrects distortion and define coordinates in the common reference system provided by geodetic control.
- Elevation and bathymetry* convey information about terrain. Elevation is a spatially referenced vertical position above or below a datum surface. Bathymetry is similar to elevation but describes submerged terrain.
- Hydrography* refers to water bodies such as rivers, streams, canals, ditches, reservoirs, lakes and ponds.
- Transportation* includes roads and streets, airports, railroads, bridges, tunnels, waterways and ports.
- Government boundaries* show the geographic areas of states, counties, incorporated places, minor civil divisions, American Indian reservations, and any other units of government.
- Cadastral data* describe the geographic extent of ownership, rights and interests in real property. Cadastral maps are prepared by counties and used for property tax purposes. These maps must clearly depict all property lines and are usually prepared at the scale of 1 inch to 400 feet. Individual counties will determine what cadastral information will be provided.