

FACT SHEET

See what the world is talking about with Geomatica® Hyperspectral capabilities. Hyperspectral data contains information about the environment by representing reflected energy from the Earth's surface in many narrow wavelength intervals. The processing and analysis of hyperspectral images leads to the discovery of Earth surface features that have absorption and reflection characteristics - features often lost within the relatively wide wavelength intervals of conventional multispectral scanners.

Hyperspectral sensors have the highest potential for mapping complex applications, mainly attributed to their fine spectral resolution. Turning hyperspectral data into useful information requires robust image-centric software like Geomatica. From state-of-the-art atmospheric correction to advanced visualization tools, the Geomatica Hyperspectral Analysis Package is the complete hyperspectral solution you need to unearth the Earth.

Geomatica Hyperspectral Analysis Key Features

- Comprehensive Metadata Support
- Visualization Operations
- Advanced Model-Based Atmospheric Correction
- Spectral Mixing and Unmixing
- Spectral Angle Mapper
- Endmember Selection
- Scatter and Spectra Plotting

Metadata Support

In hyperspectral remote sensing, extremely large volumes of image data are collected and must be processed and analyzed efficiently. This capability is provided by the image metadata support new to Geomatica.

Visualization Operations

Highlights of the Geomatica hyperspectral visualization tools include:

- 3-D hyperspectral data cube
- Thumbnail image-based band selection tool
- Band-cycling tool
- Spectra display
- Linkage of scatterplot and image displays

Advanced Model-based Atmospheric Correction

The model-based atmospheric correction method, designed specifically for hyperspectral data, provides a more rigorous alternative to simple atmospheric correction. Inputs to the model are data about terrain elevation, atmospheric conditions, solar illumination geometry, sensing

wavelength intervals, and sensing geometry within the scene.

The Geomatica atmospheric correction model incorporates the advanced MODTRAN4 radiative transfer model. The MODTRAN4 software and data files were developed by the United States Department of the Air Force and can be obtained directly from PCI Geomatics.

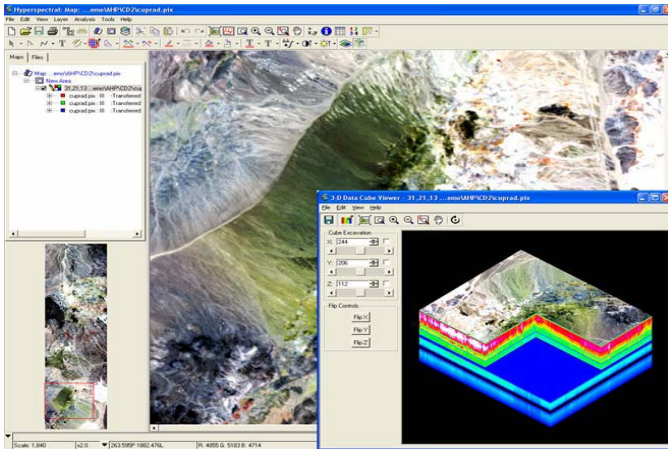
Software for generating an atmospheric water vapor map and for spectral line curvature detection and correction are included. An atmospheric water vapor content map is useful because atmospheric water vapor content can vary significantly within an imaged scene. Spectral line curvature is an optical distortion that occurs in pushbroom type sensors. For many sensors, this distortion is significant enough to affect atmospheric correction results.

Local Analysis

Geomatica provides several useful tools for local analysis of Hyperspectral data. Endmember selection estimates a set of endmember spectra for a specified region and outputs these spectra to file. Linear Spectral Unmixing linearly unmixes known endmembers from a spectral image and performs a 'sub-pixel classification'. The Spectral

Angle Mapper performs supervised classification of hyperspectral imagery given a set of spectral records which define each class.

The Canada Centre for Remote Sensing and Natural Resources Canada provided technical assistance in the development of the Hyperspectral Analysis Package through a commercial agreement.



3-D Hyperspectral Data Cube

Spectra Handling

Robust support for spectral input and output is included with Geomatica. USGS reflectance spectral files are included and spectral information in alternative formats can be imported. Likewise, spectra that have been derived from image data can be exported to several formats. A robust spectra plotting tool makes spectra analysis easy.

Licensing

The *Hyperspectral Analysis Tools* are available as part of the Geomatica Prime package.

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