

# **JPL Web Mapping Server**

<http://MapUS.jpl.nasa.gov/wms.cgi>

*Lucian Plesea*

**Jet Propulsion Laboratory**  
California Institute of Technology

# CONUS Data

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- Multi-Resolution Land Characteristics Consortium 1992 (MRLC)
  - 430 Landsat 5 scenes, acquired in 1992
    - <http://edcwww.cr.usgs.gov/glis/hyper/guide/mrlc.html#mrlc1>
  - Terrain corrected by *Space Imaging*
    - Interactive registration to 1:100,000 Digital Line Graph
    - Elevation from NIMA DTED 1
    - UTM projection, NAD83 datum

# Mosaic

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- Funded by AFRL, for use in a flight simulator
- All 6 bands, IR for night vision simulation
- Geographic projection, 1 arc-second.
- Built in 1998-1999, as a three month effort
- 218,000x95,000 six band image
- 35GB file, lossless compression
- 280 node-hours on a 32 CPU Origin 2000

## Mosaic (cont.)

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- Two main components, analysis and processing
- Analysis establishes precise coverage and statistical properties of data
  - Mask for blend and coverage
  - Intensity histogram for each band
- Based on the analysis results, blend masks and brightness corrections are generated
  - Current version does low and high clipping, strict average matching for one band, relaxed matching for the others

# Mosaic Processing Engine

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- One step from input files to output
- High performance parallel processing
- Checkpoint and restart based on partitioning
- Uses a custom journaling image file for output
- Coordinate transformation to projection and resolution
- Per scene gain and offset correction
- Weighted sum blending based on blend masks

# Journaling Image File

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- Multi-resolution, Multi-spectral support
- Paged, compressed (Gbytes for US mosaic)
  - Raw (85)
  - LZW (36) and Block Arithmetic (30) compression
  - JPEG streaming protocol (9)
- Explicit empty areas
- Multiple versions
- Permanent consistency
- Compressed 16 bit Elevation

## WMT Server

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- Providing a stable WM(T) server for the CONUS Landsat mosaic, provide critical mass of data for WMT activities
- JPL CONUS mosaic available for public
- Uses MIT “Orthophoto” server
- Extensions for band selection and gamma correction
- Active since June 2000, more than 200,000 maps

# WMT Server, Technology

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- Parallel implementation, runs on any SGI
- No temporary files are created
- Uses multi-resolution input files for low latency
- JPEG and transparent PNG
- Gamma correction
- Progressive overlay using a custom active image server.
- Shadow effect based on an elevation map.
- Uses the Journaling Image File

# Global Image (onEarth)

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- Global high resolution image server, technology development and public access to seminal data.
- Current Status:
  - Hosting the 30 arc-second of the MODIS BlueMarble, from GSFC
  - Hosting prototype .5 arc-second, Landsat 7, pan-sharpened mosaics for portions of Africa, Indonesia and Europe, 200 Gbytes
- New server, a 8 CPU Origin300 SGI, data hosted on Linux Network Attached Storage

# Global Image (onEarth)

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- Future development
- Analysis tool:
  - boundary conditions, color-matching inflexion points, cloud removal, manual tuning
- Mosaic engine:
  - higher performance, higher precision, support for color matching masks
- Web server:
  - lower latency, support for GeoTiff, WMS update