

# GeoTIFF Standardization

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# Overview

- Role and Origin of GeoTIFF
- Review of GeoTIFF Data Model
- Problems with GeoTIFF Spec
- Possible Standards Tracks

# Role of GeoTIFF

GeoTIFF is a flexible multispectral geospatial \ imagery file format.

- Suitable for airphotos, satellite images, DEMs, scientific datasets
- Supported to varying degrees by many geospatial and non-geospatial packages
- Frequently used for data distribution
- Efficient enough to use as a working format

# Origin of GeoTIFF

- Effort lead by Mike Ruth (Spot) and Niles Ritter (JPL)
- Adhoc group operating mostly by email
- Membership included data providers, software vendors and government
- Key participants were “implementors” rather than “standards consultants”
- Issued GeoTIFF 1.0 spec circa 1995
- Standard was rapidly adopted, though with varying qualities of implementation

# GeoTIFF Data Model

- Several pixel-to-world transformations
- Projected (ie UTM) and Geographic (ie Lat/Long) coordinate systems
- Coordinate system objects may be referenced by EPSG numeric IDs or by fully defining parameters
- Information stored in reserved TIFF tags

# Pixel To World Transformation

- Tiepoint + pixel size: northup rectified
- GeoTransMatrix: affine transformation (like ESRI world file), sheared or rotated
- List of Tiepoints: known points, but no transformation method implied

# Projected Coordinate System

- Reference underlying geographic CRS
- Projection method (ie. Transverse Mercator)
- Projection parameters (ie. Central Meridian)
- Linear Units (ie. Meters)
- Descriptive Citation

# Geographic Coordinate System

- Geodetic datum (by EPSG code only)
- Ellipsoid
- Prime meridian (default is greenwich)
- Angular units
- Descriptive Citation

# GeoTIFF Spec Problems

- No way of defining datums parameterically, only by reference to EPSG codes
- Many projection methods missing (in EPSG)
- Projection math ambiguity
- Parameter codes for projection methods
- New EPSG versions
- Pixel-is-point vs. Pixel-is-area controversy
- Role of citations
- Vertical datums, 3D in general

# Need for Revision

- Ambiguities and deficiencies in spec
- Some authoritative blessing for spec
- Structure for making a decision

# Standards Track

- Reform Adhoc Group
- OGC - ie. GML/JPEG2000
- ASPRS – working on RPCs for GeoTIFF
- ISO – scary!
- National Bodies – ie. SDTS, SAIF, NTF
- SPG – Focused on “in use” specifications

# Future Milestones

## GeoTIFF 1.1

- Existing 1.0 spec as an ESE
- List projection methods
- List projection parameters
- RPC support
- Newer EPSG versions

## GeoTIFF 2.0

- Vertical support
- Datum transformations
- BigTIFF?

# Invitation for Involvement

GeoTIFF mailing list:

<http://www.remotesensing.org/geotiff>