Draft WARSC Protocol
Assessing Landsat 7 Data Scenes

Ver. 1.0 12/17/01

1. Preliminary

1.1. Review NLAPS Work Order Report (*.W0) to determine if processed according to order. (Check DEM source, projection, datum, resampling method, …)

1.2. Review the NLAPS Work Order Report (*.W0) to determine if the reported model refinement, radiometric and geometric accuracy information is within our acceptable limits. (see RMSE Thresholds in appendix)

	Processing	Model Refinement RMSE	Geometric QA RMSE
Acceptable?	YES	YES	YES
Not Acceptable?			

1.3. Import each NLAPS format file from the CDROM into Imagine to obtain all of the multi-spectral bands and the panchromatic band.

2. Visually Check Dispersion of Ground Control Points (GCP)

2.1. Create export of GCP table from Work Order Report in .dbf or delimited text format

2.2. Create geo-referenced .shp file or ARC/INFO coverage

2.3. Overlay and evaluate for dispersion

	Whole Scene	CP's by Quadrants	Comments
Model Refinement	OK	OK	OK
Geometric QA	OK	OK	HIGH RESIDUALS

3. Visually Check - Radiometric Assessment (<u>conduct for each band)</u>

3.1. Anomalies to look for include 'striping or banding', 'salt and pepper' appearance, data 'dropouts', Cloud Cover, Haze, lack of contrast.

3.2. Maximize your Imagine Viewer window as much as possible on your monitor.

3.3. Display the entire band in the Viewer and look for gross anomalies.

3.4. Zoom in at least 3x , and starting in the NW corner, move over and down in the scene, looking for anomalies visible at this resolution.

3.5. Zoom to a 1x resolution, and review a minimum of 9 points on scene as follows: (note number of cells of offset and direction of offset) At this resolution, the identifiable roads in the scene should be registered within a pixel to the 24K road layer.

3.5.1. Four Corners (NW, NE, SW, SE)

3.5.2. Four Edges (N, E, S, W)

3.5.3. Middle

	Whole Scene	By Quad	9x9 'blocks'
Band 1	OK	OK	OK
Band 2	OK	OK	OK
Band 3	OK	OK	OK
Band 4	OK	OK	OK
Band 5	OK	OK	OK
Band 6	OK	OK	OK
Band 7	OK	OK	OK
Band 8	OK	OK	OK
Band 9	OK	OK	OK

4. Geometric Assessment (multi-band registration)

4.1. The following 3-band color composites should be used to determine the band to band registration of the multi-spectral Landsat data. There is at least a one band overlap to the next color composite to insure all bands are registered to each other. RGB

4.1.1. Bands 3,2,1
4.1.2. Bands 4,5,3
4.1.3. Bands 4,7,3

4.2. Launch a second viewing window, and size the two windows to fit side by side on the monitor. Once data is loaded into the windows (see below), the viewers should be geo-linked. Cursor should be used to compare the coordinates of identifiable features (e.g. road intersections) in at least 6 areas throughout the scene for the following band comparisons:

4.2.1. Bands 6a,3
4.2.2. Bands 6b,3
4.2.3. Bands 8,3

5. Geometric Assessment (single band terrain correction)

5.1. Use Bands 432 and the DNR 24K road layer as to determine Landsat scene geometric fidelity. If an area to be reviewed does not have adequate roads, then select an alternate data layer such as DNR 24K hydrology to assist with determining the geometric fidelity (see list of approved secondary sources appendix)

5.2. Maximize your image window as much as possible on your monitor.

5.3. Zoom in to 3x resolution, and starting in the NW corner, move over and down in the scene, looking for gross (greater than 5 pixels) mis-registration between the road layer and the road features identifiable in the scene.

5.4. Zoom to a 1x resolution, and review a minimum of 9 points on scene as follows: (note number of cells of offset and direction of offset) At this resolution, the identifiable roads in the scene should be registered within a pixel to the 24K road layer.

5.4.1. Four Corners (NW, NE, SW, SE)
5.4.2. Four Edges (N, E, S, W)
5.4.3. Middle

APPENDIX

1. QA RMS Error thresholds

Measure of Error	Target	Rejection Threshold		
RMSEx	1/2 Pixel	N/A		
RMSEy	1/2 Pixel	N/A		
RMSE Combined	1/2 Pixel	> 1 pixel		

2. Draft List of suitable data sets of 'higher authority' to serve as control for Geometric registration check

2.1. DNR 24 K Roads As primary data source
2.2. DNR Hydro
2.3. DNR MPL

3. GeoTiff Distribution File naming convention

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GEOTIFF File Naming Conventions (adopted from EDC)
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File names are defined as follows: L7AAfppprrr_YYYMMDD.TIF where:
L7 - Landsat 7 identifier
AA - file type identifier from the following list:
B1 - Band 1 imagery
B2 - Band 2 imagery
B3 - Band 3 imagery
B4 - Band 4 imagery
B5 - Band 5 imagery
B6 - Band 6L imagery (format 1)
B9 - Band 6H imagery (format 2)
B7 - Band 7 imagery
B8 - Band 8 imagery
f - ETM+ format (always 1 for GeoTIFF products)
ppp - Starting path of the product
rrr - starting and ending rows of the product
YYYYMMDD - acquisition date of the image
MTL - Metadata file
TIF - default GeoTIFF extension
txt - ASCII text readable