

# AWiFs Collection, Norman, OK

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**ASRC Ground Station**



# Brief History

- Operations began in April of 1992
- First commercial ground station that supported *LandSat 4, 5, & 6*
- Continue to provide operational support for Resourcesat-1, Ikonos, and IRS-1D
- Added IRS Production capabilities in 1997

# Overview

- Process Flow of Norman Operations
  - Data Acquisition
  - Data Capture
  - Data Processing
  - Orthorectification of Resourcesat Imagery
  - Final QC
  - Product Delivery
- Q&A

# Data Acquisition

- The Norman Facility includes
  - Datron 11 meter parabolic dual S-band/ X-band Antenna
  - Steerable ViaSat (Scientific Atlanta) Antenna
  - Grounded lightning rods
  - Configured for redundancy and multi-mission supports.



# Data Acquisition

- Customer specifies path, row, quad, and date for collection
- Inside CONUS:
  - Scenes down linked and captured in real-time to Norman Operations facility.
  - Norman Operations supports 2-3 Resourcesat acquisitions per day during growing season.



## IRS-P6 Receiving Stations

Norman, Oklahoma: [GeoEye](#)

Fairbanks, Alaska: [Geoeye](#)





# Data Acquisition

- Outside CONUS:
  - Real-time collection/downlink to IRS-P6 regional affiliate station; or stored on OBSSR and down linked at India.
  - Source image generated at NRSA Processing Center or regional affiliate station
  - Image delivered to Norman via FTP transfer

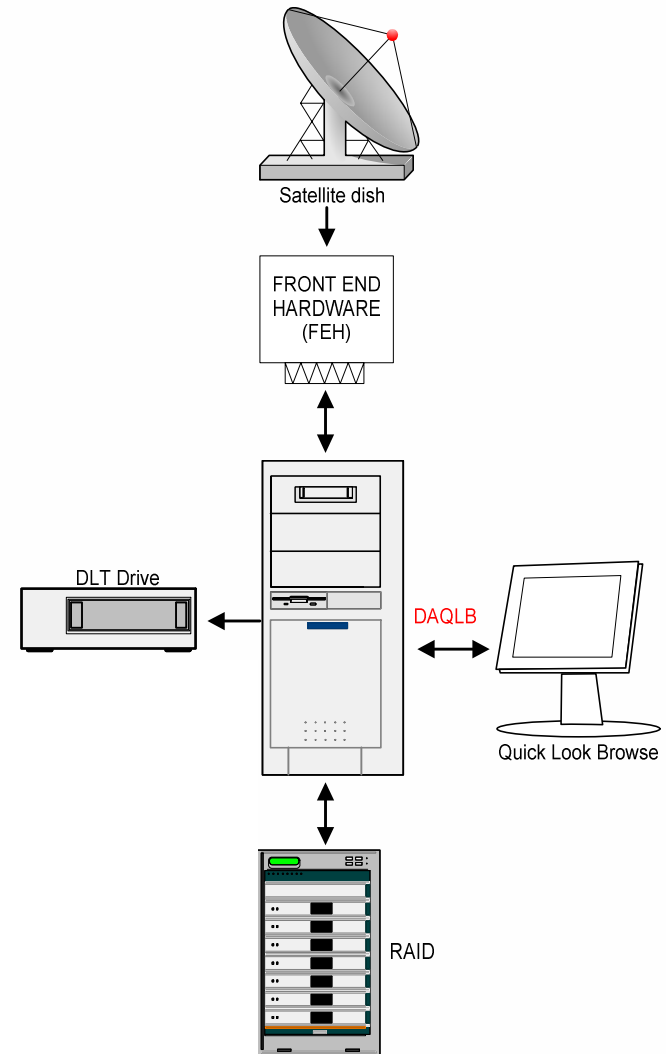


## IRS-P6 Receiving Stations

Hyderabad: **NRSA**  
Neustralitz: **Euromap**  
Abu Dhabi: **Falcon**  
Beijing: **RS GS**

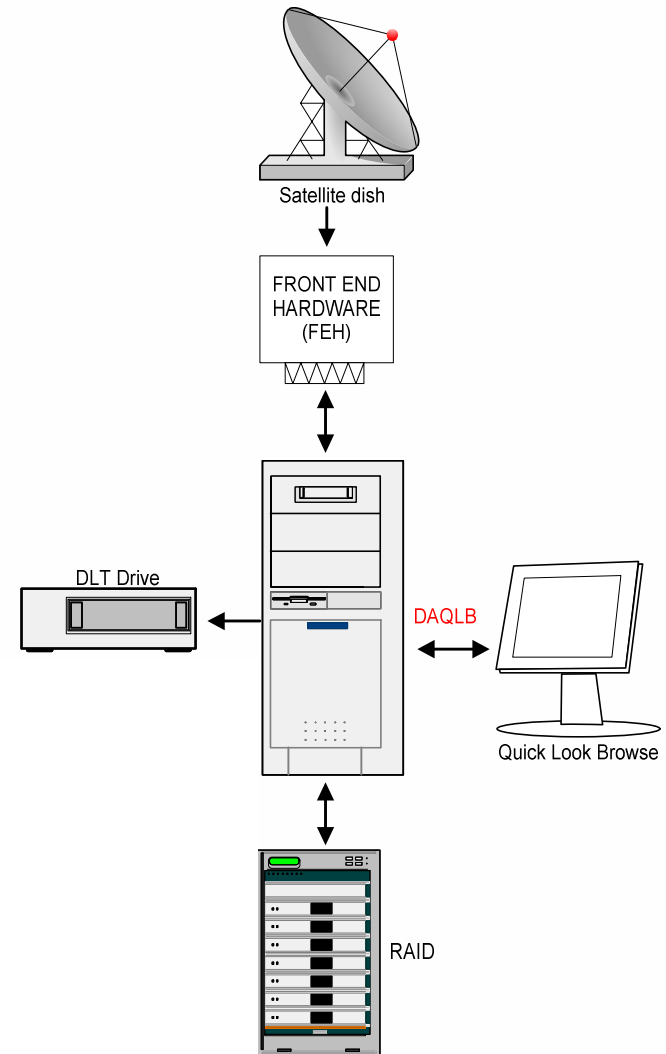
# Data Capturing

- Direct Archival and Quick Look Browse System (DAQLB) handles simultaneous ingest of serial bit streams of data from ResourceSat in real-time
- The system also archives the data on DLT media after appropriate formatting in FRED format.



# Data Capturing

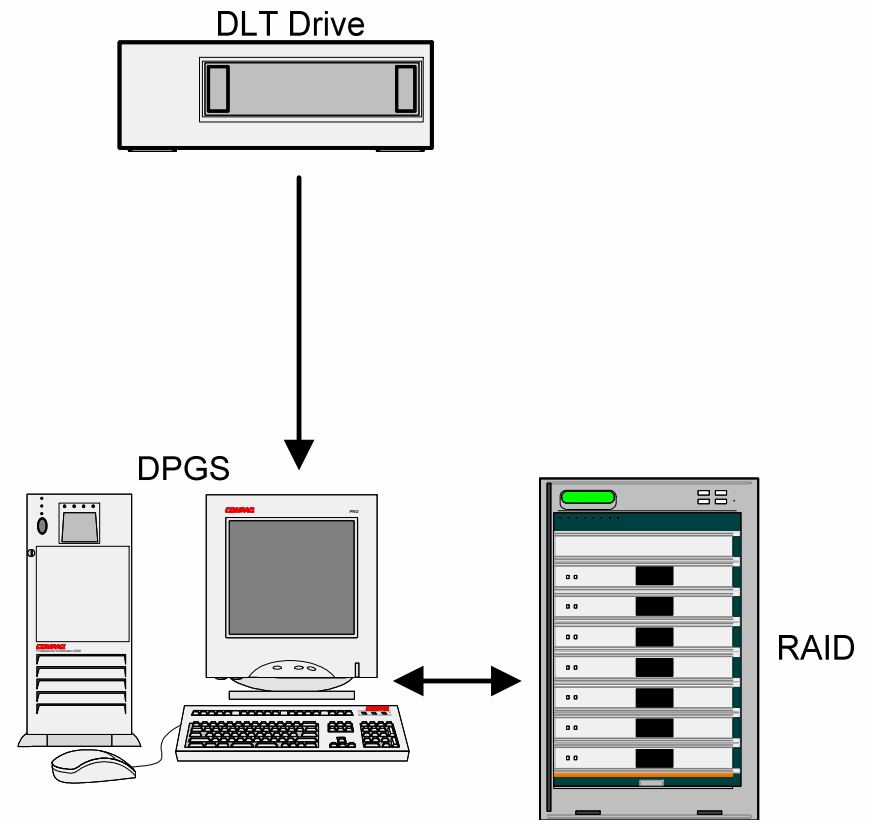
- The system processes the ancillary information and archives it within a database, that is subsequently used for product generation.
- Additionally, this system also generates thumbnail images that can be used in the data selection process.





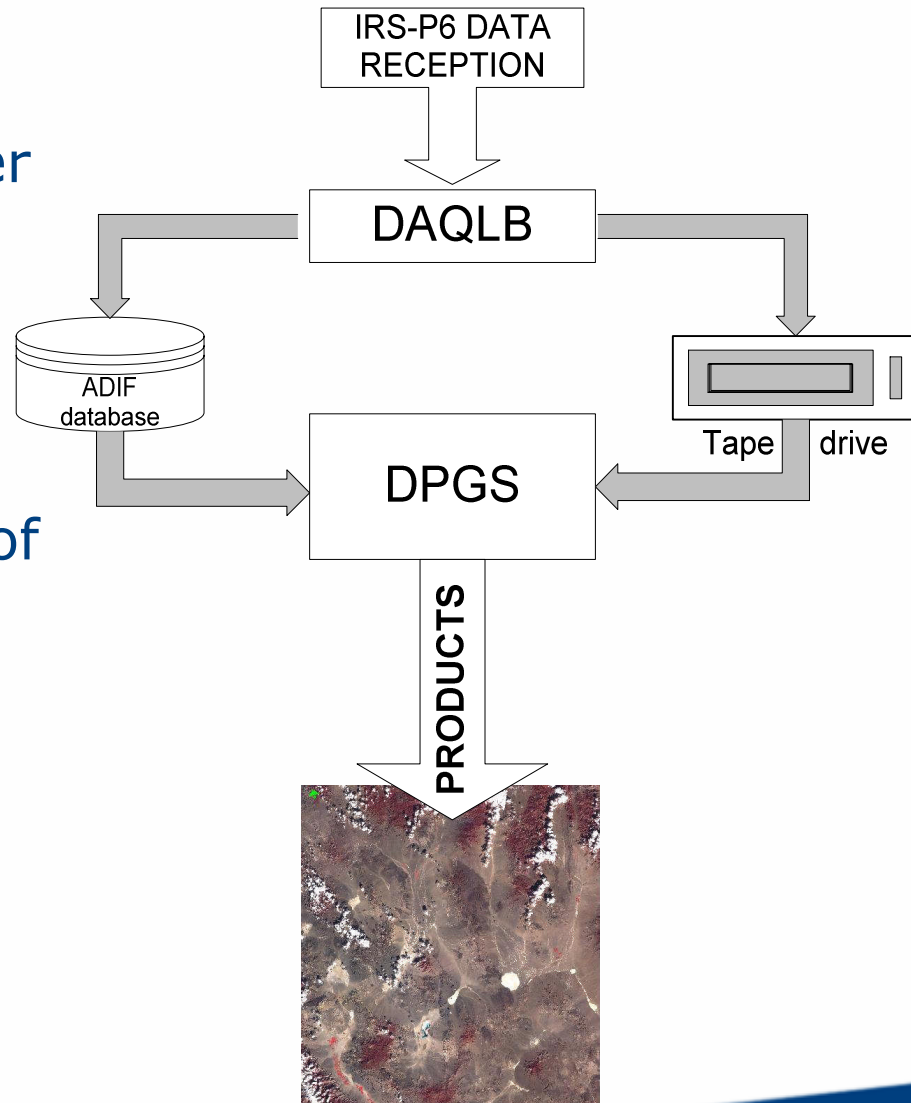
# Data Processing

- Data Production Generation System (DPGS) consists of a set of processes and runtime files containing Satellite and Sensor parameters, radiometric look-up tables, configuration files and related information required for processing.



# Data Processing

- The system downloads the raw video data corresponding to the user area of interest from the DAQLB system.
- The system then generates the source data by executing a set of processes in pre-defined sequence and precedence.

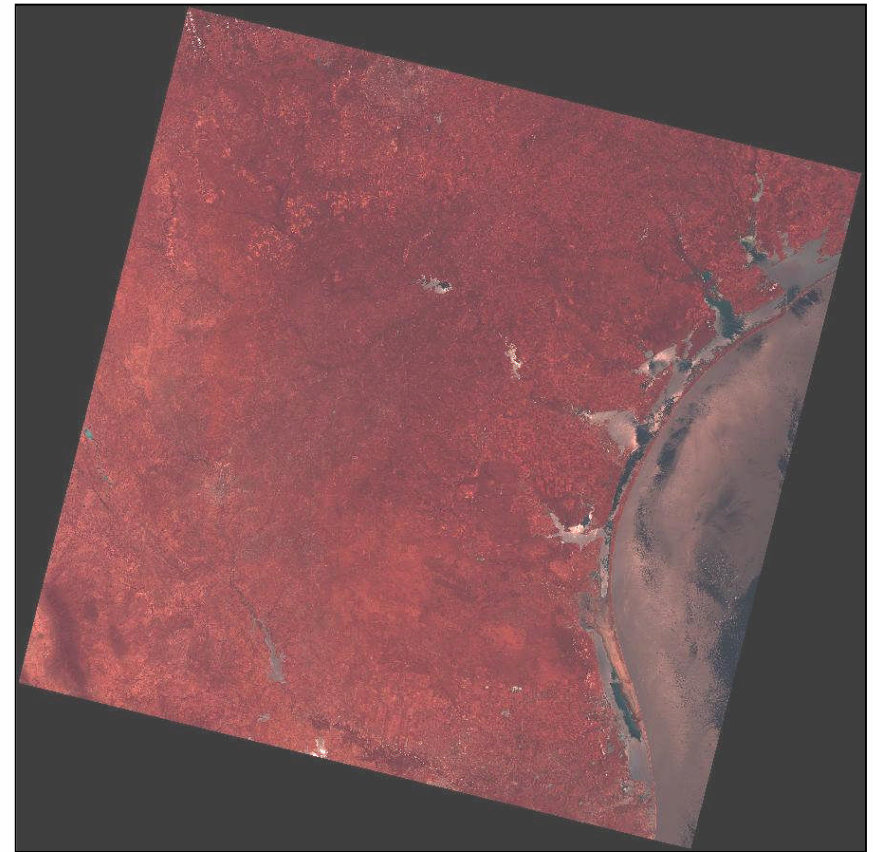


# Data Processing

- Quality control (QC) of source image consists of a visual examination of the scene. The operator would identify the following:
  - Cloud Cover
  - Processing/Downlink anomalies
  - Correct path/row/quad/acquisition date
- Customer contacted (email with screen captures) for any questionable scenes. All scenes that pass source image QC are prepared for orthorectification.

# Orthorectification

- Most Resourcesat-1 imagery sold to USDA is in the form of orthorectified AWiFS scenes.
- GeoEye has developed a production workflow with custom software to streamline the process of data management, control point measurement, block adjustment and orthorectification



# Orthorectification

Major workflow steps:

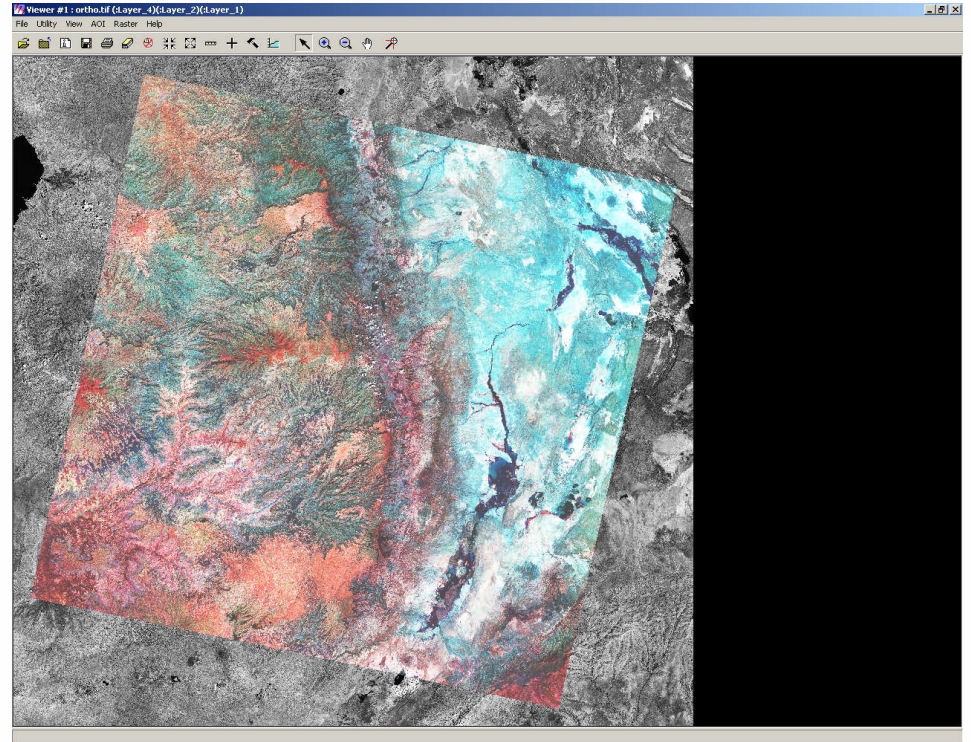
- Ancillary data compilation
  - Data staging utility compiles reference orthoimagery and the DEM
- Control point measurement
  - Automated image matching software used to collect tie points
  - Configured for AWiFS file naming conventions
  - Matches TIFF + RPC/DEM and reference orthoimage
  - Operator has the option to redefine the spacing of tie point measurements. They also have the option to select min/max number of points to extract.
- Orthorectification
  - Imagery optionally scaled from 10 bits per pixel to 8 bits per pixel
  - Cubic convolution resampling employed



# Final QC

Steps in Quality control process:

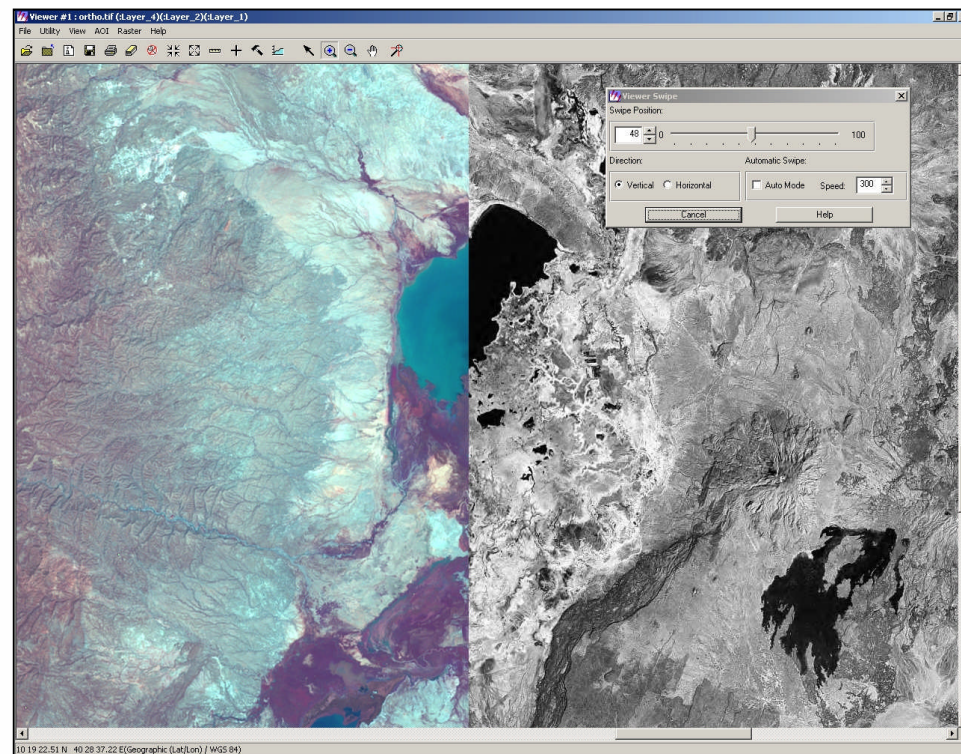
- QC operator checks several areas within image for alignment.
- All areas should be within 1 pixel of reference image
- More tie points added and ortho regenerated if tolerance is not met





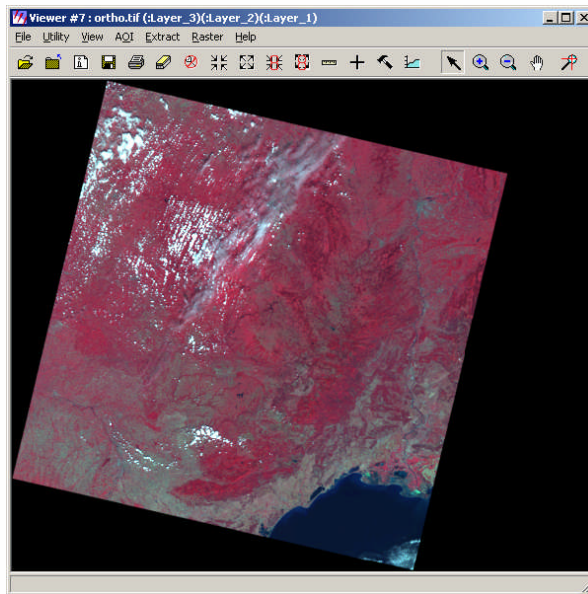
# Final QC

- ERDAS IMAGINE 'swipe' tool used to compare ortho with reference orthoimage
- Ortho viewed with different band combinations to ensure that all 4 bands are OK
- 1 pixel alignment with reference is typically achieved with no rework necessary.

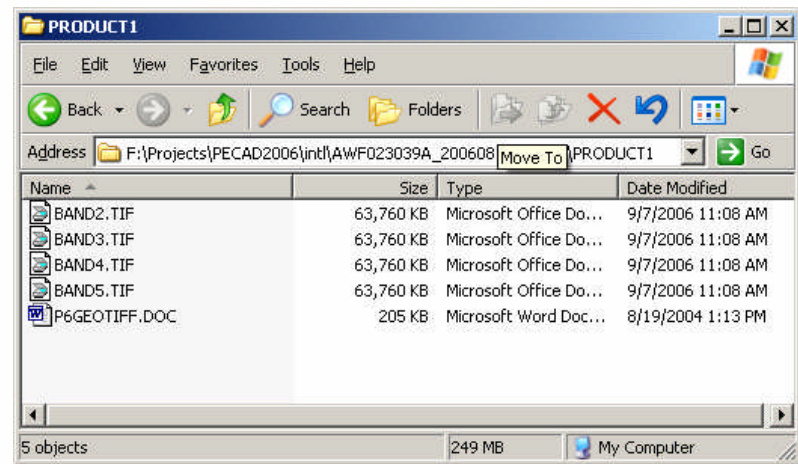
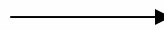


# Product Delivery

- 4-band ortho TIFF split into separate bands is generated.



4-band TIFF ortho



Output GeoTIFF ortho product

- Final product is transferred to FTP server, where customer can download.

# Summary

- Norman Operations continues to provide reliable data acquisition service of Resourcesat-1
- Custom software used for most data processing steps
- Geoeye's Resourcesat Orthorectification process is interactive, but not labor intensive. Providing numerous operator QC points to ensure the highest product quality.