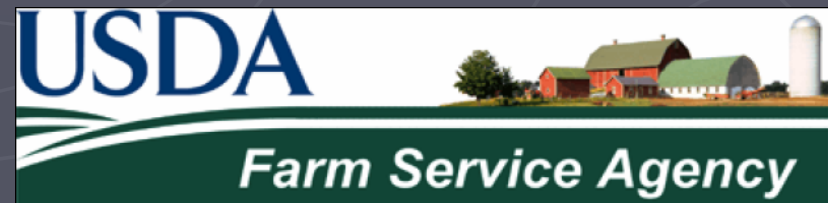


# NAIP 2007 Inspection Briefing

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# Minor Technical Difficulty



# NAIP 2007 Inspection Briefing

- ▶ Inspection Process
- ▶ Defect types
- ▶ ITT case study
- ▶ Trend analysis
- ▶ Inspection status
- ▶ QA future goals

# NAIP 2007 Inspection Briefing

- ▶ Inspection Process
  - ▶ Defect types
  - ▶ ITT case study...starting point
  - ▶ Trend analysis
  - ▶ Inspection status
  - ▶ QA future goals

# NAIP 2007 Inspection

- ▶ Performed on the CCM (Compressed County Mosaic) and 10% of individual DOQQs.
- ▶ Custom inspection program designed at APFO using ArcGis software.
- ▶ 16 categories of defects which the inspector can choose from.
- ▶ Anomaly defects will flag individual DOQQs for closer inspection.
- ▶ Defect points recorded in shapefile format, saved in ORACLE database.

# NAIP 2007 Inspection Briefing

- ▶ Inspection Process
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# Defect Types



MiscArtifact



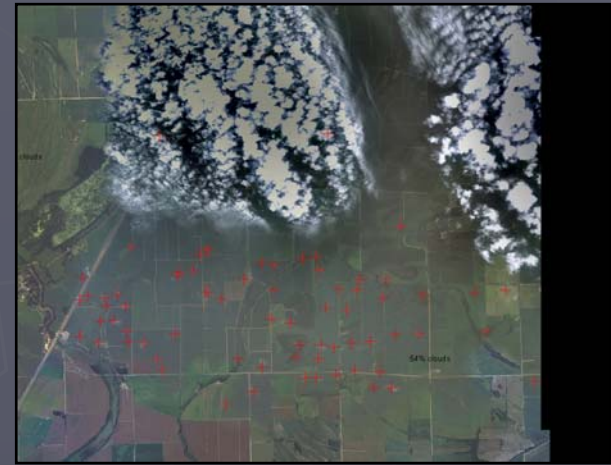
Anomaly-MiscArtifact

- ▶ MiscArtifact used to denote dirt, lint, hair and any other defect which does not fall into another specific category.
- ▶ Anomaly-MiscArtifact used to mark severe artifacts.

# Defect Types (Cont.)



Clouds



Anomaly-Clouds

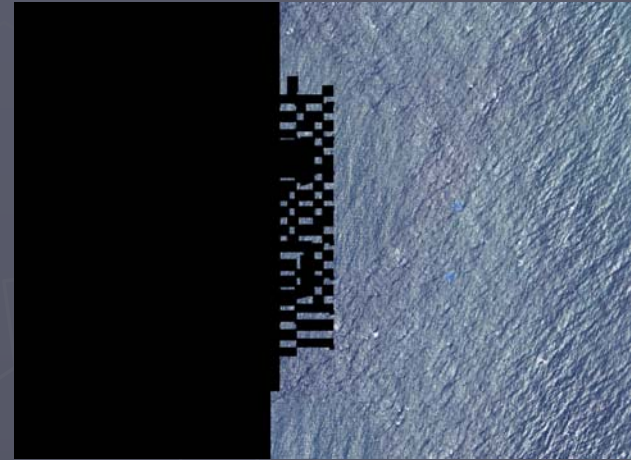
- ▶ High level, thick cumulus, cloud shadows and smoke
- ▶ Anomaly-Clouds, cloud cover is estimated to be over 10%.



# Defect Types (Cont.)



Missing Imagery



Anomaly-Missing Imagery

- ▶ Any non-image area, missing pixels and crabbing.
- ▶ Anomaly-Missing Imagery is any large non-image areas near the DOQQ boundaries or inside the tile.

# Defect Types and Descriptions



Offset



Anomaly-Offset

- ▶ Usually occur between DOQQ boundaries where the CCM was mosaiced.
- ▶ Offsets Anomaly 20+ meters.

# Defect Types (Cont.)



Smearing



Anomaly-Smearing

- ▶ Image stretched or smeared. Usually occurs in steep elevation areas

# Defect Types (Cont.)



Specular Reflectance



Anomaly-Specular Reflectance

- ▶ Light reflected from a mirror surface such as water or aluminum etc.,
- ▶ Anomaly-Specular reflectance: large sun flares, halos, double images that obliterate image detail

# Defect Types (Cont.)



Anomaly-Foreign Imagery



Scratches/Streaks

- ▶ Anomaly-Foreign Imagery, such as misaligned editing
- ▶ Scratches/Streaks may be caused by the scanning process or damage to the film.

# NAIP 2007 Inspection Briefing

- ▶ Inspection Process
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# Inconsistent Quality

- ▶ APFO determined that there was a variance in image quality.
- ▶ Issued a study to ITT to define radiometric requirements.

2004



2005



2006



# Study findings

- ▶ Developed New quality control requirements
  - Radiometric specifications
  - Pre-production image sample



# Radiometric Specifications

Four quantifying metrics were incorporated into the 2007 NAIP contract specifications.

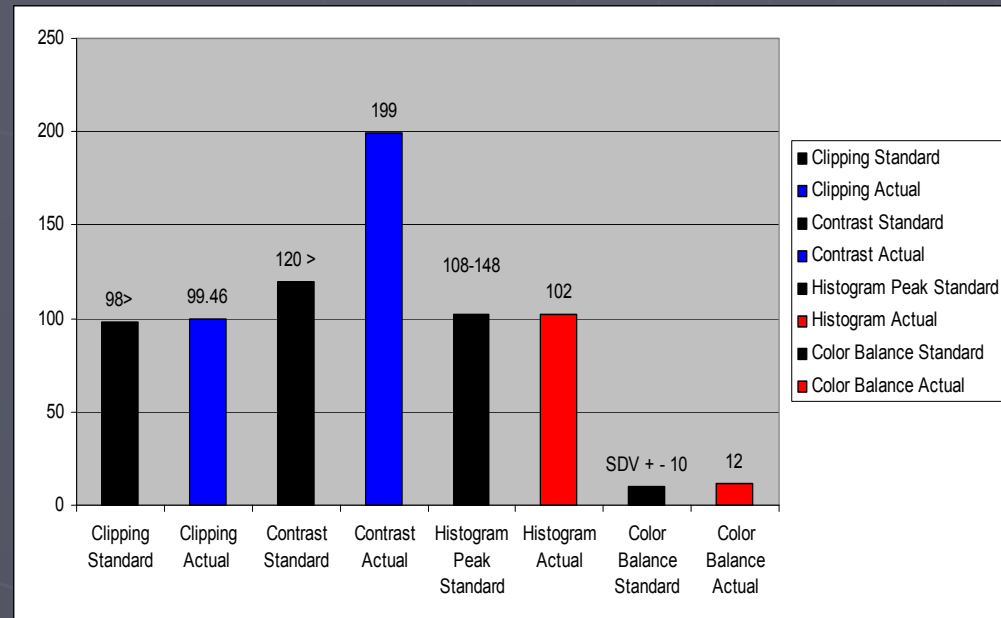
- ▶ **Overall clipping** – cumulative percentage greater than 98, preferred to be greater than 99
- ▶ **Contrast** – greater than 120, preferred value to be greater than 150
- ▶ **Histogram Peak** – Level at the peak to be between 108 and 148
- ▶ **Color Balance** – RGB triplet within 10 of each other

# NAIP 2007 Inspection Briefing

- ▶ Inspection Process
- ▶ Defect types
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- ▶ **Trend analysis**
- ▶ Inspection status
- ▶ QA future goals

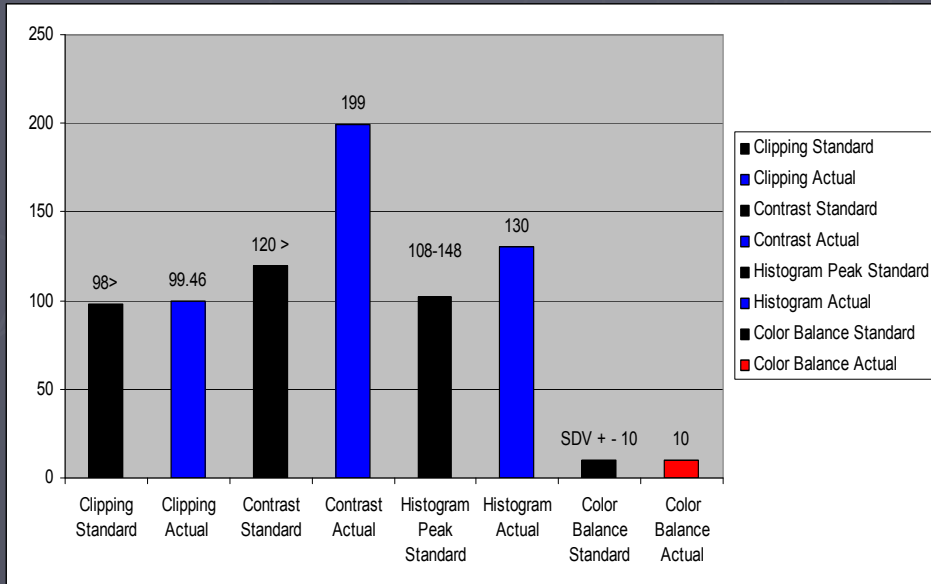
# Quality Evaluation

2004



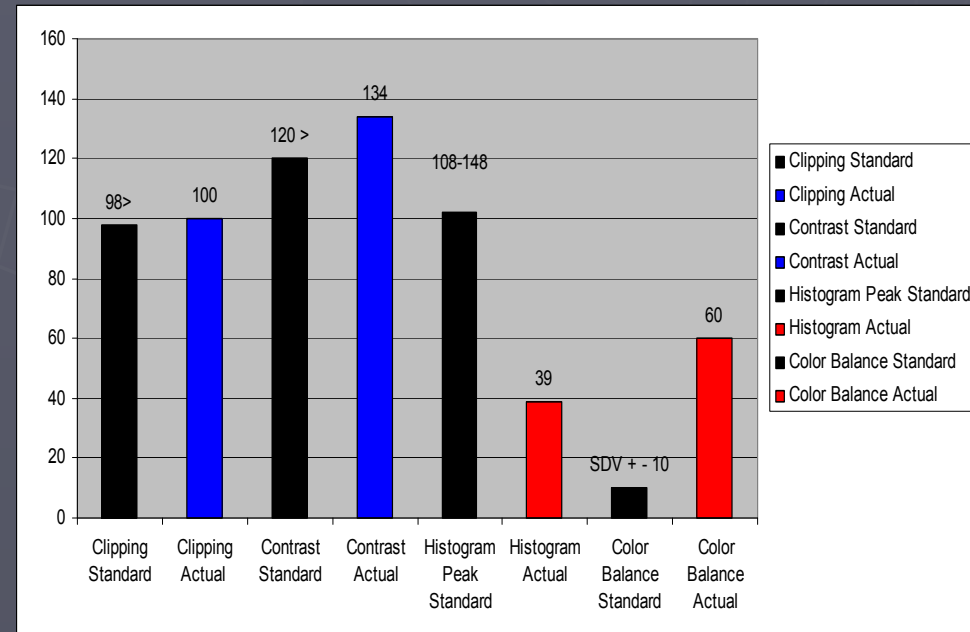
# Quality Evaluation

2005



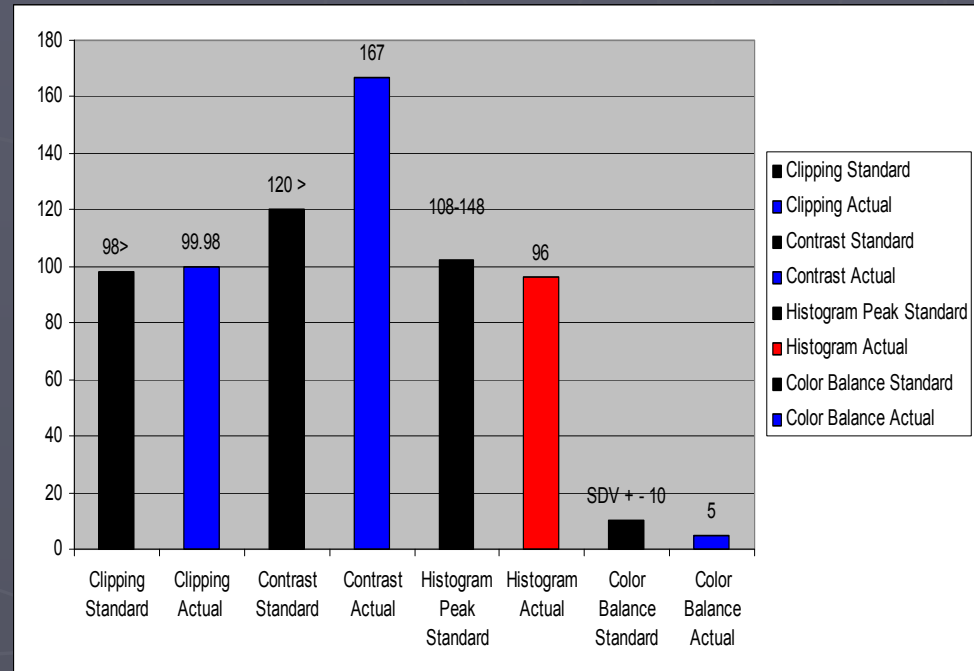
# Quality Evaluation

2006

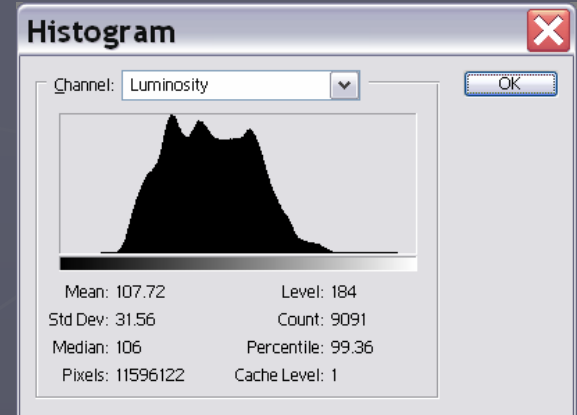


# Quality Evaluation

2007



# Original 2006 Image



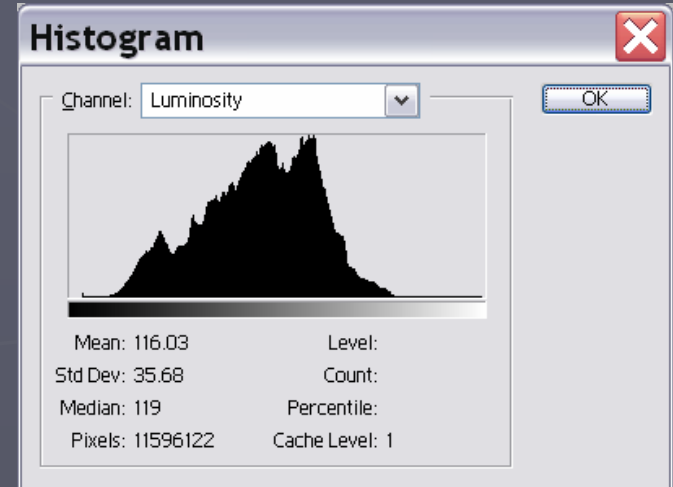
Clipping – 100%

Contrast – 131

Histogram Peak – 80

Color Balance (RGB) – 147, 128, 105

# Adjusted 2006 Image



Clipping – 99.98%

Contrast – 151

Histogram Peak – 147

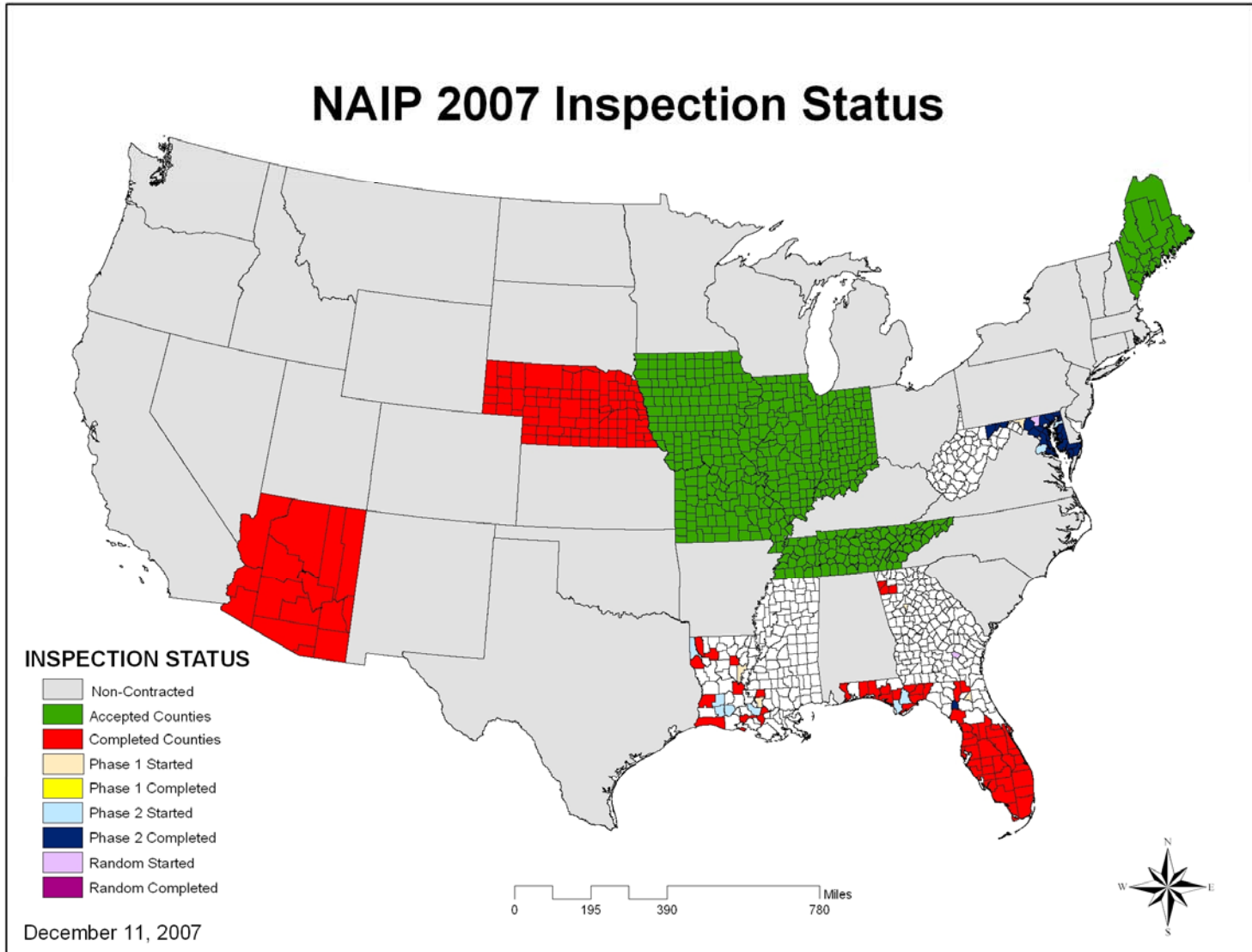
Color Balance (RGB) – 192, 194, 191



# NAIP 2007 Inspection Briefing

- ▶ Inspection Process
- ▶ Defect types
- ▶ ITT case study...starting point
- ▶ Trend analysis
- ▶ Inspection status**
- ▶ QA future goals

# NAIP 2007 Inspection Status 72% complete



# NAIP 2007 Inspection Status

- ▶ Arizona 87.7 Complete
- ▶ Florida 55% Complete
- ▶ Georgia 0% Complete
- ▶ Illinois 100% Complete
- ▶ Indiana 100% Complete
- ▶ Iowa 100% Complete
- ▶ Louisiana 0% Complete

# NAIP 2007 Inspection Status

- ▶ Maine 100% Complete
- ▶ Maryland 30.7% Complete
- ▶ Mississippi 0% Complete
- ▶ Missouri 100% Complete
- ▶ Nebraska 97.1% Complete
- ▶ Tennessee 100% Complete
- ▶ West Virginia 0% Complete

# NAIP 2007 Inspection Briefing

- ▶ Inspection Process
- ▶ Defect types
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# QA's look a head

- ▶ Manual inspection using Photoshop
  - Random inspection of tiles
  - Any imagery in question will also be looked at
- ▶ Long term goal is an automated script run prior to inspection

# QA's look a head

- ▶ Make NAIP imagery usable for multi-agency requirements by working with our contractors to refine quality standards
  - a. color
  - b. contrast
  - c. Exposure

# NAIP 2007 Inspection Briefing

- ▶ Inspection Process
  - All CCM, 10% DOQQ, ArcGis/Orical
- ▶ Defect types
  - Monitor 16 defects
- ▶ ITT case study
  - QA starting point
- ▶ Trend analysis
  - feedback to contractors, future QA standards
- ▶ Inspection status
- ▶ QA future goals
  - Work closely with contractors to improve image quality