Intergraph's ZI Imaging Digital Mapping Camera (DMC)

The most advanced digital image acquisition technology available.

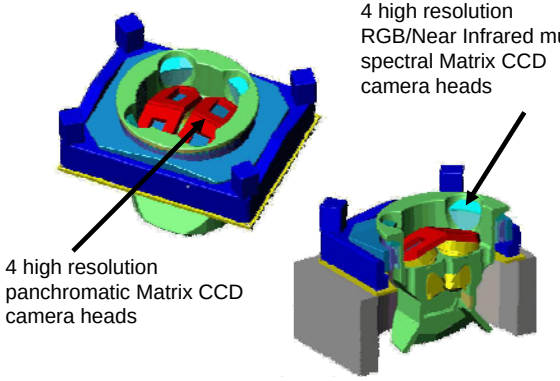
- Highest resolution and accuracy
- Superior image quality for mapping products
  - Panchromatic – 12-bits per pixel or 4,096 levels of gray (versus 256 levels of gray from film)
  - Natural Color (RGB) – 36 bits per pixel
  - Color Infra-Red (CIR) – 12-bits per pixel
  - All three products available from a single flight
  - Onboard 864 GB data storage
  - ABGPS and IMU integrated
  - Forward Motion Compensation

VARGIS Image Acquisition Team

- Three DMC's will be used to complete the image acquisition for the project:
  - 3001, Inc.
  - Photoscience
  - GE
- DMC has been service since July of 2003
- To date the project team has completed over 150 projects

Digital Mapping Camera Design

The most advanced digital image acquisition technology available.



4 high resolution RGB/Near Infrared multi spectral Matrix CCD camera heads

4 high resolution panchromatic Matrix CCD camera heads

CCD Sensors to Processed Virtual Image

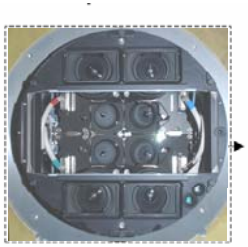
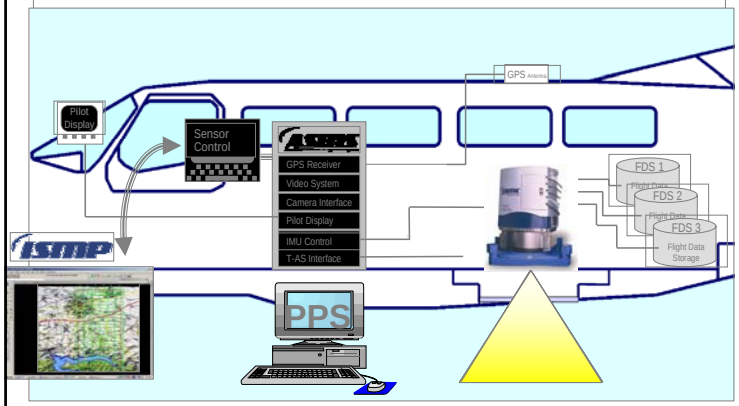


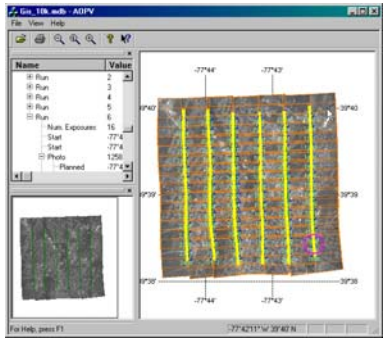
Fig. 1. DMC standard constellation with four panchromatic (Pan) and multi-spectral (MS) modules, where
F/R = forward right looking (facing flight direction)
B/R = backward right looking
F/L = forward left looking
B/L = backward left looking.

Fig. 2. Footprint of the panchromatic Images including overlap area, dashed line = virtual image

Digital Mapping Camera Components



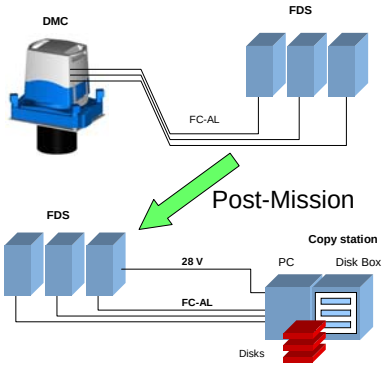
Airborne Quickview Project Viewer



Flight Mission QA/QC

- Real time video information
- Real time project status
- Real time project overview
  including flight lines and image centers
- Visual Mosaic of Mission Area

Aerial Field Data Storage to Archive Copy



- A full set of Imagery from FDS can be copied in 4 hours
  1850 images or 864 GB of data
- ABGPS and IMU data copied from 1GB flash card
- Removable disk drives used
  size and weight of one set equivalent to one film roll, but 2 times the number of images

Orthophotography

Horizontally corrected imagery

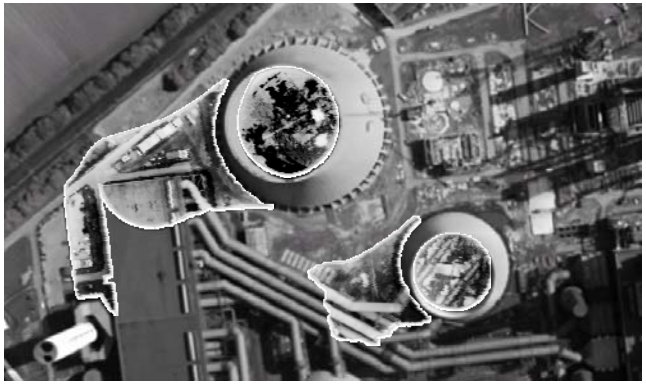
Digital Imaging Uses

- GIS Image Basemap
- Planimetric Mapping (buildings, edge of pavement, sidewalks, manholes, fences, etc.)
- Engineering Planning and Design
- Environmental Studies – vegetation stress, wetland analysis
- Emergency Management Response

FEMA Flood Mapping

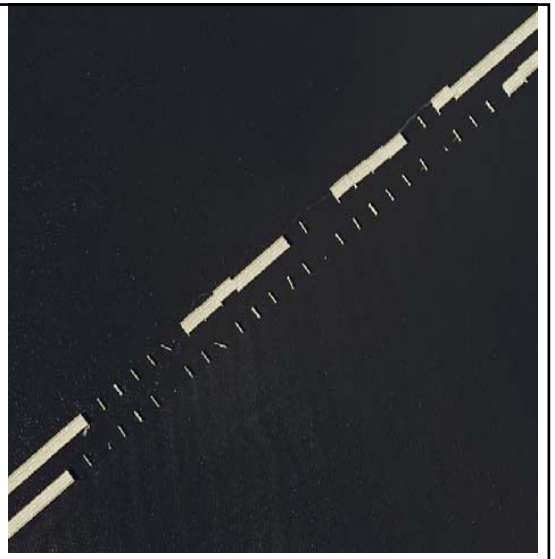
Digital Image Capture – 12-bit

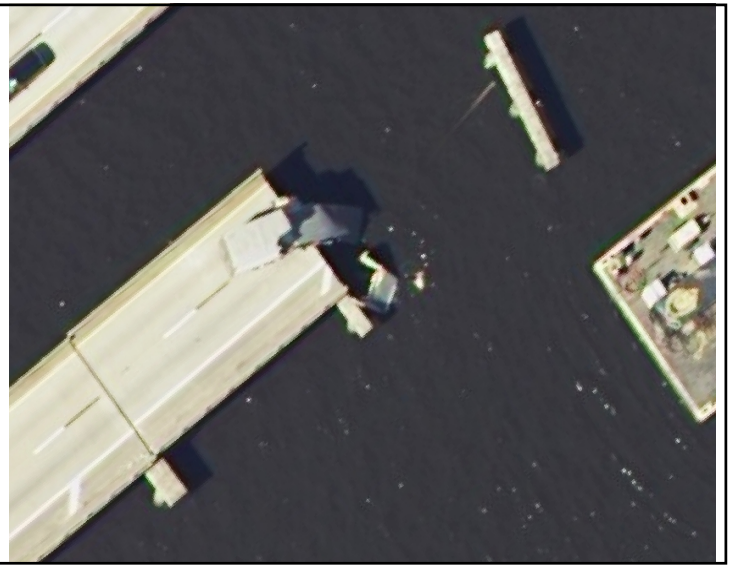
Increased radiometric resolution means more detail in highlights and shadows (4,096 shades of gray vs. 256 with film-scan based systems)



12-Bit Data Adjustment to Reduce Shadows During Mapping

I-10 Bridge
in Pensacola

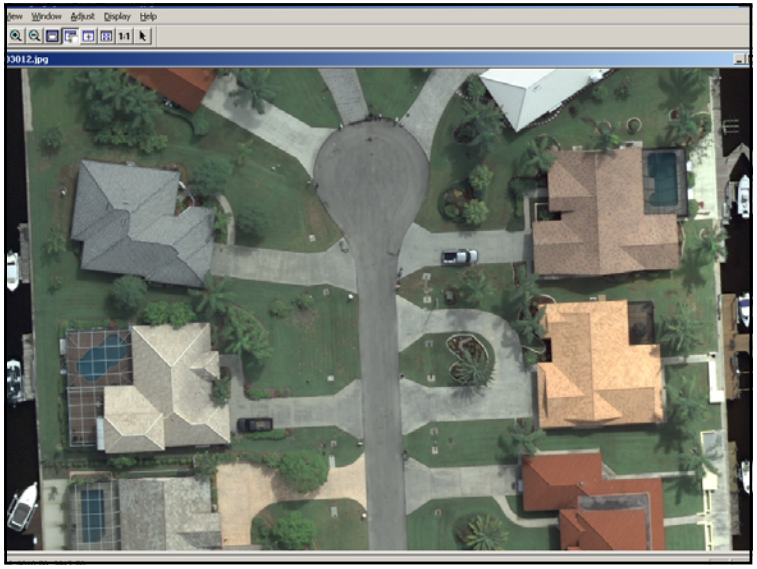


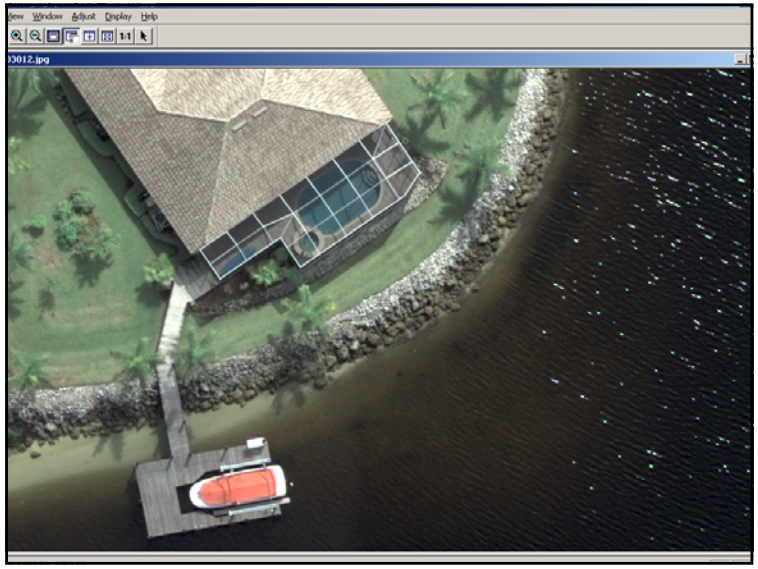


DMC Sample Imagery

imagination at work

DMC Sample Imagery





Digital Image Capture

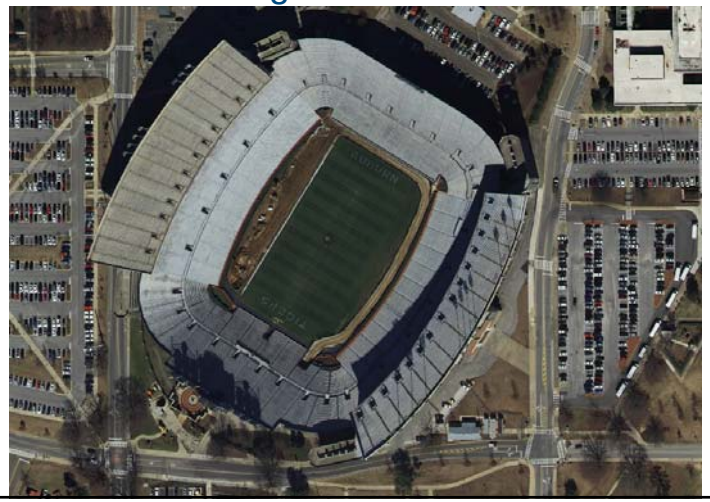
Imagery resolution down to 1.5” per pixel

DMC Panchromatic Image

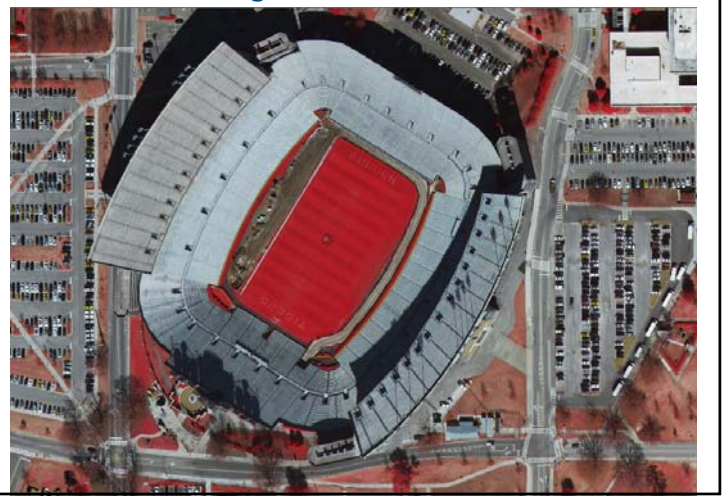
DMC RGB Image

DMC Color Infrared Image

DMC RGB Image



DMC CIR Image



Film vs. Digital Comparison

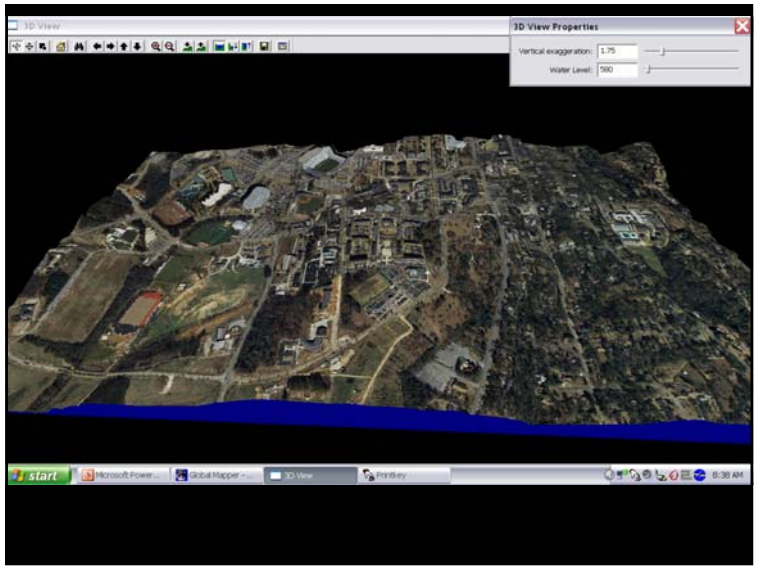
Traditional Film 3” DMC Digital 3”

The DMC provides exceptional clarity compared to a traditional film project.

Summary

Comparison with Film

- Much better radiometric resolution – 12 bit
- Less noise: no film grain, dust, scratches or Newton rings
- Captures Panchromatic, RGB and CIR all in one flight mission
- Faster turnaround
- Eliminates cost of material, processing & scanning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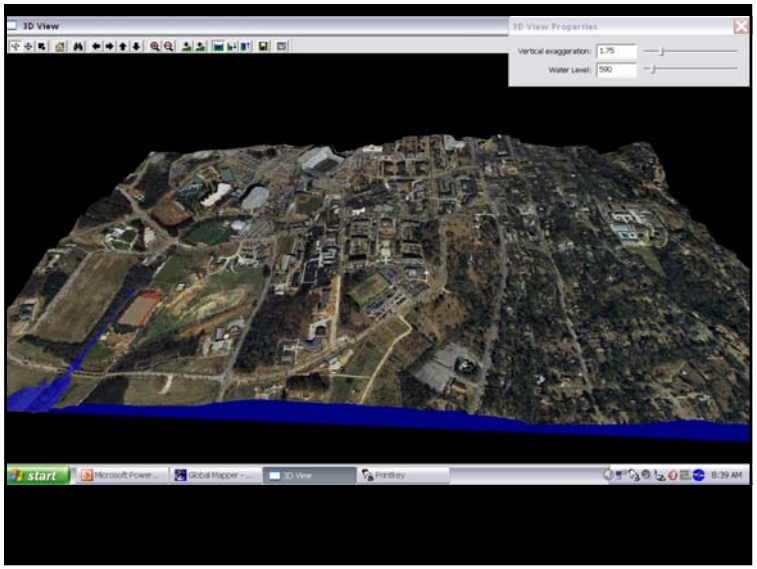
Vertical exaggeration: 1.75
Water Level: 580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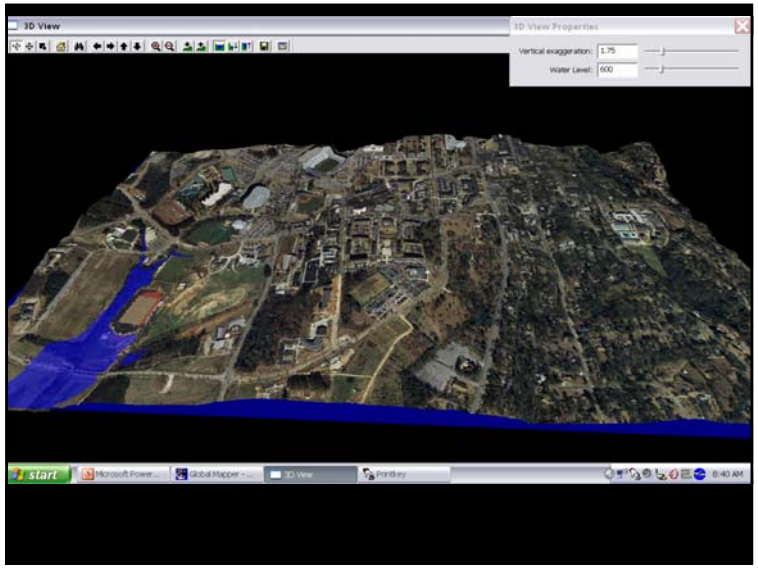
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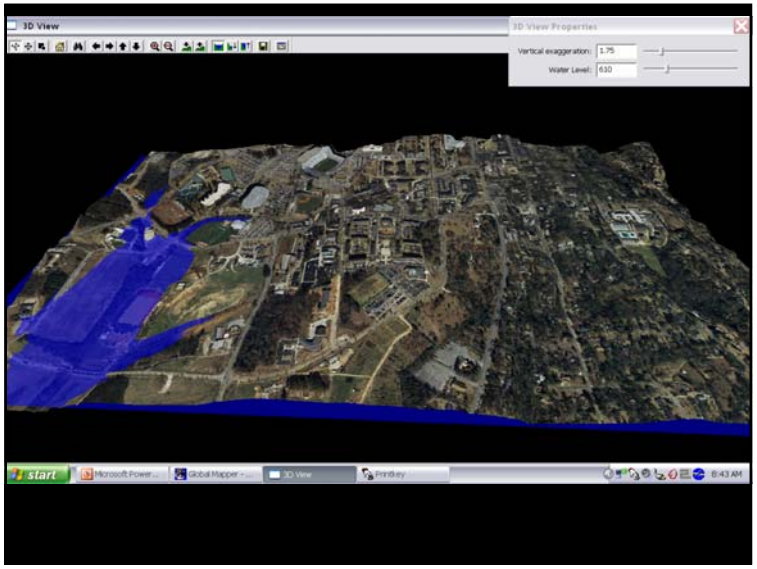
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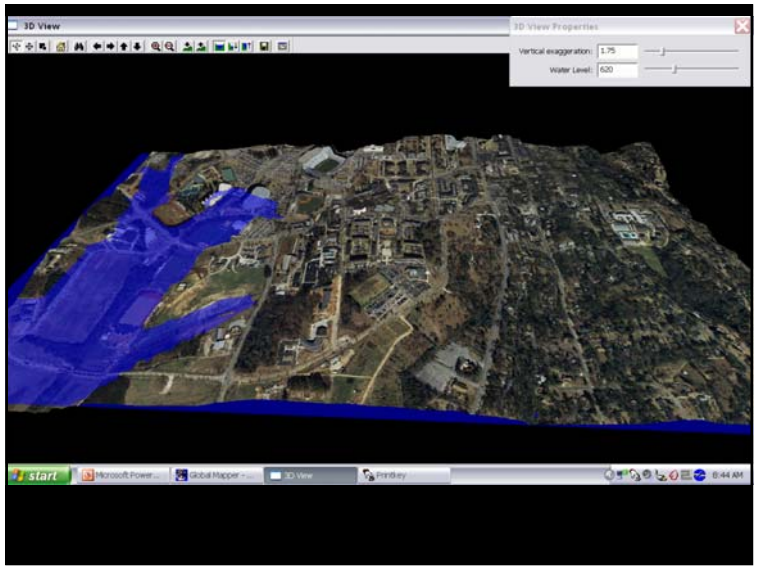
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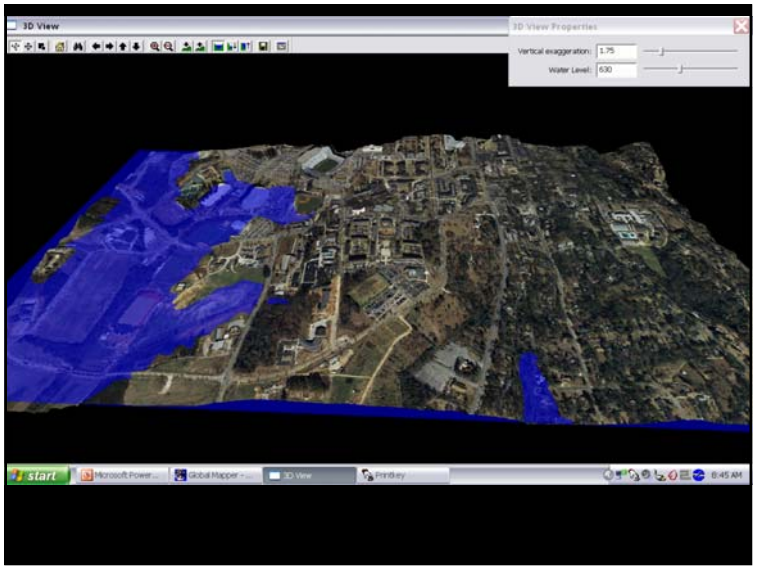
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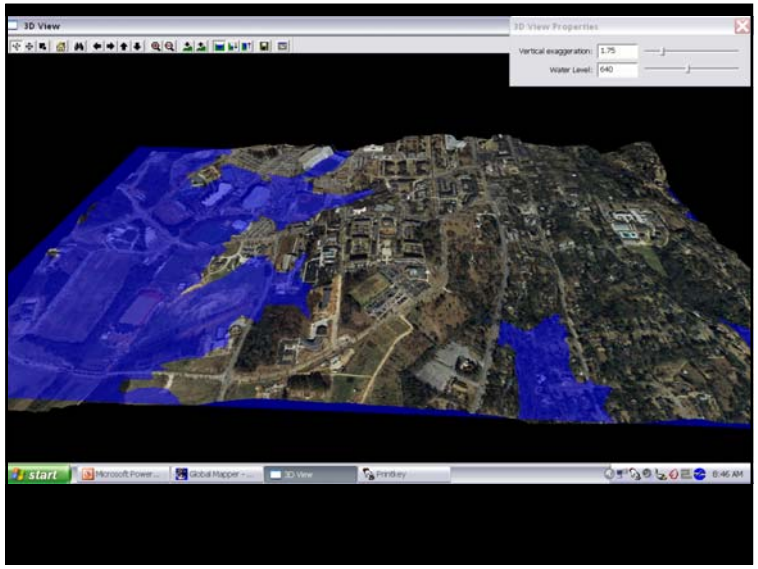
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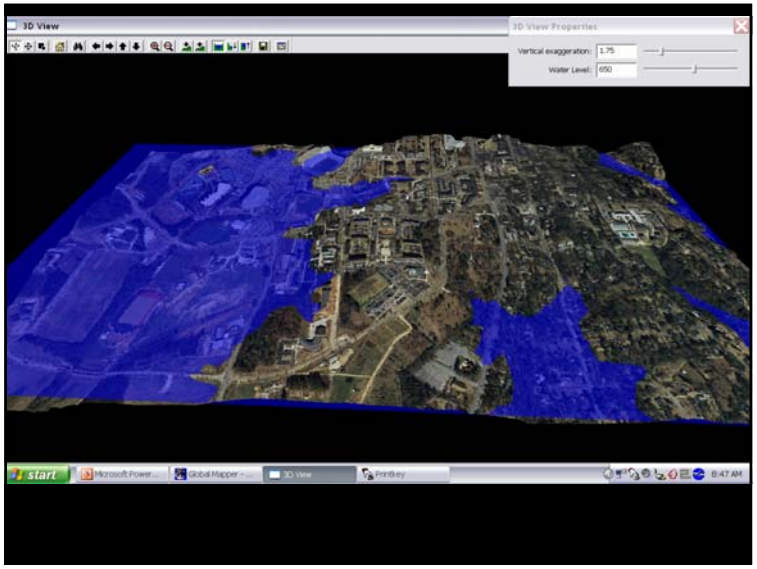
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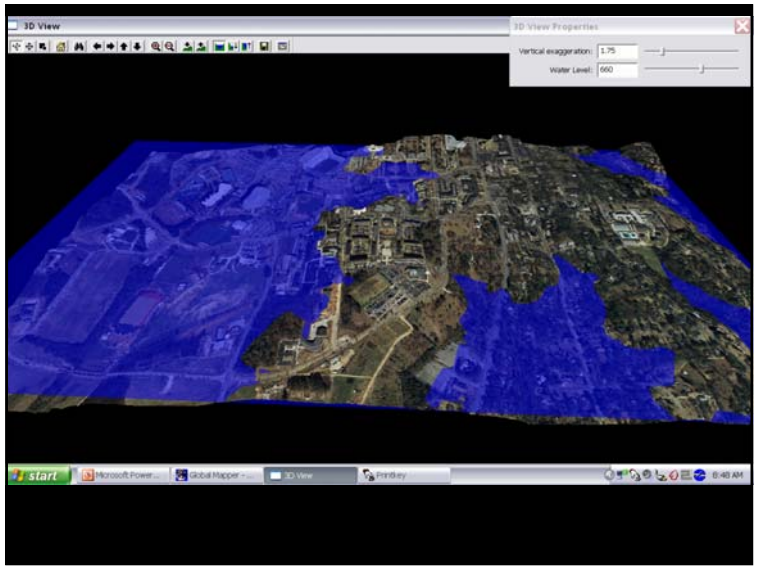
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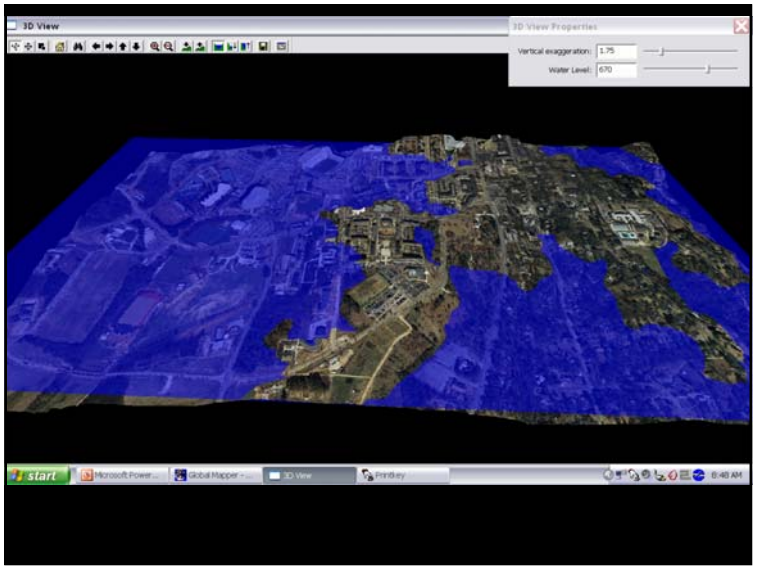
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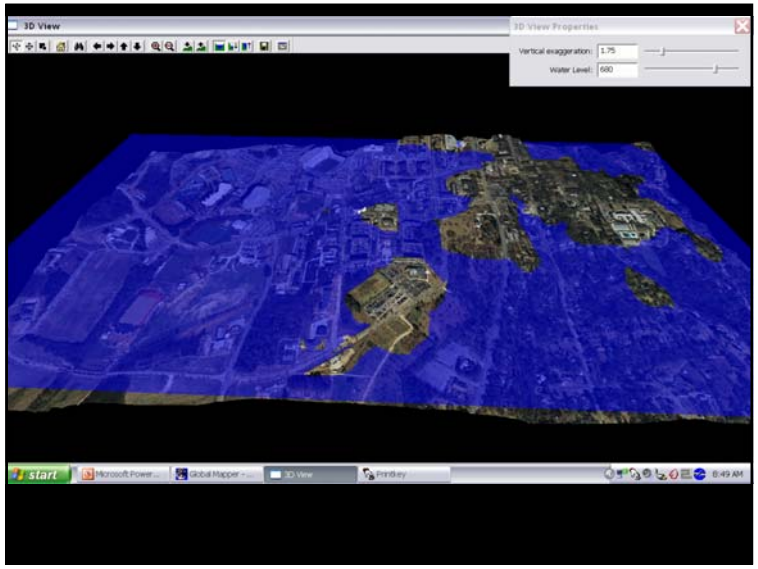
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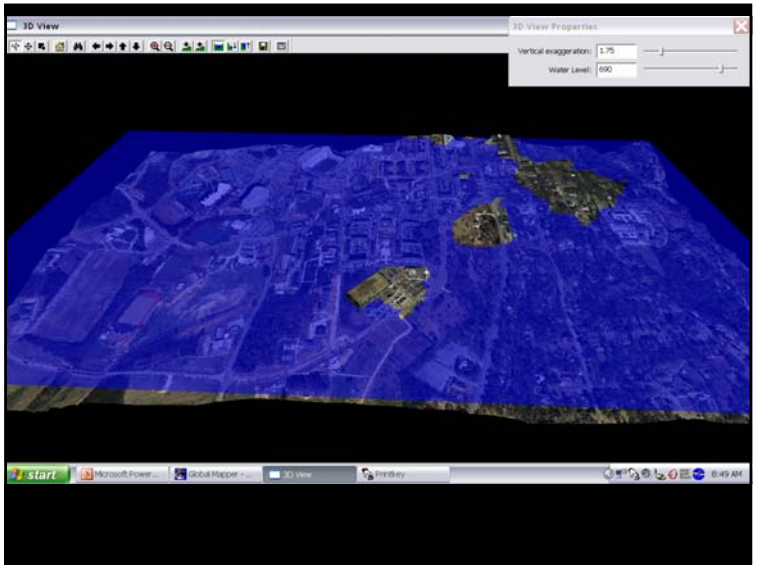
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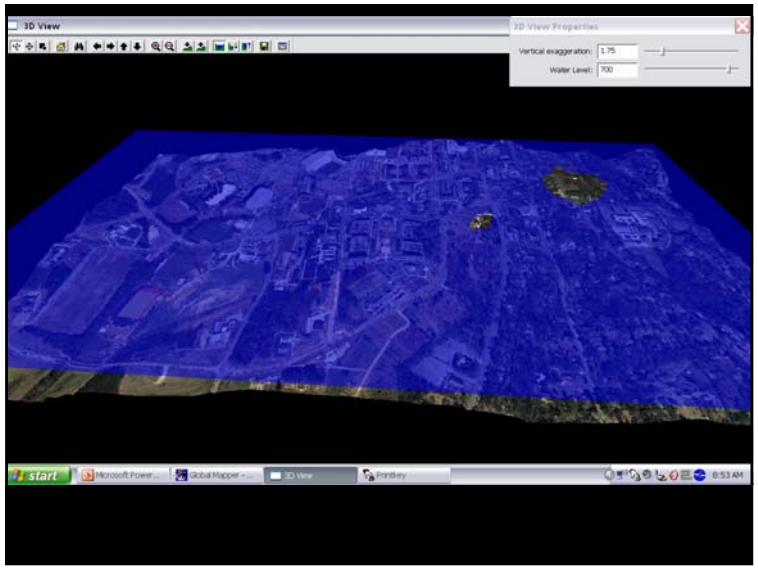
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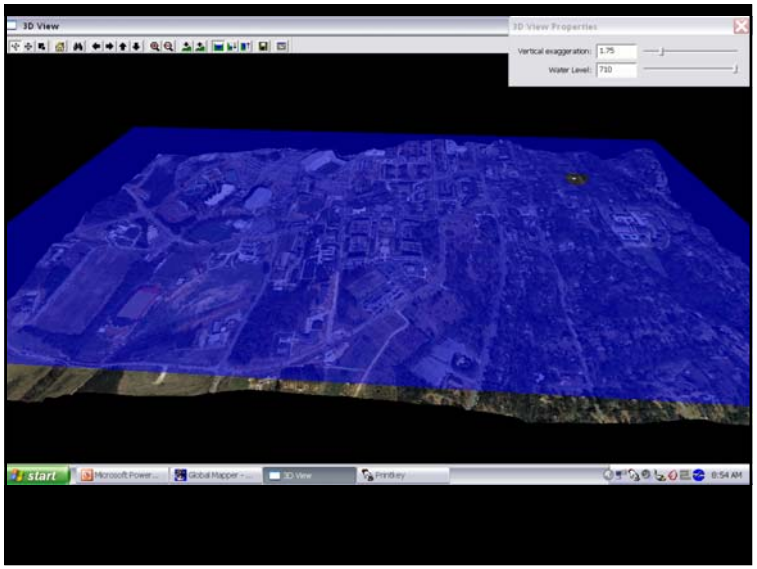
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8:54 AM

THANK YOU