

# Security and Disaster Preparedness: New York's Experience

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Presented by:

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# Security

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1. Physical security of critical facilities and data identifying critical facilities
  - Public and private aspects
2. Emergency preparedness
3. Diversity and redundancy of critical networks and technologies

# Our Emergency Preparedness Systems Were Tested on September 11, 2001

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The attack on the World Trade Center seriously disrupted utility services in lower Manhattan

## Electricity

- The collapse of WTC Building 7 destroyed two substations
- About 12,000 predominantly commercial customers were out of service, representing an estimated peak load of 362 MW.
  - Many of these customers were large commercial buildings that employ thousands of workers
- The area affected included the South Street Seaport and much of the financial district
- Con Edison made extensive use of temporary generators
- Service was restored, to the extent it could be, on October 2
- It will take months to finish permanent repairs

# Our Emergency Preparedness Systems Were Tested on September 11, 2001 (continued)

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## Gas

- Took three days to isolate gas mains
- Con Edison divided the affected area into 13 restoration zones
- Initially, gas could only be restored to buildings with permanent electric service restored
  - Buildings also had to be deemed to be structurally sound and pass piping integrity tests
- Gas service was restored approximately ten days after the event
- It is likely to take several months before Con Edison can inspect all of its damaged gas facilities

## Steam

- Con Edison initially isolated the steam network south of Canal Street, affecting 303 customers
- It began restoring service a zone at a time
- Service was restored about a week after the event

# Our Emergency Preparedness Systems Were Tested on September 11, 2001 (continued)

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## Telecommunications

- Verizon's and AT&T suffered significant network damage
  - Especially hard hit was Verizon's 140 West Street central office
- A surge in network calls swamped the network and cell systems for hours
- Verizon lost service to 295,000 exchange lines and 3.3 million special circuits and trunks. AT&T lost service to 49,000 lines and 1.1 million circuits
- Restoration work is continuing. As of November 1, 97% of lines that could be restored, had been restored

## Cable TV

- Most major network broadcast TV stations and some FM radio stations in the NYC area were off the air from their primary transmitter sites on 9/11
- The cable TV systems generally remained operable through direct connections to networks

# **For Years, the PSC Has Received and Reviewed Emergency Plans From Utilities**

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- These plans describe procedures to be followed by New York utilities in emergency situations
- Among the most useful information they contain is lists of emergency contact names and phone/beeper numbers
- These plans have been invaluable in dealing with weather-related emergencies

# **We Enhanced Our Disaster Preparedness Planning For Y2K**

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- In 1999 we had dozens of employees involved in Y2K preparedness
- In addition to concerns about computer malfunctions, there was an increased look at the possibility of sabotage or terrorist activity
- Our agency was one of many that participated in round the clock monitoring at the State Emergency Management Organization's bunker
- There were no Y2K related disturbances among NY utilities

# Use of the SEMO Command Center Has Been Important in Emergency Situations

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- Representatives from about two dozen agencies are all in one place, which can make it easier to coordinate information flow
- There are regularly scheduled briefing times
- Daily reports provided in uniform manner from all agencies
- We have been able to arrange around the clock coverage in emergency situations
- Emergency procedures are defined and have been field tested

# **Our Agency Monitored the Situation Beginning Immediately After the Attack**

- We manned a desk at SEMO beginning on 9/11 on a 24 hour basis
- We were on site at Verizon's Corporate Emergency Operations Center and at Con Edison's NYC Electric Command Center
- We had gas safety engineers at Con Edison's gas control centers
- We helped answer questions about communications issues raised by federal and state agencies, and by businesses
- We prepared daily updates for the Governor's Office and other Agencies on the status of utility service restoration

# **Our Agency Helped Customers Regain Utility Service**

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- We participated in on-site State and NYC efforts to assist business recovery
- We assisted customers through our consumer complaint help line and hot line.
- We participated on the Stock Exchange Recovery Team and the Mutual Aid and Restoration Consortium (for NYC telco companies)
- We assisted in service restoration for state facilities
- We assisted in obtaining portable generators for customers, including the MERC, until network service could be restored

# Aerial Imagery for the World Trade Center Disaster

Digital images and Geographic  
Information Systems (GIS)

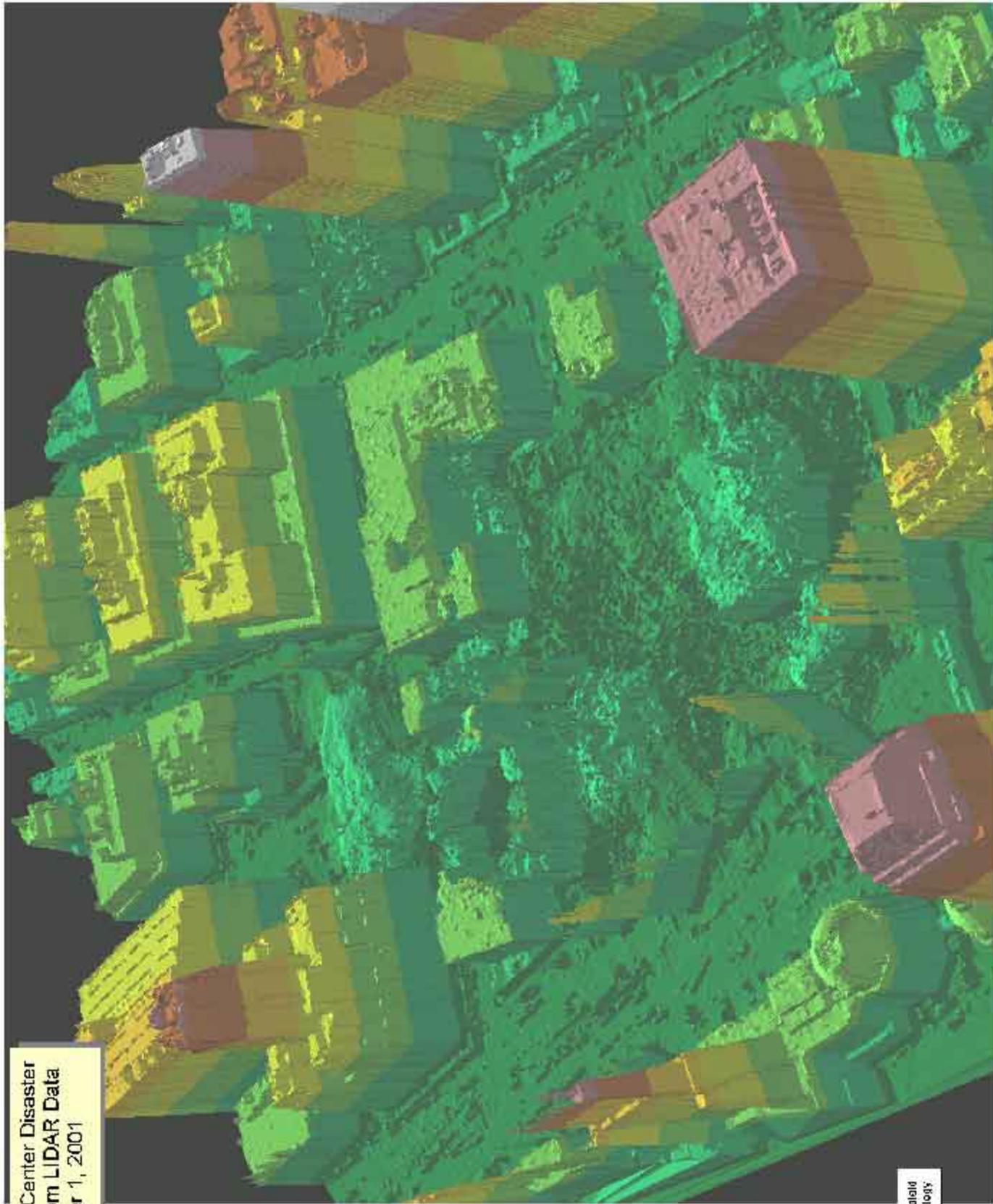
# LIDAR

- **L**ight **D**etection **A**nd **R**anging – laser light pulses bounce off ground. Ground elevations are measured by the time taken for the return of the pulses to the aircraft-mounted sensor
- Creates 3-d surface model of ground
- “Reflective Surface” – includes buildings, vehicles, trees, etc. Secondary returns can be processed to “remove” surface features
- Collected at altitude of 5000 ft over WTC site
- Point spacing of ground returns: ~1.5 meters (5 ft)
- Accuracy: +/- 15 cm (6 in) vertical, +/- 2 ft horizontal
- By comparing LIDAR surface models collected at different dates, calculations can be performed to determine volumetric differences (i.e. settlement or removal of rubble)
- Color shading on samples depicts elevation ranges
- NOTE: The technical specs above apply to all images depicted in the following sequence.

# Digital Orthoimagery

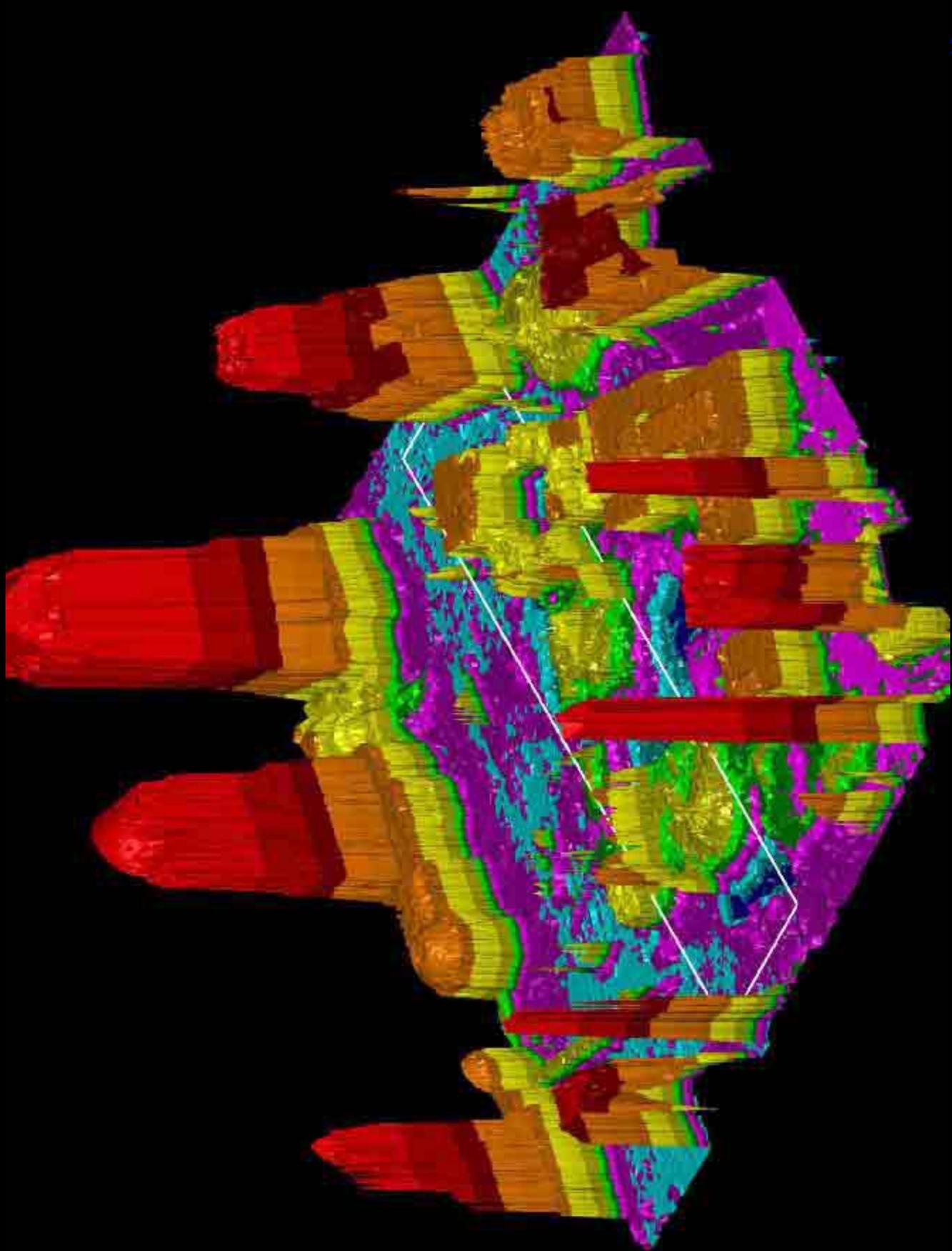
- Aerial photographs with all distortions removed (due to lens, camera perspective, and terrain relief)
- Collected with digital aerial camera mounted in the aircraft
- Simultaneous Global Positioning System (GPS, for aircraft/camera position) and Inertial Measuring Unit (IMU, for aircraft/camera tip, tilt, crab) allow very accurate ground referencing of the digital orthoimagery
- Collected at altitude of 5000 ft over WTC site
- Resolution of .5 ft (objects as small as 6 inches visible); so, each pixel in the image represents .5ft
- Accuracy of +/- 2 ft
- Orthoimagery processing completed within 8-12 hours of flights
- NOTE: The technical specs above apply to all images depicted in the following sequence.

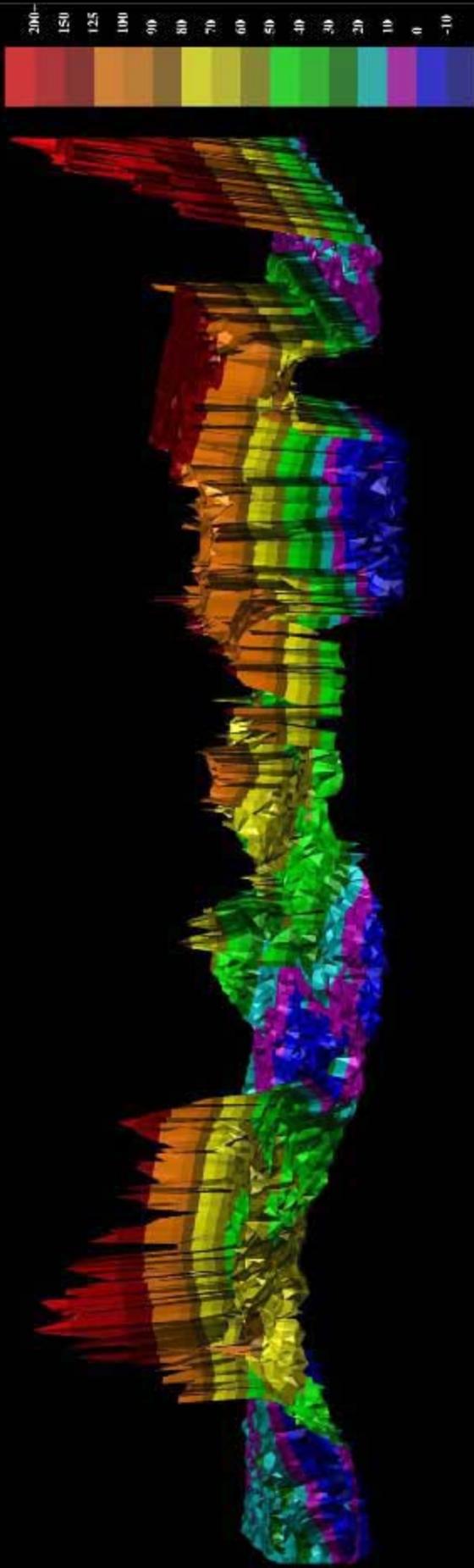
World Trade Center Disaster  
3D Model from LIDAR Data  
October 1, 2001



Governor George E. Pataki  
NYS Office for Technology





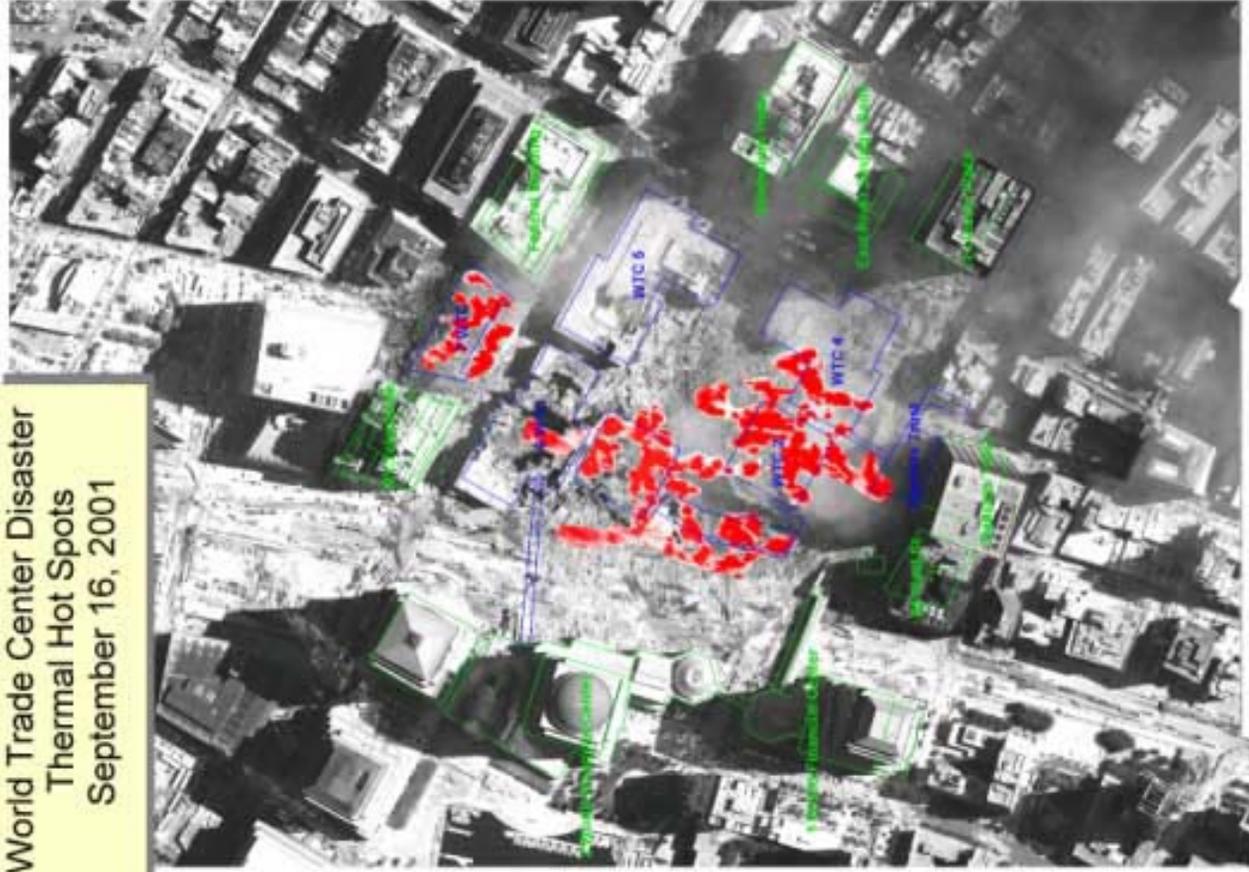


# Thermal Imagery

- Detects surface temperatures (no below-ground penetration)
- Collected at dawn, before the sun warms objects, but after hot search-lights at WTC site were turned off
- Collected at altitude of 3000 ft
- Resolution of .5 ft
- Usually used as a digital overlay to digital orthoimagery to show locations of “hot spots” on rubble pile
- Collected daily for 5 1/2 weeks to support NYC Fire Department
- Initial sensor collected only *relative* temperatures.
- Contractor found different sensor for final week that showed *actual* surface temperatures. (Sensor intended for hand-held use was quickly adapted and tested to operate from aircraft)

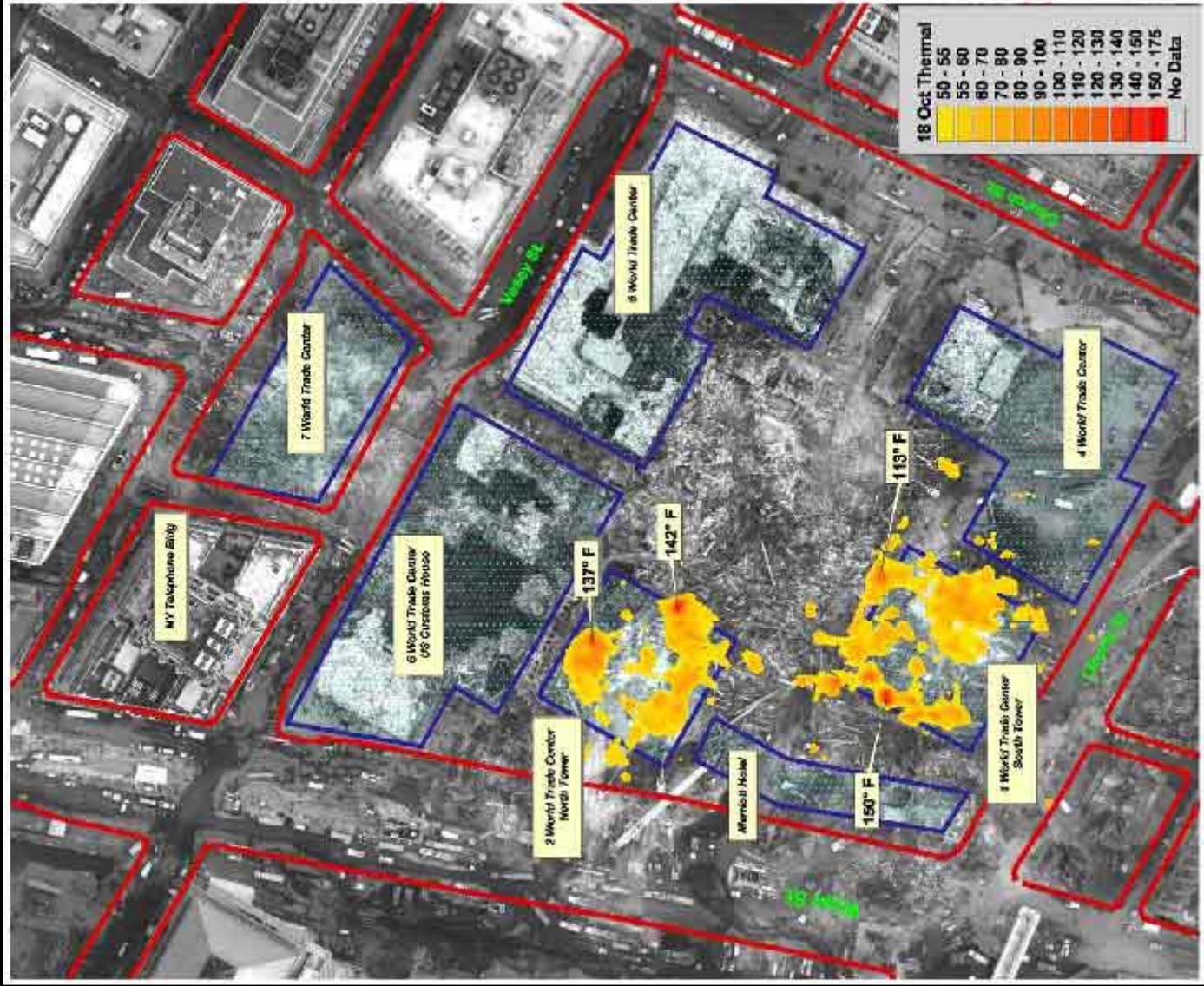
• NOTE: The technical specs above apply to all images depicted in the following sequence.

World Trade Center Disaster  
Thermal Hot Spots  
September 16, 2001



OFT overlaid gas line data with these thermal images to help emergency personnel (in particular, the fire department) determine temperatures relative to gas lines. In addition, NYC overlaid data regarding Freon tanks (for building air conditioning systems) and data regarding fuel tanks.

Red lines indicate street outlines; blue lines indicate building footprints.



# **We Are In the Process of Determining Our Future Role in Emergency Preparedness**

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- Recent events have highlighted the importance of redundant systems and diversity of providers
- Utilities have expertise in disaster preparedness and have experts in cyber-terror
- We have experience with natural disasters and with coordinating utility recovery efforts
- We need to be able to use that expertise to work with utilities; city, state, and local governments; and law enforcement agencies for planning purposes and to coordinate restoration efforts