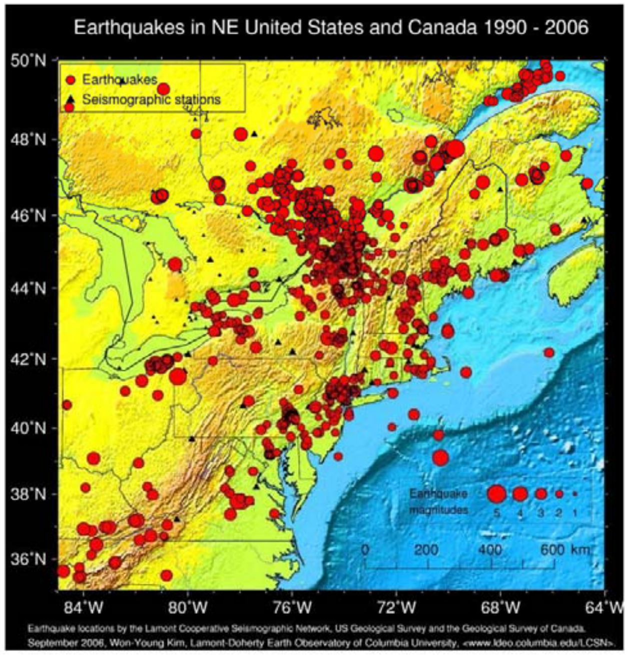
NYSERDA-Funded Broadband Seismometer at the West Valley Central School

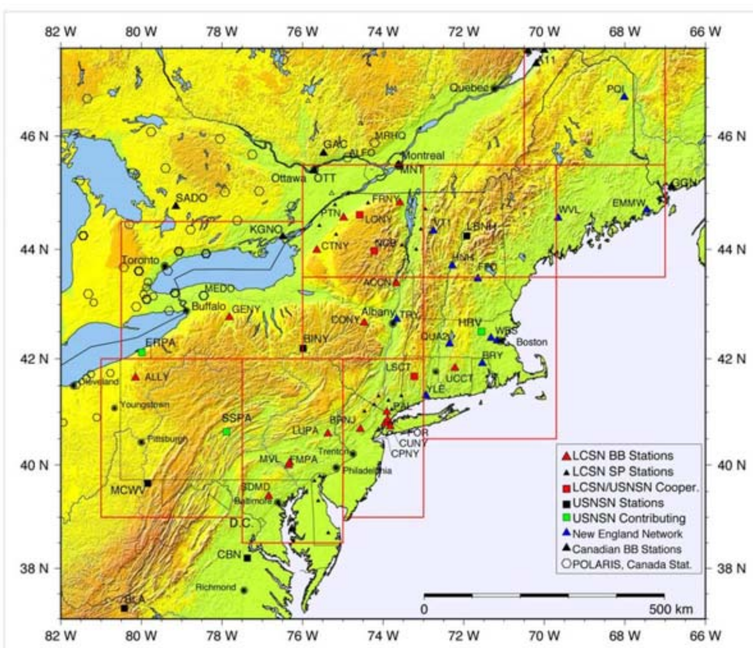
CTF Meeting – August 25, 2010

Lee M. Gordon

Project Background

- Proposal by Dr. Won-Young Kim (Lamont Doherty Earth Observatory [LDEO] at Columbia University) includes the proposed project goals:
  - Monitor seismic activity and provide real-time seismic data near the WNYNSC, including ground-shaking forces
  - Provide West Valley Central School (WVCS) with a "hands-on" component to their Earth Science curriculum
  - Fill a "data gap" in Western New York
  - Contribute to the measurement and understanding of seismic activity in the northeastern United States


Earthquakes in NE United States and Canada 1990 - 2006
Earthquakes
Seismographic stations
Earthquake magnitudes
5 4 3 2 1
0 200 400 600 km
50°N
48°N
46°N
44°N
42°N
40°N
38°N
36°N
84°W 80°W 76°W 72°W 68°W 64°W
Earthquake locations by the Lamont Cooperative Seismographic Network, US Geological Survey and the Geological Survey of Canada.
September 2006, Won-Young Kim, Lamont-Doherty Earth Observatory of Columbia University. <www.ldeo.columbia.edu/LCSN>


82 W 80 W 78 W 76 W 74 W 72 W 70 W 68 W 66 W
46 N
44 N
42 N
40 N
38 N
Quebec
Montreal
Ottawa
Toronto
Buffalo
Albany
Boston
Cleveland
Youngstown
Pittsburgh
Trenton
Philadelphia
Baltimore
D.C.
Richmond
LCSN BB Stations
LCSN SP Stations
LCSN/USNSN Cooper.
USNSN Stations
USNSN Contributing
New England Network
Canadian BB Stations
POLARIS, Canada Stat.
0
500 km

Project Implementation

- NYSERDA provided $25,000 for the purchase of a digital seismometer, data-logger and other ancillary equipment.
- LDEO will install, monitor, and maintain equipment and communications infrastructure.
- LDEO will provide NYSERDA and WVCS with seismic monitoring software.
- LDEO will assist WVCS with earthquake-related curriculum development.

Installation

- Find exposed bedrock near access to internet!

Installation Progress

- Vault, instrumentation and antennas installed
- Software, power supply and data configuration in coming weeks

NYSERDA's Meteorological Station at the SDA

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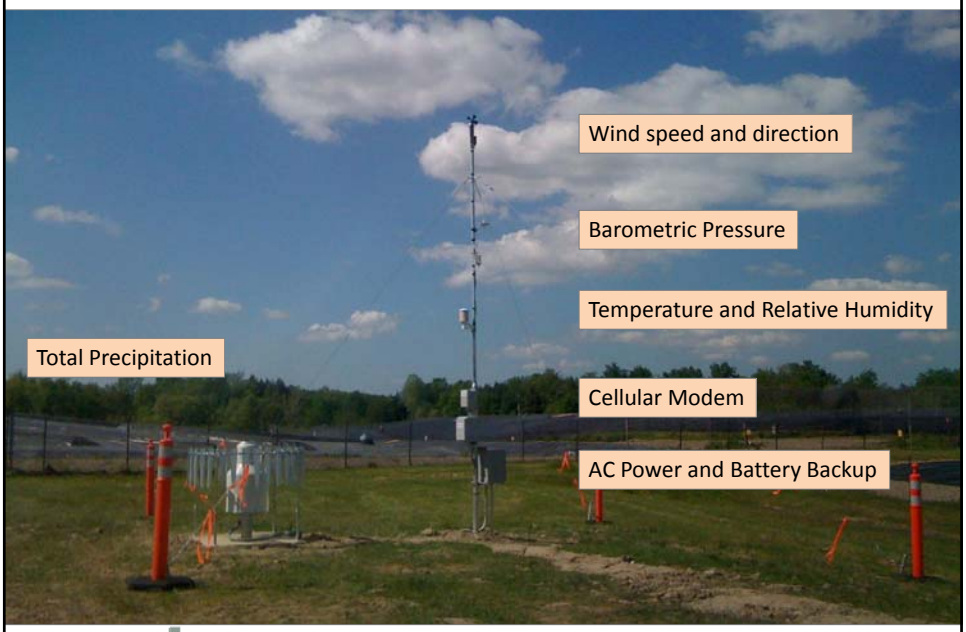
Data Needs

- Uninterrupted data
- Precise data on precipitation intensity
- Wind speeds on the SDA geomembrane cover
- Snow water content for water-balance calculations
- A component of NYSERDA's watershed hydrology monitoring activities
- Immediate access to real-time data, 24/7, alert capabilities



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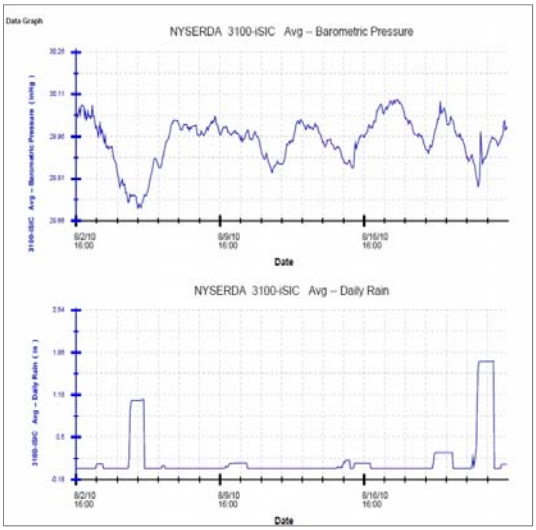
- **Ott Pluvio Total Precipitation Gauge**
- NOAA's standard
- Rain, Hail and Snow
- Continuously operating at SDA since May 24, 2010

Future Plans

- Data posted to web
- An official NOAA reporting site?



LiDAR and Orthoimagery of Buttermilk Creek Watershed

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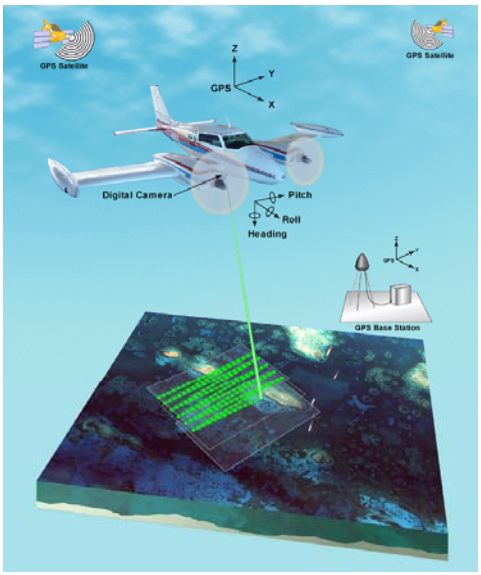
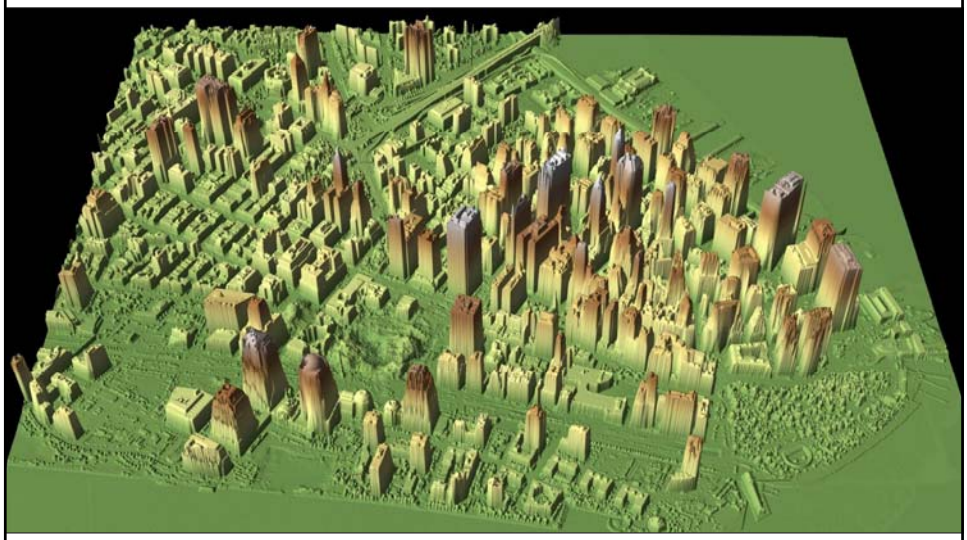
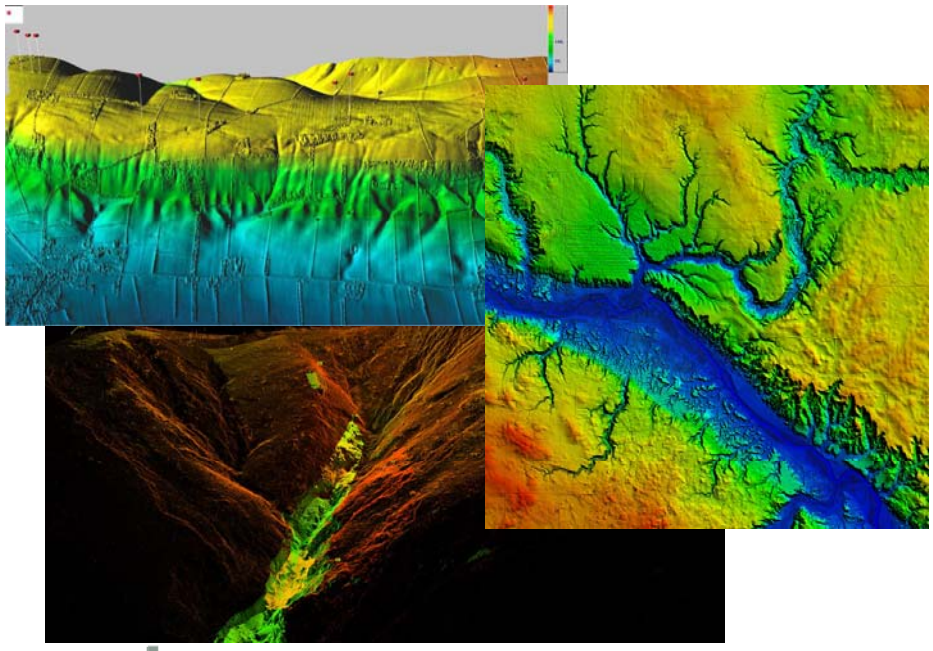
Light Detection And Ranging

- Laser and scanning mirror sends out laser pulses
- Receiver collects pulse returns
- High-Accuracy GPS provides locational information
- Result is an extremely accurate and precise 3-D topographic model

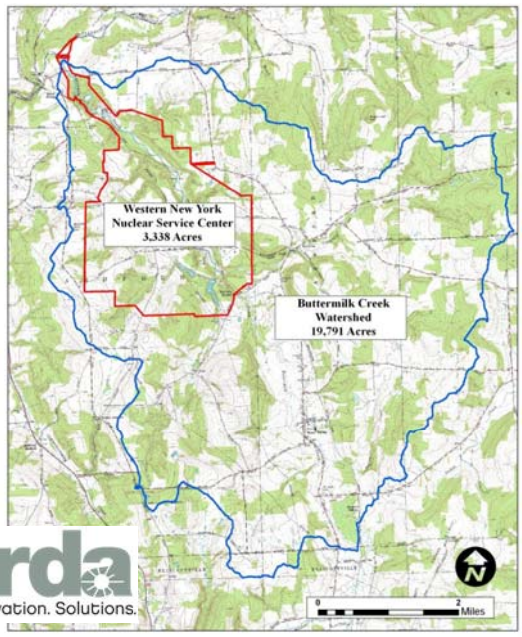


Lower Manhattan, October 2001





Proposed LiDar Project, West Valley, NY



Current NYS ortho photo
2-foot pixel size

Example ortho photo
3-inch pixel size

Possibilities

- Change detection
- Hydrologic modeling
- Generating custom contour topographic maps
- Landslide and gully location and erosion volumes/rates
- Stream network evolution and bank stability
- Slope monitoring
- Satisfies requirement of NYSERDA's Part 380 permit – comprehensive topographic mapping of the SDA and surrounding areas

Fall 2010 Data Collection

- Ground survey activities – October
  - Survey crew accessing private property
- Flight data collection – late October, early November
  - Low flying aircraft
  - Multiple flights/passes
  - Timing depends on weather/season
    - Leaves must be off the trees, no snow and clear skies

Partial Site Release Project Update

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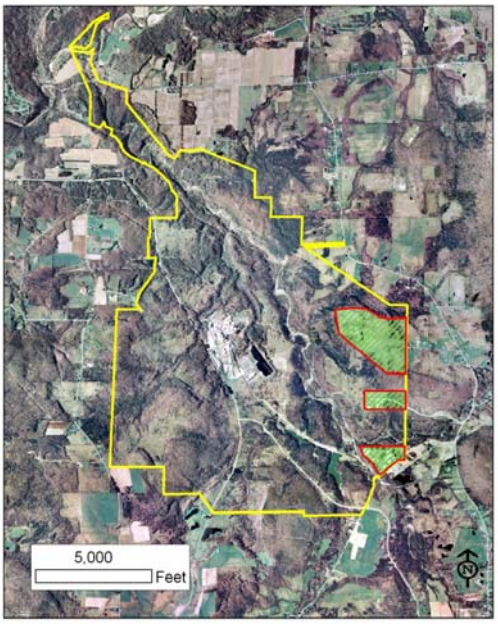
Paul L. Piciulo, Ph.D.

nyserda Energy, Innovation Solutions

Proposed PSR Areas from NRC License



Close-up of PSR Areas