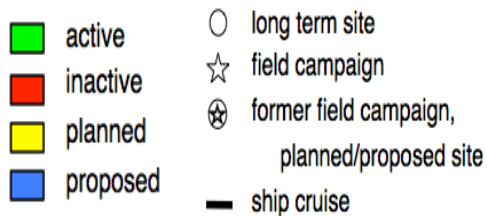
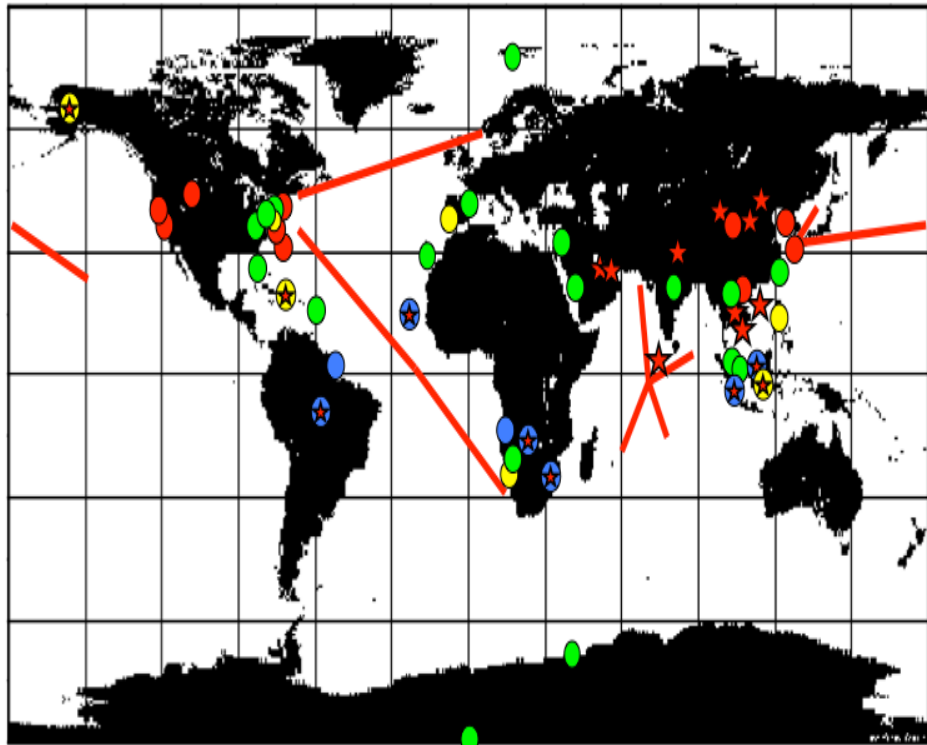


MPLNET (Micropulse Lidar Network)



- Global network of micropulse lidars
- Collocated with NASA AERONET sites
- Standardized instruments and processing algorithms
- Eye-safe, single wavelength (532-nm) elastic backscatter with narrow FOV ($\sim 100 \mu\text{rad}$)
- Autonomous, 24/7 measurements spanning 16+ years





National Aeronautics and Space Administration
Goddard Space Flight Center

MPLNET

The NASA Micro-Pulse Lidar Network



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10+ Trillion Laser Pulses and Counting!

INTRODUCING OUR NEW WEBSITE AND DATA PROCESSING SYSTEM: VERSION 3
See our [Version Information](#) page for more information.

The NASA Micro-Pulse Lidar Network (MPLNET) is a federated network of Micro-Pulse Lidar (MPL) systems designed to measure aerosol and cloud vertical structure, and boundary layer heights. The data are collected continuously, day and night, over long time periods from sites around the world. Most MPLNET sites are co-located with sites in the [NASA Aerosol Robotic Network \(AERONET\)](#). MPLNET is also a contributing network to the World Meteorological Organization (WMO) Global Atmospheric Watch (GAW) Aerosol Lidar Observation Network, [GALION](#).

MPLNET data have contributed to many studies and applications. Key focus areas for MPLNET include:

- domestic and international aerosol and cloud research
- climate change and air quality studies
- support for NASA satellite and sub-orbital missions
- aerosol modeling and forecasting

MPLNET is composed of NASA sites and others run by, or with help from, partners from around the world. Principal investigators for individual network sites may be from NASA, other US government agencies, universities, or foreign institutions. MPLNET core activities and the NASA staff are funded by the NASA Radiation Sciences Program and the [NASA Earth Observing System \(EOS\)](#). Many individual network sites also have their own funding support.

Data Policy:

Use of MPLNET data and resources should adhere to our data policy in order to maintain the integrity of the data base and fairness to the individuals who have contributed. Please review our [data policy](#).



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Sciences and Exploration Directorate
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Mesoscale Atmospheric Processes

NASA Official: Ellsworth Judd Welton
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MPLNET Product Information:

Under construction, please keep checking back as we work to complete this section of the website.

A description of our MPLNET product files is available online: [MPLNET Product File Formats and Content](#)

These tables provide an overview of our MPLNET Version 3 products, and mapping of products from Version 2 to Version 3.

V3 Product	Description
NRB	Lidar signals, volume depolarization ratios, and diagnostics.
CLD	Cloud heights and retrievals.
PBL	PBL height and estimated AOD.
AER	Aerosol heights and retrievals for coincident, co-located sunphotometer observations.
CAER	Aerosol heights and retrievals (continuous). Less accurate than AER product.

V3 Product Levels	V3 Notes	V2 Product Levels	V3 Notes
L1_NRB	NRT, not screened, initial calibration, auto	L1	
L1_CLD	GEOS5 Forecast NRT, reprocessed next day with GEOS5 Assimilated, AERONET L15 AOD	L15b	only cloud products
L1_PBL		—	
L1_AER		L15a	only sunphotometer constrained data
L1_CAER		L15caer	L15a file, but only gridded products. Browsable but not downloadable.
L15_NRB	NRT, screened, initial calibration, auto	—	
L15_CLD	GEOS5 Forecast NRT, reprocessed next day with GEOS5 Assimilated, AERONET L15 AOD	—	
L15_PBL		—	
L15_AER		—	
L15_CAER		—	
L2_NRB	Not NRT, screened, post calibration, human	—	
L2_CLD	GEOS5 Assimilated, AERONET L2 AOD	L2b	only cloud products
L2_PBL		—	
L2_AER		L2b	only sunphotometer constrained data
L2_CAER		—	



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V3 PBL Height Retrievals

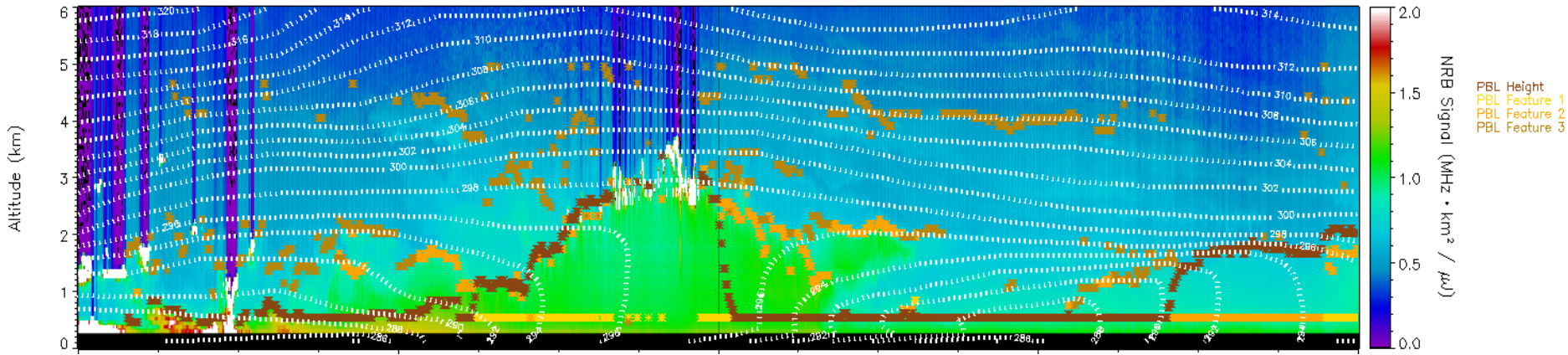
- Wavelet covariance transform utilizes the first derivative of a Gaussian wavelet and a cloud-screened, five-minute average scattering ratio profile
- Canny edge-detection used to detect up to three possible features and fuzzy logic determines the most likely choice for the PBL top height
- A continuity scheme is used to reduce sudden changes in the PBL top height
- **Citation:** Lewis, J. R., E. J. Welton, A. M. Molod, and E. Joseph (2013), Improved boundary layer depth retrievals from MPLNET, *J. Geophys. Res. Atmos.*, 118, 9870–9879, doi:10.1002/jgrd.50570



V3 PBL Height Retrievals

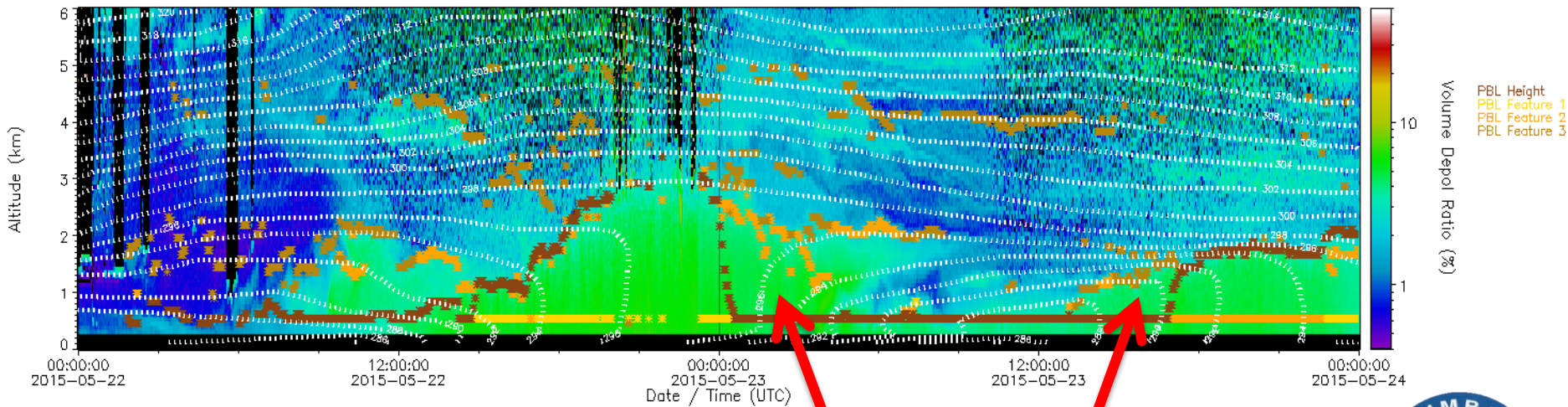
MPLNET RA L1_NRB: GSFC_ra, 2015-05-22 to 2015-05-24

Virtual_Potential_Temperature



MPLNET RA L1_VDEPOL: GSFC_ra, 2015-05-22 to 2015-05-24

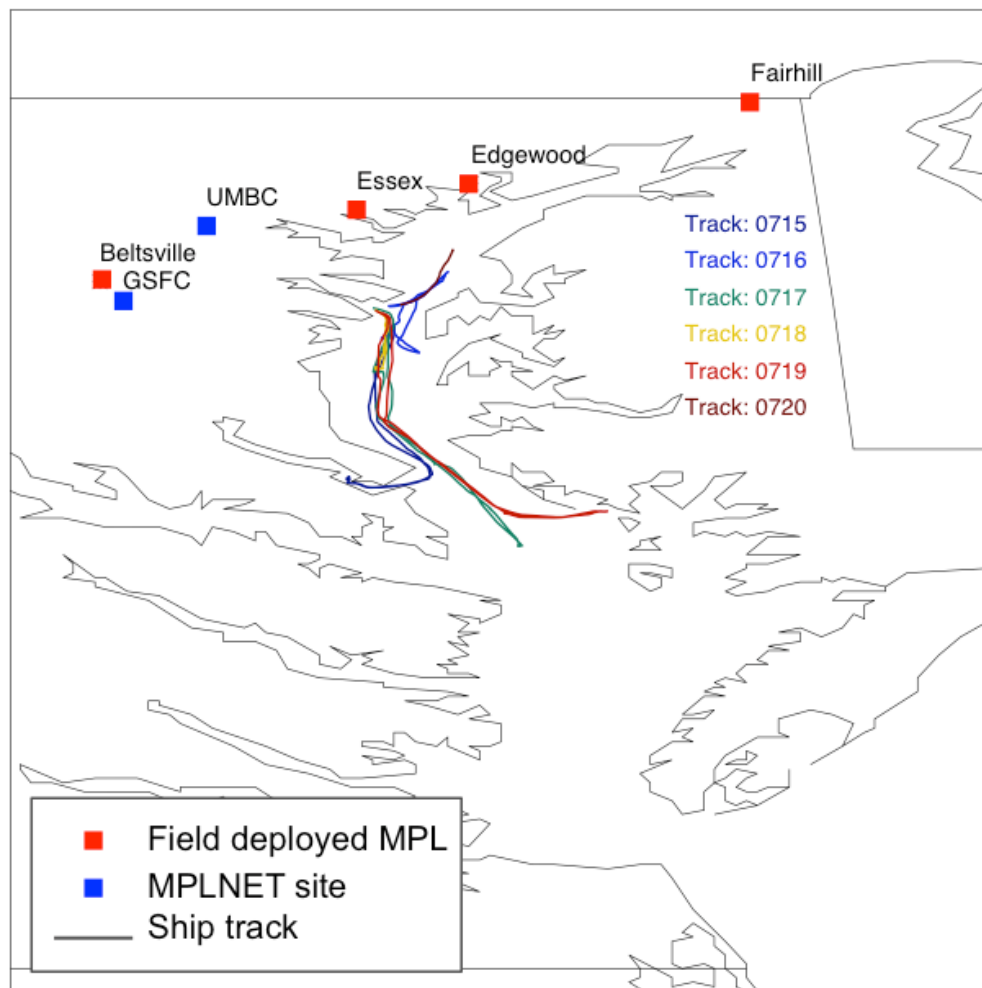
Virtual_Potential_Temperature



Issues with collapse and growth periods



Simulating Spatiotemporal Variability in an Urban Mixed Layer



Conducting an ongoing three - year study evaluating WRF simulations of the PBL over the Washington DC – Baltimore urban corridor

- **Micro Pulse Lidar Network (MPLNET) MPLs and MiniMPLs**
- NASA Langley Airborne High Spectral Resolution Lidar (**HSRL**)
- **CALIPSO** satellite measurements
- Complimentary ozonesondes and surface measurements
- NASA Award # NNH14CM13C



Simulating Spatiotemporal Variability in an Urban Mixed Layer

