

---

# Lidar Focus Group

Jennifer Comstock

Rich Ferrare

David Turner

Connor Flynn

Zhien Wang

Beat Schmid

Randy Peppler

Rob Newsom

Rich Coulter

Vic Morris

Chitra Sivaraman

# Objectives

---



- Forum for discussing ARM lidar instrumentation and data products (MPLs, Raman lidar, ceilometers)
  - Instrument performance/calibration
  - Plan instrument upgrades/replacement
  - Data quality
  - Value Added Products
- Provide recommendations for improving data quality, timeliness of data products, and future instrument needs

# Initial Topics of Discussion

---



- Data Products – Prioritize different levels of products
  - Baseline Products
    - Cloud boundaries, attenuation flag, depolarization ratio
  - Higher Order Products
    - Corrected normalized backscatter, extinction, optical depth
    - Corrections: overlap, afterpulse, deadtime
  - Raman Lidar Data Products
    - Extinction, water vapor mixing ratio, depolarization ratio, aerosol scattering ratio
    - NEW: Liquid/Ice water content and temperature channels
- Instrumentation
  - Maintenance of current systems
  - Advanced lidar instruments at NSA/TWP
  - Discontinuation of support for Vaisala CT25K ceilometer
  - Replacement strategy ceilometers and potentially MPLs
- Data Quality

# Lidar Data Products

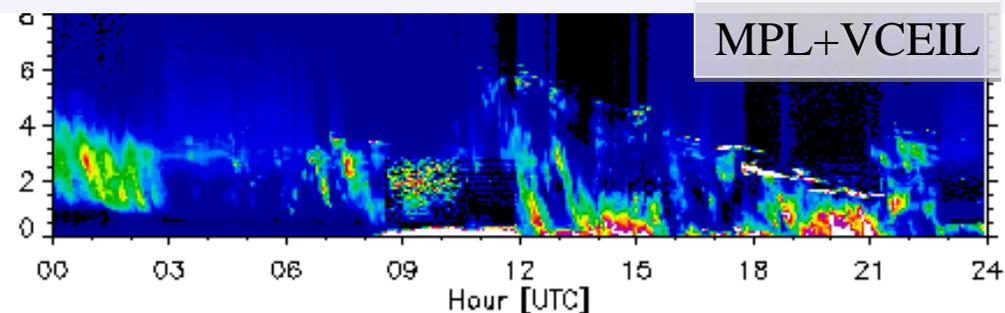
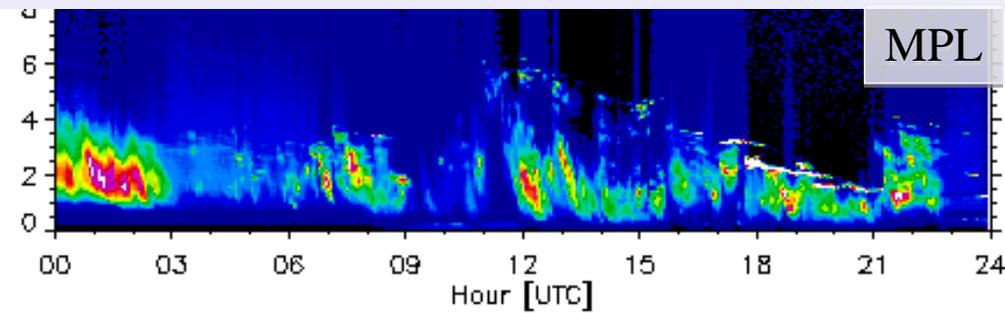
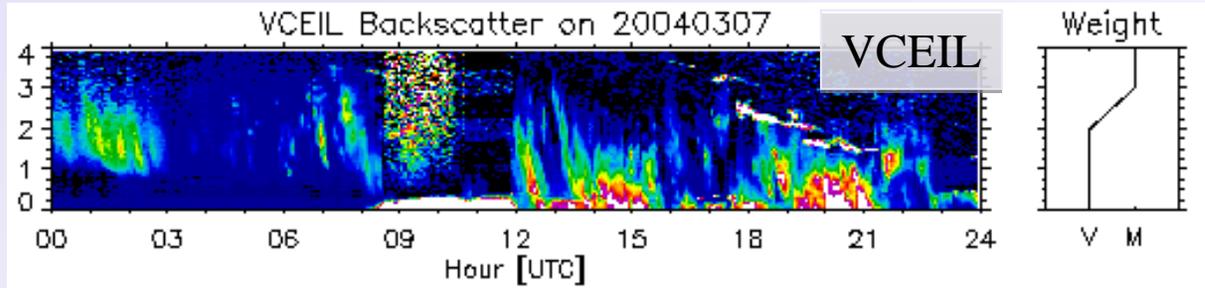
---



- MPLNOR – normalized corrected backscatter profiles and lidar cloud mask
  - Requires lidar corrections, particularly for detection of low clouds and aerosol layers
  - Backlog in processing due to difficulty in producing corrections and lack of people power to do it
  - MPL systems: 5 central facility sites, 1 AMF, 1 spare
  - New MPL-Polarization systems
- Decompose MPLNOR to produce cloud boundaries with generic corrections
  - Biggest hurdle → boundary layer clouds/aerosols
  - False detection of high clouds
- Prioritize higher order products
  - Need input from the science team

# Lidar Cloud Boundaries

## *Boundary Layer Clouds*



### ➤ Issues:

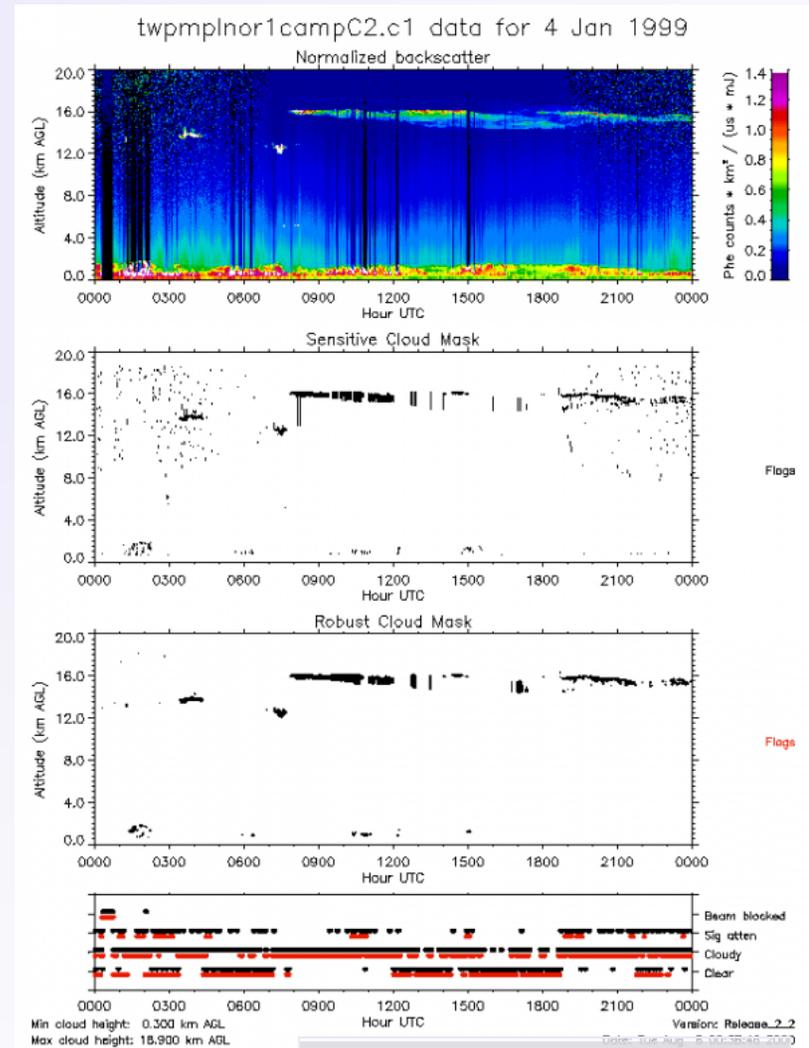
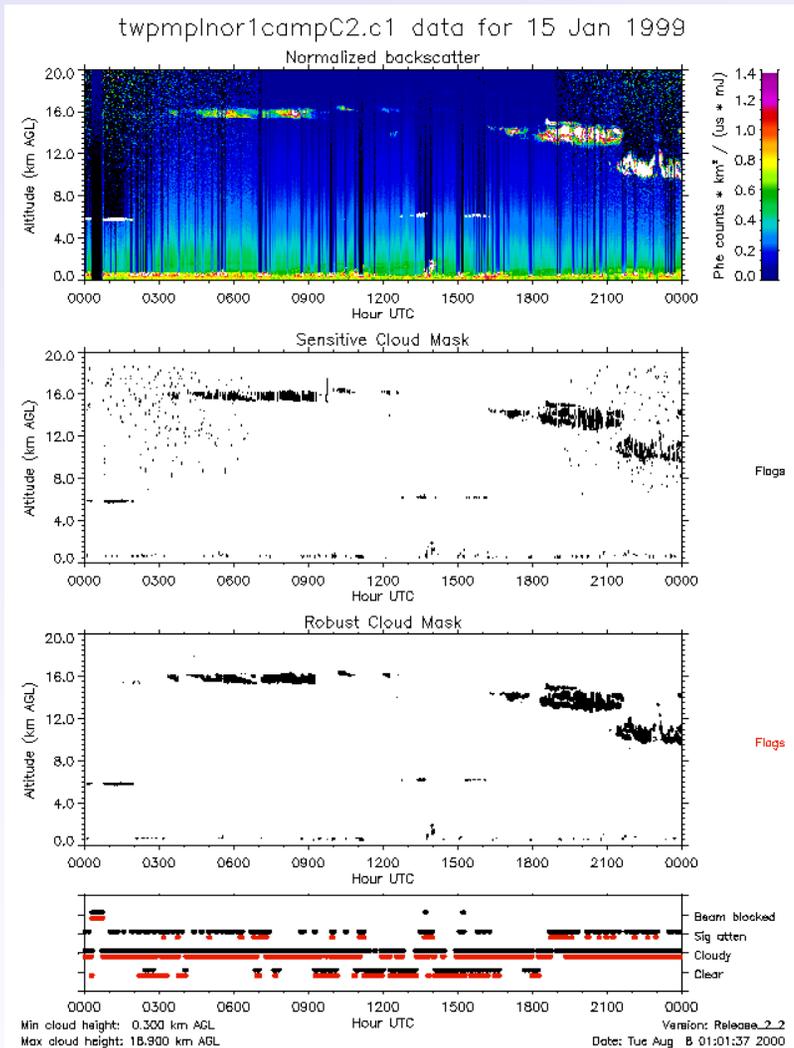
- Overlap corrections are tedious to produce and vary with time

### ➤ Potential solution:

- Combine ceilometer and MPL data in the BL
- Use generic overlap function for MPL

# Lidar Cloud Boundaries

## *High Cloud Detection*



Courtesy Connor Flynn

# Final Words

---



## ➤ Science Team Input Needed

- Prioritize higher order lidar products
- Prioritize future lidar instrument needs

## ➤ Interested individuals

- Breakout session: Wed. 7:30 pm
- Lidar Instrument Updates
- Lidar cloud and aerosol products