

# Agenda

- I. Quick intro: HMT-Southeast Pilot Study and webinar goals (Kelly Mahoney, Rob Cifelli)
- II. HMT-SEPS Observational Data (Tim Coleman, Dan Gottas)
  - **GPS-Met precipitable water observations (Seth Gutman, Kirk Holub)**
- III. Model forecasts: ExREF (Ligia Bernadet)
- IV. Questions, discussion

# Ground-Based GPS Water Vapor Observations Supporting HMT-SE

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July 31, 2013

# Overview Questions

1. The instruments we have in the field:
  - a. What are they?
  - b. Where are they? (or rather, where will they be?)
  - c. What do they measure?
  
2. Where the observed data goes:
  - a. What is on the webpage?
  - b. How I can best use the webpage?
  - c. How I can download the data? (real time and archived?)
  - d. Does the data go anywhere besides the web?
    - i. MADIS feeds -- as much as you want to say...we *\*don't\** want to get into the nitty-gritty details like AWIPS importing, etc.
    - ii. CAP/MADIS webpage for profiler data
    - iii. Anywhere else?
  
3. Who can I contact if I have questions, comments, feedback, etc.?

# Additional Information about GPS-Met

1. The instruments we have in the field:
  - a. What are they?

Commercial off-the-shelf geodetic (i.e. dual frequency carrier phase) GPS receivers. The same kind of receivers that are used by scientists, engineers and surveyors for high accuracy (mm-level) positioning.

- b. Where are they? (or rather, where will they be?)

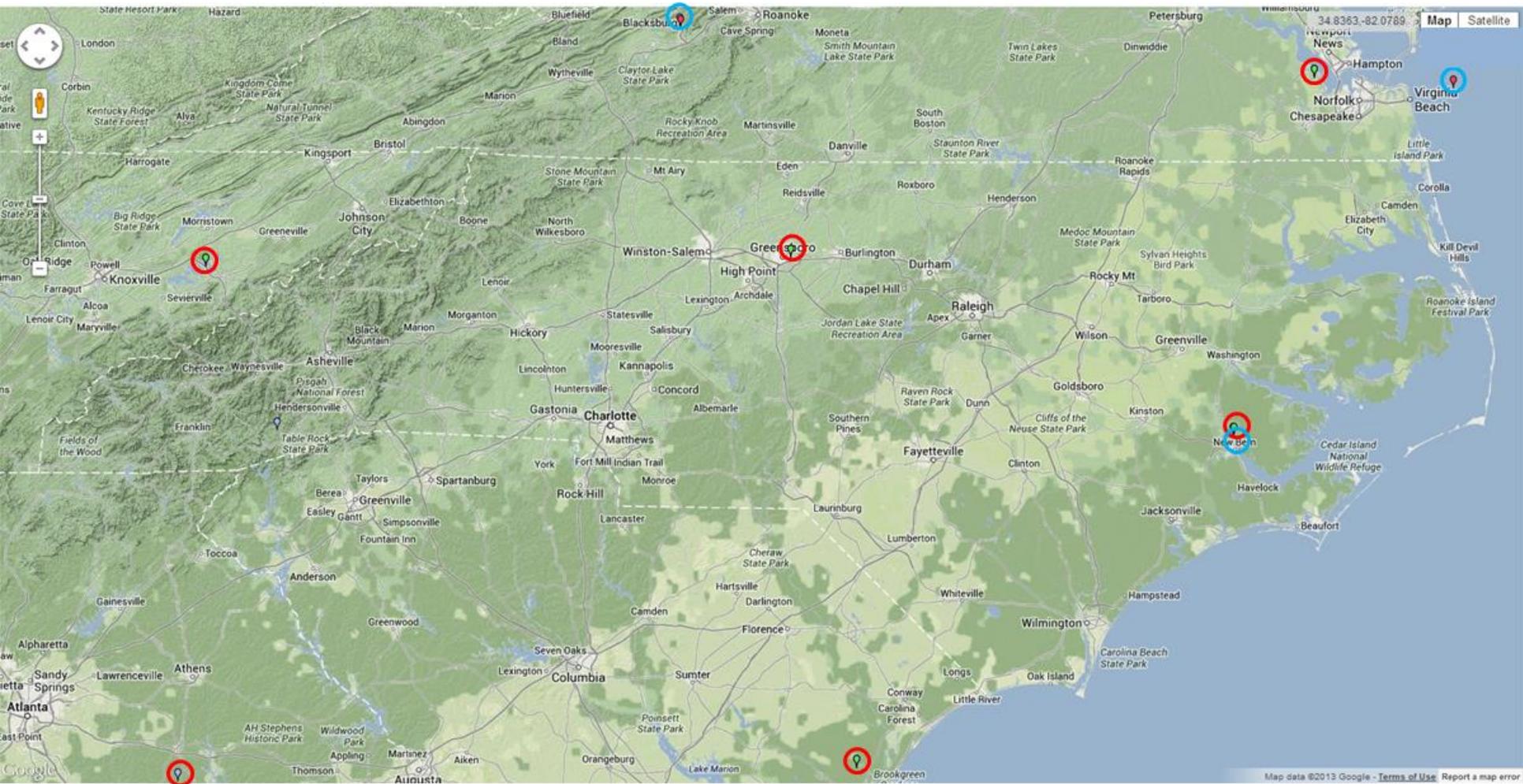
See the next two slides.

- c. What do they measure?

Changes in the radio-refractivity of the neutral atmosphere caused by temperature, pressure and water vapor in the lower troposphere.

If we make temperature and pressure readings in close proximity to the GPS antenna, then we can use this additional information to retrieve total column precipitable water vapor from the estimated signal delays with high accuracy and temporal resolution under all weather conditions..

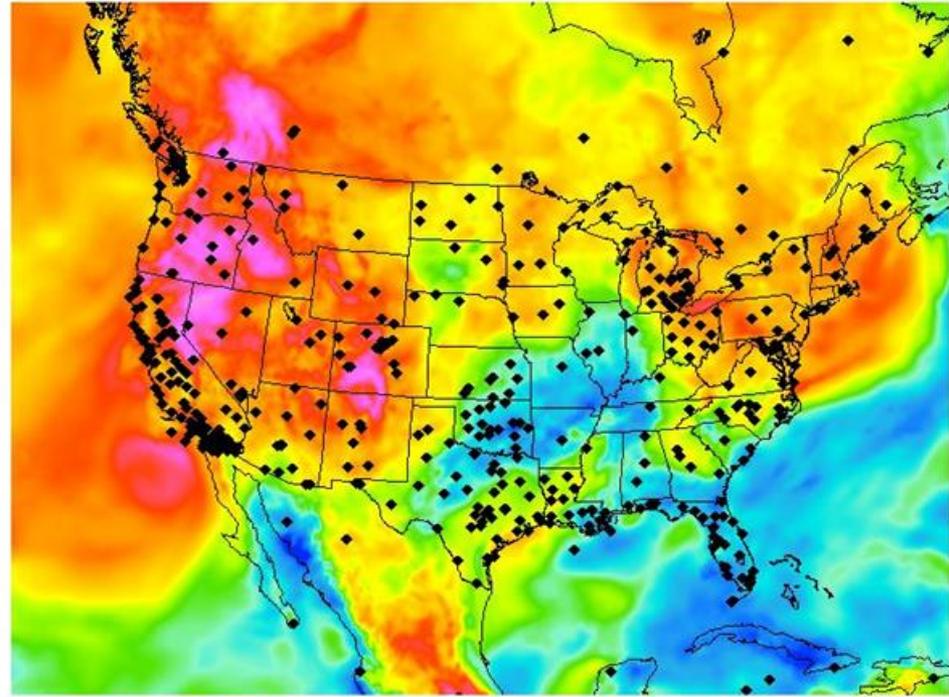
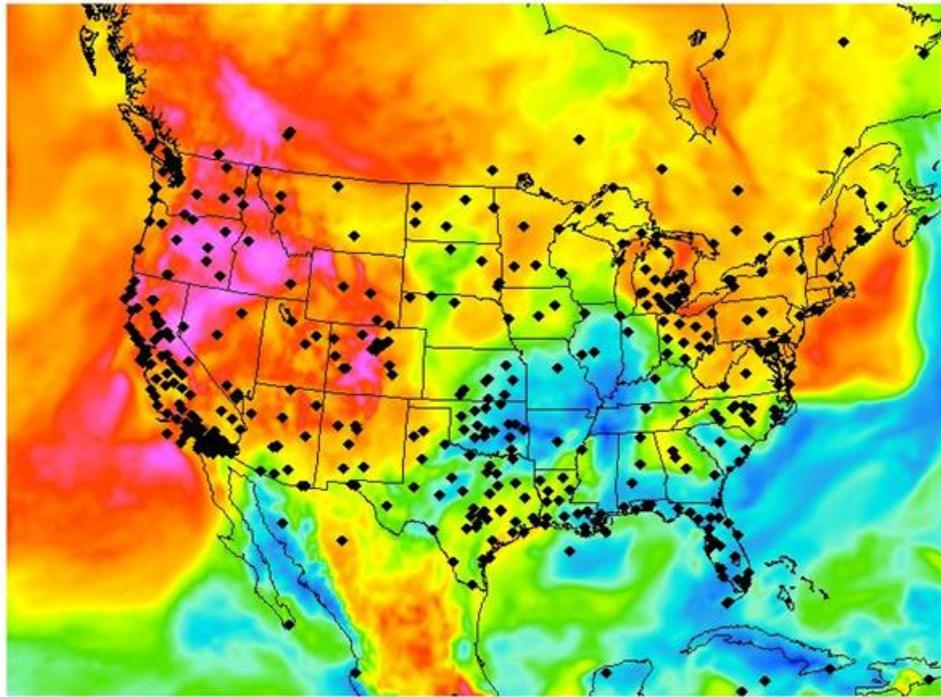
# Existing Receivers used by ESRL/GSD for GPS Meteorology





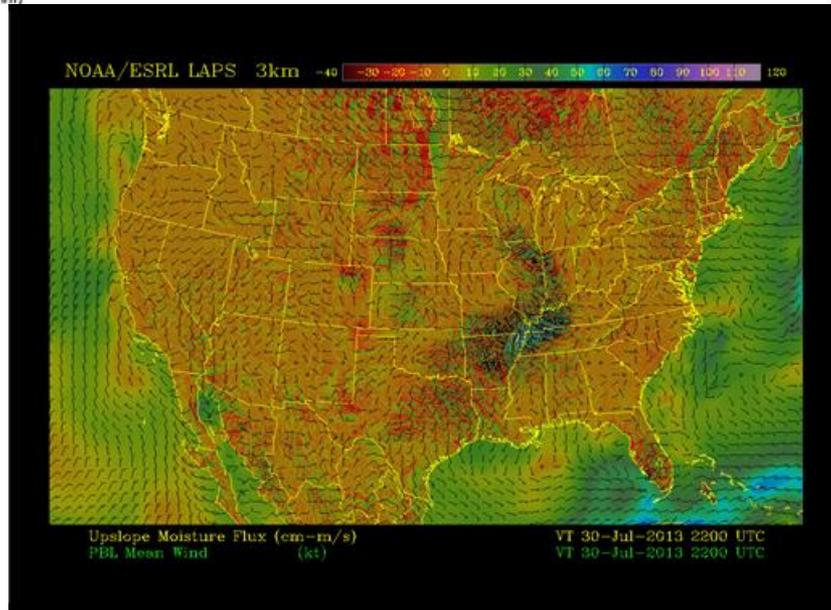
Operational RUC 13 3-h Forecast  
Valid: 30-Jul-13 21:00 UTC

Operational RUC 13 Analysis  
Valid: 30-Jul-13 21:00 UTC



Total Column PW (mm)

Total Column PW (mm)

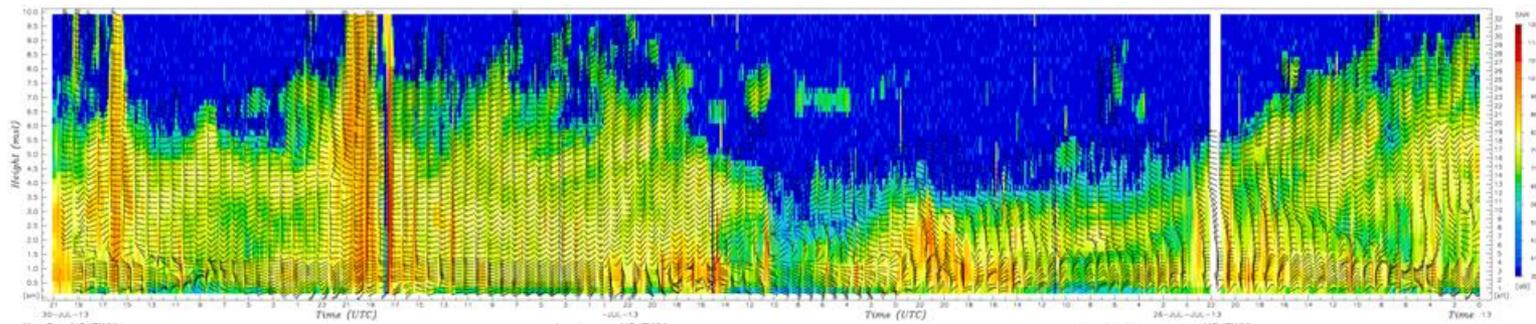


NOAA/ESRL LAPS 3km

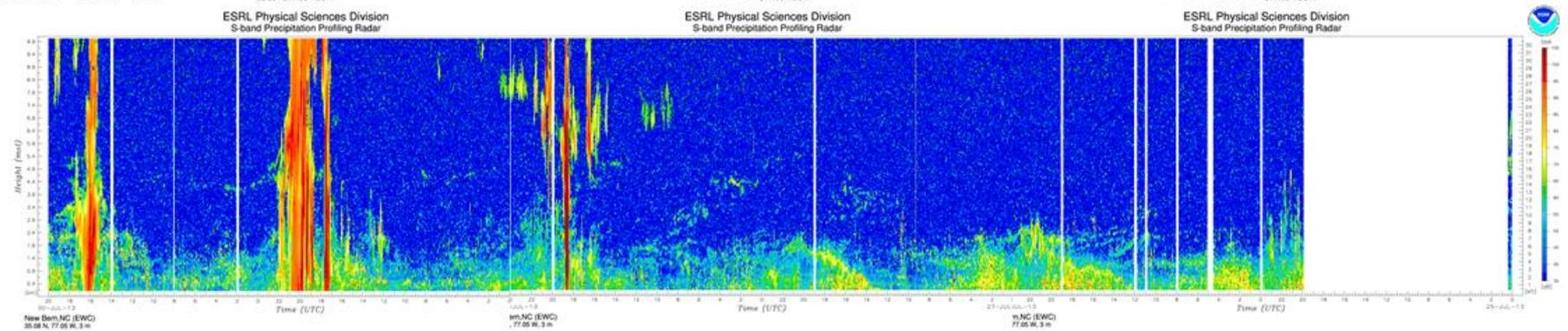
Upslope Moisture Flux (cm-m/s)  
PBL Mean Wind (kt)

VT 30-Jul-2013 2200 UTC  
VT 30-Jul-2013 2200 UTC

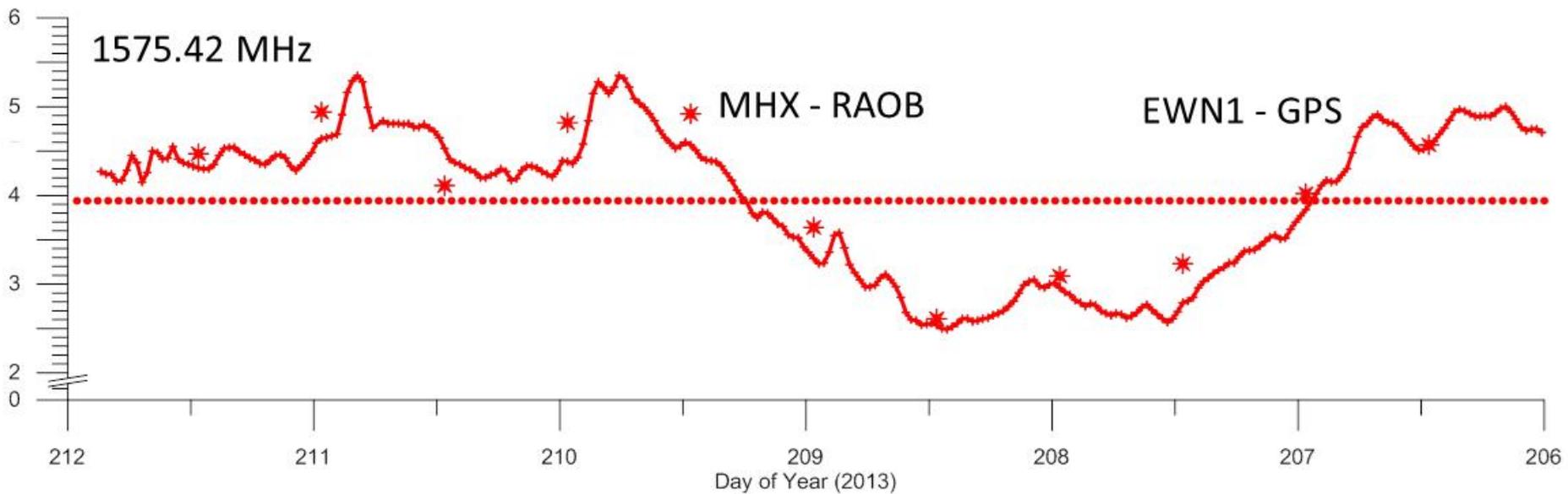
449 MHz



2875 MHz



Total Precipitable Water Vapor (cm)



# Additional Information about GPS-Met

2. Where the observed data goes: <http://gpsmet.noaa.gov>
  - a. What is on the webpage?
    - i. Access to real-time and archived data and products (<http://gpsmet.noaa.gov/cgi-bin/gnuplots/rti.cgi>)
    - ii. Comparisons with operational and research NWP Models
    - iii. Comparisons with rawinsonde and satellite TPW.
  - b. How I can best use the webpage?  
Practice.
  - c. How I can download the data? (real time and archived?)  
Instructions provided.
  - d. Does the data go anywhere besides the web?  
NCEP, MADIS, GTS, UNIDATA, ARM.

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    - iii. Comparisons with rawinsonde and satellite TPW.

b. How I can best use the webpage?

It's easy to use and pretty intuitive, but call us if you have any questions.

c. How I can download the data? (real time and archived?)

Instructions are provided in the download process/

d. Does the data go anywhere besides the web?

NCEP, MADIS, GTS, UNIDATA, ARM.

# Points of Contact

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