Near-real time CAPE Combining Hyperspectral IR Satellite Sounding and Surface Met Stations

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Introduction and Data
- Satellite data can provide spatial and temporal coverage between NWS raodomeonde launch site.
- The Convective Available Potential Energy (CAPE) is a measure of atmospheric instability, computed from vertical profiles of temperature and vapor pressure.
- Satellite estimates of the surface parcel introduce large uncertainties in satellite CAPE estimates (Gartzke et al. 2017).
- Satellite sounding-strategies in the lower tropospheric region due to the increased opacity of the atmosphere.
- Satellite and Surface observations processed by the same method to allow them to be merged.
- Combined surface station data and satellite sounding product creates accurate near-real time estimate of SBCAPE.

Methodology
- Surface Met Observations are obtained hourly from the NOAA MADIS site https://madis.nco.ncep.noaa.gov/.

Direct Broadcast
- NOAA Unique CHAS/ATMS Processing System (NUCAPS) EDR software for retrieval of atmospheric profiles from input sources/NP/C/ATMS and ATMS L1B.
- Software to process the data is available from the Community Satellite Processing Package (CSP) available from SSEC at https://madis.nco.ncep.noaa.gov
- The Convective Available Potential Energy (CAPE): a measure of atmospheric instability, computed from vertical profiles of temperature and vapor pressure.
- Satellite estimates of the surface parcel introduce large uncertainties in satellite CAPE estimates (Gartzke et al. 2017).
- The spatial gradients are similar in the surface and satellite dewpoint fields.

References and Contact
- Callyn Bloch callyn.bloch@nco.ncep.noaa.gov
- Satellites and Surface observations processed by the same method to allow them to be merged.
- The Joint Polar Satellite System (JPSS) is the Nation’s new generation polar-orbiting operational environmental satellite system.
- NUCAPS data from JPSS is used in this study.
- The use of NUCAPS satellite profile data combined with NOAA MADIS surface observations improves the SBCAPE estimates and helps fill in temporal gaps in forecast狂widesonde launches.
- Combined NUCAPS-MADIS SBCAPE product will help validate operational SBCAPE and help evaluate future improvements in the NUCAPS retrieval system.