

DoD Cloud Post-Processing and Verification Workshop

NCAR Foothills Lab 2 – Room 1001

Boulder, CO

13 – 14 September 2023

Day 1: Wednesday 13 September

0800: Coffee/breakfast

0830: Opening Remarks (Planning committee)

Session 1: Operations and Applications (Convener: Josh Cossuth)

0840: (*Invited*) Modeling updates at the US Air Force's 16th Weather Squadron; Evan Kuchera (USAF/16th Weather Squadron)

0930: Fleet Numerical Meteorology and Oceanography Center Verification Status Overview; Ray Lee (FNMOC)

0950: Deployment of Ground Station Observation Network (GSON) to deliver low latency Satellite Cloud Products; Louis Nguyen (NASA Langley)

1010: (*Virtual*) The Use of the METplus Verification and Diagnostic Capability for Verification of Cloud Fields; Tara Jensen (NCAR/RAL and DTC)

1030 – 1050: Coffee break

Session 2: Statistical post-processing of cloud forecasts, including machine learning techniques (Convener: Jason Nachamkin)

1050: Machine Learning for Coastal Fog Predictions and the AI2ES National AI Institute; Philippe Tissot (Texas A&M Corpus Christi)

1110: (*Virtual*) An overview of the Cube of Calibrated Clouds post-processing project; Justin McLay (NRL)

1130: Optical Flow Applications for Meteorological Satellite Imagery and Cloud Nowcasting Techniques; Matthew King (USAF/CSU)

1150: Hierarchical Deep Learning for Efficient Onboard Satellite Cloud Detection and Alerting; Sarvesh Garimella (MyRadar)

1210 – 1310: Lunch

1310: (*Invited*) Combining Uncertainty Quantification and XAI to Understand the Sensitivities of Deep Learning Winter Precipitation Type Predictions; David John Gagne (NCAR)

1400: The Influence of Feature Aggregation for Explainable AI for High Dimensional Geoscience Applications; Evan Krell (Texas A&M Corpus Christi)

1420: Comparative assessment of machine learning based forecast correction models for different tropospheric cloud regimes; Chuyen Nguyen (NRL)

Session 3: Probabilistic cloud forecasting (Convener: Erica Dolinar)

1440: Extended-Range Prediction of Clouds in Coupled Global Ensembles; Matthew Janiga (NRL)

1500 – 1520: Coffee Break

Session 4: Diagnosis and verification of clouds (Part 1) (Convener: Erica Dolinar)

1520: Global Cloud Free Line of Sight (CFLOS) Characterizations Using Numerical Weather Prediction Data; Steve Fiorino and Jaclyn Schmidt (AFIT)

1540: Cloud verification plans for turbulence and icing assessments; Matt Wandishin (NOAA/GSL)

1600: Using multiple observations and retrievals to evaluate WRF-simulated MCS precipitation under different synoptic patterns and MCS stages over the CONUS; Xiquan Dong (Univ. of Arizona)

1620-1730: Panel Discussion

1800: Social event (West End Tavern)

Day 2: Thursday 14 September

0800: Coffee/breakfast

0830: Opening remarks

Session 5: Diagnosis and verification of clouds (Part 2) (Convener: Eric Gilleland)

0840: (*Invited*) Fractional Clouds: A discussion of mostly cloudy and partly sunny; Greg Thompson (JCSDA/UCAR)

0930: (*Virtual*) Constraining unified parameterizations with long-term coincident cloud and turbulence observations; Mikael Witte (NPS)

0950: Understanding Fundamental Dynamics in Cumulus Clouds; Scott Powell (NPS)

1010: Developing an analysis framework for evaluating boundary-layer clouds associated with midlatitude synoptic systems in NRL COAMPS; Jordan Eissner/David Mechem (Univ. of Kansas)

1030 – 1050: Coffee break

Session 6: Cloud Analysis Techniques (Convener: Hui Christophersen)

1050: (*Virtual*) Advancing Cloud Prediction: Integrating Hyperspectral Satellite Insights and Deep Learning to improve Operational Forecast Accuracy and Model Validation; Paolo Antonelli (Adaptive Meteo)/Steven Businger (University of Hawaii at Manoa)

1110: Development of Satellite-Based Global 3D Cloud Data and Aviation Applications; Yoo-Jeong Noh (CIRA)

1130: Novel Hourly-Resolved Global Cloud Properties Derived from Operational Satellites; David Painemal (Analytical Mechanics Associates)

1150: All-Sky Radiance Assimilation Impact on Tropical Cyclone Inner Core Structure and Rapid Intensification; Yi Jin (NRL)

1210 – 1310: Lunch

Session 7: Diagnosis and verification of clouds (Part 3) (Convener: Chuyen Nguyen)

1310: A Comparison of Spatial Dissimilarity Measures; Eric Gilleland (NCAR)

1330: Verifying Cloud Forecasts with Satellite Brightness Temperatures; Sarah Griffin (CIMSS/UW-Madison)

1350: Using satellite all-sky infrared brightness temperatures for model verification; Jason Otkin (UW-Madison/SSEC/CIMMS)

1410: Regional Cloud Forecast Verification using Traditional, Spatial and Object-based Methods; Hui Christophersen (NRL)

1430: (*Virtual*) PyFLEXTRKR: An Overview of the Python Feature Tracking Software and Research Applications; Zhe Feng (PNNL)

1450: Investigating the impact of assimilating all-sky window-channel infrared radiances from GOES-ABI and Himawari-AHI on cloud analyses and forecasts; Ivette Hernandez Banos (NCAR/MMM)

1510 - 1530: Coffee Break

1530: False alarms in the satellite-based IR difference: When maritime low clouds are overstated at night; Jesse Turner (CSU)

1550: (*Virtual*) Utilizing quantified uncertainty in synthetic microwave brightness temperatures to reveal hidden tropical cyclone structures; Ellie Casas (Millersville Univ.)

1610: Evaluating impact on cloud forecasts with assimilation of all-sky microwave radiances using GOES-ABI and Himawari-AHI observations; Zhiquan Liu (NCAR)

1630: Break out Discussions