J9.7 RESULTS FROM GOES-R AND JPSS PROVING GROUND DEMONSTRATIONS AT THE HAZARDOUS WEATHER TESTBED 2015 SPRING EXPERIMENT

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1. INTRODUCTION

Geostationary Operational Environmental Satellite R-Series (GOES-R) represents the next-generation of NOAA/NASA geostationary weather satellites, with the first in the series expected to launch in October 2016. Joint Polar Satellite System (JPSS) is the next-generation NOAA/NASA polar orbiting operational environmental satellite system, already having launched the Suomi National Polar-orbiting Partnership (NPP) satellite in 2011. The GOES-R Proving Ground was established to test and evaluate GOES-R algorithms before launch using simulated data, while also familiarizing end-users with the products and capabilities that will be available with GOES-R (Goodman et al. 2012). Similarly, the JPSS Proving Ground allows for the training of users and testing of products associated with Suomi NPP. The Hazardous Weather Testbed (HWT) in Norman, OK provides an organization and space for the GOES-R and JPSS (Satellite) Proving Ground to fulfill its mission, especially with respect to the analysis and forecasting of convective weather.

Satellite Proving Ground activities in the HWT provide algorithm developers with an opportunity to observe their recently developed products being utilized by operational forecasters alongside operational data in a simulated forecast and warning environment. The feedback received from participants is incorporated into the improvement of the algorithms and development of new products. Additionally, the training and education received by HWT participants helps to ensure readiness for the subsequent receipt and use of GOES-R and JPSS data. Finally, the HWT allows for the testing of products in operational data processing and visualization systems such as AWIPS-II.

This report summarizes the Satellite Proving Ground activities that took place as part of the HWT Experimental Warning Program (EWP) Spring Experiment in May and June 2015. Satellite products demonstrated in 2015 included: GOES-R Legacy Atmospheric Profile (LAP) all-sky stability and moisture indices, GOES-R Convective Initiation (CI) algorithm, ProbSevere Model, GOES-14 Super Rapid Scan Operations for GOES-R (SRSOR) 1-min Imagery, Pseudo Geostationary Lightning Mapper (PGLM) total lightning products, Lightning Jump Algorithm (LJA), and the NOAA Unique CrIS ATMS Processing System (NUCAPS).

2. STRUCTURE OF EXPERIMENT

GOES-R and JPSS product demonstrations in the HWT/EWP 2015 Spring Experiment spanned five weeks in 2015: May 4, May 11, May 18, June 1, June 8. Each week, five NWS forecasters and one broadcast meteorologist evaluated several GOES-R and JPSS products and capabilities. Forecasters evaluated the experimental satellite products alongside standard operational data in a real-time AWIPS-II. Algorithm developers were also in attendance throughout the experiment to observe how their products were being utilized and to interact directly with the forecasters.

Participants completed training prior to their arrival in Norman via a 15-30 minute Articulate PowerPoint presentation for each product under evaluation. Product feedback came in many forms, including daily and weekly survey completion, daily and weekly debrief discussions between the forecasters, satellite liaison, and algorithm developers, weekly “Tales from the Testbed” webinar, and other informal discussions throughout the week. A real-time blog was also utilized for feedback collection. Over the duration of the experiment, more than 500 blog posts were composed by participants, visiting scientists, and HWT personal. These blog posts primarily included short-term mesoscale forecast updates, reasoning for experimental warning decisions, and general feedback such as best practices for product use and ideas for product improvement

Monday’s shift began with an orientation and spin-up period, allowing time for the participants to find the products in AWIPS-II, create workstation procedures, and ask questions about the products. By the second half of Monday, experimental operations were well underway. Tuesday-Thursday consisted of 8-hour experimental warning shifts with a flexible start time depending on when convective activity was expected to begin. Friday was a half-day which included a final weekly debrief discussion followed by the preparation and delivery of the “Tales from the Testbed” webinar.

At the start of each shift, forecasters broke into pairs and were assigned a NWS County Warning Area (CWA) in which to operate for the day. The CWAs were selected by the weekly coordinator with input from the Experimental Forecast Program (EFP) and Storm Prediction Center (SPC) forecasts of severe weather for the day. Any CONUS CWA could be selected, and the weekly coordinator could transfer a forecaster pair to another CWA if severe weather activity appeared more favorable elsewhere.

Experimental forecast shifts typically started a couple of hours before convective activity was expected to begin. This allowed forecasters an opportunity to

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become familiarized for the day, and evaluate the products that have their greatest utility in the pre-convective period. During this time, forecasters primarily composed short-term mesoscale forecasts via a live blog, focusing on how the experimental satellite products were contributing to their decision-making. As convective activity began, one forecaster in the pair would switch to issuing experimental severe thunderstorm and tornado warnings in AWIPS-II while the other would continue to write blog posts and monitor the mesoscale environment. If severe weather became considerably active within the CWA, both forecasters would issue warnings, with continued posts to the blog when possible. Experimental operations were concluded a half-hour before the end of the shift to allow for the completion of the daily survey.

3. RESULTS

3.1 GOES-R LAP All-Sky Stability and Moisture Indices

GOES-R LAP all-sky stability and moisture fields were demonstrated in the HWT for the first time in 2015. The end-product is composed of three parts: clear-sky LAP retrieval algorithm, cloudy-sky LAP retrieval algorithm, and NWP. The clear and cloudy sky retrieval algorithms use data from the GOES Sounder as a proxy for the GOES-R Advanced Baseline Imager (ABI), and information from the Global Forecast System (GFS) numerical weather prediction (NWP) model as a first guess. Where data gaps exist in the clear/cloudy sky retrieval combination (mostly due to considerable cloud cover), GFS NWP data are used. This results in one blended, all-sky, plan-view product.

Fields derived from the GOES-R LAP all-sky product and available to forecasters during the 2015 experiment included Total Precipitable Water (TPW), Layer Precipitable Water (LPW) in the SFC-0.9, 0.9-0.7, and 0.7-0.3 atmospheric layers in sigma coordinates, Convective Available Potential Energy (CAPE; surface-based), Lifted Index (LI), K-Index (KI), Total Totals (TT), and Showalter Index (SI). The LAP products were available every hour shortly after the GOES Sounder observations were made, and combine data from GOES-East and GOES-West to provide full-CONUS coverage. The purpose of this evaluation was to discover any technical issues with this new product and to gather feedback for how it could be improved to better suit forecaster needs.

The GOES-R LAP fields were primarily viewed by participants at the beginning of the experimental forecast shifts during their initial analysis of the environment. Loops of the fields revealed how instability and moisture had evolved to the present state, and where convective development was appearing more likely and less likely over time. Some forecasters continued to view the fields after convection had developed and matured as a means of tracking the environment into which it was moving. Forecasters typically viewed the fields as a color-fill display, while some viewed contour displays. Overlays of satellite imagery, radar imagery, and NWP data were commonly used with the LAP data.

Participants commented that gradients, maxima/minima, and trends in the LAP fields provided them with the most unique and useful nowcast information, rather than the absolute values themselves. It was along the moisture/instability gradients and within the areas of increasing moisture/instability that convection consistently developed (Fig. 1). Forecasters also found the LAP products useful for tracking the progression of the dryline, assessing the depth of moisture in the atmosphere, tracking moisture return, and differentiating the potential for severe vs. non-severe storms.

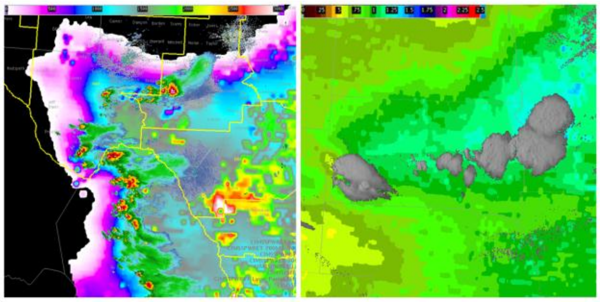

Figure 1: 2200 UTC 20 May 2015 GOES LAP CAPE and radar base reflectivity (left). 2200 UTC 09 June 2015 GOES LAP TPW and 2245 UTC GOES-East visible satellite imagery (right). Convection developed along a moisture and instability gradient in each case. From blog posts, "Convection focused along CAPE Gradient" and "Interesting Observation."

Throughout the course of the experiment, participants offered several suggestions for improving the LAP fields. Early on, there were many comments about unrealistic discontinuities in the fields. These were mainly due to instrument noise and were mostly resolved by May 25. Another suggestion was to add retrieval type (clear-sky, cloudy-sky, NWP) to AWIPS-II so forecasters have a way of knowing which of the three algorithms the field is derived from at any given point in space. Finally, forecasters indicated they would like to see improved training on layer PW, as this was a new field to many.

3.2 GOES-R Convective Initiation

The GOES-R CI product has been evaluated in the HWT for several years, and continues to receive improvements based on forecaster feedback. The CI algorithm fuses GOES cloud products and Rapid Refresh (RAP) model-derived environmental fields and uses a logistic regression framework to produce a 0-2 hr probability (0-100%) of future convective initiation for a given cloud object (Mecikalski et al. 2015). Convective initiation in this case is defined as a 35 dBz reflectivity echo at the -10C level. Using objective validation techniques, a training database of over 500,000 objects has been developed, representing convective regimes much better when compared to earlier iterations of the algorithm. Additional improvements to detection under thin cirrus and at night have been made, as well as a reduction in some of the noise associated with lower probabilities. The purpose of this demonstration was to evaluate the ability of the algorithm to increase forecaster confidence in and extend lead time to initial convective development.

The vast majority of participants found that the GOES-R CI product provided useful short-term guidance outside of information available from hourly update NWP models. Since the CI algorithm refreshes with satellite imagery, it provides forecasters with information between NWP updates, complimenting the model output. Also, the approximately 10 minute product latency ensures that forecasters are receiving updates shortly after the observations are made.

Forecasters most often viewed the CI product as an overlay on visible or infrared satellite imagery (Fig. 2). They utilized the product to monitor for convective initiation early in the experimental shift, but also throughout the shift for continued development. Forecasters found the product to be quite effective in drawing their focus to areas where initiation would soon occur and away from where it was less probable in the near future. In particular, paying attention to relative maxima in the probability field proved to be a useful strategy as those were the areas that more often resulted in initiation. Additionally, increasing probabilities over time (positive trends) in a particular area increased forecaster confidence that development was imminent there, while areas of sustained low to no probabilities allowed them to focus their attention elsewhere.

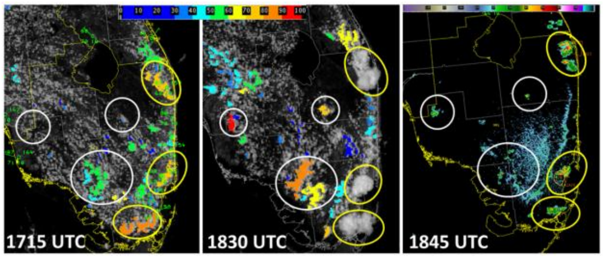

Figure 2: 1715 UTC and 1830 UTC 21 May 2015 GOES-R CI probabilities and GOES-East visible satellite imagery and 1845 UTC radar base reflectivity. Yellow (white) circles indicate greater than 70% CI probabilities from 1715 UTC (1830 UTC). From blog posts, "CI in South Florida" and "CI Continues to do well in south FL."

Forecasters mentioned that the algorithm was especially useful for highlighting future convective initiation along boundaries such as sea breezes, cold/warm fronts, dry lines, and outflows. The product was also exceptionally helpful in situations of widespread convective activity as it kept them alert to areas of imminent development. The product performed best in the absence of upper-level cirrus/cloud cover, but probabilities were often scarce or unrepresentative in the presence of such cloud cover. Although there were a few comments about the CI field appearing noisy, these situations were less common compared to in previous years. There was little opportunity this year to evaluate the product at night.

Although forecasters understand the need for a 35 dBz threshold product, many would like to see an additional product that provides a probability for the development of severe convection. Participants generally liked the CI display, though readout of the significant fields influencing the probability value would be a useful addition. With respect to training, forecasters would like to see more examples of how to apply the tool in an operational forecast environment.

3.3 ProbSevere Model

The ProbSevere Model was demonstrated in the HWT for the second year in a row in 2015, receiving minor updates since the previous evaluation. The statistical model fuses RAP-based instability and shear parameters, satellite vertical growth and glaciation rates, and radar derived maximum expected size of hail (MESH) to generate a probability that a developing storm will first produce any severe weather in the next 0-60 minutes (Cintineo et al. 2014). The developing storm is tracked in both the satellite and radar data using an object-oriented approach. The product updates every two minutes, and is displayed as a color contour that changes color and thickness with changing probability. Mousing over a contour produces readout of the probability of severe along with the model predictor values (Fig. 3).

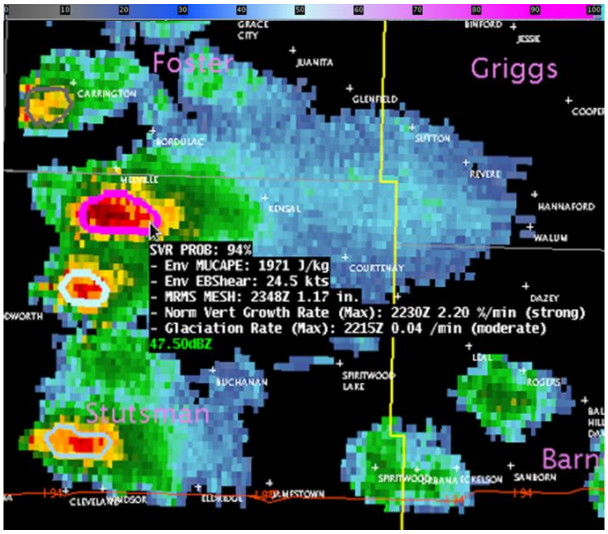

Figure 3: 2352 UTC 02 Jun 2015 ProbSevere probability contours, ProbSevere data readout, and MRMS 0.5 km reflectivity. From blog post, "Using ProbSevere as a key piece of info for warning decision."

After utilizing the ProbSevere Model during convective warning situations for a week, all forecasters felt that it was an effective situational awareness tool. It provided them with a quick and easy means of identifying and tracking developing storms that deserved the most immediate attention. This was especially the case during busy warning situations when many developing storms were present. When operations began after convection had developed, ProbSevere was often the first tool forecasters looked at as it provided them with a quick overview of where the strongest storms were located and where experimental warnings might be necessary. Participants liked the simple display and had no issues with overlaying it on their radar imagery, finding it to be an unobtrusive and intuitive addition. The data readout was also a feature that participants appreciated, making the product feel less like a black box.

In most cases, ProbSevere alone did not result in warning decisions, but instead increased forecaster confidence when making those decisions. High and/or rapidly increasing probabilities led forecasters to interrogate a storm in more detail, while low/stagnant probabilities allowed them to keep their attention elsewhere. ProbSevere also led to earlier issuance of warnings, with a large majority of forecasters answering that the output helped increase warning lead time. The lead time was most apparent when the satellite fields were available, and especially when the satellite was operating in Rapid Scan mode.

Although forecasters understood that ProbSevere was developed to provide probability guidance during the early stages of storm development, they still found utility after storm maturation. Persistent high probabilities for a storm with a history of producing severe weather indicated that the storm would likely continue to produce severe and necessitate continued warning issuance. Similarly, a storm with decreasing probabilities was likely weakening and would often lead a forecaster to let associated warnings expire with no reissuance.

As was the case last year, ProbSevere performed best with deep, discrete storms and when hail was the primary threat, while probabilities were less representative with low-topped convection when wind was the main severe threat. Forecasters would also like to see the model better handle upscale growth of convection into line segments and multicellular systems, when probabilities from visually distinct storms often merged together. Other common suggestions for improvement included: time series or trend line of recent probabilities for a storm, indicator of significant change in probabilities for a storm, training the algorithm to smaller geographic regions, adding lightning data as one of the predictors, and breaking down the probabilities by threat (e.g. wind, hail, tornado).

3.4 GOES-14 Super Rapid Scan Operations for GOES-R 1-minute Imagery

GOES-14 was out of storage mode and operating in SRSOR scan mode from May 18 to June 11, 2015. The location of the approximately 1500 km x 2000 km sector of 1-min imagery was adjusted daily based on the expected area of most active hazardous weather. GOES-14 SRSOR demonstrates a capability of the GOES-R ABI when in Mode 3 “flex mode” scan strategy, which will include 30 second imagery over one 1000 km x 1000 km sector, or two 1000 km x 1000 km sectors of 1-minute imagery (Schmit et al. 2005). An automated Overshooting Top Detection (OTD) algorithm generated from the SRSOR data was also available in AWIPS-II (Bedka et al. 2010), and 10-min atmospheric motion vectors (AMVs) were processed and made available via a webpage. SRSOR imagery was also viewed by the EFP and utilized by SPC forecasters in operations (Line et al. 2016). Previous GOES-14 SRSOR campaigns in 2012 (Schmit et al. 2013), 2013 (Schmit et al. 2014), and 2014 revealed the value of 1-min satellite data for the identification and tracking of a variety of weather phenomena.

The significance of the SRSOR imagery to the convective warning forecaster was realized by participants quickly during each week of the experiment. The most obvious benefit was the unique ability to observe cloud fields as they evolved in near real-time instead of after they had changed. Not only were forecasters receiving new images more often, but the latency of the images was significantly less compared to current routine imagery. This created substantial lead time to the identification of processes and features that are vital to convective nowcasting. The 1-min imagery aided the warning forecaster across the entire convective cycle, including: environmental analysis pre-CI, identification of CI, mature convective monitoring, warning issuance, and diagnosis of storm weakening.

In the pre-convective environment, forecasters could more precisely: monitor early morning clearing trends and the growth of boundary layer Cu fields, identify differential heating trends, classify and track regions of relatively high moisture based on cu development and movement, identify and track boundaries, and track Cu evolution below upper-level cloud cover. Forecasters commented that convective initiation could be identified in the 1-min imagery with confidence significantly earlier than was possible in the routine imagery.

After convection had developed, forecasters continued to experience benefits from the 1-min imagery over routine satellite imagery. Forecasters noted their improved ability to: analyze cloud top features such as overshooting and collapsing tops and above-anvil cirrus plumes, identify and track gravity wave features, observe warming at the cloud tops in the infrared imagery, and quickly identify storm mode and the transition between modes. When issuing warnings, the 1-min imagery allowed forecasters to monitor updraft strength between radar volume scans and diagnose further development of severe convection along a low-level boundary. The 1-min data, used in concert with lightning data, became especially important in regions where radar coverage was limited or non-existent.

Throughout the experiment, forecasters found it useful to view the SRSOR imagery in tandem with other very-high resolution observational datasets (Fig. 4). For example, overlays of lightning observations from ground-based networks provided additional information about rapid fluctuations in updraft intensity. Also, combinations of SRSOR imagery with radar imagery, especially when the radar was operating in SAILS or meso-SAILS scan mode, provided forecasters with a better conceptual model of weather phenomena such as a supercell thunderstorm. Finally, algorithms such as OTD and AMVs served to enhance the value of the 1-

min data, drawing out information that is otherwise difficult to visualize in the imagery alone.

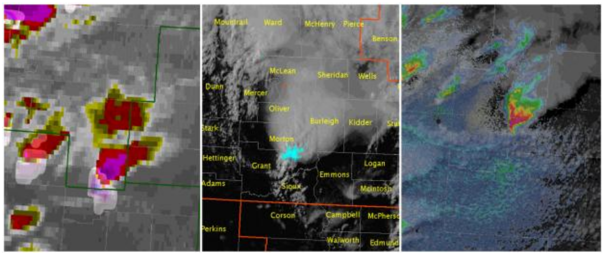

Figure 4: 11 June 2015 GOES-14 SRSOR infrared imagery and PGLM total lightning flash extent density (left), 02 June 2015 GOES-14 SRSOR visible imagery and Earth Networks total lightning flashes (middle), and 11 June 2015 GOES-14 SRSOR visible imagery and KPUX base radar reflectivity (right). From blog posts, "Integrating SRSO Visible imagery with 1 minute total lightning data," "Utilizing 1 min GOES Visible Satellite Imagery," and "Combining SRSO and Radar Data."

3.5 PGLM Total Lightning

The PGLM total lightning products were derived using observations from regional ground-based Lightning Mapping Arrays (LMAs). The raw total lightning observations from the LMA are recombined into a flash extent gridded field and then re-mapped to an 8 km x 8 km grid, matching that of the GLM. When a flash enters a grid box, the flash count is increased by one, with no flash being counted more than once for a given grid box. The product updates every 1 or 2 minutes, depending on the ground-based network being used. This year, an additional 6-min summation product was made available to match the temporal resolution of radar data and to ensure significant changes in lightning activity are not missed. Available LMA networks in 2015 included: Colorado (COLMA), Houston (HGLMA), Langmuir Lab, NM (LLLMA), North Alabama (NALMA), Oklahoma (OKLMA), Washington D.C. (DCLMA), and West Texas (WTLMA). PGLM total lightning products prepare forecasters to use data that will be available from the GOES-R GLM (Goodman et al. 2013).

Forecasters consistently commented that the PGLM products increased their situational awareness for convective growth and trends. Since total lightning can be used as a proxy for updraft intensity, the data were used to track storm intensity changes in near real-time (Fig. 5). Signs of significant increases and decreases in storm intensity were often first apparent in the PGLM data. The PGLM data also allowed forecasters to more easily identify and track thunderstorm cores, which was especially valuable when linear and multicellular storm modes were present. While some forecasters incorporated the total lightning data into their warning decisions, most would like to see additional in-depth training for proper incorporation of total lightning information into the warning process.

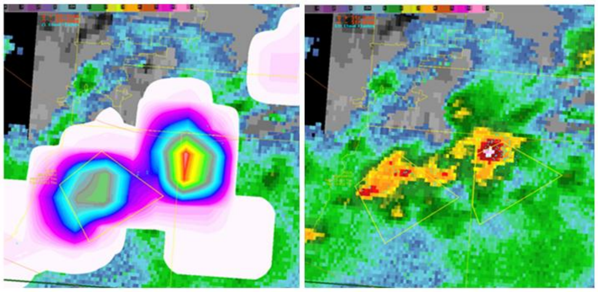

Figure 5: Interpolated PGLM flash extent density grid just prior to forecaster warning issuance (left) and KFTG reflectivity following warning (right) on 11 June 2015. From blog post, "Strong PGLM surge leads to warning."

Participants speculated on other situations in which the GLM data will have significant utility. When providing Decision Support Services (DSS) during outdoor events, knowing exactly when and where lightning activity is occurring, including the spatial extent of lightning, will provide a great advantage. Since in-cloud lightning often precedes the occurrence of cloud-to-ground lightning, total lightning data allows for more timely alerts to the public. Additionally, total lightning information is even more important for forecasters in areas lacking radar coverage such as in the western US and over the oceans, allowing them to track thunderstorms more accurately.

3.6 Lightning Jump Algorithm

The LJA was demonstrated in the HWT in 2015 for the second consecutive year. Research has shown that rapid increases in lightning activity can precede the occurrence of severe weather at the surface by tens of minutes (e.g. Schultz et al. 2009). The gridded LJA was available across the CONUS as it used total lightning data from the Earth Networks Total Lightning Network (ENTLN). Using the 1-min storm flash rate, the standard deviation over the previous 10-min period of activity (not including the period of interest) is computed. If the degree of jump (or sigma-level) is more than one standard deviation of the previous 10-min period, it is flagged as a "lightning jump." The LJA grid contains the identified storm objects, colorized by the degree of "jump" (1-sigma, 2-sigma, etc.) for that time period (Fig. 6).

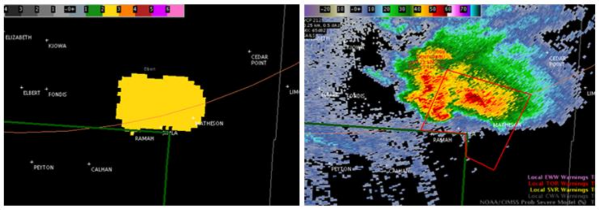

Figure 6: Storm-based lightning Jump Grid (left) and 0.5 degree reflectivity from KFTG (right) on 04 Jun 2015.

Many forecasters noted that the LJA was utilized primarily as a situational awareness tool during warning operations to track rapid intensity changes in developing and mature thunderstorms. Forecasters commented that a key advantage of the LJA was the increased lead time to storm intensity changes compared to radar imagery. Although it was typically not used alone in warning decisions, the LJA did lead to increased, and earlier, forecaster confidence that a warning might be needed for a given storm. The LJA would prompt the user to interrogate the storm further in radar imagery for potential warning issuance.

Participants were generally pleased with the simple display of the LJA, though some additions could make it even more useful. With 1-min updates, jumps were sometimes missed by the forecaster, especially during busy warning situations when much of his/her time was spent interrogating radar. Given this, forecasters recommended an additional display that shows the biggest jump over the last 5 minutes or so. Forecasters would also like to see the addition of a mouse-over data readout, similar to what is available with ProbSevere, to reveal additional information such as current flash rate, flash increase from previous time, and time series of recent flash history.

3.7 NOAA Unique CrIS ATMS Processing System

NUCAPS temperature and moisture profiles from the Suomi NPP JPSS satellite were demonstrated for the first time in the HWT in 2015. NUCAPS profiles were generated using an algorithm that combines both statistical and physical retrieval methods and data collected by the CrIS and ATMS instruments. These profiles are produced at NESDIS/NDE and delivered over the AWIPS Satellite Broadcast Network (SBN) for display in the National Skew-T and Hodograph Analysis and Research Program (NSHARP) application in AWIPS-II. During the experiment, swaths of NUCAPS profiles were available over the east coast around 1800 UTC, central US around 1930 UTC, and western US around 2100 UTC with a typical latency of 60-90 minutes.

With time of availability centralized roughly between the 1200 UTC and 0000 UTC radiosonde balloon launches, forecasters liked that NUCAPS helped to fill a temporal void in vertical sounding data. Furthermore, NUCAPS data were usually available shortly before convective initiation, providing forecasters with an update on how the thermodynamic environment has evolved since the morning radiosonde soundings. A majority of participants answered that NUCAPS provided an effective update on the current state of the thermodynamic environment.

Additionally, with approximately 25 miles separating each NUCAPS profile, forecasters could better assess aspects of the environment at a given location within a swath. This was especially helpful for forecasters working in offices with no balloon launch and in regions where geographic features lead to significant variations in environmental conditions within relatively small distances. Furthermore, the high density of profiles provided confidence to the existence of boundaries, including outflow and upper-level fronts, especially those that were suspected but difficult to discern from other observing methods.

Through comparisons with other data sources, it quickly became apparent that most NUCAPS profiles must be manually adjusted at and near the surface (using nearby surface observations) by the forecaster due to inaccuracies in the data (Fig. 7). Additionally, forecasters acknowledged the relative “smoothness” of the profiles in the vertical when compared to radiosondes. Although the general shape of the profiles and values of derived fields such as CAPE and PW were usually found to be comparable to that from observed soundings (after necessary modifications to low-levels were made), vital features such as capping inversions were not depicted well or at all.

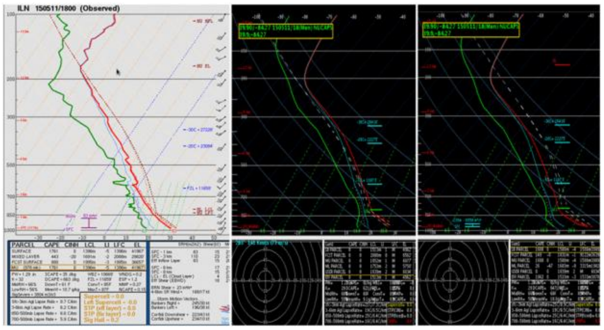

Figure 7: 1800 UTC 11 May 2015 Wilmington, Ohio radiosonde sounding on skew-T diagram (left), nearby un-modified NUCAPS sounding (middle), and same NUCAPS sounding after surface modifications (right). Note that the NUCAPS profile is very similar in shape to the radiosonde, but lacks the vertical detail. After making modifications to the surface of the NUCAPS profile, indices such as CAPE and PW matched closely with those from the radiosonde. From blog post, “Observed Radiosonde Data/NUCAPS Comparison.”

After making the necessary low-level modifications, participants felt that the NUCAPS profiles provided a reasonable representation of the general thermodynamic environment in many situations. This led them to see value in having these space-based soundings to help fill the spatiotemporal gap that exists in observed sounding information. Common suggestions for improvement made by participants included: automation of the surface/low-level correction, apply NUCAPS algorithm to other satellites, implement quality control flags into AWIPS-II, develop plan view products, and a few NSHARP related improvements.

4. SUMMARY

Satellite Proving Ground activities in the HWT help to prepare forecasters for the use of new and future satellite products and capabilities, pre-launch. Additionally, feedback received during these activities leads to the development of new and improved satellite-based algorithms. In 2015, seven GOES-R and JPSS algorithms were evaluated by 25 NWS forecasters and five broadcast meteorologists in the simulated short-term forecast and warning environment of the

HWT/EWP as part of the annual Spring Experiment. The products under evaluation included GOES-R LAP all-sky stability and moisture indices, GOES-R CI algorithm, ProbSevere statistical model, PGLM total lightning products, and LJA. Additionally, GOES-14 SRSOR imagery was available from May 18-June 11. Finally, NUCAPS temperature and moisture profiles from the JPSS Suomi NPP satellite were also demonstrated in AWIPS-II.

Participants utilized the experimental satellite algorithms, in addition to operationally available data, in AWIPS-II to issue experimental short-term mesoscale forecast updates and severe thunderstorm and tornado warnings. Feedback included suggestions for improving the algorithms, ideas for making the displays more pleasing, best practices for product use, and highlighting specific forecast situations in which the tools worked well and not as well.

Additional feedback, including examples, from the 2015 GOES-R and JPSS demonstrations at the HWT/EWP Spring Experiment can be found on the GOES-R HWT blog: http://goesrhwt.blogspot.com/.

Acknowledgments

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