U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Environmental Satellite, Data, and Information Service

NOAA 2012 Satellite Science Week Meeting
Summary Report

April 30 – May 4, 2012

Kansas City, Missouri

Final Report

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1 Introduction

The NOAA Satellite Science Week Meeting was held April 30 – May 4, 2012 in Kansas City, Missouri at the National Weather Service Training Center. This meeting was the first of its kind, combining four groups: GOES-R Algorithm Working Group, Satellite Training, the GOES-R and JPSS Proving Grounds, and Risk Reduction science activities. The goal of this meeting was to promote interchange between product developers and the user communities; ensuring a path for the transition of research to operations and user readiness. To this end, operational forecasters and international scientists were included among the 150 attendees, in addition to representatives of each of the four groups.

The interaction during Science Week is part of an ongoing effort to ensure the best approach towards resolving future and current issues and preventing redundant efforts

The meeting had four main objectives:

1. Stimulate high priority scientific advancements for operations.
2. Understand and assess NWS operational experiences with GOES-R and JPSS products in the Proving Ground (PG)
3. Enhance the plans for training development and dissemination
4. Explore collaboration potential among NOAA observing system programs

The agenda for the week was organized by application area (e.g., winds, hydrology, lightning, clouds, space weather.) The relevant PG activities, algorithm development, risk reduction, and training concerns were presented and discussed in a forum that focused on each topic. The Independent Advisory Committee (IAC) and the NWS Operational Advisory Team also met during the week. Breakout meetings were held for AWIPS II, Science and Demonstration Executive Board (SDEB), and Satellite Liaisons.

The diverse audience enabled interesting discussions and, in some areas, closed the gap between product developers, operators, and trainers. Future meetings will continue this synergetic approach with open discussion to solve rising issues with the transition to future satellites and products.

A summary of the general session is given in Section 2. The Advisory Committee Meetings are covered in Section 3. The breakout meetings are detailed in Section 4. Section 5 sums up the results of the meeting, including action items.

2 General Session Summary

This section summarizes the major topics of interest covered during the general sessions. It includes the satellite training team report and status of risk reduction program. Copies of the presentations and posters are available from the GOES-R web site.

Dr. Kathy Sullivan and Mary Kicza were guest speakers and addressed the importance of synergy between the two satellite programs: JPSS and GOES-R. One of the biggest issues facing National Weather Service forecast offices is the bandwidth capacity needed for the enormous amount of data that GOES-R will generate. One possible solution discussed was the use of plug-ins for software on desktop computers so that forecasters can pick and choose specific product data and channels to download.

The subject of training pervaded the discussion, especially the process of getting new products into training modules. COMET and the NWS Training Division are working closely with the GOES-R and JPSS Programs to develop appropriate training on operational applications of new products and decision aids The discussion included possible ways to prioritize the development of training modules for the new products.

A presentation on the newly formed Operational Proving Ground (OPG) at the NWSTC was given by Kim Runk. The OPG is to assist NWS weather forecast offices as they shift their focus to decision support services and to streamline risk reduction on new and old products. The OPG will provide the capabilities to integrate satellite data and products into NWS operations as an essential complement to all other data sources available to the forecasters. This will include the use of stand-alone and "fused" satellite products. The OPG's aim is to support a complete end-to-end test (from data to products) and to train forecasters in a real time scenario to use new products to create their forecast.

One benefit of this week was having international partners to add their perspective to discussions. The weather satellite programs in Canada, Europe, Japan, and Brazil provided updates to their future plans. There was excitement for Canada's proposed Molniya-like high eccentricity orbit for a two-satellite communications system, currently in a pre-phase A study, which would provide better coverage over northern latitudes. . Japan will be launching the new generation of Himawari satellites with an instrument similar to the GOES-R ABI. Brazil announced the launch in the near future of their government's satellite with a weather instrument, and plans to build a geostationary satellite for the South American region. Finally, EUMETSAT spoke about the upcoming launches of two satellites this year.

2.1 Satellite Training Team Report

The satellite training team presented the NWS training challenges they face in the NPP/GOES-R/JPSS era. The list of challenges and necessary solutions included:

- Training meteorologists to do data fusion in their heads is difficult; "blended" (data fusion) products must be developed.
- Training meteorologists to go to new Websites to use new data sets is difficult; new tools and products must be implemented into AWIPS II.
- Training meteorologists "when" to use new tools is difficult so developing "alerting" functions (example IFR criteria detected) is needed.
- Getting meteorologists to recall training when needed is difficult so performance support on AWIPS II must be developed (such as mouse-over highlights).

- Ensuring that training is relevant to meteorologists by testing training in the Satellite and NWS Operations Proving Ground.
- Motivating meteorologists to take training is difficult so training should be packaged into defined courses ("GOES-R Ready Course").

Training will be successful by building on COMET modules and VISIT/SHyMet virtual courses. Training must be timely – to coincide with release on AWIPS II data availability – and needs to be supported by management. The concept of AWIPS II plug-ins was well received by attendees. Forecasters need access to quick, refresher material of concepts and what new products are capable of showing.

The Proving Ground provides opportunities to develop and test new, effective training. The tasks needed to ensure user readiness include:

- Validate and optimize decision aids.
- Optimize integrated product display techniques.
- Weather Event Simulator cases for user and developer training
- Human (meteorologist) performance assessment.

Additionally, the Proving Ground opens up venues for direct user-developer (and manager) interaction. The Proving Ground also provides resources (links) to satellite training and the NWS Operations Proving Ground. The training team proposed having one, unified product table available to users so they can easily find how and where to access training and information on a product when needed. Lastly, the team mentioned five key questions needed to ensure user readiness:

- How do products help operations?
- Who are the users?
- What is the best way to prepare users?
- What is the best way to prepare decision makers?
- How do users get resources to prepare?

2.2 Summary of the Risk Reduction Program

The status of the GOES-R Risk Reduction Program was given by Ingrid Guch. The vision of the program is:

- To have capable and informed users
- To have flexible and inventive providers
- Knowledge exchange between the users and providers, and recognize the connection between capabilities and needs
- Champions of new opportunities

The vision has remained the same while the activities have changed perspective. For example, there is less emphasis on new products since Option 2 products are no longer being implemented on GOES-R. The emphasis has moved to data fusion and application of products to take advantage of the science teams that were developed to create the Option 2 algorithms. The program remains focused on the following four areas: multi-sensor, multi-satellite, data assimilation, and nowcasting. There has been more progress to incorporate the JPSS Proving Ground and Risk Reduction programs.

The Risk Reduction differs slightly from the Proving Ground by being more dedicated to the science of the algorithms and products rather than operations; the "Science Arm" of the GOES-R Proving Ground. The demonstrations, projects, and activities are all overseen by a lead scientist. For the recent round of "Call for Proposals", teams were encouraged to coordinate with other teams with similar goals, to help allocate funding to diverse projects. Severe Weather, Aviation, and Data Assimilation are the three main priorities in Risk Reduction. All projects are to be reviewed by the SDEB, NOAT, TAG and IAC teams to determine funding for the next couple of years.

3 Advisory Committee Summaries

3.1 IAC: Independent Advisory Committee

After each day of presentations the Independent Advisory Committee (IAC) met to discuss the issues and impacts of the transition to GOES-R. This was the first time this group met since it replaced the Algorithm Development Executive Board (ADEB). All of the members of this group are not directly associated with the ground system or product development, giving them an objective point of view. Their perspectives provide an unbiased and fresh look on the difficulties that will arise during the transition to GOES-R. Based on the week's meetings, recommendations were made by the group. These recommendations will be discussed and implemented by the GOES-R Program, overseen by Steve Goodman. The following recommendations were presented by John LeMarshall from the Bureau of Meteorology in Australia:

1. Scientists must remain close to their algorithms during operational implementation. Their role in product production efficiency, validation, and evolution must be facilitated by close communication/collaboration with the vendor of the ground system. However science developers should not be the principal evaluators of their own products.
2. Preparations must be made for rapid software updates, with scientist engagement, as experience with real data reveals issues (data striping, rectification issues, geo diffraction effects, missing or saturated data.) There will be situations when the algorithm change process is going from "broken to working" rather than from "adequate to better". Need to draft update strategies to be used both before Day 1 and after Day 1. A pre-planned product improvement strategy must be developed for the program. **Recommendation:** Scientists need early access to the operational GOES-R C++ code and a process needs to be established for rapid software updates both before Day 1 and after.
3. The Himawari 8 satellite will carry an Imager very similar to that on GOES-R. **Recommendation:** MOA should arrange for scientist access to Himawari data and documentation of differences from GOES-R so that experience with real ABI data can mitigate some issues before GOES-R launch.
4. Optimal GOES-R scanning and pre-processing scenarios still needs exploration (e.g., scan south to north for more timely Northern Hemisphere (NH) data, de-striping before rectification). **Recommendation:** Undertake a study to demonstrate the difference in GOES Perfect Projection of data when data is de-striped then rectified. (Information about image construction from scanning detector array needs to be made available).
5. Effective CAL/VAL is essential to ensure high quality of input data for product generation and must be effectively performed in a timely manner. A special briefing from the CAL/VAL Team is being arranged. Field campaigns for validation of GOES-R sensor measurements and derived products must also be planned as soon as possible. The detailed Basis of Estimate should take into account other planned validation campaigns and assets as much as possible. Coordination with other programs requires early commitment.
6. Preparations for routine production of Option 2 (Future Capability) Products (prior to operational production) appear to be underway as part of the Enterprise processing system. **Recommendation:** These should be sustained as much as possible so that affiliated scientists get an opportunity to evaluate the ABI data and the user community gets familiar with the product.

7. Opportunity for LEO supplement/complement to GEO measurements for product generation has been enhanced greatly by the established of the Enterprise processing system. More efforts should be encouraged for combined products where LEO benchmarks are temporally continued with GEO measurements. For example, LEO day-night band observations of fog can be extended into early morning with GEO visible composites. One caveat is that LEO and GEO must provide coherent depictions, hence physics issues need attention (e.g., viewing angle differences, diffraction issues from GEO but not LEO). For example, LEO versus GEO Vis/NIR algorithms must account for the characteristic viewing angle and solar illumination differences between the two systems.
8. Better utilization of temporal continuity for product generation and QC is progressing. Some algorithms are now making good use of the temporal advantages offered by geostationary measurements; all algorithm developers should re-consider ways to make better use for consistency checks and/or QC.
9. Product validation needs better articulation/planning. Post-launch validation must include considerations for field experiments; leveraging and contributing to existing plans for NASA/DOE/NOAA field experiments must be undertaken. **Recommendation:** Post launch plans should be presented at the next conference.
10. Data assimilation of hourly radiances/products (e.g., AMVs) in NWP models requires more attention (e.g., use of 4DVAR.) Joint Center for Satellite Data Assimilation (JCSDA) engagement in this direction need to be strengthened. Moreover, use of satellite data over land (surface viewing as well as upper tropospheric/lower stratospheric sensitive measurements) in NWP needs to be enhanced. We need to be prepared for the generation and continuous assimilation of radiances and hourly winds. Surface emissivity also needs to be updated in the CRTM. In general NWP readiness for GOES-R should continue to be a high priority activity.
11. ABI does not offer a sounding product; ABI offers layer adjustments to a NWP model's initial vertical profile estimate. This must be made clear in the product designation. Use of the word "sounding" is totally inappropriate and misleading. Utilization of the LEO high spectral resolution data rendering of moisture vertical and horizontal distributions needs to be encouraged. **Recommendations:** (1) Regional forecasts and nowcasts necessary for a Weather Ready Nation will have to make better use of the information content from AIRS, CrIS, and IASI data; GPS data should also be included. Between LEO sounding coverage, GOES-R data should be used to monitor temporal profile (atmospheric stability, etc.) changes. (2) To pursue the missing continuous viewing essential for capturing the rapidly changing conditions that go with severe weather, the move to a GEO high spectral resolution IR sounder should receive higher priority within NOAA. A Transition Plan and Transition Survey should be completed as soon as possible.
12. The Satellite Programs and the JCSDA should respond to arising needs for a) Data Assimilation (DA) Impact metrics tailored to forecaster understanding including regional, high impact DA tests and b) all DA and other impact studies and results should be respected; but not widely communicated until they are reproduced by at least one independent study or method.
13. In relation to supporting operational forecasting, the value of Visible Infrared Imager Radiometer Suite (VIIRS) in Advanced Weather Interactive Processing System (AWIPS) will be dependent on the timeliness of the data. Currently the plan is to use the IDPS at NESDIS as the source; however this will result in upwards of 2 hour latency from observation time. **Recommendation:** Make use of a network of DB sites from CONUS and OCONUS to reduce latency to within 30 minutes.
14. In relation to AWIPS II and product development, we need to bring experts in radar and NWP knowledge and skills to the product development teams. They would work with satellite experts

in order to achieve the vision of fused-integrated observations with NWP. Satellite developers don't usually have understanding of radar and vice versa and we need to avoid new stovepipes replacing the old ones. In particular, we need for this to come together for the Proving Ground.

15. Because of the importance of training to the success of the GOES-R program, it is recommended that the application production team subject matter experts be involved in training. This may be done in a number of ways, such as providing materials and training the trainers.
16. In relation to space weather, NOAA National Geophysical Data Center (NGDC) needs to complete the plan for operationalizing their products. As a first step Cal/Val will need to be addressed. **Recommendation:** For software development, NGDC should take advantage of software already developed for space weather applications.

These recommendations have been assigned to the proper points of contact and the GOES-R Program office will be kept up to date on the progress of each recommendation.

3.2 NOAT: NWS Operational Advisory Team

The NWS Operational Advisory Team (NOAT) also met each day after the presentations to discuss the satellite needs within the NWS in a GOES-R era. This new advisory board is composed of the six Scientific Services Division (SSD) chiefs and a National Centers for Environmental Prediction (NCEP) representative. Their function is to advise the GOES-R Science and Demonstration Executive Board (SDEB) by developing a yearly guidance memorandum to ensure science development and demonstration activities meet operational priorities. The group will be revising their guidance memorandum and offered the following recommendations.

The SSD chiefs opened by emphasizing that they view satellites as one component of many needed to produce products and services, particularly as the NWS focus shifts to a service role. The service role is to provide decision support for community leaders, partners, and individuals to better help them anticipate, respond, and recover from meteorological and hydrological events and minimize impacts to the economy. There are several key themes that the chiefs would like implemented in the future to support these services and they would like to know how the next generation of satellites will be integrated into each theme to improve products.

Themes:

- Convective Initiation/Warn-On Forecast
- Best State-of-the-Atmosphere (3-D analysis)
- Next Generation Forecast System
- Decision Support Information Systems
- Integrating Social Science
- Risk Reduction, Testbeds, and Dynamic Training

The SSD chiefs stated that handling convective initiation in Numerical Weather Prediction (NWP) models is one of the biggest challenges in forecasting. A better depiction of the boundary layer, especially low-level distribution of moisture, is needed for more accurate model output. This will impact the concept of "warn-on forecast", which is designed to release warning information several hours ahead of an event based on more accurate NWP models. Better boundary layer depiction will also improve QPE/QPF, development of anticipated general convection, and improve forecasts of cloud, fog, and visibility.

Developing an accurate, best state-of-the-atmosphere analysis is another challenge that forecasters face, specifically an accurate three-dimensional analysis of the current state-of-the-atmosphere. This also requires a better depiction of the boundary layer and integration of various datasets. The current state-of-the-atmosphere information is the basis for the initial zero-hour of the forecast database and the basis for the initial conditions for next generation modeling systems. The information also assists forecasters in monitoring, quality controlling the forecast database, as well as aiding in situational awareness and verification of previous forecasts.

The next generation forecast system will be a major change in forecast operations. The SSD chiefs are working to determine how the forecaster will transition to a system that is more automated and provides more probabilistic information, which will be necessary with the flood of information from more advanced observing systems. This will allow the forecaster more time to do other things and act in more of a management role in the forecasting process. The new system will improve infrastructure for decision support systems and provide input into advanced decision support systems (such as the Aviation NextGen, fire weather, and environmental ecosystems).

The SSD chiefs offered several thoughts for the satellite programs to consider:

- How does your project deal with a path to operations?
    - The chiefs urge the satellite programs to be aware of current and future NWS operations such as the ability to integrate satellite data into AWIPS II and/or evolving prototypes of future systems.
    - The chiefs suggest integrating satellite data into current and evolving operational modeling and data assimilation systems.
- Is your project satellite-centric?
    - This is neither good nor bad to the SSD chiefs. Fusing satellite products with others is good where it makes sense, but there are some applications where satellite might be the answer and there is no way to fuse it with another product.
    - The chiefs would prefer multi-sensor fusion, in addition to satellites, whenever possible. The NWS is trying to create in integrated observation system and operational NWP.
- Leverage the idea of the “enterprise/framework” satellite system.
    - Use the same upstream algorithms when feasible.
- “Throw the ball down the field”.
    - This means realizing that some of these ideas involve a “moving target”, e.g., next generation forecast and warning system(s), and integrated observation system. The goal should be to develop capabilities for future operations instead of for today’s operations.
- Continue to walk in the forecasters’ shoes.
    - Understand their job and challenges and see how they use information in an operational setting.
- Embrace emerging applications.
    - This includes wind and solar energy, and ecosystems.

The SSD chiefs then provided some examples they had developed to illustrate possible satellite fusion products. One such product that is already operational is the Blended Total Precipitable Water (TPW) product. TPW is a multi-sensor product (GPS, AMSU-SSMI) that deals with atmospheric moisture distribution. The forecasters need this for atmospheric rivers, heavy rain/snow, flood/blizzard, drought, and convective storm forecasting. They simply have to look at a TPW plot to help deduce this information.

An opportunity for potential data fusion lies in quantitative precipitation estimates (QPE). The chiefs hypothesize using GOES-R plus radar and surface observations to yield global precipitation estimates.

This information is needed for flood/flash flood, transportation, and drought forecasting and would be especially useful to places with poor radar coverage.

Another potential operational example is fusing severe weather products and integrating them into the next generation warning system. One example is fusing convective initiation, overshooting tops, and lightning jumps. This kind of information is needed for situational awareness, convective warning confidence, and decision support (particularly venues). The forecasters will generally not look at satellite products once severe weather is occurring (focusing instead on radar and surface observations) so the information needs to be integrated into the system.

A potential modeling example of fusion could be assimilating convective initiation and other severe weather products into a convective resolving NWP model. This information is needed for situational awareness, convective warning confidence, and decision support (particularly venues).

The NCEP representative then provided some considerations for the satellite programs from the NCEP viewpoint:

- Improved analysis and NWP forecasts are big targets for the operational use of new observations.
- Aim for future operational modeling/data assimilation systems.
- Coordinate via the Joint Center for Satellite Data Assimilation.
    - Service Centers (AWC, NHC, OPC, SWPC, SPC, HPC) appreciate new sensors, science, and products.
- The discriminator for successful Risk Reduction and Proving Ground products will depend on effective collaboration via respective testbeds.

Finally, some unique Alaskan considerations were presented. Their goal is to have fully coupled atmospheric-ocean-ice modeling capability. Poorly characterized sea ice impacts the boundary layer energy balance, which impacts boundary layer momentum fluxes and, thus, impacts storm track and intensity forecasts. The Alaskan highest priority is accurate cryospheric products related to sea ice (i.e., sea ice cover (extent), sea ice age (first year/multi-year), sea ice concentration and motion). These products are needed at the temporal granularity of GOES-R and JPSS.

4 Breakout Session Summaries

4.1 AWIPS II Breakout Meeting

The meeting focused on a high level discussion of the development of AWIPS II plug-ins and tools by the outside community (external to Raytheon) to support GOES-R PG activities. Several PG partners are modifying existing AWIPS II plug-ins or developing new ones to enhance the analysis and visualization of PG products in a testbed environment, and several of these have been tested in operational AWIPS II systems. It is envisioned that some these new capabilities will be baselined for AWIPS II and used for GOES-R ABI and GLM operational applications. Ed Mandel responded that he approves a testbed/single office type approach, but these plug-ins and tools will need to be evaluated by the NWS/Raytheon AWIPS II development team before being baselined into AWIPS II. The governance of this process is still being discussed.

SPoRT reported on their plan to expand the Experimental Products Development Team (EPDT) for AWIPS II to include GOES-R PG partners. The expansion would initially bring together staff from SPoRT, NOAA's CIs, and the NWS to develop a critical mass of technical expertise (outside of Raytheon's AWIPS II development team) which would focus on the development, demonstration, and transition of new plug-ins and tools to address the near-term needs of the PG community. The team would identify these needs, coordinate priority development activities with Raytheon, and lead an effort to develop plug-in capabilities and tools not currently being addressed by Raytheon. The team would gain working knowledge of the strengths and weaknesses of the AWIPS II environment for the storage and display of future operational data and provide a valuable resource to the NWS Office of Science & Technology (OST) and Raytheon on new capabilities and governance models of local AWIPS II code development. While the current size of the SPoRT EPDT is limited, NWS proposed expanding it to include a representative from each CI, a Raytheon AWIPS II developer, and a NWS OST developer/focal point. Each NWS region would also be given an opportunity to nominate a staff member to join the PG EPDT. Further expansion could also include AWIPS II developers at NOAA's Global Systems Division (GSD) and the NWS Meteorological Development Laboratory (MDL). The team would have monthly conference calls and face-to-face collaborative workshops to exchange knowledge and share development experiences. The semi-annual workshops held by SPoRT will initially focus on bringing team members up to a core competency and later on exposing members to new concepts within the framework. The initial workshop will train team members on frameworks such as Hibernate, Spring, Eclipse RCP, along with developing EDEX, and CAVE plug-ins from the ground up. Follow-up workshops would allow members to contribute in areas of expertise to train others within the group. These members would become subject matter experts that could be consulted by the rest of the group.

4.2 Science and Demonstration Executive Board (SDEB) Breakout Meeting

The GOES-R SDEB reviewed the pros/cons of the "new" Science Week format of combining the meetings of the GOES-R Algorithm Working Group (AWG), Satellite Training, the GOES-R and JPSS Proving Grounds and Risk Reduction Science activities (R3). Previously, the AWG and R3 communities met together and the PG and Training communities met together. The general consensus was that the concept to combine the groups was a good idea and in part was necessitated by reduced travel budget guidelines. The benefit of having all the GOES-R communities at the same venue for face-to-face interaction was invaluable since some researchers had never met face-to-face with the other scientists and forecasters. Breakout sessions and splinter meetings received very positive feedback, as did the

presentations by the NOAT, IAC, and the Training teams. It was suggested that future meetings should have more small-group focused breakouts and fewer PowerPoint briefings. This feedback is being applied to the agenda planning for the NOAA Satellite Conference planned for 2013.

Feedback from attendees at the meeting identified a few areas for improvement including a need to better integrate training topics and additional time and space for viewing the posters (all posters were on the same side of the hallway which limited flow and access). Additional time for AWIPS II discussion was desired, perhaps 3-4 days of breakout discussion sessions for AWIPS II alone. This speaks volumes about the desire and need to discuss user system readiness for GOES-R.

Finally, the SDEB discussed potential locations for next year and possibilities for a virtual meeting. Potential venues were evaluated following the meeting and included the new NOAA Center for Weather and Climate Prediction (NCWCP) federal building on the University of Maryland - College Park campus, a return to the NWS Training Center in Kansas City, a return to Monona Terrace in Madison, Wisconsin hosted by CIMSS, or in Huntsville, AL hosted by NASA SPoRT. As new travel guidelines were issued in the months following the meeting it was decided that the next Science Week meeting would be entirely virtual and hosted by the COMET Program in Boulder, CO. The organizing committee is already busy working on the details for next year's Science Week 2013 to be held the week of March 18.

4.3 Satellite Liaison Breakout Meeting

The Science Week meeting was the first opportunity to gather all the GOES-R Satellite Liaisons in one place; allowing them to meet each other and for the AWG, R3, and other program managers to meet them as well. Following brief introductions and a discussion of individual research interests and subject matter expertise, the meeting focused on Proving Ground planning for the upcoming year. It was decided that a 1-2 week satellite meteorology/remote sensing basics, "boot camp", would be deferred until the summer of 2013. The camp is being designed to better familiarize the Satellite Liaisons with the physical basis of the GOES-R products and would be hosted and taught by CIMSS and UW-Madison Atmospheric and Oceanic Sciences faculty. Finally, planned meetings and programmatic travel for FY13 were reviewed.

5 Conclusion

The success of the conference was due to the collaboration of different groups within the satellite programs. The meeting attendance was high and participation was lively and productive. NOAA Satellite Science Week bridged gaps of communication among many groups involved in the satellite programs. This interaction is part of an ongoing effort to ensure the best approach towards resolving future and current issues and preventing redundant efforts. Future meetings will continue this synergetic approach with open discussion to solve rising issues with the transition to future satellites and products.

There were two action items that came from the AWIPS II discussion:

- An action was taken to review and update the list of unique plug-ins and tools (existing, planned, and /or needed) desired by the GOES-R PG activity
- SPoRT took an action to articulate the EPDT expansion plan in a more formal document to be circulated to the PG team

Various recommendations from the IAC also resulted from the meeting. All actions and recommendations are being worked by their respective groups. All new information pertinent to the user will be communicated through the GOES-R website and future meetings and conferences.