LANCE User Working Group Meeting

November 16-17, 2010 Marriott Inn, University of Maryland

Report Date: January 18, 2011

The inaugural meeting of the LANCE User Working Group was held November 16-17, 2010 at UMD. The present report is a summary of the attendees, the presentations given by these attendees and the discussions of a variety of proposed enhancements presented for User Working Group consideration. The report contains an Action Item list with assignees and priorities based on the User Working Group discussions.

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1.0 Attendees

1.1 UWG Members
There are 14 members of the UWG and all members were in attendance (Bob Breckenbridge by phone) except Christopher Cantrell, Brian Hughes, and Ivan Csiszar:

Name	Affiliation	Element of Interest
Chris Justice (Chair)	University of Maryland	All Elements
Liam Gumley	University of Wisconsin/Madison	MODIS
Kim Richardson	NRL/Monterrey	MODIS, AMSR-E
James Verdin	USGS	MODIS
Gary Jedlovec	NASA/MSFC/SPoRT	MODIS, AIRS, AMSR-E
Rama Nemani	NASA/ARC	MODIS
Nickolay Krotkov	GEST/UMBC	OMI
Arlindo Dasilva	NASA/GSFC/GMAO	MODIS, AIRS
Mike Fromm	NRL/Washington DC	MODIS
Robert Brakenridge	Dartmouth Flood Observatory	MODIS
Brad Quayle	USFS	MODIS
Christopher Cantrell	AFWA	MODIS, AIRS
Brian Hughes	NOAA/NESDIS	MODIS
Ivan Csiszar	NOAA/NESDIS	MODIS

1.2 Other Attendees
There were a number of additional attendees representing other members of the user community, representatives of the individual LANCE elements, NASA HQ, and ESDIS. These are listed in Appendix 1.

2.0 Minutes

The principal topics of the UWG meeting were the review of the status of the LANCE elements, identification and discussion of potential modifications and upgrades to the LANCE system, and the provision of recommendations by the UWG for future efforts. The potential system changes were suggested by the UWG, the representatives of the LANCE elements, and other attendees representing various segments of the LANCE user community. Presentations were given by representatives of the various LANCE elements with focus on the changes that had been made to the system in response to user recommendations from the LANCE Workshop at UMD in December 2009. Since a number of members of the UWG had not attended the December Workshop a summary presentation on the overall system was given. The detailed agenda is given in Appendix 2. The meeting was divided into five sessions:

1. Welcome and Charge
2. UWG Context and Background

3. LANCE Updates
4. User Proposed Enhancements
5. Discussions

2.1 Welcome and Charge

2.1.1 Objectives and Scope of the User Working Group by Martha Maiden

The meeting was opened by Martha Maiden (NASA HQ) who welcomed the UWG members and the other attendees and thanked the former for their participation in the UWG and their support of LANCE. The very significant progress made by the LANCE system in the year since its inception was noted. The contribution of Michael Goodman (NASA HQ) in the establishment of the LANCE infrastructure was recognized. The importance of the LANCE near-real time effort in the context of the upcoming decadal survey was discussed. The following points were made concerning the LANCE products and services:

- It is essential that the LANCE data products will be tied closely to the various associated Science Team members.
- Traditionally, the user services and user advocates have in part shielded the instrument developers from the applications community and the new LANCE process will be based upon this history.
- The UWG recommendations arising from the present meeting will be highly important because a) they will reflect specific applications as well as the needs of the wider user community, and b) they will provide feedback concerning the quality of the present service as well provide guidance for future changes.

2.1.2 ESDIS Project Management Plans for LANCE by Dawn Lowe (ESDIS)

This presentation focused on:

- Identification of the various ESDIS staff members including Jeanne Behnke, Kevin Murphy, and Karen Michael.
- The rationale for including the various Aqua, Terra, and Aura LANCE under a single umbrella including common requirements and procedures and software re-use within the elements.
- LANCE in the context of EOSDIS activities.
- The management role of ESDIS including a) providing funding for the LANCE elements, b) collecting of metrics and developing and maintaining the LANCE website, c) managing the EDOS interface, d) identifying and advocating areas of commonality between the elements, e) interacting with users concerning potential system upgrades, and f) generating work plans and hosting UWG meetings.
- The responsibilities of the LANCE elements including a) generating and distributing data products, b) adhering to the latency and other

requirements, c) maintaining the element-specific components of the LANCE website and providing user support services, d) performing resource estimates for potential system upgrades, and e) performing system development and sustaining engineering functions.

- Future endeavors including a) working with LANCE elements to implement system improvements, b) continuing to foster feedback with the user community, c) planning subsequent UWG meetings and coordinating with other near-real time activities within NASA

In subsequent discussion it was noted by Martha Maiden that, prior to the UWG, LANCE had received a number of requests for system upgrades and that it was now the responsibility of the UWG to make recommendations for new products and services. Chris Justice commented on the evolution of the Rapid Response system into LANCE and pointed out that it was important to determine the extent to which LANCE should go to support users and to provide value-added services. It was also decided that the next UWG meeting would be held in approximately one year and that teleconferences would be established to support interim issues.

2.1.3 LANCE Overview and Progress by Kevin Murphy (ESDIS)

This presentation:

- Identified the LANCE objectives including providing high reliability products in less than three hours from the observation time and providing an umbrella environment with common requirements.
- Identified the locations of the individual elements designed to leverage against the standard, high-science quality data processing systems.
- Showed the system architecture, provided sample metrics, example pages from the LANCE website, and a summary of the LANCE data products.
- Identified the user registration process and included sample applications.
- Illustrated the LANCE governance model that showed the flow of LANCE upgrades from the end user, through review by the LANCE elements, ESDIS, the UWG, and NASA HQ and the eventual rejection or acceptance of the suggested upgrade for implementation.
- Summarized the LANCE progress since inception including the LANCE workshop in December 2009 and the major accomplishments including a) the initiation of AMSR-E data products, b) the addition of new data products, c) the establishment of user registration, d) the initiation of efforts to integrate the Rapid Response and the Fire Information for Resource Management (FIRMS) systems into LANCE-MODIS, and e) the presentation of 7 oral and poster papers at four meetings.

In the subsequent discussion:

- In response to the observation that some AIRS OGC products available from the GES DISC site were not available from LANCE, Bruce Vollmer pointed out that some of the AIRS web site information remained to be transferred to the LANCE web site.
- The issue of generating combined data products from MODIS and OMI was raised by Nickolay Krotkov. It was pointed out that this was a non-trivial task and alternative approaches were reviewed such us overlaying MODIS and OMI images.

2.1.4 UWG Governance by Chris Justice (UMD)

It was identified that the overall role of the UWG was to provide the guidance for the evolution of the LANCE system on behalf of the user communities. Specifically, the UWG:

- Represents the user communities who are potentially serviced by LANCE.
- Includes users who are currently using, or who plan to acquire, LANCE data.
- Includes members who are familiar with both the applications user communities and the science aspects of the data products.
- Will meet once or twice a year and will invest users with a nominal 2-year term.
- Provides guidance on LANCE management priorities and goals.
- Assesses the quality of the products and services provided by LANCE and the progress made by the elements against prior UWG recommendations.
- Develops a prioritized list of recommendations for LANCE developments and system changes for the 12 months following the UWG meeting and provides suggestions for longer range plans.

2.2 UWG Context and Background

In this section, nine members of the UWG gave brief presentations on their present and planned usage of LANCE data products and made suggestions for potential changes and additions to the LANCE elements.

2.2.1 Mike Fromm (NRL) - presentation on Upper Troposphere/Lower Stratosphere Plume Alerts.

Pre- and post-LANCE examples were shown using the Eyjafjallajokull volcano and alerts for fire and volcano alerts. It was noted that a 3-hour latency was adequate for NRL needs and that a 7-10 day data archive was sufficient.

2.2.2 Gary Jedlovec - presentation on the Short-term Prediction Research and Transition (SPoRT) Center's use of LANCE data.

It was reported that the LANCE data were used when Direct Broadcast data were unavailable for short-term (0-24 hour) weather prediction. It was noted that shorter-latency (1 hour or less) data products would be valuable a) for MODIS and AMSR-E to

support weather prediction, and b) for the IMAPP (International MODIS AIRS Processing Package) and IPOPP (International Polar Orbiting Processing Package) products for areas for which direct broadcast data were unavailable. In the subsequent discussion the presenter suggested the inclusion of direct broadcast data in LANCE.

2.2.3 Robert Brakenridge (University of Colorado) - presentation on the Dartmouth Flood Observatory (DFO).

It was reported that LANCE-MODIS bands 1, 2, and 7 land surface reflectance products are presently used to generate flood maps for southern Africa using a Dartmouth-developed flood algorithm. In addition, it was identified that standard MODIS products were used to generate maps for flood areas world wide and that a large number of users accessed the DFO web site. It was noted that the 3-hour latency was important but less critical than the daily generation of flood maps.

2.2.4 Jim Verdin (USGS) – LANCE-MODIS Applications for Drought Monitoring and Crop Yield Analyses for the Famine Early Warning Systems Network (FEWSNet).

It was reported that FEWSNet used both Aqua and Terra LANCE-MODIS surface reflectance, cloud mask, and geolocation data on a continuous basis. It was identified that these products were used to support a number of applications and that FEWSNet developed and distributed value-added products such as 7- and 14-day NDVI composites for CONUS through eMODIS. It was suggested that land surface temperature would be a useful product (in discussion it was identified that this product was already being generated). It was noted that the 3-hour latency was critical but adequate.

2.2.5 Rama Nemani (NASA/Ames) – NASA Earth Exchange (NEX).

It was reported that NEX did not currently make use of LANCE data. However, the system for the improved availability of Earth science data, models, analysis tools and scientific results was described.

2.2.6 Brad Quayle (USFS) – the use of LANCE data for the USDA Forest Service Remote Sensing Applications Center (RSAC).

It was reported that the principal source of data was the direct broadcast data obtained directly by the RSAC but that LANCE-MODIS data were used as a back-up and for the generation of some data products. A number of potential LANCE upgrades were suggested including a) provide information/links concerning the availability of alternate sources of low latency data, b) adding grid referencing, c) adding WMS and WCS capabilities, and d) coordinating with other agencies to facilitate near-real time data for future sensors.

2.2.7 Liam Gumley (University of Wisconsin) – the use of Direct Broadcast and LANCE data at the Space Science and Engineering Center (SSEC).

The use of the CONUS Direct Broadcast data with the IMAPP products was described. It was noted that LANCE-MODIS L1 and L2 land surface reflectance products were used in the MODIS Image Processing System (MIPS), an iPhone application for coordinated satellite/ground observation of clouds, volcanic ash retrievals, and to test Direct Broadcast algorithms. It was noted that the 3-hour latency was not critical for the SSEC applications but that the volcanic ash application would benefit from reduced latency. For future efforts it was noted that a) web services would be advantageous, b) there would be application for a rolling NBAR product, c) interfacing with the Direct Broadcast sites for MODIS and AMSR-E should be considered.

2.2.8 Nickolay Krotokov (GEST/UMBC) – the NASA-NOAA-FMI-KNMI project to monitor Volcanin Clouds with the Aura Ozone Monitoring Instrument (OMI).

The use of the continuous download of the SO2 data to NOAA to generate a variety of value-added volcanic ash products was described. It was suggested that LANCE should link to the FMI which displays Direct Broadcast data from Sodankyla.

2.2.9 Kim Richardson (NRL/Monterey) – Navy Utilization of LANCE data.

The use of the MODIS aerosol and geolocation products from LANCE and the NOAA NRTPE system to generate an aerosol assimilation product to support modeling efforts was described. The future use of AMSR-E products was discussed and the desire for additional products (assimilation) was identified. In the ensuing discussion the need to prioritize LANCE efforts was identified.

2.3 LANCE Updates

In this section, five presentations were given that discussed the status of EDOS and the AMSR-E, AIRS/MLA, OMI, and MODIS elements. For the element presentations the following topics were discussed: system overview, system changes since the December 2009 LANCE workshop, ongoing developments, and user-suggested upgrades for consideration by the UWG.

2.3.1 EDOS Latency Enhancements by Bruce McLemore (EDOS)

The EDOS architecture and the present data timeline were presented. A number of enhancements are planned and are currently under development and the principal purpose of this presentation was to discuss these and identify the related schedules. Three enhancements were identified:

- The removal of the Reed-Solomon decoding bits prior to network transfer. It was anticipated that this will reduce the transfer file size by approximately 12% and reduce the Aqua/Terra latency by approximately 2 minutes and the Aura latency

by approximately 1 minute. The schedule for installation was given as January 2011.

- The addition of lossless data compression prior to network transfer and the inclusion of decompression upon receipt at EDOS. It was anticipated that this would reduce the file transfer size by up to 30% and reduce the Aqua/Terra latency by approximately 6 minutes and the Aura latency by approximately 2 minutes. The schedule for installation was given as January 2011.
- The inclusion of a L0 processing and distribution capability at White Sands for Terra to replace the present GSFC/EDOS functions. Since this would obviate the need to transfer raw data from White Sands to EDOS, it was anticipated that this would reduce the Terra latency by in excess of 10 minutes. The schedule for installation was given as May 2011.

In the subsequent discussion, EDOS was asked to make every effort to establish the White Sands processing capability earlier than May.

2.3.2 LANCE-AMSRE Status. Presenter and Element Lead, Helen Conover.

2.3.2.1 System Overview
- The instrument is designed to detect water in all phases and 5 data products are available.
- User support is provided through the GHRC Support Office.
- The typical average latency is approximately 2 hours.
- There are presently 10 registered users and data distribution is approximately 3GB/day.

2.3.2.2 System Changes since December 2009
- LANCE-AMSRE production started in September and a redundant system was added in November.
- User registration, a website, and EMS-based metrics were implemented in September.

2.3.2.3 Ongoing Developments
- A new L2A algorithm is expected in December.
- Pixel-by-pixel comparisons of LANCE and standard products is expected in early 2011.

2.3.2.4 User-Suggested Upgrades for UWG Consideration
- Generate data products in BUFR format.
- Generate incremental daily products.
- Add a sub-setting capability.
- Add browse imagery.
- Display AMSR-E data products in the Rapid Response system.

2.3.2.5 Discussion

- The generation of sub-setted and incremental products were anticipated to be small tasks (response to a question by Chris Justice)
- The present system includes a configuration control process and provides users with data and system announcements by e-mail (response to a question by Martha Maiden)

2.3.3 LANCE-AIRS/MLS Status. Presenter and Element Lead, Bruce Vollmer

2.3.3.1 System Overview
- Eleven data products are available from AIRS and 4 from MLS.
- Images for some AIRS products are available by WMS.
- User Support is provided by the GES DISC.
- Typically the latency is approximately 2 hours and 98% of data are available in less than 3 hours from observation.
- There are presently 32 registered users and data distribution is approximately 40GB/day.
- The AIRS algorithms are identical to those used in standard production but uses predicted ephemeris as input. The MLS algorithms have been modified to meet the latency requirements.
- The system includes redundancy

2.3.3.2 System Changes since December 2009
- AIRS L1 products have been made available in BUFR format
- User registration and EMS-based metrics were implemented

2.3.3.3 Ongoing Developments
- None were reported

2.3.3.4 User-Suggested Upgrades for UWG Consideration
- Improved quality for MLS products and the addition of a water vapor product
- Provide data through OPenDAP and use Giovanni for selected products
- Add variable sub-setting and the netCDF format

2.3.3.5 Discussion
- It was identified that the use of OPenDAP was the highest priority given by the element (response to a question by Chris Justice)

2.3.4 LANCE-OMI Status. Presenter and Element Lead, Curt Tilmes

2.3.4.1 System Overview
- The OMI near-real time capability was developed jointly by NASA and KNMI.
- Seven data products are available.
- The typical latency is approximately 2.3 hours and 98% of data are available in less than 3 hours from observation.

2.3.4.2 System Changes since December 2009

- LANCE-OMI production started in March.
- An ftp server was added in July.
- User registration and a website were added in July

2.3.4.3 Ongoing Developments
- A redundant system will be added in January.
- Three new L3 KNMI products will be added.
- EMS-based metrics will be added in January.

2.3.4.4 User-Suggested Upgrades for UWG Consideration
- Generate data products in the netCDF and GeoTiff formats

2.3.4.5 Discussion
- It was noted that the Finnish group collects Direct Broadcast data and distributes these throughout Europe. Proprietary considerations preclude distribution of the L1B software and the L1B data products through LANCE and a link to the Finnish web site could be established (response to a question from Chris Justice).

2.3.5 LANCE-MODIS Status. Presenter, Mike Teague. Element Lead, Ed Masuoka

2.3.5.1 System Overview
- A total of 32 L1, L2 land and atmospheres, and L3 land data products are available for Terra; a similar number are available for Aqua. These products have were developed in consultation with the MODIS Science Team members.
- The typical average latency is 1.8 hours and approximately 97% of data are available within 3 hours of observation.
- There are presently 96 registered users and data distribution is approximately 800GB/day.
- Minor modifications have been made to the land algorithms and the standard and near-real time products compare well. The atmospheres products compare less favorably because of the sensitivity to the ancillary data the production rules for which have been relaxed to meet the latency requirements.
- User support is provided through the LAADS User Support Office.

2.3.5.2 System Changes since December 2009
- A cloud-cleared land surface temperature product has been added.
- Additional browse products have been added.
- A sub-setted and mosaiced land surface reflectance product was added to support the Dartmouth Flood Observatory.
- A variety of tools were added in March including sub-setting, mosaicing, and the GeoTiff format.

2.3.5.3 Ongoing Developments
- A redundant system will be added in January.
- Both Collection 5 and 6 data products will be generated starting in March/April.

- The Rapid Response system is being transitioned into LANCE-MODIS and will be operational in January
- The Fire Information for Resource Management System (FIRMS) is being transitioned into LANCE-MODIS and will be operational in March
- A WMS is being developed to support user access to Rapid Response images. This will be operational in February.
- A WCS is being developed to support user access to the data tools. This will be operational in February.

2.3.5.4 User-Suggested Upgrades for UWG Consideration
- Use Direct Broadcast data to reduce the product latency
- Generate and distribute global flood maps
- Generate and distribute the NRL assimilation aerosol product.

2.3.5.5 Discussion
- None

2.4 User-Proposed Enhancements

In this section, three presentations were given by representatives of the user communities that advocated substantial upgrades to the LANCE-MODIS system for consideration by the UWG.

2.4.1 Flood Maps by Fritz Policelli (NASA/GSFC)

The GSFC group and the Dartmouth Flood Observatory presently receive the sub-setted and mosaiced Band 1,2 and 7 land surface reflectance flood mapping product for a small number of tiles and generate flood maps. Neither group has the capacity to generate flood maps on a global basis and it was proposed that the generation and distribution of these maps should become a LANCE-MODIS function. The following points were made:

- The present flood maps are manually generated and are available approximately 8 hours after an event.
- The known issues include cloud cover/cloud shadow and dense vegetation issues, and the fact that the 250m MODIS resolution is adequate for most but not all users.

In the subsequent discussion, while recognizing the importance of flood mapping, Chris Justice expressed concern about there being no equivalent Science Team product and it was unclear who was responsible for scientific oversight of the product. It was also unclear as to whether there is operational partner for this applications product willing to support long term value-added product generation.

2.4.2 NRL Aerosol Products by Kim Richardson (NRL)

NRL/Monterey presently receives the MODIS aerosol and geolocation products and generates a 6-hour aerosol assimilation product (filtered, gridded aerosol optical depth with error estimation) for FNMOC. NRL is a research organization and is not commissioned for data production and distribution on an operational basis. NRL proposed that the generation and distribution of this product should be included in LANCE-MODIS. The following points were made:

- The product is potentially useful to any aerosol forecasting effort.
- The algorithm was generated in coordination with the GSFC aerosol team and has been published in the peer-reviewed literature.
- NRL will continue to maintain and improve the algorithm and will generate a version for MODIS Collection 6.

In the subsequent discussion, Chris Justice noted that the endorsement of the Science Team was important.

2.4.3 Opportunities for DHS Use of NASA Capabilities including Direct Broadcast by Bruce Davis (DHS/FEMA)

The presentation focused on the benefits of direct broadcast data to disaster response. The following points were made:

- Direct Broadcast measurements are particularly for "no-notice" incidents for which no preparations have been made.
- The rapid development of data products that support disaster response would be very useful.

In the subsequent discussion it was identified that DHS/FEMA would need products in OGC-compliant form in order to include these in existing WebGIS systems.

2.5 Discussions and Recommendations

A series of vu-charts summarizing the various suggested enhancements were generated by Chris Justice and formed the basis for the discussions by the UWG members and the determination of recommendation actions.

2.5.1 LANCE Reduced Latency

- The planned EDOS enhancements that have the potential to reduce the latency by up to 30 minutes were strongly endorsed by the UWG members. It was requested that EDOS makes every effort to deliver these enhancements ahead of the present May 2011 schedule.

- The interest in obtaining OMI direct broadcast data to support volcanic plume data could be satisfied by downloading the data directly from Finland. It would not be necessary for LANCE-OMI to provide these data.
- The UWG believed that the MODIS Direct Broadcast community already provided good coverage for CONUS. However, Gary Jedlovec was assigned an action item to determine if any LANCE products not currently being generated by the direct broadcast community were required with reduced latency. The UWG believed that it was not possible to assess the potential for including MODIS direct broadcast data in LANCE until this issue was resolved.
- The UWG believed that LANCE should explore the possibility of including AMSR-E direct broadcast data in the system. An alternative approach of including additional software for the LANCE-AMSRE products at the direct broadcast sites was discussed. Karen Michael was assigned an action item to investigate this issue. It was noted that the processing algorithms were freely available from JAXA but that JAXA required signature of an agreement that precluded further distribution of the L1A algorithm or related products.

2.5.2 New and Enhanced LANCE Products

- The potential value of including the NRL assimilation product in LANCE was discussed. There were concerns about the value of this gridded product to the wider modeling community given the coarse spatial and temporal resolution. It was decided not to recommend including this product when it was appreciate that certain users did not need the data on an operational basis.
- Liam Gumley believed that there was a significant user community for including a daily rolling NBAR product in LANCE-MODIS. The UWG recommended that LANCE staff contact Boston University concerning the utility and feasibility of including this product.
- The UWG endorsed the new products planned for inclusion in the LANCE-OMI system (see Section 2.3.4.3)
- The UWG recommended action on the proposed generation of incremental AMSR-E products (see Section 2.3.2.4) since these would significantly reduce the present latency for the snow and sea ice products.
- The UWG recognized the value of the flood maps. The UWG recommended generating the present flood mapping product based on the MODIS land surface reflectance on a global basis and distributing the products to the Dartmouth Flood Observatory. However, the generation and distribution of derived flood maps by LANCE-MODIS was not recommended and it was felt that an operational partner was required to support future production and to provide long-term stewardship. Michael Goodman offered tomake a recommendation to NASA HQ to continue funding the flood group to further develop and test automated global products. The UWG discussed the general case in which an algorithm which is currently not being generated as a standard product by the Science Team, is being developed and used locally by an organization that does not have sufficient resources to generate products on a global basis. The UWG did not feel that it would be appropriate to take on this role in LANCE and that the organization should search

for an operational partner that can take responsibility for the global products and their oversight.

- The UWG recognized the value of combined products such as OMI/MODIS products that it believed were superior to the present combined images.
- The UWG will recommend a ROSES call for LANCE application product development support involving an operational partner.
- The UWG discussed the generation of MODIS products using the new Collection 6 algorithms that will be available in March 2011. It was recommended that both Collection 5 and 6 products should be generated for a nominal period of 3 months after completion of the Collection 6 reprocessing campaign in the standard system. However, this was not applicable for Rapid Response images that should be generated only for the most recent collection. The UWG identified the need for a test interval in which the users are able to assess the impacts on operational chains and provide feedback to LANCE.

2.5.3 Obtaining Data

- Liam Gumley raised the potential problem caused by processing large data volumes in a short time period following an interval of downtime. It was agreed that LANCE would investigate how far back in time users would like processing to occur in this circumstance.
- Following some discussion, it was agreed that LANCE should perform trade studies on the application of new technologies for data distribution and visualization

2.5.4 Additional Tools

- The UWG recommended that the LANCE elements should investigate the potential value of adding the BUFR format for LANCE products.
- It was recommended that LANCE should investigate the implementation of common sub-setting tools and format conversion tools through the LANCE web site.
- It was suggested that the LANCE-MODIS should investigate the use of grid referencing.

2.5.5 LANCE Web Site

A number of improvements to the LANCE web site were suggested by the UWG including:
- The addition of browse imagery for all elements and the inclusion of links to visualization tools.
- The addition of the UWG charter together with the outcomes of the UWG meetings.
- The inclusion of an interactive area on the website to allow users to ask questions and provide feedback.

- The addition of links to the Direct Readout Laboratory and Direct Broadcast sites to provide lower latency data products.
- The inclusion of additional documentation such as an acknowledgement guide to allow users to recognize their usage of LANCE products, a standard LANCE presentation, and identification (under NEWS) of new products and tools under development.

2.5.6 Outreach

- The UWG recommended that improvements should be made to the present LANCE flyer. This action was assigned to Kevin Murphy.
- The UWG recommended that LANCE continues to make presentations and give demonstrations at scientific meetings but should start including applications meetings such as the Direct Broadcast meeting to be held next year.
- The group supported the plan to hold a symposium next year to include LANCE, direct broadcast, and other entities generating near-real time products. This action was assigned to NASA HQ.
- The UWG believed that the needs of FEMA had not been well represented at the meeting. Kevin Murphy and Mike Teague were assigned the action to pursue their requirements.
- Mike Teague and Kevin Murphy were assigned the action of investigating the feasibility of forming an IWG for near-real time data across all NASA programs.

2.5.7 Inreach

- The UWG suggested that LANCE should investigate the inclusion of metrics for the use of LANCE products in publications although it was recognized that this may be difficult to accomplish.
- It was noted that, although the EOSDIS data centers conduct user satisfaction surveys, no surveys were presently conducted for LANCE services.

2.5.8 Continuity of Products "Beyond the E in LANCE" (NPP)

The UWG discussed the continuing production of near-real time products beyond Aqua, Terra, and Aura. The following issues were raised:
- The UWG emphasized the importance of data continuity for near-real time products to enable NASA to meet the needs of research and operational users.
- The UWG emphasized that LANCE has the capacity and infrastructure to provide near-real time services for NPP. The group identified the objective of generating VIIRS, OMPS, and CrIS products within 6 months of NPP launch. Chris Justice was assigned the action of generating a strong recommendation from the UWG concerning this issue.

2.5.9 New Instrument Data Streams

The UWG recognized the importance of generating near-real time data products from other data sources, particularly those that did not generate direct broadcast data such as SMAP, GCOM-W, and GCOM-C. The UWG noted the importance of aerosol data from CALIPSO, soil moisture data from SMAP, and SST and precipitation products from AMSR-2 on GCOM-W. The UWG will ask the LANCE executive committee to identify the approach required for non-EOS near-real time data systems.

3.0 Action Items

Following the UWG meeting, ESDIS staff reviewed the UWG comments and generated the following action item list that is sorted by the various sub-sections of Section 2.5 Discussion and Recommendation. A "high" priority indicates that work is ongoing, "medium" indicates that work will begin as soon as resources become available, and "low" indicates that the item is not deemed urgent to work on. Some effort is expected to be applied to the low-priority items in CY11.

UWG Action Topic	Description	Assignee	Priority
Reduced Latency	Investigate AMSR-E DB usage	K.Michael	High
	Identify if any needed LANCE products are presently not available at DB sites	G.Jedlovec	Low
New/Enhanced Products	Investigate adding NBAR to LANCE-MODIS	M.Teague	Medium
	Investigate incremental AMSR-E products	H. Conover	Low
	Extend Flood Mapping product for global coverage	M.Teague	High
	Encourage NASA ROSES calls to include use of LANCE data and new applications product development	C.Justice	High
	Extend period for MODIS Collection 5 and 6 products	M.Teague	High
	Investigate adding other element products to Rapid Response	M.Teague	High
Obtaining Data	Investigate and implement processing timeline when systems are down	K.Michael	Low
	Perform trade studies for data distribution techniques	C.Tilmes	Medium
	Perform trade studies for visualization techniques	B.Vollmer	Medium
Additional Tools	Investigate adding BUFR format	K.Murphy	Medium
	Investigate MODIS grid referencing	M.Teague	Low
	Investigate standard tool sets	K.Murphy	Low

LANCE Web Site	Investigate browse products	M.Teague	Low
	Add UWG charter and meeting notes	K.Murphy	High
	Add interactive area for users	K.Murphy	Medium
	Add links for DB	V.Thanvi	High
	Add standard presentation	V.Thanvi	Medium
	Add planned tools/services list	V.Thanvi	High
Outreach	Improve Flyer	K.Murphy	High
	Attend applications meetings	K.Murphy	High
	Plan NRT Symposium	M.Maiden	Medium
	Investigate adding IWG	K.Murphy	Medium
	Investigate FEMA's needs	M.Teague	High
Inreach	Investigate publication metrics	J.Behnke	Low
Product Continuity	Generate UWG recommendation for adding NPP data to LANCE	C.Justice	Medium
New Instrument Data	Identify approach for adding non-EOS data products	C.Justice	Low
Ongoing Activities	Move EDOS enhancements schedule forward	K.Michael	High
	Add new OMI Products	C.Tilmes	High
	Add new AMSR-E L2A algorithm	H.Conover	High
	Add standard product comparison for AMSR-E	H.Conover	High
	Add redundant systems for MODIS and OMI	M.Teague	High
	Add EMS metrics for OMI	C.Tilmes	High
	Merge Rapid Response and LANCE-MODIS	M.Teague	High
	Merge FIRMS and LANCE-MODIS	M.Teague	High
	Add WMS and WCS to LANCE-MODIS	M.Teague	High

Appendix 1 Other UWG Attendees

Name	Affiliation	Representing
Martha Maiden	NASA HQ	
Michael Goodman	NASA HQ	
Dawn Lowe	GSFC/ESDIS	
Jeanne Behnke	GSFC/ESDIS	
Kevin Murphy	GSFC/ESDIS	
Karen Michael	GSFC/ESDIS	
Hampapuram Ramapriyan	GSFC/ESDIS	
Michael Teague	GSFC/ESDIS	
Vir Thanvi	GSFC/ESDIS	
Fritz Policelli	GSFC	Flood Mapping Application
Bruce Davis	DHS/FEMA	FEMA Applications
Pat Coronado	GSFC	Direct Broadcast Applications
Bruce McLemore	GSFC	EDOS
Jeff Schmaltz	GSFC	LANCE-MODIS (Rapid Response)
Diane Davies	UMD	LANCE-MODIS (FIRMS)
Ed Masuoka	GSFC	LANCE-MODIS
Helen Conover	UAH	LANCE-AMSRE
Kathryn Regner	UAH	LANCE-AMSRE
Curt Tilmes	GSFC	LANCE-OMI
Phil Durbin	GSFC	LANCE-OMI
Bruce Vollmer	GSFC	LANCE-AIRS and -MLS

Appendix 2 Agenda

Day One - Tuesday, Nov 16

MEETING SIGN-IN
8:00 – 8:45

WELCOME AND CHARGE
8:45 – 9:00 Objectives and scope of the User Working Group - Martha Maiden (HQ)

9:00 – 9:15 ESDIS Project Management Plans for LANCE - Dawn Lowe (ESDIS)
9:15 – 9:45 LANCE Overview and Progress - Kevin Murphy (ESDIS)
9:45 – 10:00 UWG Governance - Chris Justice (UWG Chair)

UWG CONTEXT AND BACKGROUND
10:00 – 10:15 Mike Fromm (NRL)
10:15 – 10:30 Gary Jedlovec (SPoRT)
10:30 – 10:45 Robert Brakenridge (University of Colorado)
10:45 – 11:00 James Verdin (USGS)

11:00 – 11:15 Break

11:15 – 11:30 Rama Nemani (NASA)
11:30 – 11:45 Brad Quayle (USFS)
11:45 – 12:00 Liam Gumley (U. Wisconsin-Madison)
12:00 – 12:15 Nickolay Krotkov (GEST/UMBC)
12:15 – 12: 30 Kim Richardson (NRL)

LUNCH
12:30 – 1:30 Lunch

LANCE UPDATES
1:30 – 1:50 Latency Enhancements – Karen Michael (EDOS)

1:50 – 2:10 AMSR-E - Helen Conover
2:10 – 2:30 AIRS/MLS – Bruce Vollmer
2:30 – 2:50 OMI – Curt Tilmes
2:50 – 3:10 MODIS – Mike Teague

3:10 – 3:30 Break

USER PROPOSED ENHANCEMENTS

3:30 – 4:00 Flood Maps – Fritz Policelli
4:00 – 4:30 NRL Aerosol Products – Kim Richardson
4:30 – 5:00 Direct Broadcast – Bruce Davis

5:30 – Happy Hour and Dinner (Marriott)

Day Two - Wednesday, Nov 17

9:00 – 11:00 Technical discussions and common issues

11:00 – 11:15 Break

11:15 – 12:15 UWG Managed Session with Program Management on future capabilities

LUNCH
12:00 - 1:00 Lunch

CONCLUSIONS
1:00 – 2:00 UWG Debrief LANCE Management and Element Leads

2:00 – 3:00 Closing Remarks - Chris Justice/Martha Maiden