

Report Title: Advanced Satellite Aviation Weather Products (ASAP) initiative at the University of Wisconsin-Madison (CIMSS/SSEC)
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Task Highlights & Progress Summary:

This is the final progress (15 July 2010 – 31 January 2011) report for the 2010 ASAP initiative at University of Wisconsin-Madison CIMSS/SSEC in collaboration with the University of Alabama-Huntsville, MIT, and NCAR. Described are tasks as listed on the NASA LaRC/SSAI CIMSS Statement of Work for ASAP 2010.

Wayne Feltz leads the University of Wisconsin-Madison CIMSS/SSEC effort. The contact information is (608) 265-6283, or wayne.feltz@ssec.wisc.edu. The CIMSS ASAP-project staff also includes: Justin Sieglaff, Tony Wimmers, Mike Pavolonis, Ralph Petersen, Jason Brunner, and Chris Velden. Coordination between John Mecikalski at the University of Alabama-Huntsville, Robert Sharman NCAR, and Marilyn Wolfson/Haig Iskenderian MIT is ongoing.

Coordination, Presentations and Conferences:

Internal ASAP coordination meeting was held on June 30th, July 15th, August 11th, September 8th, October 12th, 2010. Telcons were conducted with Dr. Haig Iskenderian on above dates with regard to satellite-based convective interest field and wind processing development. Other areas of common interests were discussed including turbulence.

Research Progress:

1) Support for JPDO NextGen Involvement (In collaboration with UAH and NASA LaRC)

Wayne Feltz participated in the following coordination conferences and meetings with one of primary goals to make sure satellite-based research applications are connected to operational pathways:

- Provided overview of GOES-R Aviation algorithm linkages with NextGen activities related to turbulence, convection, icing, and volcanic ash at GOES-R Proving Ground and Algorithm Working Group annual meetings
- Participated in GOES-R Proving Ground Pacific region testbed workshop connecting satellite aviation requirements to end user testbeds in Honolulu, Hawaii from July 28-30th, 2010
- Participated in 2010 EUMETSAT meeting in Cordoba, Spain presenting an abstract titled GOES-R Overview of Aviation Applications for Detection of Convection, Turbulence, and Volcanic ash from September 19th – 24th, 2010
- Attended 2010 AMS Satellite Meteorological and Oceanic Satellite Meeting in Annapolis, Maryland from September 28 – October 1, 2010 where presentation of abstracts titled “Progress toward satellite-based atmospheric

- interest field detection” poster was presented.
- Coordinated and attended observational sessions at “Annual Interagency Weather Research Review and Coordination Meeting” to be held 30 November – 2 December 2010 in Boulder, Colorado the following talks: “GOES-R/JPSS/Satellite Aviation Applications Overview” and “Progress Toward Satellite-based Atmospheric Turbulence Interest Field Detection”

2) Continue CoSPA validation ASAP research (In collaboration with UAH, MIT, and NCAR)

UW-CIMSS continues to collaborate with MIT/Lincoln Lab and UAH on transition of SATCAST into CoSPA algorithm. Highlights below:

- Implemented MIT improved nearest neighbor wind interpolation routine
- UW-CIMSS has integrated box-average cloud top cooling rate methodology into SATCAST algorithm (ver 1.3) and provided to UAH and MIT
- WINDCO code has been made more efficient (64-bit) and MIT has significantly increased processing speed
- Transitioning atmospheric motion vectors for optimal use with GOES-13 and worked with MIT to expand wind processing to GOES-West
- Provided oversight and feedback on using box-average method within SATCAST to speed production time of convective initiation products, Figure 1 shows a comparison between to methods which account for scene to scene motion
- Provided ideas on possible strategies for object tracking convection



CI Interest from Box Average

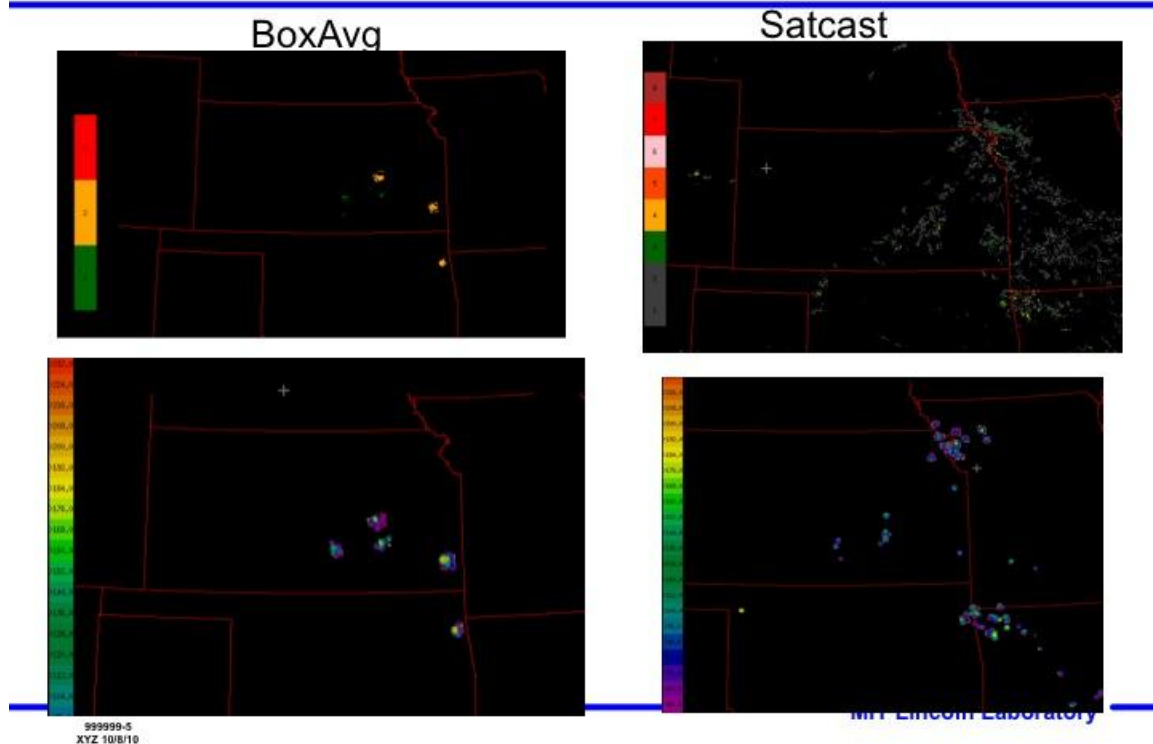


Figure 1: Comparison of convective initiation signal using box average vs atmospheric motion vectors to account for cellular movement between consecutive GOES-12 images.

2010 ASAP related Peer-reviewed Papers:

- Bedka, K. M., J. Brunner, R. Dworak, W. Feltz, J. Otkin, and Thomas Greenwald, 2010. Objective Satellite-Based Overshooting Top Detection Using Infrared Window Channel Brightness Temperature Gradients, *Jour. of Appl. Meteor. and Clim.*, 49, 2, 181-202.
- Feltz, W. F.; Bedka, K. M.; Otkin, J. A.; Greenwald, T. and Ackerman, S. A., 2009. Understanding satellite-observed mountain-wave signatures using high-resolution numerical model data. *Weather and Forecasting*, Volume 24, Issue 1, 2009, pp.76-86. Call Number: Reprint # 6016
- Lenz, A., K. Bedka, W. Feltz, and S. Ackerman, 2009: Convectively-Induced Transverse Band Signatures in Satellite Imagery. *J. of Wea. and Fore.*, 24, 5, 1362-1373
- Sieglauff, J., L. Cronce, K. Bedka, W. F. Feltz, K. M. Bedka, M. J. Pavolonis, and A. K. Heidinger, 2010. Nowcasting Convective Storm Initiation Using Satellite Based Box-averaged Cloud Top Cooling and Cloud Typing Trends. *Jour. Appl. Meteor. and Clim.*, online version:
<http://journals.ametsoc.org/doi/pdf/10.1175/2010JAMC2496.1>