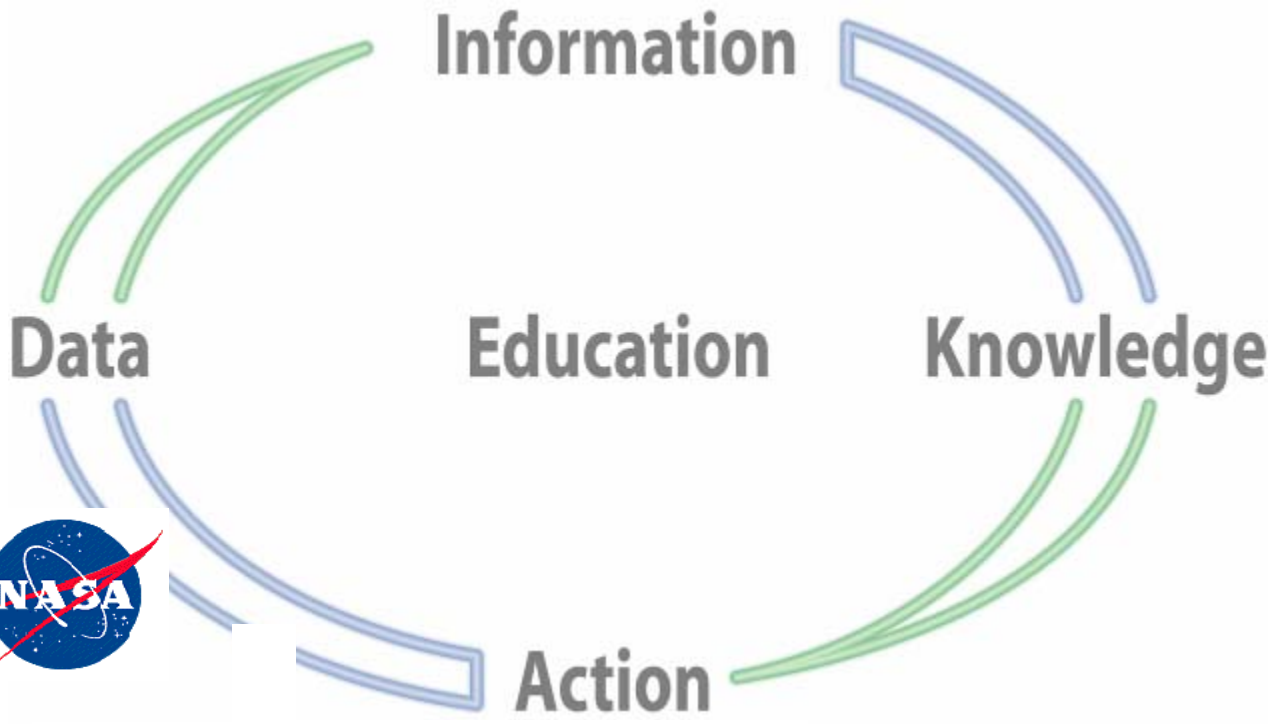
CI Directors Meeting
CIMSS



Presented by S. Ackerman

CA Research Themes

- Weather Nowcasting and Forecasting
- Clouds and Radiation
- Global Hydrological Cycle
- Environmental Trends
- Climate
- Education and Outreach

T. Carlson in recent BAMS article…

- "...The system tends to produce some silliness. I was once almost part of a hydrology proposal that never was written because the prospective principal investigator could not find a sociologist to put on the grant." Teaming for teaming sake
- "...to put his name on the proposal (with a corresponding salary allotment) the day before it was submitted on the condition that he need do no work on the grant." Bribery

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Research Community

Research communities bring people together for shared learning, discovery, and the generation of knowledge. Within a research community, all participants take responsibility for achieving the goals.

Importantly, research communities are the process by which individuals come together to achieve goals. These goals can be specific to individual projects or can be those that guide the entire institute.

Four core ideas define the research community process:

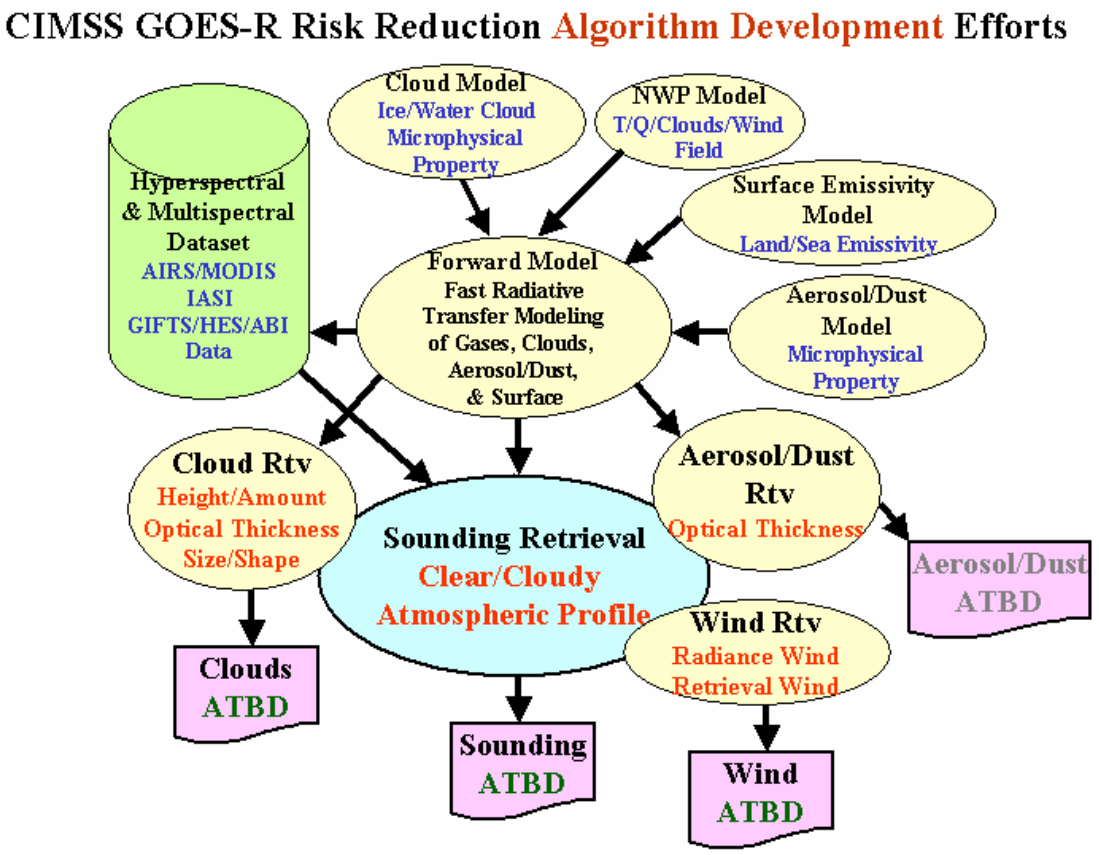
Research Community

1. Shared discovery and learning: Collaborative research activities where participants share responsibility for the learning and research that takes place are important to development of a research community.

CIMSS Role in Support of Broad Scope of GOES-R Risk Reduction and Algorithm Working Group Activities

Risk Reduction – Algorithm Development

1. Radiances
2. Atmospheric Sounding
3. Winds
4. Clouds
5. Land Surface
6. Atmospheric Composition
7. Aerosols
8. Tropical Cyclone Research and Application
9. Biomass Burning and Aerosols



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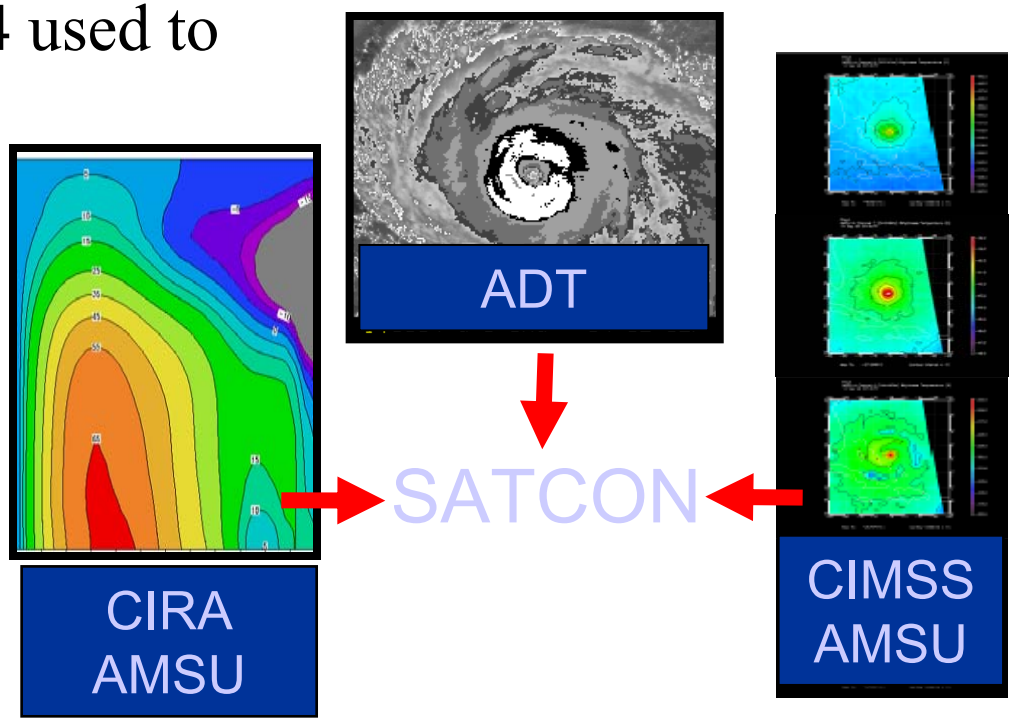
SATCON Methodology

Each TC intensity estimation method has situational strengths and weaknesses

Weight each member in a way that maximizes the strengths while minimizing the weaknesses of each method

Training data from 2001-2004 used to develop SATCON weights (SATellite Concensus) (158 cases vs recon pressure)

Test in real-time on 2005 Atlantic TC cases



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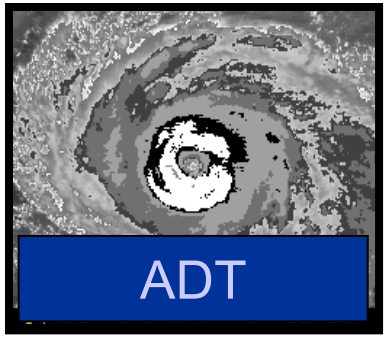
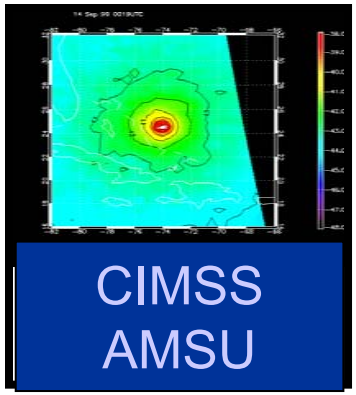
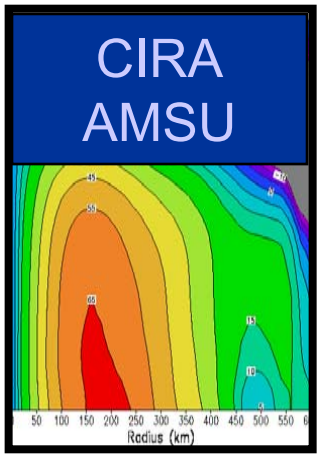
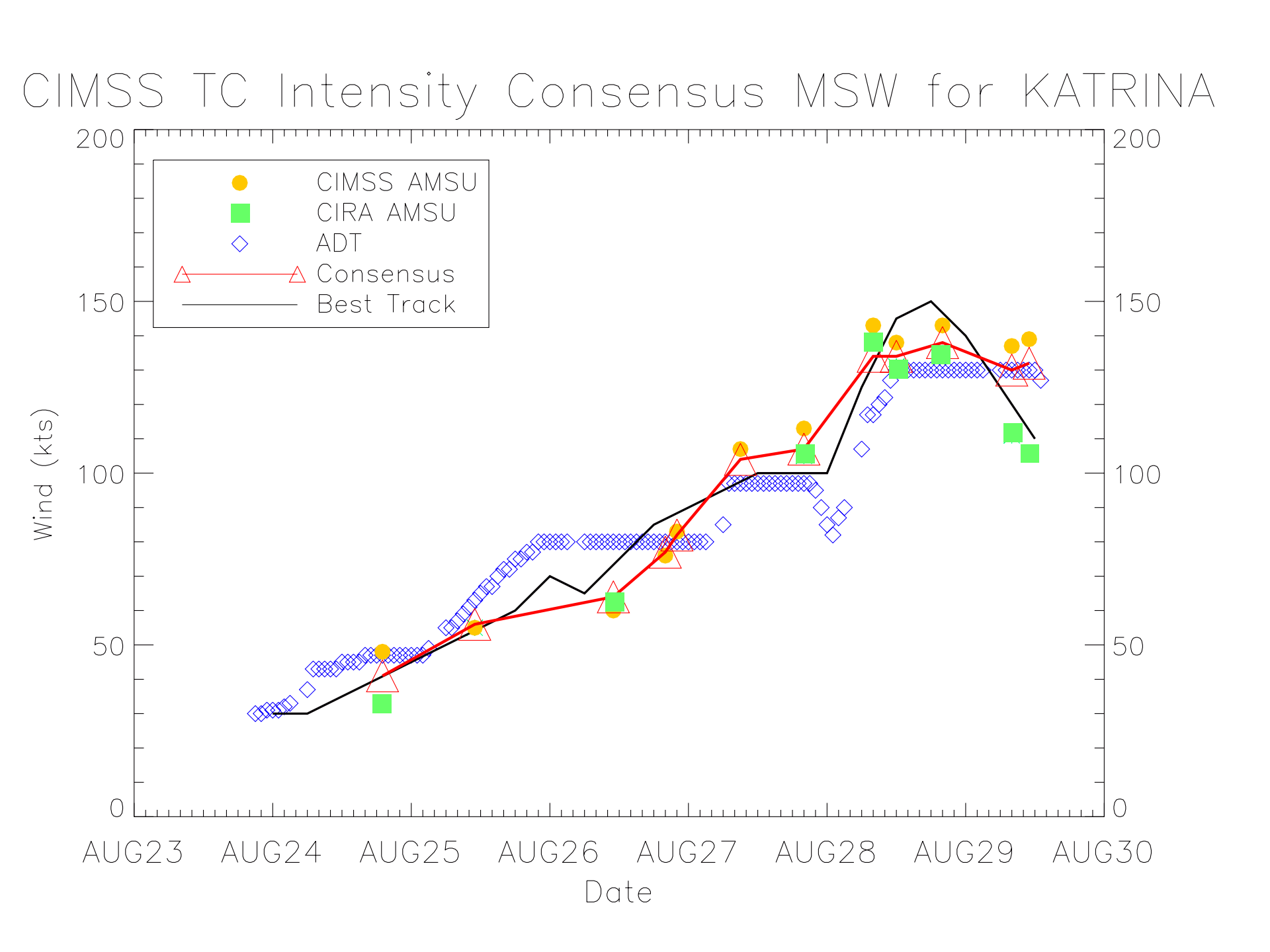
Situational Tendencies: Each approach has weakness and strengths

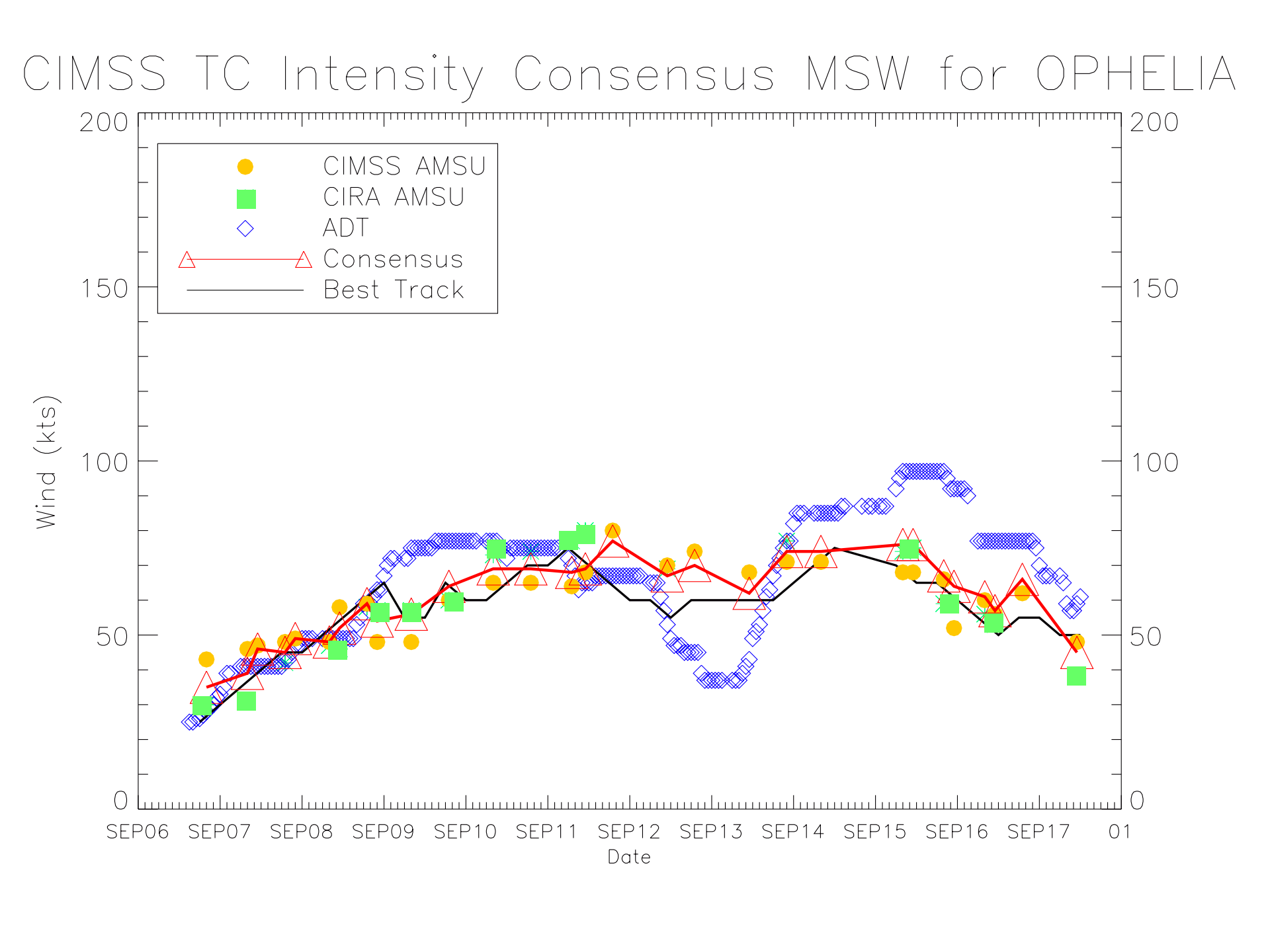






More Skill	Less Skill	
Mature Storms Clear Eye	Filling Storms Shear	Weight each member in a way that maximizes the strengths while minimizing the weaknesses of each method
Weak Storms Large Eyes	Small Eyes Heavy Precip	
Weak Storms Higher Lat's	Small Cores Heavy Convection near core	


CIMSS TC Intensity Consensus MSW for KATRINA
CIMSS AMSU
CIRA AMSU
ADT
Consensus
Best Track
Wind (kts)
Date
0
50
100
150
200
AUG23
AUG24
AUG25
AUG26
AUG27
AUG28
AUG29
AUG30

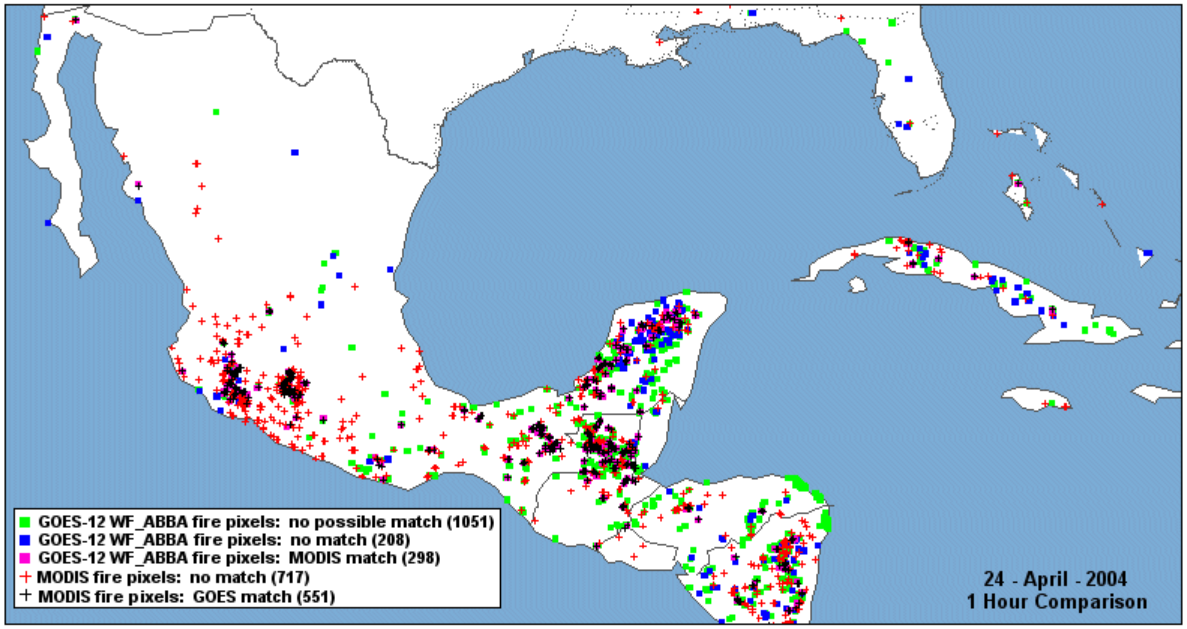

CIMSS TC Intensity Consensus MSW for OPHELIA
CIMSS AMSU
CIRA AMSU
ADT
Consensus
Best Track
Wind (kts)
Date
200
150
100
50
0
SEP06
SEP07
SEP08
SEP09
SEP10
SEP11
SEP12
SEP13
SEP14
SEP15
SEP16
SEP17
01

Research Community

2. Functional connections among researchers: Research communities develop when the interactions among researchers are meaningful, when they are functional and necessary for the accomplishment of the "work“. Moreover, meaningful connections must extend throughout the research community—among students, postdocs, faculty, and staff—rather than simply among cohort- or role-related peers.

CIMSS

Comparison of GOES WF_ABBA and MODIS Fire Products



1 - Hour Window Comparison

GOES Fire Pixels

68% Outside of the MODIS field of view

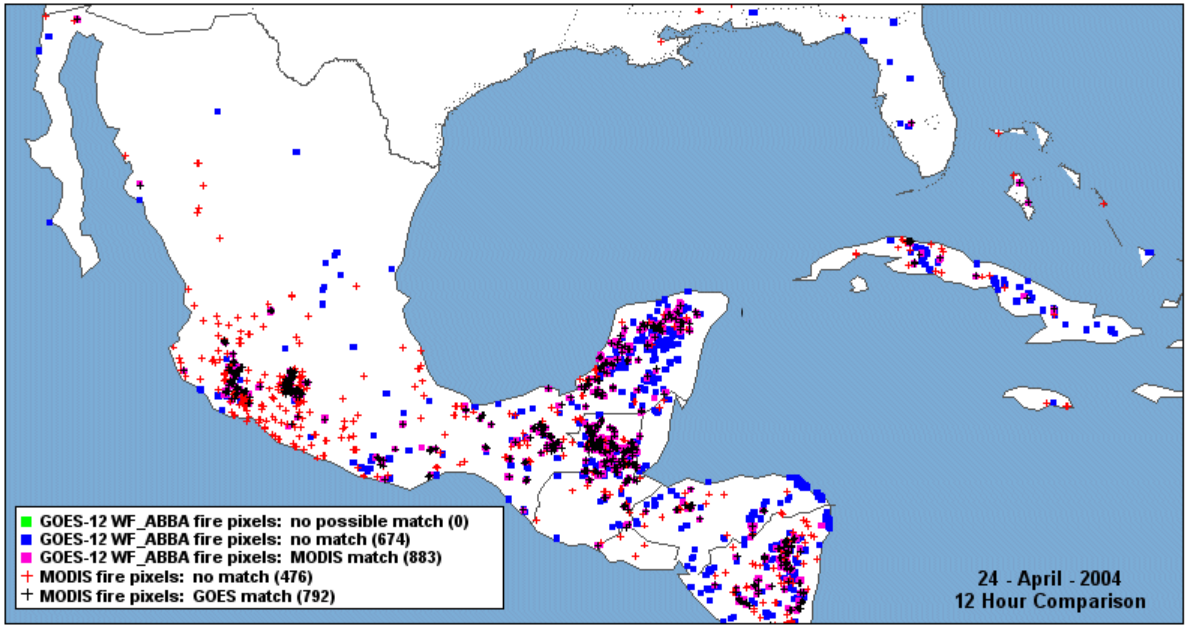
13% Within MODIS field of view, but no match

19% MODIS match

MODIS Fire Pixels

57% No GOES match

43% GOES match



12 - Hour Window Comparison

GOES Fire Pixels

0% Outside of the MODIS field of view

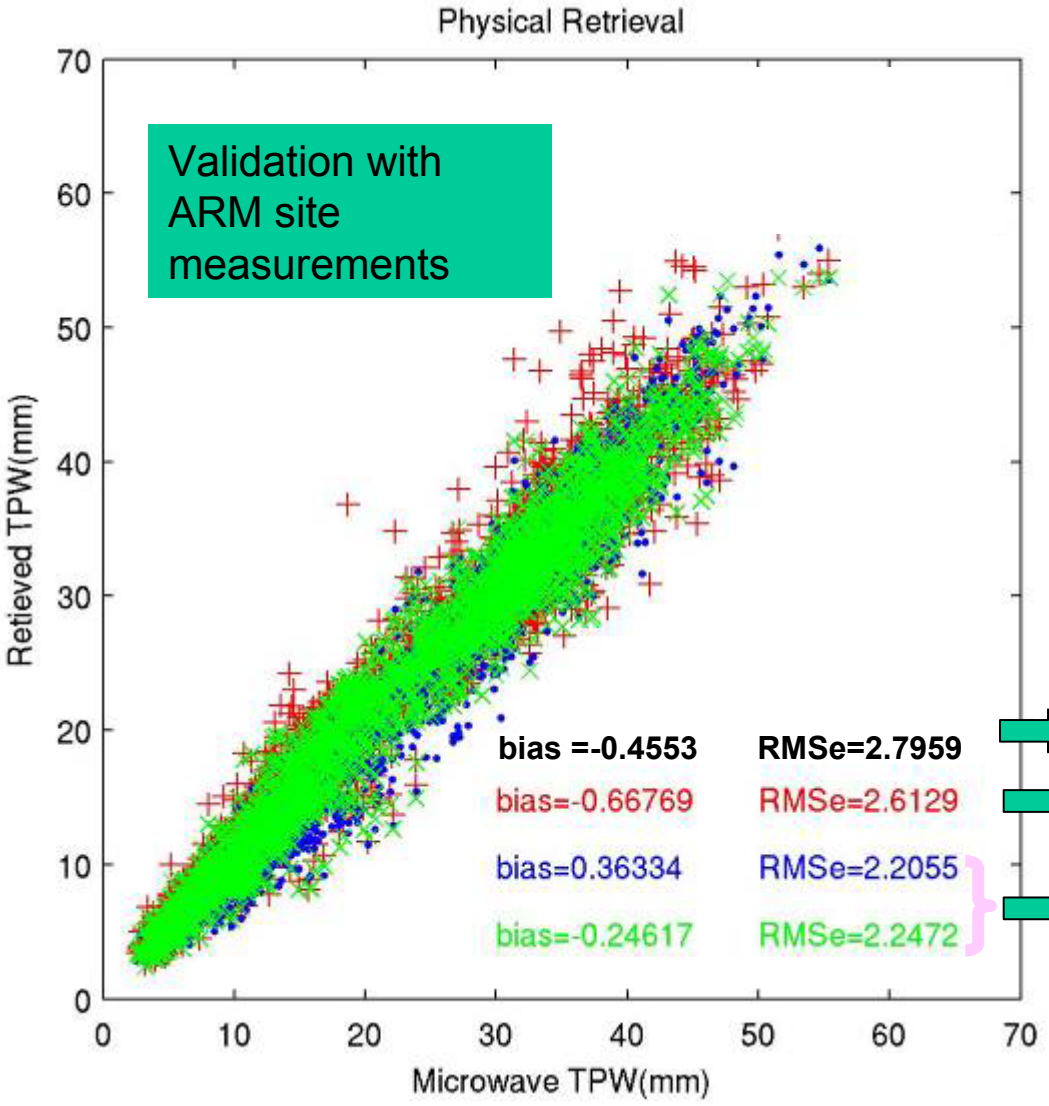
43% Within MODIS field of view, but no match

57% MODIS match

MODIS Fire Pixels

38% No GOES match

62% GOES match



Collaboration with ORA/FPDT

CIMSS Research (GIMPAP)
(Ongoing)

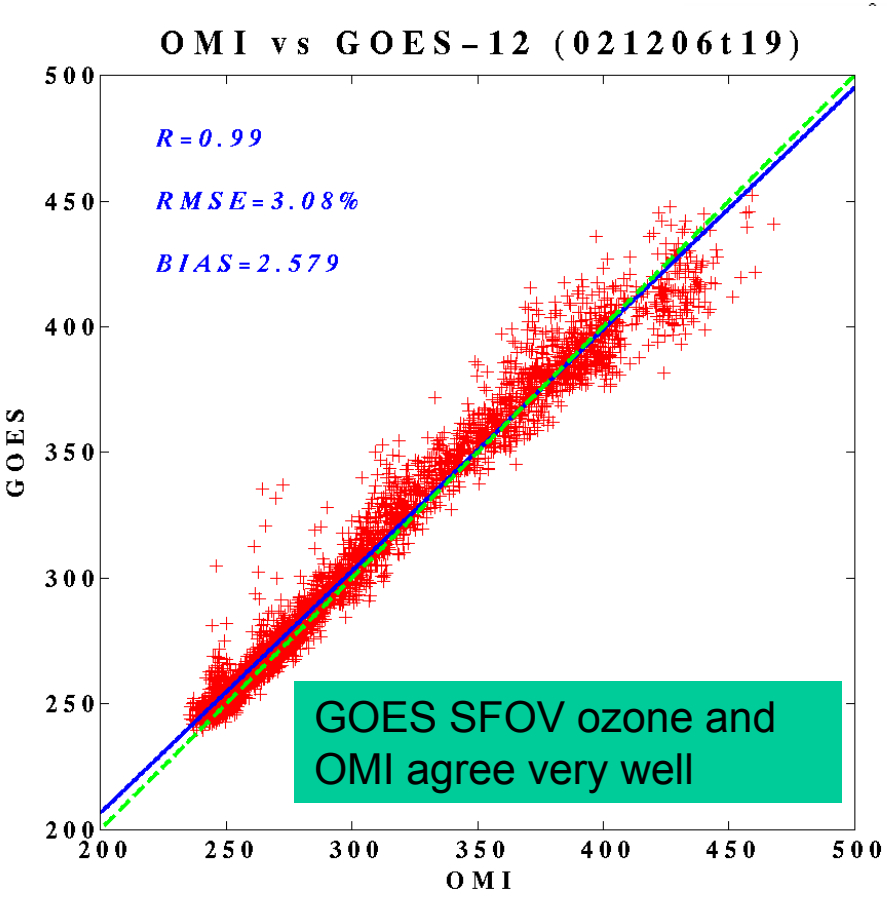
CIMSS routinely
(August 2006)

FPDT testing
(December 2006)

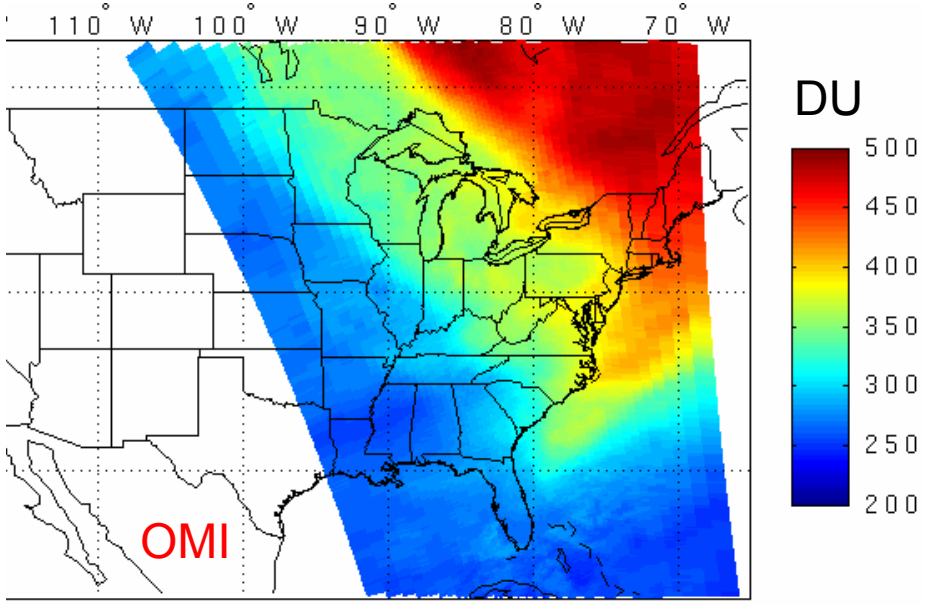
Operational Update

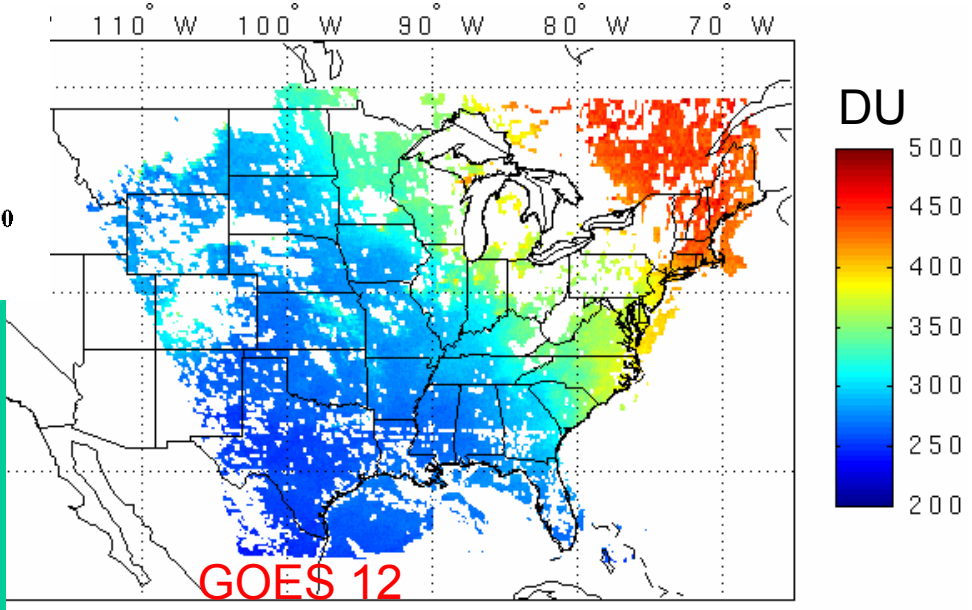
GIMPAP study: Recent new algorithm improves the GOES Sounding product when compare with the legacy product.

OMI and GOES 12 (12 Feb 2006)



GOES SFOV ozone and OMI agree very well





GIMPAP study: 1% RMSE improvement was found in the new algorithm over the current legacy one, GOES provides hourly ozone experimental product.

CIMSS Role in Support of Broad Scope of GOES-R Risk Reduction and Algorithm Working Group Activities

The CIMSS GOES-R AWG activities fall into eight broad areas:

1. **GOES-R Proxy Data Set Development**
2. **Sounding Algorithm Evaluation and Selection**
3. **Sounding Algorithm Validation**
4. **Winds from GOES-R ABI**
5. **Cloud Properties**
6. **Ozone for Air Quality**
7. **Atmospheric Aerosols**
8. **GOES-R ABI Fire Detection and Characterization**

Research Community

3. Connections to other related research, applications and life experiences: Research communities flourish when implicit and explicit connections are made to experiences and activities beyond the program in which one participates at any given moment. These connections help situate one's research in a larger context by solidifying one's place in the broader community, decreasing one's sense of personal isolation.

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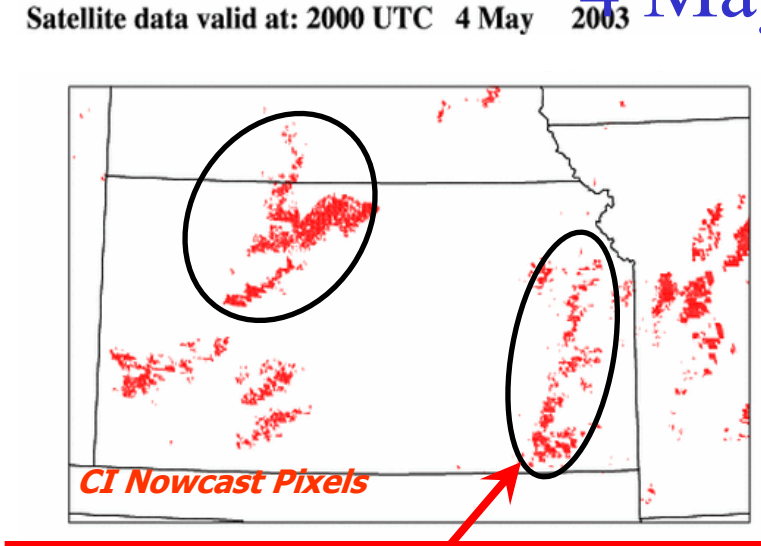
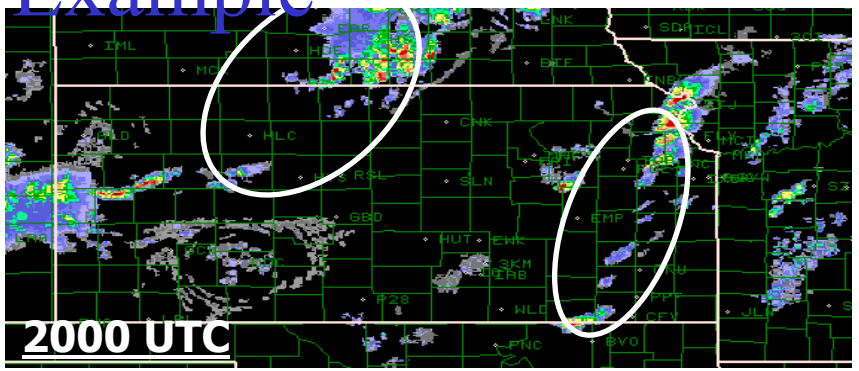
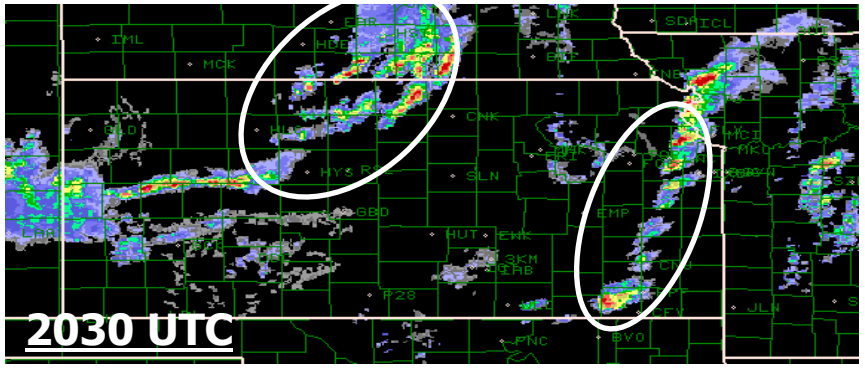
Convective Initiation Nowcast

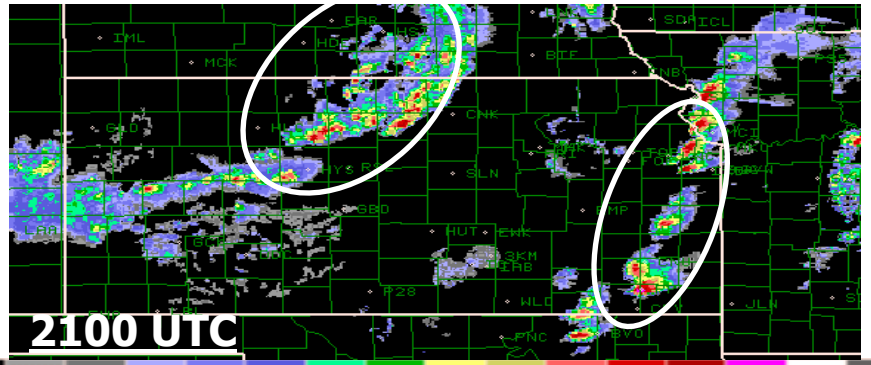
4 May 03 Example



These are 1 hour forecasted CI locations!







- Satellite-based CI indicators provided *30-45 min advanced notice* of CI in E. and N. Central Kansas.
- PODs ~45% at 1 km (FARs ~40%)
- ***NEW Linear Discriminant Analysis methods provide ~65% POD scores for 1-hour convective initiation.***

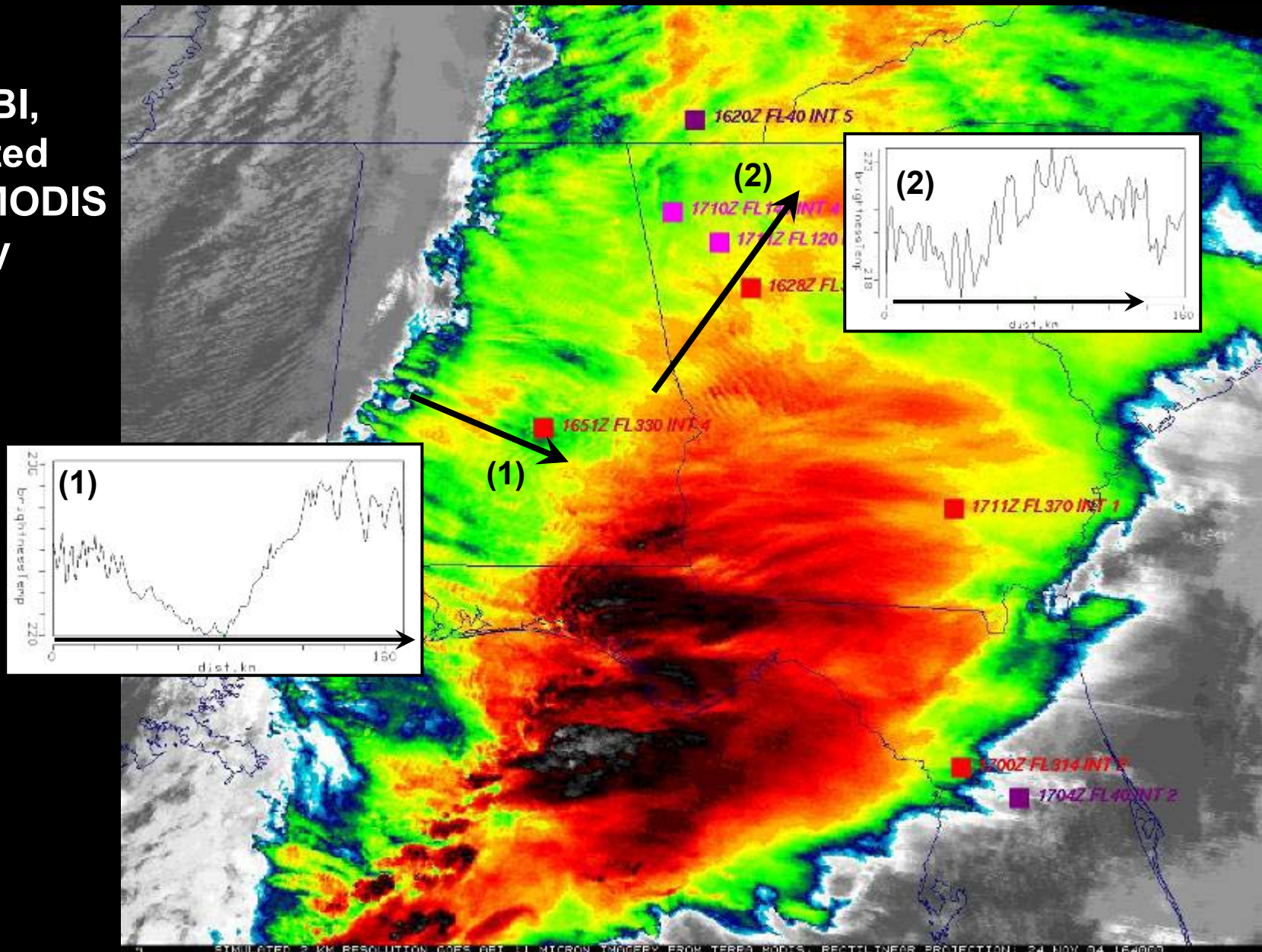
Many Channels used in CI Diagnosis

CI Interest Field	Critical Value
10.7 μm T_B (1 score)	< 0° C
10.7 μm T_B Time Trend (2 scores)	< -4° C/15 mins ΔT_B/30 mins < ΔT_B/15 mins
Timing of 10.7 μm T_B drop below 0° C (1 score)	Within prior 30 mins
6.5 - 10.7 μm difference (1 score)	-35° C to -10° C
13.3 - 10.7 μm difference (1 score)	-25° C to -5° C
6.5 - 10.7 μm Time Trend (1 score)	> 3° C/15 mins
13.3 - 10.7 μm Time Trend (1 score)	> 3° C/15 mins
8.5-10.7 μm (MODIS, VIIRS)	> 0° C
3.7-10.7 μm (MODIS, VIIRS)	> 0° C

- Instantaneous 13.3–10.7 um: **Highest POD (84%)**
- Time-trend 13.3–10.7 um: **Lowest FAR (as low as 38%)**
- **Important for CI & Lightning Initiation**

Convective Gravity Waves

2 km ABI, Simulated using MODIS imagery



Research Community

4. Inclusive environment: Research communities succeed when the diverse backgrounds and experiences of participants are welcomed in such a way that they help inform the group's collective research. Whenever possible, activities should be sought that help participants reach out and connect with others from backgrounds different from their own.

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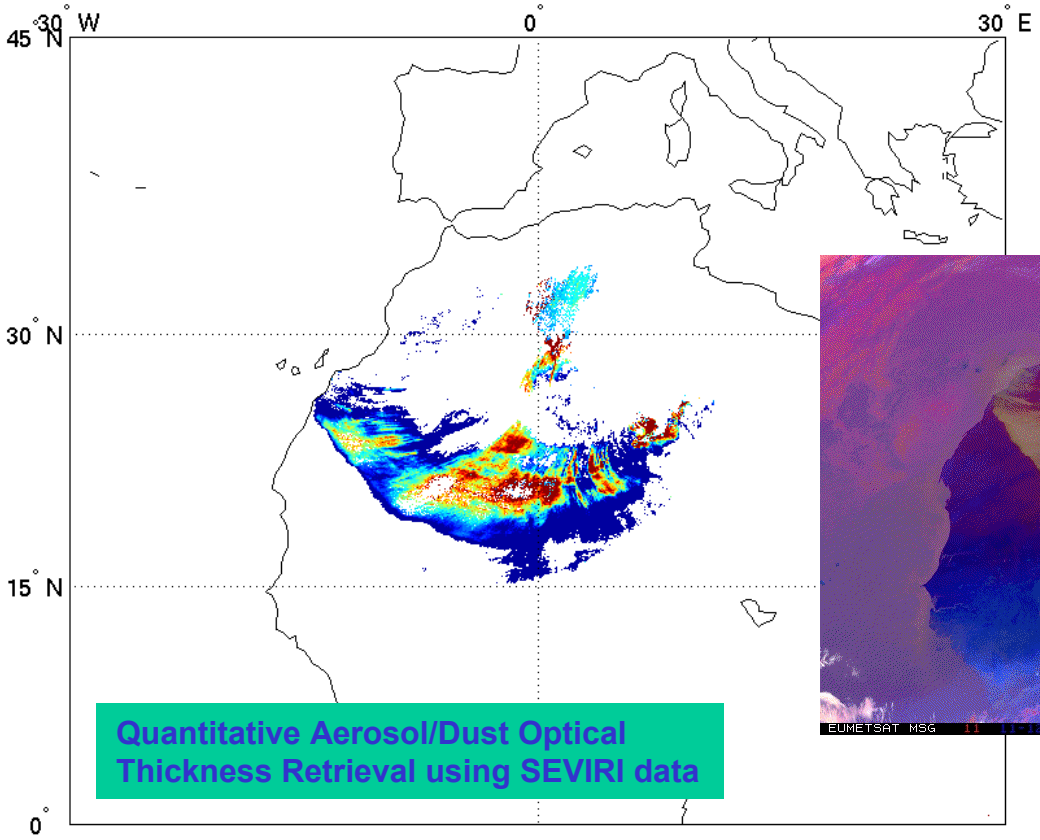
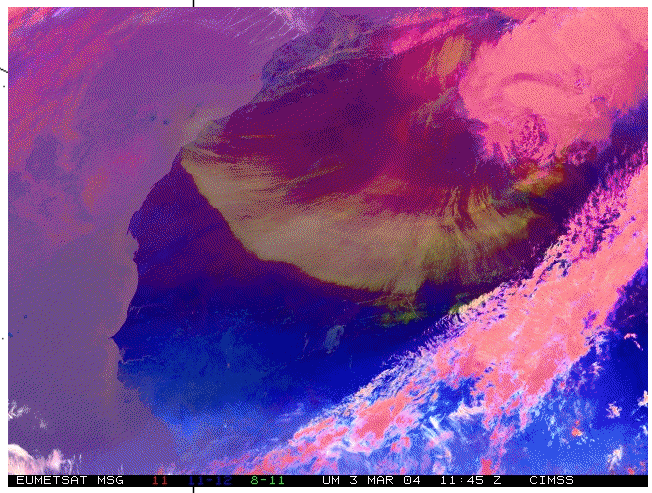
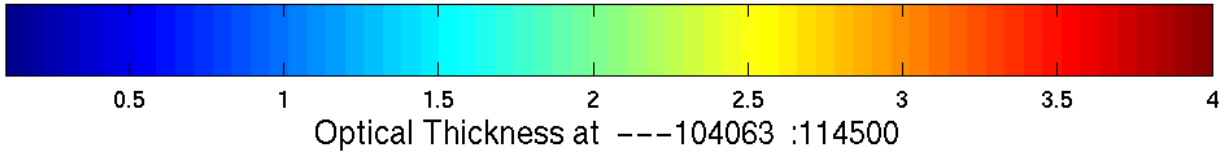
GOES-R ABI/HES study:
New product from ABI is demonstrated with SEVIRI



Quantitative Aerosol/Dust Optical Thickness Retrieval using SEVIRI data





Collaborative work from CIMSS and NSMC scientists