



Status of ATCF, N-AWIPS and AWIPS2



- ATCF is the primary software tool for NHC, CPHC and JTWC tropical cyclone product generation
- NWS working to integrate ATCF functionality into AWIPS2 over the next 5 years
- NAWIPS and AWIPS2 are both used for satellite and model data display and product generation
- NAWIPS migration to AWIPS2 is a high priority for NWS



History of the Automated Tropical Cyclone Forecasting (ATCF) System



- Prior to 1988: Grease pencils and acetate
- 1988: ATCF (MS-DOS PC version) to JTWC in Guam
- 1990: ATCF to NHC
- 1996: First Unix ATCF - C, Fortran, XVT toolkit, Unix/Python/Perl scripts
- 1998: ATCF and TC web page coupled, first forecast track consensus
- 2000: Y2K compliance, HP-Unix
- 2001: Unix ATCF to NHC - NRL manages C & GUI code, NHC manages site-specific "standalone" code
- 2002: Extended to 5-day forecast capability
- 2003: TC web page imagery on ATCF, Red Hat Enterprise Linux
- 2004: Consensus track forecast error estimates (GPCE)
- 2005: Intensity guidance, wind probabilities aids integrated
- 2007: Intensity forecast consensus aid integration for JTWC and NHC
- 2009: Intensity forecast error estimates (Intensity GPCE aid integration)
- 2010: Web-ATCF for training and home use
- 2012: Flat file database replaces relational database for grids and raw data
- 2014: Genesis probability forecasting
- 2016: Wind radii forecast consensus aid, 120-h wind radii forecasts
- 2017: Gale wind radii observations/estimates



Highlights of 2018 ATCF Upgrades for NHC



• NRL

- Improve performance of ATCF forecast dialog and display GUIs for systems with large a-decks
- Add “Storm State” selections for “Tropical Cyclone” and “Potential Tropical Cyclone” to “Forecast Type” menu in Advisory Composition GUI
- Enable dialog box to make 64-kt wind radii forecasts at 48 h

• NHC

- Include 48-h forecast of 64-kt wind radii forecast in the TCM and other operational products
- Modify NHC vortex message decoder to account for vortex message changes in 2018
- Enable WPC issuance of TCPs for inland depressions in the ATCF

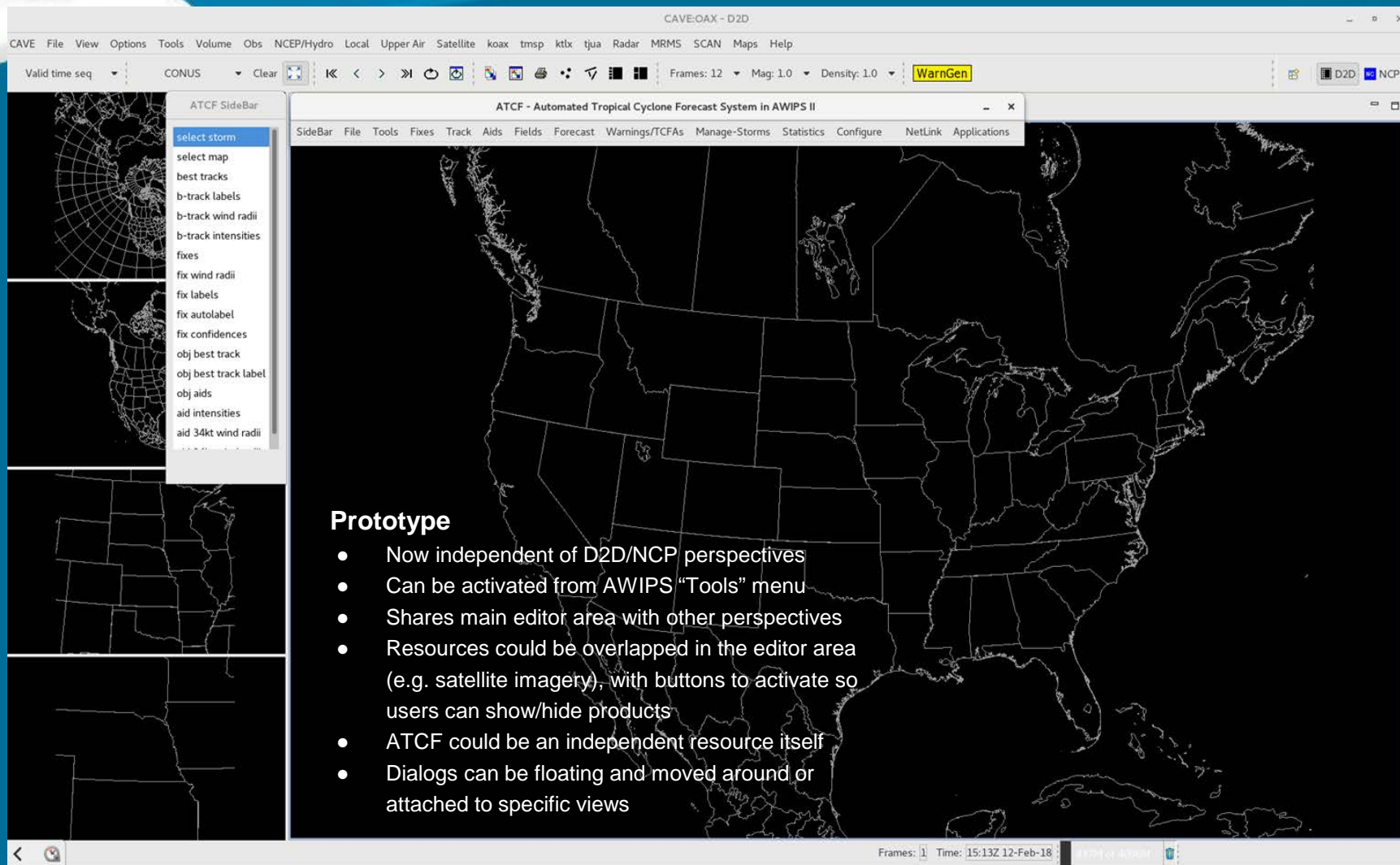


ATCF in AWIPS2 Status

- Development moved from NCEP/NCO to AWIPS Program Office (APO)
- One contractor effort for last 2 years
- Initial capabilities
 - A, B, E, F deck import/export
 - Model guidance plots
 - May be folded into AWIPS baseline by 2020
- NWS/Central Processing increasing support to 3 contractors in FY19
- Full capabilities still 4 to 5 years away



Future AWIPS2 Software Ported ATCF with Sidebar



Prototype

- Now independent of D2D/NCP perspectives
- Can be activated from AWIPS "Tools" menu
- Shares main editor area with other perspectives
- Resources could be overlapped in the editor area (e.g. satellite imagery), with buttons to activate so users can show/hide products
- ATCF could be an independent resource itself
- Dialogs can be floating and moved around or attached to specific views



ATCF Transition to AWIPS2 CAVE-NCP Graphical User Interface



Select profile:
CWL
Ensemble
ESB1200z

Save New Profile...
Delete Profile...

ATCF

Select DTG(s):
2016100506
2016100512
2016100518
2016100600
2016100606
2016100612
2016100618

Select Objective Aids:
TCON Consensus of all: AVN
TCOE Consensus of all: AVN
TCOA Consensus of all: AVN
TCCN Corrected version of
ICON Consensus of all: DSH
TVCN Consensus of >=2: AVN
TVCE Consensus of >=2: AVN
TVCA Consensus of >=2: AVN
TVCC Corrected version of
GFEX Consensus of AVNI and
TVCX Consensus of >=2: AVN

Partial Aid Display
Display to TAU:
Full
12
24
36
48
60
72
96
120
144
168

-48 -36
-24 -18
-12 -6

Select Defaults

Latest DTG

☐ Toggle Bold Selected Aids
☒ Display aid intensities
☐ GPCE
☐ GPCE Climatology
☐ GPCE-AX
☐ 34 kt aid wind radii
☐ 50 kt aid wind radii
☐ 64 kt aid wind radii
☐ Bold Lines (all aids)
☐ Colors by intensity (TD, TS and TY/HU)
☐ Colors by Saffir-Simpson scale

Clear Aids Display
Different Storm...
PrintnSave

Help APPLY OK Cancel

Select profile:
CWL
DR
Ensemble
ESB1200z

Save New Profile...
Delete Profile...

AWIPS 2

Select DTG(s):
2017100412
2017100418
2017100500
2017100506
2017100512
2017100518
2017100600

Select Objective Aids:
CARQ Combined ARQ Position
OFCL NHC official forecast
OFCL NHC official forecast (Interpolated 06 h
OCD5 Combination of CLP5 and Decay-SHIF
XTRP Extrapolation using past 12-hr motion
CLP5 CLImatology-PERsistence model 5-day
TCLP Trajectory CLIPER model 7-day
TABD Trajectory and Beta Model from GFS, d
TABM Trajectory and Beta Model from GFS, n
TABS Trajectory and Beta Model from GFS, sh
HWRF HWRF model

Partial Aid Display
Display to TAU:
full
12
24
36
48
60
72
96
120
144
168

DTG vs. Latest
-48 -36
-24 -18
-12 -06
Latest DTG

Clear Select Defaults Select All

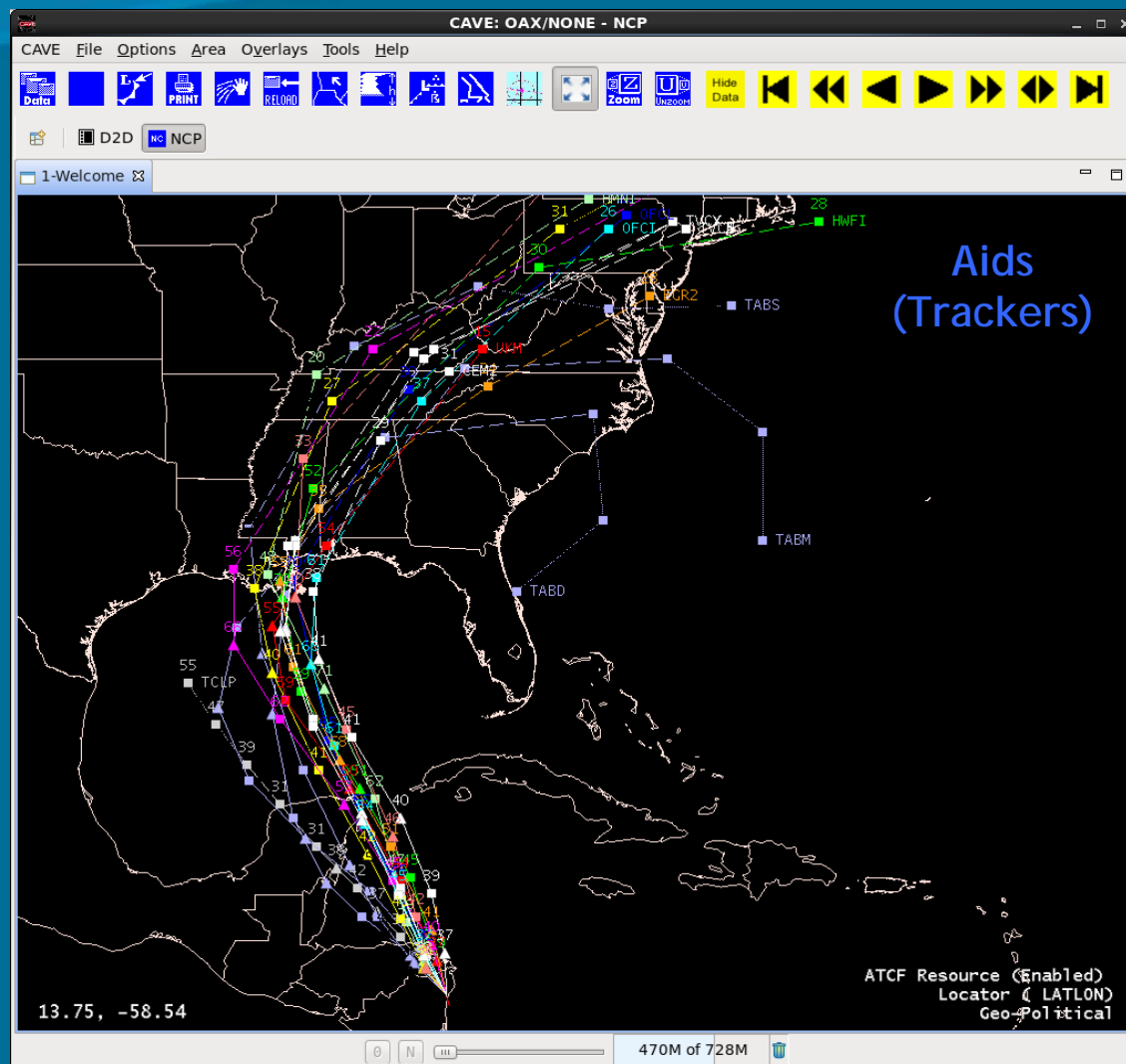
Display Options
☐ Toggle Bold Selected Aids
☒ Display Aid Intensities
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☐ 34 kt aid wind radii
☐ 50 kt aid wind radii
☐ 64 kt aid wind radii
☐ Bold Lines (all aids)
☐ Colors by intensity (TD, TS, and TY/HU)
☐ Colors by Saffir-Simpson scale

Clear Aids Display
Different Storm...
PrintnSave

Apply OK Cancel



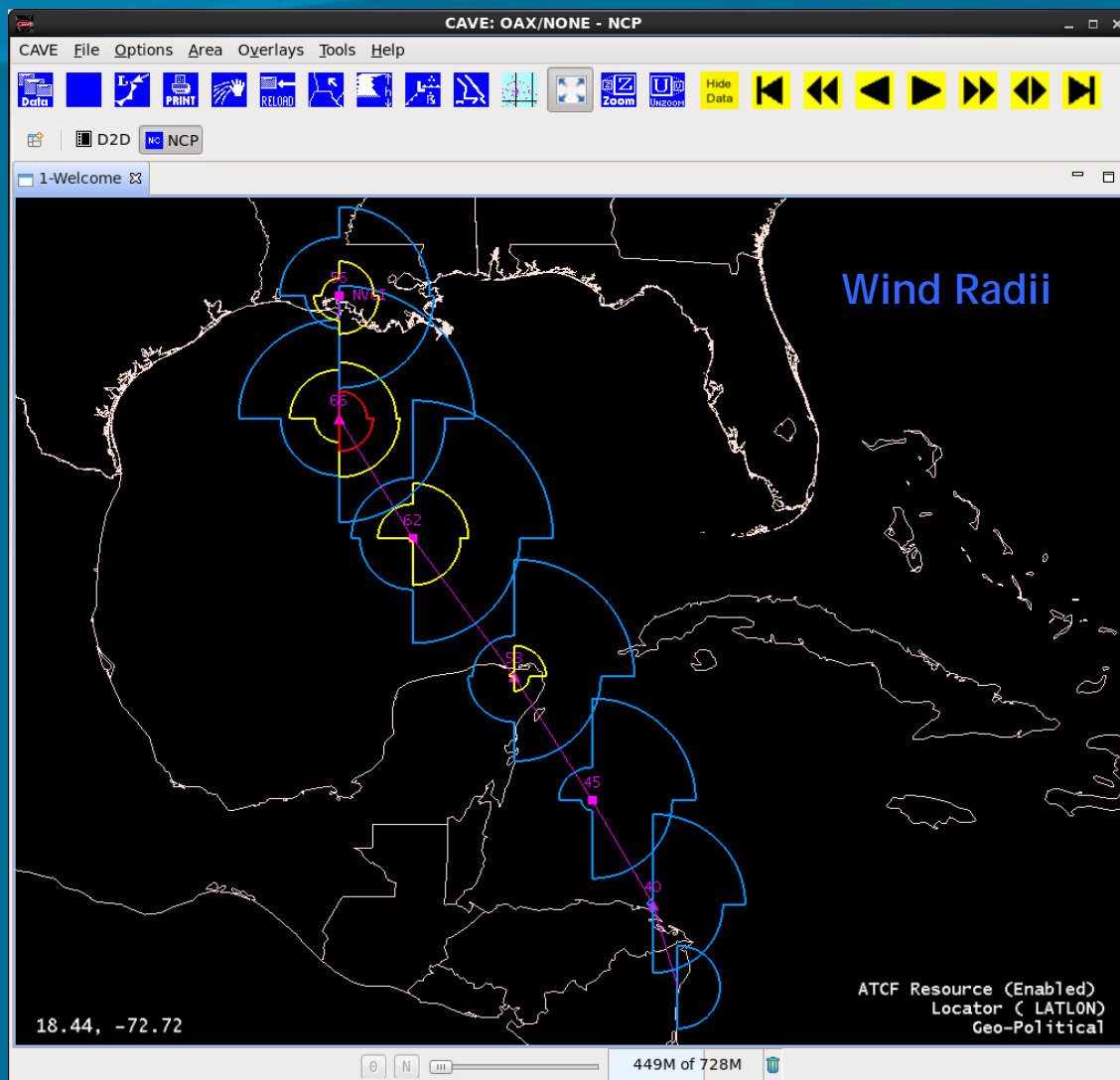
ATCF Transition to AWIPS2 CAVE-NCP Graphical User Interface



TCORF/IHC, 13-15 March 2018, FIU, Miami, FL



ATCF Transition to AWIPS2 CAVE-NCP Graphical User Interface



TCORF/IHC, 13-15 March 2018, FIU, Miami, FL

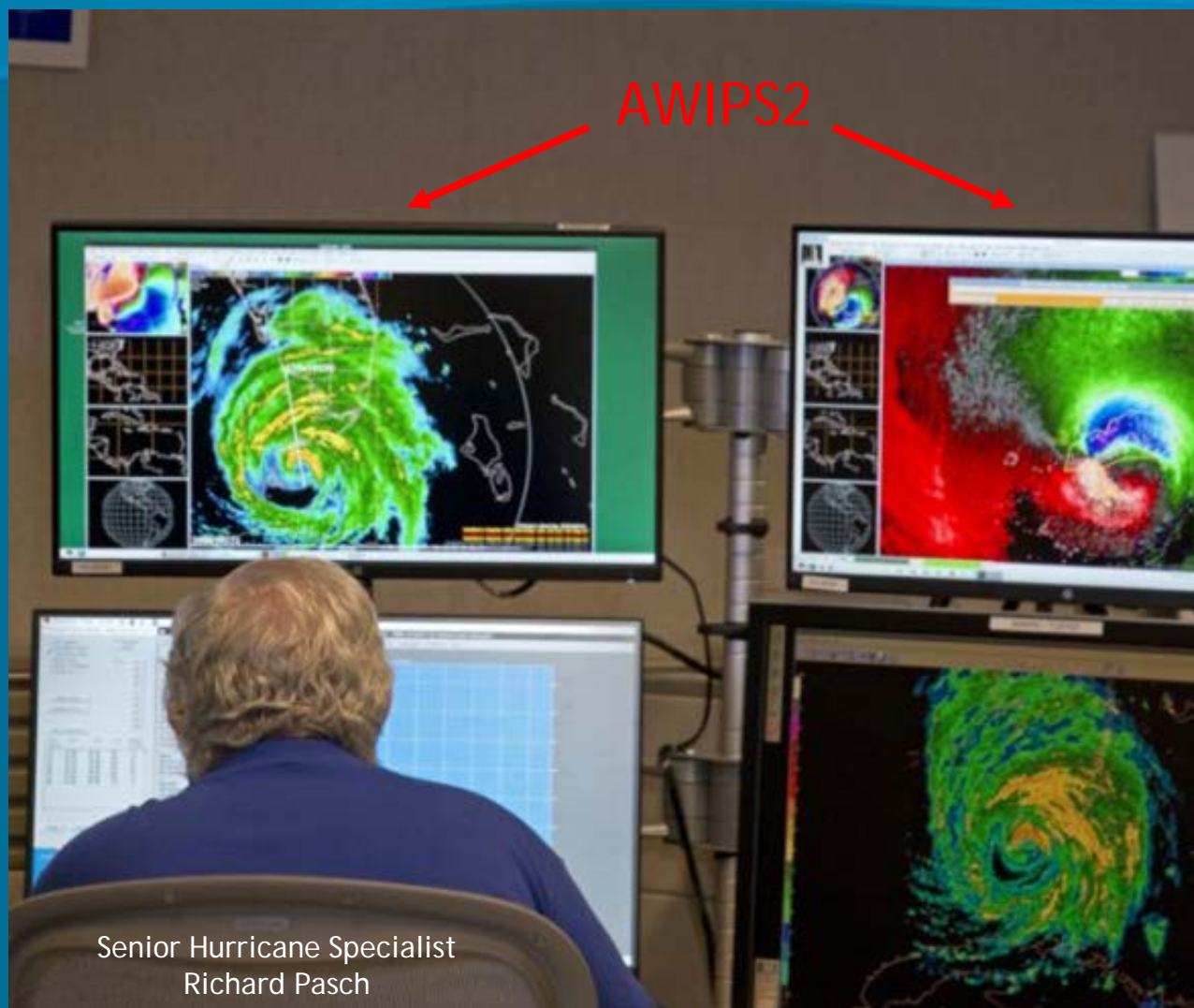


N-AWIPS to AWIPS2 Status

- AWIPS used by HSU in 2017 for GOES-16 data
- AWIPS workstations on all HSU operations desks in 2018
 - Will replace satellite N-AWIPS system
- NHC provided “use cases” to APO for hardware/software evaluation
- Migration will continue in 2018
 - Non-SBN data flow, product generation
- Possible completion of migration for 2020 hurricane season



AWIPS2 Workstation at NHC in 2017



ATCF →

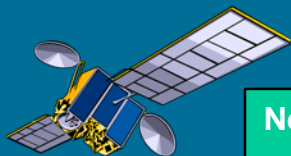
Senior Hurricane Specialist
Richard Pasch



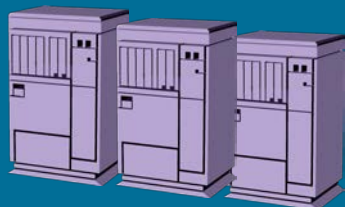
NHC AWIPS2 Data Flow



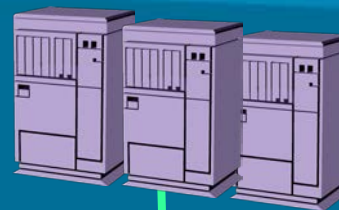
High resolution McIDAS/NetCDF4 data



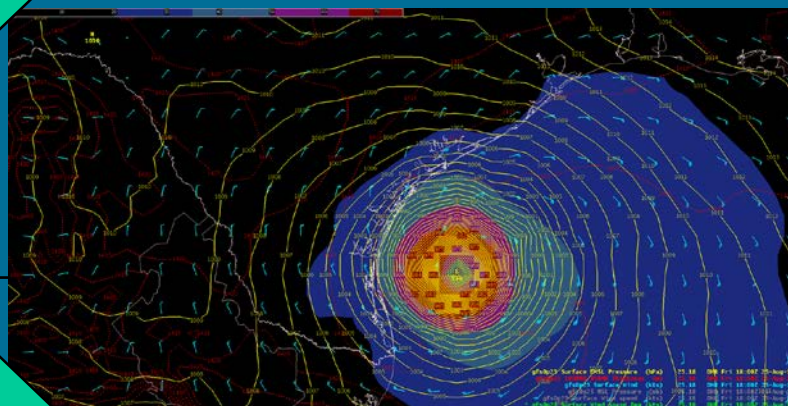
Non-SBN DBNet



Global high resolution NCEP models



Local NHC data sets
Hurricane Hunter observations

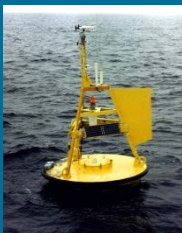


D2D Menus

GFE Menus

Text Editors

Buoys,
Ships



SBN LDM flow

ASOS



NEXRAD



18 AWIPS Workstations,
4 EDEX Servers

Products

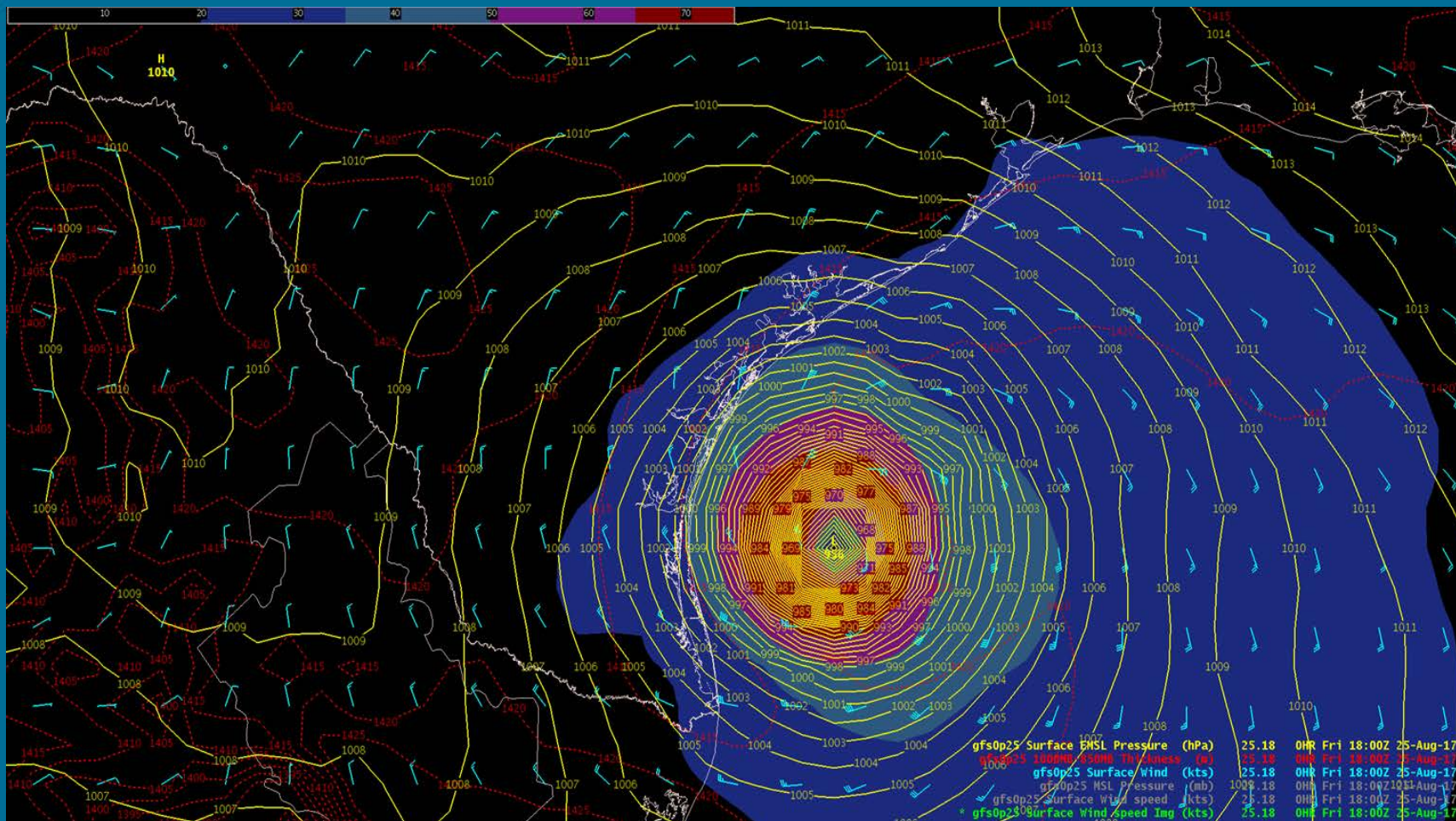
Service provided
24 hrs/day,
365 days/yr

TCORF/IHC, 13-15 March 2018, FIU, Miami, FL



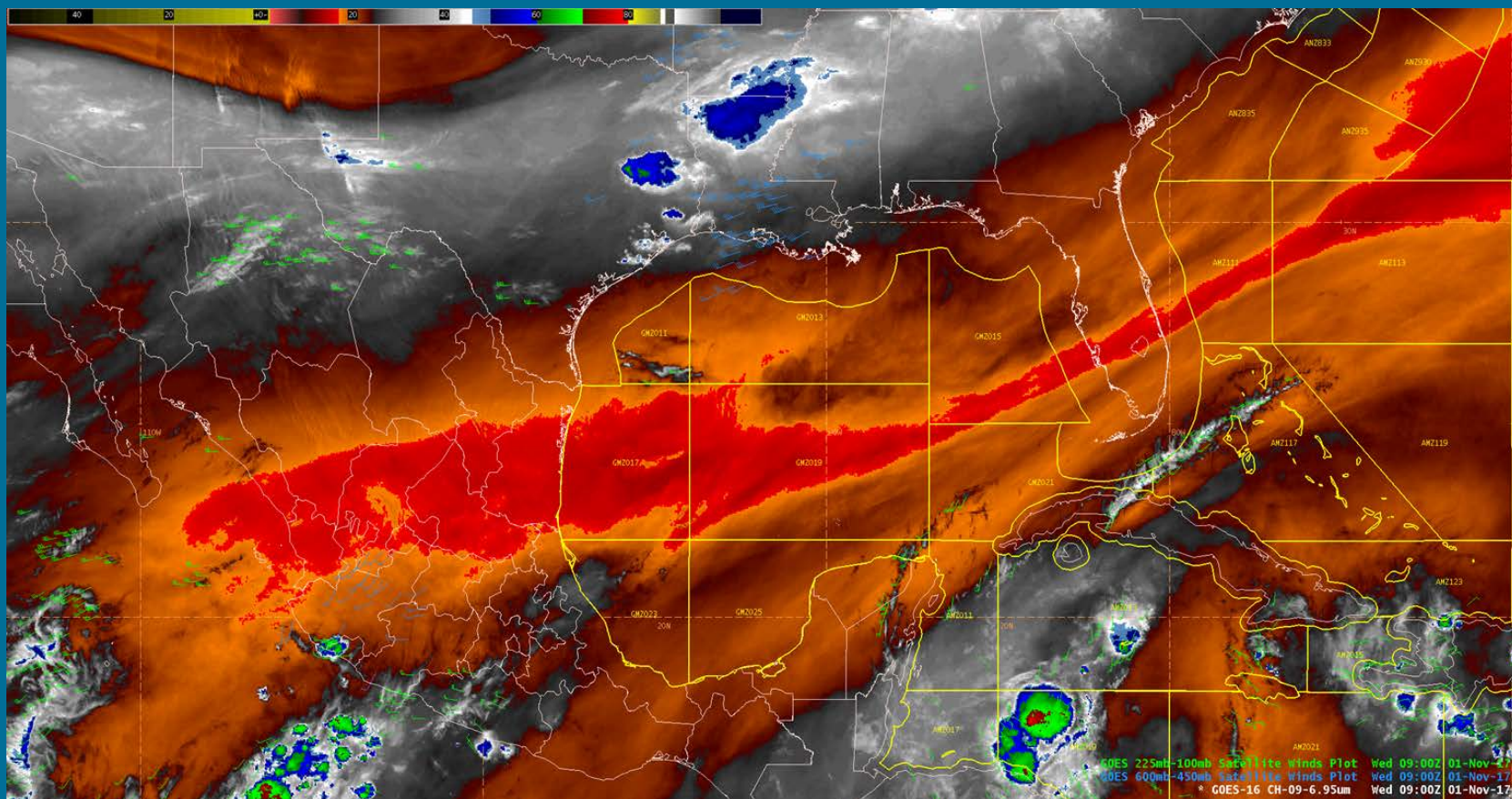
Model Data in AWIPS2

Hurricane Harvey Landfall





Satellite Data Displayed in AWIPS2





AWIPS2 and Collaboration with the Research Community

- Setting up operational AWIPS system is a difficult task
- Large hardware and support investments
- Unidata provides a simplified version for collaboration
 - Smaller hardware investment needed
 - Data flow via LDM
 - Supports two visualization frameworks
 - CAVE and Python Data Access Framework (Python-AWIPS)
 - Unidata provides user support
- Path for R2O collaboration
 - HRD, universities, etc.



Thank you!

References:

- Miller, R.J., A.J. Schrader, C.R. Sampson, and T.L. Tsui, 1990: The Automated Tropical Cyclone Forecasting System (ATCF), *Weather and Forecasting*, **5**, 653-660.
- Sampson, C.R. and A.J. Schrader, 2000: The Automated Tropical Cyclone Forecasting System (Version 3.2), *BAMS*, **81**, 1231-1240.
- NRL users manual for the ATCF:
http://www.nrlmry.navy.mil/atcf_web/docs/pdf/ATCF_User%27s_Manual_10192010.pdf
- NRL documentation on the ATCF:
http://www.nrlmry.navy.mil/atcf_web/docs/