Convective Storm Nowcasting Applications of McIDAS-V

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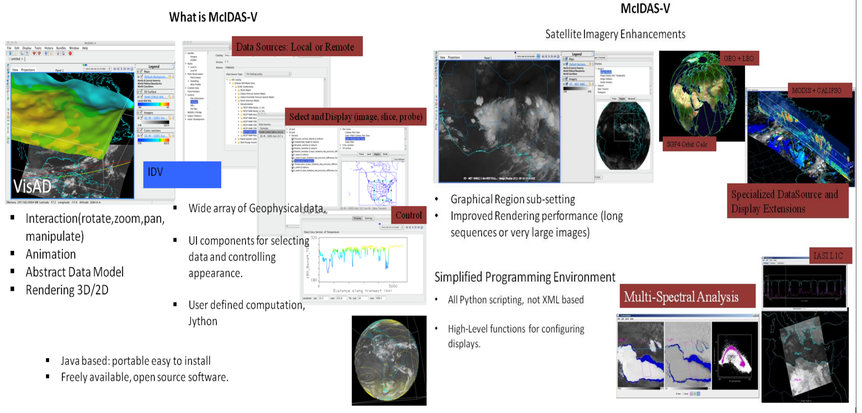
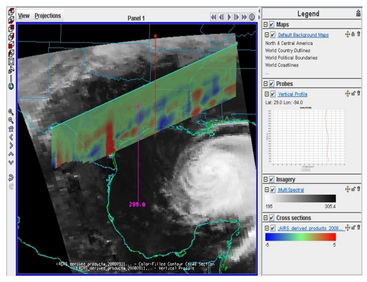
1. McIDAS-V: INTRODUCTION AND BACKGROUND

Man computer Interactive Data Access System (McIDAS)-V:
•Free, open source, visualization and data analysis software package
•Next generation in McIDAS software packages.
•Displays weather satellite (including hyperspectral) and other geophysical data in 2- and 3-dimensions
•Analyzes and manipulates data with powerful mathematical functions.

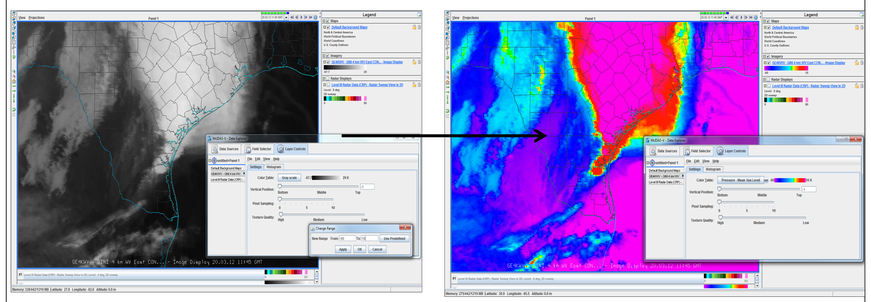


Advanced Display Capability



AIRS Level 1B window channel image (grey-scale) and moveable 2-D slice of ECMWF-AIRS Single FOV water-vapor retrieval (color-scale). Slice values are re-sampled on the fly from the 3-D difference field and auto-updated as the slice is dragged in space - demonstrating interactive direct manipulation, data integration and python driven data computation.

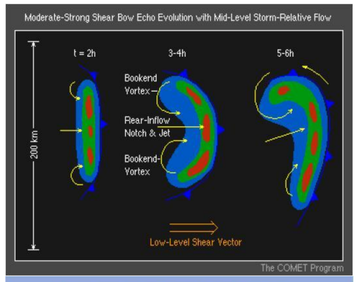
McIDAS-V has been proven to be highly effective in the convective storm nowcasting process:
• Ability to visualize important diagnostic parameters in plan and cross-sectional views and vertical profiles.
•Bi-spectral imager WV-IR brightness temperature difference (BTD) product developed using McIDAS-V functionality that includes the ability to apply built-in color enhancements to gray scale images.

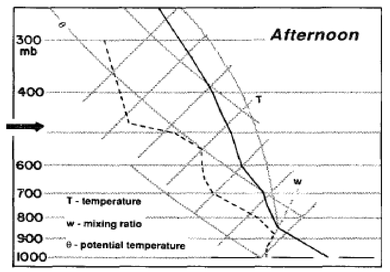


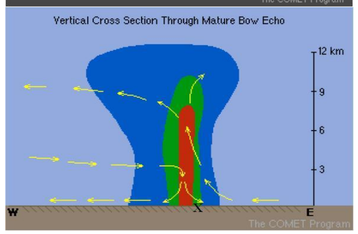
•McIDAS-V has been proven useful as a convection product validation tool, and a short-term forecasting and analysis tool.

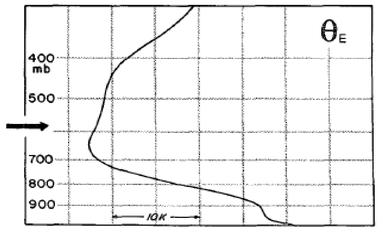
2. CASE STUDY OF McIDAS-V APPLICATIONS

Convective Windstorm Conceptual Model

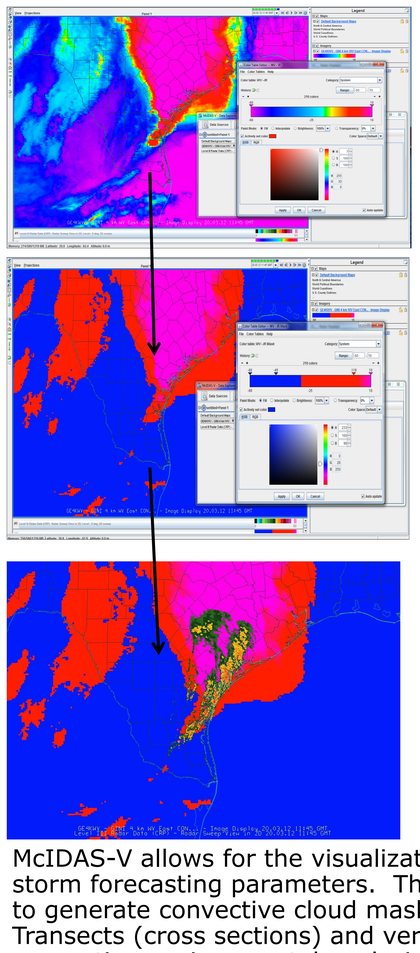




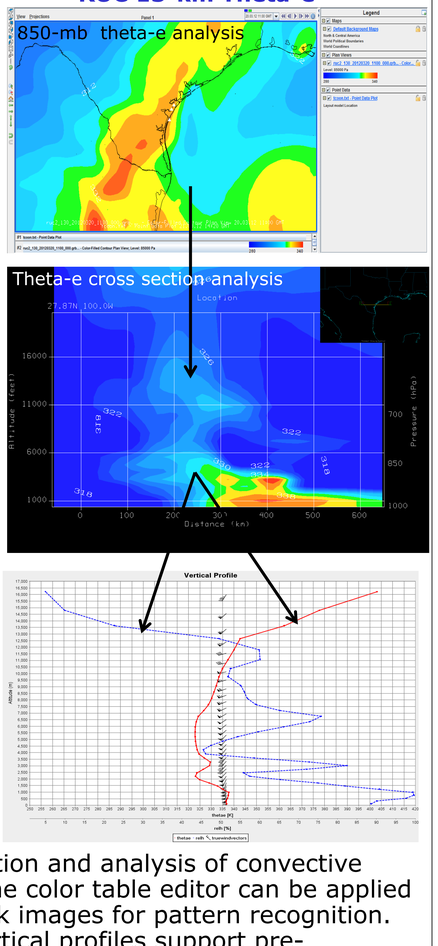




Satellite Analysis
GOES-13 4-km WV-IR BTD



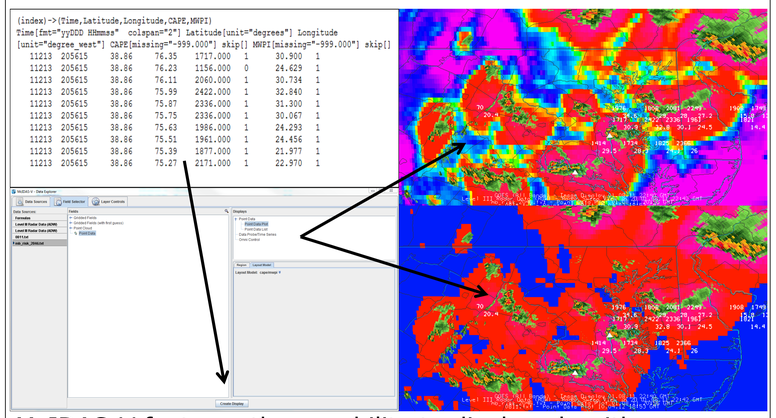
NWP Model Analysis
RUC 13-km Theta-e



McIDAS-V allows for the visualization and analysis of convective storm forecasting parameters. The color table editor can be applied to generate convective cloud mask images for pattern recognition. Transects (cross sections) and vertical profiles support pre-convective environmental analysis and parameter evaluation.

3. McIDAS-V ALGORITHM VALIDATION APPLICATIONS

1 August 2011 Chesapeake Bay Downbursts



McIDAS-V features the capability to display algorithm output parameters in text format as an overlay on satellite and radar imagery.

4. VALIDATION RESULTS

McIDAS-V allows for the direct comparison of algorithm output parameters to surface observations. The imagery above compares downburst wind gust potential values to WeatherFlow wind gust observations.

4. REFERENCES

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