McIDAS Program Status

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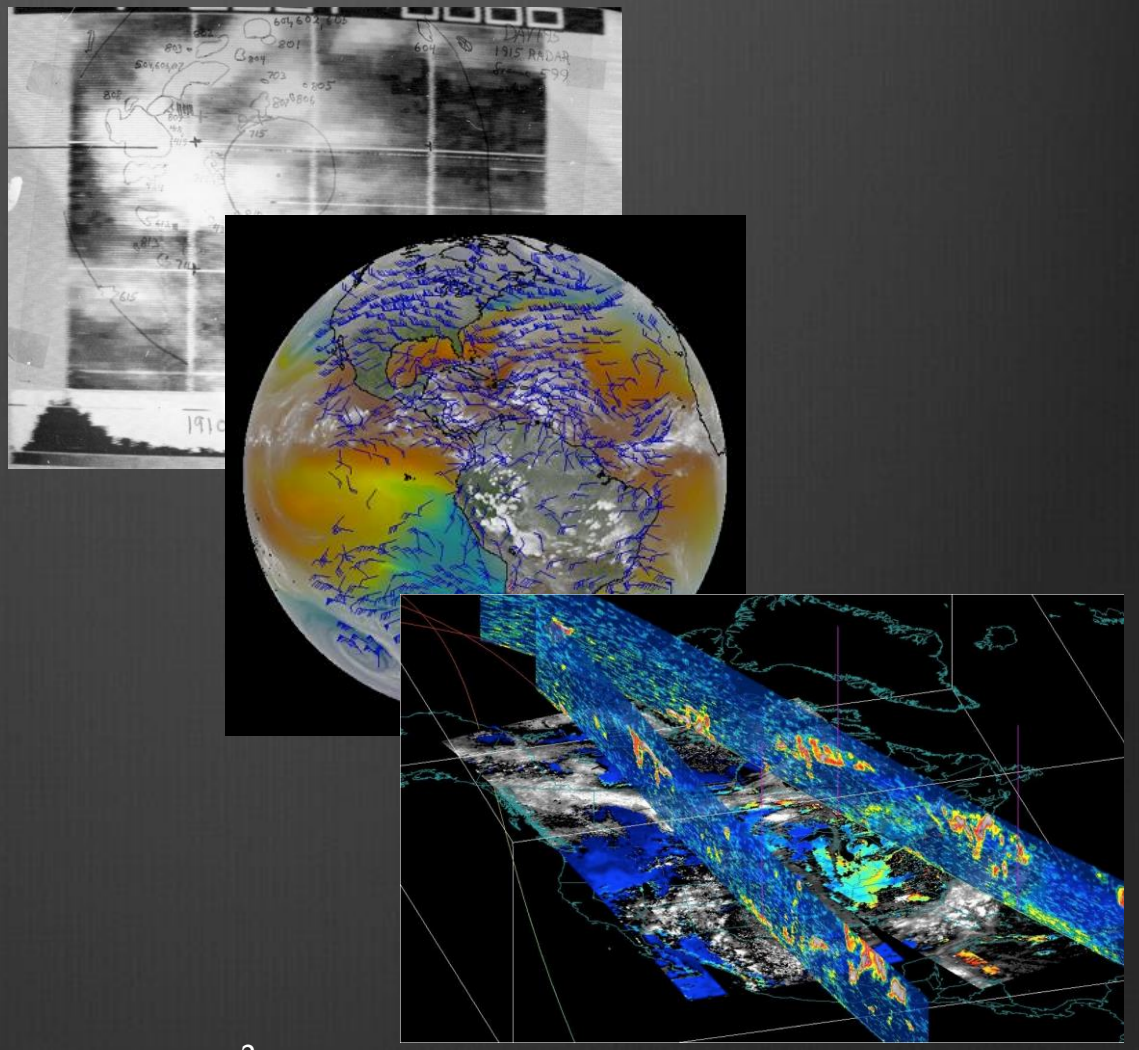
2016 McIDAS Users' Group Meeting
16 November 2016

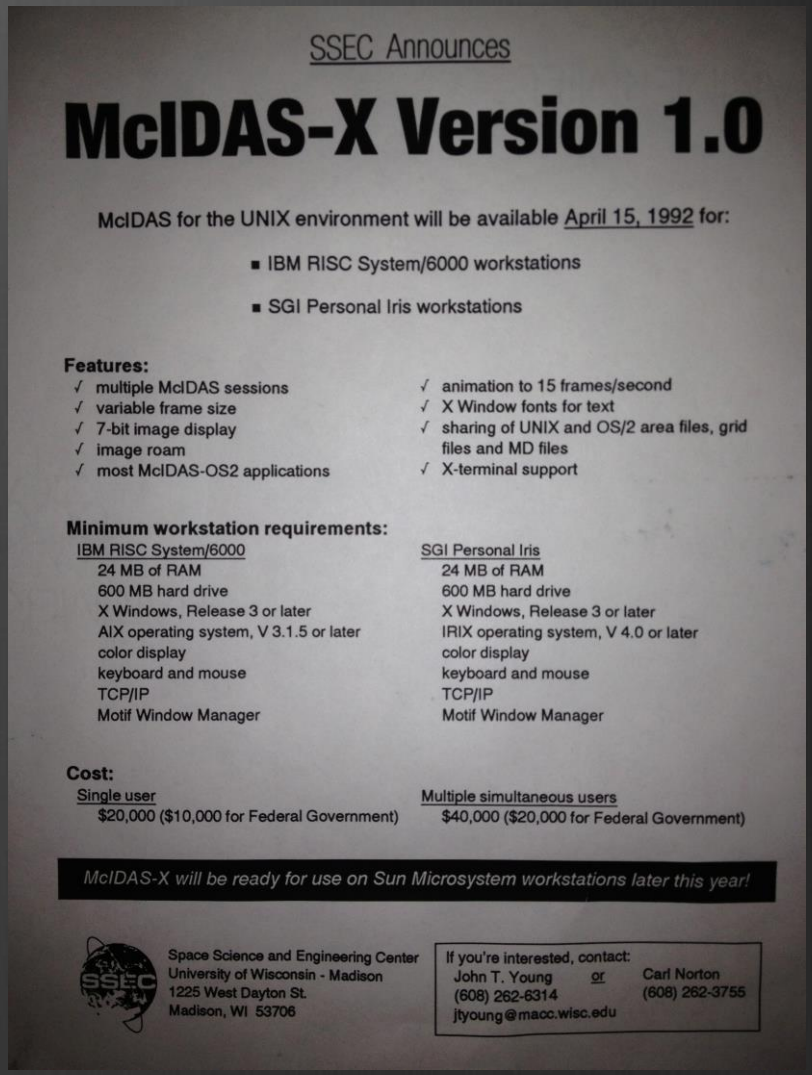
McIDAS Status

- McIDAS-X
- McIDAS-XCD
- McIDAS-XRD
- SDI
- McIDAS-V



McIDAS-X Introduction

- Ported code from mainframe and DOS- and OS/2-based computers to IBM AIX workstations
- Released April 1992
- A distributed system as opposed to previous mainframe



SSEC Announces

McIDAS-X Version 1.0

McIDAS for the UNIX environment will be available April 15, 1992 for:

- IBM RISC System/6000 workstations
- SGI Personal Iris workstations

Features:

- ✓ multiple McIDAS sessions
- ✓ variable frame size
- ✓ 7-bit image display
- ✓ image roam
- ✓ most McIDAS-OS2 applications
- ✓ animation to 15 frames/second
- ✓ X Window fonts for text
- ✓ sharing of UNIX and OS/2 area files, grid files and MD files
- ✓ X-terminal support

Minimum workstation requirements:

IBM RISC System/6000
- 24 MB of RAM
- 600 MB hard drive
- X Windows, Release 3 or later
- AIX operating system, V 3.1.5 or later
- color display
- keyboard and mouse
- TCP/IP
- Motif Window Manager

SGI Personal Iris
- 24 MB of RAM
- 600 MB hard drive
- X Windows, Release 3 or later
- IRIX operating system, V 4.0 or later
- color display
- keyboard and mouse
- TCP/IP
- Motif Window Manager

Cost:

Single user
$20,000 ($10,000 for Federal Government)

Multiple simultaneous users
$40,000 ($20,000 for Federal Government)

McIDAS-X will be ready for use on Sun Microsystem workstations later this year!

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University of Wisconsin - Madison
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If you're interested, contact:
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or
Carl Norton (608) 262-3755

McIDAS-X
Keys to Success

- Port to Unix
- ADDE (Abstract Data Distribution Environment)
- Infrastructure: Reglue effort (better integration with Unix and isolating of X Window System use)

Resulted in the longevity of McIDAS-X

Reliability, Stability

Solid infrastructure

McIDAS-X Current

- Periodical updates (1-2 times per year)
- Number of supported platforms reduced over last several years
- Capability with newest and future satellites:
  - Himawari-8, -9 AHI
  - GOES-R ABI and GLM
  - S-NPP and JPSS-1 VIIRS ADDE server (McIDAS-XRD)

McIDAS-X Future

- MUG bug fixes, adaptive maintenance (updates for current and new satellites), and OS and external library updates
- Enhancements continue to be funded outside the MUG and code contributed by internal projects and external sites
- McIDAS-X is expected to be supported beyond 2020 for current GOES GVAR and upcoming GOES-R series satellites. No sunset date in sight.

McIDAS-XCD
Conventional Data

- Ingest conventional weather data from NOAAPORT
- Current version to be supported for at least another year
- Beta of new version will be available in early 2017
- More information in *McIDAS-XCD Status Update*

McIDAS-XRD
Research and Development

- A collection of R&D code that is not formally tested by McIDAS User Services:
  - Over 100 McIDAS commands
  - Over 15 ADDE servers
  - Testing is limited to ensuring code builds on supported platforms
- Status: Current support level continues
- Future: Coincides with McIDAS-X future

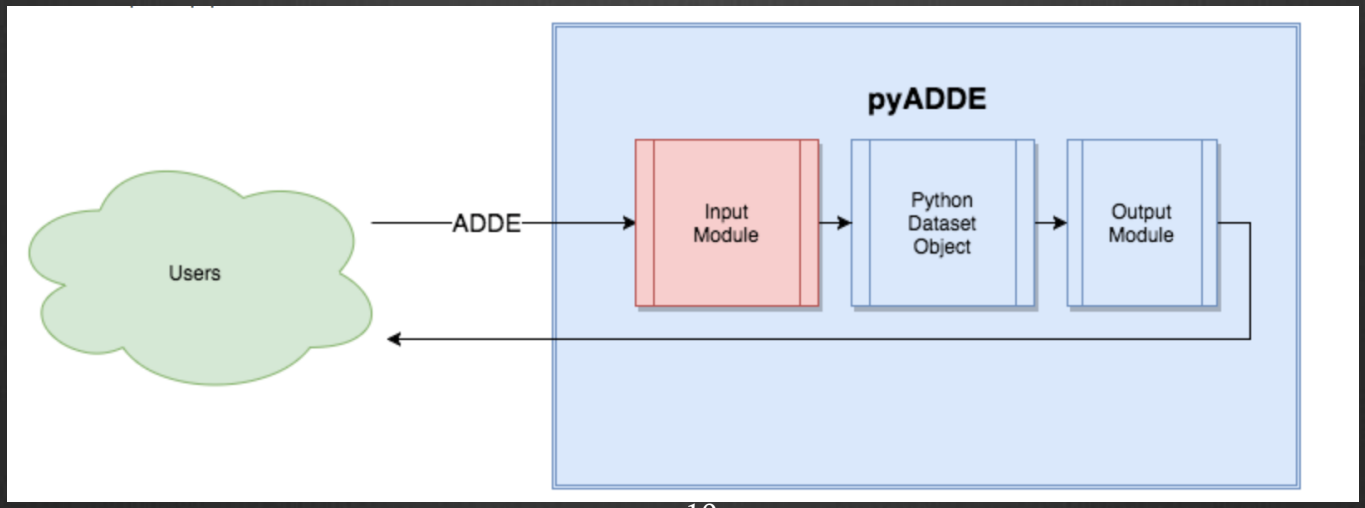
ADDE Servers

- OpenADDE:
  - Open source version of the McIDAS ADDE servers
  - Last updated in 2006
  - Status: Not supported nor maintained
- Future: SSEC is investigating Python-based servers and Unidata is looking into packaging the existing ADDE servers in Docker containers

Python ADDE Servers

Why pyADDE:

- Write a new server without McIDAS-X knowledge
- Only *Input Module* will need to be written:
  - Read native file
  - Compute lat/lon for each n^{th} point
  - Reshape into Python Dataset Object
  - pyADDE does the rest



Python ADDE Servers

- Advantages:
  - Evolution rather than revolution
    - May make use of McIDAS-X Fortran and C library functions in the short-term
  - Extensions more easily implemented
    - Return other formats (e.g., netCDF), not only McIDAS-X Area
    - Perhaps additional geographic projections (using proj.4)
- Status:
  - Prototype server being developed
    - Reduced functionality
  - Plan is to have first version of pyADDE complete by fall 2017
    - Dependent on availability of developers and no technical show-stoppers

SDI

- SDI (SSEC Desktop Ingestor) 1997 - 2005
- SDI-104 (SSEC Data Ingestor) 2005 – ?
- SDI-GRB Appliance 2016 - ?
- Status: SDI-104 supported; SDI-GRB in development
- Future:
  - SDI-104: supported as long as GOES GVAR satellites are operational or backup
  - SDI-GRB Appliance: throughout the GOES-R era
- More details in *McIDAS SDI Status Update*


McIDAS
V

McIDAS-V Motivation

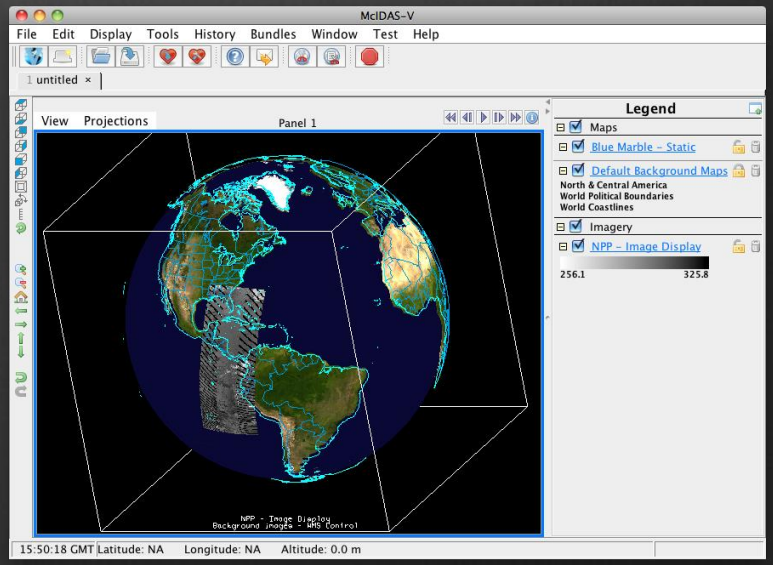
- McIDAS-X software (currently written in Fortran 77 and C) has a 40-year heritage resulting in limited extensibility potential
- New visualization concepts cannot be incorporated
- Forthcoming environmental satellite data cannot be utilized efficiently (GOES-R & JPSS operational systems)

McIDAS-V Goals

- McIDAS-V shall be a powerful and versatile software system for environmental data processing, analysis and visualization
- McIDAS-V shall support existing and evolving needs of scientific research and algorithm/applications development for new programs, such as NPOESS and GOES-R as well as for retrospective data, such as that from GOES and POES
- McIDAS-V shall support data fusion and algorithm interoperability from existing and future sources
- The McIDAS team shall continue to fully support the MUG and McIDAS-X functionality as users transition to McIDAS-V
- McIDAS-V shall support operational users by providing tools and interfaces that enable a natural transition path for research results into operations
- McIDAS-V shall be used to educate students in remote sensing and physical sciences, and students must be integrally involved in its development, evolution and use

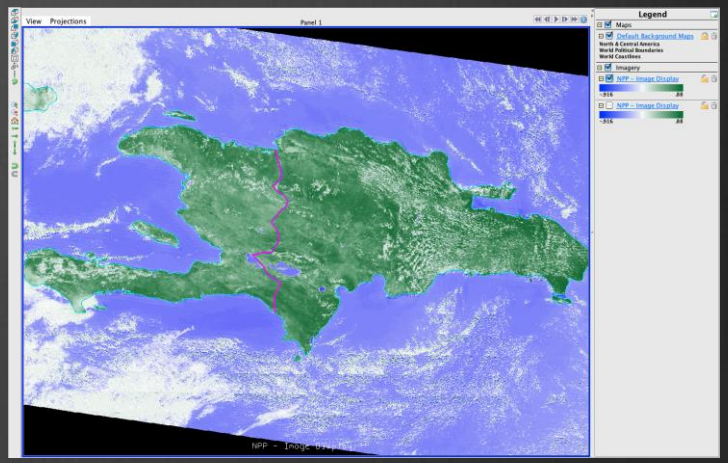
Are we meeting the goals?

- Overall, the work is progressing toward most of the goals, however, there are limiting factors:
  - Funding sources
  - Enhancements vs. improving Infrastructure
  - Hardware performance
  - User expectations



McIDAS-V Internal Review

- Science
  - Who are the users?
  - What functionality is important?
- Technical
  - Identify current technical issues
  - Anticipate future issues
  - Plan a technical direction
- Programmatic
  - Coordinate internal funding sources
  - Mechanism for McIDAS-V infrastructure improvements



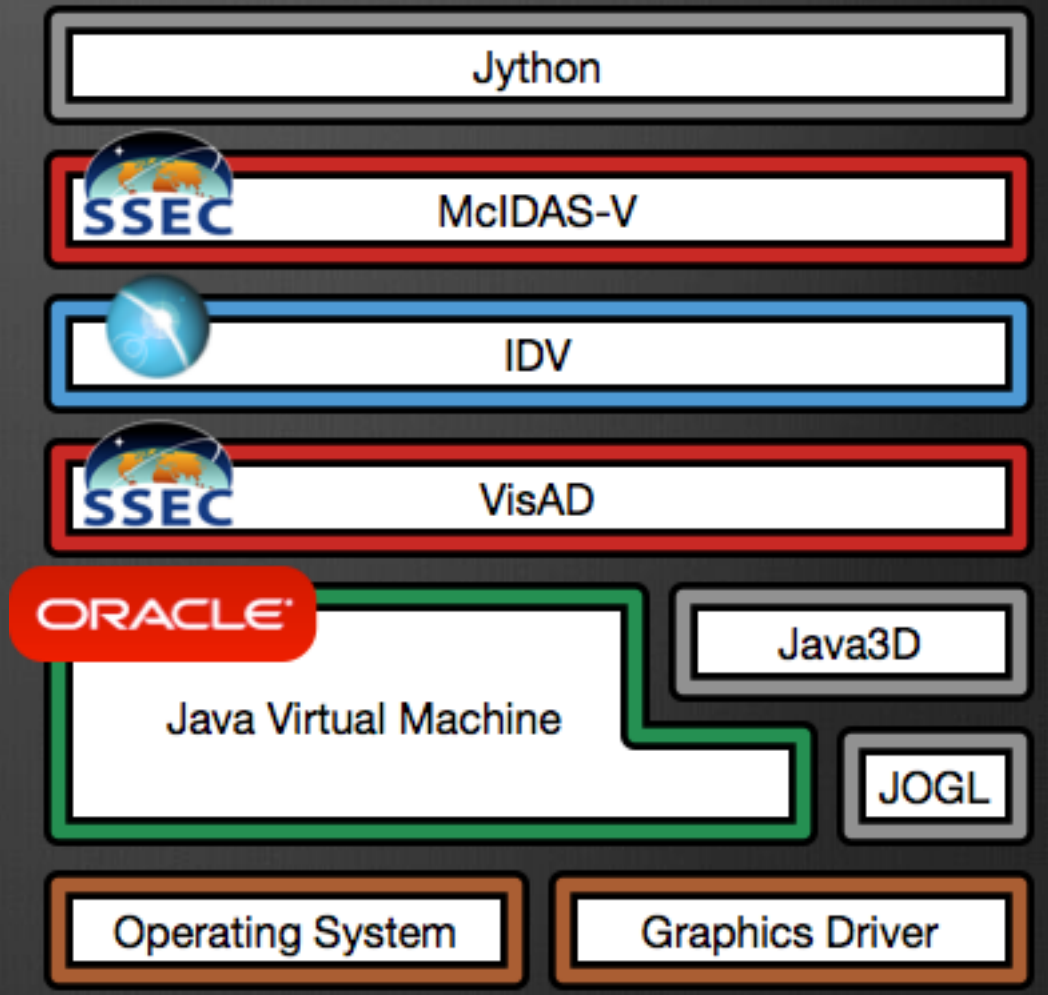
Distinctive Features

From the survey and expert input, the key features of McIDAS-V are:

- Freely available
- Read a variety of file formats (netCDF, HDF-4, HDF-5, GRIB, BUFR, ASCII text)
- Time-match and integrate into single 3D display, with animation
- Display 2D fields as point observations and contours
- Display 3D grids as volumes and transects
- Data access of local and remote (ADDE, THREDDS, OPeNDAP) datasets. Also, local access through ADDE
- GUI driven (both a plus and somewhat a minus). Easy for new users to learn due to GUI design, as opposed to scripting or command line programs

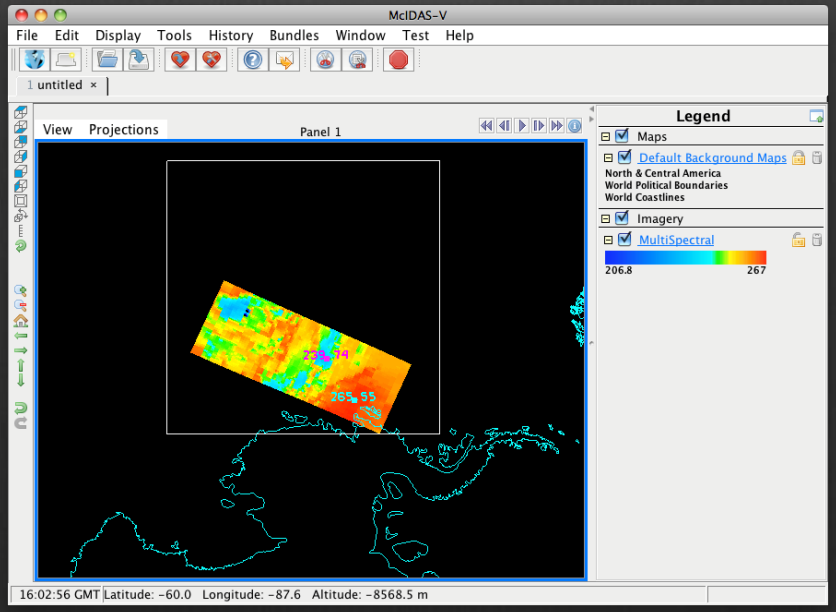
Dependency "Layer Cake"

- Major components by Unidata, SSEC, Oracle, open source community
- Additional components include file format libraries, math libraries, packaging and build utilities; all open source
- OS vendors Linux,Windows, Mac
- Hardware drivers from manufacturers



McIDAS-V Funding

- MUG
- Several CIMSS grants for S-NPP/JPSS and GOES-R
- NASA ROSES proposals



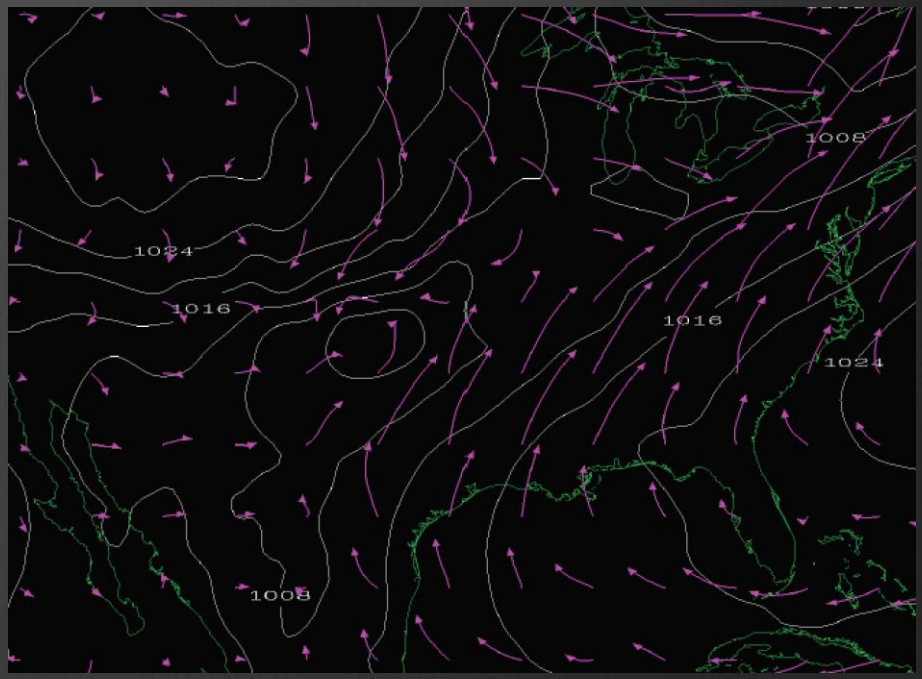
MUG Support

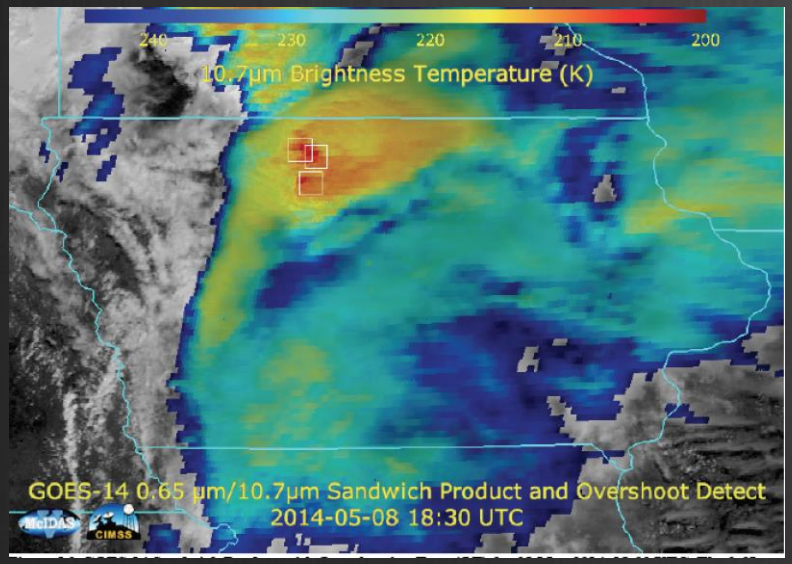
- User-level Infrastructure: User Interface, Scripting
- Bug fixes: Prioritize, coordinate internally and with Unidata
- Testing
- Documentation: Includes maintaining tutorials
- Help Desk: Includes maintaining forums

CIMSS Grants
GOES-R

Several CIMSS grants for GOES-R

- Improvements to scripting
- Preparation for GOES-R
- ‘Sandwich product’
- Trajectories

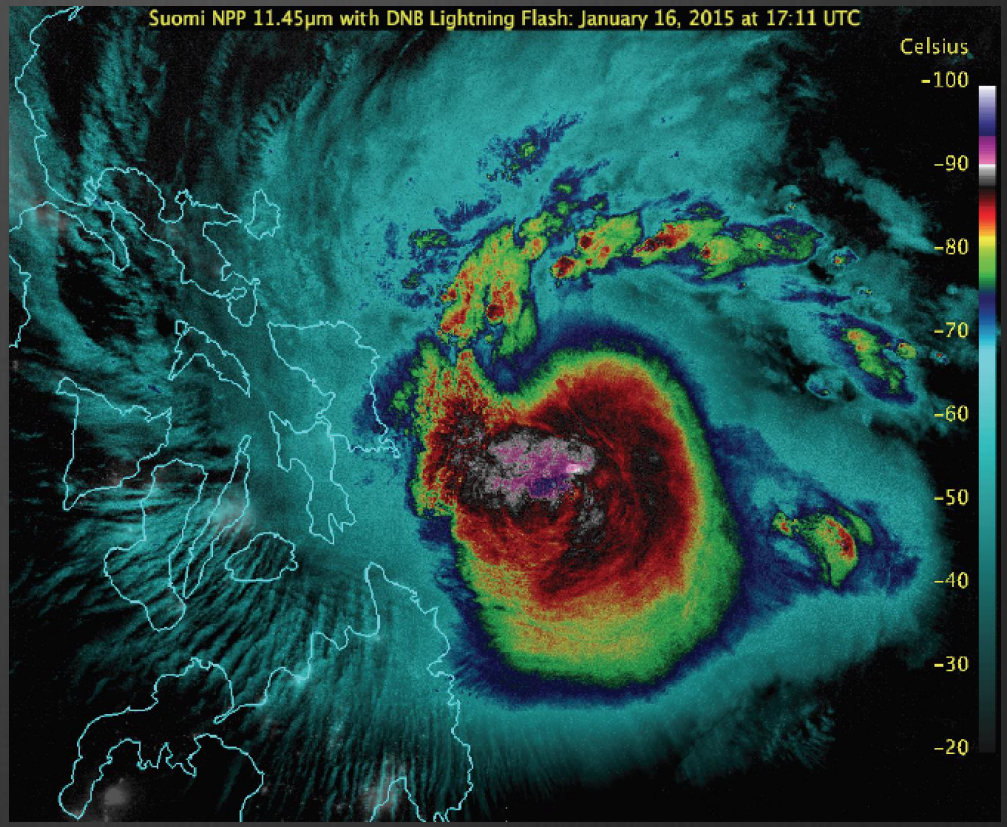




CIMSS Grants
Suomi NPP

CIMSS grant for S-NPP data in collaboration with CIRA

- Improvements for visualization of VIIRS, CrIS, ATMS
- Updates to Time Matching
- Enhancements for Layer Labels



Other Proposals

NASA ROSES (Research Opportunities in Space and Earth Sciences)

- Santek and Kulie (SSEC), and Ramamurthy (Unidata)

- 2015 (not selected): "Interactive Algorithm Development and Product Validation through Innovative Data Access and Visualization Methods"

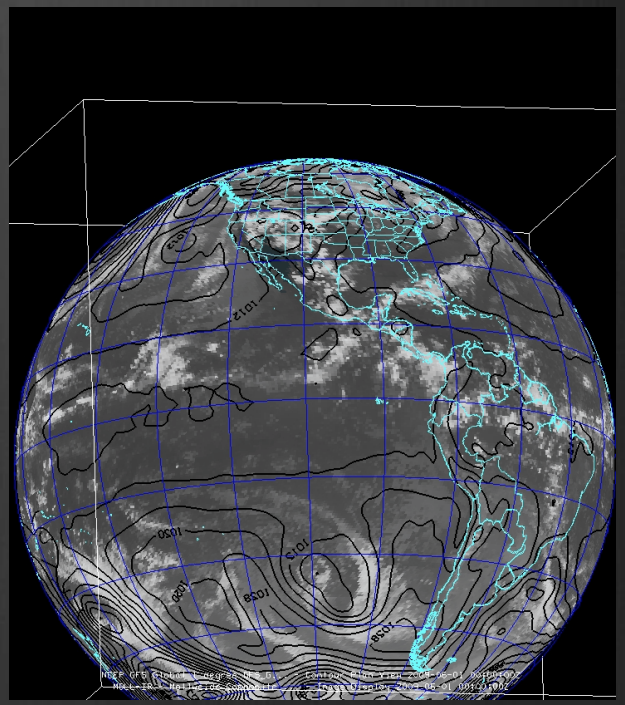
- No new opportunities in 2016

McIDAS-V Priorities

- Fix Critical bugs (MUG, Unidata)
- Incorporate enhancements from CIMSS projects, especially those that are not possible in McIDAS-X (CIMSS, MUG)
  - Trajectories, VIIRS, CrIS, ATMS
- Ensure new data sources are usable (MUG, CIMSS)
  - Himawari-8 AHI, GOES-R ABI
- Maintain compatibility with Unidata's IDV (Unidata, MUG)
- Major underlying infrastructure changes are still needed

McIDAS-V Future

- Continue to engage younger generation:
  - Workshops and training
  - Classroom
- Appeal to researchers:
  - Input/output data formats
  - Scripting
  - More data fusion
- With GOES-R in McIDAS-X, re-evaluate operational requirements:
  - Who is the user?
  - What functionality is needed?



McIDAS-X and –V Summary

- No immediate plans for support fee structure changes
  - MUG members will continue to receive priority support for –X and –V
- New development likely done in –V rather than –X, however:
  - We're still maintaining –X for compiler changes, OS upgrades, etc.
  - We're still creating ADDE servers for new satellites
  - If –X works for you, then stay with –X. When new features or data types come along in –V, then do your new development in –V.
  - If you need help with the new development, contact the McIDAS Help Desk
- McIDAS-X is expected to be supported beyond 2020 for current GOES GVAR and upcoming GOES-R series satellites. No end date in sight.