Lessons learned: Transition of SSM/I Hydrological Products to NCDC

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Outline:
Challenges and Recommendations

- Documentation and flow charts
- Physical hand-off
- Software/hardware reconciliation
- Code implementation
- Unexpected differences
- Advice for future research to operations efforts

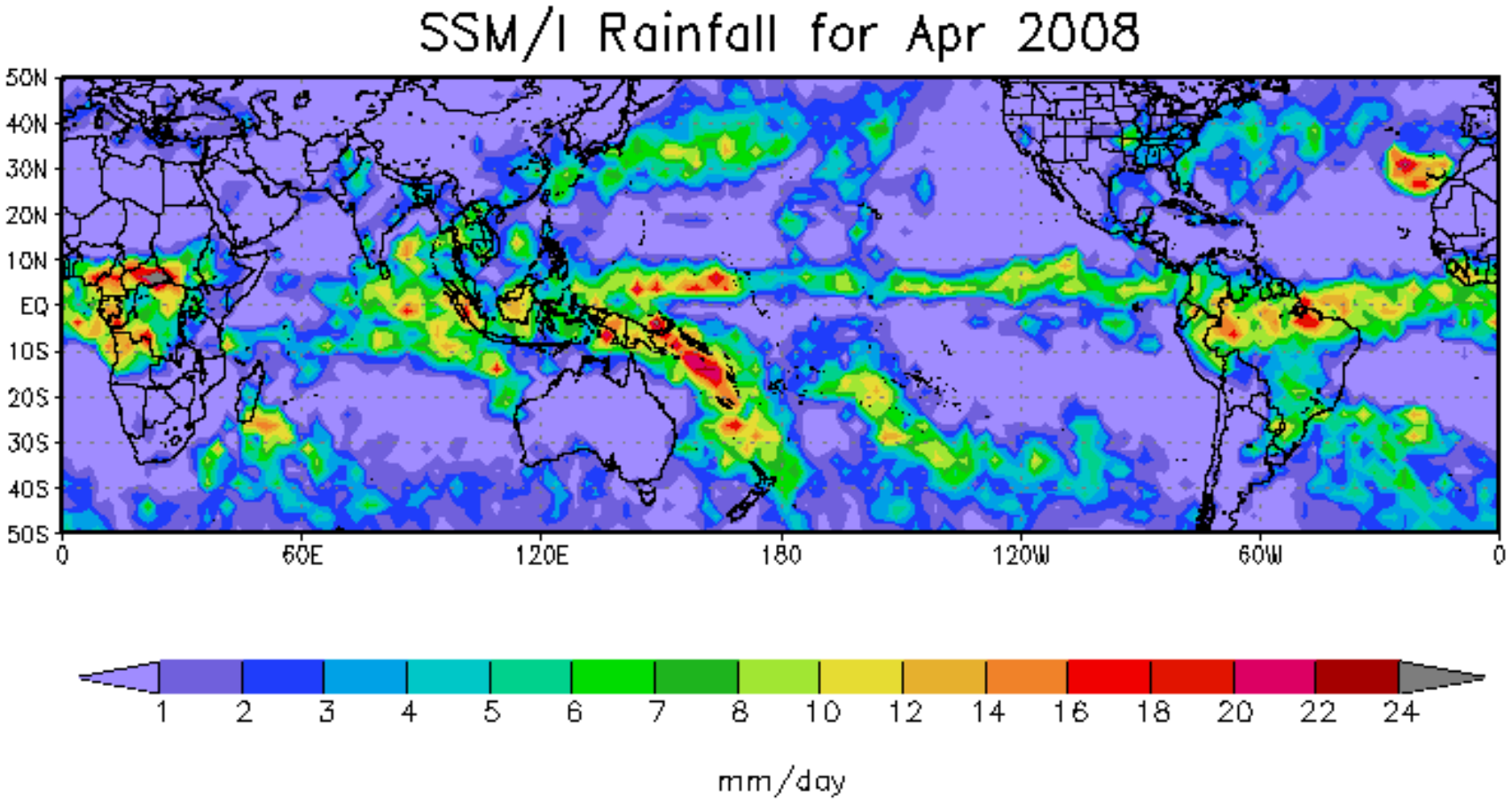
What are the products?

- Monthly
  - mean rainfall (85 GHz primary algorithm; 37 GHz secondary algorithm)
  - rain frequency (85 GHz primary algorithm; 37 GHz secondary algorithm)
  - Total precipitable water, cloud liquid water, cloud frequency, snow cover frequency, sea-ice concentration and sampling frequency.
- Pentad
  - rainfall
  - rain frequency

Example – SSM/I Monthly Product

Monthly Rainfall

based on Special Sensor Microwave Imager Satellite data



Documentation and flow charts

- Archival requirements (no longer the old days)
- Develop timeline or plan of work
- Only handle data and code after documentation provided
- Product flow chart (with code filenames)
- Product must be placed in operational status before transition
- Data and peer-review manuscripts

Archival requirements at NCDC

1. Archive Appraisal

Follows NOAA-wide procedure as required by NAO 212-15
Defines data archive value -justifies the archive
Scopes the project and Identifies resources for archiving

2a. Negotiate Submission Agreement

Identifies contacts and roles within the organizations
Defines the data and metadata to be submitted
Specifies data submission method, schedule, inventory, procedures, etc.

2b. Identify and Create Archive Metadata for Archive Users

Any information that supports independent understanding and use of the data
Metadata standards (FGDC CSDGM, ISO 19115) employed for sharing information

3. Maintain Submission Agreement and Archive Metadata

Reflect changes such as updates, new versions, new contacts
Must maintain contacts and data definitions in the agreement for ongoing data ingests
Keep metadata content current for users

NOTES:

Time and effort required is proportional to the size and scope of the project
The Data Center creates and maintains the documents

Courtesy: Philip Jones, Archive Branch

Data Center Product Website

NOAA Satellite and Information Service
National Environmental Satellite, Data, and Information Service (NESDIS)

National Climatic Data Center
U.S. Department of Commerce

DOC > NOAA > NESDIS > NCDC

Search Field: Search NCDC

Return to Satellite Home

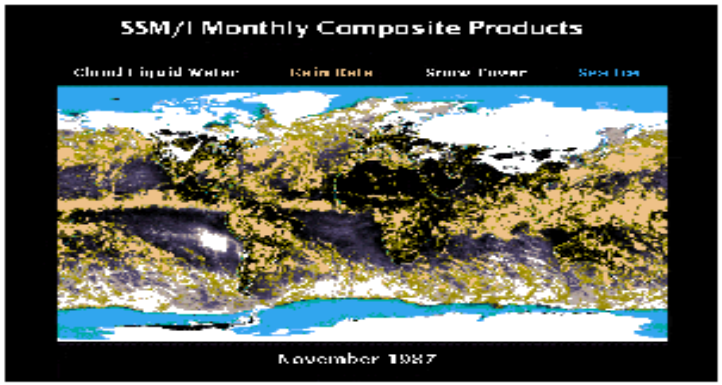
Special Sensor Microwave/Imager (SSM/I)

Global Gridded Products

Overview | Description | Data Access | Questions and Comments

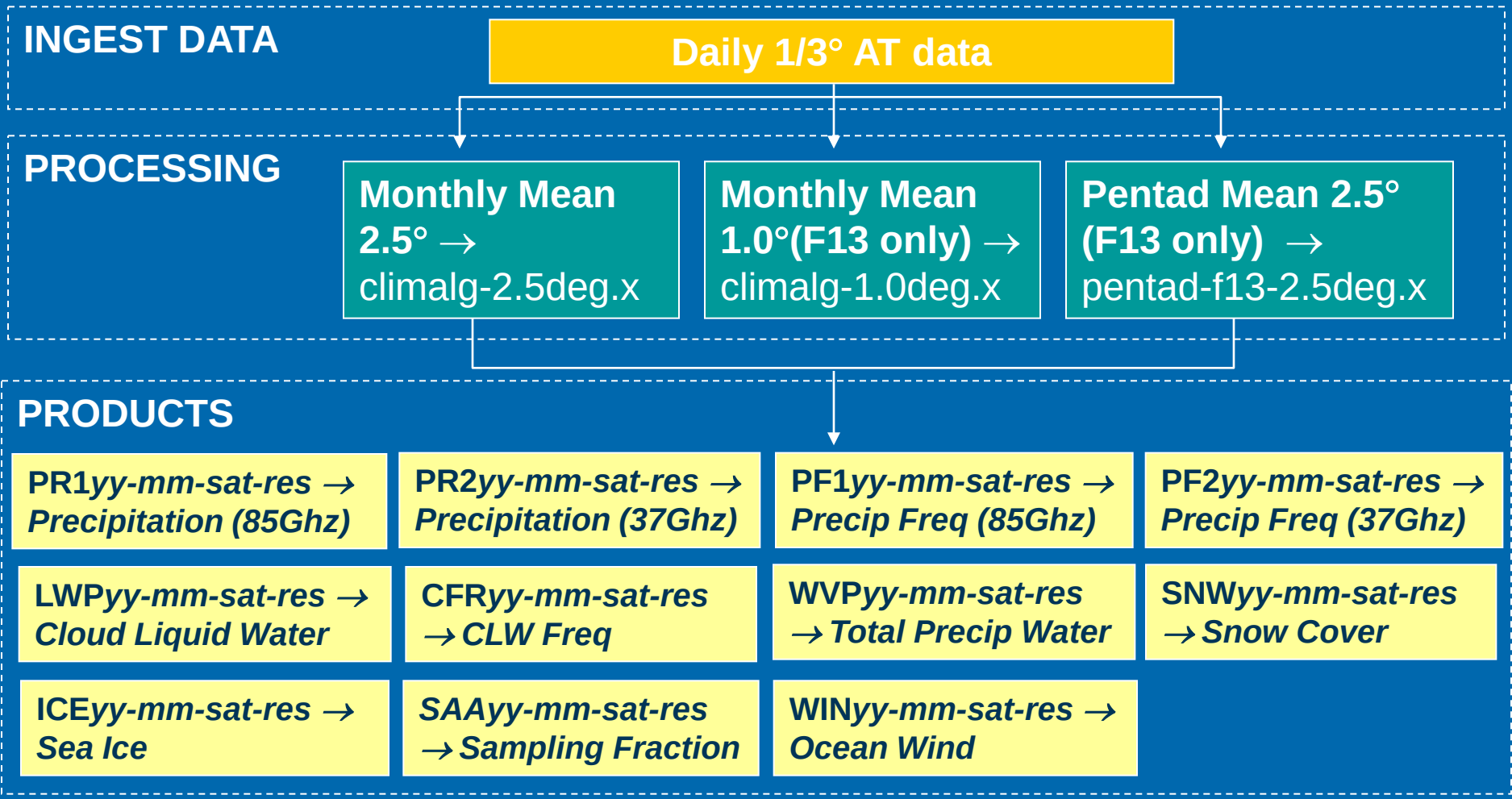
Overview

The Defense Meteorological Satellite Program (DMSP) Special Sensor Microwave/Imager(SSM/I) became operational in July 1987 on the F-8 satellite. Subsequent SSM/I's have been flown on the F- 10 (November 1990), F-11 (December 1991), F-12 (August 1994), F-13 (March 1995), F-14 (April 1997) and most recently, F-15 (January 2000) satellites. At present, NESDIS receives data from the F-13, F-14 and F-15 satellites.



The SSM/I is a seven channel passive microwave radiometer operating at four frequencies (19,35, 22,235, 37.0, and 85.5 GHz) and dual-polarization (except at 22.235 GHz which is V-polarization only). It should be noted that the SSM/I will be replaced by an advanced sensor, the SSMIS (Special Sensor Microwave Imager Sounder) on the F-16 satellite, which was launched in October 2003. The F-16 data is now available through the NESDIS CLASS system. There should be little impact on the suite of hydrological products described here, as the primary channels used are very similar between the SSM/I and SSMIS.

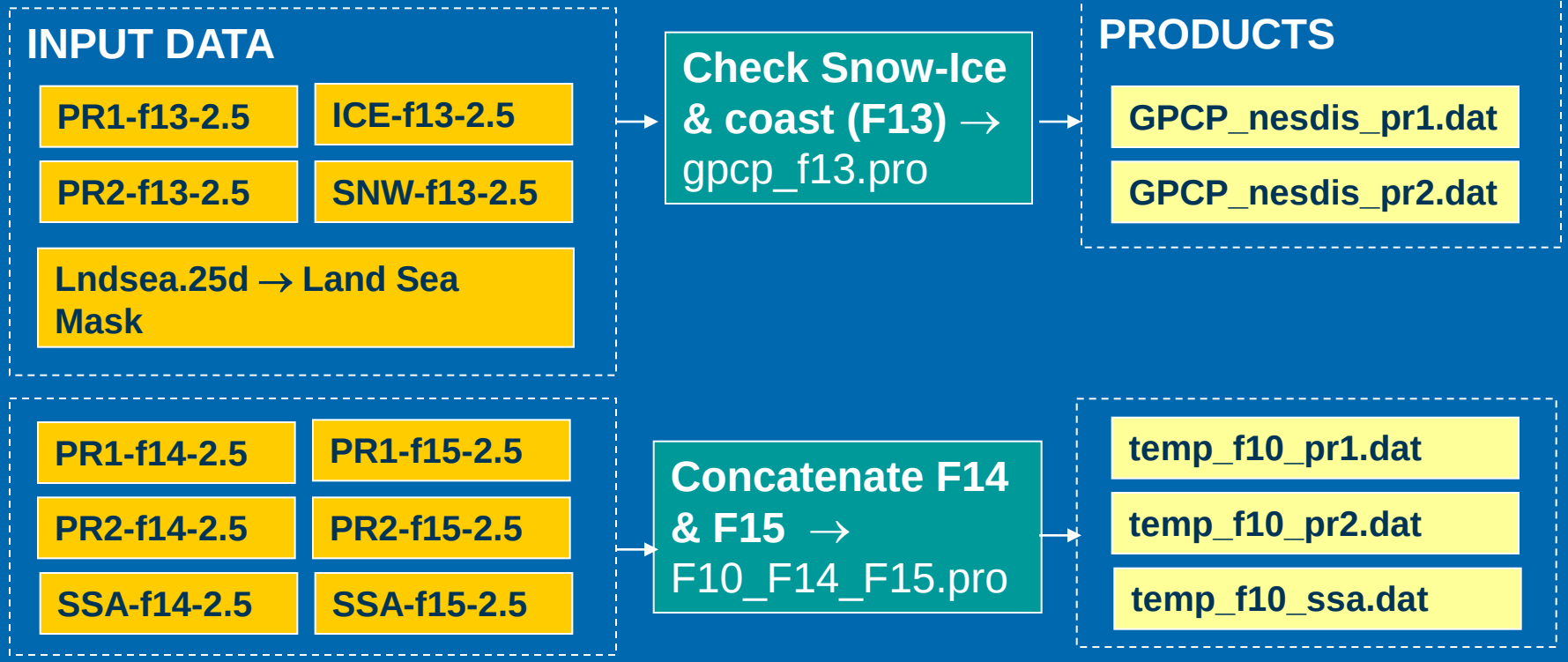
SSM/I Hydrological Products Generation Flow Chart (1)



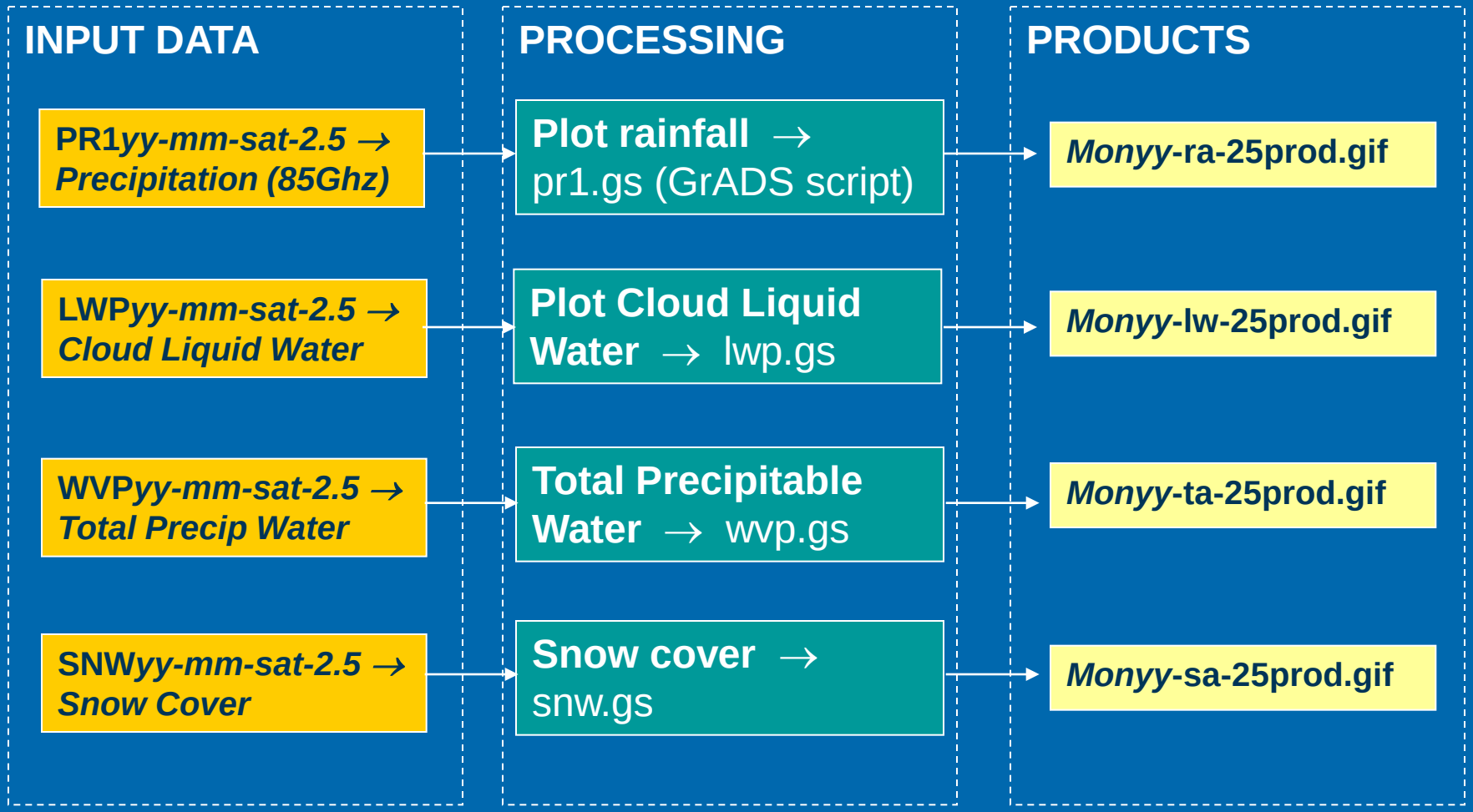
Notes:

- yy=year, mm=month, sat=f13,f14 or f15 and res=2.5 or 1.0. In case of pendad .pen is added
- Ocean wind is calculated for 1.0° resolution and pentad mean
- Only PR1 and PF1 is calculated for 1.0° resolution

SSM/I Hydrological Products Generation Flow Chart (3)



SSM/I Hydrological Products Generation Flow Chart : Monthly & Pentad Graphics Output



Note: Mon=3-letters month.; yy=year

Pentad is performed just only for F13

Research-to-Operations Transfer of data

- Recent and historical data transfer
  - FTP best for small to medium size dataset
  - External disk drive (corruption can occur)
- Ancillary data
  - Problems encountered with receiving most up-to-data version for operational processing
  - Can result in product inaccuracies if not treated properly

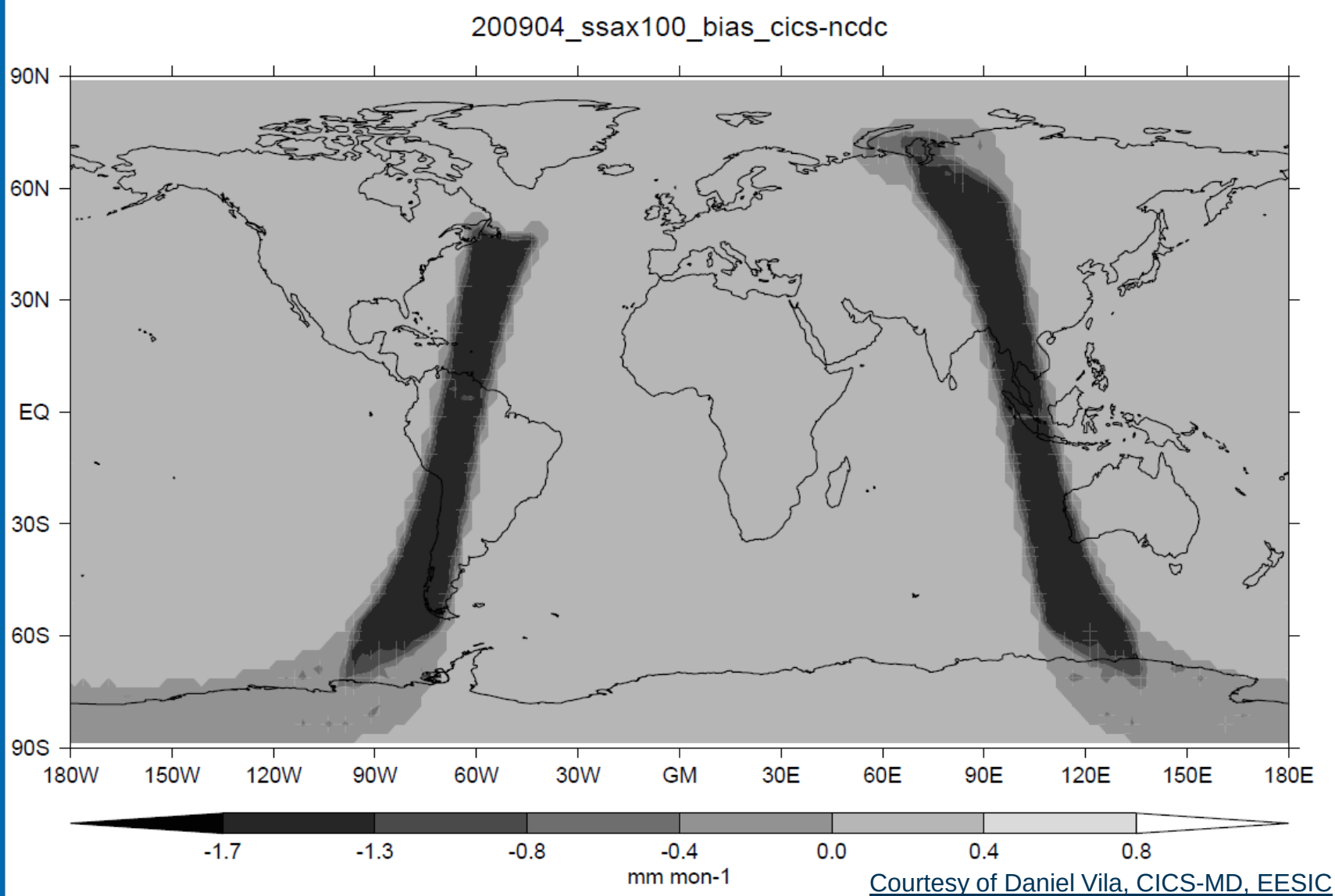
Potential software/hardware issues

- Exchange operating system type and version information
- Compiler differences (e.g. C, Fortran)
- “Makefile” differences

Code implementation

- Never runs correctly the first time!
- Hard coded directory and data locations
- “Versionitis”-lack of versioning software
- Previous data stewards leave their “marks”
- Reliance on compiler options/switches
- Non-intrinsic gridding scripts for GrADS software (also not supported anymore)

Example-Unexpected differences



Courtesy of Daniel Vila, CICS-MD, EESIC

Instrument or data changes

- Instruments or data sources fail
- Involvement of PI or data author crucial for scientific verification
- Customer notification

Recommendations

- Documentation and flow chart are first priorities
- Products should be operational with as little manual manipulation as possible before hand-off
- Easily accessible versioning system
- Possible use of software like Java to avoid platform incompatibility issues
- Continuous communication between PI and operational data center