University of Wisconsin SSEC

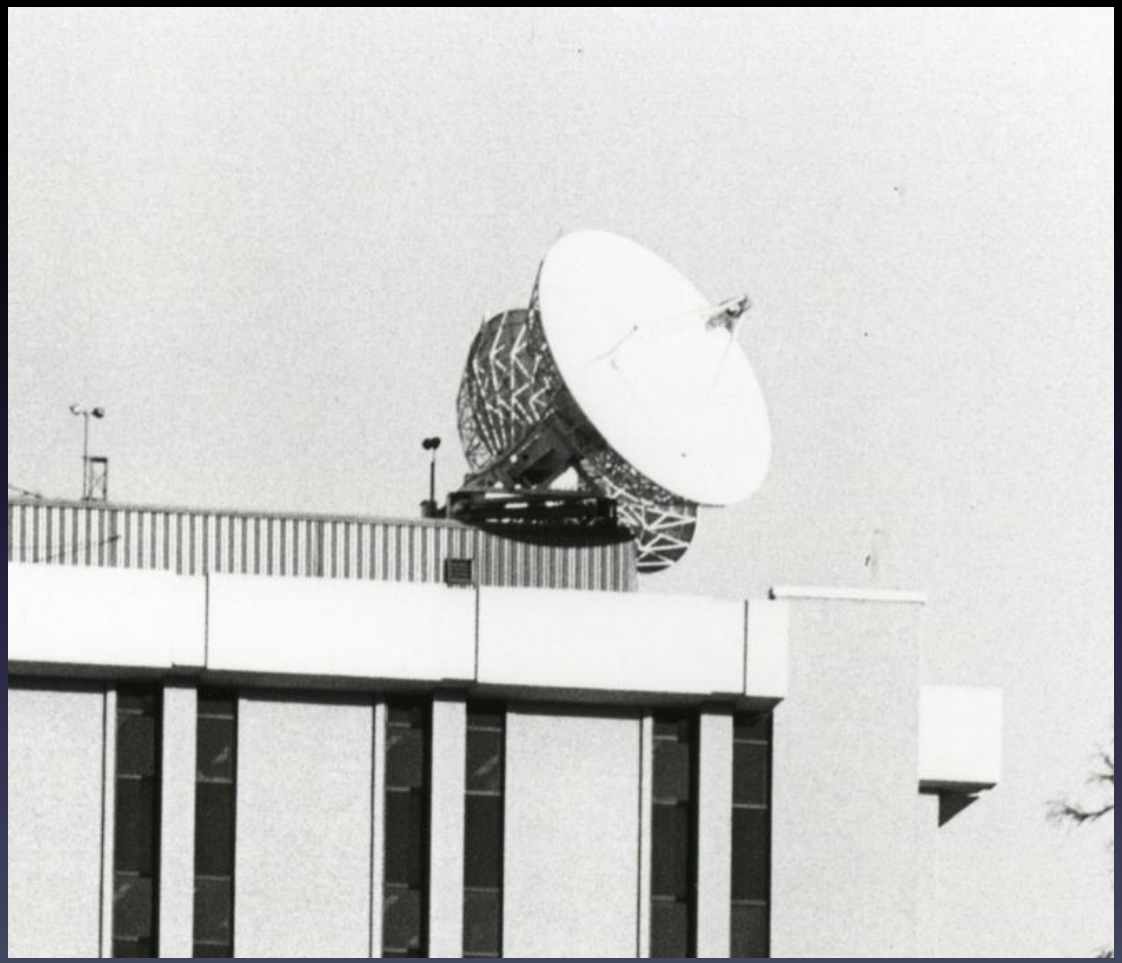
Satellite Data Services Archive

2016 McIDAS Users Meeting

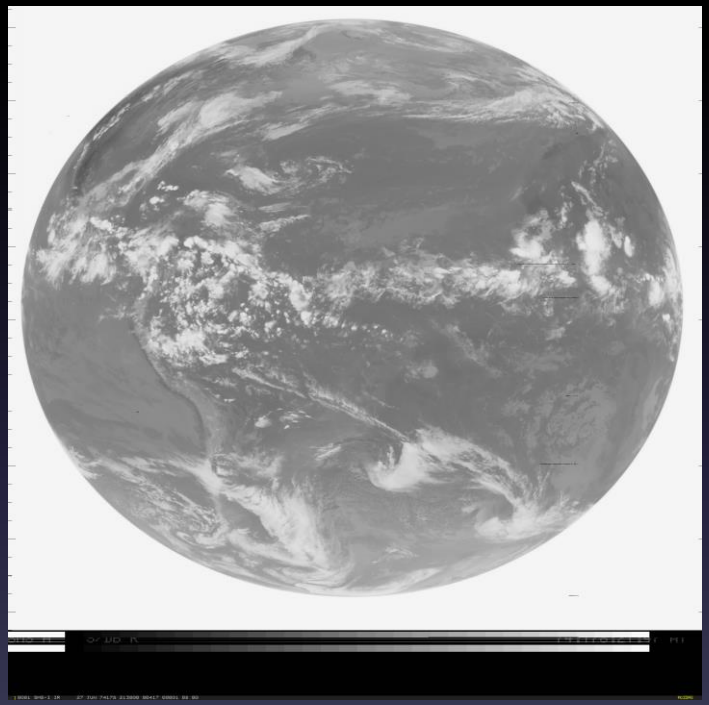
November 17, 2016

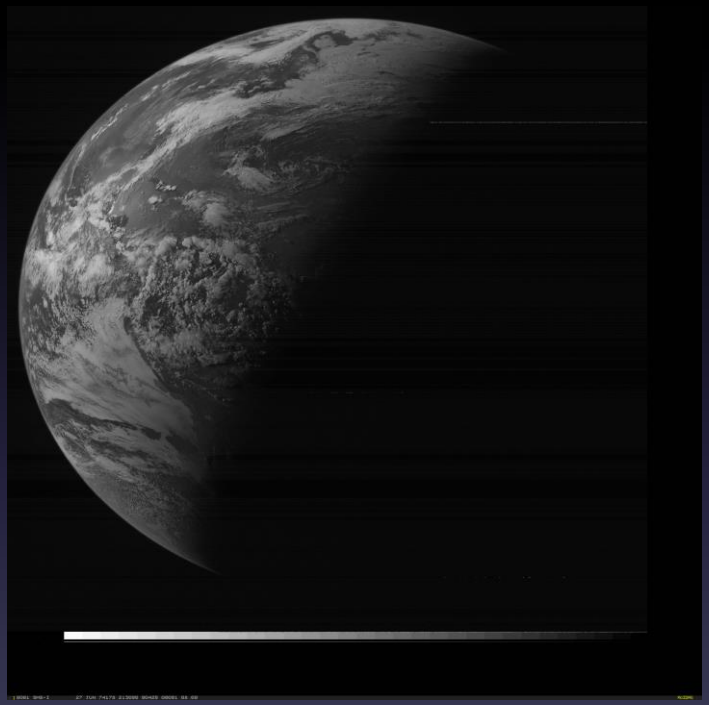
History

First antennas 1974



First Satellite Imagery in the online archive





1974 day 178

9-Track tapes

Dr. Verner Suomi

U-matic (1978-1996)

U-matic (1978-1996)

National Archive (1979-2004)

- SSEC became the National Archive of GOES data in 1979
- Tried to send the archiving activity to NOAA over the next 25 years
- Finally Moved to NCDC in 2004 (Now called NCEI)

3590 tapes (1996-2005)

Online Archive (2005- Present)

LTO-5

Source	Satellites	Years	sensors	Formats	Servers
US Geo	SMS1&2 GOES1-7	1974, 1978-1996	imager and sounder	Mode A,AA,AAA AREA	ADDE
US Geo	GOES8-15	1993-Present	imager and sounder	GVAR and AREA for sounder	ADDE
Eumetsat	Met-1, Met-3, Met5-7	1978-1979 1992-1995 1998-Present	imager	Native, AREA OMTP pdus	ADDE
Eumetsat	Met8-11	2004-Present	SEVERI	HRIT	ADDE
Japan (JMA)	GMS-1 GMS-5	1978-1979 1998-Present	Imager	AREA	ADDE
Japan (JMA)	MTSAT1R,2	2005-Present	Imager	HiRID,HRIT	ADDE
Japan (JMA)	Himawari-8	2015-Present	Imager	HSD	ADDE
China	FY2,C,D,E,G	2005-Present	Imager	AREA	ADDE
India (ISRO)	Kalpana Insat-3D	2004-Present 2014-Present	VHRR Imager, Sounder	HDF4,5	ADDE
South Korea (KMA)	COMS	2012-Present	CMOS	HRIT	ADDE

Source	Years	Formats	Servers
Insitu Point	1976-Present	McIDAS MD	ADDE
Noaaport Model Output	1996-Present	McIDAS GRID, GRIB1, GRIB2	ADDE, THREDDS
Noaaport Text	1996-Present	Original text, concatenated binary file	ADDE
Global Satellite Composite	2001-Present	AREA	ADDE
Cloud top height global composites	2003-Present	AREA	ADDE
Lots of others misc, sst composites,SSMI, modis winds	Early 2000-Present	AREA, l1b,	ADDE, THREDDS

Statistics

- 210 TB of data via ADDE in first 10 months of 2016
- 12 million transaction in 2016
- Averaged 2.5 TB transferred via ADDE per day in October 2016
- As of Dec 2015, over 975 TBs online.
- (closer to 1.5 PB when redundant data are included)

- Grows approximately about ~150 TB/year

Backend Hardware

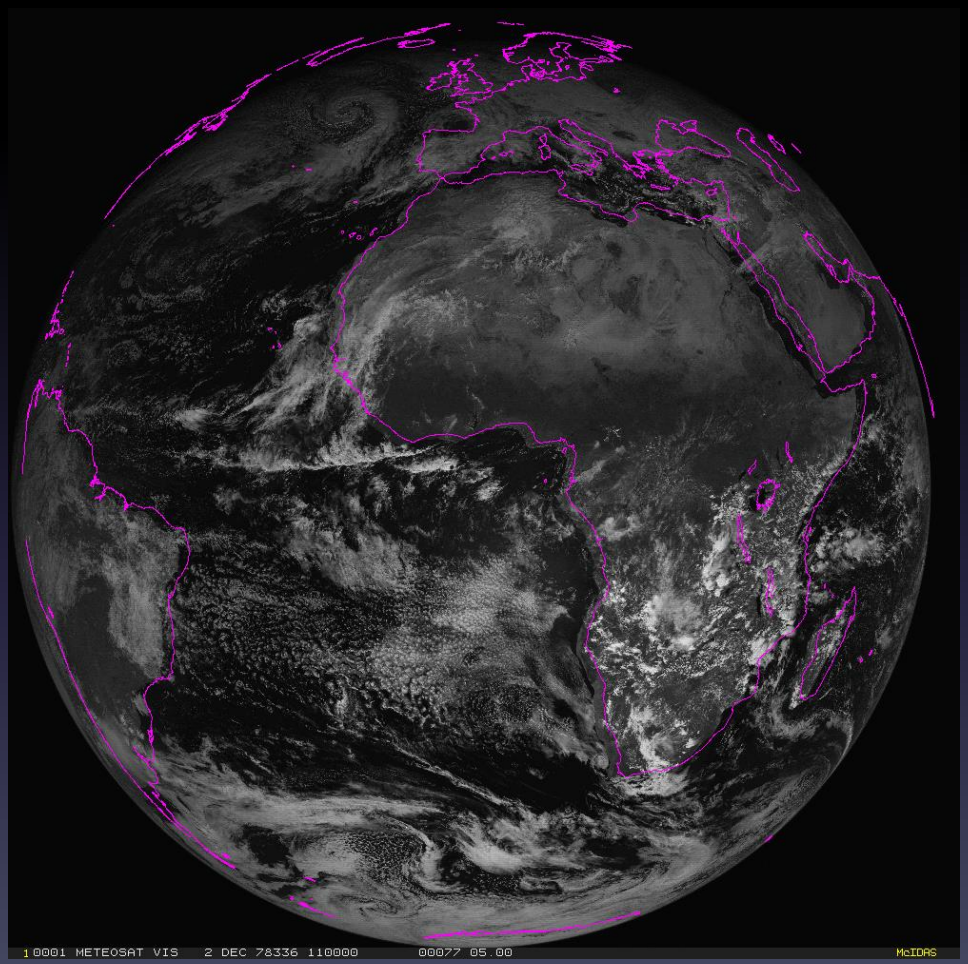
- 6-Dell PowerEdge R430 servers
- 2 Dell PowerEdge R730 servers
- 3 Dell PowerVault MD3460 storage arrays
- 2 Dell PowerVault MD3060e storage arrays
- Lustre 2 on zfs

Recent Performance Enhancements

Modifications to Lustre server data prefetch:

- Himawari-8 entire Day List
  - Before enhancements 200+ seconds
  - After Enhancements ~13 seconds
- COMS
  - Before enhancements ~17 seconds
  - After Enhancements ~2.5 seconds

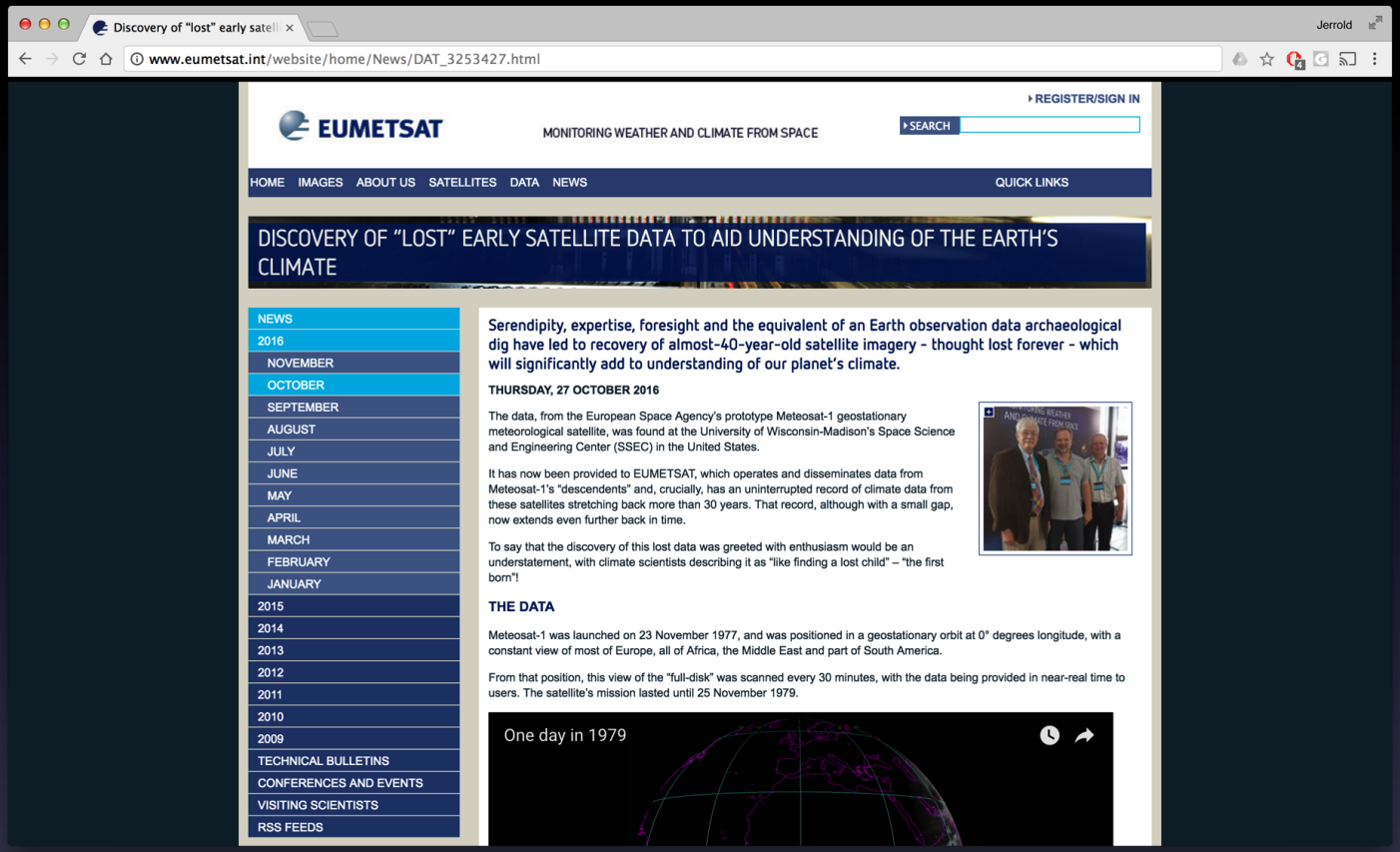
Meteosat-1



Meteosat-1

- Originally pulled from 9-track tape in early 2000s, but not decoded.
- Covers time period of December 1, 1978 – November 24, 1979
- Rediscovered in summer 2016 due to an inquiry by Paul Menzel
- Decoded, Navigated, and Calibrated by Dan Forrest and Dave Santek
- Provided to Eumetsat in November 2016

Eumetsat article



One Day in 1979

SMS 1974-1980

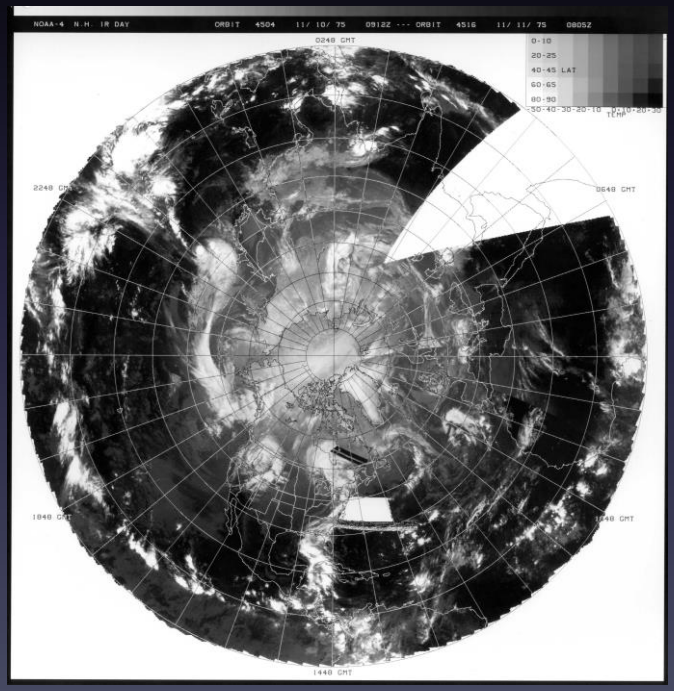
- Doug Ratcliff, Dan Forrest, Nancy Troxel-Hoehn, Jerrold Robaidek

SMS 1974-1980

- ~1,300 9-track tapes scheduled for destruction by NASA Goddard
- Reading was complete in the past week
- Processing and decoding now
- Tapes covered a period of 1974 – 1980, but most were from July 1974 and Fall 1975 time period

Edmund Fitzgerald

- November 10, 1975



Edmund Fitzgerald

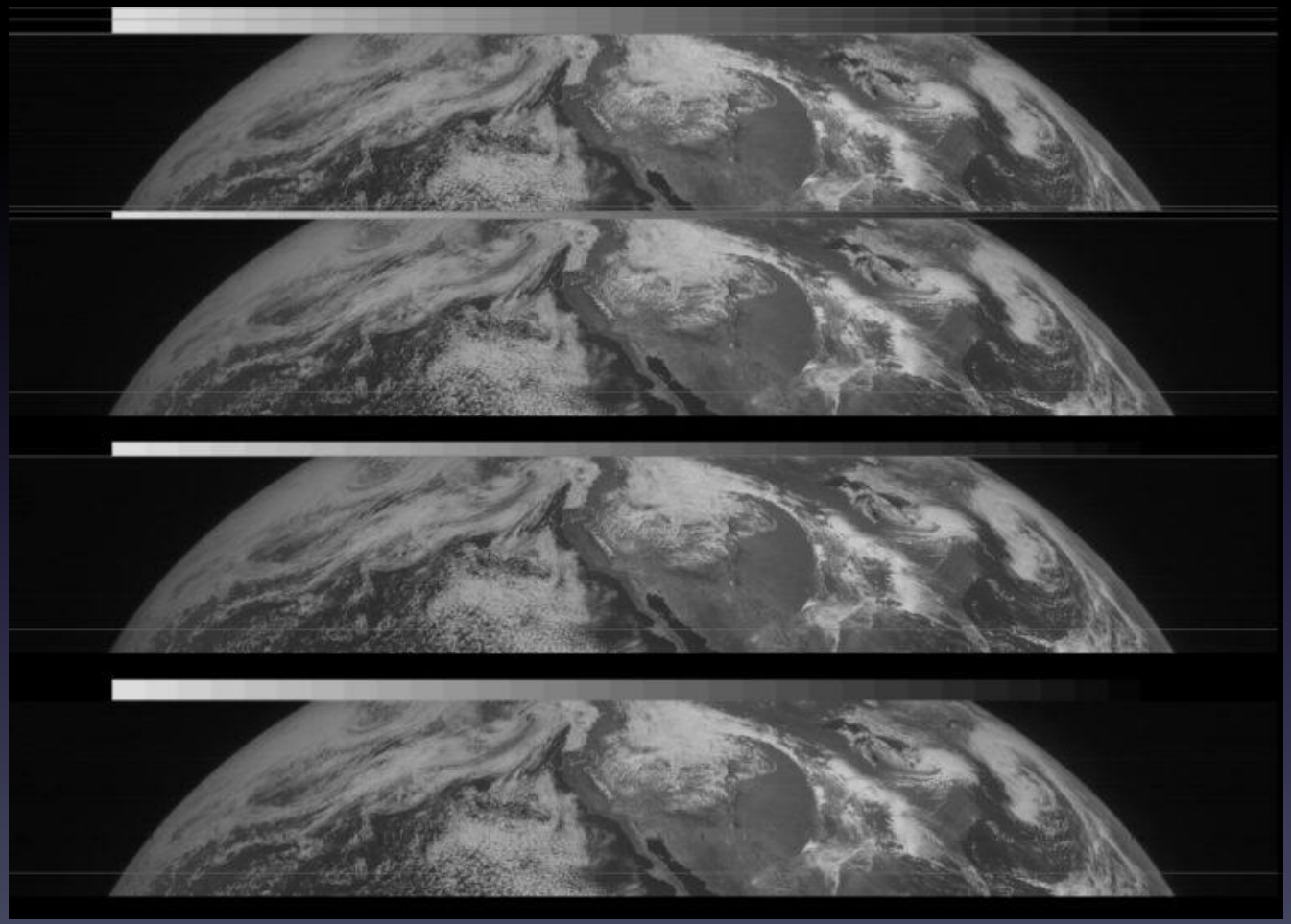
- "Superior, they said, never gives up her dead"
- The tapes did not contain this data.
- But almost an entire year of GOES data has now recovered that had previously been lost.

SMS 1974-1980

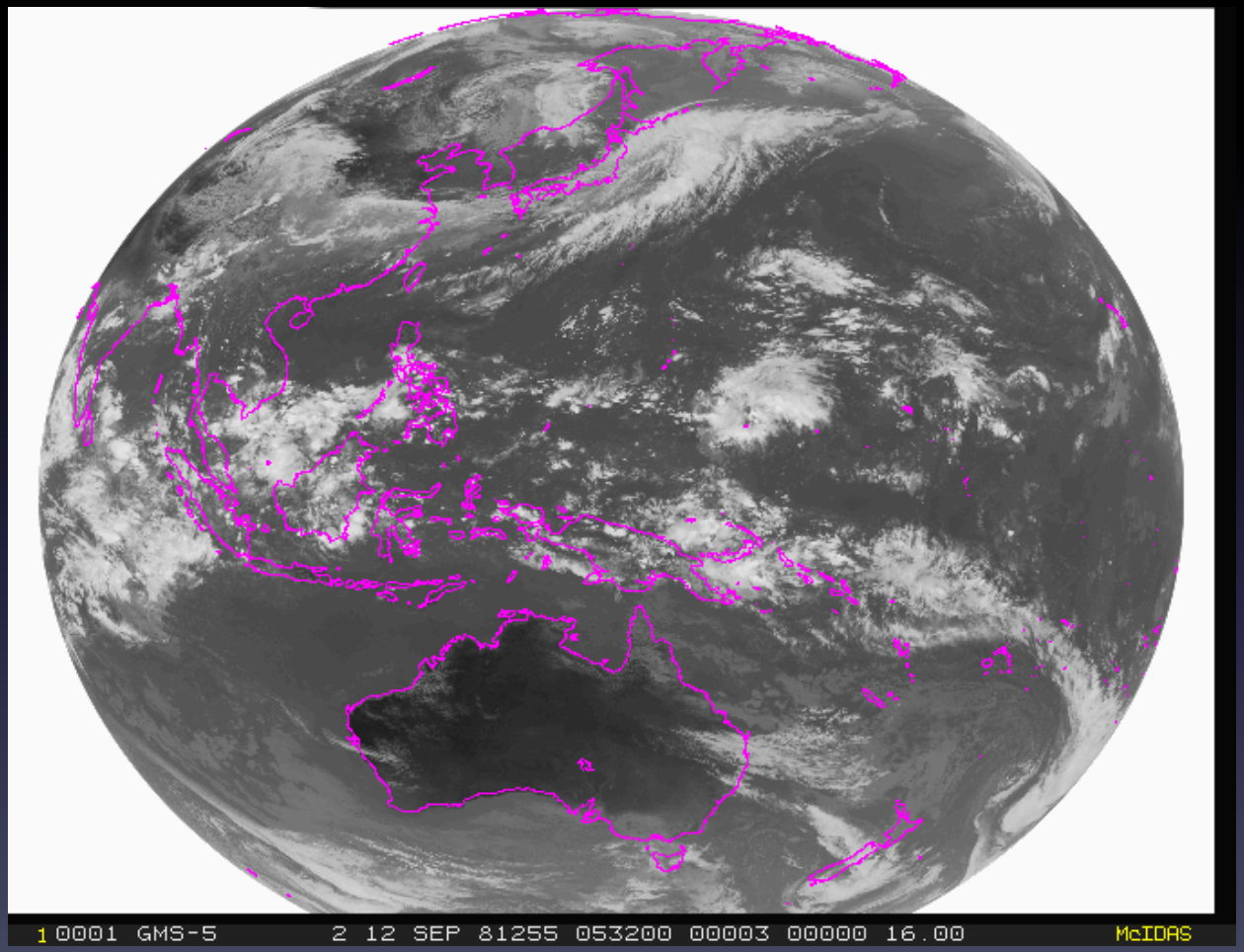
An interesting case:

- Major tornado outbreak swept across Omaha, Nebraska, killing three people and injuring more than 100
- Five-minute imagery created from 6 May 1975

SMS-1 1974-1975 +

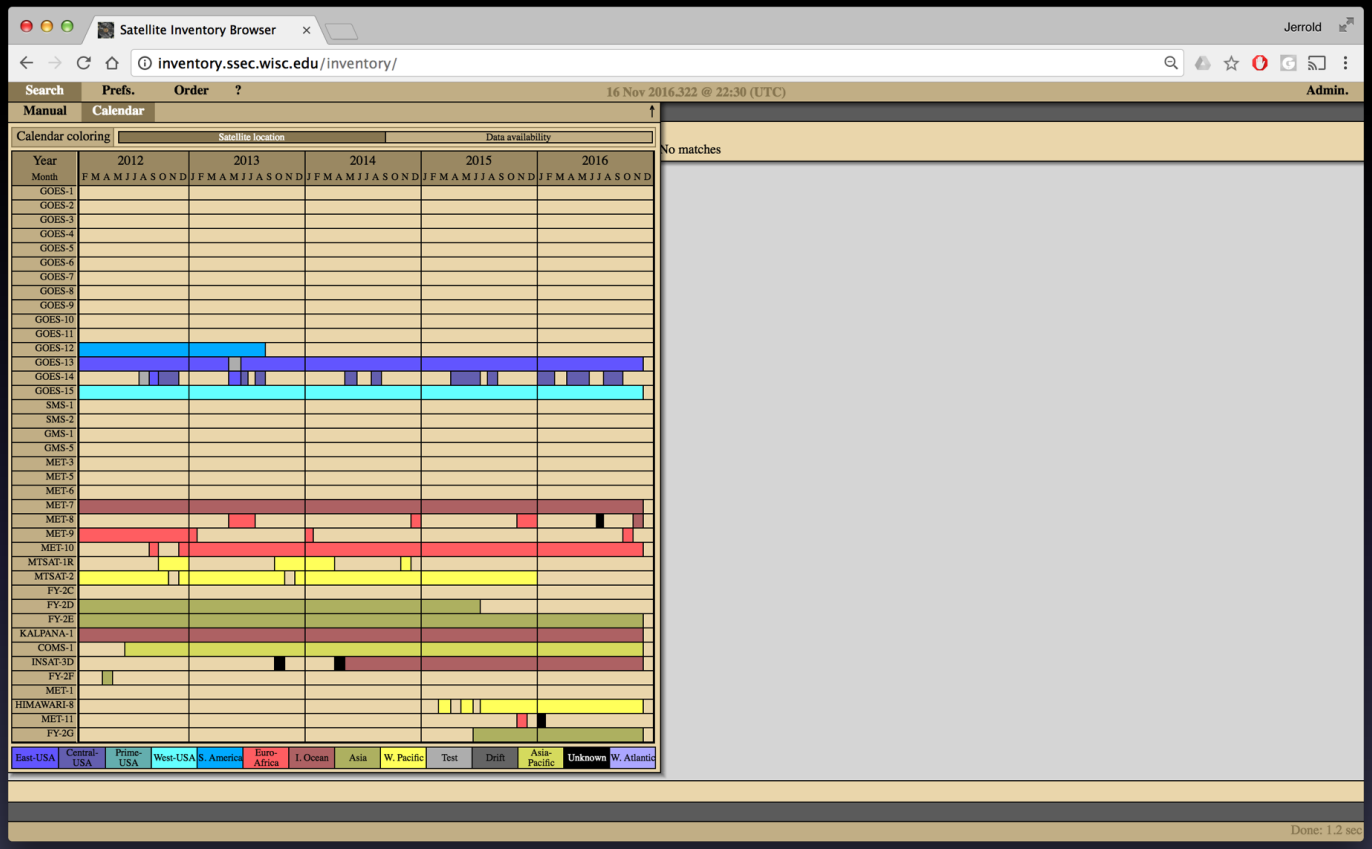


GMS IR (1981-1998)



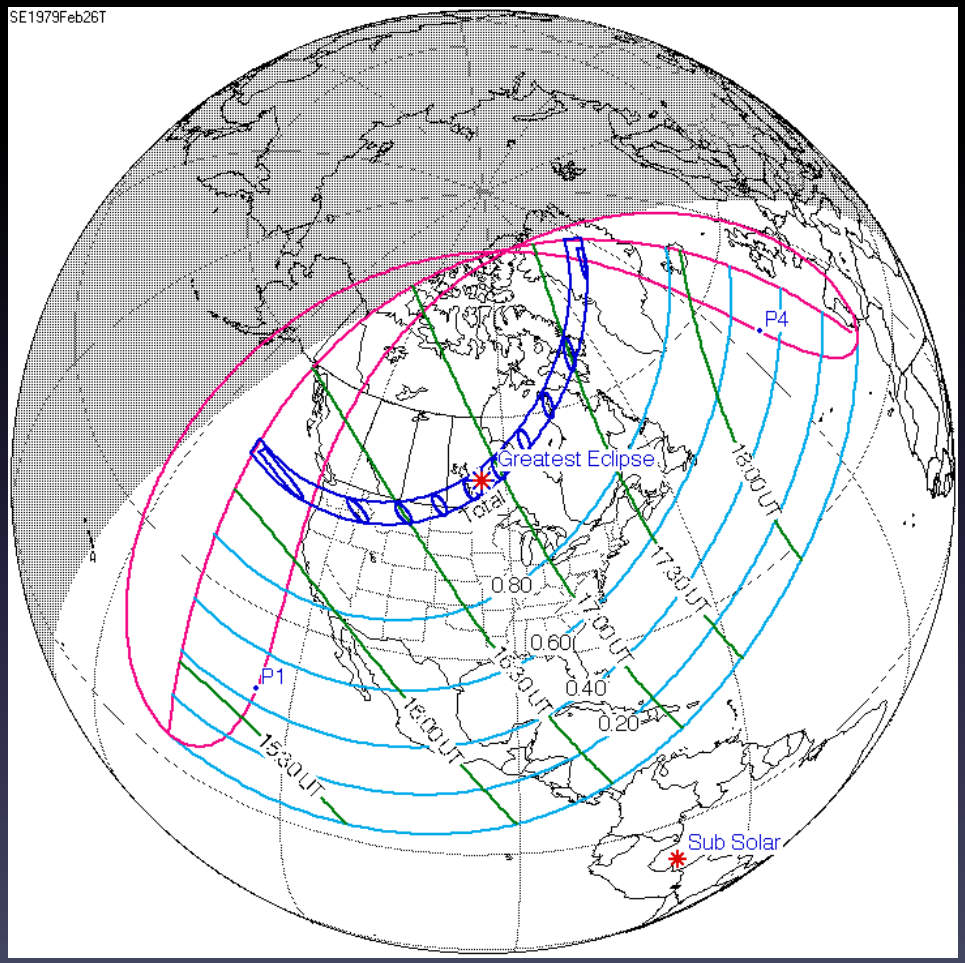
Inventory

http://inventory.ssec.wisc.edu/inventory



Fact Check

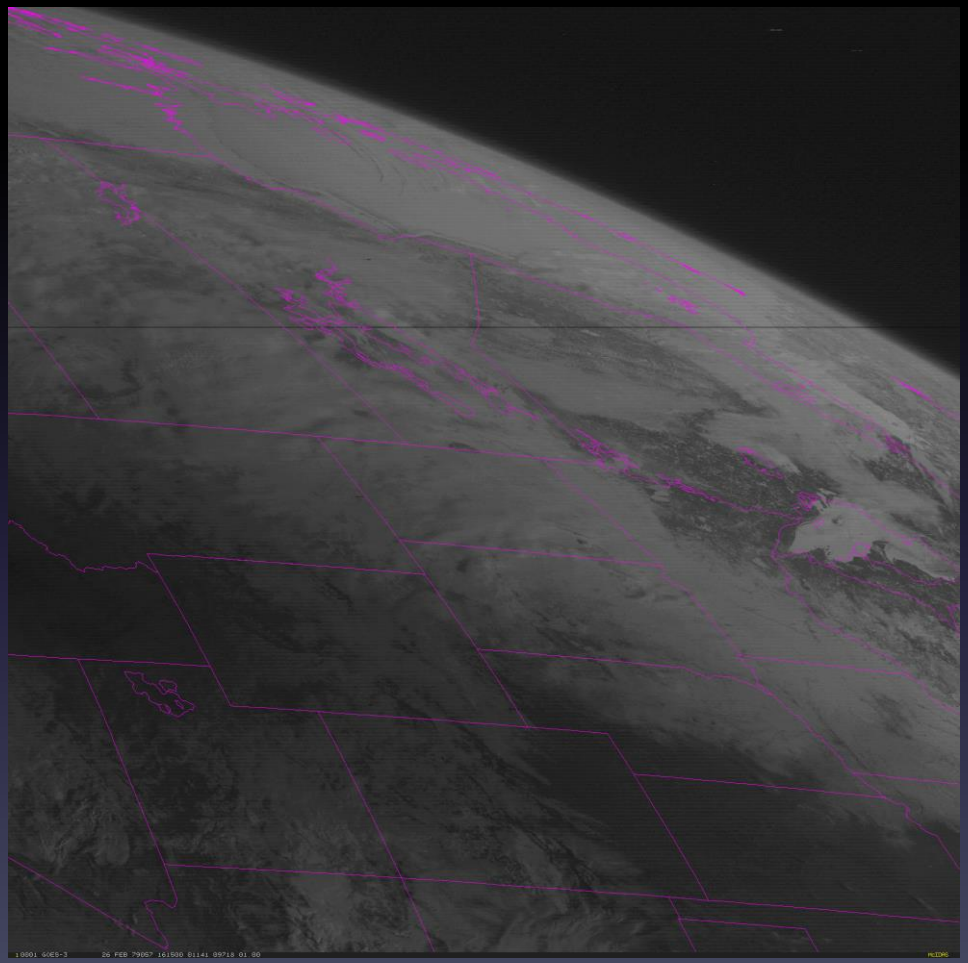
Total Eclipse of February 26, 1979



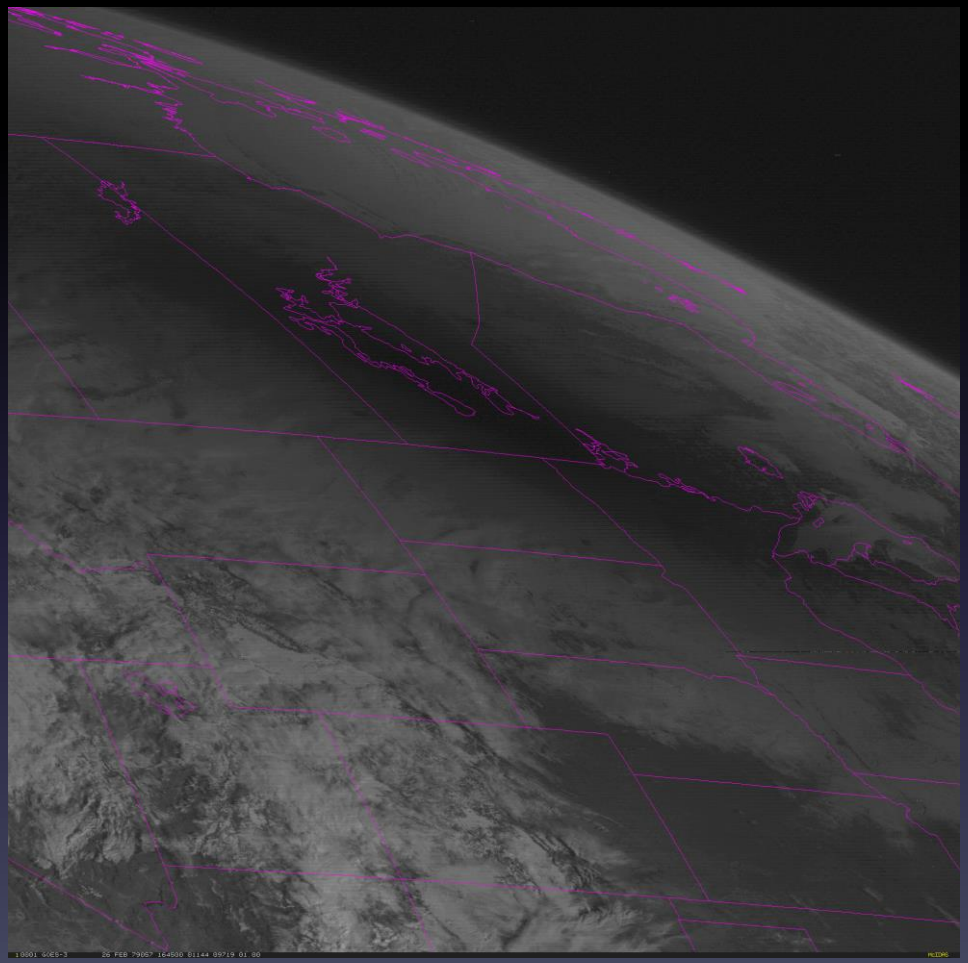
McFETCH

- http://mcfetch.ssec.wisc.edu/cgi-bin/mcfetch?dkey=**********&output=gif&GROUP=AGOES03&DESCRIPTOR=A-VIS&SERVER=geoarc.SSEC.WISC.EDU&date=February+26,+1979&band=1&mag=1+-1&map=yes&lat=48+100&USER=****&PROJ=****&TIME=16:15&size=2000+2000
- http://mcfetch.ssec.wisc.edu/cgi-bin/mcfetch?dkey=**********&output=gif&GROUP=AGOES03&DESCRIPTOR=A-VIS&SERVER=geoarc.SSEC.WISC.EDU&date=February+26,+1979&band=1&mag=1+-1&map=yes&lat=48+100&USER=****&PROJ=****&TIME=16:45&size=2000+2000

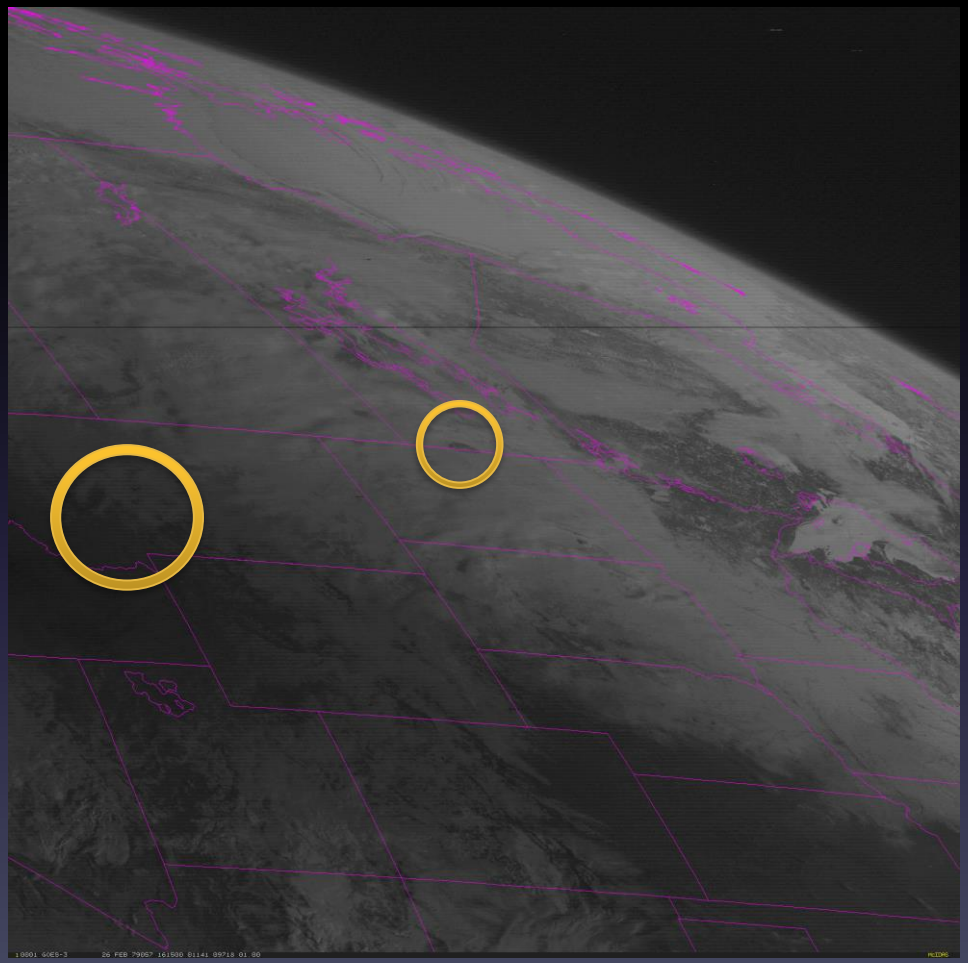
February 26, 1979



February 26, 1979



February 26, 1979



February 26, 1979

- Story checks out!

End