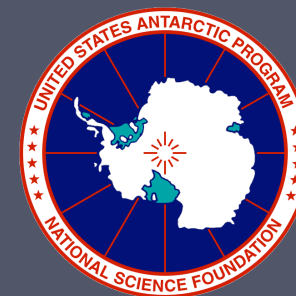


# Satellite Status Report 2013

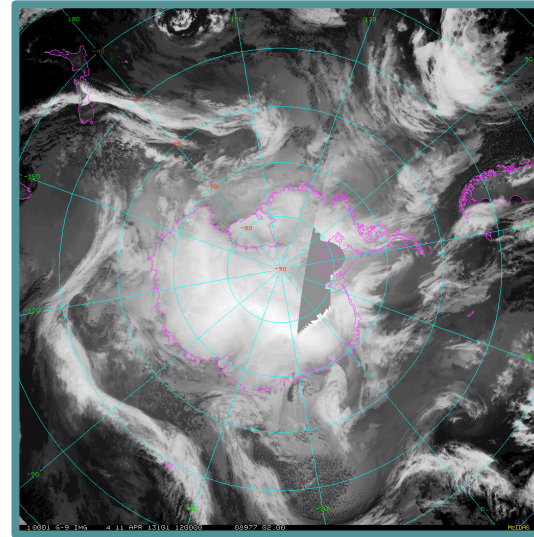


Matthew A. Lazzara and David E. Mikolajczyk  
Antarctic Meteorological Research Center  
Space Science and Engineering Center  
University of Wisconsin-Madison



# Outline

- Geostationary satellites
  - GOES
  - METEOSAT
  - MTSAT
  - COMS
  - FY-2
  - INSAT
- Polar-orbiting satellites
  - POES
  - DMSP
  - Suomi-NPP
  - EOS
  - METOP
  - FY-3



- Future Satellites Systems
  - A sampler...
    - PCW
    - JPSS
    - DWSS/DWS
- McMurdo Satellite “Data Gap”
  - Visual analysis

# Geostationary Satellites

General Overview...

United States

# GOES

- Current Satellites

GOES-12 – GOES for South America

60° W

GOES-13 – GOES-EAST (Just received)

75° W

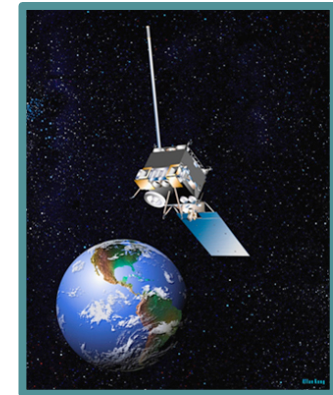
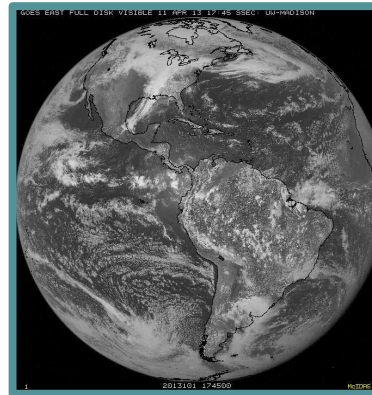
GOES-14 – GOES spare (EAST)

105° W

GOES-15 – GOES-West

135° W

- Possible micro meteor cause of recent GOES-13 outage



- Future Launches:

<u>Platform</u>	<u>Launch Date</u>
GOES-R	2015
GOES-S	2019
GOES-T	2017
GOES-U	2024

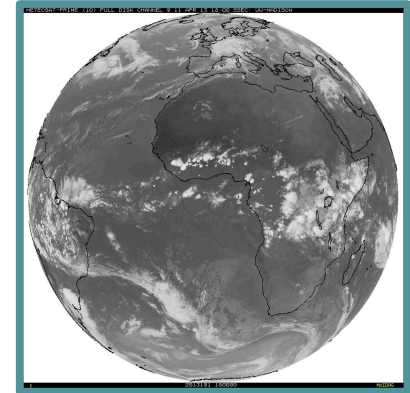
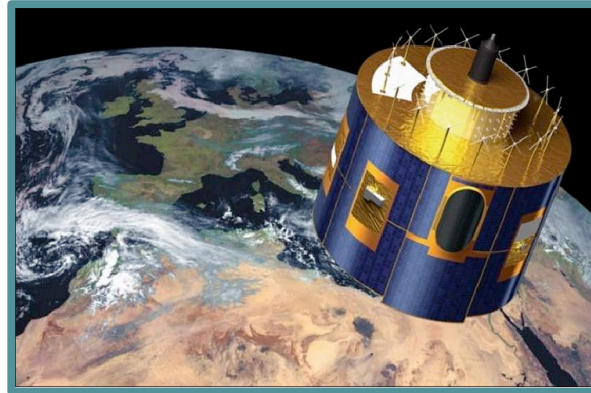
- Continue policy of putting spares in on-orbit storage until needed



EUMETSAT

# METEOSAT

- Current Satellites



Meteosat-7 – Indian Ocean Mission

57° East

Meteosat-9 - Rapid Scan Service

9.5° East

Meteosat-10 – Primary

0°

- Future Launches

<u>Platform</u>	<u>Launch Date</u>
-----------------	--------------------

Meteosat-11	2015
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MTG-I1	2018
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MTG-S1	2020
--------	------

MTG-I2	2022
--------	------

MTG-I3	2026
--------	------

MTG-S2	2028
--------	------

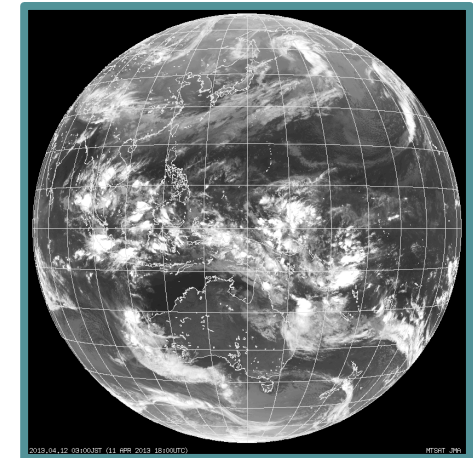
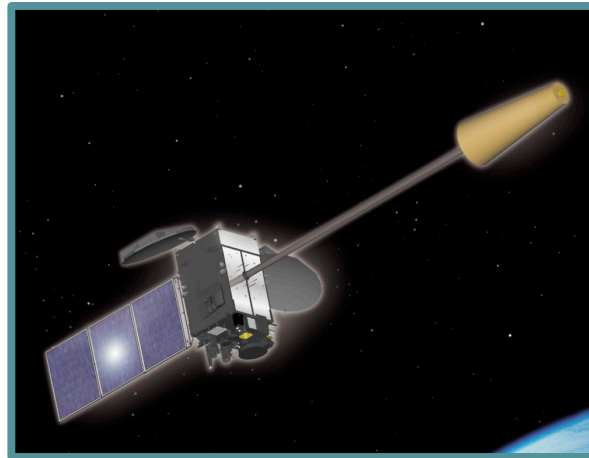
MTG-I4	2031
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*Notice plans for SEPARATE  
Imager and Sounder missions!*

Japan

# MTSAT (Himawari)

- Current Satellites



MTSAT-1R – Standby

140° East

MTSAT-2 – Operational

145° East

<u>Platform</u>	<u>Launch Date</u>
-----------------	--------------------

Himawari-9 (MTSAT-3)	2016
-------------------------	------

# China FY-2

- Current Satellites

FY-2D

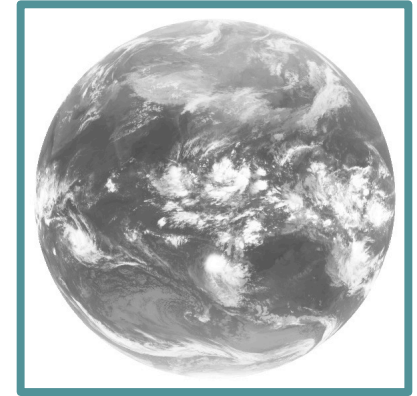
86.5° East

FY-2E

105° East

FY-2F

112.5° East



- Future Launches

<u>Platform</u>	<u>Launch Date</u>
FY-2G	2013
FY-2H	2015
FY-4A	2015
FY-4B	2017
FY-4C	2019
FY-4D	2021
FY-4E	2025
FY-4F	2028
FY-4G	2031

India

# INSAT

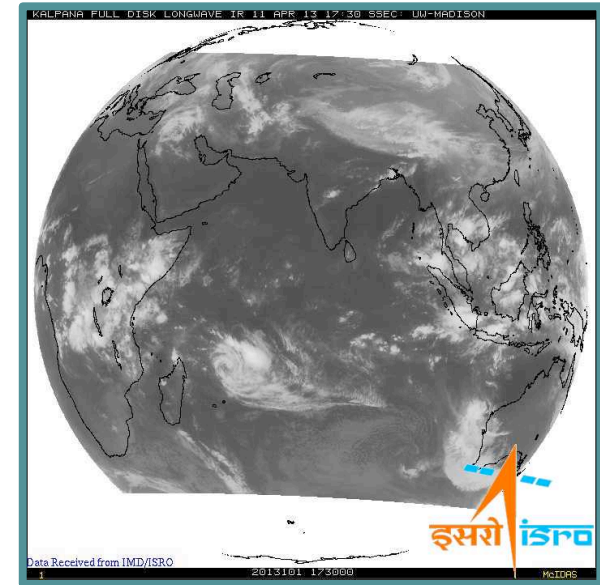
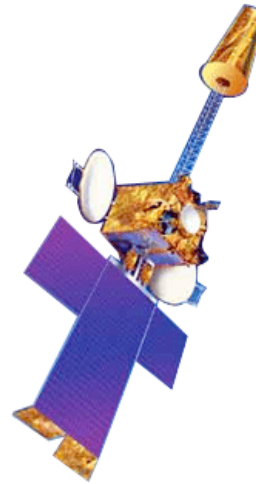
- Current Satellites

Kalpana-1

74° East

INSAT-3A

95.5° East



- Future Launches

<u>Platform</u>	<u>Launch Date</u>
INSAT-3D	July 2013

South Korea

## COMS

- Current Satellite:  
COMS-1  
130° East
- Future Launches:  
COMS-2 2016-2017



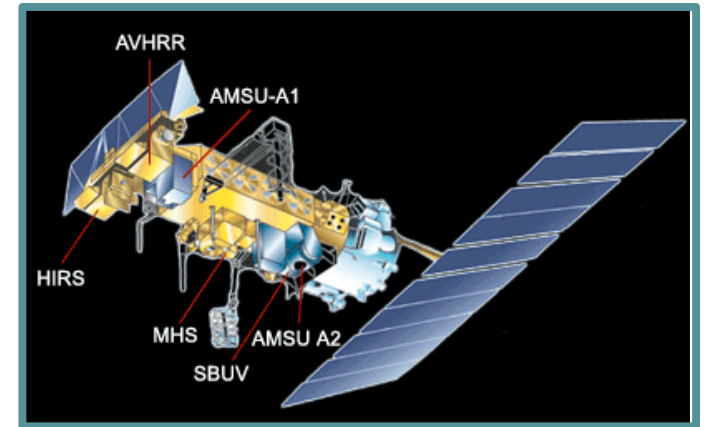
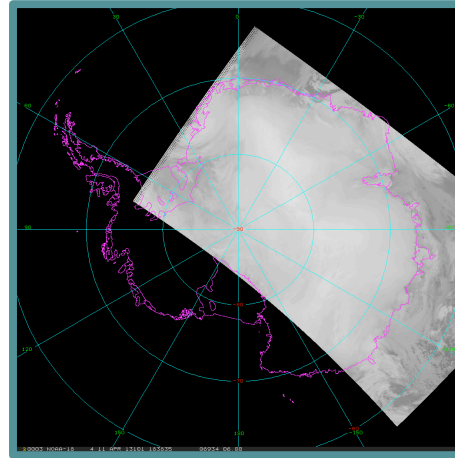
# Polar Orbiting Satellites

## General Overview

United States - NOAA

# POES

- Current Satellites



NOAA-15

Backup Satellite (AM)

NOAA-16

Backup Satellite (PM)

NOAA-17

Decommissioned

NOAA-18

Secondary Satellite (PM)

NOAA-19

Primary Satellite (PM)

- Future Launches

None – Move to the JPSS system

United States – USAF

## DMSP

- Current Satellites

DMSP F16

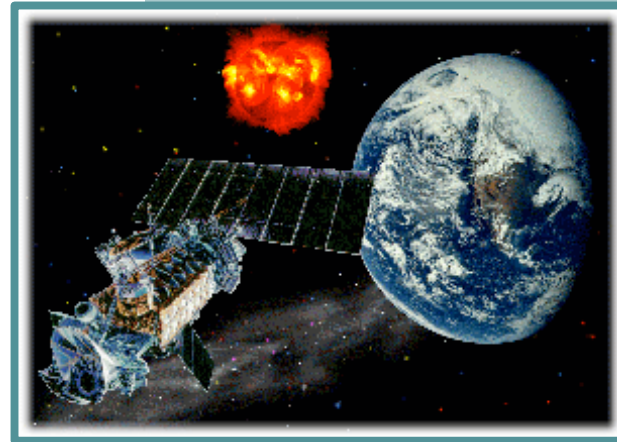
Backup (mid-AM)

DMSP F17

Secondary (AM)

DMSP F18

Primary (mid-AM)



- Future Launches

<u>Platform</u>	<u>Launch Date</u>
DMSP F19	2013 (AM)
DMSP F20	2020 (AM)
WSF-1 ?	mid-2020s
WSF-2 ?	~2030

***NOAA to cover PM orbit; No more US satellites in mid-AM orbit!  
DWSS program has been canceled – WSF a possible replacement***



United States - NASA

## EOS

- Current Satellites

Terra

AM orbit

Enough fuel until 2018

May operate to 2020

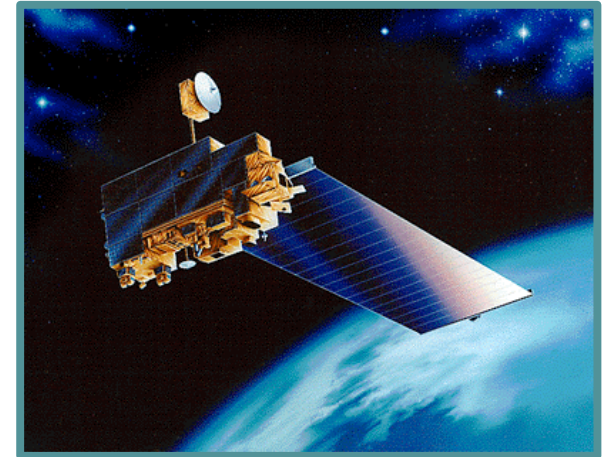
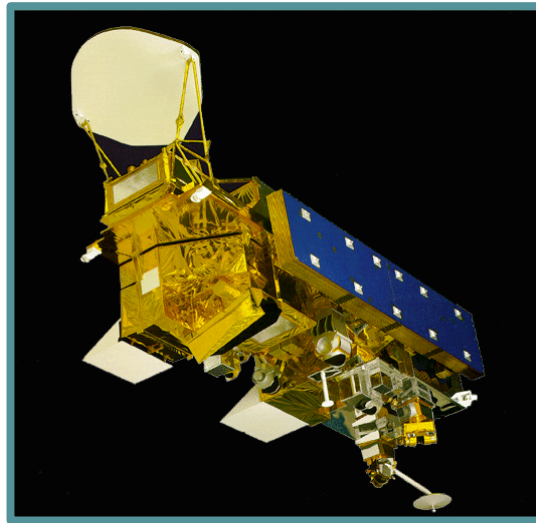
(Battery life)

Aqua

PM orbit

Enough fuel until 2022

May operate longer



- Future Launches

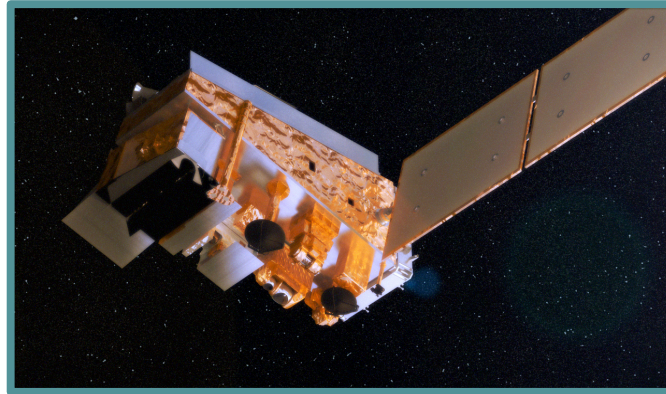
None

JPSS is the follow-on...

United States – NOAA/NASA

## Suomi-NPP

- Current Satellite



### Suomi-NPP

Primary (PM)

- NASA Checkout complete
- Hand-over to NOAA complete
- Operational NOAA satellite

- Future Launches

None

- Move to JPSS system & WSF system

EUMETSAT

# METOP

- Current Satellites

METOP-A

Secondary (AM)

METOP-B

Primary (AM)

\* METOP-B global direct  
broadcast fully functional

***Note: Separate Optical and  
Microwave Platforms!***



- Future Launches

<u>Platform</u>	<u>Launch Date</u>
METOP-C	2016
METOP-SG-A1	2020
METOP-SG-B1	2022
METOP-SG-A2	~2026
METOP-SG-B2	~2028
METOP-SG-A3	~2033
METOP-SG-B3	~2035

# China FY-3

- Current Satellites

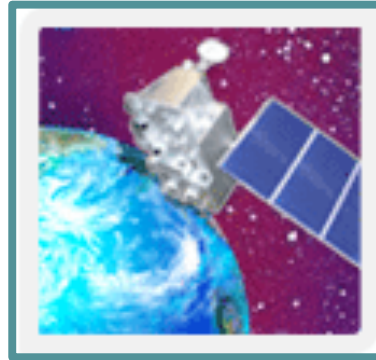
FY-3A

(AM)

FY-3B

(PM)

Replaced the FY-1 series



- Future Launches

<u>Platform</u>	<u>Launch Date</u>
-----------------	--------------------

FY-3C	2013
-------	------

FY-3D	2014
-------	------

FY-3E	2016
-------	------

FY-3F	2018
-------	------

FY-3G	2020
-------	------

# Future Satellite Systems

A Sampler...

United States - NOAA

## JPSS



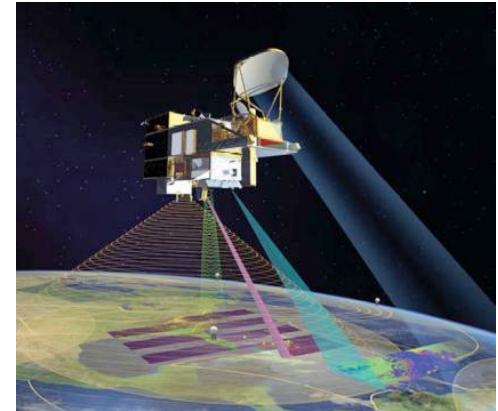
<u>Platform</u>	<u>Launch Date</u>	
JPSS-1	2017	} Will NOT have ADCS
JPSS-2	2021	
Free Flyer-1	2016/7	← Will have ADCS
Free Flyer-2	2022 ?	

JPSS will \*not\* have L-band unless DoD funds it  
(US Navy may be the only interested party).

United States - USAF

## DWSS/WSF

- Defense Weather Satellite System
- (DWSS)
  - Canceled Program
- Weather Satellite Follow-On (WSF)
  - Under discussions
  - Review of other possibilities for USAF support
    - Full system like DWSS or JPSS
      - With three suboptions...full, mid-range, small systems
    - Cube sats
    - Partnerships across multiple satellite systems
    - Stop fielding satellites – rely on what is around!



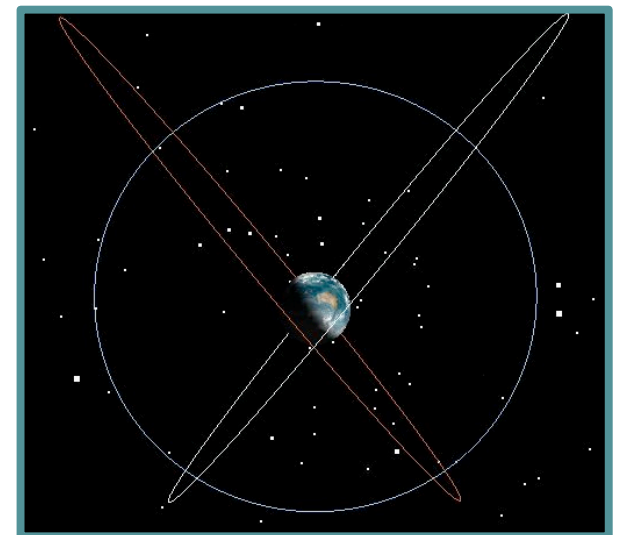
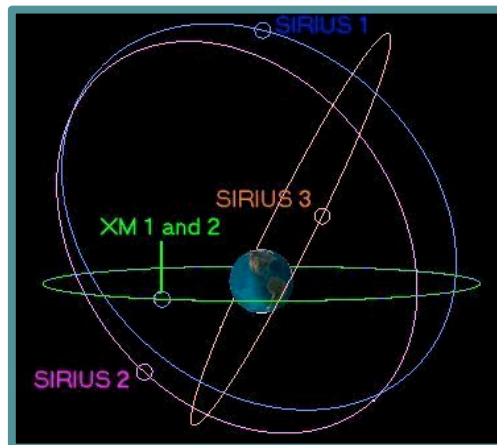
Canada

# PCW

- Polar Communications & Weather
  - Highly Elliptical Orbit (HEO)
  - May or may not have imager
    - Lots of research into doing this for Canada and for satellite derived winds, etc.
  - Likely to have communications



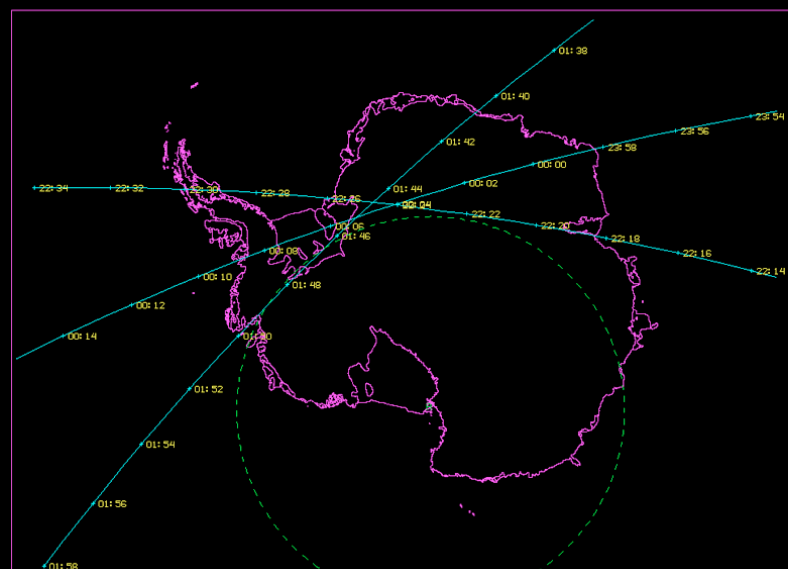
- Orbits under consideration:
  - “True” Molynia
  - “Three Apogee” Molynia
  - *Modified Tundra*



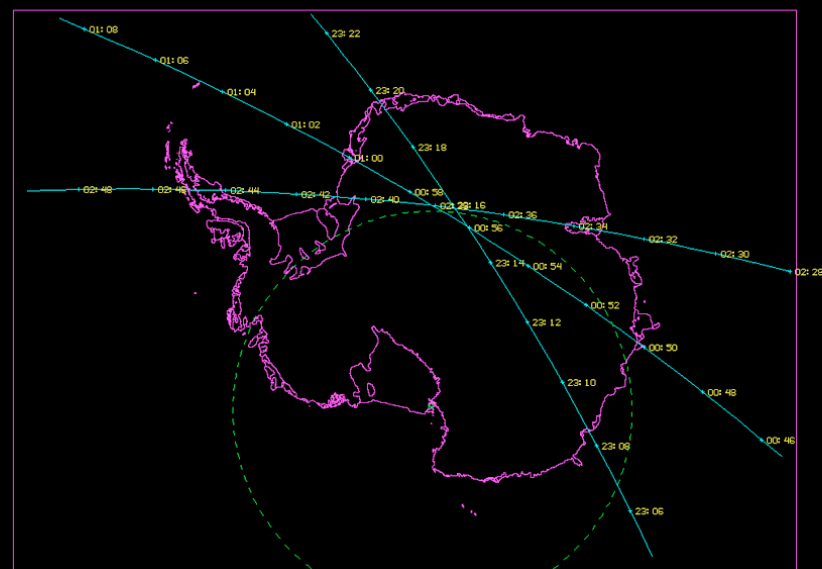


# McMurdo Satellite “Data Gap”

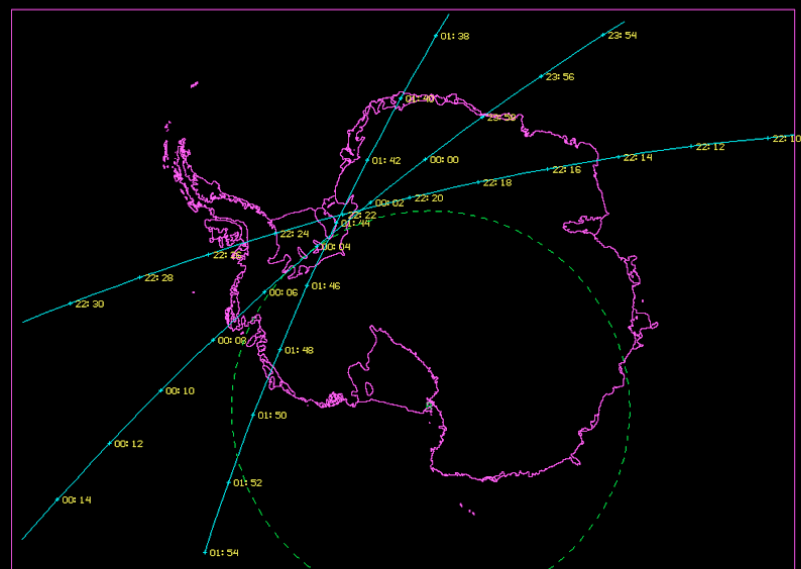
A Brief Visual Analysis



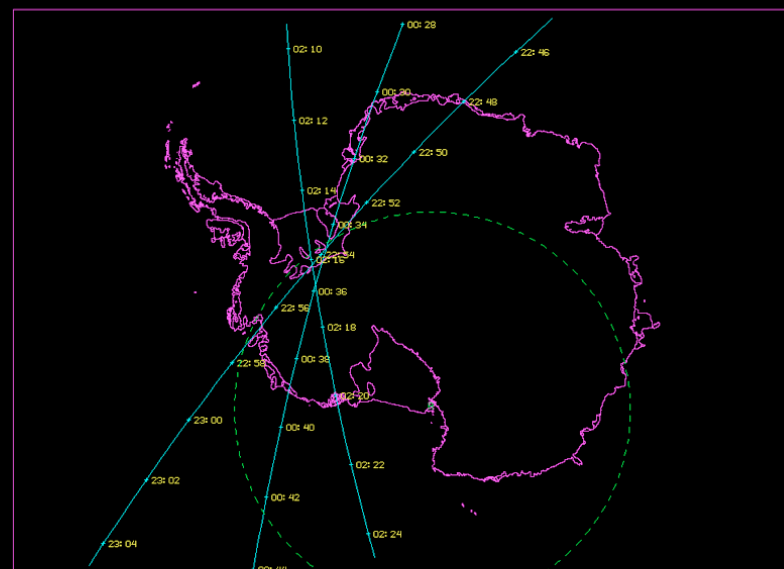
NOAA 15



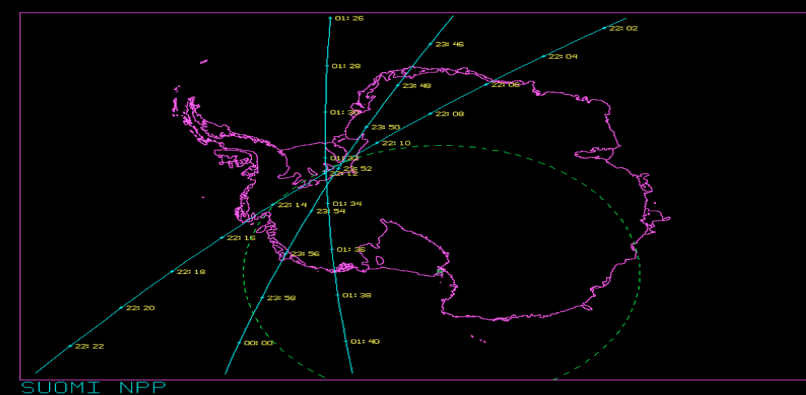
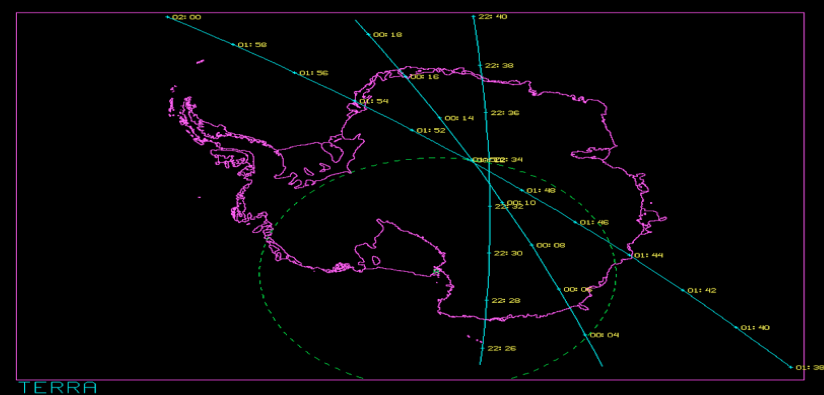
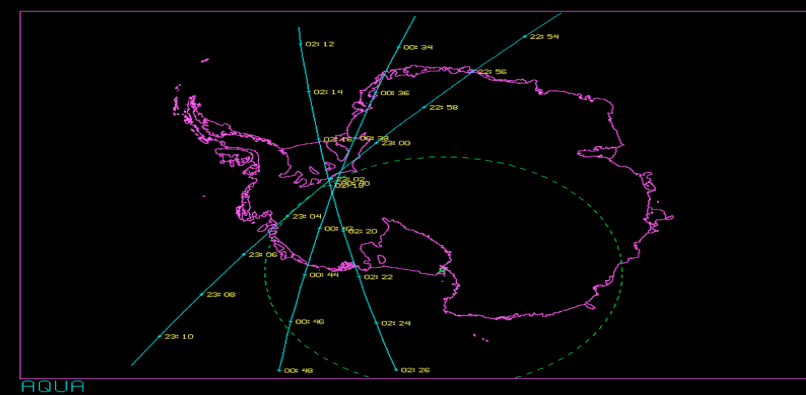
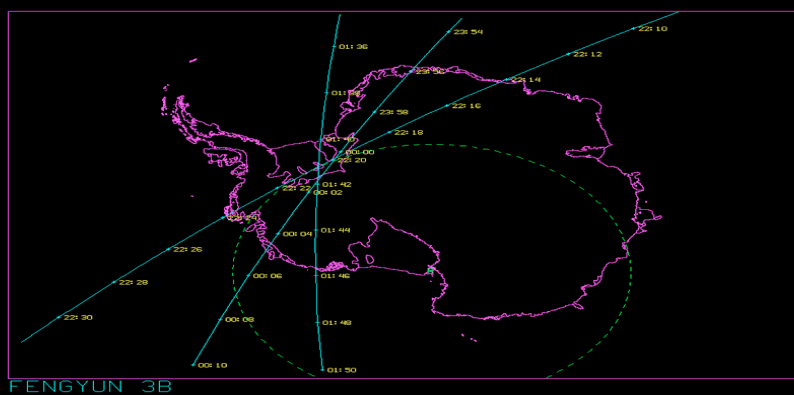
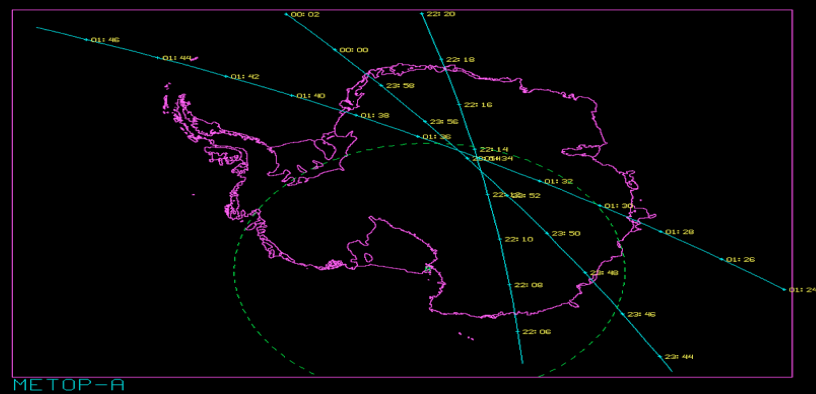
NOAA 16



NOAA 18



NOAA 19



# Thank you!!

# Questions?

This material is based upon work supported by the National Science Foundation, grant #ANT-1141908 and by the SPAWAR Office of Polar Programs.

*...more in the Data Discussion presentation on Wednesday afternoon!*