



Progress on FengYun Satellite Data Sharing and Service



LIU Jian

National Satellite Meteorological Center, CMA

4th Asia-Oceania Meteorological Satellite Users Conference

Oct 9-11, 2013, Melbourne, Australia

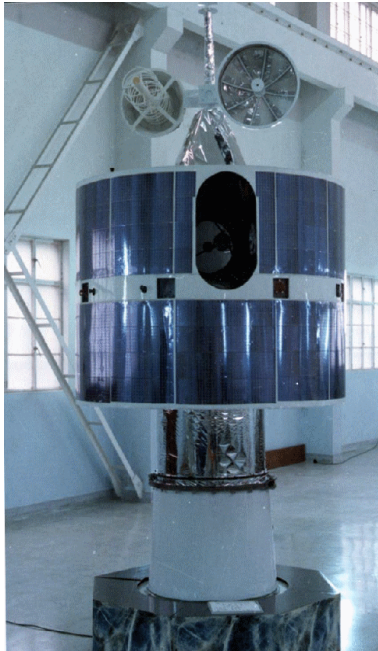


Outline

1. Satellite Data in NSMC/ CMA
2. Satellite Data Sharing and Service
3. Summary

1. Satellite Data in NSMC/CMA

- FENGYUN Geostationary satellite



No	Satellite-ID	Coverage	Begin Time	End time
1	FY-2A	Full Disk / 1-h	1997.10	2003.03
2	FY-2B	Full Disk /1-h	2000.07	2005.06
3	FY-2C	Full Disk /1-h	2004.10	2009.11
4	FY-2D	Full Disk /1-h	2006.12	
5	FY-2E	Full Disk /1-h	2008.12	
6	FY-2F	Full Disk / 1-h + Regional Rapid Scan / <6 min	2012.08	

1. Satellite Data in NSMC/CMA

No.	Products	No.	Products	No.	Products
1	Raw image	10	Rainfall estimation	19	SST
2	Normalized image	11	Precipitable water	20	Snow cover
3	Projected image	12	AMV	21	Sea ice monitor
4	Mosaic image	13	Typhoon location	22	Fire spots
5	Cloud classification	14	Upper troposphere Humidity	23	Water bodies
6	Total cloud amount	15	Cloud water profile	24	Soil humidity
7	Sand storm detection	16	OLR	25	ISCCP dataset
8	Heavy fog monitor	17	TBB		
9	Precipitation index	18	Solar irradiance		

1. Satellite Data in NSMC/CM

- FENGYUN Sunsynchronous orbit



No	Satellite -ID	Begin Time	End Time	ECT
1	FY-1A	1988.09	1988.10	15:30 as.
2	FY-1B	1990.09	1991.08	07:50 des.
3	FY-1C	1999.05	2004.07	07:00 des.
4	FY-1D	2002.05	2012.04	09:00 des.
5	FY-3A	2008.07		10:15 des.
6	FY-3B	2010.11		13:40 as.
7	FY-3C	2013.09		10:00 des.

Current FY-3 Operational Products (42)

Discipline	Measurement	FY-3 Instruments
Atmosphere	Cloud/Fog Properties	MERSI VIRR IRAS MWRI MWHS
	Total Water Vapor	VIRR MERSI MWRI
	Precipitation	MWHS MWRI
	Aerosol Properties	MERSI VIRR
	Atmospheric Temperature and Humidity	IRAS MWTS MWHS
	Total Ozone and Ozone Profile	TOU SBUS IRAS
Land	Land Cover	VIRR MERSI
	Surface Temperature	VIRR
	Vegetation Dynamics	VIRR MERSI
	Fire and Flood Monitoring	VIRR MERSI
	Surface Wetness	MWRI
Sea	Sea Surface Temperature	VIRR MWRI
	Sea Surface color	MERSI
Snow/ ice	Sea Ice	MERSI VIRR MWRI
	Snow Cover	VIRR MWHS MERSI MWRI
Radiation	Earth's Radiation and Solar Irradiance	ERM SIM
Space weather	High Energy Particles	SEM
	Radiation Dose	

1. Satellite Data in NSMC/CMA

Archived FY data (-20131003)

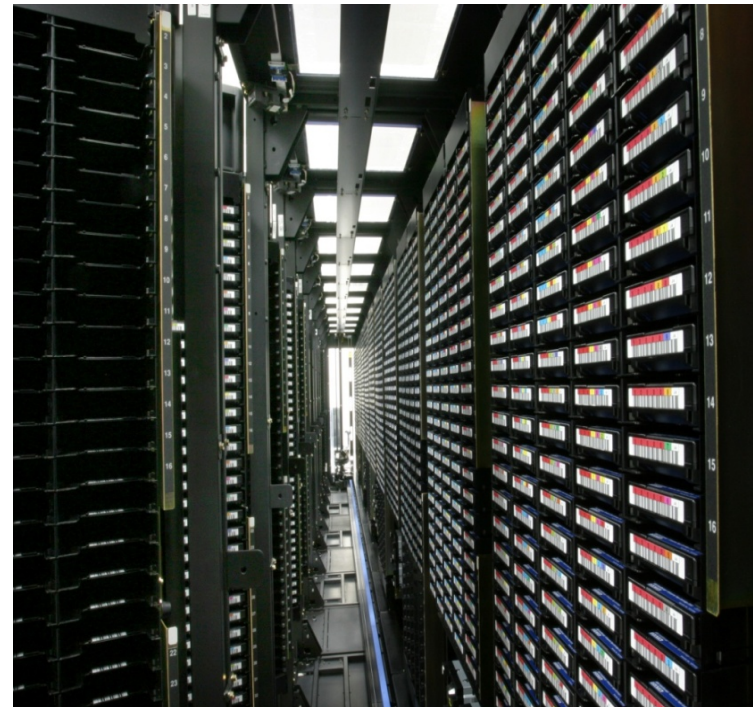
Satellite	File count	volume(TB)
FY-3C	4053	0.6
FY-3B	12,551,318	779.30
FY-3A	19,306,296	1135.0
FY-2F	602,716	10.5
FY-2E	2,566,081	26.8
FY-2D	3,546,869	43.8
FY-2C	2,447,396	29.8
FY-1D	2,694,246	6.5
Total	43,718,975	2032.3



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1. Satellite Data in NSMC/CMA

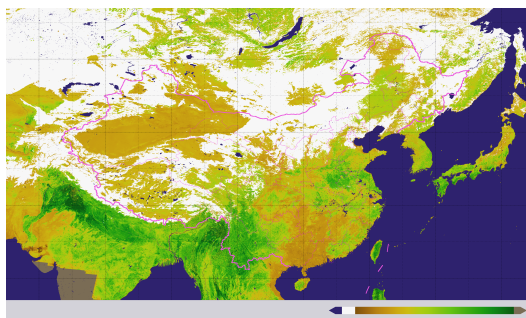
- ❏ Data reprocessing is another effort NSMC is working on. Relocation, calibration of data collected since 1984 is a long term efforts.
- ❏ Long term satellite dataset has being developed in NSMC, which are based on more than 20 year preservation of satellite data.



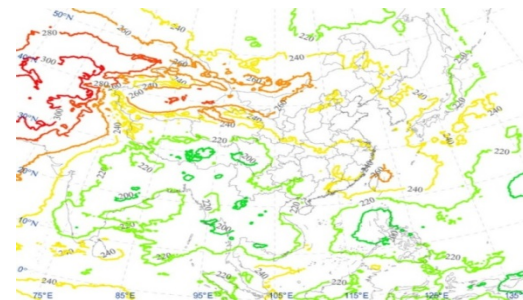
Long term satellite dataset



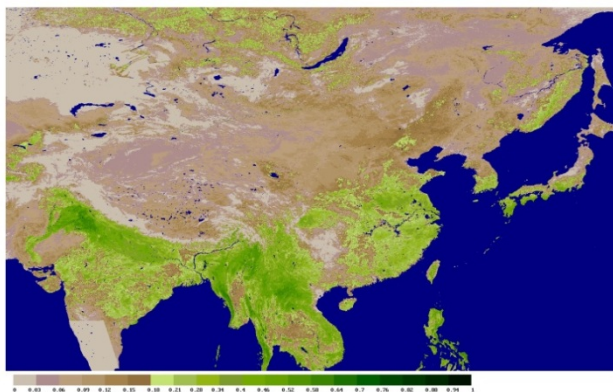
Typhoon



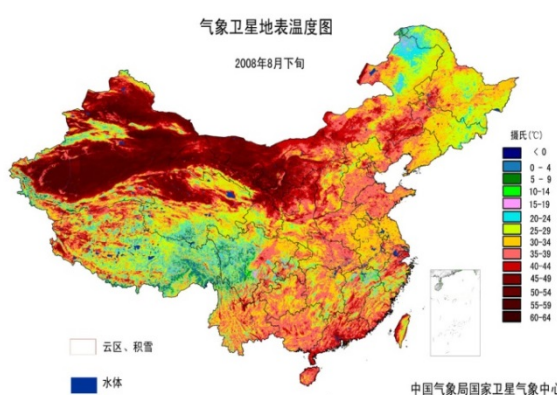
Snow Cover



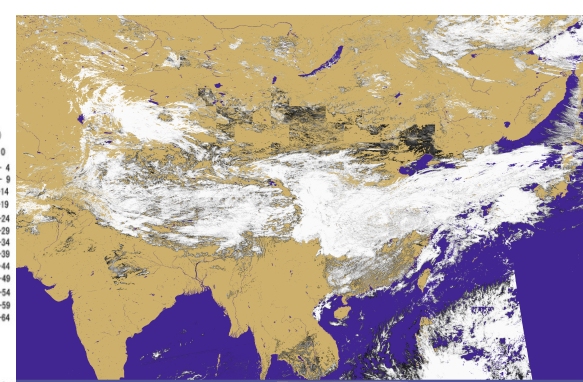
OLR



NDVI



Surface Temperature

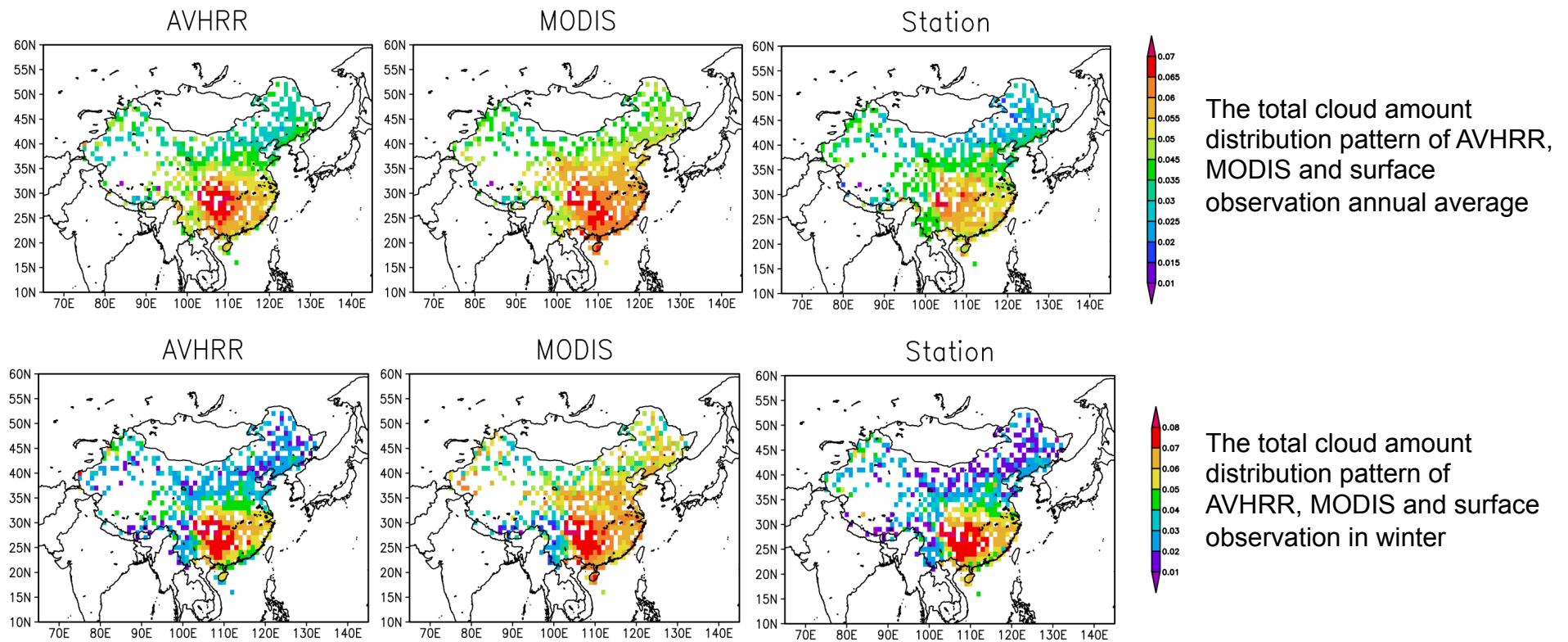


Cloud amount

Long term satellite dataset

product	coverage	Time period	format
OLR	E70° - E140° N15° - N60°	1989~2008	Resolution:5km,Proj:Geographic Lat/Lon HDF, JPG
TBB	E70° - E140° N15° - N60°	1989~2008	Resolution:5km, Proj:Geographic Lat/Lon HDF, JPG
cloud amount	E65° - E145° N10° - N60°	1989-2008	Resolution:0.01°, Proj:Geographic Lat/Lon HDF, JPG
snow cover	E65° - E145° N10° - N60°	1989-2008	Resolution:0.01°, Proj:Geographic Lat/Lon HDF, JPG
LST	E65° - E145° N10° - N60°	1989-2008	Resolution:0.01°, Proj:Geographic Lat/Lon HDF, JPG

Long term satellite data reprocessing-validation



2 Satellite Data Sharing and Service

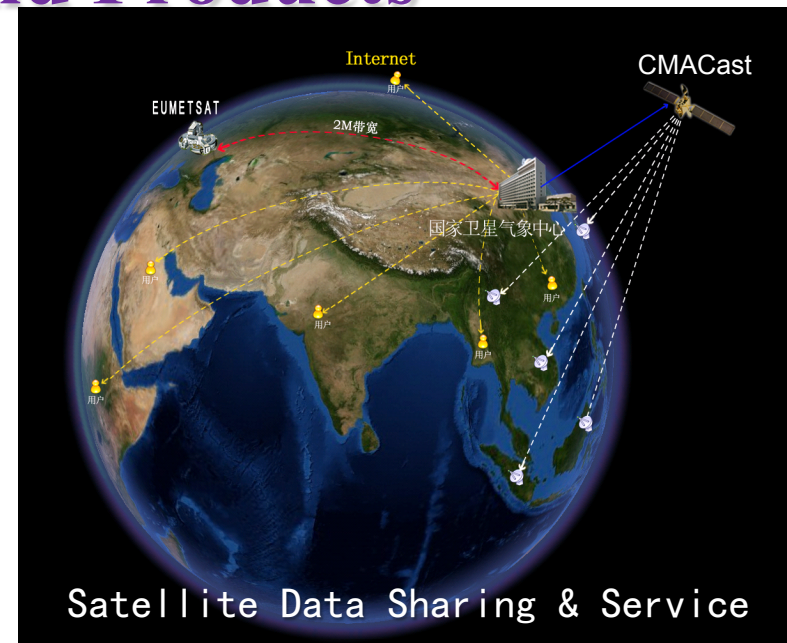
- Access to Satellite Data and Products

1) Website-based Data Service

2) CMACast

3) Active Data Dissemination

4) Direct satellite broadcast



2 Satellite Data Sharing and Service

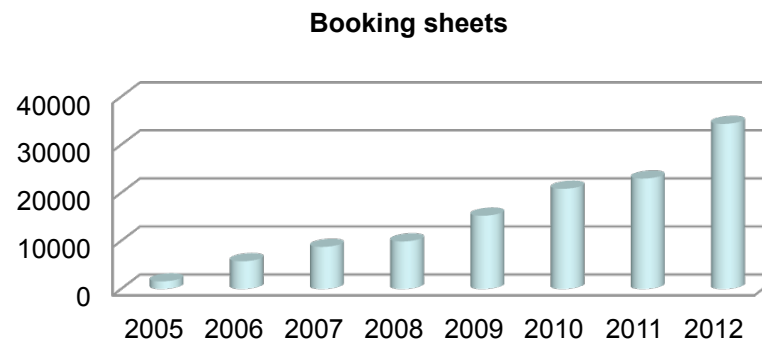
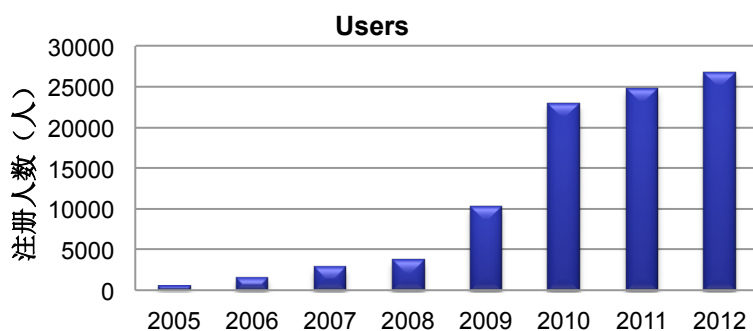
1) Website-based Data Service

- Web page: <http://satellite.cma.gov.cn>
- users can browse, retrieve and download all available near real-time satellite data and products from NSMC archives.

2. Satellite Data Sharing and Service

Since 2005

Satellite	22
Products	92
Data	2203.2TB
Registered users	28,342



4th Asia-Oceania Meteorological Satellite Users Conference



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2 Satellite Data Sharing and Service

NSMC became DCPC in June 2012, by now, 29 products out of the NSMC production list have been internationally disseminated through WIS. It is by the WIS rule that a product for WIS dissemination must be officially recommended by the permanent representative of a NMHS to WMO.

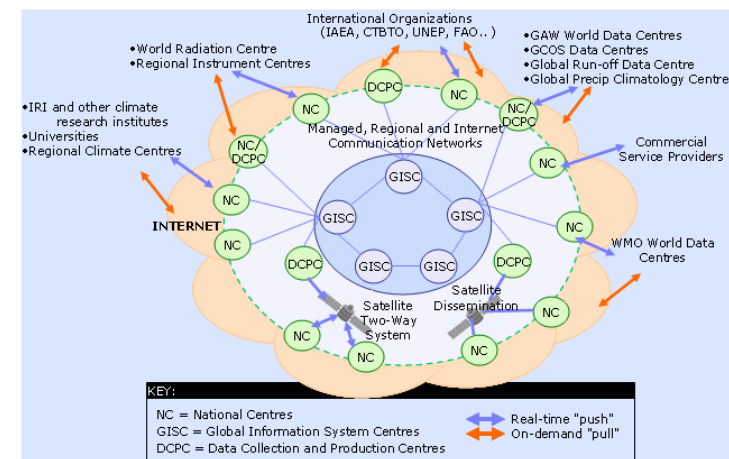
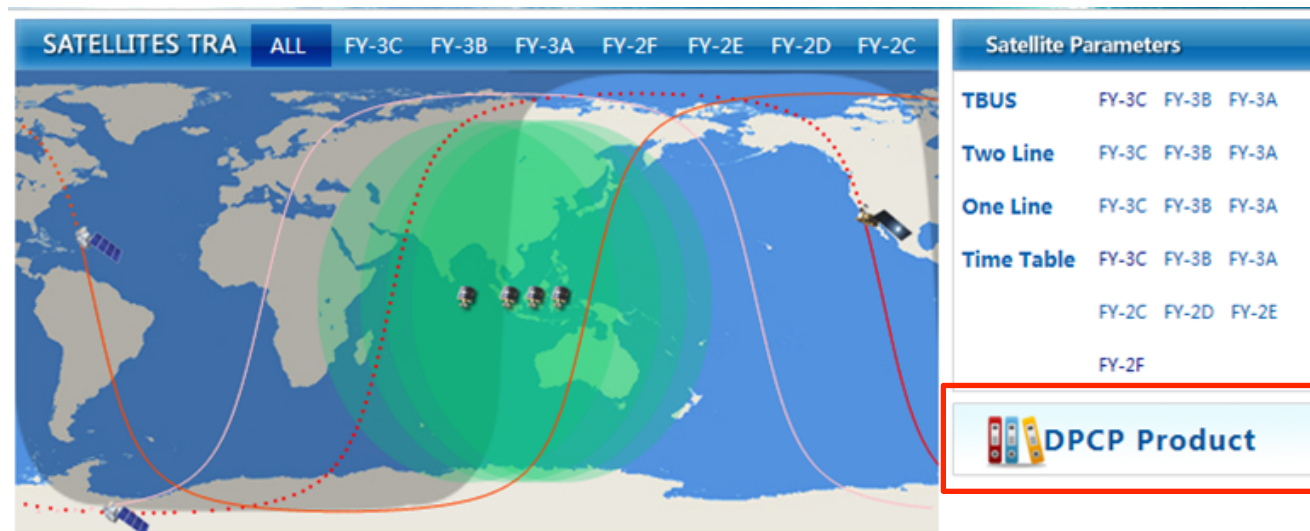


Figure 1 - Diagram showing WIS core components and Information Exchange

2 Satellite Data Sharing and Service

Users can find our DCPC products wherever at located GISC(Global Information System Center), or at our DCPC Service.



2 Satellite Data Sharing and Service

<http://satellite.cma.gov.cn>

New functions:

More convenient for user

- Multiple data portal
- Multi data search mode
- Multi data layer links

The screenshot shows the FENGYUN Satellite Data Center website. The header includes the title 'FENGYUN Satellite Data Center' and 'NATIONAL SATELLITE METEOROLOGICAL CENTER'. Below the header is a navigation bar with tabs: HOME, SATELLITES, DATA, IMAGES, PRODUCTS, DOCUMENTS, TOOLS. A search bar is located on the right. The main content area is titled 'Data View' and shows a selection interface for satellite data. It includes checkboxes for 'Satellite' (FY-3C, NOAA-18, NOAA-17, NOAA-16, NOAA-15), 'Product' (L0 DATA, L1 DATA, Atmosphere, Land, Ocean, Other), 'Instrument' (Global Navigation Satellite System, Visible and InfraRed Radiometer(VIRR), InfraRed Atmospheric Sounder(IRAS), MicroWave Temperature Sounder, MicroWave Humidity Sounder(MWHS), Medium Resolution Sp...), 'Catalog' (L1 Data(L1)), and 'Period' (Orbit). Below the selection interface is a table with columns: Product, Satellite, Instrument, Period, Format, Resolution, Start Date, Last Date, File count, Volume (GB), Availability, and Operation. The table lists three data entries for FY-3C VIRRL1000M, FY-3C VIRRL10BC, and FY-3C VIRRL10BC. The total file count is 21 and the total volume is 0.97 GB. At the bottom, there is a 'Time Range' section with 'Start Date' (2013-09-24) and 'End Date' (2013-09-25) fields, and radio buttons for 'Last 3 days', 'Last Week', and 'Last month'. There are also 'Availability' and 'Search' buttons. The footer includes the NSMC logo, the text 'China Meteorological Administration National Satellite Meteorological Center', and the copyright notice 'Copyright © NSMC 2011. All Rights Reserved. 京公网安备110108002134号'.

FENGYUN Satellite Data Center
NATIONAL SATELLITE METEOROLOGICAL CENTER

Home > Data > Data View

LEO GEO

You have select : FY-3C L1 DATA Visible and InfraRed Radiometer(VIRR)

☐ Satellite ☒ FY-3C ☐ FY-3B ☐ FY-3A ☐ FY-1D
☐ NOAA-18 ☐ NOAA-17 ☐ NOAA-16 ☐ NOAA-15

☐ Product ☐ L0 DATA ☒ L1 DATA ☐ Atmosphere ☐ Land
☐ Ocean ☐ Other

☐ Instrument ☐ Global Navigation Satellite System ☒ Visible and InfraRed Radiometer(VIRR) ☐ InfraRed Atmospheric Sounder(IRAS)
☐ MicroWave Temperature Sounder ☐ MicroWave Humidity Sounder(MWHS) ☐ Medium Resolution Sp...

☐ Catalog ☐ L1 Data(L1)

☐ Period ☐ Orbit

Product	Satellite	Instrument	Period	Format	Resolution	Start Date	Last Date	File count	Volume (GB)	Availability	Operation
<input type="checkbox"/> FY-3C VIRRL1000M	FY3C	VIRR	HHmm	HDF	1000M	2013-09-25	2013-09-25	7	0.48	View	Go
<input type="checkbox"/> FY-3C VIRRL10BC	FY3C	VIRR	HHmm	HDF	--	2013-09-25	2013-09-25	7	0.01	View	Go
<input type="checkbox"/> FY-3C VIRRL10BC	FY3C	VIRR	HHmm	HDF	--	2013-09-25	2013-09-25	7	0.48	View	Go
Total:								21	0.97		

Time Range

Start Date : 2013-09-24 End Date : 2013-09-25 ☐ Last 3 days ☐ Last Week ☐ Last month

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2 Satellite Data Sharing and Service

http://satellite
New function

- The issue of data report and synchronization
- increase the data display

Product Continuity			
Product:	FY-3C VIRRL11000M		
File Count	9	Volume	633.9MB
Data Available	2013-09-25 altogether 1 days		
No data	2013-09-24 altogether 1 days		
Product:	FY-3C VIRRL1OBC		
File Count	9	Volume	633.3MB
Data Available	2013-09-25 altogether 1 days		
No data	2013-09-24 altogether 1 days		
Product:	FY-3C VIRRL1OBC		
File Count	9	Volume	13.4MB
Data Available	2013-09-25 altogether 1 days		
No data	2013-09-24 altogether 1 days		

NATIONAL SATELLITE METEOROLOGICAL CENTER

Home > Data > Data Download

FY-3 FY-2 FY-1 NOAA EOS/MODIS MTSAT OtherData OBS&NWP MSG XIBU

FY-3C FY-3B FY-3A

Instrument: GNOS >> VIRR >> IRAS >> MWTS >> MWHS >> ERM >> SOAD >>

Cloud Mask (CLM)

Introduction:
MERSI cloud mask product:
MERSI cloud mask is generated with multi-feature threshold method. The product identifies a cloudy or cloud-free sky, as well as a confidence flag. It is an orbit product with original resolution without geographic projection.

Purpose:
MERSI cloud mask product:
Information on cloudy or cloud-free sky based on MERSI data is made available for quantitative applications of MERSI data.

Data Overview

Cloud Mask (CLM)

- Data From/To : —
- File Count : 0
- Volume : 0B

Resolution	Start Date	Last Date	File count	Volume(GB)	Availability
1000M			0	0	View

25-25 ☐ Last 3 days ☐ Last Week ☐ Last Month

9

More...

FY-3 MIP/T/HRPT Data Preprocessing software packages

Quality Report

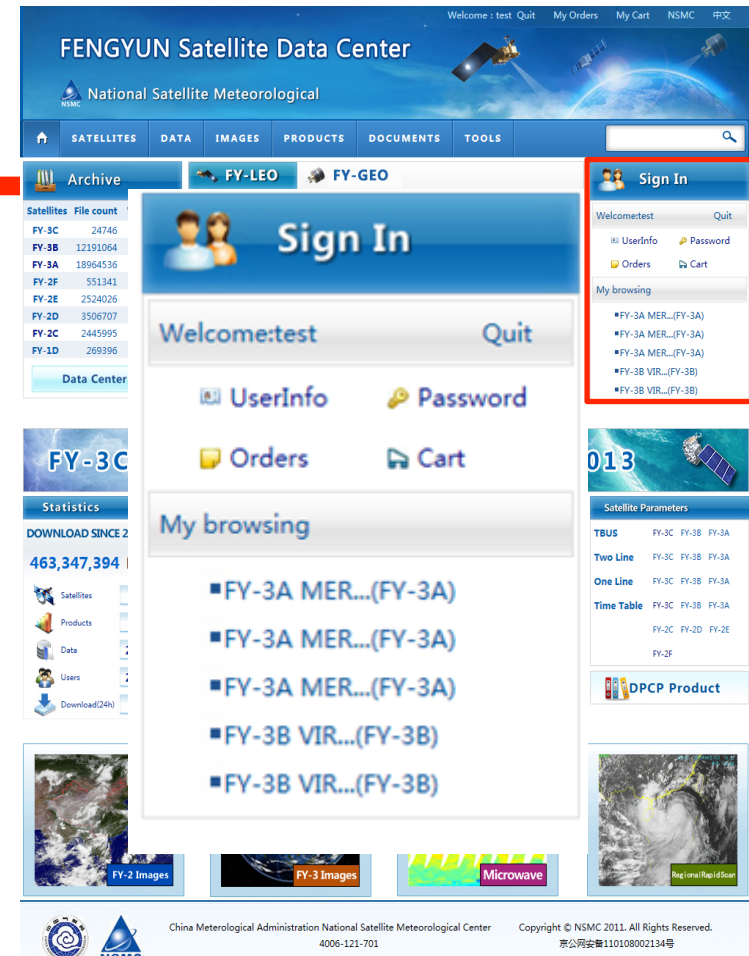
FY3C MERSI CLOUD MASK(8.35MB)

2 Satellite Data Sharing and Service

<http://satellite.cma.gov.cn>

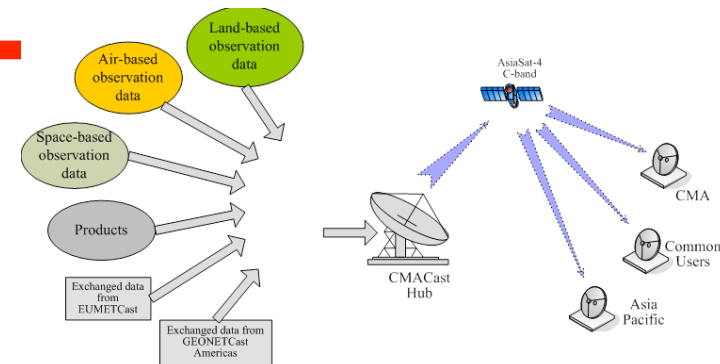
New functions:

- Recording user behaviors(past data search, clicked webpage, data download)
- providing direct entrance and query method of interesting data for users.



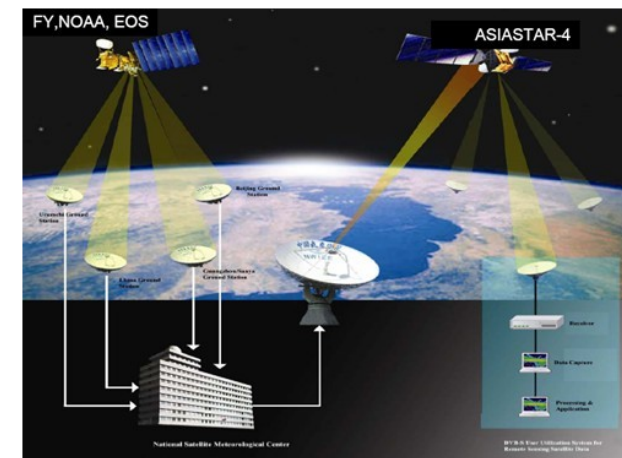
2 Satellite Data Sharing and Service - CMACast

- CMACast is a newly established DVB-S2 standard satellite data broadcast system of China Meteorological Administration.
- More than 2400 subordinate agencies and local offices of CMA use this system to receive real-time observation data and products for weather forecast relevant services every day.
- It is also the most effective way for common user communities in China to obtain different kinds of meteorological data and products from CMA.



2 Satellite Data Sharing and Service - CMACast

- CMACast is also a major component of WMO IGDDS and GEONETCast systems.
- With enlarged bandwidth, improved user and data management mechanisms and enriched data contents, CMACast has achieved the ability to offer all services within the framework of GEONETCast and will provide much better services to users in Asia Pacific Region.



2. Satellite Data Sharing and Service- CMACast

CMACast

China donated 27 suits of user station system for 19 developing countries.

- 2006, 6 : Bangladesh, Iran, Indonesia, Mongolia, Pakistan and Thailand
- 2007, 11: Vietnam, North Korea, Tajikistan, Kyrgyzstan, Turkmenistan, Laos, Burma, Sri Lanka
- 2011, 16: Bangladesh, Indonesia, Kyrgyzstan, Laos, Malaysia, Maldives, Mongolia, Burma, Nepal, Pakistan, Philippines, Sri Lanka, Tajikistan, Thailand, Uzbekistan and Vietnam

2 Satellite Data Sharing and Service

- CMA data exchange with EUMETSAT – FY-2E, FY-3A/3B

	Products
1	FY-2E nominal data (hourly data)
2	FY-2E atmospheric Motion Vectors (infrared,water vapour, 6 hourly data)
3	FY-2E precipitation estimate (6 hourly, 24 hourly data)
4	FY-2E black body brightness temperature (hourly, daily, 5 days, 10 days, monthly data)
5	FY-2E total cloud cover (hourly data)
6	FY-2E precipitable water from a clear sky (3 hourly data)
7	FY-2E surface incidence solar radiation (daily data)
8	FY-2E cloud land moisture profile (3 hourly data)
9	FY-2E cloud type(hourly data)
10	FY-2E snow cover(daily data)
11	FY-2E outgoing longwave radiation (3 hourly, daily, 5 days, 10 days, monthly data)
12	FY-3A/3B MWTS 1b data
13	FY-3A/3B MWHS 1b data

3 Summary

- Data & users increase fast
- Website & CMACast are data service main ways
- New FENGYUN data service website offers some new functions



Thanks for your attention



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