

CURRENT STATUS OF FY-1C

Summary and purpose of paper

FY-1C was launched on May 10, 1999. It has been operating beyond the designed lifetime. This paper briefly describes the status of the satellite as of September 1, 2001.

CURRENT STATUS OF FY-1C

The polar orbiting meteorological satellite FY-1C was launched on 10 May 1999. This three-axis stabilized satellite has been operating over 2 years.

FY-1C Orbit Characteristics

The orbit characteristics of FY-1C are shown in table 1.

Table 1. Orbit Parameters of FY-1C satellite

Orbit	Altitude	Inclination	Eccentricity	Descending node
Sun-synchronous	862 km	98.79 ⁰	0.00188	7:50 am

FY-1C Primary Instrument Payload

FY-1C carries a multi-channel visible and infrared scan radiometer (MVISR) that has 10 channels including 4 visible channels, 3 near IR channels, 1 short wave IR channel and 2 long wave IR channels. The wavelength of each channel and primary usage is shown in Table 2.

Table 2. MVISR channels and primary use

Channel	Wavelength (μm)	Primary Use
1	0.58-0.68	Daytime cloud, ice and snow, vegetation
2	0.84-0.89	Daytime cloud, vegetation, water vapor
3	3.55-3.95	Heat source, night cloud
4	103.-11.3	SST, day/night cloud
5	11.5-12.5	SST, day/night cloud
6	1.58-1.64	Soil moisture, ice/snow distinguishing
7	0.43-0.48	Ocean color
8	0.48-0.53	Ocean color
9	0.53-0.58	Ocean color
10	0.90-0.965	Water vapor

Transmission Modes

Real time picture transmission:

·CHRPT format: real time transmission

Delayed picture transmission:

- GDPT Format: daily global data coverage of 4 channels(0.58-0.68 μ m,0.84-89 μ m,10.3-11.3 μ m,11.5-12.5 μ m) with 3.3 km spatial resolution.
- LDPT Format: pre-selected local-area data coverage of 10 channels with 1.1 km spatial resolution at nadir.

Operating beyond the Designed Lifetime

FY-1C is now operating beyond the designed lifetime. A second on-orbit checkout was conducted prior to the second anniversary of the satellite operation. It demonstrated that the satellite's condition was as good as that when the first checkout was made after the launch. All five on-board subsystems, namely, the attitude controlling, energy supplying, heat controlling, transmission and remote sensing, are in good working state. The backup system & equipment, the redundancy designed for the sake of reliability, are not used by far.

However, the MVISR output signal attenuates considerably compared with 2 years ago. The degradation problem seems more obvious for Channel 1. As there is no calibration on board for visible channel, before any quantitative application, the visible and near infrared data must be corrected either with reference to the in situ measurements from a calibration site, or by using cross-calibration schemes.

Examples of FY-1C Data Applications

Various FY-1C products have been developed at NSMC and they are used in meteorology, hydrology, climate research, agriculture and environment monitoring.

The CHRPT data is open to all users, both at home and abroad. Operational effort is now undertaken to make FY-1C products accessible through Internet.

Some examples of FY-1C data applications are given from figure .1 to figure. 6.

Figure 1: an example of image mosaic from FY-1C in polar stereo-graphic projection over North Hemisphere.

Figure 2: an example of three channels color image.

Figure 3: an example of global vegetation index.

Figure 4: the contour of OLR.

Figure 5: an example of global SST.

Figure 6: an example of snow cover by channel 1 and channel 6 data.

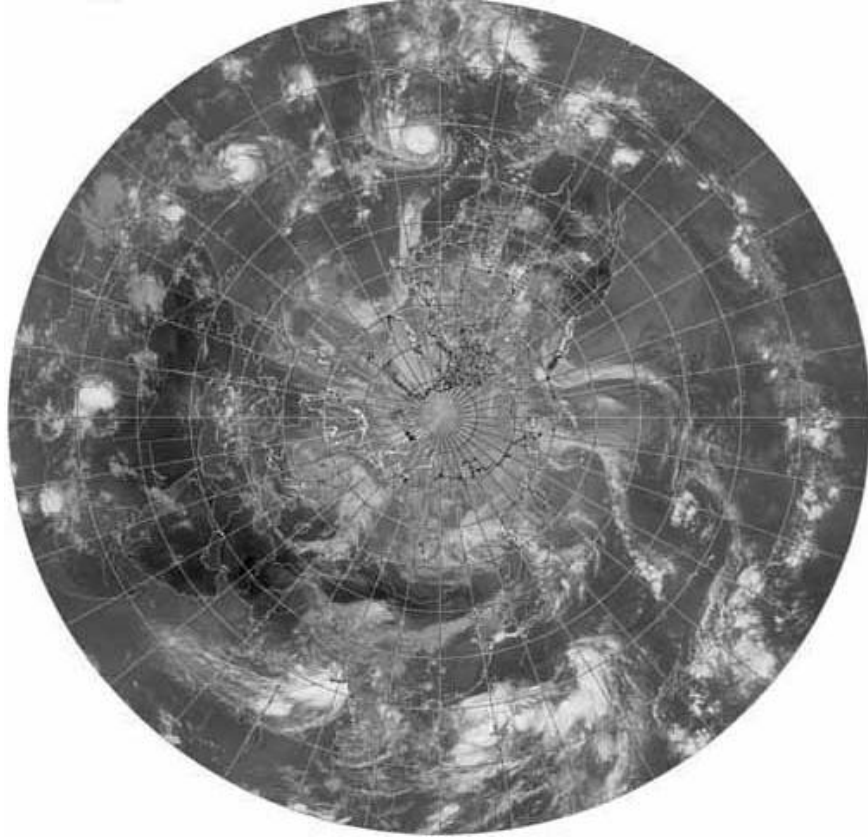


Figure 1 Image mosaic of North Hemisphere from FY-1C

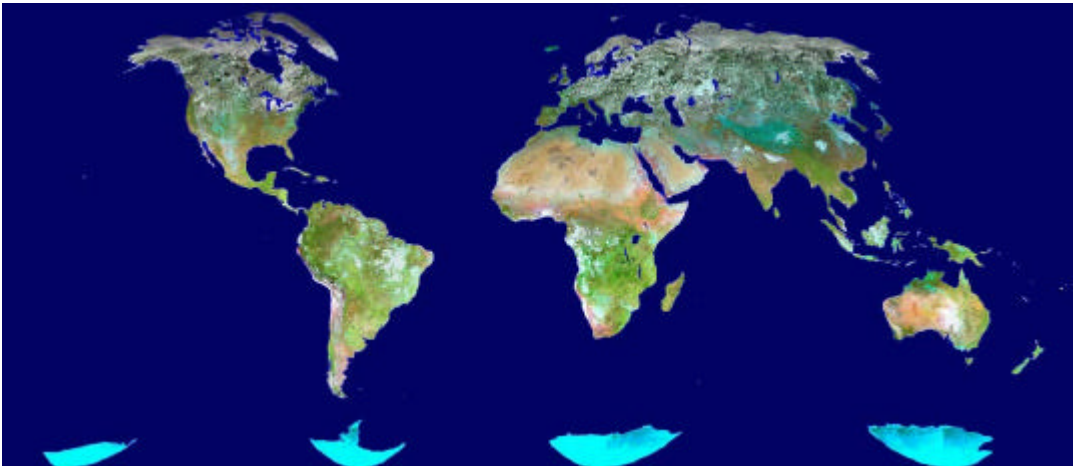


Figure 2. Example of three channel color image

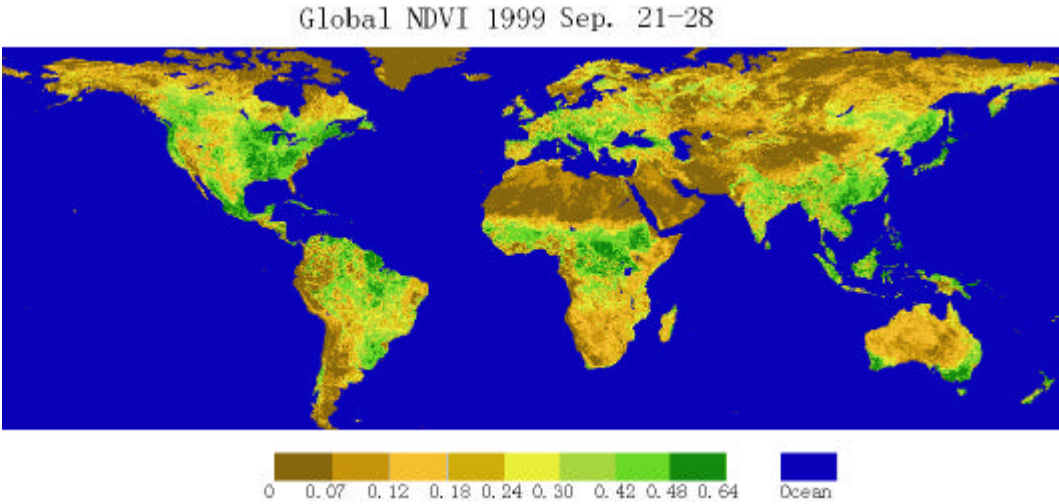


Figure 3. Example of vegetation index in August 1999

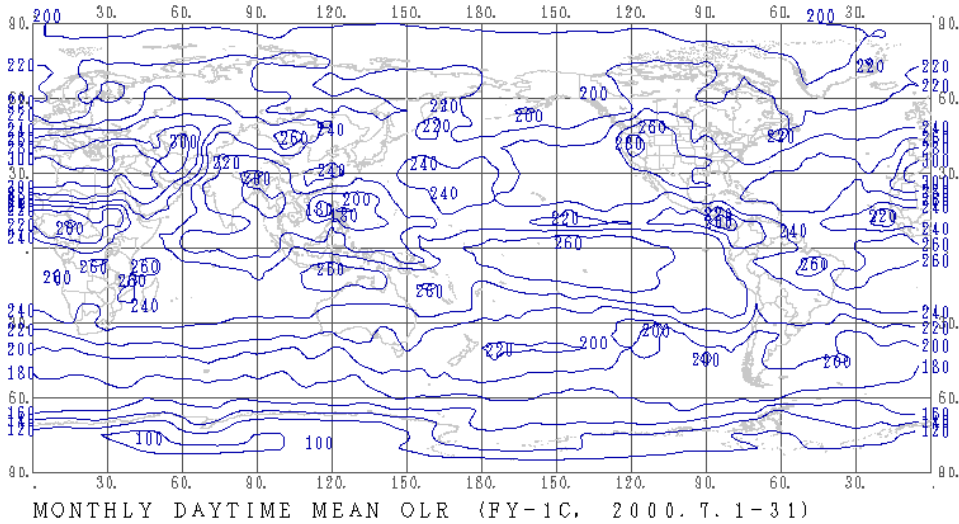


Figure 4. Example of global OLR.

风云一号 (FY-1C) 全球 SST
1999. 9 (21-30)

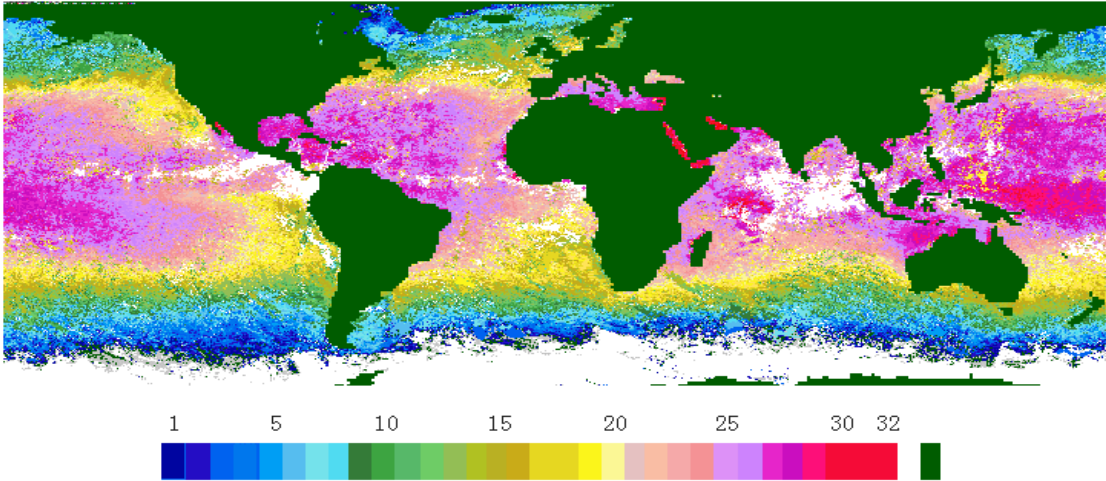


Figure 5. Example of global SST

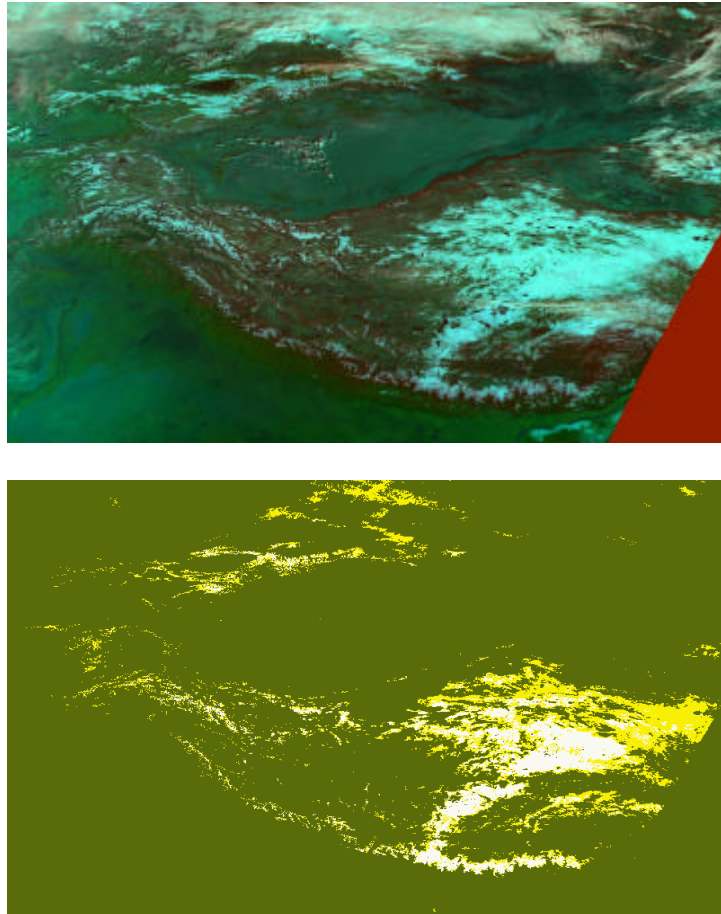


Figure 6. Example of snow cover over Tibet