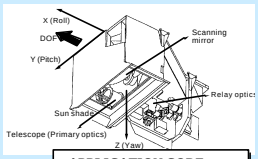
Global Imager

NASDA has been developing this since 1993 as a general purpose medium spatial resolution visible-infrared imager to cover atmosphere and land observation as well as ocean color observations.

The GLI is an optical sensor designed to observe the atmosphere, ocean, land, and cryosphere.

VNIR			SWIR			MTIR		
(1km resolution) ch1	380(10)	O A C	(1km resolution) ch24	1050(20)	L A C	(1km resolution) ch30	3.715(0.33)	O A C
ch2	400(10)	O	ch25	1135(70)	A	ch31	6.700(0.5)	A
ch3	412(10)	O	ch26	1240(20)	L A C	ch32	7.300(0.5)	A
ch4p	443(10)	O L A C	ch27	1380(40)	A	ch33	7.500(0.5)	A
ch5p	460(10)	O L A C	(250m resolution) ch28	1640(200)	L A C	ch34	8.600(0.5)	O L A C
ch6	490(10)	O	ch29	2210(220)	L A C	ch35	10.80(1.0)	O L A C
ch7p	520(10)	O A C	unit [nm]			ch36	12.00(1.0)	O L A C
ch8p	545(10)	O A C				unit [μm]		
ch9	565(10)	O L						
ch10	625(10)	O						
ch11	666(10)	O						
ch12	680(10)	O						
ch13	678(10)	L A C						
ch14	710(10)	O						
ch15	710(10)	L A C						
ch16	749(10)	O						
ch17	763(8)	L A						
ch18	865(20)	O						
ch19	865(10)	L A C						
(p:piecewise linear)								
(250m resolution) ch20	460(70)	L A C						
ch21	545(50)	L A C						
ch22	660(60)	L A C						
ch23	825(110)	L A C						
unit [nm]								

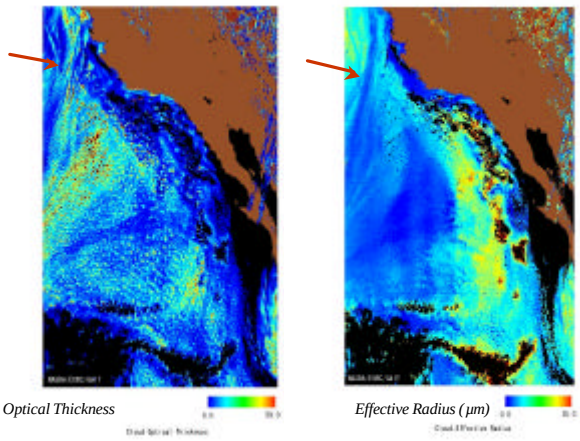


APPLICATION CODE
- O : OCEAN
- L : LAND
- A : ATMOSPHERE
- C : CRYOSPHERE

Cross tracking scan

Altitude	: 803 km
Inclination	: 98.6 deg.
Swath width	: 1600 km
Resolution (subpoint)	: 1 km : 250 m
Tilt angle	: 20 deg.
Period	: 101 min.
Recurrent Period	: 4 days
Local time	: 10:30AM
Data rate	: 4.1Mbps

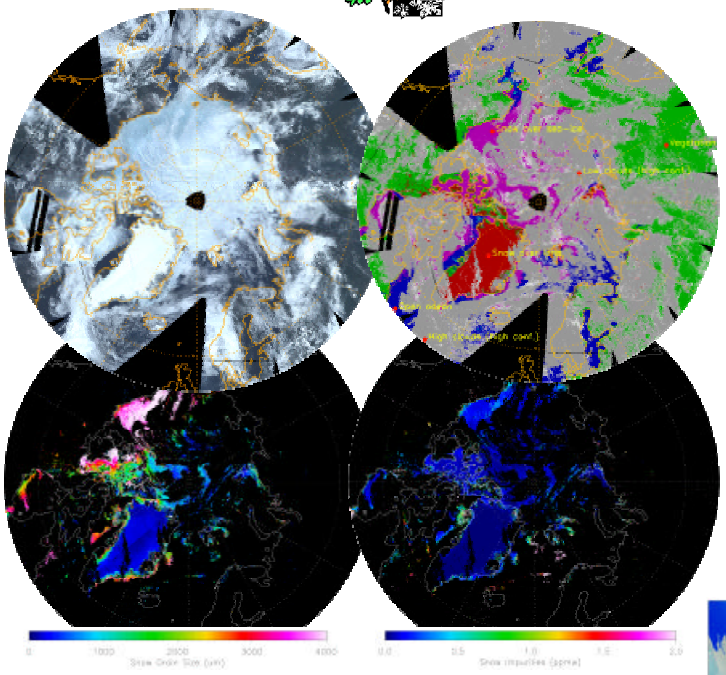
Atmosphere



Seeking the interaction between clouds and aerosols

These figures show optical thickness (left) and effective radius (right) of the marine stratocumulus clouds appeared in a stable stratified airmass off the coast of California. In image of upper left ( ), stripe-like structures of small cloud particle were found. They are thought about with change of cloud microphysics by smoke of ships navigating over the ocean surface, and continental natural-origin aerosols. It is pointed out that this event can change radiation budget of the Earth, and the possibility which gives a big influence to climate change. Cloud and aerosol observed with GLI are made use of assessment of climate change mechanism and climate forecast in the future. (MODIS data acquired on June 18, 2000 were analyzed by GLI Level2 algorithm)

Land and Cryosphere



Upper left panel, **RGB composite image around the northern polar region** composed from about 30 MODIS Level-1B data on June 18, 2000. MODIS ch.1 (0.645μm), ch.4 (0.555μm) and ch.3 (0.469μm) are assigned to Red, Green and Blue channels, respectively. Upper right panel, color-coded image of **the cloud and surface classification flag** generated using the GLI CTSK1 algorithm (cloud/clear and snow/sea-ice discriminators).

Snow over land cannot be seen over the continents except over the Greenland ice-sheet in this season. Almost all the areas within the Arctic Ocean are covered with snow over sea-ice.

Lower panels, color-coded images of the daily spatial distributions of (lower left) **snow grain radius in mm** and (lower right) **mass fraction of impurities mixed in snow in ppmw** retrieved by the GLI CTSK2b1 algorithm.

Snow grains are kept small (r<500μm) over the Greenland ice-sheet where altitude is very high and thus temperature is kept low even in summer, on the contrary that snow grains over the snow within the Arctic Ocean are large (r>500μm) and become larger toward the lower latitude areas reflecting the spatial distributions of received solar radiation and air temperature. As for snow impurities mass fractions are high for the snow over sea-ice near the continental coasts, which can be due to the dry deposition of wind-blown dusts or anthropogenic aerosol particles from the continents.

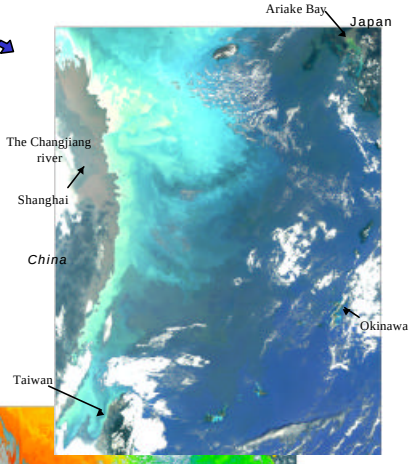
Ocean

RGB image of normalized water leaving radiances (nLw at 666nm, 545nm and 460nm) derived by GLI ocean-color algorithm (OTSK1a) using MODIS L1B data in 20 February 2001.

Land and cloud area are filled by RGB-image of satellite observed radiances (at 625nm, 545nm and 490nm).

Upper left is the mouse of the Changjiang river. Japan island is in the upper right and Okinawa island is in the middle right.

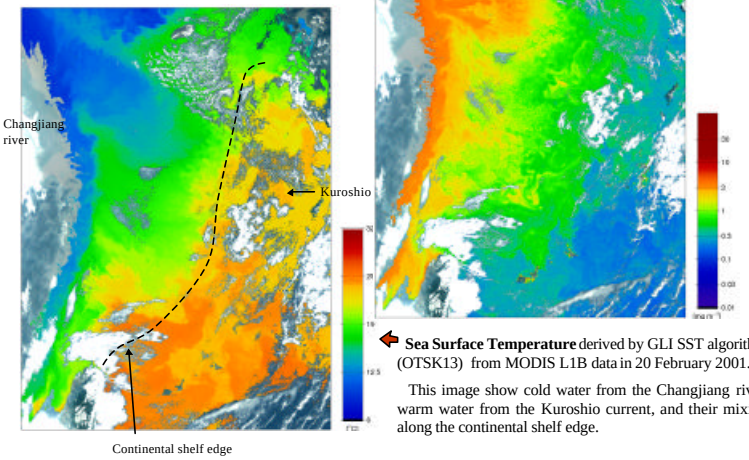
This image show "ocean color" removing the atmospheric effect. The ocean color changes in various conditions (in the mouse of the Changjiang river , Kuroshio, Ariake Bay etc.) due to solids, biological activities.



Chlorophyll-a concentration derived by GLI ocean-color algorithm (OTSK2) from MODIS L1B data in 20 February 2001.

The "ocean color" can be interpreted as the amount of phytoplankton chlorophyll-a.

This image indicates that biological activities is higher in the continental shelf in the East China Sea.



Sea Surface Temperature derived by GLI SST algorithm (OTSK13) from MODIS L1B data in 20 February 2001.

This image show cold water from the Changjiang river, warm water from the Kuroshio current, and their mixing along the continental shelf edge.