Projection List of GCOM-C

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Projection		Product					Page
		L1	Atmosphere	Ocean	Land	Cryosphere	
Non-GLOBAL	Scene	L1 250m/500m/1km		L2 Ocean 250m/500m/1km		L2 Cryosphere OKhotsk sea-ice distribution 250m/500m/1km	p.2-4
Non-GLOBAL	Tile		L2 Atmosphere 250m/1km		L2 Land 250m/1km L2 Statistics Land 250m/1km	L2 Cryosphere * 250m/1km L2 Statistics Cryosphere * 1km	p.6
GLOBAL	Global EQA (sinusoidal Equal Area)		L2 Atmosphere Global 1/24deg (4km)				p.5
GLOBAL	Global EQA (Binning)		L3 Bin Atmosphere 1/12Deg (8km)	L3 Bin Ocean 1/24Deg (4km)	L3 Bin Land 1/24Deg (4km)	L3 Bin Cryosphere * 1/24Deg (4km)	p.7
GLOBAL	Global EQR (EQuiRectangular)		L3 Map Atmosphere 1/12Deg (8km)	L3 Map Ocean 1/24Deg (4km)	L3 Map Land 1/24Deg (4km)	L3 Map Cryosphere * 1/24Deg (4km)	p.8
GLOBAL	Polar stereo					L3 Map Cryosphere * 1/24Deg (4km)	p.9

* Okhotsk sea ice distribution is scene type

- Scene, tile, and PS products include observation data for part of Earth.
- Global EQA, global EQA (Binning), global EQR Products include the global observation data.
- Please refer the answer in Q3 for the details on the "**Granule ID definition**" for each product.

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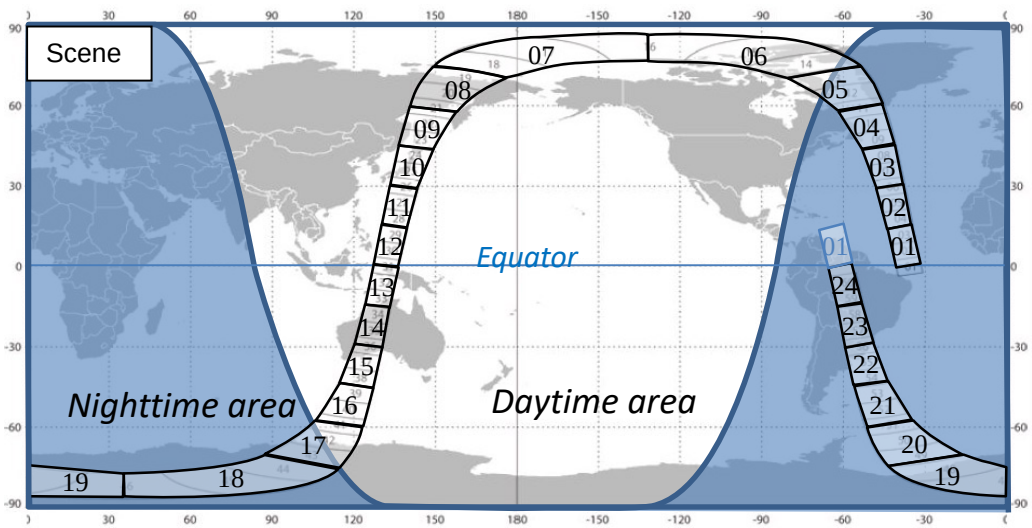
- ◆ Scene L1: VNR-NP (non-polarized), IRS (infrared)
- ◆ Scene L2: Ocean product, Cryosphere product (OKID only)

- One orbit revolution (from an ascending node to the next ascending node) is divided to 24 scenes by the latitude argument.
- When resolution is switched or the sensor is turned off (or on), the scene may be divided into multiple scenes.
- The scene number in granule ID is "01" to "24" starting from equator.
- The IRS product has multiple combinations of resolutions of each band. (see bottom table)
- Because the data is stored in the order of observation time, data in in the ascending scene (from south to north) is stored for the south at the top and the north at the bottom in image. (please also refer to Q23)



VNR-NP and IRS scene definition

プロダクト種別	VNR-NP プロダクト	VNR-PL プロダクト	IRS プロダクト		
分解能記号	分解能	分解能	SW01,02,04 分解能	SW03 分解能	TIR 分解能
K	1km	1km	1km	1km	1km
			OFF		1km
			1km	1km	OFF
H	—	—	1km	1km	500m
			OFF		500m
Y	—	—	1km	1km	250m
X	—	—	1km	250m	1km
M	—	—	1km	250m	500m
Q	250m	—	1km	250m	250m
			OFF		250m
			1km	250m	OFF
L	1km 低解像度 リサンプリング プロダクト	—	1km	1km 低解像度 リサンプリング プロダクト	1km 低解像度 リサンプリング プロダクト
			1km	1km 低解像度 リサンプリング プロダクト	1km
			1km	1km	1km 低解像度 リサンプリング プロダクト

Resolution combination

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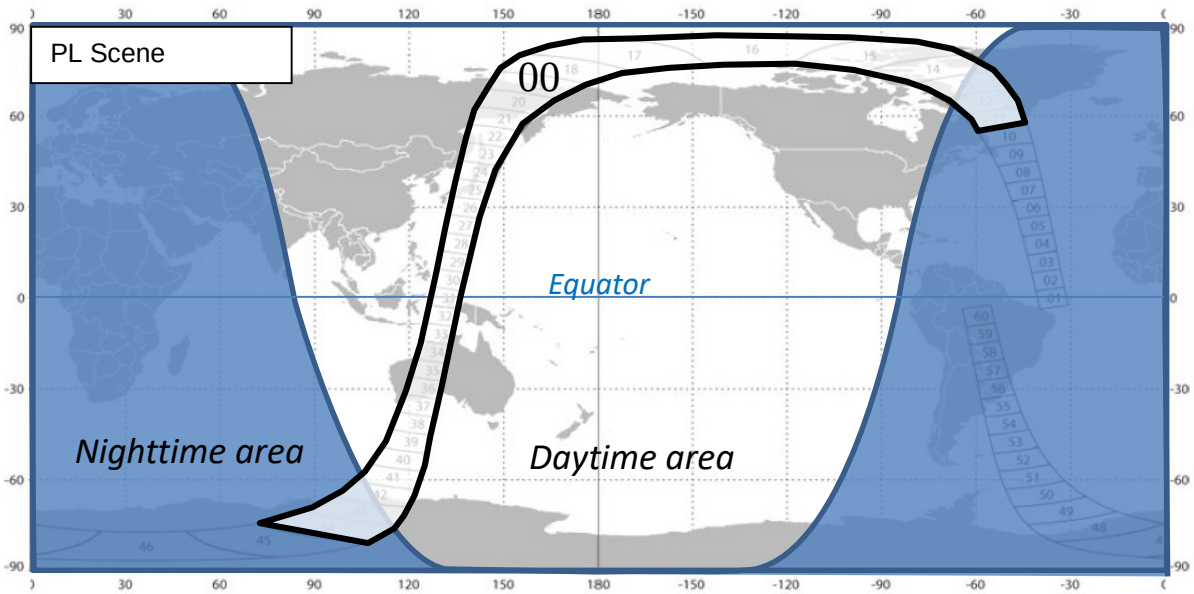
◆ Scene: L1 VNR-PL (Polarization)

- VNR-PL(POL) scenes is not divided like VNR or IRS. One scene of VNR-PL includes all daytime observation areas in one orbit.
- Because the tilt angle is changed around latitude 0 deg zone, there are discontinuous areas and stretched image appears. (see bottom right)
- The scene number of the granule ID is fixed to "00".



VNR-PL scene definition

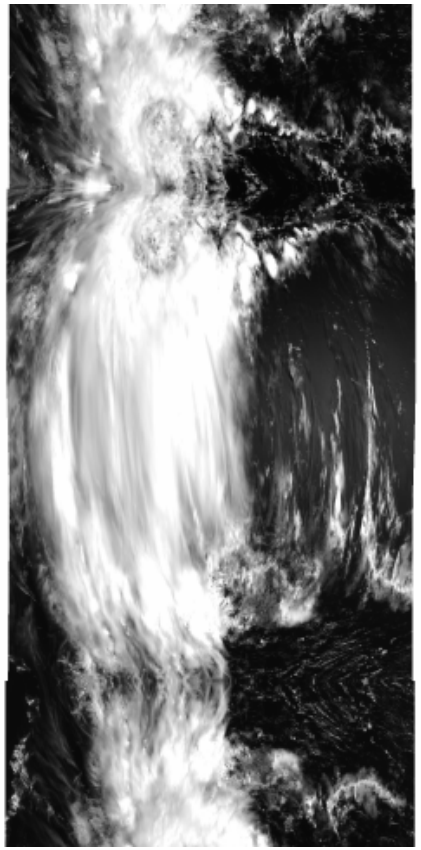


Image during tilt operation

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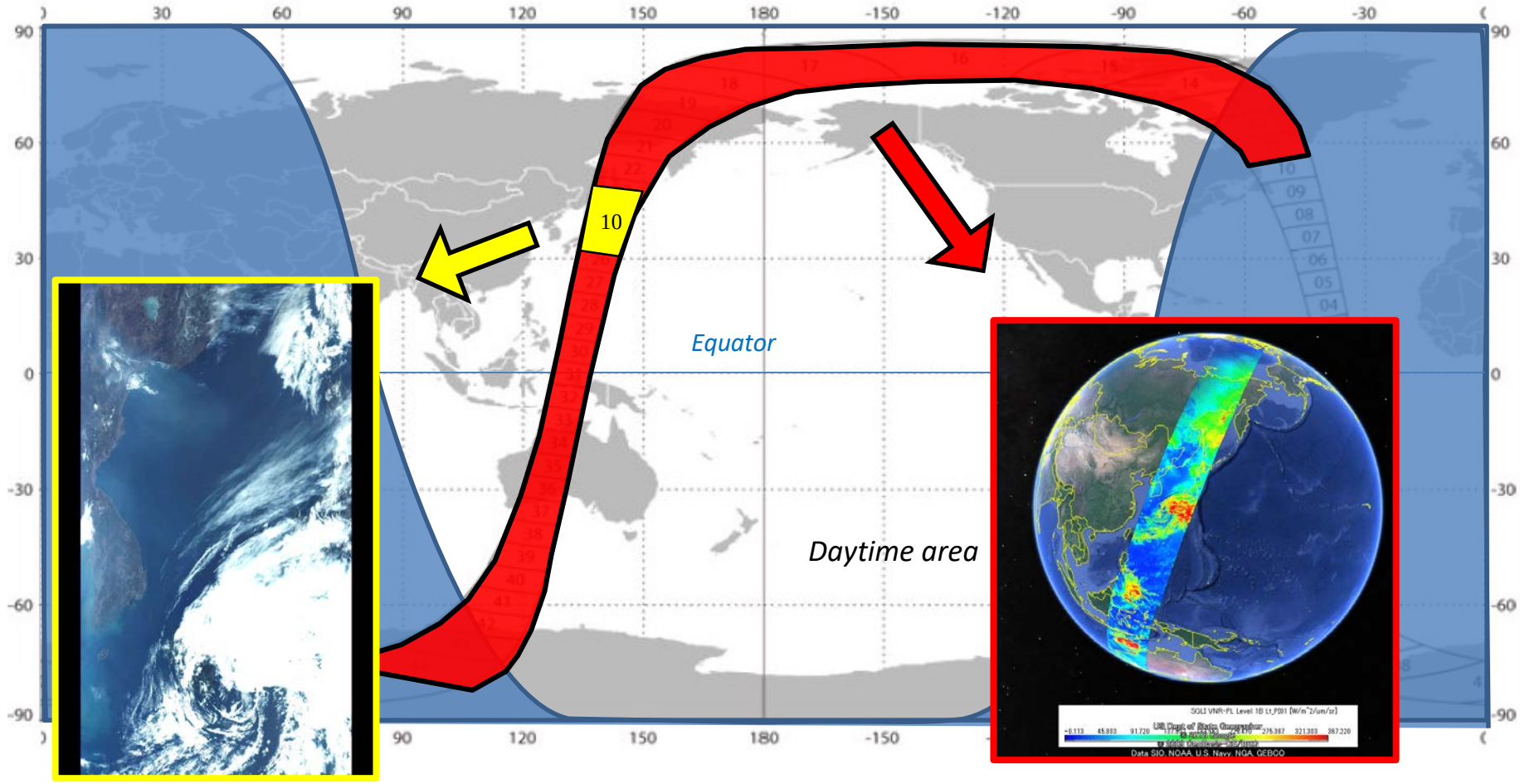

1 scene of VNR-NP and IRS

1 scene of VNR-PL
(overlaid on Google Earth)

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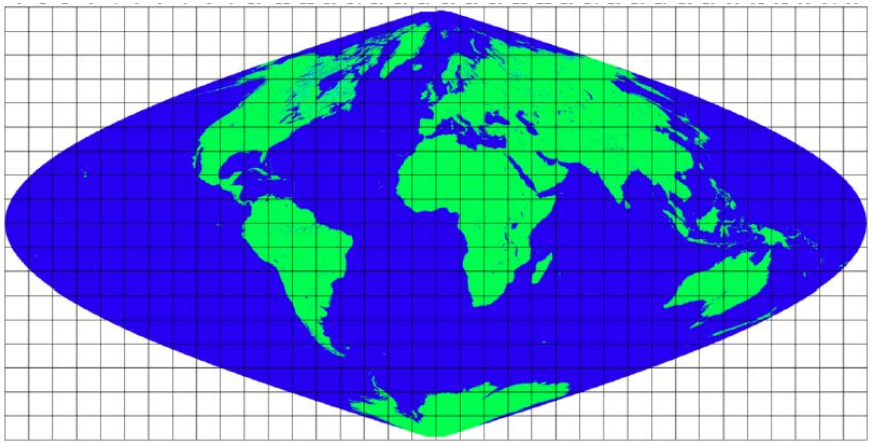
◆ Global EQA (sinusoidal equal area)

- EQA (sinusoidal equal area) is an equal area projection in which latitude lines are expressed as parallel straight lines and meridians are expressed as sine curves (the central meridian is a straight line orthogonal to the latitude line).
- There are three types of EQA in GCOM-C products
  - Global EQA … Level-2 (L2), “A” in Granule-ID
  - TILE EQA … Level-2 (L2), “T” in Granule-ID (next page).
  - Global EQA-bin … Level-3 (3B), “X” in Granule-ID (page 7)
- The center of Global EQA projection is 0 degree. (0degE , 0degN)
- 2 Global EQA products (satellite orbit direction(A/D)) are created every day.
- The processing level of granule ID is described as "**L2**", and the projection is described as "**A**".



Global EQA

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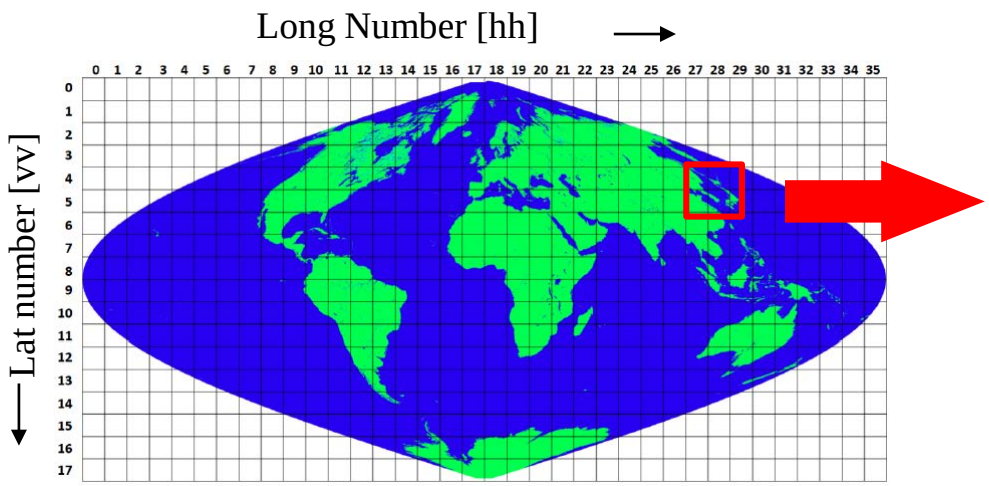
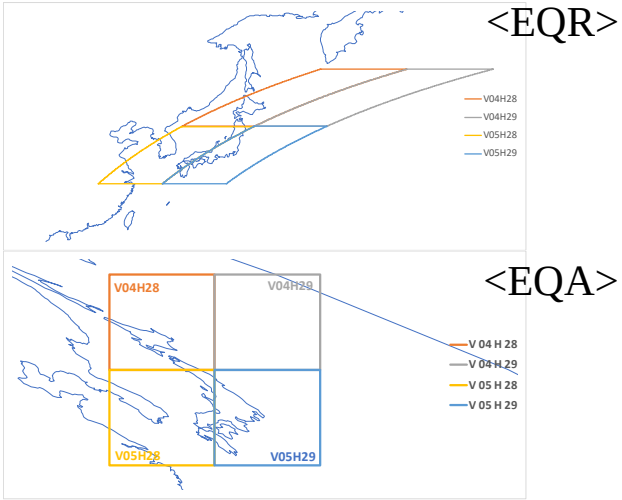
◆ TILE EQA

- Tile is divided global EQA every 10 degrees in latitude and every 10 degrees in longitude on the equator.
- The tile number of the granule ID is represented by a 4-digit number [vvhh: "0000" to "1735”], be arranged in order to the latitude number (vv) and the longitude number (hh).
- 2 products (satellite orbit direction(A/D)) for each tile are created every day.
- For the near real-time product, products are created for each downlink. From this reason, multiple products of the same tile number may be created on same day. These are distinguished by added number from "000" to "999" on the end of the granule ID.
- The processing level of granule ID is described as "**L2**", and the projection is described as “**T**".



Tile definition



Tile of around Japan

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◆ Global EQA (Binning) （EQA bin）

- Global EQA(Binning) is stored on one dimension, It is stored in the order of latitude from -90 deg to +90 deg, longitude from -180 deg to +180 deg.

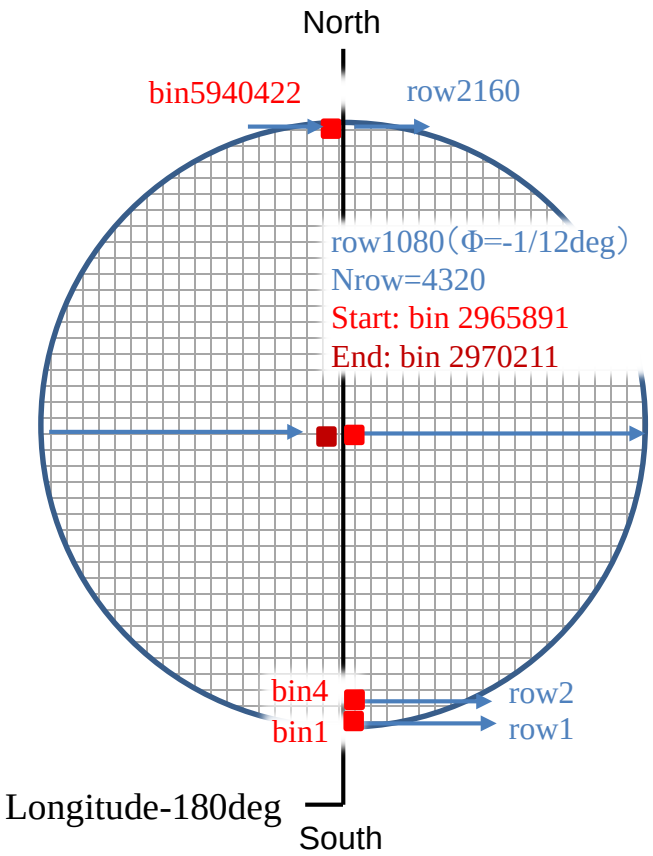
- Line number of latitude direction [A]
  Resolution C: 2160 lines (every 1/12 deg)
  Resolution F: 4320 lines (every 1/24 deg)

- Line number of longitudinal direction [Nrow]
  If the center latitude of row is Φ,
  Nrow =[2 × A × cos(Φ)] ([ ] is represents rounding)

<Calculation example (resolution C)>
row=1 (Φ= -2159/24deg): Nrow=[2*2160*cos(-2159/24)]=3
row=720 (Φ= -1441/24deg): Nrow=[2*2160*cos(-1441/24)]=2160
row=1080 (Φ=-1/12deg): Nrow=[2*2160*cos(-1/24)]=4320

- Create 2 products (satellite orbit direction(A/D)) per statistical period.

- The processing level of granule ID is described as "**3B**" and the projection is described as "**X**".



Global EQA(Binning) definition
[Case: Resolution C (1/12deg)]

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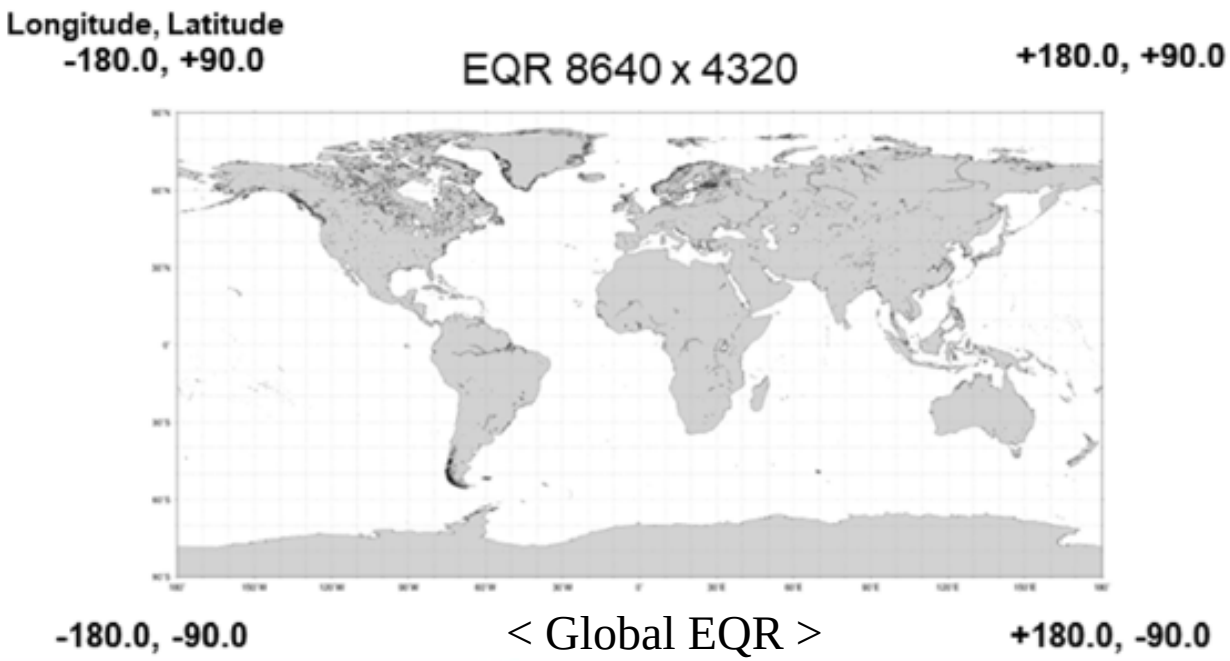
◆ Global EQR

- Equal latitude and longitude projection (latitude: -90 to +90 deg, longitude: -180 to +180 deg) is defined as global EQR.

- The grid interval is 1/12 deg (resolution C) and 1/24 deg (resolution F) in both latitude and longitude.

- Create 2 products (satellite orbit direction(A/D)) each statistical period.

- The processing level of granule ID is described as "**3M**" and the projection is described as "**D**".



< Global EQR >

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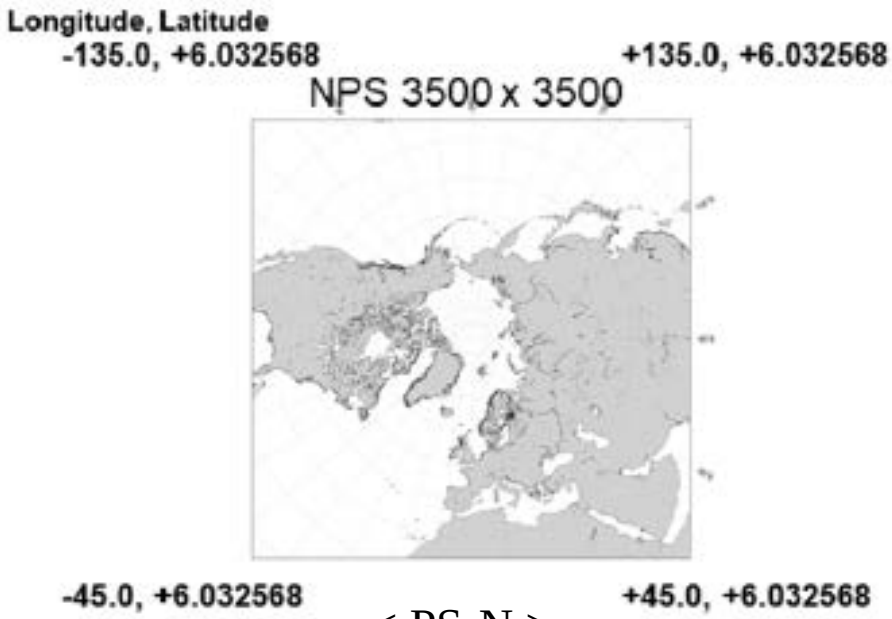
◆ PS (Polar Stereo)

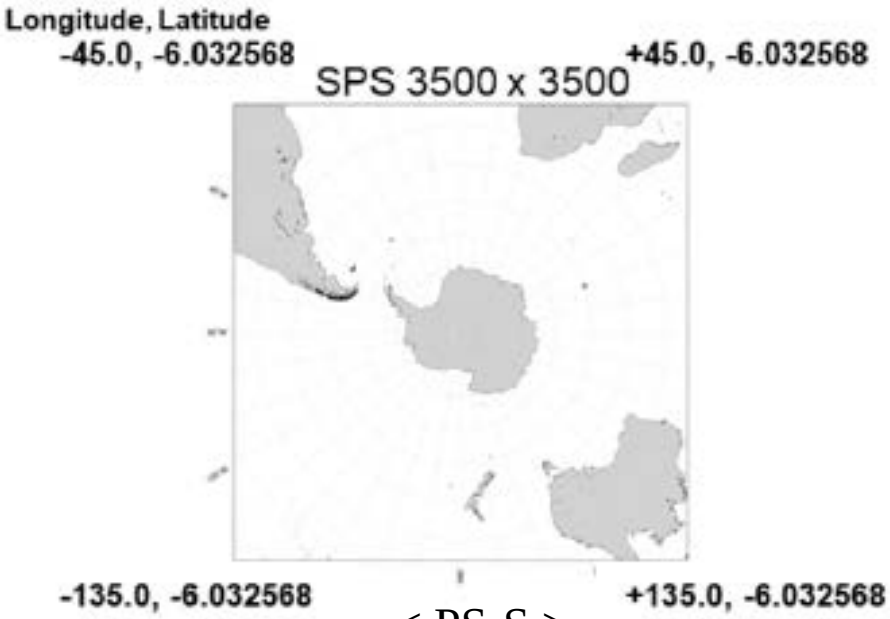
- PS is defined as "polar stereo projection centered on the north and south poles".

- The processing level of granule ID is described as "**3M**", and the projection is described as "**N**: North Pole" or "**S**: South Pole" .

- Create 4 products (satellite orbit direction(A/D) and pole(N/S)) each statistical period.



< PS-N >



< PS-S >