ICESat/GLAS Surface-Type Mask

The NASA GLAS science team developed a global mask to flag surface types for use in creating standard ICESat/GLAS data products. This mask was originally for science team use only, to ensure proper transition from one surface type to another, with surface types overlapping. NSIDC is now offering this surface-type mask as a standalone product to the public. It should be used strictly as a tool to learn how surface types were flagged for use in creating standard ICESat/GLAS data products. Other publicly available surface-type masks may be more suitable for other applications, depending on the scientific objective. The surface-type mask is available via HTTPS.

NOTE: GLAS Surface-Type Mask was developed using GLAS binary data. Accordingly, descriptions on this page refer to GLA05, 06, 12, 13, 14, and 15 binary products. Access to GLAS binary data was removed 01 August, 2017. Surface-Type Mask remains available as described below. All GLAS data are available in HDF5 format, products GLAH01 to GLAH15.

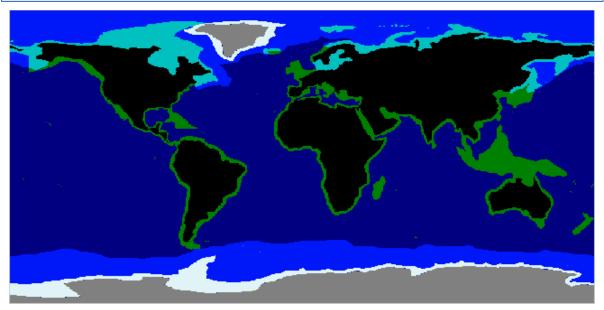


Figure 1. A reduced-resolution image created from the surface-type values

The data are stored as an 10800 by 5400 byte array, where each byte represents the surface type for one 2 arc minute grid cell on the earth. Each 10800 byte record represents a 360 degree latitude band. The first record starts at the north pole and the records follow at 2 arc minute intervals to the south pole. Within a record, the first byte is at 180° W and proceeds east at 2 arc minute intervals to 180° E.

Valid pixel values range from 1 to 15. The surface types are bit-coded, and any combination of surface type is allowed, although not all combinations are actually used. The bit coding is:

- bit 0 = land
- bit 1 = sea ice (winter maximum extent)

- bit 2 = ocean
- bit 3 = ice sheet

where bit 0 is the least significant bit. The table below shows the values used in the file.

Table 1. Description of values used in Figure 1.

Color in above image	Binary value	Decimal value	Surface types	Percentage of the mask	Data in Product
Not used	00000000	0	No type assigned	0	
	00000001	1	Land	18.88	GLA05, GLA06, GLA14
Not used	00000010	2	Sea ice	0	
Not used	00000011	3	Sea ice + land	0.02	
	00000100	4	Ocean	43.12	GLA05, GLA06, GLA15
	00000101	5	Ocean + land	5.12	GLA05, GLA06, GLA14, GLA15
	00000110	6	Ocean + sea ice	17.06	GLA05, GLA06, GLA13, GLA15
	00000111	7	Ocean + sea ice + land	3.69	GLA05, GLA06, GLA13, GLA14, GLA15
Not used	00001000	8	Ice sheet	0	
	00001001	9	Ice sheet + land	9.18	GLA05, GLA06, GLA12, GLA14
Not used	00001010	10	Ice sheet + sea ice	0	
Not used	00001011	11	Ice sheet + sea ice + land	0.01	
Not used	00001100	12	Ice sheet + ocean	0	
Not used	00001101	13	Ice sheet + ocean + land	0.02	
Not used	00001110	14	Ice sheet + ocean + sea ice	0	
	00001111	15	Ice sheet + ocean + sea ice + land	2.90	GLA05, GLA06, GLA12, GLA13, GLA14, GLA15

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