



ICESat-2 Mission Status and Overview at 6 years

Nathan Kurtz and the ICESat-2 Project Science Office

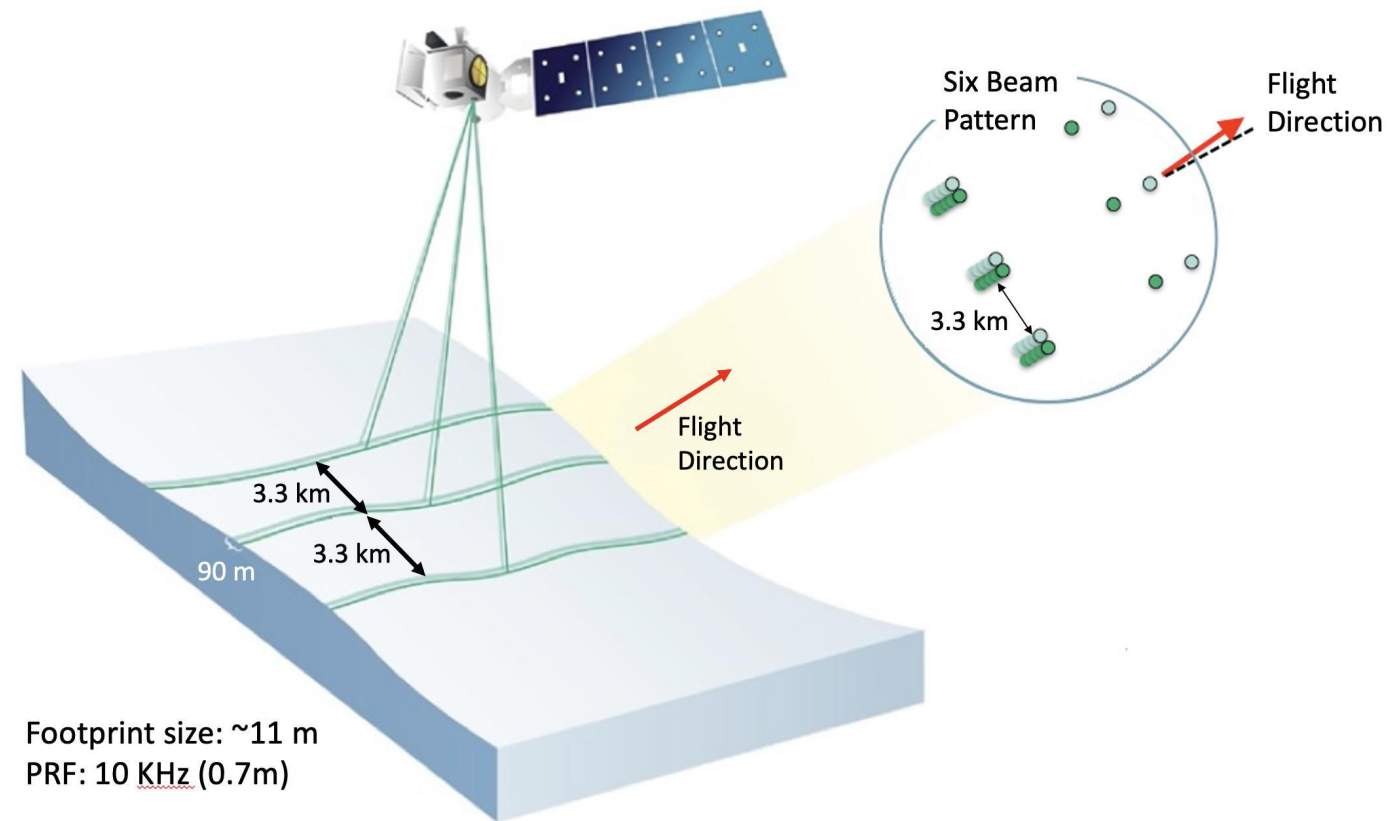
November 13, 2024

<https://icesat-2.gsfc.nasa.gov/>



Advanced Topographic Laser Altimeter System (ATLAS) instrument
Photon-counting laser altimeter at 532 nm (green)

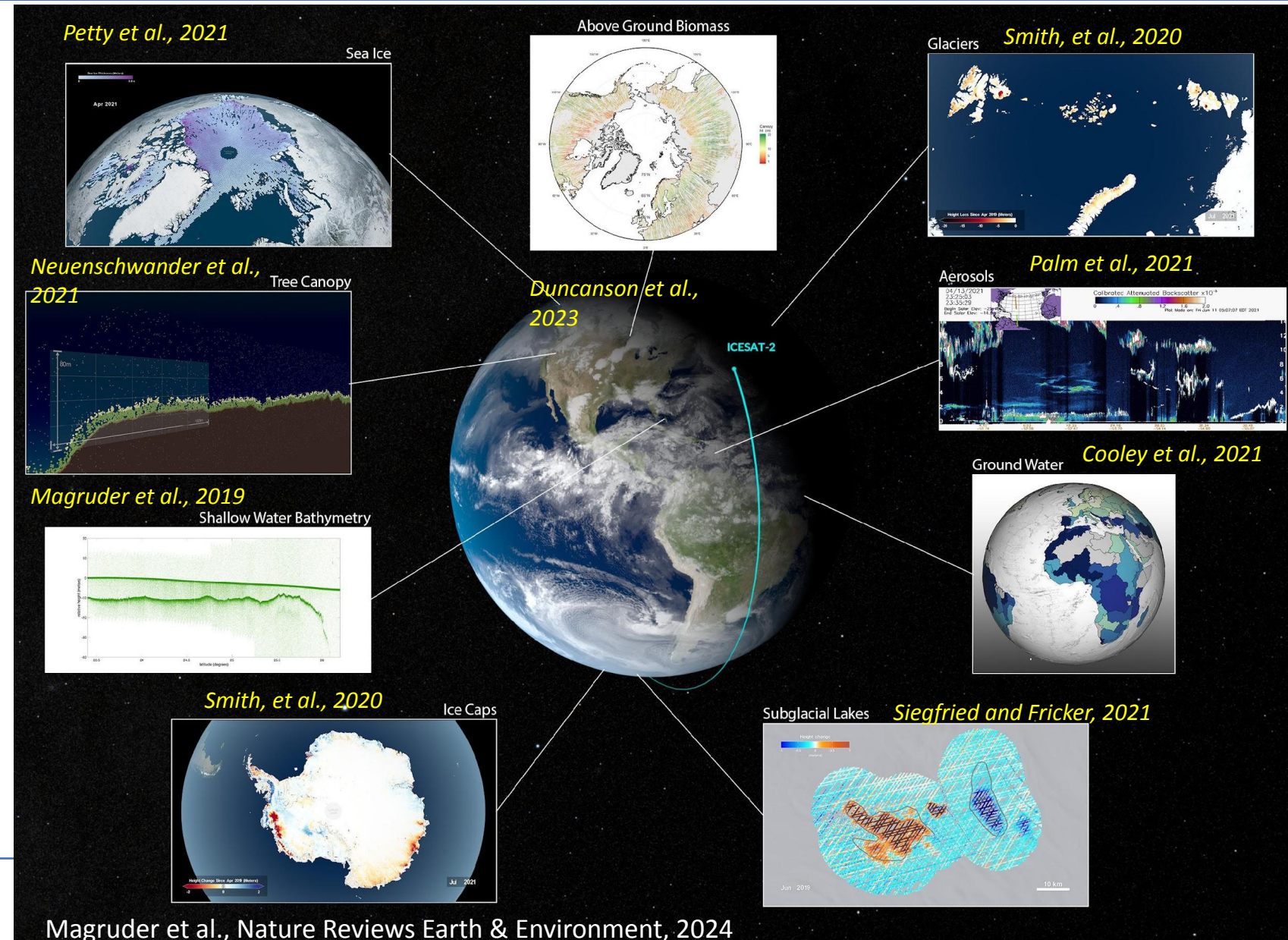
6 spots arranged in pairs
11 m footprint diameter
0.7 m along-track spacing



Extraordinary accuracy and precision of surface elevation measurements from space:

Height accuracy better than 10 cm
Geolocation accuracy better than 5 m

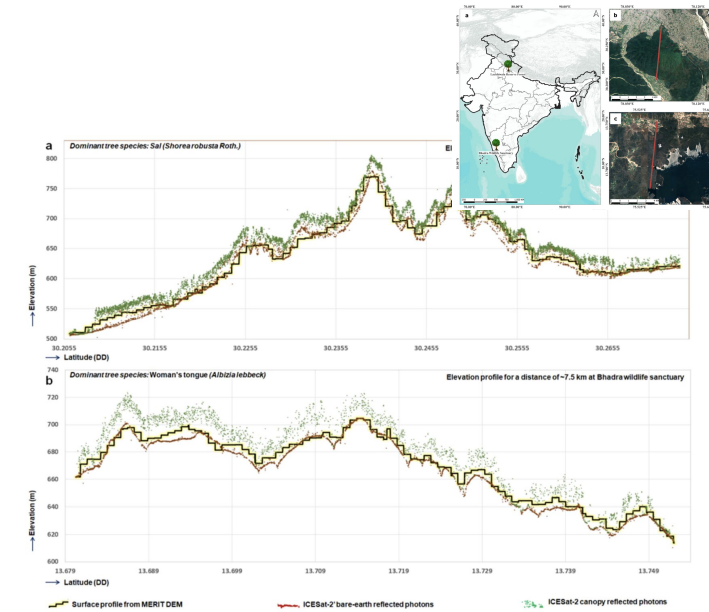
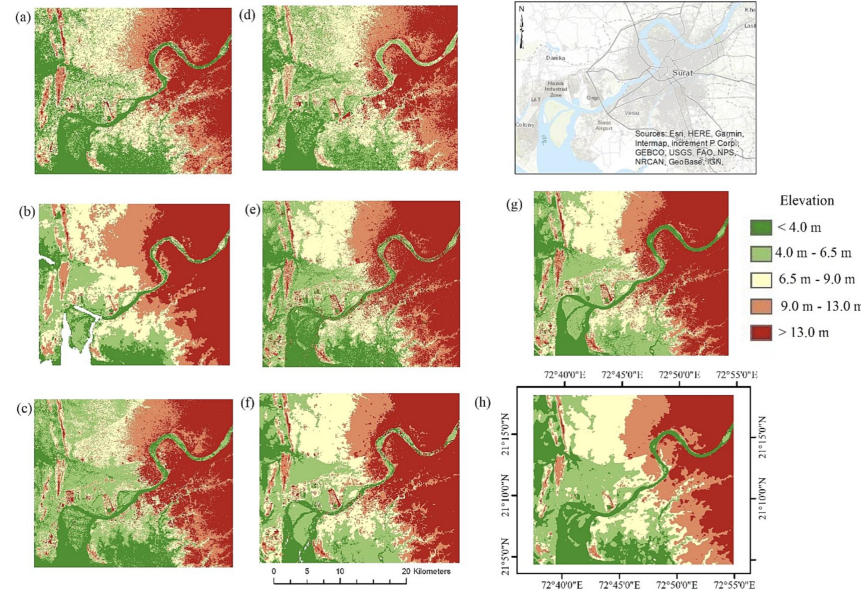
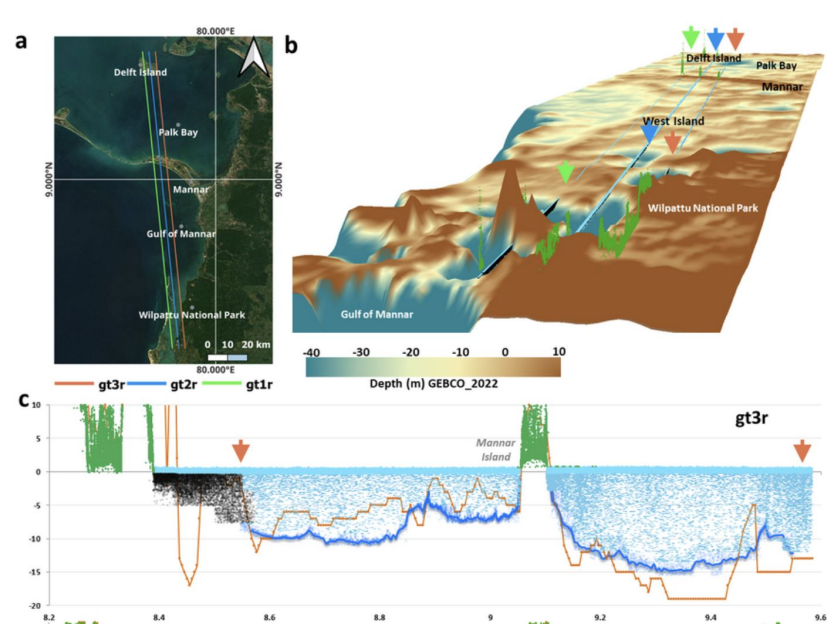
As we enter our 7th year we are getting towards direct measurement of decadal changes in the cryosphere, biosphere, atmosphere, oceans, and inland water



Bathymetry: Performance of GEBCO_2023 Gridded Bathymetric Data tested with IS2

Hydrology: IS2 used to assess suitability of global digital elevation models

DEM validation: IS2 used to assess MERIT DEM's performance as bare Earth model



Giribabu, D., Hari, R., Sharma, J. *et al.* Performance assessment of GEBCO_2023 gridded bathymetric data in selected shallow waters of Indian ocean using the seafloor from ICESat-2 photons. *Mar Geophys Res* **45**, 1 (2024). <https://doi.org/10.1007/s11001-023-09534-z>

Nandam, V., & Patel, P. L. (2024). A framework to assess suitability of global digital elevation models for hydrodynamic modelling in data scarce regions. *Journal of Hydrology*, *630*, 130654.

Dandabathula, Giribabu, Rohit Hari, Jayant Sharma, Koushik Ghosh, and Apurba Kumar Bera. "Validation of MERIT DEM's Performance as a Bare-Earth Model Using ICESat-2 Geolocated Photons." *Earth* *12*, no. 5 (2023): 166-175.

Current Status

All is well!

2,200 days on-orbit since launch on 15 September 2018

ATLAS transmitting laser light since 1 October 2018

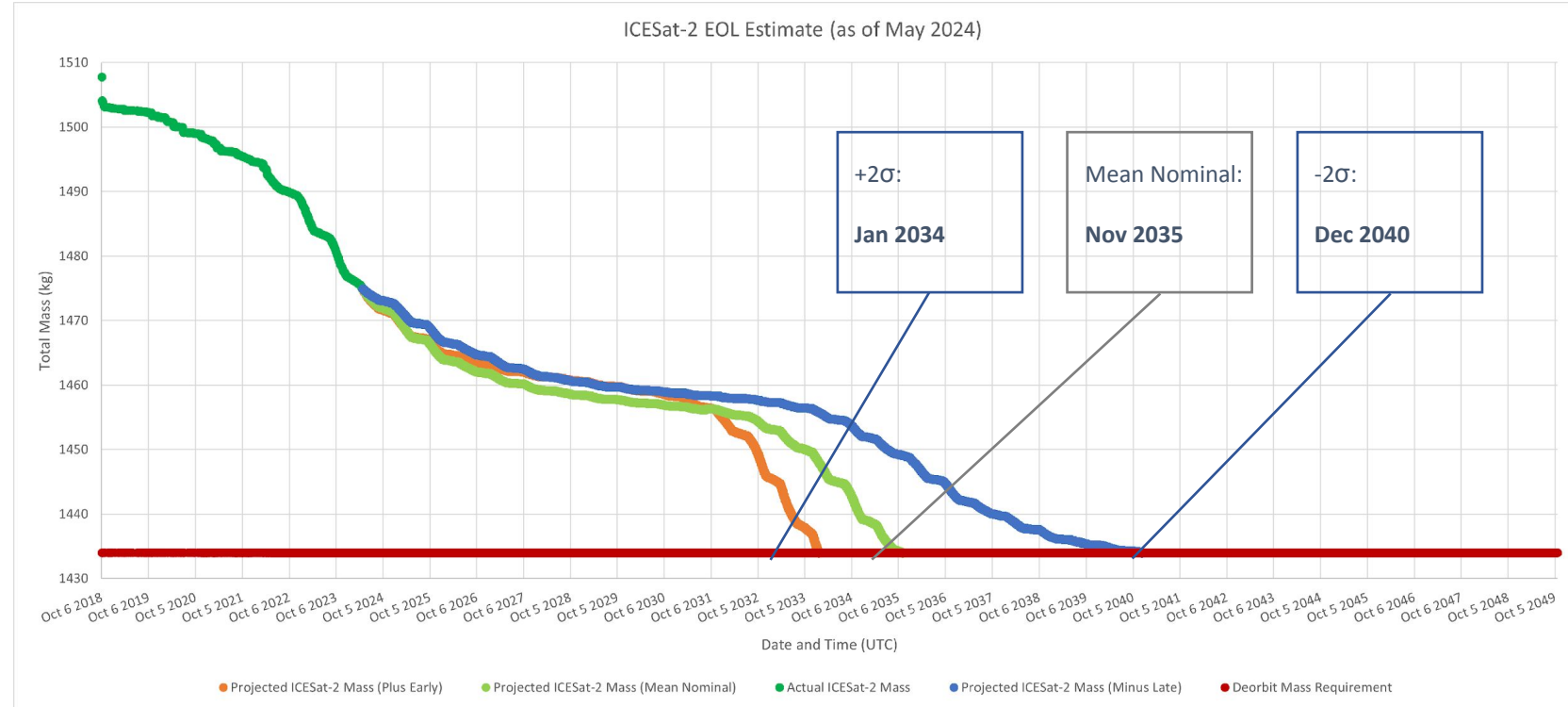
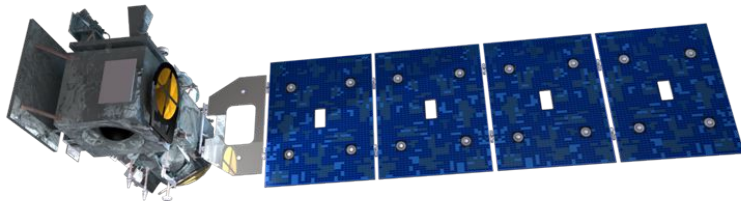
1.855 Trillion laser pulses, and counting

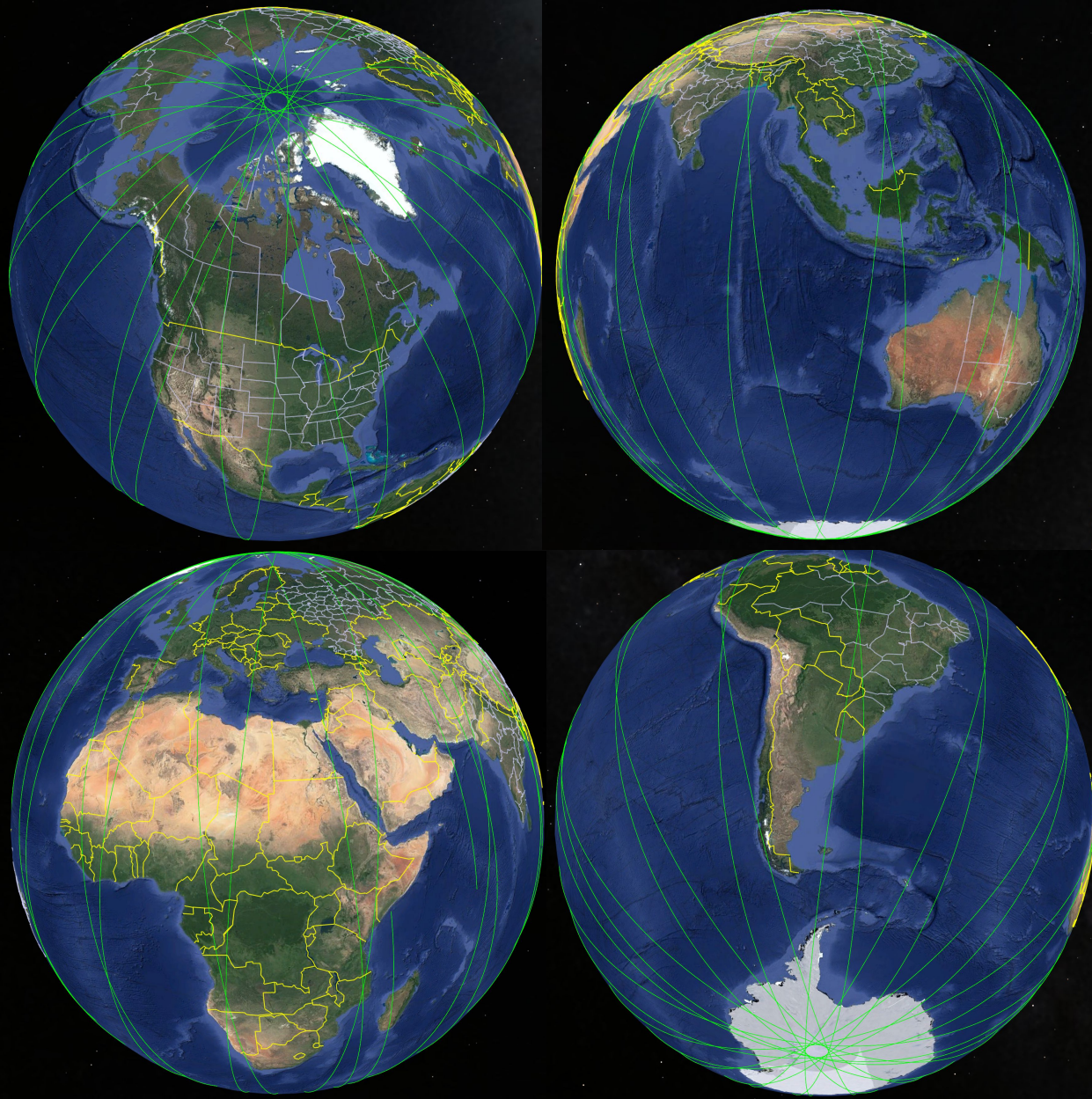
***Performance metrics
remain nominal and within
requirements.***



Life-limiting factor is on-board fuel. Fuel use dependent on solar activity - current peak activity of cycle 25.

Estimated mean nominal End of Life is Nov 2035





Coverage spans 88° N to 88° S
92-degree orbit inclination angle

Repeat polar tracks every 91 days

Pointing plans alternate between
repeat measurements and increased
densification

Reference Ground Track plans:
<https://icesat-2.gsfc.nasa.gov/science/specs>

Data hosted at National Snow and Ice Data Center (NSIDC DAAC) – Rel006 now available

Latency

Standard products ~45 days from acquisition

Quick Look products ~3 days from acquisition

Data available Oct 14, 2018 – July 31, 2024

Quick Look data available August 1, 2024 – present

As of July 31, 2024:

8,782 registered users

54,852,912 science file downloads

~500 papers published to date

100+ papers published in 2024 alone

Data

The following table lists the ICESat-2 data sets currently available from NSIDC DAAC. Use the links to visit each data set's landing page, where you can view documentation and options for obtaining the data.

Note: Version 5 data sets are being released as they become available. For some ATL products Version 4, 3, 2, or 1 is the most recent product version.

Data for this collection: 33

[EXPLORE ALL DATA](#)

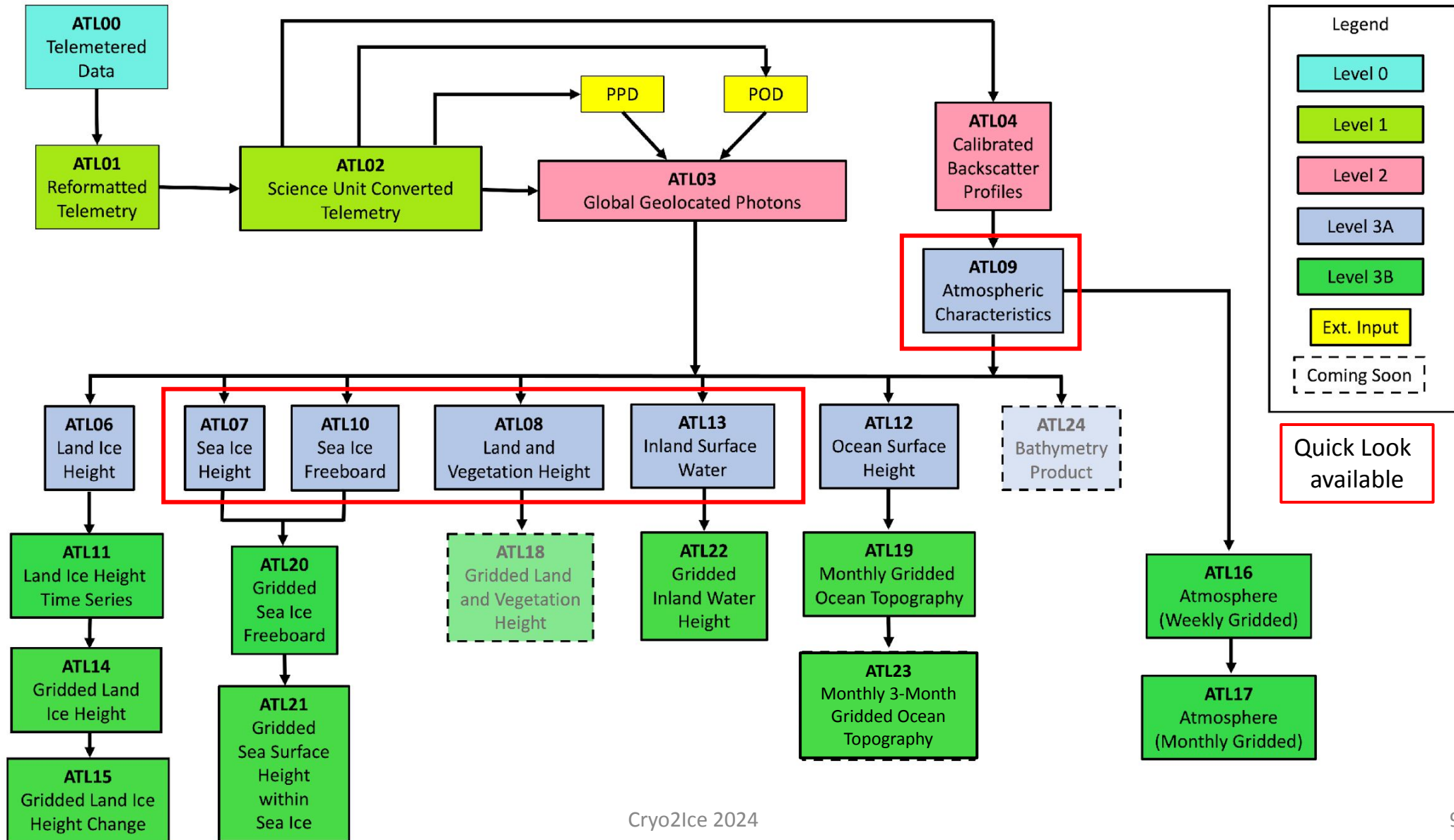
Filter by: - All - [Apply](#)

NAME	SPATIAL COVERAGE	TEMPORAL COVERAGE	PARAMETER(S)
ATLAS/ICESat-2 L1B Converted Telemetry Data, Version 6 (ATL02) <small>Cloud access now available</small>	N: 90 S: -90 E: 180 W: -180	13 October 2018 to present	ENGINEERING TELEMETRY ANCILLARY DATA
ATLAS/ICESat-2 L1B Converted Telemetry Data, Version 5 (ATL02) <small>Cloud access now available</small>	N: 90 S: -90 E: 180 W: -180	13 October 2018 to present	ENGINEERING TELEMETRY ANCILLARY DATA
ATLAS/ICESat-2 L2A Global	N: 90	13 October 2018	TERRAIN ELEVATION

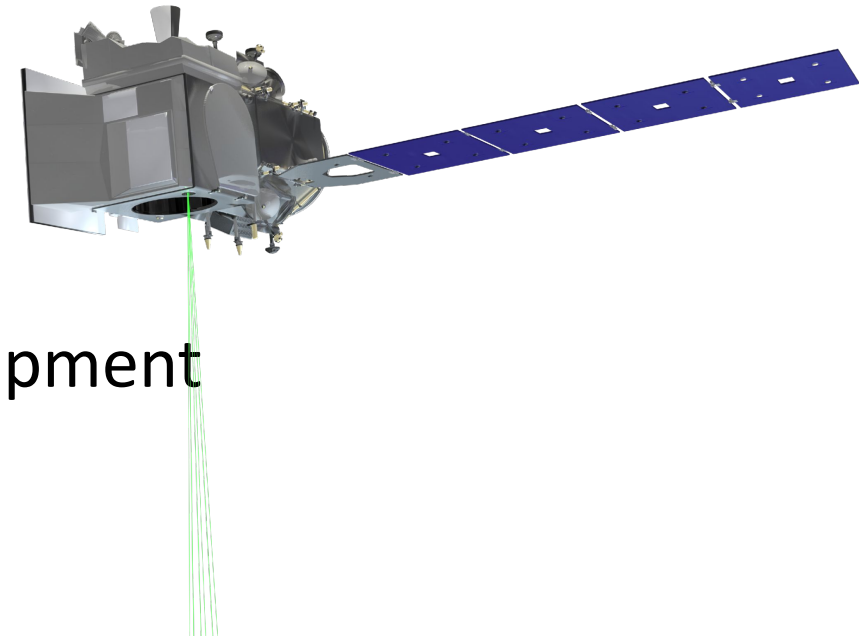
- Overview
- Documentation
- Help Articles
- Data Tools
- Data Announcements
- Published Research
- ICESat-2 Product Overviews
- Related Data
- Data**

[Support](#)

<https://nsidc.org/data/icesat-2/data>

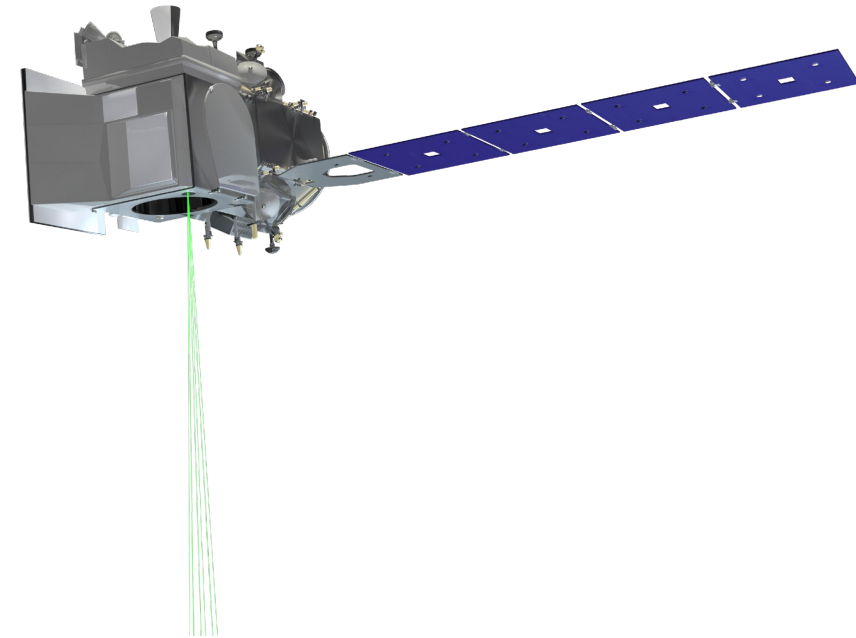


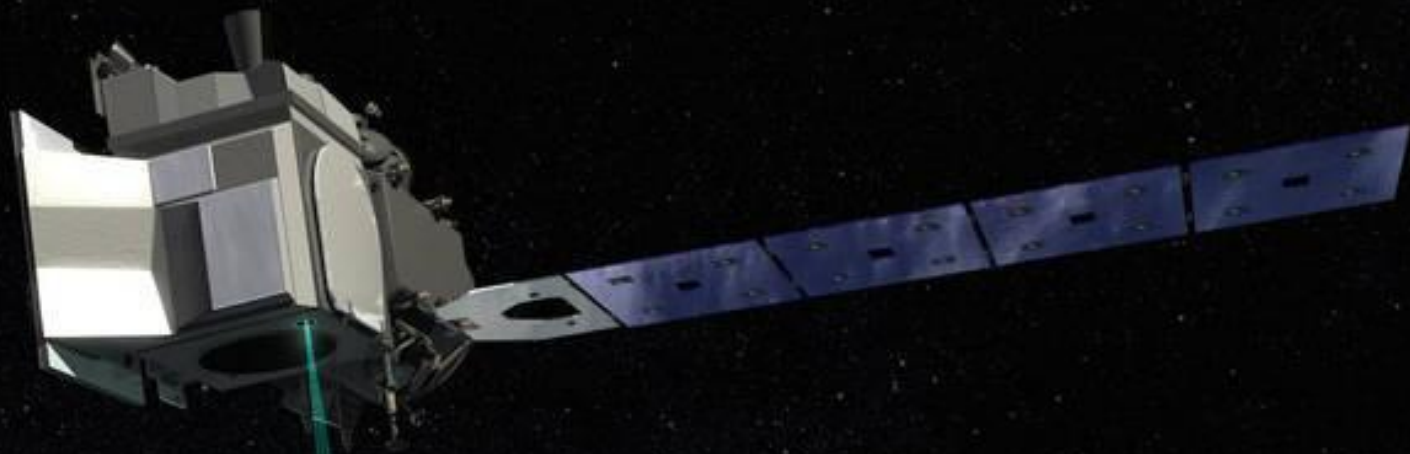
- New release of Level 3b gridded products
- ATL24 bathymetry expected late 2024/early 2025
- Release 007 target release Spring 2025
- Future standard products under development
 - Gridded Land and Vegetation Height (ATL18)
- Other Future Quick Look products under development
 - Gridded Sea Ice Freeboard (ATL20)
 - Lake Ice Freeboard



For field campaigns or specific tracks of interest please let us know at least 3 weeks in advance to ensure operation in science mode

- ICESat-2 is healthy with no significant instrument or spacecraft concerns and sufficient fuel until ~2035
- The accuracy and precision of ICESat-2 are unparalleled from space allowing for unprecedented monitoring of essential climate variables across the Earth system
- As we enter into Year 7, we are now getting towards direct measurement of decadal changes in the cryosphere by a single mission



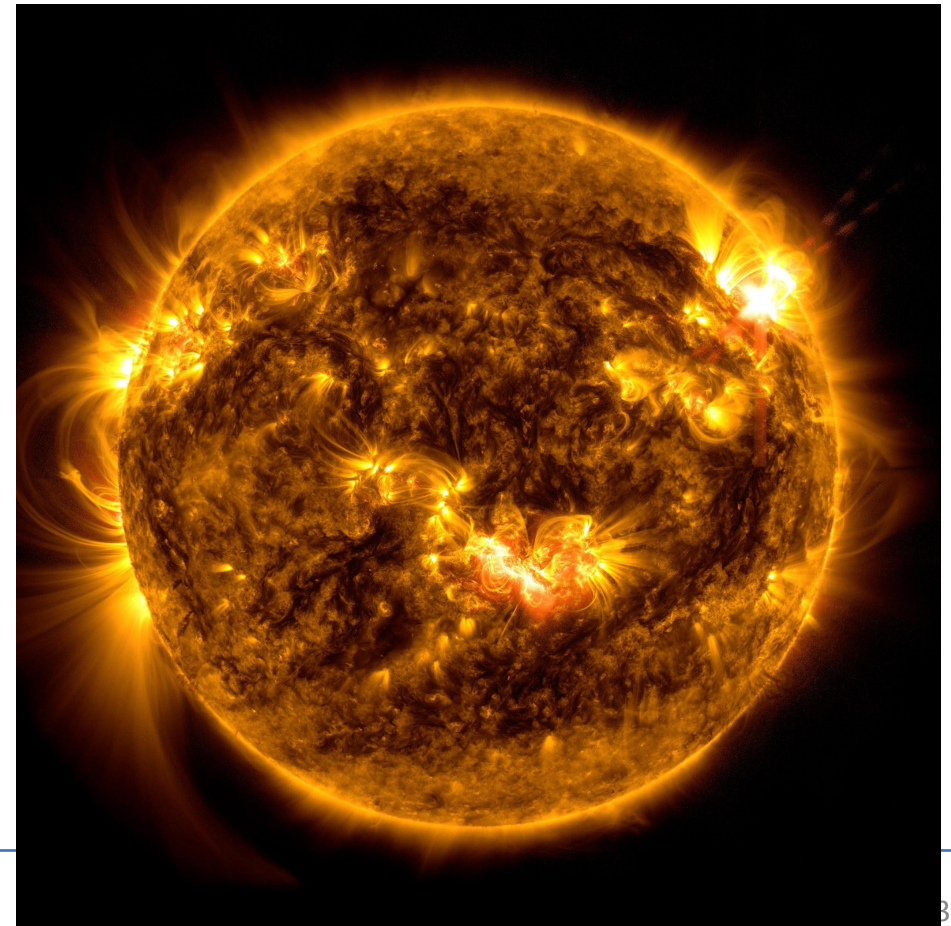
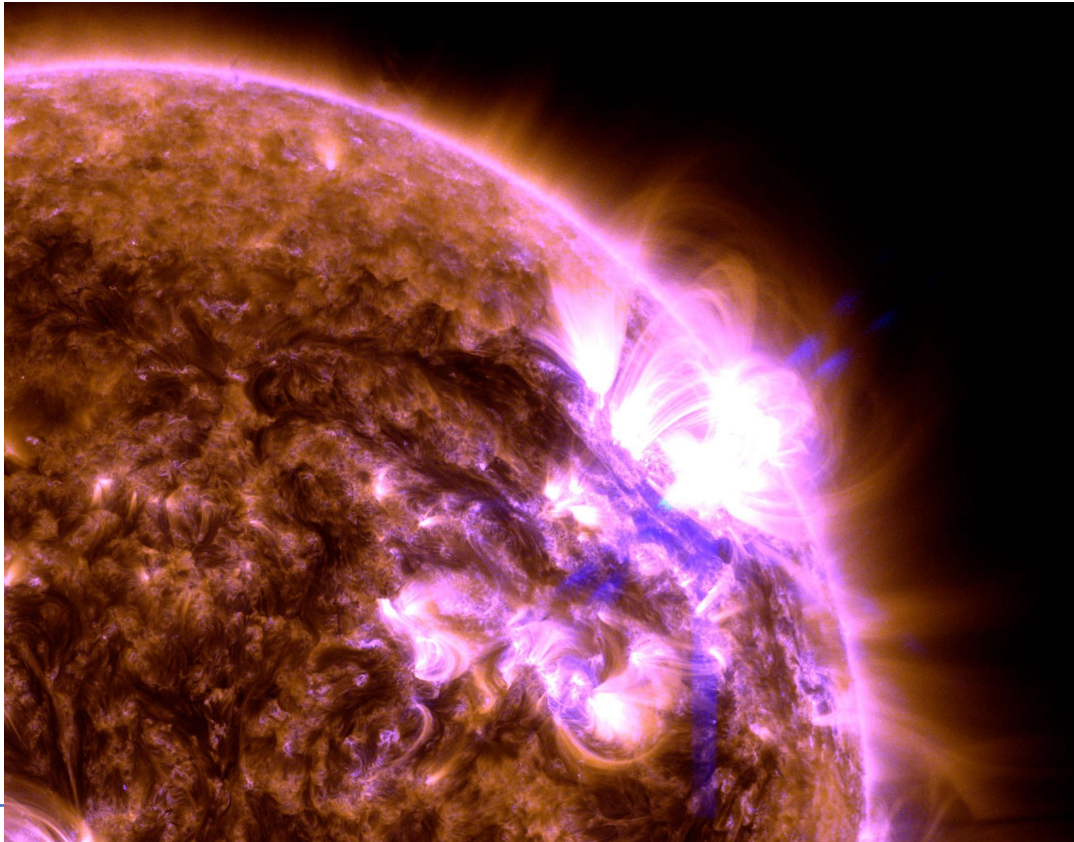


Thank you

<https://icesat-2.gsfc.nasa.gov/>

May 8th

Most powerful solar storm
since May 1989!



- **May 10-17:** Safe-hold due to most powerful solar storm since 1989
- **May 14 - June 22:** RGT excursion peaked at 286.526 km
- **May 28 – June 18:** Collected pure background
- **June 18 21:47 UTC:** Resumed RGT pointing on RGT 22
- **June 21 3:07 UTC:** Resumed Science Mode data collection on RGT 55
- **June 22 19:08:55:** Returned to nominal orbit
- **June 25 09:56 UTC:** Yaw flip to -X
- **June 27 00:00:** Resumed vegetation off-pointing and TOOs on RGT 145
- **June 29:** On-orbit parameter optimization activities completed