



# ICESat-2 for Arctic Applications

Launch of the NASA Ice, Cloud and Land Elevation Satellite (ICESat-2) mission on September 15, 2018 has enabled freely available spatially dense and fine precision global information of our Earth's surface elevation. Since 2012, NASA ICESat-2 Applications program has worked to understand how the ICESat-2 observations can be used to inform a variety of applications, including use of ICESat-2 for Arctic marine applications. This includes Early Adopter (EA) work on the potential use of ICESat-2 to improve operational sea ice forecasting for decision processes related to Arctic marine navigation, shipping, and national defense strategic operations. ICESat-2 hosts 24 EAs who provide insight into the opportunities and challenges for rapidly ingesting or effectively applying the information to inform target actions.

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## ACKNOWLEDGEMENTS

ICESat-2 Early Adopters, Woody Turner [Applied Sciences Program, NASA Headquarters] & ICESat-2 Project Office

## KEY QUESTIONS

- How can ICESat-2 be used effectively within analyses, forecasts, and models so as to improve decision processes needed to address practical societal needs?
- What is the scientific information flow for different applications starting from observation to end-use? Who is involved?
- How can the expected observations be leveraged or complemented with other data sources so as to lead to improved data products?

## APPLICATIONS GOALS

- Understand and engage the potential user community of ICESat-2 science data.
- Expand awareness of ICESat-2 science data products.
- Understand ICESat-2's potential relevance and value to society.
- Applications discovery for all mission data products.
- Bridge science teams and stakeholders to create new synergies that can lead to improved data products.

## OUTREACH STRATEGY

The ICESat-2 Applications Program implements various engagement and outreach activities, as well as Early Adopter and Applied User programs, to facilitate dialogue between potential users, project scientists, science definition team members, NASA Headquarters and the mission's data distribution center—the NASA National Snow and Ice Data Center (NSIDC).

This dialogue creates the necessary feedback loops needed to clarify the expected functionality of ICESat-2 and how its science data can be integrated, improved or leveraged to advance research objectives aligned with or beyond those of the mission, and in support of a range of decisions and actions of benefit to communities across the globe.

## ASK ME ABOUT THE ICESAT-2 APPLIED USERS PROGRAM!

OBSERVATION

GLOBAL OBSERVATIONS for GLOBAL APPLICATIONS



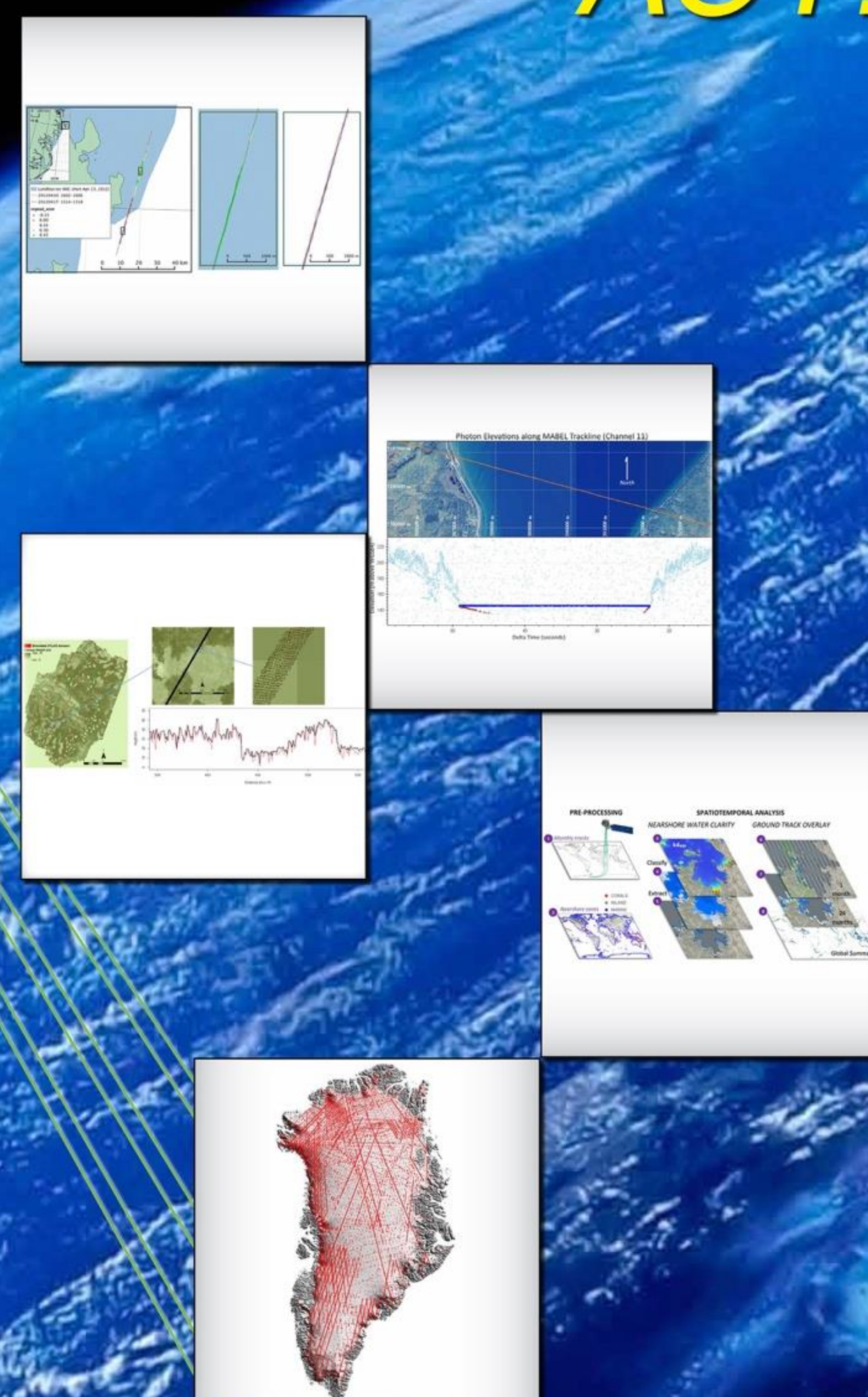
ICESat-2's global height measurements of our Earth's surfaces will allow for practical uses of the data beyond polar regions.

With its detailed global coverage, ICESat-2 will fill in gaps where coverage has previously been limited or non-existent.

INTEGRATION

ICESat-2 EARLY ADOPTERS

It's a BALANCING ACT!



Earth science data users have broad needs for data to inform their research and applications.

Knowing what to expect from ICESat-2 data in terms of functionality, volume and access allows data users to make informed decisions on how to meet their model, forecast, or analyses requirements.

APPLICATION

ICESat-2 EARLY ADOPTERS



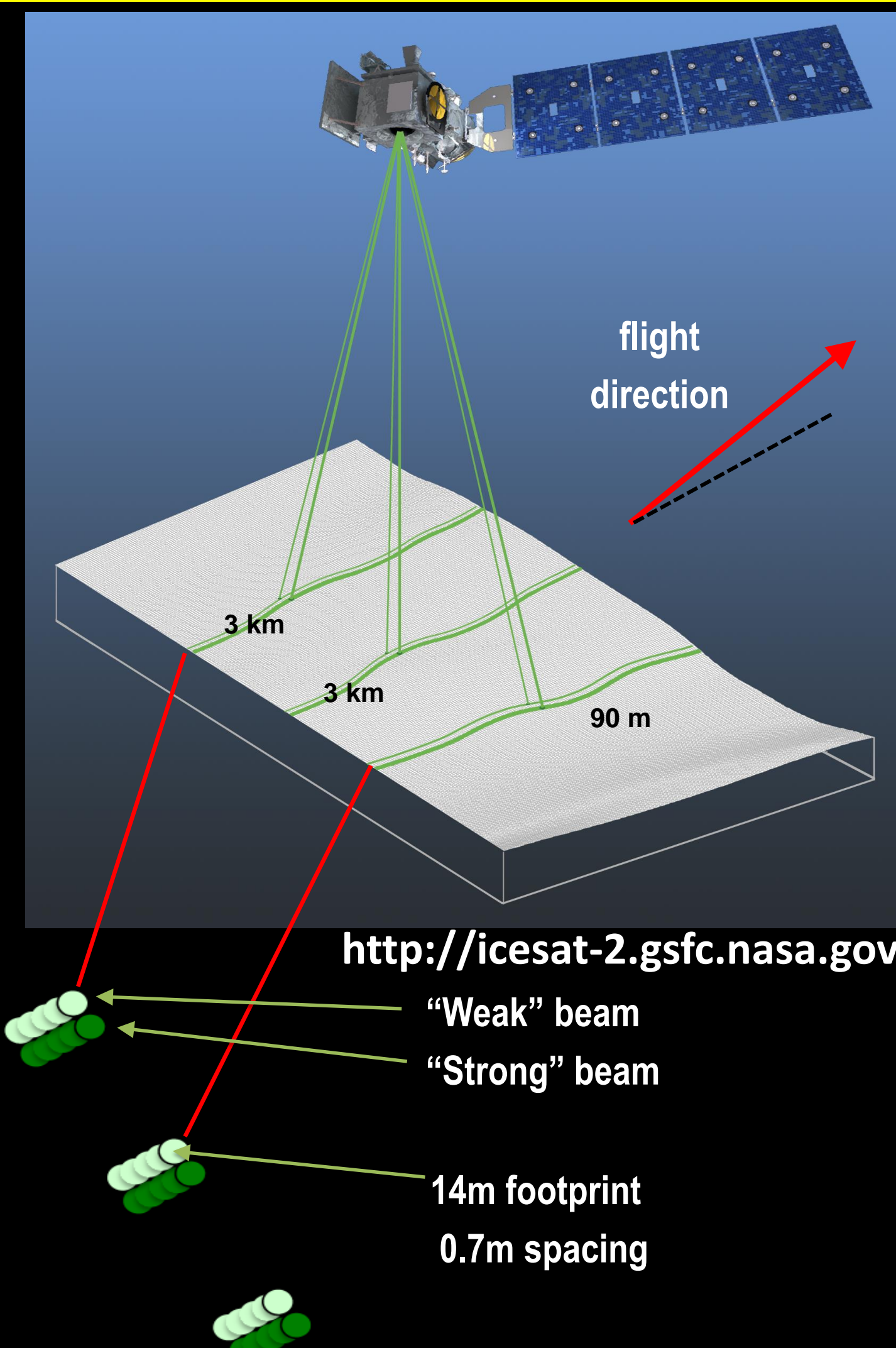
ICESat-2 Earth observations and scientific knowledge will inform policy, business and management decisions.

ICESat-2 Early Adopters envision improvements in decision processes needed to advance applications. These applications range from monitoring global flood risk, to operational sea ice forecasting for Arctic shipping, to improving fire fuel mapping in the United States.

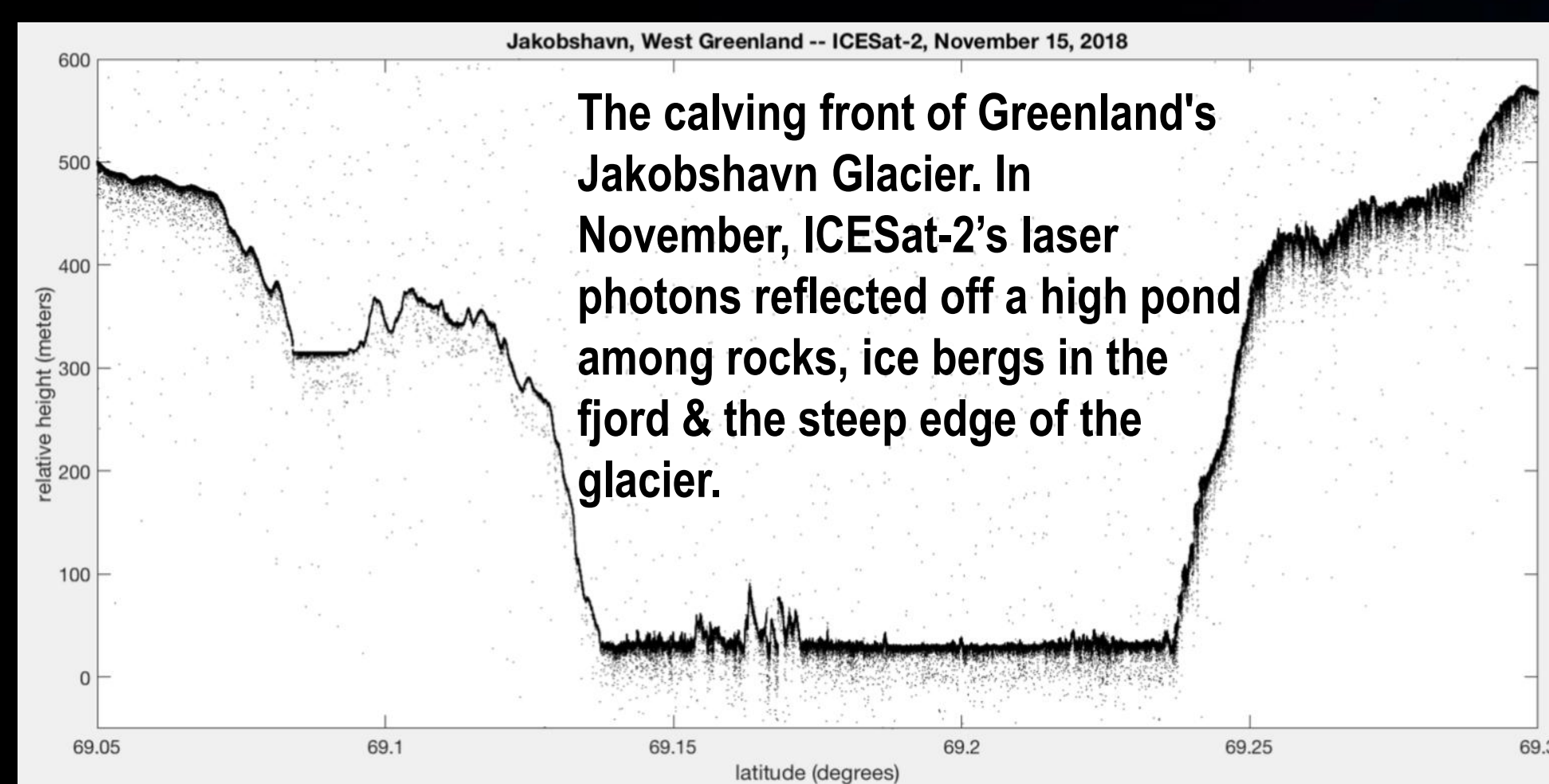
### About ICESat-2 Early Adopters

ICESat-2 Early Adopters are individuals or groups from national and international public or private sector organizations, universities, and government agencies who have a direct or clearly defined need for ICESat-2 data products. They have an existing application or decision-making activity and apply their own resources (funding, personnel, facilities, etc.) to demonstrate the utility of ICESat-2 data for their particular application. An Early Adopter may either be an end-user or conduct the pre-launch research for an end-user.

## NASA ICESAT-2 DATA NOW AVAILABLE VIA THE NASA NSIDC DISTRIBUTED ACTIVE ARCHIVE CENTER

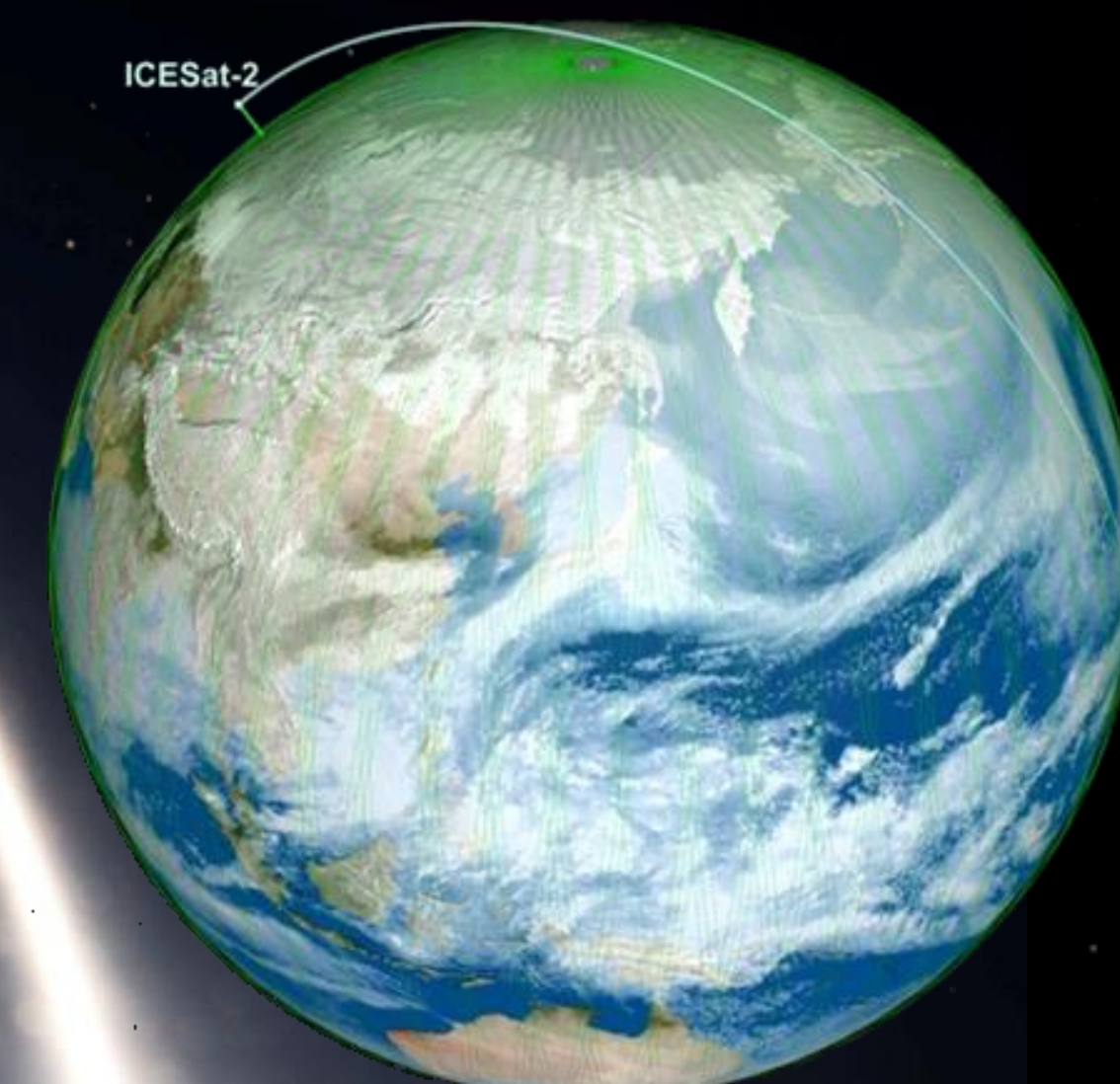


- **Instrument:** Advanced Topographic Laser Altimeter System (ATLAS)
- **Status:** 273 days on orbit and 222 billion laser pulses (through 15 June 2019) since launch. Performance metrics remain nominal, and within requirements.
- ICESat-2 data is available via the **NASA NSIDC DAAC**. Visit <https://nsidc.org/data/icesat-2> to access and download the data!



[https://twitter.com/NASA\\_ICE](https://twitter.com/NASA_ICE)

**High latitudes:** ICESat-2 repeats observations along precisely established reference tracks.



**Low latitudes:** ICESat-2 operates in a systematic off-pointing mapping scenario slated to start July 25, 2019.

Image: NASA/Bill Ingalls