

## Release of First-Light Images by WNISAT-1R

*An important milestone for the satellite's commissioning phase  
and a step closer to nominal operations*

[WNISAT-1R](#), the atmospheric- and marine-observation satellite developed by Axelspace Corporation (HQ: Chuo-ku, Tokyo; CEO: Yuya Nakamura) and Weathernews Inc. and launched from the Baikonur Cosmodrome in Kazakhstan on July 14, 2017 at 6:36 AM UTC, has been confirmed to be working as expected and has succeeded in capturing its first images of the Earth.

WNISAT-1R is currently in a preliminary *commissioning* period. A first part of this period, the *critical phase*, in which the basic health conditions of the satellites are confirmed, has been concluded. Now the *bus checkout phase* and the *mission checkout phase*, focused on verifying the normal operation of, respectively, all bus-related and all mission-related components, are ongoing. After all these initial checks will have ended, the automated operation system will be tested and control of the satellite will be handed over to Weathernews, officially starting the *nominal operations* phase.

### First-Light Images

Four shots taken by WNISAT-1R are shown in Figures 1 through 4. Figure 5 details the time and location where each image was taken. These images are the result of the common efforts of Weathernews Inc., Axelspace Corp. and the Tokai University Research and Information Center's Yokotsuka Laboratory.

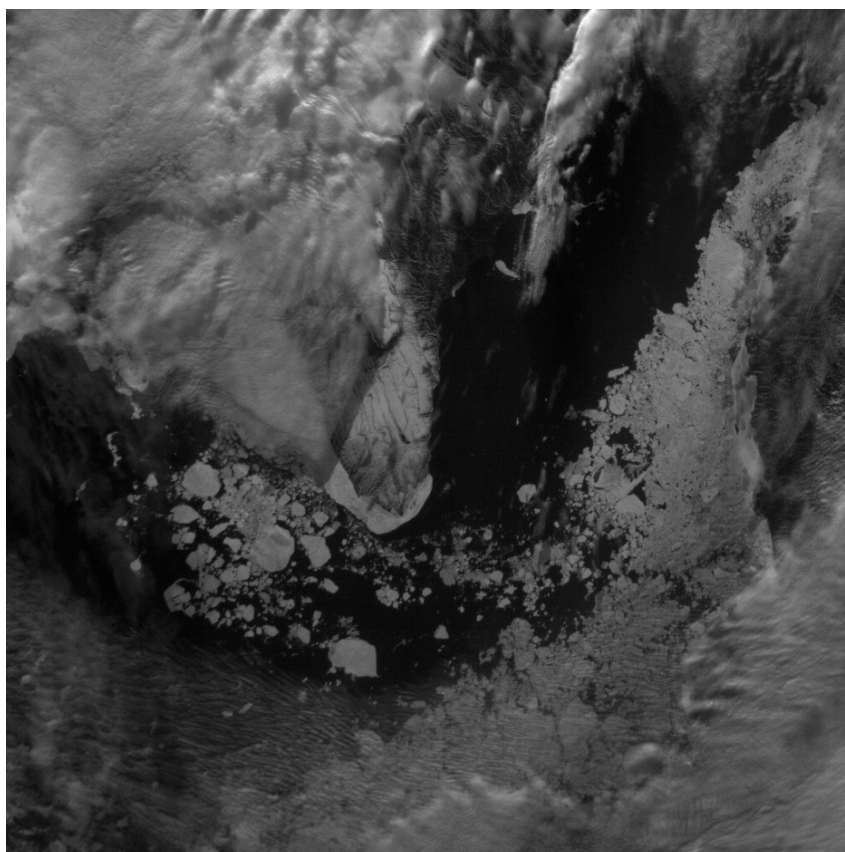


Figure 1: Vilkitsky Strait, Russia (band: panchromatic).

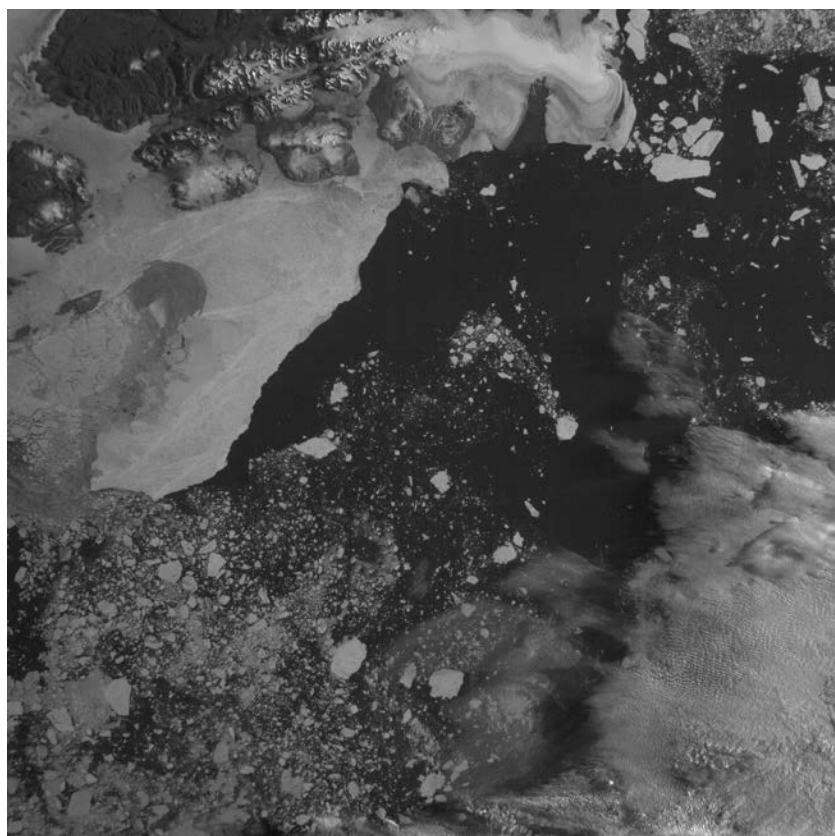


Figure 2: Northern Greenland (band: panchromatic).

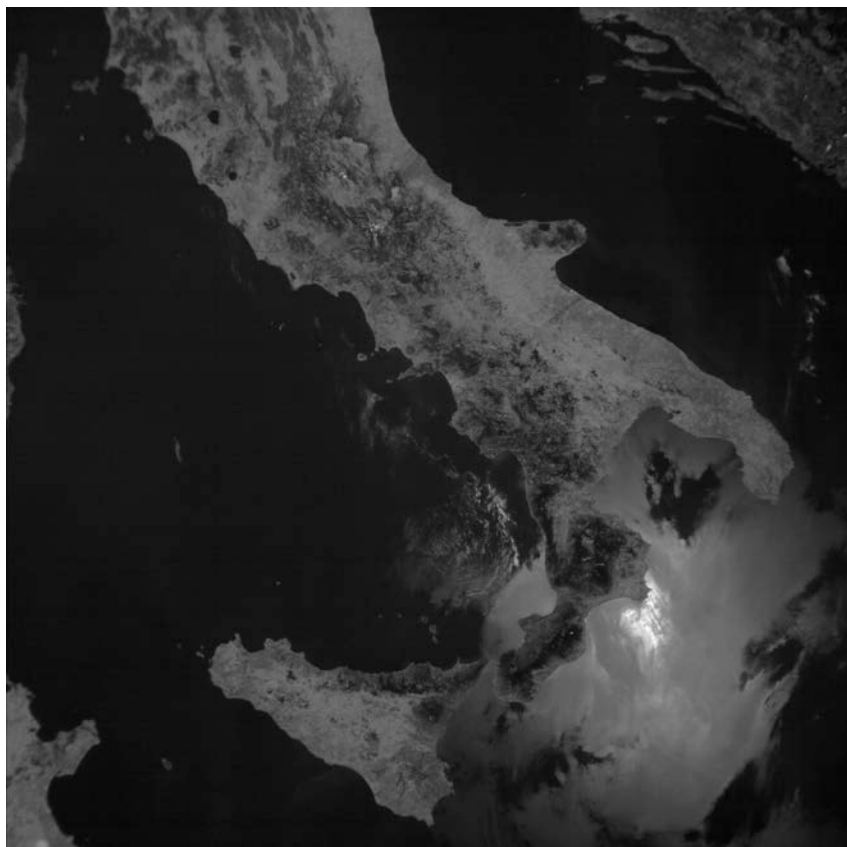


Figure 3: Southern Italy (band: red).

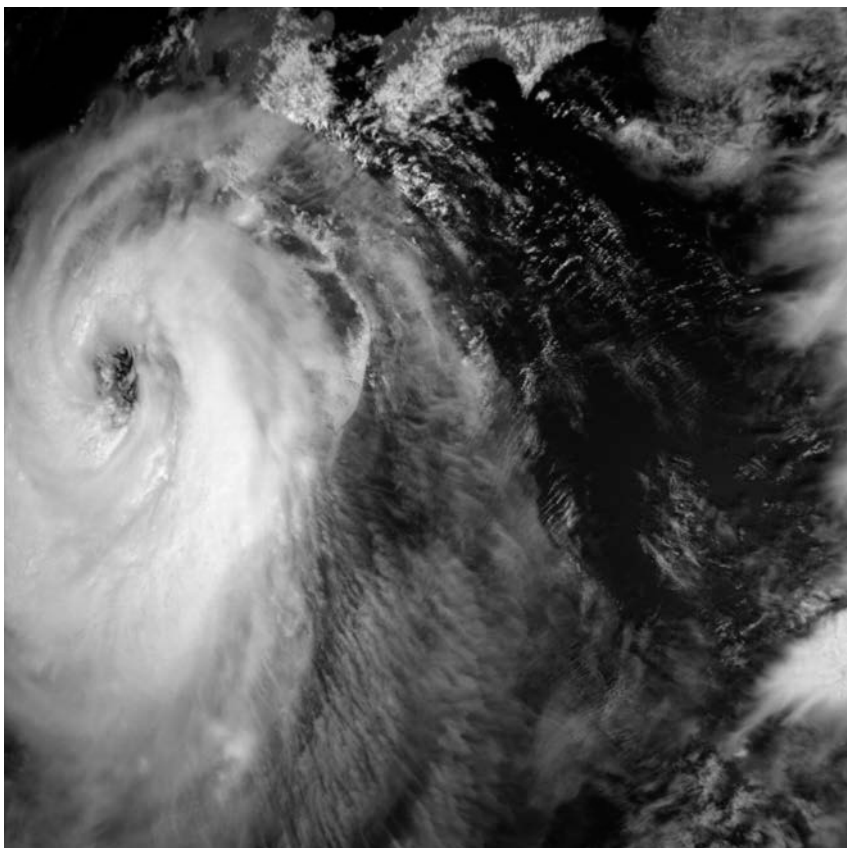


Figure 4: Kyushu and Shikoku, Japan (band: NIR).

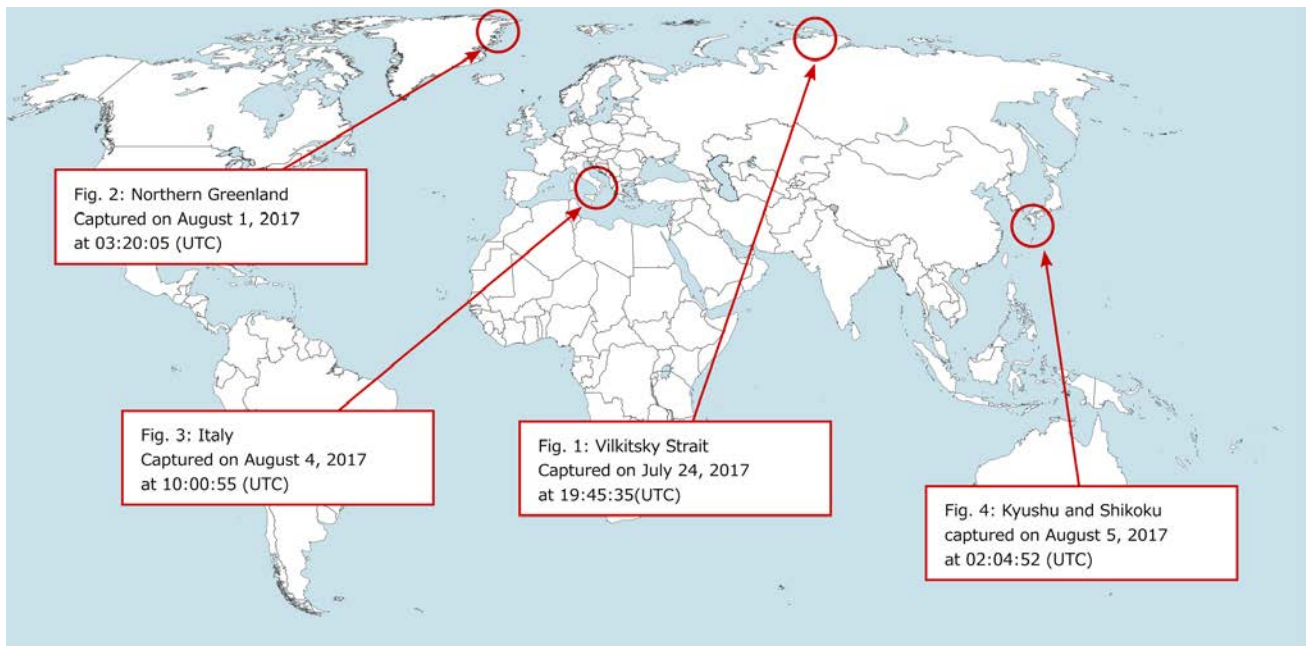


Figure 5: Time and location of each image.

For cargo ships, the segment of the Northern Sea Routes that is hardest to navigate is the Vilkitsky Strait: Figure 1 shows that it is possible to analyze in detail the distribution of sea ice in the region. Figure 4 shows Typhoon Noru on August 5<sup>th</sup>, 2017 as it wandered above the Pacific Ocean headed towards Japan.

#### Note

- Each image was acquired independently on a single spectral band, and is thus shown as a grayscale picture.
- Scale varies between the images.

#### About WNISAT-1R

With a mass of 43kg, the microsatellite WNISAT-1R is equipped with an optical camera to observe atmospheric and marine natural phenomena. To provide high quality information about the best sea routes in places like the Bohai Sea (China) and the Gulf of Saint Lawrence (Canada) during the winter and the Arctic Sea during the summer, it is necessary to frequently measure the distribution of sea ice. The most effective way to do this is with a dedicated satellite in space, and WNISAT-1R has been built to be such a satellite. Developed jointly by Axelspace and Weathernews, it inherits and improves on its predecessor WNISAT-1, which was launched in 2013. Moreover, besides its main mission described above, WNISAT-1R has the additional missions of observing atmospheric phenomena such as typhoons and volcanic activity and the analysis of ground conditions based on reflected signals from GPS and other navigation satellites, a technology called GNSS-R (Global Navigation Satellite System – Reflectometry)<sup>1</sup>.



## Main Specifications of WNISAT-1R

Mission Specifications	
The number of cameras	4 (independent bands)
Spectral Bands	PAN <sup>2</sup> (450-650nm), G(535-607nm), R(620-680nm), NIR(695-1005nm)
Pixel Count	2048 x 2048
Ground Resolution	PAN, G: 200m R, NIR: 400m
Bit Depth	12bit

## Glossary

1. GNSS: acronym standing for Global Navigation Satellite System. Besides the GPS constellation developed and operated by the United States, the term also covers other projects such as Russia's GLONASS and Europe's Galileo.
2. PAN: abbreviation of "panchromatic". It refers to a single band that is sensitive to all visible wavelengths for this satellite.

## About Axelspace

Head office location: Clip Nihonbashi Building 2-3F, 3-3-3 Nihonbashi-Honcho, Chuo-ku, Tokyo, Japan

President & CEO: Yuya Nakamura

Establishment: August 8, 2008

Capital stock: 1,957 Million JPY (as of August 2017)

Main business content: Solutions based on microsatellite technology, design and production of microsatellites and related components, launch arrangements and operational support, business related to microsatellite data

URL: <https://www.axelspace.com/en/>

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