



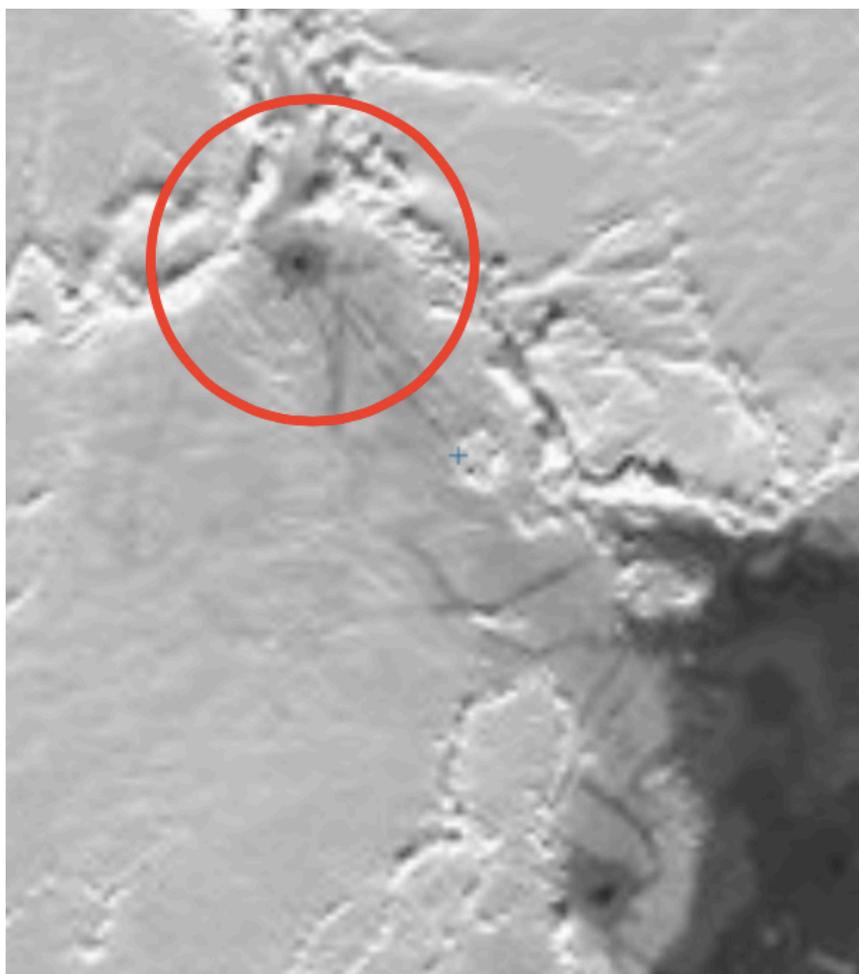
ACADEMIC COMPETITION SAVES SEAL PUPS

# MAXAR

## ACADEMIC COMPETITION SAVES SEAL PUPS

Although Russia introduced a ban on the catch of harp seals in the White Sea in 2009, population numbers have continued to decline. Available expanses of thick sea ice, a main factor in seal pup survival, are under threat from warming seas and icebreaking vessels. Leveraging high-resolution satellite imagery, a team of students are helping icebreaking ships navigate around seal whelping grounds.

To maintain key transit routes through the White Sea, icebreakers clear shipping routes through ice fields each November through May. The vessels cannot change course quickly and only with advance notice of whelping ground locations, direction, and speed of ice drift can routes be planned to avoid whelping grounds. As part of a competition organized by LoReTT Engineering Company, students were taught to use satellite imagery to identify whelping grounds, map surrounding ice, and calculate ice drift to help icebreakers plan and navigate clear routes.



HARP SEAL WHELPING GROUNDS SEEN FROM MAXAR'S GEOEYE-1

### PROTECTING ICE FOR WHELPING

Around February and March each year, harp seal females gather on expanses of drifting pack ice, or whelping grounds, to birth and nurse their pups. Without expanses of thick, solid ice, pups drown or are crushed by broken-up chunks of ice. With the decline of ice cover expected to continue, the survival rate of pups is under serious threat. Taking action to monitor and protect ice expanses for whelping is critical for population recovery.



*"Every day the children sent reports on the location of the detected whelping grounds to the headquarters of the icebreaking operations of the Western Arctic Seaport Authority which processed such information in order to correct the icebreaking routes. When children see harp seals in satellite images, this is a delight."*

OLGA GERSHENZON, CO-FOUNDER AND DEPUTY DIRECTOR GENERAL, LORETT ENGINEERING COMPANY

## LEARNING FOR A CAUSE

Sealpups-2019 was organized as part of On Duty for Planet, an initiative that fosters space-related projects and technology contests for Russian students. More than 1300 students aged 13 to 19 took part in the first stage of online testing. In the second stage, 110 students organized into 22 teams were trained during a two-month period.

Over the course of 10 days in March of 2019, students reviewed new images daily and identified 20 whelping grounds. By monitoring and predicting the movement of ice, the students could provide updates to the Western Arctic Seaport Authority, allowing for alternate courses for icebreaking vessels to avoid the identified areas.

To protect a moving target, Maxar's ability to provide images with ultra-high spatial resolution, updated daily, helped locate whelping grounds as they drifted.

During the final stage of the contest, 15 students from 14 Russian cities went to the Sirius Educational Center in Sochi, Russia to undertake real-time harp seal pup rescue. Students conducted image processing and analysis, ice mapping, search for whelping grounds, ice drift calculations, overflight validation, and transfer of data to seaports.

## Technology with heart

Accessible geospatial data and technology enable new ways to monitor, analyze, and share critical information about our planet. We are proud to partner with organizations like LoReTT and participate in educational opportunities like this, helping new generations cultivate the skills to tackle complex environmental challenges.

### RUSSIAN STUDENTS, AGES 13-17, LEARN TO USE SATELLITE IMAGES TO PROTECT HARP SEAL PUPS



## SEEING CLEARLY AND QUICKLY

Changing the course of icebreakers to protect a moving target requires knowing precise locations of breeding grounds and receiving frequent, clear updates to predict where ice will shift next. The ultra-high spatial resolution of Maxar's GeoEye-1 and Worldview-1 and 2 imagery provided the project's clearest images, allowing students to confidently distinguish whelping grounds from space.

Maxar's ability to deliver up-to-date high-resolution images daily made it possible to confirm predictions of animal location and adjust the path of the icebreaking vessels in sufficient time.

## PARTNERING FOR STUDENTS AND SPECIES

To create a project sophisticated enough for real-life impact yet feasible for analysis by young students required the resources and support of a range of partners. A number of satellite operators (Roscosmos State Corporation for Space Activities, Progress Rocket Space Centre, Maxar, ImageSat Int., ImageSat Int., and SpaceWill) provided imagery, tools, and support alongside experts from leading scientific and commercial organizations (Moscow State University, Polar Research Institute of Marine Fisheries & Oceanography (PINRO), LoReTT Engineering Company, Institute of Environmental Survey, Planning & Assessment, SCANEX Research & Development Center).