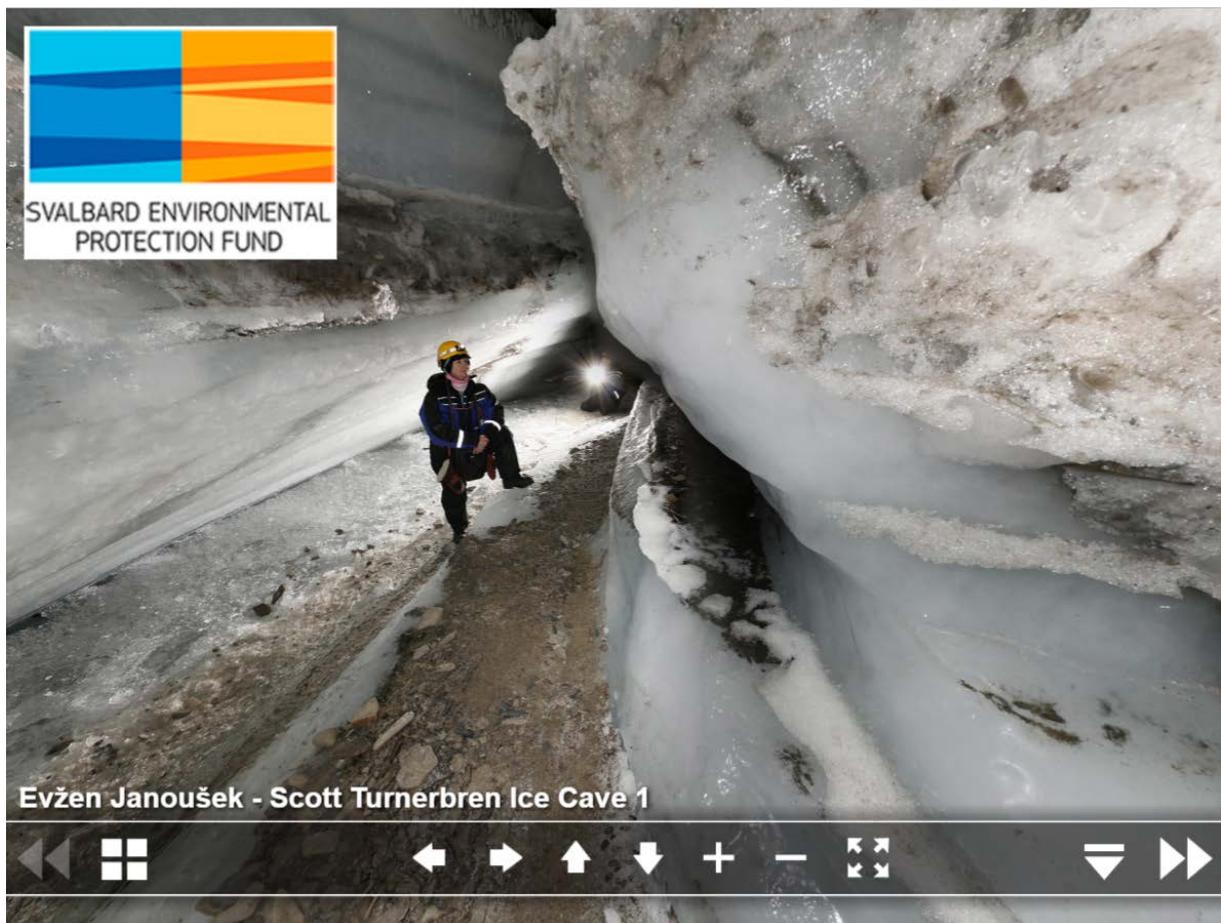


FINAL REPORT FOR THE PROJECTS 15/90

Svalbard environmental protection fond

# VIRTUAL TOUR – LONGYEARBYEN AND ICE CAVES



Made at UNIS by

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## Annotation

Ice cave is a unique natural phenomena of cold regions. They form in glaciers and contain significant amount of frozen water, glittering and sparkling in the rays of spelunker light.

In the project we created vivid image of ice cave as virtual tour available in internet. Virtual tour is a simulation of an existing location, composed of a sequence of high resolution spherical panoramas. 3 such tours (Scott Turnerbreen, Tellbreen and Longyearbyen ice caves) allow user to view the picturesque scene of ice cave while on-line and virtually "move" from point to point. These caves are popular tourist attractions and a great opportunity to get acquainted with the ice caves.

The tours can be used for promotion of tourism on Svalbard and for monitoring of changes of the caves.

Field investigation of ice caves on Svalbard, near the northernmost settlement Longyearbyen, was carried out in April 2016 with financial support of The Svalbard Environmental Protection Fund and logistic support of The University Centre in Svalbard (UNIS).

## Field work in April 2016

20 April 2016, two specialists from Czech Speleological Society (Prague): Evzen Janosek and Svetlana Burianova came to Svalbard for the meetings at UNIS and field work (Fig. 1). They were affiliated at UNIS as guest researches and fulfilled mandatory Safety course on 20-21 April, including shooting and driving scooter. Some consultation, planning and preparation came before the visit.

21 April, we have discussed approach, made outside reconnaissance.

During next five days we made the high-resolution photography sessions in 3 ice caves near Longyearbyen (Fig.2).

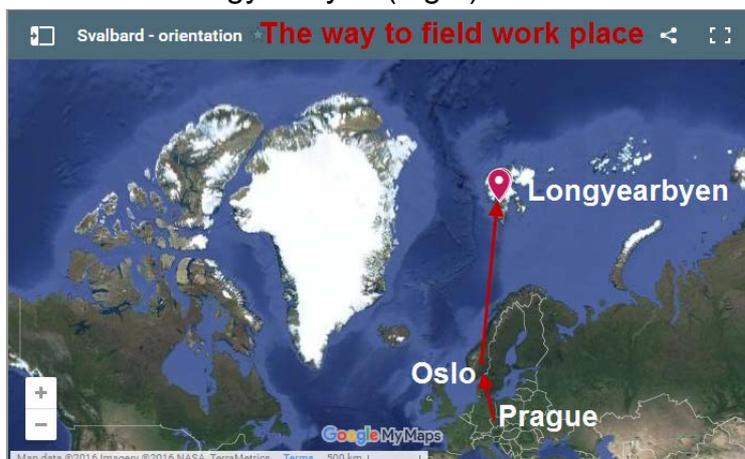


Figure 1. Place of field work and way to Longyearbyen

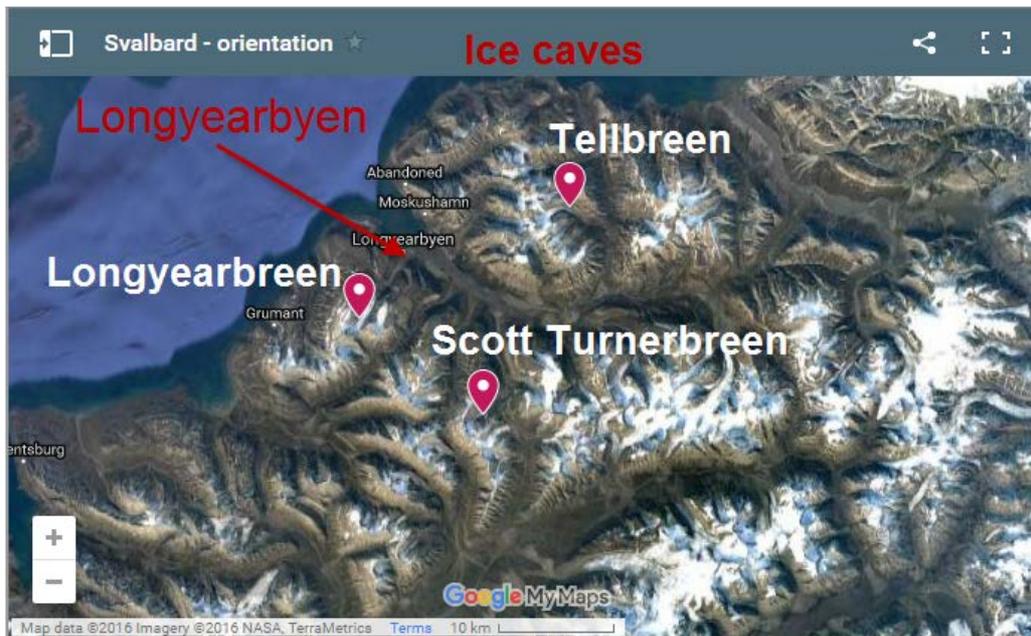


Figure 2. Location of 3 observed ice caves near Longyearbyen

Field work consisted of the way to ice cave, getting in cave, reconnaissance in the cave, photography and way back. All work were performed according to HSE regulation, existing at UNIS. Two ice caves (Longyearbreen and Tellbreen) were reached be snow scooters. The ice cave on Scott Turnerbreen can be visited only by dog sledges, as Boltedalen leading there is closed for scooter traffic in March-May. We get there with incredible help of Tommy Jordbrudal and 40 dogs belonged to his family company “Husky Travellers”.

### Photography and equipment

We used high quality **photographical equipment (full frame camera with wide angle lense, panoramic head, special tripod, flashes with radio controlled transmitter, special transport boxes)**; special speleological equipment and Evzen’s experience of creating the virtual tours for several caves in Europa and Turkia.

Evzen used his Canon EOS 5D Mark II and Canon EF 17-40mm 1:4L, Canon EF 50mm 1:1,4; flashes 2x SPEEDLITE 580EXII. With focal length 17 mm Ezven made 21 shots on each working stations (Fig.3)

### Processing

After field work complain the material were processed in the program KRPANO (for creation and viewing high-performance panoramic images and interactive virtual tours), PTgui (for publishing in internet).



Figure 3. Evžen Janousek performing photography in ice caves near Longyearbyen

Further the short descriptions of ice caves, working moment photos, images and links to Virtual Tours in the caves are presented.

The Virtual Tours can be found on Evžen Janoušek personal web-site

<http://www.evzenjanousek.com/>

Section devoted to Svalbard trip and ice caves is here

<http://www.evzenjanousek.com/virtualni-prohlidky-svalbard-en.html>

## Longyearbreen Ice Cave

N 78° 10.396' E 015° 28.168

The island of Spitsbergen (Svalbard) near the town of Longyearbyen

Longyearbreen glacier cave has a form of a meandering corridor that slopes gently downwards. It is 1-2 meters wide, 1-8 meters high and its freely accessible part is 250 m long. The entrance starts in the igloo with a 6 meter deep shaft, equipped with a solid duralumin ladder. The freely accessible part of the cave ends in a six meter deep stage, requiring rope, an ice ax and crampons.

The site is accessible by a snowmobile or by skis. It is located 6 km from the center of Longyearbyen.



Figure 4. Longyearbyen ice cave

<http://vt.evzenjanousek.com/svalbardLongyearbreen/>



Figure 5. Virtual tour in Longyearbreen ice cave

## Tellbreen Ice Cave

N 78° 15.406' E 016° 14.650

The island of Spitsbergen (Svalbard) near the town of Longyearbyen

The cave in the glacier Tellbreen has two entrances. It is accessible only through the lower entrance, while the top one is blocked with snow (N 78° 15.482' E 016° 13.3).

The entrance starts in the igloo and continues through a short narrow creeping dug in a snow stopper. The meandering narrow corridor rises slightly upward. It is 1-2 meters wide, sometimes up to six meters high. Besides ice layers, the corridor also shows layers of gravel. After 100m, there is a chimney blocked with snow. The snow in the passage is removed, but after couple dozens of meters the passage ends in a two meter deep stage and complete glaciation.

At the end of April, it was not possible to get to the upper entrance. The bottom of the cave is covered with ice. For safety, crampons are recommended.

The cave is accessible by snowmobile. It is located 20 km from the center of Longyearbyen (Fig. 6).



Figure 6. Way to Tellbreen ice cave



Figure 7. Inside Tellbreen ice cave

<http://vt.evzenjanousek.com/svalbardtellbren/>

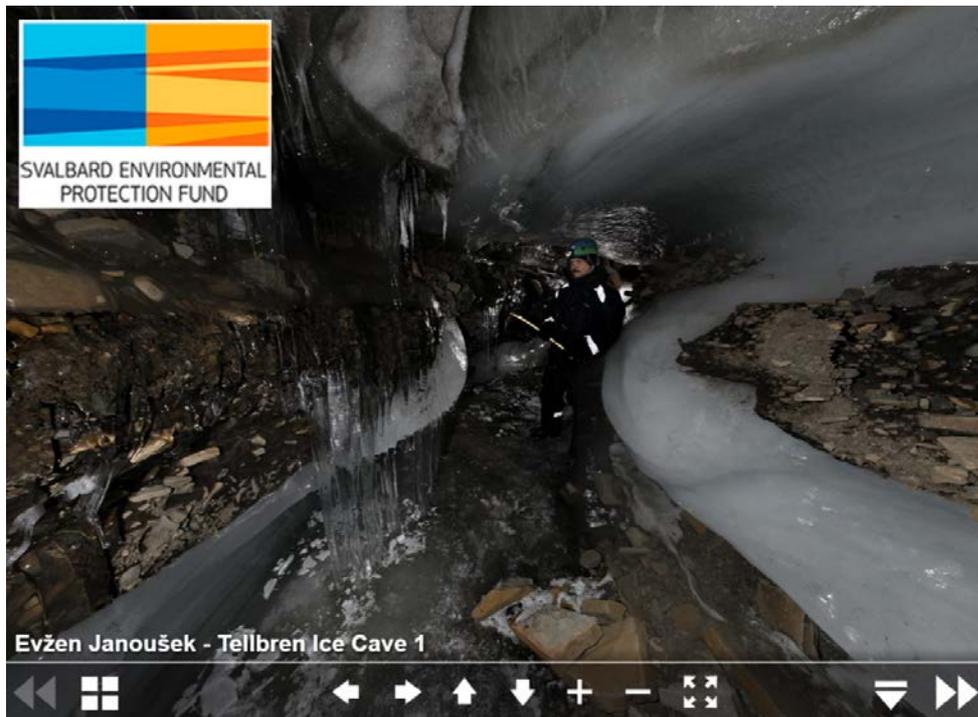


Figure 8. Virtual tour in Tellbreen ice cave

## Scott Turnerbreen Ice Cave

N 78° 05.999' E 015° 55.366

The island of Spitsbergen (Svalbard) near the town of Longyearbyen

The cave entrance is located in the usual igloo from which you climb down the ladder through about a twenty-meter deep shaft dug in the snow. The cave consists of a meandering corridor, 2-4 meters wide, up to 12 meters high and at least 600 meters long. In some places there are stacks leading to the surface. They are blocked with snow and on the surface marked with rods. In case of the collapse of the entrance the stacks can be dug out in order to rescue the trapped visitors.

The twenty kilometer long road from Longyearbyen to the cave is only accessible by ski or dogsled. For snowmobiles the valley is closed.



Figure 9. Way to Scott Turnerbreen ice cave. It is really “croudy” place. Lunch while we waited 2 tourist grupes finished their excursions.

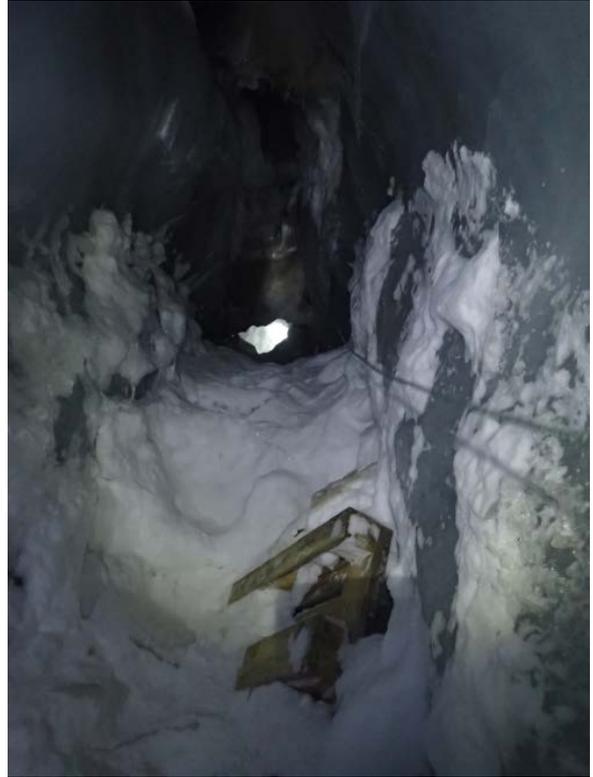


Figure 10. Inside Scott Turnerbreen ice cave

<http://vt.evzenjanousek.com/svalbard/>



Figure 11. Virtual tour in Scott Turnerbreen ice cave

## Conclusion

Virtual tours in 3 ice caves near Longyearbyen are the vivid images of caves which can be used to promote the ideas of nature conservation by showing her beauty and vulnerability. As the exact description of caves in April 2016 virtual tours can be used to further study and observation of changes.

It is an effective marketing tool that allows the user to show the potential product or service in a special way. It creates in the viewer "presence effect" - vivid, memorable visual images and provides the most complete information about a product or service.

Such tours will promote sustainable tourism.

We are very grateful to the Svalbard Environmental Protection Fund Field for financial support and nice opportunity to investigation of ice caves and create virtual tours. Many thanks to UNIS for logistic support and Tommy Jordbrudal and "Husky Travellers" for unforgettable dog sledge tour to Scott Turnerbreen.