

HEARD ISLAND

The 2016 Cordell Expedition

Discovering Life in the Extremes

VKØEK

Linking the Remote in Realtime

TEAM PRESENTS RESULTS OF THE EXPEDITION

Most of the original goals were accomplished, and some new ones, too

Newsletter Vol. 2 No. 6
July 1, 2016
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In this issue of the Newsletter, we proudly list some of the more significant accomplishments of the 2016 Heard Island Expedition VKØEK. There is hardly space to give detailed accounts, but this compilation shows clearly that this was “Not Your Ordinary DXpedition;” it was a multi-disciplinary expedition, involving amateur radio, environmental science, and information technology. It was designed and executed as an effort to advance the art and science of expeditions to remote places, involving real-time satellite-enabled communications, exploration and documentation of the effects of global climate change, and extensive outreach on social media.

THE 2016 CORDELL EXPEDITION VKØEK
Entry made 11 April 2016

Landed 22 March 2016 by small boat Atlas Cove. Campsite set up ca 300 m SE of ANARE ruins, on a relatively flat terrace ca. 50 m from the Nullarbor, elevation ca. 20 ft. Campsite used 2 air beam tents, ca. 20x21 ft. An 4-wheel-drive ATV was used with wagons to transport all equipment from the beach landing to the campsite. Personnel usually landed at Wharf Pt. - ATV used to service the landing.

Purposes of the expedition:

1. Amateur radio operation
2. Field science re climate chg.
3. Advanced communications.

The radio operation logged about 75000 contacts on all amateur bands and modes.

A collection of specimens of rocks, water, and soil was made.

A 3-day visit to the Spit Bay area enabled us to enter Stephenson Lagoon by small boat (3 m water at entrance @ high tide). A collection of soil and water samples, and some rocks, was made.

The communications was enabled by 3 Inmarsat BGANTM terminals, and several sat-phones (incl. Iridium). With Wifi all members of the team had open access to the internet. This was used to provide extensive public coverage of the expedition, much of it in real time.

Various members of the team made photo-documentation walks from camp. Two members made a 3-day field trip to Laurens Schrenck.

Stephenson Lagoon
5 April 2016

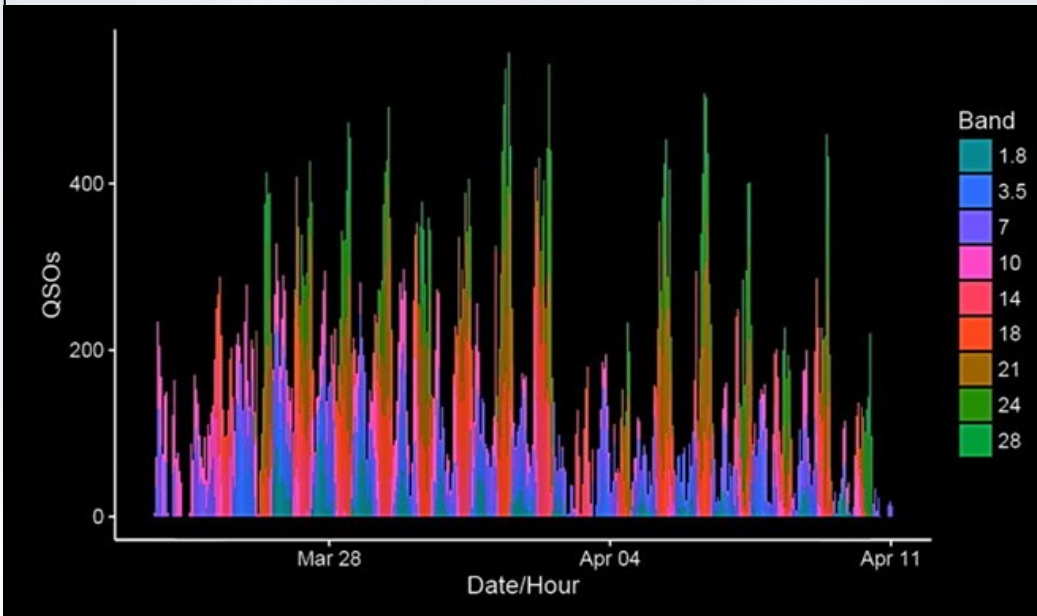
Map showing N. Breakwater (unkn.), S. Breakwater (3 m max water), BRAVEHEART (ca 1 mi off shore), TARN, and SPIT BAY.

Braveheart
Nigel Jolly Owner (not present)
Matthew Billy
Neil Broughton
Bill Roundhill
Charlie Bedford
Elliott Stead
Nick East

Cordell TEAM:
Exp. Ldr. Robert Schmieder KKØEK
Radio Ldr. Dave Lloyd K3EL
Fred Betton KM4MKD
Adam Brown KZARB
Hans-Peter Blattler HO9BXF
Alan Cheshire VK6CQ
James Colletto N6TQ
Dave Farnsworth WJ2O
Vadym Ivliov UT6UD
Kenneth Karr N6ZTI
Gavin Marshall VK2BAX
Bill Mitchell AEØEE
Carlos Nascimento NP7IW
Arliss Thompson W7XU

The entry in the Heard Island Visitor Log, made 11 April 2016. The log is kept in one of the refuge shelters at Atlas Cove, placed there in 2003 by the Australian Antarctic Division. The logs date back to 1953, and include hundreds of names from dozens of visits.

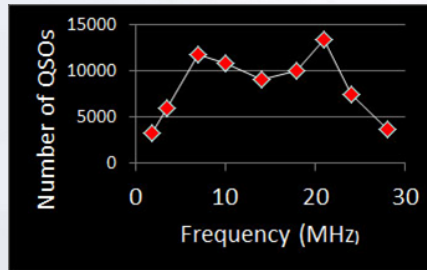
RADIO OPERATIONS



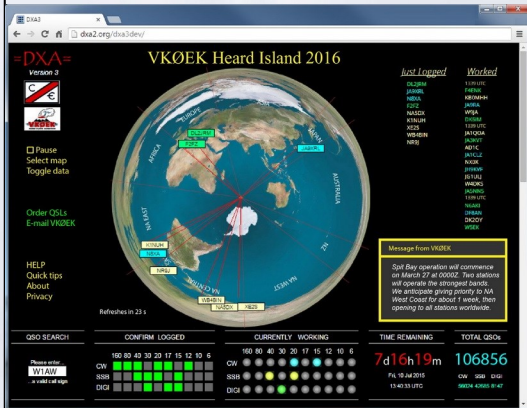
← **DX** Using the callsign **VKØEK**, the Heard Island team logged 75,034 QSOs, including 21,220 unique callsigns and 174 DXCC entities. More than 3200 QSOs were logged on 160 m. The team established 6 complete multiband stations, although limitations of propagation prevented the team from using all stations all the time.

The entire operation was done by from Atlas Cove. A proposed operation at the opposite end of the island (at Spit Bay) was found to be impossible due to violent weather and surf, not authorized by the permit, and unnecessary because of the observed QSO rates, so it was scrapped.

↑ **Q(t)** Number of QSOs logged each hour over the course of the **VKØEK** operation. The broad dip near April 4 and a similar drop near April 11 were due to reduced propagation, not reduced effort.



→ **Q(f)** Total number of QSOs logged as a function of frequency. Clearly, the bands 40, 30, 20, 17, and 15 m were the most productive, the totals falling off at lower and higher frequencies.



← **DXA** The real-time online graphical log server, was successfully used for the third time (previous: **K7C Kure 2005** and **TX5K Clipperton**). More than 70,000 unique callsigns were logged into **DXA**.

→ **CC** The team's country flags supported on one of the Yagi antennas. **VKØEK** also used several 4-square vertical array antennas.



← **/MM**

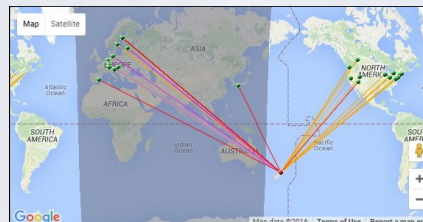
The team operated maritime mobile using the callsigns **ZL/ZS9HI/MM** and **ZL/VKØLD/MM**. More than 10,000 QSOs were logged over the 23 days of cruising (about 400/day).



← **WSPR**

With a 250 mW transmitter on 10-40m using the callsign **ZS9HI**, the expedition vessel was tracked on the **WSPRnet**.

↓ **RBN** Using the callsign **ZS/ZS9HI/MM** we were tracked on the **Reverse Beacon Network**.



↓ **JT65** Successful implementation of the **JT65** mode, enabling this very-low-signal strength mode.



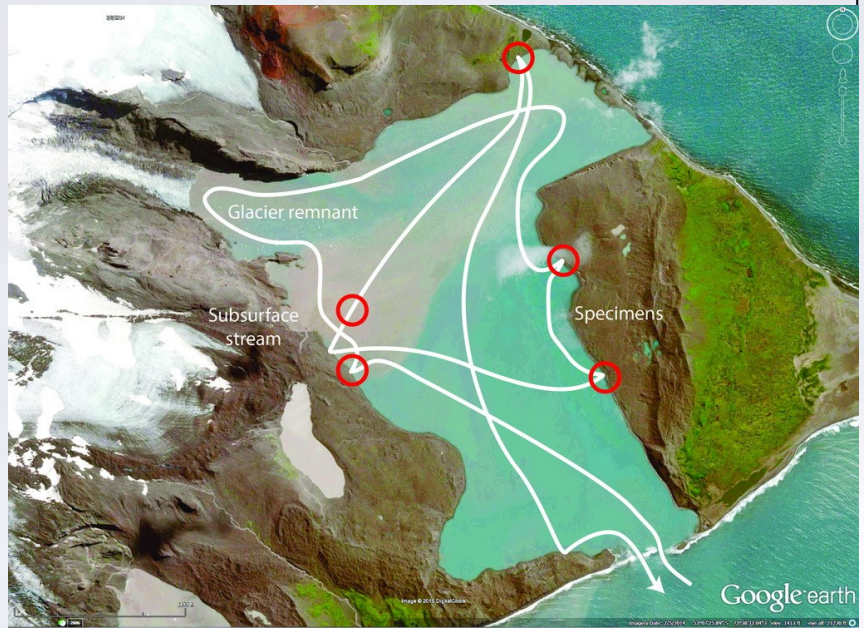
← **RR** In a technology development/demo, we used the Elecraft radios to briefly operate the HI station remotely using **VKØLD** under onsite supervision of the license holder.

FIELD OPERATIONS

→ **EXPL** We were the first persons to enter the Stephenson Lagoon, created by melting of the large glacier (remnant seen in the upper left). The lagoon is about 2 miles long and 1 mile wide.

The lagoon is at least 100 m deep. It is fed partially by a subsurface stream that drains out of a smaller lagoon (called a "Tarn"). What appears to be red rock is actually the reddish till covering the blue glacial ice.

On the service boat from the Braveheart, we plunged through heavy surf at the southern breakwater (red arrow), and found the lagoon to be relatively calm, with low wind and relatively warm. Over 3 hours we moved around the lagoon, photographically documenting the geological and glacial structures, and making the first collection of specimens, including a sediment sample from the lagoon bottom. These specimens will be examined by specialists.



→ BUOY

The team deployed 15 buoys for NOAA and Wood Hole Oceanographic Institute. The buoys drift across the ocean, telemetering environmental data.



→ **GLAC** We solved the mystery of the "blue gashes" we had spotted in satellite images: They are the exposed edges of glaciers, covered in coarse till that slips down the steep ice scarp as the glacier retreats due to melting. This feature is an indication of the speed and dynamics of glacial retreat due to global warm-



↓ **WX** We deployed a multi-function weather station and accumulated data at Atlas Cove over the duration of our stay.



↑ We deployed six temperature/light level sensors that recorded every 10 seconds for 3

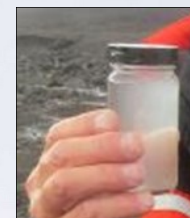


↑ **GPAN** We used a GigaPan camera to take ultrahigh resolution images of geological and glacial structures, useful for comparison with historical and future records.

↓ **COL** We made the first collection of rocks, water, sediments, and soil from the Lagoon and from numerous sites at Atlas Cove. These will provide the first identifications of the biological and biological environment around the lagoon, and document possible changes in previously examined locations. After more than 13 years since the last scientific expedition, the changes are obvious and extensive.



↓ **DRN** We carried out the first drone flight on Heard Island, obtaining aerial images of our campsite and environs.



IT OPERATIONS



THE HEARD ISLAND PROJECT

The Heard Island Project is centered around an expedition to Heard Island, lying at 53°S 73°E in the Southern Ocean. The island is extremely isolated, and very seldom visited.

The expedition included an ambitious amateur radio operation using the callsign **VKØEK**, studies of the effects of climate change, and a number of innovations for providing real-time satellite- and internet -based communications with the remote site.

The expedition team of 14 sailed on March 10, 2016, from Cape Town, South Africa, spent 20 days on Heard Island, and ended the voyage at Fremantle, Western Australia on April 22, 2016.

The team made extensive efforts to provide outreach, to keep our audience informed, and to respond to inquiries and requests. Most of this was internet-based.

→ **GPS** During the voyage, you could track us on a GPS website.



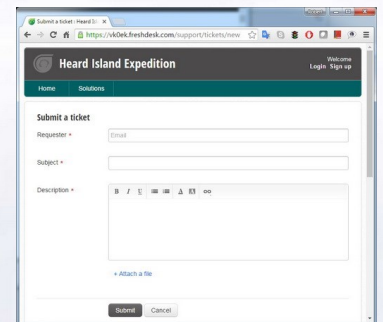
← **WEB** The Expedition website is the primary repository of information, although it was on hold during the expedition.

→ **BLOG** The DXpedition website (blog) was the primary source of current information during the operation.

→ **FACE, TWIT** Facebook, Twitter, and other social media were important means for outreach for the expedition.



→ **NEWS** The Newsletter is issued roughly monthly. It is always 4 pages, and is distributed only electronically (as a PDF file) to a subscriber list, which includes more than 7000 persons.



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Project Management

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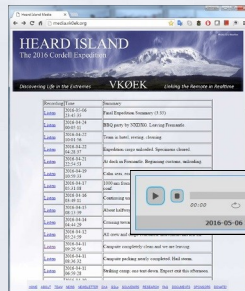
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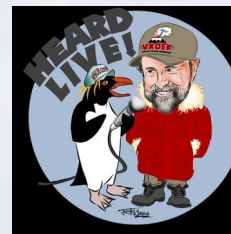
Email and Websites

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<http://www.vkoek.org>



← **AUDIOLOG** Activity logs were recorded multiple times each day during the expedition. These were immediately available online.

↑ **HELP** The online help desk enabled anyone to email a comment or request to the expedition, and receive a response within a few hours. More than 2000 requests were handled.



← ↑ **SKYPE** Numerous interviews were conducted from Heard Island using the Skype connection over the Inmarsat link. These included interviews with W4KUB and several classrooms in California and Ukraine

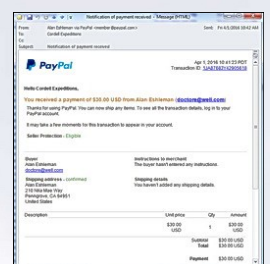


↑ **AAD** During the stay on Heard Island, we filed daily reports with the Australian Antarctic Division, in compliance with the permit.



← **SOUVENIRS** A variety of souvenirs (mugs, tee shirts) were available as the expedition started.

→ **FINANCE** The internet connection made possible the management of finances during the expedition. More than 5000 individuals made cash contributions and purchased souvenirs.



Past issues of the Newsletter [HERE](#).