

# GREENLAND CAVES PROJECT

Gina Moseley



Photos Courtesy of Robbie Shone



AFCL 469

Air force surveys in geophysics  
No. 135

Evaluation of arctic ice-free land sites  
Kronprins Christian Land and Peary Land,  
North Greenland 1960

William E. Davies  
Daniel B. Krinsley

May 1961



GRD

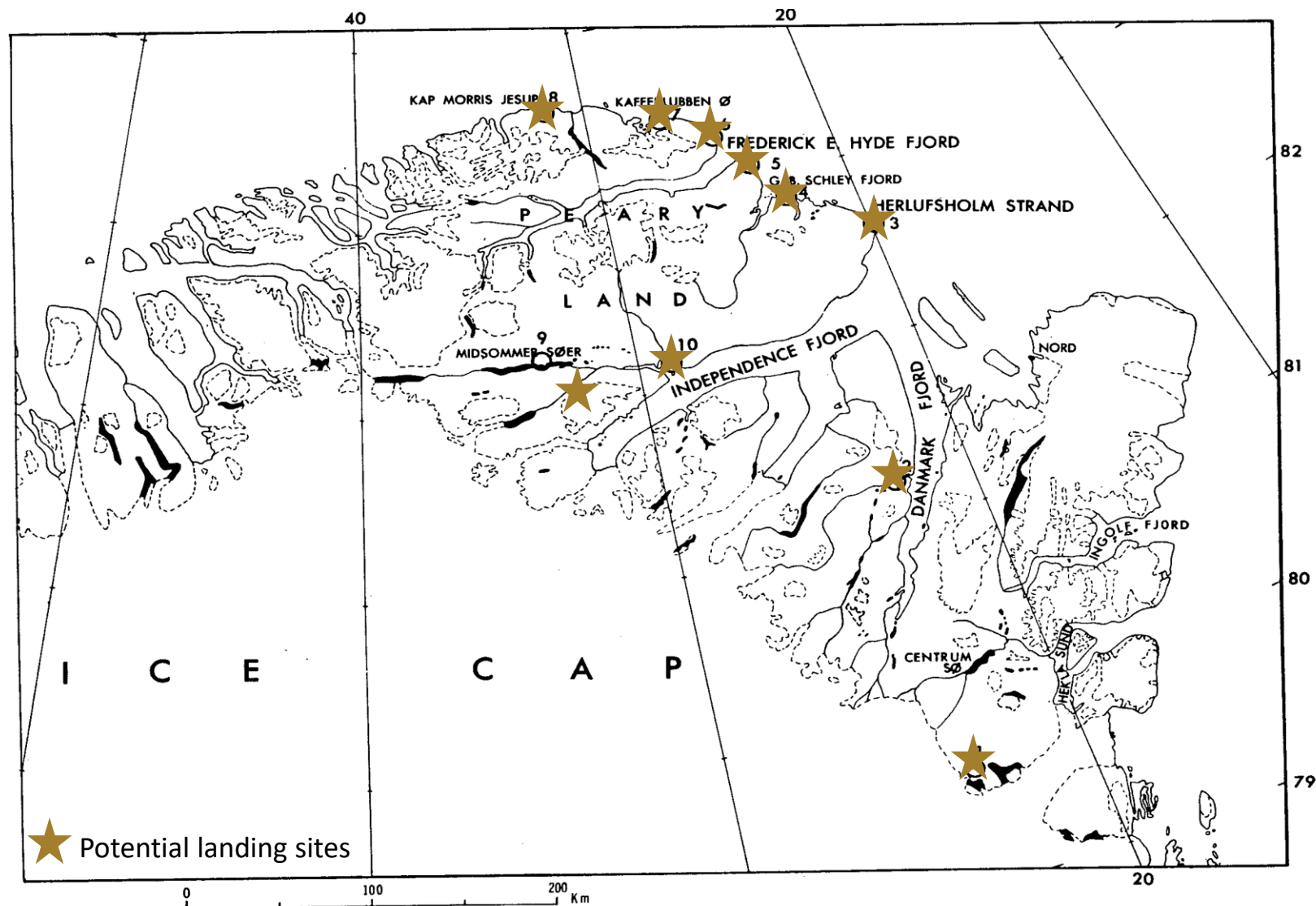
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# Cold War History





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# Cold War History





# Cave Discoveries

## SHORTER CONTRIBUTIONS

### Caves in Northern Greenland\*

WILLIAM E. DAVIES AND DANIEL B. KRINSLEY

Several unsuspected solution features in the limestone plateau of northeastern Greenland were discovered during the summer of 1960. The most interesting of these discoveries are several large solution caves.

The area of caves is along a south tributary of a large valley (fig. 1), provisionally named Grottedalen, about 15 miles due north of Centrum Sø (80°21' N, 22°22' W on current American maps). Grottedalen trends southeastward from the central part of Kronprins Christian land and empties into Vandredalen which in turn connects with Hekla Sund via Sæfaxi Elv. Grottedalen is about 3,000 feet wide, 1,500 to 2,000 feet deep near the caves, and is flanked with morainal deposits. The valley walls are steep. The lower 500 feet are formed of glacial moraine and talus; the upper part is limestone forming stepped, vertical cliffs along the face of the plateau, the summit of which is at an altitude of 2,100 to 2,400 feet (fig. 4). The Centrum limestone (Ordovician-Silurian) is the bedrock along most of Grottedalen. In the vicinity of the caves it dips gently westward, but 6 miles to the east it is folded and faulted. The Centrum limestone is gray to black, with beds of chert and dolomitic limestone intercalated. In the cavern zone it is massive and weathers dark brown. The Centrum is about 7,500 feet thick (Adams and Cowie, 1953).

The caves are along both sides of a small north-south valley tributary to Grottedalen. This valley extends 3,000 feet to the south. Near its mouth it is 200 to 300 feet wide and 1,500 feet deep; at its head it is a canyon about 100 feet wide and 300 feet deep. There are 11 caves along the east wall of

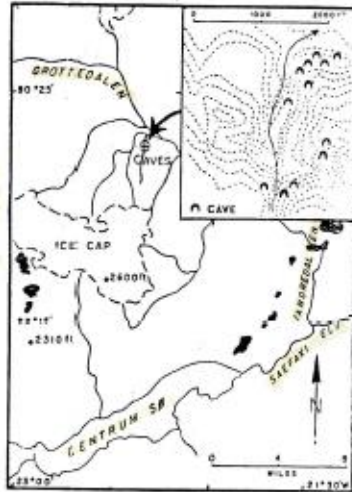


Figure 1

Map of area around Grottedalen showing location of caves. Solid black areas are lakes; dashed lines on inset are form lines.

the valley and one on the west wall (fig. 1). The caves are at 3 levels, 1,600-1,700 feet, 2,000-2,050 feet, and 2,200 feet altitudes. The passages are 15 to 40 feet in diameter and extend 30 to 200 feet from the valley wall. The largest cave is on the east side of the valley at the north end of the canyon (elevation, 2,000 feet). In plan it is U-shaped with 2 openings on the valley wall (fig. 2). The lower caves (1,600-1,700 feet elevation) are partly filled with glacial moraine. The higher caves contain no morainal deposits and thus the upper surface of the most recent ice advance down

\*Publication authorized by the Director, U. S. Geological Survey

















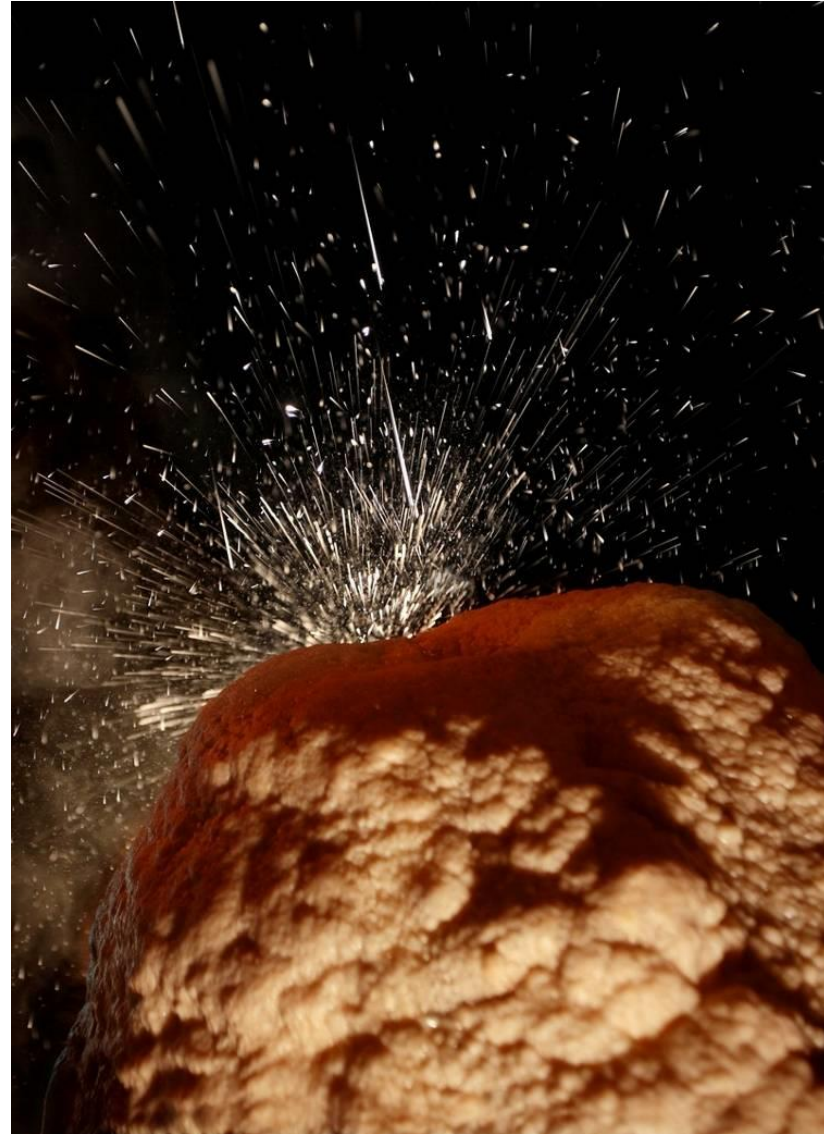




# Speleothems!

“ The fill is capped by a **flowstone** deposit 4 inches thick formed of a coarsely crystalline calcite.”

Stalactite  
with a ‘c’  
= ceiling

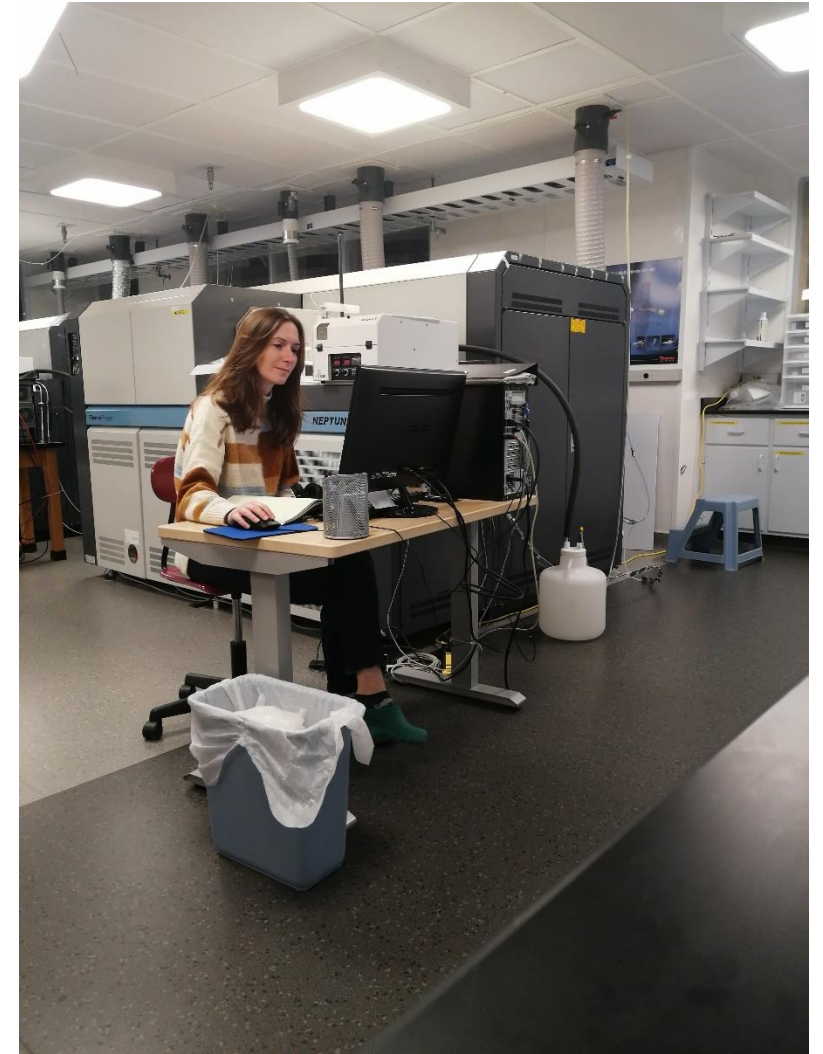
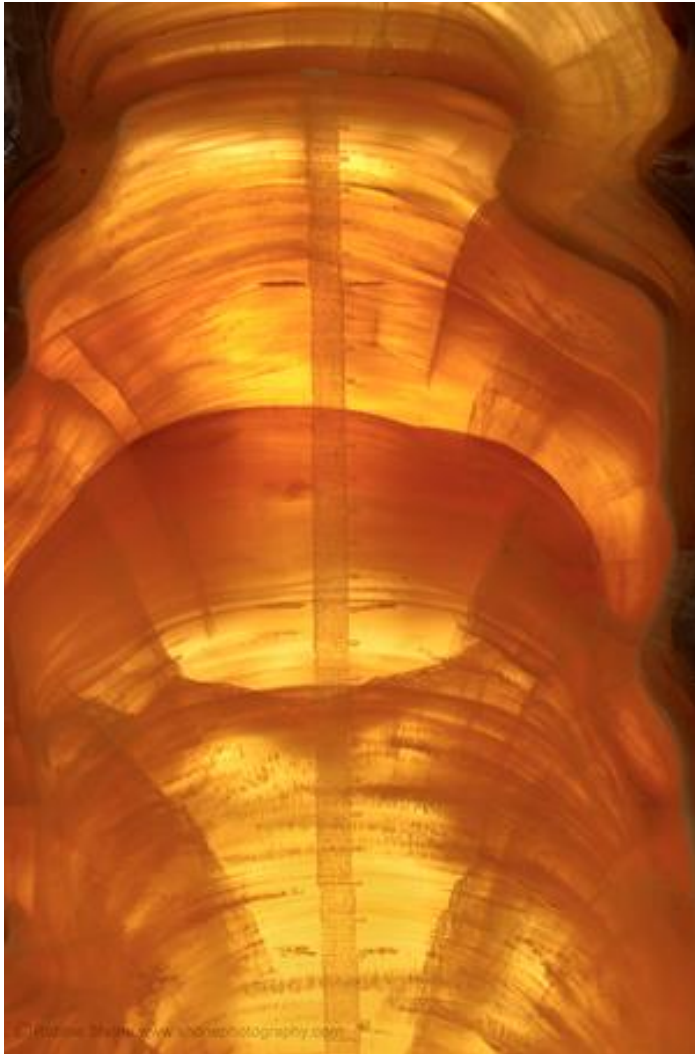


Stalaggmite  
with a ‘g’  
= ground



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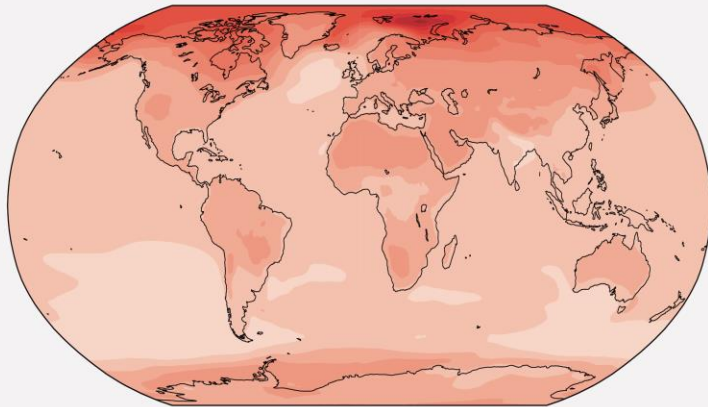


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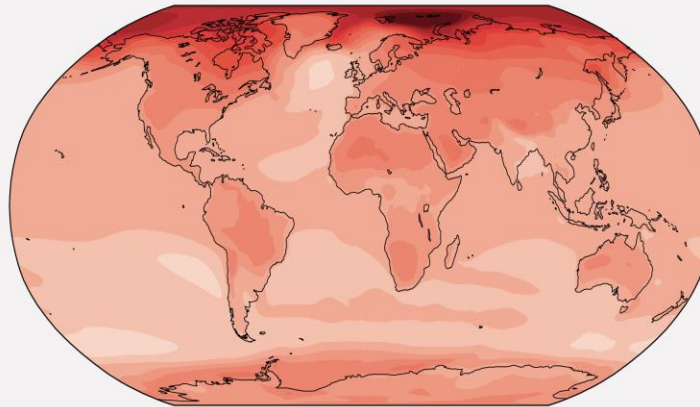
(b) Annual mean temperature change (°C)  
relative to 1850–1900

Across warming levels, land areas warm more than ocean areas, and the Arctic and Antarctica warm more than the tropics.

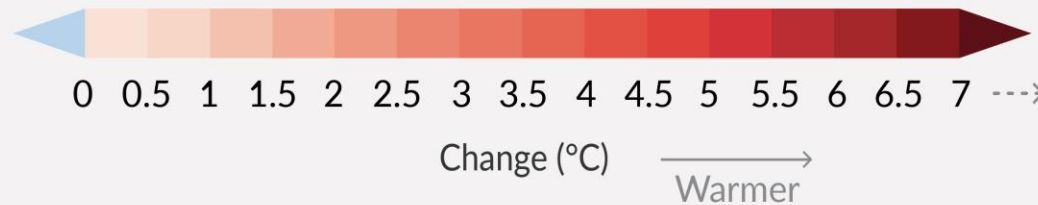
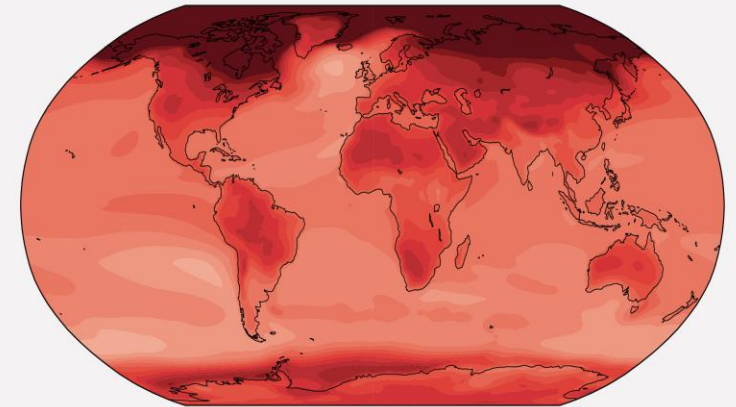
Simulated change at 1.5°C global warming



Simulated change at 2°C global warming



Simulated change at 4°C global warming



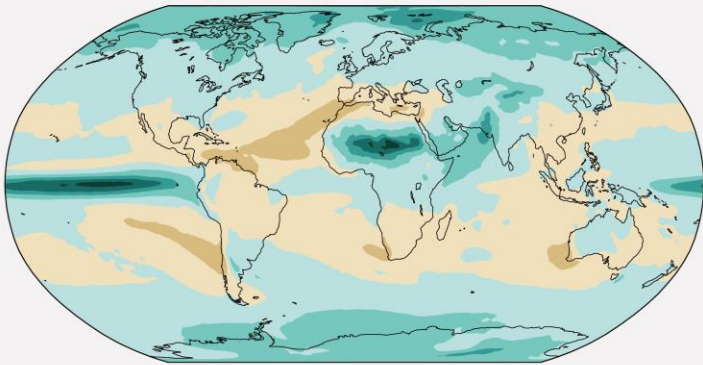


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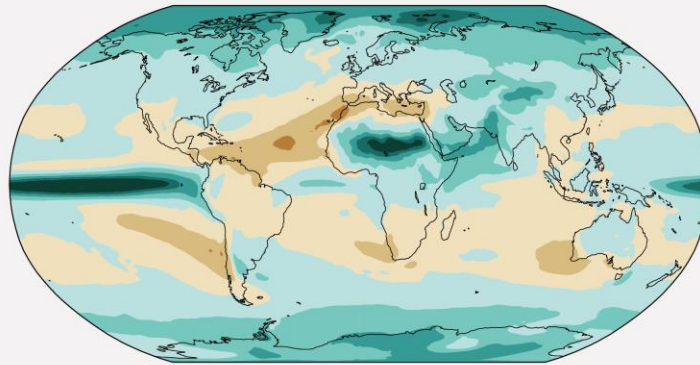
(c) Annual mean precipitation change (%)  
relative to 1850–1900

Precipitation is projected to increase over high latitudes, the equatorial Pacific and parts of the monsoon regions, but decrease over parts of the subtropics and in limited areas of the tropics.

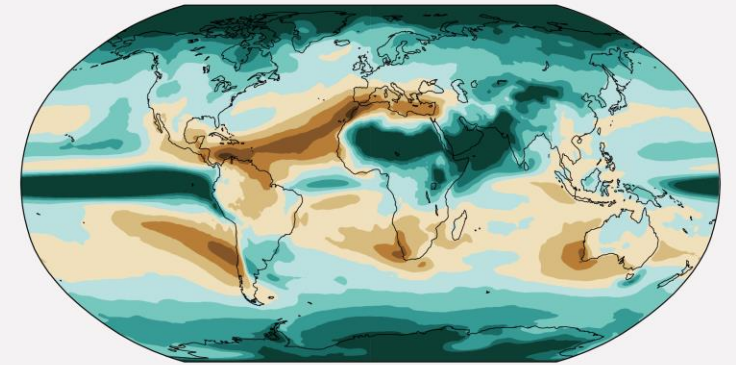
Simulated change at 1.5°C global warming



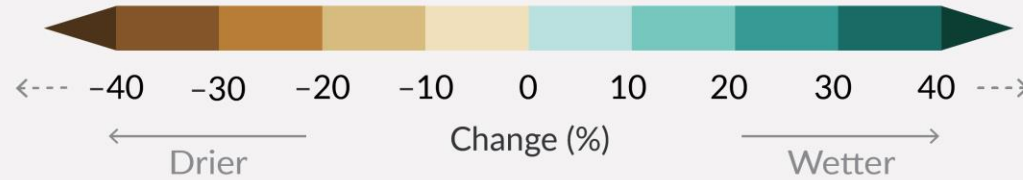
Simulated change at 2°C global warming



Simulated change at 4°C global warming



Relatively small absolute changes  
may appear as large % changes in  
regions with dry baseline conditions.





# Greenland Caves 2015





# Greenland Caves 2015 – The Funding

## Leading cave photographer set to record pioneering expedition

Team explore caves in search for information on previous climate changes



## Peak trio off on Greenland trip

Team, are aiming to visit the far north of Greenland during the summer of 2015. They are aiming to visit the far north of Greenland during the summer of 2015.

## Funds needed to scale face of climate change

Thousands of people are drinking alcohol while expecting, new figures reveal.

## Lecturer's appeal for latest project

Thousands of people are drinking alcohol while expecting, new figures reveal.

## Delays during junction work

Thousands of people are drinking alcohol while expecting, new figures reveal.

## First firm for business park

Thousands of people are drinking alcohol while expecting, new figures reveal.

## Cost of cremations and burials to rise

Thousands of people are drinking alcohol while expecting, new figures reveal.

## Grönland Fenster in wärmere Zeiten

Thousands of people are drinking alcohol while expecting, new figures reveal.

## Why lecturer is real rock star

Thousands of people are drinking alcohol while expecting, new figures reveal.

## climate change project just what doctor ordered

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THREE officers at a young offenders institution were injured when an inmate lashed out with a piece of metal, a court heard.

Convicted robber Mustafa Manshah was charged with the sharp weapon at Brixton Young Offenders Institution after he didn't have a shower, Staffordshire.

Three officers at a young offenders institution were injured when an inmate lashed out with a piece of metal, a court heard.

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## climate change project just what doctor ordered

AN ex-Great Wyrley High School pupil is embarking on an ambitious expedition to the Arctic Circle to carry out the first record of climate change from caves.

Gina Moseley, a doctor who lectures at the University of Innsbruck, in Austria, is heading the Northeast Greenland Caves Project.

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### Important

The party will visit caves in northeast Greenland and collect samples of ice and sediment deposits.

The chemical signature of the samples will be analysed to provide information about how the climate and vegetation has changed over the years.

Dr Moseley said: "We have a fantastic opportunity here to improve our knowledge of long-term climate change in the Arctic and in particular, for a period that was warmer than today."

These results are highly important for scientists that work on predicting our environment might look like warmer years."

Further details about the climate change research expedition can be found at [www.northeastgreenland-cavesproject.co.uk](http://www.northeastgreenland-cavesproject.co.uk) or via social media sites Facebook and Instagram.

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Gina at Conturines Cave in Italy



The ex-Wyrley schoolgirl in Borneo



Dr Moseley at work in a cave at Gunung Mulu National Park in Borneo

As well as the sampling work, they will be searching the area for undiscovered caves. The expedition has already received £50,000 support from the Transglobe Expedition Trust, the Petzl Foundation, the British Cave Research Association, the National Speleological Society and the Ghar Parau Foundation.

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## THE INTERSECTION OF ADVENTURE + SCIENCE



A CAVING EXPEDITION IN NORTHEAST GREENLAND SEEKS TO UNCOVER CLUES TO CLIMATE CHANGE DEPOSITED IN THE EARTH'S DEPTHS OVER THE AGES.

By Catherine DiSanto



# Greenland Caves 2015 – The Funding

## ***Financial Sponsors***

University of Minnesota - Xi'an Jiaotong University - National Geographic Society -  
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Phil & Lin Shone - Innsbruck Quaternary Research Group - Go Balance (*formerly Celestial Green Ventures*) - Gina  
Moseley - Mount Everest Foundation - Austrian Academy of Sciences  
British Cave Research Association - Transglobe Expedition Trust - Robbie Shone  
Sue & Pete Moseley - National Speleological Society - Quaternary Research Association  
Wilderness Lectures - Ghar Parau Foundation - Chris Blakeley - Limestone Research & Consultancy Ltd. - Andy Eavis -  
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# Greenland Caves 2015 – The Team





# Greenland Caves 2015 – The Training





# Greenland Caves 2015 – The Planning





# Greenland Caves 2015 – The Expedition

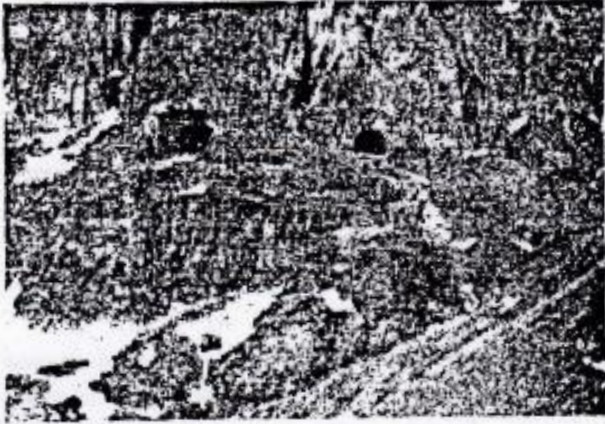


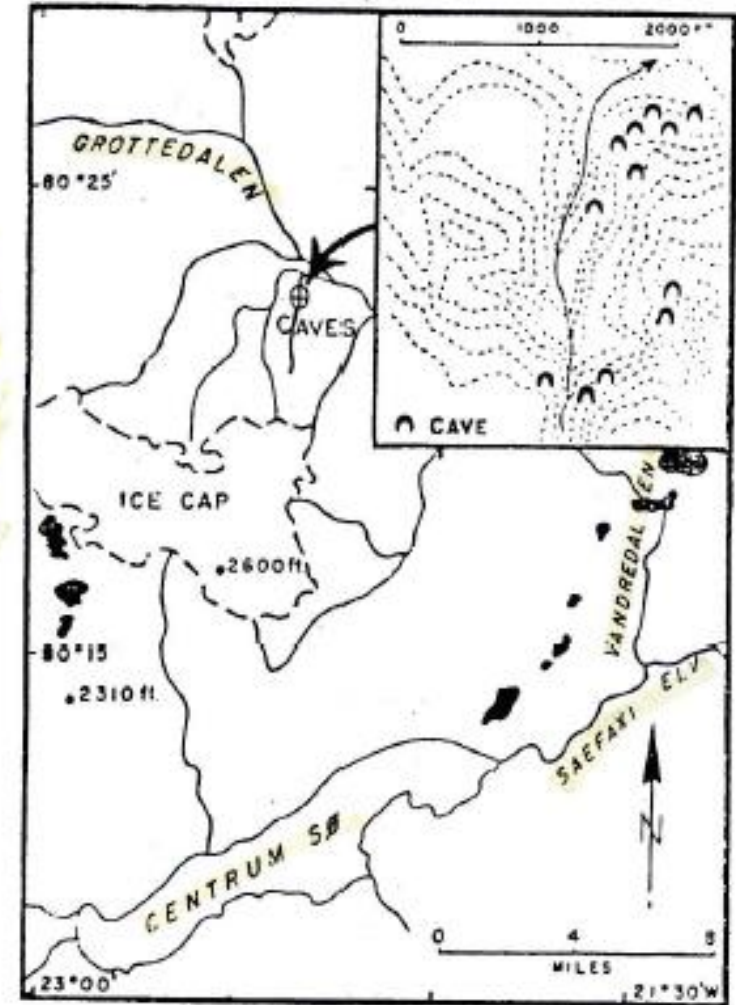
Figure 2

Caves on southeast side of valley. The two entrances are connected by a passage 40 feet high and 40 feet wide.



Figure 4

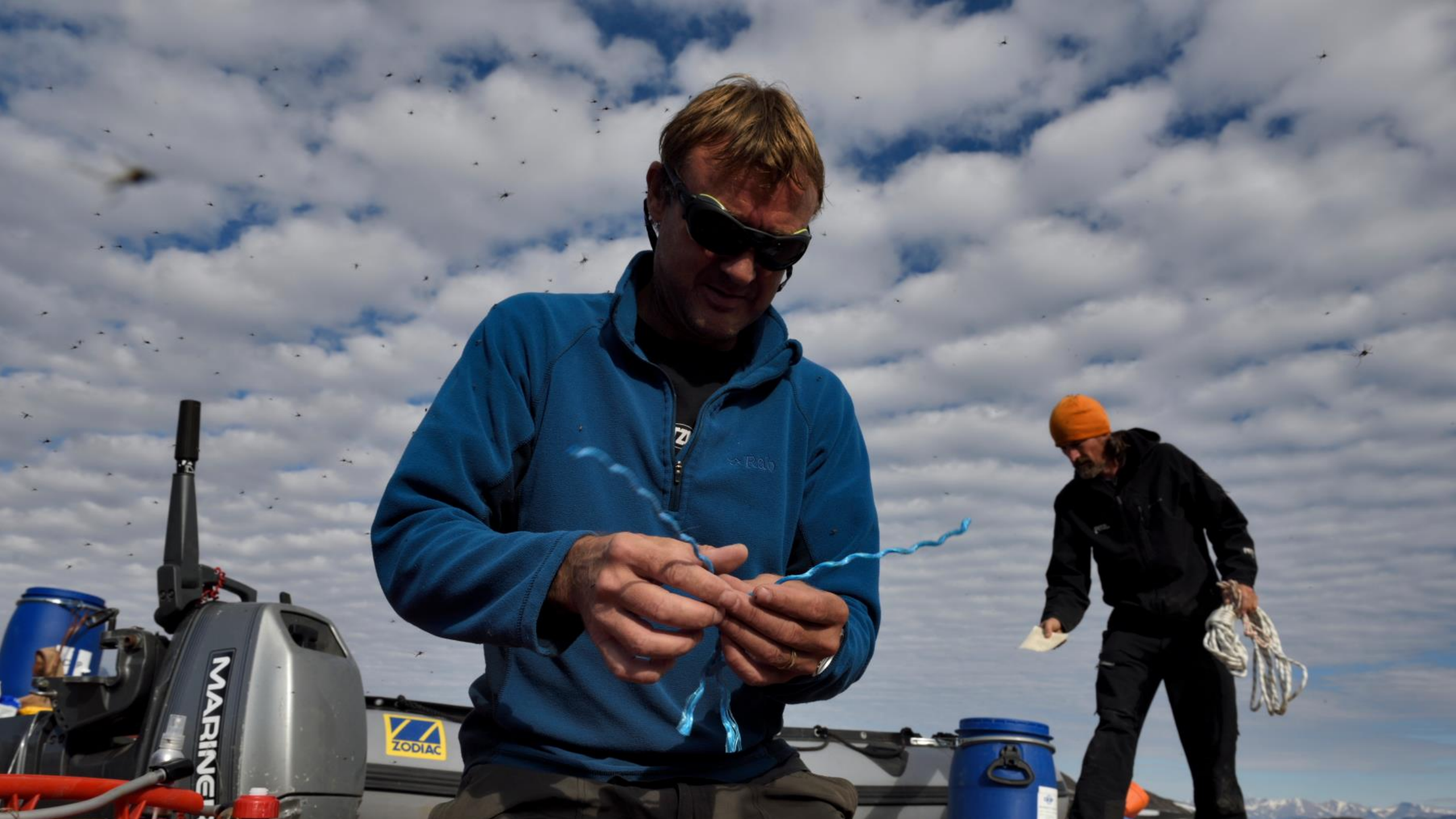
View northeast from cave on west side of valley.























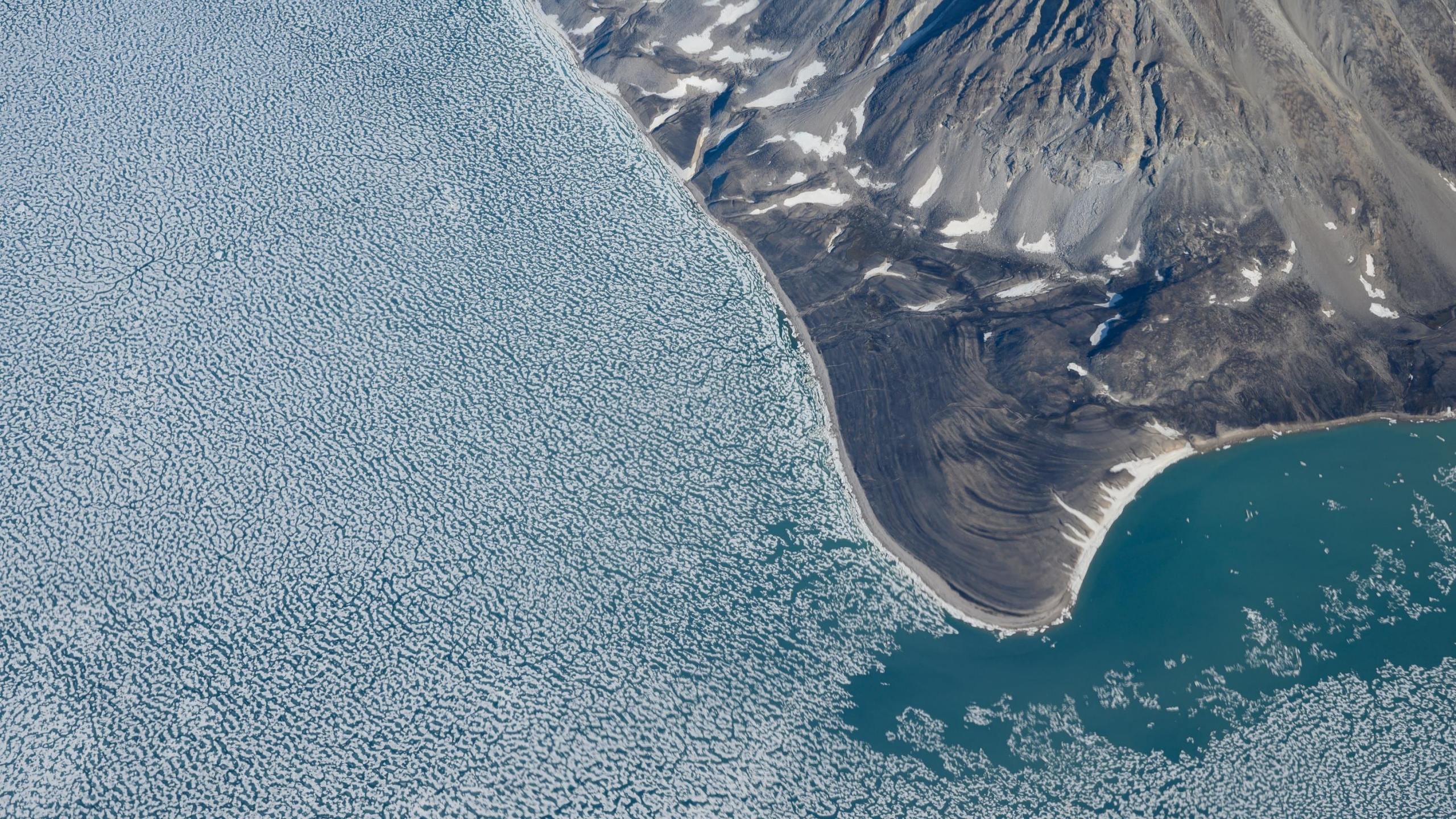
















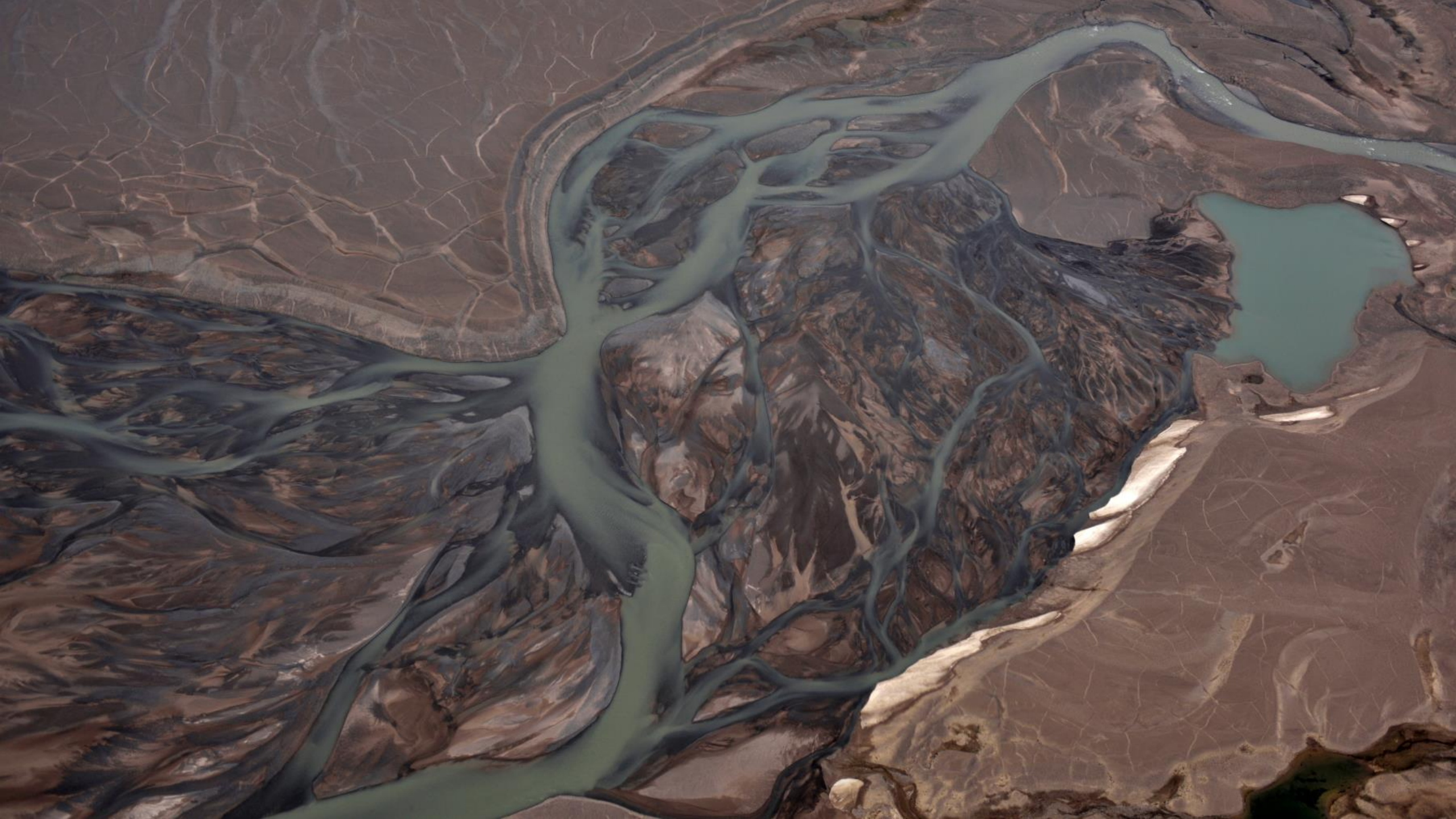
















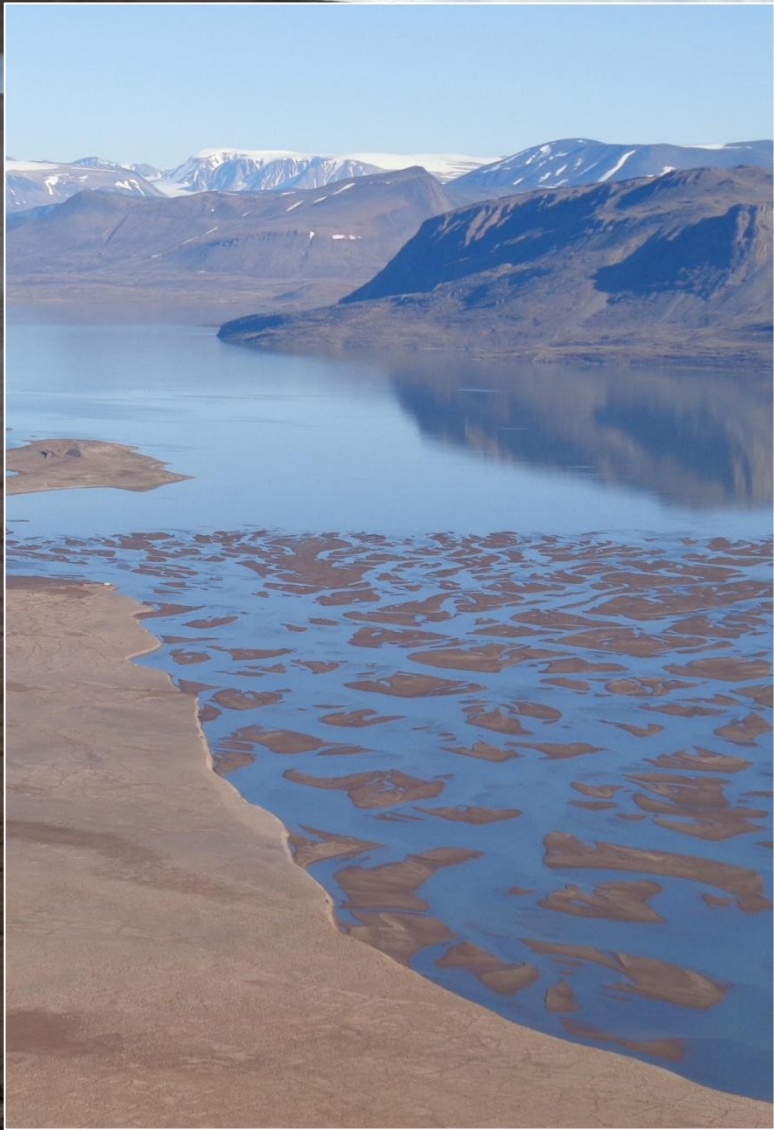
































































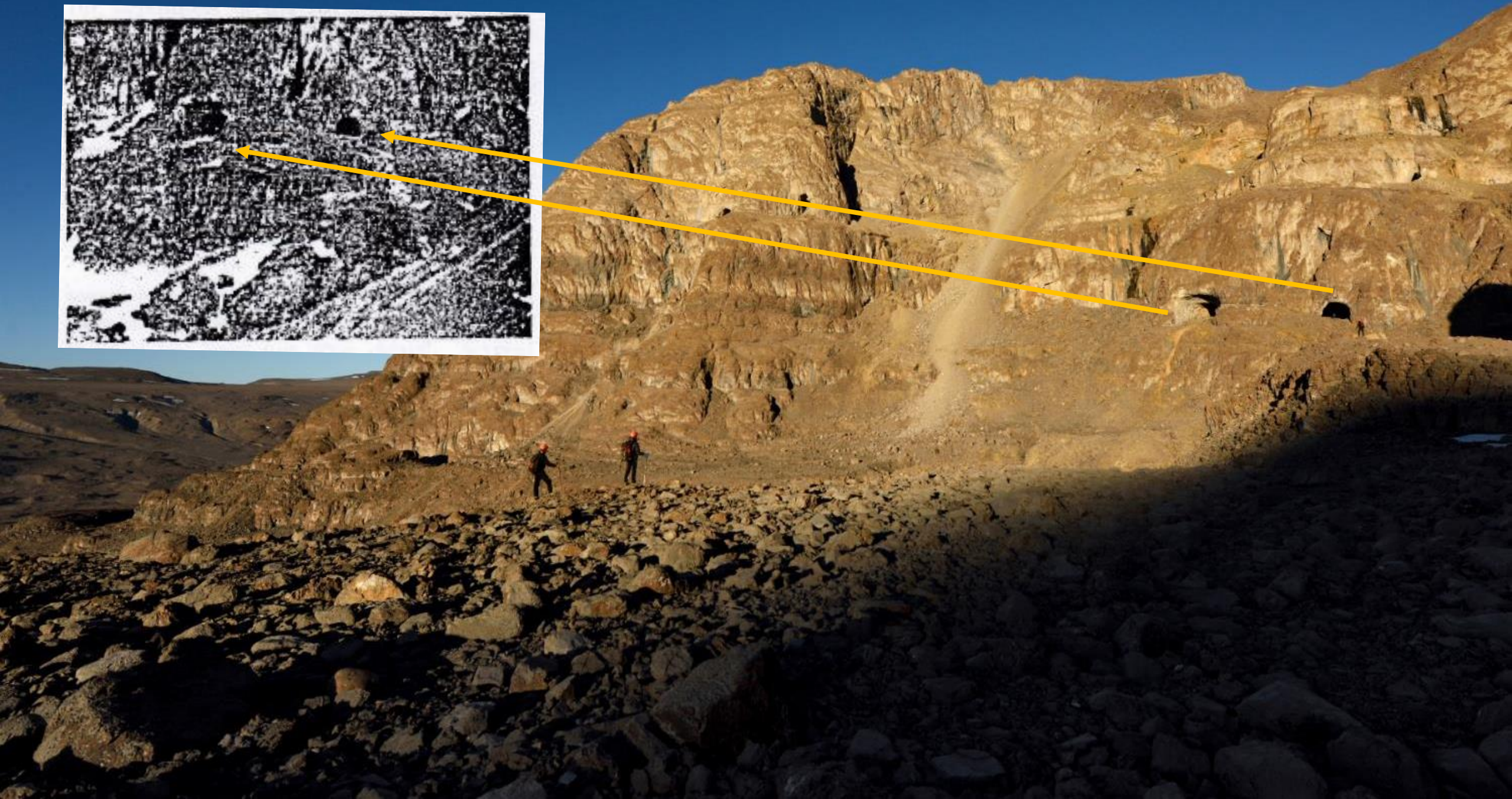
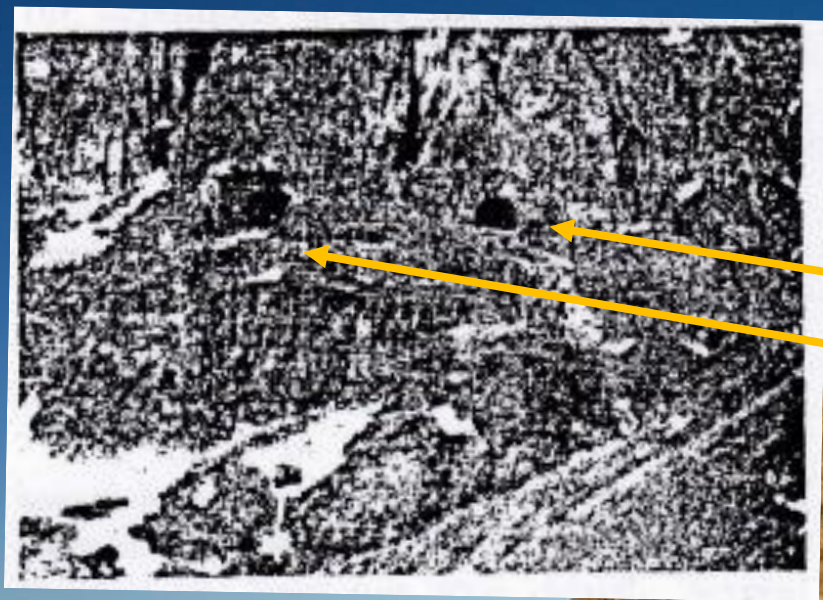




















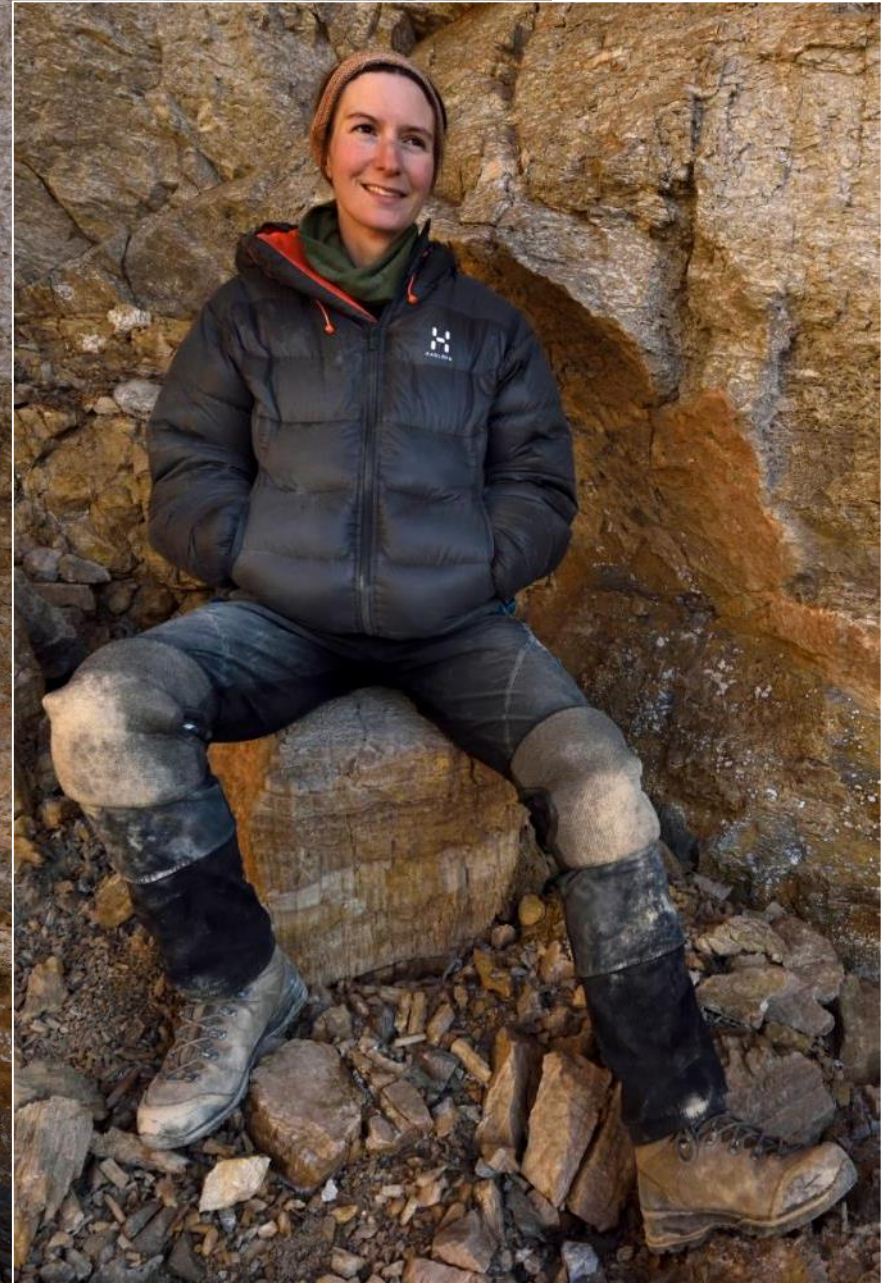








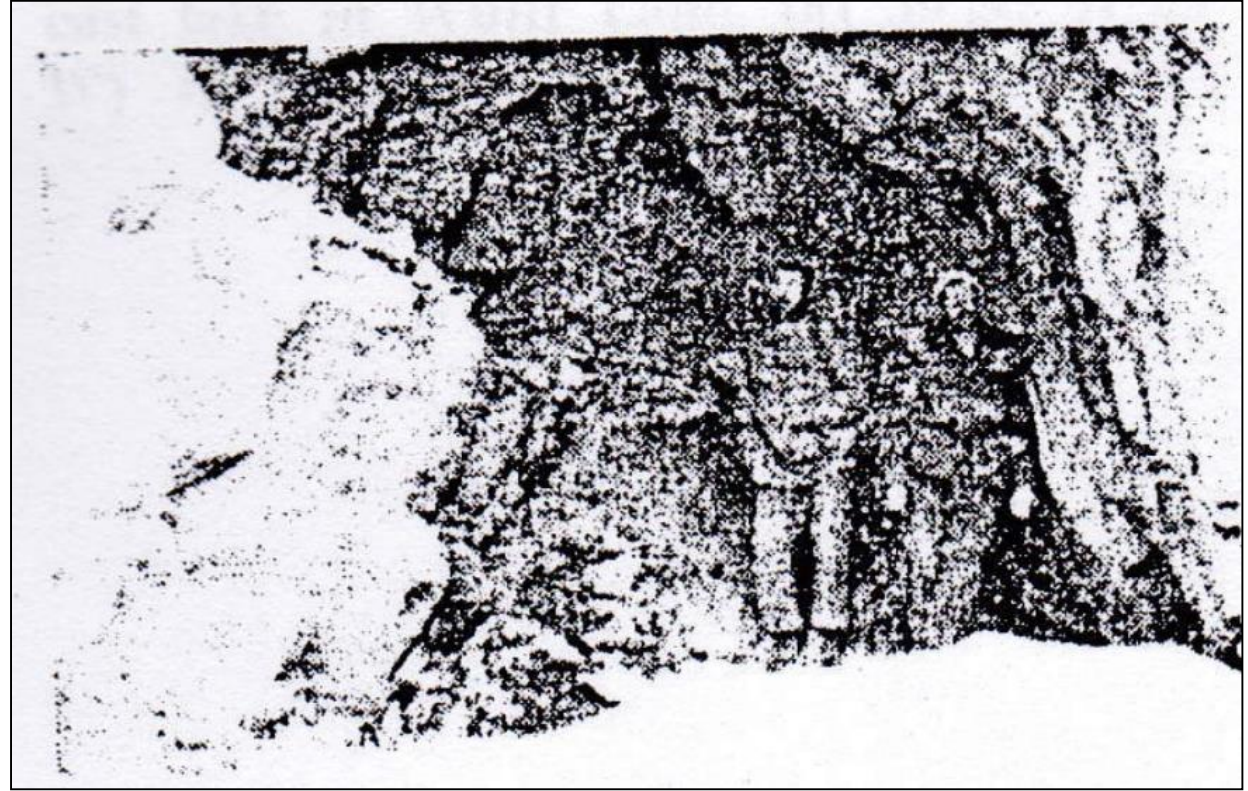
















June 29, 1980

Walter H. Morphine  
Richard Perelli  
Wm E. Davis

AFCRC - US Army  
+ US Geological Survey

attached to AFCRC  
Centrum of party  
visited here.

000





**After 3 days at the caves**

Documented 26 caves

Totalling 330 metres

Collected 16 calcite samples

1 water sample, 2 ice samples, 2 sediment samples, 1 bone, 1 feather





# East Greenland 2018



Wegener Halvø  
Peninsula





# East Greenland 2018





# Northeast Greenland 2019





























# Northern Caves 2023



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Thank You