



**30 YEARS' EXPERIENCE IN DEEP  
ICE CORE DRILLING CAMPS**

**LARS BERG LARSEN**

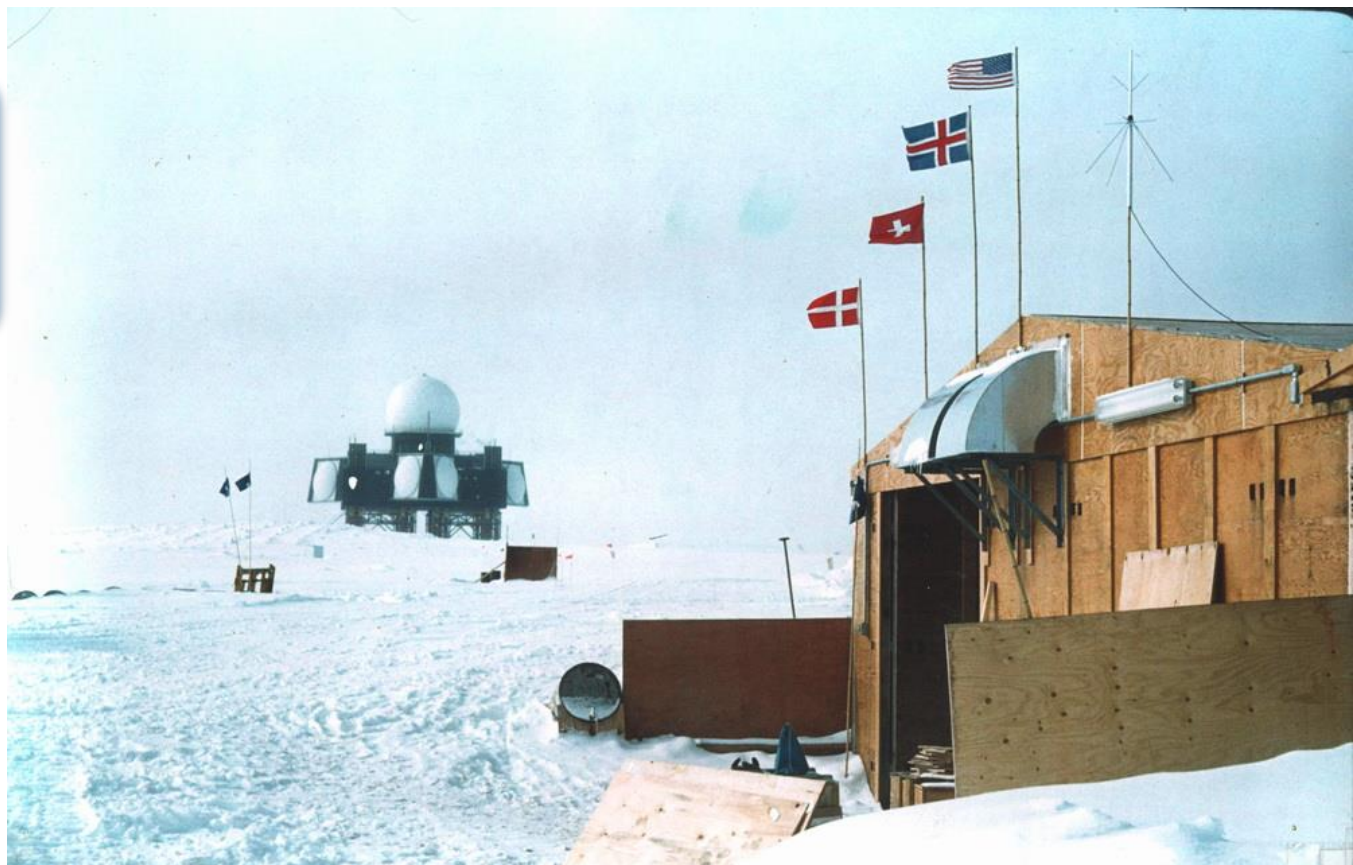
**UNIVERSITY OF COPENHAGEN  
NIELS BOHR INSTITUTET  
CENTER FOR ICE & CLIMATE**

**Polar Tech Conference, Denver 03/22/2016**

# How to get from here..

## GISP (DYE3)

Greenland Ice Sheet Project  
1979-1981



To here...

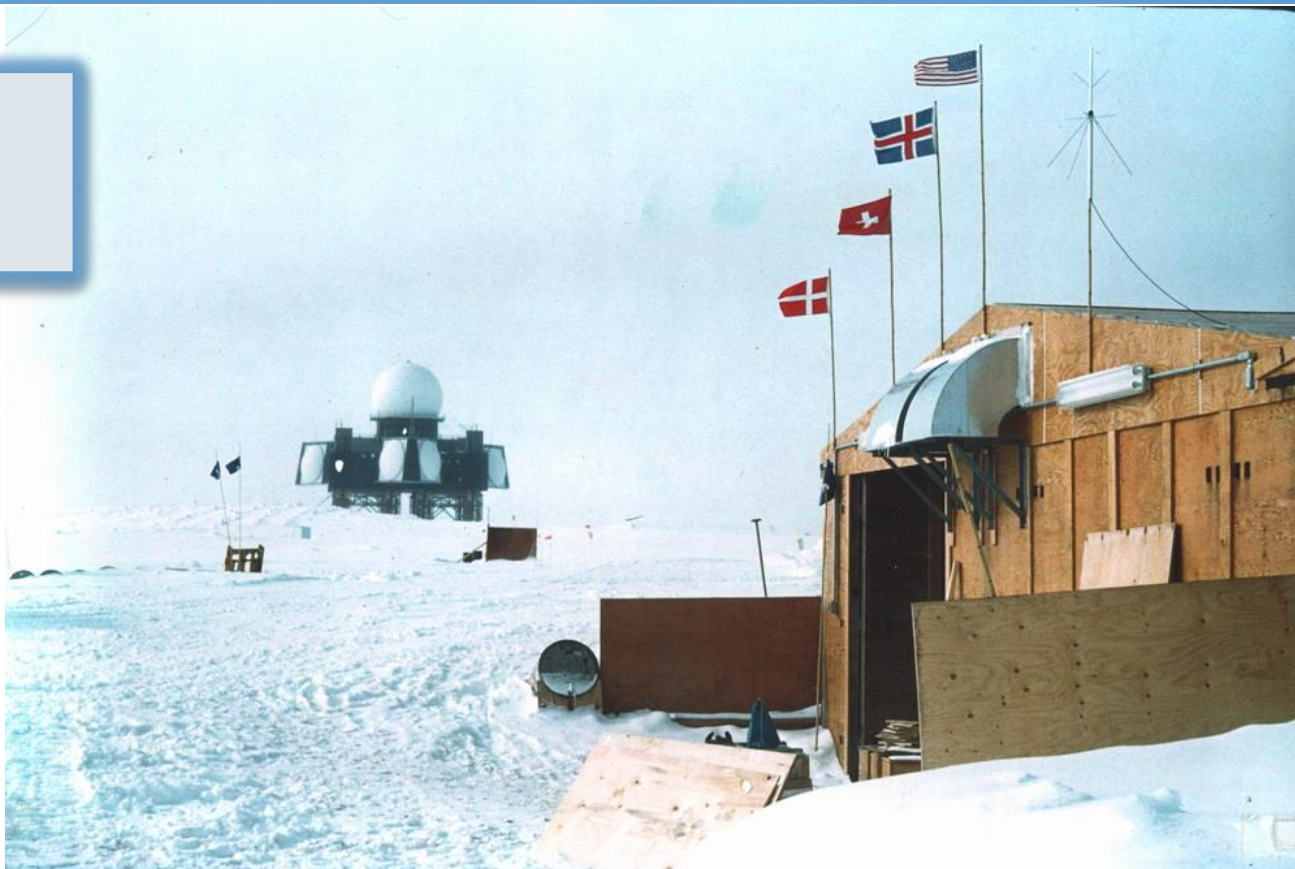
# EGRIP

East Greenland  
Ice coring  
Project  
2015-2020





GISP  
1979



1912-13  
J.P Koch



GISP  
1980





# Snow accumulation..

GISP  
1981



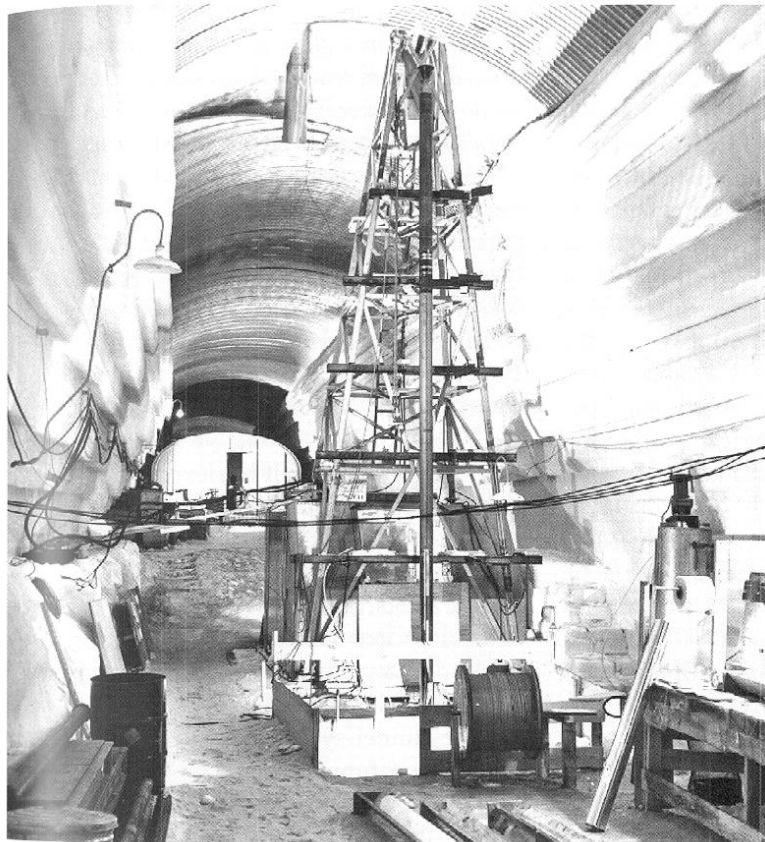
# Sub surface..

GISP  
1981

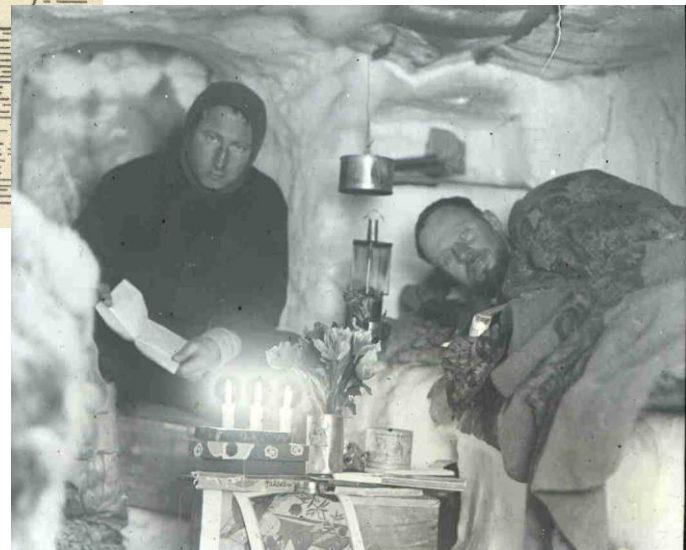
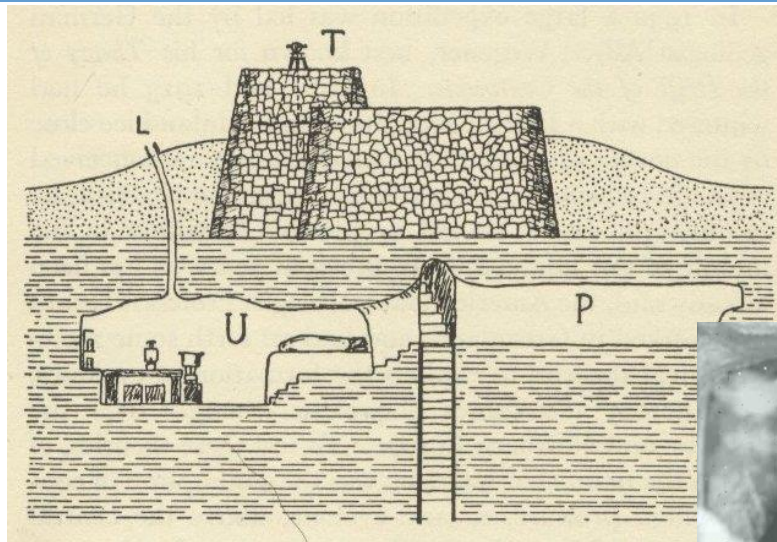




# Camp Century 1961

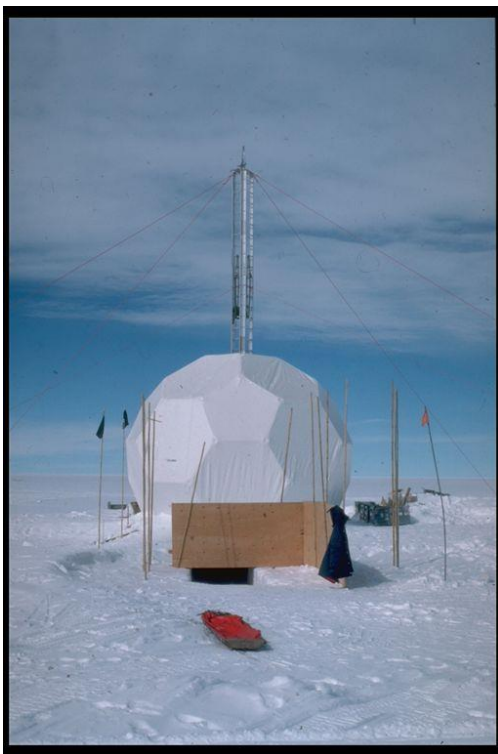


# Eismitte 1930-31

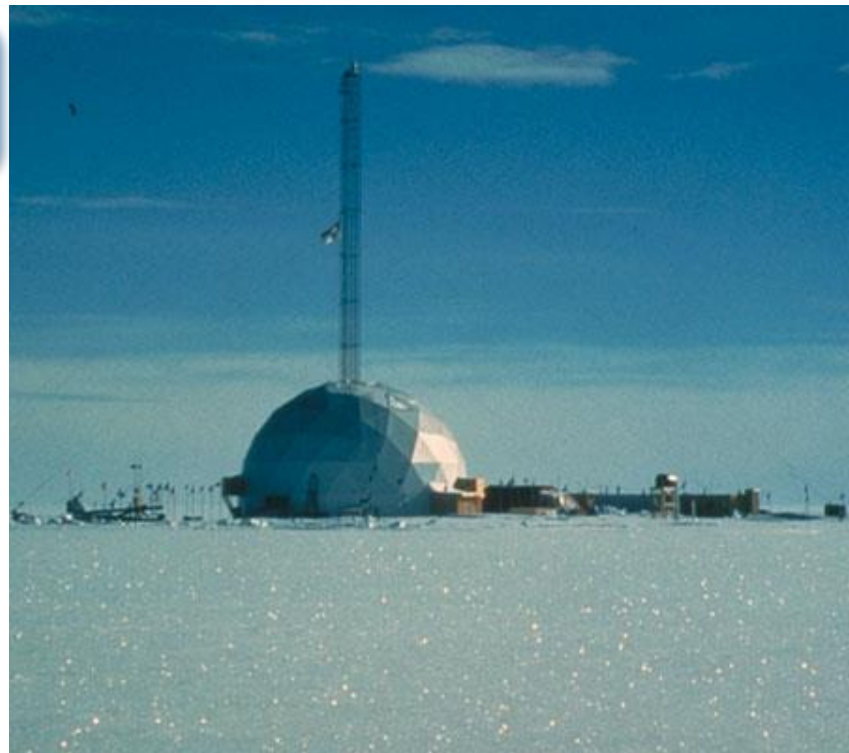


# GRIP – GISP2 1989-93

GRIP



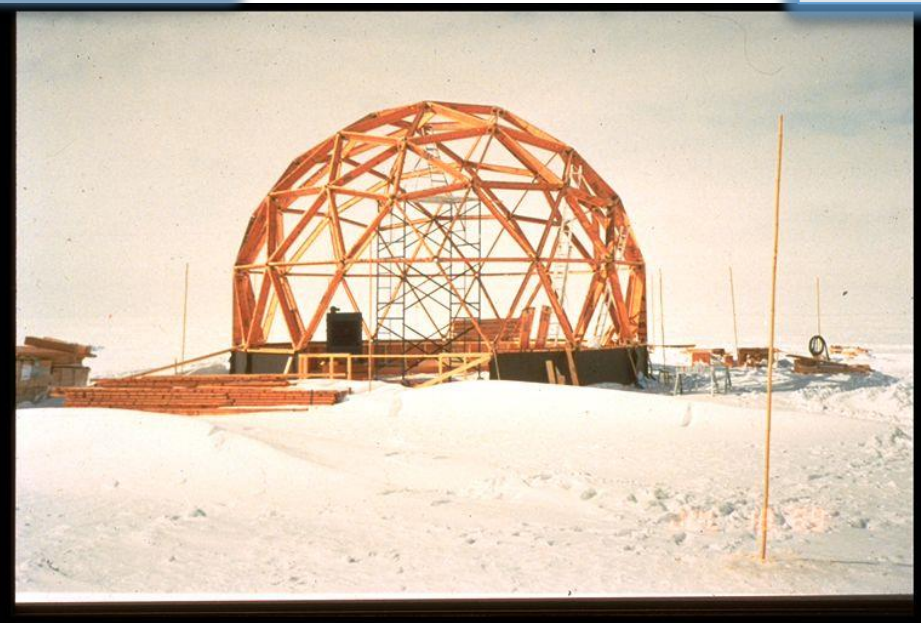
GISP2





# GRIP – GISP2 1989-93

GRIP



GISP2



# GRIP – GISP2 1989-93

Jarl Joset 1958



*Station Jarl-Joset blev konstrueret som en rund plastic-kuppel i 2 etager.*

DYE3 1966



# GRIP 1989-93

Main Dome +  
Drill Dome 1990





# GRIP 1989-93

Drill Dome 1994



# NGRIP 1996-2003

## Main Dome 1996



# NGRIP 1996-2003

## Main Dome 1996





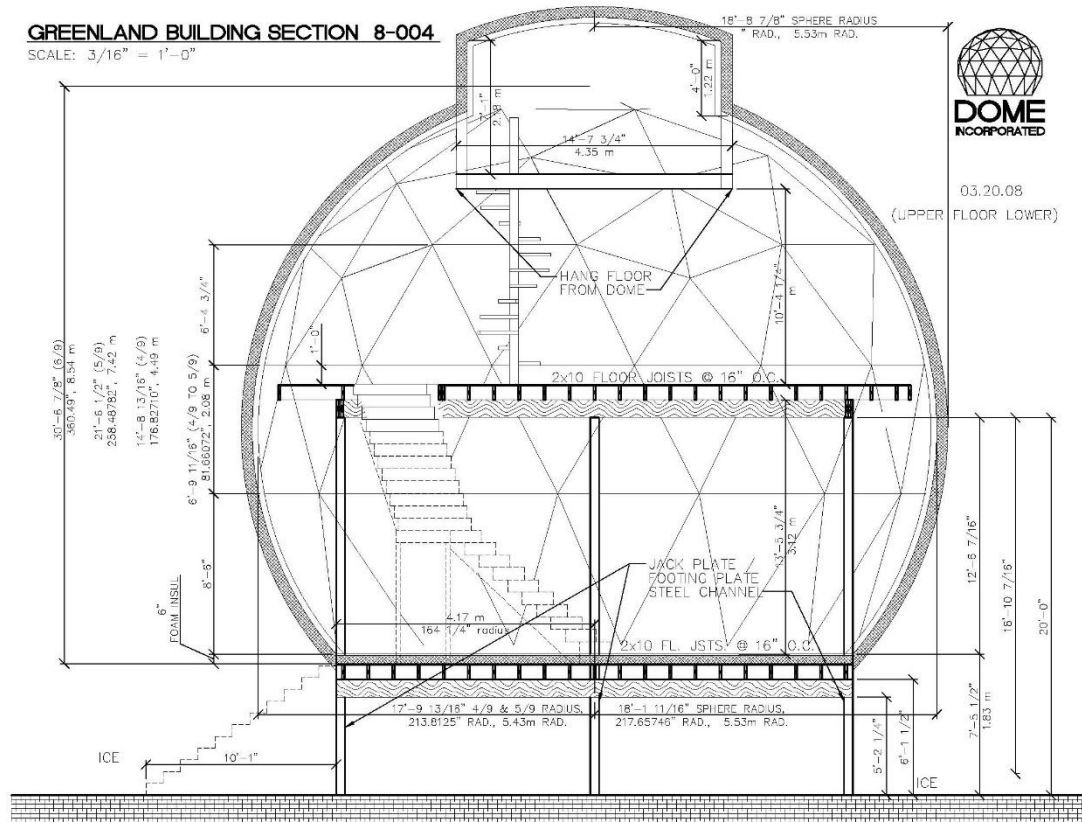
# NGRIP 1996-2003

## Main Dome 2007



# NEEM 2007-2012

## New Dome



03.20.08  
(UPPER FLOOR LOWER)

# NEEM 2007-2012

## Main Dome 2007





# NEEM 2007-2012

## Main Dome 2012



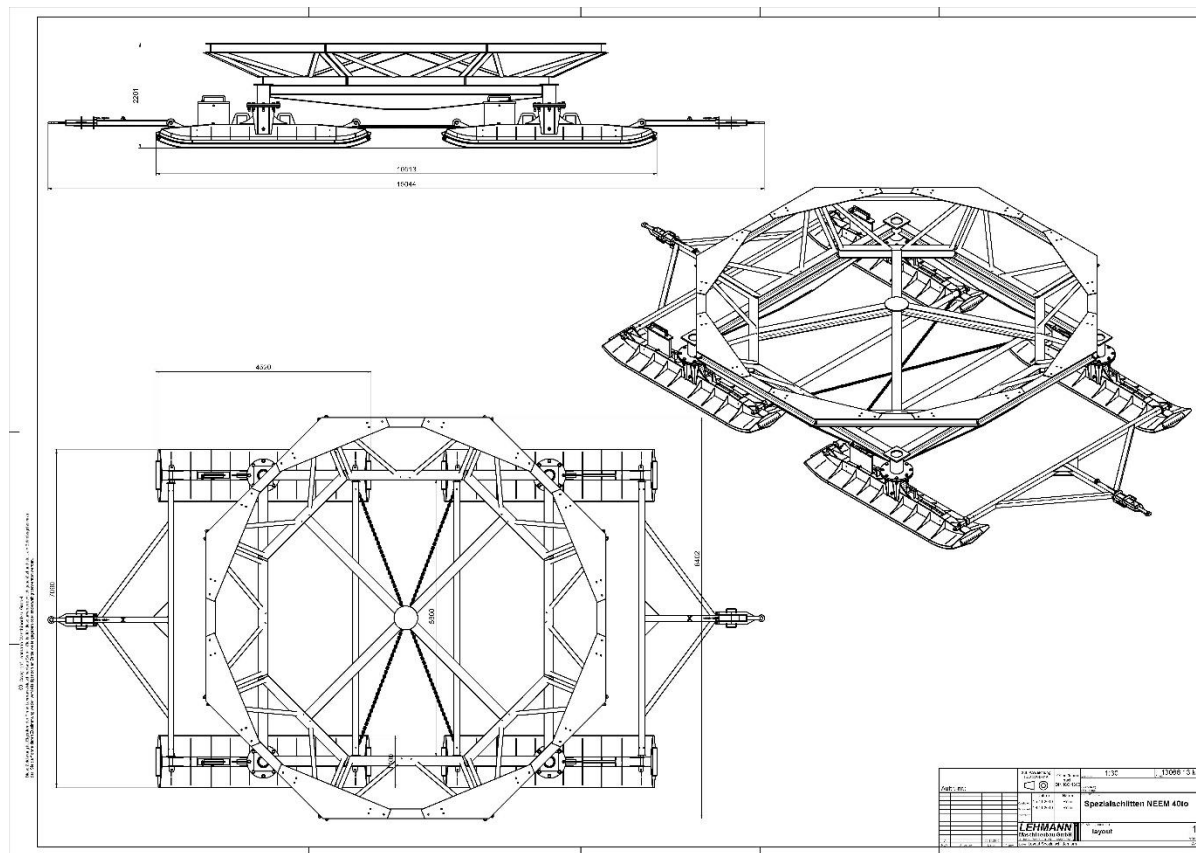
# NEEM 2007-2012

## NEEM Camp 2015



# Recycle NEEM Camp..

Version 1..





# Recycle NEEM Camp..

Version 2.

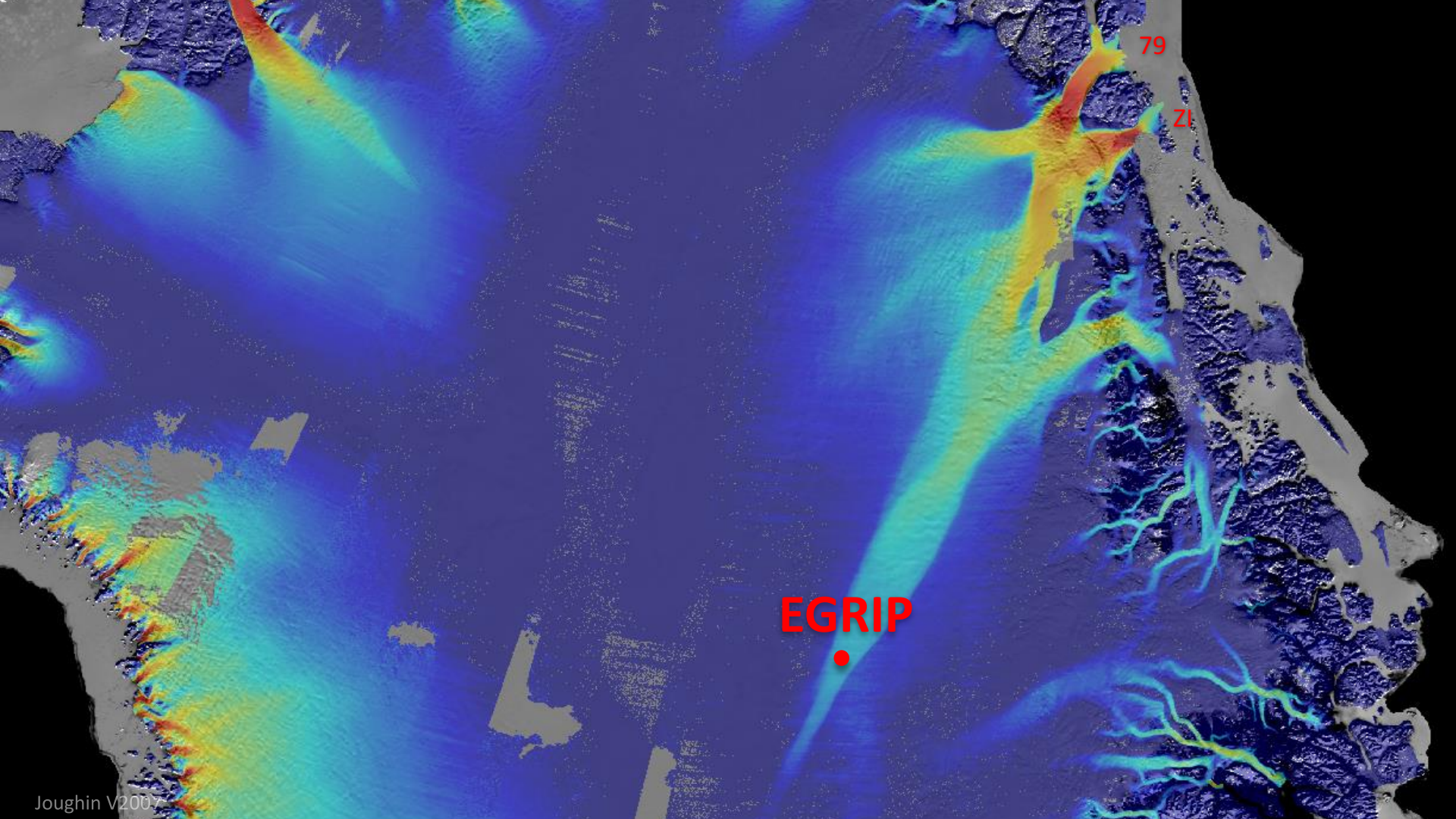


# Recycle NEEM Camp..









**EGRIP**

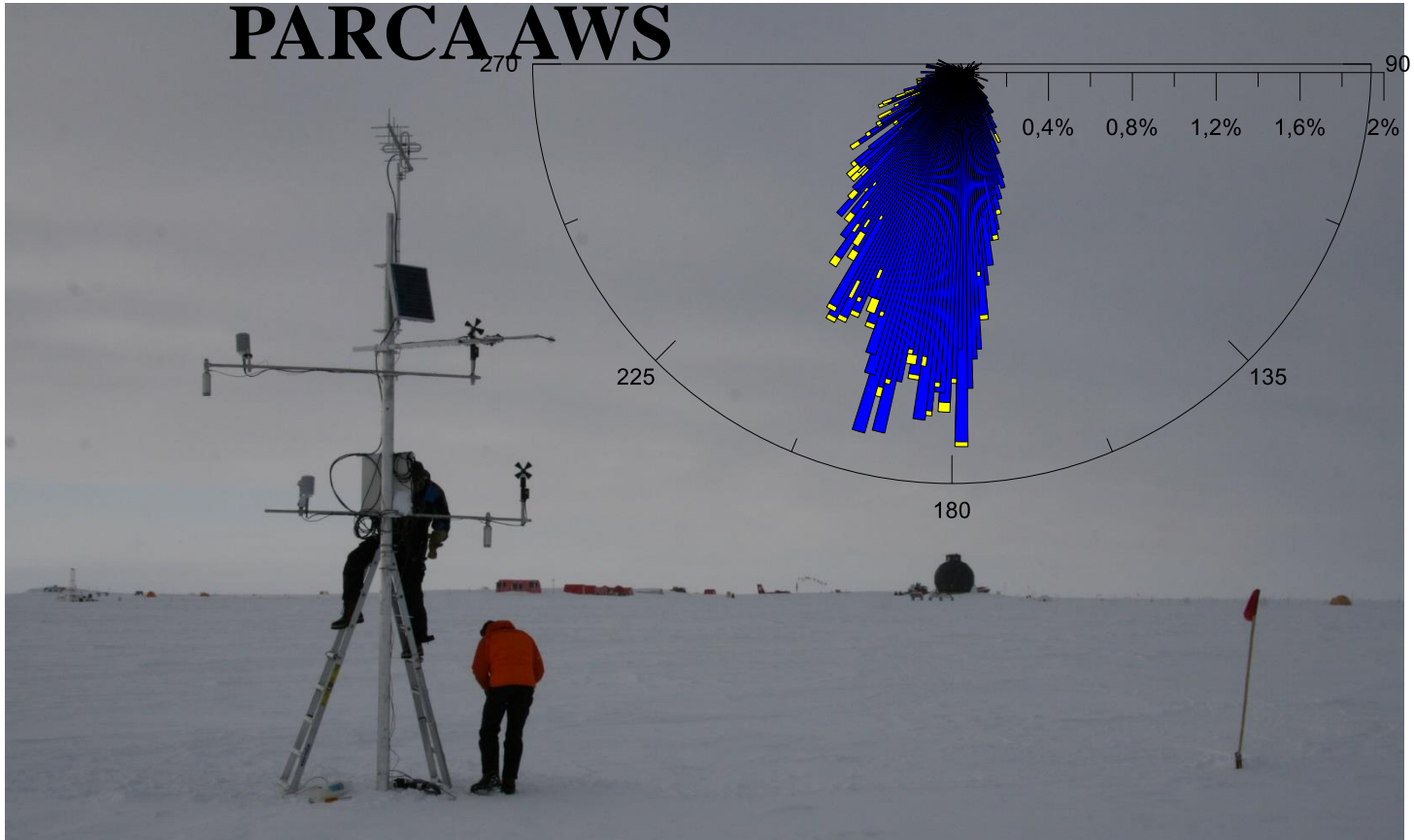
79

Z1

EGRIP 13-JUN-2015



# PARCA AWS





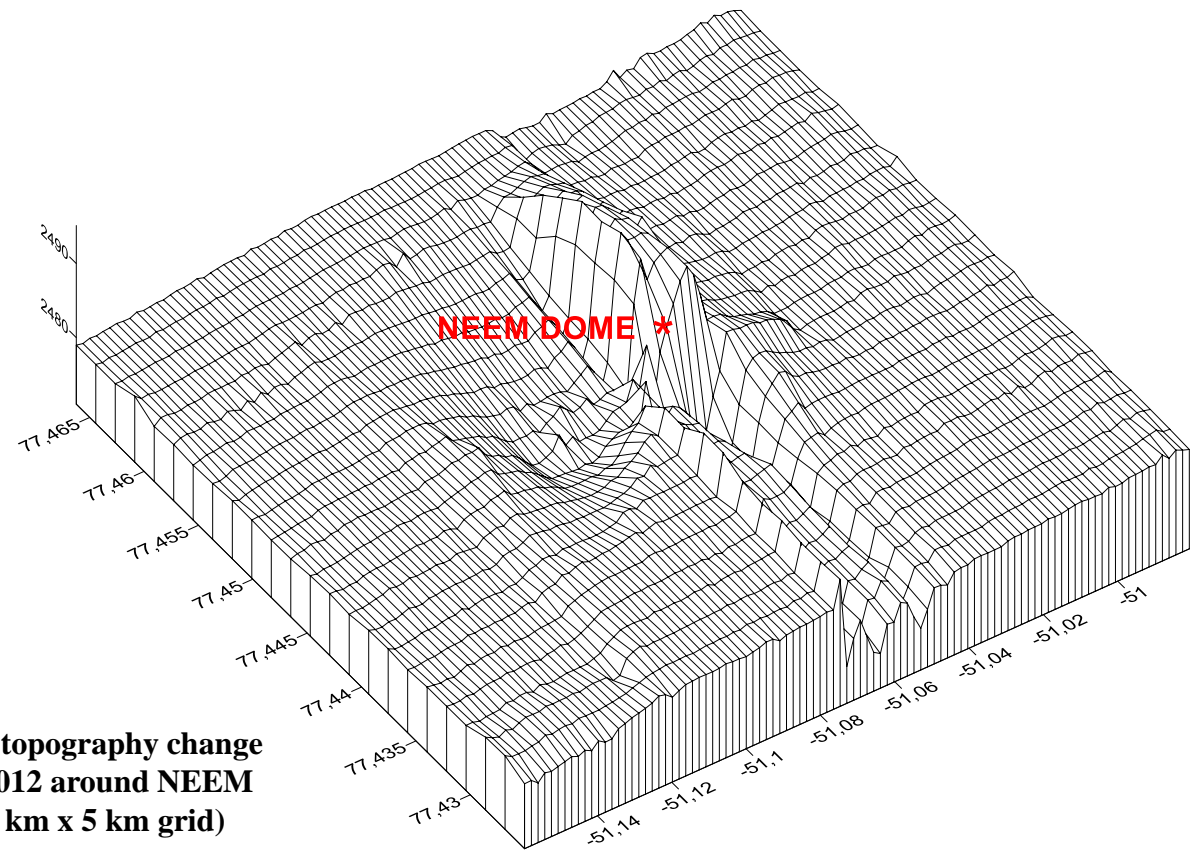
# Camp layout



# Camp layout



Prevailing wind direction



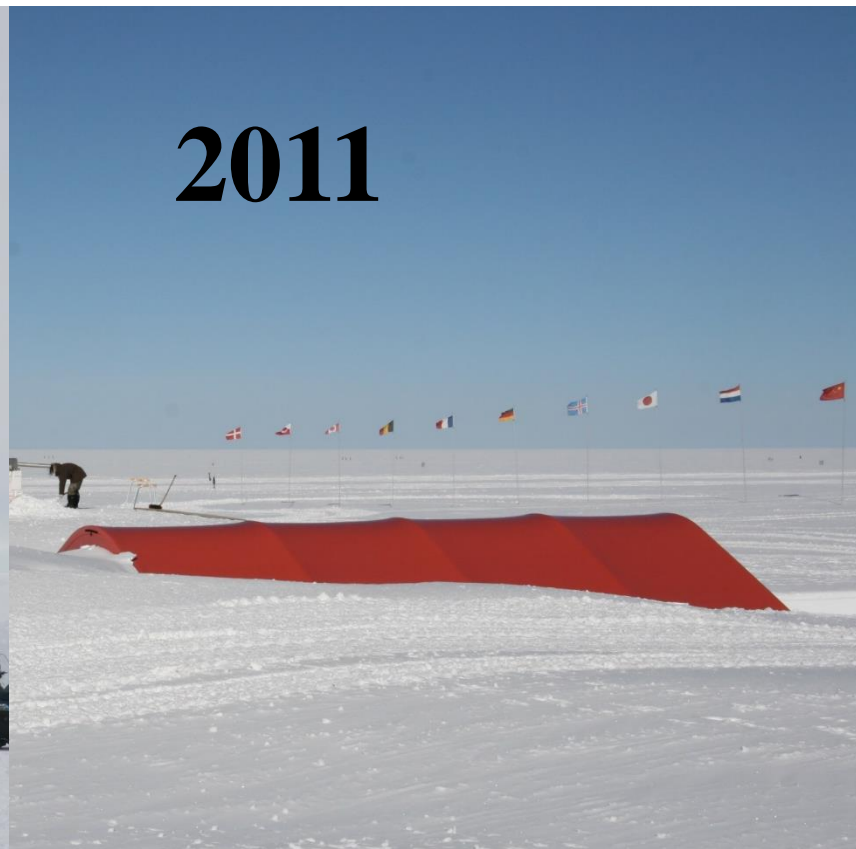
**Surface topography change  
2007 - 2012 around NEEM  
camp (5 km x 5 km grid)**



2008



2011

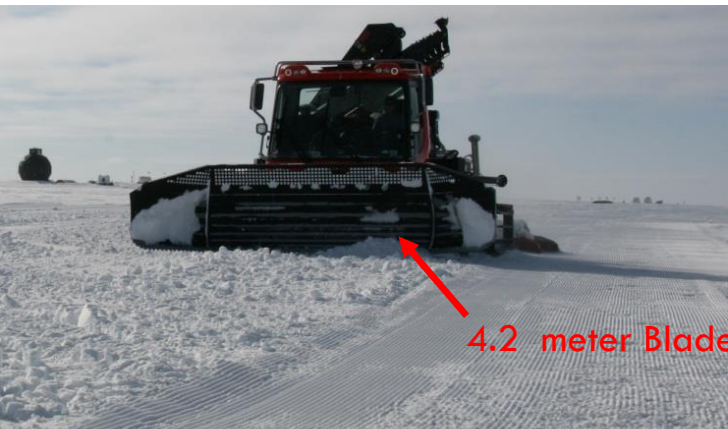


# Other structures





# SKIWAY:

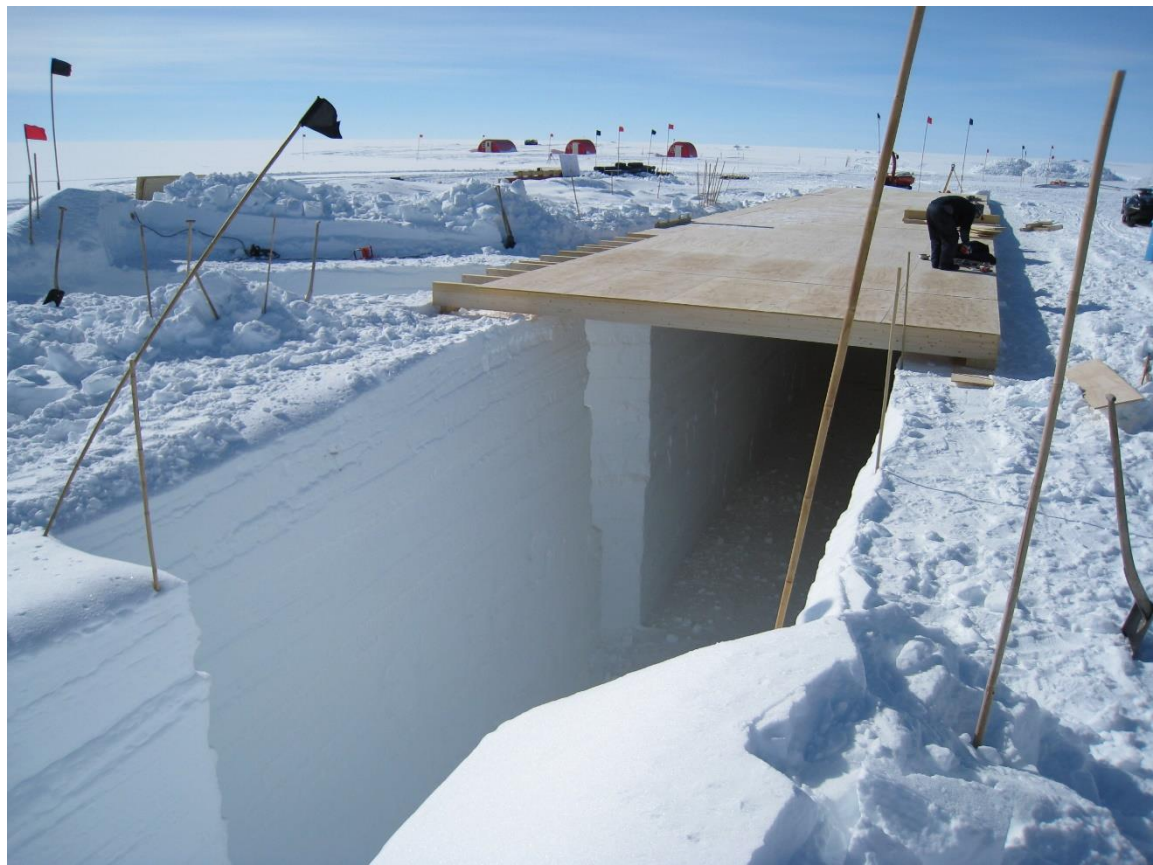




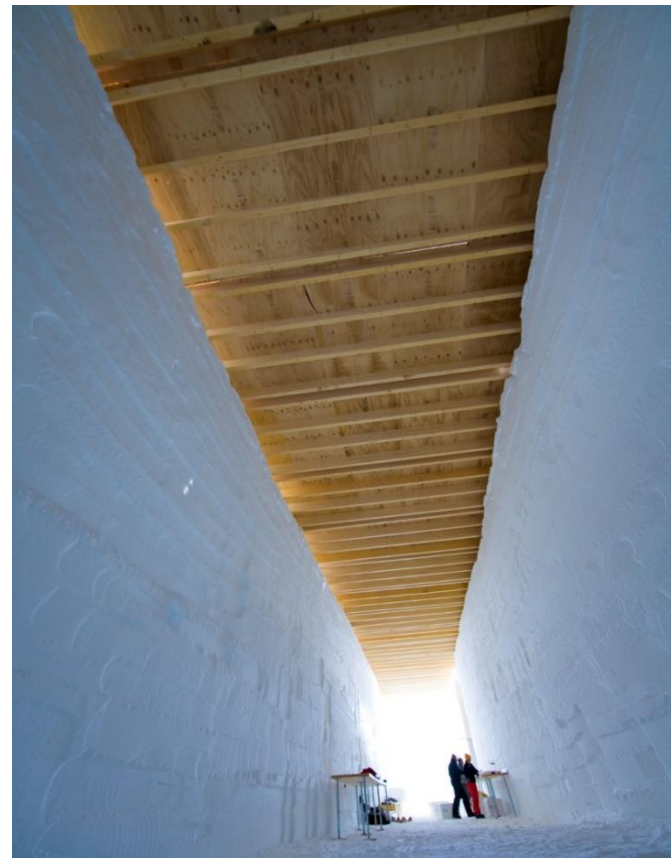




*Overdækning med bølgeblisksplader af en af gangene i Camp Century.*

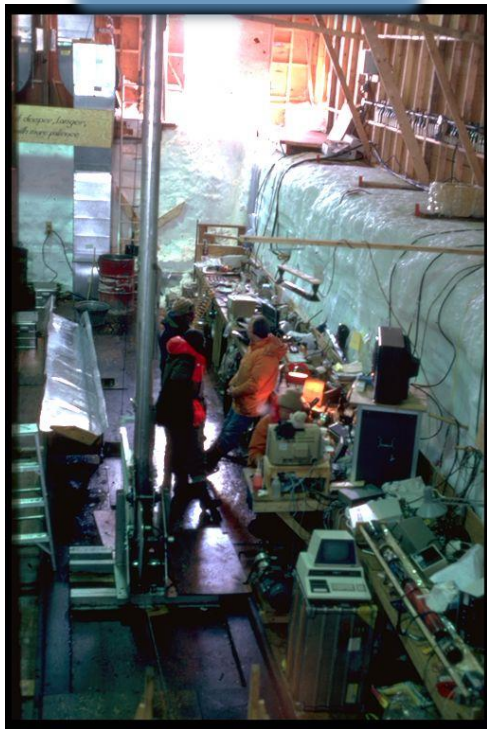


NEEM  
Science and  
Drill trench  
2008





1980



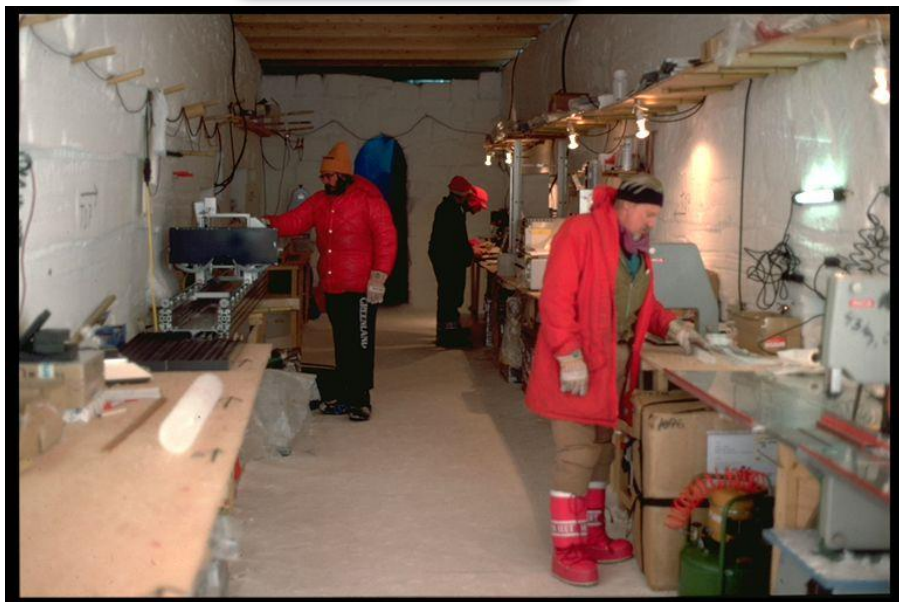
1992



2011



1990



2011



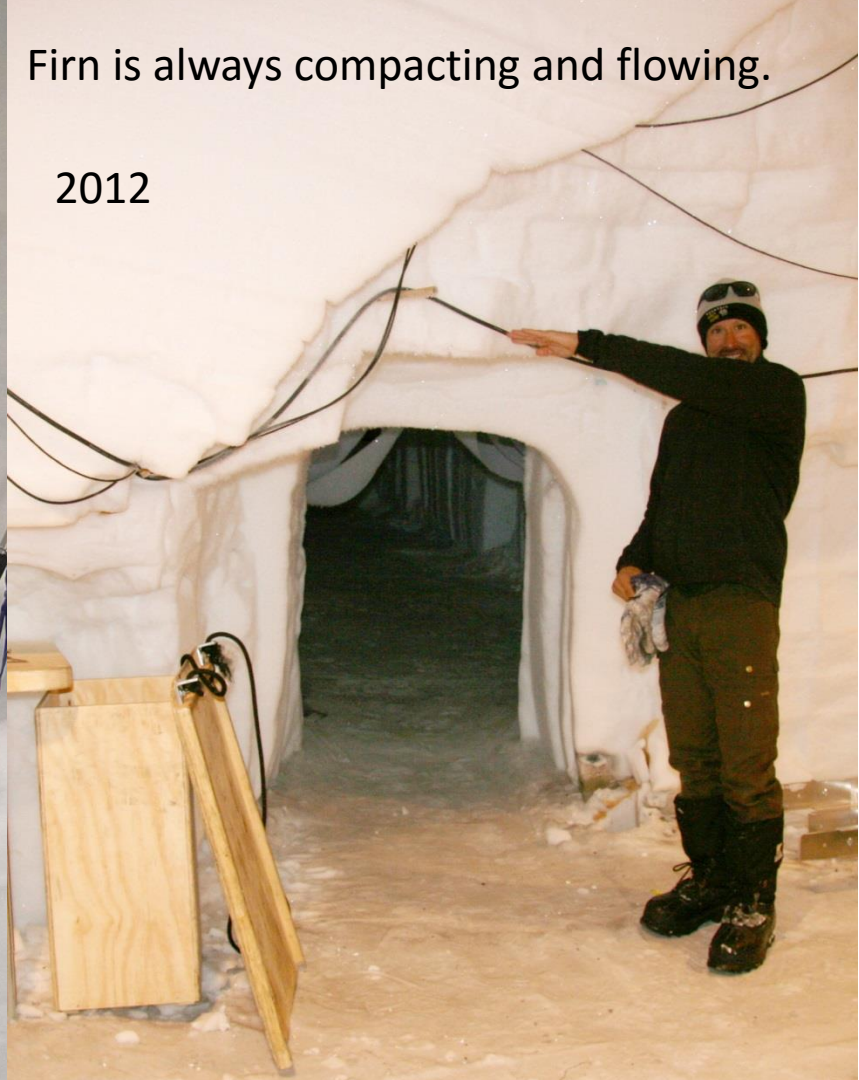
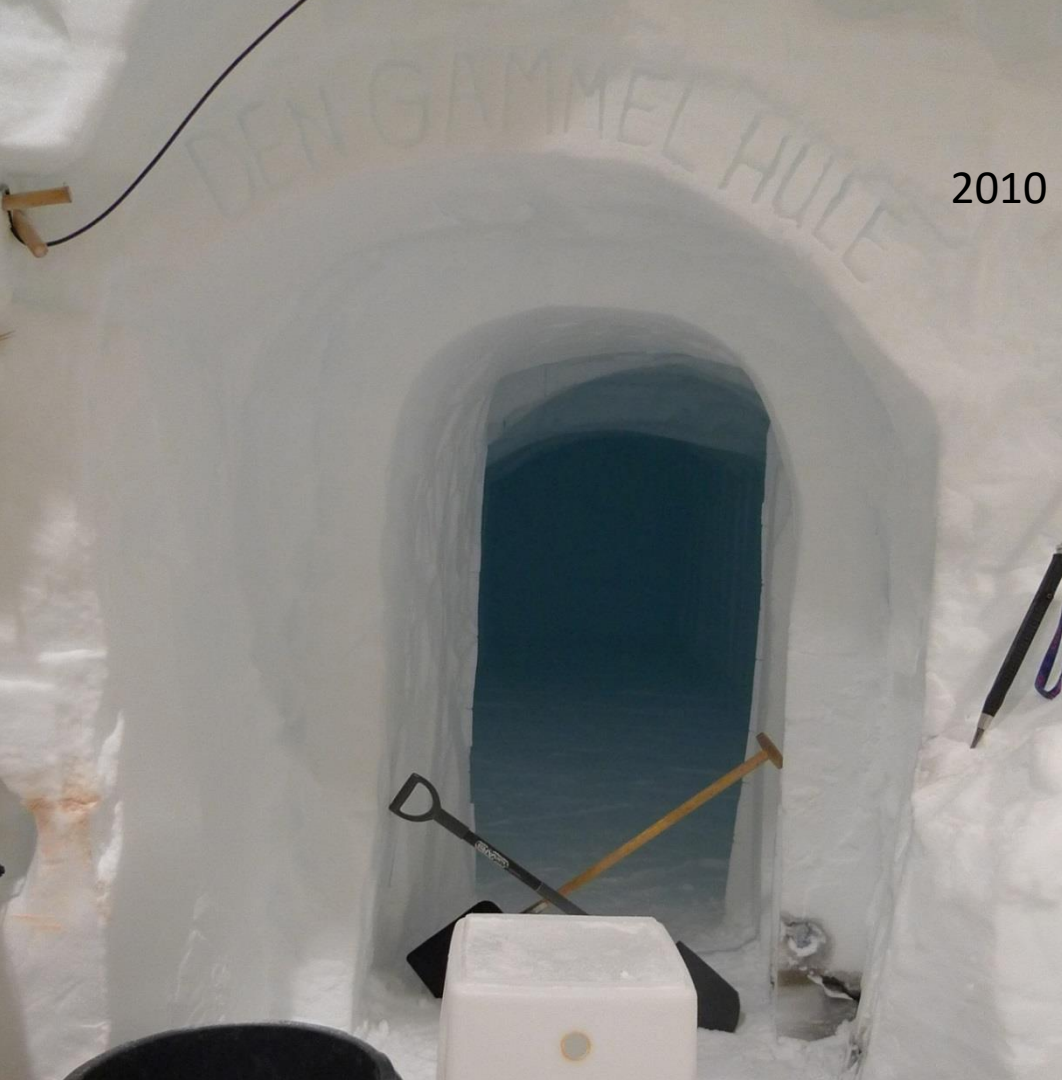




# Balloon trenches.

Picture: Balloon trench at NEEM 2012 (4.5m diameter x 19.5 m long)

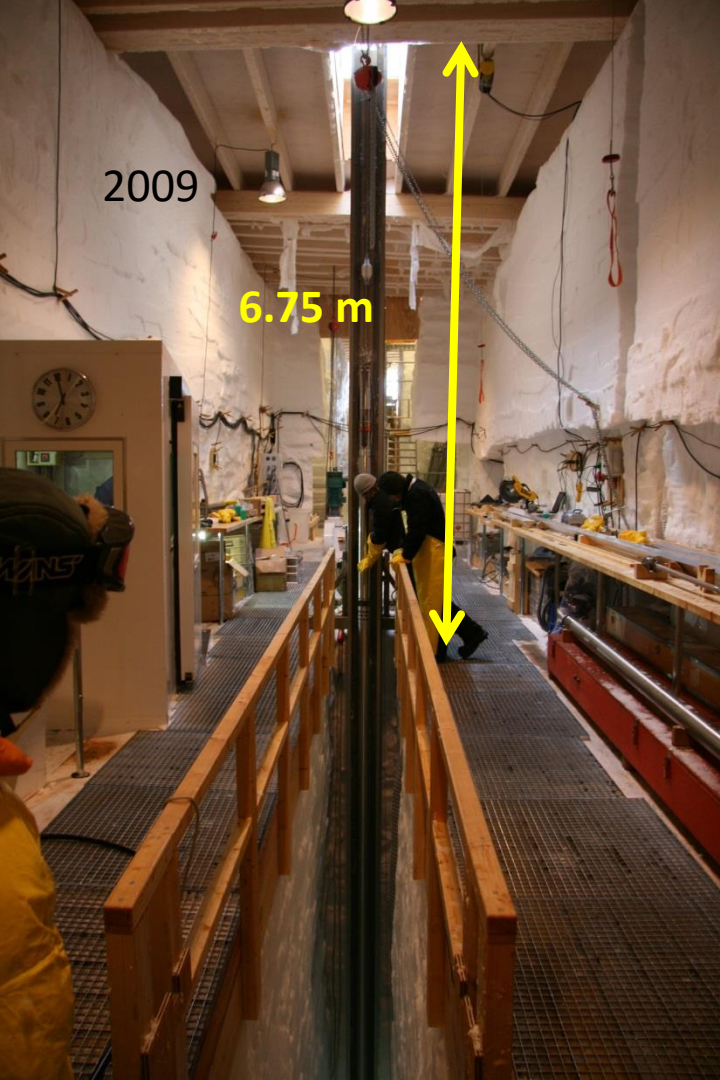




Firn is always compacting and flowing.

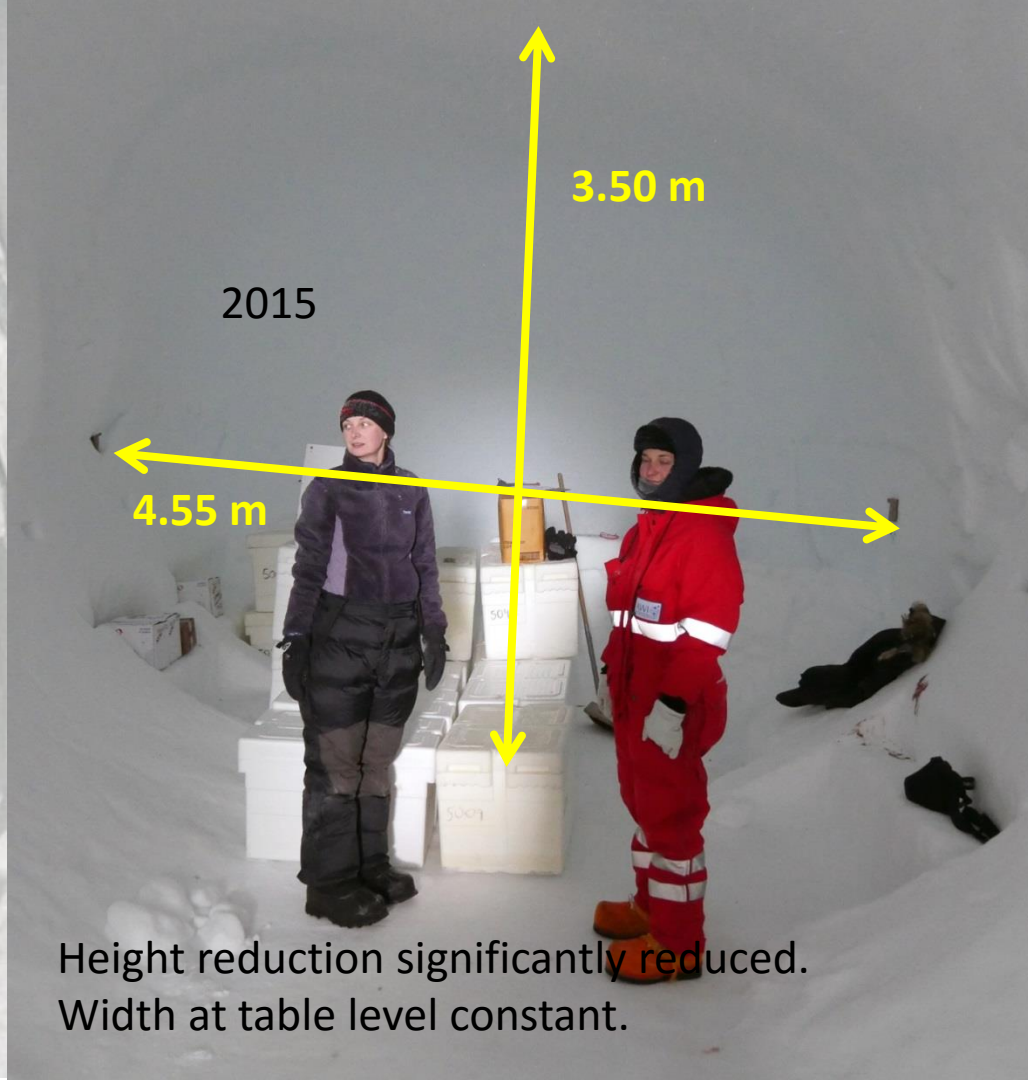
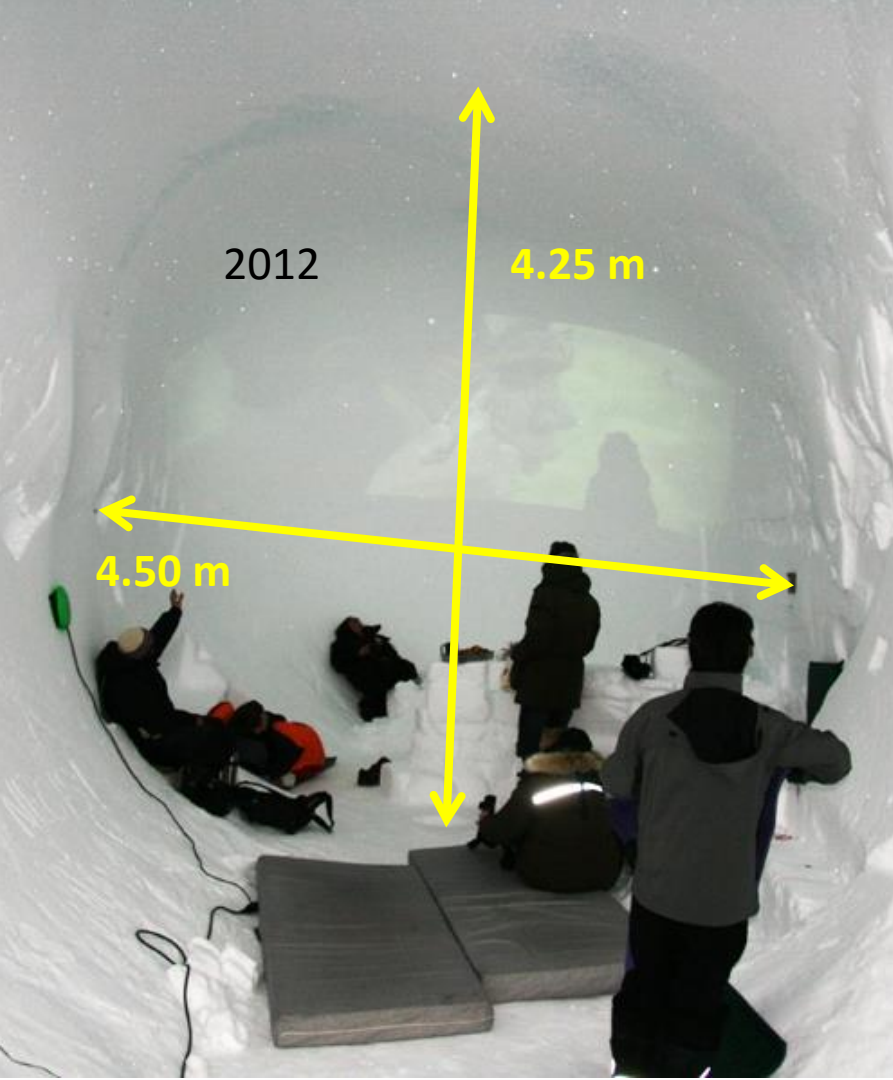






Drill trench in 2009 and 2012. Note, how the walls are slumping in on the tables. Change in width at table height is considerable.

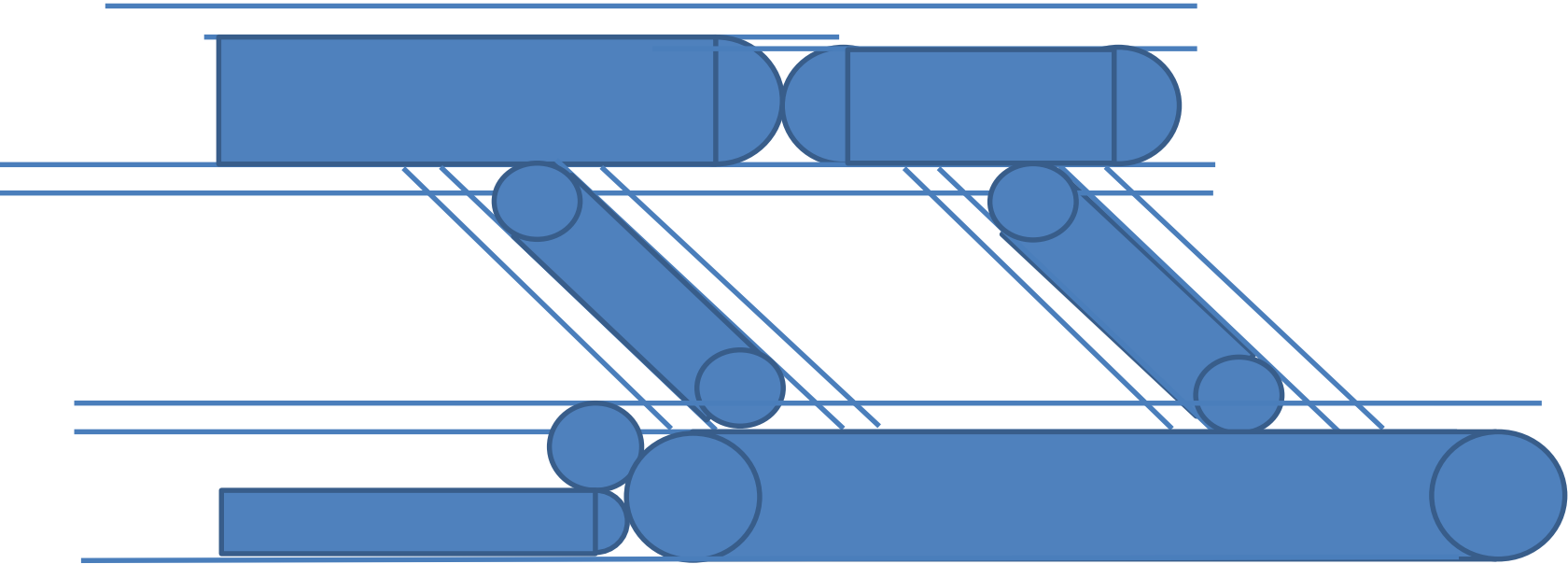






## Tunnels and trenches.

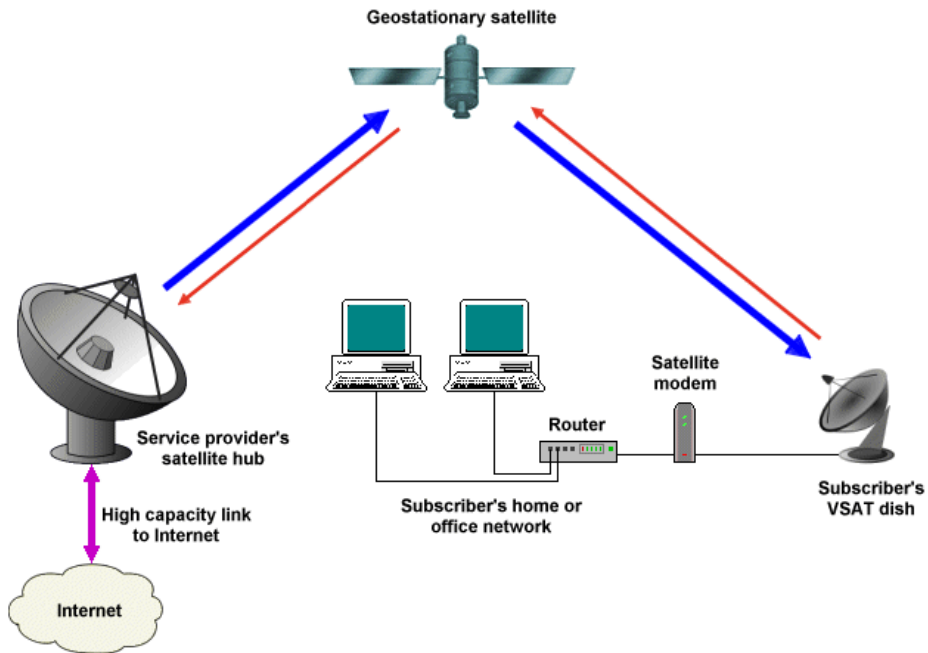
Outer width 7.2 m, tunnels 5.4 m. Inner width 4.8 m and 4.6 m, tunnels 2.8 m, ramp 2.2 m  
balloon diameters: 5 m, 4.85 m, 3.0 m and 2.4 m.







<b>GISP/DYE3</b>	<b>GRIP/GISP2</b>	<b>NGRIP</b>	<b>NEEM</b>	<b>EGRIP</b>
<b>1979-1982</b>	<b>1989-1993</b>	<b>1996-2003</b>	<b>2007-2012</b>	<b>2015-2020</b>
<b>HF</b>	<b>HF</b>	<b>HF</b>	<b>HF</b>	<b>HF</b>
<b>INS</b>	<b>STD--C</b>	<b>STD-C</b>	<b>OPENPORT</b>	<b>OPENPORT</b>
	<b>GPS</b>	<b>BGAN</b>	<b>IRIDIUM</b>	<b>IRIDIUM</b>
		<b>IRIDIUM</b>	<b>GPS</b>	<b>GPS</b>
		<b>GPS</b>	<b>PLB</b>	<b>PLB</b>
		<b>PLB</b>	<b>SPOT</b>	<b>SPOT</b>
				<b>VSAT</b>
				<b>GSM</b>



## GSM desktop Phone



**KONLEN Store No.314132**

