

Live from IPY! Ice Core Drilling in West Antarctica January 11, 2010




With PolarTREC Researcher Heidi Roop and the WAIS Divide Ice Core Team



Wimba Classroom - Arctic Research Consortium of the United States (ARCUS)

WELCOME TO WIMBA



ARCTIC RESEARCH CONSORTIUM OF THE UNITED STATES

Connection strength: [Signal strength icon]

TALK [Mute icon]

Options [Microphone icon] [Camera icon] [Phone icon]

Exit - Lobby - Help

Chat window:
You have entered the lobby.
You have entered 'Arctic Research Consortium of the United States (ARCUS)'.
Your media format is WimbaMedia.
You say, "I'm going to change the slide momentarily- to show the one I need for my new screen shot?"
To: Main Room

People (3)	
Kristin_Timm	[Mute] [Volume]
kristina_creek	[Mute] [Volume]
Kristin_Timm	[Mute] [Volume]

Slides will be shown here

If using VOIP, press and hold here to talk

Your connection strength

'Chat' with one person or the entire group

Raise your hand to ask a question

List of all participants

Return to the lobby or exit

Please note:

- Participant using the telephone can mute/unmute by pressing *6 on the phone.
- Today's event will be recorded and archived.

Roll Call

When called, please state your:

- ✓ Name
- ✓ School / Institution
- ✓ The number of students participating with you in the same location



International Polar Year (IPY)

The International Polar Year (2007-2009) is an exciting scientific campaign focusing on the world's polar regions!

IPY is a time for discovery, science, learning, and awareness about the polar regions with activities for youth, scientists, and the public.

www.ipy.org



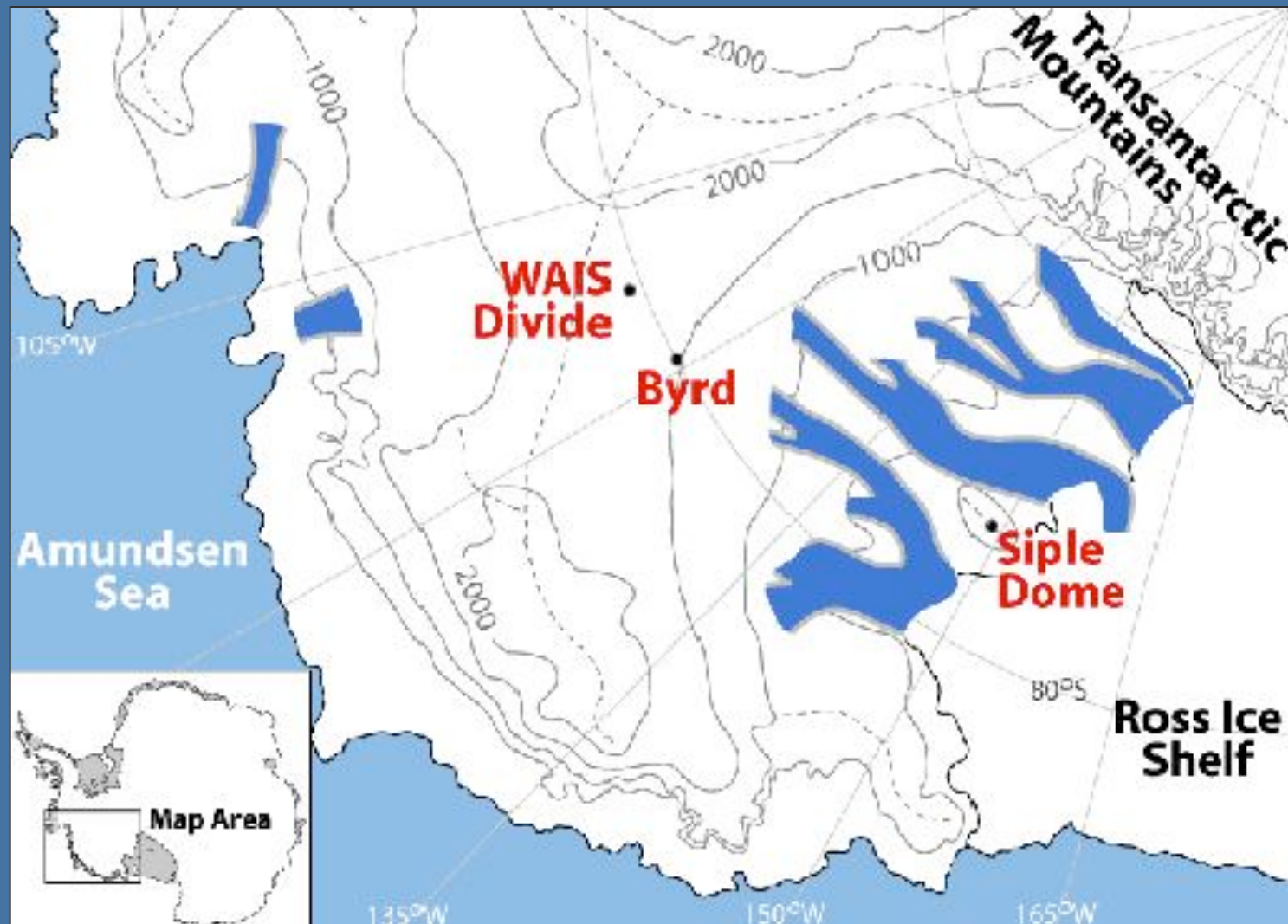
What is PolarTREC?

PolarTREC is a professional development experience in which K-12 teachers are paired with researchers in authentic polar research experiences.

In the next three years over 40 teachers from around the United States will join scientists in the Arctic and Antarctica in celebration of the International Polar Year!

www.polartrec.com

Where in the world are we?



- Please insert a better map of Antarctica with WAIS Divide if you have one. I am not sure this one is good enough

Welcome to WAIS Divide!



A little camp dedicated to ice cores in the middle of an ice sheet.

WAIS Fun Facts

The average temperature = -24°C

Average snow accumulation = ~ 17 inches

Average number of people in camp = 45

Number of outhouses = 7

Number of buildings = 13

The average daily caloric intake = 4,000 calories.
(about double what an average adult consumes back home)

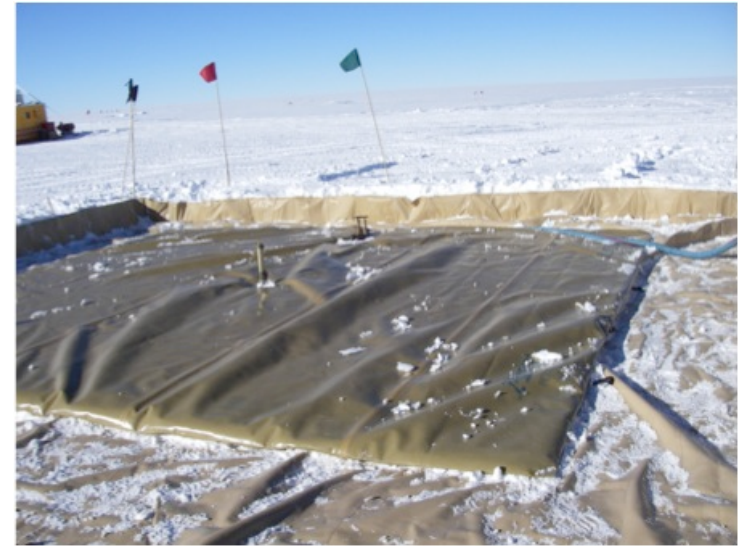
Average number of cookies consumed daily = 3

The WAIS Divide Ice Core Team



The camp population fluctuates but averages about 45 people. Most people at WAIS work in support of the ice core drilling project.

At WAIS Divide, we are **dependent** on flights.
Every nut, bolt, drop of fuel, and morsel of food
comes by airplane.



WAIS DIVIDE CAMP

The Drill Arch



Galley



Heated jamesway for sleeping



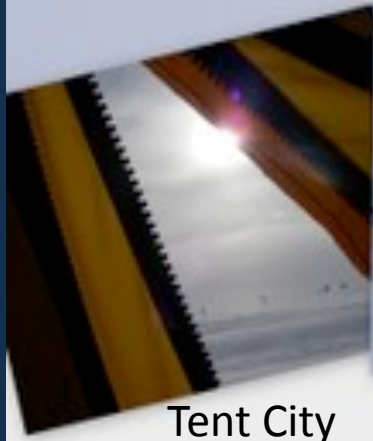
Snow machines and grooming equipment



Outhouses

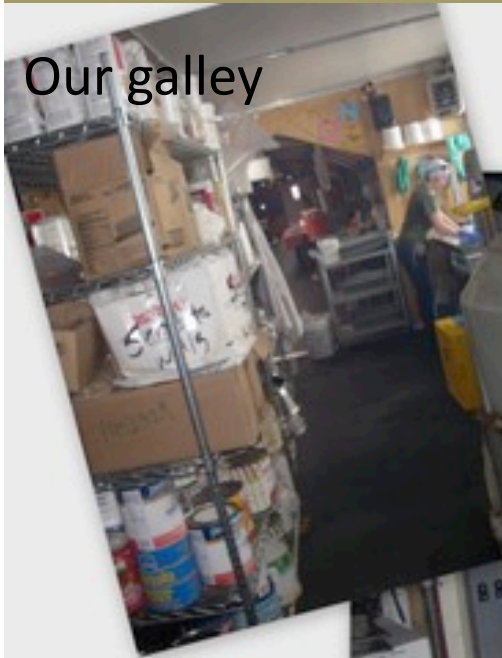


Tent City



Fueling up at WAIS

Our galley



The WAIS convenient mart!



Birthday cherry pie



Holiday cheese platter and hummus!



Sushi!

We love ice and snow but need water for survival...



Watching a bucket of snow melt



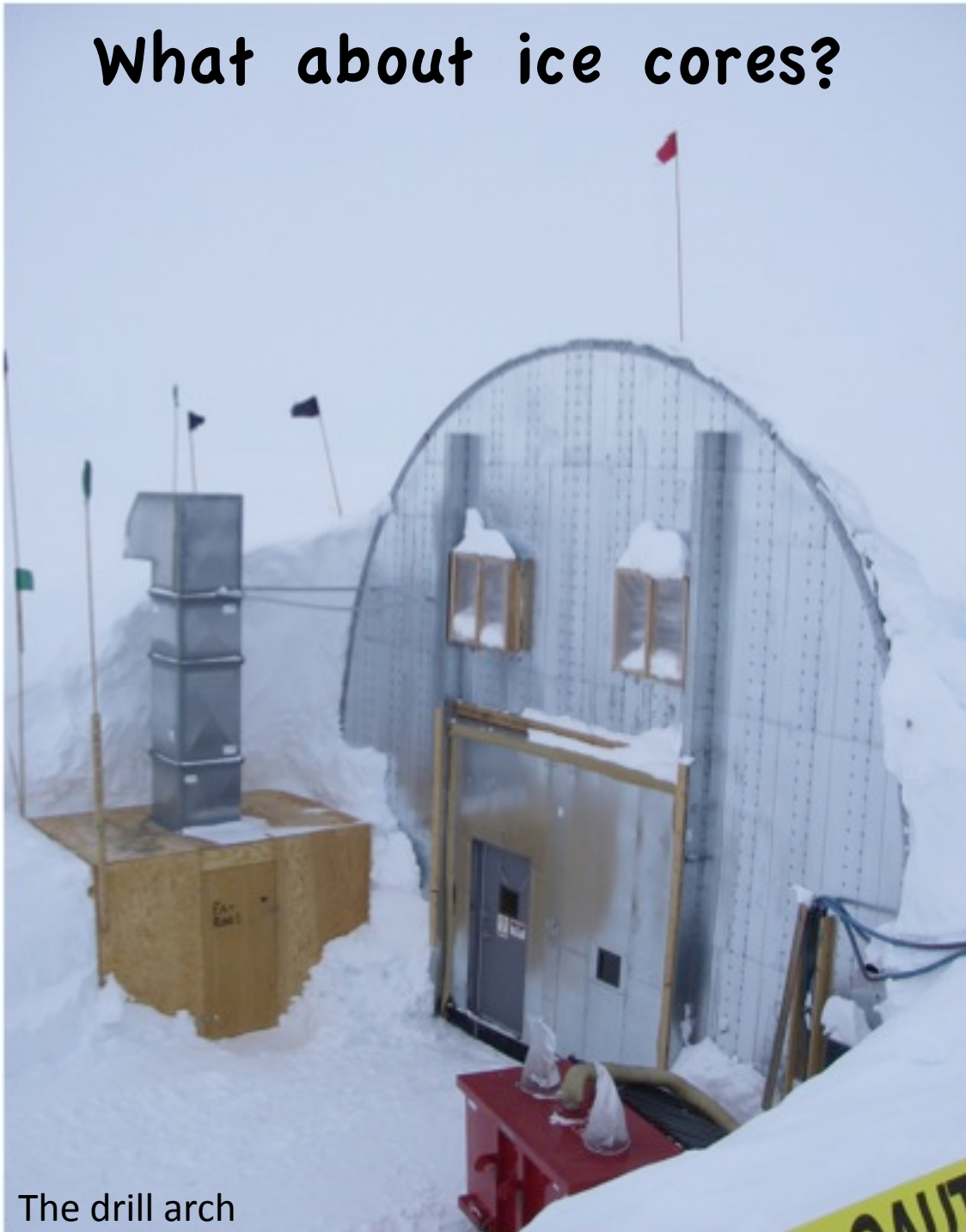
The heating elements



The water tank

Snow melters and lots of shoveling produce the ~200 gallons of water needed to sustain camp on a daily basis.

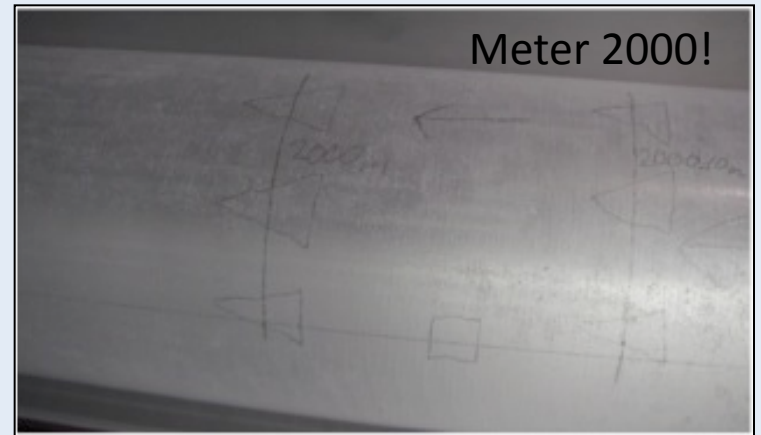
What about ice cores?



The drill arch



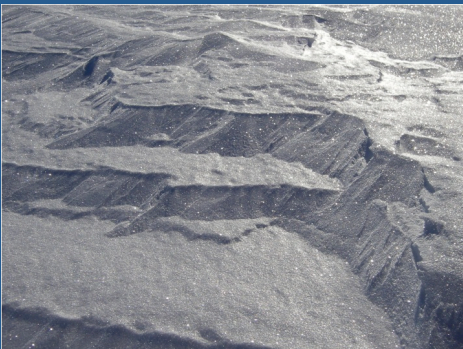
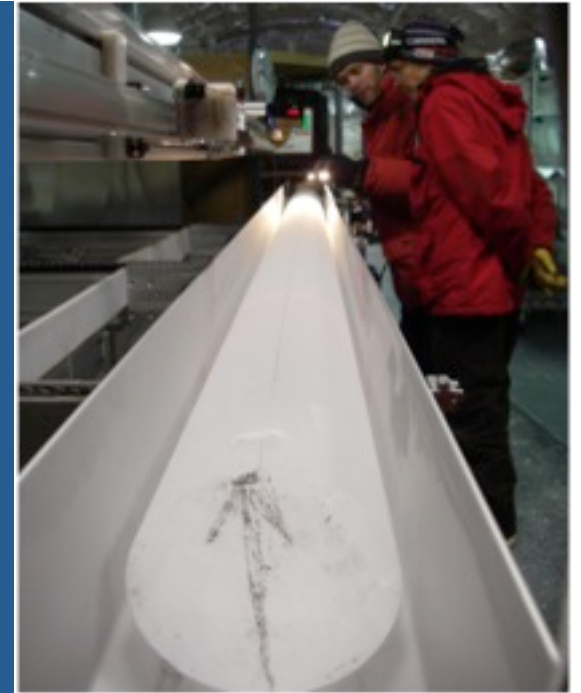
Volcanic
Ash Layer



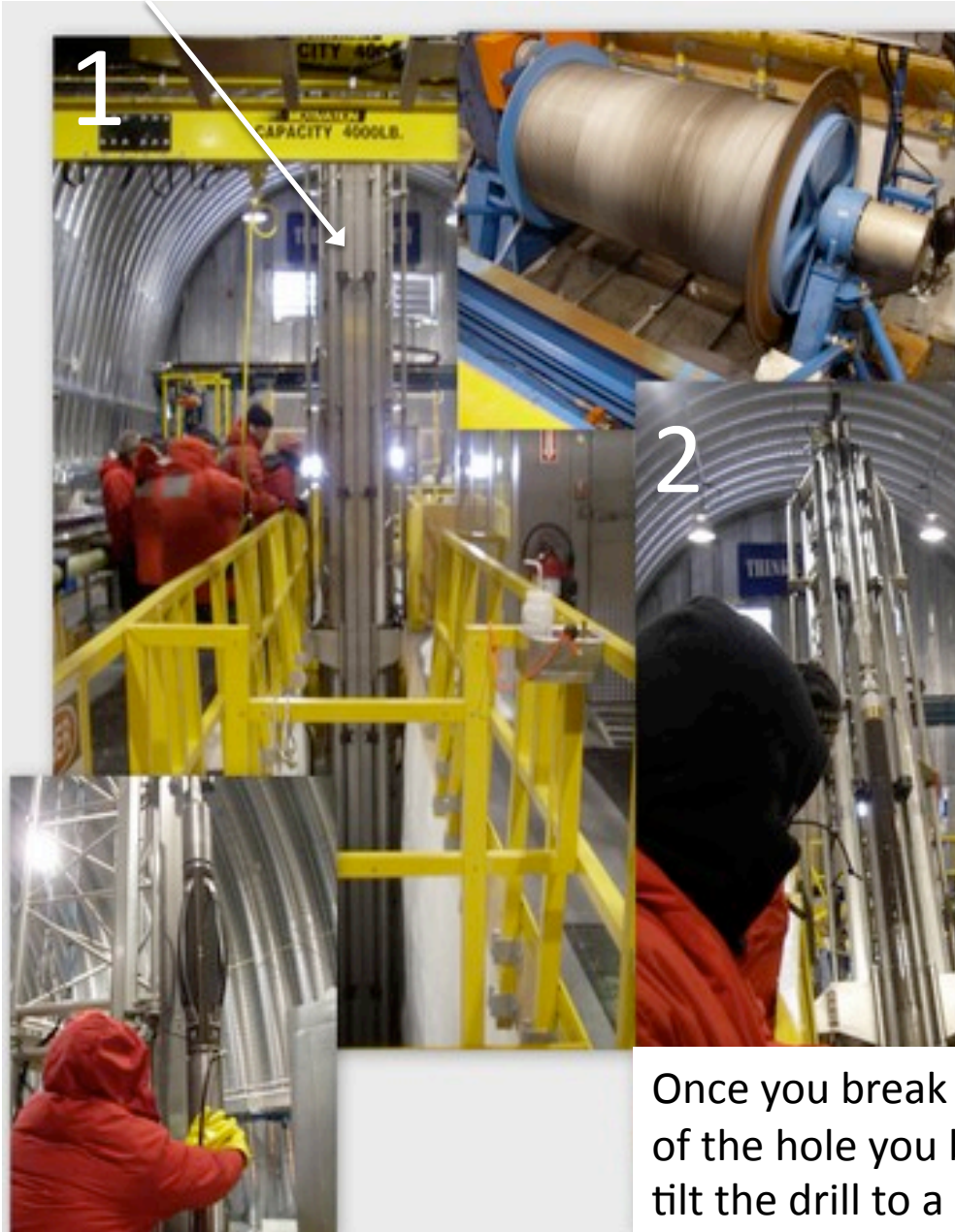
Meter 2000!

Primary WAIS Divide Ice Core Project Goals

- Recover a 2-mile-long ice core
- Develop a record of the Earth's climate over the last 100,000 years, with annual resolution back 40,000 years
- Compare the WAIS ice core climate record to Greenland ice cores records for a better picture of global climate change
- Study the stability of West Antarctic Ice Sheet
- Study bacteria within the ice cores



Send the drill down the borehole



The core goes through a hole in the wall to the cold side of the arch, then the ice gets documented, cut, and packed.

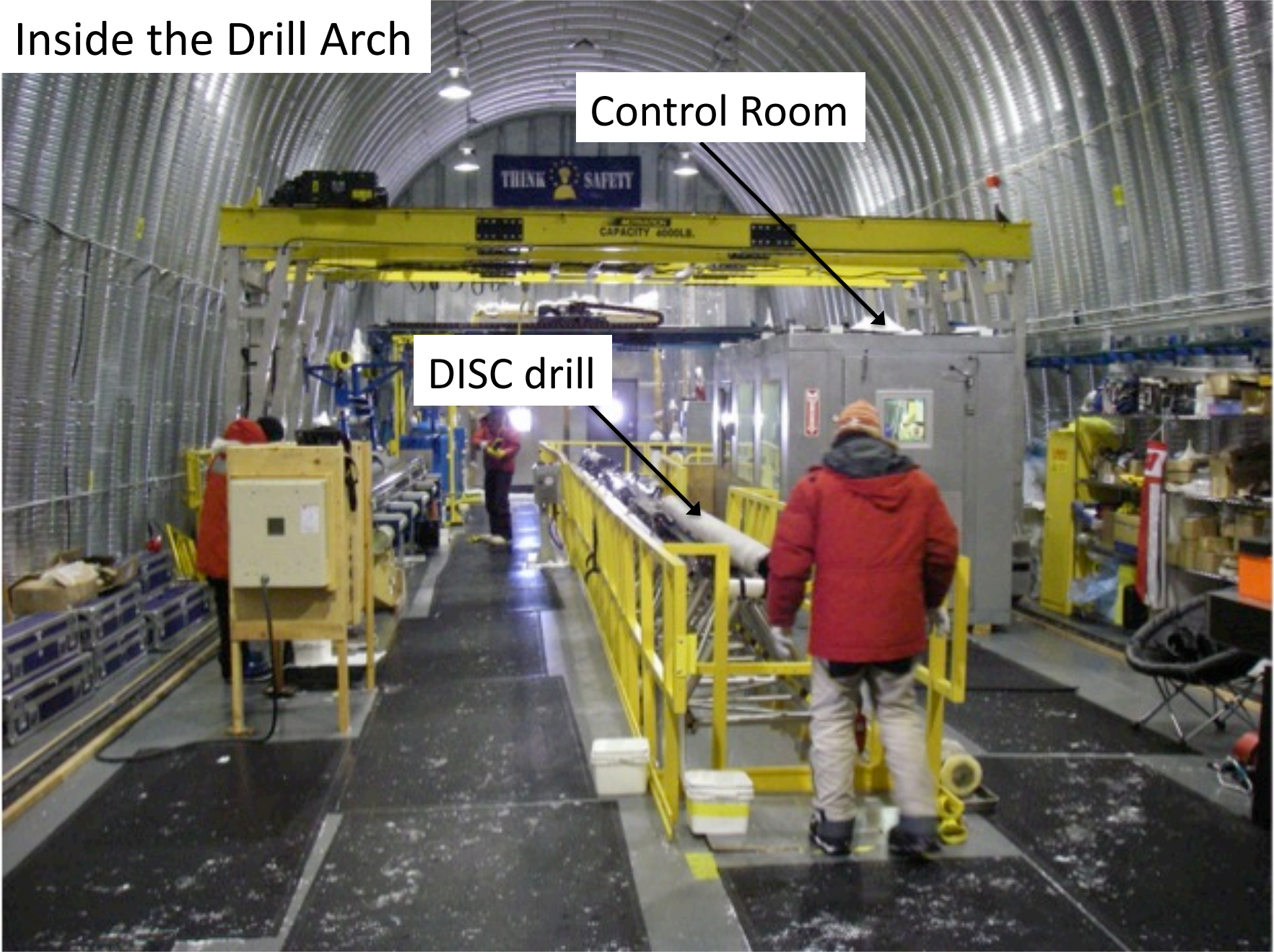
Once you break the core out of the hole you bring it up and tilt the drill to a horizontal position.



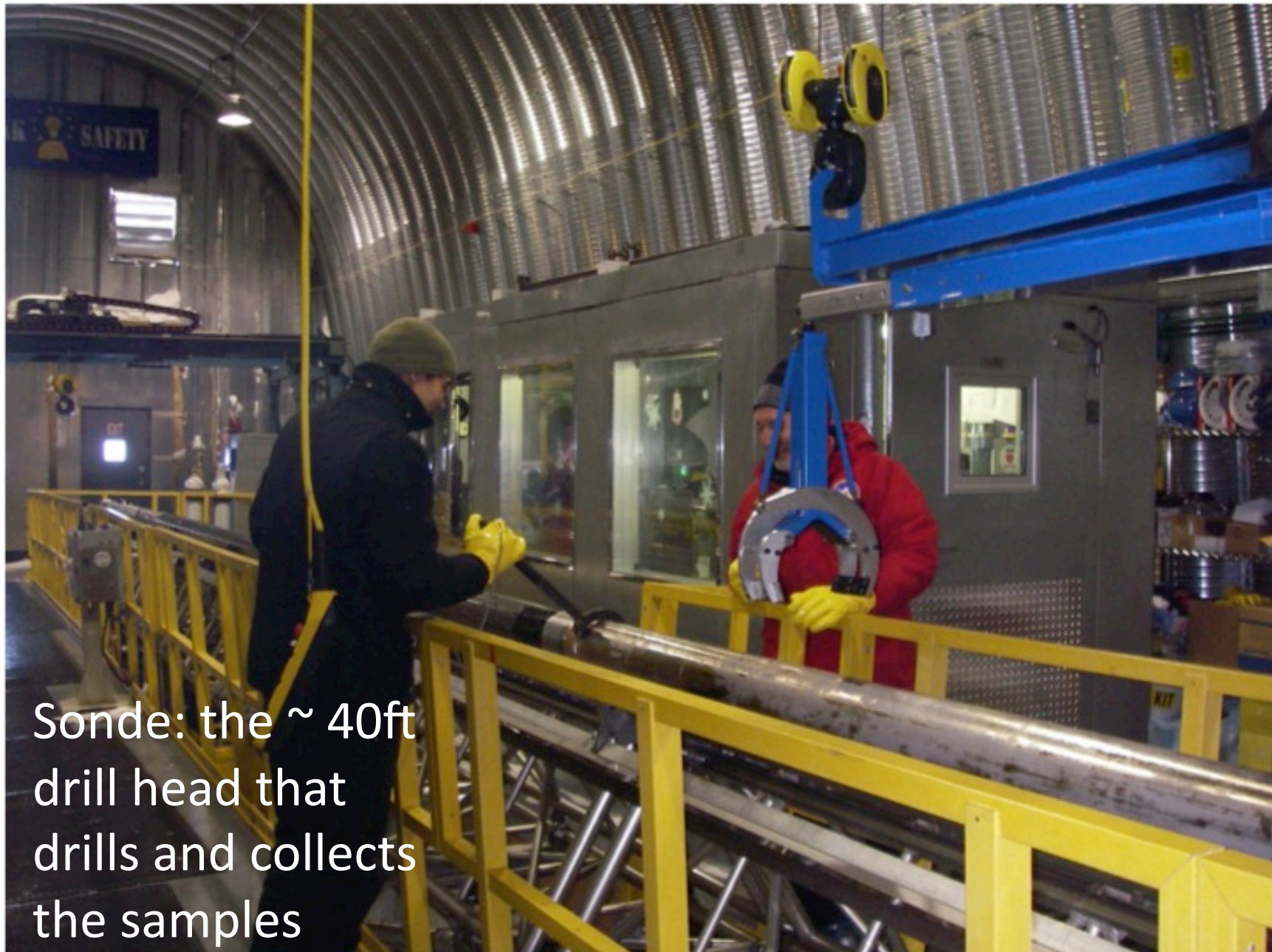
Inside the Drill Arch

Control Room

DISC drill



Key components of the drill:



Sonde: the ~ 40ft
drill head that
drills and collects
the samples

Key components of the drill:



Core cutters and dogs- these cut the core and then break it free from the borehole

Key components of the drill:

Slot: a ~30 ft deep hole that allows the tower to tilt from vertical to horizontal

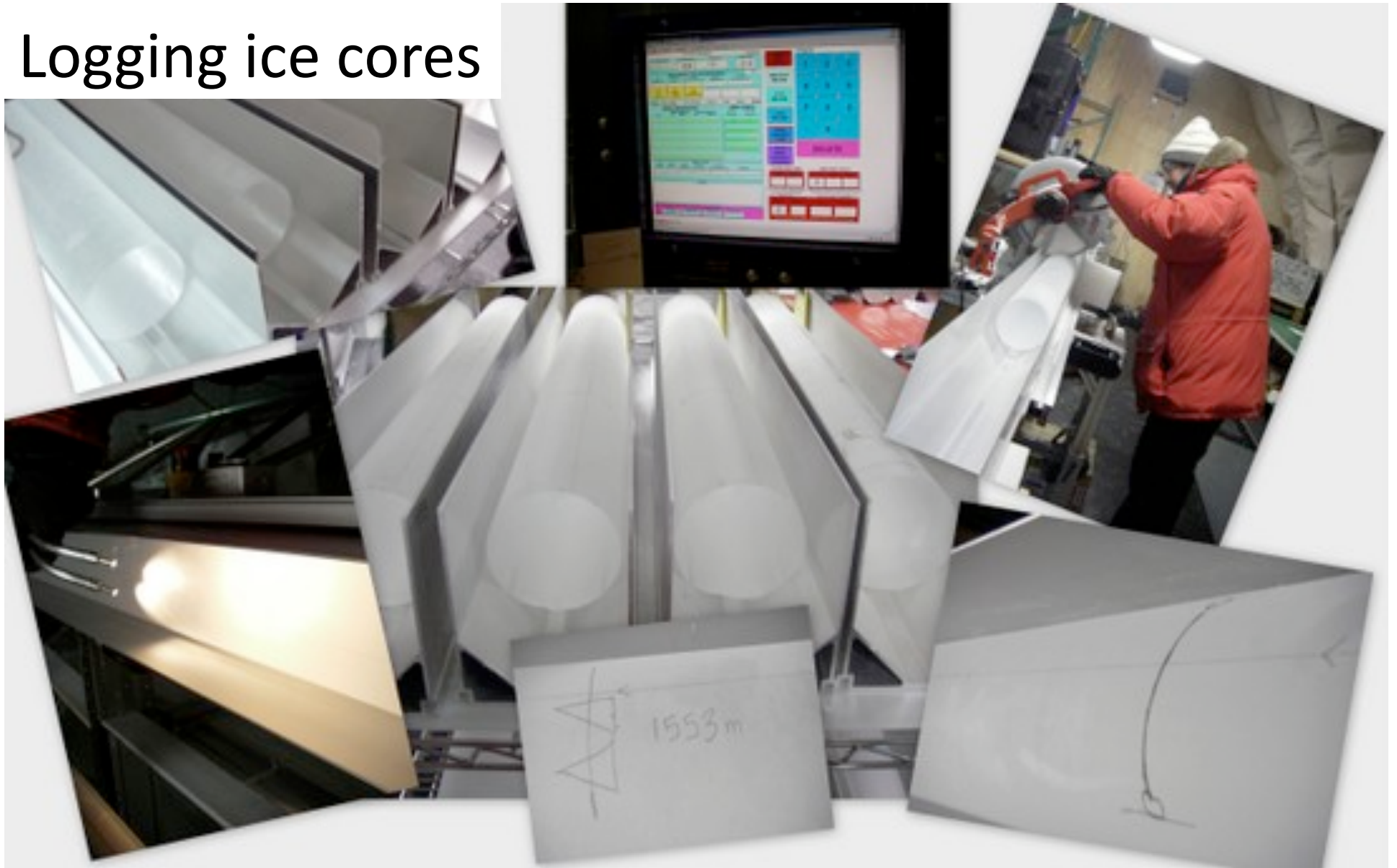


Key components of the drill:



Control Room: houses the computers that drive the drill

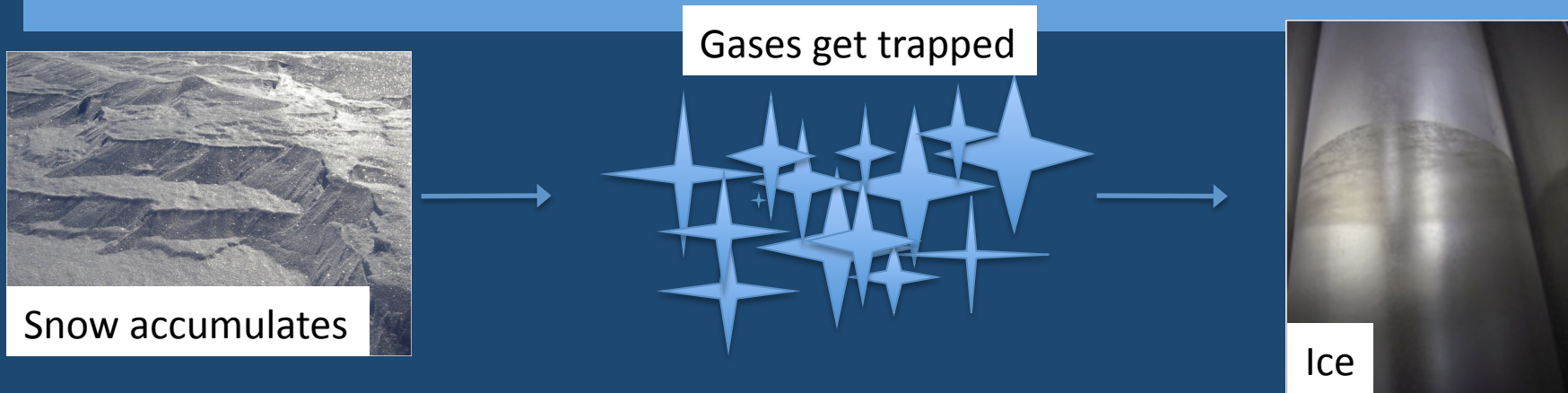
Logging ice cores



Each core gets checked for quality (fractures, breaks, spalls) and is marked with lines and arrows that help identify the depth of the ice relative to the entire core. Each 3 meter core from the drill is then cut into 1 meter sections.

What can ice cores tell us about past climate?

- Ice can preserve ancient atmospheres
 - The concentrations of greenhouse gas like carbon dioxide and methane can be extracted from air bubbles trapped within the ice.



- The chemical composition of the ice can be used to understand past changes in:
 - Atmospheric circulation
 - Human impacts on the environment
 - Extent of arid (dry) landscapes and forest fires
 - Volcanic eruptions



Tephra (volcanic ash) deposit we found at 1583 m deep!

Snow Pits and other science at WAIS Divide



Chainsaws and lots of digging!



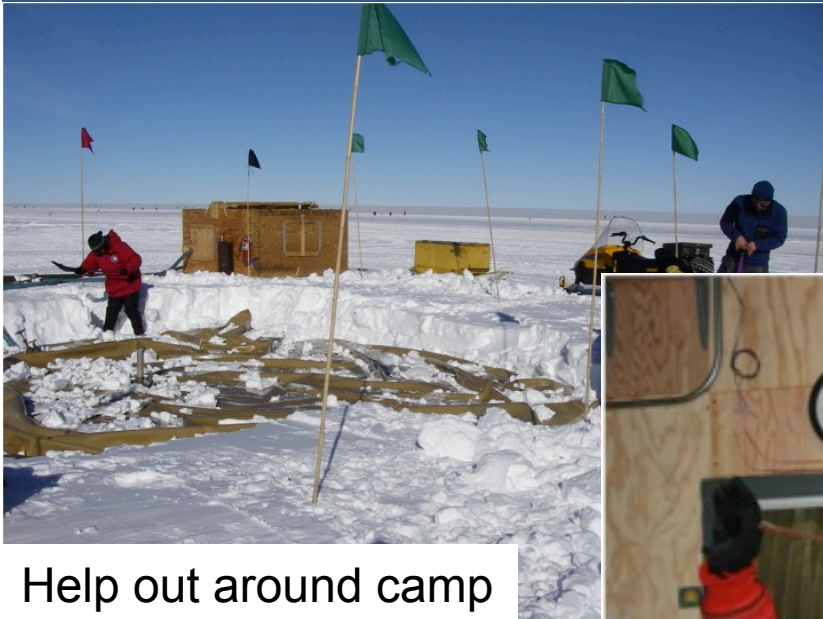
John Fegyveresi looking at annual layers of snow accumulation



Cover the pit with plywood to block out the sun



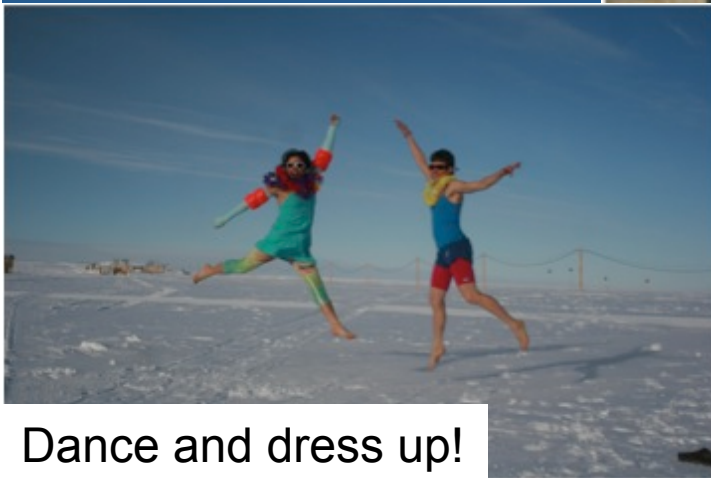
When we aren't working with ice...
we have fun!



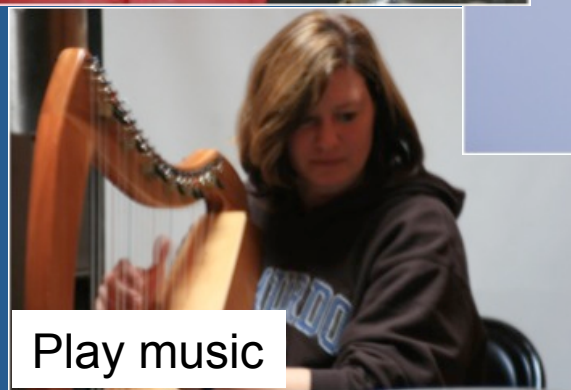
Help out around camp



Run and ski



Dance and dress up!



Play music

Happy Holidays at WAIS Divide!



Gift Exchange

Holiday Trees!



Cookie decorating



Our Holiday packages arrive!



Cookies and Cake!



French pastries!

Questions?



Thank You!

The archive of this event will be available shortly at: www.polartrec.com!

If you have further questions, please contact us at:
info@polartrec.com or call 1-907-474-1600

