Navigation and Communication
UNIS Winter Safety Course
08-12 January 2018

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UNIS

Course Objectives

Navigation

Maps, GPS, TopoSvalbard, Weather

Communication

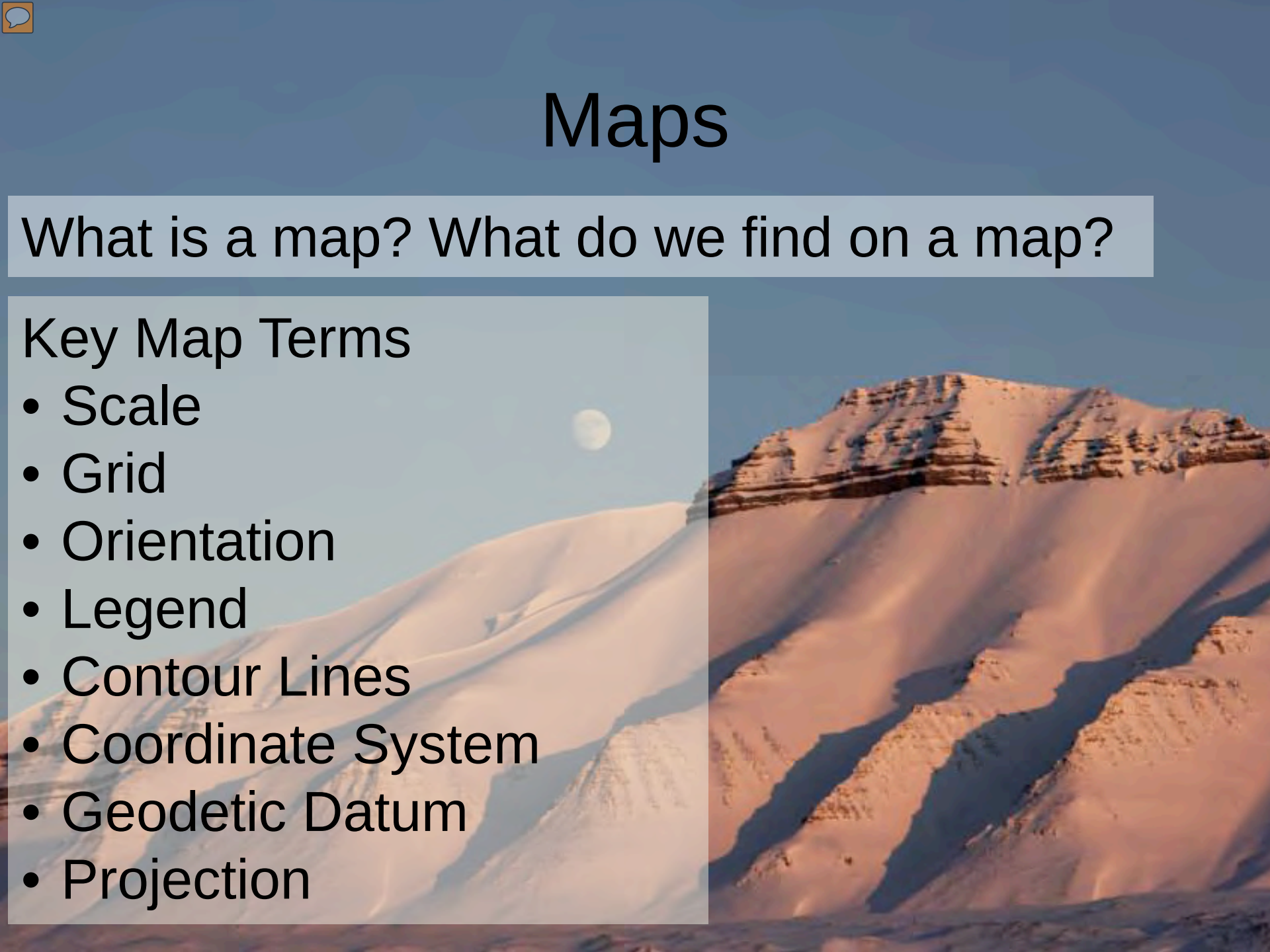
VHF Radio, Satellite Phone, Cell phones, Emergency Beacon, InReach

Maps

What is a map? What do we find on a map?

Key Map Terms

- Scale
- Grid
- Orientation
- Legend
- Contour Lines
- Coordinate System
- Geodetic Datum
- Projection



Maps Continuted (UTM System)

-Why use UTM? Constant distance relationship anywhere on the map… LAT LONG differs as you move towards poles

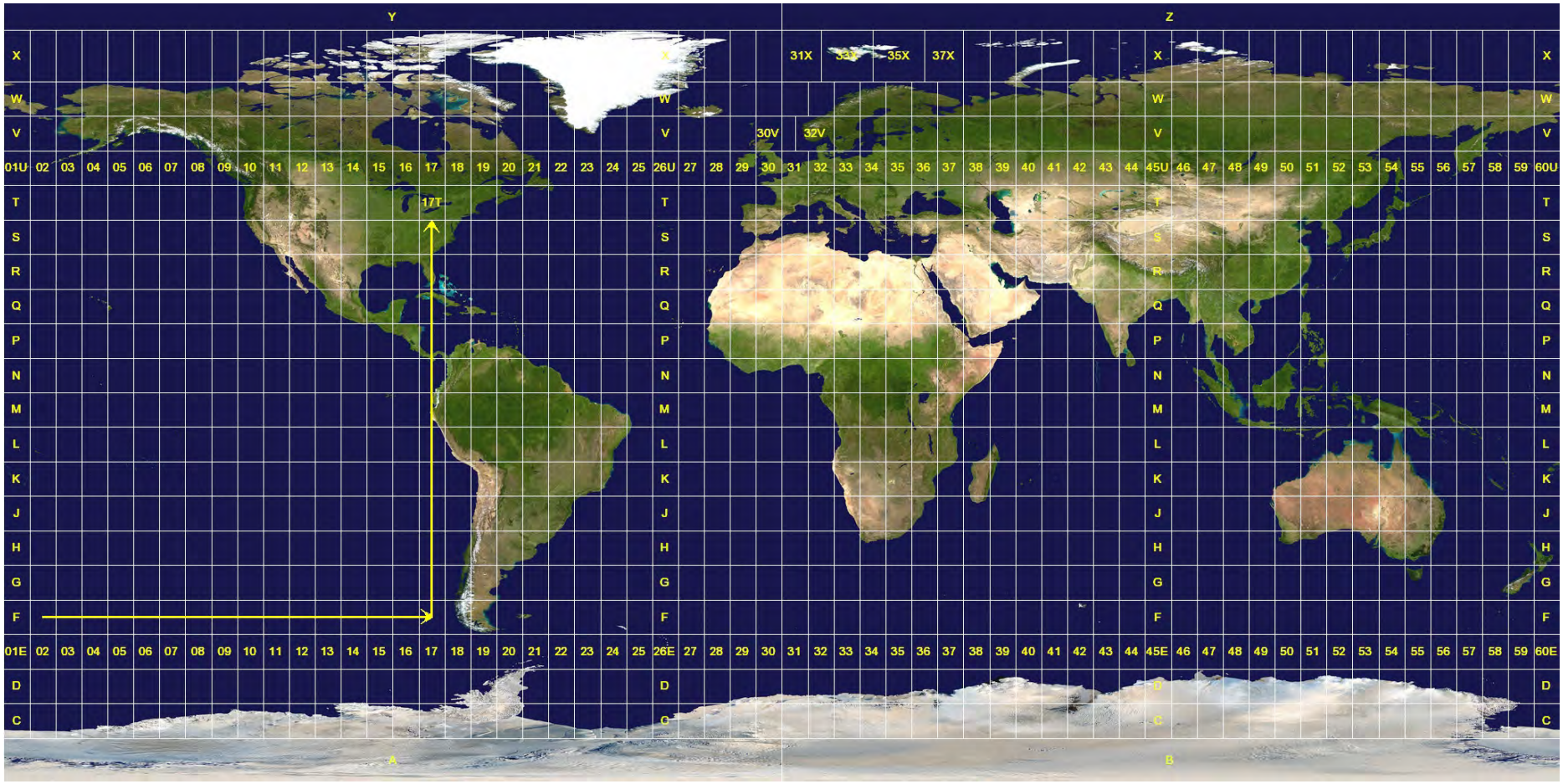
We use metric units, only meters, no degrees, minutes, seconds. You can measure it

Locations can be identified by three numbers: Zone, Easting & Northing

-The UTM system divdes the Earth between 80°S & 84°N latitude into 60 zones, each with 6° of longitude in width

-Each latitude band is 8 degrees high, and is lettered starting from "C" at 80°S, increasing up the alphabet until "X“

The last latitude band, "X", is extended an extra 4 degrees, so it ends at 84°N latitude, thus covering the northernmost land on Earth.


Y
Z
X
W
V
01U 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26U 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45U 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60U
T
S
R
Q
P
N
M
L
K
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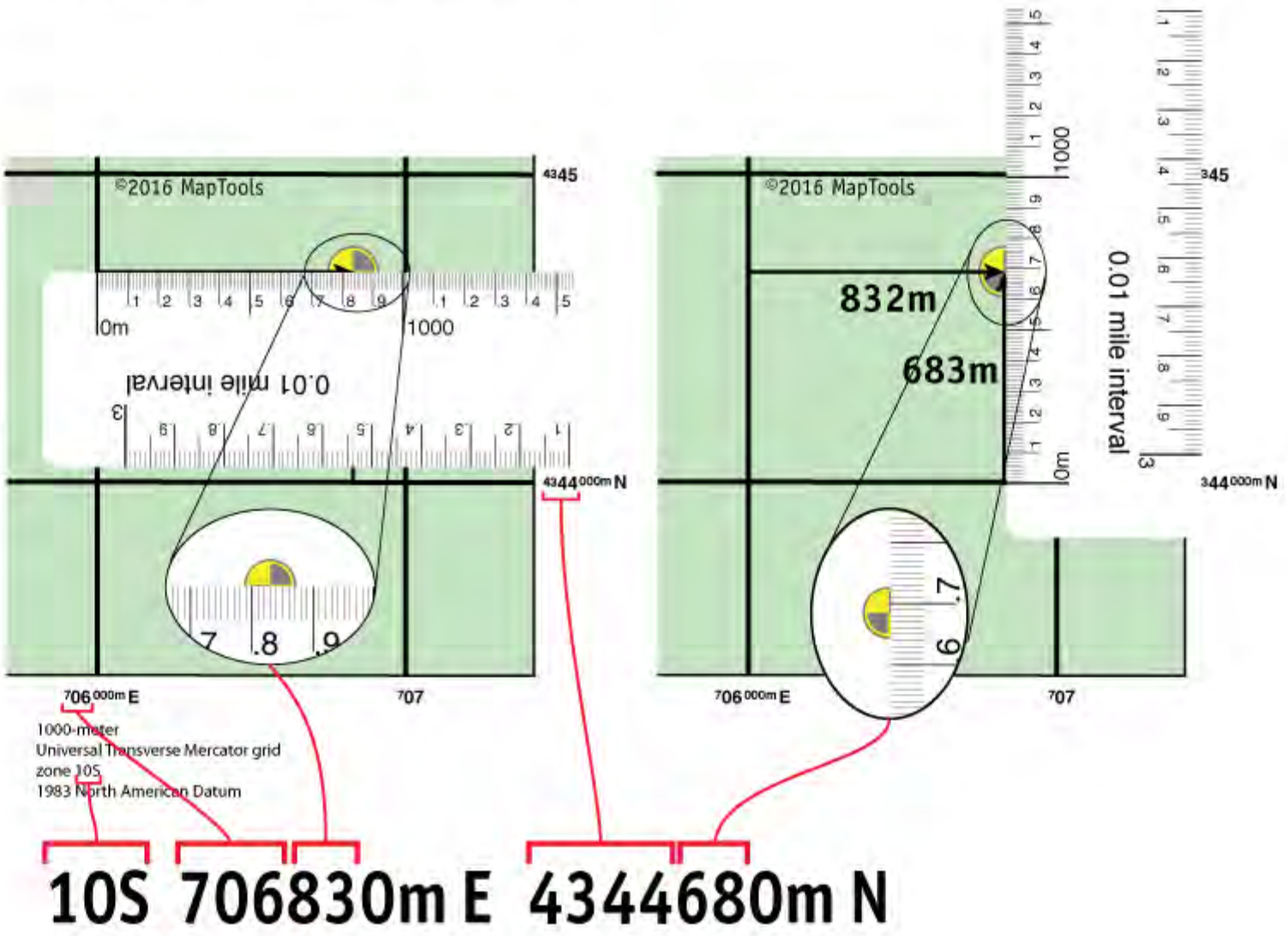
G
F
01E 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26E 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45E 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60E
D
C
31X
35X
37X
30V
32V
17T
A
B

Using various tools to plot and measure UTM positions on a map

Grid Style Tool | Slot Style Tool | Corner Ruler Roamer Style Tool | Mini Corner Style Tool | Map Ruler

Using a map ruler to plot/measure a UTM position with 10m precision



Locating a UTM position

A position is given by the UTM zone number and the easting & northing coordinate pair in that zone

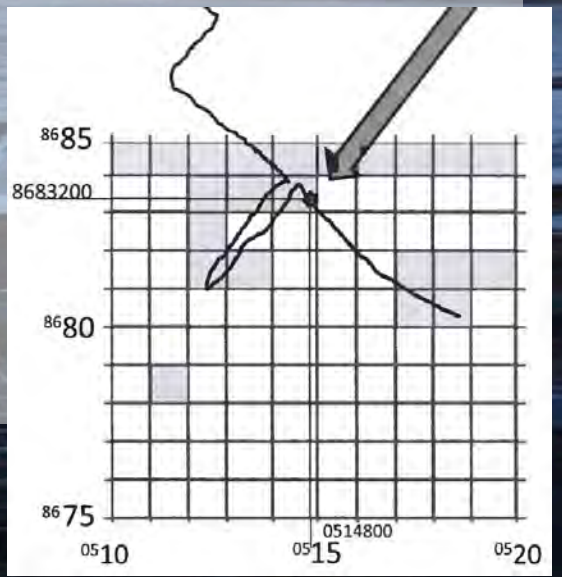
UTM grid coordinates are expressed as a distance in meters to the east & north

UTM has grid lines spaced every 1km

Eastings range from approx 167000 meters close to the poles, to 833000m near the equator. Northings range from 0 at the equator to approximately 9,300,000 meters at 84°N

UNIS position in UTM

- The Svalbard zone is 33X
- 33X 514758 8683319
- 4758 meters east of the 51 line
- 8683319 meter / 8683 km north of equator



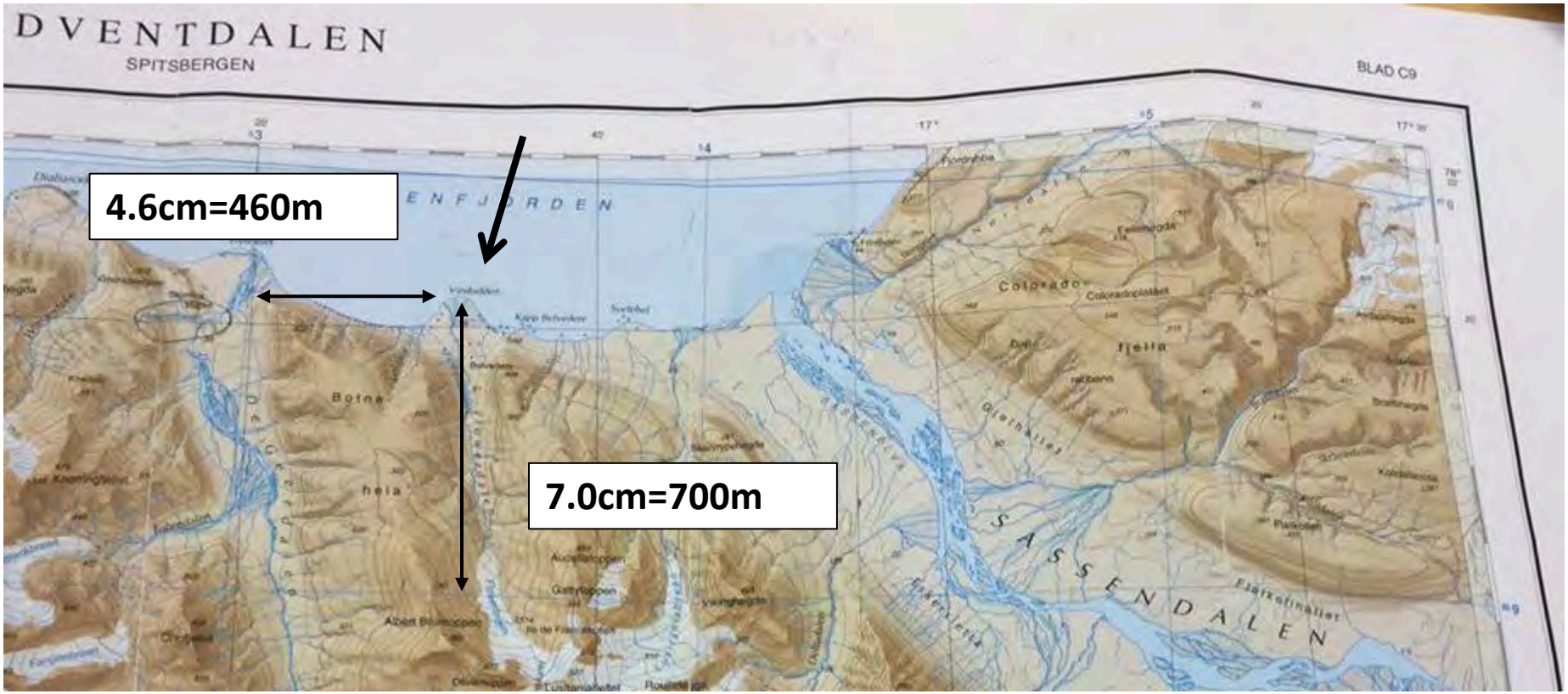
UNIS is at 33x 05**14**758

86**83**319

The two first small digits refer to the 100 km route 05 86.

The two next large digits are called principal digits and refer to the 1 km route 14 83.

The last three digits represent the distance in meters east/north into the route.



Short UTM: 346970

UTM coordinates: 33x 05 3460 869 700

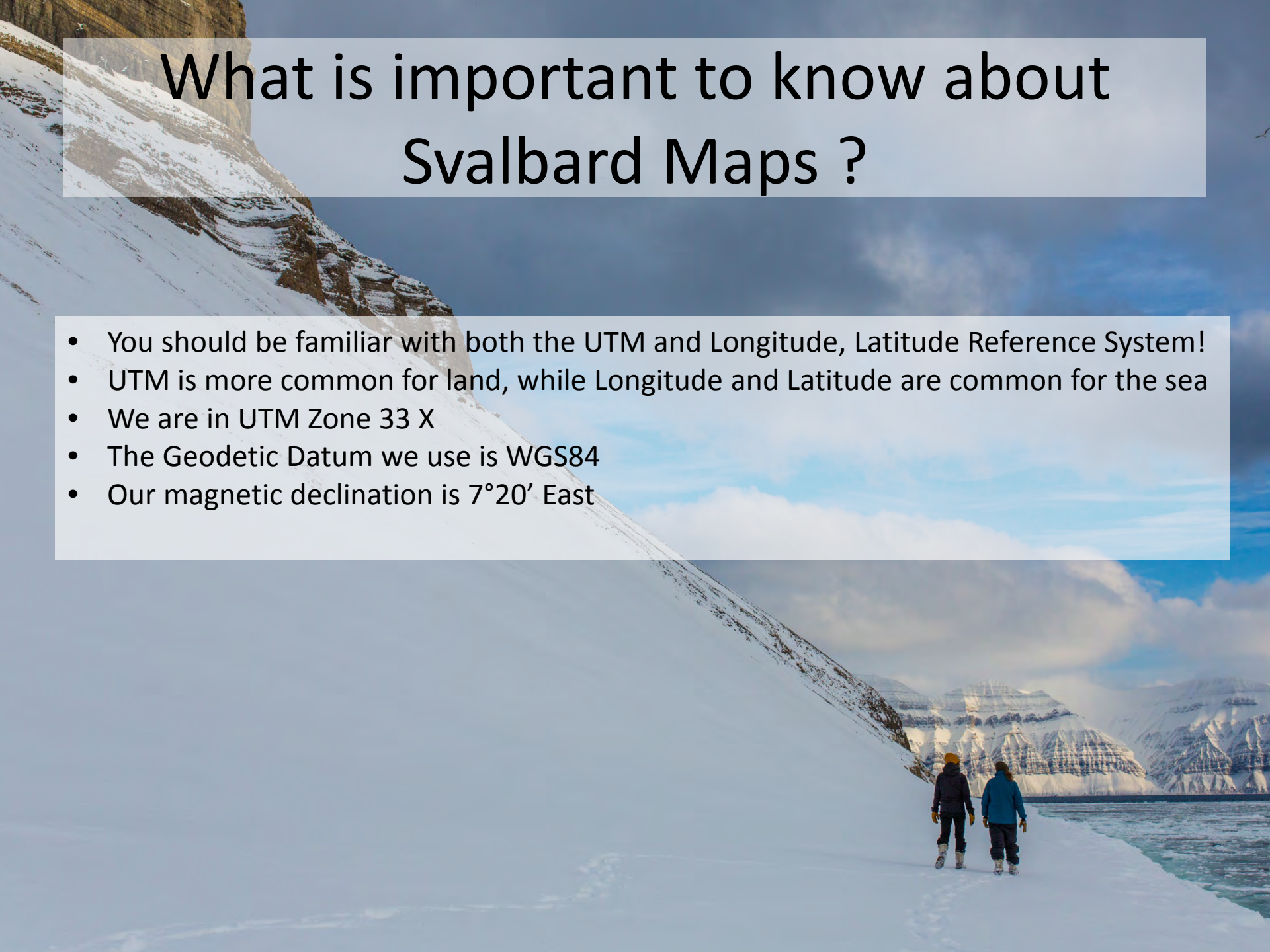
Map Exercise

- If the scale is 1:100000, what does 1cm =?
- What are the UTM coordinates/Elevation of Innerhytta?
- Find the location from the UTM coordinates:

  33x 0543385 8698463

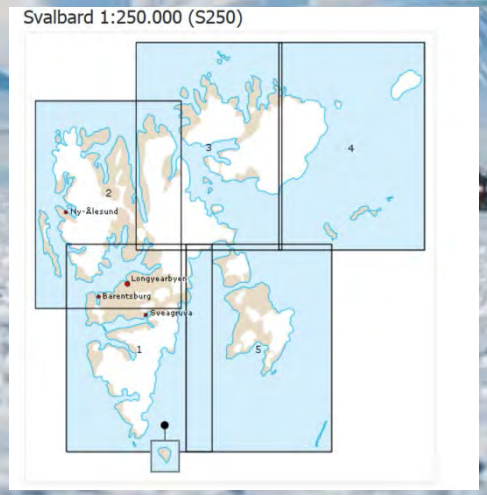
What is important to know about Svalbard Maps ?

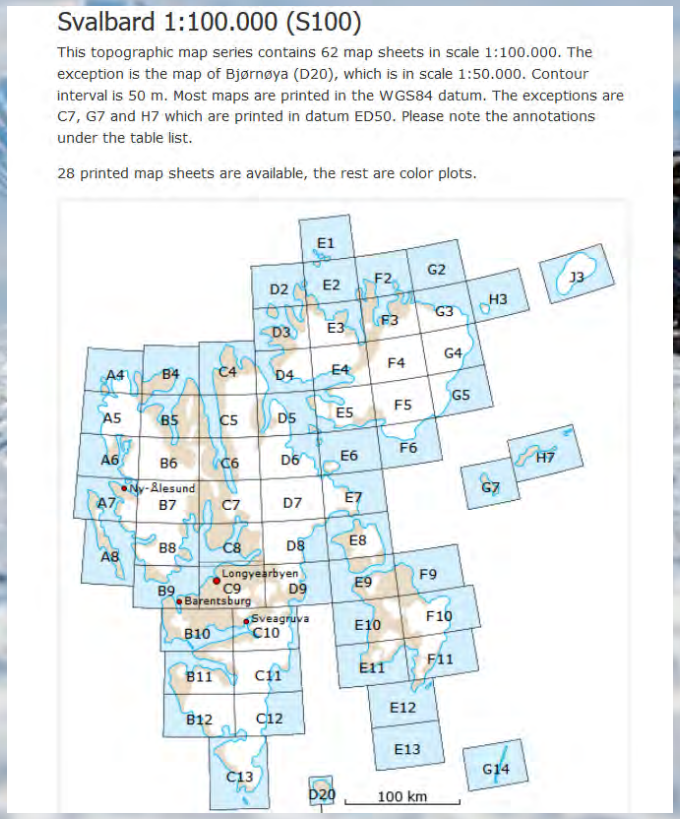
- You should be familiar with both the UTM and Longitude, Latitude Reference System!
- UTM is more common for land, while Longitude and Latitude are common for the sea
- We are in UTM Zone 33 X
- The Geodetic Datum we use is WGS84
- Our magnetic declination is 7°20’ East



Svalbard Maps

In Svalbard the Norwegian Polar Institute provides a map service
Maps are available in different scales which are published in several series
Svalbard 1:500.000 (S500)
Svalbard 1:250.000 (S250)
Svalbard 1:100.000 (S100)





Svalbard Maps continued

Overview of Svalbard topographic maps:

http://www.npolar.no/en/services/maps/printed/topographic-svalbard.html

Every map will contain:

- Name
- Scale
- Code
- Inset Maps
- Contour Lines/Data
- Map Data
- Legend

Svalbard Maps Continued

TOPO Svalbard – digital maps for Svalbard

toposvalbard.npolar.no

geodata.npolar.no (for downloading arcGIS)

Topographic Maps

3D Maps

Aerial photos

Satellite Imagery

Let’s look at Svalbard…

GPS

Instrument which utilizes the Global Positioning System by connecting to satellites

-Track your position and movement

-Trackback

-Make Waypoints and routes

-Navigate towards waypoints

-Moving map

-MAP datum, WGS 84 or ED 50

-Position ref, UTM or LAT/LONG

-Transfer GPS data into PC map system (OZI Explorer)

Set up a track...

- Get a Montana GPS
- Open up ozi explorer on your computer

VHF

Field Communication
(Group to Group)
Emergency Communication
(Group to Vessel, Group to Group)
BATTERIES!
LOCK!

Channels:

- CH 1 Skolten and Scheteligmountain repeater
- CH 3 Nordenskiöld and Zeppelinermt repeater
- CH 5 Radio to radio
- CH 6 Radio to radio
- CH 7 Såta and Ishetta telephone link
- MA 6 Maritime channel SHIP to SHIP
- MA 16 Maritime channel 16 (emergency Bodø Radio)
- SNSK Store Norske Spitsbergen Kullkompani

Letter	Code	Letter	Code
A	Alpha	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliett	W	Whiskey
K	Kilo	X	X-Ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

Radio Procedures

- Sara Sara this is Group A, Group A, Over
- Group A, this is Sara, Over
- Sara, this is Group A, we are now at position 1, moving towards position 2, Over
- Group A this is Sara, roger
- Sara, this is group A, out

Satellite Phones

Field Communication
(Group to UNIS)
Emergency Communication
(Group to UNIS, Group to Sysselmannen)

Turning on procedures

UNIS daytime	+47 79 02 33 00
UNIS Duty 24/7	+47 95 28 35 11
Governor emergency 24/7	+47 79 02 12 22
Hospital	+47 79 02 43 00

It is NOT possible to call Norwegian emergency numbers 110, 112 and 113

Satellite Phone Procedures in an emergency:

- Present yourself
- Position
- What kind of accident/injury
- Who is injured, state of injury
- Situation for rest of the group
- What kind of assistance do you need
- Agree on next time of contact

Emergency Beacon

Emergency use ONLY

24 hrs signal in all conditions (not under water)

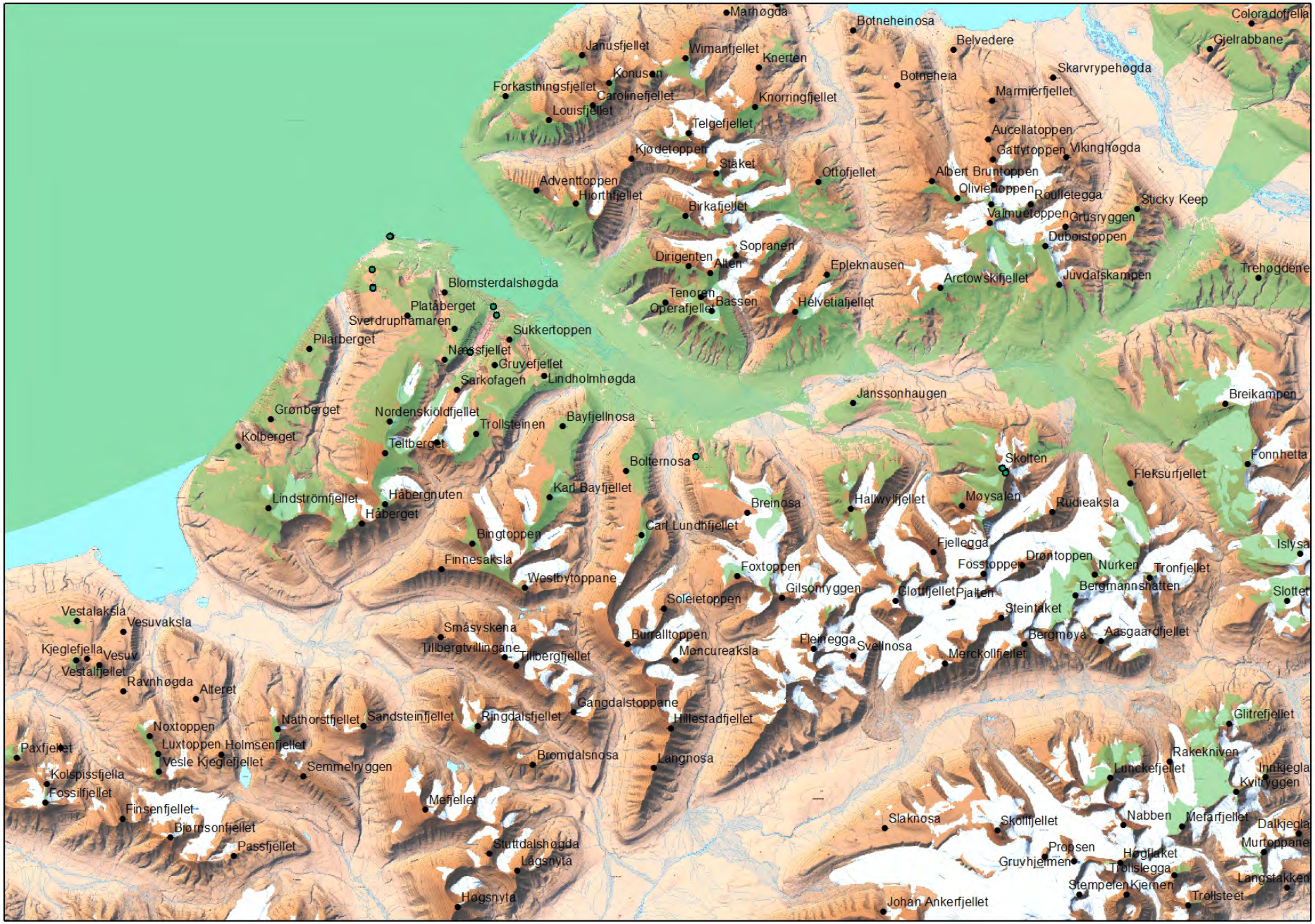
Transmit on 406 MHz for world wide satellite coverage

Local homing on 121,5 MHz for sysellmannen

GPS unit gives accurate position information

inReach

Automatic GPS Tracking
SMS Capabilities
Emergency Function
Iridium Satellite


Marhøgda
Botneheinosa
Coloradofjella
Janusfjellet
Wimanfjellet
Belvedere
Gjelrabbane
Knerten
Konusen
Botneheia
Skarvrypehøgda
Forkastningsfjellet
Carolinefjellet
Marmorfjellet
Knorringfjellet
Louisfjellet
Telgefjellet
Aucellatoppen
Kjødetoppen
Gattytoppen
Vikinghøgda
Staket
Albert Bruntoppen
Adventtoppen
Ottofjellet
Hiorthfjellet
Olivinkoppen
Roulettegga
Sticky Keep
Birkafjellet
Valmuetoppen
Grusryggen
Duboistoppen
Sopranen
Dirigenten
Alten
Epleknausen
Arctowskifjellet
Juvdalskampen
Trehøgdene
Blomsterdalshøgda
Tenoren
Bassen
Helvetiafjellet
Platåberget
Operafjellet
Sverdrupfjellene
Sukkertoppen
Pilarberget
Næssfjellet
Gruvefjellet
Sarkofagen
Lindholmhøgda
Janssonhaugen
Breikampen
Grønberget
Nordenskiöldfjellet
Bayfjellnosa
Trollsteinen
Kolberget
Teltberget
Bolternosa
Skolten
Fonnhetta
Fleksurfjellet
Karl Bayfjellet
Lindströmfjellet
Håbergnuten
Breinosa
Hallwylfjellet
Møysalen
Rudieaksla
Håberget
Carl Lundhfjellet
Bingtoppen
Fjellegga
Islysa
Finnesaksla
Foxtoppen
Drøntoppen
Nurken
Tronfjellet
Fosstoppen
Westbytoppane
Gilsonryggen
Bergmannshatten
Slottet
Soleietoppen
Gløttfjellet
Pjalten
Vestalaksla
Steintaket
Vesuvaksla
Småsyskena
Buralltoppen
Flenegga
Bergmøya
Aasgaardfjellet
Kjeglefjella
Tilbergtvillingane
Moncureaksla
Svellnosa
Merckollfjellet
Vesuv
Tilbergfjellet
Vestalfjellet
Ravnhøgda
Alteret
Gangdalstoppane
Glitrefjellet
Nathorstfjellet
Sandsteinfjellet
Ringdalsfjellet
Hillestadfjellet
Noxtoppen
Rakekniven
Luxtoppen
Holmsenfjellet
Paxfjellet
Bromdalsnosa
Langnosa
Lunckefjellet
Innkjegla
Vesle Kjeglefjellet
Semmelryggen
Kolspissfjella
Kvitryggen
Fossilfjellet
Meifjellet
Slaknosa
Skollfjellet
Nabben
Mefarfjellet
Dalkjegla
Finsenfjellet
Murtoppane
Bjørnsonfjellet
Propsen
Gruvhjelmen
Høgflaket
Passfjellet
Stuttdalshøgda
Trollslegga
Langstakken
Lågsnyta
Stempelen
Kjernen
Trollsteet
Høgsnyta
Johan Ankerfjellet

Communication Exercise

- **Leave UNIS, turn on all devices (Sat phone, GPS and VHF radio). Wait until phone will be registered in a network and call to number: 004741670215 (explain who you are and where you are).**
- **When you exit UNIS main building activate your GPS and use the GOTO function to navigate your route**

- **When you are halfway through report to UNIS Ops on your VHF Channel 5**
-
- **When you get back to UNIS we will upload your GPS track onto the computer**

Resources

- www.toposvalbard.no
- www.npolar.no
- www.yr.no
- www.geodata.npolar.no
- www.varsom.no
- www.polarview.met.no
- http://www.npolar.no/no/tjenester/kart/