Course Objectives

- Navigation Maps, Coordinate Systems GPS, TopoSvalbard, Weather

- Communication VHF Radio, Satellite Phone, Cell phone, Emergency Beacon, InReach
Latitude and Longitude

- Latitude is the geographic coordinate which specifies the north-south position of a point on the Earth’s surface
  - Lines of constant latitude are called parallels and run east-west parallel to the equator
- Longitude is the geographic coordinate which specifies the east-west position of a point.
  - Lines of constant longitude are called meridians and run north-south parallel to the prime meridian
Geographic Coordinate Conversion

- Degrees Minutes Seconds 00°00’00"
- Decimal Degrees 00.00°
- Degrees Decimal Minutes 00°00.00’
- 60 minutes in a degree and 60 seconds in a minute
- 1 minute=1 nautical mile=1.852km
- Decimal degrees= degrees + (minutes/60 + seconds/3600)
- Decimal degrees to decimal minutes= decimal degree x 60 = seconds
- UNIS is 78°13’21"N 15°39’06" E
UTM System

- Locations are identified by three numbers: Zone, Easting & Northing

Each UTM zone spans 6° of longitude, from 84° North and 80° South. Zones taper from 666,000 meters in "width" at the Equator (where 1° of longitude is about 111 kilometers in length) to only about 70,000 meters at 84° North and about 116,000 meters at 80° South.

A UTM position is the zone number and the easting and northing planar coordinate pair in that zone. The point of origin of each UTM zone is the intersection of the equator and the zone’s central meridian. To avoid negative numbers, the central meridian is designed to coincide with 500,000 meters East.
Maps Continued (UTM System)

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

- The UTM system divides 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.
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 0514758 8683319
- 4758 meters east of the 51 line
- 8683319 meter / 8683 km north of equator
UNIS is at 33x 0514 758 8683 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.

- 4 digits 04 91 accurate to 1000 meters
- 6 digits 042 915 accurate to 100 meters
- 8 digits 0425 9152 accurate to 10 meters, approximately the size of a house.
- 10 digits 04250 91520 accurate to 1 meter.
Map Scale- 1:100,000, UTM grid lines every 5cm

UTM Coordinates of Fredheim: 33X E0543336 N8698556
Map Scale=1:50,000, UTM grid lines every 2cm

UTM Coordinates of Vespynten Lighthouse: 33X E509487 N8686512
Maps

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

Key Map Terms
• Scale
• Grid
• Orientation
• Legend
• Coordinate System
• Geodetic Datum
• Projection
Map/Coordinates Exercise

USING the TURKART:
- What are the UTM coordinates/elevation of Innerhytta?
- Find the location from the UTM coordinates:
  33x E0512738 N8690455

USING the C9 Map:
- What are the UTM coordinates/elevation of Janssonhaugen?
- Find the location from the UTM coordinates:
  33x E0534591 N8697016

Convert UNIS Lat Long coordinates from Deg, Min, Sec to Decimal Degrees and Degrees Decimal Minutes.
UNIS is 78°13’21"N 15°39’06" E

Remember!!!
- Degrees Minutes Seconds = 00°00’00"
- Decimal Degrees = 00.00°
- Degrees Decimal Minutes = 00°00.00’
- 60 minutes in 1 degree and 60 seconds in 1 minute
- 1 minute=1nautical mile=1.852km
- Decimal degrees= degrees + (minutes/60 + seconds/3600)
- Decimal degrees to decimal minutes= degree + decimal degree x 60
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
• If you have an emergency, report coordinates in Decimal Degree Minutes!
• We are in UTM Zone 33 X
• The Geodetic Datum we use is WGS84
• Our magnetic declination is 7°20’ East (changes every year)
• Glaciers! Moraines! Rivers! Sea Ice!
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:

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…
Trip Planning Exercise

Find on student server
Trip Planning Resources:

www.yr.no
www.varsom.no
https://www.unis.no/resources/weather-stations/
http://polarview.met.no/
https://geodata.npolar.no/
www.windy.com
**VHF**

**Field Communication**
(Group to Group)

**Emergency Communication**
(Group to Vessel, Group to Group)

**BATTERIES!**

**LOCK!**

**Channels:**
- CH P1 UNIS
- CH P2 UNIS
- CH MA 6 Maritime channel SHIP to SHIP
- CH MA16 Maritime channel (emergency)
- CH MA10 Maritime channel (helicopter)
- REP CH1 Repeater
- Rep CH3 Repeater
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<td>Mike</td>
<td>Z</td>
<td>Zulu</td>
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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 that
- 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 On 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 (Degrees, Decimal Minutes)
• 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
GPS

Instrument which utilizes the Global Positioning System by connecting to satellites
- Track your position and movement
- Trackback
- Make Waypoints tracks and routes
- Navigate towards waypoints or tracks
- Moving map
- MAP datum, WGS 84 or ED 50
- Position ref, UTM or LAT/LONG
- Transfer GPS data into PC map system (OZI Explorer)
Communications Exercise

Find on the student server