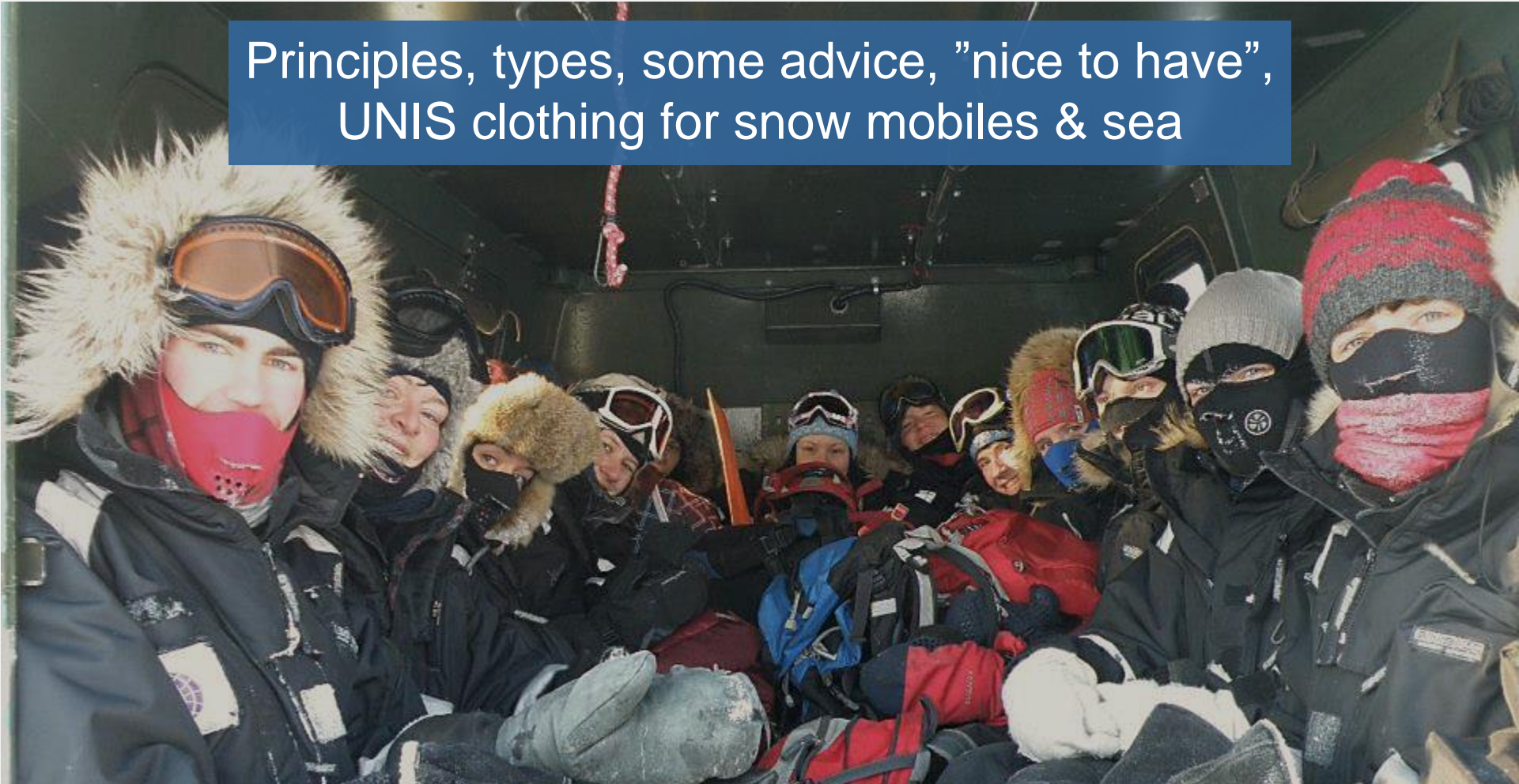


Winter Clothing

Principles, types, some advice, "nice to have",
UNIS clothing for snow mobiles & sea



Objective

Understand the basic principles of proper clothing in Arctic winter conditions

- Clothing vs planned activity
- Different fabrics and advantage/disadvantage
- Demonstration of relevant clothing

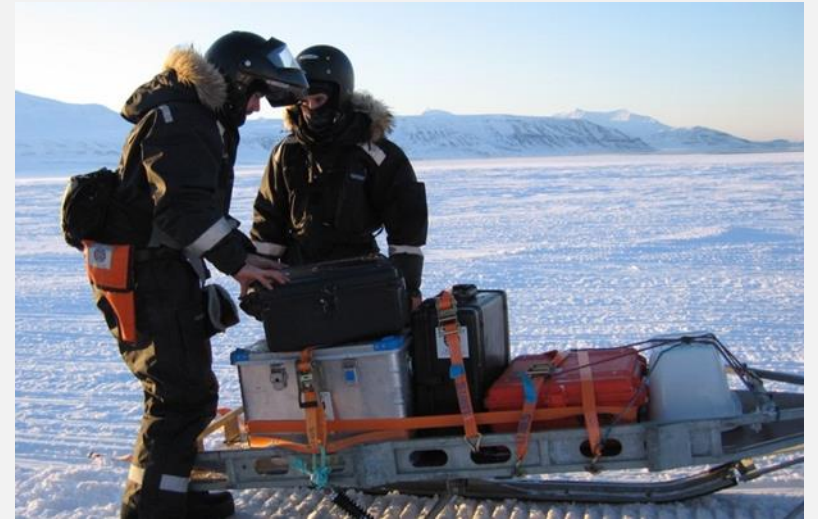
Bring extra underlayer clothing for the sea ice training!



What to wear today? It depends...

What are you going to do?

- Moving vs standing still?
- Working with water?
- Need to use your fingers?
- How long are you out for?



Body heat loss

By convection (air circulation) (1)

Cold wind major factor! FB

By Conduction (Contact) (2)

important on snow, ice, cold metal etc.

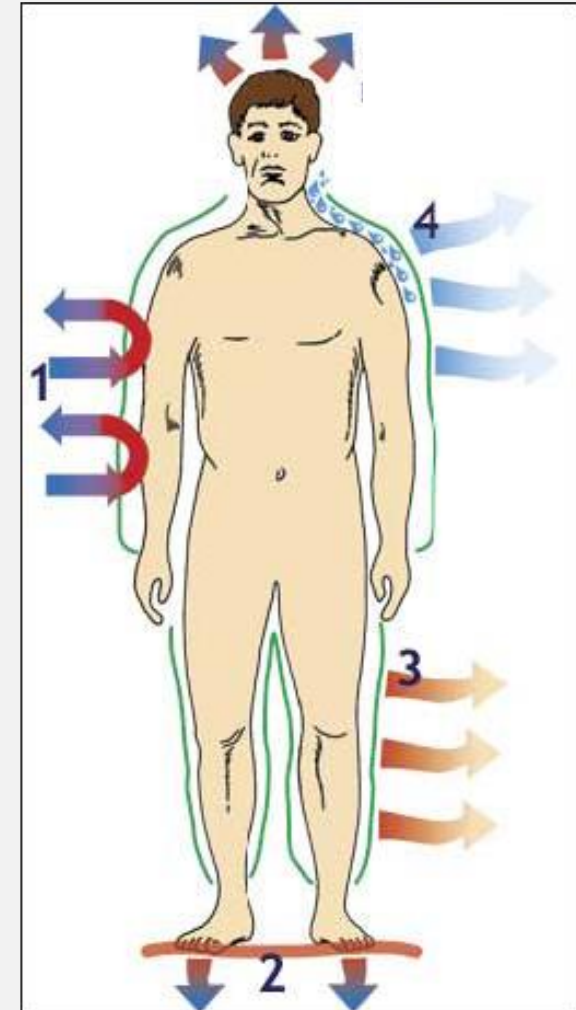
By radiation (3)

The body releases heat to its surroundings when these are colder than the body.

By evaporation (4)

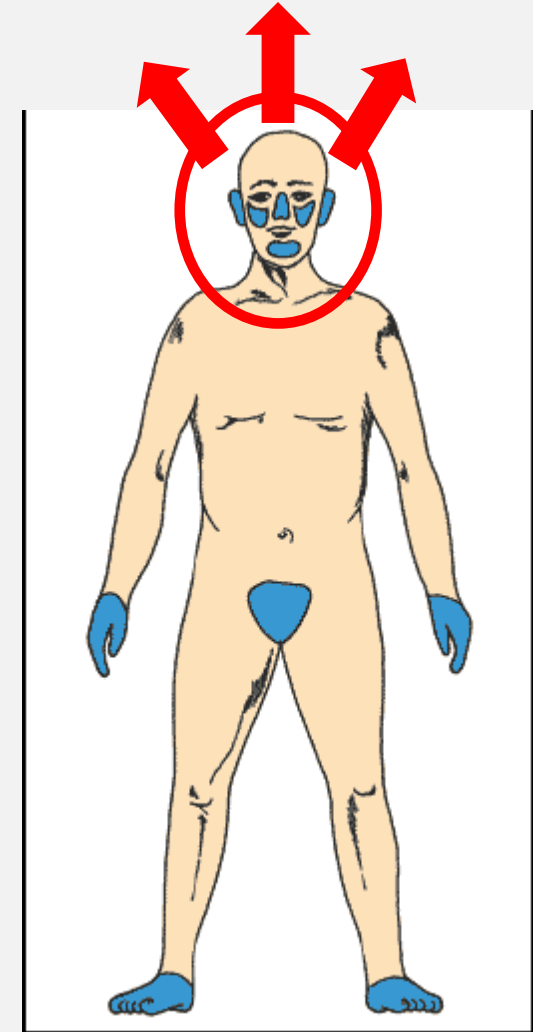
Sweat and Water

Why is it so cold to be wet?



Important aspects

- Uncovered head and neck could be compared to having one leg or arm without clothing.
- Hands, feet, ears, nose and genitals are the most exposed to frostbite.
- By using mittens instead of finger gloves, it will be easier to keep the hands warm.
- Wind cools down faster than temperature – cover up + windproof



What do we want from the clothing?

- **Keep us warm and dry**
- **Windproof and waterproof**
- **Keep snow away from boots**
- Easy to take on and off
- Small in volume (e.g. down jacket in the backpack)
- Easy to use zippers with gloves on

We also expect clothing to have these qualities:

- Transport humidity from the body
- Be warm even when not totally dry
- Breathe air/humidity out
- Quick to dry



*-15C and no wind = lots of sweat
= side zippers and jacket open for the
uphill*

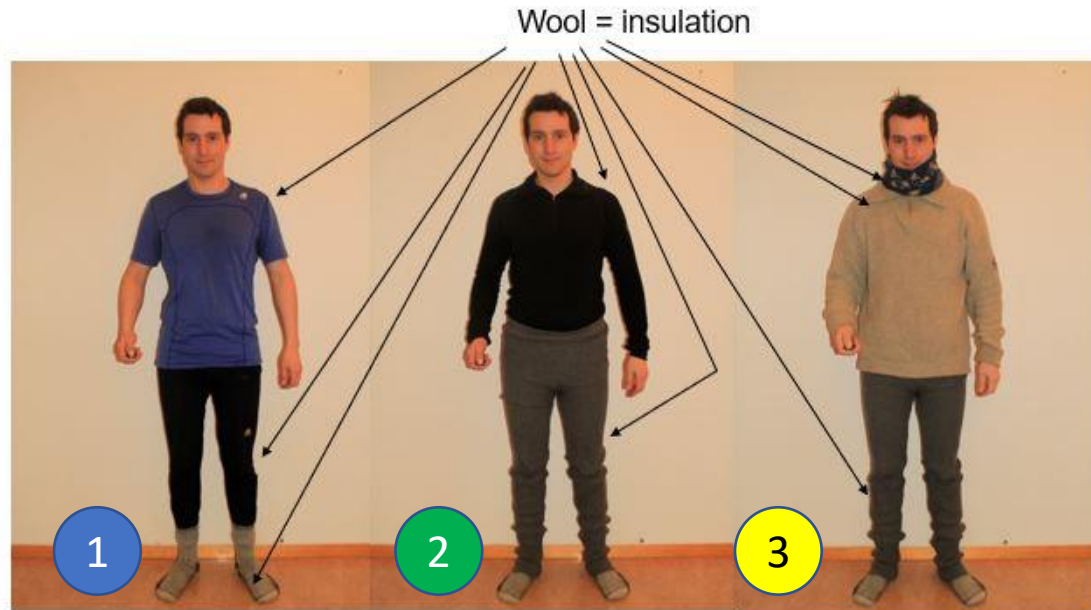
How do we keep warm?

- Appropriate clothing suited to the situation and workload.
- Movement & activity (whole body, toes, fingers)
- Snacks and warm drink, food – have snacks and thermos easily available and eat often
 - Some snacks can freeze solid very quickly
- Avoid exhaustion and sweating – adjust clothing

MOST IMPORTANT - Take care of each other!



Add or remove layers depending on activity!



Hiking to a mountain top in July



Lunch break in July



Fieldwork in December



Clothing

Long underwear

- Wool, merino wool (or in combination with synthetic fabrics)
- Fully covering with long sleeves and back

Isolation layers

- Wool, Fleece, Primaloft etc. synthetic fabrics, Down

Outer wear (Shell clothing):

- Windproof (cotton, synthetic or Gore Tex etc.)
- Long enough in the back
- Good hood
- Pants keep snow out from boots
- Large enough (space for layers under it)



Clothing

Hands

- Always windproof shell + warm insulation layer (good if loose inner glove → easier to get dry)
 - Mittens warmer than gloves
 - Thin liner gloves or separate working gloves
 - in case you need to do precise tasks → no bare fingers on - 20-degree metal, wood, ropes etc.
 - Extra warm mittens + gloves as back up
- gloves, mittens get easily wet when working in snow, water etc.

Footwear

- Socks: thinner and thicker **wool socks** or mixture wool+synthetic – **never cotton!**
- **Shoes large enough:** space for 2 pairs of socks + not tight around toes and feet
- Thick sole and thick, loose insulation around foot (wool, Thinsulate etc.) → loose inner shoes easier to dry
- Higher to keep snow out



UNIS clothing for snowmobile driving and fieldwork in cold

Clothing for snowmobile driving:

- Snowmobile suit:
 - Warm & insulated, windproof, good hood, many pockets
- Warm boots
- Face mask
- Mittens
- Helmet
- Basic goggles
 - *Wearing glasses? Much easier with contacts lenses...*



UNIS clothing for snowmobile driving and fieldwork in cold

Under UNIS clothing you need to wear your own layers of:

- Long underwear 1-2 layers
- Warm wool socks 1-2 layers
- Insulation layer 1-2:
 - wool pullover, thick fleece, thin down jacket
 - Fleece pants, soft shell pants
- Neck warmer
- Bring with your liner/working gloves + warm hat + extra insulation

Number of layers depends on the weather, time spent outside and activity level!



Clothing for working at sea / sea ice

Regatta floating suit

- Splash proof + windproof floatation coveralls
- Insulated
- Used on cruises, work on sea ice, small boat transportation



Clothing for working at sea / sea ice

Immersion suit

- The wearer's core body temperature will not drop by more than 2C after being in cold water for 6 hours
- Used on cruises, work on sea ice, small boat work



Clothing – sum up

- Face, hands and feet are most exposed
- Windproof
- Large enough size – especially shoes
- Spare extra clothing. Especially mittens and a warm hat!
- Always bring clothing suited for extreme weather conditions.
- You must be able to cover your face totally



Recommended things to have/buy

- Warm windproof hat or fur hat
- Windproof mittens/gloves
- Thin liner gloves
- Neck warmer / Buff
- Thick woollen socks
- Long wool underwear
- Thermos bottle of steel
- Face mask + thin balaclava
- Ski goggles
- Sunglasses (March →)



*Ladies, don't freeze
your...
No need to completely
undress for #1*



Doing fieldwork on Svalbard we need to accept:

- Somewhat cold fingers and toes
- Some lack of comfort
- Some unpleasantness
- Situations with some stress
- The need of taking care of not just ourselves, but also group members
- Great fun and good memories!
- New skills and knowledge!



At the same time, we need to keep in mind, recognize and understand:

- When situations start to **change from unpleasant to potentially dangerous**.
 - Getting cold – mildly hypothermic – hypothermic – unable to do anything
 - Getting tired, losing visibility ...
 - Start to get frostbites in face
 - Start to lose feeling in fingers, toes

- Be honest and tell others early if you start to have problems!
- Do something before it is too late!
- How is your buddy doing?
- **STOP, think, change plans if needed**