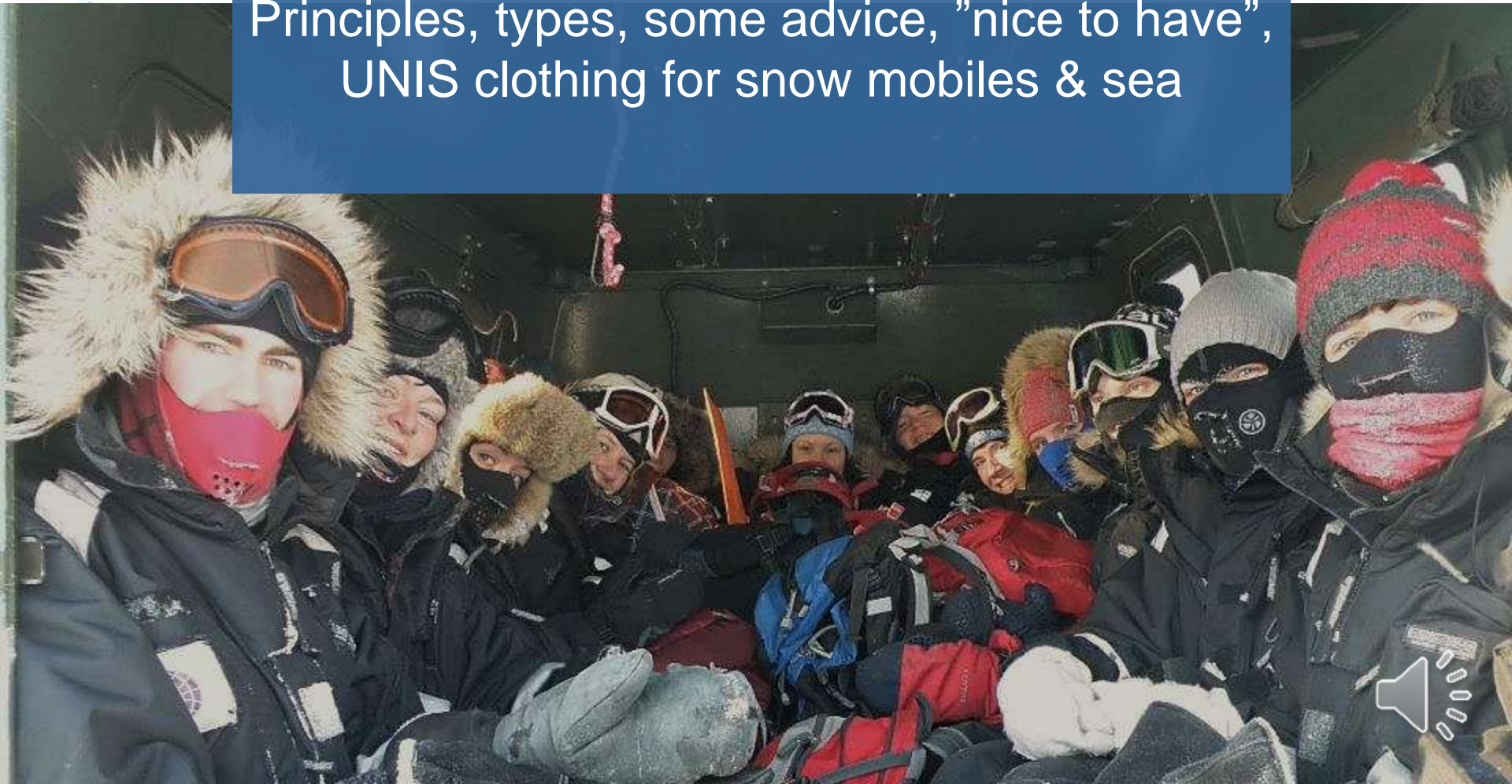


Winter Clothing

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



OBJECTIVE

Understand the basic principles of correct clothing in Arctic winter conditions

- Be able to choose the correct type of clothing to planned activity.
- Know the difference between the different fabrics and advantage and disadvantage among them.
- Demonstration of relevant clothing and “nice to have” small equipment for arctic field work.

What is determining the type of clothing we choose to wear?

- Weather conditions
 - **Temperature**
 - **Wind**
 - Precipitation (rain/ snow)
 - Ground conditions (Snow, soil, sea ice / wet or dry)
- Type of activity
 - **Moving or stationary**
 - Length of the activity
 - Need to use your fingers
 - Working with water



Weather

- Variable and often windy weather (maritime versus polar air)
- Hard to predict
- **Big local variations**
- **Weather may change very rapidly**
- Average temperature winter: **-5°C to -20°C but with wind often -20 to -40.**
- **Often windy → wind chill, low visibility or whiteout with blowing snow**
- **Very exposed to weather**



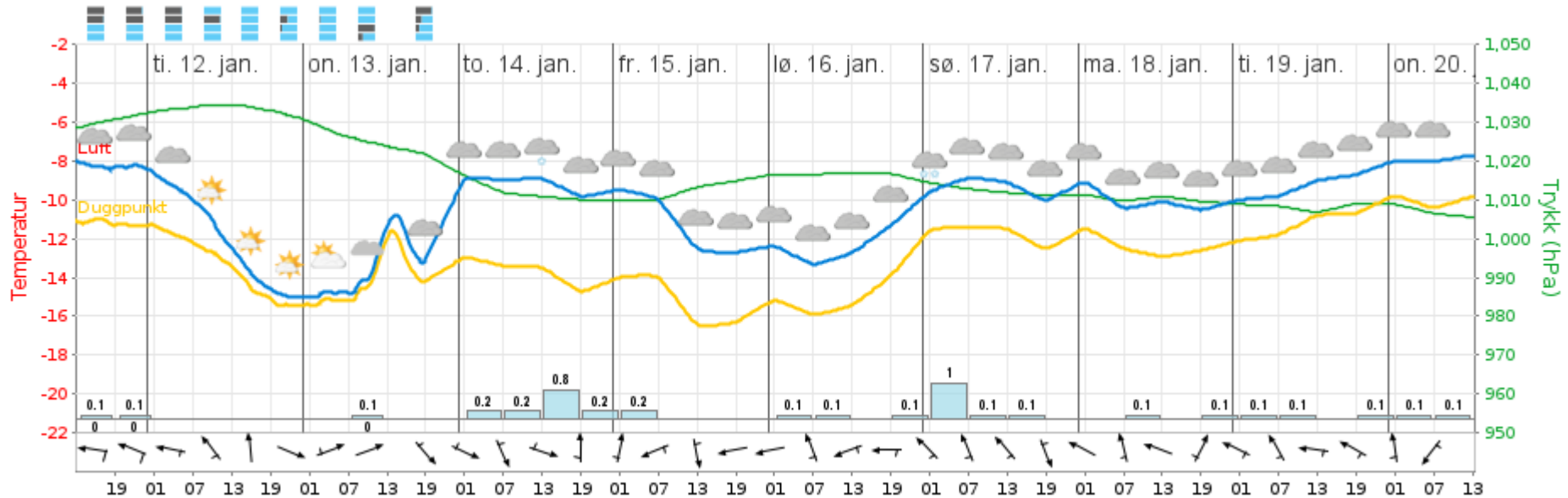
Weather is a major risk factor in Svalbard

Windchill Chart

Vindstyrke i Beaufort	Luft-temp.	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
	meter/sek.	Indeks											
Svak vind	1,5	4	-2	-7	-13	-19	-24	-30	-36	-41	-47	-53	-58
	3	3	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63
Lett bris	4,5	2	-4	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66
	6	1	-5	-12	-18	-24	-31	-37	-43	-49	-56	-62	-68
Laber bris	7,5	1	-6	-12	-19	-25	-32	-38	-45	-51	-57	-64	-70
	9	0	-7	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72
Frisk bris	10,5	0	-7	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73
Liten kuling	12	-1	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74
	13,5	-1	-8	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75
Stiv kuling	15	-1	-8	-15	-22	-29	-35	-42	-49	-56	-63	-70	-76
	16,5	-2	-9	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77
Sterk kuling	18	-2	-9	-16	-23	-30	-37	-43	-50	-57	-64	-71	-78
	19,5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79
	21	-2	-9	-16	-23	-30	-37	-44	-51	-59	-66	-73	-80
Liten storm	22,5	-3	-10	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80
	24	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81














Weather Meteogram

- Updates found by the reception daily



Check also:

[Weather forecast for Longyearbyen \(Svalbard\) – www.yr.no](http://www.yr.no)

Navn	Symbol	m/s	knop
Stille		0.0 - 0.2	0 - 1
Flau vind		0.3 - 1.5	1 - 3
Svak vind		1.6 - 3.3	4 - 6
Lett bris		3.4 - 5.4	7 - 10
Laber bris		5.5 - 7.9	11 - 16
Frisk bris		8.0 - 10.7	17 - 21
Liten kuling		10.8 - 13.8	22 - 27
Stiv kuling		13.9 - 17.1	28 - 33
Sterk kuling		17.2 - 20.7	34 - 40
Liten storm		20.8 - 24.4	41 - 47
Full storm		24.5 - 28.4	48 - 55
Sterk storm		28.5 - 32.5	56 - 63
Orkan		32.6 -	64 -

What do we expect 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
- 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
- Easy to dry (single layers)

Body heat loss

By air circulation (1)

- The heated air layer next to the skin leaks out and is replaced by cold air (**convection**).
- **Cold wind major factor!**

By contact (2)

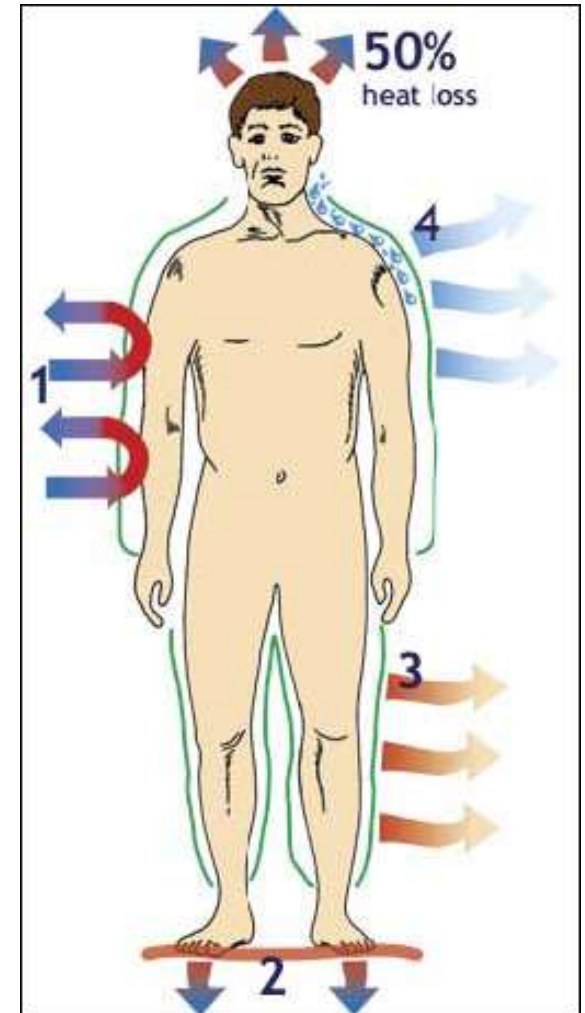
- The contact between the body and surface you lie or sit on "steals" heat from the body (**conduction**).
- **Very important on snow, ice, cold metal etc.**

By radiation (3)

- The body releases heat to its surroundings when these are colder than the body.
- little importance to a person who is correctly dressed for cold weather.

By evaporation (4)

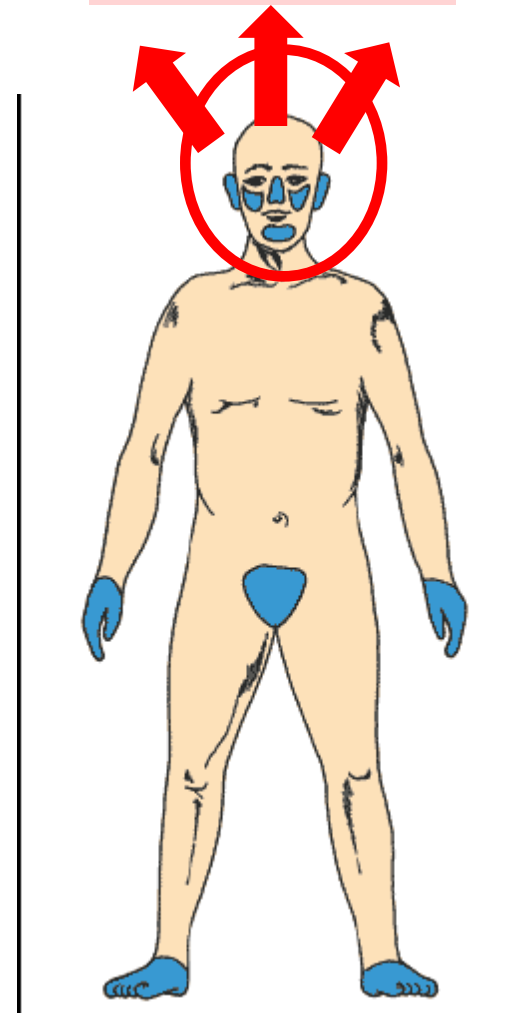
- Sweat and water in the clothes evaporates. Evaporation requires heat to occur and heat is drawn from the body.



Important aspects

- **Uncovered head and neck lose up to 50% of body heat production**
- **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**

50% heat loss





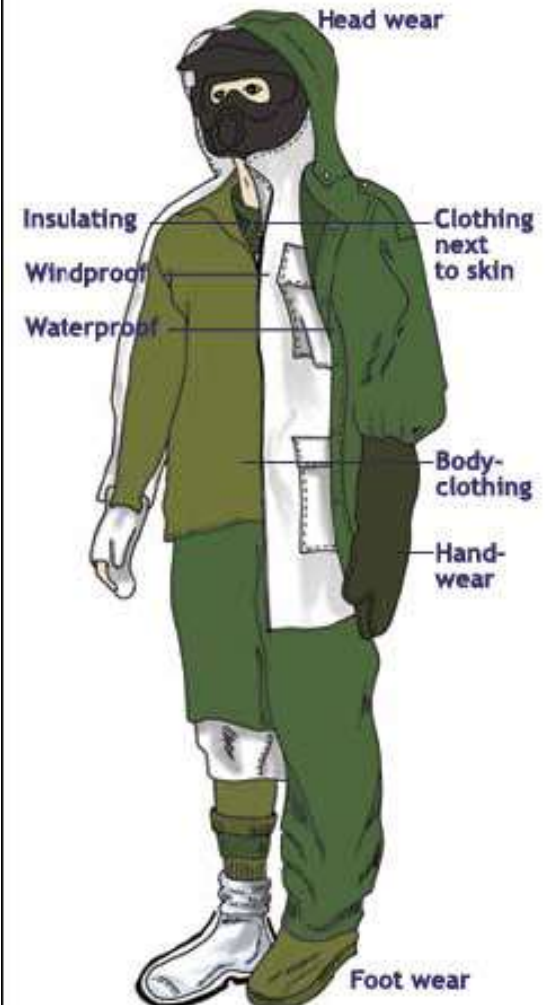
UNIS

The University Centre in Svalbard

The different parts of clothing:

- Long underwear
- Isolation layers
- Outer wear (Shell clothing)
- Headwear
- Face protection
- Neck protection
- Hand wear
- Footwear

- Eye protection



Normal principles for clothing

- Inner layer of insulation
- Insulation between layers
- Wind /water-proof outer layer

- Ventilation
- More layers instead of one thick layer
- Never put on more clothing than just enough to keep you warm.

- Spare clothing.
- Size (Big enough)



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

- **Headwear**
 - **Windproof** most of the days
 - Woollen hat or fur hat (covers very well ears and cheeks)
 - Bring extra
 - Balaclava of wool, fleece to wear under
- **Face protection**
 - Different fabrics (neoprene/wool)
 - Windproof – especially when driving snow scooters
 - Cover your nose, cheek bones

 - **Ski goggles**
 - **Good, dark sun glasses later in season**
- **Neck protection**
 - Wool / fleece / Buff etc.



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 big 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

Clothing

- Face, hands and feet are most exposed
- Windproof
- Big 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
- Goggles
- Sunglasses (March →)



UNIS clothing for scooter driving and fieldwork in cold

Clothing for scooter driving:

- Scooter overall:
 - Warm & insulated, windproof, good hood, many pockets
- Warm boots
- Face mask
- Mittens
- Helmet
- Basic goggles



UNIS clothing for scooter driving and fieldwork in cold weather

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 you liner/working gloves + warm hat + extra insulation

Amount depends on the weather, time outside and activity level



Clothing for working at sea / sea ice

Regatta floating suit

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



Clothing for travelling & working at sea

Rescue suits

- Waterproof insulated floatation suits with boots and neoprene gloves
- Used on small boat transportation when needed
- Also evacuation suit from ships



How do we keep warm ?

- Correct clothing suited to the situation and work load.
- Movement & activity (whole body, toes, fingers)
- Snacks and warm drink, food – have snacks and thermos easily available and eat often
 - Remember that snacks and food can freeze solid very fast
- Avoid exhaustion and sweating – adjust clothing

Doing fieldwork on Svalbard we need to accept:

- **Cold fingers and toes**
- **Some lack of comfort**
- **Some unpleasantness**
- **To work in cold, dark, new and sometimes rough situations**
- **Situations with some stress**
- **To cross some mental borders**
- **Some long working days**
- **The need of taking care of not just ourselves, but also group members**

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, loosing visibility ...**
 - **Start to get frostbites in face**
 - **Start to loose feeling in fingers, toes**
- **Be honest and tell others early if you start to have problems and do something before it is too late**
- **STOP, think, change plans if needed**

OPENING HOURS TODAY



Open until 20:00

**20% discount on all clothing
15% on everything else**



Open until 20

**20% discount on ordinary prices.
Valid out 2017**

Thank You!
Have a nice and active first week!

