

Basic Avalanche Knowledge and Safe Route Planning - in avalanche terrain

Avalanche awareness

Avalanche types

3 types of avalanches:

- Slab avalanche
- Point release (loose snow)
- Cornice fall

Almost all fatal avalanches are slab avalanches

Avalanche awareness

Slab avalanche



Avalanche awareness

Slab avalanches



Avalanche awareness

Large slab avalanche



Avalanche awareness

Loose snow avalanche



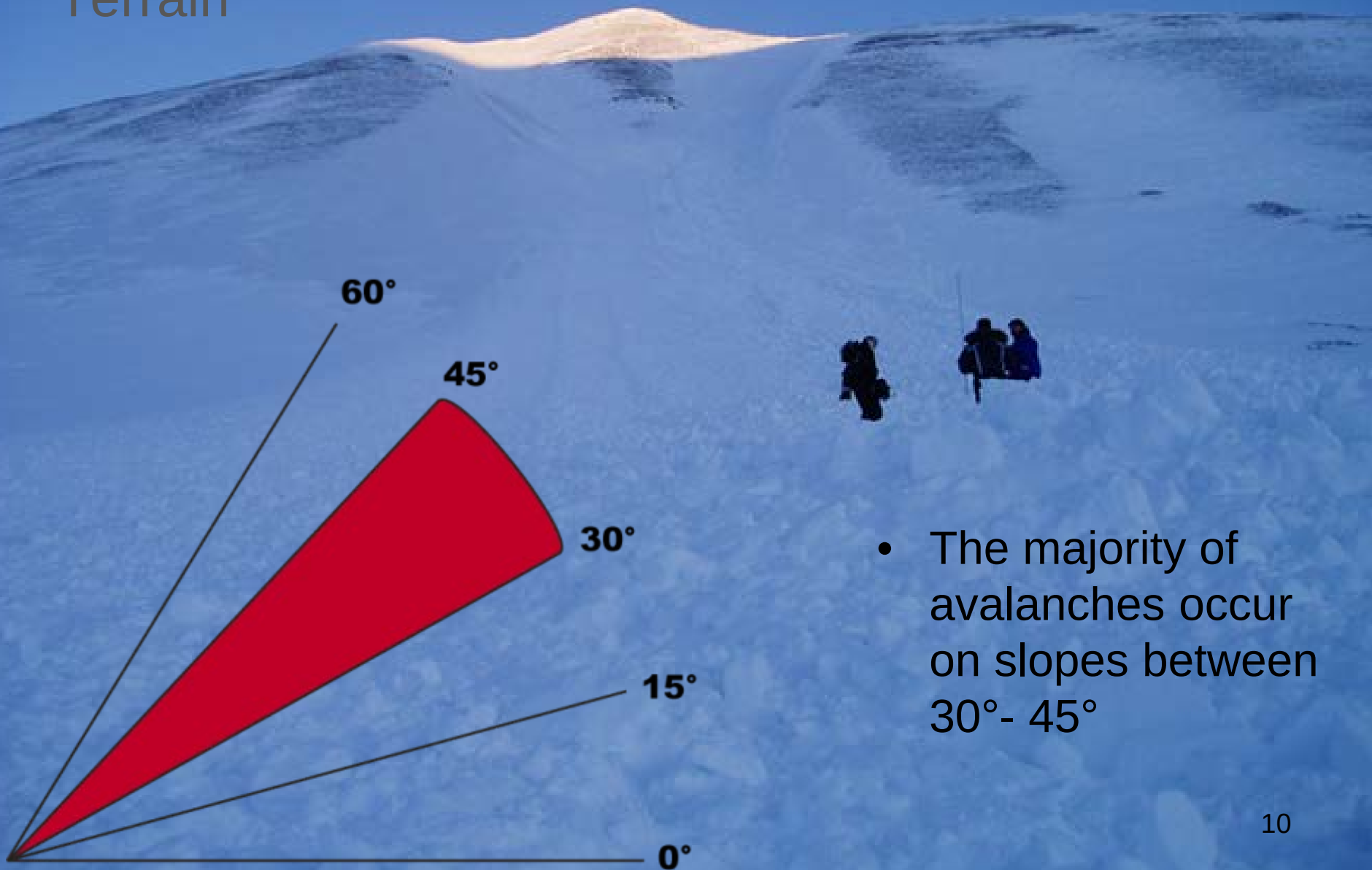
Avalanche awareness

Cornice fall avalanche



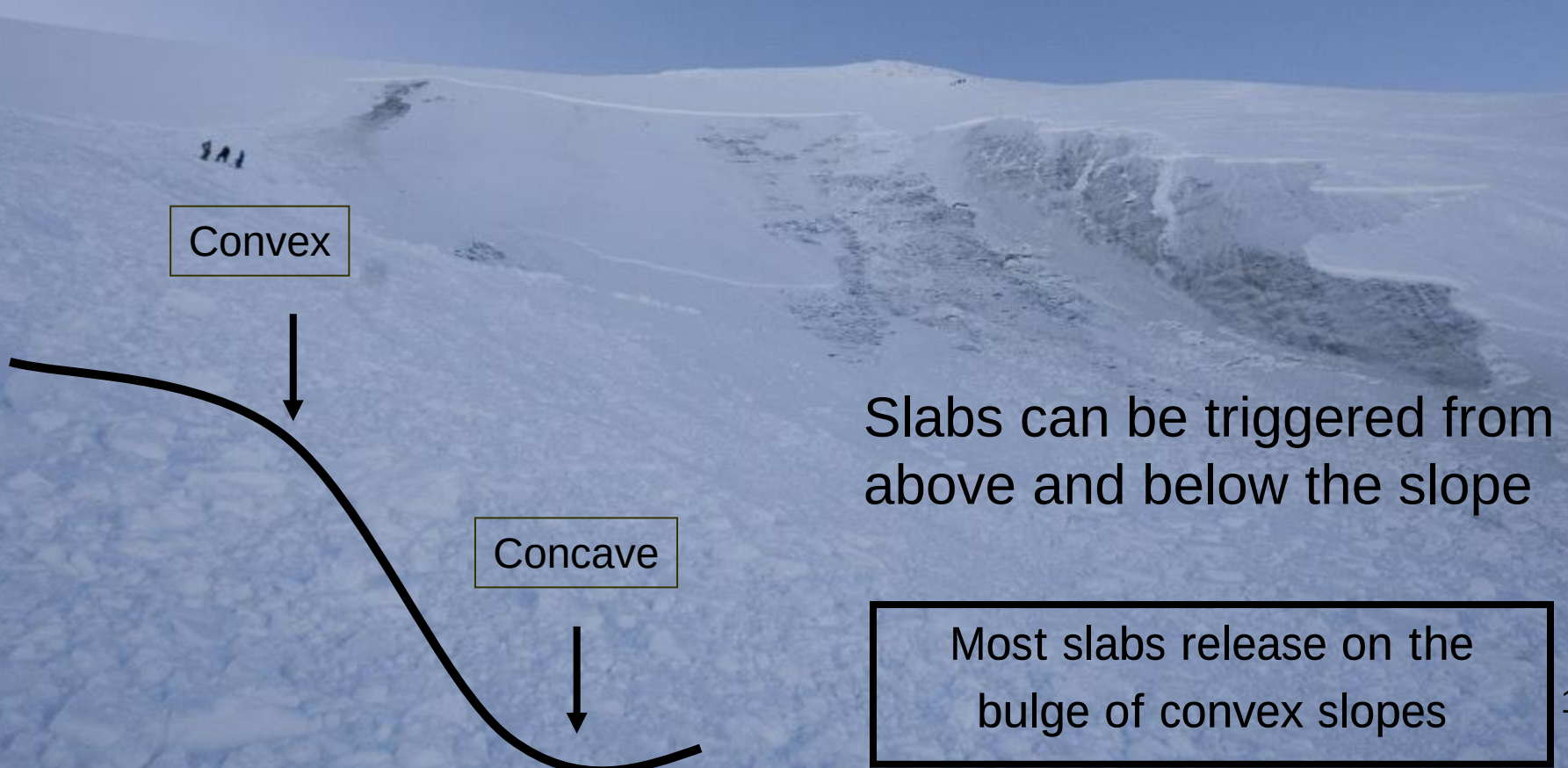
Avalanche awareness

Terrain



Avalanche awareness

Terrain

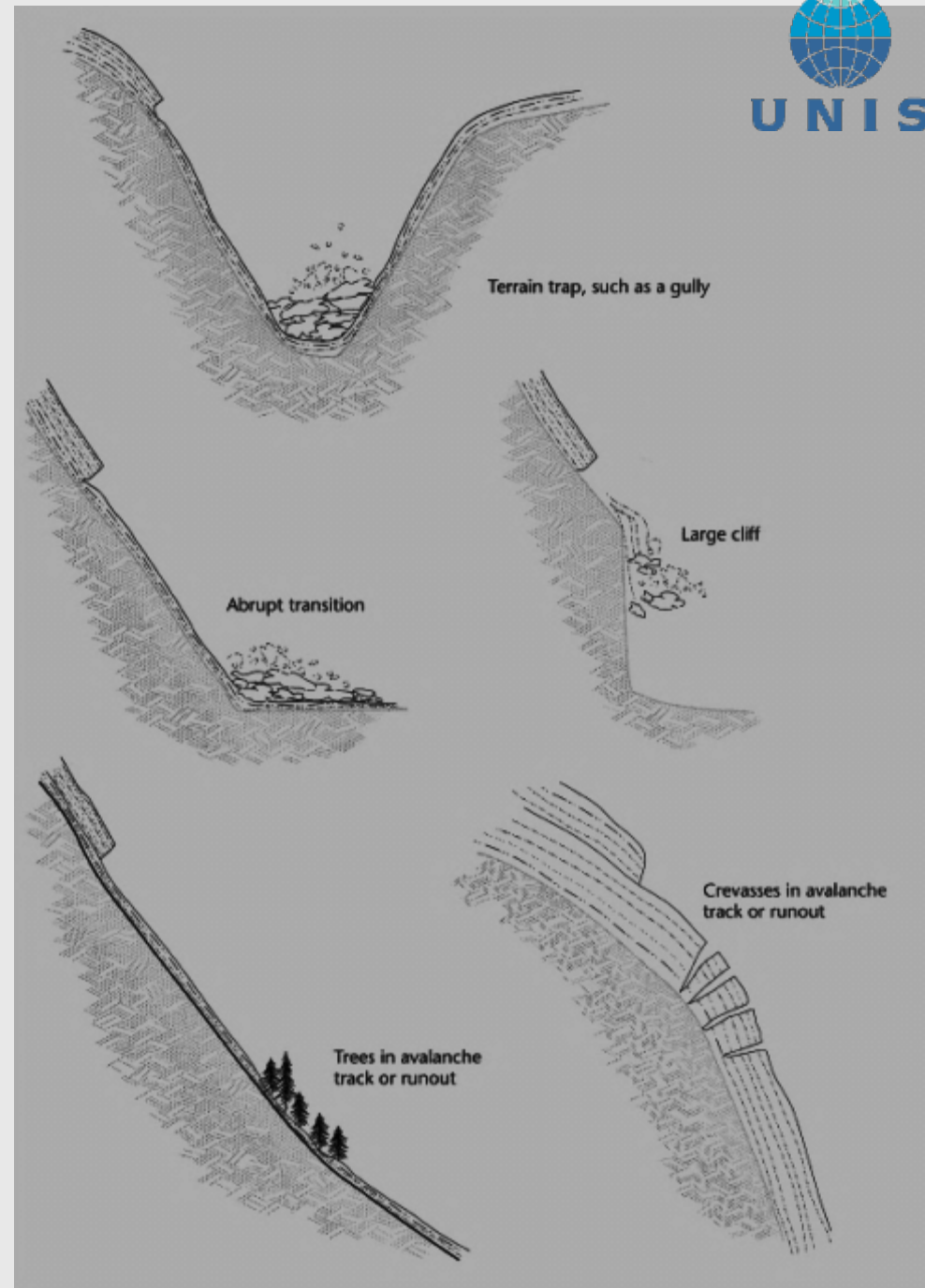


Release zone



Terrain traps

Avalanche paths with
very dangerous or
un survivable
consequences



Terrain

Summary

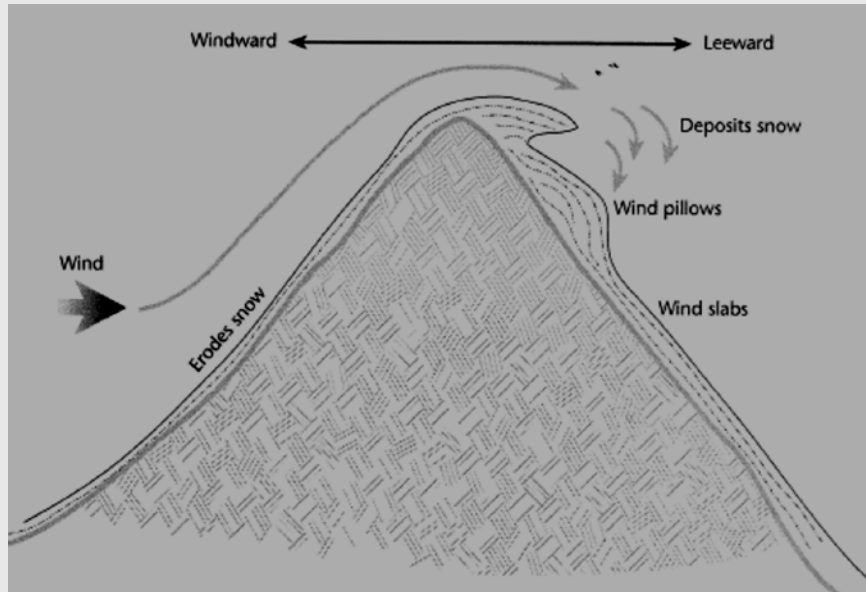
Learn to identify:

- Angel of the slope
- Release zones
- Safe zones
- Terrain traps
- Run out zones

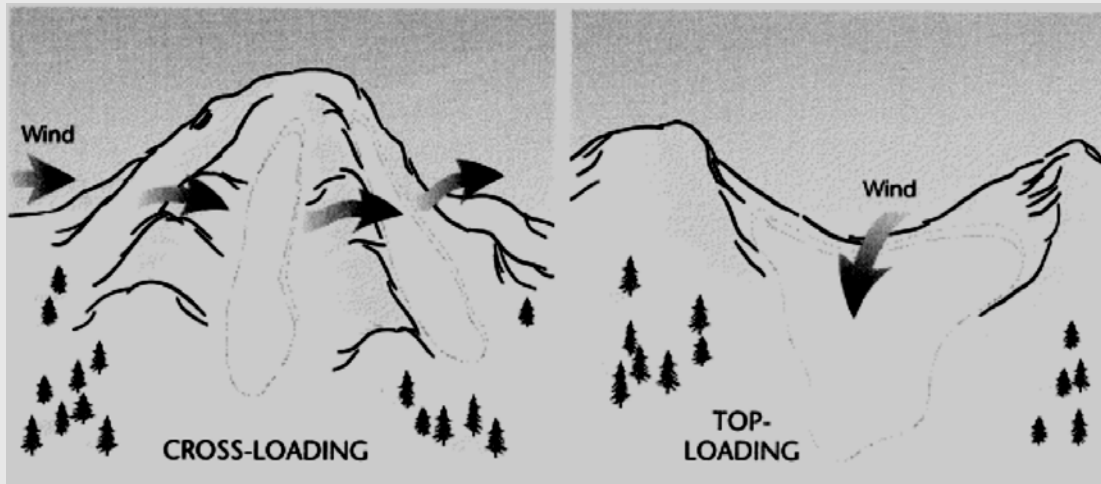


Avalanche awareness

Weather



- Wind transport snow
- Temperature (flux)
- Precipitation



Most avalanches
Occur during and
immediately after
storms

Avalanche awareness

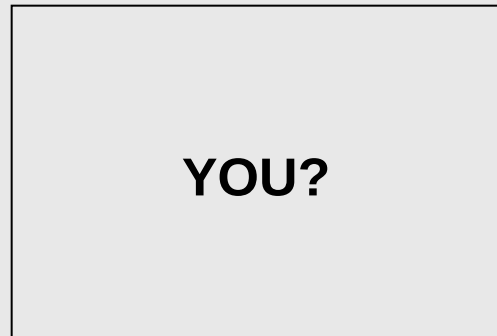
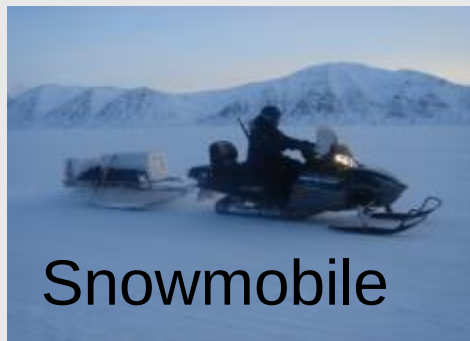
Snowpack

- Strong and weak layers in the snowpack
- Weak layers cause avalanches
- "strength" and "hardness"



Avalanche awareness

Who's at risk?



- 90% of the avalanches involving humans have been triggered by their own actions

Avalanche awareness

Safe routing

Two options for traveling in avalanche terrain:

1. Avoid avalanche terrain – always in dark and bad weather
2. Make planned, safe movements in avalanche terrain
 - Demanding
 - Requires training, knowledge and experience
 - Avoid the release- and, when required, the run-out zones
- Wrong navigation or a wrong judgment may lead to fatal consequences

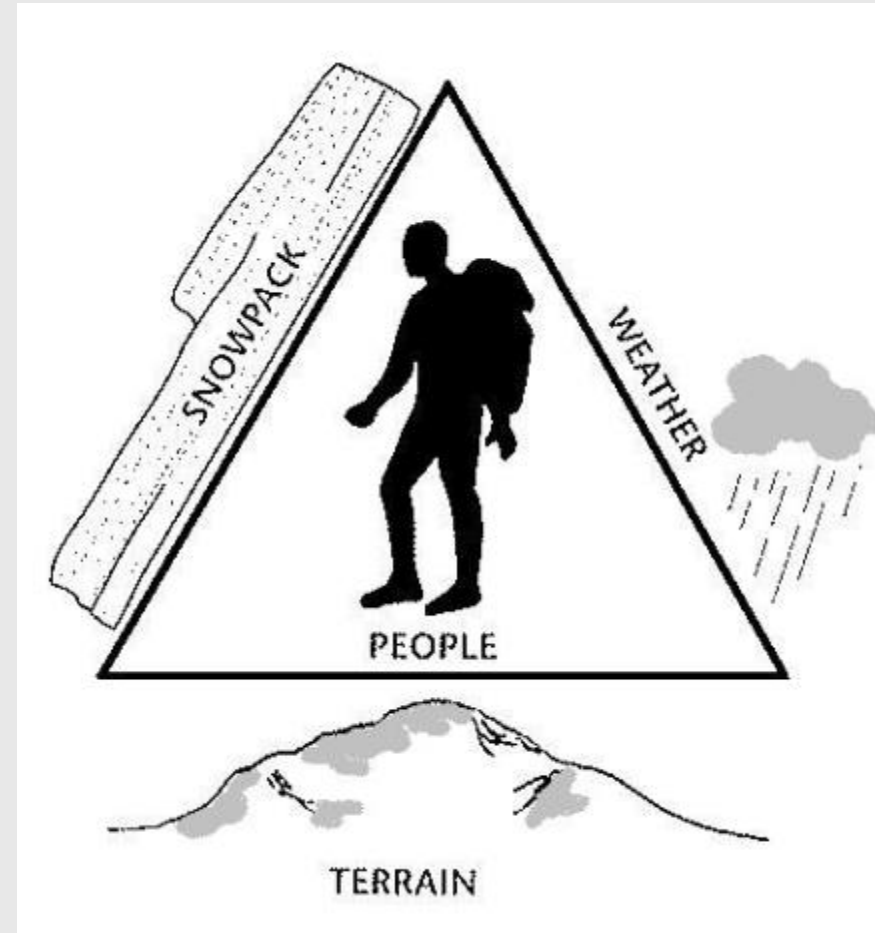


Planning

The 4 - factors

The 4 – factors assessment:

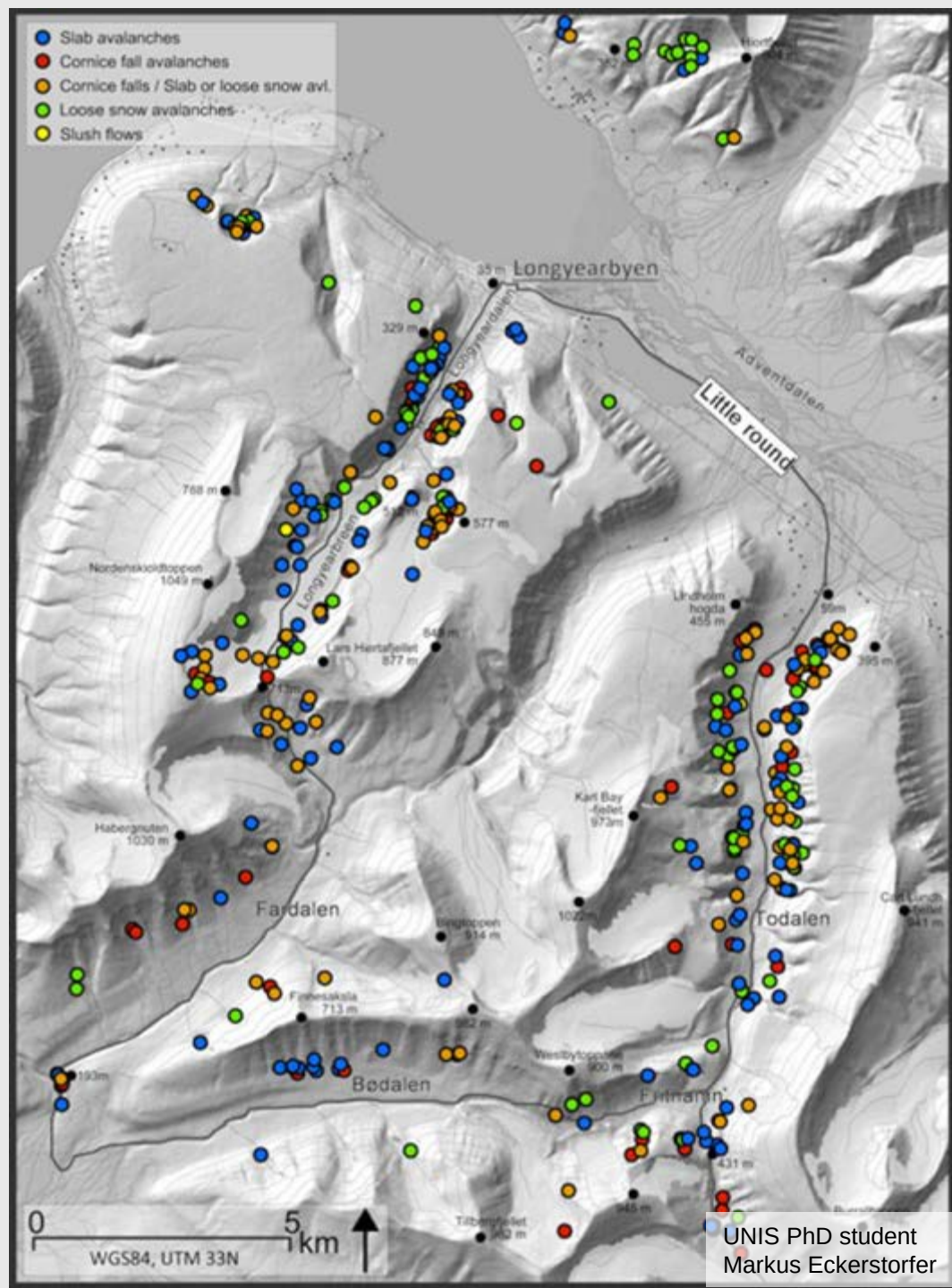
- Is this avalanche **terrain**?
- Is the **snowpack** unstable?
- Does the **weather** contribute to instability?
- **The human factor:**
How does your needs and experience influence the assessment of weather, terrain and the snowpack?



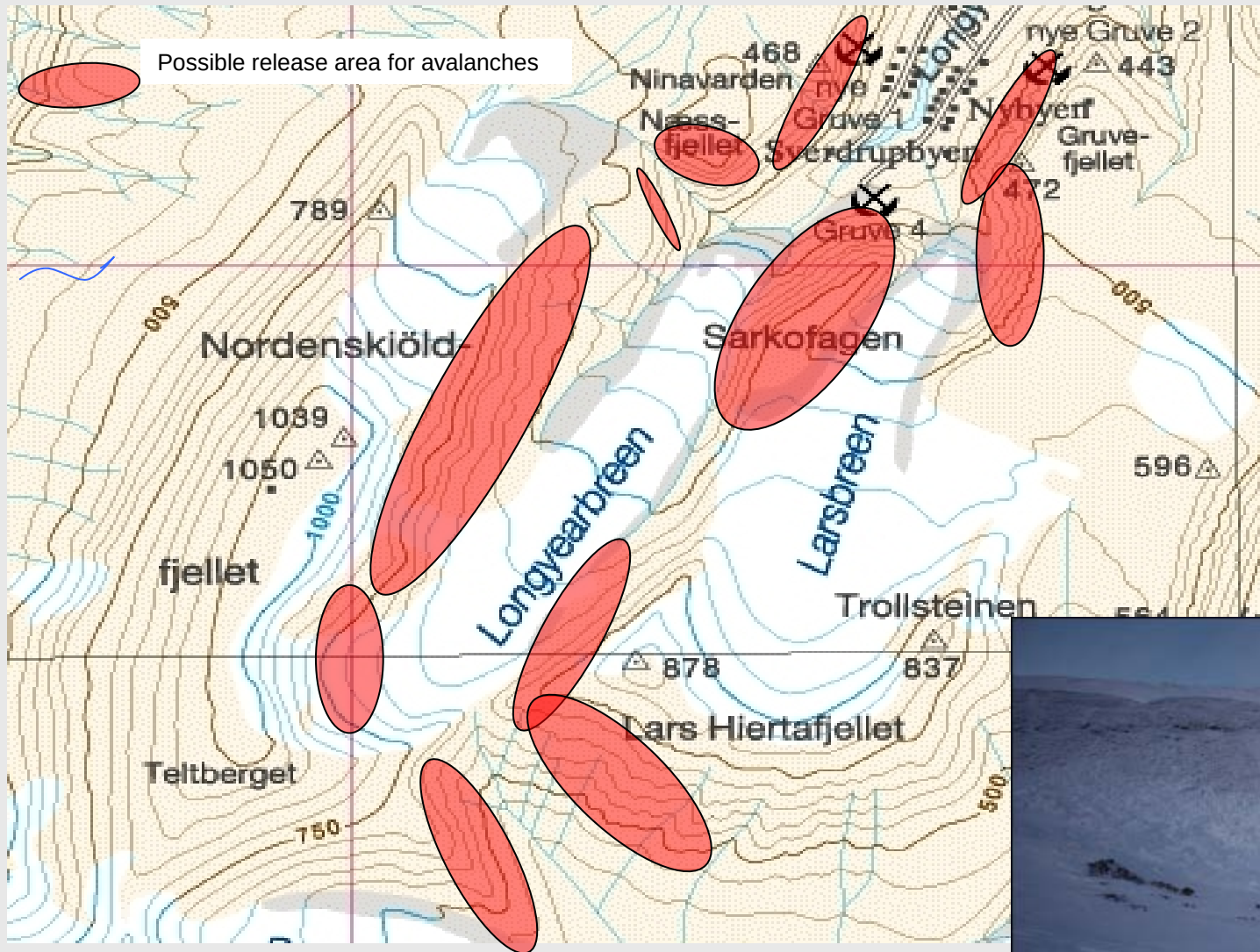
Planning

Terrain

- Does the slope have a history of sliding?



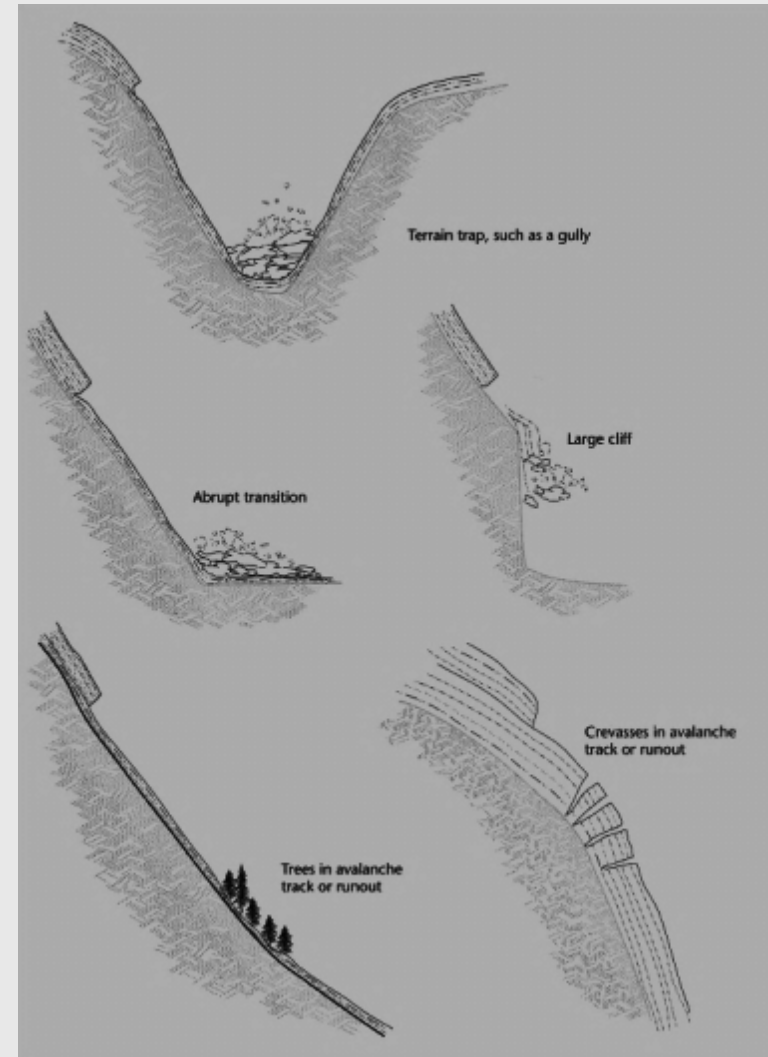
Planning Terrain



Terrain factors

Guidelines

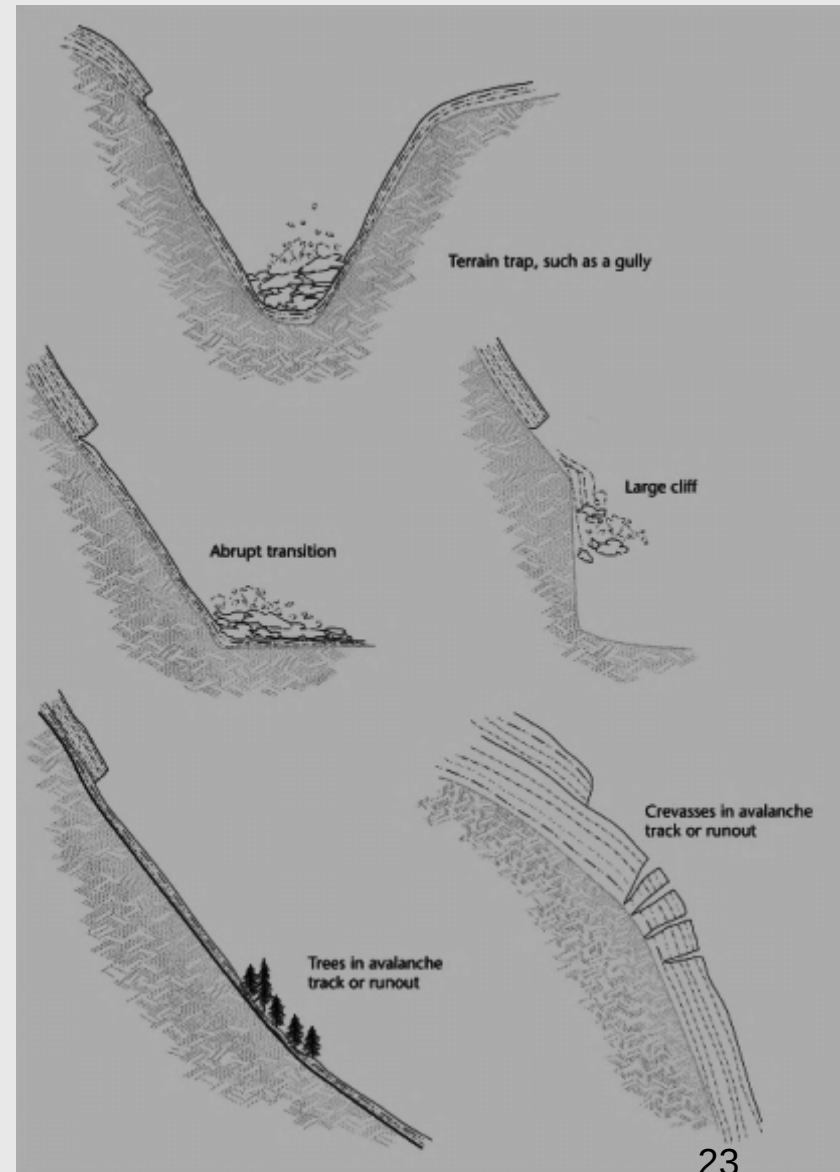
- Release zones
 - Convex slopes (stretching forces)
 - Leeward side
- Follow ridges
- Terrain traps
 - «Hidden» cliffs/steep slopes
- Cornices. 5 m and higher
- Run out zones



Terrain factors

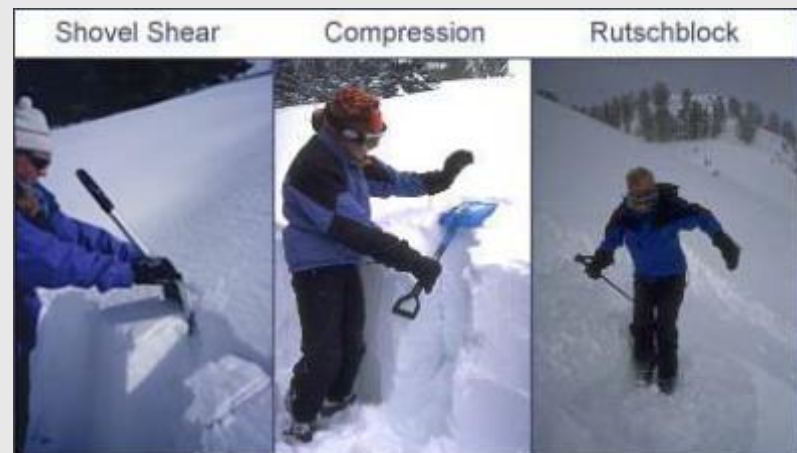
How to minimize the risk

- How to cross potentially dangerous terrain?
- Exposure time in potentially dangerous terrain?
- Have an escape route in mind



Planning Snowpack

- Forecast and nowcast
- Is the snowpack unstable?
- In case we do not have the necessary skills to evaluate the snowpack:
 - Signs of instability, fresh avalanches, whoomp-sounds, shooting cracks, slides?
 - Is there any historical information available for the area?
- Does the ongoing assessment of the snowpack cause reasons for worry?



Ongoing assessment during movement - Snowpack

- Spontaneous or remotely triggered avalanches
- Recent avalanche activity



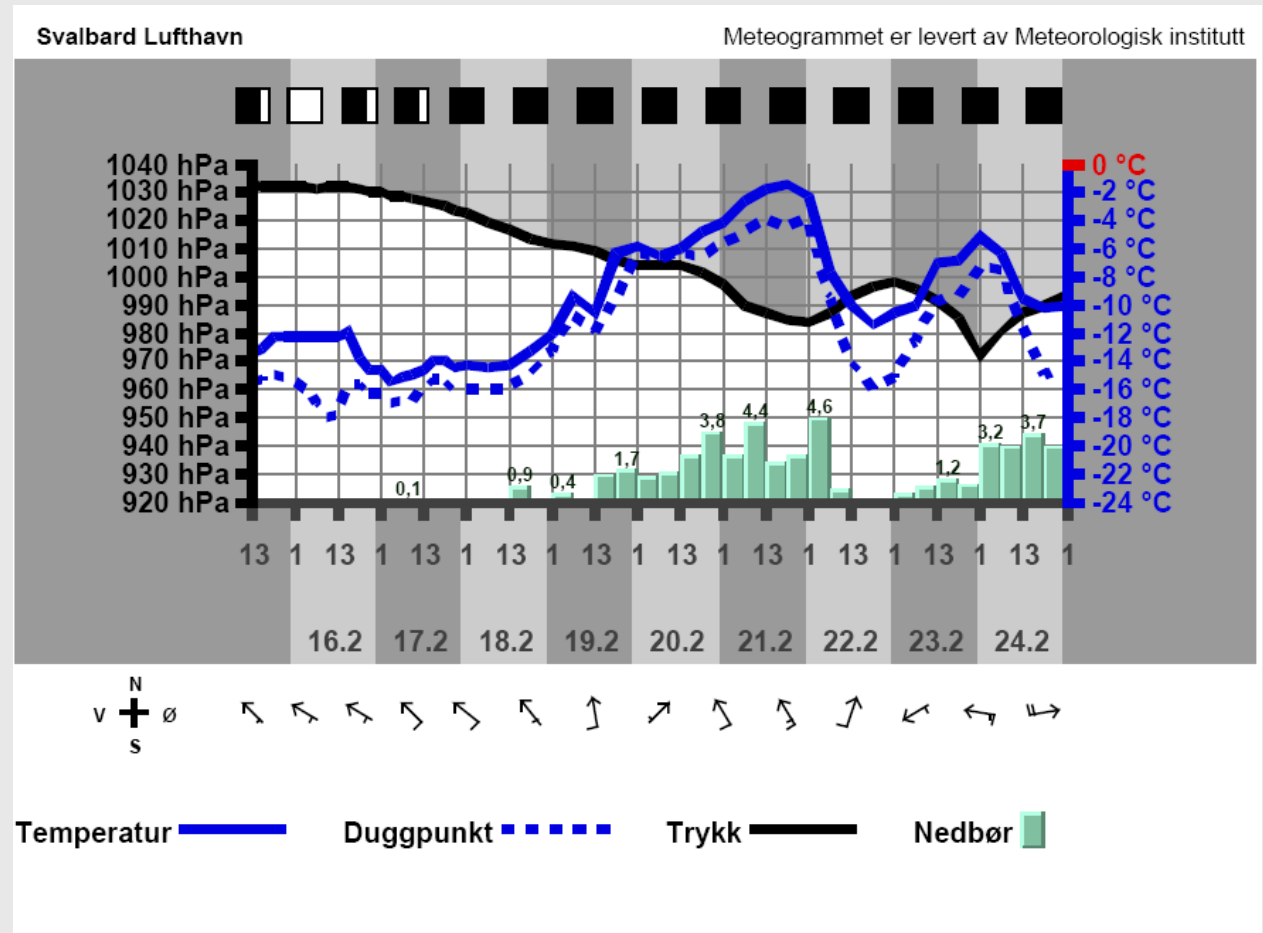
Planning Weather

Look for:

Strong Winds

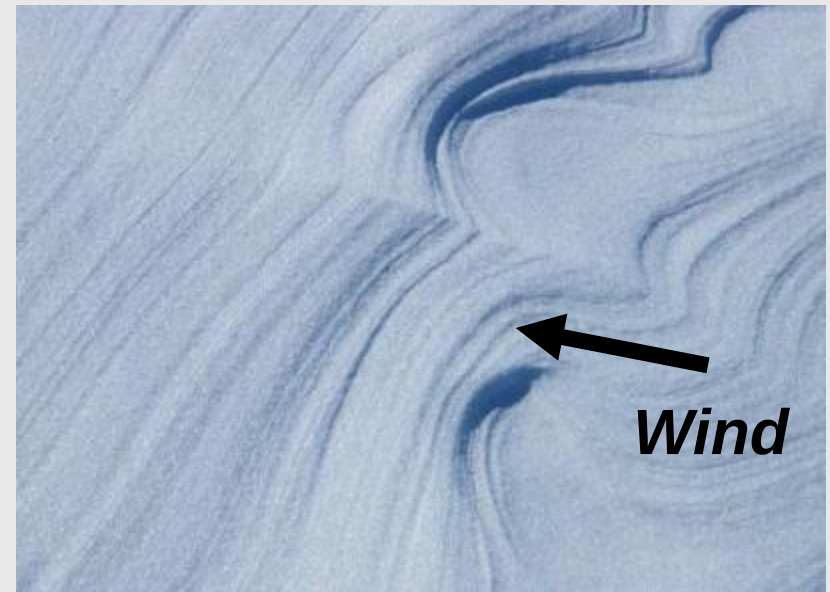
Temp fluctuations

Large volumes of
precipitation



Ongoing assessment during movement - Weather

- Wind signs (wind ridges; zastrugi , ripples)



The human factor

- 90% of the avalanches involving humans have been triggered by their own actions

Attitude:

People sometimes ignore danger signs due to pride, ego and ambition.

Time:

Weekend warrior syndrome.

Blue Sky:

Sunny weather sometimes draws people out too soon after a storm.

Herding Instinct:

People tend to think less in large groups.

«Tracker dog»:

People tend to think that tracks in a slope is a safe slope

The human factor

- Be aware of errors groups typically make
- Communication within the group
- Do every one have the basic safety gear?
- Can every one use it? To late to learn it when you are the last person standing.



The human factor



Avalanche rescue

Basic safety gear



The avalanche has stopped. Those unaffected by the avalanche must immediately start the rescue – TIME IS CRITICAL!

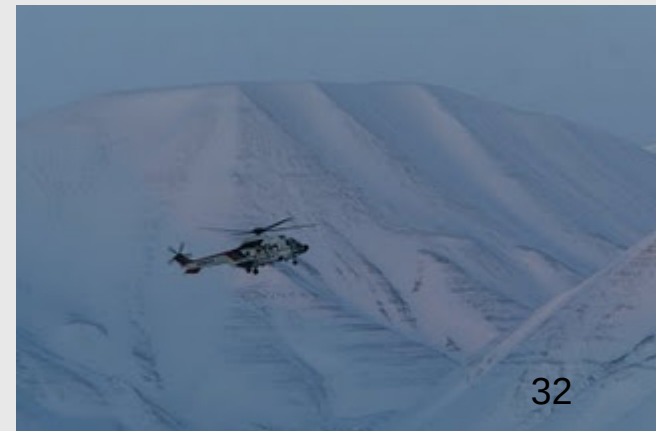
Avalanche rescue

Safety gear

- Additional safety equipment

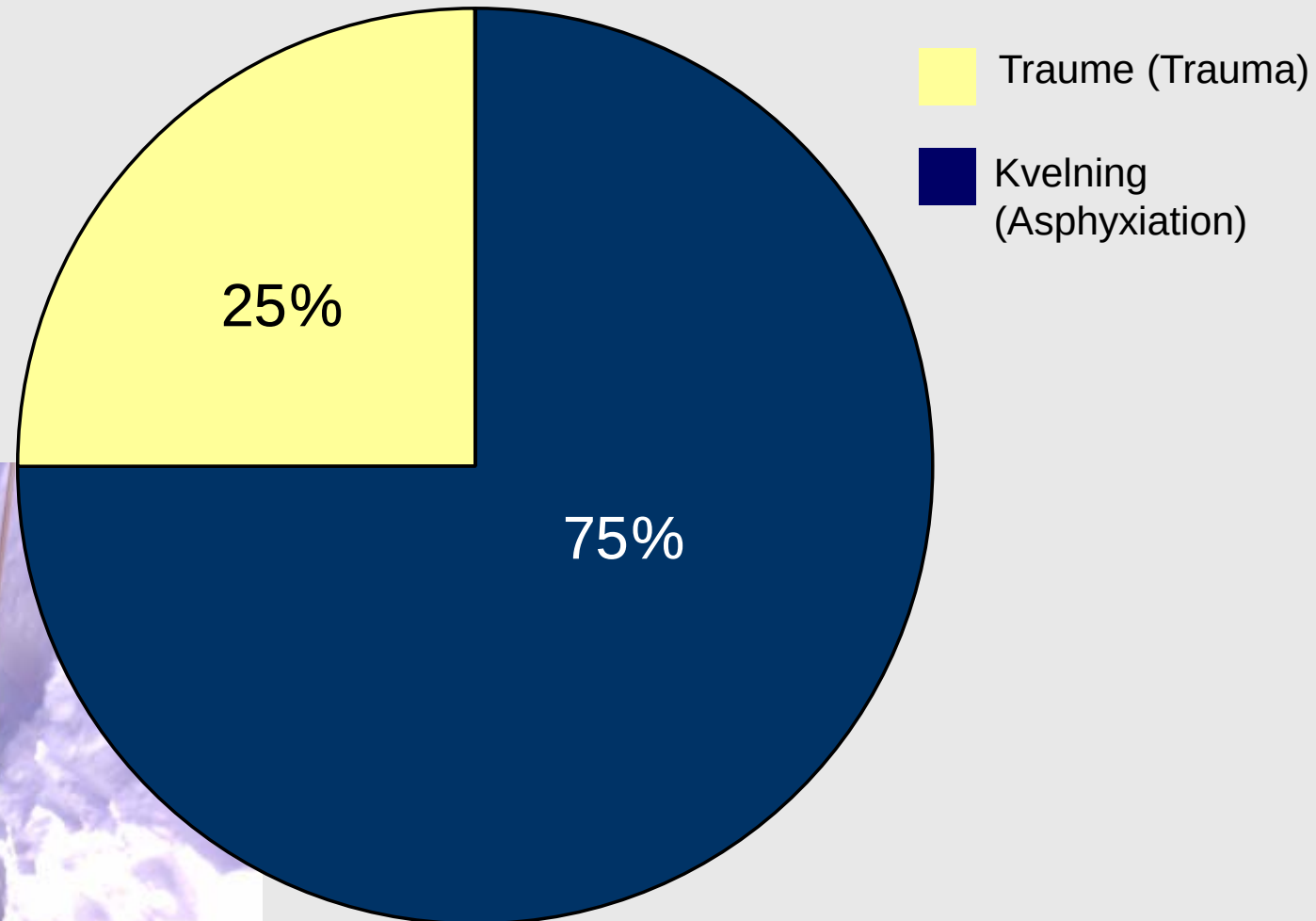


- Organized rescue



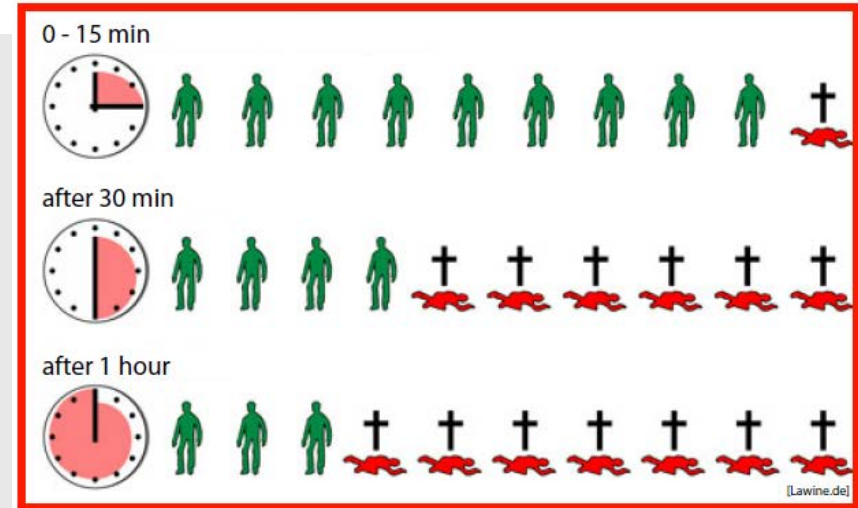
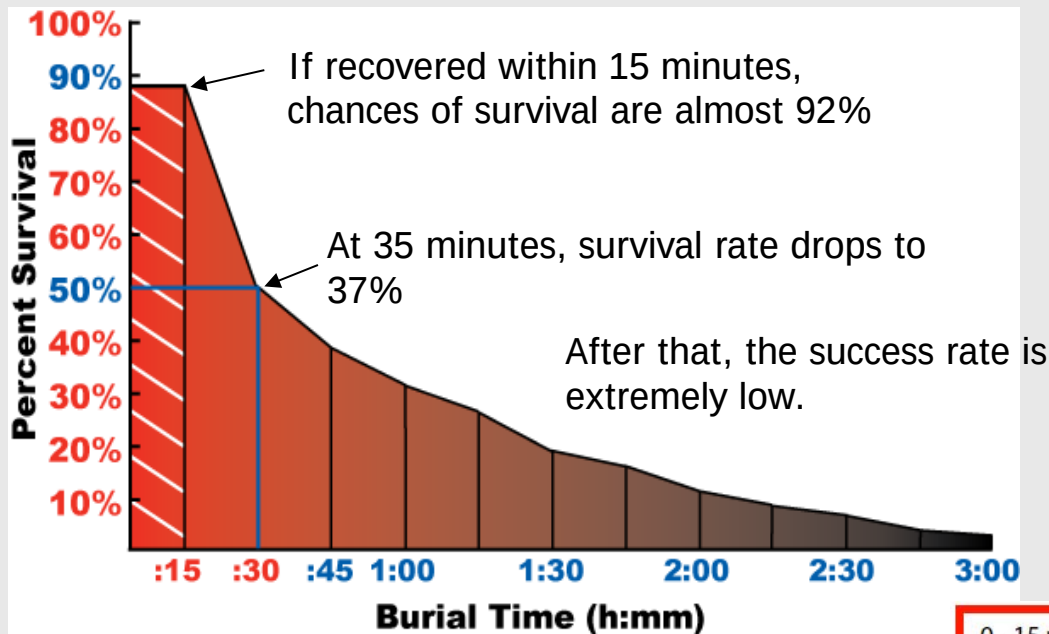
Avalanche rescue

Causes of death



Avalanche rescue

Time is critical



If you are caught in an avalanche



UNIS

- Yell “Avalanche”, wave your arms to alert the group.
- Try to escape to the side.
- If the slide knocks you over:
 - Try to keep your airway clear of snow
 - Get rid of skis and ski poles
- Try to stay on top
 - «Swim» and FIGHT Hard!

As the slide begins to slow:

- Thrust a hand upward in hopes of being seen
- Try to get an air pocket, Cover your face
- If buried, try to stay calm, breathe slowly and conserve your air.



Film

Behavior as a rescuer

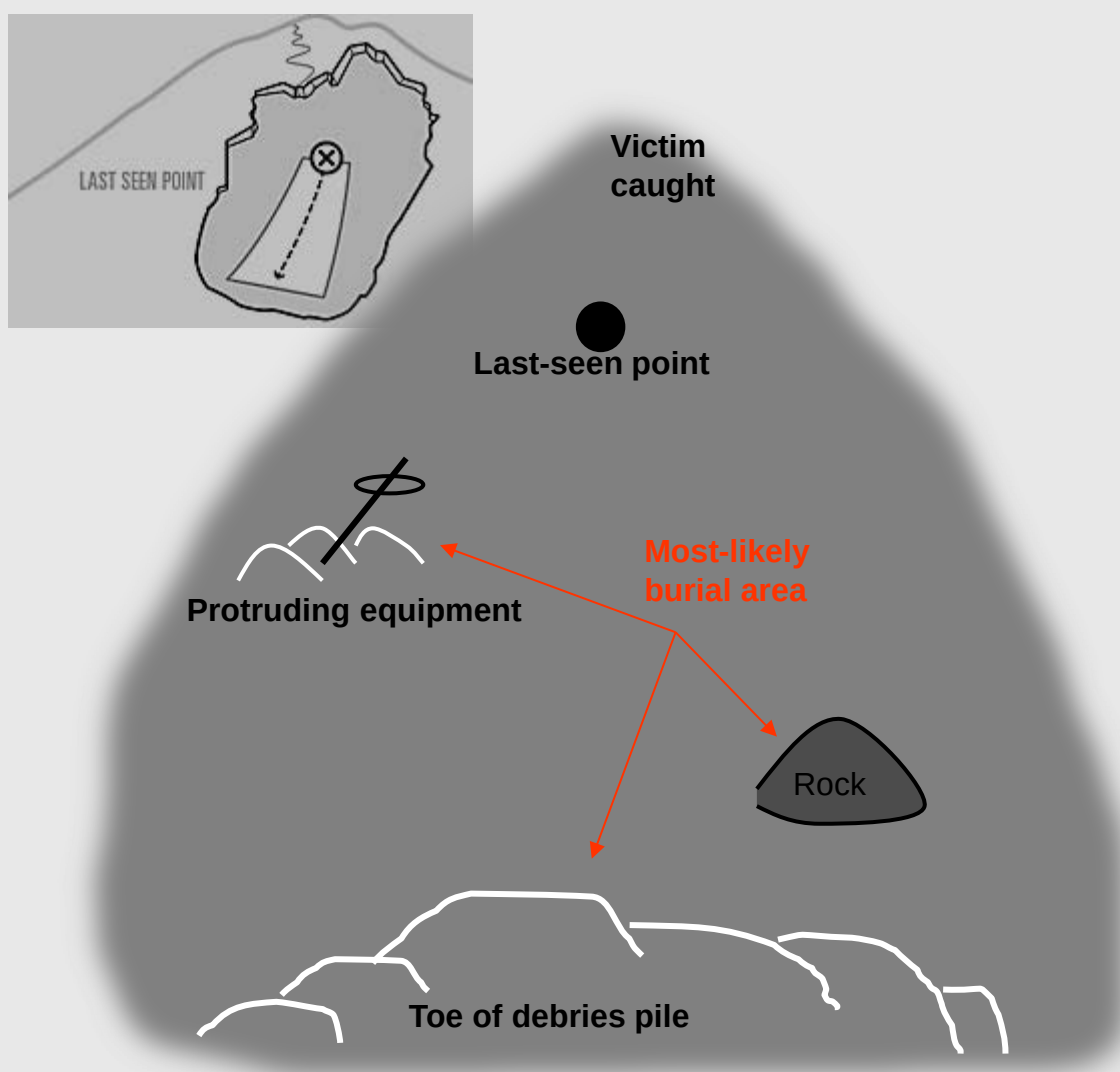
1. Watch the avalanche and the victims carefully
2. Remember the point where the victims got captured
3. Try to stay calm and organize the rescue
 - Your own safety?
4. Decide a primary search area
5. Turn your avalanche beacon on «receive», get your shovel and probe ready and start searching
6. Search also with your ears and eyes
7. Alert the Police – Syssemmannen

If the victims don't carry an avalanche beacon:

- Search with ears and eyes
- Alert immediately Syssemmannen
- Systematic, but rough probing



Companion rescue



The rescuer:

- Organizing the team
- Surface search: rapid and thorough
- Transceiver search (concurrently with surface search)
- Digging: most effective method
- Treatment of patient

Companion rescue

Surface search



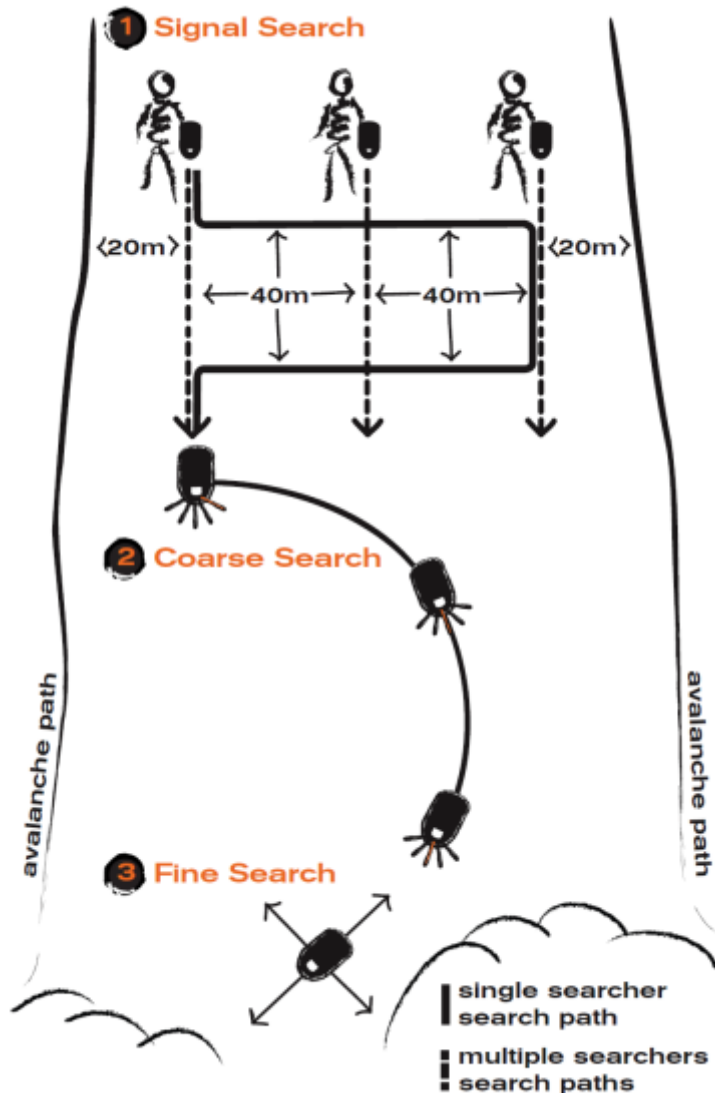
Companion rescue

Transceiver search

Depending on access and possibilities:

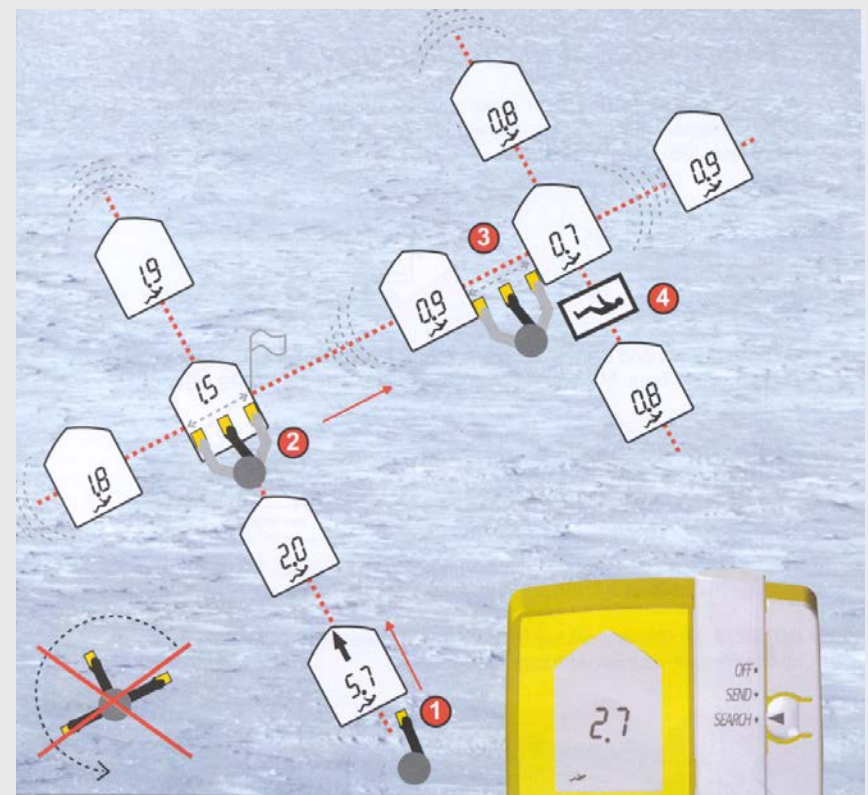
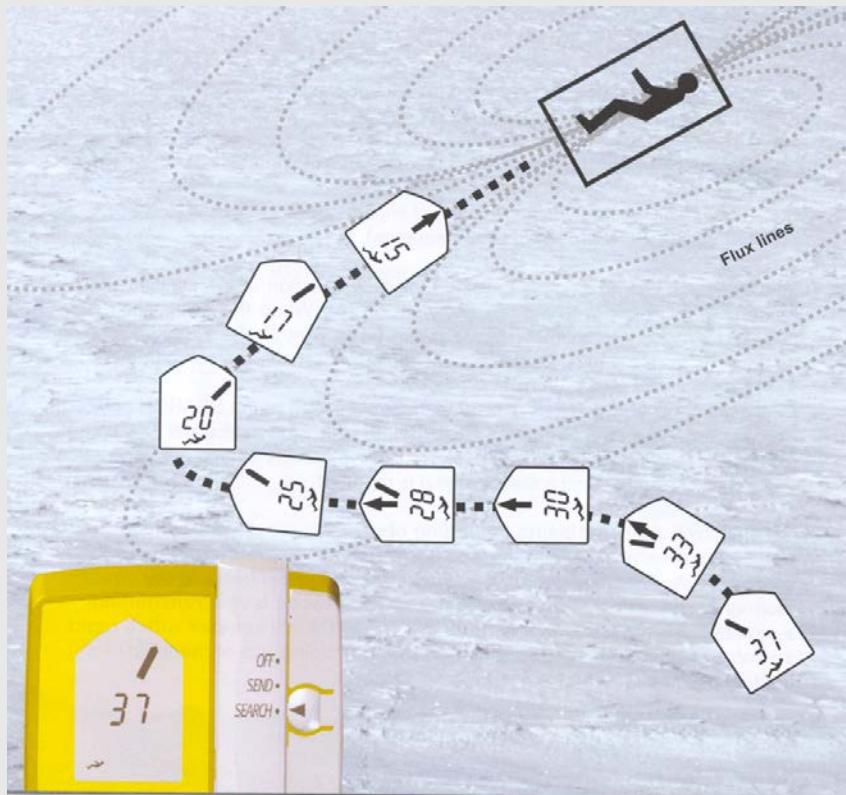
- Search from the top / bottom in zig-zag patterns (alone)
- Search in strips with 40 m gaps (more rescuers)

DO IT FAST!



Companion rescue

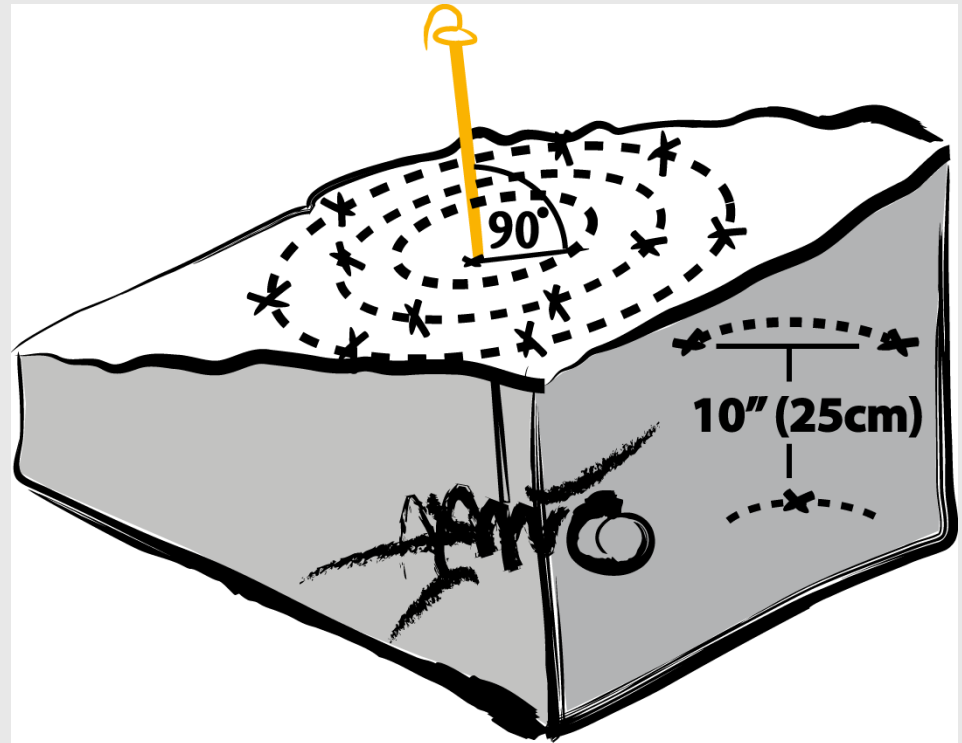
Transceiver search



Companion rescue

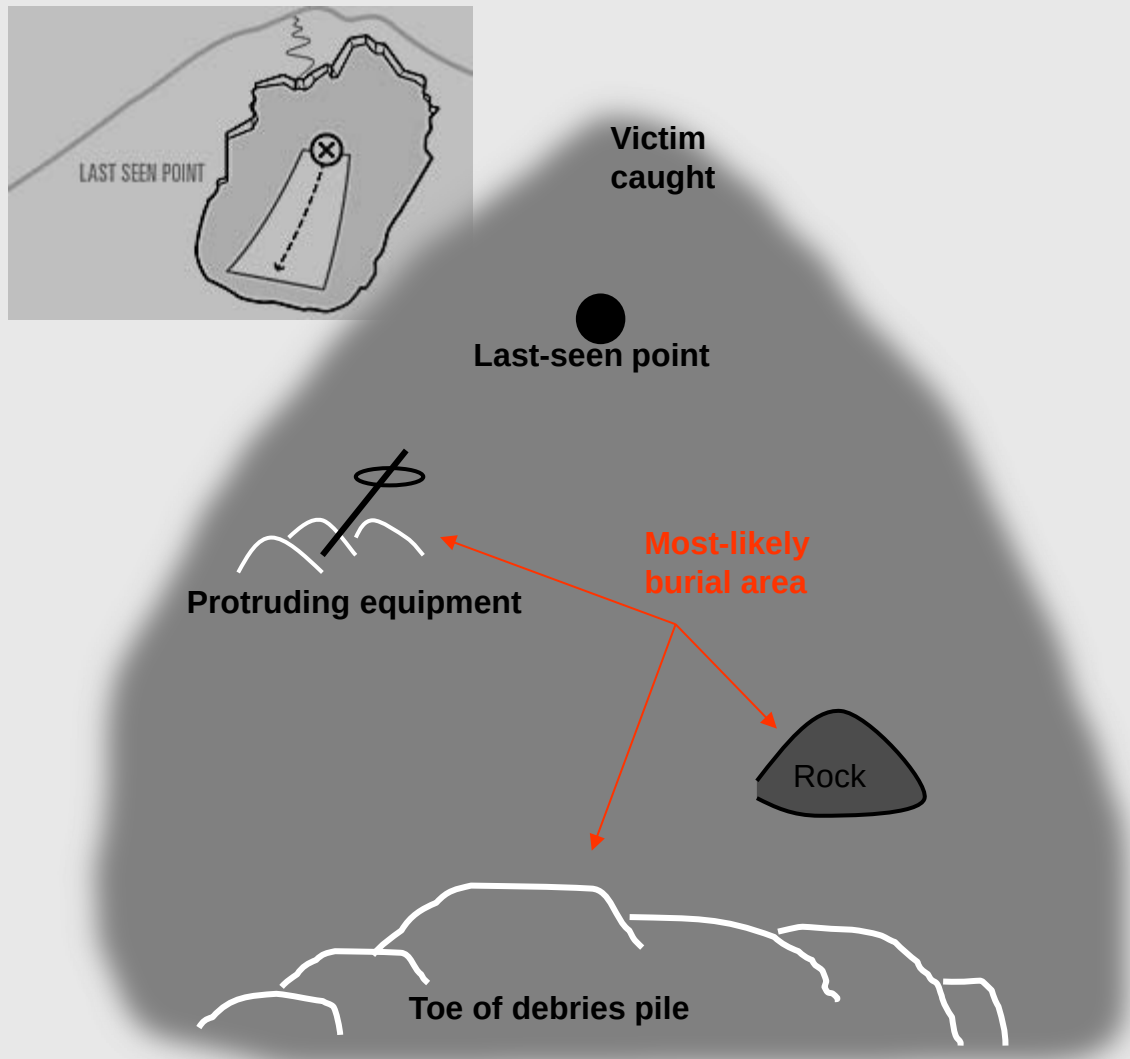
Probing

- Transceiver search probing
- Spot probing
- Organized Probe lines



Companion rescue

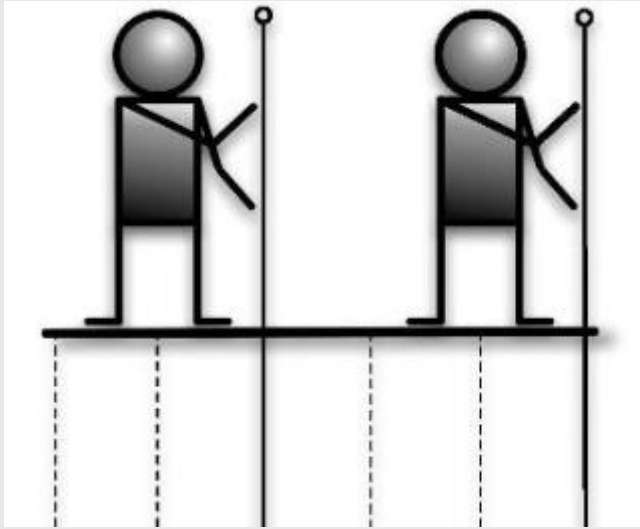
Probing



- Spot probing



Probe lines



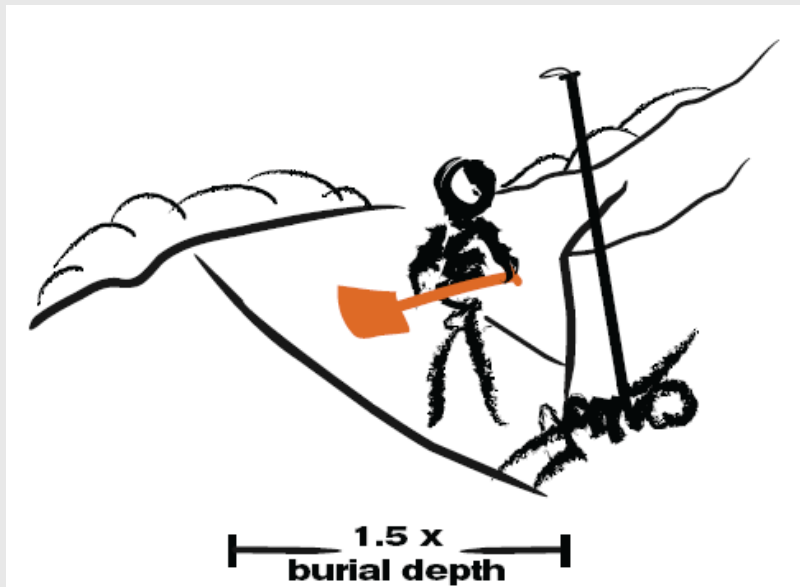
Shoveling - ABCD

- A = Airway
- B = Burial Depth
- C = Clear Snow to the Sides
- D = Dig Only Once



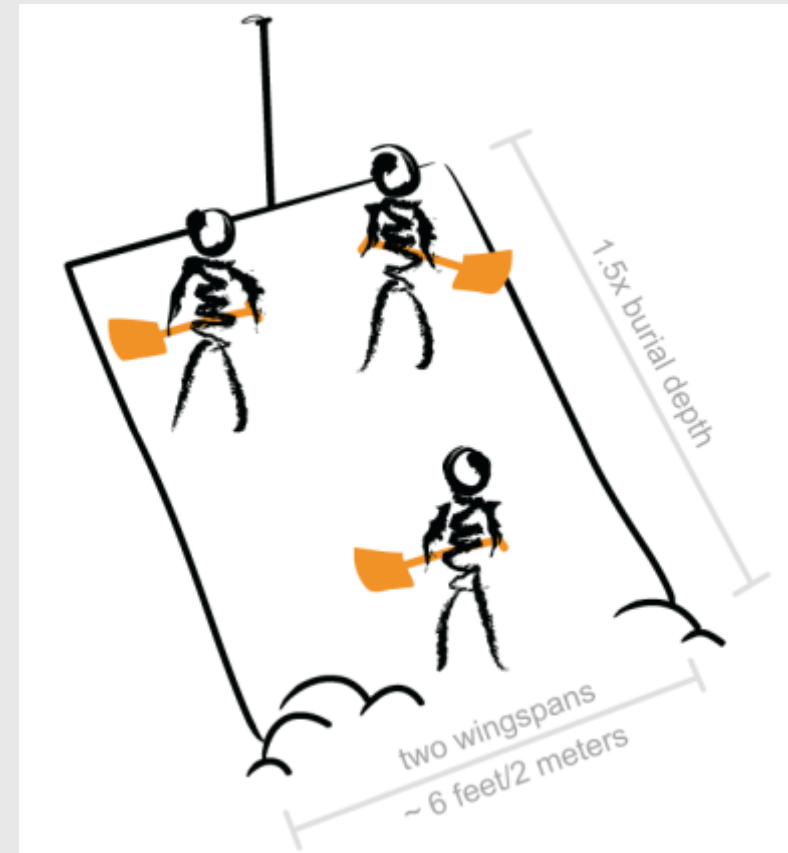
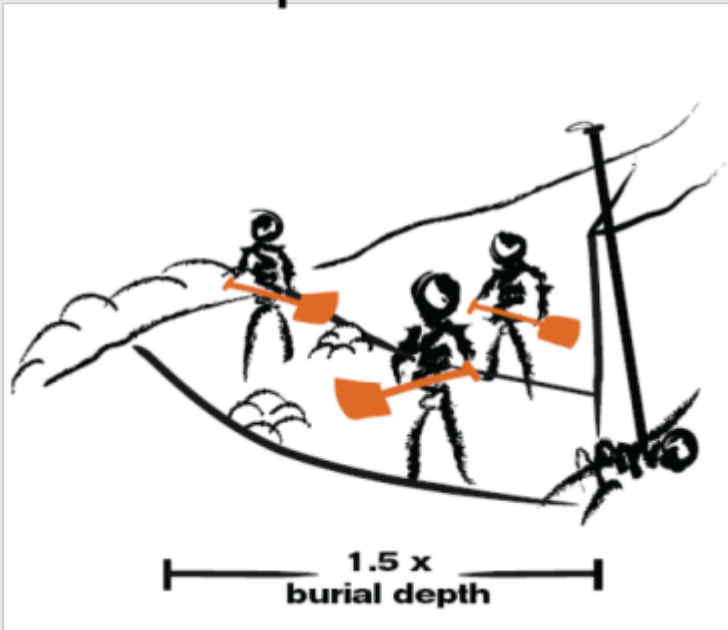
Shoveling

- Singel rescuer



Shoveling

- Multiple rescuers



Avalanche First - Aid

- Dig the head out first
- Check airways
- If the victim cannot breath
- If the victim can breath unassisted
- Extraction of patient
- Protect against further heat loss
- Evacuation



First aid i general:

A(irway) **B**(reathing) **C**(irculation) **D**(isability) **E**(xposure)

Sources

- www.varsom.no
- www.snoskred.no
- www.backcountryaccess.com
- Den lille snøskredboka, Kjetil Brattlien
- Staying alive in avalanche terrain, Bruce Tremper