

Seattle Basic Alpine Climbing Lecture #5 2023-May-11

Glacier Travel – Jan Abendroth
The Climbing Party – Cebe Wallace



Logan Peak / Banded glacier

Agenda

- Glacier Travel
45min
- Break – 5min
- The Climbing Party
45min

Glacier travel...



... beautiful



... breathtaking



... dawn



Mt. Shuksan
from Baker

... sunrises



... mountain shadow



... mountain shadow



... active geology



... ice falls



... summits!



Mt. Baker
Easton or
Coleman

... strenuous



Mt Si
Time trial

Check in with
your SIG leader
if not done yet!

Pictured climber is a strong climber,
the climb was strenuous!

Safety on Glacier trips

- Crevasse rescue: hauling system (3:1, 2:1, 6:1)

Safety on Glacier trips

- Route
- Team (Cebe's lecture)
- Weather
- Current conditions
- Gear
- Camp
- Route choice
- Safe glacier travel
- ...
- Crevasse rescue

Route - Mt. Baker, next weekend?

Basic climbing guide

Baker/Boulder Glacier	2	BG	3/3	--JJ--
Baker/Coleman Glacier	2	BG	3/3	--JJA--
Baker/Easton Glacier	2	BG	3/3	--JJA--

Resources:

- Basic climbing guide ([Course materials](#))
- Mountaineers webpage
- <https://www.summitpost.org/>
- <https://cascadeclimbers.com/>
- Fred Beckey guides and other books

Baker via Easton GI BG 10 778'

Equipment: Standard glacier equipment including wands.
Jurisdiction: Mt. Baker Wilderness / Mt. Baker-Snoqualmie National Forest
http://www.fs.fed.us/r6/mbs/recreation/mtn_climbing/index.shtml
Ranger Station: 810 SR-20, Sedro-Woolley(360) 856-5700 ext 515
Maps: USGS: Mt Baker, Baker Pass
 Green Trails: Mt Baker, Hamilton
References: Cascade Alpine Guide vol. III, 3rd edit (2008), pp 37-38
 Selected Climbs in the Cascades, Vol. I, 2nd ed., (2003) pp 278-282.
 Summit Routes (2004) pp 238-240

Approach: Take I-5 to just N of Mt. Vernon and go E on SR 20 (N Cascades Highway) and turn left on Baker Lake Road. Continue 12.5 mi. to just past the Rocky Creek Bridge, turn left onto FS #12. Go 3.5 mi. to Sulfur Creek road (FS#13). Turn right and follow it 6 mi. to its end in a logging patch at 3,400'. Cross Sulfur Creek, through Schreiber's Meadows (no suspension bridge across the river), through timber, across melt water streams, and up forested slope (switch backs) to Morovitz Meadows (2 mi.). From Upper Meadow take right fork to Baker Pass. Head up on a trail to the crest of the Railroad Grade. Campsites are in trees behind eastern moraine around 5,500', and on ridge E of Railroad Grade at 5,800'. High camps are possible N of Baker Pass at 6,000', and as high as 6,800' in low snow conditions.

Climbing Route: From high camp get onto the Easton Glacier and ascend almost due N aiming at or a little W of Sherman Peak. Near the base of Sherman Peak, go W to the eastern base of the Roman Wall. Go up snow slopes or ascend to rocky ridge, keeping right of Roman Wall. Ascend steep snow past the Roman Wall to large summit plateau. The summit (10,778') is at the far ENE side.

Descent: Descend the climbing route.

Data:	Seattle to TH	2.5h
	TH to Camp	3-4h
	Camp to Summit	5-8h
	Summit to Camp	2-3h
	Camp to TH	2-3h

Comments: The route described stays E (right) of the major crevasses. (In low snow conditions, a route can be found that borders the Demming Glacier.) The upper snow slope is steep enough to pose problems, if icy. In early to mid season, a direct line up the Easton Glacier may be possible, crossing the bergschrund on snow bridges. Get permit at the Baker Lake ranger station in Sedro Woolley.

Baker via Boulder GI BG 10 778'

Equipment: Standard glacier equipment
Jurisdiction: Mt. Baker Wilderness / Mt. Baker-Snoqualmie National Forest
http://www.fs.fed.us/r6/mbs/recreation/mtn_climbing/index.shtml
Ranger Station: 810 SR-20, Sedro-Woolley (360) 856-5700 ext 515
Maps: USGS: Mt Baker
 Green Trails: Mt Baker, Lake Shannon
References: Cascade Alpine Guide vol. III, 3rd edit (2008), p 37
 Climbing the Cascade Volcanoes (1993), pp. 39-41, 45-46

Approach: Take I-5 to just N of Mt. Vernon and go east on SR 20 (N Cascades Highway) and turn left on Baker Lake Road. Just past Boulder Creek, turn left onto Forest Service Road 1130. At 1.5 miles, turn left onto FS 1131 (sign says Boulder Ridge Trail). Drive 4.2 miles to road end or trailhead. The trail starts as an old cat track through an old clearcut for 1,000', then enters big timber. Continue 2.1 mi. to a small meadow (3,400'). Follow trail through gross mud and around the south side of the meadow, and pick up trail remnants and trail markers on the NW side and proceed through light brush, traversing to a draw. Head up the open draw until a buttress blocks the way. A short not-so-easy scramble puts you up on top of the buttress and on top of Boulder Ridge. (A hand line of questionable vintage has been in place recently — check this before use!) An open ridge leads to Boulder Glacier. Camp on the ridge at about 5,700'. Alternatively, it is possible to camp on a flat area sheltered by the cleaver at about 7,500' allowing for a shorter summit day.

Climbing Route: Ascend glacier 500-1,000' avoiding small crevasses. Turn N to avoid small buttress, then head W straight up glacier. At about 9,500' traverse SSW .25 mi. to skirt buttress. Be careful of rockfall and crevasses. Ascend steep snow slope for last 500' to summit (10,778').

Descent: Descend the climbing route.

Data:	Seattle to TH	2.5h
	TH to Camp	+2 900
	Camp to Summit	+5 200
	Summit to Camp	2.5h
	Camp to TH	4-5h
		5-7h
		3h
		3h

Comments: Although the approach can be arduous this is an exceptional glacier climb for Basic Course students. It is very beautiful, with a great view of Mt. Shuksan, and a more remote than the Coleman or the Easton. There are crevasses to negotiate and a Bergschrund to cross, yet overall route finding is straight forward and the incline is moderate. Submit voluntary permit at the Baker Lake ranger station in Sedro Woolley.

Baker via Coleman GI BG 10 778'

Equipment: Standard glacier equipment including wands.
Jurisdiction: Mt. Baker Wilderness / Mt. Baker-Snoqualmie National Forest
http://www.fs.fed.us/r6/mbs/recreation/mtn_climbing/index.shtml
Ranger Station: SR-524 Glacier (360) 599-2714
Maps: USGS: Mt Baker
 Green Trails: Mt Baker
References: Cascade Alpine Guide vol. III, 3rd edit (2008), p. 31.
 Summit Routes (2004) pp 241-242
 100 Hikes in the North Cascades, Heliotrope Ridge.

Approach: Take I-5 N to Bellingham, then just N of Bellingham, drive E on SR 542 (Sunset Highway) to 1 mi. E of Glacier. Turn right (S) on Glacier Creek Road and continue 9 mi. to head of Mt. Baker Trail (3,700'). Hike up Heliotrope Ridge trail to the site of the old cabin and follow climbers' trail beyond (trail is covered with snow early in season) and up steep ridge to moraine at the edge of the glacier. Base camp may be made here at about 6,000'. You can also continue, proceeding S and ascending to about 7,000' where base camp can be made along the ridge or at the base of the Black Buttes.

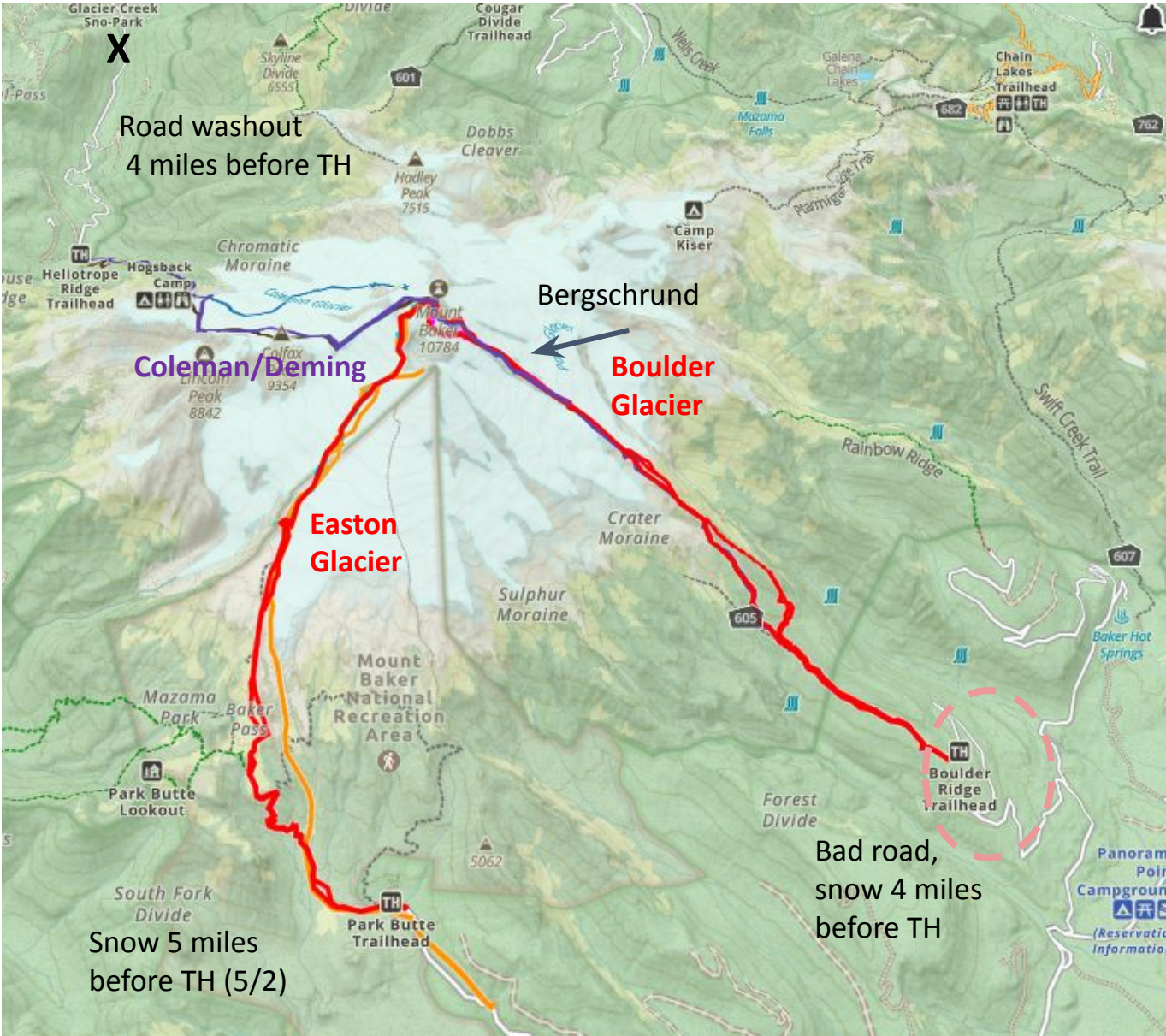
Climbing Route: Ascend from the base camp at 6,000', proceed S and climb gradually SE toward the Black Buttes. Skirt along the Black Buttes, keeping far enough away to avoid avalanches or rockfall, then go easterly to the saddle between the base of the Roman Wall (on the main mountain) and the Black Buttes (about 9,200' at the saddle). From the saddle, ascend the rocky ridge NE keeping right of the Roman Wall. Ascend steep snow past the Roman Wall to the large summit plateau. The summit is at the far ENE side.

Descent: Descend the climbing route.

Data:	Seattle to TH	2.5h
	TH to Camp	+2 300'
	Camp to Summit	+4 800'
	Summit to Camp	2-3h
	Camp to TH	2-3h

Comments: There are many crevasses on this climb. In good weather views from camp on ridge near Buttes and from summit are spectacular.

Mt. Baker - Basic Routes

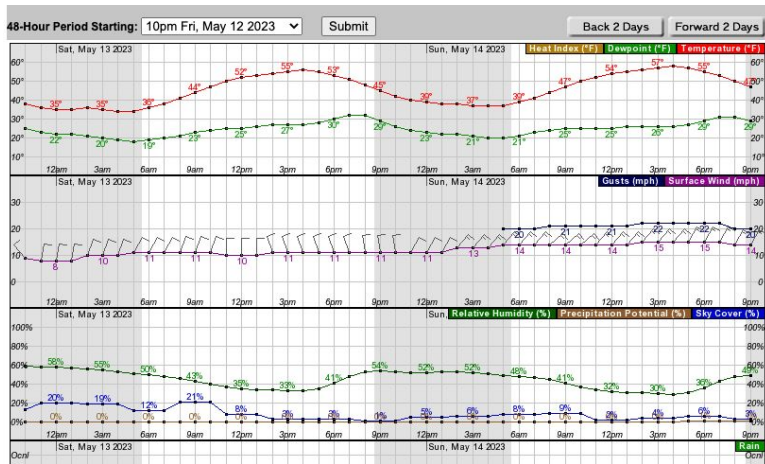


Weather - Mt Baker



High: 48 °F Low: 34 °F High: 56 °F Low: 37 °F High: 58 °F

- Friday** Sunny, with a high near 48. South wind around 9 mph becoming north in the morning.
- Friday Night** Mostly clear, with a low around 34.
- Saturday** Sunny, with a high near 56.
- Saturday Night** Clear, with a low around 37.
- Sunday** Sunny, with a high near 58.
- Sunday Night** Mostly clear, with a low around 38.
- Monday** Mostly sunny, with a high near 58.



°C	Wed 10	Thu 11	Friday 12	Saturday 13	Sunday 14	Monday 15	Tue 16	
°F	PM night	AM PM night	AM PM night	AM PM night	AM PM night	AM PM night	AM PM night	
	snow shwrs clouds	some clouds	clear	clear	clear	clear	clear	
Wind mph	5 5	10 10	10 10	5 5	5 5	15 15	25 25	
Max °F	21 23	23 23	28 30	32 36	37 39	41 45	43 43	
Min °F	19 21	21 21	25 30	30 30	34 37	41 43	39 39	
Feet	12 12	10 12	16 18	21 28	30 30	28 28	27 21	
Freezing Level ft	8203 8038	8203 8695	9023 10335	10663 11648	12468 12796	13124 13944	13780 12796	
Sea lvl	-	-	5:31	-	5:30	-	5:28	-
Sunrise	8:35	-	8:36	-	8:37	-	8:38	-

	Thursday 11	Friday 12	Saturday 13	Sunday 14
GFS 22km	8w 11w 2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w
ECMWF 9km	8w 11w 2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w
ICON 13km	8w 11w 2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w
METEORBLUE	8w 11w 2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w	2w 5w 8w 11w 2w 5w 8w 11w

Resources:

- NOAA: <https://forecast.weather.gov/>
- <https://www.mountain-forecast.com/>
- <https://www.windy.com/>

Current route conditions



Sketchy snow bridge,
turned around

Colfax Peak,
attempt

Current route conditions



Busy weekend.
Safety in numbers?

Mt. Baker
Roman Wall
Coleman

... another weekend, different route on the same mountain



Mt. Baker
Boulder
Glacier

Mt. Hood - any weekend?



Mt. Hood,
PNW Mountaineers FB group
https://youtu.be/AW_HYlqqIX0

Current route conditions

- Road access?
- Is the route 'in'?
- Day of the week?
- Any current dangers?
- River crossings?
- Rock fall?
- Best time to start?
- Forest fires?

Resources:

- Mountaineers webpage: trip reports,
- Facebook, climbers like to post!
- <http://www.peakbagger.com>
many recent posts, GPS tracks



Mt Ruth, early vs late season 2021

Gear

- Technical personal gear dependent on climb, see gear matrix
- Technical group gear organized by trip leader
- Personal gear very dependent on conditions, length and difficulty of approach, personal comfort tolerance

	Rock Climbs	Glacier Climbs		Rock Climbs	Glacier Climbs
Required Equipment (X), Optional Equipment (O)					
1" or 9/16" tubular nylon webbing (or sewn runners) as follows:			Gloves (wool/synthetic)	X	X
Three 5 ft runners (or 60cm/24in sewn runners), color A	X	X	Second pair gloves/mittens ⁽¹⁾		O
Two 9 ft runners (or 120cm/48in sewn runners), color B	X	X	Mitten shells (overmitts)	O	X
One 120 cm nylon (not Dyneema) sewn runner	X	X	Day pack (frameless or rucksack) ⁽⁴⁾	X	O
Chest harness: one 8 ft webbing, color C			Overnight pack (internal or external) ⁽⁴⁾	Note 5	X
5mm or 6mm perlon in 3 lengths:	X	X	Compass ⁽¹⁾	X	X
Foot Prusik (length per above chart), color D	X	X	Map of climbing destination ⁽¹⁾	X	X
Harness Prusik (length per above chart), color E	X	X	Sunglasses/eye protection ⁽¹⁾	X	
2 Tie-off "hero" loops, 4 ft, color F	X	X	Glacier glasses w/side shields ⁽¹⁾		X
Commercial seat harness	X	X	Sunscreen ⁽¹⁾	X	X
Leather belay gloves	X	X	Lip balm w/sun protection ⁽¹⁾	X	X
Climbing helmet	X	X	Insulating sit-pad	O	O
Six non locking carabiners. No tiny ones like Nano/ Mini but wire gate OK	X	X	Headlamp ⁽¹⁾	X	X
Three additional locking carabiners - may be smaller than the pearbiner	X	X	Extra batteries (and bulb if not LED) ⁽¹⁾	X	X
Munter hitch carabiner (pearbiner) ⁽¹⁾	X	X	First aid kit ⁽¹⁾	X	X
Rescue pulley (lightweight, for alpine)		X	Waterproof matches or lighter ⁽¹⁾	X	X
Ice Axe		X	Fire starter ⁽¹⁾	X	X
Front-point crampons		X	Knife ⁽¹⁾	X	X
Chock pick	X		Food	X	X
Belay device	X	X	Extra food ⁽¹⁾	X	X
Insulating hat (wool or synthetic)	X	X	Water bladder/bottle (wide mouth) ⁽¹⁾	X	X
Sun hat or bandanna	X	X	Second water container ⁽¹⁾	X	X
Underwear (wool or synthetic)	X	X	Water filter or purification method (one per 2-3 climbers) ⁽¹⁾	Note 6	X
Thermal base layer--pants and LS shirt (wool or synthetic)	X	X	Emergency shelter ⁽¹⁾	X	X
Shirt/Sweater, SL and LS (wool/synth)	X	X	Paper and pencil (or waterproof pen)	X	X
Thermal insulating top	X	X	Toilet kit	X	X
Wind shell jacket ⁽²⁾	O	O	Sleeping bag	Note 5	X
Rain shell jacket, breathable ⁽¹⁾	X	X	Insulating pad	Note 5	X
Pants (wool/synthetic)	X	X	Tent (can be shared) or bivy sack	Note 5	X
Second pair pants (wool/synthetic)	O	O	Stove and fuel (one per two climbers)	Note 5	X
Rain pants, breathable ⁽¹⁾	X	X	Pot (one per stove)	Note 5	X
Gaiters (full length)		X	Bowl and/or cup	Note 5	X
Boot socks (wool/synthetic) 2 pair	X	X	Spoon	Note 5	X
Liner socks ⁽¹⁾ 2 pair	O	O	Ear plugs/ eye cover	Note 5	O
Mountaineering boots	X	X			

	A	B	C	D	E	F	G	H	I
1 Dragontail			Confirmed In	Rope	Pickets	Shovel	Stove + Fuel	Water Filter	Navigation
2 Group gear				1x 40m	4	1	1 per tent	2	Need
3 Rope leads									
4 Mike			yes		2				SPB
5 Jan			yes	1	2				SPB, InReason
6									
7									
8 Climbers				Does not apply	Does not apply				
9 A			yes	Does not apply	Does not apply	1			SPOT
10 B			yes	Does not apply	Does not apply	1			
11 C			yes	Does not apply	Does not apply				GPS
12 D			yes	Does not apply	Does not apply				
13						*	*	*	
14 Camping									
15 Tent #		Tent Owner		Camper	3rd person?	Notes:			
16	1	Jan		Mike	--	We will have running water. 1 cartridge per tent is ok			
17	2	A		B					
18	3	C		D					
19	4								
20	5								
21	6								

Resources:

- Basic climbing handbook
- Discuss with SIG

JA's climb google sheet.

Every leader handles this differently

Crampons – make them fit!



- Snug fit
- semi-automatic crampon, requires ledge at heel
- Horizontal front points ok
- Steel vs. aluminum – both work for Basic climbs, check with leader if in doubt

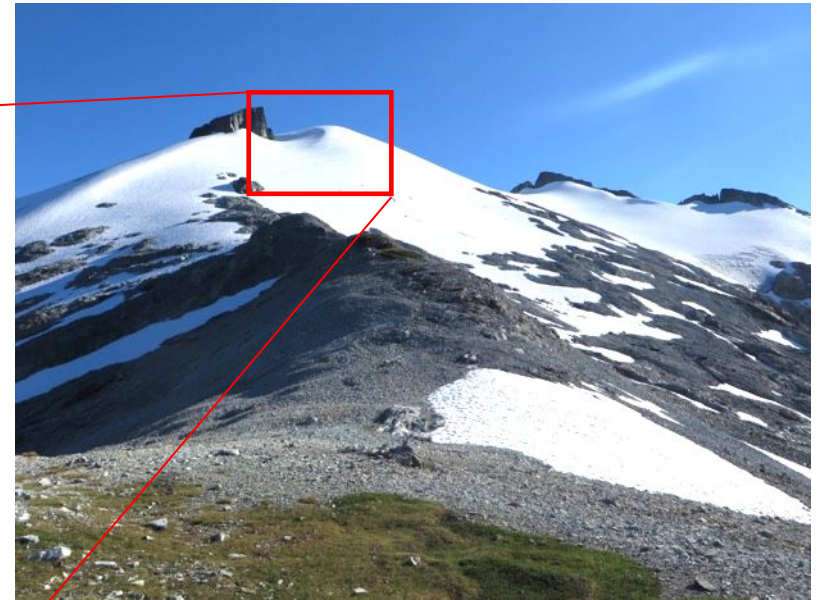


- Very loose fit
- No heel ledge
- Hiking boots are too flexible

**Check your crampon fit,
esp. if you change boots!**

Packing thoughts

- Any gear you need right now will be at the bottom of your pack ;-)
- Travel as light as you wish, don't rely on other people's gear.
- Think if you can double purpose gear.
- Technical gear needed on approach?



Mt. Ruth/Icy Peak

Camp

- Glacier trips often 2+ days
- Safety – rock fall, avalanche
- Shelter – wind exposure
- Convenience:
location on route,
running water
- Gear up for alpine start,
enjoy the view



Mt. Baker / Easton



Ruth Mt

Route decisions – sometimes straightforward

Don't blindly follow a route though!



Route decisions – example Ruth/Icy



Route decisions – example Ruth/Icy

Climbing Route:

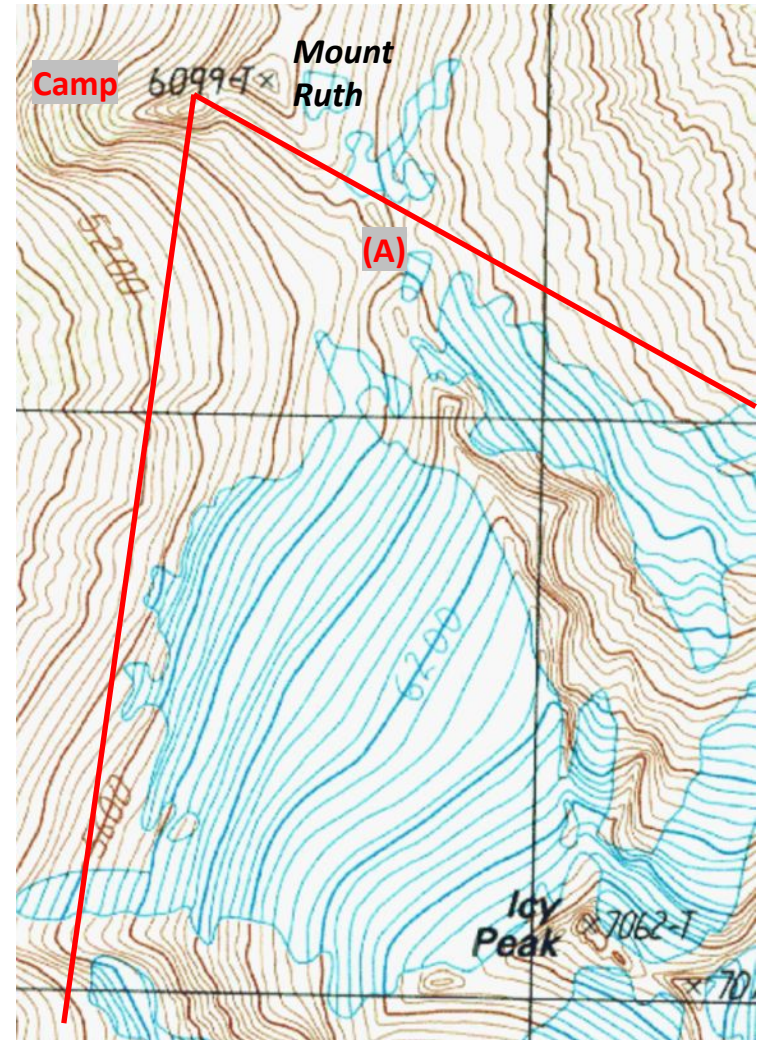
Rope up and traverse glacier S to first notch right (NW) of Ruth summit. Camp on other side of notch on snow if possible, to minimize impact (6,600'): A shovel may be of some use.

Traverse W-facing snow slope to S facing ridge leading down to the Ruth-Icy saddle. Rather than going down the normal steep gully of loose scree and rock leading directly to the saddle area, stay left of the gully and descend a leftwards slanting slope to saddle area (5,800'). **(A)**

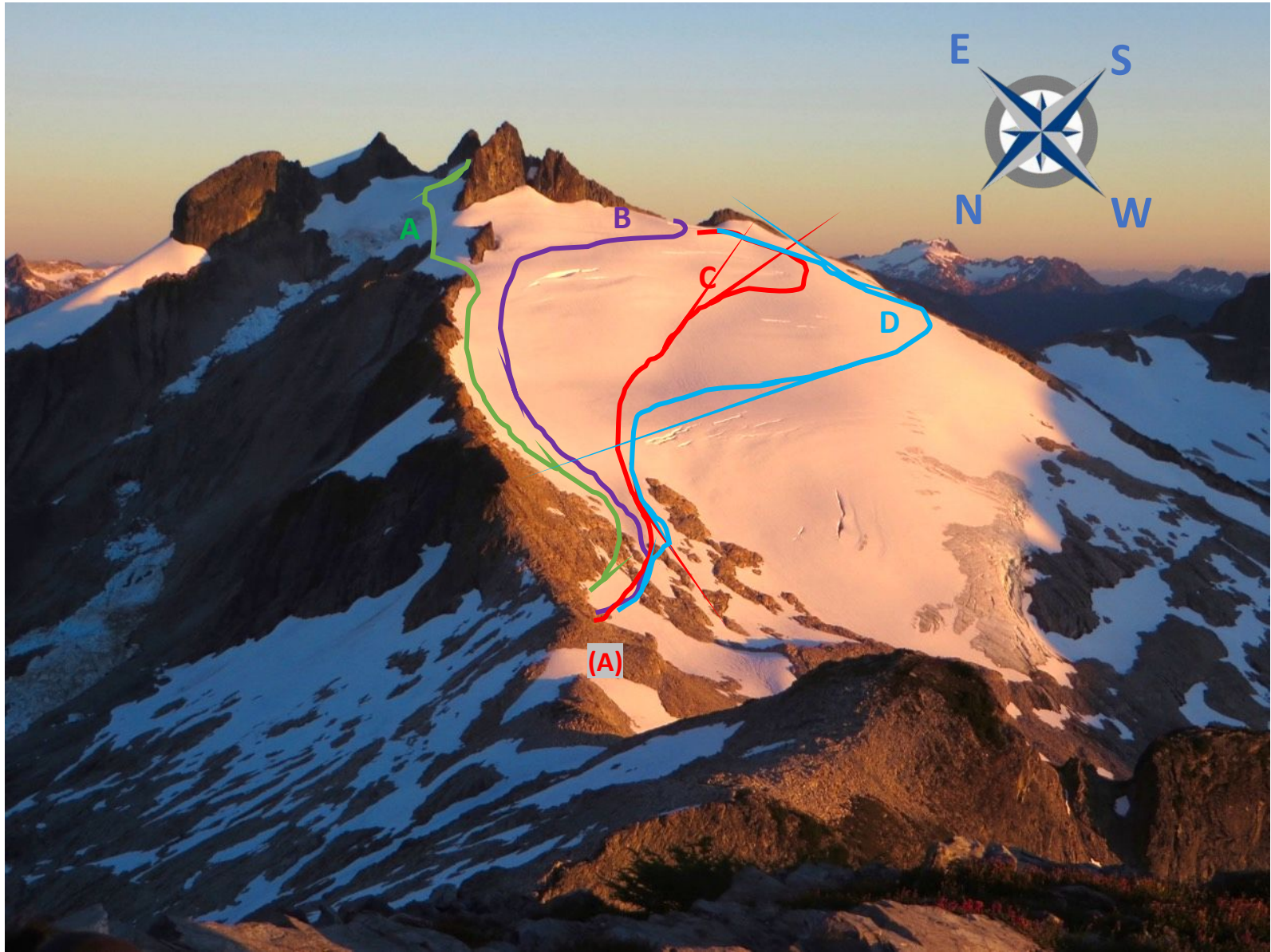
Climb gradual glacier on Icy's NW slope in general SE direction, keeping rock ridge on left and crevasses on right. At about 6,500', head S and traverse top part of glacier at the W face of Icy.

Skirt Icy's W notch and turn up the S side of Icy through talus and snow. Find first prominent gulley and climb to top where rap slings are around a horn. (Fixed line recommended).

Summit is a couple steps above and left. Watch for loose rock and wear helmets!



Route decisions – example Ruth/Icy



Route decisions – example Ruth/Icy

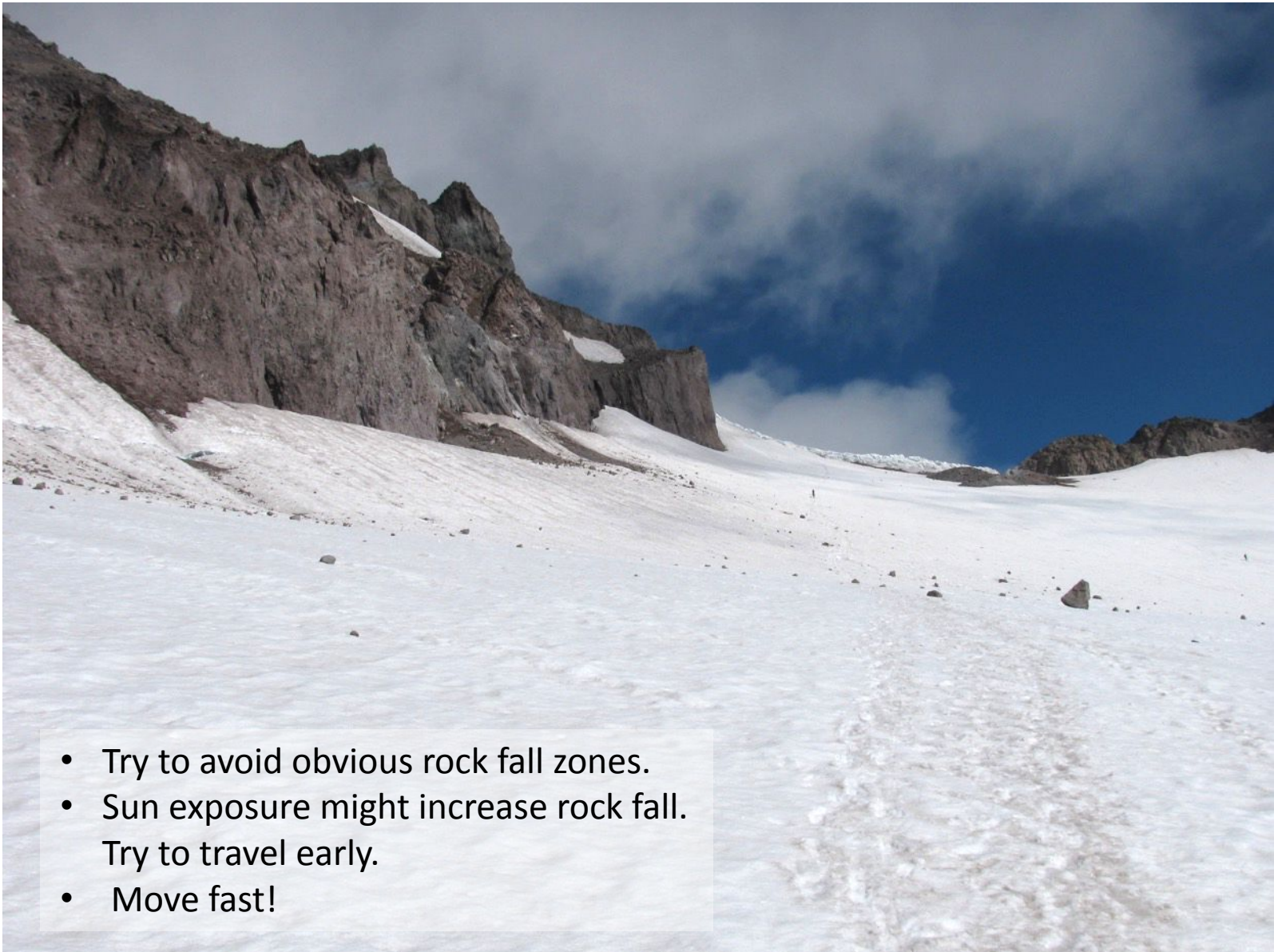


Route decisions – example Ruth/Icy



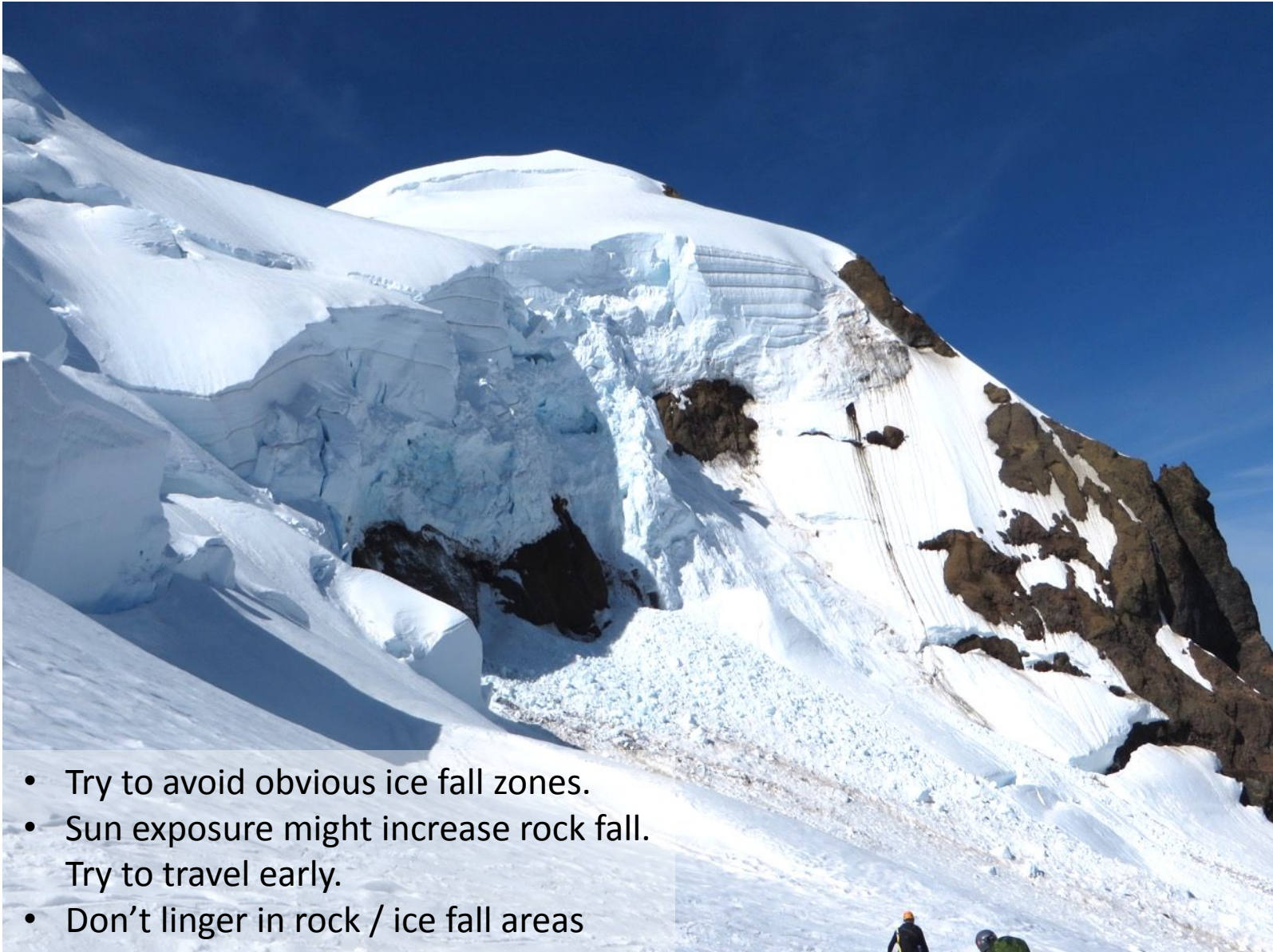
Ruth Mt.
Icy peak

Route decisions – rock / ice fall



- Try to avoid obvious rock fall zones.
- Sun exposure might increase rock fall.
Try to travel early.
- Move fast!

Route decisions – rock / ice fall



- Try to avoid obvious ice fall zones.
- Sun exposure might increase rock fall.
Try to travel early.
- Don't linger in rock / ice fall areas

Route decisions – rock / ice fall

Similar place
July 2019

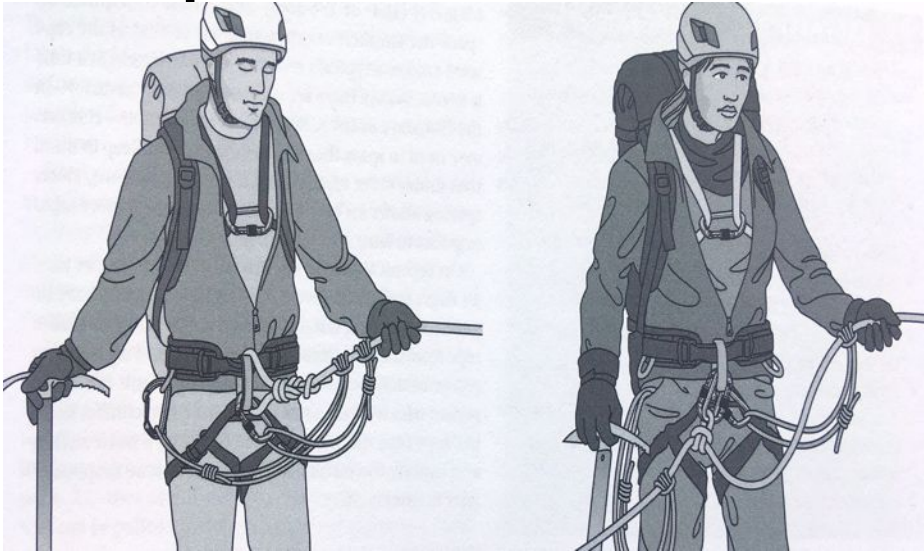


Route decisions – rock / ice fall

This could
have been
very bad!

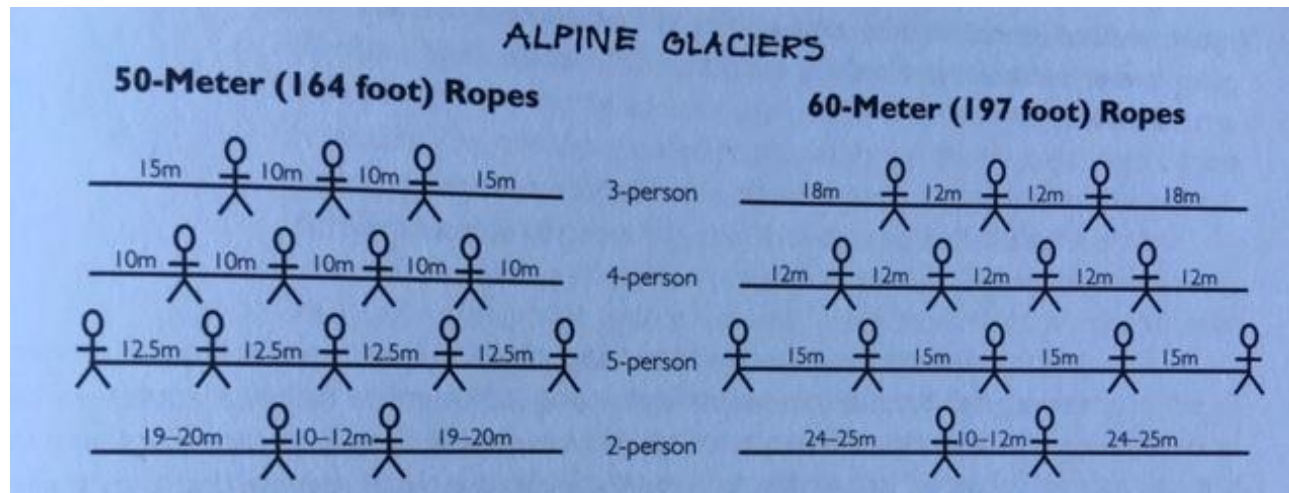


Rope teams – tie in



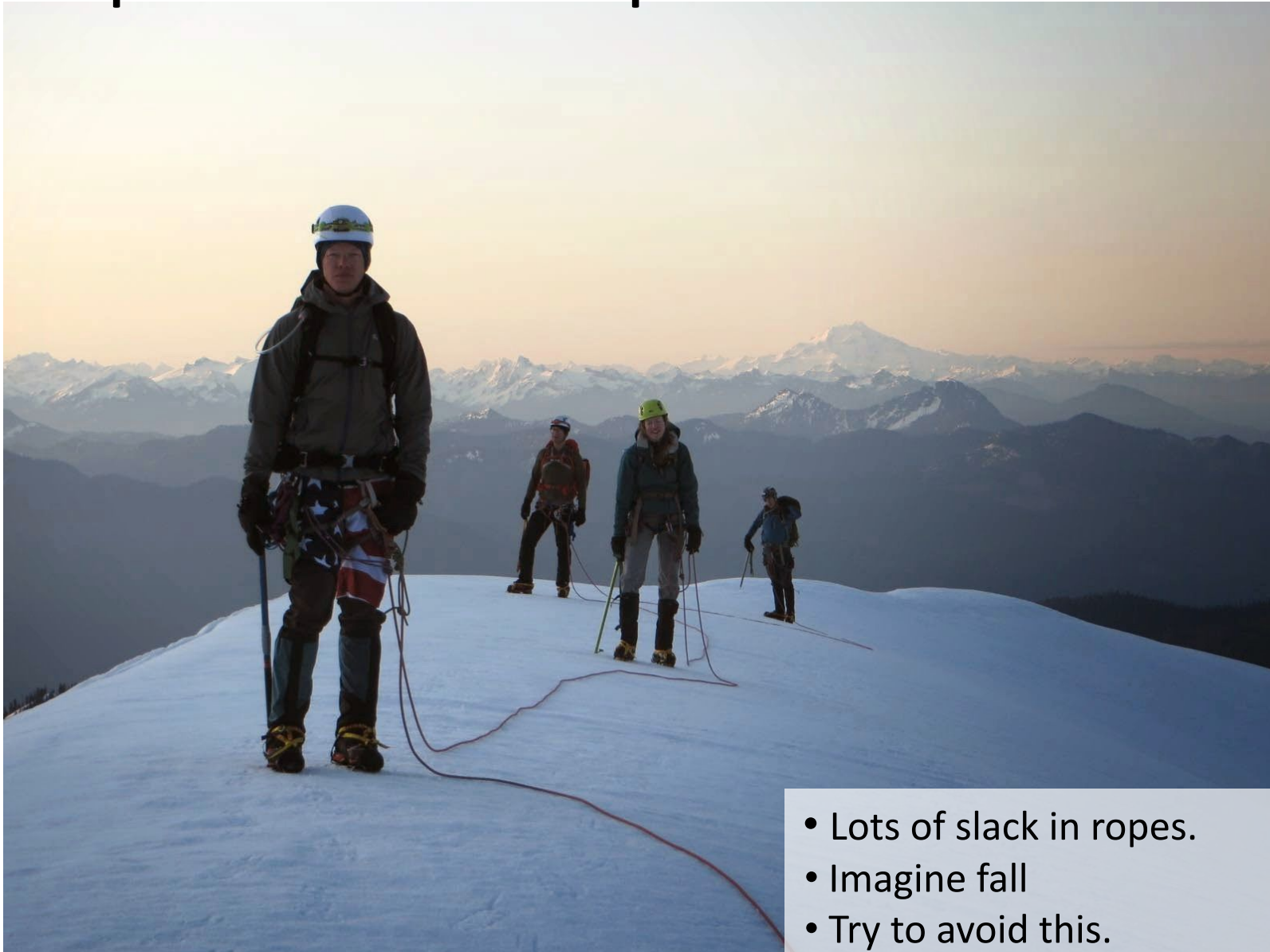
- Tie in with figure 8 or butterfly.
- Backup carabiner for butterfly.
- Consider extra rescue rope for climbers at the end.
- Prusik slings.
- Partner check!

FoTH 9



Andy Selters,
Glacier travel and
crevasse rescue

Rope teams – keep the slack out!



- Lots of slack in ropes.
- Imagine fall
- Try to avoid this.

Rope teams – keep the slack out!



- Same FT
- Better rope management

Rope teams – running belay

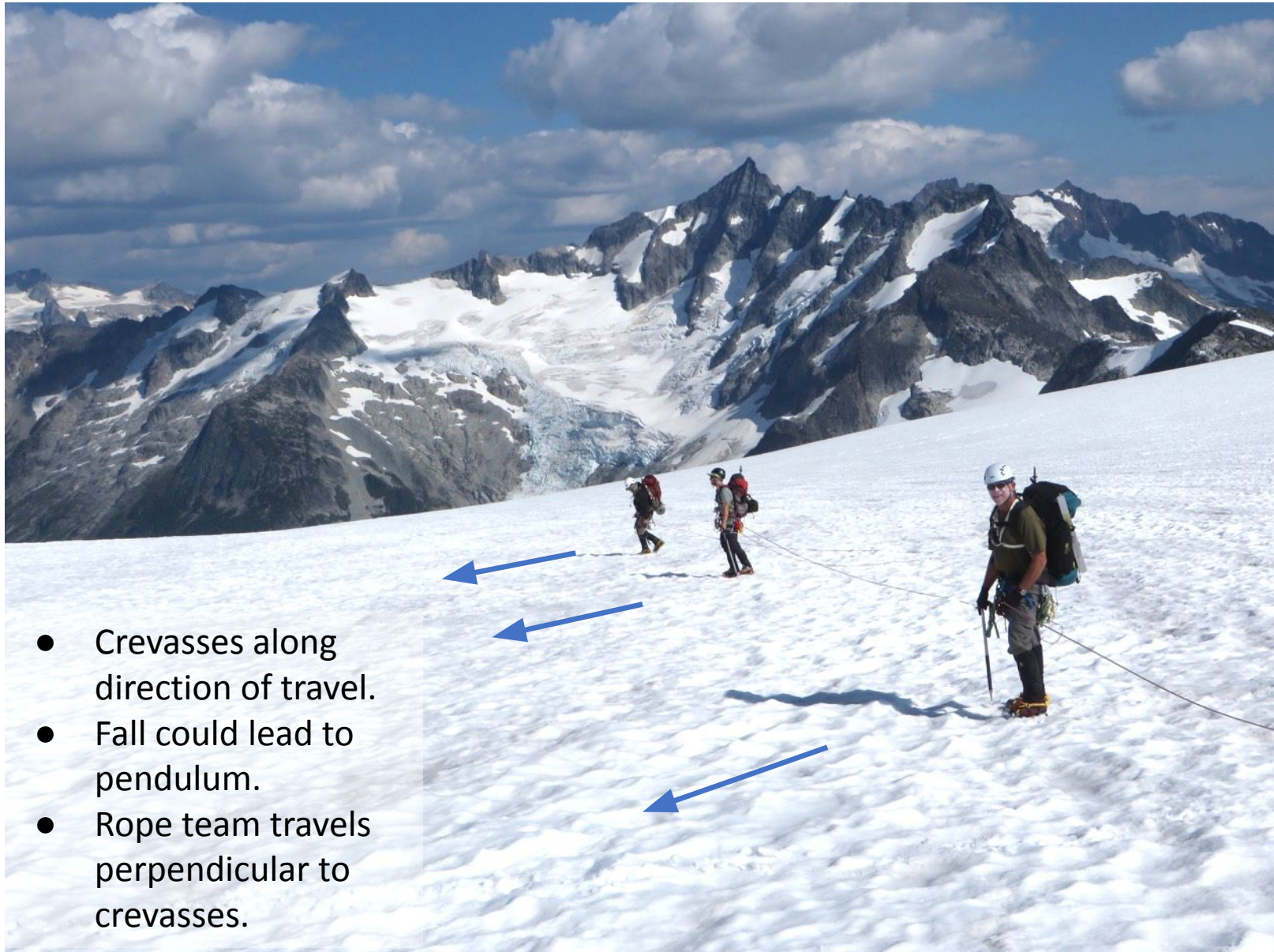


Exposed travel,
steep snow/ice,
traverses.

Arrest not likely,
Picket, ice screw,
rock protection,

Decided against
protection:
solid snow,
solid climbers.

Rope teams – Echelon



- Crevasses along direction of travel.
- Fall could lead to pendulum.
- Rope team travels perpendicular to crevasses.

Crevasses!



Snowfield peak

Crevasses!



Stay clear of huge ones!

Crevasses!



Step over little ones.
Narrower on climbers left.

Crevasses!



Ladders on Rainier

Crevasses!



End run a very large one.

Crevasses!

Tricky one!
Try to keep slack out of rope!



Holding a fall – worst best case!



<https://www.youtube.com/watch?v=TkMDUGqiB4A>

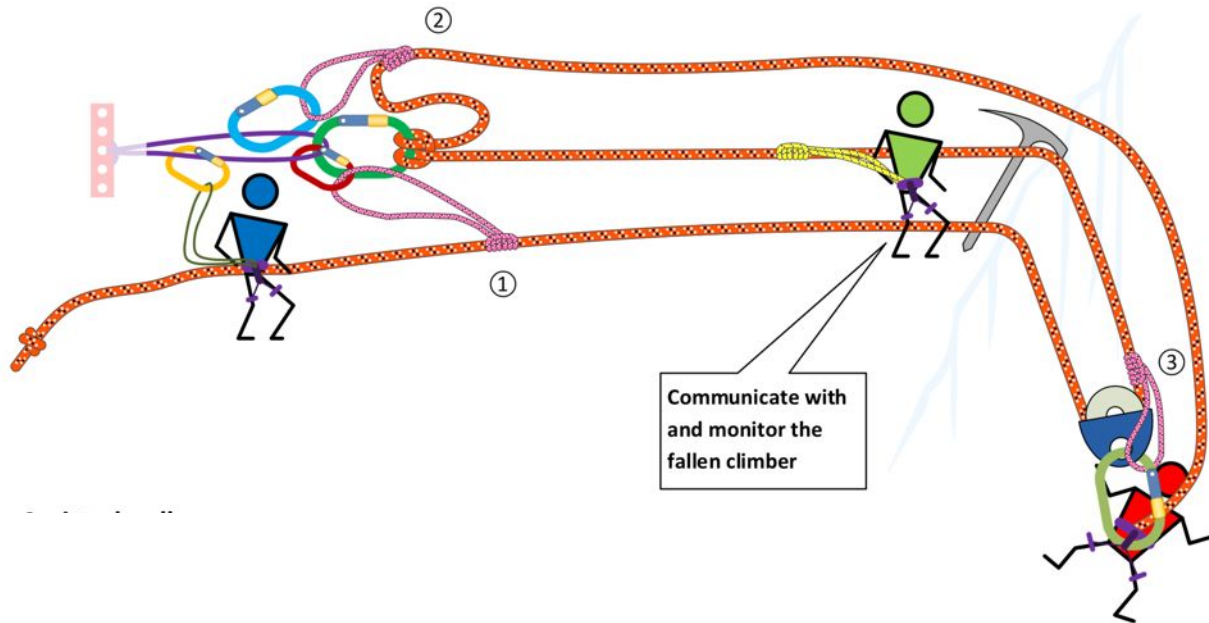
Crevasse rescue - outline

- Rope up for glacier travel
- Hold the fall
- Anchor the rope, including backup.
Communicate with fallen climber.
- Safely approach crevasse, communicate.
- Make a plan how to extract fallen climber.
Emergency help needed?
- Extract fallen climber – Texas prusik, team pull,
set up raising system, consider rope entrenchment.

Crevasse rescue illustrated

Check out Deling Ren's

An Illustration to Crevasse Rescue ([link](#))



Crevasse rescue evaluation

Evening FT at Kite Hill
in Magnuson Park

*unless otherwise communicated
dog poop on Kite Hill

May 23rd and 25th
each 6:30pm-9:30pm

Teams of 3,
go through CR scenario,
once in each position.

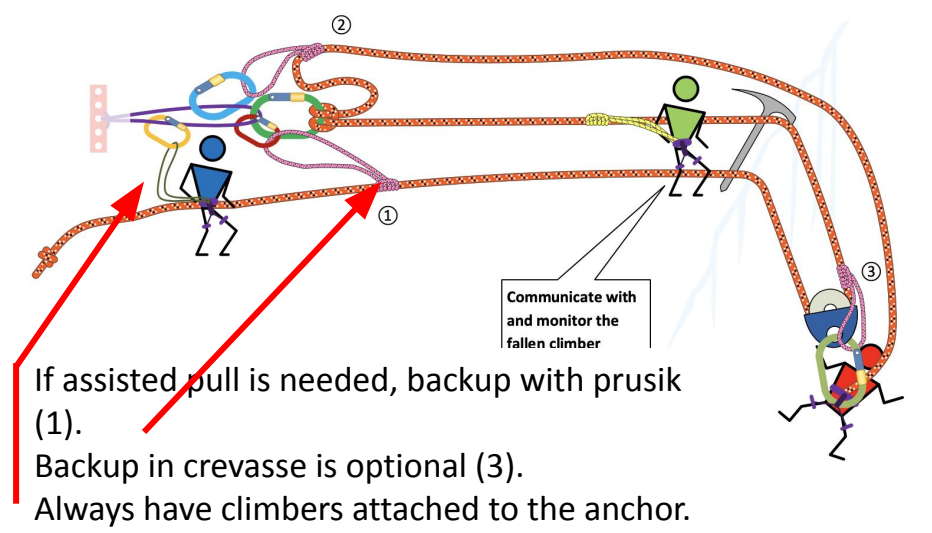
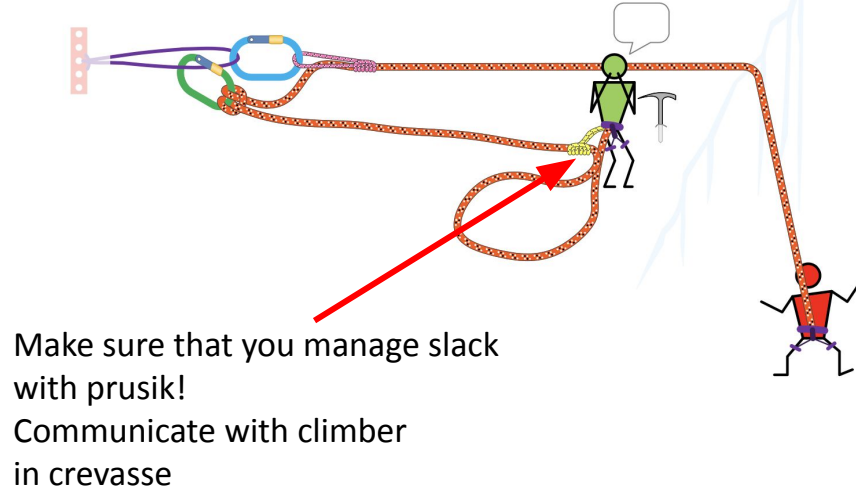
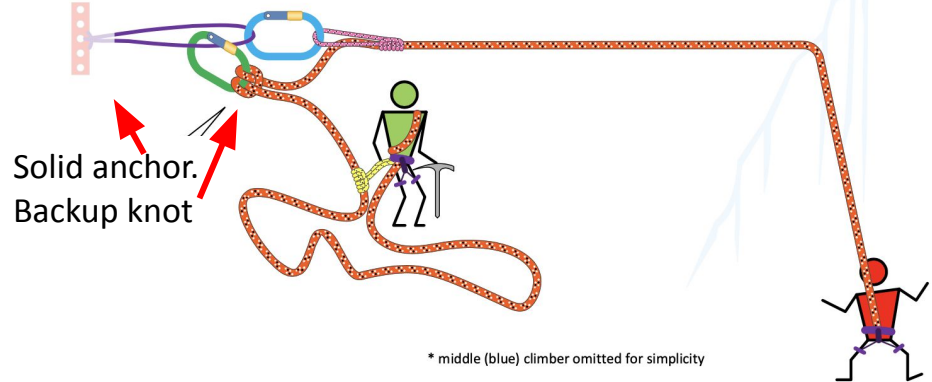
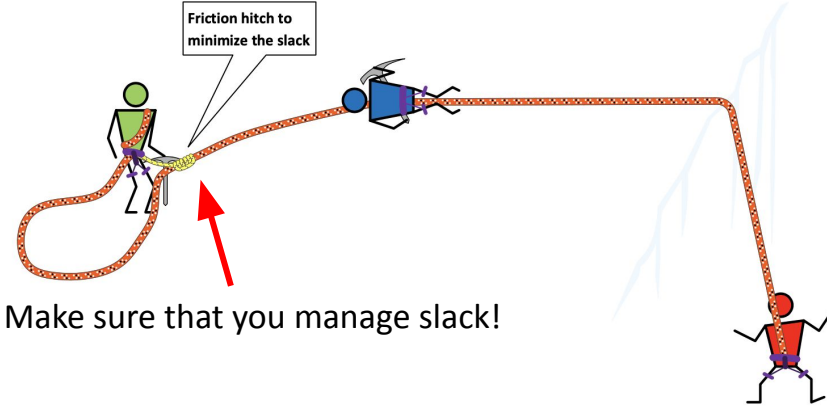
Needs-to-redo criteria:

- Poor rope tie-in, and travel with too much slack.
- No or little communication between climbers.
- Climber C approaches climber B or the crevasse with significant slack in the rope or prusik.
- The initial rope attachment via a prusik is not backed up with a knot.
- Transfer of load without testing the anchor which will take the load.
- No progress capture of the hauling system.
- Climbers B and C always need to be tied into the anchor or have to tend the slack of their rope with a prusik

See updated [2023 curriculum](#)



Crevasse rescue eval. - key points



Crevasse rescue videos

AMGA (American Mountain Guides Association) has published a set of excellent videos on Glacier techniques and Crevasse rescue.

Some of the details are different - don't get confused by this!

- Snow anchors:
<https://vimeo.com/264670274>
- Roping up:
<https://vimeo.com/264670737>
- Anchor set up and transferring the load to an anchor:
<https://vimeo.com/265007409>
- Backing up a picket anchor:
<https://vimeo.com/265009761>
- Approaching and preparing the lip of the crevasse:
<https://vimeo.com/265008195>
- Rappelling down to the fallen climber:
<https://vimeo.com/265010472>
Note that the different rope ascending technique.
- Hauling via C-loop and variations:
<https://vimeo.com/265012079>
Note: Instead of a micro traxion we can use a pulley with a Prusik

Be safe and
enjoy your glacier trips!

