

Supplementary Materials: Self-Rated Health, Life Balance and Feeling of Empowerment When Facing Impacts of Permafrost Thaw– a Case Study from Northern Canada

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Table S1. Variables of interest (self-rated) and perceived environmental factors.

	Well-being			
	OK, good		very good	
	n	(%)	n	(%)
How often do you use your natural environment for:				
hunting (n = 53)				
never, rarely	13	(34)	1	(7)
sometimes, very often	25	(66)	14	(93)
fishing activities (n = 51)				
never, rarely	12	(32)	3	(21)
sometimes, very often	25	(68)	11	(79)
picking mushrooms, berries (n = 53)				
never, rarely	7	(18)	2	(13)
sometimes, very often	31	(82)	13	(87)
recreational activities (n = 53)				
never, rarely	18	(47)	5	(33)
sometimes, very often	20	(53)	10	(67)
economic activities (n = 53)				
never, rarely	36	(95)	12	(80)
sometimes, very often	2	(5)	3	(20)
scientific activities (n = 53)				
never, rarely	27	(71)	10	(67)
sometimes, very often	11	(29)	3	(33)
Quality of life				
	OK, good		very good	
	n	(%)	n	(%)
How often do you use your natural environment for:				
hunting (n = 52)				
never, rarely	11	(31)	3	(18)
sometimes, very often	24	(69)	14	(82)
fishing (n = 50)				
never, rarely	11	(31)	4	(27)
sometimes, very often	24	(69)	11	(73)
picking mushrooms, berries (n = 52)				
never, rarely	5	(14)	4	(23)
sometimes, very often	30	(86)	13	(77)
recreational activities (n = 52)				
never, rarely	17	(49)	5	(29)
sometimes, very often	18	(51)	12	(71)
economic activities (n = 52)				
never, rarely	33	(94)	14	(82)
sometimes, very often	2	(6)	3	(18)
scientific activities (n = 52)				
never, rarely	25	(71)	11	(65)
sometimes, very often	10	(29)	6	(35)
Satisfaction with life				
	OK, good		very good	
	n	(%)	n	(%)
How often do you use your natural environment for:				
hunting (n = 52)				
never, rarely	10	(31)	4	(20)
sometimes, very often	22	(69)	16	(80)
fishing (n = 50)				
never, rarely	9	(28)	6	(33)

sometimes, very often	23	(72)	12	(67)		
picking mushrooms, berries (n = 52)						
never, rarely	5	(16)	4	(20)		
sometimes, very often	27	(84)	16	(80)		
recreational activities (n = 52)						
never, rarely	15	(50)	6	(30)		
sometimes, very often	16	(50)	14	(70)		
economic activities (n = 52)						
never, rarely	31	(97)	16	(80)		
sometimes, very often	1	(3)	4	(20)		
scientific activities (n = 52)						
never, rarely	24	(75)	12	(60)		
sometimes, very often	8	(25)	8	(40)		
Life balance						
	not very strong		very strong			
	n	(%)	n	(%)		
How often do you use your natural environment for:						
hunting (n = 52)						
never, rarely	9	(30)	5	(23)		
sometimes, very often	21	(70)	17	(77)		
fishing (n = 50)						
never, rarely	10	(33)	5	(25)		
sometimes, very often	20	(67)	15	(75)		
picking berries, mushrooms (n = 52)						
never, rarely	4	(13)	5	(23)		
sometimes, very often	26	(87)	17	(77)		
recreational activities (n = 52)						
never, rarely	16	(53)	6	(27)		
sometimes, very often	14	(47)	16	(73)		
economic activities (n = 52)						
never, rarely	29	(97)	18	(82)		
sometimes, very often	1	(3)	4	(18)		
scientific activities (n = 52)						
never, rarely	22	(73)	14	(64)		
sometimes, very often	8	(27)	6	(36)		
Feeling of empowerment						
	no, somewhat		yes			
	n	(%)	n	(%)		
How often do you use your natural environment for:						
hunting (n = 53)						
never, rarely	11	(35)	3	(14)		
sometimes, very often	20	(65)	19	(86)		
fishing (n = 51)						
never, rarely	12	(39)	3	(15)		
sometimes, very often	19	(61)	17	(85)		
picking berries, mushrooms (n = 53)						
never, rarely	5	(16)	4	(18)		
sometimes, very often	26	(84)	18	(82)		
recreational activities (n = 53)						
never, rarely	15	(48)	8	(36)		
sometimes, very often	16	(52)	14	(64)		
economic activities (n = 53)						
never, rarely	28	(90)	20	(91)		
sometimes, very often	3	(10)	2	(9)		
scientific activities (n = 53)						
never, rarely	19	(61)	18	(82)		
sometimes, very often	12	(39)	4	(18)		
Self-rated health						
	low		medium		high	
	n	(%)	n	(%)	n	(%)
How often do you use your natural environment for:						
hunting (n = 53)						
never, rarely	2	(100)	11	(27)	1	(10)
sometimes, very often	0	(0)	30	(73)	9	(90)
fishing (n = 51)						
never, rarely	2	(100)	10	(26)	3	(30)

sometimes, very often	0	(0)	29	(74)	7	(70)
picking berries, mushrooms (n = 53)						
never, rarely	2	(100)	6	(15)	1	(10)
sometimes, very often	0	(0)	35	(85)	9	(90)
recreational activities (n = 53)						
never, rarely	2	(100)	18	(44)	3	(30)
sometimes, very often	0	(0)	23	(56)	7	(70)
economic activities (n = 53)						
never, rarely	2	(100)	37	(90)	9	(90)
sometimes, very often	0	(0)	4	(10)	1	(10)
scientific activities (n = 53)						
never, rarely	2	(100)	26	(63)	9	(90)
sometimes, very often	0	(0)	15	(37)	1	(10)

Table S2. Variables of interest (self-rated) and perceived environmental challenges.

	Well-being			
	OK, good		very good	
	n	(%)	n	(%)
How important is thawing of the frozen ground in explaining each of the following:				
Challenges associated with hunting, harvesting (n = 53)				
not important, a little important	1	(2.5)	2	(13)
important, very important	36	(95)	13	(87)
I don't know	1	(2.5)	0	(0)
Challenges associated with economic activities (n = 53)				
not important, a little important	11	(29)	7	(47)
important, very important	22	(58)	7	(47)
I don't know	5	(13)	1	(6)
Challenges associated with the physical environment (n = 53)				
not important, a little important	5	(13)	0	(0)
important, very important	31	(82)	12	(80)
I don't know	2	(5)	3	(20)
Challenges associated with human health (n = 53)				
not important, a little important	3	(8)	1	(7)
important, very important	32	(84)	11	(73)
I don't know	3	(8)	3	(20)
Challenges associated with culture (n = 53)				
not important, a little important	3	(8)	1	(7)
important, very important	35	(92)	14	(93)
Challenges associated with housing, buildings, roads (n = 53)				
not important, a little important	4	(11)	1	(7)
important, very important	33	(87)	14	(93)
I don't know	1	(2)	0	(0)
Do you think that thawing of the frozen ground causes problems for you? (n = 49)				
no	8	(22)	3	(23)
yes	28	(78)	10	(77)
Have you lost some picking spots because they became flooded or submerged? (n = 46)				
no	29	(85)	8	(67)
yes	5	(15)	4	(33)
	Quality of life			
	OK, good		very good	
	n	(%)	n	(%)
How important is thawing of the frozen ground in explaining each of the following:				
Challenges associated with hunting, harvesting (n = 52)				
not important, a little important	1	(3)	2	(12)
important, very important	33	(94)	15	(88)
I don't know	1	(3)	0	(0)
Challenges associated with economic activities (n = 52)				
not important, a little important	14	(40)	3	(18)
important, very important	15	(43)	14	(82)
I don't know	6	(17)	0	(0)
Challenges associated with the physical environment (n = 52)				

not important, a little important	4	(11,5)	0	(0)
important, very important	27	(77)	16	(94)
I don't know	4	(11,5)	1	(6)
Challenges associated with human health (n = 52)				
not important, a little important	3	(9)	1	(6)
important, very important	28	(80)	14	(82)
I don't know	4	(11)	2	(12)
Challenges associated with culture (n = 52)				
not important, a little important	3	(9)	1	(6)
important, very important	32	(91)	16	(94)
Challenges associated with housing, buildings, roads (n = 52)				
not important, a little important	3	(8)	1	(6)
important, very important	31	(89)	16	(94)
I don't know	1	(3)	0	(0)
Do you think that thawing of the frozen ground causes problems for you? (n = 48)				
no	7	(21)	4	(27)
yes	26	(79)	11	(73)
Have you lost some picking spots because they became flooded or submerged? (n = 46)				
no	27	(84)	10	(71)
yes	5	(16)	4	(29)
Satisfaction with life				
OK, good very good				
n (%) n (%)				
How important is thawing of the frozen ground in explaining each of the following:				
Challenges associated with hunting, harvesting (n = 52)				
not important, a little important	1	(3)	2	(10)
important, very important	31	(97)	17	(85)
I don't know	0	(0)	1	(5)
Challenges associated with economic activities (n = 52)				
not important, a little important	10	(31)	7	(35)
important, very important	16	(50)	13	(65)
I don't know	6	(19)	0	(0)
Challenges associated with the physical environment (n = 52)				
not important, a little important	4	(13)	0	(0)
important, very important	25	(78)	18	(90)
I don't know	3	(9)	2	(10)
Challenges associated with human health (n = 52)				
not important, a little important	3	(9)	1	(5)
important, very important	26	(81)	16	(80)
I don't know	3	(9)	3	(15)
Challenges associated with culture (n = 52)				
not important, a little important	3	(9)	1	(5)
important, very important	29	(91)	19	(95)
Challenges associated with housing, buildings, roads (n = 52)				
not important, a little important	3	(9)	1	(5)
important, very important	28	(88)	19	(95)
I don't know	1	(3)	0	(0)
Do you think that thawing of the frozen ground causes problems for you? (n = 48)				
no	6	(20)	5	(28)
yes	24	(80)	13	(72)
Have you lost some picking spots because they became flooded or submerged? (n = 46)				
no	27	(90)	10	(63)
yes	3	(10)	6	(37)
Life balance				
not very strong very strong				
n (%) n (%)				
How important is thawing of the frozen ground in explaining each of the following:				
Challenges associated with hunting, harvesting (n = 52)				
not important, a little important	1	(3)	2	(9)

important, very important	29	(97)	19	(86)
I don't know	0	(0)	1	(5)
Challenges associated with economic activities (n = 52)				
not important, a little important	10	(33)	7	(32)
important, very important	15	(50)	14	(64)
I don't know	5	(17)	1	(5)
Challenges associated with the physical environment (n = 52)				
not important, a little important	4	(13)	0	(0)
important, very important	24	(80)	19	(86)
I don't know	2	(7)	3	(14)
Challenges associated with human health (n = 52)				
not important, a little important	3	(10)	1	(5)
important, very important	25	(83)	17	(77)
I don't know	2	(7)	4	(18)
Challenges associated with culture (n = 52)				
not important, a little important	3	(10)	1	(4)
important, very important	27	(90)	21	(96)
Challenges associated with housing, buildings, roads (n = 52)				
not important, a little important	3	(10)	1	(4)
important, very important	26	(87)	21	(96)
I don't know	1	(3)	0	(0)
Do you think that thawing of the frozen ground causes problems for you? (n = 48)				
no	4	(14)	7	(35)
yes	24	(86)	13	(65)
Have you lost some picking spots because they became flooded or submerged? (n = 46)				
no	25	(93)	12	(63)
yes	2	(7)	7	(37)
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Feeling of empowerment				
no, somewhat		yes		
n	(%)	n	(%)	
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How important is thawing of the frozen ground in explaining each of the following:				
Challenges associated with hunting, harvesting (n = 53)				
not important, a little important	2	(7)	1	(4)
important, very important	28	(90)	21	(96)
I don't know	1	(3)	0	(0)
Challenges associated with economic activities (n = 53)				
not important, a little important	10	(32)	8	(36)
important, very important	17	(55)	12	(55)
I don't know	4	(13)	2	(9)
Challenges associated with the physical environment (n = 53)				
not important, a little important	2	(6)	3	(14)
important, very important	25	(81)	18	(82)
I don't know	4	(13)	1	(4)
Challenges associated with human health (n = 53)				
not important, a little important	1	(3)	3	(13,5)
important, very important	27	(87)	16	(73)
I don't know	3	(10)	3	(13,5)
Challenges associated with culture (n = 53)				
not important, a little important	1	(3)	3	(14)
important, very important	30	(97)	19	(86)
Challenges associated with housing, buildings, roads (n = 53)				
not important, a little important	2	(7)	3	(14)
important, very important	28	(90)	19	(86)
I don't know	1	(3)	0	(0)
Do you think that thawing of the frozen ground causes problems for you? (n = 49)				
no	7	(25)	4	(19)
yes	21	(75)	17	(81)
Have you lost some picking spots because they became flooded or submerged? (n = 46)				
no	21	(78)	16	(84)
yes	6	(22)	3	(16)
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Self-rated health				

	low		medium		high	
	n	(%)	n	(%)	n	(%)
How important is thawing of the frozen ground in explaining each of the following:						
Challenges associated with hunting, harvesting (n = 53)						
not important, a little important	0	(0)	2	(5)	1	(10)
important, very important	2	(100)	38	(93)	9	(90)
I don't know	0	(0)	1	(2)	0	(0)
Challenges associated with economic activities (n = 53)						
not important, a little important	0	(0)	13	(32)	5	(50)
important, very important	2	(100)	23	(56)	4	(40)
I don't know	0	(0)	5	(12)	1	(10)
Challenges associated with the physical environment (n = 53)						
not important, a little important	0	(0)	3	(7,5)	2	(20)
important, very important	2	(100)	35	(85)	6	(60)
I don't know	0	(0)	3	(7,5)	2	(20)
Challenges associated with human health (n = 53)						
not important, a little important	0	(0)	4	(10)	0	(0)
important, very important	2	(100)	32	(78)	9	(90)
I don't know	0	(0)	5	(12)	1	(10)
Challenges associated with culture (n = 53)						
not important, a little important	0	(0)	4	(10)	0	(0)
important, very important	2	(100)	37	(90)	10	(100)
Challenges associated with housing, buildings, roads (n = 53)						
not important, a little important	0	(0)	4	(10)	1	(10)
important, very important	2	(100)	36	(88)	9	(90)
I don't know	0	(0)	1	(2)	0	(0)
Do you think that thawing of the frozen ground causes problems for you? (n = 49)						
no	1	(50)	7	(19)	3	(30)
yes	1	(50)	30	(81)	7	(70)
Have you lost picking spots because they became flooded/submerged (n = 46)						
no	2	(100)	30	(83)	5	(63)
yes	0	(0)	6	(17)	3	(37)

Table S3. Variables of interest (self-rated) and perceived environmental impacts.

	Well-being			
	OK, good		very good	
	n	(%)	n	(%)
Over the past 10 years, thawing of the frozen ground has led to (n = 51)				
negative changes	33	(89)	13	(93)
positive changes	4	(11)	1	(7)
Thawing of the frozen ground is having an impact on the ability to obtain food / other resources for daily use from the land (n = 52)				
no	6	(16)	1	(7)
yes	16	(42)	7	(50)
somewhat	16	(42)	6	(43)
Is thawing of the frozen ground connected to other problems you have or your community has? (n = 53)				
no	4	(10)	0	(0)
yes	25	(66)	9	(60)
I don't know	9	(24)	6	(40)
If yes, which ones: safety problems * 1				
answered to options (n = 36): this option was selected (n = 16)	12	(46)	4	(40)
If yes, which ones: infrastructure problems * 1				
answered to options (n = 36): this option was selected (n = 27)	19	(73)	8	(80)
According to you, what mainly causes the thawing of the frozen ground? * 2				
Increase in temperatures (option was selected: n = 50)	36	(95)	14	(93)
Quality of life				
	OK, good		very good	
	n	(%)	n	(%)
Over the past 10 years, thawing of the frozen ground has led to (n = 50)				
negative changes	28	(85)	17	(100)

positive changes	5	(15)	0	(0)
Thawing of the frozen ground is having an impact on the ability to obtain food / other resources				
for daily use from the land (n = 51)				
no	6	(17)	1	(6)
yes	16	(46)	7	(44)
somewhat	13	(37)	8	(50)
Is thawing of the frozen ground connected to other problems you have or your community has? (n = 52)				
no	3	(8)	1	(6)
yes	23	(66)	10	(59)
I don't know	9	(26)	6	(35)
If yes, which ones: safety problems * 1				
answered to options (n = 36): this option was selected (n = 16)	11	(44)	5	(45)
If yes, which ones: infrastructure problems * 1				
answered to options (n = 36): this option was selected (n = 27)	19	(76)	8	(73)
According to you, what mainly causes the thawing of the frozen ground? * 2				
increase in temperatures (option was selected: n = 49)	34	(97)	15	(88)
Satisfaction with life				
OK, good very good				
n (%) n (%)				
Over the past 10 years, thawing of the frozen ground has led to (n = 50)				
negative changes	27	(87)	18	(95)
positive changes	4	(13)	1	(5)
Thawing of the frozen ground is having an impact on the ability to obtain food / other resources				
for daily use from the land (n = 51)				
no	5	(15)	2	(11)
yes	14	(44)	9	(47)
somewhat	13	(41)	8	(42)
Is thawing of the frozen ground connected to other problems you have or your community has? (n = 52)				
no	4	(12)	0	(0)
yes	20	(63)	13	(65)
I don't know	8	(25)	7	(35)
If yes, which ones: safety problems * 1				
answered to options (n = 36): this option was selected (n = 16)	9	(41)	7	(50)
If yes, which ones: infrastructure problems * 1				
answered to options (n = 36): this option was selected (n = 27)	17	(77)	10	(71)
According to you, what mainly causes the thawing of the frozen ground? * 2				
Increase in temperatures (option was selected: n = 49)	30	(94)	19	(95)
Life balance				
not very strong very strong				
n (%) n (%)				
Over the past 10 years, thawing of the frozen ground has led to (n = 50)				
negative changes	26	(90)	19	(91)
positive changes	3	(10)	2	(9)
Thawing of the frozen ground is having an impact on the ability to obtain food / other resources				
for daily use from the land (n = 51)				
no	6	(20)	1	(5)
yes	12	(40)	11	(52)
somewhat	12	(40)	9	(43)
Is thawing of the frozen ground connected to other problems you have or your community has? (n = 52)				
no	3	(10)	1	(4)
yes	21	(70)	12	(55)
I don't know	6	(20)	9	(41)
If yes, which ones: safety problems * 1				
answered to options (n = 36): this option was selected (n = 16)	10	(44)	6	(46)
If yes, which ones: infrastructure problems * 1				
answered to options (n = 36): this option was selected (n = 27)	17	(74)	10	(77)
According to you, what mainly causes the thawing of the frozen ground? * 2				
Increase in temperatures (option was selected: n = 49)	29	(97)	20	(91)
Feeling of empowerment				
no, somewhat yes				

	n		n	
	(%)		(%)	
Over the past 10 years, thawing of the frozen ground has led to (n = 51)				
negative changes	25	(86)	21	(96)
positive changes	4	(14)	1	(4)
Thawing of the frozen ground is having an impact on the ability to obtain food / other resources for daily use from the land (n = 52)				
no	5	(17)	2	(9)
yes	15	(50)	8	(36)
somewhat	10	(33)	12	(55)
Is thawing of the frozen ground connected to other problems you have or your community has? (n = 53)				
no	1	(3)	3	(14)
yes	19	(61)	15	(68)
I don't know	11	(36)	4	(18)
If yes, which ones: safety problems * ¹				
answered to options (n = 36): this option was selected (n = 16)	10	(48)	6	(40)
If yes, which ones: infrastructure problems * ¹				
answered to options (n = 36): this option was selected (n = 27)	19	(91)	8	(53)
According to you, what mainly causes the thawing of the frozen ground? * ²				
Increase in temperatures (option was selected: n = 50)	30	(97)	20	(91)
Self-rated health				
	low		medium	
	high			
	n	(%)	n	(%)
Over the past 10 years, thawing of the frozen ground has led to (n = 51)				
negative changes	1	(50)	36	(92)
positive changes	1	(50)	3	(8)
Thawing of the frozen ground is having an impact on the ability to obtain food / other resources for daily use from the land (n = 52)				
no	0	(0)	7	(17)
yes	1	(50)	19	(48)
somewhat	1	(50)	14	(35)
Is thawing of the frozen ground connected to other problems you have or your community has? (n = 53)				
no	0	(0)	3	(7)
yes	1	(50)	26	(63,5)
I don't know	1	(50)	12	(29,5)
If yes, which ones: safety problems * ¹				
answered to options (n = 36): this option was selected (n = 16)	1	(100)	13	(45)
If yes, which ones: infrastructure problems * ¹				
answered to options (n = 36): this option was selected (n = 27)	1	(100)	22	(76)
According to you, what mainly causes the thawing of the frozen ground? * ²				
Increase in temperatures (option was selected: n = 50)	2	(100)	38	(93)

*a minimum of 15 participants chose the option reported

¹ Options: Financial, happiness, spiritual, safety, work, political, health, infrastructure, fresh-water supply, food storage, religious

² Options: Increase in temperatures, fires, anger from spirits, too many trails, increase in shrubs, decrease in snow depth, God, roads and housing, other (participants were asked to select two options)

Table S4. Variables of interest (self-rated) and perceived adaptation factors.

	Well-being			
	OK, good		very good	
	n	(%)	n	(%)
Do you feel that enough is being done to adapt or face the impacts related to thawing of the frozen ground by:				
individuals (n = 53)				
no	14	(37)	8	(53)
yes	7	(18)	1	(7)
somewhat	17	(45)	6	(40)
the community (n = 53)				

no	8	(21)	5	(33)
yes	16	(42)	3	(20)
somewhat	14	(37)	7	(47)
local authorities (n = 53)				
no	10	(26)	6	(40)
yes	17	(45)	3	(20)
somewhat	11	(29)	6	(40)
regional authorities (n = 53)				
no	11	(29)	2	(13)
yes	17	(45)	4	(27)
somewhat	10	(26)	9	(60)
national authorities (n = 53)				
no	15	(39)	2	(13,3)
yes	17	(45)	5	(33,3)
somewhat	6	(16)	8	(53,3)
global community (n = 53)				
no	13	(34)	1	(7)
yes	16	(42)	5	(33)
somewhat	9	(24)	9	(60)
In which ways do you think your community is best prepared to adapt to thawing				
of the frozen ground? (selected the option) * 1				
Hunting / fishing activities (n = 19)	12	(32)	7	(47)
Traditional knowledge (n = 29)	22	(58)	7	(47)
The strongest need to adapt to thawing of the frozen ground in order to facilitate				
day to day activities (selected the option) * 2				
Health (n = 15)	10	(26)	5	(33)
Housing (n = 18)	12	(32)	6	(40)
Hunting / fishing activities (n = 28)	17	(45)	11	(73)
Traditional knowledge (n = 33)	22	(58)	11	(73)
Quality of life				
OK, good very good				
n (%) n (%)				
Do you feel that enough is being done to adapt or face the impacts related to thawing of the frozen ground by:				
individuals (n = 52)				
no	16	(46)	6	(35)
yes	6	(17)	2	(12)
somewhat	13	(37)	9	(53)
the community (n = 52)				
no	9	(26)	4	(24)
yes	14	(40)	5	(29)
somewhat	12	(34)	8	(47)
local authorities (n = 52)				
no	10	(28,5)	5	(29,5)
yes	15	(43)	5	(29,5)
somewhat	10	(28,5)	7	(41)
regional authorities (n = 52)				
no	10	(29)	2	(12)
yes	14	(40)	7	(41)
somewhat	11	(31)	8	(47)
national authorities (n = 52)				
no	13	(37)	3	(18)
yes	14	(40)	8	(47)
somewhat	8	(23)	6	(35)
global community (n = 52)				
no	13	(37)	1	(6)
yes	13	(37)	7	(41)
somewhat	9	(26)	9	(53)
In which ways do you think your community is best prepared to adapt to thawing				
of the frozen ground? (selected the option) * 1				
Hunting / fishing activities (n = 19)	13	(37)	6	(35)
traditional knowledge (n = 28)	20	(57)	8	(47)

The strongest need to adapt to thawing of the frozen ground in order to facilitate				
day to day activities (selected the option) * 2				
Health (n = 15)	9	(26)	6	(35)
Housing (n = 18)	11	(31)	7	(41)
Hunting / fishing activities (n = 27)	18	(51)	9	(53)
Traditional knowledge (n = 32)	17	(49)	15	(88)
Satisfaction with life				
OK, good very good				
n (%) n (%)				
Do you feel that enough is being done to adapt or face the impacts related to thawing of the frozen ground by:				
individuals (n = 52)				
no	13	(40,5)	9	(45)
yes	6	(19)	2	(10)
somewhat	13	(40,5)	9	(45)
the community (n = 52)				
no	8	(25)	5	(25)
yes	14	(44)	5	(25)
somewhat	10	(31)	10	(50)
local authorities (n = 52)				
no	9	(28)	6	(30)
yes	14	(44)	6	(30)
somewhat	9	(28)	8	(40)
regional authorities (n = 52)				
no	10	(31)	2	(10)
yes	15	(47)	6	(30)
somewhat	7	(22)	12	(60)
national authorities (n = 52)				
no	12	(37)	4	(20)
yes	14	(44)	8	(40)
somewhat	6	(19)	8	(40)
global community (n = 52)				
no	12	(37)	2	(10)
yes	13	(41)	7	(35)
somewhat	7	(22)	11	(55)
In which ways do you think your community is best prepared to adapt to thawing				
of the frozen ground? (selected the option) * 1				
Hunting / fishing activities (n = 19)	13	(41)	6	(30)
Traditional knowledge (n = 28)	16	(50)	12	(60)
The strongest need to adapt to thawing of the frozen ground in order to facilitate				
day to day activities (selected the option) * 2				
Health (n = 15)	8	(25)	7	(35)
Housing (n = 18)	11	(34)	7	(35)
Hunting / fishing activities (n = 27)	17	(53)	10	(50)
Traditional knowledge (n = 32)	15	(47)	17	(85)
Life balance				
not very strong very strong				
n (%) n (%)				
Do you feel that enough is being done to adapt or face the impacts related to thawing of the frozen ground by:				
individuals (n = 52)				
no	11	(37)	11	(50)
yes	6	(20)	2	(9)
somewhat	13	(43)	9	(41)
the community (n = 52)				
no	7	(23)	6	(27)
yes	12	(40)	7	(32)
somewhat	11	(37)	9	(41)
local authorities (n = 52)				
no	8	(27)	7	(32)
yes	13	(43)	7	(32)
somewhat	9	(30)	8	(36)
regional authorities (n = 52)				

	no	10	(33,3)	2	(9)
	yes	13	(43,3)	8	(36)
	somewhat	7	(23,3)	12	(55)
national authorities (n = 52)					
	no	12	(40)	4	(18)
	yes	13	(43)	9	(41)
	somewhat	5	(17)	9	(41)
global community (n = 52)					
	no	13	(43)	1	(4)
	yes	11	(37)	9	(41)
	somewhat	6	(20)	12	(55)
In which ways do you think your community is best prepared to adapt to thawing					
of the frozen ground? (selected the option) * ¹					
	Hunting / fishing activities (n = 19)	11	(37)	8	(36)
	Traditional knowledge (n = 28)	16	(53)	12	(55)
The strongest need to adapt to thawing of the frozen ground in order to facilitate					
day to day activities (selected the option) * ²					
	Health (n = 15)	8	(27)	7	(32)
	Housing (n = 18)	11	(37)	7	(32)
	Hunting / fishing activities (n = 27)	14	(47)	13	(59)
	Traditional knowledge (n = 32)	14	(47)	18	(82)
Feeling of empowerment					
		no, somewhat		yes	
		n	(%)	n	(%)
Do you feel that enough is being done to adapt or face the impacts related to thawing of the frozen ground by:					
individuals (n = 53)					
	no	17	(56)	5	(23)
	yes	4	(13)	4	(18)
	somewhat	10	(32)	13	(59)
the community (n = 53)					
	no	10	(32)	3	(14)
	yes	10	(32)	9	(41)
	somewhat	11	(36)	10	(45)
local authorities (n = 53)					
	no	10	(32)	6	(27)
	yes	12	(39)	8	(36,5)
	somewhat	9	(29)	8	(36,5)
regional authorities (n = 53)					
	no	9	(29)	4	(18)
	yes	11	(35,5)	10	(46)
	somewhat	11	(35,5)	8	(36)
national authorities (n = 53)					
	no	10	(32)	7	(32)
	yes	12	(39)	10	(45)
	somewhat	9	(29)	5	(23)
global community (n = 53)					
	no	8	(26)	6	(27)
	yes	11	(35)	10	(46)
	somewhat	12	(39)	6	(27)
In which ways do you think your community is best prepared to adapt to thawing					
of the frozen ground? (selected the option) * ¹					
	Hunting / fishing activities (n = 19)	11	(35)	8	(36)
	Traditional knowledge (n = 29)	19	(61)	10	(45)
The strongest need to adapt to thawing of the frozen ground in order to facilitate					
day to day activities (selected the option) * ²					
	Health (n = 15)	11	(35)	4	(18)
	Housing (n = 18)	10	(32)	8	(36)
	Hunting / fishing activities (n = 28)	16	(52)	12	(54)
	Traditional knowledge (n = 33)	20	(65)	13	(59)
Self-rated health					
		low		medium	
		high			
		n	(%)	n	(%)

Do you feel that enough is being done to adapt or face the impacts related to thawing of the frozen ground by:						
individuals (n = 53)						
no	0	(0)	20	(49)	2	(20)
yes	0	(0)	7	(17)	1	(10)
somewhat	2	(100)	14	(34)	7	(70)
the community (n = 53)						
no	0	(0)	10	(24)	3	(30)
yes	1	(50)	14	(34)	4	(40)
somewhat	1	(50)	17	(32)	3	(30)
local authorities (n = 53)						
no	0	(0)	3	(32)	3	(30)
yes	1	(50)	15	(36)	4	(40)
somewhat	1	(50)	13	(32)	3	(30)
regional authorities (n = 53)						
no	0	(0)	11	(27)	2	(20)
yes	1	(50)	16	(39)	4	(40)
somewhat	1	(50)	14	(34)	4	(40)
national authorities (n = 53)						
no	0	(0)	13	(32)	4	(40)
yes	1	(50)	17	(41)	4	(40)
somewhat	1	(50)	11	(27)	2	(20)
global community (n = 53)						
no	0	(0)	10	(24)	4	(40)
yes	1	(50)	16	(39)	4	(40)
somewhat	1	(50)	15	(37)	2	(20)
In which ways do you think your community is best prepared to adapt to thawing of the frozen ground? (selected the option) * ¹						
Hunting (fishing activities (n = 19)	0	(0)	16	(39)	3	(30)
Traditional knowledge (answered and selected the option: n = 29)	1	(50)	21	(51)	7	(70)
The strongest need to adapt to thawing of the frozen ground in order to facilitate day to day activities (selected the option) * ²						
Health (n = 15)	0	(0)	15	(37)	0	(0)
Housing (n = 18)	0	(0)	16	(39)	2	(20)
Hunting / fishing activities (n = 28)	0	(0)	24	(59)	4	(40)
Traditional knowledge (n = 33)	2	(100)	27	(67)	4	(40)

*a minimum of 15 participants chose the option reported. ¹ Options: Health, housing, mobility, hunting / fishing activities, traditional knowledge, other. ² Options: Health, housing, mobility, hunting / fishing activities, traditional knowledge, other

Table S5. Variables of interest and associations with demographic / perceived environmental factors ($p < 0.1$).

		Well-being						
		OK	good	very good	not very good	very good		
		n (%)	n (%)	n (%)	<i>p</i> -value	n (%)	n (%)	<i>p</i> -value
Being in nature for hunting (n = 53)								
never, rarely						13 (34)	1 (7)	0.080
sometimes, very often						25 (66)	14 (93)	
Being in nature for scientific activities (n = 53)								
never, rarely		6 (46)	21 (84)	10 (67)	0.050			
sometimes, very often		7 (54)	4 (16)	5 (33)				
Challenges associated with economic activities (n = 53)								
not important, a little important		2 (15)	9 (36)	7 (47)	0.081			
important, very important		7 (54)	15 (60)	7 (47)				
I don't know		4 (31)	1 (4)	1 (6)				
		Quality of life						
		OK	good	very good		not very good	very good	

	n (%)	n (%)	n (%)	p-value	n (%)	n (%)	p-value
Being in nature for recreational activities (n = 52)							
never, rarely, sometimes	6 (75)	23 (85)	9 (53)	0.066	29 (83)	9 (53)	0.043
very often	2 (25)	4 (15)	8 (47)		6 (17)	8 (47)	
Challenges associated with economic activities (n = 52)							
not important, a little important	4 (50)	10 (37)	3 (18)	0.008	14 (40)	3 (18)	0.027
important, very important	1 (12)	14 (52)	14 (82)		15 (43)	14 (82)	
I don't know	3 (38)	3 (11)	0 (0)		6 (17)	0 (0)	
not important, a little important, important	5 (63)	18 (67)	12 (71)	0.058			
very important	0 (0)	6 (22)	5 (29)				
I don't know	3 (37)	3 (11)	0 (0)				
Satisfaction with life							
	OK	good	very good		not very good	very good	
	n (%)	n (%)	n (%)	p-value	n (%)	n (%)	p-value
Being in nature for economic activities (n = 52)							
never, rarely					31 (97)	16 (80)	0.066
sometimes, very often					1 (3)	4 (20)	
Challenges associated with economic activities (n = 52)							
not important, a little important	2 (40)	8 (30)	7 (35)	0.096			
important, very important	1 (20)	15 (55)	13 (65)				
I don't know	2 (40)	4 (15)	0 (0)				
not important, a little important, important	3 (60)	18 (67)	14 (70)	0.082	21 (66)	14 (70)	0.083
very important	0 (0)	5 (18)	6 (30)		5 (15)	6 (30)	
I don't know	2 (40)	4 (15)	0 (0)		6 (19)	0 (0)	
Challenges associated with housing, buildings, roads (n = 52)							
not important, a little important	1 (20)	2 (7)	1 (5)	0.052			
important, very important	3 (60)	25 (93)	19 (95)				
I don't know	1 (20)	0 (0)	0 (0)				
not important, a little important, important	1 (20)	12 (44)	9 (45)	0.088			
very important	3 (60)	15 (56)	11 (55)				
I don't know	1 (20)	0 (0)	0 (0)				
Lost picking spots because they became flooded / submerged (n = 46)							
no	3 (100)	24 (89)	10 (63)	0.084	27 (90)	10 (63)	0.047
yes	0 (0)	3 (11)	6 (37)		3 (10)	6 (37)	
Life balance							
					not strong	strong	
					n (%)	n (%)	p-value
Being in nature for recreational activities (n = 52)							
never, rarely					16 (53)	6 (27)	0.089
sometimes, very often					14 (47)	16 (73)	
never, rarely, sometimes					26 (87)	12 (55)	0.013
very often					4 (13)	10 (45)	
Lost picking spots because they became flooded / submerged (n = 46)							
no					25 (93)	12 (63)	0.022
yes					2 (7)	7 (37)	
Feeling of empowerment							
	no	somewhat at	yes		no, somewhat	yes	

	n (%)	n (%)	n (%)	p-value	n (%)	n (%)	p-value
Gender (n = 53)							
female	9 (82)	13 (65)	8 (36)	0.030	22 (71)	8 (36)	0.023
male	2 (18)	7 (35)	14 (64)		9 (29)	14 (64)	
Being in nature for fishing (n = 51)							
never, rarely	6 (55)	6 (30)	3 (15)	0.075			
sometimes, very often	5 (45)	14 (70)	17 (85)				
Being in nature for picking berries, mushrooms (n = 53)							
never, rarely, sometimes	5 (45)	14 (70)	7 (32)	0.049	19 (61)	7 (32)	0.051
very often	6 (55)	6 (30)	15 (68)		12 (39)	15 (68)	
Thawing is impacting ability to obtain food / other resources from the land (n = 52)							
no	0 (0)	5 (26)	2 (9)	0.084			
somewhat	3 (27)	7 (37)	12 (55)				
yes	8 (73)	7 (37)	8 (36)				
	Self-rated health						
	low		medium		high		
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	p-value
Being in the natural environment for hunting (n = 53)							
never, rarely			2 (100)	11 (27)	1 (10)		0.042
sometimes, very often			0 (0)	30 (73)	9 (90)		
Being in nature for picking berries, mushrooms (n = 53)							
never, rarely			2 (100)	6 (15)	1 (10)		0.028
sometimes, very often			0 (0)	35 (85)	9 (90)		
Challenges associated with economic activities (n = 53)							
not important, a little important, important			0 (0)	27 (66)	9 (90)		0.035
very important			2 (100)	9 (22)	0 (0)		
I don't know			0 (0)	5 (12)	1 (10)		

Statistical analysis was conducted using original groups and reclassifications as follows:

1. Age was reclassified into three groups: 18 - 34 years, 35 - 54 and over 55 years.
2. Profession was reclassified as follows: Public sector / private sector / hunter and fisher / not currently employed (unemployed, retired, homemaker). The group "other" was manually checked and answers were relocated into the groups of public sector, private sector, and hunter / fisher based on the information that was provided.

Table S6. Variables of interest and associations with factors describing specific impacts at the individual and community levels ($p < 0.1$).

	Self-rated quality of life							
	OK		good		very good		not very good	
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	p-value
During the past 10 years, the thawing of the frozen ground has led to (n = 50)								
positive changes	0 (0)	5 (19)	0 (0)	0.093				
negative changes	7 (100)	21 (81)	17 (100)					
Fires mainly cause the thawing of the frozen ground (n = 11)								
answered and option was selected	0 (0)	9 (33)	2 (12)	0.067				
Decrease in snow depth mainly causes the thawing of the frozen ground (n = 4)								
answered and option was selected	2 (25)	0 (0)	2 (12)	0.032				

Yes, thawing of the frozen ground is connected to other problems of the individual / community: financial problems (n = 3) answered yes and option was selected	0	(0)	0	(0)	3	(27)	0.068	0	(0)	3	(27)	0.023
Life balance												
not strong strong												
n (%) n (%) p-value												
Yes, thawing of the frozen ground is connected to other problems of the individual / community: Financial problems (n = 3) answered yes and option was selected								0	(0)	3	(23)	0.040
Yes, thawing of the frozen ground is connected to other problems of the individual / community: Political problems (n = 5) answered yes and option was selected								1	(4)	4	(31)	0.047
Feeling of empowerment												
no somewhat yes no, somewhat yes												
n (%) n (%) n (%) p-value n (%) n (%) p-value												
Fires mainly cause the thawing of the frozen ground (n = 11) answered and option was selected	1	(9)	9	(45)	1	(5)	0.002	10	(32)	1	(5)	0.017
Decrease in snow depth mainly causes the thawing of the frozen ground (n = 4) answered and option was selected	0	(0)	0	(0)	4	(18)	0.066	0	(0)	4	(18)	0.025
Yes, thawing of the frozen ground is connected to other problems of the individual / community: Problems at work (n = 2) answered yes and option was selected	2	(29)	0	(0)	0	(0)	0.033					
Yes, thawing of the frozen ground is connected to other problems of the individual / community: Infrastructure problems (n = 27) answered yes and option was selected	7	(100)	12	(86)	8	(53)	0.029	19	(91)	8	(53)	0.019
Self-rated health												
low medium high												
n (%) n (%) n (%) p-value												
Yes, thawing of the frozen ground is connected to other problems of the individual / community: Problems with fresh-water supply (n = 9) answered yes and option was selected								1	(100)	4	(14)	0.006

Table S7. Variables of interest and associations with perceived adaptation factors ($p = <0.1$).

	Well-being											
	OK		good		very good		p-value	not very good		very good		
	n	(%)	n	(%)	n	(%)		n	(%)	n	(%)	
The community is best prepared to adapt to thawing of the frozen ground: health (n = 9)												
answered and option was selected								4	(11)	5	(33)	0.097
The community is best prepared to adapt to thawing of the frozen ground: housing (n = 9)												
answered and option was selected	0	(0)	4	(16)	5	(33)	0.068	4	(11)	5	(33)	0.097
The strongest need to adapt to thawing of the frozen ground: hunting / fishing activities (n = 28)												
answered and option was selected	8	(62)	9	(36)	11	(73)	0.066	17	(45)	11	(73)	0.074
Enough has been done to adapt or face impacts related to thawing by regional authorities (n = 53)												
yes								17	(45)	4	(27)	0.077
somewhat								10	(26)	9	(60)	
no								11	(29)	2	(13)	
Enough has been done to adapt or face impacts related to thawing by national authorities (n = 53)												
yes	5	(39)	12	(48)	5	(33.3)	0.065	17	(45)	5	(33.3)	0.015
somewhat	2	(15)	4	(16)	8	(53.3)		6	(16)	8	(53.3)	
no	6	(46)	9	(36)	2	(13.3)		15	(39)	2	(13.3)	
Enough has been done to adapt or face impacts related to thawing by the global community (n = 53)												
yes	6	(46)	10	(40)	5	(33)	0.091	16	(42)	5	(33)	0.025
somewhat	2	(15)	7	(28)	9	(60)		9	(24)	9	(60)	
no	5	(39)	8	(32)	1	(7)		13	(34)	1	(7)	
	Self-rated quality of life											
	OK		good		very good		p-value	not very good		very good		
	n	(%)	n	(%)	n	(%)		n	(%)	n	(%)	
	The strongest need to adapt to thawing of the frozen ground: traditional knowledge (n = 32)											
answered and option was selected	4	(50)	13	(48)	15	(88)	0.022	17	(49)	15	(88)	0.007
Enough has been done to adapt or face impacts related to thawing by the global community (n = 52)												
yes								13	(37)	7	(41)	0.038
somewhat								9	(26)	9	(53)	
no								13	(37)	1	(6)	
	Self-rated satisfaction with life											
	OK		good		very good		p-value	not very good		very good		
	n	(%)	n	(%)	n	(%)		n	(%)	n	(%)	
	The strongest need to adapt to thawing of the frozen ground: traditional knowledge (n = 32)											
answered and option was selected	2	(40)	13	(48)	17	(85)	0.023	15	(47)	17	(85)	0.008
Enough has been done to adapt or face impacts related to thawing by regional authorities (n = 52)												
yes	1	(20)	14	(52)	6	(30)	0.020	15	(47)	6	(30)	0.020

	somewhat	1 (20)	6 (22)	12 (60)		7 (22)	12 (60)			
	no	3 (60)	7 (26)	2 (10)		10 (31)	2 (10)			
Enough has been done to adapt or face impacts related to thawing by the global community (n = 52)										
	yes	0 (0)	13 (48)	7 (35)	0.005	13 (41)	7 (35)	0.027		
	somewhat	1 (20)	6 (22)	11 (55)		7 (22)	11 (55)			
	no	4 (80)	8 (30)	2 (10)		12 (37)	2 (10)			
<hr/>										
Life balance										
<hr/>										
					not strong		strong			
					n	(%)	n	(%)	p-value	
<hr/>										
The community is best prepared to adapt to thawing of the frozen ground: mobility (n = 3)										
answered and option was selected						0	(0)	3	(14)	0.070
<hr/>										
The strongest need to adapt to thawing of the frozen ground: traditional knowledge (n = 32)										
answered and option was selected						14	(47)	18	(82)	0.020
<hr/>										
Enough has been done to adapt or face impacts related to thawing by regional authorities (n = 52)										
yes						13	(43.3)	8	(36)	0.039
somewhat						7	(23.3)	12	(55)	
no						10	(33.3)	2	(9)	
<hr/>										
Enough has been done to adapt or face impacts related to thawing by the global community (n = 52)										
yes						11	(37)	9	(41)	0.002
somewhat						6	(20)	12	(55)	
no						13	(43)	1	(4)	
<hr/>										
Feeling of empowerment										
<hr/>										
			no		no, somewhat		yes			
			n	(%)	n	(%)	n	(%)	p-value	
<hr/>										
Enough has been done to adapt or face impacts related to thawing by individuals (n = 53)										
yes						4	(13)	4	(18)	0.067
somewhat						10	(32)	13	(59)	
no						17	(55)	5	(23)	
<hr/>										
Self-rated health										
<hr/>										
			low		medium		high			
			n	(%)	n	(%)	n	(%)	p-value	
<hr/>										
The strongest need to adapt to thawing of the frozen ground: health (n = 15)										
answered and option was selected						0	(0)	15	(37)	0.063