

# Networks for Science-Informed Innovation in the Arctic: Insights on the Structure and Evolution of a Canadian Research Network

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## SUPPLEMENTARY APPENDIX

TABLE S1. Number (%) of ArcticNet actors by sector.

	Complete network <sup>1</sup>	Phase 1	Phase 2	Phase 3	Phase 4 <sup>2</sup>
Number of unique organizations	301	94	151	167	175
Canadian academic	55 (18)	36 (38)	38 (25)	40 (24)	42 (24)
Northern	96 (32)	25 (27)	52 (34)	53 (32)	55 (31)
International	102 (34)	16 (17)	40 (26)	52 (31)	50 (29)
Federal government	12 (4)	8 (9)	6 (4)	6 (4)	9 (5)
Provincial government	8 (3)	5 (5)	4 (3)	5 (3)	4 (2)
Non-profit	13 (4)	2 (2)	5 (3)	5 (3)	7 (4)
Private sector	15 (5)	2 (2)	6 (4)	6 (4)	8 (5)
Number of Individuals	1659	394	622	732	728
Canadian academic	862 (52)	246 (62)	332 (53)	371 (51)	419 (58)
Northern	417 (25)	60 (15)	143 (23)	194 (27)	138 (19)
International	147 (9)	20 (5)	47 (8)	66 (9)	64 (9)
Federal government	146 (9)	50 (13)	65 (10)	66 (9)	64 (9)
Provincial government	39 (2)	12 (3)	14 (2)	13 (2)	22 (3)
Non-profit	28 (2)	4 (1)	11 (2)	15 (2)	13 (2)
Private sector	20 (1)	2 (1)	10 (2)	7 (1)	8 (1)

<sup>1</sup> The complete network does not represent sums; rather, it captures all possible networked connections.

<sup>2</sup> Data from 2017–18 and 2018–19 were unavailable and thus not included.

TABLE S2. Structural characteristics for centrality (average degree) and boundary spanning (average betweenness) by sector during the four ArcticNet phases.

	Complete network		Phase 1		Phase 2		Phase 3		Phase 4	
	Average degree	Average between	Average degree	Average between	Average degree	Average between	Average degree	Average between	Average degree	Average between
Organizations	31.3	145.9	19.0	41.1	21.5	74.7	24.6	81.5	23.5	83.9
Min/Max	1/209	0/5426	3/69	0/721	2/107	0/1607	2/112	0/1669	1/120	0/2447
Canadian academic	64.2	598.0	37.3	92.5	37.3	237.0	41.1	260.6	38.7	250.7
Northern	26.0	68.5	16.3	10.6	16.3	19.5	18.0	34.2	19.7	45.5
International	19.7	15.4	12.7	2.2	12.7	1.0	18.8	6.3	14.9	9.7
Federal government	48.3	268.2	37.8	41.2	37.8	182.5	37.2	173.5	34.0	127.6
Provincial government	37.6	62.7	16.3	0.1	16.3	16.1	25.2	11.1	29.5	57.6
Non-profit	21.6	18.2	18.0	0.2	18.0	10.8	23.0	35.9	17.5	5.8
Private sector	19.5	2.8	16.2	0.2	16.2	0.0	13.5	0.8	16.8	0.0
Individuals	43.2	1469.2	29.1	276.2	32.6	452.3	38.9	561.8	31.5	682.2
Min/Max	2/398	0/138519	3/133	0/11430	2/155	0/35167	3/186	0/37459	3/132	0/25116
Canadian academic	45.8	2057.2	29.8	399.2	33.7	671.4	40	783.9	32.2	859.2
Northern	41.1	1031.5	28.0	31.1	33.5	281.0	39.3	413.5	30.4	675.7
International	35.6	249.1	23.3	16.6	23.6	14.5	36.5	78.8	29.8	249.3
Federal government	41.5	1087.0	24.8	98.6	31.5	268.9	35.6	310.7	30.6	429.2
Provincial government	52.7	309.5	48.0	44.5	33.8	3.6	43.2	2.5	35.5	0.0
Non-profit	38.6	1278.8	32.5	719.4	30.3	0.0	34.9	1001.3	22.7	0.0
Private sector	36.1	13.0	33.5	41.5	32.3	0.0	23.1	0.0	34.6	0.0

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TABLE S3. ArcticNet actors with the largest ego networks.

Organizations		Individuals	
All Phases (301 organizations)	Ego network size	All Phases (1659 individuals)	Ego network size
Université Laval	209	Male; Fisheries and Oceans Canada	398
Université du Québec à Rimouski	177	Male; Fisheries and Oceans Canada	371
Government of Nunavut	153	Male; University of Manitoba	367
University of British Columbia	151	Male; Trent University	319
Université de Montréal	149	Male; Memorial University of Newfoundland	318
<b>Phase 1 (94 organizations)</b>		<b>Phase 1 (394 individuals)</b>	
Université Laval	69	Male; Fisheries and Oceans Canada	133
McGill University	62	Male; University of Manitoba	117
University of Manitoba	59	Male; University of Manitoba	115
Université du Québec à Rimouski	57	Male; Canadian Museum of Nature	99
Fisheries and Oceans Canada	49	Male; Fisheries and Oceans Canada	95
<b>Phase 2 (151 organizations)</b>		<b>Phase 2 (622 individuals)</b>	
Université Laval	107	Male; Trent University	155
Université du Québec à Rimouski	82	Male; Fisheries and Oceans Canada	150
Memorial University of Newfoundland	78	Male; Université Laval	143
McGill University	77	Male; Université Laval	14
University of Alberta	70	Male; Université Laval	135
<b>Phase 3 (167 organizations)</b>		<b>Phase 3 (732 individuals)</b>	
Université Laval	112	Male; University of Manitoba	186
Université du Québec à Rimouski	99	Male; Fisheries and Oceans Canada	181
University of British Columbia	84	Male; Nunatsiavut Government	176
Trent University	80	Male; Université Laval	164
Government of Nunavut	76	Male; Fisheries and Oceans Canada	164
<b>Phase 4 (175 organizations)</b>		<b>Phase 4 (728 individuals)</b>	
Université Laval	120	Male; University of Manitoba	132
Université de Montréal	89	Male; Fisheries and Oceans Canada	120
Université du Québec à Rimouski	89	Male; Université Laval	119
Memorial University of Newfoundland	80	Male; Fisheries and Oceans Canada	113
Government of Nunavut	79	Male; Université de Montréal	104

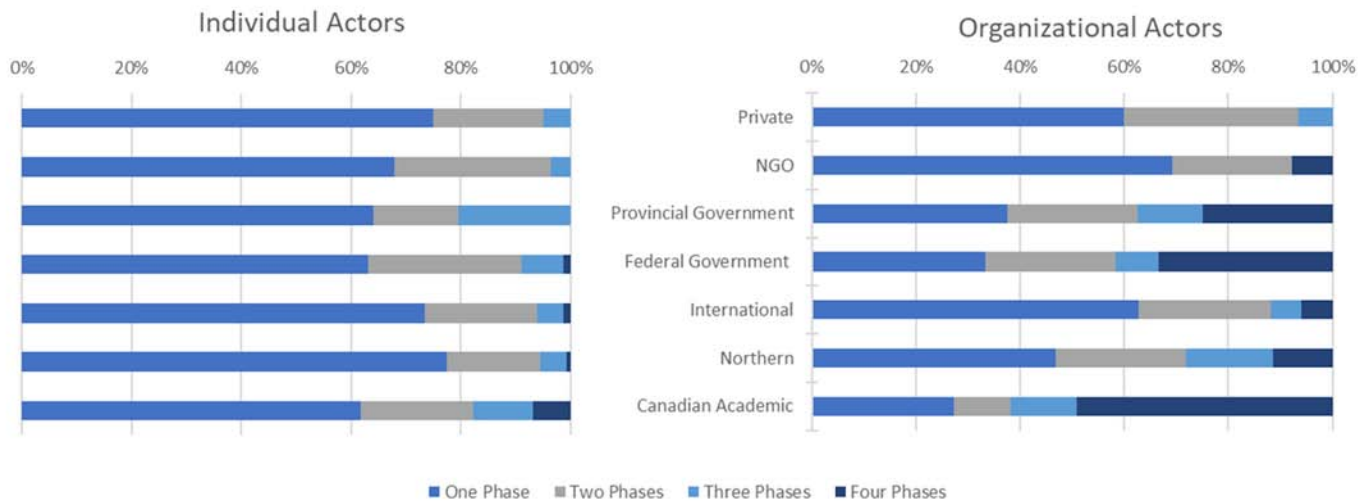


FIG. S1. ArcticNet actor turnover and retention over the four phases. Data from 2017–18 and 2018–19 were unavailable and thus not included.