

## **Nunamiutanik Nirgitainik Umayuniklu Ilingaitukhanik tahapkunani Tunungani Taahiutainiklu**

**2018 nunaini hulidjutinik uniklutiniklu tahapkunanga tahiknit naunaiyainikmun  
hungnauyakhainiklu naunaitkutakhanik talvani Ikaluktutiami**

NRI Naunaitkutak Atugakhanik Nungudjutilingnik Ubluinik Atukniant # 04 011 18R-M

21.3.2019

**Milla Rautio**, PhD unalu Kanatami Naunaitkutakhanik Kinikhianikmun Hunauyakhainiklu  
Ikhivautalik Nunatuttukanit unalu Tunungani Imakmiutaniklu Nirgitainik Umayuniklu  
Nunamiutaniklu Nirgitainiklu

Université du Québec à Chicoutimi (UQAC)

Hivayaut : (418)5455011 kiudjutait. 5084

[milla.rautio@uqac.ca](mailto:milla.rautio@uqac.ca)

Michael Power, Univ. of Waterloo, [m3power@sciborg.uwaterloo.ca](mailto:m3power@sciborg.uwaterloo.ca)

Connie Lovejoy, Université Laval, [connie.lovejoy@bio.ulaval.ca](mailto:connie.lovejoy@bio.ulaval.ca)

Marlene Evans, Environment Canada, [marlene.evans@ec.gc.ca](mailto:marlene.evans@ec.gc.ca)

Joseph Culp, Environment Canada, [joseph.culp@ec.gc.ca](mailto:joseph.culp@ec.gc.ca)

Nicolas Derome, Université Laval, [nicolas.derome@bio.ulaval.ca](mailto:nicolas.derome@bio.ulaval.ca)

## **Titikiutihimayunik Makpiraata Naunaitkutanik imalu havakhautikhanik hulidjutikhainiklu**

Tahapkununalu havaktauvtunik aullaganginakhimayuk mikharut naunaitkutakhanik  
kinikhianikmun ihiviukhinikmun hungnauyakhainiklu havaagivukgait tahapkunanal  
Kanatamiunit Taryumi Tunungani Taryumi Naunaitkutakhanik Kinikhianikmun  
Ihiviukhinikmun Hungnauyakhainiklu Havakvik (CHARS) imalu havakhikhimayunik  
talvunakukhimayunik NSRI naunaitkutak atugakhanik nungudjutilingnik ubluinik  
atukniant # 04 011 18R-M. Tahapkunani ilagiyainiklu ihiviukhinikmun  
naunaitkutakhaniklu ilauvukhimayunik ikalukhiungnikmun pidjautahimayunik  
talvunakukhimayuniklu DFO naunaitkutak atugakhanik nungudjutilingnik ubluinik  
atukniant tapfumanga Dr. Marlene Evans. Tahapkununalu 2017 naunaitkutakhanik  
kinikhianikmun ihiviukhinikmun hungnauyakhainiklu pidjutivukhimayuniklu  
ikayutauyukhaniklu tahapkununa Taryumi Hilaryuami Kauhimaauvtunik Kanatami  
ikayuktauvtunik havakhautikhanik “Nunamiutanik Nirgitainik Umayuniklu  
Ilingaitukhaniklu Tunungani Taahiutainiklu” Hilaryuamilu Nunamiutanik Nirgitainik  
Umayuniklu Munakgiyauyukhanik Ihiviukhinikmunlu Havakhautikhaniklu (CBMP)  
pidjautayunik naudjutihimayunik havaagivukgainiklu avakugutikhanik  
ilihakatiknikmunlu atugakhanik pilingnik tamakpianginik hilaryuami nunalaanilu.  
Ilikuaktunik havakhautikhaniklu malikgakanik adjikiiktukhanik naunaiyainikmun  
hungnauyakhainiklu naunaitkutakhanik ataniktuktauyukhaniklu pilingnik  
havakhautikhanik ikayutauyukhaniklu hivituyunik nakuyunik imalu adjikiikniaklugitlu

tukihigiarutunik alangayunit nunainiklu talvani Tununngani imalu piutainiklu nunamiutanik nirgitainik umayuniklu.

Tamna hivuliuyukhanik havakhautikhanik 2018 mi naunaiyainikmun hungnauyakhainiklu naunaitkutakhanik pidjatauukhimayunik ilitukgiyauyukhanik imalu kanukgitakhainiklu nunamiutanik nirgitainik umayuniklu uukhulingnik ilingaituniklu uvunalu imakmiuvuktunik nunamiutaniklu kanukgilidjutivuktunik nirgitinungakpaktunik (Hg) kanukgilidjutivuktunik imalu alungukpallianiiianik tahapkunani tahiutainik nirgitainiklu atadjutivuktuniklu tahiinik kungnituaniginik Ikaluktutiami nunalingni. Nunamiutanik nirgitainik umayuniklu ilingaituniklu ihuakuttauvuktut nunmaiutanik nirgitainik ilingaitunik hurgani ungigliyukhaniklu, ilingaituniklu uvunalu ilingaitukhanik avaatainiklu, ilauyuniklu inungnilu, uvunalu ammigaitunik atadjutivukgainiklu ihumadjutigiyaavuktunik ima naunaitkutaavuktunik nunattigut ilingaidjutaavuktuniklu. Kanukgilidjutivuktuniklu ihuakuttaavuktunik ilingaitunik nallikmutlu atadjutilutiklu ammigaitunik Hg kanukgilidjutivuktunik tahapkani nunamiutanik nirgitainik umayuniklu. Tahapkunani Hg kanukgilidjutivuktunik imakiutanik nirgitainik umayuniklu nirgittinungukpaktunik timaini tahapkunanilu Ikalukpiini tahikmiutaniklu ikalutainik ihuuni huutkulimaitutlu ikayutauvuktut akhuut ingilgangnitak pitkuhiktukpaktuk Inungni nikigivukgait imalu imakmiutanik nirgitainiklu atuktauganginakpaktut huutkullimaituk Tahapkununa naunaitkutakhaniklu ikayutaulutiklu atugakhaliuknikmunlu tahapkunani Ikaluktutiak nunalingni munakgiyauyukhaniklu nakuukgutikhaniklu nunamiutanik nirgitainik umayuniklu havakpauhidjutunik (uvuna.. ikalukhiuknikmun) talvani nunaini.

Tahapkununa ihiviukhinikmunlu naunaitkutakhanik imalu naunaiyukhimayainik pidjatauhimayut hivitunikhainit naunaitkutakhanik pidjutikariakaktunik naunaitkutalingnik talvani Tunungani Taahinik Nunamiutanik Nirgitainik Umayuniklu Munakgiyauyukhanik Ihiviukhinikmun Pangnattaayunik talvani hilaryuami Tunungani taahiniklu nunamiutanik nirgitainik umayuniklu tutkikhakhimayunik havaagiyaayukhanik tamakpianginik Tunungani nunalaani pidjutaulutik talimanik ukiunik havaagiyaulutik. Ilikuaktunik naunaiyainikmun pidjatauhimayunik tikuahtauhimayunik talvani nallikmiklu naunaitkutalingnik nunatiggut naunaitkutainik havaagivukgainik imakakniinitlu malikhugit Makpiraagukhanik1 atani uma.

Makpiraagukhanik 1. Imakmiutanik umayuniklu kanukgilidjutivuktunik imalu Atadjutivuktunik imakmiutanik umayuniklu ammigiyaayukhanik nunatiggut iluitullugitlu (FECs) mikharut tunungani taahinik nunatiggutlu, uvunalu ilitukgiyaayukhaniklu tahapkunani Tunungani Taahiniklu Nunamiutanik Nirgitainik Umayuniklu Munakgiyaayukhanik Ihiviukhinikmunlu Pangnattaayunik.

<b>Naunaiyainikmun</b>	<b>Naahugiyaayukhanik ipiknakpiaktuniklu Ammigiyaayukhanik Nunatiggut Iluitullugitlu (FEC)</b>
Imakmiutanik nunamiutanik nauvuktunik nirgitinungakpaktuniklu	Imakmiutanik ikalungilu nauvuktunik nirgitinungakpaktuniklu imalu ipiknakpiaktut naunaitkutauvuktunik alanguktikpaktunik nalliak kuugluktitainikmun ihuigutivuktuniklu, atadjutivuktunik nauvuktunitlu kanukmilu nauvuktuniklu nirgitingnungakpaktunik imalu nauyuituniklu.
Taryumilu imakmiutanik nunamiutaniklu nirgitainik	Ilingaitunik ipiknakpiaktunik pihimangmataah tungaviuvukmataalu nirgitinut umayuniklu, kayakgiyaayukhaniklu alanguktikpaktuniklu, ilitukgiyaayukhanik naunaitkutakhanik nallikmik kanukgituniklu alanguktikpaktuniklu, nallautakgutuniklu pidjautahimayut aullaktikgutikhanik ilitukgiyaayukhanik kuugluktitainikmun ihuigutivuktuniklu, ikitunitlu nallikmik tapfumunalu atukauvuktuniklu; ilanginik atuktaugaakpaktunik munakgiyaayukhanik ihiviukhinikmun naunaitkutakhanik hungnaikhimayutlu.
Imakmiutanik utangingniklu nirgitainitlu	Ilingaitunik ipiknakpiaktunik pihimangmataah tungaviuvukmataalu nirgitinut umayuniklu, kayakgiyaayukhaniklu alanguktikpaktuniklu; naunaitkutakhanik hungnaikhimayutlu tamatkiumayunik ikituniklu, ihiviukhinikmunlu naunaitkutakhanikk avaatingnut nungumanginiklu, chl-a atuktauvuktuniklu imalu nallautakhimayunik imakmiutanik nirgitainik atadjutivuktuniklu ilingaitunik nauvuktuniklu; ilingaitunik ungnakmik ihiviukhinikmunlu naunaitkutakhanik pidjutikattaknaituniklu ihiviukhikattaknaitunik akkikhaikpangmataalu, pidjautaulutik ingilgangikhiktukhanik tutkukumayukhanik naunaitkutakhanik.
Imakmiutanik Nirgitainik Umayuniklu Mikigahuakhutiklu	Ilingaitunik ipiknakpiaktunik pihimangmataah uvunalu ilingainikhainiklu nirgitinit ilingaituniklu, ilidjuhikgiyainiklu nunalingni kanukgilidjutivuktuniklu, ipiknakpiaktuniklu mikharut nirgitinut imakmiutaniklu, kayakgiyaayukhaniklu alanguktikpaktuniklu.
Taryumilu imakmiutanik nunamiutaniklu nirgitainik	Nirgitinut ilingaitunik nirgitit nirgivukgainik nallaumadjutainiklu, ipiknakpiaktunik naudjutivuktuniklu imalu aipakhanik ilidjuhiinik nauvuktuniklu tahapkunani nirgitinik imakmiutaniklu; nunalingni ilidjuhiit ilidjuhikgiyainiklu nunatiggut alanguktikpaktuniklu; ayuuknaituniklu ihiviuktaayukhanik naunaitkutakhanik imalu ayuuknaitpiaktuniklu ilitukgiyaayukhanik; ilanginik

	atuktaugaakpaktunik munakgiyauyukhanik ihiviukhinikmun naunaitkutakhanik hungnaikhimayutlu.
Ukhuukaknit imalu ilingaituniklu ukhuukaknit/ilingaitunik ukilaanikmunlu	Ipiknakpiaktunik nunalingni hulidjutikhaniklu imalu nunamiutanik nirgitainik umayuniklu, atugakhaniklu ilitukgiyauyukhanik alanguktikpaktunikli tahapkunani atuktauvuktuniklu, atugakhaniklu tutkikhainikmun tikuaktauvuktunik nirgitinik ilitukgiyauyukhanik ilingaitunik ukilaanikmunlu (imakmiutanik utangingniklu nirgitainitlu ukittautivuktunik. imakmiutanik ikalungilu nauvuktunik nirgitinungakpaktuniklu); ikitunik naunaitkutanik pidjutauvukhimayut.
Imakmiutanik nunamilu nirgitit pungniiupayunik kingnipayuniklu, Takungnaikpaktuniklu nunaap naunia nunamungakpaktunik nirgitingungakpaktuniklu imakmiutanutlu	Ilingaitunik ipiknakpiaktunik pihimangmataah naunaitkutaavuktuniklu tamatkiumayunik ilidjuhiiniklu atuktauvuktuniklu, hukugiktunik atadjutivuktunik talvani nunamiutanik nirgitainik umayuniklu; ilingaitunik ungnaknik ihiviukhinikmunlu naunaitkutakhanik pidjutikattaknaitumiklu ihiviukhikattaknaitumik akkikhaikpangmataalu; naunaitkutanik avaatingnitlu imalu pidjutaugufuuluktuniklu ilauyukhaniklu



## Ihiviukhinikmunlu naunaitkutakhanik

Saivat tattit imait kanogittaaghainik ooktoktaohimayut Ekaluktutiak aipaagani Akasiotillo 2018-mi. siksittaot tattit ooktoktaohimakmiyut kaniginniagiakhainnik okiomi hikohimatillogit, immallo komagovaloilo tattiniitut naonaiyaktaohimayot kanigilimavagiaghainnik tattit hikohimatillogit. Okiomi tattinik naonaiyaikatanggitut okioktaktomi okiok havigonighaokmat okioktaktomi, kaoyimayaotianggitkiplonilo kanogitpalmagaat okiomi. Tattit tamaita naonaigahoakpaktavut hihainniginnik ikkiiknakninggitigollo, anningnikakninggitigollo elittoginahoakhogit kaoyimatiaktaoligiaginni kanogitpakmagaagita okioktaktomi tattit. Elittoghakpakmiyavot tattit niginiakvikatiakmagaagita honavalok nut omayovaloillo tamatkigahoakhogit naonaiyagahoakpaktavot komakot ekaloillo tattiniitut..

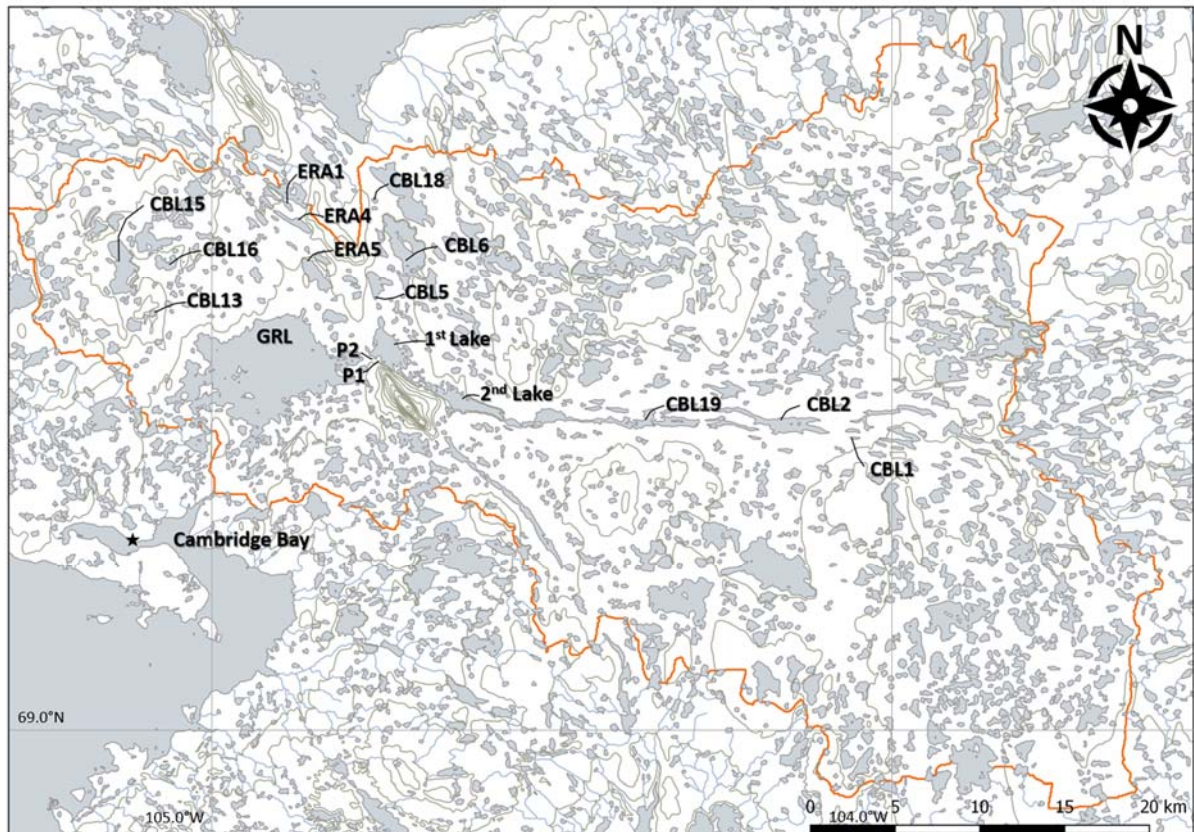


Fig. 1. Nunaoyami naonaitagotighak tattit takooktaohimayot.

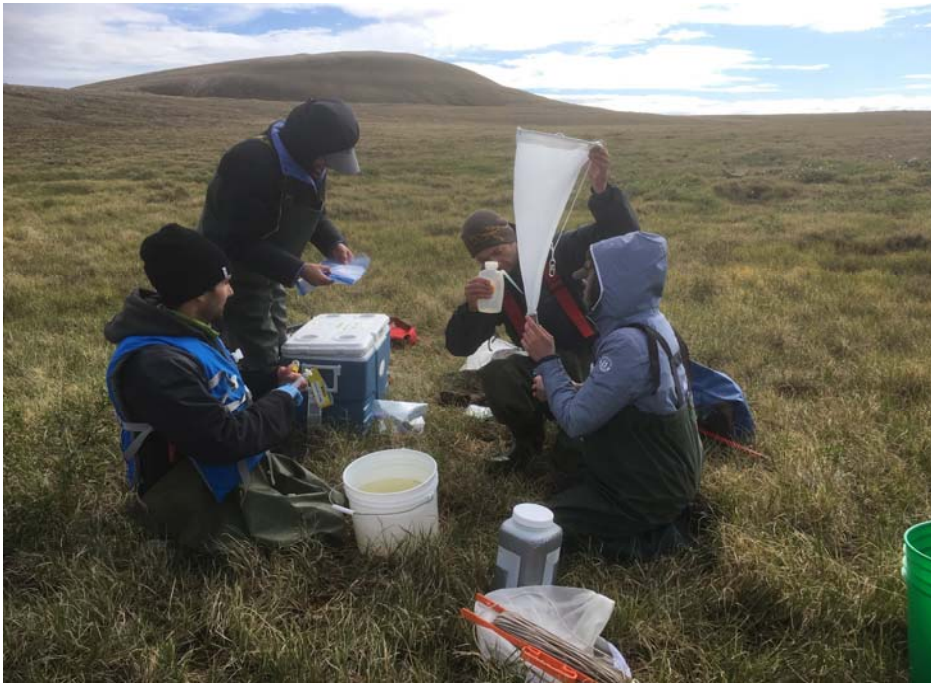


Fig. 2 Ooktootaoyut



Fig. 3 Ooktoktaoyut tahikat.





Fig. 4. Naonaiyakvikmi havaagiyavut.



Fig. 5. Kovyiktokhoto.



Fig. 6. Okiomi, topikhimavaktogot hikomi naonaiyagomayaptikni nalianni tattini hikop ataaniitonik.



Fig. 7. Ooktoghimangmiyakot naonaiyagahoakhogo Ekaluktutiaq tahiani Esitakvikmi 2018-mi.



## Naonaigotit

Hivoliit naonaiktavut 2018-mi takoogitjotiptikni takoghaovut tattit anggiyut tahikanit alanggitkiyaoyoonniktut. Honavaoit tahikani naovaktut amigaitkiyaoyot tahingnit. Komagovaloit nelittoghaktaohimayut aklilaagotitigot knggonmot. Tamaita amiktilaanggit 75-goyut omayovaloik naonaiktavut tattini tahikanilo, CBL malgok amigainnighaoyut 41-goplotik naonaiktavut).

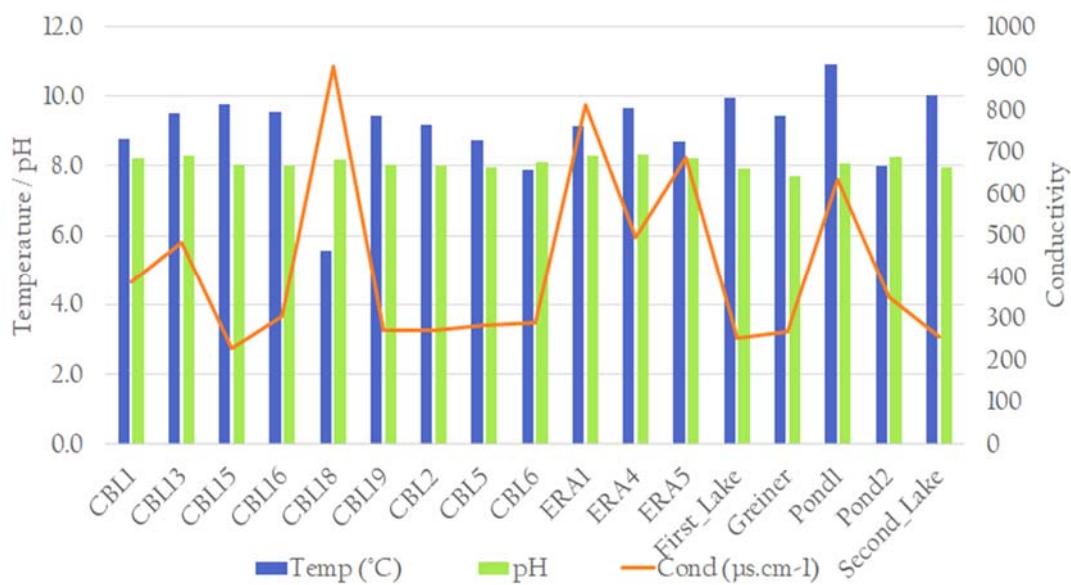


Fig. 8. Ikkiiknaknigit, ooktomiyavut 17-nik tahiknik.

Table 2. Ititilaaginnik tattit naonaiyaotit.

Lake	SUVA l.mg C <sup>-1</sup> .m <sup>-1</sup>	a320 m <sup>-1</sup>	DIC mg.l <sup>-1</sup>	DOC mg.l <sup>-1</sup>	TN mg.l <sup>-1</sup>	TP mg.l <sup>-1</sup>
CBL1	2.34	6.60	24.50	4.20	0.34	0.01
CBL13	0.95	3.17	30.50	4.00	0.41	0.01
CBL15	1.69	4.45	20.20	4.30	0.37	0.01
CBL16	1.67	5.11	22.00	5.50	0.42	0.01
CBL18 (pond)	2.00	20.42	39.60	17.20	1.17	0.01
CBL19	2.41	7.49	16.30	4.20	0.33	0.01
CBL2	2.47	7.08	16.40	4.20	0.31	0.01
CBL5	1.87	4.29	17.90	3.90	0.34	0.01
CBL6	1.55	3.82	18.50	4.30	0.31	0.01
ERA1	4.55	19.57	36.00	6.90	0.49	0.01
ERA4	1.57	5.00	31.80	6.00	0.44	0.01
ERA5	2.32	13.82	38.00	9.90	0.94	0.03
First Lake	2.33	6.57	15.50	4.20	0.33	0.01
Greiner	1.34	8.56	16.80	6.10	0.83	0.01
Pond1	2.04	26.04	36.20	19.70	1.18	0.01
Pond2	1.93	16.44	39.50	14.50	0.94	0.01
Second Lake	2.46	7.44	15.10	4.30	0.33	0.01

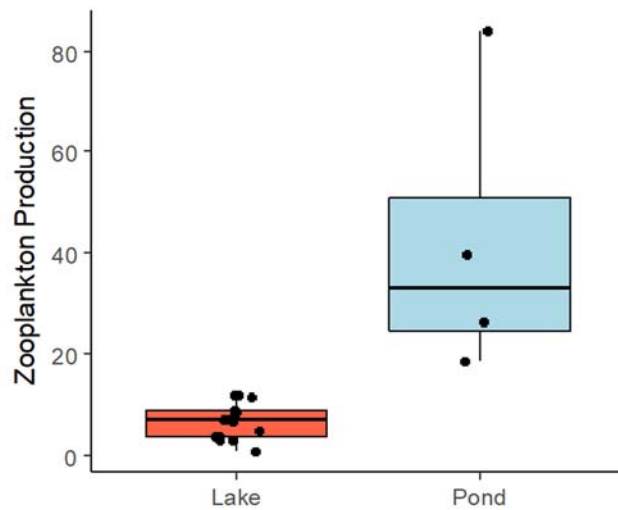


Fig. 9. Honavaloignaovagiaghainik tattit tahikallo naonaiyaivakmiyogot.

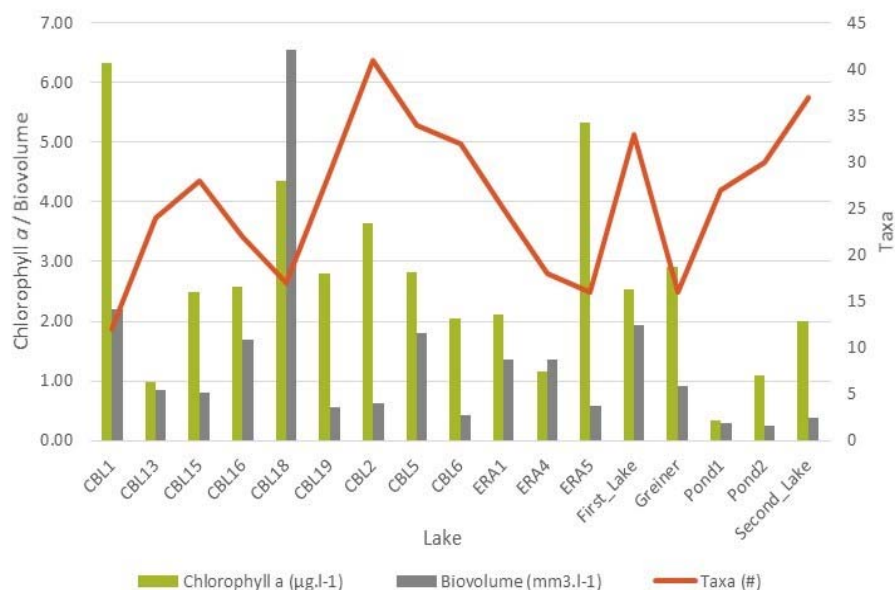


Fig. 10. Kaffioktilaaginnik omayovaloit tattini tahikkaniklo 17-ni naonaiyaihimagmiyogut.

### Tohaktitjotigiyavut Elihimayaoyotigot

Hivoagot naonaigotigiyavut tohaktitjotigiyavut okioktaktomi nunalingnut. Malgoknik onipkaagijotikakhota aipaagotoagaagat miitiktitivaotiptikni Kolaisimavik atoktillogo 2018-mi Atoami. Ataohik onipkaagoplani ataohiklo nivigayuk takoyaghak naonaigotighak talvalo elittogipkaijotaokmiyuk GRIL-kotigot katimaviktoagotaani March 2019-mi. Talgoktaokt titigakhimagiplotik.

Malgok Inuinnaak angnagotik pikataohimagmiyuk UQAC-mi May 2018-mi elihatiagomaplotik naonaktoligiyit havaagivagainik. Nivinggayut takoyaghat naonaigotighaoplotik nomiktitihiyayut Inuinnaktut onipkaagiyaoyoghanik *Ekaluktutiakmionut*. Nivinggayut takoyaghat hanakihimayutmalikhogit pitkohimayait Ekaluktutiap Anggonahoakatoligiyiinit HTO-koginnit kanoktot onipkaagiyaonighaagot takopkaktitaonighaagollo naonaiyaktaohimajotigiyaitigot apighootaoyaagani Ekaluktutiamionit.



## Takooginiakhimakmiyut 2019-mi

Tattit Ekaluktutiami takooktaoniaktut naonaiyaktaolotik aoyami, okiaghamilo okiokkallo 2019-mi. 25 tattit takooktaoniaktut naonaiyaktaolotik. Hapkoa tattit tahikallo takooktaongakhimanggitut elittoghagahoaklogit. Naonaiyakhimmaakniakmiyakut Ekaluktutuiak tahik ovalo Ekaluktutiami tahivaloit amigaitot, tiliyaohimagapta Ekaluktutiap HTO-koinnit.



Fig. 10. Nunaoyami naonaitiagotighak tattit takooktaohimayot 2019.

Nakooyot Nakoovalagittolloniit oghot okioktaktomi  
nikaoyonik: oghingonaktot oghot nikigiyaoyoni  
ekaloknilo enongnollo

GOOD AND BAD FATS IN ARCTIC FOOD WEBS: FATTY ACID SOURCES AND  
STOCKS FROM PLANKTON TO FISH AND PEOPLE

*Guillaume Grosbois, Sarah Amaudrut, Paola Ayala, Milla Rautio*

Université du Québec à Chicoutimi



Polar Knowledge  
Canada

Savoir polaire  
Canada



Chaires  
de recherche  
du Canada

Canada  
Research  
Chairs



NSERC CREATE training program  
in Lake and Fluvial Ecology



**NSERC  
CRSNG**

**UQAC**  
Université du Québec  
à Chicoutimi



Groupe de recherche  
interuniversitaire en limnologie  
et en environnement aquatique

**Canada**

Designed by Elise Imbeau  
[eliseimbeau@outlook.com](mailto:eliseimbeau@outlook.com)