



New

## Scientific Research

**Λϙ⋈ϑ<sup>5</sup>PLϑ<sup>5</sup>b:**

Mark Skidmore  
Montana State University  
Department of Earth Sciences, 226 Traphagen Hall  
Bozeman Montana 59717  
United States  
ℳ<sup>5</sup>i⋈ℳ<sup>c</sup>: 406 994 7251. ϑbϑ<sup>b</sup>d<sup>c</sup>:

$\epsilon_b \Delta^c \dot{\bar{O}}_n \sigma^b \wedge c_n d\epsilon^f b^g d n d^a l^a \sigma^b$

The research team from Montana State University and the University of Texas at Austin including a graduate student, are proposing a project that would conduct a radar survey of the glaciers of the Devon Ice Cap with a focus on Sverdrup Glacier and the summit region. The aerial survey of part of the Devon Ice Cap would use a radar instrument mounted on a helicopter. The survey would be based out of Grise Fiord with the helicopter and personnel returning to the community at the end of each survey day. We anticipate the aerial survey of the Devon Ice Cap would involve 7 to 10 days of survey flights. All personnel would stay in accommodation in Grise Fiord. There would be no field camps associated with this project. The radar survey would provide information on properties of the Devon Ice Cap glaciers with a focus on Sverdrup Glacier and summit region. The survey would provide information on ice thickness, the shape of the glacier bed and the location of water beneath the ice. This data would improve understanding of the way water flows beneath the ice cap and how this might relate to the speed of ice flow. Results from the research would be shared with the communities of Grise Fiord and Resolute Bay and the Nunavut Research Institute. The project would begin at the Polar Continental Shelf Program facility near Resolute Bay, where the radar instruments would be installed on the helicopter. Test flights would be flown from the Polar Continental Shelf Program facility surveying a glacier on southern Devon Island, west of Maxwell Bay before the team transits to Grise Fiord for the scientific survey of the Devon Ice Cap. We anticipate 1 to 3 days of test survey flights. The survey team would transit back to the Polar Continental Shelf Program facility to disassemble the survey system following the scientific survey. The planned research would take place during the period from mid-April to mid-June 2023.

ᐅᐃᐱᑎᓚ: Des chercheurs et un doctorant de l'Université d'État du Montana et de l'Université du Texas à Austin, proposent d'effectuer un relevé radar des glaciers de la calotte glaciaire Devon, en particulier du glacier Sverdrup et de la région sommitale. Le relevé aérien d'une partie de la calotte glaciaire Devon utiliserait un instrument radar héliporté. L'équipe aurait pour camp de base la communauté de Grise Fiord où l'hélicoptère et le personnel retourneraient à la fin de chaque journée de travail. Nous prévoyons que l'étude aérienne de la calotte glaciaire Devon nécessitera de 7 à 10 jours de vols. Tout le personnel sera hébergé à Grise Fiord. Il n'y aura pas de camps de terrain associés à ce projet. Le relevé radar fournira des informations sur les propriétés des glaciers de la calotte glaciaire Devon, en particulier sur le glacier Sverdrup et de la région sommitale. L'étude fournira des informations sur l'épaisseur de la glace, la forme du lit du glacier et l'hydrologie sous-glaciaire. Ces données permettront de mieux comprendre la façon dont l'eau s'écoule sous la calotte glaciaire et le lien avec la vitesse d'écoulement de la glace. Les résultats de la recherche seront partagés avec les communautés de Grise Fiord et de Resolute Bay et avec l'Institut de recherche du Nunavut. Le projet débiterait dans les infrastructures du Polar Continental Shelf Program, près de Resolute Bay, où les instruments radar seront installés sur l'hélicoptère. Des vols d'essai seront effectués à partir du Polar Continental Shelf Program'' pour observer un glacier dans le sud de l'île Devon, à l'ouest de la baie Maxwell, avant que l'équipe ne se rende à Grise Fiord pour effectuer le relevé scientifique de la calotte glaciaire Devon. Nous prévoyons 1 à 3 jours de vols d'essai. L'équipe retournera aux installations du Polar Continental Shelf Program pour désassembler le système radar de l'hélicoptère une fois le relevé terminé. Les recherches prévues se dérouleront de la mi-avril à la mi-juin 2023.

[illegible]

Operations Phase: from 2023-04-16 to 2023-06-16

$\Lambda \subset \mathbb{N} \triangleleft \mathbb{N} \xrightarrow{\sigma} \mathbb{Q}^6 \supset C$

[illegible]

$\Delta_{\sigma} \subset \Delta_C$

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ᐱᐅᑎᐱᑕᑐᖅ	Daniel	North Inn	2022-12-12
ᖅᓃᐅᑎᐱᑕᑐᖅ ᐱᓴᓂᑕ	Ian Dudla	Municipality of Resolute Bay	2022-05-26
ᐱᐅᑎᐱᑕᑐᖅ	Etuk	Siku Services	2023-02-10
ᖅᓃᐅᑎᐱᑕᑐᖅ ᐱᓴᓂᑕ	Chantell	ATCO	2023-02-10
ᖅᓃᐅᑎᐱᑕᑐᖅ ᐱᓴᓂᑕ	Nancy Amarualik	Resolute Bay Hunters and Trappers Association	2022-05-26
ᐱᐅᑎᐱᑕᑐᖅ	Iviq Hunters and Trappers Organisation	Iviq Hunters and Trappers Organisation	2023-02-24
ᖅᓃᐅᑎᐱᑕᑐᖅ ᐱᓴᓂᑕ	Nancy Amarualik	Resolute Bay Hunters and Trappers Association	2023-02-24

[illegible]

$a^{\dagger}r d^{\alpha} r^{\alpha} \sigma^b$   $\Lambda_{\tau} n d n^e \Delta D \sigma d^{\beta b} J^c$   $n n \zeta^{\gamma} \omega^c:$

North Baffin

[illegible][illegible]

### Project transportation types

Transportation Type	Route	Length of Use
Air	Transiting from Resolute to Grise Fiord	

### Project accomodation types

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Λ<sup>9</sup>δ<sup>c</sup> Δ<sup>9</sup>ρ<sup>2</sup>ζ<sup>5</sup> Δ<sup>9</sup>CDσ<sup>2</sup>Δ<sup>2</sup>ζ<sup>5</sup> Δ<sup>c</sup>ζ<sup>5</sup>ρ<sup>2</sup>Π<sup>2</sup>ρ<sup>c</sup> Δ<sup>j</sup>CD<sup>c</sup>, Γ<sup>c</sup>Δ<sup>2</sup>Π<sup>c</sup>, ζ<sup>5</sup>ζ<sup>5</sup>CD<sup>j</sup>ζ<sup>5</sup>, με<sup>2</sup>ρ<sup>c</sup> Δ<sup>2</sup>ρ<sup>c</sup>Δ<sup>2</sup>

በበፍጥረቱ ምሳሌ ለፍጥነቱ ምሳሌ ለፍጥነቱ ምሳሌ

ΔL<sup>96</sup> ΔC<sup>96</sup> CΔ<sup>96</sup> ΔL<sup>96</sup> ΔC<sup>96</sup>

ᐃᑦ ᑕᐱᑦ ᐱᐃᑦ ᑕᐃᑦ ᑕᐃᑦ ᑕᐃᑦ	ᑦᐃᑦ ᐃᑦ ᑕᐃᑦ ᑕᐃᑦ ᑕᐃᑦ ᑕᐃᑦ	ᐃᑦ ᐃᑦ ᑕᐃᑦ ᑕᐃᑦ ᑕᐃᑦ ᑕᐃᑦ
0	No water retrieval, since no camp and no water use	No water retrieval, since no camp and no water use

$\triangleleft^b C d^c$ 
$$\Delta^b C d_c n_\sigma \Delta^a \sigma^a$$

Fuel and chemical storage	Other, Fuel barrels	Thirty five barrels total for the project	Empty barrels would be returned to PCSP in Resolute Bay	N/A

4<sup>a</sup> 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1

The project has no field camp and would have no water use and would not generate solid, liquid or hazardous waste. The project involves caching fuel and helicopter refueling using that fuel. We would employ mitigation measures to prevent and reduce any impact of a spill. Fuel caching would occur in established locations at Gascoyne Inlet and Truelove Lowlands and fuel drums at those locations would be placed within containment berms. The fuel would be staged in increments to limit the amount of fuel at a cache. As fuel is used, new barrels would be flown out in replacement, with the empty barrels being removed and returned to Resolute Bay. We are aware of the requirements to notify CIRNAC within 30 days of establishing a fuel cache and would send the appropriate information on the fuel caches to the general CIRNAC land administration email: [landsmining@rcaanc-cirnac.gc.ca](mailto:landsmining@rcaanc-cirnac.gc.ca). Helicopter refueling at the fuel caches would follow standard industry procedures implemented by Canadian Helicopters, who also carry spill kits on the helicopters, in the case of a fuel spill. We are aware of the requirements regarding fuel spillage reporting, should one occur and would follow the guidance as outlined at <https://www.gov.nu.ca/environment/documents/spill-response>. All fuel barrels would be returned to PCSP in Resolute Bay following fieldwork.



# **Additional Information**

**SECTION A1: Project Info**

**SECTION A2: Allweather Road**

**SECTION A3: Winter Road**

**SECTION B1: Project Info**

**SECTION B2: Exploration Activity**

**SECTION B3: Geosciences**

**SECTION B4: Drilling**

**SECTION B5: Stripping**

**SECTION B6: Underground Activity**

**SECTION B7: Waste Rock**

**SECTION B8: Stockpiles**

**SECTION B9: Mine Development**

**SECTION B10: Geology**

**SECTION B11: Mine**

**SECTION B12: Mill**

**SECTION C1: Pits**

**SECTION D1: Facility**

**SECTION D2: Facility Construction**

**SECTION D3: Facility Operation**

**SECTION D4: Vessel Use**

**SECTION E1: Offshore Survey**

**SECTION E2: Nearshore Survey**

**SECTION E3: Vessel Use**

## SECTION F1: Site Cleanup

## SECTION G1: Well Authorization

## SECTION G2: Onland Exploration

## SECTION G3: Offshore Exploration

## SECTION G4: Rig

## SECTION H1: Vessel Use

## SECTION H2: Disposal At Sea

## SECTION 11: Municipal Development

[illegible]

The fuel caching location at Truelove Lowlands is at a well-established site using for caching fuel, the former site of the Arctic Institute of North America field camp. There is an existing airstrip at this location. The fuel caching location at Gascoyne Inlet is at a well-established site for caching fuel, for the field camp for Defence Research and Development Canada. There is an existing airstrip at this location. The survey region of the Devon Ice Cap is between 75 and 140 km away from the closest community, Grise Fiord. The test survey region on the glacier west of Maxwell Bay is 150 km away from the closest community, Resolute Bay.

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There is no vegetation on the Devon ice cap or glacier to the west of Maxwell Bay that would be surveyed from the helicopter. It is possible that animals may migrate across the Devon ice cap or this glacier but these locations are not known animal migration corridors.

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The fuel caching location at Truelove Lowlands is 95 km away from the closest community, Grise Fiord. The survey region of the Devon Ice Cap is between 75 and 140 km away from the closest community, Grise Fiord. The fuel caching location at Gascoyne Inlet is 100 km away from the closest community, Resolute Bay. The test survey region on the glacier west of Maxwell Bay is 150 km away from the closest community, Resolute Bay.

### Miscellaneous Project Information

Not applicable

[illegible]

The scientific research project would have a positive economic benefit for the local communities as it would rely upon local services in Grise Fiord; including lodging at the Grise Fiord Lodge - Inns North, some supplies from the Co-op and aviation fuel through Siku Services and in Resolute Bay, aviation fuel through ATCO. The optimal elevation for the radar survey of the Devon Ice Cap and glacier to the west of Maxwell Bay would involve the helicopter flying at an elevation of 1600 feet above the ice surface.

The ground level noise from the helicopter flying at this elevation would be limited and thus would have a minimal impact on any wildlife if they were on the ice surface. However, to mitigate the impact of helicopter noise on wildlife, if animals were observed on the ice surface on a given day, then the survey location for that day would be changed to move away from the location of the animal(s). Fuel caching would occur in established locations at Gascoyne Inlet and Truelove Lowlands, where there are existing airstrips. The fuel drums at those locations would be placed within containment berms. The fuel would be staged in increments at Truelove Lowlands and as fuel is used, new barrels would be flown out in replacement, with the empty barrels being removed and returned to Resolute Bay. Helicopter refueling at the fuel caches would follow standard industry procedures implemented by Canadian Helicopters, who also carry spill kits on the helicopters, in case of a fuel spill. All fuel barrels would be returned to PCSP in Resolute Bay following fieldwork. The footprint of the berm for the fuel cache at each location would be small (10' x 15') but the fuel cache may result in some minor compaction of the soil and vegetation beneath. This impact would be limited due to the relatively short duration for the fuel cache and the likelihood that the ground would be frozen during this time. Caching fuel and refueling the helicopter would produce minor and short-term elevated noise levels at the fuel caching location when aircraft land and take-off. This effect is mitigated by the infrequent and short duration of these noise disturbances.

### **Cumulative Effects**

No cumulative effects are anticipated.

## Impacts

$\mathcal{L}(\mathcal{A}) \subseteq \mathcal{L}(\mathcal{B})$     $\mathcal{L}(\mathcal{A}) \cap \mathcal{L}(\mathcal{B}) = \mathcal{L}(\mathcal{A})$     $\mathcal{L}(\mathcal{A}) \cup \mathcal{L}(\mathcal{B}) = \mathcal{L}(\mathcal{B})$

[illegible]
$$(P = \langle b \rangle_{\mathcal{A}} \mathcal{P} \cap \mathcal{V}^{\mathcal{A}} \mathcal{Q}^{\mathcal{B}})^{\mathcal{C}}, N = \langle b \rangle_{\mathcal{B}} \mathcal{P}' \mathcal{V} \langle \mathcal{D} \mathcal{V}^{\mathcal{A}} \mathcal{Q}^{\mathcal{B}} \rangle^{\mathcal{C}} \langle \mathcal{C} \mathcal{D} \mathcal{F}' \mathcal{V} \mathcal{P}' \mathcal{B} \rangle^{\mathcal{B}} \langle \mathcal{D} \mathcal{V}^{\mathcal{A}} \mathcal{Q}^{\mathcal{B}} \mathcal{F}' \rangle^{\mathcal{C}} \rhd, M = \langle b \rangle_{\mathcal{B}} \mathcal{P}' \mathcal{V} \langle \mathcal{D} \mathcal{V}^{\mathcal{A}} \mathcal{Q}^{\mathcal{B}} \rangle^{\mathcal{C}} \langle \mathcal{C} \mathcal{D} \mathcal{F}' \mathcal{V} \mathcal{P}' \mathcal{B} \rangle^{\mathcal{B}} \langle \mathcal{D} \mathcal{V}^{\mathcal{A}} \mathcal{Q}^{\mathcal{B}} \rangle^{\mathcal{C}} \rhd, U = \mathcal{B} \mathcal{D} \mathcal{P} \mathcal{L}^{\mathcal{A}} \mathcal{Q}^{\mathcal{B}} \mathcal{F}' \mathcal{C} \rangle^{\mathcal{B}})$$

1	polygon	Devon Ice Cap survey region
2	polygon	Test flight region: glacier ice west of Maxwell Bay
3	point	Gascoyne Inlet - Fuel Cache
4	point	Truelove Lowlands - Fuel Cache

- |   |         |   |
|---|---------|---|
| 1 | polygon | Devon Ice Cap survey region                         |
| 2 | polygon | Test flight region: glacier ice west of Maxwell Bay |
| 3 | point   | Gascoyne Inlet - Fuel Cache                         |
| 4 | point   | Truelove Lowlands - Fuel Cache                      |

