SUPPLEMENTAL MATERIAL

Challenge	Mitigation Strategy	Successful?
Recovery of instrumentation		
Iceberg capsize: loss of instrumentation	Site selection (iceberg): stable water line	Yes
Iceberg tilting: instrument slip/loss of instrumentation	Site selection (iceberg): stable water line	Yes
Iceberg deterioration (fracture)	Site selection (iceberg): minimal undercutting at water line, no big cracks visible, or obvious locations of weakness that would result in a sizable change in the center of mass location	Yes
Iceberg deterioration (grounding)	Site selection (bathymetry): prior to the field campaign, track the movement and preferred fjord locations of all prospective large icebergs. Exclude any that are near shallow regions in the fjord bathymetry (using bathymetric map).	Yes
Iceberg deterioration (wave erosion)	Site selection (fjord): minimize the possibility of the iceberg traveling beyond the fjord, where wave erosion is high. Consider only icebergs in the upper part of the fjord during the deployment period. Use prior variability in location to exclude quickly transiting icebergs.	Yes
Helicopter cannot land (location)	Site selection (fjord): minimize the possibility of the iceberg traveling to the open ocean, where winds are greater, poor weather can persist more easily, and wave action can rock the iceberg more freely. Consider only icebergs in the upper part of the fjord during the deployment period. Use prior variability in location to exclude quickly transiting icebergs.	Yes
Helicopter cannot land (surface conditions)	Site selection (iceberg): minimize the possibility of tail clip by selecting an iceberg with relatively flat surface topography	Yes
Unable to locate iceberg	Instrumentation: install an expendable GPS adjacent to the ApRES system, relaying hourly position to an online server. Coordinate communication with team members able to access the internet and relay positions to the field team.	Yes
Data processing and interpretation		
Instrument slip: inconsistent survey	Installation (set up): securing antennas to icebergs via climbing slings and 10" ice screws	Partially
Surface melt/Meltwater pooling	Site selection (iceberg): deploying ApRES system on a local topographic high of the iceberg to enable meltwater to flow away from the system Installation (set up): Mount antennas on wooden 2x2s to decrease the heat capacity of the material in contact with the ice, to minimize melting in of the antennas and meltwater pooling	Partially
Inconsistent iceberg environments: iceberg grounding, iceberg moving to different environments (out of fjord, wave erosion)	Site selection (fjord): minimize the possibility of the iceberg traveling to the open ocean or becoming grounded by increasing the travel distance to the ocean and avoiding icebergs near shallow fjord bathymetry	Yes
Overlapping off-nadir and at nadir returns	Site selection (iceberg): select iceberg with rectangular surface geometry and seemingly straight/ perpendicular sidewall geometry (no subsurface foot visible) Installation (location): Install ApRES off-center, to maximize the potential of individual sidewall and basal returns	Partially
Battery failure due to being on the surface: cold, moisture	Instrumentation: Secure the car battery within a thermally insulated and waterproof enclosure, affixing it to the iceberg using a climbing sling and ice screw.	Yes
Validation of findings by independent methods		
Lack of independent validation	Instrumentation: ensure equipment is operational for on-iceberg and ship-based independent measurements (geodetic GPS, drone, multibeam sonar, and CTD)	Yes
Incomplete/inconclusive in situ validation surveys	Site selection (fjord): deploy system on iceberg with ship accessibility, ensuring the ship can sail to the iceberg (distance) and complete a circumnavigation survey (minimal-no adjacent icebergs/sea ice)	Yes

Table S1. Projected challenges in on-iceberg ApRES deployment, data processing, and analysis, and the field strategies employed to mitigate each challenge. Additional considerations to the proposed strategies were the constraints of a <15 min on-iceberg installation window, the cargo capacity of the helicopter, and minimal reconnaissance helicopter flying time.

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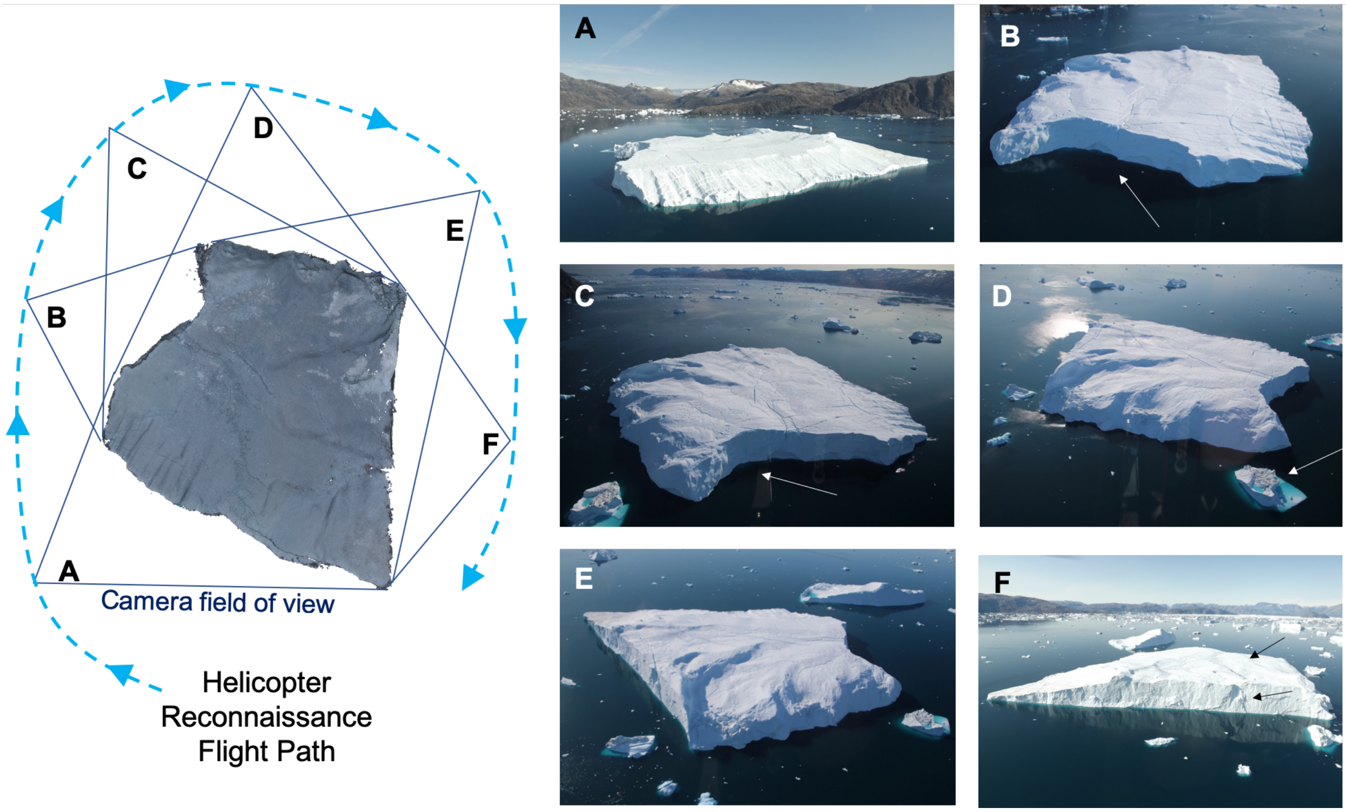

Fig. S1. Reconnaissance photos of Iceberg SF0419 (a-e) with arrows highlighting features of consideration during the reconnaissance flight. Also noted in the inset figure are the field of view for each photo (solid dark blue line) and helicopter flight path (dashed light blue line). White arrows identify locations where challenges in either the recovery of instrumentation or data processing and validation may be introduced. Iceberg SF0419 was chosen because there was no visible submerged toe (c) as can be seen in an adjacent iceberg (d), minimal erosion and no visible tilting at the waterline (b), no evidence of potential surface fractures penetrating through the iceberg (f, black arrows), and the iceberg was large enough in size for a helicopter landing and in the desirable location in the fjord.