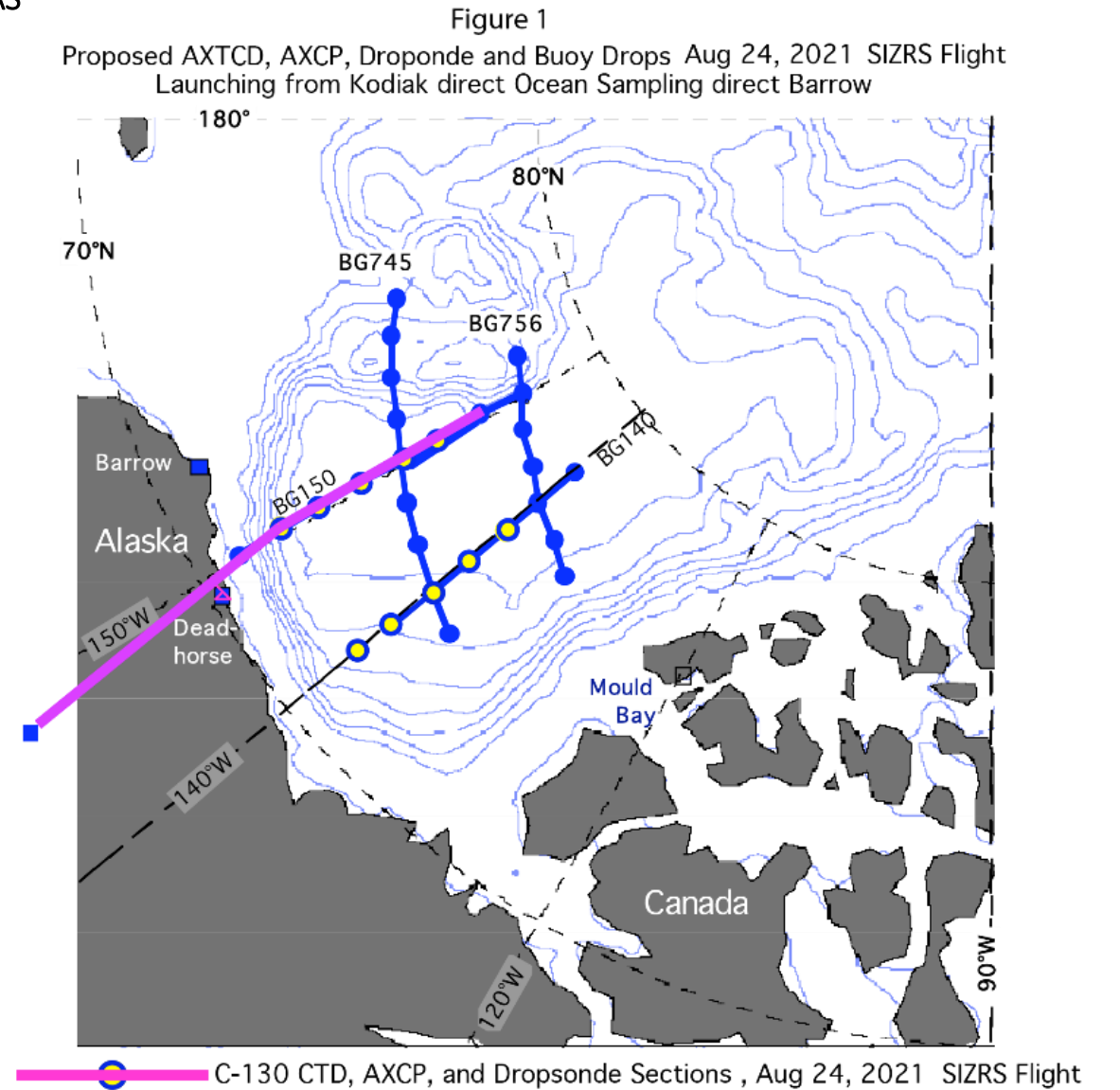


NAVY/NSF SCOAR Meeting Aug. 23, 2021
Update on USCG Aircraft Research
Phil McGillivary, USCG PACAREA Science Liaison
Philip.a.mcgillivary@uscg.mil / pmcgillivary@gmail.com



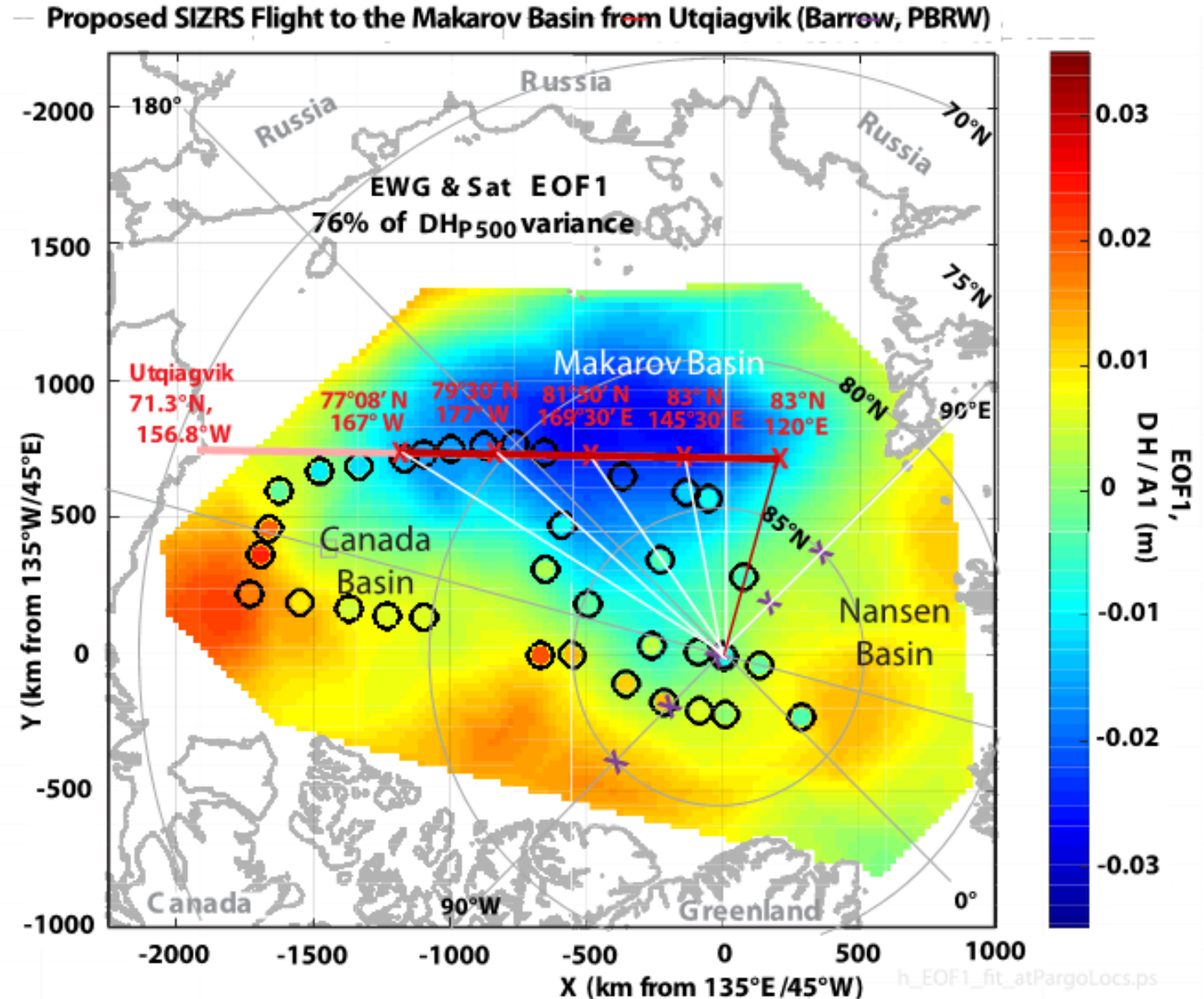
CG Icebreaker HEALY

- Univ. Washington ONR SIZRS program resumed in June 2021, and was scheduled for another flight in July, but C130s were needed for other unplanned event response, however flights will resume in August 24 on the SIZRS 150oW link.

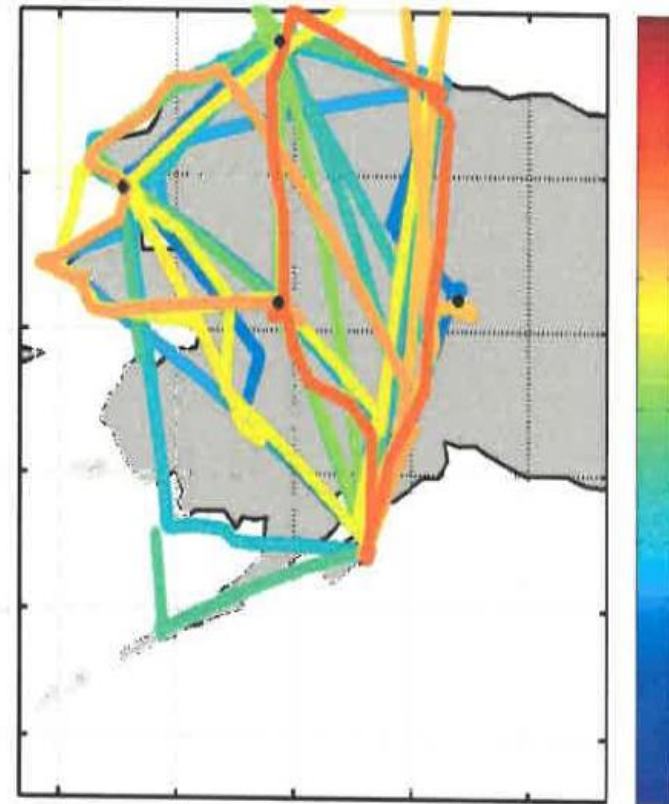


Aug 24, 2021 Flight with ocean stations at:
N72°, 150°W; N73°, 150°W; N74°, 150°W; N75°, 150°W; N76°, 150°W; N77°, 150°W
AXCTD and AXCP drops from 200' to 500' at N72° to N77°
Dropsonde sampling along 150°W from 10,000 feet, 155 KIAS at N77° to N72° southbound
AXCTD/AXCP/Dropsnde launch through paratrooper door,

- On Aug. 25 a CG C130 will go on its first flight into the Makarov Basin after an RON in Barrow/Utqiagvik for the UW ONR funded Arctic Ocean project. Jamie Morison said: "I'm really happy to get a chance to get back to the center of variability for the first time since PARGO 1993."



- NOAA's CG C130 Arctic Atmospheric Gas Sampling program, managed by Colm Sweeney, was on hiatus in 2020 due to both covid and also the transition from CG C130-H to C-130-J aircraft, which required some hardware modifications. However the program is scheduled to resume this year, with flight paths similar to those below on right.



- Russian military exercise held for the first time in the recent history of the Pacific Fleet in the central part of the Pacific Ocean off Hawaii in June 2021, including 20 ships, a sub, and support vessels, as well as 20 aircraft, including long range anti-sub aircraft, MIGs, anti-sub and rescue helos. The exercise fleet approached within 20-30 miles of the coast of Hawaii.
- Navy & CG vessels responded: CG ScanEagles sent still images to Navy ship.



Russian Destroyer ADM PANTALEYEV



KA-27-LP Helix anti-submarine helo

- CG has also been using ScanEagles routinely since August of 2020 for anti-IUU monitoring efforts, such as those involving the Chinese squid fleet in the Galapagos, which will resume this year as well. (In 2020 no Chinese vessels were confirmed as conducting IUU fishing, but that may have been because they moved out of Galapagos EEZ when they learned a CG vessel was approaching.)
- Main point is: ScanEagles are now being routinely used for many of USCG's 11 mission areas. However sharing and transmission of still or video data is still limited.

- Currently Link-16 is limited to LoS comms
- In 2019 AFRL funded Viasat to develop a Link-16 capable satellite with mil-grade encryption to support 100MB/sec data streams. The 50-lb mini-satellite, XVI LEO, will launch in fall 2021. After the demo, a wider network will be pursued.
- The Link-16 satellites would allow a ScanEagle UAS (or others) to stream live video to multiple 'partners'.

- XVI sat image



Army contracted with Textron for a One System Remote Video Terminal (OSRVT) and a smaller system, the Soldier Portable OSRVT (SORT) for downlink of UAS video. CG will investigate SORT for small boats or field inspectors to access UAS video/imagery. SORT also allows map annotation and data analysis. So far only one CG cutter has such a system, but funds are being considered for others.



In summer 2021 CG/Navy-NRL/SOUTHCOM joint exercise used Martin UAV V-BAT (below) launched/recovered from a CG ship, testing Detect & Avoid (DAA) software & BVLOS flight.



CG also testing BVLOS & DAA with L3Harris FVR-90 VTOL UAS (left), and Aerovironment PUMA Long Endurance (right) to date testing from land with Cape Cod ATC in advance of later ship testing.

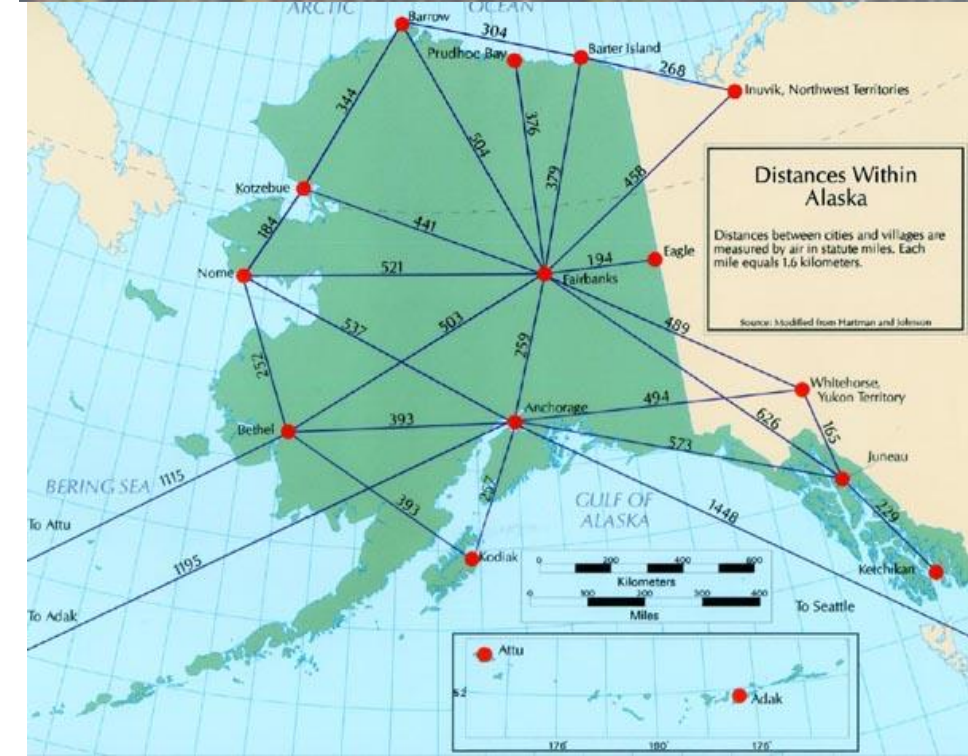


CG participated in joint NIWC tech demo at Port of LA/LB w/ launch & recovery of quadrotor UAS on a moving ASV (a WAM-V, <http://www.wam-v.com>) w/ Planck Aero systems software (<http://planckaero.com>). The companies signed a partnership agreement Aug. 10, 2021.



USCG is responsible for inspecting >300 Alaska oil tanks, many atop melting permafrost; some have already collapsed. It can take the limited CG inspectors up to 3 years to complete inspections due to travel & accommodation issues in remote villages. A DHS-funded program w/ University of Alaska (Dr. Jessica Garron) is testing rotary s-UAS for inspections and SAR ops with trained local operators, starting in Unalakleet Village. The program will be further evaluated at end of year in consideration of providing other villages s-UAS. Lower figure shows that UAF ACUASI SeaHunter UAS could reach all Alaskan oil tanks for more in depth monitoring should an oil spill occur.

Unalakleet Tank Farm



As part of an ONR ICE-PPR (International Collaborative Engagement Program for Polar Research) project with the Coast Guard International Ice Patrol, a project on iceberg tracking will be conducted in Baffin Bay in summer of 2021 that will include use of UAS for mapping icebergs to study their dynamics and drift trajectories to enable better modeling of trajectories for future maritime risk reduction models for shipping concerns.



Future plans include an operational test of four eLORAN transmitters around the Navy's Lake Pend Oreille (Idaho) base to test eLORAN positional accuracy to AUVs, ASVs, and a UAS provided by Chris Zappa. The effort has been included in the current Air Force budget of the Senate Armed Services Committee at a funding level of \$4M for the exercise using eLORANs provided by Hellen Systems, Inc.. The system is expected to transmit through ice to AUVs but unfortunately Lake Pend Oreille no longer freezes, so we are looking to propose a joint project with ICE-PPR colleagues from Norway, Sweden or Finland later this year to accomplish that.



Following Dec. 2020 National Academy report “Leveraging Unmanned Systems for Coast Guard Missions”, (<https://www.nap.edu/catalog/25987/leveraging-unmanned-systems-for-coast-guard-missions>), CG set up a UxS Working Group in Jan. 2021 to implement report recommendations which has met weekly, initially under CG UAS office coordination. In Aug. 2021, a CG CAPT was assigned to produce a Strategy document by fall 2021, followed by an Implementation Plan for all UxS Systems with a CG UxS WG Core Group. These documents will draw on and coordinate with similar Navy and NOAA documents.

