VOLTITUDE

Unlocking the Stratosphere®

Filling the Gaps with Attritable Stratospheric Platforms

Paul Stevens CEO Voltitude Ltd

www.voltitude.co.uk

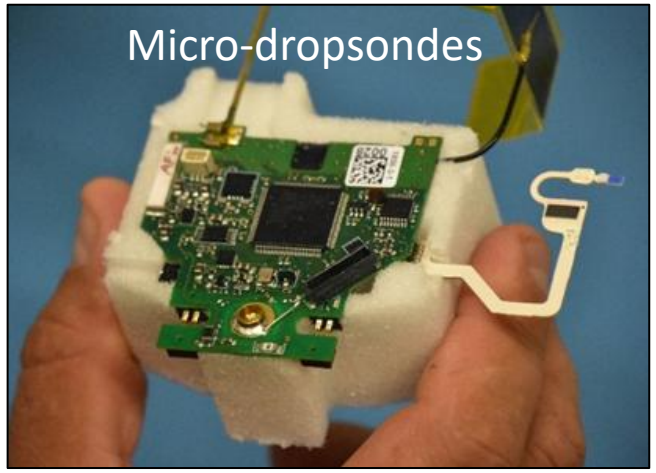
Introducing

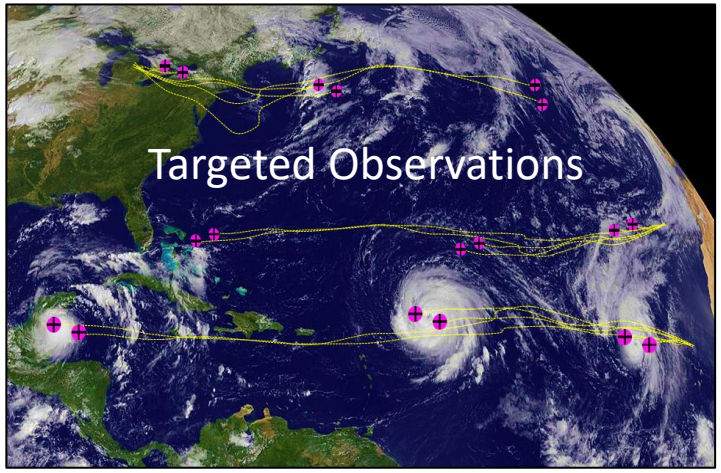
Voltitude Ltd

Unlocking the Stratosphere using fixed wing High Altitude Pseudo Satellites (HAPS) and micro-High-Altitude Balloons (mHAB).

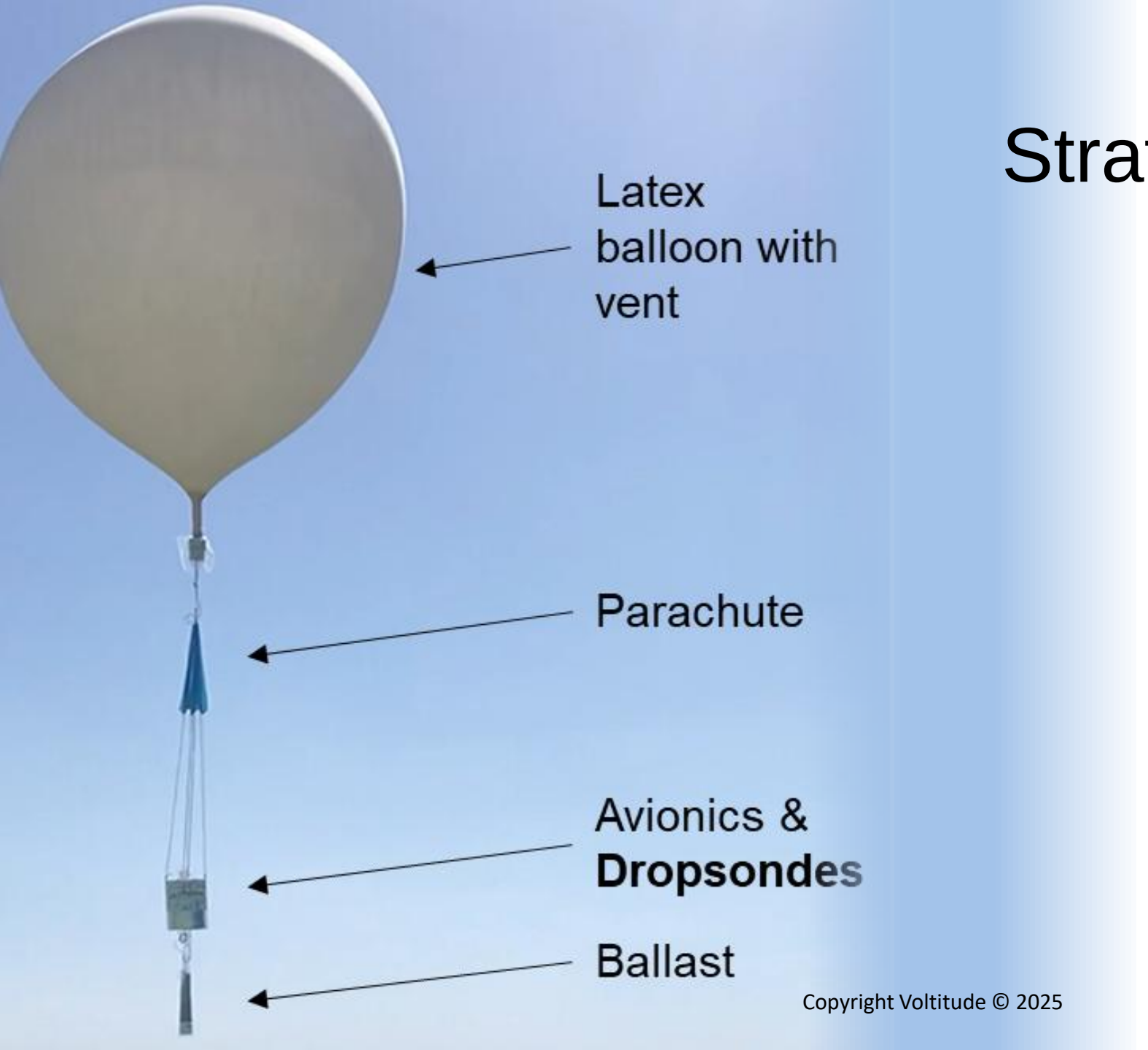
Primary Missions:

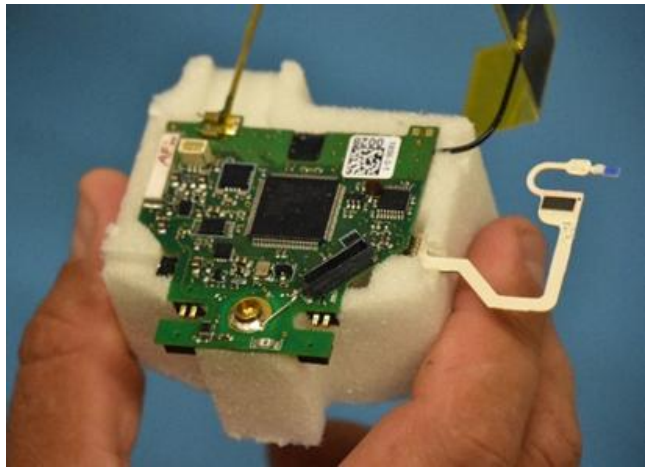
- Targeted meteorological observations over remote regions of the globe.
- Remote sensing from the stratosphere.
- Defense – gap filling ISR capabilities.

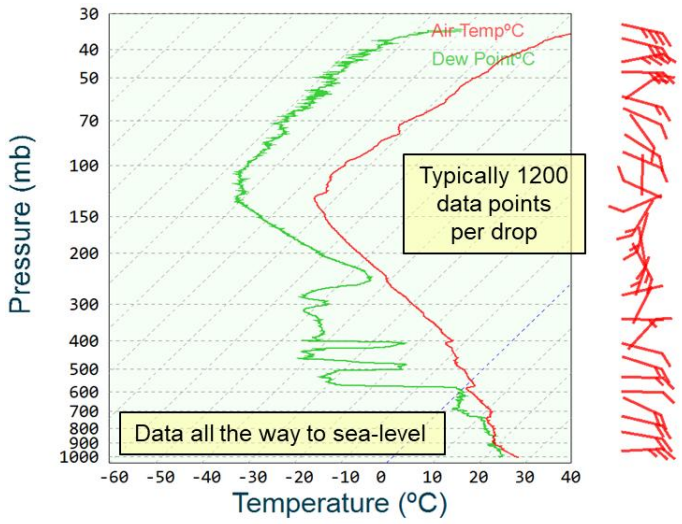




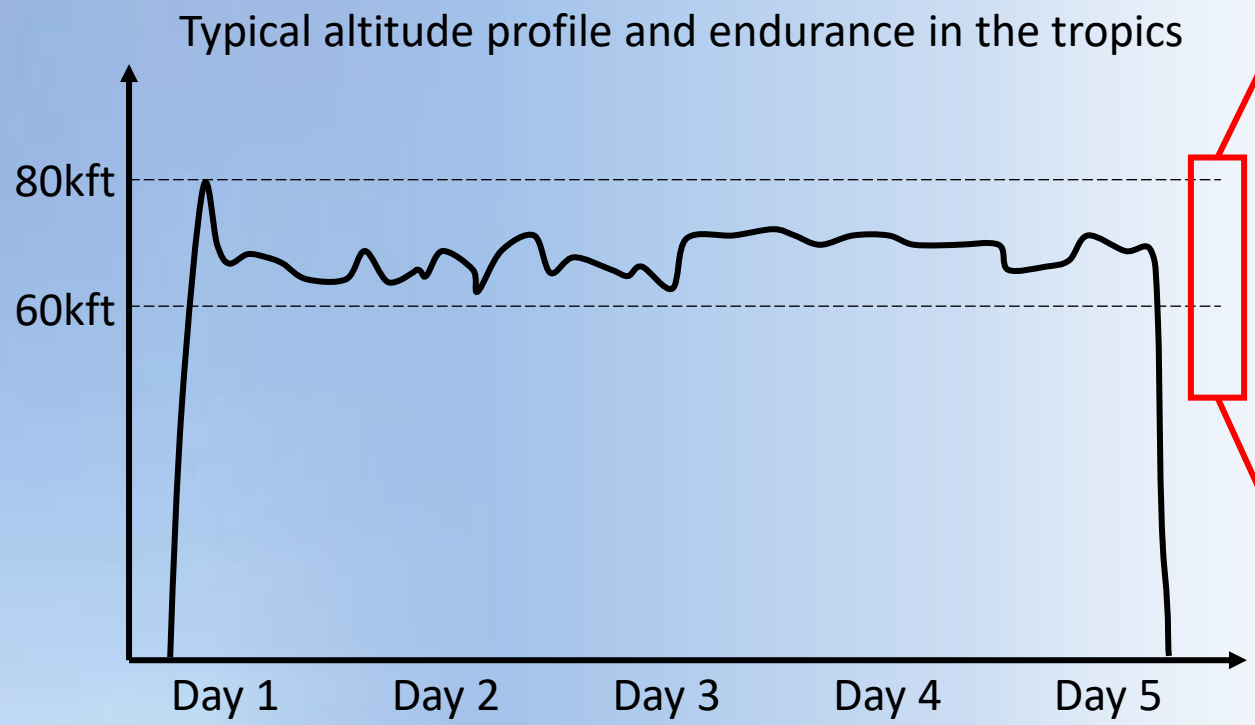
StratoSonde® mHAB

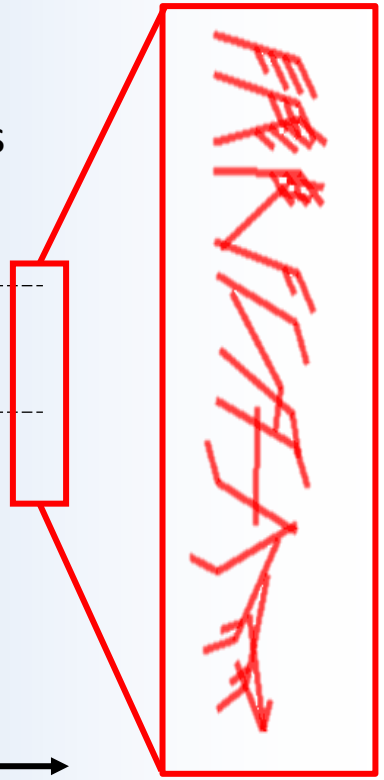






mHAB Navigation





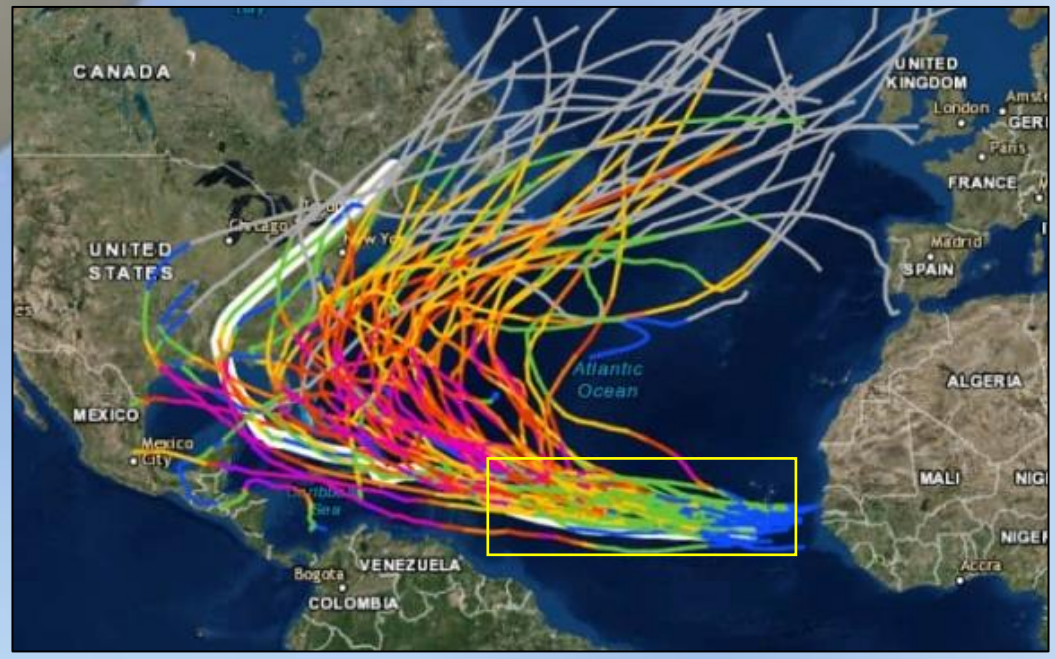
Strong Easterly

Light and variable winds just above the tropopause

Tropospheric winds

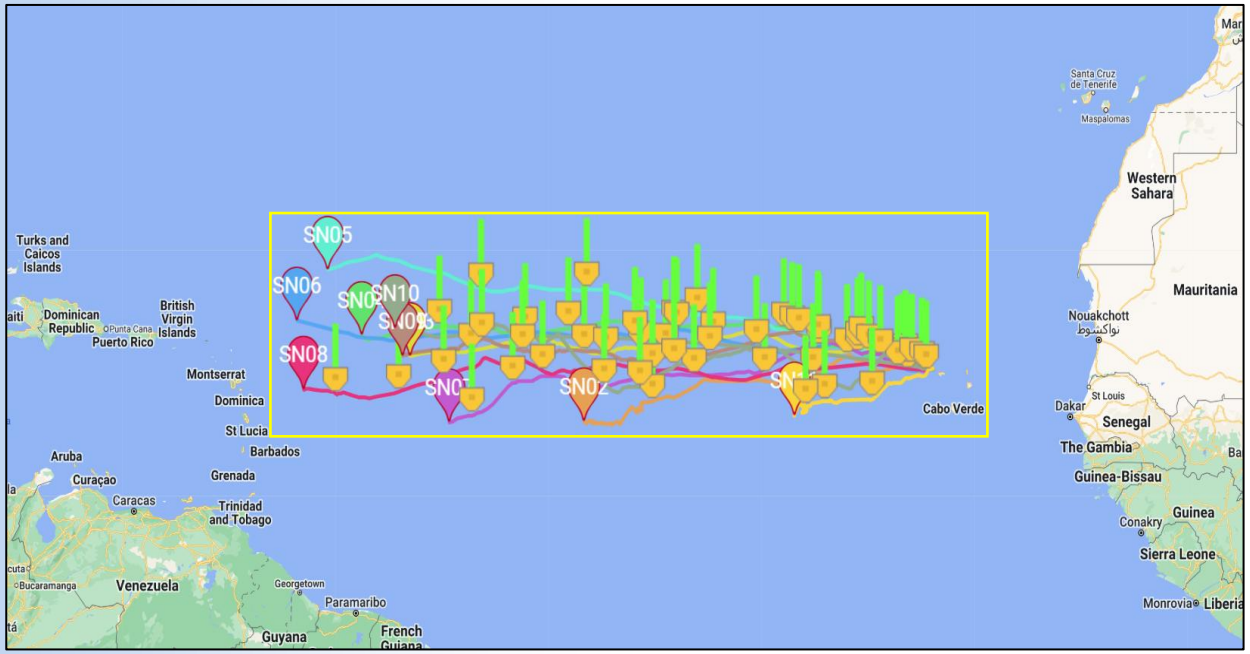
Tropical Cyclone Research

Category 4 and 5 hurricane tracks for the past 50-years



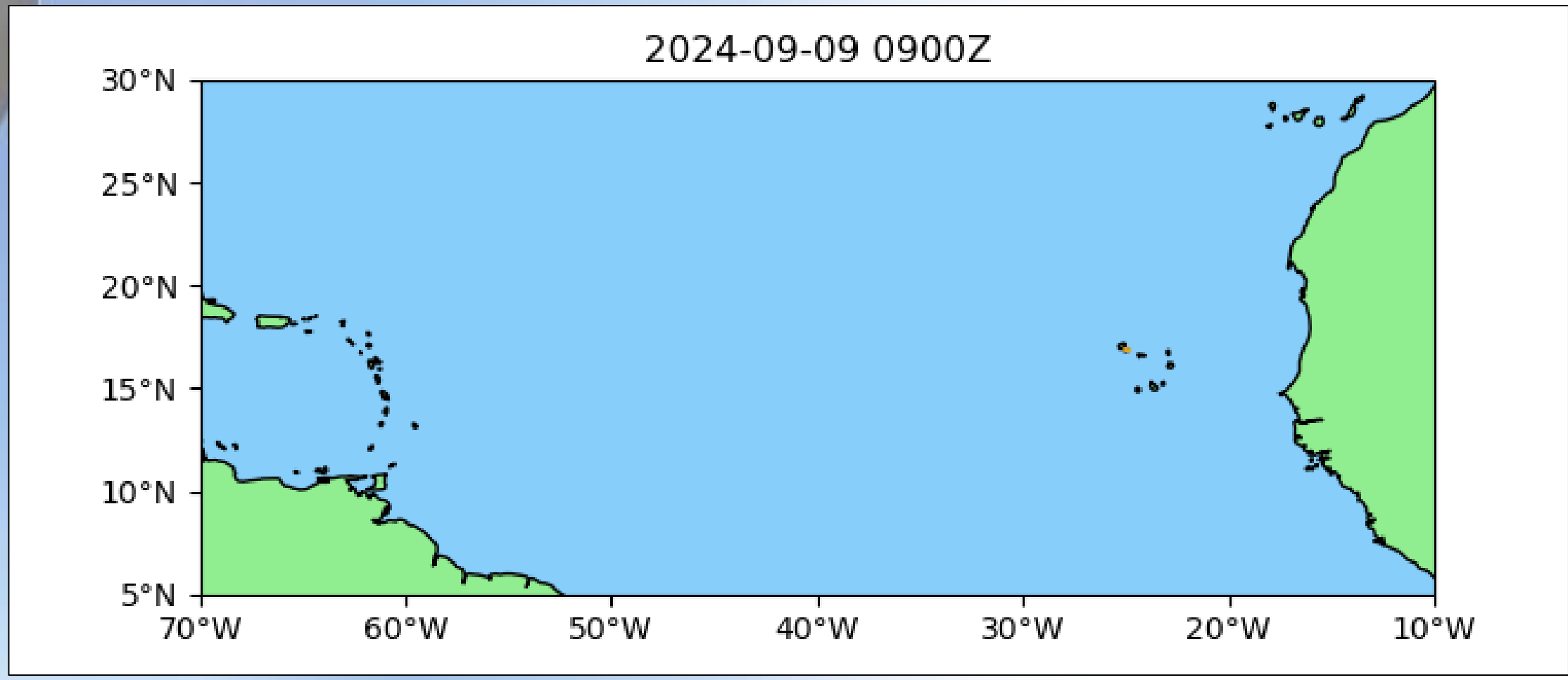
Over 85% Cat 4&5 TC undergo genesis and intensification within the yellow box.

Launched from Cabo Verde, the StratoSonde mHAB system fully covers the regions of interest.

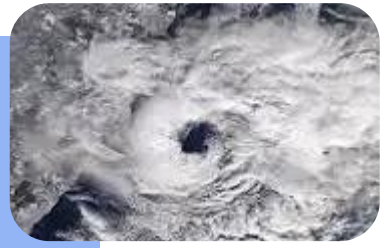


7-day snapshot of StratoSonde mHAB, with locations of 60-dispensed dropsondes.

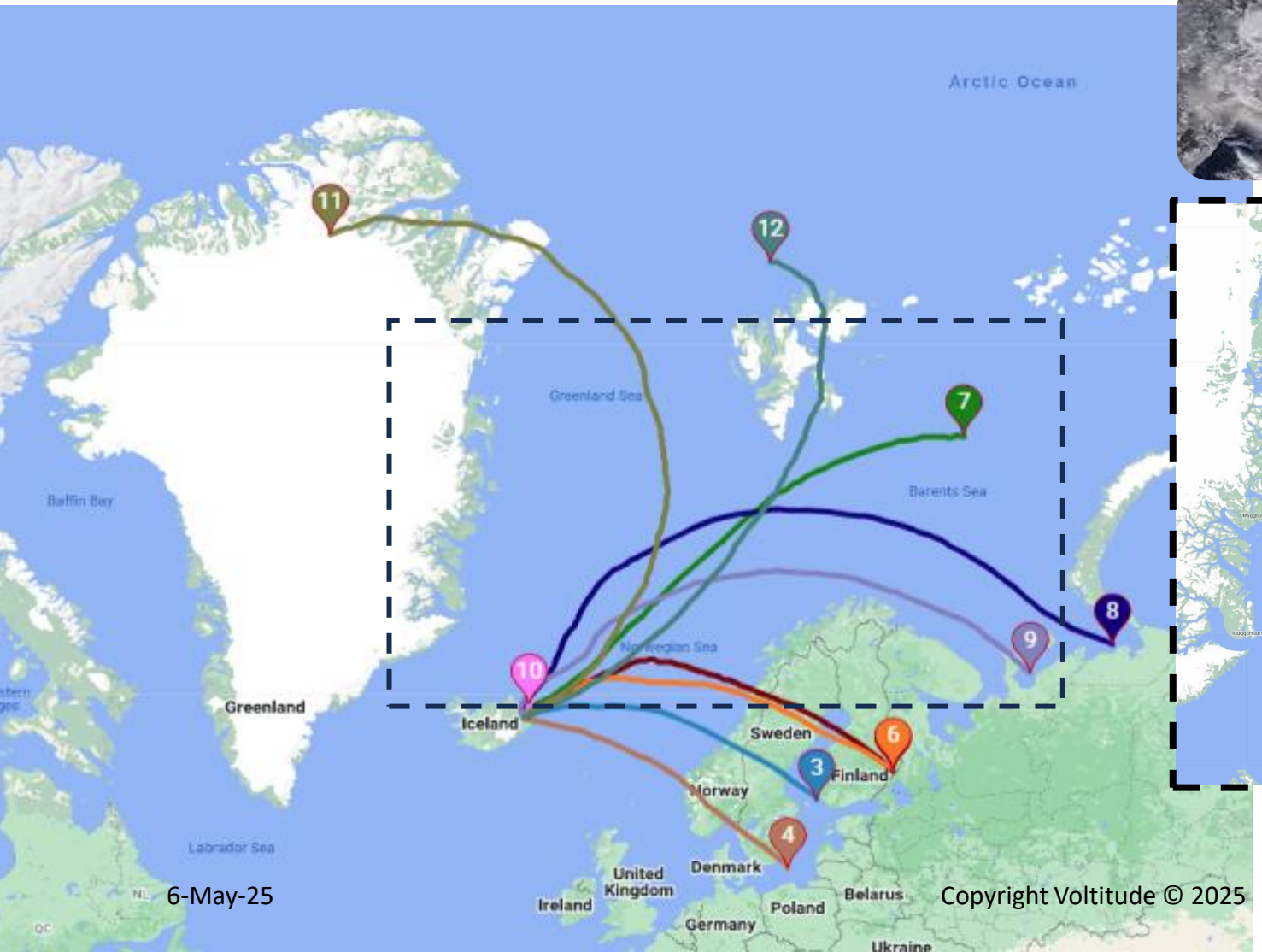
Tropical Cyclone Research

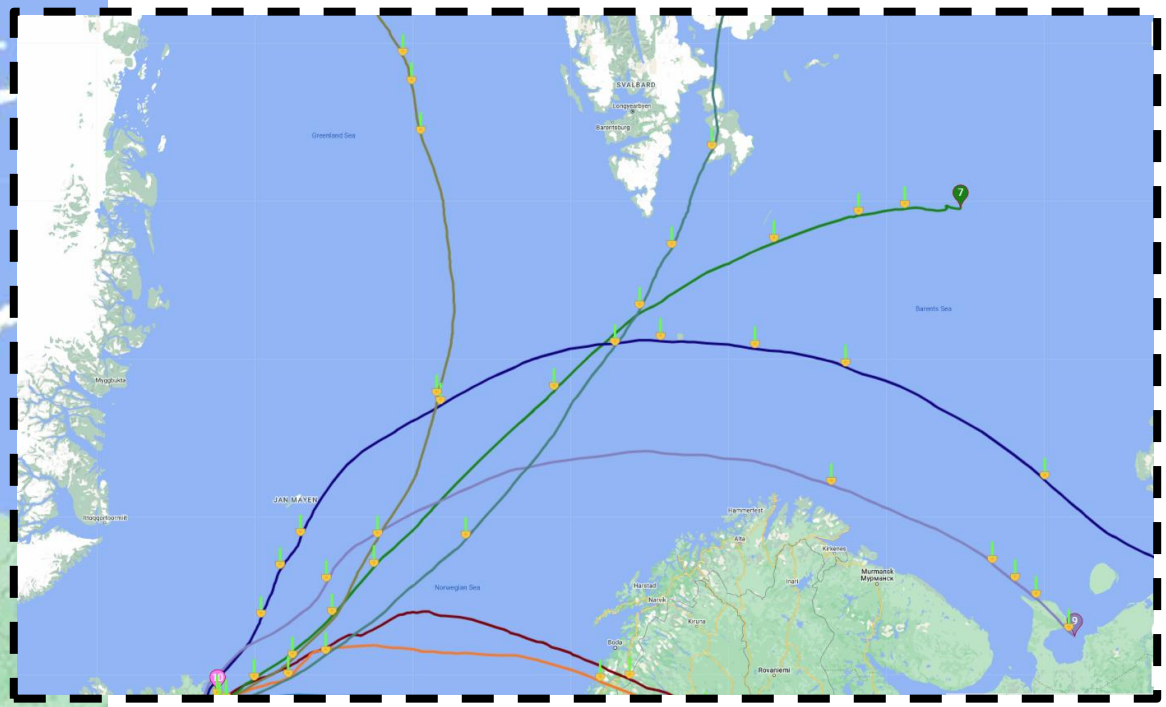


Polar-Low Research with UK Met Office



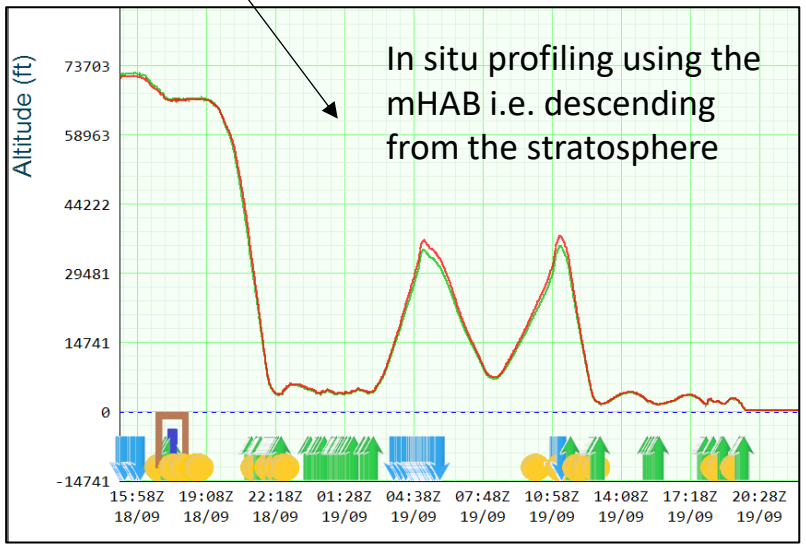
Dropsonde data from high in the arctic supporting research into destructive **polar-lows**.





60 dropsondes over a 10-day period.

Other 3rd Party Payloads



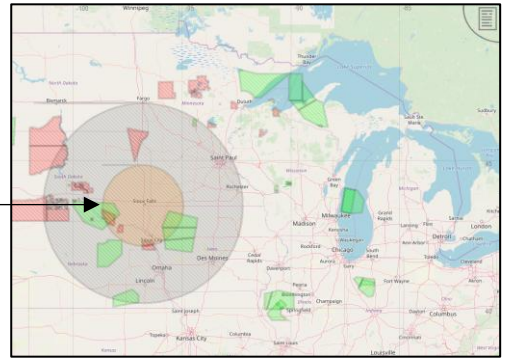
ISR HAB Gap Filling Demonstration

UK MOD - Project Aether is exploring emerging technologies which enable wider area projection of ISR and Communications from the stratosphere.

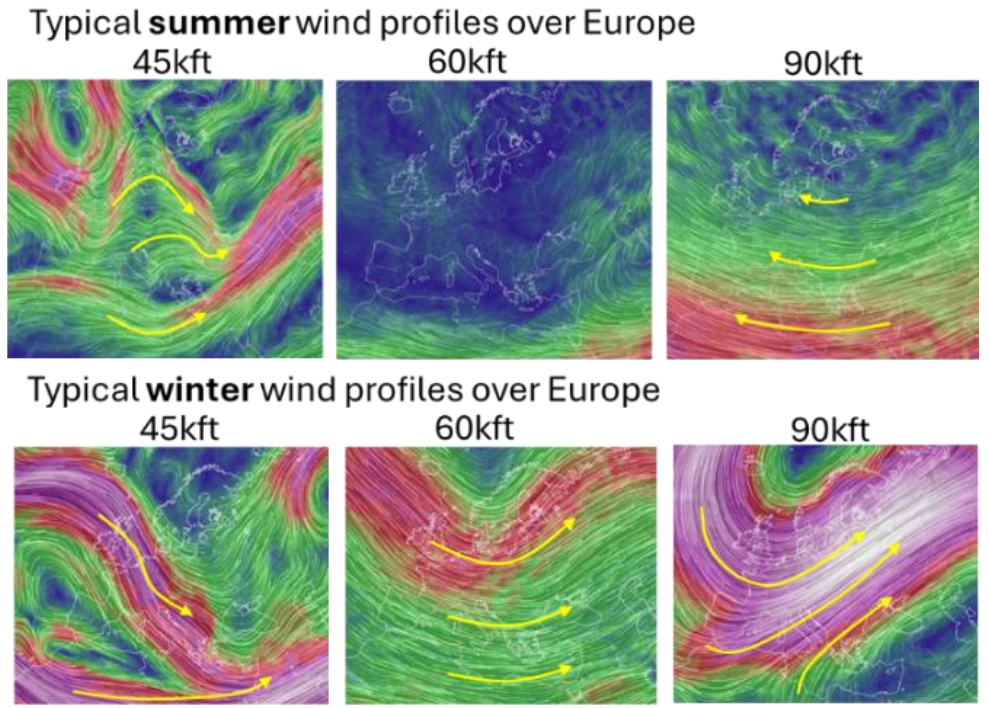
Recent **“high-latitude winter”** demonstration of ISR capability from the stratosphere.

March 2025 South Dakota Demonstration

150km radius Target Area centred on Sioux Falls



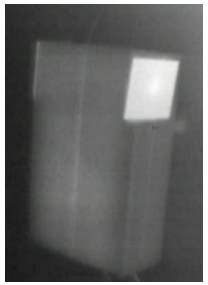
The Challenge for High Latitude Winter HAB Navigation

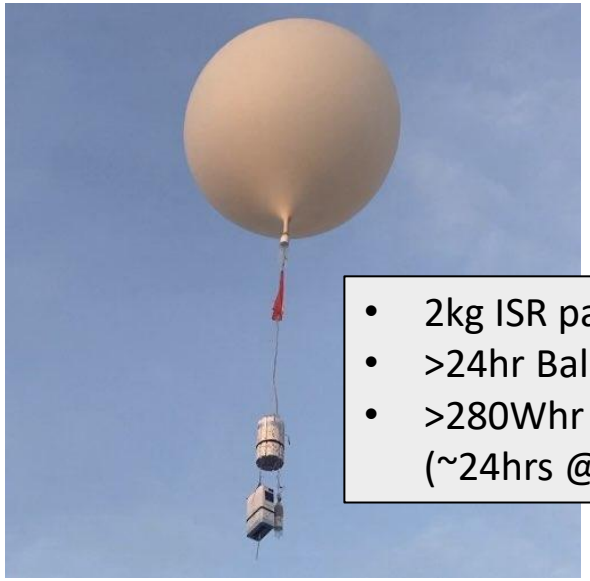


ISR HAB Gap Filling Demonstration

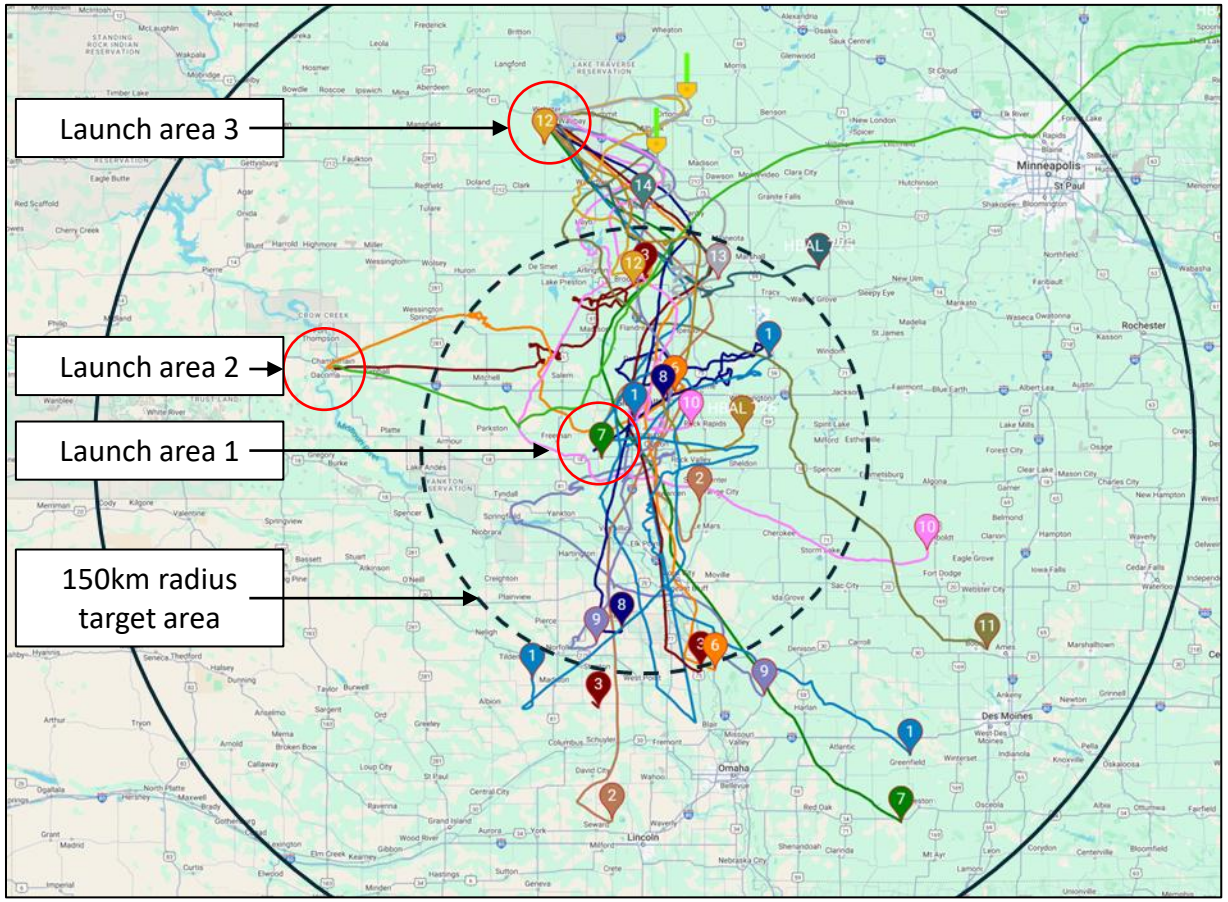
ISR Payload:

- SDR Provided by **Landguard Systems Ltd**
- Integrated on to **Voltitude StratoSonde mHAB** and **Aerostar Lightning HAB systems**.
- CONOP mHAB ‘gap-fill’ between Lightning flights.





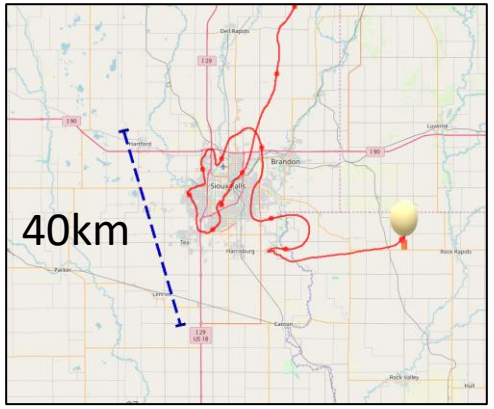
- 2kg ISR payload
- >24hr Ballast
- >280Whr power (~24hrs @12W)



ISR HAB Gap Filling Demonstration

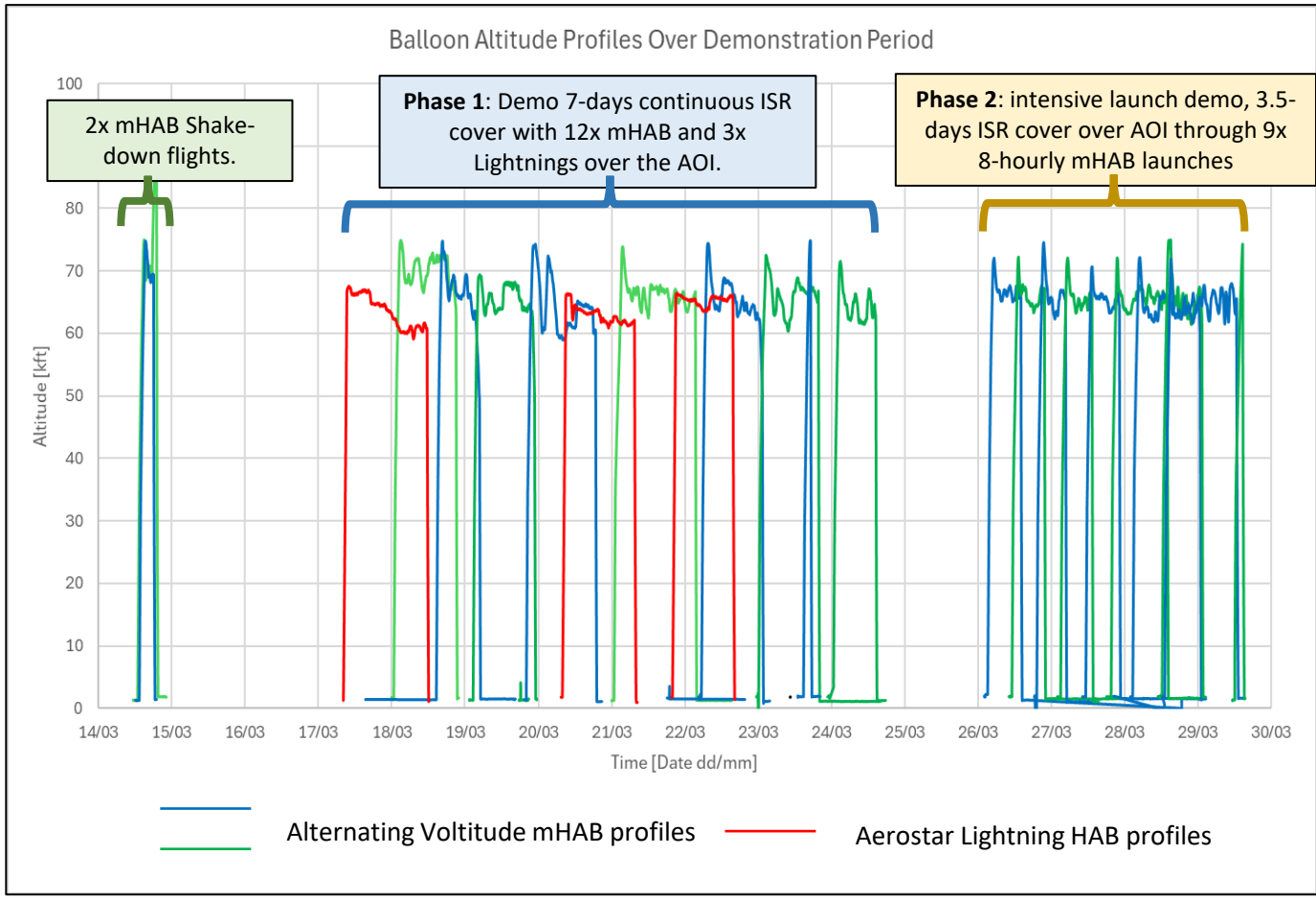
Phase 1: 7-day continuous ISR demo

- Unseasonal stratospheric winds permitted some station-keeping over the target area.
- Extremely windy surface conditions with precipitation.
- 3x Lightning HAB and 12x mHAB Achieved **>94% coverage**, above 60kft AND within the target area.



Phase 2: 3.5-day intensive ISR demo:

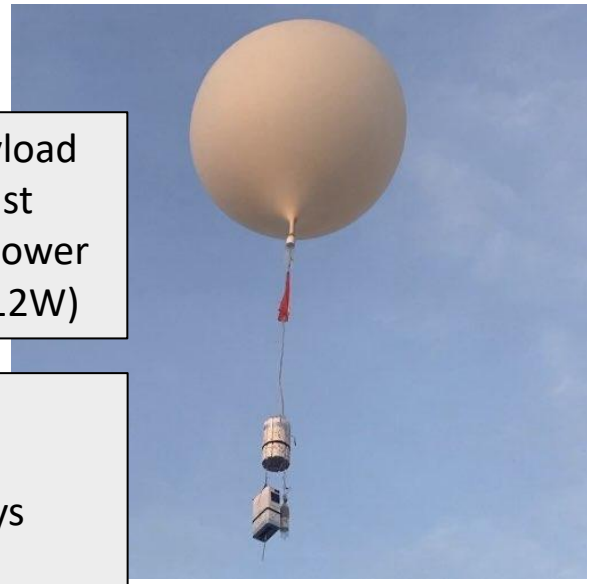
- Winter like stratospheric winds, station keeping not possible.
- 9x mHAB launched every 8hrs.
- Achieved **>100% coverage** above 60kft AND within the target area.



Attritable HAPS

StratoSonde mHAB a ‘light category’ unmanned free balloon exempt from FAA Part 101.

- Operates at any latitude and time of year.
- Mission endurance between 24hrs to 6-days depending on payload and CONOPS.
- Very wide operating envelope, **ideal for gap filling**.

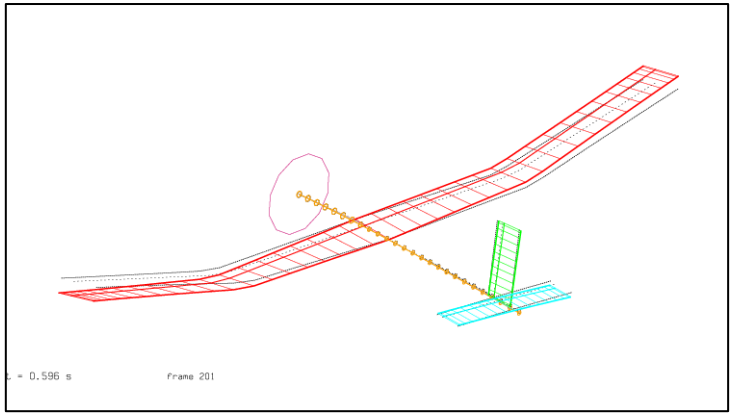


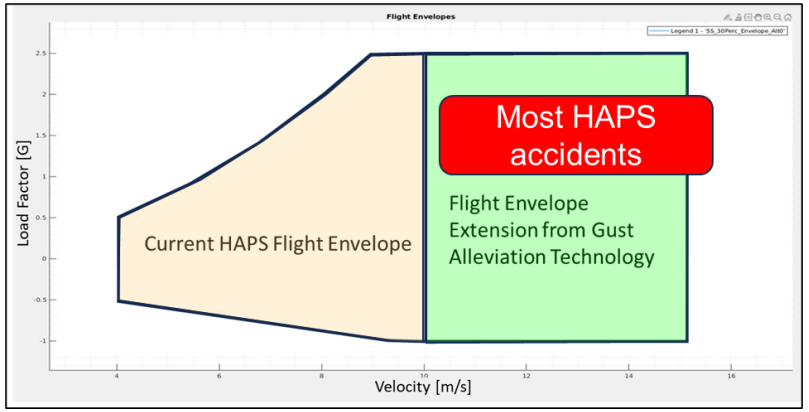
- 2kg ISR payload
- >24hr Ballast
- >280Whr power (~24hrs @12W)

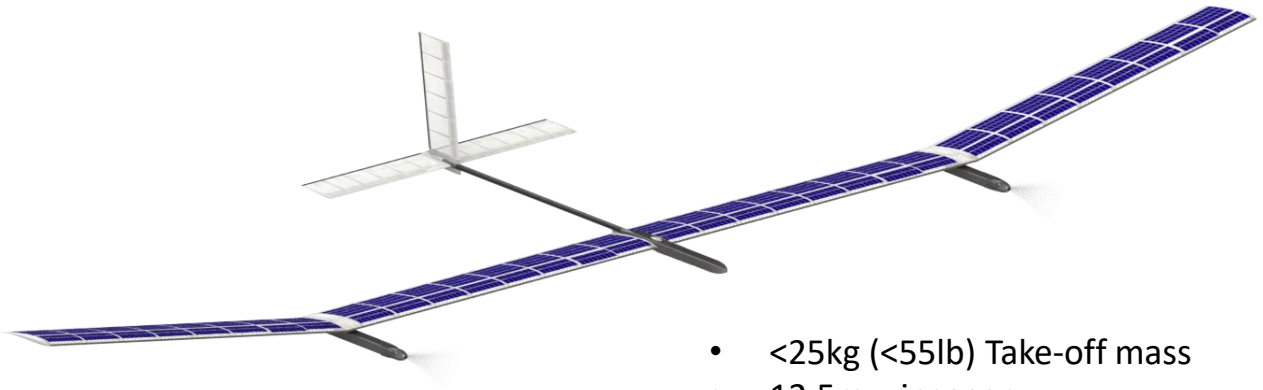
- Dropsonde payload
- Up to 6-days endurance

Voltitude is **prioritising high availability** and **low operating cost** to achieve equivalent ‘gap filling’ capabilities with small **fixed-wing solar electric HAPS.**

StratoSat 25 – Stratospheric Work-Horse







- <25kg (<55lb) Take-off mass
- 12.5m wingspan
- 2kg payload

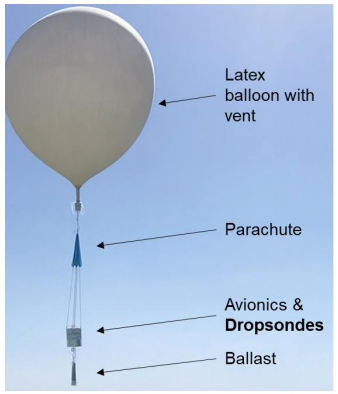
A new generation of fixed-wing solar electric uncrewed aircraft for the stratosphere.

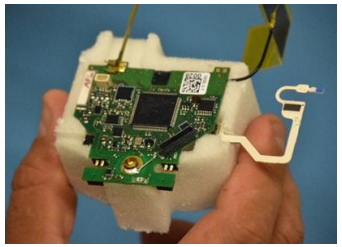
- Featuring Voltitude's **patented gust alleviation technology**.
- Enables solar powered stratospheric aircraft to take-off and land over a much wider operating envelope.
- Reduces vulnerability to turbulence.
- Enables many new commercial services.

Use Cases - Dropsondes

Tropical Cyclones (TC):

- Targeted observations with dropsondes dispensed from above the TC vortex throughout the life of the TC.
- Intercept and obtain targeted observation for **extra tropical storms.**



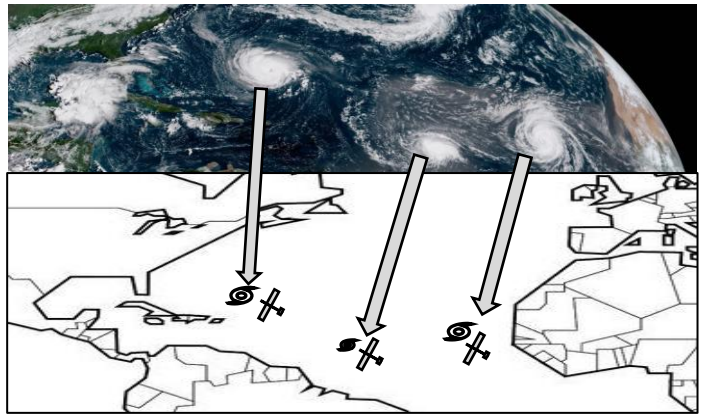


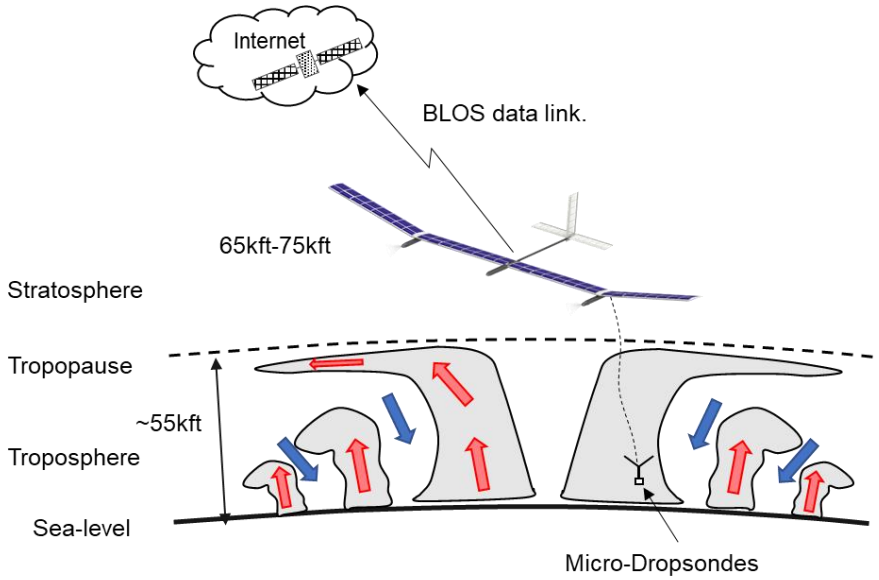
Voltitude currently achieves:

- **25 dropsondes per kilogram** of payload (400g for x10 on the StratoSonde mHAB).

Targeting:

- **50 dropsondes per kilogram** on the StratoSat-25 during the TC season.
- 100x dropsondes per aircraft with today's battery technology.



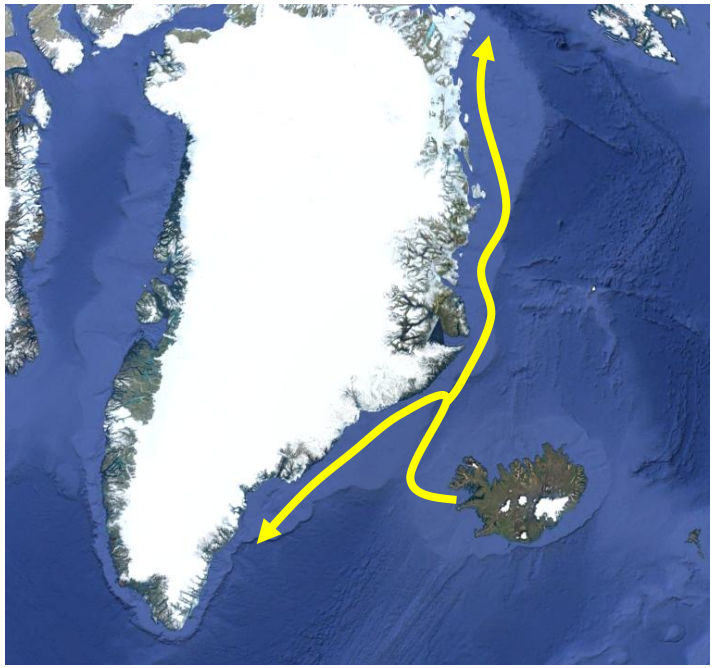


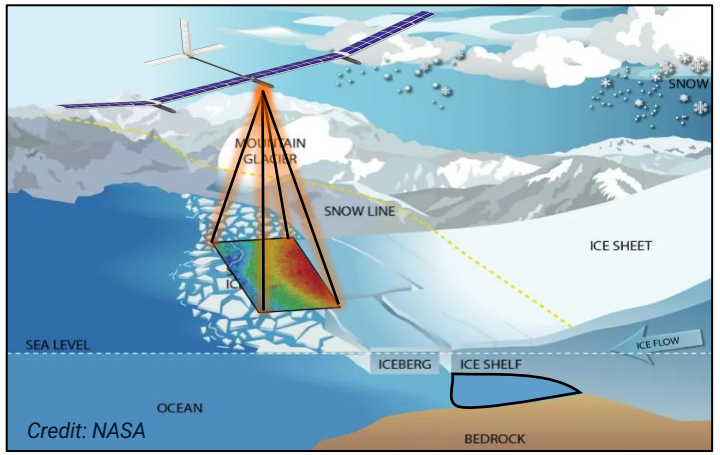
Project CryoWatch – Funded by ARIA

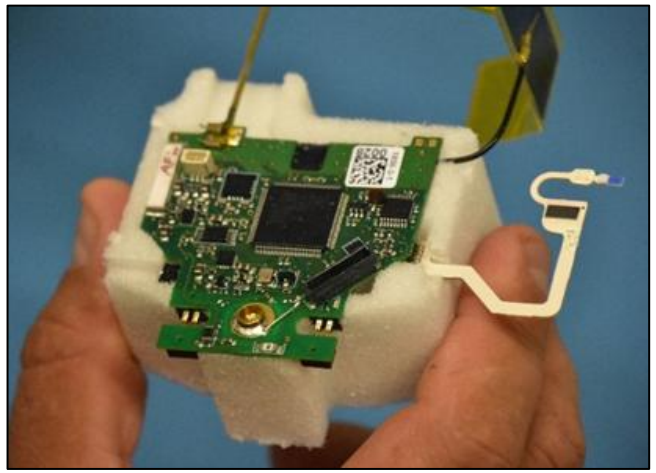
Advanced Research and Invention Agency (ARIA), UK R&D funding agency built to unlock scientific and technological breakthroughs that benefit everyone.

Project CryoWatch will use ultra-persistent, solar powered, **High Altitude Pseudo Satellites (HAPS)**, stationed in the stratosphere, to present a scientific and technological breakthrough in climate monitoring and research capability.

HAPS enable high-resolution monitoring for high-frequency processes, over long-time periods, with dynamic flexibility to monitor more than one large scale region of interest. Initial mission persistent monitoring of Southeast Greenland's Icesheet Grounding Zone.







Thank You

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