

## A new aerial perspective of South Georgia's coastal habitats

### Neil Golding, SAERI

Majestic wildlife, breath-taking vistas and extreme weather; these are some of the many lasting memories SAERI's Coastal Habitat Mapping project manager Neil Golding will have following his return from a month-long trip to South Georgia

Neil's trip to South Georgia was part of a wider South Georgia Heritage Trust expedition focused on 19<sup>th</sup> century sealing archaeology, which set sail on 23<sup>rd</sup> February 2019 aboard the MY Hans Hansson. As well as providing aerial imagery support to the South Georgia Archaeological Project, he was primarily there to collect data for the Darwin DPLUS065 Coastal Habitat Mapping project. These data were in the form of ground validation information, verifying ground cover/habitat type at various locations to train and validate computer models being used to create coastal habitat maps for South Georgia. During the expedition, the coastal mapping team collected 241 ground validation sample points.

With permission from Air Safety Support International and the Government of South Georgia & the South Sandwich Islands (GSGSSI), Neil also had a unique opportunity to map some of South Georgia's extraordinary coastal habitats with drones. The ability to collect stunning ultra-high resolution aerial imagery at up to 8mm per pixel resolution and fly missions covering 260 hectares will be of enormous benefit to the development of fine-scale habitat models/maps for the GSGSSI, a partner on the project, as well as other stakeholders.



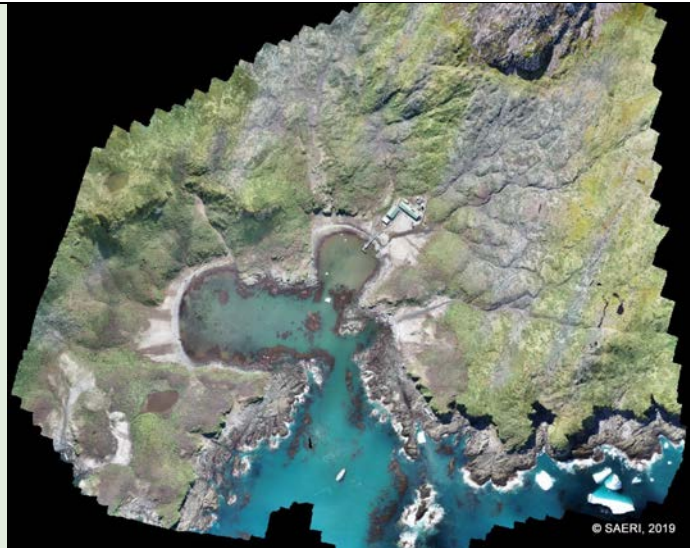
*Preparing to fly a drone-mapping mission at Gold Head, Gold Harbour.*

In total, the variable South Georgia weather allowed 8 drone mapping missions to be flown in areas ranging from Bird Island off the north-west tip of South Georgia to Moltke Harbour, Royal Bay, the location of the 1882-83 International Polar Year German research station which was South Georgia's first scientific research station. Other areas mapped by drone included Elsehul, Jason Harbour, Start Point (Salisbury Plain), Fortuna Bay, Albatross Cove (Cooper Bay) and Gold Harbour. Once processed, the resultant aerial photo mosaics will be made available to the wider public via the GSGSSI web-mapping portal.



*Deploying ground control points at Elsehul. These allow accurate digital elevation models to be created for specific areas, such as the area being investigated by the archaeological team of the South Georgia Archaeological Project.*

We all know that South Georgia is by no means flat! This represented a challenge to the Coastal Mapping project – how to collect high quality aerial imagery in mountainous terrain, safely? This is where technology really helped. Innovative drone mapping software allowed Neil to plan missions which would follow the terrain, allowing him to map steep glacial valley slopes and rocky outcrops safely and efficiently at a set altitude. Much of this mission planning required internet connectivity to download terrain data, and this was where the generous support of Iridium Communications and MailASail was invaluable, allowing the team to sit off the coast of South Georgia on the vessel and plan a drone mission in one of the most remote environments in the South Atlantic.



*An albatrosses view of Bird Island from 100m above ground level. The Bird Island Research Station can be seen in the centre of the image. It is possible to see individual Wandering Albatross sitting on their nests on the high-resolution orthomosaic*

The DPLUS065 Coastal Habitat Mapping project is grant aided by the Darwin Initiative through UK Government funding. Support is also provided through the Falkland Islands Government Environmental Studies Budget. The project is using recently available satellite imagery alongside other spatial data and local expert knowledge to develop the first island-wide broad-scale coastal margin (terrestrial, intertidal and subtidal) habitat maps for South Georgia & the Falklands. In specific areas of interest, fine-scale habitat maps using high-resolution satellite and drone imagery are also being created. These habitat maps will create an essential baseline for South Georgia, providing a sound basis for use in future planning, decision-making and monitoring.

GSGSSI has been an integral partner of this three-year project led by SAERI. Other partners include Falkland Islands Government, Oregon State University, JNCC and the Shallow Marine Surveys Group. The project is due to conclude in March 2020.

This work could not have happened without support from the wider South Georgia Archaeological Project expedition. Thanks go to South Georgia Heritage Trust, Bob Burton from the South Georgia Association, Cambridge Archaeological Unit (University of Cambridge), Iridium Communications and MailASail, National Geographic, Quixote Expeditions, Gifford Hickey, Dion Poncet & Oliver Prince.

You can find out more about the DPLUS065 Coastal Habitat Mapping project by visiting our website: <https://www.south-atlantic-research.org/research/terrestrial-science/coastal-mapping-project/> or contact the project manager directly on [ngolding@saeri.ac.fk](mailto:ngolding@saeri.ac.fk)

