BAS GEOMAP 2 Series (sheet 6)
Bathymetry and Geological Setting of the South Sandwich Islands Volcanic Arc
Side 2: The South Sandwich Islands
Scale: 1 : 50 000 and 1 : 25 000

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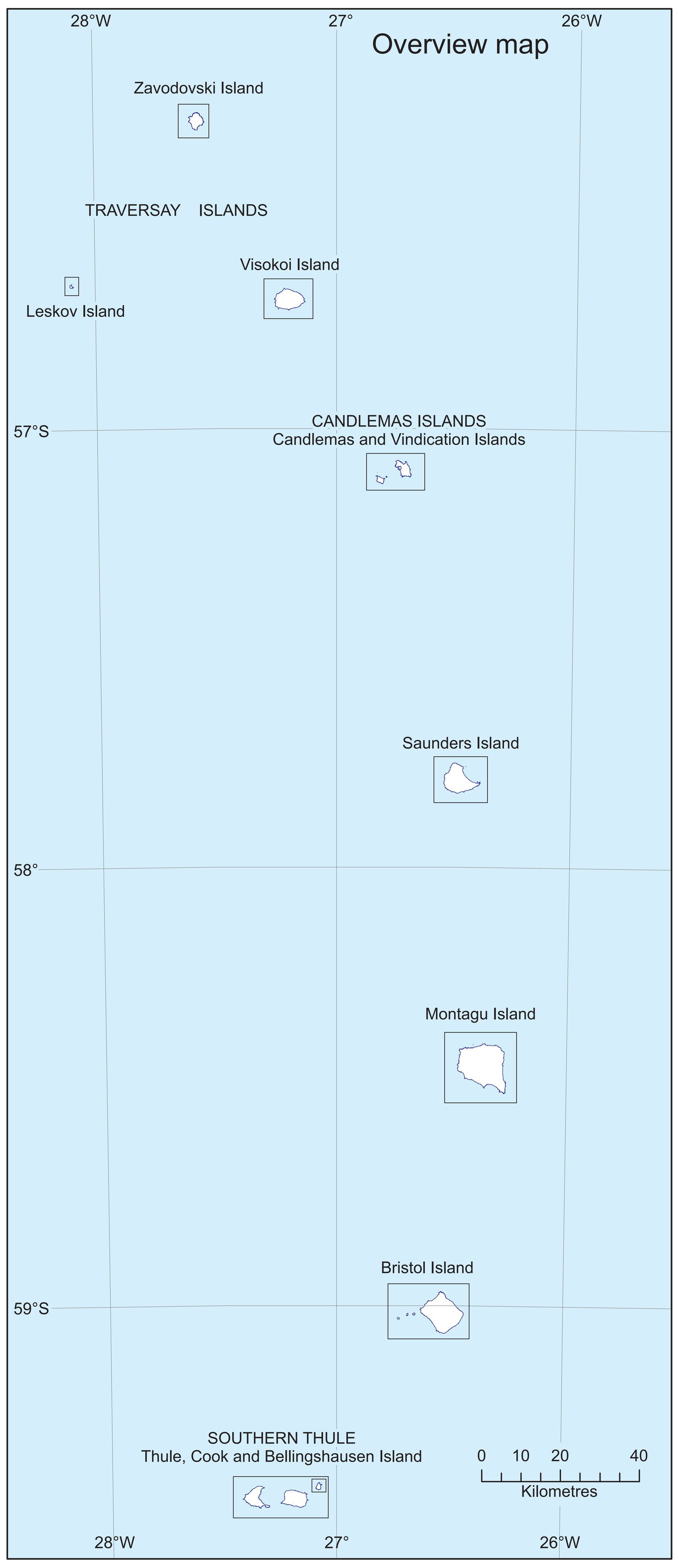
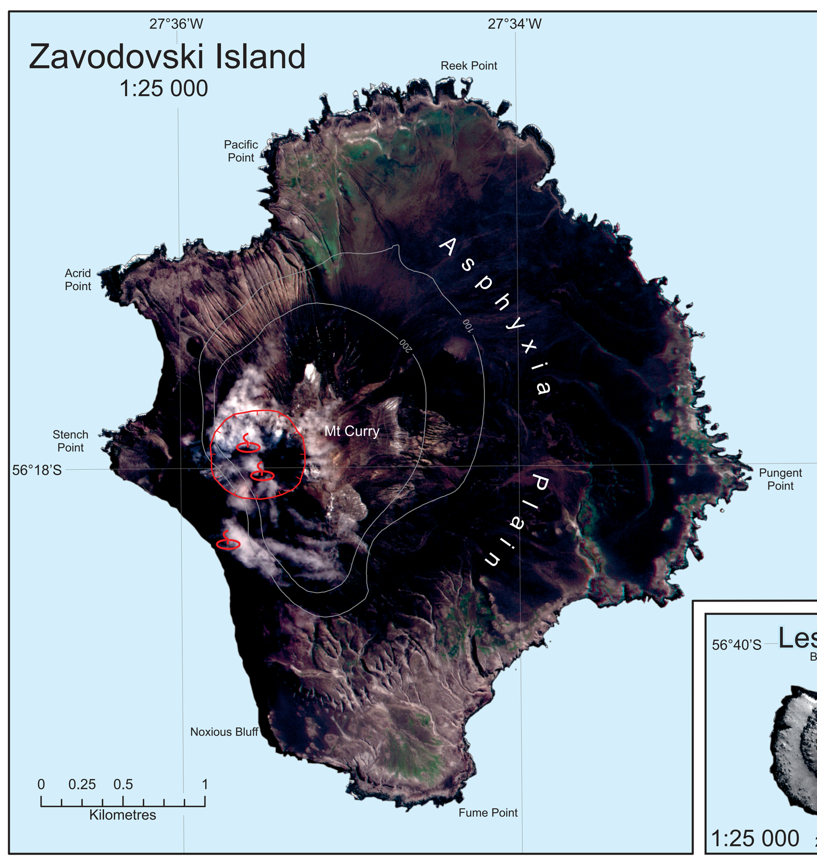
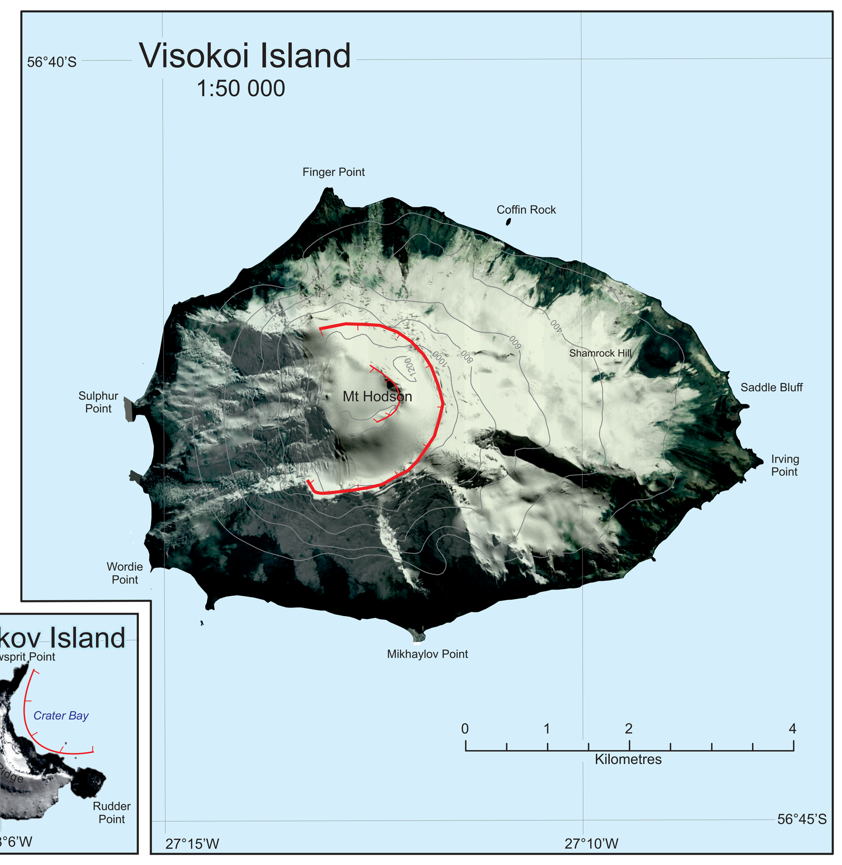
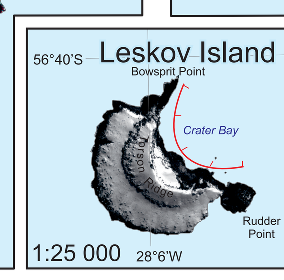
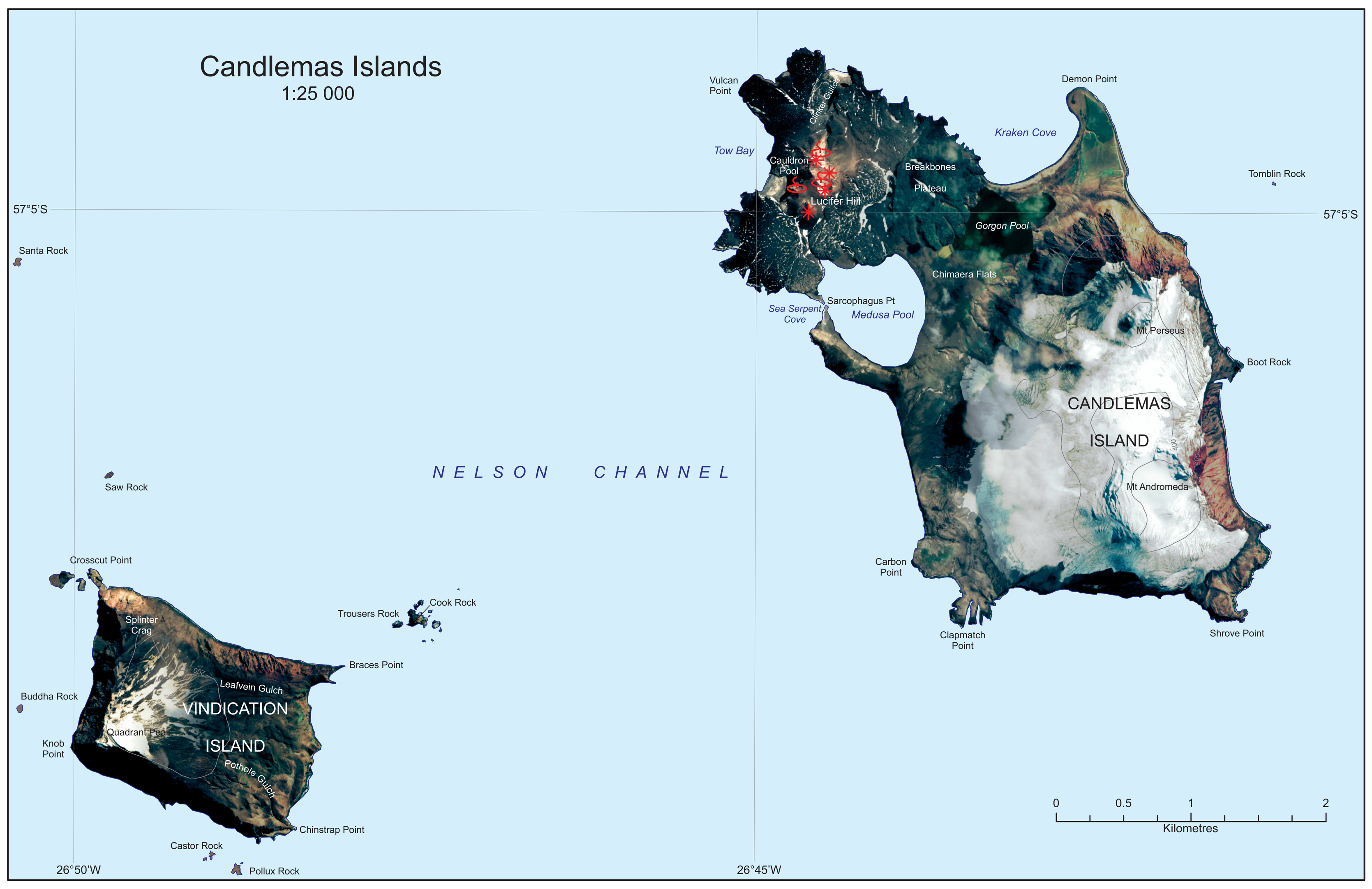
Side 2: The South Sandwich Islands











Projection details:
All island maps are projected in Lambert Conformal Conic projection central meridian of -27°W standard parallels of -57 and -59°S latitude of true scale -58°S
Datum: WGS 1984

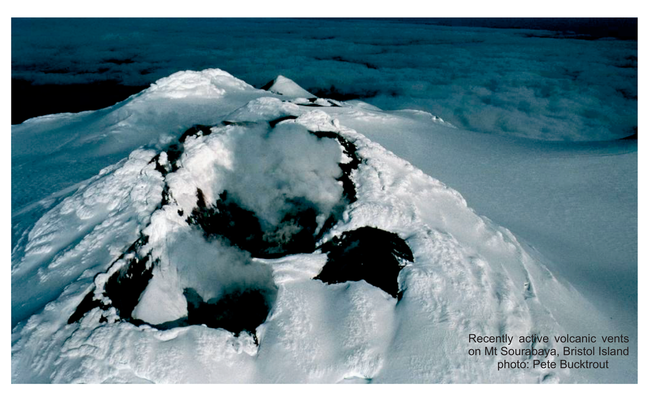
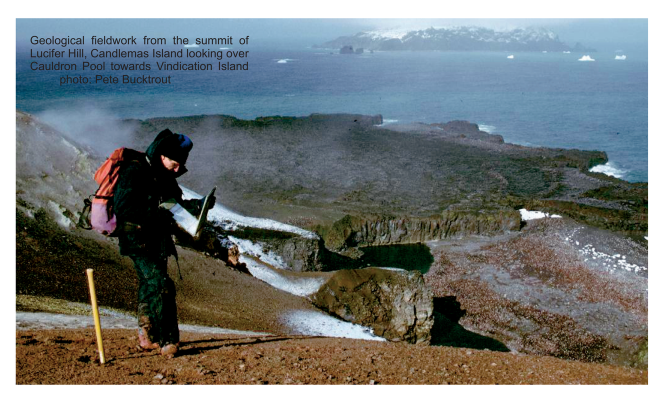
Contours at 200m interval, data taken from GDEM grids and previous surveys
Coastlines digitized from QuickBird2 and Worldview1 satellite images

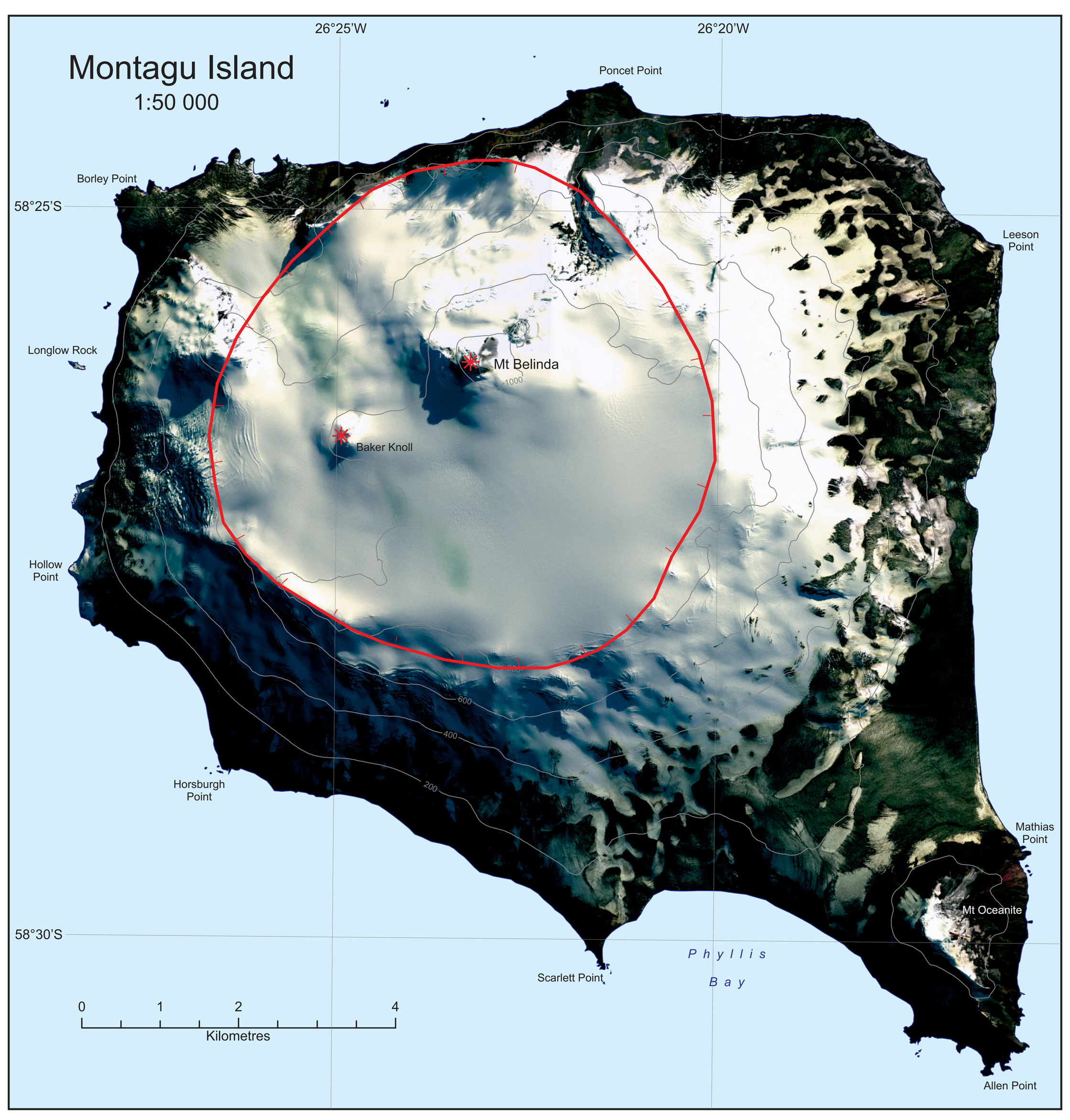
Image details:
All images acquired from the Digital Globe archive.
Due to cloud cover in some cases multiple images have been merged to give a seamless representation of the island topography.
Details of each image used are:

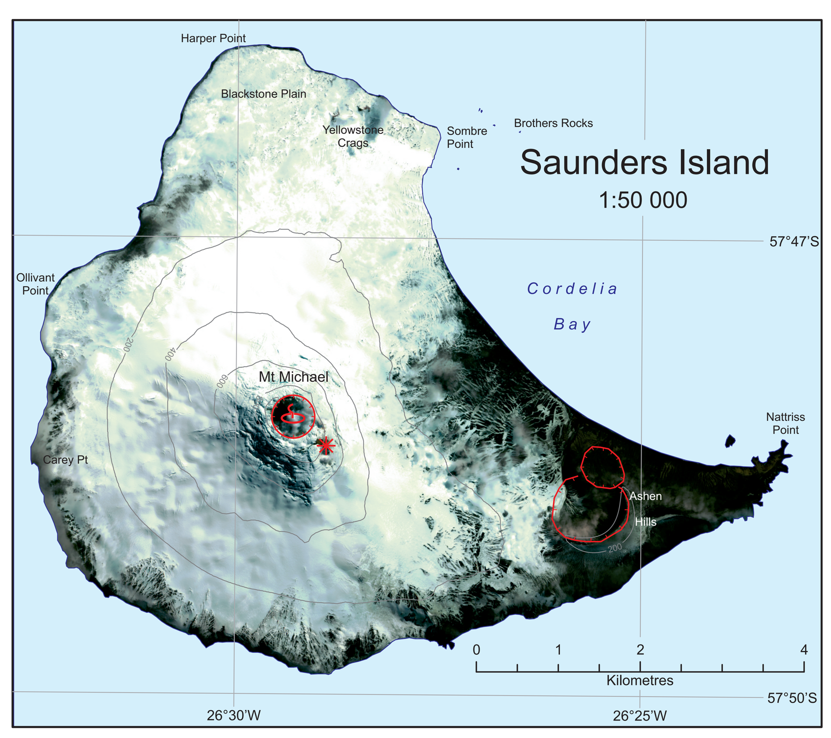
Bristol Island (coast): QB2101001000CBD7500 20/20/2010
Bristol Island (inland): WV2 103001001BCDA100 8/9/2012
Candlemas Island: WV2 1030010008C06E00 4/3/2011
Vindication Island: QB2 1010010004C0D900 14/1/2006
Thule Island: QB2 1010010010B00B00 22/11/2012
Cook and Bellingshausen: WV2 10300100070D5D00 15/11/2010
Leskov Island: WV1 102001000FB68C00 20/10/2010
Montagu Island: WV2 10300100094B8700 3/2/2011
Montagu Island (ice): WV2 103001001A1D8A00 28/08/2012
Saunders Island: WV2 10300100070FB500 6/11/2010
Visokoi Island (coast): QB2 101001000CECB500 30/1/2011
Visokoi Island (inland): WV1 102001000F06B800 12/9/2010
Zavodovski island: WV2 103001000A90E700 4/3/2011

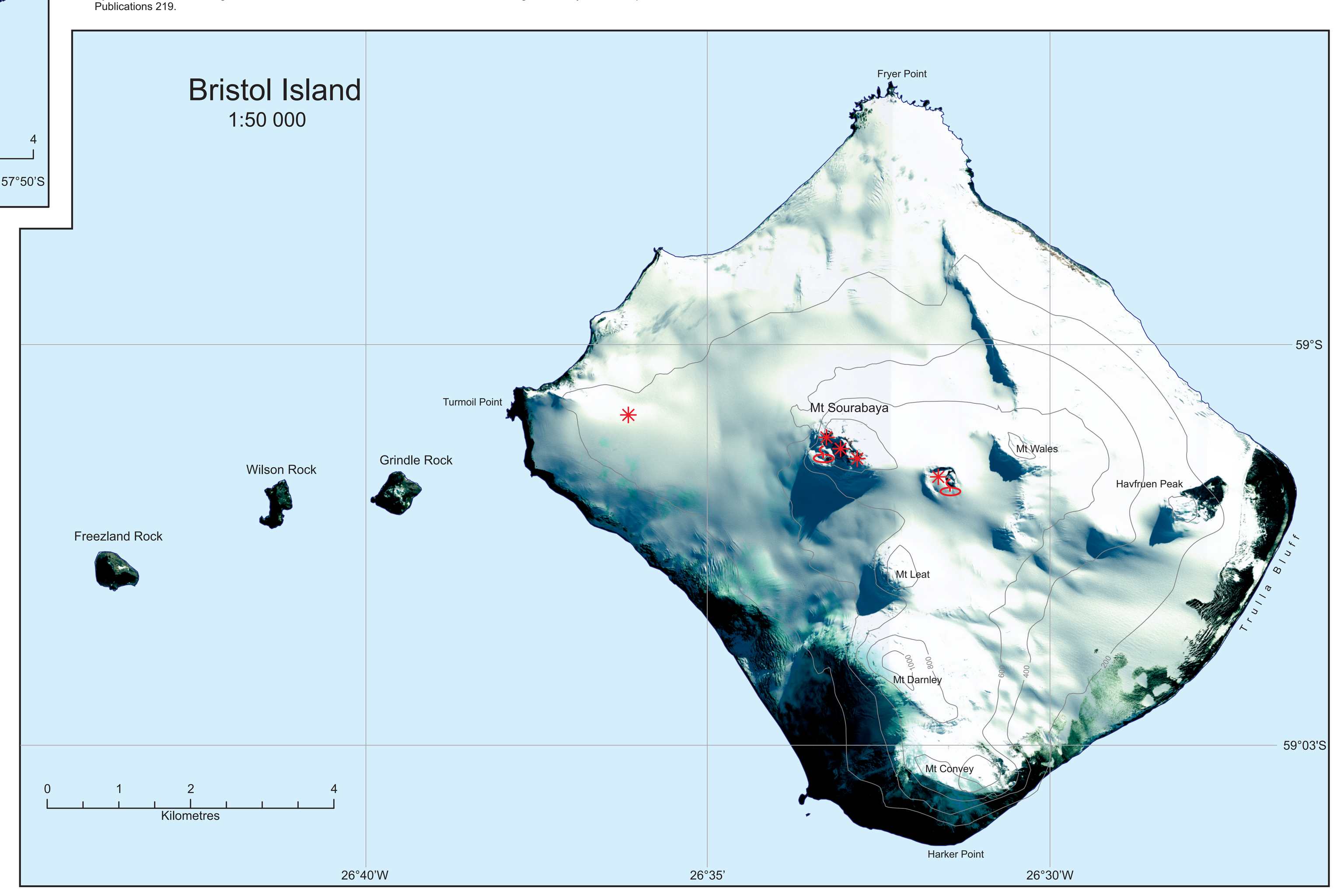
VOLCANIC SYMBOLS
- Fumarole or steam vent
- Large cone, vent, cinder cone or spatter cone
- Crater
- Crater location approximate
- Caldera
- Caldera location approximate

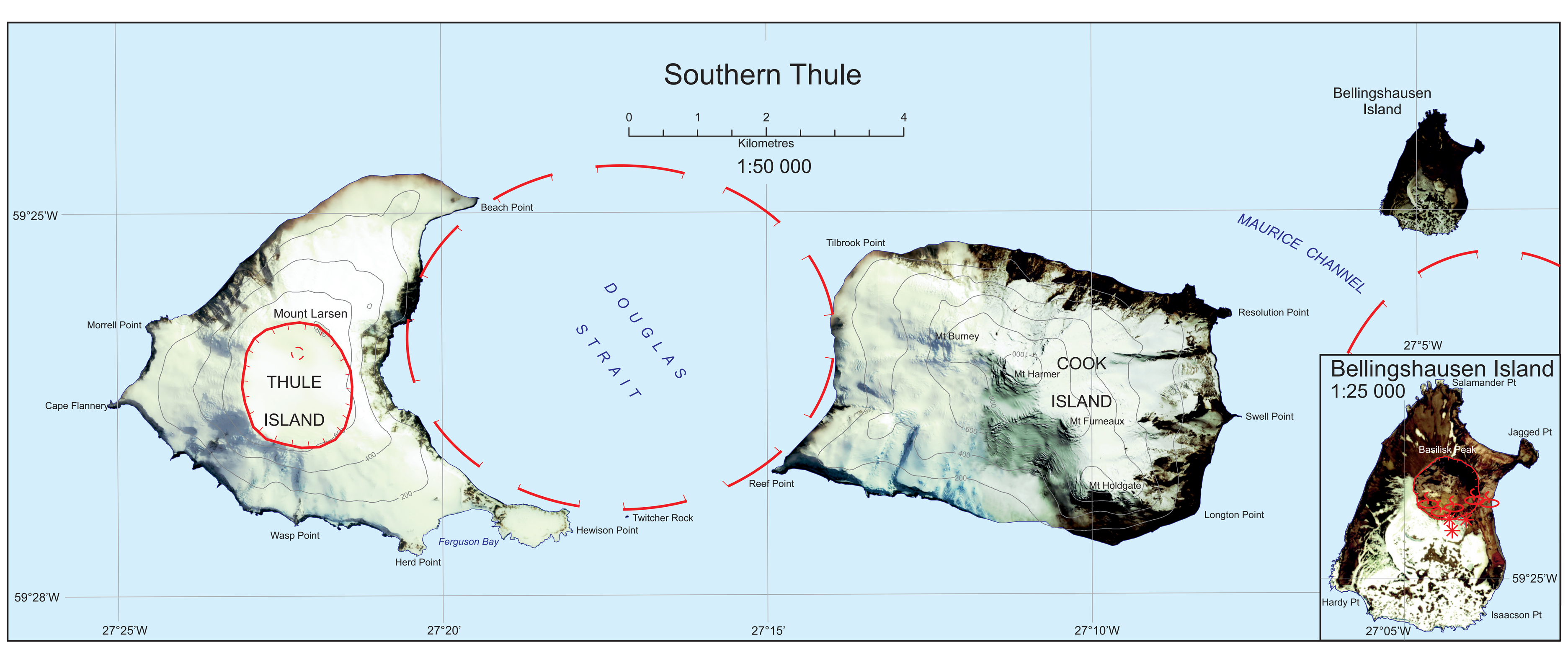


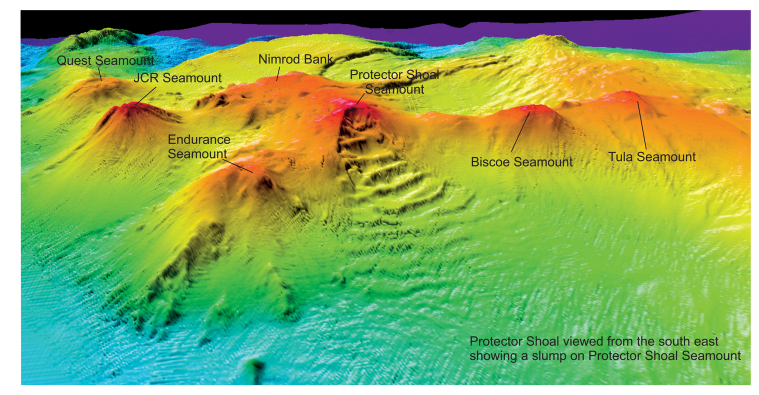








Protector Seamounts
Protector Seamounts form a group of seamounts clustered around a prominent plateau, Nimrod Bank. Protector Shoal, with a depth of 55 m below sea level recorded in 2007, is the shallowest point in the seamount group. Protector Shoal seamount has a well preserved, prominent slump structure on its southern flank. One of the seamounts, Quest, has a summit caldera formed by collapse. Dredged samples obtained from the seamounts have a wide range of compositions in the range andesite to rhyolite (Leat et al., 2007; British Antarctic Survey unpublished data, 2011). An explosive submarine eruption that formed an extensive floating pumice raft took place from a source within the seamount group in 1962 (Gass et al., 1963).



Protector Shoal viewed from the south east showing a slump on Protector Shoal Seamount

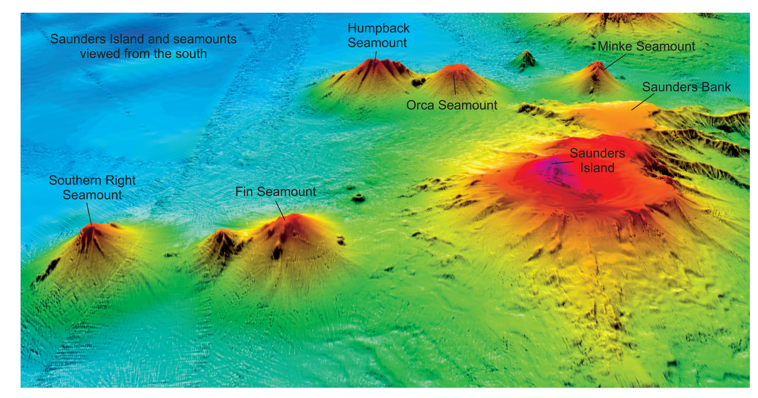
Zavodovski Island
Bathymetric data show that Zavodovski is a locally extensively dissected volcano, the largest in the northern part of the South Sandwich Arc. The eastern part of the edifice shallower than 1000 m is intensely dissected by mass wasting and interpreted to be extinct (Leat et al., 2010). The western part of the edifice volcano emerges to form Zavodovski Island. The island is dominated by a volcanic cone, Mount Curry which consists of scoria and ash and has a recently active crater to the south-west of the summit (Baker, 1990; Patrick and Smellie, 2013). To the north, east and south of the cone, flanking lavas are exposed in low coastal cliffs. The lavas are covered by ash deposits that are locally intensely gullied. The recently active crater and western flanks of Mount Curry have persistently active fumaroles (Patrick and Smellie, 2013). The concave coastline from Stench Point to Noxious Bluff is interpreted as the headwall of a lateral collapse structure, the Mount Curry collapse, that translated material to the west. The collapse scar can be traced offshore in the form of inward facing, 200 m high submarine scarps defining an embayment some 6.5 km across. Available analyses indicate that the subaerial products of Zavodovski Island are basalts and basaltic andesites.

Leskov Island
The small island of Leskov is the emergent summit of a seamount chain that extends SW from Zavodovski Island. It consists of andesite lava flows or domes eroded to form high cliffs around the island.

Visokoi Island
The submarine structure of Visokoi is approximately cone-shaped adjoining a dissected plateau to the east. The Mount Hodson stratovolcano dominates the island. The western slopes of the volcano appear to be modified by lateral collapse. At the summit there is an ice-filled crater or small caldera (Patrick and Smellie, 2013). Known compositions are basalts and basaltic andesites.

Candlemas Islands
The group consists of Candlemas and Vindication islands and several sea stacks emerging from a shallow plateau. The submarine edifice has several radiating ridges and embayments formed by collapse. There is a prominent sediment chute east of Candlemas Island. Vindication Island and the south-east part of Candlemas Island are extinct and consist of eroded basalt and basaltic andesite lavas and scoria deposits. The north-west part of Candlemas consists of recent andesite and dacite lava flows and tephra deposits centred around Lucifer Hill (Tomblin, 1979; Leat et al., 2003). The summit area of Lucifer Hill is persistently fumarolic, coinciding with an area of heated ground present in satellite observations (Patrick and Smellie, 2013).

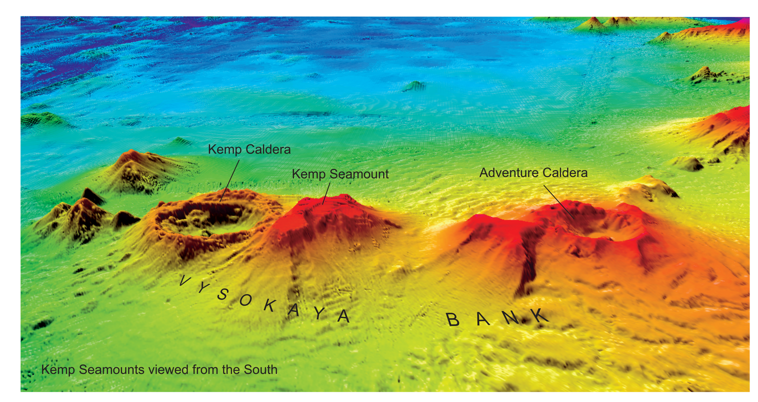
Saunders Island
Saunders Island is the summit part of an approximately conical submarine edifice which adjoins the dissected plateau forming Saunders Bank to the north. Several seamounts are centred around this main edifice forming two chains trending from north-east to south-west. Saunders Island is dominated by a central stratovolcano forming Mount Michael. A summit crater is thought to host a lava lake identified by satellite observations (Lachlan-Cope et al., 2001), and small explosive eruptions have occurred from the summit area (Patrick and Smellie, 2013). Ashen Hills, east of Mount Michael consists of extinct coalesced pyroclastic cones. The northern part of the island, Blackstone Plain, consists of recent basaltic lava flows (Baker, 1990). Available analyses from Saunders Island are basalts and basaltic andesites.



Montagu Island
The submarine Montagu edifice approximates a cone, incised on its eastern flanks and extending into a submarine ridge to the west. Sediment wave fields are prominent on its eastern and southern slopes. The coasts are rugged, formed by rock and ice cliffs, with a prominent satellite cone forming Mount Oceanite in the south-east of the island. By contrast, the interior of the island has subdued topography and is interpreted as an approximately circular, largely ice-filled, caldera (Patrick et al., 2005; Patrick and Smellie, 2013). The highest point of the island, Mount Belinda is an intracaldera volcanic cone. An eruption of Mount Belinda during 2001-2007, confirmed by satellite and visual observations, formed a lava flow that reached the coast at Poncet Point, and minor tephra deposits (Patrick and Smellie, 2013). Available analyses are basalts and basaltic andesites, but available samples poorly represent the different volcanic stages of the caldera volcano.

Bristol Island
The submarine Bristol edifice approximates a cone, more incised on its eastern than western flanks and with prominent sediment wave fields on most slopes. The coast of Bristol Island mostly consists of ice cliffs. Several craters near the centre of the island around Mount Sourabaya have been observed from satellite data and during over-flights (Patrick and Smellie, 2013). One or more of these may have been the source of a possible eruption in 1935 and a fire-fountain or strombolian eruption in 1956 (Holdgate and Baker, 1979; Baker, 1990; Patrick and Smellie, 2013). Known compositions of volcanic rocks from Bristol Island and Freezland Rock, a sea-stack to the west, are basalts, basaltic andesites and andesites.

Southern Thule
This island group comprises Cook, Thule and Bellingshausen islands and minor islets and sea-stacks that together form the emergent parts of a single large volcanic edifice. The Southern Thule edifice is elongated in an east-west direction, is strongly incised on its eastern flank, and has sediment wave fields on most submarine slopes. Cook Island exposes lava sequences in coastal cliffs. Thule Island has a circular ice-filled depression forming its summit region interpreted as a caldera (Smellie et al., 1998; Leat et al., 2003; Patrick and Smellie, 2013). A submarine caldera occupies Douglas Strait between Cook and Thule islands (Smellie et al., 1998; Allen and Smellie, 2008). A third, entirely submerged caldera is interpreted to exist east of Cook Island (Smellie et al., 1998; Leat et al., 2013). Available analyses from Cook and Thule islands include basalt, basaltic andesite, andesite and dacite. Bellingshausen Island is a low-lying stratocone. It has a main summit crater that is persistently vigorously fumarolic, and there is additional active steaming on lower slopes (Patrick and Smellie, 2013). A small explosive eruption occurred on the south flank between 1968 and 1984 (Smellie et al., 1998). Known volcanic compositions from Bellingshausen Island are overwhelmingly basaltic andesite.



Kemp Seamounts viewed from the South

Vysokaya Bank
Bathymetric data show that the bank comprises a submarine complex of volcanoes comprising Adventure Caldera, Kemp Caldera, Kemp Seamount and several smaller seamounts. Adventure Caldera forms the eastern part of the complex and occupies the summit of a cone-shaped volcanic edifice. To the west, Kemp Seamount is formed by an approximately cone-shaped volcano, and further west there is the second, deeper caldera, Kemp Caldera. Sediment wave fields occupy some slopes of the complex and appear to be sourced at Adventure Caldera. Hydrothermal activity has been identified within both Kemp and Adventure calderas. Dredged samples recovered from Kemp Seamount are basalts and basaltic andesites: basalts and dacites have been recovered from Adventure Caldera.

Nelson Seamounts
Located south-west of the non-volcanic Tyrell Bank, this seamount cluster represents the southernmost extent of recent volcanism in the South Sandwich arc. Compositions of dredged samples are dacite.

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