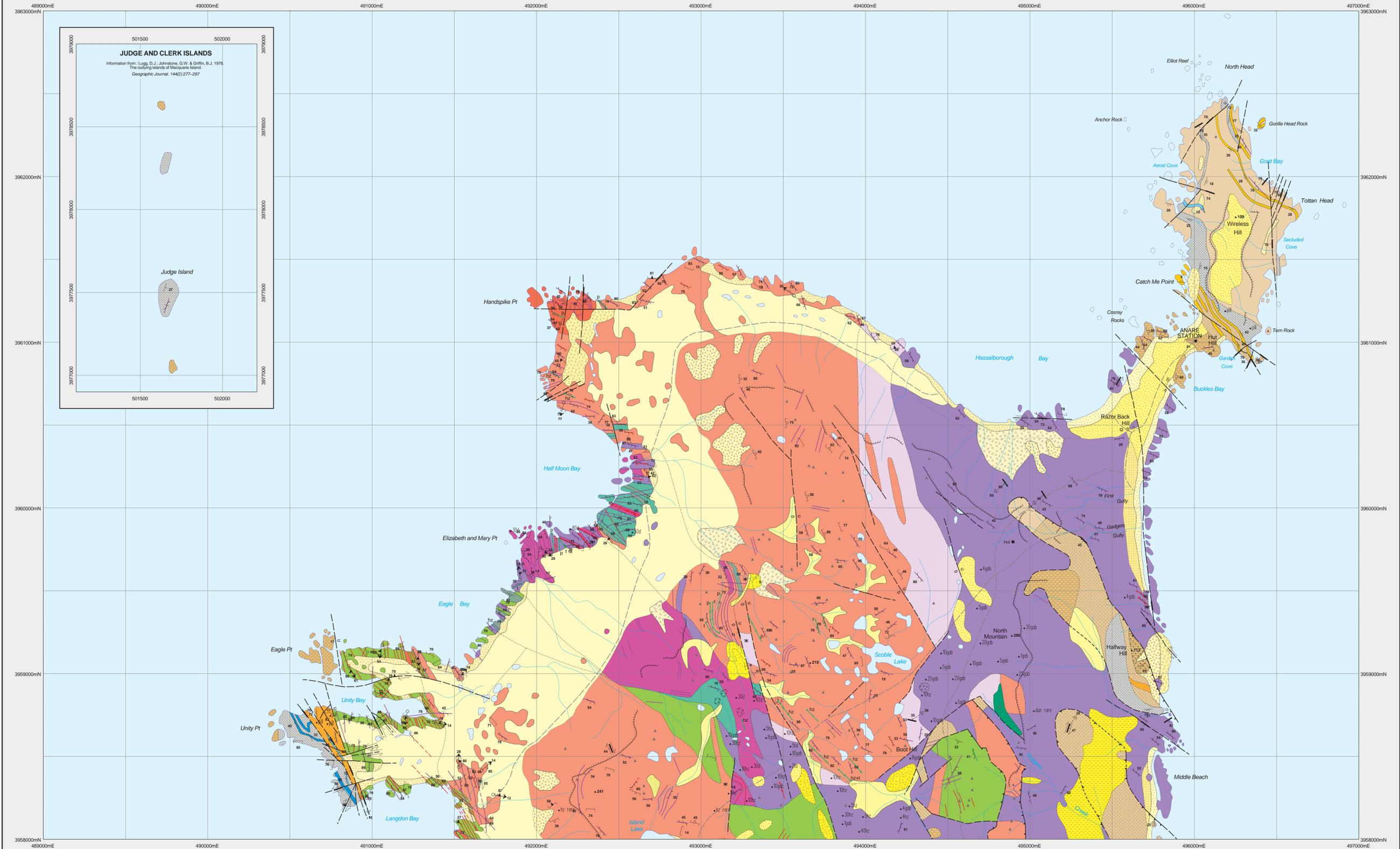


GEOLOGY OF MACQUARIE ISLAND - SHEET 1



Geology by B. D. Goscombe, BSc (Hons), PhD and J. L. Everett, BSc (Hons), December 1984 - May 1995, September 1995 - January 1996. Project initiated and supervised by A. V. Brown, BSc (Hons), PhD, Director, Mineral Resources Tasmania, with funds provided by the Australian Antarctic Foundation, and logistical support provided by the Australian Antarctic Division.

Base map drawn from several sources: The Spot multippectral satellite mosaic produced by the Australian Centre for Remote Sensing (ACRES) 1994. Division of National Mapping Macquarie Island 1:50,000 topographic map (1971) warped to conform with the satellite mosaic along coastline and lakes. Incomplete aerial photography flown in 1976 (mainly in the north of the island). GPS positions and field observations.

Map produced by the Data Management Group, Mineral Resources Tasmania, using GIS software. Original map produced March 1998. Absolute position with respect to horizontal datum and topographic features is approximate.

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- ALLUVIAL, LACUSTRINE AND SWAMP DEPOSITS**
 - Alluvium, including deposits at the margin of lakes.
 - Bogs, swamps and "leatherbed" (includes significant areas of peat without bedrock outcrops - on the west coast these peat deposits cover palaeo-beach deposits on an elevated terrace-cut platform 6-8m above sea level).
 - Palaeo-lake deposits of laminated mud, silt and organic material, often infilled, usually concealed beneath younger alluvium (not shown). Exposed palaeo-lake deposits indicated (large dots).
- SLOPE DEPOSITS**
 - Scree slopes.
 - Alluvial fans, with slopes of less than 22 degrees.
 - Deposits of large (2-20m) boulders along coasts, typically in bays on west coast.
- BEACH AND AEOLIAN DEPOSITS**
 - Pebbly to cobbly beach deposits.
 - Beach deposits with sand.
 - Coastal wind blown and dune sand.
 - Aeolian silt and sand deposits, often with gravel lag; approximate thickness of deposit in metres indicated where known.
 - Palaeo-beach deposits of rounded and smoothed cobbles and pebbles, less commonly with coarse sand; mostly on the plateau, but also on the rim (465750m; 3960750mN) as up to 9m above sea level, and below peat cover along the northern west coast (not indicated). Scattered palaeo-beach cobbles and pebbles (shown as overprint on underlying units).
- CLASTIC DEPOSITS**
 - Deposits of grey clay with streaked, faceted and polished cobbles and pebbles.

- Lag deposits of striated, faceted and polished cobbles and boulders.
- Isolated striated, faceted and polished cobbles and boulders.
- SEDIMENTARY ROCKS**
 - Mudstone and siltstone, usually laminated and red.
 - Conglomerate, usually clay supported, consisting of sub-rounded to sub-angular cobbles - to boulder-sized clasts of basalt and dolerite, in a mudstone to sandstone matrix.
 - Sedimentary rock matrix between pillows in lavas or blocks in breccia indicated (large dots).
 - ooze - pale grey to green siliceous ooze, mostly - red to grey mudstone.
- VOLCANICLASTIC ROCKS**
 - Volcaniclastic breccia, clay-supported, with blocks of usually aphyric basalt, plagioclase-phyric basalt blocks indicated (sp).
 - Breccia containing isolated pillows or lenticular zones of pillows indicated (pl).
- LAVAS**
 - Pillow basalt, aphyric to very sparsely phytic (<5% plagioclase phenocrysts), usually amygdaloidal.
 - Flow basalt, sparsely to moderately phytic (5-30% plagioclase phenocrysts), usually amygdaloidal.
 - Pillow basalt, densely to very densely phytic (>30% plagioclase phenocrysts), usually amygdaloidal.
 - Hyaloclastite (glass and basalt fragments) matrix of pillows indicated (% proportion of glass (Dg)); with hyaloclastite matrix containing plagioclase phenocrysts (Dg-sp).
 - Diaggregated pillows indicated by overprint.

- Tabular basalt flows, medium- to fine-grained, usually aphyric; rarely sparsely plagioclase-phytic (sp) or densely plagioclase-phytic (sp). Rarely with zones of pillow (pl). Auto-brecciation indicated (bre).
- Tabular basalt flows, medium- to coarse-grained with macroscopically visible plagioclase laths, usually aphyric; rarely sparsely plagioclase-phytic (sp). Rarely with zones of pillow (pl). Auto-brecciation indicated (bre).
- INTRUSIVE ROCKS**
 - Sheeted dolerite dykes, with screens of massive, coarse-grained gabbro absent; minor (<5%) or abundant (5-30%), % proportion of gabbro screens (Dgab) and individual gabbro screens indicated.
 - Transition zone of subparallel proportions of massive coarse-grained gabbro screens (30-70%) and sheeted dolerite dykes (30-70%).
 - Gabbro and olivine gabbro, usually massive, may contain dolerite dykes (0-20%) and rare ultramafic screens as indicated. Proportion of harzburgite screens indicated (Dsh). Proportion of dolerite dykes indicated (Ddd).
 - Gabbro screen within sheeted dolerite dykes; orientation known, trace.
 - Gabbro and olivine gabbro with compositional layering; Handspike Point, 492250mE, 3961250mN.
 - Troctolite, usually with compositional layering. Proportion of dolerite dykes indicated (Ddd).
 - Quartzite, usually with compositional layering. Proportion of dolerite dykes indicated (Ddd).
 - Massive wehrlite intrusion, plagioclase absent to very rare; without dolerite dykes (North Mountain, 494800mE 3958000mN).
 - Dunite and plagioclase-bearing massive wehrlite and minor dunite. Proportion of dolerite dykes indicated (Ddd).
 - Harzburgite, usually massive or occasionally with mineral layering; partly or completely serpentinized. Proportion of dolerite dykes typically <10% but locally up to 30%.
 - Ultramafic screen or screen-like tabular zone, orientation known, trace. Pyroxenite (px), troctolite (t), harzburgite (hz), plagioclase-bearing wehrlite (p) and dunite (du) indicated.

- Geological boundary - position approximate.
- Geological boundary - position inferred.
- Unconformity.
- Fault - position approximate.
- Fault - inferred.
- Thrust fault - teeth on upper plate.
- Dolerite dykes, trace or trend.
- Gabbro dykes (>0.5m wide), trace or trend.
- Microgabbro vein/dykes.
- Dunite lenses.
- Phlogopite-feldspar vein.
- Gabbro screen.
- Ultramafic screen.
- Base of escarpment.
- Approximate top of escarpment.
- Track.
- Topographic high point.
- Draft hole.
- Penguin fossil locality.

- Bedding in sedimentary rock - right way up; overturned.
- Bedding defined by orientation of massive tabular lava units.
- Bedding defined by lithological layering of distinct rock units.
- *Bedding defined by plane of pronounced flattening of pillows.
- Compositional layering in intrusive rocks.
- Strike and dip of dyke or vein.
- Strike and dip of screen or screen-like tabular zone within intrusive rock.
- Cleavage, fracture-cleavage or fractures - dipping; vertical.
- Foliation.
- Mylonite and ultra-mylonite zone orientation - dipping.
- Ductile shear-band orientation (<10mm wide).
- Trend and plunge of mineral elongation or mineral aggregate lineation.
- Strike and dip of outcrop scale fault.
- Trend and plunge of slickenside, within indicated fault plane.
- Sense of movement on fault or ductile shear zone - dextral; sinistral (note: for scraps on the plateau, the most recent, but not necessarily the most important, sense of movement is indicated).

Scale: 1:10 000
Projection: Universal Transverse Mercator
Horizontal datum - WGS 1984 Zone 57

