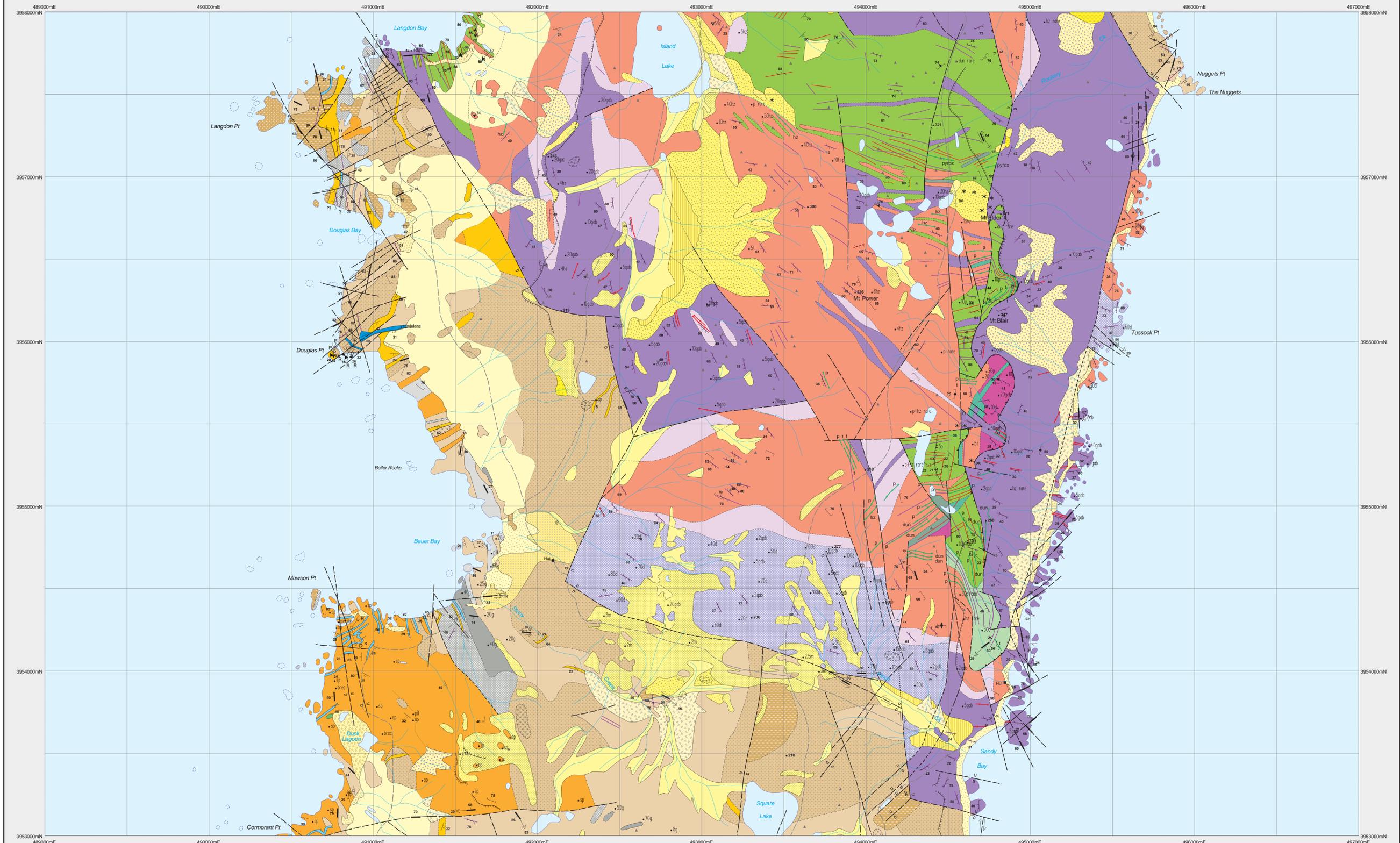


# GEOLOGY OF MACQUARIE ISLAND - SHEET 2



Geology by B.D. Goscombe, BSc (Hons), PhD and J.L. Everard, BSc (Hons), December 1994 - 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 multipass 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 photographs from 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.
  - Older alluvium of terraces.
  - Colluvium of wash slopes.
  - Bogs, swamps and "featherbed" (includes significant areas of peat without bedrock outcrops; on the north-west coast these peat deposits cover palaeo-beach deposits on an elevated wave-cut platform 0-3m above sea level).
  - Palaeo-lake deposits of laminated mud, silts and organic material, extent inferred, 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 or near coasts.
- BEACH AND AEOLIAN DEPOSITS**
  - Pebbly to cobbly beach deposits.
  - Beach deposits with sand.
  - Coastal wind blown and dune sand.
  - Angular 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 below peat cover along the northern west coast (not indicated).
  - Scattered palaeo-beach cobbles and pebbles (shown as overprint on underlying units).

- GLACIOGENE DEPOSITS**
  - Deposits of grey clay with silted, faceted and polished clasts and pebbles.
  - Lag deposits of silted, faceted and polished cobbles and pebbles.
  - Isolated silted, faceted and polished cobbles and pebbles.
  - Silts of angular coarse sandstone and gravel scattered over a fine matrix (490000E 3955000m).
- SEDIMENTARY ROCKS**
  - Mudstone and siltstone, usually laminated and red.
  - Conglomerate, usually clay supported, consisting of sub-rounded to sub-angular cobble- to boulder-sized clasts of basalt and dolerite, in a mudstone to sandstone matrix. (Gabbro clasts in conglomerate at 490000E 3956000m).
  - Siltstone and shale, massive, brownish-grey to black in breccia calcareous ooze - red to grey mudstone.
  - Transition zone of subequal proportions of massive coarse-grained gabbro (30-70%) and sheared dolerite dykes (30-70%).
- VOLCANICLASTIC ROCKS**
  - Hyaloclastic breccia consisting of angular to sub-rounded blocks of usually aphyric basalt in a glass matrix. Plagioclase-phyric blocks indicated (sp); proportion of glass indicated (sp).
  - Volcaniclastic breccia, matrix-supported, with blocks of usually aphyric basalt, plagioclase-phyric basalt blocks indicated (sp).
  - Volcaniclastic breccia, clast-supported, with blocks of usually aphyric basalt, plagioclase-phyric basalt blocks indicated (sp).
  - Breccia containing isolated pillows or lenticular zones of pillows indicated (sp).
- LAVAS**
  - Pillow basalt, aphyric to very sparsely phytic (<5% plagioclase phenocrysts), usually amygdaloidal.
  - Pillow basalt, sparsely to moderately phytic (5-30% plagioclase phenocrysts), usually amygdaloidal.
  - Pillow basalt, densely to very densely phytic (>30% plagioclase phenocrysts), usually amygdaloidal.
  - Hyaloclastic (glass and basalt fragments) matrix of pillows indicated. % proportion of glass (sp).
  - Matrix of pillows containing plagioclase phenocrysts (20%-50%).

- Disaggregated pillows indicated by overprint.
- Tabular basalt flows, medium- to fine-grained, usually aphyric; rarely sparsely plagioclase-phyric (sp) or densely plagioclase-phyric (sp). Rarely with zones of pillows (not shown).
- Tabular basalt flows, medium- to coarse-grained with macroscopically visible plagioclase phenocrysts; rarely sparsely plagioclase-phyric (sp). Rarely with zones of pillows (not shown). Auto-brecciation indicated (brecc).
- Small plugs of picrite.
- INTRUSIVE ROCKS**
  - Sheared dolerite dykes, with screens of massive, coarse-grained gabbro absent, minor (<2%) or abundant (5-30%). % proportion of gabbro screens (sp) and isolated gabbro screens indicated.
  - Sheared dolerite dykes with minor to abundant screens of massive fine-grained gabbro. Proportion of sheared dolerite dykes indicated (sp); typically 50-80%.
  - Transition zone of subequal proportions of massive coarse-grained gabbro (30-70%) and sheared dolerite dykes (30-70%).
  - Gabbro and dolerite gabbro, usually massive, may contain dolerite dykes (0-20%) and rare ultramafic screens as indicated. Proportion of harzburgite screens indicated (sp). Proportion of dolerite dykes indicated (sp).
  - Gabbro screens within sheared dolerite dykes; orientation known, trace.
  - Troctolite, usually with compositional layering. Proportion of dolerite dykes indicated (sp).
  - Dominantly plagioclase-bearing massive white and minor dunite. Proportion of dolerite dykes indicated (sp).
  - Dunite and plagioclase-bearing dunite, massive; partly or completely argyroditic.
  - Dominantly harzburgite with subordinate dunite and plagioclase-bearing wehrlite. Proportion of dolerite dykes indicated (sp).
  - Harzburgite, usually massive or occasionally with mineral layering (partly or completely argyroditic). Proportion of dolerite dykes typically <10% but locally up to 30%.
  - Ultramafic screens are green like tabular zone; orientation known; trace. Pyroxenite (pyrox), troctolite (tr), harzburgite with plagioclase matrix containing plagioclase phenocrysts (20%-50%).

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

- Bedding in sedimentary rock - right way up.
- 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.
- Azimuth and direction of flow of lava, indicated by pillows (P), ropey lava (R), lava tubes (T) or drag on underlying sediments (D).
- Trend and plunge of flow of lava, indicated by long axes of pillows (P) or ropey lava (R).
- Compositional layering in intrusive rocks.
- Strike and dip of dyke or vein.
- Strike and dip of screen on screen-like tabular zone within intrusive rock.
- Cleavage, fracture-cleavage or fractures - dipping.
- Strong penetrative cleavage with possible grain-refinement.
- Foliated foliation.
- Mylonite and ultra-mylonite zone orientation - dipping, vertical.
- Ductile shear-bend 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 plateaux, the most recent, but not necessarily the most important, sense of movement is indicated).

Scale: 1:10 000  
0 200 400 600 800 1000m

Projection: Universal Transverse Mercator  
Horizontal datum - WGS 1984 Zone 57

