

## GLOSSARY

<b>Abyssal depths</b>	The deep ocean below ~2000 m.
<b>Acid sulphate soils</b>	Soils deposited under reducing conditions which contain iron sulphides. When exposed to the air the sulphides oxidise to sulphate minerals and sulphuric acid. The acid can attack foundation structures and pollute water courses.
<b>Agglomerate</b>	Rock solidified from coarse, rounded fragments ejected in volcanic eruptions.
<b>Aggregate</b>	Crushed rock, gravel or sand used in concrete, roads, etc.
<b>Alluvium/alluvial</b>	Sediments deposited by rivers and creeks.
<b>Alluvial fan</b>	A broad cone-shaped deposit of alluvium made by a stream where it descends from mountain terrain to run out onto a level plain.
<b>Alluvial terraces</b>	Flat bench-like surfaces formed by alluvial sediments deposited from streams at different times in their history. Usually the highest terrace is the oldest.
<b>Aquifer</b>	Layer or zone below the surface capable of supplying water from a spring, well or bore.
<b>Argillite</b>	Hardened siltstone, mudstone or shale.
<b>Basalt</b>	A dark grey or black, fine-grained rock with low amounts of silicon, usually erupted as volcanic lava flows, but also occurring in dykes, sills and plugs.
<b>Basin</b>	A slowly subsiding part of the Earth's crust in which sediments accumulate.
<b>Beach ridge</b>	A ridge of sand washed or blown up above an active beach. Where there is abundant sand supply a series of ridges may build up in succession.
<b>Beds/bedding</b>	The succession of layers resulting from successive pulses of sediment being deposited.
<b>Breccia</b>	A rock solidified from medium to coarse, angular fragments; can be sedimentary, volcanic, or intrusive in origin.
<b>Calcite</b>	A white to cream mineral of calcium carbonate, $\text{CaCO}_3$ .
<b>Cassiterite</b>	Pale to dark brown, resistant tin oxide mineral ( $\text{SnO}_2$ ). The main ore of tin.
<b>Chert</b>	A sedimentary rock composed of very fine-grained silica (silicon oxide, $\text{SiO}_2$ ).
<b>Cinder cone</b>	See Scoria cone.

<b>Clay minerals</b>	Layered aluminium-silicon-oxygen silicate minerals that form in soils and elsewhere. They comprise most of the clay particles (see 'soil texture') in soil. Due to their high surface area and chemical nature they are largely responsible for soil fertility. The type of clay mineral occurring in soil depends on the primary minerals, the environment and time. Kaolinite is the most stable clay mineral and hence the most common in the highly weathered region of far north Queensland. It has the lowest surface area and nutrient holding capacity of all clay minerals.
<b>Coal measures</b>	A sequence of sedimentary rocks containing coal seams, not necessarily economic.
<b>Conduits</b>	Routes by which molten magma can reach the surface.
<b>Continental shelf</b>	The gently-sloping submerged edge of a continent, extending from the coast to the top of the continental slope in about 100 m of water. Commonly covered by marine sediments.
<b>Continental slope</b>	The steep slope marking the edge of the continental shelf which falls to the abyssal depths.
<b>Cooling columns</b>	When lava or sub-surface magma cools, it contracts to crack in a regular pattern, producing long pentagonal and hexagonal columns, supposedly at right angles to the cooling surface.
<b>Crust</b>	Outer layer of the Earth, about 35 km thick beneath continents and 10 km beneath the oceans.
<b>Crustal plate/ tectonic plate</b>	Major fragment of the crust which can slowly move over geological time. Can include both continental and oceanic crust.
<b>Diatreme</b>	Volcanic vent or pipe drilled through enclosing rocks by the explosive energy of gas-filled magmas.
<b>Erosion</b>	The process by which rock and earth materials are loosened, worn away and removed from parts of the Earth's surface.
<b>Escarpment</b>	A long steep face or slope abruptly terminating highlands or a plateau.
<b>Fault</b>	A major break in rock sequences along which movement has occurred.
<b>Feldspar</b>	A family of common, white, grey or pink rock-forming silicate minerals, consisting of silicon, aluminium, oxygen and either potassium or sodium and calcium.
<b>Fold</b>	A place where rocks have been bent upwards or downwards by crustal forces.

<b>Foliation</b>	Fine layering or banding in metamorphic rocks caused by recrystallisation of minerals into separate layers, commonly at an angle to the original bedding.
<b>Granite</b>	A coarse-grained intrusive igneous rock composed mainly of quartz, potassium feldspar, plagioclase feldspar and mica.
<b>Greenstone</b>	Metamorphosed basaltic lava or tuff.
<b>Greywacke</b>	A hardened, medium to coarse-grained sedimentary rock composed of small fragments of older rocks, feldspar and quartz in a fine-grained matrix.
<b>Groundwater</b>	Water underground in the saturated zone, permeating rocks or sediments.
<b>Habitats</b>	Spatially recognisable areas where the physical, chemical and biological environment is distinctly different from surrounding environments.
<b>Ice age</b>	A cold climatic period when much water was locked up in polar ice caps and glaciers, resulting in a lower sea level.
<b>Igneous rocks</b>	Rocks formed from solidification of molten rock (magma) generated within the Earth, either in intrusions (plutonic) or at the surface (volcanic).
<b>Ignimbrite</b>	A rock consolidated from a high-temperature, high-velocity, gas-charged flow of volcanic debris from a violent eruption, commonly very hard from the welding together of the hot plastic fragments; also known as welded tuff.
<b>Intrusion</b>	A body of molten rock that has penetrated into other rocks and solidified beneath the surface.
<b>Iron oxides</b>	Various minerals and amorphous materials consisting mostly of iron and oxygen, but in some cases including hydrogen in hydroxides.
<b>Joints/jointing</b>	Planar surfaces formed when a rock fractures from stresses.
<b>Kaolinite</b>	A common clay mineral of soils and weathered rocks, white when pure, containing aluminium, silicon, oxygen and hydrogen, with the general formula of $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_2$ .
<b>Lava</b>	Molten rock poured out from volcanoes or other fissures in the Earth's crust.
<b>Limestone</b>	Sedimentary rock consisting mainly of calcium carbonate, often in the form of shell and coral debris.
<b>Maar</b>	A volcano formed by the explosive interaction of rising magma and underground water. A large crater is formed as the depth of the water/magma interaction becomes deeper. An abundant supply

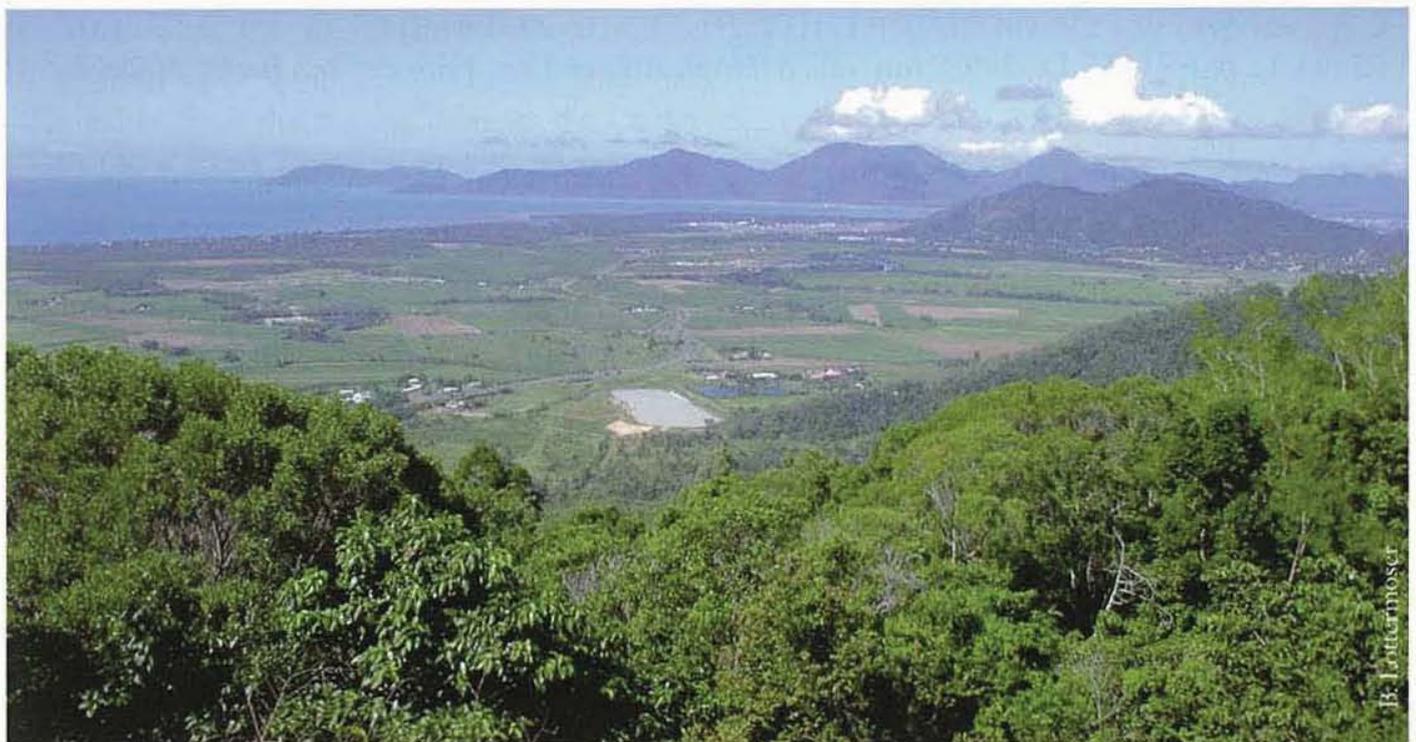
of water is required to sustain the eruption.

<b>Magma</b>	Molten rock generated at depth in the crust or upper mantle.
<b>Malachite</b>	A bright green, copper carbonate mineral ( $\text{Cu}_2\text{CO}_3(\text{OH})_2$ ) which results from weathering of copper minerals, usually copper sulphides.
<b>Mantle</b>	Layer of the Earth between the crust and the core, extending to 2900 km beneath the surface.
<b>Marble</b>	Limestone recrystallised by heat and fluids.
<b>Metamorphism</b>	Process of transformation and recrystallisation of rocks by pressure and heat; new minerals commonly grow in new positions.
<b>Meta-sediments</b>	Sedimentary rocks slightly recrystallised by metamorphism, but having their original nature still recognisable.
<b>Mica</b>	A family of platy, sheet-like rock-forming silicate minerals.
<b>Mineral sands</b>	Coastal, dune or river sands containing resistant dark minerals such as ilmenite ( $\text{FeTiO}_3$ ), rutile ( $\text{TiO}_2$ ), zircon ( $\text{ZrSiO}_4$ ) and monazite ( $(\text{Ce,La,Y,Th})\text{PO}_4$ ) that are of industrial interest.
<b>Mudstone</b>	A very fine-grained sedimentary rock consolidated from mud, commonly with little banding or bedding evident.
<b>Nugget</b>	An irregular, rounded lump of gold found in stream beds.
<b>Ochre</b>	Powdery material used for decoration; brown and yellow ochres are composed of iron oxides while white ochre is of kaolinite clay.
<b>Parent material</b>	(Of soils). The material from which soil forms. It may be hard rock, weathered rock, or transported material such as alluvial sediments.
<b>Perlite</b>	Rhyolitic lava rapidly chilled to a black glass by contact with the ground or air; has a high water content that causes it to expand if heated.
<b>Permeability</b>	The property of a rock or soil that expresses the ease in which fluids such as water move through it.
<b>pH</b>	A measure of the acidity or alkalinity of a substance. pH 1 is highly acid, pH 14 is highly alkaline, while pH 7 is neutral.
<b>Phyllite</b>	A fine-grained metamorphic rock derived from mudstone or shale by heat and pressure, with recrystallised mica minerals lying in one direction, giving a silky sheen to the rock.
<b>Precambrian</b>	All the vast span of geological time before about 540 million years ago.
<b>Pleistocene</b>	The epoch of geological time from 1.8 million to 10 000 years

	ago.
<b>Pumice</b>	A solidified froth of volcanic lava and gas.
<b>Pyroclastic</b>	Volcanic materials that have been ejected violently as fragments from a volcanic vent; form tuff, welded tuff, agglomerate, breccia etc.
<b>Quartz</b>	Crystalline silica (silicon oxide, SiO <sub>2</sub> ).
<b>Quartzite</b>	A hard meta-sedimentary or metamorphic rock consisting mainly of quartz recrystallised from chert, sandstone, or other siliceous rocks.
<b>Radiolaria</b>	Microscopic, single-celled marine organisms with a siliceous skeleton.
<b>Recrystallisation</b>	Formation of new minerals in a rock from destruction of old, commonly by pressure and heat.
<b>Reef (coral)</b>	A mound or ridge-shaped organic structure which is built by calcareous organisms, is wave resistant and stands in relief above the surrounding seafloor.
<b>Rhyolite</b>	A light-coloured, fine-grained volcanic or intrusive rock with a high silica content; the fine-grained equivalent of granite.
<b>Savanna</b>	Grassland region with scattered trees, in tropical or sub-tropical regions with marked seasonal rainfall.
<b>Schist</b>	A medium to coarse-grained metamorphic rock, with a well defined layering, or foliation, of different minerals.
<b>Scoria</b>	Fragments of lava, usually basalt, with very numerous gas bubbles (vesicles) that are ejected during gas-rich volcanic eruptions. The equivalent rock formed from magma with a chemical composition of rhyolite is called 'pumice'.
<b>Scoria cone</b>	A small, steep sided volcano formed when gas-rich eruptions throw fragmented rocks and lava into the air. The pieces fall back down and build up the volcanic cone around the central vent.
<b>Shale</b>	A very fine-grained sedimentary rock with a pronounced thin layering.
<b>Shearing/ Shear zone</b>	Distortion or breaking of rocks by successive thin slices being dragged laterally over each other. A zone where shearing has taken place.
<b>Shield volcano</b>	A broad volcano with gentle slopes formed by lava oozing out of a central vent and flowing quickly away; named after resemblance to an upturned warrior's shield.

<b>Siltstone</b>	A fine-grained sedimentary rock intermediate in grain size between sandstone and mudstone.
<b>Slate</b>	A very fine-grained, hard meta-sedimentary or metamorphic rock with a finely spaced layering that allows it to be split easily.
<b>Sodic soils</b>	Soils are called sodic if sodium makes up a high proportion (generally >6%) of the cations held on the surfaces of clay particles.
<b>Soil organic matter</b>	The remains of plants, animals and microorganisms, including charcoal. It consists of a wide range of materials, some of which decompose very quickly and some of which decompose very slowly. It is the main determinant of soil nutrient-holding capacity in weathered tropical soils.
<b>Soil profile</b>	A vertical section of soil.
<b>Soil structure</b>	The arrangement of particles and pores in soils. Soils with 'good structure' for plant growth are friable, have aggregates that are stable when wet, and many pores that conduct water and air deep into the soil.
<b>Soil texture</b>	The particle-size distribution of soil. Particle sizes are divided into clay (diameter <2 $\mu\text{m}$ ), silt (diameter 2-20 $\mu\text{m}$ ), sand (diameter 20-2000 $\mu\text{m}$ ) and gravel (>2 mm). 'Clay soils' are soils in which >35% of particles are clay particles. 'Heavy clay' soils contain >50% clay particles. Silt and sand particles can consist of any mineral, but quartz is common as it is resistant to weathering. 'Sandy soils' are soils with >70% sand and <10% clay particles. 'Loam' soils have similar proportions of sand, silt and clay.
<b>Strata</b>	Beds or layers of sedimentary rocks.
<b>Tectonic plate</b>	See Crustal plate.
<b>Tuff</b>	A rock consolidated from fine fragments from volcanic eruptions.
<b>Turbid</b>	Opaque or muddy from suspended matter.
<b>Turbidite</b>	A rock deposited by successive pulses of sediment slumping down the continental slope in 'turbidity' currents and discharging on to the deep ocean floor.
<b>Vein/veinlet</b>	A mineral-filled fracture cutting across rocks.
<b>Vesicles/ vesicular</b>	Small cavities originating as gas bubbles in lavas; containing

	numerous vesicles.
<b>Volcanic ash</b>	Un-cemented fragmental ejecta from volcanoes, mostly under 4 mm in diameter. Consolidates to tuff.
<b>Water table</b>	The level below which the ground is saturated with water.
<b>Weathering</b>	The physical, chemical and biological processes that cause rocks exposed to the weather to disintegrate into soil-like materials. The primary rock minerals are transformed into secondary minerals, most commonly clays (see 'clay minerals') and eventually oxides. Weathering requires water and is accelerated by high temperature and biological activity. It is therefore rapid in wet tropical environments.
<b>Welded tuff</b>	A tuff which has been hardened by its retained heat; see Ignimbrite.
<b>Wolframite</b>	A dark, hard mineral of the element tungsten $(\text{FeMn})\text{WO}_4$ . One of the ores of tungsten.
<b>'Wonky hole'</b>	A hole in the sea bed on the inner continental shelf where fresh water bubbles to the surface after flowing through buried gravels and sands in old submerged river channels.



The Barron River delta forming the coastal plain below the coastal escarpment near Cairns.

## FURTHER READING

### Geology

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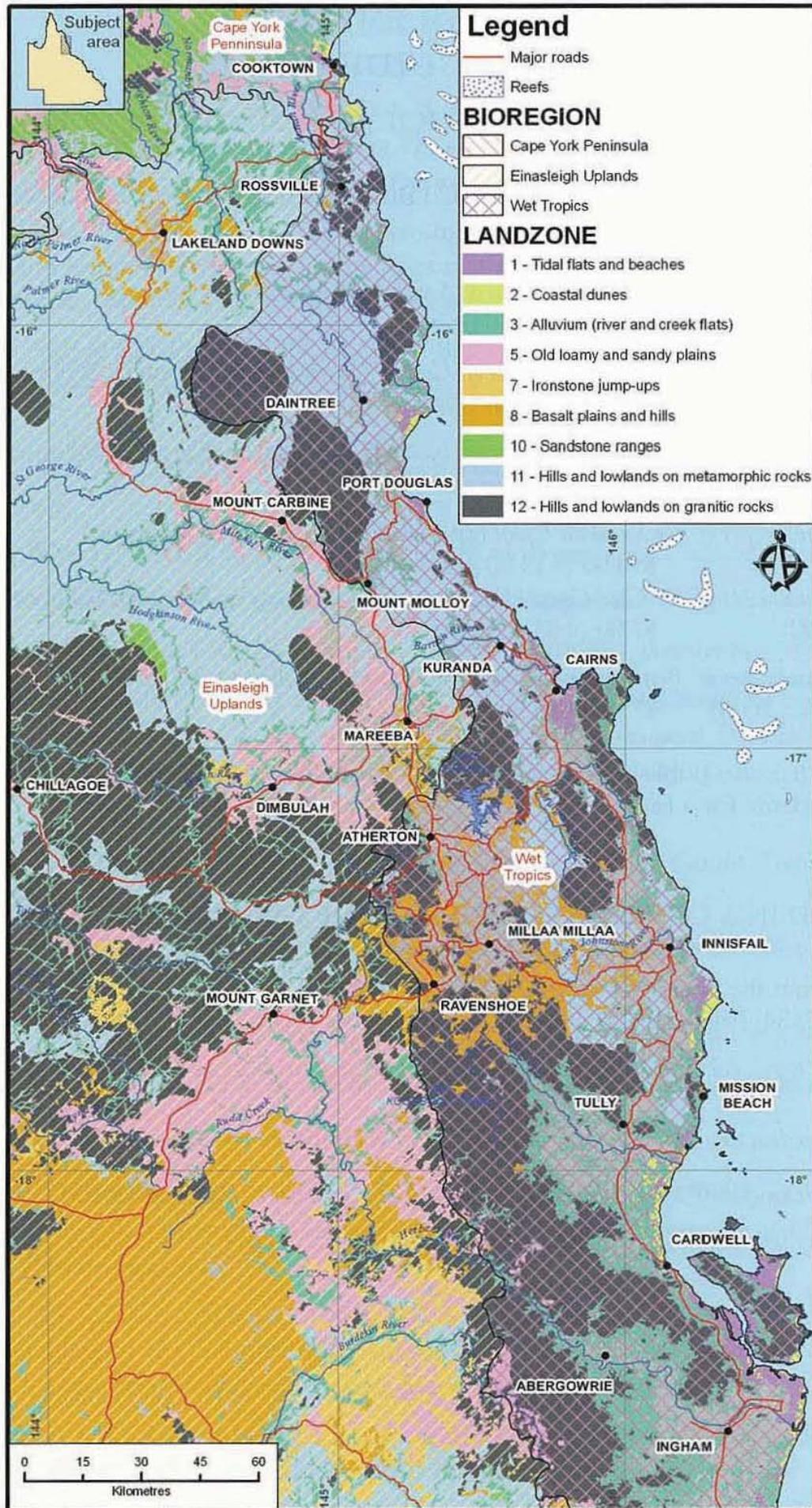
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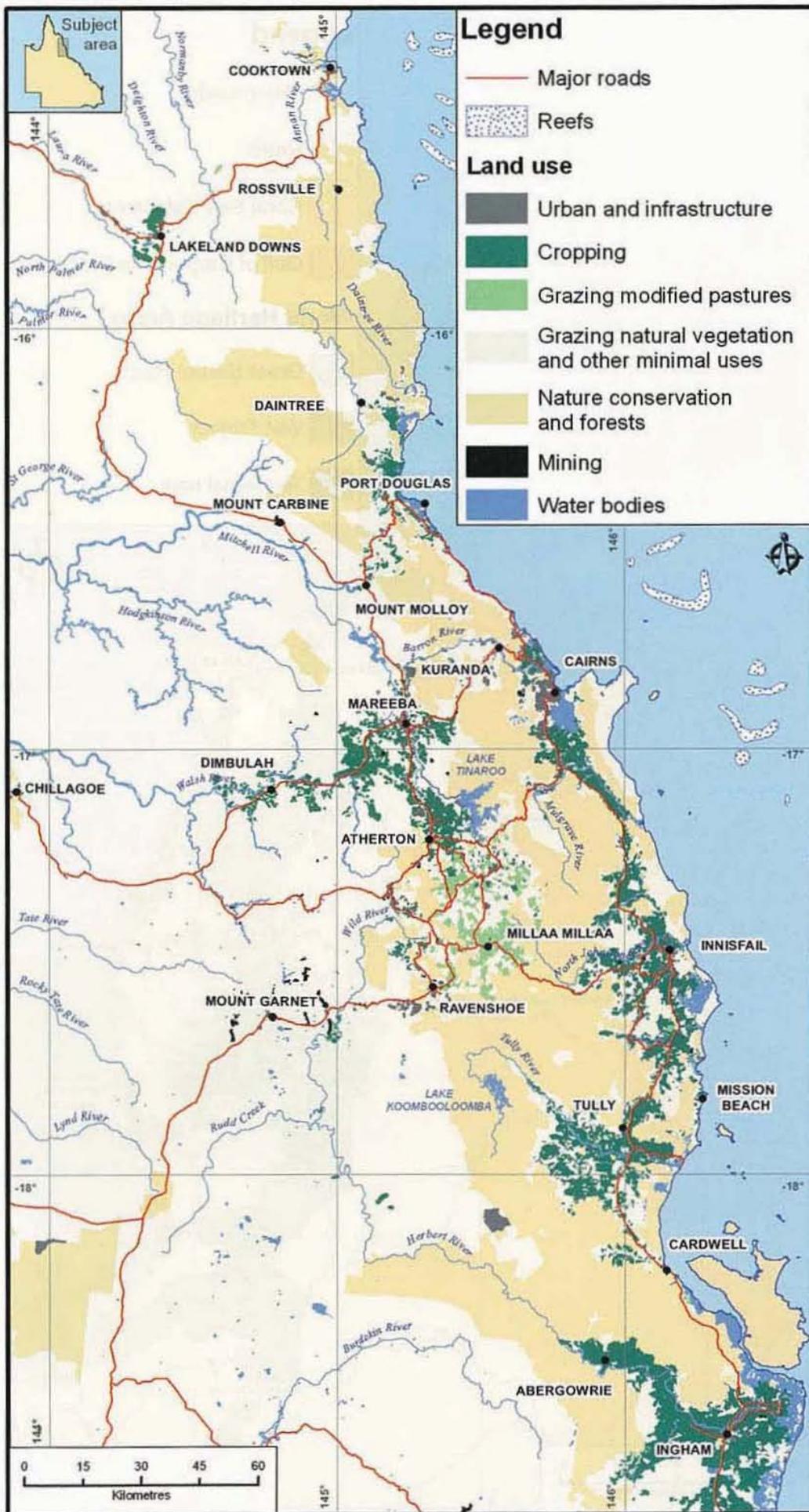
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Bioregions and Land Zones in the Wet Tropics and surrounds.



Land use in the Wet Tropics and surrounds.



Locality map, showing the region's two World Heritage Areas, and the Great Divide between rivers flowing into the Gulf of Carpentaria and the Coral Sea.