

2 NORTHLAND REGION TODAY



Northland is a long, narrow peninsula with a subtropical climate. It has a land area of 1.25 million hectares and a population of 148,470 (Statistics NZ 2006). Local government in the region includes Northland Regional Council and the Far North, Kaipara and Whangarei District Councils as shown in figure 1 (below).

Northland is a diverse region in both socio-economic patterns and environmental characteristics. Northland is renowned for its scenic and accessible coastline, sheltered harbours, many offshore islands and ecosystems of important conservation value. While Northland is currently undergoing significant growth particularly in eastern coastal areas, it remains a relatively poor and isolated region of New Zealand (NRC 2006).

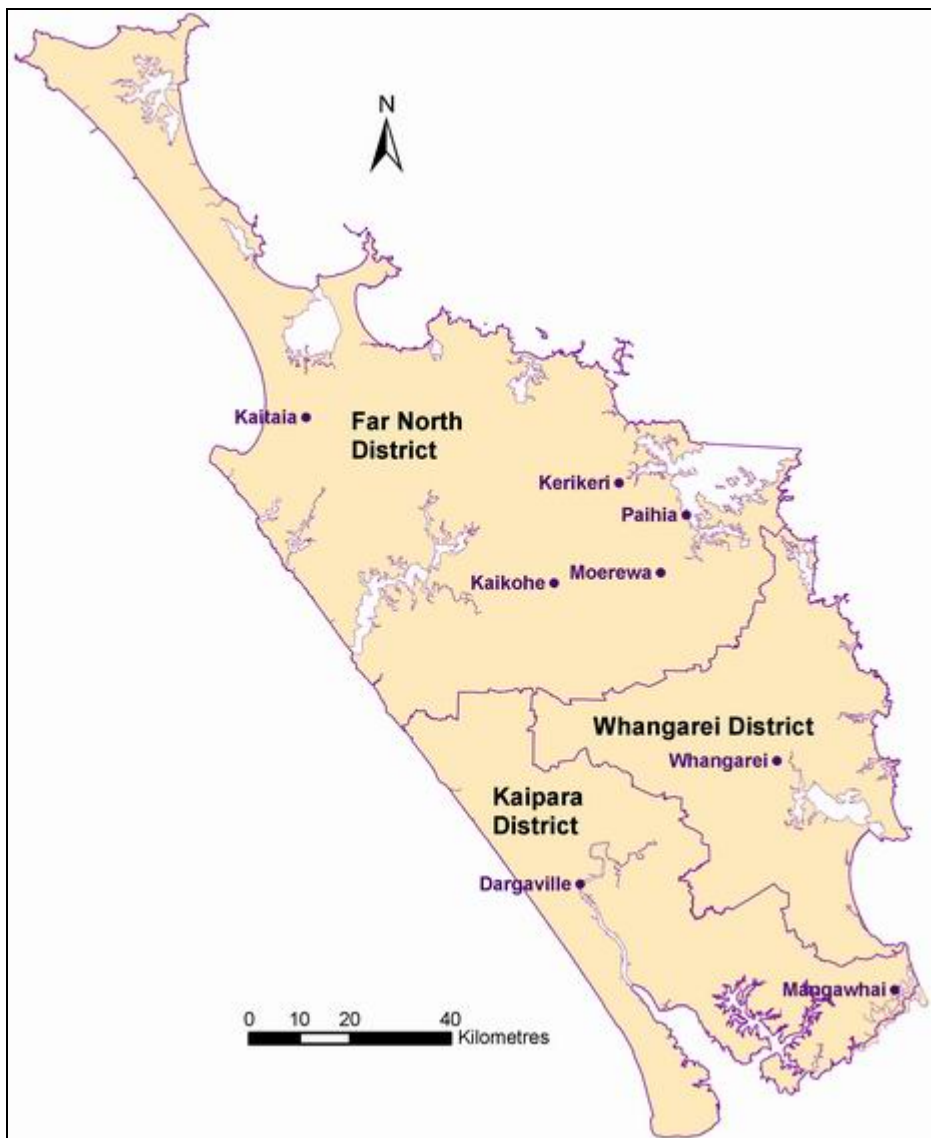


Figure 1: Map of Northland region showing districts and main urban areas.

2.1 Our region

Climate

Northland, with its proximity to the sea, almost subtropical location and low elevation, is characterised by a mild, humid and rather windy climate. Summers tend to be warm and humid. Winters are characteristically mild with many parts of the region having only a few light frosts each year. The prevailing wind for most parts of the region is from the south west. However, in summer tropical cyclones give rise to north-easterly winds and heavy rainfall.

The mean annual rainfall ranges from about 1000-1300mm in low-lying coastal areas to over 2500mm on some of the higher country. Approximately one-third of the yearly rainfall total falls in the winter months of June, July and August. The region experiences high-intensity rains which can cause severe flooding.



Droughts are common in Northland during the summer months. High pressure weather conditions are prevalent during this period, often resulting in several weeks or months of dry and hot or windy weather. Records indicate that parts of the region on average have a drought of economic significance every three years.

Mean annual temperatures range from 15.5°C to 16°C in the far north and eastern areas, to between 14°C and 15.5°C in the south west and coastal districts, giving it the highest mean annual temperatures in NZ. Daily and annual temperature variations are low. Whangarei, the major settlement of the region, has around 1900 sunshine hours per year, and receives an annual rainfall of approximately 1300mm, about average for NZ.

Climate change

In August 2006, the National Institute of Water and Atmospheric Research Ltd (NIWA) carried out a comprehensive assessment on the impact of climate change and climate variability on Northland's water resources based on all available literature. The assessment considered natural climate variability in the Northland region and the potential effects of predicted climate changes over the next 50 to 80 years.

The main findings of the assessment were:

- All predictions suggest an increase in temperature, particularly during the winter;
- Overall annual rainfall may not change but rainfall trends for the next 30 to 80 years are for increased dry periods (drought and low flows) and increased high intensity rainfall events (floods); and
- The change in rainfall trends and temperature is likely to result in decreased recharge to groundwater resources, and increased potential for saltwater intrusion in coastal aquifers,
- And more frequent and extended periods of low flows and more high-intensity flood events in rivers and streams.
- Potential effects on the agricultural industry through harsher conditions for pasture, increased likelihood of erosion and a climate more suitable for subtropical grass species.

Other than this assessment there is currently very little information to assess the extent and potential effects of climate change in Northland. However, there has been work done both nationally and internationally, looking at the potential impacts of climate change and ways of preventing it from happening.

For more information refer to the following page on Ministry for the Environment's website at the following link:

<http://www.mfe.govt.nz/issues/climate/>

Landforms and soils

Northland is only 80km across at its widest point, bounded by the Tasman Sea and Pacific Ocean. As a peninsula, Northland's coastline is its most distinctive physical feature. The coastline of 3025 kilometres with its many sheltered harbours and offshore islands, sets the Northland coast apart from other areas of NZ.

The region is also unlike most of NZ in that there are few mountain ranges and the highest point, Te Raupua in the Waima Range, is only 781 metres above sea level.

Typically, inland areas are dominated by rolling hill country with landforms ranging from the ancient uplifted east coast greywacke rocks to relatively young volcanic lava and active coastal dunes. Many rivers, streams, tidal inlets and harbours dissect and break the pattern of hills. Modest areas of flat low-lying land are restricted to areas adjacent to the Awanui and Northern Wairoa rivers.

More than 100 different soil types have been identified in the Northland region (NZMS 290 map series). This variety is due to differences in underlying rock, the low relief and the influence that the warm, moist climate and original vegetation has had on soil formation.

Northland has significant areas of strongly leached, heavy clays overlying unearthened rock with thin topsoil and low subsoil fertility.



More information on the state of our land resources is available in the land and soils chapter of this report.

Water resources

Rivers and streams

Many of Northland's rivers are relatively short with small catchments. The Wairoa River is Northland's largest, draining a catchment area of 3650 square kilometres (29% of Northland's land area).

Most of the major rivers flow into harbours, rather than discharging directly to the open coast. This has significant implications for coastal water quality. Flows in rivers vary considerably with rainfall, high intensity storm events causing flash floods and prolonged dry spells leading to very little flow in many smaller catchments. Overall, Northland's rivers are generally characterised as being slow flowing and muddy.

Lakes

The Northland region has a large number of small and generally shallow lakes. They were formed either by dune activity, volcanic activity or are artificially made.

The dune lakes are in four main groups situated on the Aupouri, Karikari and Pouto peninsulas and the Kai Iwi lakes. They generally range in size between five and 35 hectares and are usually less than 15 metres deep. Lake Taharoa of the Kai Iwi group is one of the largest and deepest dune lakes in the country, covering an area of 237 hectares and being 37 metres deep.

Lakes Omapere and Owhareiti near Kaikohe were formed by lava flows damming valleys. Further to the north are two large artificially made lakes associated with the Kerikeri irrigation scheme, which are a major water resource for the area.



Groundwater

Groundwater is water beneath the surface of the earth which saturates the pores and fractures of sand, gravel, and rock formations. It is a valuable water resource to Northland, being utilised for numerous town and rural water supplies, irrigation and stock water. Whangarei, Kaitaia, Mangonui, Kaikohe, Okaihau, Maungakaramea and Ruawai all take groundwater for municipal water supplies. Groundwater is also an important water source for many coastal communities, such as Russell, Taipa and Matapouri.

In general there are three main types of groundwater aquifers: Sands and gravels, volcanic cones and related lava flows and sedimentary rocks. Geothermal fields represent an unusual variation in which water is subject to heat and pressure as a result of geothermal activity. Northland has one geothermal field centred on Ngawha Springs to the east of Kaikohe.

More information on Northland's groundwater and geothermal resources is available in the groundwater and geothermal chapters of this report.

Coastal waters

Northland's most distinctive physical feature is its long and varied coastline, with 3025 kilometres of rugged cliffs, sandy beaches and sheltered harbours.

The east coast, bounded by the Pacific Ocean, is characterised by enclosed mangrove-lined harbours and estuaries, rocky headlands and sheltered bays. Offshore islands, including those in the Bay of Islands, the Cavalli Islands and the world-renowned Poor Knights Islands, are a distinctive feature. The east coast is sheltered from the prevailing westerly winds, but is occasionally lashed by north-easterly gales and the remnants of tropical cyclones.

By contrast, the west coast has a relatively smooth outline, broken only by the mouths of several extensive shallow harbours. It is more exposed to the elements than the east coast, with long sandy beaches swept by oceanic swells from the Tasman Sea.

More information on Northland's coastal environment is available in the natural character of the coast and coastal water quality chapters of this report.

Ecosystems and Biodiversity

Rivers, lakes and wetlands

The rivers with the highest conservation values are those whose catchments are the least modified, including the Waipapa River in Puketi forest and Waipoua River.

Dune lakes and associated freshwater wetlands are numerous on the coastal sands of the region. Northland also has many inland wetlands, the most significant being Ngawha Springs wetlands, Motatau wetlands, Waitangi wetland complex, Punakitere wetlands, Maitahi fen and Mangonui River wetlands.

The original area of wetlands has been greatly reduced due to drainage and conversion for agricultural purposes. The remaining wetlands show evidence of these practices in that they are small, scattered and vulnerable to changes in hydrological regimes. The most significant areas of dune lakes and wetlands remaining are Aupouri Peninsula, Kaimaumau Swamp, Lake Ohia, Kai Iwi Lakes and on the Pouto Peninsula.

These lake and wetland ecosystems are important habitats for a wide variety of plant and animal species, which are regionally or nationally significant because of their rarity. These include birds such as the brown teal, banded rail, NZ dabchick, marsh crake, fern bird and bittern, the aquatic plants *Hydatella inconspicua*, *Myriophyllum robustum* and native freshwater fish such as black mudfish, banded kokopu, short jawed kokopu and dwarf inanga.

Forest and Shrublands

Nearly 14% of the land area of Northland remains in native forest and shrubland, and this includes over half of the nation's remaining kauri forest. The region's forest and associated shrublands are notable for their high proportion of native species, species diversity, structural complexity and tropical links.



Podocarp/hardwood/kauri forests are the most extensive forest type in Northland. These comprise a wide variety of hardwoods including rewarewa, kohekohe, tawa, pukatea and taraire among others. Podocarp species such as rimu, totara, miro and matai are scattered throughout the region, along with kauri which often grow in small clumps on steep sites. Other distinctive forest types are evident on the coast, such as manuka/kanuka shrublands found at Te Paki in the Far North. Coastal forest generally comprises pohutukawa, houpara and kowhai together with karaka, puriri and kohekohe. Volcanic broadleaf and alluvial flood forests have both been severely diminished by land development and are now represented by small remnants.

Northland's forest and shrubland areas support a rich diversity of wildlife. They are home to large populations of nationally rare or declining species such as the North Island Brown Kiwi, North Island Kokako, native pigeon or kukupa and Hochstetter's frog, as well as small residual populations of more threatened species such as the red and yellow crowned parakeets, kaka and long and short-tailed bats. Some forests in the region also support the only naturally breeding populations of species including flax snail, kauri snail and the Northland green gecko. Survival of these and other species is threatened by adverse effects of human activity such as forest clearance, the activities of animal pests (e.g. possums, wild cats and poorly controlled domestic dogs) and plant pests.

Coastal

The west coast of Northland is exposed to almost continuous onshore oceanic swells that cause turbulence, turbidity and sediment movement in shallow marine and intertidal habitats. Marine species occupying this type of environment are consequently few and hardy.

The west and east coast harbours as well as numerous lakes and swamps are valuable feeding grounds for migratory waders such as plovers, godwits, turnstones and tattlers. Harbours and estuaries within drowned river valleys are common along the east coast of Northland. Most are ecologically similar to those on the west coast, but Parengarenga, Houhora and Rangaunu Harbours differ in having large intertidal sand flats and shell banks.

Extensive areas of mangrove forest and salt marsh are present in harbours on the east and west coasts of Northland. These habitats are invaluable as a rearing ground for juvenile fish species including many commercially exploited species, and important feeding and roosting areas for birds.

The east coast of Northland is predominantly rocky with intervening sandy beaches. Coastal dunes are home to several endangered plant species, with beaches important as roosting, nesting and feeding areas for coastal birds such as the threatened New Zealand dotterel, the rare and endemic variable oystercatcher and the endangered fairy tern.



Marine habitats containing locally endemic species and New Zealand endemics that are very rare elsewhere are present at the Three Kings Islands and in the Cape Reinga area. These areas and also the Moturoa Islands, Cape Karikari, Cavalli Islands, Cape Brett and the Poor Knights Islands are influenced by the East Auckland current. This warm, subtropical current brings with it the larvae of Indo-Pacific species including several species of molluscs, echinoids (sea-eggs) and a variety of fish. The larvae mature within the areas washed by the current, and along with many endemics, make these areas ecologically unique.

Indigenous, terrestrial coastal vegetation in Northland has been largely removed or otherwise modified by human influences. Unmodified coastal forest is now very rare, being present on some islands, and at only a few localities on the mainland: Herekino Harbour mouth and Ninety Mile Beach. Indigenous dune field vegetation is similarly rare and restricted to areas such as North Cape, the North Heads of the Kaipara and Hokianga harbours and isolated areas on the east coast.

2.2 Our people

Population change

The Northland region is home to about 148,500 people, which is 3.7 percent of New Zealand's population (Statistics NZ 2006). There are some 30 townships with populations of more than 500 people. The largest centre is the city of Whangarei with a population of just over 49,000. Other major centres are shown in table 1 (below). The population is generally concentrated along the region's east coast, particularly in the Whangarei and Bay of Islands areas.

Table 1: Population in Northland's major centres (Statistics NZ 2006)

Centre	Population
Whangarei	49070
Kerikeri	5860
Kaitaia	5550
Dargaville	4460
Kaikohe	4110
Opuia-Paihia-Waitangi	3960

Between the 1996 and 2006 censuses, Northland's population increased by 11,420 people, which is about 2800 less than the previous 10 year period. This is an average annual increase of 0.8%, slightly less than the national annual increase of 1.1%.

The two areas with the largest population increases over the past five years are the Kerikeri and Mangawhai areas, with 20 and 24% increases respectively. This is related to the significant amount of lifestyle and subdivision development that has occurred and is continuing to occur in these areas.

Following the 2001 census, using historical population figures Statistics New Zealand have predicted a median population projection of 159,600 for Northland in 2026, as shown in figure 2 (below). Although regional growth is important for economic development it also puts pressures on our regional infrastructure, including roading, sewage and water utilities, and natural resources.

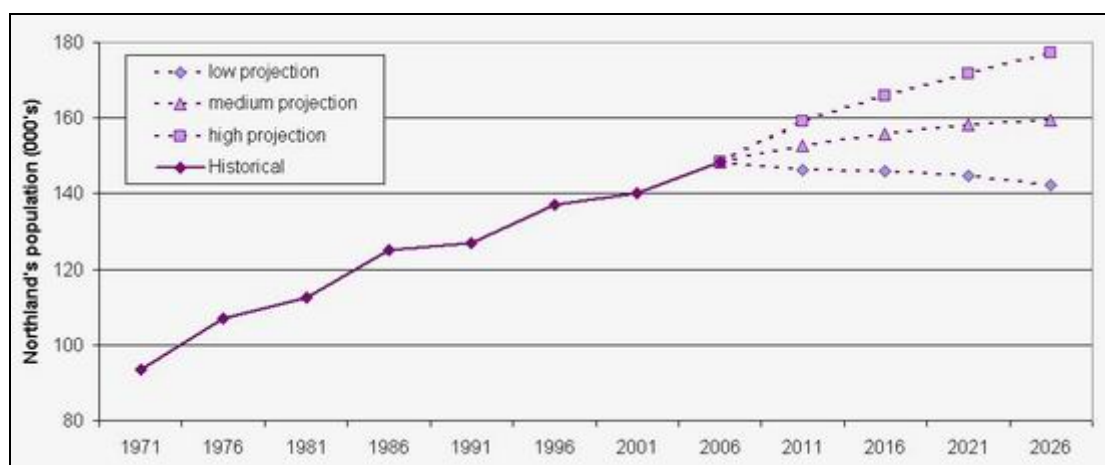


Figure 2: Historical and projected population for Northland (Statistics NZ 2006).

Gender and age

Northland's population has slightly more females (75,618) than males (72,822). This is consistent with previous years and the rest of New Zealand, where females made up 51.2% of the population in the 2006 census (Statistics NZ). Interestingly males dominate the younger age groups from 0 to 24 years, while females make up the greater proportion of all other age groups from 25 years and up, except 65 to 74 years as shown in figure 3 (below).



The median age in Northland in 2006 was 38, where as in 2001 it was 36. There is very little difference in the proportion of Northland's residents who were in the working age bracket of 15 to 65 years between 2001 and 2006, with it being approximately 62% in both. The proportion of people over 65 has increased from 13.3% in 2001 to 14.4% in 2006.

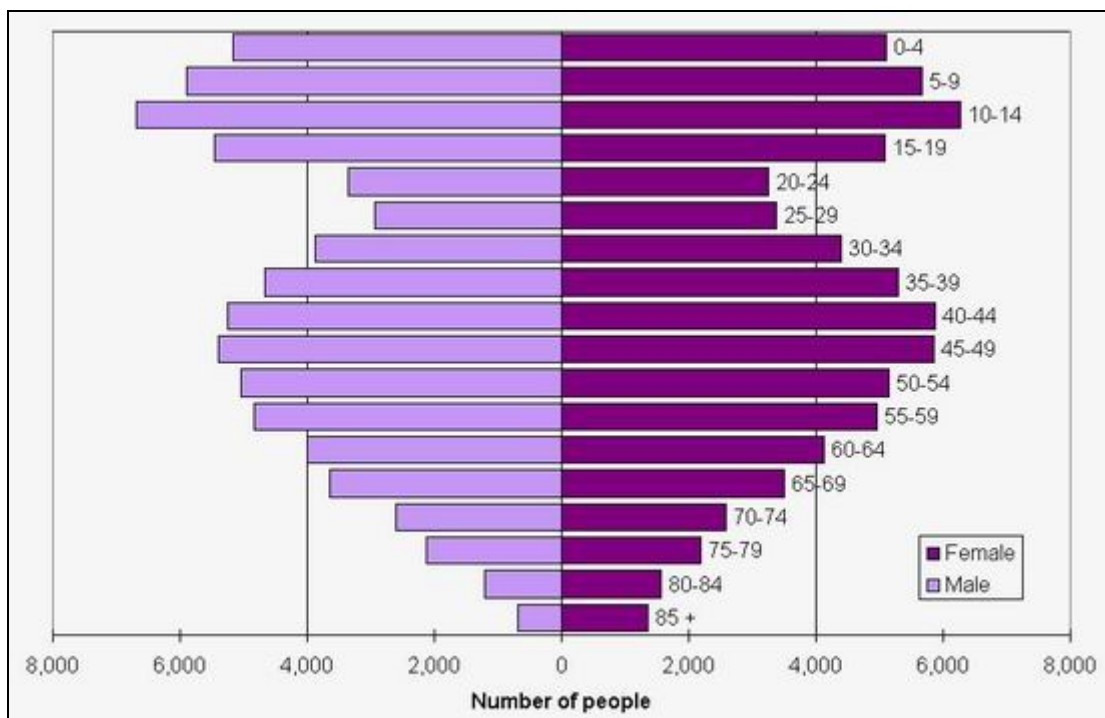


Figure 3: Age and gender structure of Northland's population (Statistics NZ 2006).

Ethnicity

In Northland 31.7% of our population identified themselves as Maori in the 2006 census as shown in figure 4 (below), compared with 14.6 percent nationally. The same proportion of Northlander's identified themselves as European as the rest of New Zealand, at 68%.

Some ethnic groups, such as Pacific Island and Asian, make up a very small proportion of our communities, with less than 5% of Northlanders. This can be related to the fact that Northland's many rural settlements are not as popular for immigrants, who traditionally settle in urbanised areas.

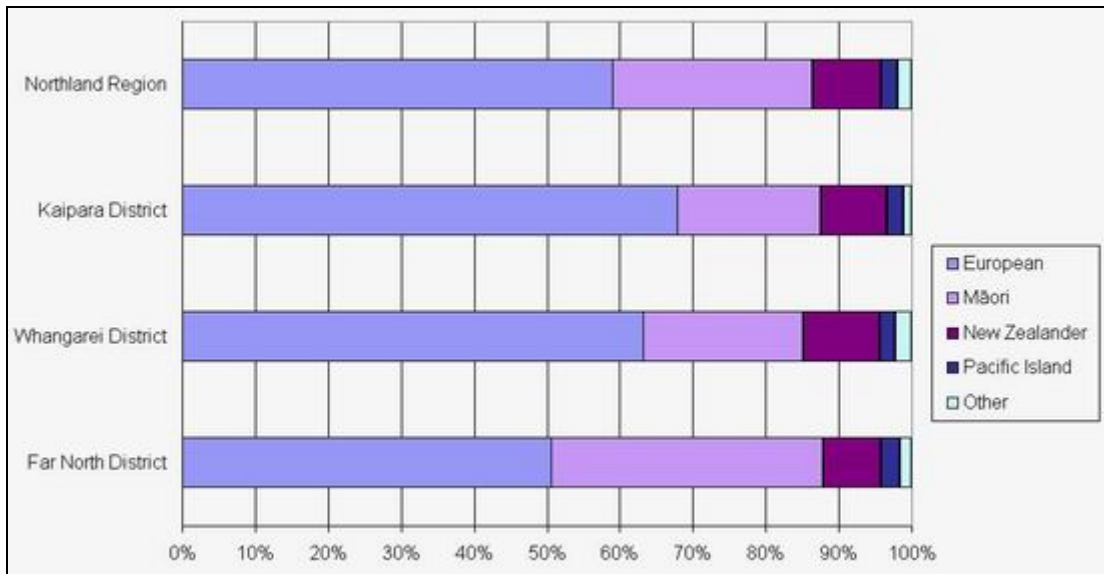


Figure 4: Ethnic composition of Northland's population (Statistics NZ 2006).

2.3 Our economy

Northland's economy is largely agricultural with well over half of the region's land devoted to dairy, beef and sheep farming. Northland produces 26% of New Zealand's meat exports and 10% of milk production (NRC 2006). Exotic forestry is also significant at about 10% of the region's land. The region also has a well developed horticultural industry, centred mainly around the growing of avocados, citrus, kiwifruit, kumara, squash and flowers.



Northland is a popular holiday destination, making tourism a significant industry. Other significant contributors to the Northland economy are the mining, marine farming and manufacturing industries. New Zealand's only oil refinery is located at Marsden Point in the Whangarei Harbour, which is also home to New Zealand's newest deepwater port.

Northland's gross regional product of \$3.4 billion annually is about 3% of the national total (NRC 2006). As Northland's economy grows it also places pressure on our regional infrastructure and natural resources.

Work and income

Approximately 55,000 employees work for almost 17,000 businesses throughout Northland (NRC 2006). At least 93% of Northlanders in the labour force (people either in work or available for work) were in full or part-time employment in 2006, compared to 90% nationally (Statistics NZ 2006). However, only about 56% of Northland's resident population aged 15 years or over are in full time or part-time employment, as shown in figure 5 (below).

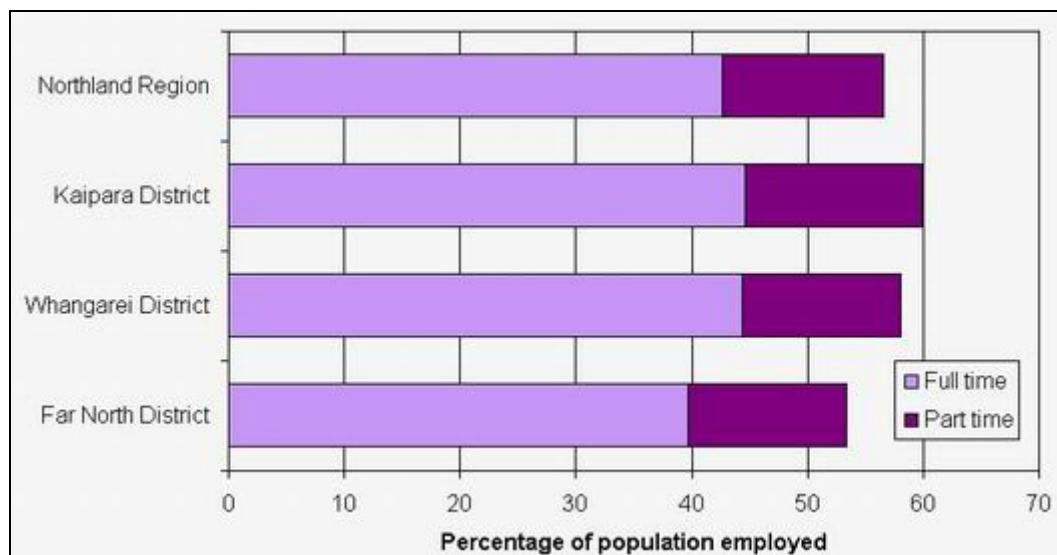


Figure 5: Percentage of Northland's population in full time or part-time employment for residents aged 15 years or over (Statistics NZ 2006).

In 2006 the median personal annual income level for Northlanders (aged 15 years or over) is \$20,900 compared with a national average of \$24,400 (Statistics NZ 2006) and the 2001 median for Northland of \$18,500. Less than 15% of Northland's population (aged 15 years or over) earns over \$50,000 a year, as shown in figure 6 (below). About 50% of Northland's population (aged 15 years or over) have a personal income of less than \$20,000 a year.

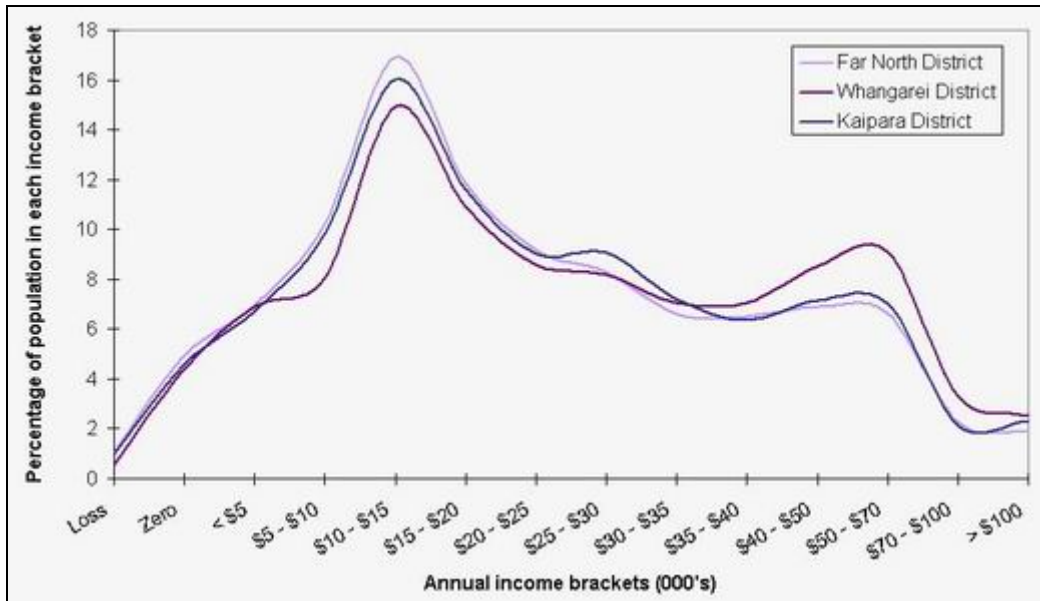


Figure 6: Percentage of Northland’s population in each income bracket for those aged 15 years and over (Statistics NZ 2006).

Education

Northland has a relatively high percentage of the population aged 15 years or over who have no formal qualification (27%), which is one of the factors that can hamper the economic growth of our region. Almost 60% of Northlanders have at least a secondary school qualification as shown in figure 7 (below).

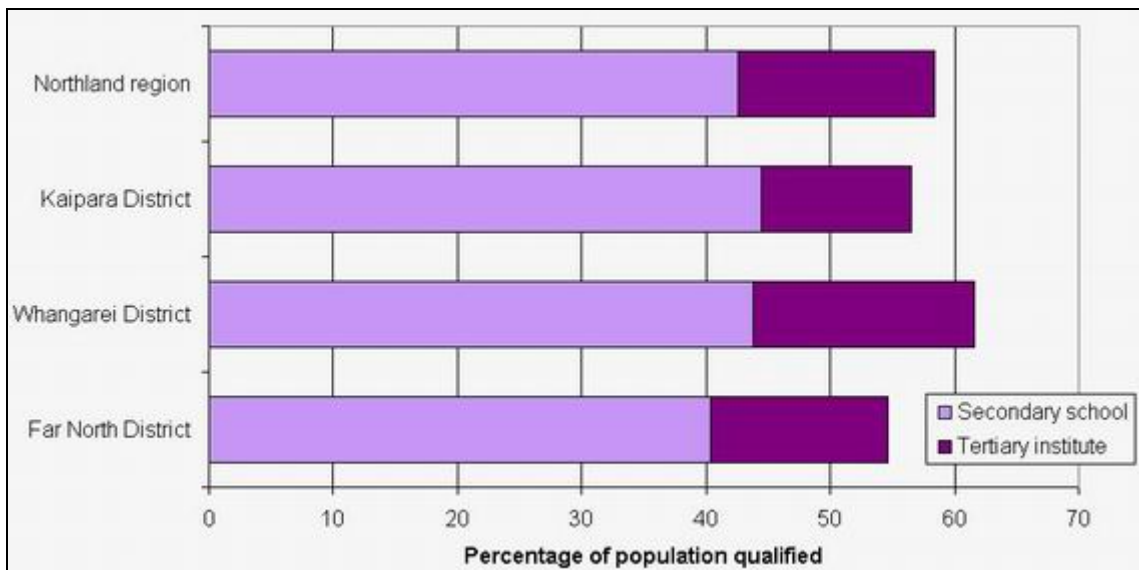


Figure 7: Percentage of Northland’s population with their highest education being secondary school or tertiary education, for residents aged 15 years and over (Statistics NZ 2006).

2.4 Our Infrastructure

Transportation

The main transportation networks in Northland are roads, rail, coastal shipping and air. The roading network consists of State Highways 1, 10, 12 and 14, all of which are sealed, a series of major arterial routes and urban roads, which are mostly sealed and several windy rural roads, of which approximately 70% are unsealed.

Private vehicle is the main form of transport used by people in Northland, due to a limited public transport system and the expansive nature of the region. Approximately 87% of the region's households have access to at least one motor vehicle (Statistics NZ 2006), as shown in figure 8 (below).



Figure 8: Percentage of Northland households that have access to one or more motor vehicles (Statistics NZ 2006).

Northland's rail network is currently limited to Dargaville through Waiotira and Otiria (near Moerewa) through Whangarei, including spur lines to the old Port Whangarei and the Kauri dairy factory north of Whangarei. A spur line to the new Port Whangarei at Marsden Point is now proposed. The major port facilities in Northland are at Marsden Point in the Whangarei Harbour. There are three commercial airports within Northland, at Kaitiā, Whangarei and near Kerikeri.

More information on Northland's transport network is available in the transport chapter of this report.

Waste management

Solid waste

There are currently three waste disposal sites operating in the Northland Region at Ahipara and Russell in the Far North District, and Hakaru (near Mangawhai), in the Kaipara District. The balance of refuse generated within the Far North and Kaipara Districts is transported to Redvale landfill in Auckland. The Re:Sort transfer station and recovery park in Whangarei accepts solid waste from the Whangarei District for compaction and transfer to Redvale Landfill in Auckland.

More information on solid waste disposal and recycling is available in the solid waste management chapter of this report.

Wastewater

The majority of sewage wastewater generated in Northland is collected and treated in communal wastewater treatment systems that are owned and operated by the three district councils. These systems generally consist of a sewer system, with pumps, which discharge into an oxidation pond. The treated effluent is then discharged into a wetland prior to entering natural water bodies. Currently there are 29 municipal sewage discharges in Northland.

However, a significant proportion of domestic wastewater, particularly in the Far North and Kaipara districts, is discharged “on-site” on individual properties. It is estimated that there are approximately 20,000 on-site systems in Northland, servicing around 30% of the population.

More information on wastewater treatment is available in the surface water quality chapter of this report.

Energy and electricity

Almost all electricity supply to Northland enters from the south through Transpower’s Otahuhu substation and is carried north by high voltage overhead transmission lines passing through Mangere, Mt Roskill and Henderson districts, and linking to Albany and the north.

Northland is supplied from the South by the 220kV double circuit Henderson to Marsden A transmission line and the 110kV Henderson to Maungatapere A line, as shown in figure 9 (right). From Maungatapere there is a 110kV double circuit line to Kensington and a 110kV double circuit line to Kaikohe that carries on as a single 110kV single circuit line to Kaitaia. There are also two 50kV single circuit Maungatapere to Dargaville lines.

Northland currently has two generation plants, Ngawha Geothermal generating 15MW (has consent to expand to 25MW) and the Wairua Hydro plant which generates 11MW. Northland has several further proposals for wind generation and a proposal for tidal generation but these have not been committed to yet.



Figure 9: Map of electricity lines (Transpower NZ 2007)

Northland is currently able to generate only 5% of its energy demands and therefore gets the majority of its electricity supply from the National Grid (electricity which is generated in the southern parts of the North Island and the South Island). Northland is very reliant on a secure supply of electricity being maintained through Auckland city.

This is a concern as Northland electricity demands in 2017 are expected to exceed 1050 MV as shown in figure 10 (below). Figure 10 shows Northland's forecast demand for both a medium (expected) and prudent forecast (which represents a 10% probability of exceedance of expected growth).

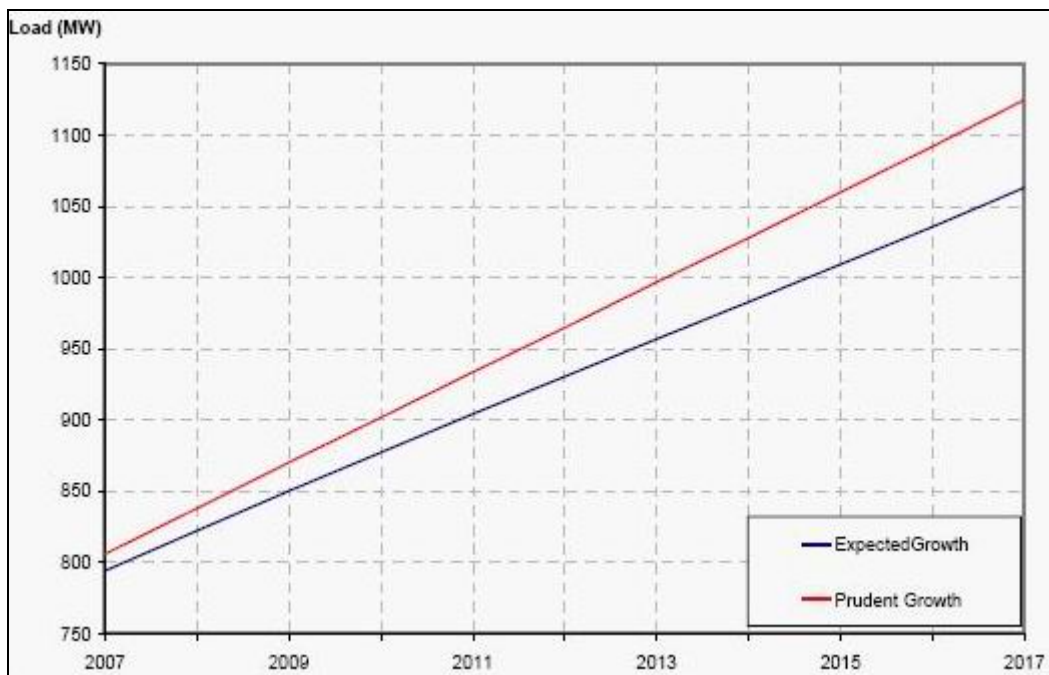


Figure 10: Expected growth in electricity demand for Northland (Transpower NZ 2007).

The stability of supply is also a significant issue for the Northland region. Voltage instability has serious implications for Northland's major industries such as the New Zealand Refinery and Golden Bay Cement. An example is recent instability affecting the intermediate pumps in the refinery pipeline which prevented any product from being sent down the pipeline and caused product storage problems at the refinery. This is a significant issue that very nearly required suspension of the refining process and fuel production. Interruptions to fuel production and supply have the potential to cripple all activities within the Auckland and Northland region that rely on any type of fuel.

A recent study into renewable energy generation by the Energy Efficiency and Conservation Authority (EECA 2006) identified the following types of potential renewable energy within the Northland region:

- Mini, small & medium scale hydropower.
- Wind power.
- Ethanol (derived from low-grade forestry).
- Wave and Tidal energy.
- Significant potential for solar thermal (hot water) systems and passive solar use in buildings.

Telecommunications

The telecommunications network in Northland consists of six major exchanges, at Whangarei (2), Dargaville, Kerikeri, Kaikohe and Kaitaia and another 41 smaller exchanges. The majority of these 47 exchanges are now digital. There are also various other networks available to Northland including the cellular telephone, mobile radio and paging networks.

The majority of Northland's households (82%) have access to a telephone, while far fewer households have access to the internet (49%), as shown in figure 11 (below). In Northland internet use is lower than the national average due to current limitations with broadband capacity (NRC 2006) and cost.

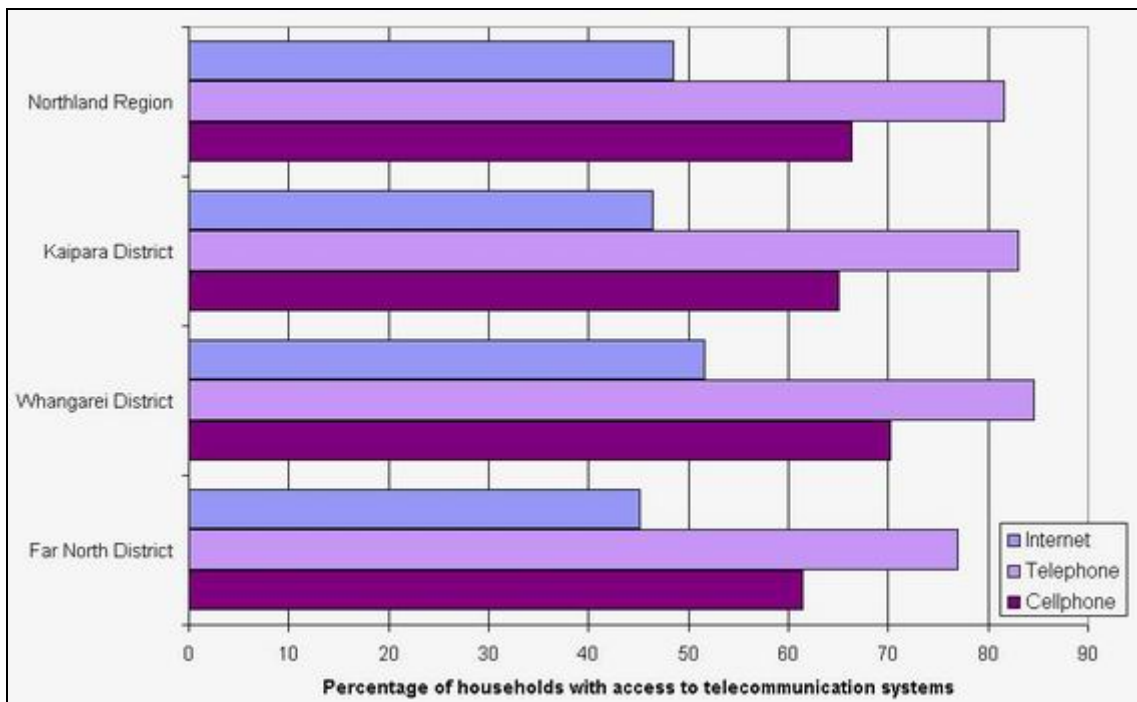


Figure 11: Percentage of households with access to telecommunication systems including internet, telephone and cellphone (Statistics NZ 2006).

2.5 Our heritage

Northland has a rich history as the first area settled by a large Maori population and the focus of early European exploration and settlement. There is an extensive range of traditional and archaeological sites, historic buildings and structures.

Traditional sites are important because of their historical, cultural and spiritual association with Maori. This includes everyday sites such as pa sites and traditional food gathering areas and waahi tapu (sacred sites) such as urupa (burial grounds), sites where blood has been spilt or tauranga waka (sites where ancestral canoes landed).

More information on traditional sites is available in the tangata whenua chapter of this report.

Archaeological sites relate to the more recent European occupation during the timber milling and gum digging eras and include camps, dams and coastal shipwrecks. The heritage of Northland is also reflected in the early colonial buildings and structures such as the missionary houses at Waimate, Kerikeri and Russell and the Waitangi Treaty House and National Reserve.



2.6 References

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