Kaipara, Place, People

and Key Trends

Kaipara District Environmental Scan 2019

Kaipara te Oranganui

KAIPARA DISTRICT

Two Oceans Two Harbours

Contents

1 Executive Summary

This Environmental Scan was compiled in October 2019. The purpose of this document is to provide a fact-based overview of the environment in which Kaipara District Council operates. This includes information on the physical environment, demographic trends, economy and state of the district's infrastructure. While the information presented in this document is intended to inform decision-making, this document does not make recommendations.

This report finds Kaipara is a geographically extensive district centred around the northern reaches of the Kaipara Harbour (the largest harbour in the southern hemisphere). Kaipara Harbour is a significant nursery ground for key fishery species but has and is experiencing significant degradation through sedimentation. Kaipara has some extensive areas of highly versatile soils while most of the district is comprised of more marginal hill country. The main geological hazards affecting the district are land instability (slumping and sliding) and consolidation settlement in soft ground under the load of new buildings. Kaipara, together with the wider Northland region, is considered among the most technically stable areas in the country (meaning there is a low risk of damaging earthquakes).

Kaipara has a mild, humid subtropical climate. Rainfall is typically plentiful all year round with sporadic very heavy falls however, droughts and floods are not uncommon. Climate change is anticipated to make Kaipara drier with droughts more common.

Kaipara District Council has been advised to plan for a sea level rise of 1.5m above the 1986-2005 baseline over the next 100+ years. Sea level rise of this magnitude will have significant ramifications for the Kaipara District due to its proximity to the ocean, extensive tidal river network, and large expanses of low-lying land.

Kaipara had a 2018 estimated resident population of 23,200 persons and is experiencing strong growth (20.6% from 2013 to 2018), driven by migrants leaving Auckland. Migrants to Kaipara are typically those nearing retirement age and, increasingly, young families. All areas of Kaipara are now growing strongly though most growth is centred on Mangawhai (60% increase from 2013 to 2018) and the Kaiwaka-Oneriri area (34% increase between 2013 and 2018). Employment growth is evident across the district; however, job creation has been limited in Mangawhai suggesting those moving to Mangawhai are typically either retired/semi-retired or commuting back to Auckland for work or working remotely.

Dargaville has seen a 13% population growth between 2013 and 2018, far exceeding dwellings growth of 2% over the same period. Consequently, house prices climbed 60.5% over the three years to 30 June 2017 and the town now has a shortage of available rental properties. This disproportionately affects lower income families for whom rent represents a greater proportion of their total income.

Most areas of Kaipara have medium to low wellbeing scores according to the New Zealand Index of Multiple Deprivation. Deprivation was generally worse in urban centres than in the rural areas between them with indicators for education and access to services scoring particularly poorly across all areas.

Kaipara's economy is founded on its primary industries, particularly the dairy sector, supported by a strong manufacturing sector. It is evident that in good growing seasons the district as a whole is able

to prosper with GDP growth far exceeding that in other districts. Conversely, drought years and years with lower dairy pay-outs have the opposite effect. In all, Kaipara's economic performance shows far greater year on year fluctuations than other areas of Northland and New Zealand generally.

Kaipara's economy is currently performing well with GDP growth averaging 3.6% per annum from 2015 to 2018, though this has since slowed to 1.9% over the 12 months to June 2019. Kaipara's economy is anticipated to slow further over the near term, in line with a slowdown in the national economy. Kaipara's unemployment rate is currently at its lowest rate in the last decade at just 4.3% in June 2019.

Kaipara's tourism sector is continuing to perform well, with visitor activity increasing even as the outlook for tourism nationally worsens due to falling international tourist arrivals and the slowing national economy weighing on domestic tourists. Guest nights in Kaipara rose 5.6% over the year to June 2019 with a 0.9% lift in tourism spending also observed.

Northland (including Kaipara) has poor connectivity (both internally and to the rest of New Zealand) via land transport (road and rail). Despite planned improvements to the state highway network north of Auckland City, Northland's road connections will continue to have significant areas of low resilience. Of Kaipara's local roads (roads other than state highways) 71% or 1,119km are unsealed and 450km are sealed. These land transport challenges have a negative impact on access for Kaipara's goods to international markets.

Northland's rail system has been maintained in a state of 'managed decline' for some years but is now receiving a major upgrade. Services on the Dargaville branch and to the Far North district remain suspended though the lines remain in place and the latter is proposed to be reopened. The remainder of the North Auckland Line (NAL) continues to operate between Auckland and Fonterra's dairy factory at Kauri (just north of Whāngārei) however, deferred maintenance has seen train speeds lowered. The key reason for rail's failings in Northland is that the network has no connection to Northland's port. There is a proposal to build a rail link to Northport at Marsden Point however this has yet to be realised. The Government has announced it will significantly upgrade the NAL between Swanson and Whāngārei and reopen the line to the Far North. The Government is also purchasing the land needed for a rail link to Northport however there is as yet no commitment to construct the line.

Northland's port at Marsden Point (Northport) is a natural deep-water port with flexible facilities capable of handling large multi-purpose vessels. The port has ample vacant industrial zoned land to facilitate its expansion. Consideration is currently being given to developing capacity at Northport to replace Auckland as one of two strategic North Island ports, together with associated rail line upgrades and development. Such a development could be beneficial for the Kaipara district.

Kaipara's telecommunications infrastructure is undergoing considerable improvement with increasing mobile phone and broadband coverage and expansion of the ultra-fast broadband fibre network. In addition, the opening of the Hawaiki submarine cable with its Mangawhai landing station makes Mangawhai well positioned to attract future digital industries.

Potable water supplies and reticulated wastewater systems are provided to a limited number of Kaipara communities and there is pressure to connect more households and communities. In particular, Mangawhai, which is fast emerging as the district's largest centre, is currently almost entirely dependent

on private roof water tanks for its water supply. Mangawhai's wastewater scheme is relatively new and can have its capacity progressively increased to cope with Mangawhai's growth into the future. However, an additional disposal site for the treated wastewater will be required as wastewater volumes grow. Across the remainder of the district's water, wastewater and stormwater networks, ageing infrastructure will create the need for increased renewals over the next five to ten years.

Kaipara district has the second largest area in New Zealand protected by land drainage schemes after the Hauraki Plains. This includes the Dargaville central business district and Ruawai township as well as vast areas of productive farmland with highly versatile soils in the Ruawai, Aratapu, Hoanga and Parore areas. Much of this area is presently just above or just below mean sea level and concerns are growing that the projected sea level rise could make defence of this area unviable. Kaipara District Council is committed to working with its communities to address this issue.

2 Introduction

The Environmental Scan provides an overview of the Kaipara district; the land, its people, their economy and the infrastructure on which it relies. Its purpose is to both identify the environment as it exists at present and to identify emerging trends and potential drivers for change.

The Environmental Scan is structured around the New Zealand Treasury's four capitals; human, social, natural and financial/physical, and the four wellbeings that define the purpose of local government; social, economic, environmental, and cultural (section 10 of the Local Government Act 2002). In the Environmental Scan these are interpreted as the following sections:

3. Kaipara – two oceans, two harbours (natural, environmental);
4. Demography – the people and communities of the Kaipara (human, social, cultural);
5. Economy – our livelihoods (economic); and
6. Infrastructure (financial/physical).

The Environmental Scan pulls together information from a variety of sources including Statistics New Zealand and Infometrics as well as an analysis of Council's internal records (e.g. resource consent data). While the information and analysis presented in this report is intended to support planning and decision-making functions of Council, it is not the role of this document to make recommendations or advise actions.

The Environmental Scan is a key document informing the development of Kaipara District Council's Long Term Plan and 30 Year Infrastructure Strategy. It also serves as a reference document for Council when developing other plans and strategies. The Environmental Scan is prepared every three years at around the same time as the Local Body Elections so it can be available to inform newly elected members of the environment in which the Council operates. The Environmental Scan is also made available to the public on Council's website, both for their information and to provide an easy source of data that can be quoted in support of applications and submissions e.g. community groups and clubs applying for funding may want to support their application by explaining how their local population has grown.

3 Kaipara – Two Oceans, Two Harbours

Mai Waipoua ki Pouto i Te Tai Hauāuru

Whakawhiti atu i te raki o te moana o Kaipara ki Oruawharo

Mai Oruawharo ki Mangawhai ki te rāwhiti

Mai Mangawhai ki Tangiteroria, whakahoki atu ki Waipoua

When introducing one's self or giving a pepeha, one often begins by describing the maunga (mountains), awa (rivers) and moana (harbours) that collectively comprise the land from which one comes. These features are the landmarks which tell us we are home.

Kaipara's geology, topography, soils and climate offer both unique opportunities and constraints. These affect where settlements and infrastructure can be built and what crops can be grown.

3.1 Land around the water – our maunga, awa and moana

Kaipara is one of the few districts that stretches from the west coast to the east coast; from Ripiro Beach on the Tasman Sea to Mangawhai Heads on the Pacific Ocean. The district includes two harbours, the Kaipara opening to the Tasman Sea and the Mangawhai Harbour opening to the Pacific Ocean.

The roughly triangular district stretches from a thinning of the North Auckland Peninsula south of Kaiwaka and Mangawhai in the southeast, around the foothills of the Brynderwyn Ranges and through the Northland hinterland to reach the Waipoua Forest in the northwest. From there the district extends down the west coast to the Kaipara Harbour entrance at Pouto. The district is bisected by the Northern Wairoa River and its tributaries, which flow into the northern end of the Kaipara Harbour. A map of the district is shown in Figure 1.

Figure 1: Map of the Kaipara district

Kaipara Maunga

In the northern part of the district, the tupuna mountain of Maunganui holds a commanding presence at the head of Ripiro Beach. This small remnant of a once massive volcano still measures 459m above sea level and is a pillar for the Te Roroa people.

The highest peak in Kaipara and second highest in Northland is the tupuna mountain of Tutamoe at 770m above sea level. Tutamoe presides over much of the Northern Kaipara District. Both Northland's east and west coasts can be seen from the summit which can be accessed via a walking track from Tararua Road.

The two rocky peaks of Maunga Tokatoka and Maungaraho preside over the south western Northern Wairoa area. These mountains are the exposed roots of former volcanoes and today form prominent local landmarks.

Tangihua, at 627m above sea level is the highest peak in the Tangihua Range. This dividing range between the east and west forms a prominent boundary between the Kaipara and Whāngārei districts.

Pukekaroro together with nearby Pukepohatu/Baldrock are the prominent peaks presiding over the southeast of the district. Pukekaroro is the Papa Maunga for Te Uri o Hau. Both Baldrock and Pukekaroro are of volcanic origin. Baldrock is composed of dacite lava, while Pukekaroro is mainly tuffs with thin lava flows.

Waipoua Forest

The Waipoua Forest straddles Kaipara's northern boundary. The Waipoua and adjoining forests of Mataraua and Waima, collectively comprise the largest remaining tract of the native forest that once covered most of Northland. These forests are managed as part of the Conservation Estate and are home to large stands of kauri trees, including Tane Mahuta, the largest known kauri tree alive today.

Tane Mahuta, the Waipoua Forest and nearby Trounson Kauri Park are among Northland's major tourist attractions and contribute greatly to attracting tourists to the region.

However, these forests are under threat from kauri dieback (*Phytophthora agathidicida*), a plant pathogen that can kill kauri of all ages. Kauri dieback lives in the soil and infects kauri roots. There is no cure for kauri dieback, and the disease kills most if not all the kauri it infects.

Kauri dieback is spread by soil disturbance (e.g. under boots, machinery or even by animals such as pigs), just a pinhead of soil can spread it. The Department of Conservation (DOC) and Te Roroa, as kaitiaki over Waipoua Forest, are working to protect Tane Mahuta from this disease.

Ripiro Beach and the Pouto Peninsula

Most of Kaipara district's west coast is comprised of consolidated and active sand dunes running from Maunganui Bluff in the north to Pouto Point in the south. This long peninsula's eastern edge is bounded by the Kaihu Valley in the north and the Northern Wairoa River and Kaipara Harbour in the south. The peninsula's western edge is bounded by the Tasman Sea and lined by the extensive Ripiro Beach.

Ripiro Beach is a long sandy beach running almost the whole length of the Kaipara district's west coast. The beach serves as a road and is drivable over the whole of its 107km length. The beach is lined by sandy bluffs along its northern extent and active sand dunes along its southern extent. It also adjoins an extensive area of shifting sand at its southern end near Pouto.

This natural wilderness area is popular for surfing, fishing, off-road driving, motorcross riding and forms part of the route of the Kaipara Missing Link Cycle Trail (one of the New Zealand Cycle Trail's Heartland Rides). These activities can damage these fragile sand dune environments if not undertaken responsibly.

There are also concerns about coastal erosion in some areas along the beach, particularly at Baylys.

Kai Iwi Lakes

The Pouto Peninsula is dotted with fresh water dune lakes along the whole of its length. The best known of these are the Kai Iwi Lakes, three of which Kai Iwi, Taharoa and Waikare are located within the Taharoa Domain; a large recreation reserve administered by the Kaipara District Council in partnership with Te Roroa and Te Kuihi as Mana Whenua.

The Kai Iwi Lakes have exceptionally high water quality and are of high ecological significance. The Taharoa Domain is popular for camping, hiking, swimming, water skiing, kayaking, trout fishing and sailing. The Domain incorporates two campgrounds which are managed by Kaipara District Council and its popularity appears to be growing with both campers and day visitors.

Northern Wairoa River

The Northern Wairoa River and its tributaries are a dominant feature of the northern and western Kaipara district. The Northern Wairoa River is the longest and largest river in Northland draining a catchment of 3,650km^2 which stretches across all three Northland districts. The river flows into the Kaipara Harbour and is tidal for about 100km of its lower length (Northland Regional Council [NRC], 2019). Strong tidal currents and the mixing of fresh and salt water keep sediment suspended and result in the river having a muddy brown appearance for much of its lower reach.

The lower reaches of the Northern Wairoa River are surrounded by extensive flood plains, including the Ruawai, Hoanga and Kaihu Valley areas. These areas are protected by land drainage schemes and harbour some of the district's most fertile soils. Consequently, this area is responsible for production of almost the whole of New Zealand's kumara crop.

Flooding remains a concern in much of the Northern Wairoa catchment, especially as the effects of climate change begin to be realised.

Kaipara Harbour

The Kaipara Harbour is the largest enclosed harbour in the Southern Hemisphere and New Zealand's largest estuarine ecosystem (Integrated Kaipara Harbour Management Group [IKHMG], 2019). The Kaipara Harbour is the receiving environment of a massive 640,000ha catchment that extends across the Auckland and Northland regions and includes almost the whole of the Kaipara district (see Figure 2) (IKHMG, 2019).

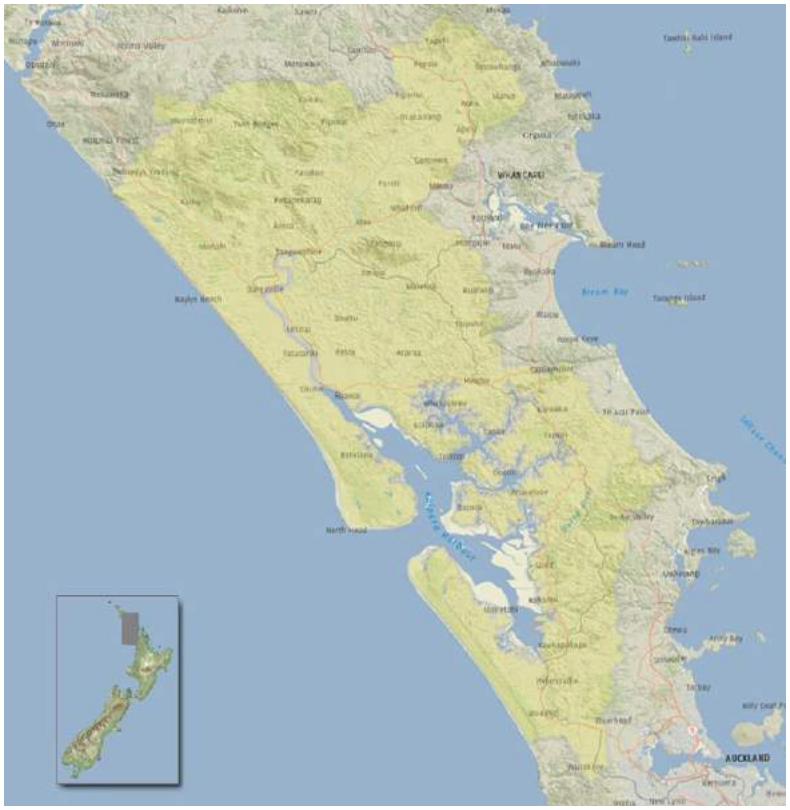


Figure 2: Extent of the Kaipara Harbour catchment (IKHMG, 2019)

Evidence exists that the Kaipara Harbour plays a significant fisheries role in the wider west coast North Island ecosystem as a nursery ground for key commercial and recreational species including snapper, grey mullet, flounder, white shark, hammerhead shark and rig (IKHMG, 2019).

The Kaipara Harbour has suffered a prolonged period of degradation, primarily due to the release of sediment from the deforestation of its catchment (IKHMG, 2019). This degradation continues into the present with inputs of sediment from streambank and hill country erosion continuing to be the primary pollutant (IKHMG, 2019).

To address the ongoing environmental degradation of the Kaipara Harbour, Mana Whenua under the leadership of Ngāti Whātua, established the Integrated Kaipara Harbour Management Group (IKHMG) in 2005, of which Kaipara District Council is a participating partner (IKHMG, 2019). The IKHMG is a multiple-stakeholder partnership combining two approaches to environmental management: one indigenous (Mātauranga Māori) and the other derived from western science. This forms the basis for future research, planning, policy development and management of the Kaipara Harbour's ecosystems; harbour and catchment (IKHMG, 2019).

Mangawhai Harbour

The Mangawhai Harbour opens to the Pacific Ocean on Kaipara district's east coast and is protected from the open ocean by a large sand spit. The sand spit is the result of sand being pushed north across the harbour mouth by wave action (known as longshore drift). The longshore drift pushes the harbour entrance further north until it meets the hard rock of Mangawhai Heads and can go no further. The harbour entrance is kept open by the force of tidal flows in and out of the harbour as well as flows of fresh water from the harbour's catchment flowing into the sea.

The sand spit is a dynamic landform and can change in response to wave action, ocean and tidal currents. In the years leading up to 1991, a series of large storms (including Cyclone Bola in 1987) caused the Mangawhai Harbour entrance to block up with sand and a new entrance to form further down the sand spit. This new entrance would have gradually been forced northward by the long shore drift current to resume its usual position, however in the meantime it was proving hazardous for navigation. In response, a large number of committed locals gathered together, dug out the usual harbour entrance and stopped up the new entrance.

Following this event, the Mangawhai Harbour Restoration Society was formed to maintain the Mangawhai Harbour into the future. The Society's work has included establishing a nursery to grow native spinifex and pingao plants to stabilise the Mangawhai sand spit, dredging of the Mangawhai Harbour and removing mangroves.

The Mangawhai Harbour is also a key habitat and foraging ground for the New Zealand fairy fern/tara iti which nests on the Mangawhai sand spit. With a population of around 45 individuals that includes approximately 12 breeding pairs, the New Zealand fairy tern is probably New Zealand's most endangered indigenous breeding bird (DOC, 2019).

3.2 Geology – bones of the landscape

Kaipara's geology is important to understand, because it speaks to the geotechnical properties, strength characteristics, and engineering properties of the rocks and soils (ENGEO, 2019). It is the foundation upon which our district is built.

The Kaipara district is characterised by rolling hills of some of the most diverse and complex geology in all of New Zealand (ENGEO, 2019). The basement rock (commonly called bedrock) of the Kaipara District is typically comprised of thin-bedded, alternating fine grained sandstone and argillite (claystone/mudstone) with massive beds of laminated argillite and highly fractured Greywacke sandstone. These rocks are typically strong to very strong and closely fractured. These basement rocks are the oldest known rocks in the Kaipara district and most often are buried deep beneath younger rocks and soil. The whole of Northland's geology has been tilted down to the west by tectonic forces. This means these older rocks are typically only exposed along the east coast, northeast of Mangawhai Heads, where they form sheer craggy cliffs in coastal exposures, and spiny mountainous terrain inland (ENGEO, 2019). This tilting is also the reason why most rivers in Northland flow to the west instead of the east.

These bedrocks are overlain by rocks of the Northland Allochthon (ENGEO, 2019). The Northland Allochthon is the result of a rare geological phenomenon in which the down tilting of the bedrocks created a vast under sea basin into which younger sedimentary rocks gradually slid to lie over the top of the older bedrocks. This occurred at a time when Northland was covered by the sea. The Northland Allochthon is a series of thrust sheets and broken up rock containing a range of sedimentary and igneous rocks. Stronger rocks of the Allochthon, include the Mahurangi Limestone and Punakitere Sandstone and are most common in the east of the district (ENGEO, 2019).

Due to the nature of their past movement, the Northland Allochthon thrust sheets (or nappes) are faulted, folded and sheared resulting in a complex structure (ENGEO, 2019). They also tend to be deeply

weathered. This results in rolling hills that are generally soft and vulnerable to slipping and instability. These hills are bisected by broad valleys and incised gullies, which are filled with young alluvial sediment eroded from the surrounding landscape and deposited by rivers. In particular, extensive river flats have developed around the lower reaches of the Northern Wairoa River (ENGEO, 2019).

Kaipara's complex geology is also bisected by past volcanic activity and plutonic rocks (plutonic rocks form when magma rises through the Earth's crust but hardens inside the earth rather than emerging at the surface as a volcano) (ENGEO, 2019). Remnants of these old volcanos and plutonic rocks exist throughout the district, including in the Kaihu, Waipoua, Tutamoe, Kaiwaka and Mangawhai areas. Between Tokatoka and Dargaville about 140 small basaltic, andesitic and dacitic intrusions extend through Northland Allochthon rocks. Maungaraho is a prominent example of these (ENGEO, 2019).

The most resent geological feature of the Kaipara District is the Pleistocene to Holocene-aged coastal sand deposits which comprise almost the whole of Kaipara's west coast area as well as much of the Mangawhai area (ENGEO, 2019). Holocene-aged fixed dunes comprise loose and poorly consolidated sands with inter-dune lake and swamp deposits of minor sand, mud and peat. These deposits are generally stabilised by vegetation growth. Pleistocene dune deposits typically comprise weakly cemented and uncemented sands with preserved interdune deposits, where buried organic material has formed lignite. These lignite layers are notably observed at Baylys Beach though they are present along the whole of the Kaipara's west coast. The presence of titanomagnetite (an iron rich mineral) in the west coast sands makes these consolidated sand dunes susceptible to the development of iron pans. Mobile (or active) dune deposits comprise constantly moving sand dunes with sparse vegetation, particularly in the Pouto area (ENGEO, 2019).

There are no known active faults in the Kaipara District, and the Northland Volcanic Field is generally considered to be dormant (ENGEO, 2019). This means Northland and Kaipara have a low risk of volcanism and damaging earthquakes and is considered one of the most technically stable regions in the country.

The main geological hazards to consider in the Kaipara District are consolidation settlement in soft ground under the load of new buildings, land instability near steep land or Northland Allochthon rock units and liquefaction in young alluvial sand deposits (ENGEO, 2019). In particular, land slumping and sliding is particularly prevalent given Northland's susceptibility to high intensity rainfall events, the broken up nature of the Northland Allochthon rocks and the warm wet subtropical climate which accelerates the weathering of rock minerals into clays. All of these geological hazards can be adequately managed, however early recognition is key to understanding and developing an effective and efficient solution (ENGEO, 2019).

3.3 Soil – foundation of life

With such complex and varied geology, it naturally follows that the Kaipara district has a diverse range of soil types and that soil type is highly localised. Kaipara's soils include sandy soils derived from weathered sand dunes, hill country soils derived from strongly weathered sedimentary or volcanic rocks, and alluvial and peat soils deposited on flood plains and river terraces. A significant limiting factor of

Kaipara's soils is drainage, with many of the most versatile soils having imperfect drainage; a problem not uncommon in Northland.

The most versatile soils in Kaipara are found on the flood plains around the Northern Wairoa River (Griffiths et al., 2003). These are predominantly clays and peaty clays dominated by Whakapara soils from alluvium derived from sedimentary rocks. While these can be poorly drained, they are well supplied with plant nutrients and are widely used for kumara growing. Better drained alluvial terraces and hill country flood plains also occur but have a narrow distribution and are generally not used for cropping (Griffiths et al., 2003).

In addition, about 51km^2 of Parore peaty sandy loam occurs in small valleys in the sand country (Griffiths et al., 2003). While these soils are generally very poorly drained with shallow rooting depth, they may provide good growing environments for a limited range of crops. Due to these soils being imperfectly drained and susceptible to flooding, careful site assessments are required when considering moisture-sensitive crops (Griffiths et al., 2003).

Most of the western Kaipara is comprised of sand country soils which occur all the way up the west coast, and for a significant distance inland; becoming older and more weathered away from the coast (Griffiths et al., 2003). The sequence begins seaward with the very weakly developed and recent Pinaki series. The Red Hill series occurs inland from these and covers an area of 90km^2. The Red Hill series has just enough development to provide one of the better opportunities for land-use conversion to higher value crops (especially in some protected inter-dune basins), although subsoil acidity would need checking as it can be low. Tangitiki sandy soils are slightly older and show high variability over short distances, with some sites strongly podzolised ('egg cup podzols' where large kauri trees once grew). Podzols named Te Kopuru occur furthest inland on the oldest dunes. These are uniformly poor in many attributes affecting the growth of deeper rooting and moisture-sensitive crops (Griffiths et al., 2003). All these sandy soils benefit from being free draining however this drainage can be impeded by the regular occurrence of iron pans. These free draining qualities can also make these soils more drought prone. While these sandy soils are best known for dominating Kaipara's west coast, similar sandy soils are also to be found around Mangawhai, with some rated as highly versatile (Harmsworth, 1996).

Kaipara also has some areas of volcanic soil where rolling slopes have developed on basalt volcanic geology and where terraces have formed from redeposited volcanic material (Griffiths et al., 2003; Harmsworth, 1996). These primarily occur in the Donnellys Crossing to Kaihu area, Tangihua Range and Tinopai Peninsula. These soils are usually brown granular loams and clays, complexed with or associated with yellow-brown earths or brown or red loams complexed with or associated with yellow-brown earths. For example, brown granular clays and loams and yellow-brown earths often form complex associations or soil complexes on a range of volcanic and sedimentary rock types around the periphery of the Tangihua Range. The volcanic soils are usually spatially dominant in these associations and complexes (Harmsworth, 1996). These volcanic soils are naturally well supplied with plant nutrients, have good structure and offer good opportunities for crop production. While upper subsoils can be firm and plant rooting slightly restricted, the soils do not become firmer with increasing depth (Griffiths et al., 2003).

The majority of soils across the rest of the district are hill country soils which have weathered from a variety of sedimentary rock types (Harmsworth, 1996). These are to be found on the rolling hill country which typifies most of central Kaipara. The main parent materials are sandstones, mudstones, argillites (shale), and limestones, and in some areas deeply weathered volcanic rock may also be complexed or associated with the sedimentary rock types. Because of the complex and variable spatial pattern of rock types from which these soils have formed, soil type can vary considerably over short distances. Furthermore, many of the soils form complexes or spatially complex associations, having formed from a mix of parent rock types. Adding to the complexity, these soils range from weakly to strongly leached and weakly podzolised to podzolised (Harmsworth, 1996).

Yellow-brown earths are recorded extensively across this hill country landscape, including the Pūhoi, Waiotira, Omu, Omanaia, Purua, and Omaiko suites) (Harmsworth, 1996). Rendzinas and associated soils are also common, typically forming on limestone, calcareous argillite, or calcareous mudstone. The rendzinas and associated soil group comprises three main soil suites; being Arapohue, Maungaturoto, and Konoti (Harmsworth, 1996).

Some of these sedimentary soils can be valuable for agriculture where they occur on easy slopes (Griffiths et al., 2003). In particular, soils in the area east of the Kaihu River/Waihue Road area are typically Omu, Aponga and Mata series soils with potential plant rooting depth generally about 45-60cm (Griffiths et al., 2003). Soils in the hills east of Dargaville and Ruawai are typically Arapohue and Rockvale series soils formed from argillaceous limestone, and while both have heavy clayey subsoils, potential plant rooting depth is still about 60–90cm in Rockvale soils, but is shallow (25-45cm) in Arapohue soils. The Waiotira soils are another of the better hill country soils being moderately well drained and having few root restrictions above about 60cm depth. However, slope steepness on Waiotira soils generally precludes arable land uses and subsoil pH may need to be checked (Griffiths et al., 2003).

Figure 3 maps Kaipara's soils based on their New Zealand Land Resource Inventory (NZLRI) Land Use Capability (LUC) score. The LUC considers both soil type and slope to identify how versatile an area of land is. Class 1 land is land with virtually no limitations for arable use and suitable for cultivated crops and most other uses. At the other end of the scale, class 8 land is land with very severe to extreme limitations or hazards that make is unsuitable for cropping, pasture or forestry. There is no class 1 land in Kaipara but there are extensive areas of class 2 land as well as class 3 and 4 land.

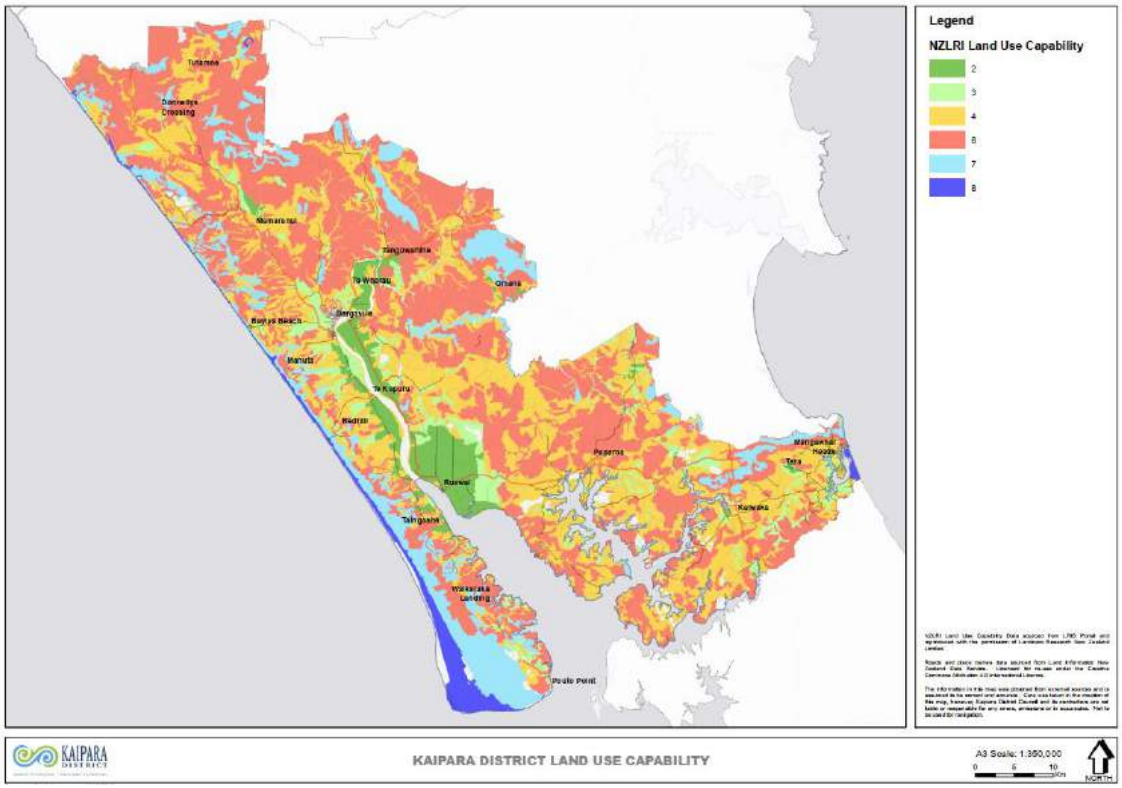


Figure 3: Land use capability in the Kaipara District (NRC, 2016)

Figure 4 maps Kaipara's highly versatile soils as identified in the Northland Regional Policy Statement. In addition to showing the LUC class 2 and 3 land, it also identifies the specific LUC units for Kaipara's most versatile soils.

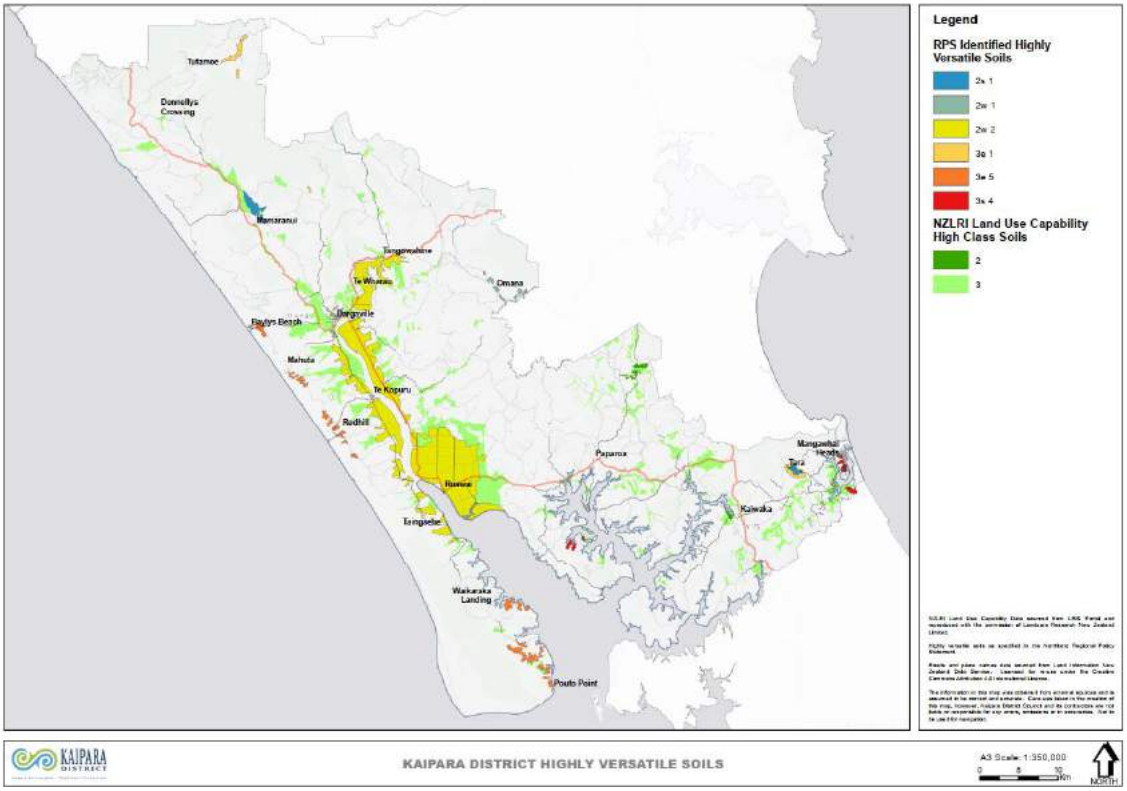


Figure 4: Kaipara's highly versatile soils as identified in the Northland Regional Policy Statement (NRC 2016)

3.4 Weather and climate

Northland, with its northern location, low elevation and close proximity to the sea is characterised by a mild, humid and relatively windy climate (National Institute of Water and Atmospheric Research [NIWA], 2014). Summers are warm and tend to be humid, while winters are mild, with many parts of the region having only a few light frosts each year. Rainfall is typically plentiful all year round with sporadic very heavy falls. However dry spells do occur, especially during summer and autumn. Most parts of Northland receive about 2,000 hours of sunshine per year. It can be very windy in exposed areas and occasionally Northland experiences gales (NIWA, 2014).

Mean annual temperatures in Northland are typically between 14°C and 16˚C, with a mean annual temperature range (difference between summer and winter) averaging just 8.1˚C (NIWA, 2014). The mean annual temperature for the region north of Auckland City is the highest for any part of New Zealand (NIWA, 2014). Figure 5 below shows the median annual average temperature as it varies across Northland.

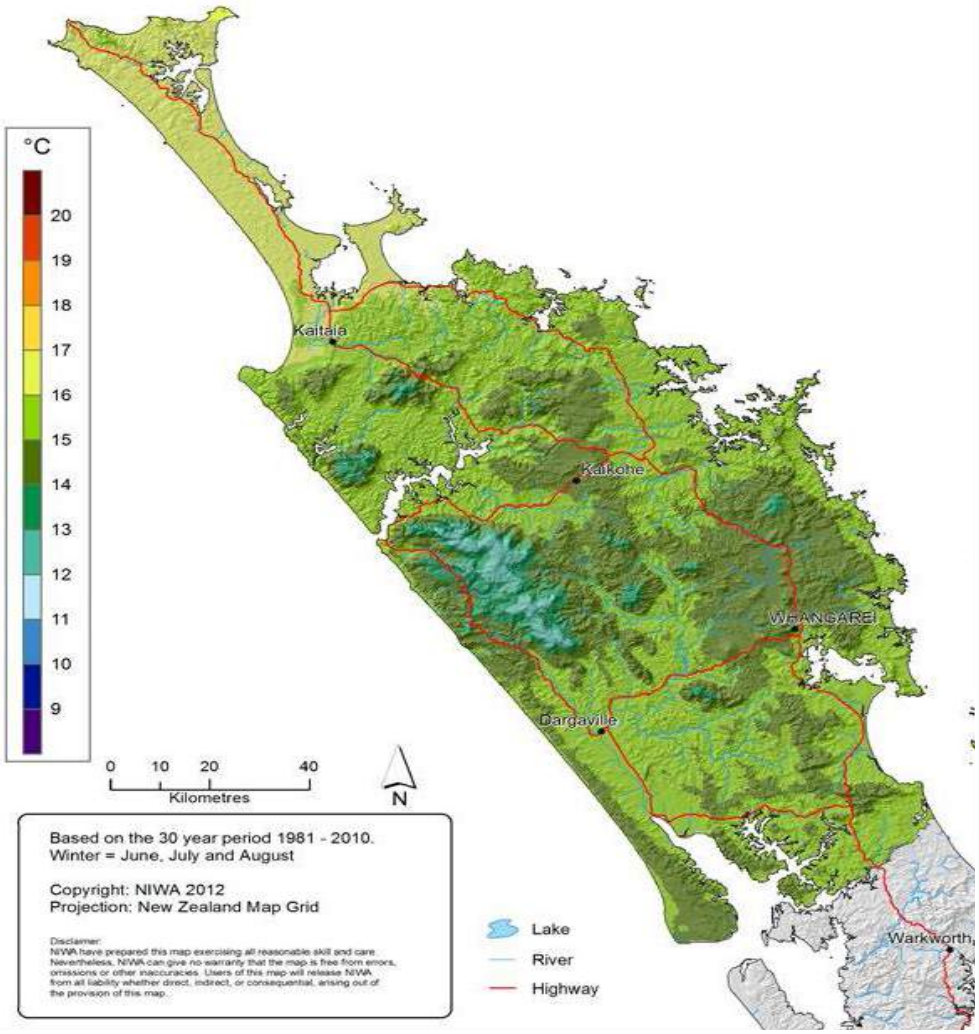


Figure 5: Northland median annual average temperature (NIWA, 2014)

The airflow over Northland is predominantly from the southwest (NIWA, 2014). This is particularly so in winter and spring, however in summer the proportion of winds from the easterly quarter, especially in eastern districts, about equals that from the southwest (NIWA, 2014).

Northland's proximity to the sea and low altitude causes winds to be very moist with abundant rainfall throughout the region (NIWA, 2014). Rainfall distribution patterns are related to topography with rainfalls ranging from about 1,000mm in low-lying coastal areas, to approximately 2,000mm at higher elevations. Figure 6 shows the distribution of median annual rainfall based on the 1981/2010 period (NIWA, 2014).

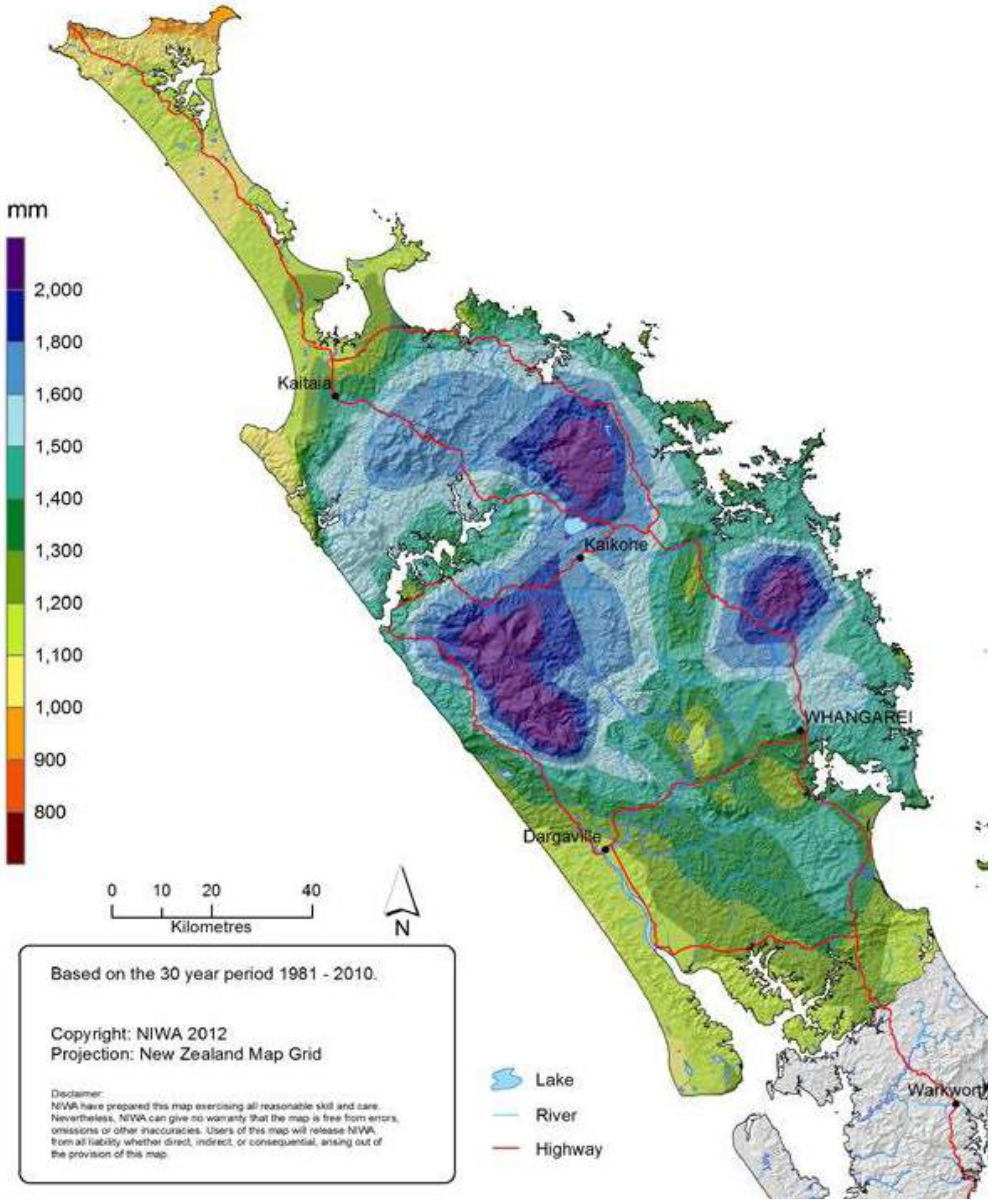


Figure 6: Northland median annual total rainfall 1981-2010 (NIWA, 2014).

Seasonal influences on rainfall distribution are also quite well-defined (NIWA, 2014). Table 1 lists monthly rainfall norms and percentages of annual totals for the period 1981/2010 for selected weather stations. This table clearly shows that rainfall is greater during the winter, June to August, period (NIWA, 2014).

Table 1: Northland's monthly rainfall norms and percentages of annual totals for the period 1981/2010 shown as a) monthly/annual rainfall norms (mm) and b) percentage of annual total for each month (%) (NIWA, 2014).

Location		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Cape Reinga Aws	a	58	65	56	109	96	103	128	95	85	61	57	76	988
	b	6	7	6	11	10	10	13	10	9	6	6	8	
Kaitaia Observatory	a	85	93	81	96	135	151	169	144	128	99	87	100	1367
	b	6	7	6	7	10	11	12	11	9	7	6	7	
Kaitaia Aero Ews	a	69	121	86	119	138	125	136	104	93	93	73	99	1253
	b	5	10	7	9	11	10	11	8	7	7	6	8	
Kaeo Northland	a	88	102	120	140	144	169	200	170	148	113	102	100	1596
	b	6	6	8	9	9	11	12	11	9	7	6	6	
Rawene 2	a	78	72	89	98	128	145	164	142	118	91	83	91	1299
	b	6	6	7	8	10	11	13	11	9	7	6	7	
Opononi	a	86	65	93	94	124	144	133	116	105	93	92	88	1234
	b	7	5	8	8	10	12	11	9	8	8	7	7	
Kaikohe Aws	a	110	106	109	140	139	152	188	159	124	100	96	109	1532
	b	7	7	7	9	9	10	12	10	8	6	6	7	
Kerikeri Airport	a	122	117	138	145	154	185	205	182	162	127	114	123	1775
	b	7	7	8	8	9	10	12	10	9	7	6	7	
Russell	a	91	87	116	117	130	144	172	146	121	97	89	90	1400
	b	7	6	8	8	9	10	12	10	9	7	6	6	
Waipoua Visitor Centre	a	89	82	103	97	146	177	166	153	132	110	93	94	1443
	b	6	6	7	7	10	12	11	11	9	8	6	7	
Whangarei Airport	a	78	98	117	103	110	132	169	127	110	84	76	97	1300
	b	6	8	9	8	8	10	13	10	8	6	6	7	
Dargaville 2	a	64	69	102	107	97	121	141	109	109	82	63	74	1137
	b	6	6	9	9	9	11	12	10	10	7	6	7	

Figure 7 shows region-wide variability in days of soil moisture deficit per year (days when there is not enough soil moisture to sustain plant growth without irrigation) for the period 1981/2010. The figure shows that, in an average year, there is between 50 and 70 days of soil moisture deficit for most areas of the Kaipara (NIWA, 2014). The area around Mangawhai appears to be particularly dry. It should be noted however, that this model does not take soil type into account. Free-draining sandy soils such as those in the western Kaipara will therefore likely have more days of soil moisture deficit than indicated by this figure.

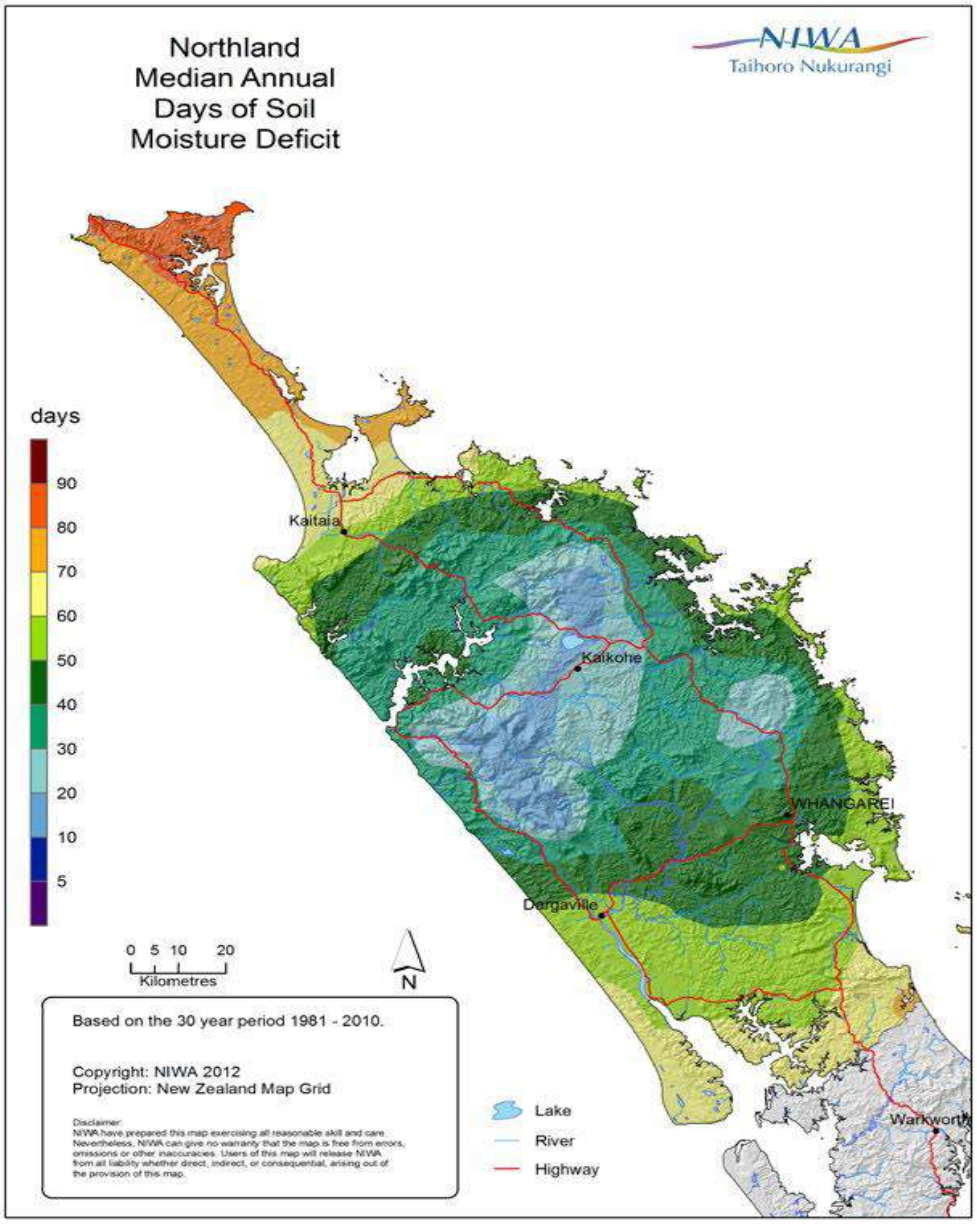


Figure 7: Northland median annual days of soil moisture deficit (NIWA, 2014).

In addition to varying throughout the year, rainfall can also vary considerably from year to year with the risk of both floods and droughts. Rainfall can also be highly localised, particularly with respect to thunderstorms and heavy downpours. Extreme weather events, such as droughts and storms do occur and can endanger essential services and the prosperity of Northland's primary industries. In the recent past, Kaipara experienced droughts in 2010, 2012/13 and 2014 (Ministry for Primary Industries [MPI], 2013) and major floods in February, March and July 2007, April 2008, January 2011, March 2012, July 2014, August 2016 and August 2017. The July 2014 flood/storm event was particularly severe and, according to Rosier et. al. (2015), was likely intensified by climate change. Both the lack and abundance of rain can therefore pose significant problems for Council infrastructure with heavy rain causing slips and flooding and droughts causing water restrictions.

However, despite these occasional extremes, Kaipara enjoys a pleasant subtropical climate overall with reasonably consistent warm temperatures and plentiful rain and sunshine.

3.5 Climate change

The world's climate is warming, due largely to greenhouse gas emissions from human activity (MFE, 2017). These gases such as carbon dioxide and methane add to the Earth's natural "greenhouse effect", a blanket of gases that keep heat from escaping into space, keeping the Earth warm. Unnaturally high concentrations of these gases, the result of rapid fossil fuel consumption and deforestation since the industrial revolution, are causing the Earth to warm at an unprecedented rate (MFE, 2017).

At a global level, this warming has a number of key effects that will be felt differently in different countries. Firstly, warmer temperatures will mean faster evaporation, resulting in many areas becoming more drought-prone even if total rainfall does not decrease. In addition, the melting of polar ice is causing sea levels to rise, potentially flooding low-lying coastal areas. In New Zealand, the major impacts of climate change that will require significant adaptation will be coastal hazards, drought and floods (MFE, 2017).

Many factors need to be taken into account when considering how future global warming will affect our communities. The rate and extent of warming is dependent on the level of greenhouse gases humans continue to emit and these depend on the combined effect of a wide range of socio-economic influences and climate-related policies (MFE, 2017). This section sets out the key changes projected to effect Kaipara over the next 20 to 70 to 100 years. These assumptions are predominantly based on the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report's representative concentration pathway 8.5 (RCP8.5) and 8.5H+ (RCP8.5H+). These assume a continuing high emission baseline scenario, with no effective global emissions reduction, and emissions not stabilised till soon after 2100. It also assumes a higher rate of sea level rise (e.g. from faster polar ice sheet melt) being experienced in the latter part of this century and beyond 2100 (MFE, 2017).

Under these scenarios, average global temperatures are projected to be between 3.2^{o}C and 5.4^{o}C warmer by 2100 relative to the 1850–1900 baseline (MFE, 2017). Temperature increases are expected to be larger in the tropics and subtropics than in the southern mid-latitudes (i.e. New Zealand).

Northland's climate is projected to warm by approximately 0.75°C to 1.25°C by 2040, with average spring temperatures warming less compared with the other seasons (NIWA, 2016). By 2090, Northland's climate is projected to have warmed by approximately 2.5°C to 3.5°C, with more warming in summer, then autumn, compared with other seasons. A slight acceleration in warming is projected for the second 50 years of the 21st century compared to the first 50 years. Figure 8 shows these seasonal patterns of projected temperature increase for 2040 and Figure 9 shows the corresponding patterns for 2090 relative to the baseline climate of 1986-2005 (NIWA, 2016).

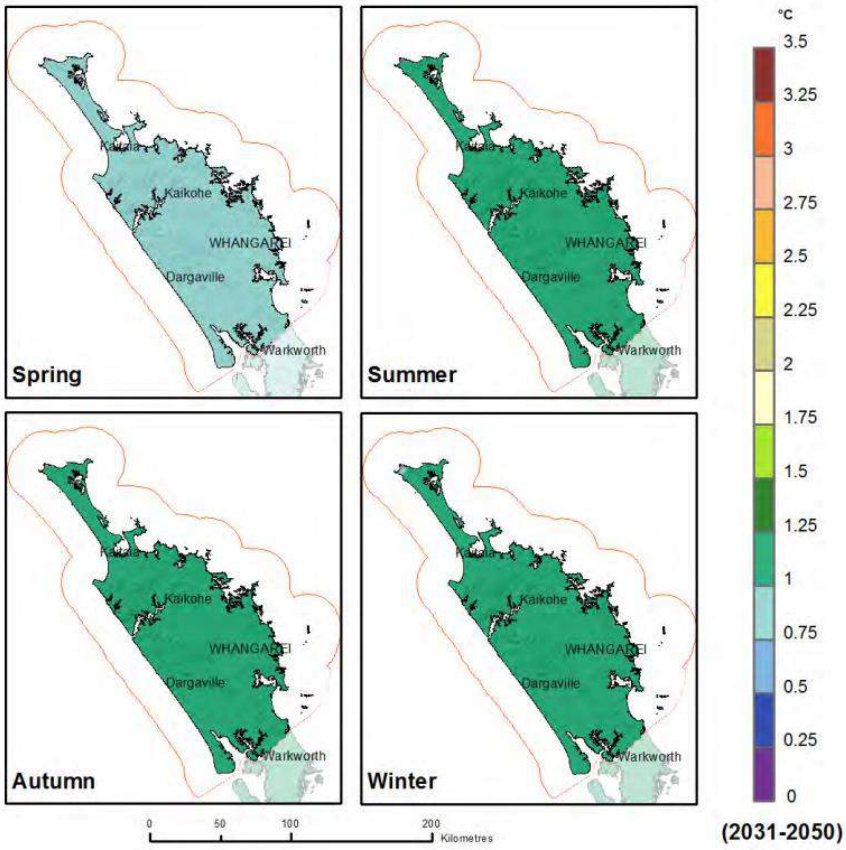


Figure 8: Projected seasonal temperature increase (additional ºC) by 2040 (taken as an average for the period 2031-2050) relative to the baseline climate of 1986-2005 (NIWA, 2016).

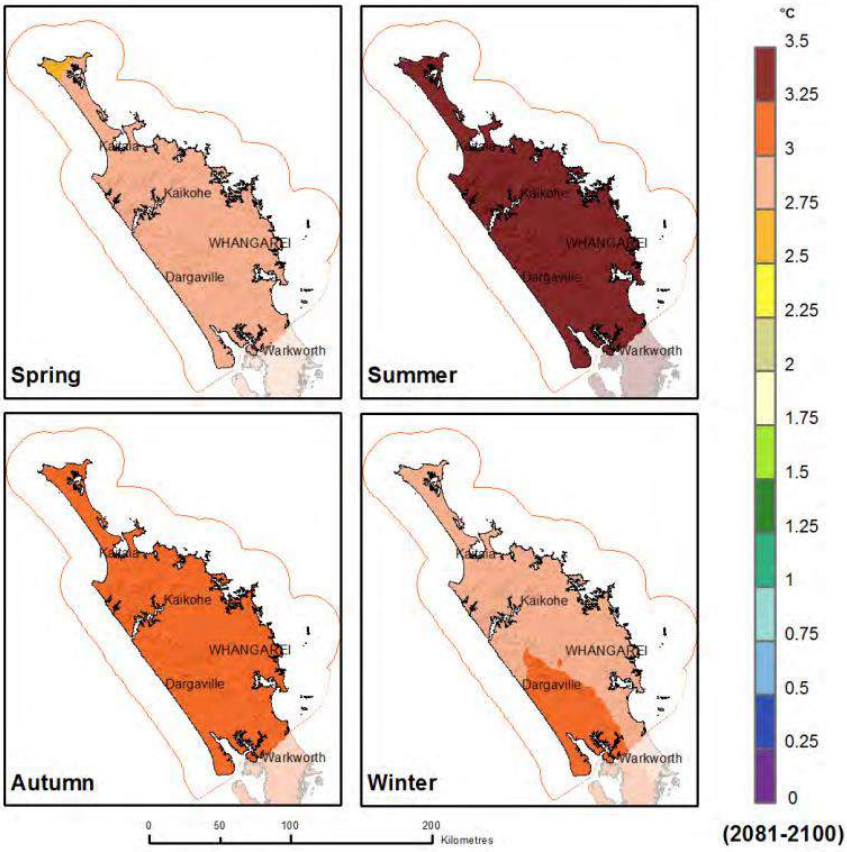


Figure 9: Projected seasonal temperature increase (additional ºC) by 2090 (taken as an average for the period 2081-2100) relative to the baseline climate of 1986-2005 (NIWA, 2016).

As seasonal mean temperatures increase over time, changes in temperature extremes are also expected (NIWA, 2016). In general, an increase in high temperature extremes, and a decrease in low temperature extremes is expected. High temperature extremes (i.e. 'hot days') are considered as the number of days per year of 25°C or above, and low temperature extremes (i.e. 'cold nights' or frosts) are considered as the number of nights per year of 0°C or below. By 2040 it is projected Kaipara will experience about 20 to 30 more hot days per year (additional to the 25 hot days per year experienced on average during 1986-2005). By 2090 this is projected to be an extra 80 hot days per year relative to 1986-2005. A notable exception is the hill country north of Dargaville around the Tutamoe range which is projected to be cooler, only experiencing up to 50 more hot days per year by 2090 (NIWA, 2016).

Concurrently, the number of frosts is projected to decrease across Northland, with a decrease from one frost every two years during 1986-2005 to one frost every five years by 2040 and one frost day every ten years by 2090. In many parts of the region, frosts will no longer occur by the late 21st century. This reduction in frosts is expected to be greater in the Kaipara district than elsewhere in Northland (NIWA, 2016).

Rainfall is projected to decrease in Kaipara and much of Northland particularly in spring and winter with summer rainfall projected to increase (NIWA, 2016). The spatial distribution of these trends is shown in Figure 10 for 2014 and in Figure 11for 2090. Northland is projected to have about 20 more dry days (days with rainfall <1mm) per year by 2090 (NIWA, 2016).

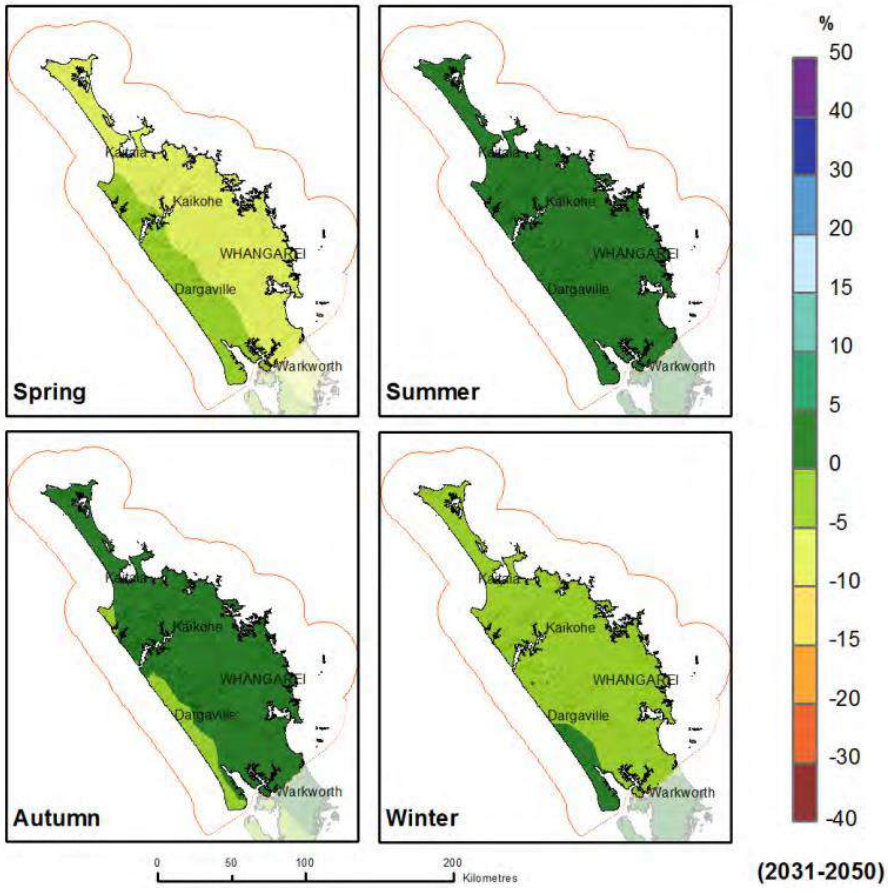


Figure 10: Projected seasonal precipitation changes (% change) at 2040 (2031-2050 average) (NIWA, 2016).

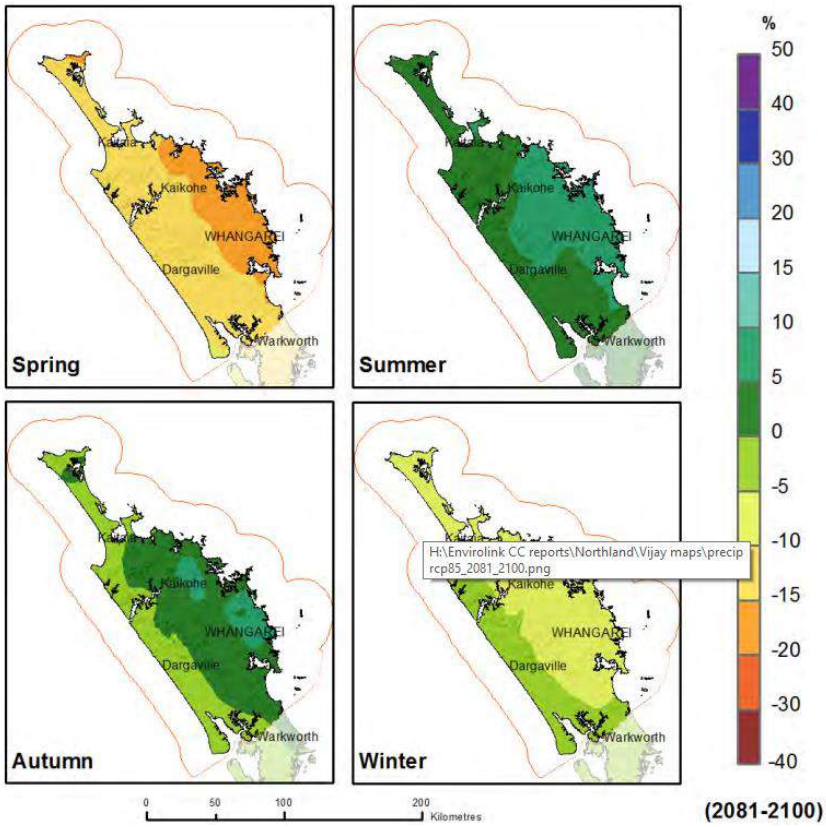


Figure 11: Projected seasonal precipitation changes (% change) at 2090 (2081-2100 average) (NIWA, 2016).

Despite more summer rain, droughts are projected to become more common as higher temperatures increase evaporation (NIWA, 2016). Potential evapotranspiration deficit (PED) is the cumulative difference between potential evapotranspiration and rainfall for days of soil moisture under half of available water capacity. PED, in units of mm, can be thought of as the amount of rainfall needed in order to keep pastures growing at optimum levels. As a rule of thumb, an increase in PED of 30 mm or more corresponds to an extra week of reduced grass growth (NIWA, 2016). Future PED for Northland is projected for 2040 and 2090 in Figure 12.

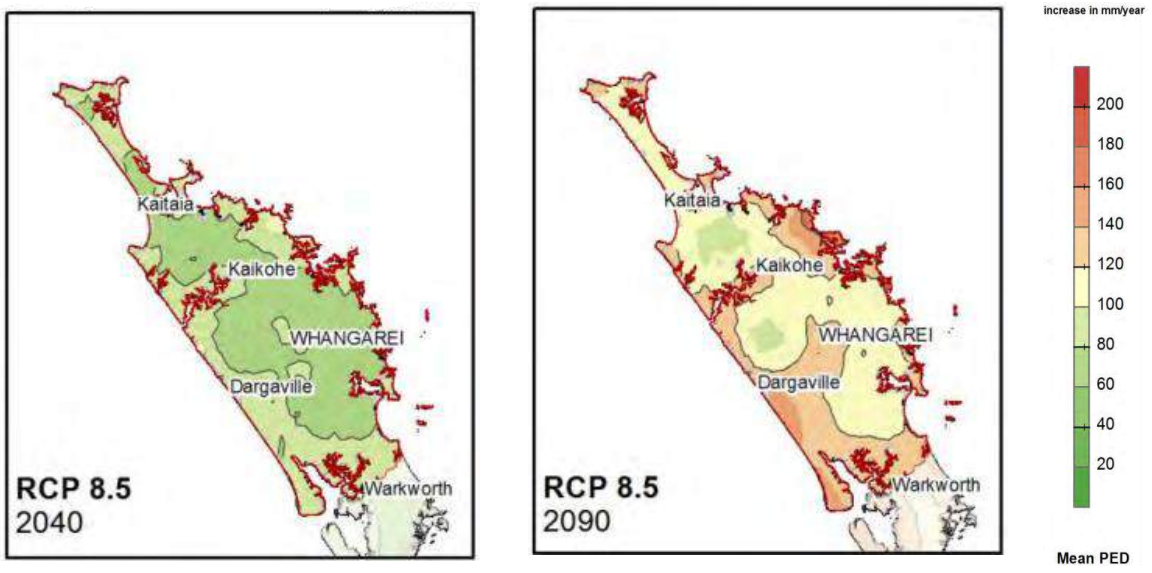


Figure 12: Projected additional potential evapotranspiration deficit (PED) in mm for 2040 and 2090 compared to 1995.

By 2040 western Kaipara is projected to experience increases in PED of 80-100mm/year (NIWA, 2016). However, by 2090 most of Kaipara is projected to experience increases in PED of 120-140mm/year, Mangawhai an increases of 140mm/year and some pockets south of Dargaville projected to experience increases in PED of over 140mm/year. It should be noted however that this model does not account for soil type, therefore, areas of free-draining sandy soils are likely to experience even higher PED. Kaipara can therefore expect to spend significantly more time in drought as climate change progresses (NIWA, 2016).

The warming climate is also causing sea levels to rise; due partly to additions of water from melting ice sheets and partly due to thermal expansion of the oceans (i.e. water expands in size as it warms) (MFE, 2017). Evidence suggests global sea level has risen by around 0.2m since 1900 and low-lying areas of New Zealand are already seeing an increased incidence of coastal storm inundation (MFE, 2017). The mean rate of globally averaged sea level rise appears to have been 1.7±0.2mm per year between 1901 and 2010. A slightly higher annual rise of 2.0±0.3mm per year appears to have occurred in the 40-year period from 1971 to 2010 (see Figure 13) (MFE, 2017).

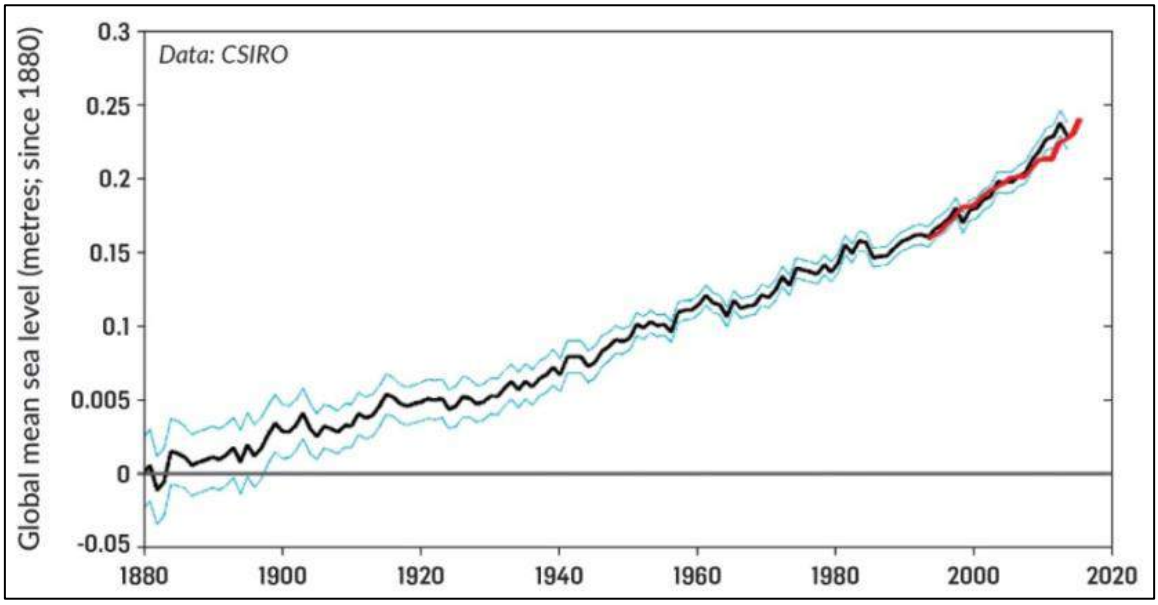


Figure 13: Cumulative changes in global mean sea level since 1880, based on a reconstruction of long-term tide gauge measurements to the end of 2013 (black) and recent satellite easements to the end of 2015 (red). Note: Lighter lines are the upper and lower bounds of the likely range (±1 standard deviation) of the mean sea level from available tide gauges (MFE, 2017).

Given the observed rate of sea level rise and current climate projections, the guidance given to Kaipara District Council is to plan for sea level rise of 1.5m above the 1986-2005 baseline over the next 100+ years (this is based on the IPCC's RCP8.5H+ scenario). This suggests sea level will be 1.5m higher than the 1986-2005 average by 2120-2130 (MFE, 2017).

Sea level rise of this magnitude will have significant ramifications for the Kaipara District due to its proximity to the ocean, extensive river network, and large expanses of low-lying land (Johnson, 2018). In particular, the Northern Wairoa area includes the second largest area of land protected by a land drainage scheme in New Zealand (after the Hauraki Plains). Much of this land around Ruawai, Aratapu and Hoanga is either just above or just below present day sea level and may be difficult to defend if sea

level rises in line with these projections (Tonkin and Taylor 2016; Goodhue et al., 2012; Johnson, 2018). This issue is explored further under section 6.4.4; Land drainage.

Local government road and 'three waters' infrastructure will also be affected by sea level rise. In particular, many of Council's wastewater treatment plants are located adjacent to tidal rivers and many kilometres of roads are built on flood plains.

Even a minor rise in sea level can be expected to increase the frequency of damaging or disruptive coastal hazards (MFE, 2017). For example, a modest sea level rise of 0.3m to 0.4m (possibly reached by 2050–2060) will convert a present-day rare storm-tide inundation event (e.g. with a 1% annual exceedance probability) to an event that will occur on average once a year (MFE, 2017).

Higher sea levels will also push saltwater further up lowland rivers, increasing the extent to which they are tidal and saline (MFE, 2017). Sea level rise is also likely to encroach on coastal aquifers, raising groundwater levels, reducing groundwater flow velocities and increasing salinization (NIWA, 2016). How far this effect extends from the coast depends on aquifer properties, flow velocities, and the amount of sea level rise. Less groundwater recharge can also be expected due to less precipitation and higher evaporation (NIWA, 2016).

Climate change is likely to have the largest impact on primary industries such as agriculture, horticulture, and forestry through changes in climate variability and climate extremes (NIWA, 2016). In response to warmer temperatures, farmers and growers in Northland are likely to increase their usage and dependence on existing subtropical plant species and introduce new commercial species that are heat and drought-tolerant. Kikuyu grass (*Pennisetum clandestinum*) is likely to become the most prevalent forage grass as it spreads readily and forms dense swads, out-competing most other pasture species. Chicory (*Cichorium intybus*) and plantain (*Plantago lanceolata*) are two other pasture species that are deep-rooted and drought tolerant, which may increase in abundance in Northland (NIWA, 2016).

Climate change will generally increase pasture production, especially in winter, through higher temperatures and an extended growing season (NIWA, 2016). Climate change is also likely to be generally positive for cropping in Northland. Higher temperatures will allow earlier sowing of crops, and they will generally reach maturity faster (depending on sowing time). However, higher temperatures could also lead to decreased yields. The greatest risk for pasture and cropping will be the availability of water, which is projected to decrease due to increased evaporation and reduced average annual rainfall, although increased summer rainfall will likely prove beneficial (NIWA, 2016). Higher temperatures and more "hot days" are also likely to cause more heat stress in cattle and livestock (NIWA, 2016).

In horticulture, subtropical crops such as persimmon and macadamia have already become commercially viable in northern New Zealand, and it is expected that new subtropical (and possibly tropical) crops will begin to be commercially grown as the climate warms in Northland (NIWA, 2016). Avocado in particular is currently expanding in the region. A lack of winter chilling will become increasingly limiting for the kiwifruit industry in Northland, in particular for the Hayward variety. That said, new kiwifruit varieties which require lessor winter chilling to achieve adequate bud break and flowering are being developed (NIWA, 2016).

Pinus radiata, is expected to perform even better in a warmer Northland than it currently does (NIWA, 2016). However, wild fires are likely to become a greater risk with increasing temperatures and decreasing rainfall. The number of days per year of Very High and Extreme Forest Fire Danger is projected to increase from 5.9 days/year to 8.2 days/year for Kaitaia, and from 2.2 days/year to 3.1 days/year for Dargaville over the period to 2050 and 2090 (NIWA, 2016).

Changes in pests and diseases will also be an important factor for agriculture (NIWA, 2016). Many foreign species which are currently unable to survive and reproduce in New Zealand may be able to establish as the climate warms. However, while much of the biosecurity risk will come from species establishing from beyond New Zealand's borders, there are also a number of species already in New Zealand which are not able to spread and flourish to the extent they could if the climate was warmer. These types of pests are often weeds but may also be invertebrates (such as the *Sphenophorus venatus vestitus* weevil, migratory locust *Locusta migratoria*, tropical armyworm *Spodoptera litura* and even the native moths *Epyaxa rosearia* and *Scopula rubraria*) (NIWA, 2016).

While efforts to reduce greenhouse gas emissions and so reduce the extent of climate change remain critical, the changes already underway in the Earth's environment will mean some degree of adaptation to climate change will be necessary. The changes anticipated as the climate warms will bring both opportunities and challenges for the Kaipara community. How Kaipara will respond to these remains to be seen.

3.6 Distribution of Settlement

Kaipara is an extensive rural district with no cities and significant distances between centres. Historically, transport was primarily by sea, resulting in many settlements being established in the upper reaches of harbours/harbour arms or along navigable rivers.

The largest settlements in the district are Dargaville and Mangawhai. Dargaville is the key service centre for the western and northern part of the district. It is 13km/10 minutes' drive from Baylys and 12km/12 minutes' drive from Te Kopuru which serve as satellite settlements. Dargaville is 57km/50 minutes' drive from Whāngārei (Northland's only city) and 175km/two and a half hours' drive from Central Auckland.

Mangawhai has historically been a community with a significant proportion of holiday homes as well as a large retiree population. However, the settlement is now emerging as a service centre for the surrounding area, including Kaiwaka which is 18km/19 minutes' drive away. Mangawhai is 100km/one and a half hours' drive from Central Auckland, 64km/an hour and seven minutes' drive from Whāngārei, 25km/28 minutes' drive from Waipu and 88km/one hour and ten minutes' drive from Dargaville.

Outside of the two largest settlements, the district is serviced by a collection of smaller settlements which also service the needs of the District's rural residents. The most prominent of these are Kaiwaka, Matakohe, Paparoa, Ruawai and Maungaturoto. Maungaturoto is 62km/53 minutes' drive from Whāngārei and 112km/one hour 40 minutes' drive from Auckland.

Some of Kaipara's smallest communities are very remote and have few services such as shops and health care. Emergency services can often be a considerable distance away. For example, Pouto is 69km/one hour and ten minutes' drive from Dargaville and Donnellys Crossing is 41km/37 minutes' drive from Dargaville.

4 Demography – Our people, Our communities

Ko ngā maunga ngā poupou hei whāinga mō ngā awa o te rohe o te Kaipara. Ko ngā moana ko Kaipara, ko Mangawhai. Ko ngā waka i hoea mai nei i te nuku o whenua i mauria mai ngā iwi, ngā hapū me ngā whanau ki ngā marae. Ko ngā marae ngā puna huihuinga tangata, huihuinga kaupapa.

Tihei ki runga, mauri ora ki whenua.

This section looks at population and demographic trends affecting Kaipara's communities. It begins by considering population trends nationally and regionally, before looking at local population trends and local wellbeing.

At the time of writing this report the 2018 Census data for populations and dwellings had just been released. This newly released Census data provided population counts with a reasonable degree of accuracy. Population estimates, not based on the 2018 Census data were also available and were not scheduled to be updated with 2018 Census data until early 2020. Accordingly, this report has chosen to present both the latest population estimates and the newly released 2018 Census counts. While these two sources report slightly different numbers (the 2018 Census figures tend to be lower as they have yet to be adjusted for census undercount), the trends they reveal are the same. Both therefore contribute to a better understanding of our people and their wellbeing.

"He aha te mea nui o te ao. He tāngata, he tāngata, he tāngata".

What is the most important thing in the world? It is people, it is people, it is people.

4.1 Population nationally

New Zealand's population, as per the 2018 Census was 4,699,755. The 2018 Census, shows New Zealand's population grew at its fastest rate in half a century, with 10.8% growth between the 2013 and 2018 Census.

According to the latest population estimates, New Zealand's usually resident population reached 4.92 million at 30 June 2019 (Statistics New Zealand, 2019). New Zealand's population grew by an estimated 76,000 persons, or 1.6% in the year to June 2019. New Zealand's population growth rate remains high by historical and international standards. The world's population is currently growing at 1.1% per year and New Zealand has exceeded this growth rate in each of the last five years (Statistics New Zealand, 2019).

The largest driver of growth in New Zealand has been net migration, contributing an additional 49,400 persons, while natural increase (births minus deaths) contributed an additional 26,600 persons (Statistics New Zealand, 2019).

Over the near term, New Zealand's rate of population growth is experiencing a slowdown (New Zealand Treasury, 2019A). This is primarily attributed to net migration which is the main driver of cyclical changes in New Zealand's population growth. Net migration peaked at 64,000 in 2016 and has been declining since, a trend the New Zealand Treasury assumes will continue (New Zealand Treasury, 2019A).

However, while New Zealand is growing overall, the growth paths of New Zealand's regions and cities are quite different from each other (Salvation Army Social Policy and Parliamentary Unit, 2015).

Provincial areas are scarcely growing or even experiencing decline while Auckland and the Upper North Island have and are projected to continue growing strongly (Salvation Army Social Policy and Parliamentary Unit, 2015). Figures 14 and 15 show how growth rates have varied across different areas of New Zealand between the 2013 and 2018 Census. They reveal population decline in provincial parts of the central North Island and strong growth on the peripheries of Auckland as the city overflows into neighbouring areas. Strong growth was also seen in the Queenstown-Lakes District where lifestyle opportunities are driving migration (Statistics New Zealand, 2019).

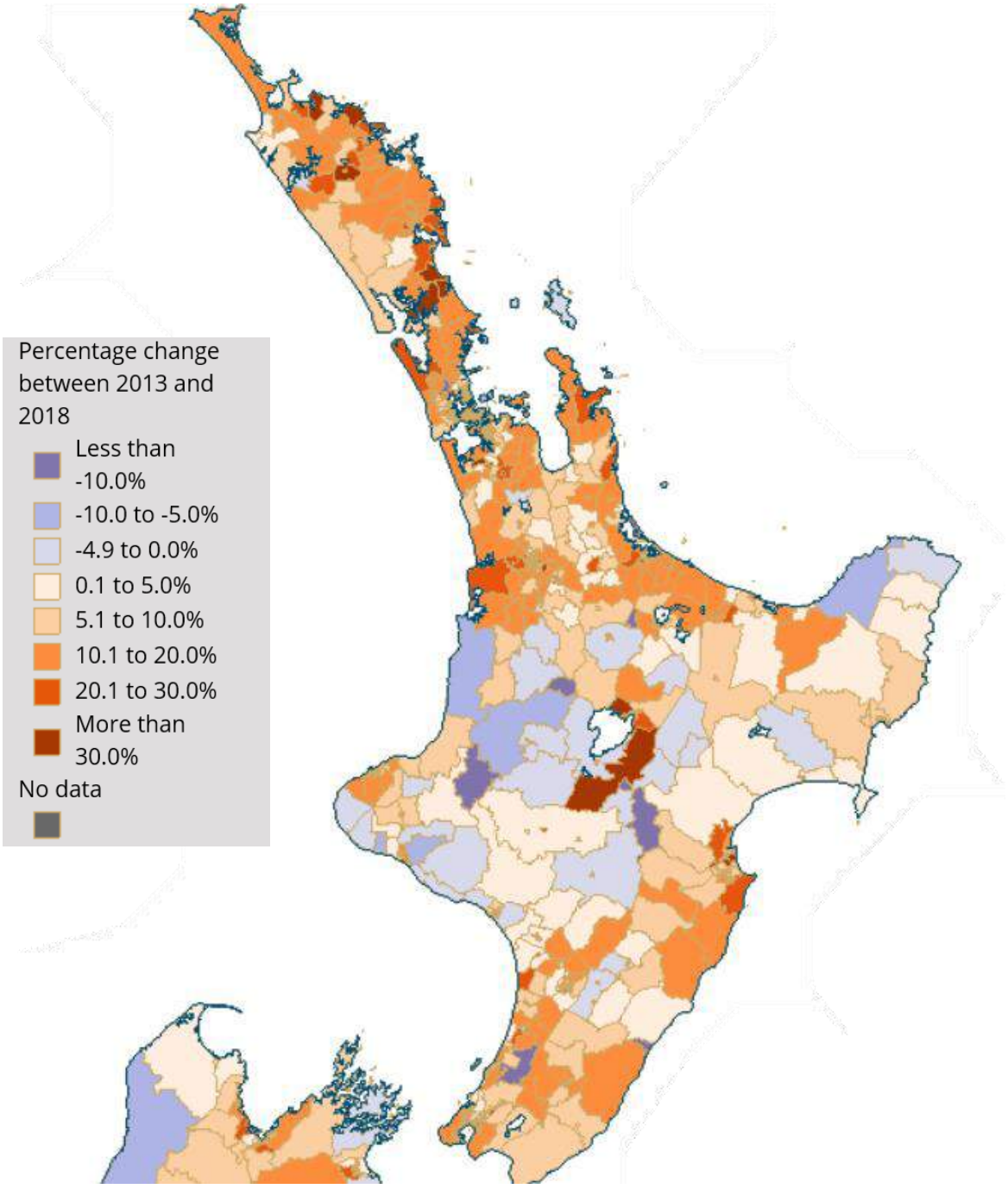


Figure 14: Population changes in the North Island between the 2013 Census and 2018 Census (Statistics NZ, 2019).

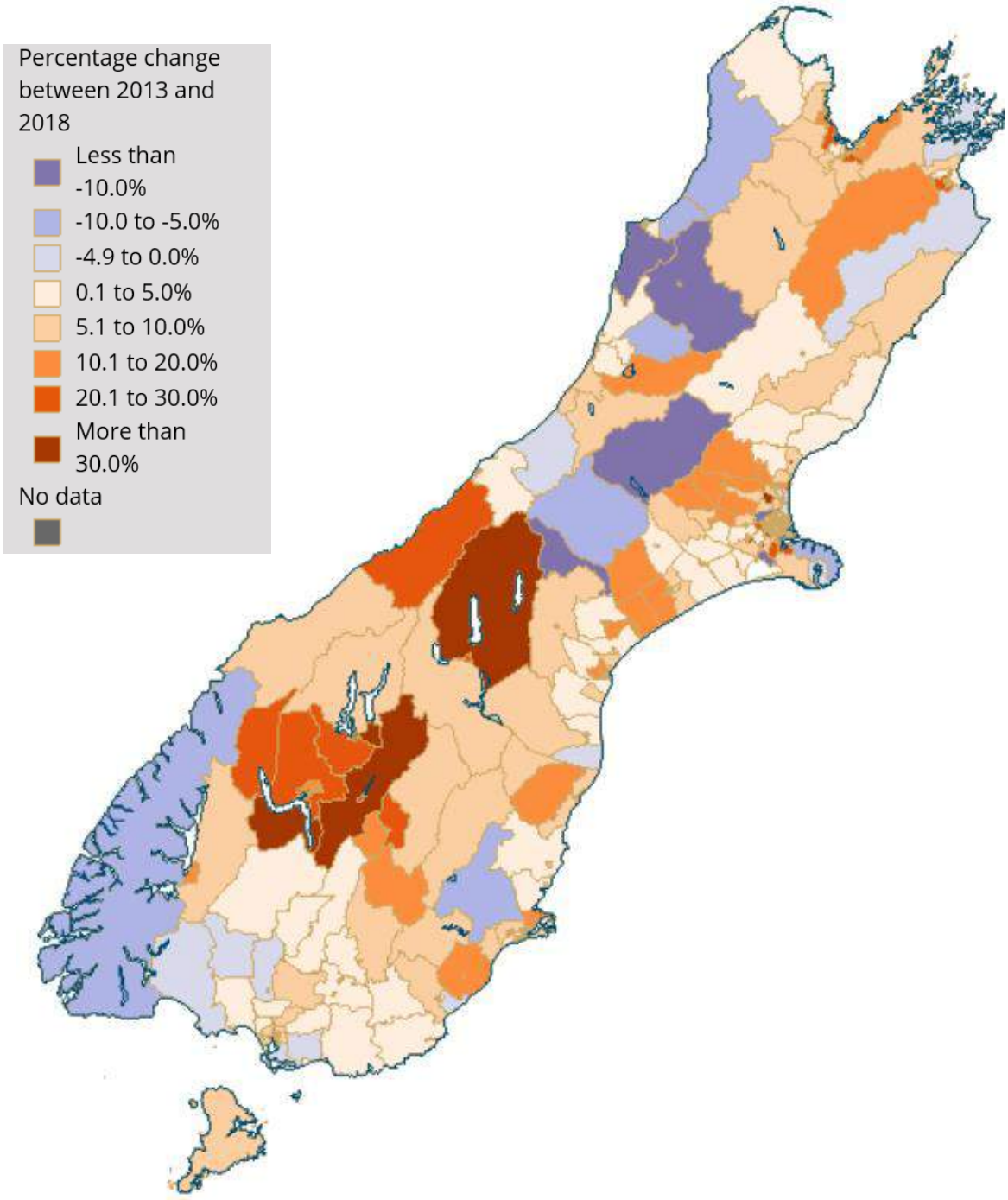


Figure 15: Population changes in the South Island between the 2013 Census and 2018 Census (Statistics NZ, 2019).

The 2018 Census shows New Zealand's population is unevenly distributed, with about 76% of New Zealanders living in the North Island and half of them living in three regions; Auckland, Waikato and Bay of Plenty. At the time of the 2018 Census around 46% of New Zealanders lived within the triangle of Auckland, Hamilton and Tauranga (the so called 'Golden Triangle').

Trends towards centralisation and globalisation have seen Auckland emerge as New Zealand's only global scale city, a city which can compete with other international cities for business and migrants. Auckland is increasingly spilling over into its peripheries with Warkworth and Pukekohe now recognised as satellite settlements. This has fuelled the growth of the Waikato region and Tauranga with population

and business expanding into the Waikato District particularly. However, constrained transport linkages have prevented expansion into Northland to the same extent. Meanwhile, the trend for retirees to retire outside of Auckland has resulted in expansion of coastal settlements in the Coromandel and along Northland's east coast (including Mangawhai).

Statistics New Zealand predicts Auckland will continue to be New Zealand's fastest growing region, and account for three-fifths of the country's population growth between 2013 and 2043. From an estimated population of 1.6 million in 2016, Auckland is projected to reach 2 million in the early 2030s. That means out of every 100 people in New Zealand, 33 currently live in Auckland, however this will increase to 37 in 2028 and 40 in 2043 (Statistics New Zealand).

Natural increase (births minus deaths) is projected to account for three-fifths of Auckland's growth and net migration the remaining two-fifths. Interestingly the number of people moving into the city from other New Zealand regions is now less than the number of Aucklanders moving away. Auckland's net migration gains are therefore due to positive international rather than internal migration.

Almost 33,000 Aucklanders left Auckland for other parts of the country over the four years to June 2017 (Patterson, 2019C). What is more, the exodus of Aucklanders to the regions has accelerated from a net 2,727 people in 2014 to 12,942 people in 2017. The three regions closest to Auckland; Northland, Waikato and Bay of Plenty, attracted two thirds (68%) of Auckland's regional population exodus, further reinforcing the emergence of the Upper North Island as New Zealand's main population and economic centre. However, migrants from Auckland also made major contributions to other centres, including Dunedin and Queenstown-Lakes which each saw a net gain of more than 1,100 residents from Auckland over the four years to June 2017. Other parts of the country that are worth mentioning as destinations for Aucklanders include Wellington and Hawke's Bay (Patterson, 2019C).

Net regional migration out of Auckland is characterised by high net outflows of people in their late twenties and through their thirties with children (Patterson, 2019C). This suggests the unaffordability of housing in Auckland is a key driver pushing these young families into adjacent regions. Net regional migration outflows also accelerate as people reach retirement, suggesting people are seeking better lifestyle opportunities as well as releasing capital by selling their Auckland family home (Patterson, 2019C).

Based on current trends it is apparent that New Zealand is on a divergent growth path and that this path risks the creation of two New Zealand's; Auckland (with its surrounding overflow area) and the rest. In general, Aucklanders will be younger, wealthier, better skilled and more ethnically diverse than the rest of New Zealand (Salvation Army Social Policy and Parliamentary Unit May 2015).

However, while Auckland is New Zealand's most internationally competitive city, it faces significant challenges (PricewaterhouseCoopers, 2019). Auckland has rising housing, food and transport costs, coupled with sluggish income growth. This results in residents having lower discretionary income in 2019 than a decade ago ($96 less per week) (PricewaterhouseCoopers, 2019).

By contrast, over the last decade, Wellington and Christchurch experienced increases in weekly discretionary income of $137 and $124 respectively, by combining high income growth with relatively low housing costs (PricewaterhouseCoopers, 2019). In contrast, the smaller cities of Hamilton and

Tauranga have maintained discretionary income through lower basic expenditure, while Queenstown currently has high incomes outstripping rapidly increasing house prices (PricewaterhouseCoopers, 2019).

It is this increasing unaffordability of Auckland, coupled with the attractions of lower density living, that is increasingly drawing residents to relocate to those regions bordering Auckland or to secondary upper North Island cities (PricewaterhouseCoopers, 2019). Businesses too are relocating to where industrial land is cheaper and transport links are less congested.

4.2 Population regionally

According to the 2018 Census count, Northland's population has increased 18.1% since the 2013 Census to reach 179,076. This makes Northland the fastest-growing region in the country, with more than 27,000 more people living in the region than five years ago. The second fastest growing region was Bay of Plenty (15.2% growth), followed by Waikato (13.5% growth).

According to the latest population estimates, Northland had an estimated resident population of 179,100 in 2018 (Infometrics, 2019). This was a 2.1% increase on the previous year and health enrolments (a proxy for local population growth) suggest this growth is sustained, increasing a further 2% over the 12 months to June 2019 (Infometrics, 2019).

Whāngārei is Northland's only city and the closest city servicing the Kaipara district. Whāngārei district accounts for about half Northland's population with an estimated usually resident population of 91,400 in 2018, or a 2018 Census count of 90,960. According to the 2018 Census, Whāngārei is growing strongly, increasing 18% between 2013 and 2018. Both Northland and Whāngārei's growth is mainly attributed to net migration which accounted for 3,100 and 1,400 persons respectively over the 2018 calendar year. Natural increase contributed a further 600 and 300 persons respectively (Infometrics, 2019).

Net migration's greater contribution to Northland's population growth than natural increase is in contrast to historic trends and suggests an increasing number of people moving to Northland. Out-migration from Auckland is a key contributor to this trend as high living costs drive Aucklanders to look north and south of the city. Retirees leaving Auckland to enjoy a quieter lifestyle in coastal settlements along Northland's east coast will also be contributing.

Not surprisingly given these trends, the fastest growing areas of Northland were around Kaiwaka/Oneriri, Mangawhai and Waipu which are both close to Auckland and near the sea. The rural area around Mangawhai recorded the largest population growth (50.2% or 702 additional residents) over the 2013-2018 period, followed by 633 at Waipū, and 537 at Kaiwaka/Oneriri.

The Far North district also saw strong growth in some areas, the district growing by 17.1% or 65,250 residents to reach a usually resident population of 65,250 according to the 2018 Census count.

Table 2 shows the annual levels of net regional migration (i.e. migration to and from other areas of New Zealand) for Northland's territorial authorities and neighbouring Auckland. It shows that Northland's territorial authorities have received growing numbers of regional migrants, while Auckland is increasingly loosing residents to the rest of New Zealand (Patterson, 2019).

Table 2: Net regional migration flows for Northland territorial authorities and the Auckland Region (Patterson, 2019).

Net regional migration

From all other parts of NZ, June years

Year	Kaipara District	Whangarei District	Far North District	Auckland
2014	-144	690	120	-2,727
2015	192	720	-72	-6,924
2016	309	777	204	-10,332
2017	498	1,092	690	-12,942
Average (2014-17)	214	820	236	-8,231

4.3 Kaipara's Population

4.3.1 Kaipara Uri – Kaipara's first peoples

Kaipara settlement goes back more than nine centuries, when the ancestors of the many iwi and hapū lived by fishing, hunting and growing crops in an area blessed with rich harvests from the harbour, ocean, rivers, forest and soil. The Kaipara was also a major route for travel to and from the north, to the Waitemata and Manukau Harbours.

The major iwi/hapū of the Kaipara are Te Roroa and Te Uri o Hau. Te Roroa occupy the hinterland and rich valleys between the Kaipara and Hokianga harbours, particularly the Kaihu Valley, Waipoua, Tunatahi (Dargaville) and Maunganui Bluff areas. Te Uri o Hau occupy the Pouto peninsula and northern side of the Kaipara Harbour. The southern Kaipara is made of several hapū and iwi, namely Ngāti Whātua Tuturu, Te Taou and Ngāti Rongo whom extend their tribal area to Taupaki (IKHMG, 2019).

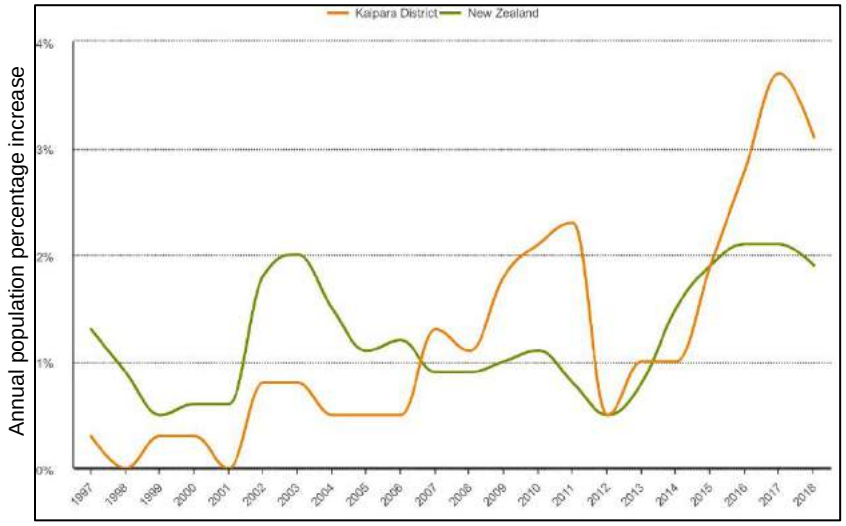
Figure16: The major Kaipara hapū rohe and location of significant battle sites prior to 1840.

Te Uri o Hau, together with their overarching Iwi; Ngāti Whātua, and Te Roroa have Mana Whenua status over their ancestral lands (their rohe). This means they are recognised as having authority to exercise kaitiakitanga over their rohe. Council needs to be aware of Te Uri o Hau and Te Roroa's rohe extents and work with these Iwi appropriately.

4.3.2 Population Growth in Kaipara

In 2018 Kaipara had an estimated resident population of 23,200 persons (Infometrics, 2019). According to the 2018 Census, Kaipara's population rose 20.6% from 18,963 in 2013 to 22,869 in 2018 making it the fastest growing district in Northland. Based on estimates, Kaipara's annual average population growth rate was 2.5% over the five years from 2013 to 2018. Kaipara's average rate of population growth over this period, exceeded that of Northland (1.7%), Whāngārei (1.8%), Far North (1.22%), and New Zealand (1.9%) while being slightly below that of Auckland (2.6%) and on par with that of Waikato District (2.5%). As shown in Figure 17, the rate at which Kaipara's population is growing has been strengthening since 2001 with the exception of a slowdown around 2012. Furthermore, it can be observed in both Figure 17 and Figure18 that Kaipara's population growth has accelerated since 2014.

Figure 17: Year on year population growth rate between 1997 and 2018 (Infometrics, 2019).



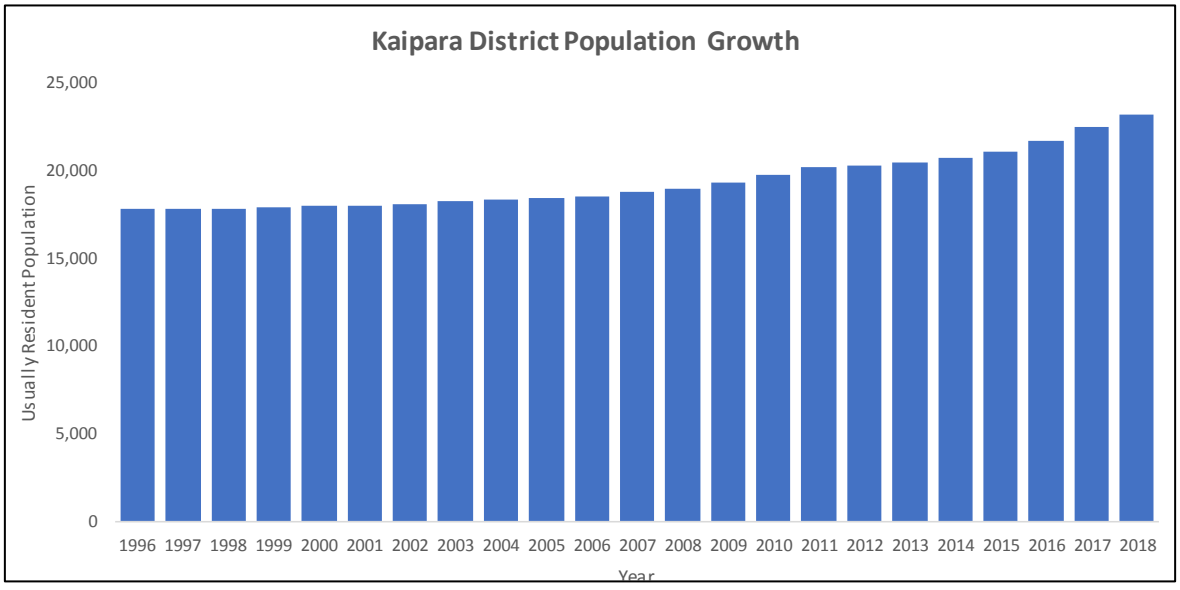


Figure 18: Kaipara's population from 1996 to 2018 (Infometrics, 2019).

Kaipara's growth has however not been shared equally between its many distinct communities. Figure 19 shows the fastest growing areas in Kaipara between 2013 and 2018 were around Mangawhai, Kaiwaka/Oneriri and to a lesser extent, Maungaturoto. Interestingly, this high rate of growth in south-eastern Kaipara was not shared by neighbouring areas of northern Auckland/Rodney.

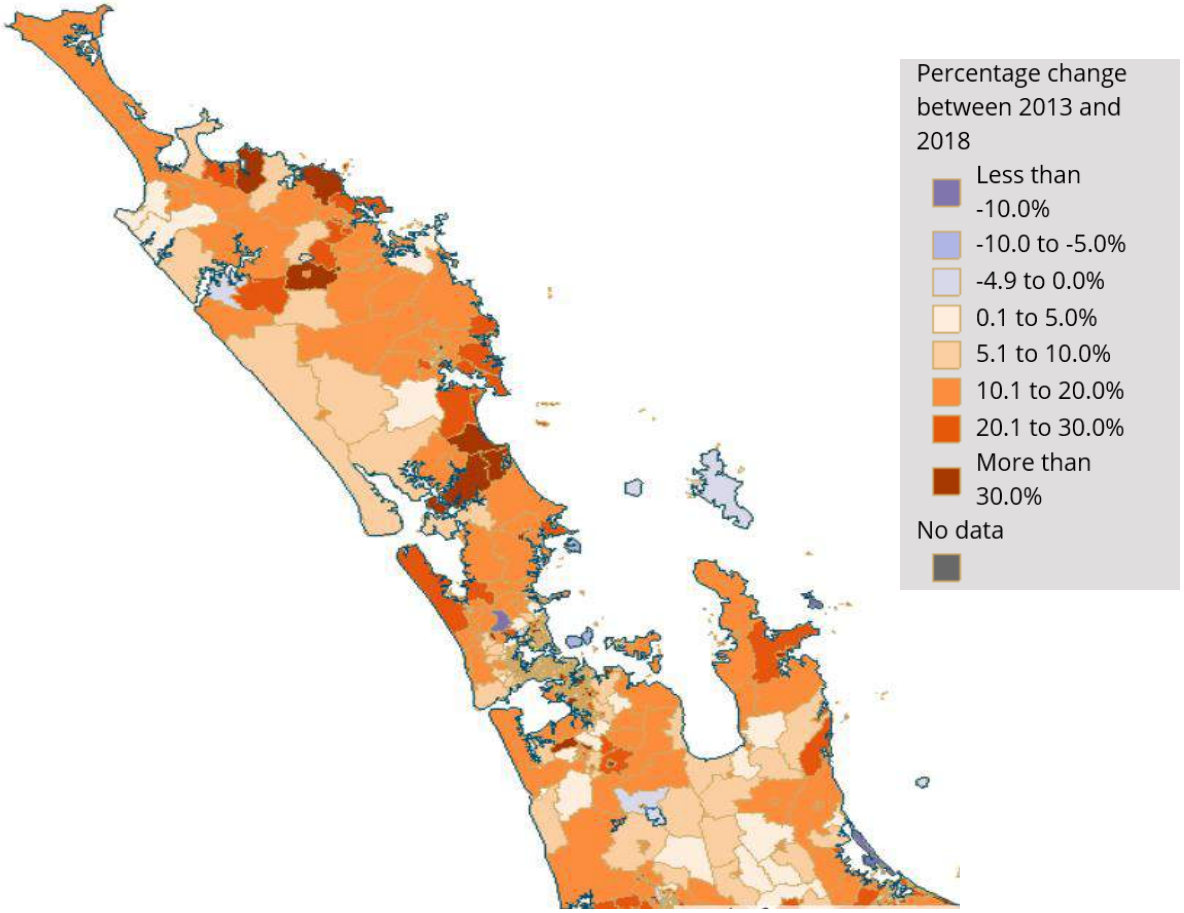


Figure 19: Population change between the 2013 Census and 2018 Census (Statistics NZ, 2019).

Figure 20 below shows how different areas of Kaipara have grown over time. It reveals Mangawhai has grown exponentially over the course of the dataset, while all other areas show a similar trend of roughly stable populations with a recent period of population growth from about 2015 onward.

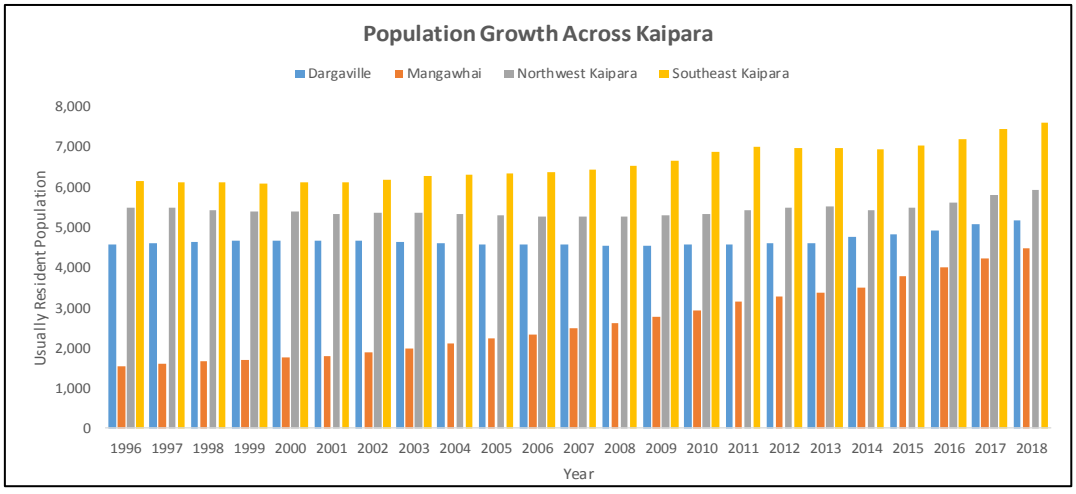


Figure 20: Population growth trends across different areas of Kaipara District from 1996 to 2018 (Infometrics, 2019).

Table 3 further breaks down how populations grew across various parts of Kaipara District over the period 2015-2018. The data shows that approximately 32.7% of Kaipara's population growth over that period was concentrated in Mangawhai (which includes the three areas of Mangawhai Heads, Mangawhai Rural, and Mangawhai [Village]), despite this area only accounting for just over 19% of Kaipara's total population (Infometrics, 2019). By comparison, other parts of Kaipara generally attracted a smaller share of population growth relative to their overall share of Kaipara's total population (Infometrics, 2019; Patterson, 2019).

Table 3: Population growth over the period 2015-2018 (Infometrics, 2019).

SA2 area	Change in population, 2015-18	Share of Kaipara's population growth	Population, as at June 2018	Population as share of Kaipara total
Dargaville	340	16.3%	5,170	22.3%
Kaipara Coastal	310	14.9%	4,000	17.2%
Kaiwaka	220	10.6%	2,000	8.6%
Mangawhai [Village]	90	4.3%	730	3.1%
Mangawhai Heads	290	13.9%	1,800	7.8%
Mangawhai Rural	300	14.4%	1,950	8.4%
Total Mangawhai	680	32.7%	4,480	19.3%
Maungaru	160	7.7%	1,950	8.4%
Maungaturoto	110	5.3%	1,330	5.7%
Otamatea	110	5.3%	1,690	7.3%
Ruawai-Matakohe	150	7.2%	2,600	11.2%
Total	**2,080**	**100%**	**23,220**	**100%**

Kaipara's growth is mainly attributed to net migration (people moving to Kaipara from other areas of New Zealand and overseas) which accounted for 600 additional persons over the 2018 calendar year. Natural increase contributed a further 100 persons (Infometrics, 2019).

Regional migration (migrants from other parts of New Zealand rather than from oversees) accounted for approximately 41% of Kaipara's total population growth over the four years to June 2017, compared to 40% from international migration and 19% from natural increase (see Figure 21) (Patterson, 2019).

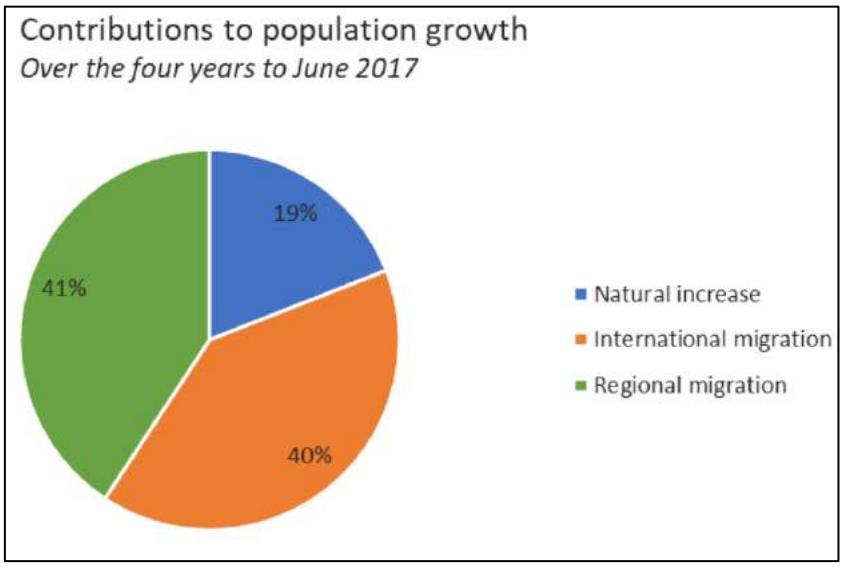


Figure 21: Proportion of Kaipara's population growth attributed to natural increase and migrants from oversees and other parts of New Zealand over the four years to June 2017 (Patterson, 2019).

Net regional migration's greater contribution to Kaipara's population growth than natural increase is in contrast to historic trends and suggests an increasing number of people moving to Kaipara (Patterson, 2019).

As shown in Table 4, net regional migration to Kaipara has been increasing from a loss of -144 people in 2014 to a gain of 498 people in 2017 (Patterson, 2019).

Table 4: Net regional migration to Kaipara from other parts of New Zealand, June years (Patterson, 2019).

Year	Net migration
2014	-144
2015	192
2016	309
2017	498
Average (2014-17)	214

Auckland was the largest contributor of regional migrants to Kaipara over the four years to June 2017 as severely unaffordable housing has pushed people from Auckland into regional New Zealand. Auckland lost an average of 374 people per annum to Kaipara over the four years to June 2017. The other key sources of regional migration to Kaipara were generally from provincial parts of the central North Island.

Table 5 summarises the ten territorial authorities from which Kaipara district has gained the most regional migrants over the four years to June 2017 (Patterson, 2019).

Table 5: Key sources of regional migration gain to Kaipara over the four years to June 2017 (Patterson, 2019).

Net gain from:	Average migration 2014-17 (pa)	Total migration 2014-17
Auckland	374	1,494
Rotorua District	10	39
Thames-Coromandel District	7	27
Waikato District	7	27
Nelson City	6	24
Otorohanga District	5	21
Palmerston North City	5	18
Central Otago District	4	15
Lower Hutt City	4	15
Ashburton District	3	12

Over the four years to June 2017 the key destinations for net regional migration outflows were other parts of Northland, particularly Whāngārei (Patterson, 2019). Kaipara lost an average of 92 residents a year to Whāngārei and an average of 14 per year to Far North over the four years to June 2017 (Patterson, 2019). However, these four-yearly averages can be deceptive, Table 6 below reveals a declining trend in losses to Whāngārei and an increasing trend in Aucklanders moving north.

Table 6: Net regional migration flows to Kaipara District from other territorial authorities (Patterson, 2019).

Net regional migration

Regional migration from other territorial authorities

Net migration from:	Average migration 2014-17 (pa)	2014	2015	2016	2017
Auckland	374	138	294	489	573
Rotorua District	10	-6	30	-3	18
Thames-Coromandel District	7	-3	12	9	9
Waikato District	7	0	3	-9	33
Nelson City	6	9	3	6	6
Otorohanga District	5	3	9	12	-3
Palmerston North City	5	3	9	0	6
Central Otago District	4	0	6	3	6
Lower Hutt City	4	0	-3	15	3
Ashburton District	3	3	6	9	-6
South Taranaki District	3	6	9	-3	0
Hauraki District	2	12	-12	6	3
Gore District	2	3	6	0	-3
Grey District	2	6	-6	3	3
Invercargill City	2	6	-6	-6	12
Timaru District	2	0	-3	6	3
Marlborough District	1	3	9	-9	0
Rangitikei District	1	3	6	0	-6
Southland District	1	-3	-3	0	9
Taupo District	1	-3	12	-18	12
Whakatane District	1	0	6	-6	3
Kaikoura District	0	0	0	0	0
Opotiki District	0	-3	0	0	3
Queenstown-Lakes District	0	-3	-3	0	6
South Wairarapa District	0	0	0	0	0
Carterton District	-1	3	-6	3	-3
Clutha District	-1	-3	0	-3	3
Hurunui District	-1	-3	-3	3	0
Kapiti Coast District	-1	9	3	-15	0
Mackenzie District	-1	-3	0	0	0
Porirua City	-1	3	-3	-3	0
Stratford District	-1	0	0	-3	0
Tasman District	-1	-6	-6	6	3
Upper Hutt City	-1	0	-3	0	0
Waimakariri District	-1	-3	6	-6	0
Waimate District	-1	0	-3	0	0
Central Hawke's Bay District	-2	-6	-3	6	-3
Horowhenua District	-2	-6	-12	12	0
Selwyn District	-2	-9	-6	0	9
Waitomo District	-2	-3	0	-6	3
Buller District	-2	-3	-3	-6	3
Hastings District	-2	0	-3	-3	-3
Masterton District	-2	-3	6	-3	-9
Napier City	-2	3	-3	-6	-3
Waipa District	-2	9	-6	3	-15
South Waikato District	-3	9	6	-27	0
Waitaki District	-3	0	0	-9	-3
Wellington City	-3	-12	-9	3	6
Kawerau District	-4	-3	-3	0	-9
Manawatu District	-4	-6	0	-3	-6
New Plymouth District	-4	0	0	6	-21
Westland District	-4	0	-6	-6	-3
Christchurch City	-5	-15	3	-6	0
Tauranga City	-5	-3	0	-3	-12
Wairoa District	-5	0	-12	-6	0
Western Bay of Plenty District	-5	0	0	-6	-12
Gisborne District	-5	0	-12	-9	0
Ruapehu District	-5	-9	-6	-9	3
Tararua District	-5	-9	-3	-3	-6
Whanganui District	-5	0	-3	-3	-15
Dunedin City	-6	-3	-6	-6	-9
Hamilton City	-10	-30	12	-9	-12
Matamata-Piako District	-14	-24	-3	-15	-12
Far North District	-14	-51	24	18	-48
Whangarei District	-92	-141	-129	-81	-18
Total migration into Kaipara	**214**	**-144**	**192**	**309**	**498**

Kaipara experiences significant net migration losses of people aged 15-19 years, possibly because of school leavers seeking tertiary education in cities (Patterson, 2019). Interestingly, there now appears to be net inflows of young families. This trend is apparent in the higher net inflows of children (0-14 years) and adults in their thirties, with many leaving Auckland, possibly in search of affordable housing and better lifestyle opportunities for their families. Regional migration to Kaipara rises again sharply as people approach retirement. This is likely because retirees are not concerned about finding employment in the area they move to. In addition, the potential to sell an Auckland property and buy a house in Kaipara for significantly less than the sale price may facilitate early retirement options. However, Kaipara also experiences net regional migration losses to other areas as people become more elderly, possibly because of their greater needs for healthcare.

Dargaville

Dargaville remains Kaipara district's largest centre with an estimated 2018 population of 5,170 and a 2018 Census count of 4,794. Analysis of Infometrics' data reveals Dargaville is showing sustained growth in both population and employment following a period of stagnation and, at times, even decline which lasted up until 2013 (refer to Figure 22). The 2018 Census suggests Dargaville's population has grown by 13% from 2013 to 2018.

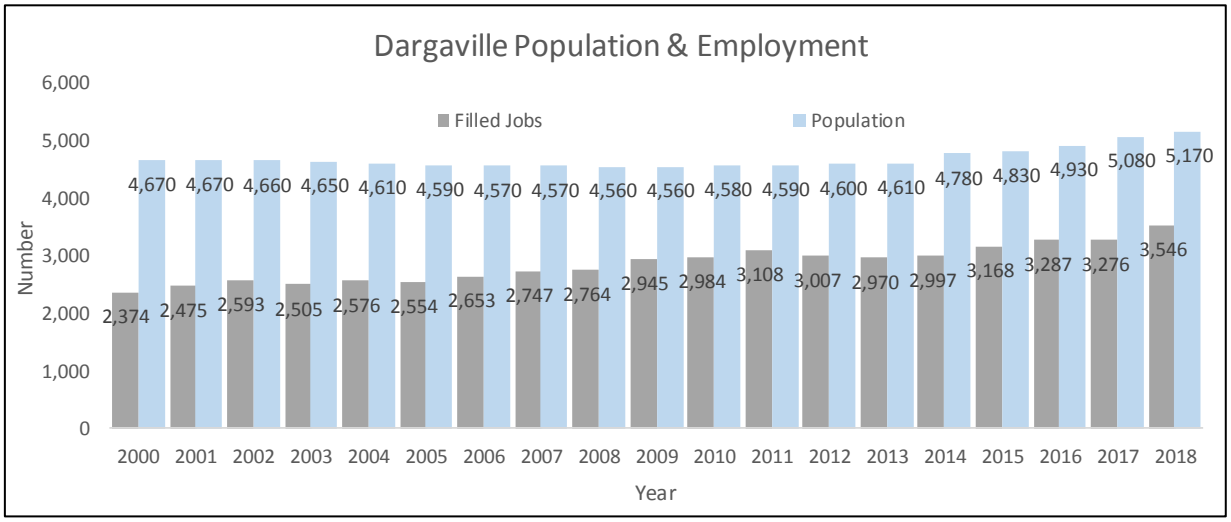


Figure 22: Population and employment growth in Dargaville (Infometrics, 2019).

This changing trend is also evident from house prices (New Zealand Herald, 2017). An analysis by Quotable Value (QV) of Northland property values shows Dargaville experienced a 60.5% increase in the median price of residential properties in the three years to June 30, 2017. This increase in house prices likely reflects that Dargaville's population growth (13% from 2013 to 2018) has far exceeded dwellings growth (2% from 2013 to 2018). The town is now considered to have a shortage of available rental properties (New Zealand Herald, 2017).

The reasons for this change are not well understood but appear to stem from an uplift in the local economy. Dargaville's commutability to the expanding Whāngārei metropolitan area and its affordability compared to Auckland are also likely contributing factors. Dargaville is supported by communities such as Te Kopuru and Baylys which act as satellite residential areas. These areas are likely experiencing similar trends, however data at this level is limited.

Northwest Kaipara

Dargaville acts as a service centre for a large rural area roughly equal to half the geographic extent of the district which stretches from Pouto to the Waipoua Forest and east to Tangiteroria, Arapohue and Ruawai. Beyond this, communities look to Whāngārei, Auckland or, to some extent, Maungaturoto for their services centre needs. Much of this area falls within the Northwest Kaipara small area profile for which Infometrics provides detailed data. This area includes all the area mentioned above with the exception of the Ruawai area beyond Tokatoka (refer to the map in Figure 23.

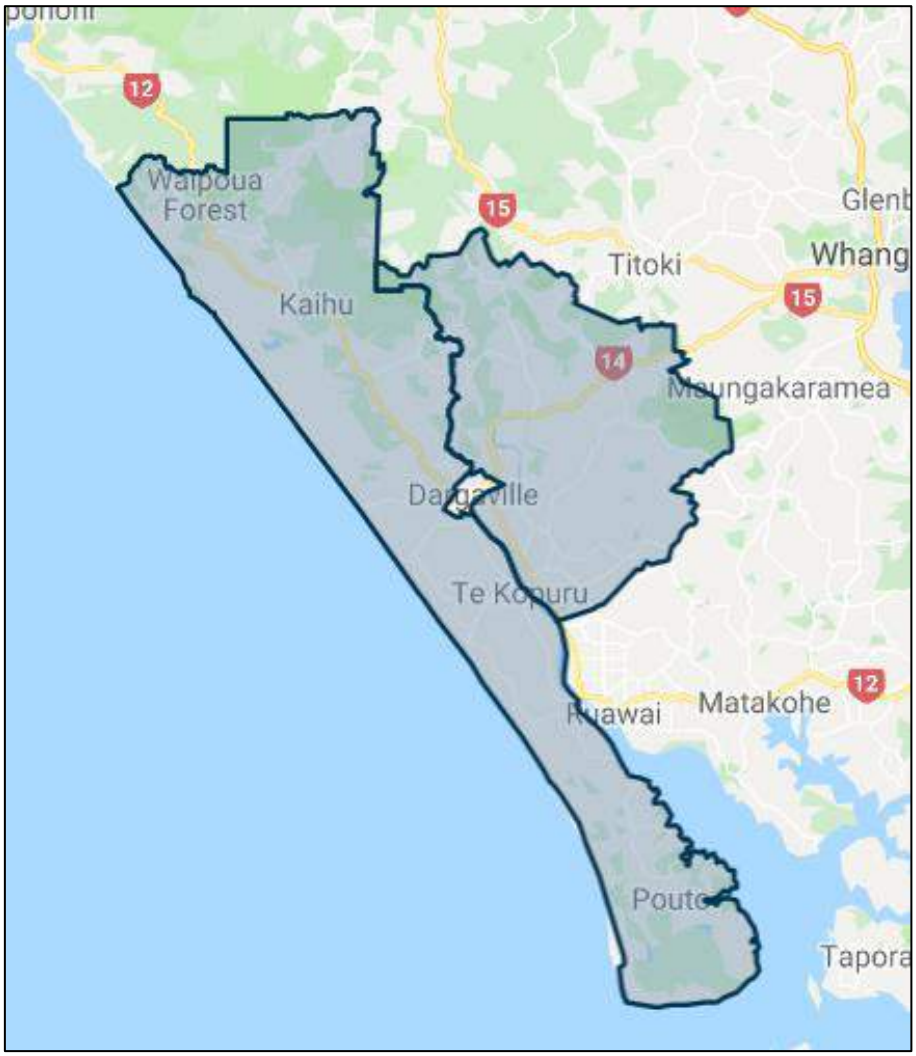


Figure 23: Geographic extent of Infometrics' Northwest Kaipara Small Area Profile (Infometrics, 2019).

In 2018, Northwest Kaipara had an estimated population of 5,950 persons (Infometrics, 2019) or 5,490 according to the 2018 Census count. The area's population has followed a similar trend to that of Dargaville, showing an increase over recent years. However, growth in employment has not kept pace with population growth, suggesting many in these communities commute to Dargaville for work. Between 2013 and 2018, Northwest Kaipara's estimated population grew by 8% (or 7% according the 2018 Census) while employment only increased by 3% (Figure 24). By comparison, Dargaville's estimated population increased by 12% (or 13% according to the 2018 Census) while its employment increased by 19% over the same period (Infometrics, 2019). Population increase without employment growth could also be attributed to more children and retirees.

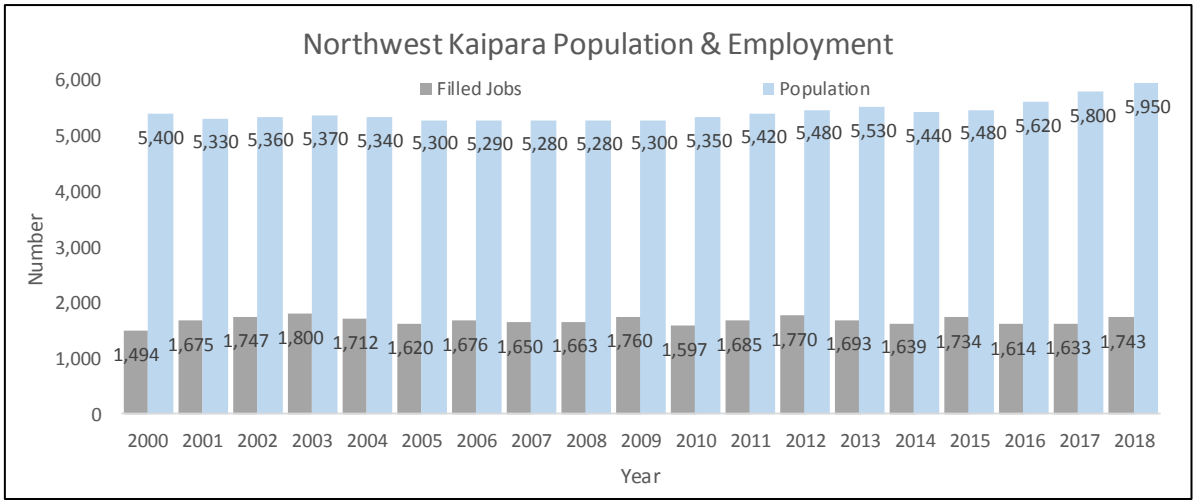


Figure 24: Comparison between population and employment growth in Northwest Kaipara (Infometrics, 2019).

Mangawhai

The second largest centre in Kaipara is Mangawhai, with an estimated 2018 usually resident population of 4,480 (Infometrics, 2019) or 5,031 according to the 2018 Census, which indicates a 60% increase in population from 2013-2018. This growth was split between Mangawhai Heads which grew 61% (to reach 1,995 residents), Mangawhai Village which grew 85% (to 936 residents) and Mangawhai Rural which grew 50% (to 2,100 residents) (Statistics New Zealand). However, past analysis comparing the number of unoccupied dwellings to occupied dwellings and wastewater flows between peak and off-peak times suggests Mangawhai's population (in particular Mangawhai Heads) more than doubles during holiday periods, with a peak population likely exceeding 7,700. This makes it Kaipara's largest centre during these times. This has implications for Council when planning for infrastructure and service provision. Services must be able to cope with peak, not just usually resident, demand.

However, Mangawhai is a town facing transition. Recent data suggests the proportion of people living permanently in Mangawhai is increasing. This is likely due to people retiring permanently to their holiday homes, as well as more new homes being built for permanent residents.

A comparison of population growth to employment growth reveals that, Mangawhai's population is growing exponentially, however its employment is growing only modestly (Figure 25) (Infometrics, 2019). This, together with the older age structure of the population suggests a high proportion of retirees in the Mangawhai community. In addition, there are a number of indicators suggesting more working-age people are moving to Mangawhai and commuting to the North Shore of Auckland for work. More affordable housing and anticipated better lifestyle opportunities, coupled with improving transport links and new technology which increasingly enables working from home, are considered to be factors driving this trend.

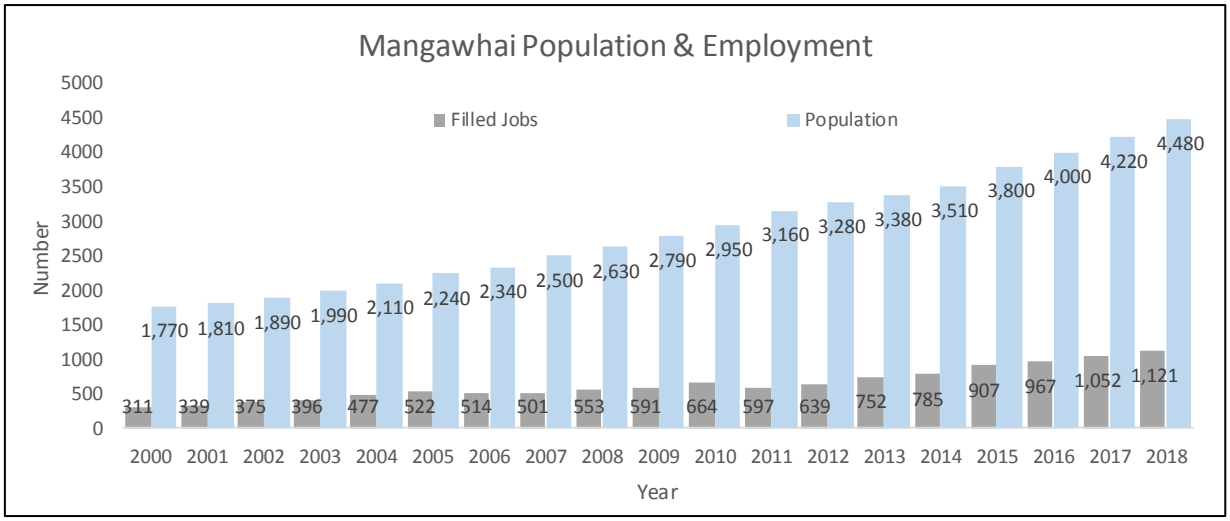


Figure 25: Comparison between population and employment growth in Mangawhai (Infometrics, 2019).

As a result of these trends, Mangawhai is transitioning from a holiday and retirement destination to a permanent settlement and service centre for the local area. The proposed "Mangawhai Central" development, including a supermarket, commercial and retail outlets and a medical centre, will likely cement this transition.

The trends which have influenced Mangawhai's more recent growth look set to intensify. New Zealand's ageing population and the proposed additional services will likely add to the influx of retirees. Meanwhile, completion of the Pūhoi to Warkworth motorway extension and other roading improvements will further reduce travel times to Auckland and the North Shore, making Mangawhai increasingly attractive to commuters. These commuting opportunities will likely increase the flow of younger workers and their families into the area. In addition, Mangawhai's proximity to Northland's expanding port at Marsden Point and the growing Waipu-Marsden area may further spur its growth.

This rapid and ongoing growth poses various challenges for the Mangawhai community as they seek to retain their rural coastal amenity and relaxed pace of life while allowing for development to take place. This will entail guiding development to achieve a workable urban form and giving consideration to Mangawhai's infrastructure. This challenge is exacerbated by existing infrastructure constraints, the result of Mangawhai's historic 'bach' nature and ad-hoc manner of development. More information on these infrastructure constraints is provided in Section 6.

Southeast Kaipara

The Southeast Kaipara area encompasses the whole south-eastern part of the district stretching from Ruawai to Kaiwaka but excludes Mangawhai (refer to Figure 26).

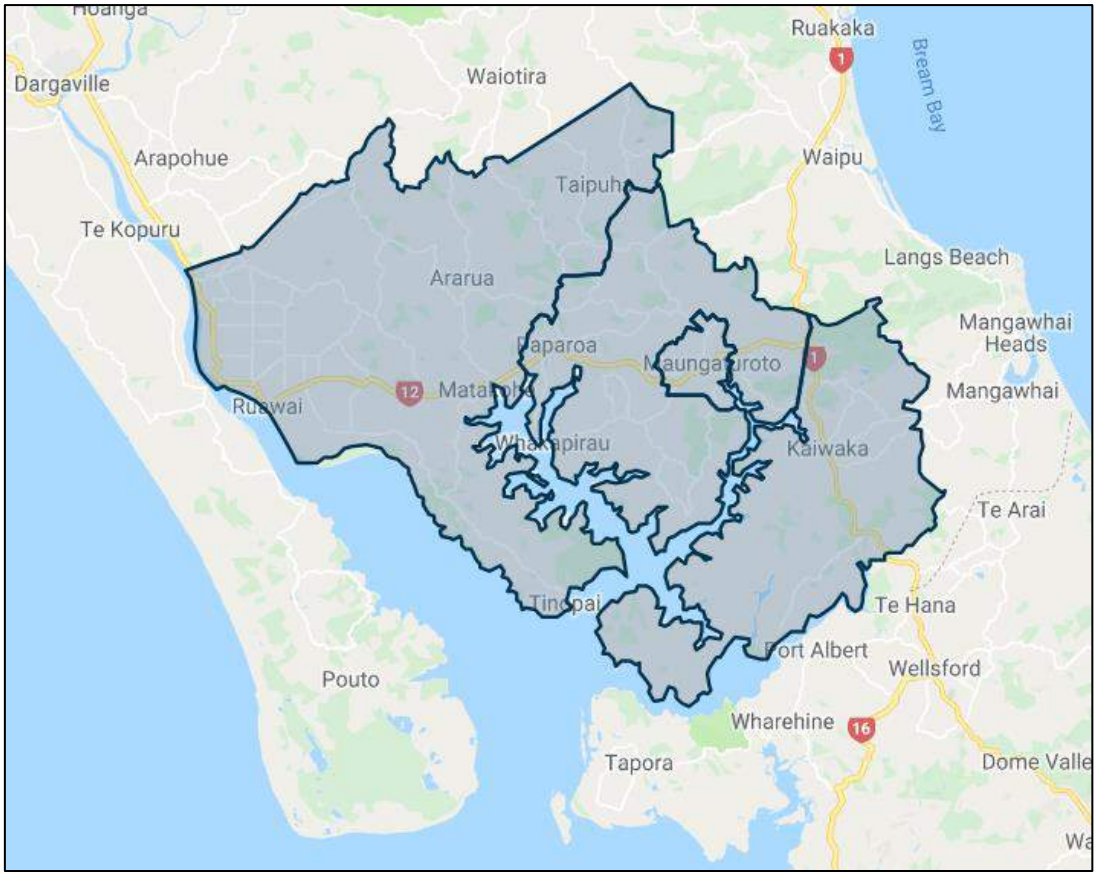


Figure 26 Geographic extent of Infometrics' Southeast Kaipara Small Area Profile. Also shown are the sub areas of Kaiwaka, Otamatea, Maungaturoto and Ruawai-Matakohe (Infometrics, 2019).

This area had an estimated 2018 population of 7,620 persons. Its population has been reasonably stable, growing at an average pace of 1.21% per year between 2000 and 2018.

As Figure 27 shows, this rate of growth has fluctuated and at times turned negative. The area shows a recent increase in the rate of population growth since 2015, a trend not dissimilar to that seen in Dargaville and Northwest Kaipara. However, despite population growth, Northwest Kaipara's employment has remained stagnant suggesting the area's population growth is likely to be mostly in the older, post working age group or made up of people commuting to the North Shore of Auckland.

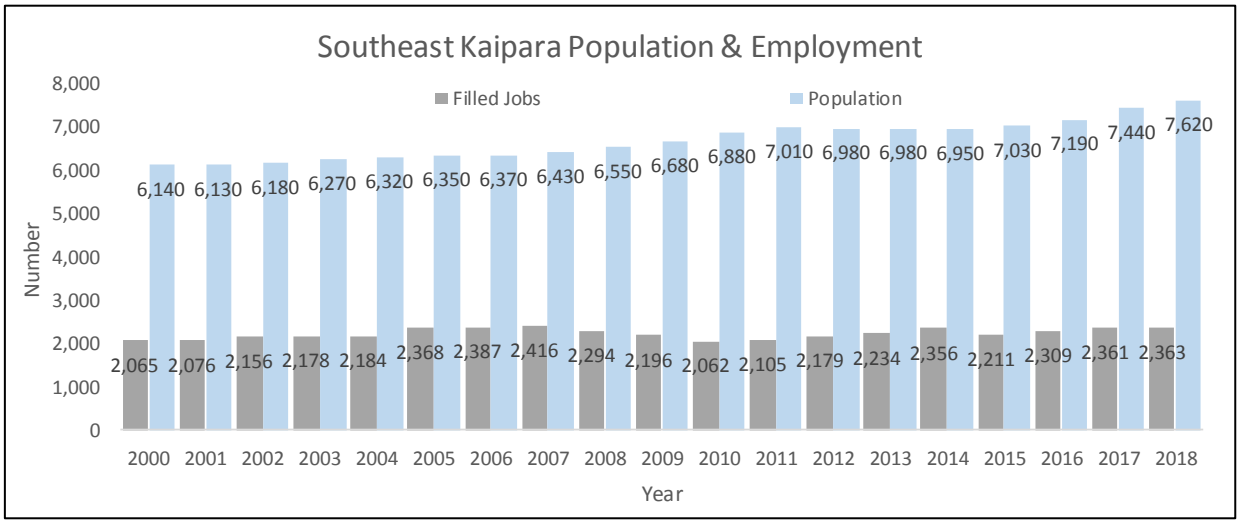


Figure 27: Comparison between population and employment growth in Southeast Kaipara (Infometrics, 2019).

The Southeast Kaipara area is home to a collection of rural communities and settlements such as Ruawai, Matakoke, Tinopai, Paparoa, Pahi, Whakapirau, Maungaturoto and Kaiwaka.

The area around Kaiwaka, including the Oneriri Peninsular and Hakaru area, is becoming increasingly popular for lifestyle block developments. These are the closest areas of the district to Auckland, are supported by services in Kaiwaka and Mangawhai, are sited in picturesque rolling hill country and are close to either the Mangawhai Harbour or Kaipara Harbour. According to the 2018 Census, this area grew by 34% between 2013 and 2018 to have a population of 2,139. Kaiwaka itself had a 2018 estimated resident population of 2,000, having increased by 220 persons or 10.6% since 2015 (Infometrics, 2019). It is reasonable to anticipate these trends will only strengthen in time as roading improvements continue to reduce travel times to Auckland and Auckland's growth continues to push up the price of land on its peripheries.

To a lesser extent, this same trend is affecting parts of Otamatea (for statistical purposes, Otamatea is taken as the area around, but not including Maungaturoto). According to the 2018 Census, this area grew by 16% between 2013 and 2018 to have a population of 1,713. The village of Paparoa (included within the Otamatea area) is being expanded by a 14 lot residential subdivision aimed at retirement living and a further 15 rural residential lots.

Maungaturoto's population increased by 17% over the same 2013 to 2018 period to reach 1,269, according to the 2018 Census count. Maungaturoto is Kaipara's third largest township and acts as a service centre for much of the surrounding rural area. It is also home to a number of industrial operations, including Fonterra's dairy factory, providing considerable local employment.

As rural populations in the south east of the district continue to increase, more demand is created for local services such as shops and healthcare. Consequently, the future of rural hubs such as Kaiwaka, Paparoa and Maungaturoto seems bright, particularly if employment opportunities can be increased through the establishment of further manufacturing, horticulture and poultry farming.

4.3.3 Age structure of Kaipara's population

Kaipara's population is comparatively old and is getting older. In 2013 19.3% of Kaipara's population were 65 or older compared to 14.1% nationally (Infometrics, 2019). By 2018 this had risen to 22.5% and 15.3% respectively. Kaipara district currently ranks 10th out of New Zealand's territorial authorities for having the highest proportion of its population aged over 65 (Infometrics, 2019).

Figure 28 shows an age pyramid for Kaipara's population and Figure 29 compares the age structure of Kaipara's population to the national population. This figure shows that the district has disproportionally fewer people aged between 20 and 50 than it does children and people aged over 50.

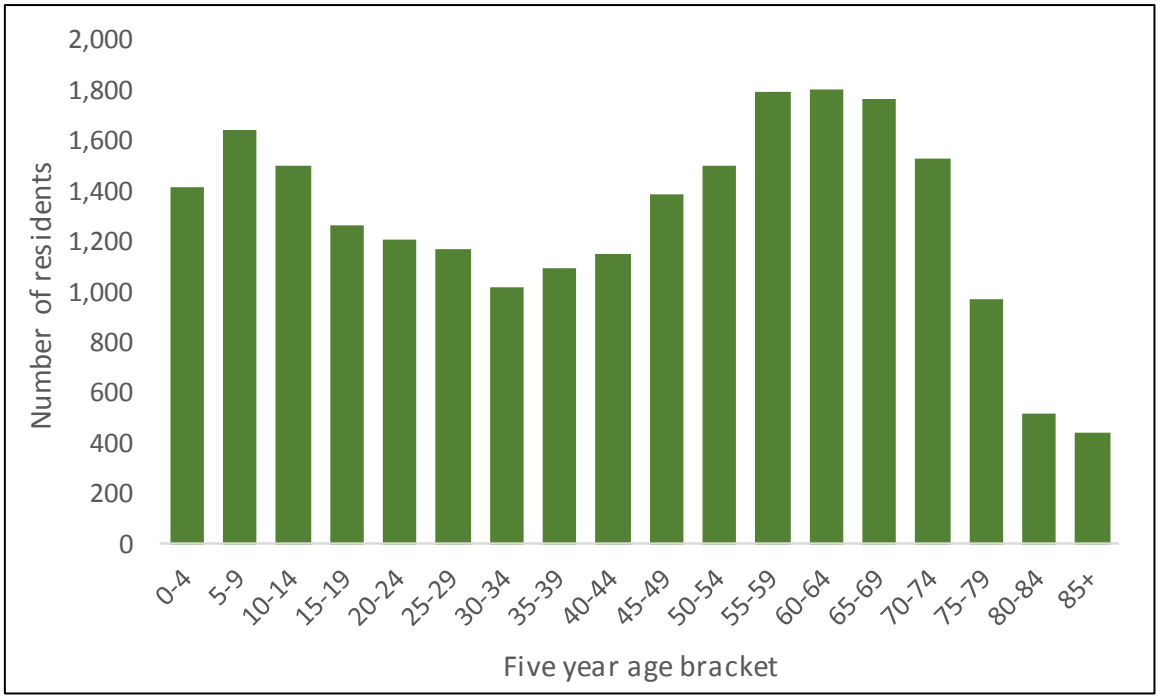


Figure 28: Age structure of Kaipara's population in 2018 (Infometrics, 2019).

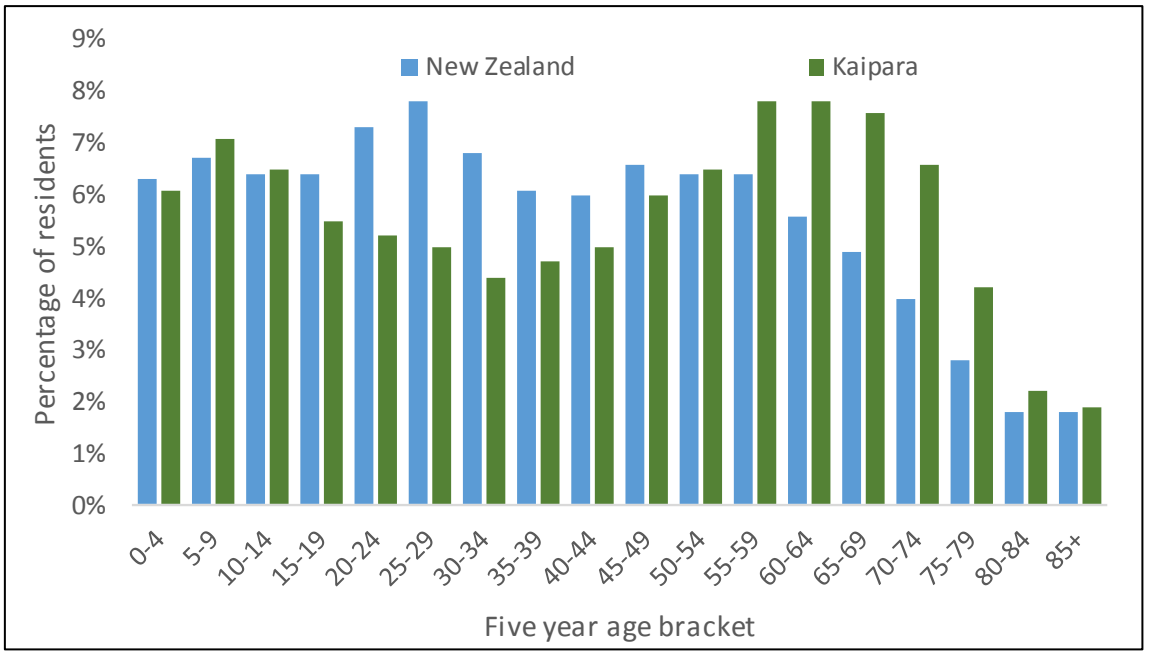


Figure 29: Comparison of the age structure of Kaipara's population in 2018 to that of New Zealand (Infometrics, 2019).

This disproportion between different age groups in the Kaipara community is the result of trends associated with natural increase and net migration. Natural increase is the net result of births minus deaths. Improved health care and nutrition have resulted in people living to be older, this results in more people in the older age brackets. Concurrently, there is a trend towards couples having fewer children. This has resulted in fewer people in the younger age brackets. These trends are exacerbated by the "baby-boomer" cohort (those born between 1946 and 1964) being abnormally large due to a brief trend towards larger families in developed countries in the mid part of the 20th century. This large baby-boomer cohort is now moving into the retirement age bracket.

These trends towards longer life expectancy and smaller families are by no means unique to Kaipara, affecting wider New Zealand and many other developed countries. However, in the Kaipara, and in many other parts of provincial New Zealand, this natural increase of elderly in the local community is further augmented by net migration trends. This is twofold; youth leaving the district in search of tertiary education, then gaining employment and settling outside the district further reduces the number of young people and young families in the district. At the same time, there is a trend for people nearing retirement to seek a better lifestyle in the countryside, particularly in coastal locations such as Mangawhai. This further contributes to the abundance of people in the district in the older age brackets.

Over the four years to June 2017, approximately half of Kaipara's population growth was among the 65+ age group, while only 41% of the growth was among people of working age (see Table 7) (Patterson, 2019). However, there was significant variation in this ageing trend across different parts of Kaipara. Population growth in Otamatea, Ruawai-Matakohe and Kaipara Coastal appears to have been driven most by the older age cohort. At the other end of the spectrum, population growth in Maungaturoto and Dargaville was driven predominantly by people of working age (Patterson, 2019).

Population growth in Mangawhai now appears to be more evenly spread between retired, working age, and youth (Patterson, 2019).

Table 7: Proportion of 2014-17 population growth by age in each SA2 area in Kaipara (Patterson, 2019).

SA2 area:	Retired (65+)	Working age (15-64)	Youth (0-14)
Otamatea	93%	29%	-21%
Ruawai-Matakohe	89%	44%	-33%
Kaipara Coastal	75%	13%	13%
Maungaru	69%	13%	19%
Mangawhai Heads	63%	20%	17%
Kaiwaka	58%	36%	6%
Mangawhai Rural	44%	47%	9%
Mangawhai	39%	30%	30%
Dargaville	30%	61%	9%
Maungaturoto	26%	83%	-9%
Total	**51%**	**41%**	**8%**

Table 8 shows the proportions of populations across each part of Kaipara that were represented by each age group in 2017 (Patterson, 2019). As a point of comparison, 15% of the New Zealand population were 65+ in 2017, 65% were of working age and 20% were youth. Despite recent increases in the proportion of working age families moving to Mangawhai, Mangawhai still has the oldest population in the district (Patterson, 2019).

Table 8: Proportion of 2017 population by age in each SA2 area in Kaipara (Patterson, 2019).

SA2 area:	Retired (65+)	Working age (15-64)	Youth (0-14)
Mangawhai Heads	37%	48%	14%
Mangawhai	34%	45%	21%
Dargaville	24%	56%	20%
Mangawhai Rural	24%	58%	18%
Otamatea	22%	60%	18%
Ruawai-Matakohe	20%	61%	20%
Kaipara Coastal	18%	62%	20%
Kaiwaka	18%	63%	20%
Maungaturoto	18%	59%	23%
Maungaru	16%	63%	21%
Total	**22%**	**58%**	**19%**

These population ageing trends are however not reflective of Kaipara's Māori population. Figure 30 reveals Kaipara's Māori population is comparatively youthful. In stark contrast to the district's non-Māori population, Kaipara's Māori population included a large number of children and young adults and few elderly people. This is partly the result of a trend towards bigger families among Māori and partly due to a generational change in cultural identity, with more young people of Maori decent choosing to identify as New Zealand Maori. That the district's Māori population had fewer older and elderly persons than the district as a whole may be related to Māori having lower life expectancy than non-Māori. In all, Kaipara's Māori population had a similar age profile to Māori nationally (as shown in Figure 31).

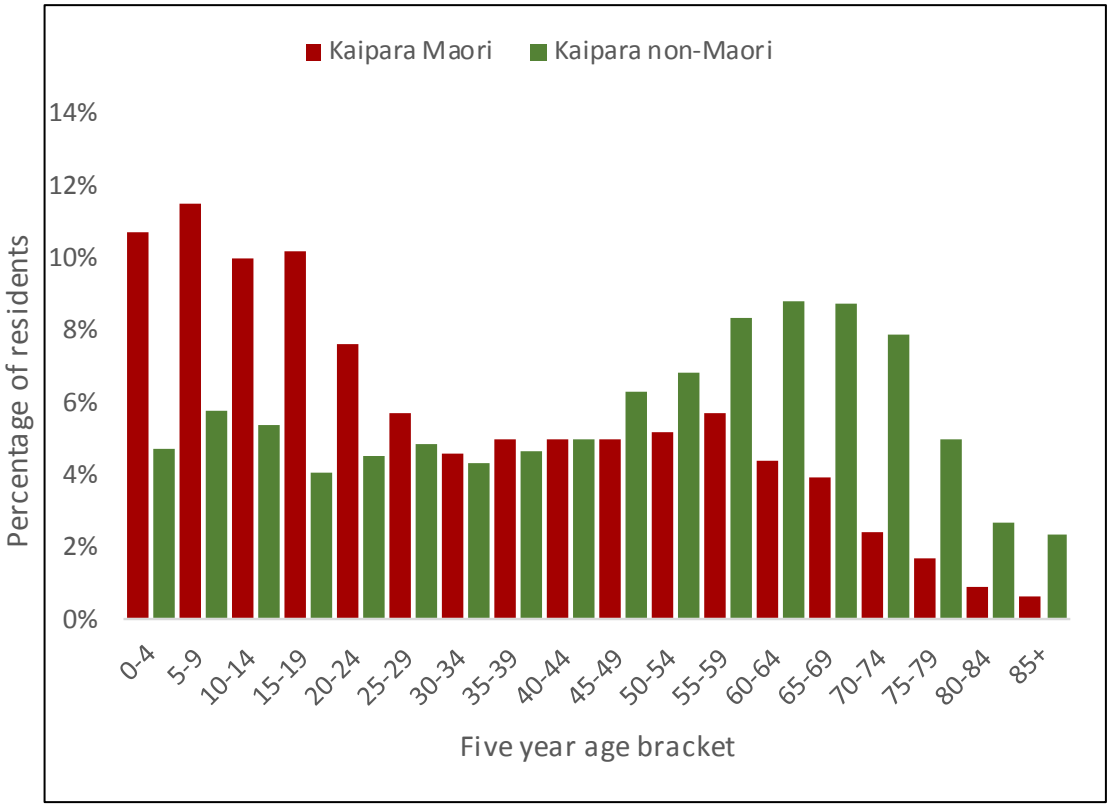


Figure 30: Age structure of Kaipara's Māori population in 2018 compared to that of Kaipara's non-Māori population (Infometrics, 2019).

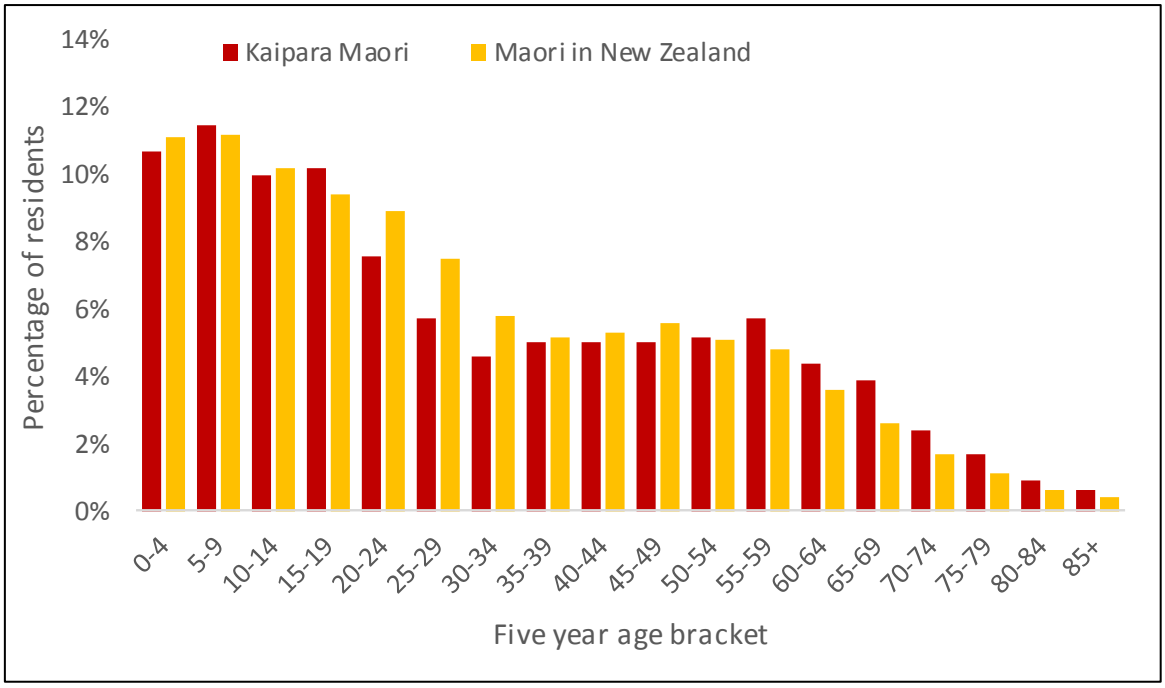


Figure 31: Age structure of Kaipara's Māori population in 2018 compared to the Māori population nationally (Infometrics, 2019).

4.3.4 Ethnicity of Kaipara's population

Table 9 shows the ethnic make-up of Kaipara's population in the different communities as at the 2013 Census (the equivalent data from the 2018 Census is not scheduled for release until March 2020). Four of the Census Area Units (CAUs), Te Kopuru, Ruawai, Dargaville and Kaiwaka, have a relatively large Māori population compared to the district average, while the opposite is true for Mangawhai and Mangawhai Heads.

Table #: ***Ethnic make-up of Kaipara district according to the 2013 Census.***

Census Area Unit	Europian	Maori	Pacific	Other	Total
Te Kopuru	67.1%	40.6%	3.2%	3.9%	465
Kaipara Coastal	77.0%	22.9%	2.1%	4.2%	2,955
Maungaru	84.6%	17.2%	1.1%	2.7%	1,695
Dargaville	68.5%	29.8%	5.5%	4.3%	4,251
Maungaturoto	78.5%	21.9%	2.8%	2.0%	753
Ruawai	75.2%	33.8%	0.7%	2.8%	435
Kaiwaka	70.8%	33.9%	2.6%	5.2%	576
Rehia-Oneriri	83.2%	17.3%	2.0%	3.4%	5,418
Mangawhai	90.5%	9.5%	1.6%	4.1%	1,329
Mangawhai Heads	90.1%	9.7%	1.7%	3.0%	1,086
Total Mangawhai	90.3%	9.6%	1.6%	3.6%	2,415
Kaipara District	84.2%	23.1%	2.9%	3.7%	18,963

In 2018 Kaipara's Māori population was estimated at 5,410 persons, an increase of 1.3% since 2017. This means 23.3% of Kaipara's population identified as Māori compared to 43.5% in the Far North, 27.9% in Whāngārei, 10.8% in Auckland and 15.2% nationally (Infometrics, 2019). Figure 32 shows how Kaipara's Māori population and non-Māori population have grown between 2000 and 2018.

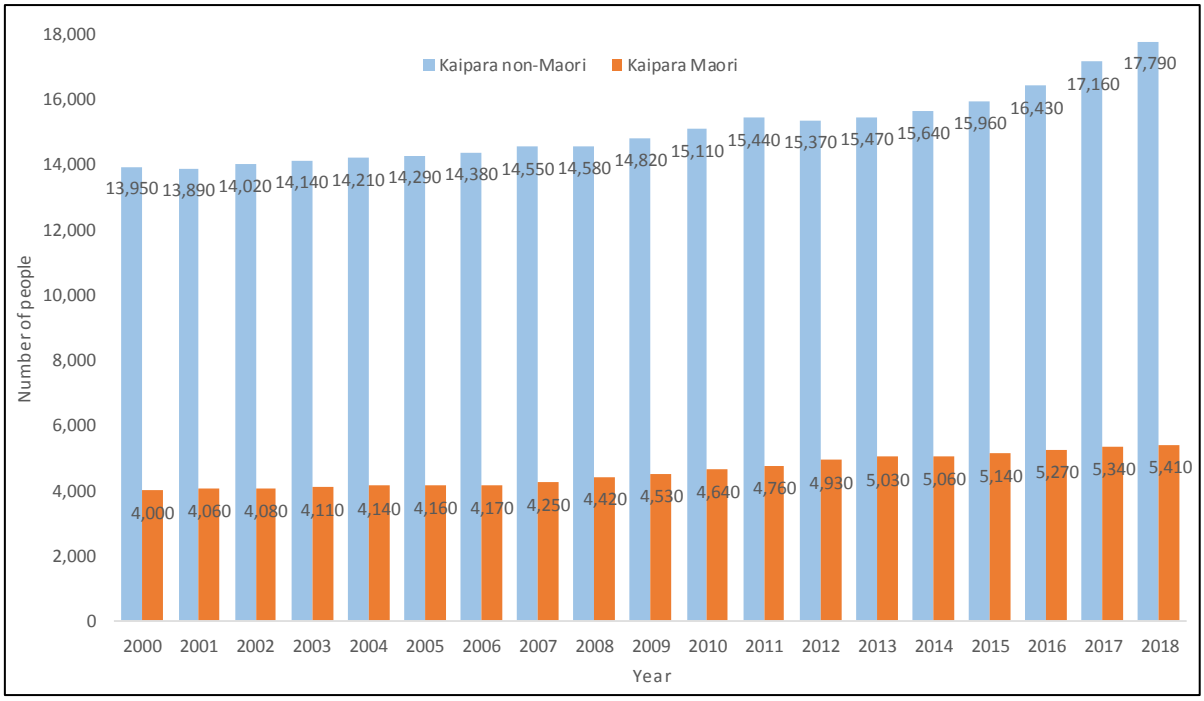


Figure 32: Growth in Kaipara's Māori and non-Māori populations (Infometrics, 2019).

Kaipara's Māori population is comparatively large as a proportion of the population (compared to the national average) and is growing in real terms. Prior to 2015, Kaipara's Māori population had also been growing as a proportion of the total population, reaching a maximum of 24.4%. However, this proportional growth has more recently been offset by increased net migration of non-Māori to the District.

4.4 Wellbeing

One means of comparing wellbeing between areas is through the New Zealand Index of Multiple Deprivation (IMD). The IMD gives an overview of disadvantage based on seven domains of deprivation; employment, income, crime, housing, health, education and access to services (Chiang & Exeter, 2019). The IMD divides the New Zealand land mass into 5,958 neighbourhood-level data zones, each containing an average of 712 people. A score is then attributed to each of these based on their performance against the seven domains of deprivation. Data zones are then ranked from the least to most deprived (1 to 5,958) and grouped into five quintiles. Quintile 1 represents the least deprived 20% of data zones in the whole of New Zealand while quintile 5 represents the most deprived 20%.

In Northland, 47.8% of data zones are amongst the 20% most deprived in New Zealand. Compared to other regions in New Zealand, Northland has the largest proportion of most deprived data zones, as demonstrated in Table 10 (Chiang & Exeter, 2019).

Table 10: Proportion of data zones in each area ranked in each of the different quintiles. The first quintile (Q1) represents the least deprived 20% of data zones while the fifth quintile (Q5) represents the most deprived 20% (Infometrics, 2019).

Regions	Q1	Q2	Q3	Q4	Q5
Northland	**2.2%**	**7.1%**	**19.0%**	**23.9%**	**47.8%**
Southland	45.8%	27.1%	10.2%	13.6%	3.4%
Otago	34.9%	23.5%	21.0%	16.0%	4.6%
Canterbury	33.1%	24.2%	17.4%	17.9%	7.5%
Wellington	25.3%	21.9%	19.1%	18.8%	14.9%
Nelson Marlborough	20.9%	26.5%	29.6%	13.8%	9.2%
Auckland	19.6%	19.3%	20.4%	17.5%	23.2%
Hawke's Bay	16.7%	14.5%	18.1%	25.8%	24.9%
Taranaki	16.0%	19.9%	28.2%	26.3%	9.6%
Waikato	12.6%	18.9%	20.3%	23.9%	24.4%
West Coast	12.5%	27.1%	20.8%	29.2%	10.4%
Manuwatu	10.9%	18.1%	18.6%	26.2%	26.2%
Bay of Plenty	7.6%	14.4%	18.5%	27.4%	32.1%
Gisborne	6.3%	14.1%	15.6%	18.8%	45.3%

In the Far North, 57.7% (49/85) of data zones are among the 20% most deprived, while 1.2% (1/85) were among the 20% least deprived in New Zealand. In Whāngārei, those in the Q5 quintile accounted for 31.3% (35/112) of data zones and 3.6% (4/112) were in the Q1 quintile. In Kaipara, 42.9% (12/28) were in each of the Q5 and Q4 quintiles and no data zones were among the least deprived Q1 quintile (Chiang & Exeter, 2019).

The following Figures 33 to 36 show how deprivation (as measured by the IMD) varied around Kaipara, Northland, the North Island and South Island. Light shading represents lessor deprivation (Chiang & Exeter, 2019).

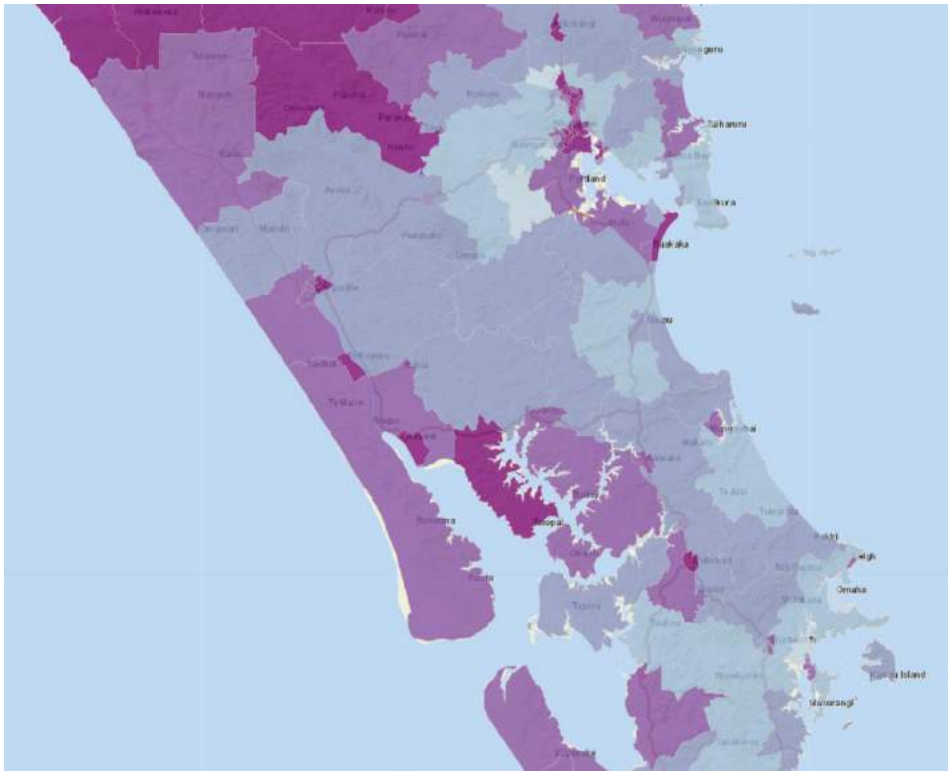


Figure 33: The disparity of deprivation in the Kaipara (as measured by the IMD) (Chiang & Exeter, 2019).

Figure 34: The disparity of deprivation in Northland (as measured by the IMD) (Chiang & Exeter, 2019).

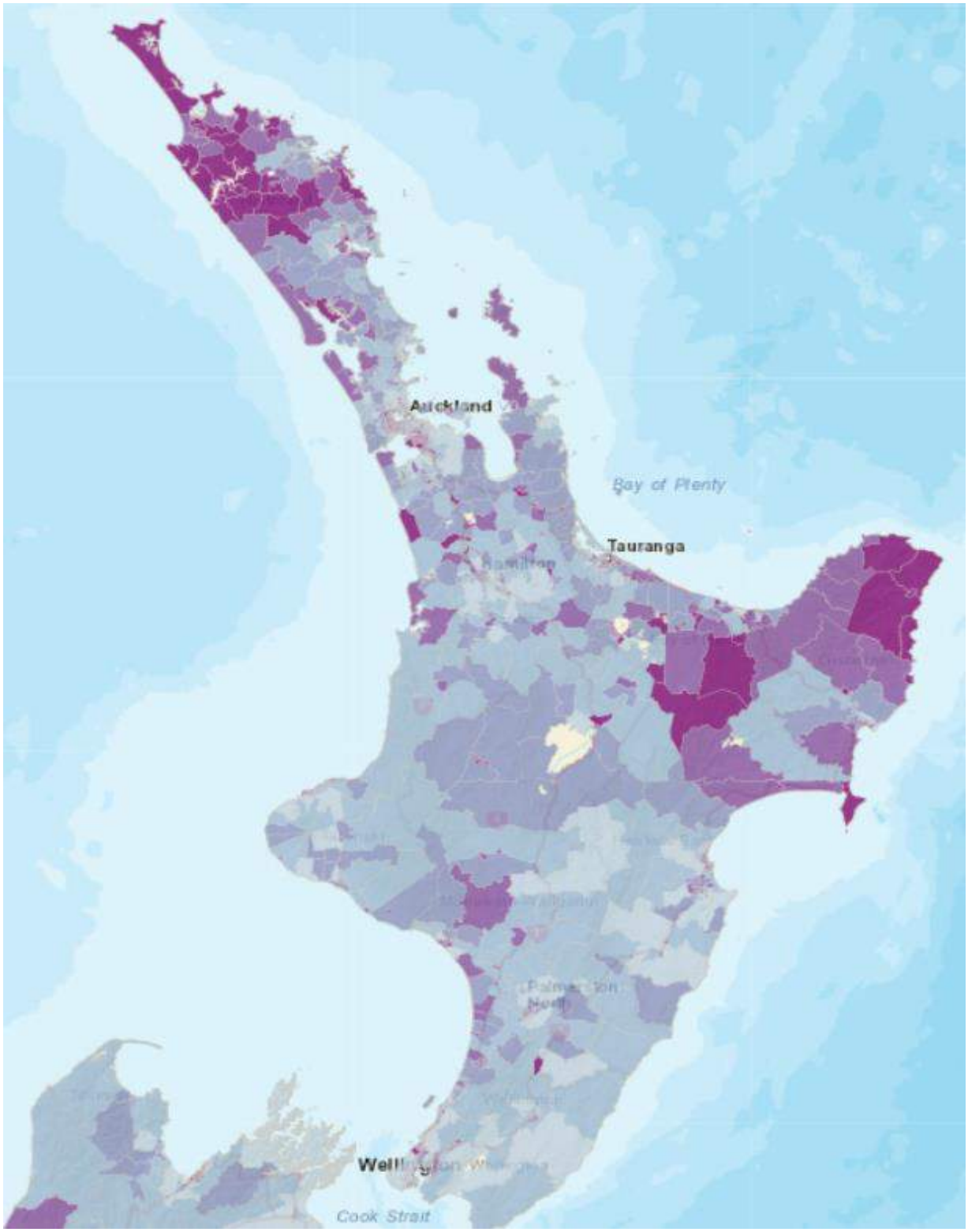


Figure 35: The disparity of deprivation in the North Island (as measured by the IMD) (Chiang & Exeter, 2019).

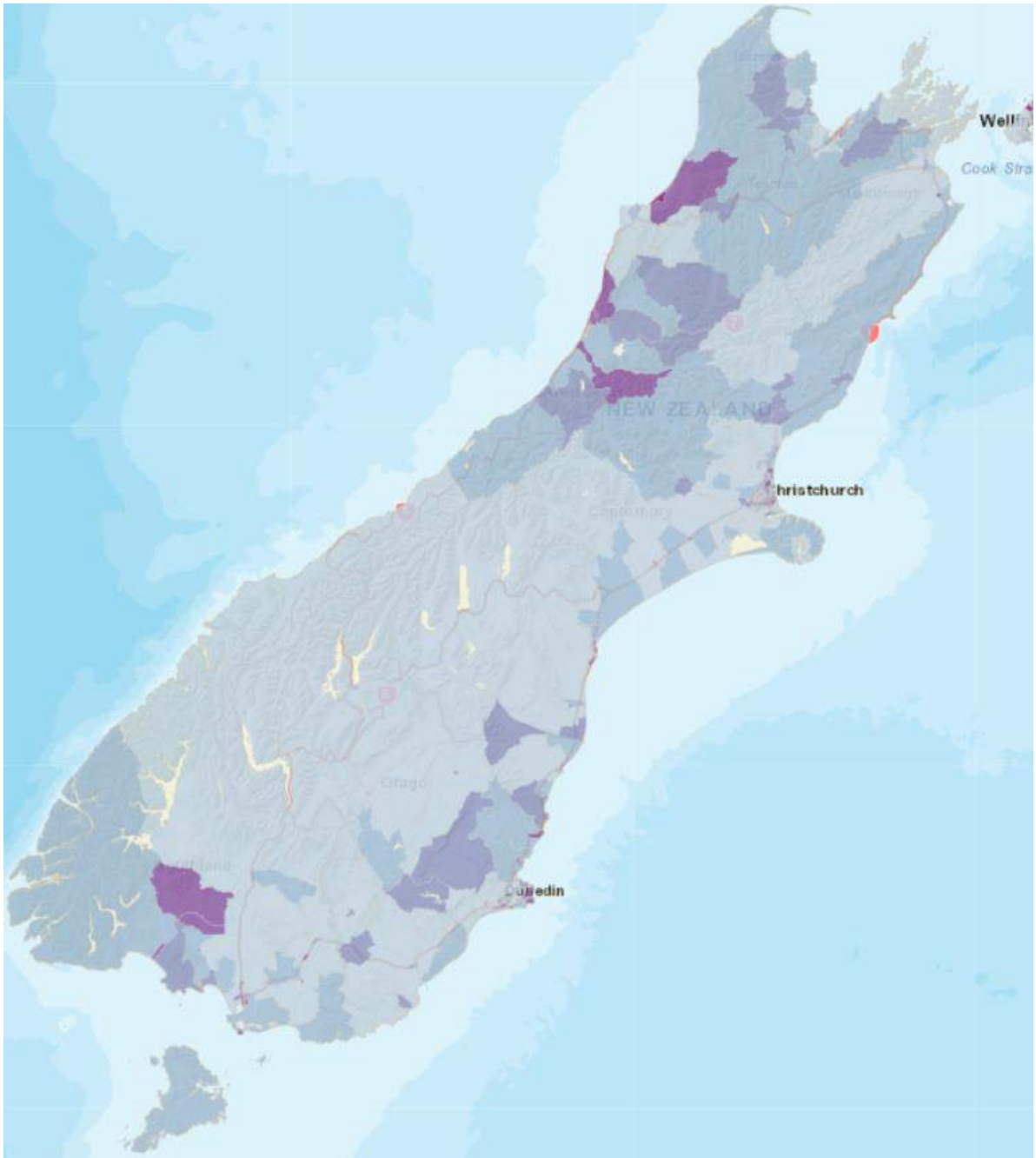


Figure 36: The disparity of deprivation in the South Island (as measured by the IMD) (Chiang & Exeter, 2019).

Looking at the components of Kaipara's IMD score (employment, income, crime, housing, health, education and access to services), Kaipara generally received its best scores in the crime, health and housing categories and its worst scores for education and access to services. This reveals people in Kaipara had low levels of housing deprivation and are much healthier than elsewhere in Northland (Chiang & Exeter, 2019). The poor score for access to services reflects the expansive and rural nature of the district, together with the limited number of services so far established in Mangawhai. The access domain measures the distance to the nearest three General Practitioners (i.e. doctors), supermarkets, service stations, schools and early childhood education centres. High deprivation ranks for the access domain suggest that people living in these data zones would need to travel further for these amenities (Chiang & Exeter, 2019).

That Kaipara's people achieve relatively good outcomes for income, housing and health while having poor outcomes for education may reflect the greater proportion of "unskilled" jobs in the primary, manufacturing and trade sectors (which are over represented in Kaipara's economy). While these jobs often do not require higher qualifications such as a university degree, they do require specialist skills such as machine operating and practical skills which are recognised and rewarded by employers in these industries.

In 2018 41% of jobs in the Kaipara economy required only low level skills compared to 38% nationally, 27.5% required semi-skilled workers compared to just 17.6% nationally (Infometrics, 2019). Furthermore, just 8.7% of jobs in the Kaipara required skilled workers and 22.8% required highly skilled workers compared to 11.1% and 33.3% respectively in the national economy (see Figure 37) (Infometrics, 2019).

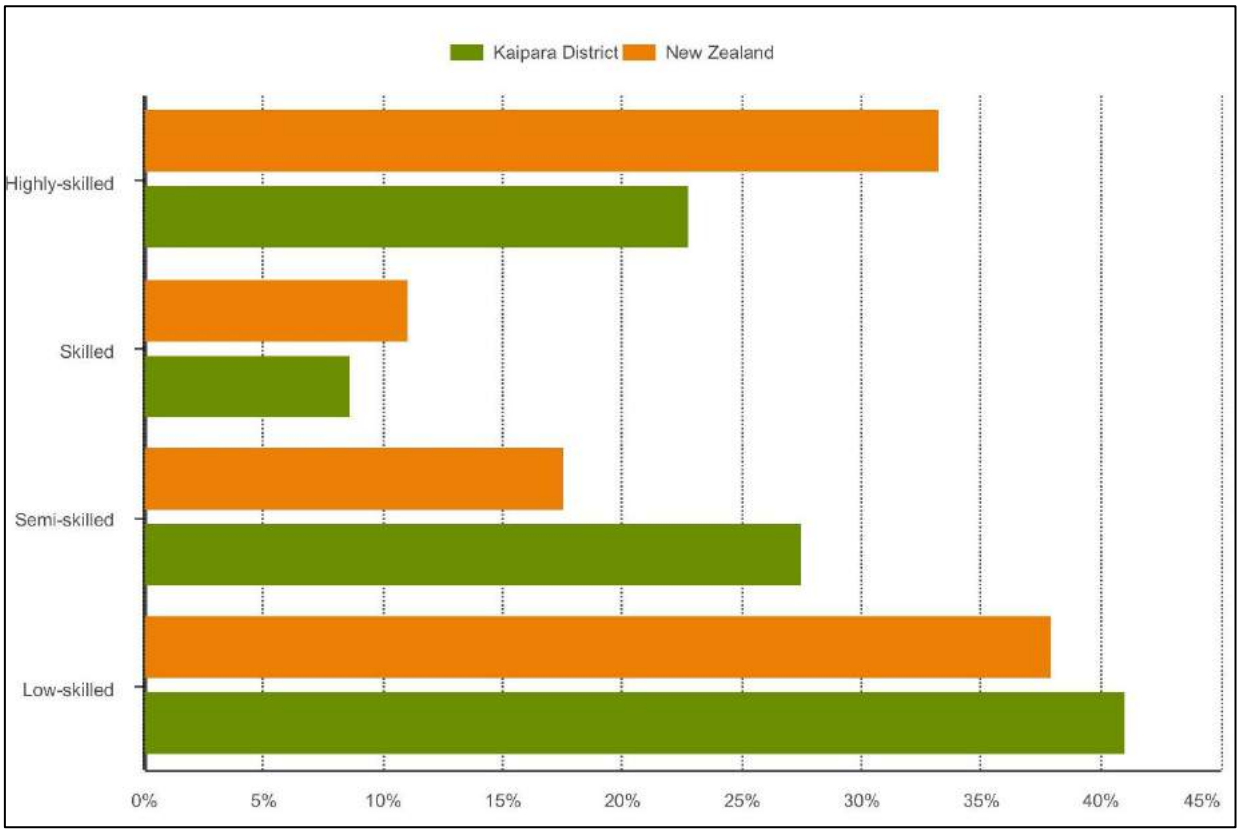


Figure 37: Percentage of employment requiring different broad skill levels in Kaipara and New Zealand (Infometrics, 2019).

Education outcomes for Northland may be improving, with the number of Northland youth leaving school with no qualifications decreasing from 14.2% in 2017 to 13.6% in 2018 (Infometrics, 2019). By contrast, across New Zealand, the percentage of school leavers without any qualification increased from 10.2% in 2017 to 11.2% in 2018. That is, 7,033 school leavers had no qualification in 2018, up 615 people from 2017. Further analysis of the data reveals considerable disparities between regions, as shown in Figure 38 (Infometrics, 2019).

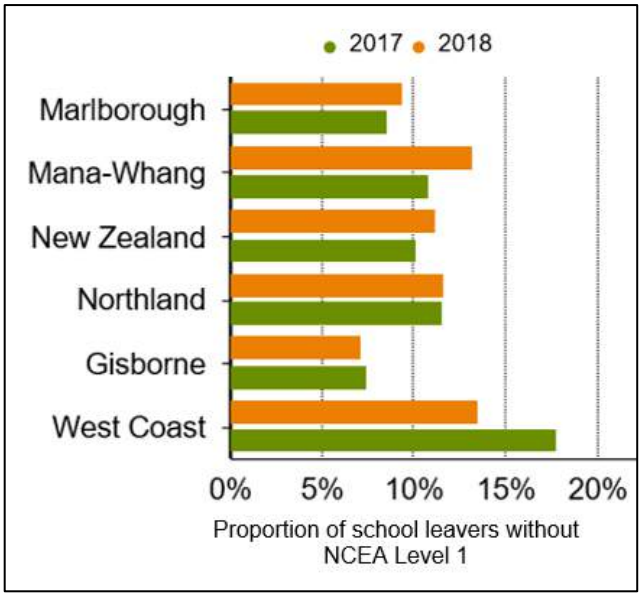


Figure 38: Proportion of school leavers without NCEA Level 1, 2017 vs 2018, top and bottom regions (Infometrics, 2019).

Northland's truancy rate in 2017 was the second-worst regional rate in New Zealand (Infometrics, 2019). Higher levels of truancy highlights issues at home which make it more difficult for students to remain at school, leading to poorer educational outcomes generally. The Far North had the fourth highest truancy rate in the country, at 8.4%. Whāngārei (5.2%) and Kaipara (4.6%) had lower rates of unjustified absences, but both were still above the 2017 nationwide average of 4% (Infometrics, 2019).

These trends are important as research shows that two in five school leavers without any school qualification are likely to end up unemployed or not engaged in further education or training (NEET) (Infometrics, 2019).

Māori education outcomes continue to lag behind other groups in New Zealand (Infometrics, 2019). In 2017 85% of non-Māori achieved NCEA Level 2 or above, compared to 68% for Māori. While there is no Kaipara specific data on this indicator, it does have implications for the district given the high percentage of Māori in the population. Nationally, Māori educational outcomes are improving, which shows progress in enabling Māori to access more opportunities in life. But the gap still remains too large. A focus on Māori education outcomes is important given the growth in Māori in the working age population over the next 10-20 years (Infometrics, 2019).

While Kaipara, despite its low education score, scores well for income generally, its 2018 average annual personal income ($52,547) was still below the Northland average ($54,110), national average ($60,891), average for New Zealand excluding Auckland ($57,813), Auckland ($66,205), Whāngārei ($57,527) and Waikato district ($54,623) (refer to Figure 39). Kaipara's personal income did however surpass that of the Far North where average annual personal income was just $48,109 in 2018 (Infometrics, 2019). In their report, Chiang and Exeter (2019) identify low income levels as a key area of concern in the Northland region.

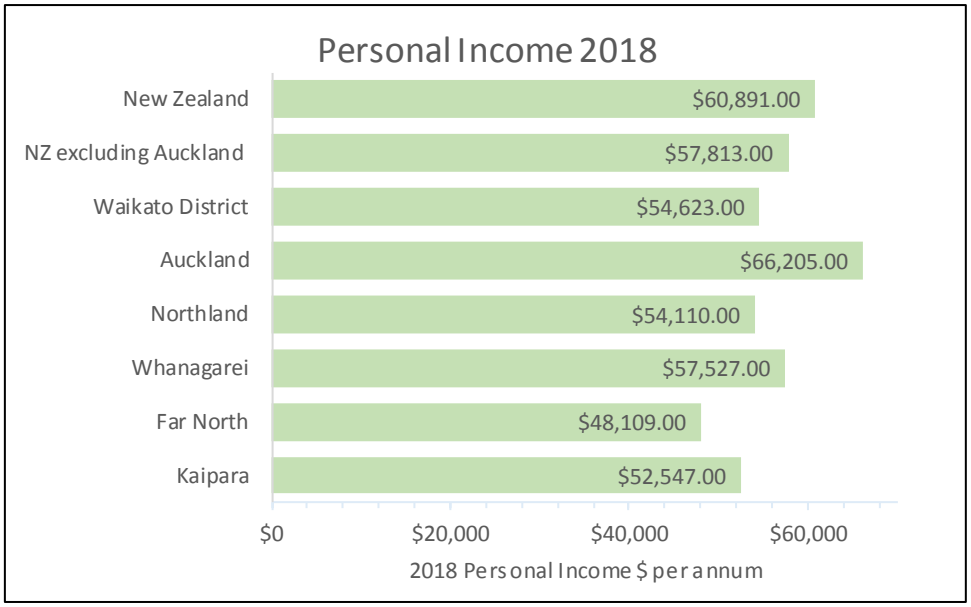


Figure 39: Comparison of personal income in 2018 (Infometrics, 2019).

The average Māori personal annual income in Kaipara was $51,057 in 2018, slightly below the average personal income of all people in Kaipara ($52,547) and below the regional average for Māori ($52,575) and the New Zealand average for Māori ($51,939) but higher than the Far North average for Māori ($46,745).

Māori in Kaipara had a higher unemployment rate in 2018 (12.4%) than the district average (4.7%) and for Māori nationally (9.9%) but lower than for Māori in the Far North (13.9%) (Infometrics, 2019).

Household income, a measure of the income per household rather than per individual, is often a better measure of wellbeing than personal income, especially when considering shared expenses such as the cost of housing. The median household income in Kaipara was estimated at $78,530.76 as at June 2019. This was considerably lower than the New Zealand median household income of $90,150 (Infometrics, 2019).

Median household incomes are higher in areas of New Zealand with a greater urban concentration, with household incomes in metropolitan New Zealand in 2013 being 29% higher than in provincial New Zealand. This metro-provincial divide is due to a higher concentration of white-collar jobs in urban areas, which generally pay more. Professional, technical, and scientific services add to higher household incomes, alongside government-based and creative-based industries (Infometrics, 2019).

For lower-income households, high housing costs relative to income are often associated with severe financial difficulty and can leave households with insufficient income to meet other basic needs such as food, clothing, transport, medical care and education. High outgoings-to-income ratios are not as critical for higher-income earners, as there is sufficient income left for their basic needs (Infometrics, 2019).

Housing affordability can be assessed by comparing average house values with average annual earnings (Infometrics, 2019). This gives a housing affordability index which is the ratio of the average current house value to average annual earnings. A higher ratio, therefore, suggests that median houses cost a greater multiple of typical incomes, which indicates lower housing affordability. This means that

an area with cheap houses will still have poor housing affordability if local incomes are too low (Infometrics, 2019).

Kaipara scores 10.05 on this housing affordability index suggesting housing is less affordable than other areas of Northland, the Waikato District and the New Zealand average for all areas excluding Auckland (Figure 40) (Infometrics, 2019).

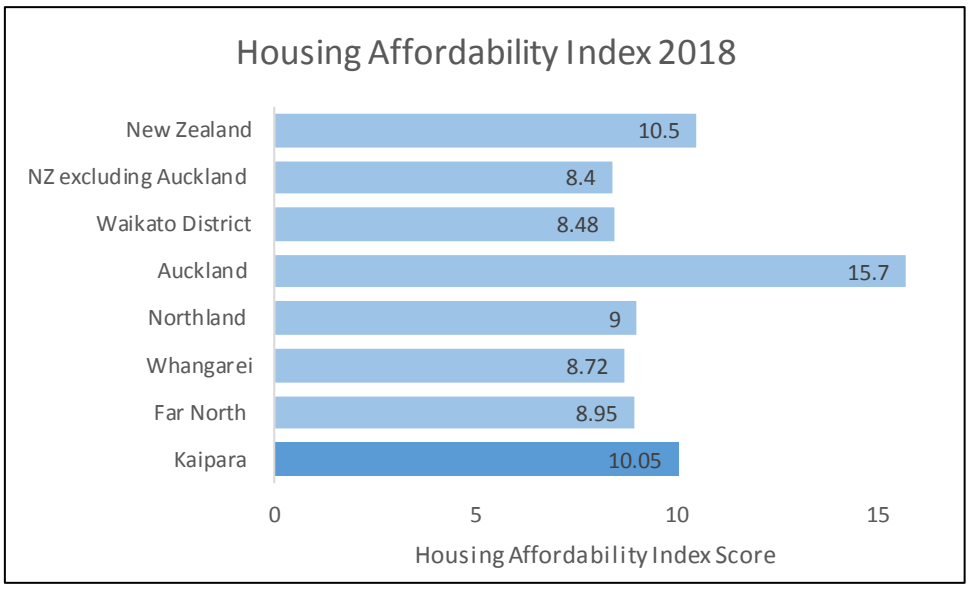


Figure 40: Comparison of housing affordability in 2018 (Infometrics, 2019).

Similarly, the affordability of renting can be considered in the same way by comparing average weekly rents with average weekly earnings (which are calculated from average annual earnings) (Infometrics, 2019). Kaipara scored 0.323 on this rental affordability index suggesting rental accommodation is more affordable than the Far North and roughly on par with Whāngārei and Northland, but less affordable than New Zealand excluding Auckland (refer to Figure 41).

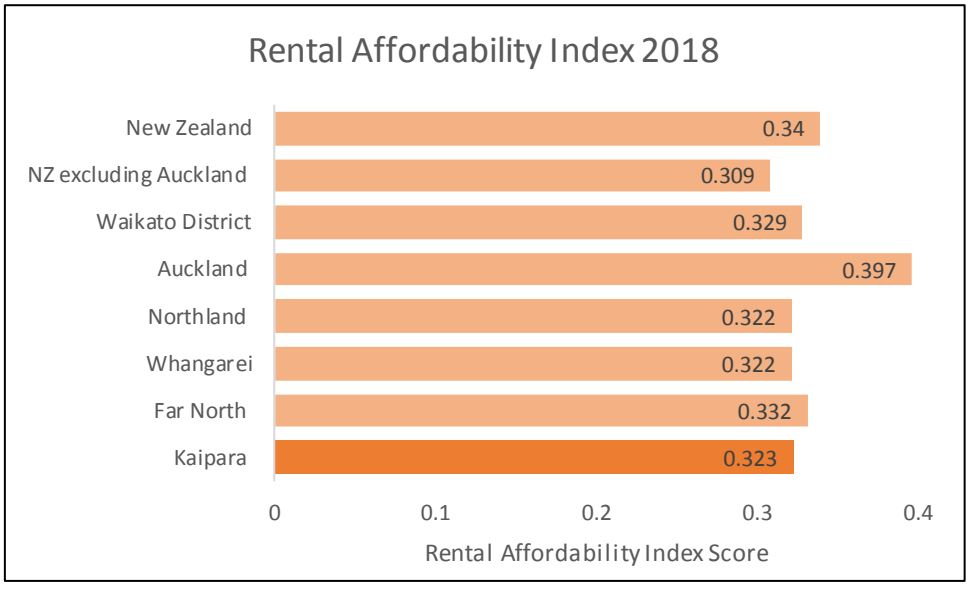


Figure 41: Comparison of rental housing affordability in 2018, higher numbers equal lower affordability (Infometrics, 2019).

The average rent in Kaipara in 2018 was $327 per week. This compares to $307 in the Far North, $356 in Whāngārei, $335 in Northland, $344 in New Zealand excluding Auckland, $398 in New Zealand overall, $505 in Auckland and $345 in Waikato district (Infometrics, 2019).

Although New Zealand's population grew substantially between the 2013 and 2018 Census, the dwelling stock didn't follow suit (Infometrics, 2019). New Zealand's occupied dwelling numbers rose 6.6% between the 2013 and 2018 Census, slower than the 10.8% population increase.

Strong population growth in Northland also wasn't met with the same growth in dwellings, with the Far North (2nd place behind Queenstown Lakes District), Kaipara (5th place) and Whāngārei (6th place) all seeing some of the largest differences between population and dwelling growth (Infometrics, 2019). This undersupply is anticipated to further reduce housing affordability.

New Zealand's crime rate is low by international standards, with New Zealand being ranked second in the Global Peace Index 2018 behind Iceland (Infometrics, 2019). Recorded crimes continued to fall over the year to June 2018, with total reported crime dropping 7% from a year before. Over this period, there were 153,800 criminal proceedings underway, down from 165,000 in the previous year. Over the long term, New Zealand's crime rate has been continuing to fall, from 3,756 crimes per 100,000 people in 2015 to 3,441 crimes per 100,000 people in 2017. This decline in crime rate comes as police numbers have risen, reaching 9,011 sworn officers in 2018. The number of murders in New Zealand has fallen in the last two years of reporting, with just 48 murders reported in 2017 (Infometrics, 2019).

Across New Zealand, metropolitan areas generally have a lower crime rate than provincial areas, with 2,877 crimes per 100,000 people in metropolitan areas in 2018, compared to 3,680 crimes per 100,000 people in provincial New Zealand. For the four years that detailed data is available, the provincial crime rate (3,680 in 2018) has never gone lower than the highest metropolitan crime rate (3,536 in 2015). However, this provincial crime rate is an average that varies between provincial centres. In particular, Kaipara's crime rate was 2,884 crimes per 100,000 people in 2017, lower than the 2017 national average (3,441 crimes per 100,000 people).

The number of New Zealanders presenting to mental health and addiction services has risen from 139,000 in 2009 (3.2% of the population) to nearly 227,000 people (4.7% of the population) in 2017 (see Figure 42) (Infometrics, 2019). By comparison, 4.4% of Kaipara's population presented to mental health and addiction services in 2017, below the national average (Infometrics, 2019).

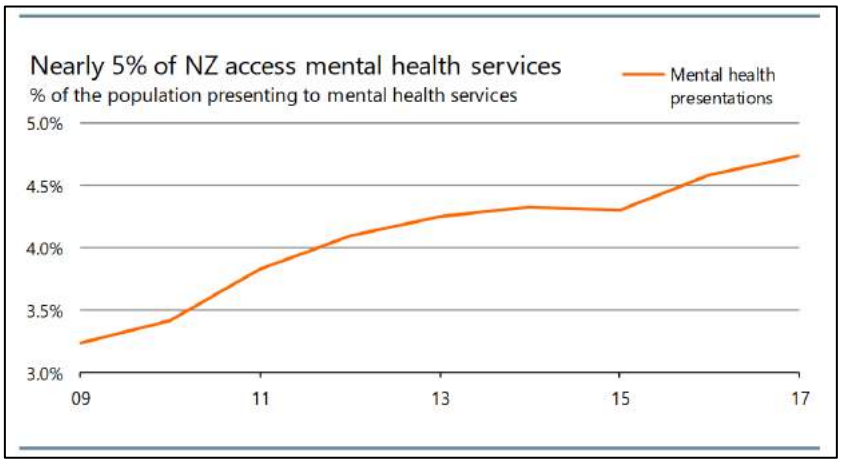


Figure 42: Percentage of New Zealand's population accessing mental health services (Infometrics, 2019).

Growing rates of self-harm confirm the concerning trend of deteriorating mental health in New Zealand, with nearly 4,900 intentional self-harm hospitalisations in 2017 (Infometrics, 2019). As shown in Figure 43, self-harm hospitalisation rates have increased from a low of 66.75 per 100,000 people in 2011 to 93.14 per 100,000 people in 2017 (Infometrics, 2019).

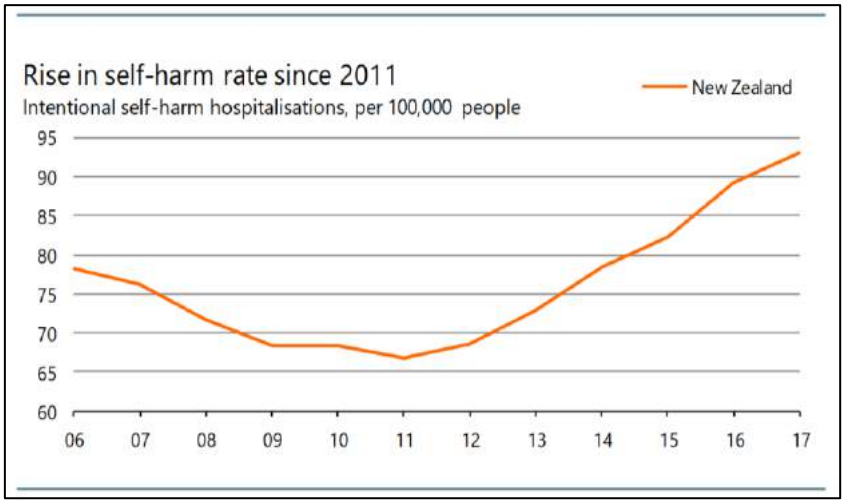


Figure 43: Number of hospitalisations per 100,000 people resulting from self-harm in New Zealand (Infometrics, 2019).

New Zealand's suicide statistics are particularly poor, with the rate of youth suicides the worst in the developed world (Infometrics, 2019). Data from the Ministry of Justice shows the provisional suicide rate fell from 12.68 deaths per 100,000 people in 2008 to 12.27 in 2015. However, by 2018, the provisional suicide rate had increased to 13.67 deaths per 100,000 people. Kaipara's suicide rate was similar to the national average at 13 per 100,000 people (Infometrics, 2019).

Kaipara's life expectancy was only slightly below the national average. The average Kaipara person born in 2017 is expected to live to 81.2 years compared to 81.77 for the average New Zealander. The lowest life expectancy in New Zealand was in the Far North, where life expectancy at birth in 2017 was 79.41 (Infometrics, 2019).

Life expectancy in Northland is 80 years of age; slightly lower than the national average (Infometrics, 2019). However, presentation of this figure for Northland's population as a whole fail to reveal the true picture of disparity in the region. Closer analysis reveals non-Māori in Northland had the same mortality rates as nationally. However, life expectancy for Northland Māori was just 70 years for girls and 64 years for boys, lower than for Māori nationally.

5 Economy – Our Livelihoods

A thriving local economy creates opportunities for communities and individuals to establish businesses, engage in employment and live prosperously. A strong local economy with plentiful job opportunities will help a district retain its population and attract new residents from other districts and abroad.

5.1 Global perspectives

As a small open economy, New Zealand's economic growth is particularly affected by external flows of goods, services and finance, which can change quickly. The outlook for world economic growth is fragile

and has become more uncertain. Trade tensions and a range of country-specific factors have seen global economic growth slow over 2018, with this slowdown persisting throughout 2019 (New Zealand Treasury, 2019A). Brexit, a European slowdown, and the United States-China trade war are all issues that threaten New Zealand's export outlook (Infometrics, 2019).

In the United States, annualised Gross Domestic Product (GDP) growth eased from 3.1% in the March 2019 quarter to 2.1% in the June 2019 quarter (New Zealand Treasury, 2019B). Business investment and export growth fell 0.6% and 5.2% respectively, reflecting ongoing trade tensions and global uncertainty (New Zealand Treasury, 2019B).

China's annual GDP growth was 6.2% in the June 2019 quarter (New Zealand Treasury, 2019B). As in the US, the weakness was driven by falling exports, reflecting ongoing trade tensions. However, growth stabilised in June 2019 for industrial production, retail sales and fixed asset investment, suggesting that stimulus measures implemented by Chinese authorities are supporting domestic demand. It is likely that similar rates of growth will be achieved over the latter half of 2019, as stimulus continues to ensure growth is maintained at the official target of 6.0% - 6.5% (New Zealand Treasury, 2019B).

In the face of falling exports and weak business investment, many economies are so far being held up by domestic consumer spending which remains resilient. For example, June 2019 quarter GDP growth in the United States and China was supported by solid consumption growth. In the United Kingdom, retail sales volumes lifted 1% in June 2019, to be up 3.7% on an annual basis. Growing consumption reflects solid labour markets with rising wages and record low unemployment rates in many countries (New Zealand Treasury, 2019B).

Global growth is expected to stabilise over the second half of 2019 and pick-up in 2020 (New Zealand Treasury, 2019B). The pick-up is contingent on stabilisation in developing economies (such as Argentina and Turkey), as well as progress towards resolving trade policy differences. However, there are also downside risks to this prediction, including escalating trade and technology tensions, geopolitical tensions and a 'no-deal' Brexit (New Zealand Treasury, 2019B).

5.2 Commodity prices

The success of New Zealand's export trade is strongly influenced by the price on international markets of the commodities New Zealand exports. These prices can be influenced by changes in demand as well as supply from other countries that produce the same commodities. Conversely, New Zealand's domestic economy is also influenced by the international price of commodities which New Zealand imports, such as oil.

Unprocessed primary product exports from New Zealand have grown at the fastest pace compared to other exports over the 1998-2008 period, and now account for 40% of the value of New Zealand's merchandise exports. Dairy products accounted for a quarter of New Zealand's total merchandise exports in 2018, up from 17% in 1998. Over the same period, goods exports to China's have risen from just 3% of total exports to 25%. This puts New Zealand at risk from shocks emanating from either China or the global dairy sector (New Zealand Treasury, 2019B).

The composition of New Zealand's dairy exports by country has changed drastically over the past 20 years. In 2000, dairy export destinations were diverse, with the top 10 markets each accounting for

just 3% to 7% of total exports, while China did not even feature on this list. China's demand for dairy grew rapidly in the 2000s, supported by an increase in incomes and urbanisation, with the latter being associated with a shift towards a more "Westernised" diet. New Zealand's dairy exporters arguably started benefiting disproportionately from this from 2008 onwards due to the Free Trade Agreement (FTA) with China coming into effect. China now imports about a third of New Zealand's dairy products (New Zealand Z Treasury, 2019B).

China overtook Australia as New Zealand's largest export destination by value in 2013 (New Zealand Treasury, 2019B). Exports to Australia have declined in recent years, reaching $8.2 billion in 2018, compared to the 2011 peak of $10 billion. Meanwhile, during 1998-2018, export growth to China amounted to $13.1 billion, or 39% of New Zealand's total nominal export growth. Dairy products accounted for 32% of New Zealand's total exports to China in 2018. Dairy, wood, and meat now account for two thirds of New Zealand's total exports to China with wool's importance having waned (in the 1990s wool accounted for more than half New Zealand's exports to China) (New Zealand Treasury, 2019B).

Exposure to a single market (China), and moreover to a single sector in this market (dairy), holds risks for homogenous bulk commodities where overall supply and demand are the most important drivers over the medium to longer term (New Zealand Treasury, 2019B). A single event in either China or the global dairy sector can lead to a substantial change in export revenues. Over the 2008-2013 period, several factors resulted in a sharp increase in export revenues, but the reverse can also happen, as was the case in 2015-2016. Globally, New Zealand accounted for 11.5% of total global dairy exports (New Zealand Treasury, 2019B).

Over the 2018-2027 period, the Organization for Economic Cooperation and Development (OECD) projects that China's per capita dairy consumption levels will grow by an average of 1.6% p.a., which implies a noticeable increase in absolute terms given the country's massive population (New Zealand Treasury, 2019B). Moreover, Chinese consumers continue to be suspicious about local dairy products, preferring foreign dairy products from trusted producers such as New Zealand with its 100% Pure reputation (New Zealand Treasury, 2019B). While these trends are expected to benefit the New Zealand dairy sector over the medium term, over exposure to one sector (dairy) and one market (China) will remain a risk.

Horticulture, particularly kiwifruit and wine, offer possible opportunities to diversify New Zealand's exports (New Zealand Treasury, 2019B). Wine grape production increased at a rate of 4.6% p.a. during 2002-2017, increasing its contribution to total horticultural production from 25% to 42%. In the 12 months ending June 2018, the value of New Zealand's wine exports grew for the 23rd year in a row. New Zealand primarily produces Sauvignon Blanc, which accounted for 86% of New Zealand's total wine exports in 2018. New Zealand's wine exports predominantly go to three countries; the US, UK, and Australia. In 2018, these three countries accounted for 76% of New Zealand's total wine exports in value terms. While exports to these countries dominate, there has also been robust growth in exports to Canada, the Netherlands, and China (New Zealand Treasury, 2019B).

New Zealand's kiwifruit exports have been on an upward trajectory over the past two decades, with export values growing at an average rate of 8.4% p.a. over the 1998-2018 period (Figure 17). In 2017,

kiwifruit once again overtook wine as New Zealand's largest horticultural export earner (refer to Figure 44) (NZ Treasury, 2019B).

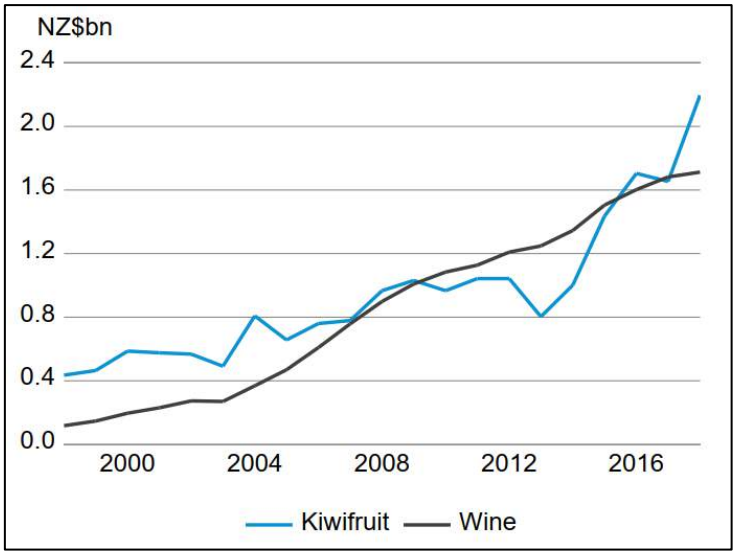


Figure 44: New Zealand exports of kiwifruit and wine (NZ Treasury, 2019B).

Meat exports to China have also increased, with the reduction in domestic supply of pork in China as a result of African Swine Fever bolstering their demand for alternative meat products, something which should provide further support for beef prices going forward (New Zealand Treasury, 2019B). China has already overtaken the United States as New Zealand's main market for beef exports (New Zealand Treasury, 2019B).

Log export volumes in June 2019 were 16% higher than in June 2018, while log prices fell 4.6%, reflecting recent softness in log prices as a result of excess global supply to the Chinese market. There is potential for subdued log exports over the second half of 2019 as China draws down their existing stocks. Log prices are expected to recover in 2020 (Infometrics, 2019).

Currently, the outlook for export commodity prices remains positive, with dairy and meat prices supported by continued global demand and tightening global supply (NZ Treasury, 2019A). Chinese demand for food is projected to continue to expand amid tighter global supply, particularly in the meat and dairy industries (NZ Treasury, 2019A). Income levels are good for lamb and fine wool, solid for beef, improving for dairy and excellent for some of New Zealand's horticultural products.

On the whole, oil prices are assumed to be stable, reflecting solid supply supported by past investment in exploration, technological advancements, and weaker global demand compared with recent years. However, over the short term, higher fuel prices can be expected due to oil supply concerns in the Middle East (Infometrics, 2019).

5.3 New Zealand's economy

The New Zealand economy continues to perform well, but concerns are growing about the future, with a long, slow, slowdown expected over the next few years (Infometrics, 2019). There is a deteriorating economic outlook as both business and government investment remains poor, inflation remains low, and the employment outlook softens. With slowing population growth expected to eventuate before the

end of 2019, the focus turns to consumer spending and whether it can prop up economic growth, or if it too succumbs to global and domestic uncertainty (Infometrics, 2019).

As of June 2019, consumers are continuing to increase their spending, but the rate of growth appears to be softening (Infometrics, 2019). Spending growth is likely to continue easing as households keep a closer eye on their spending in the light of a softening economic outlook. Further easing of consumer spending is likely to weigh heavily on the outlook for GDP growth (Infometrics, 2019).

Provisional estimates from Infometrics show New Zealand's GDP expanding by 2.5% per annum over the 12 months to June 2019. This suggests steady economic growth in June 2019, although the future looks less positive (Infometrics, 2019). Weak business investment remains of concern for future growth prospects, and government spending and investment remains slow to progress, with capital investment $0.9 billion below forecast for the 11 months to May 2019 (Infometrics, 2019).

Weak business confidence continues to weigh on the growth outlook, with the June 2019 Quarterly Survey of Business Opinion (QSBO) measure of general business sentiment falling to its lowest level since the March 2009 quarter, in the face of the deteriorating global environment (New Zealand Treasury, 2019B). Business confidence weakened in the June 2019 quarter in the QSBO, likely due to both softening domestic demand and a slowing global economy. General business sentiment fell to its lowest level since the March 2009 quarter with a net 31% of firms expressing negative sentiment, up from 27% the previous quarter. The manufacturing sector provided much of the negative impetus in the June 2019 quarter QSBO, likely reflecting an increase in international risks, with export orders down sharply, reflecting the global decline in trade volumes. Firms' expectations about their own activity over the next three months also fell, with a net 4% of firms reporting they expect weaker activity over the September 2019 quarter. Continued business pessimism has increased the downside risk to near-term GDP growth forecasts (New Zealand Treasury, 2019B).

Despite the slowing economy, exports remained strong in the June 2019 quarter, up 2.8% annually, with exports of logs and meat leading the way, although falling log prices and stockpiles of logs in China may act as a drag on log exports in the September 2019 quarter. Imports fell in the June 2019 quarter, as capital goods imports continued to soften, reflecting ongoing weakness in business confidence (New Zealand Treasury, 2019B).

Increases in food prices, fuel prices and housing costs drove Consumers Price Index (CPI) inflation of 0.6% in the June 2019 quarter, and lifted annual inflation to 1.7% from 1.5% in March 2019. Higher world oil prices drove petrol prices up by 5.8% in the June 2019 quarter (up 3.3% annually). Fuel price growth is expected to ease over the September 2019 quarter as international uncertainty decreases and the effects of the recently stronger exchange rate flows through. The New Zealand Treasury expects fuel prices to ease, leading to a slightly weaker CPI inflation outlook with an annual headline inflation forecast of 1.6% in the September 2019 quarter (New Zealand Treasury, 2019B).

The unemployment rate dropped again in June 2019, taking the annual average rate to 4.1% – the lowest since the global financial crisis (GFC) (Infometrics, 2019). Employment growth was faster than expected in the June 2019 quarter as part-time employment recovered some of its losses from the previous six months. New Zealand's labour market remains tight, with competition for workers expected to remain strong over the next year. Consequently, wage growth has begun to pick up and firms are

reporting high levels of difficulty finding labour (NZ Treasury, 2019A). Labour cost inflation reached 2.1%pa, the fastest growth rate since December 2011 as a tighter labour market gives employees more bargaining power and the effects of the 1 April 2019 minimum wage increase showed through in lower-skilled wage growth. Businesses are expected to continue increasing pay to retain their staff over the next few years, with higher minimum wage increases pushing wages higher still (Infometrics, 2019).

The number of Jobseeker Support recipients continues to increase, up 9.6% per annum over the 12 months to June 2019 (Infometrics, 2019). Strong growth in Jobseeker Support recipients is in stark contrast to the declining unemployment rate. Government policy remains part of the reason for this divergence, with less stringent welfare policies increasing the number of people accessing Jobseeker Support, despite the lower unemployment rate. Part of the growth may also be attributed to more people not being actively engaged in the job market, or who are not work-ready, but are able to access support, with the number of people not in the labour force rising 3.8% per annum in the June 2019 quarter (Infometrics, 2019).

The dichotomy between the housing market in Auckland and the rest of the country continues (Infometrics, 2019). In the year to June 2019, housing value growth was solid across most of the country, with many regions into double-digit growth territory. By contrast, house values fell by -2.3% in the Auckland over the same period.

Amidst rising prices, the number of houses sold has started to ease across the country, down by 0.9% nationally in the year to June 2019 (Infometrics, 2019). Sales were down in most regions, with only weak growth in the remainder. Once again, Auckland was the exception where sales volumes showed signs of recovery. Nationally, demand for housing seems to be constrained by its relative unaffordability, which limits the participation of current and potential owner occupiers in the market. Property investors have generally been discouraged by policy changes, such as the extended bright-line test, foreign buyer ban, healthy homes standards and ring-fencing of rental losses. The abandonment of plans for a capital gains tax does not seem to have affected demand. Interest rate cuts have also failed to affected sales (Infometrics, 2019). The New Zealand Treasury expects housing activity to stabilise over the rest of 2019, supported by low mortgage rates and less uncertainty around tax policy changes (New Zealand Treasury, 2019B).

Residential building consents inched higher in the year to June 2019, up 5.8% to reach 34,700 (Infometrics, 2019). Growth was particularly strong in the Auckland region which consented over 14,000 new homes in the year ended June 2019 (up 13%) (the most ever consented in a year) (New Zealand Treasury, 2019B). However, as the construction industry approaches capacity constraints across the country, the rate of growth is easing, down from a peak of 24.1% in the year to June 2014. Growth in standalone dwellings is minimal, with growth led by multi-unit dwellings (Infometrics, 2019).

Non-residential consents grew strongly in the year to June 2019, up 7.9% to $7.4 billion. However, further strong growth seems unlikely (Infometrics, 2019). Weak business confidence and low investment intentions are sapping strength from private sector consents, and declines in private sector work are predicted to be the dominant trend in overall activity during 2020 and 2021 (Infometrics, 2019).

The growth in vehicle volumes on New Zealand's roads continue to soften, with traffic growth slowing back to 1.5% per annum over the 12 months to June 2019 (Infometrics, 2019). Slowing growth in vehicle

activity on the roads highlights softer general activity in the economy, consistent with the expectations for slower economic growth. Traffic flows are also being held back by higher fuel prices, which have increased over 10c/l on average in the June 2019 quarter compared to March 2019, due to oil supply concerns in the Middle East (Infometrics, 2019).

Car registrations further declined in the year to June 2019, down 8.6% (Infometrics, 2019). Used car registrations, especially for large used cars, are falling faster than new car registrations. Weak consumer confidence, softening employment prospects, and higher fuel prices are all combining to make consumers more cautious about making big purchases (Infometrics, 2019).

Commercial vehicle registrations edged up 0.3% in the year to June 2019 (Infometrics, 2019). Registrations are at historically high levels and the strong domestic construction industry is maintaining demand for the movement of aggregates, timber and other construction products. However, poor business confidence and investment intentions continue to sap momentum out of the commercial vehicle market amid rising cost pressures and concern about export prospects in a weakening global economy beset by fears of a trade war (Infometrics, 2019).

Guest nights have recovered some of their momentum, growing 1.3% over the 12 months to June 2019 (Infometrics, 2019). Domestic guest nights remain strong, rising 4%. This growth is a little out of step with weaker consumer confidence and consumer spending, and lukewarm domestic visitor spending growth, and suggests that Kiwis are still willing to go on vacation, albeit with tighter budgets. In contrast, international guest nights fell 2.1% over the 12 months to June 2019. A key driver of this fall in international guest nights was a decline in Chinese tourist arrivals of 6.2% per annum in the 12 months to June 2019 (Infometrics, 2019).

Visitor spending rose 3.2% in the June 2019 year, continuing 2019's tepid economic performance (Infometrics, 2019). Domestic visitor spending grew 2.3%, reflecting weak domestic consumer spending amid the prospect of a slowing domestic economy. International visitor spending rose 4.6%, led by 5.2% growth in spending by Australian tourists (New Zealand's biggest market) and a 14% rise in spending by tourists from the United States. Falling Chinese tourist arrivals continues to flow through to declines in spending by Chinese tourists, which fell 1.1% in the June 2019 year (Infometrics, 2019).

5.4 Northland's Economy

Northland's economy is based on manufacturing and its primary industries, in particular the dairy industry which alone accounts for 3.3% of the region's filled jobs and 4.4% of its GDP. Far North and Kaipara districts have similar economic structures, with a strong focus on primary production. Whāngārei is the region's main urban and servicing centre with a higher concentration of manufacturing and service industries. In particular, Whāngārei is home to the region's port, Northport, and New Zealand's only oil refinery, Refining New Zealand. Consequently, petroleum and coal product manufacturing account for 6.8% of Northland's GDP and 0.5% of its employment. In all, manufacturing (including the oil refinery) was the largest contributor to Northland's GDP (16.1%) followed by the agriculture, forestry and fishing sector (11.4%) (Infometrics, 2019).

Northland sits at the apex of the fastest growing area of New Zealand; Auckland and the upper North Island (AECOM, 2019). The upper North Island accounts for over half of the country's population, over

half the freight moved and over half the country's Gross Domestic Product (GDP). However, despite its proximity to New Zealand's largest economic centre, the Northland economy underperforms the rest of New Zealand on a number of social and economic measures (AECOM, 2019).

Northland contributes 2.6% of New Zealand's Gross Domestic Product (GDP), despite making up 3.6% of the national population (AECOM, 2019). This means Northland has lower GDP per person, being 26% below the national average (AECOM, 2019).

A contributing factor to this economic underperformance and unrealised potential is Northland's physical isolation from Auckland and the rest of New Zealand (AECOM, 2019). While other regions are also challenged by New Zealand's geography, Northland is unique in that it is in close proximity to New Zealand's largest economic centre, yet practically isolated from it. The regions current State Highway 1 connection to Auckland is long and winding, has areas of medium to high crash risk and is increasingly affected by growing congestion in urban Auckland. Northland also has transport challenges within the region such as areas of low resilience, growing traffic volumes within Whāngārei at peak times and areas of high crash risk. This geographical isolation also means that Auckland-based people and businesses find it harder to access Northland. This in turn means that Northland may not be considered for travel or new investments, when other areas adjacent to Auckland are more accessible (AECOM, 2019).

The key 'push' factor for this potential movement of population and industrial activity to Northland is the ongoing growth of Auckland (AECOM, 2019). Over the last ten years Auckland's population has grown faster than previously forecast and is now expected to grow to 2.4 million people by 2043, with around half this future population living north of the Waitematā Harbour. This growth is placing constraints on the transport system within the city and the land available for industrial activities (AECOM, 2019).

This creates an opportunity for Northland to accommodate industry, businesses and population finding it difficult to expand or establish in Auckland (AECOM, 2019). Northland has affordable land in reasonable proximity to Auckland and has one of the finest deep water ports in the country. However, Northland's direct competitor for this growth is the Waikato district which is better connected to Auckland by road and rail as well as being close and well connected to the Port of Tauranga. Northland therefore has considerable opportunities to grow its economy along with the rest of the Upper North Island. However, to recognise these opportunities, Northland will need to overcome its transportation constraints (AECOM, 2019).

5.5 Structure of Kaipara's economy and employment

Kaipara's economy is founded on its primary industries (particularly dairy), supported by a strong manufacturing sector. In 2018, the primary sector (agriculture, forestry and fishing) accounted for 27.9% of Kaipara's GDP while manufacturing contributed a further 10.7% as is shown in Figure 45. Dairy cattle farming's contribution to the local economy alone was 6.4 times the national average, with 13.6% of Kaipara's GDP coming from dairy cattle farming compared to 2.1% nationally. The primary and manufacturing sectors were also the two biggest contributors to employment in Kaipara in 2018 accounting for 26.7% and 11.1% of filled jobs, respectively (Figure #46) (Infometrics, 2019).

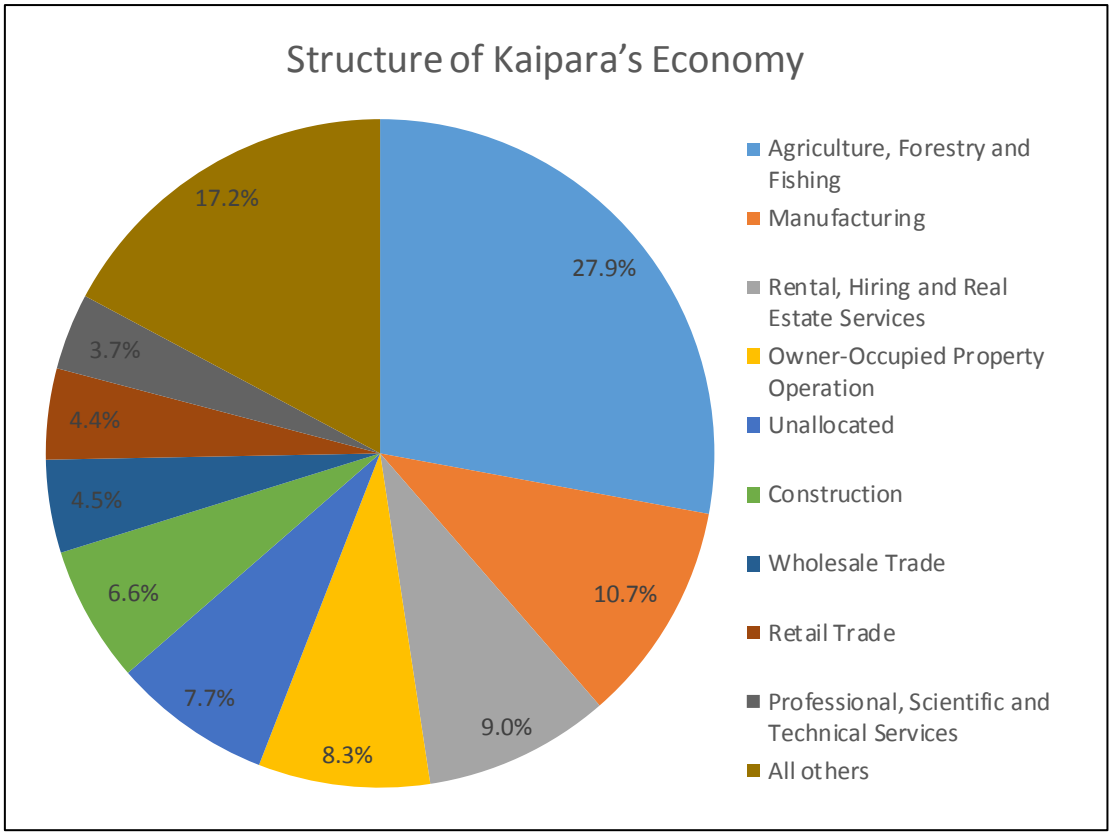


Figure 45 The contribution of different sectors to Kaipara's GDP in 2018 (Infometrics, 2019).

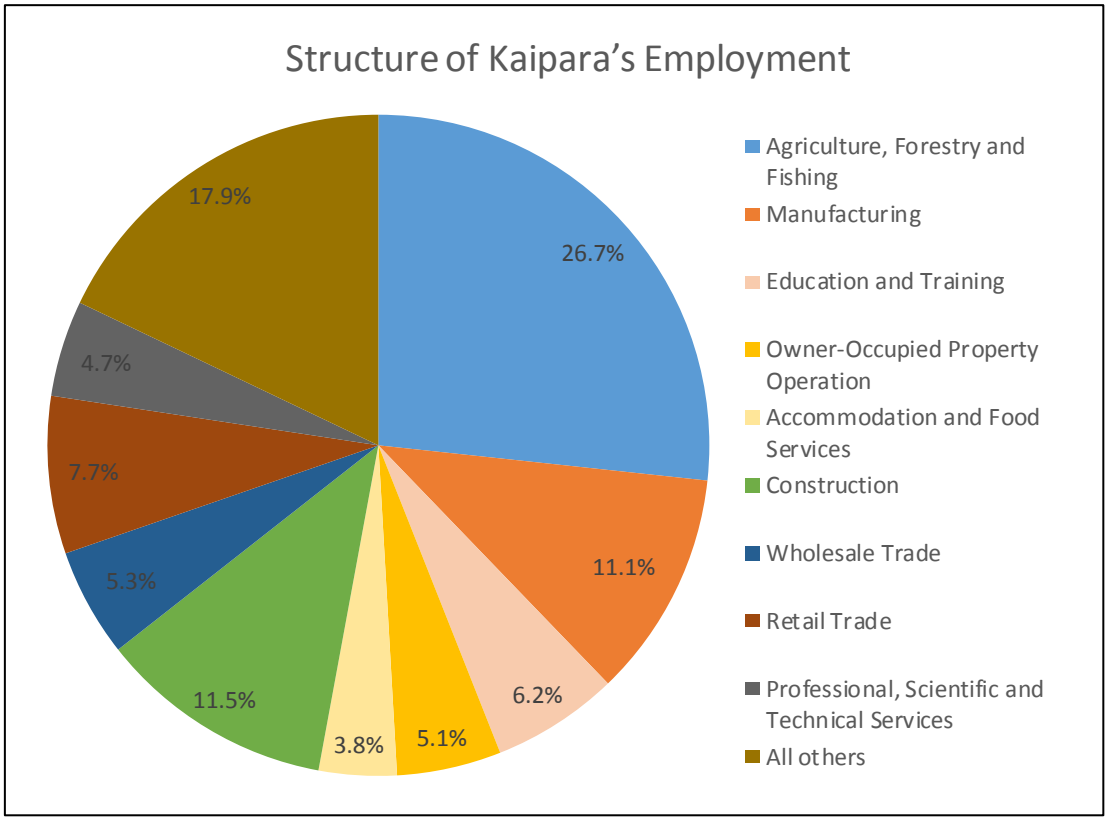


Figure 46: The contribution of different sectors to the number of filled jobs in Kaipara in 2018 (Infometrics, 2019).

However, the structure of Kaipara's economy is not consistent across the district (Infometrics, 2019). The Northwest Kaipara area is predominantly focussed on the primary sector with agriculture, forestry

and fishing accounting for 67% of GDP and 73.7% of filled jobs in 2018 (see Figures 47 and 48). Dairy farming alone accounted for 34.8% of Northwest Kaipara's 2018 GDP while sheep, beef and grain farming accounted for a further 15%, horticulture and fruit growing a further 10.7% and forestry a further 4.9% (Infometrics, 2019).

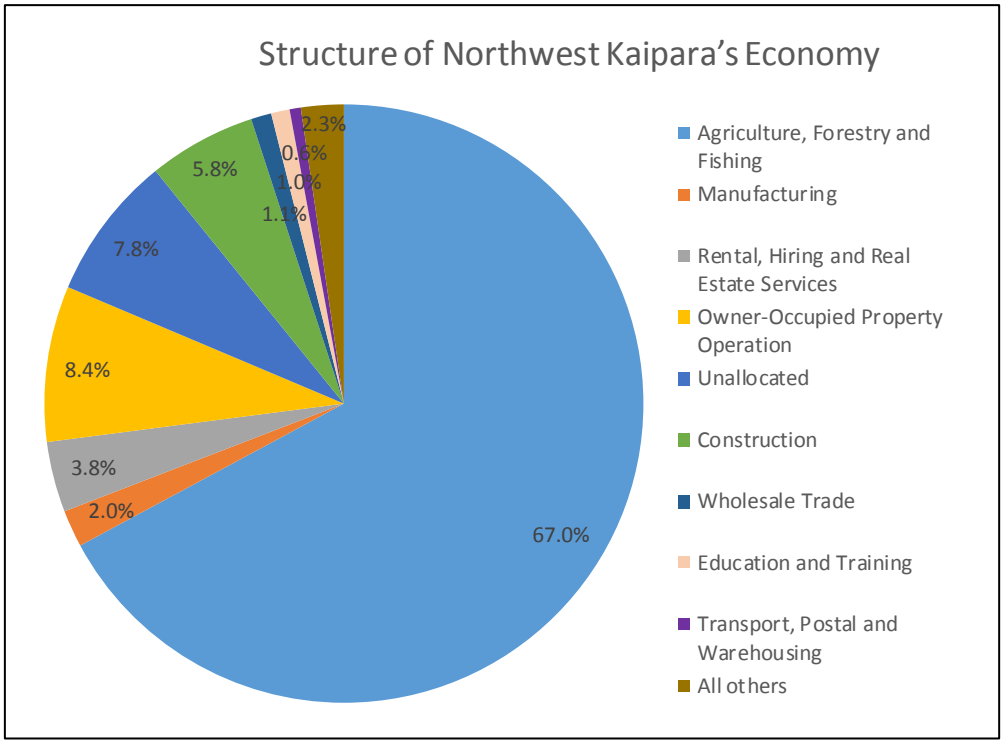


Figure 47: The contribution of different sectors to Northwest Kaipara's GDP in 2018 (Infometrics, 2019).

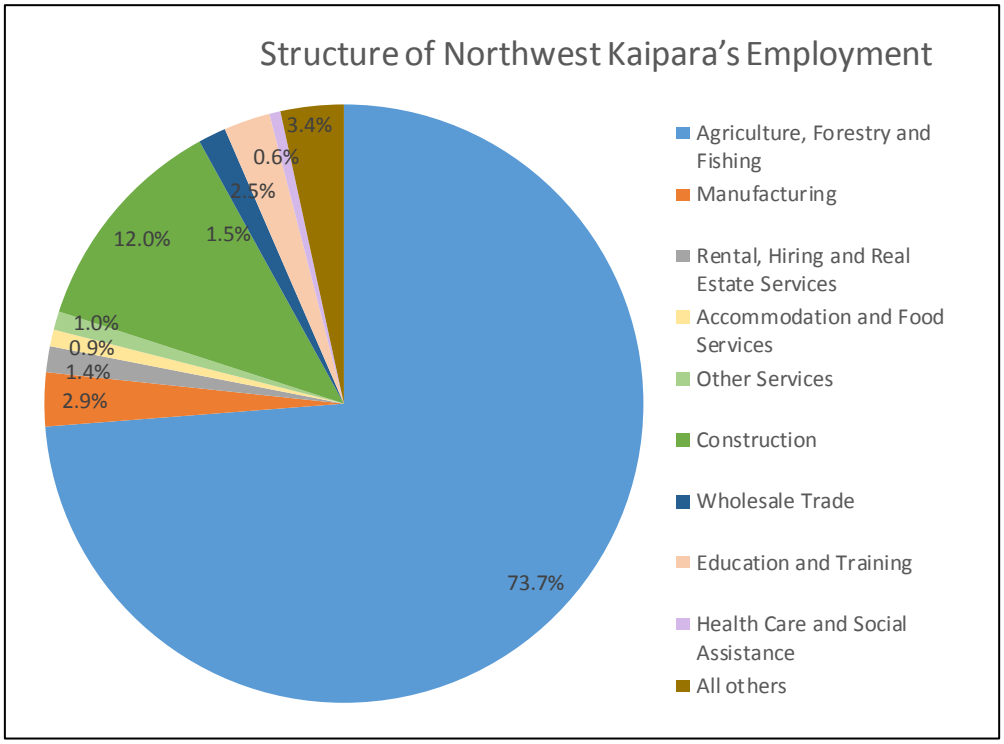


Figure 48: The contribution of different sectors to the number of filled jobs in Northwest Kaipara in 2018 (Infometrics, 2019).

Southeast Kaipara was also highly dependent on the primary sector (31.4% of 2018 GDP) but was also well supported by the manufacturing sector (15.2% of 2018 GDP) (see Figure 49) (Infometrics, 2019). The greater importance of Manufacturing to Southeast Kaipara likely reflects the presence of Fonterra's Maungaturoto Dairy Factory. Collectively, the primary and manufacturing sectors accounted for almost half of all filled jobs in the Southeast Kaipara area, as is shown in Figure 50 (Infometrics, 2019).

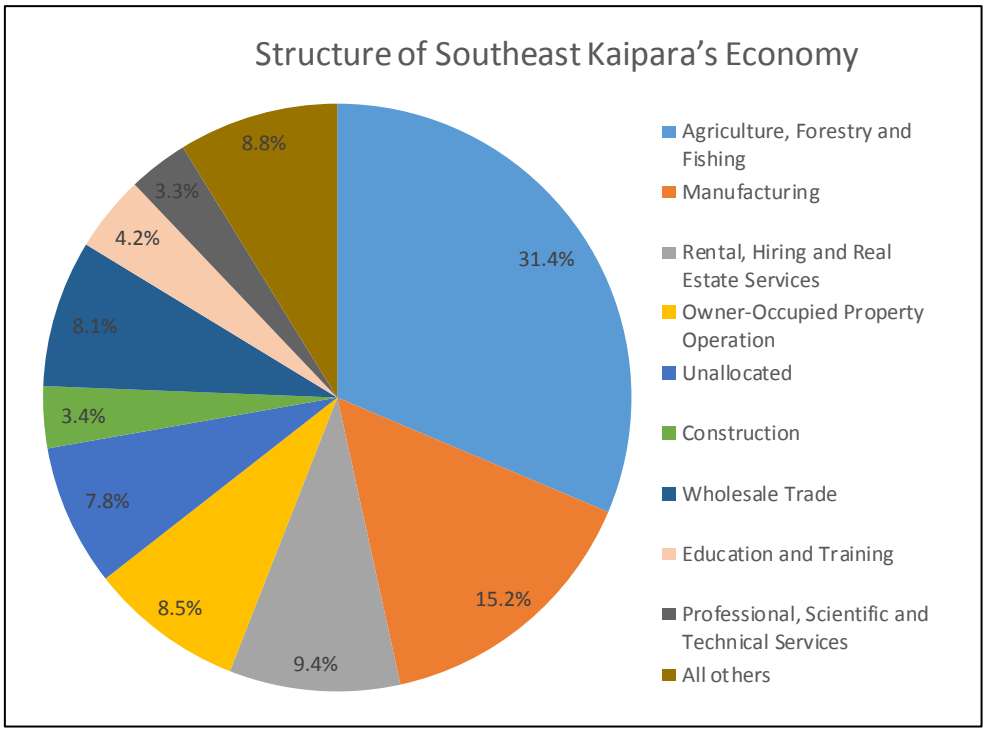


Figure 49: The contribution of different sectors to Southeast Kaipara's GDP in 2018 (Infometrics, 2019).

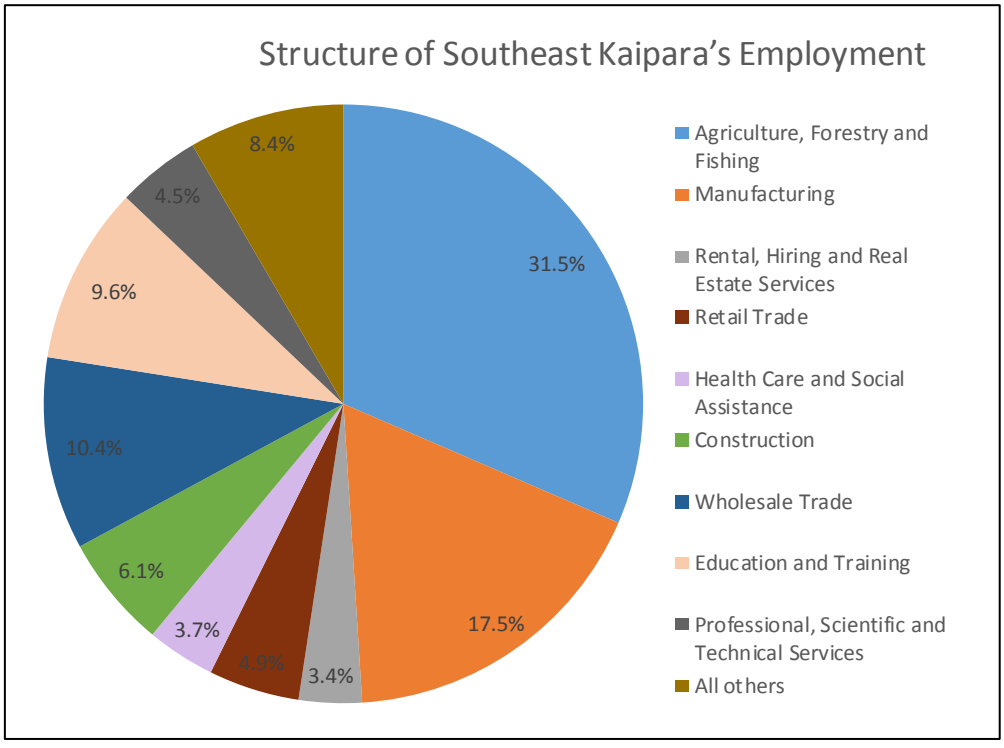


Figure 50: The contribution of different sectors to the number of filled jobs in Southeast Kaipara in 2018 (Infometrics, 2019).

Dargaville township, which acts as a service centre to the wider Northwest Kaipara area had a more diversified economy with a stronger focus on manufacturing, which accounted for 11.4% of GDP and 11.3% of filled jobs in 2018 (see Figures 51 and 52) (Infometrics, 2019). This reflects the presence of Silver Fern Farms' meat works together with the many smaller fabricating and processing manufacturing businesses present in the town. As a rural service centre, and with many of its manufacturing businesses supporting the primary sector (e.g. the meat works), Dargaville's fortunes are closely linked to the primary industries it services. Drought years have been seen to result in less commercial activity in Dargaville due to farmers having less money to reinvest in their businesses and rural workers having less disposable income. This trend is likely to also be true of other rural Kaipara towns such as Maungaturoto, however detailed data for these towns is not available.

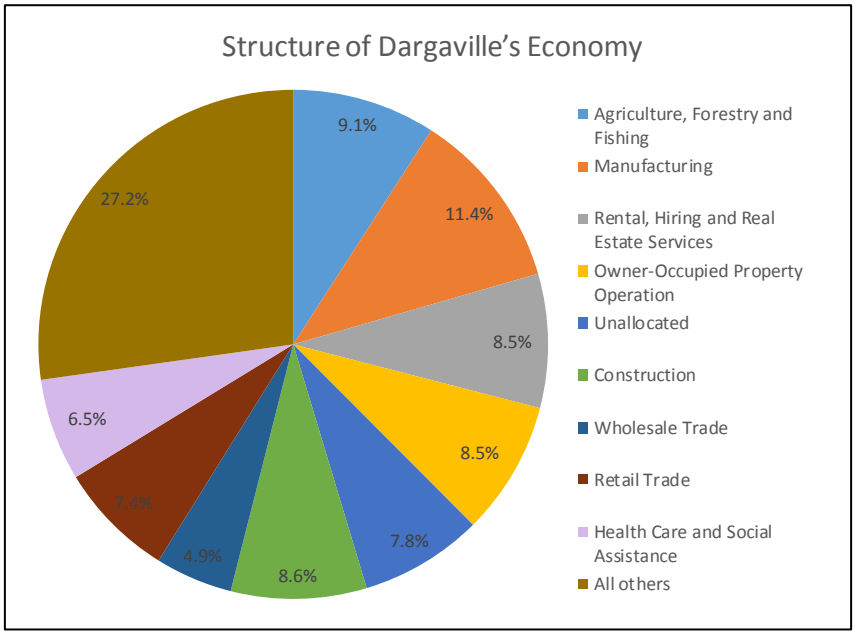


Figure 51: The contribution of different sectors to Dargaville's GDP in 2018 (Infometrics, 2019).

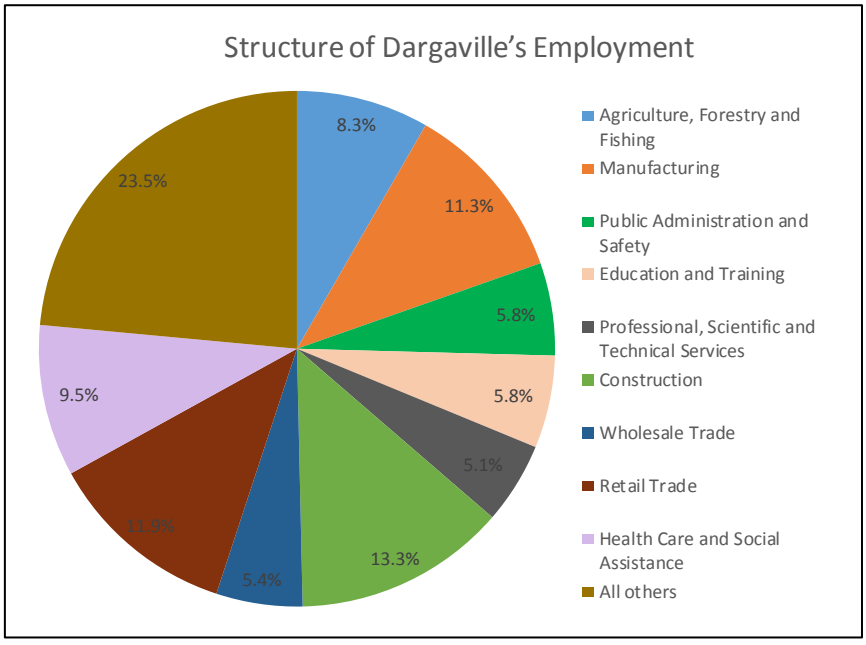


Figure 52: The contribution of different sectors to the number of filled jobs in Dargaville in 2018 (Infometrics, 2019)

By contrast, Mangawhai has little economy of its own with only 1,121 filled jobs for a usually resident population of 4,480 people (Infometrics, 2019). This reflects the large number of retired people who have chosen to make Mangawhai their home, as well as the increasing number of working age people who commute to Auckland for their employment. Unsurprisingly for a fast growing seaside resort, Mangawhai's economy is primarily comprised of real-estate services (21.6% of GDP and 7.3% of filled jobs) and the construction sector (10.5% of GDP and 17.7% of filled jobs) (see Figures 53 and 54). Accommodation and food services were also important, accounting for 13.2% of filled jobs (Infometrics, 2019).

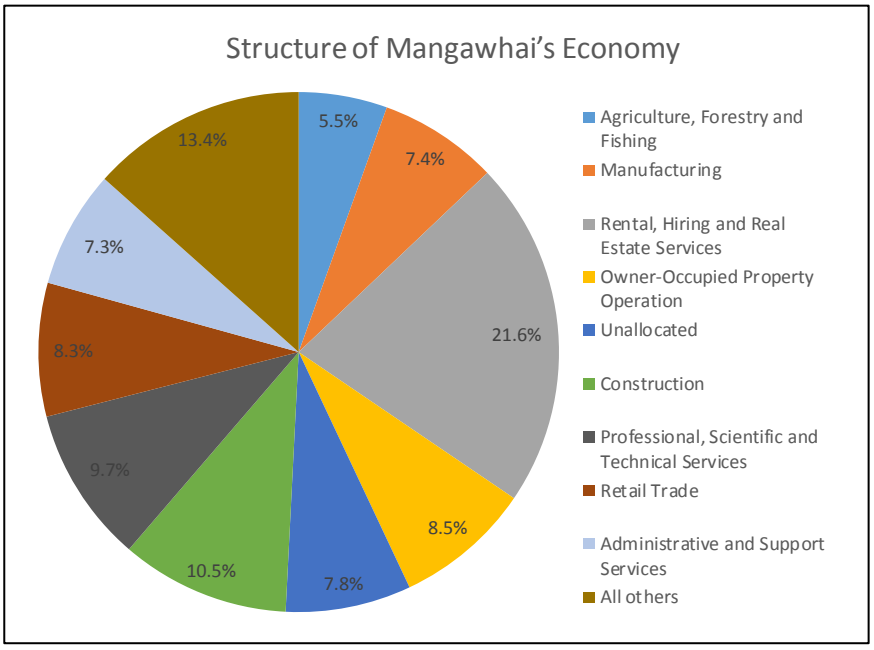


Figure 53: The contribution of different sectors to Mangawhai's GDP in 2018 (Infometrics, 2019)

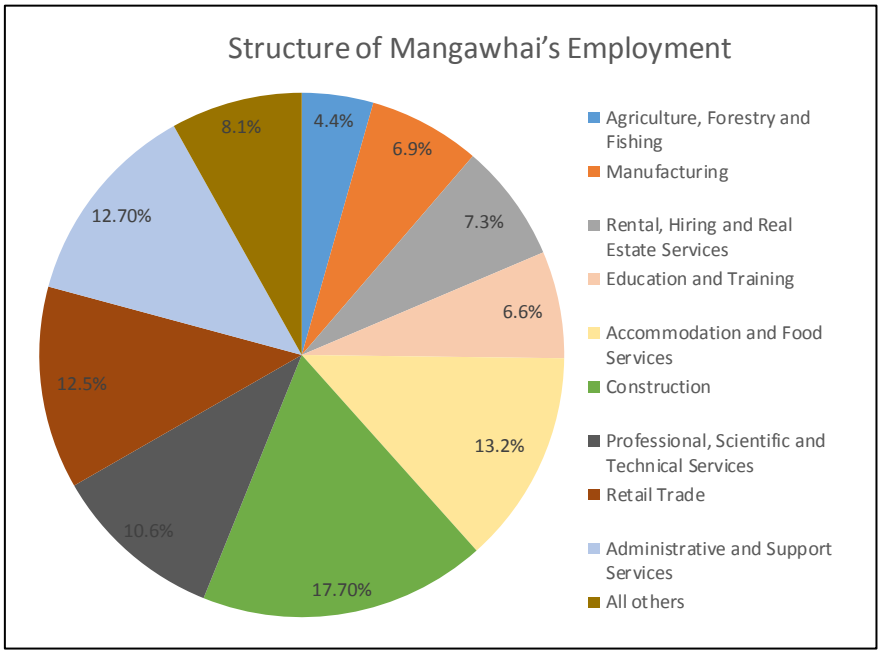


Figure 54: The contribution of different sectors to the number of filled jobs in Mangawhai in 2018 (Infometrics, 2019)

The Figure 55 below further breaks down the contribution different industries make to Kaipara's economy. It reveals the importance of industries within the primary sector such as dairy (13.6% of 2018

GDP), sheep beef and grain farming (5.9% of 2018 GDP), forestry (3% of 2018 GDP) and horticulture and fruit growing e.g. kumara (2.8% of 2018 GDP). Dairy farming alone was worth $104.6 million to Kaipara's economy in 2018 (Infometrics, 2019).

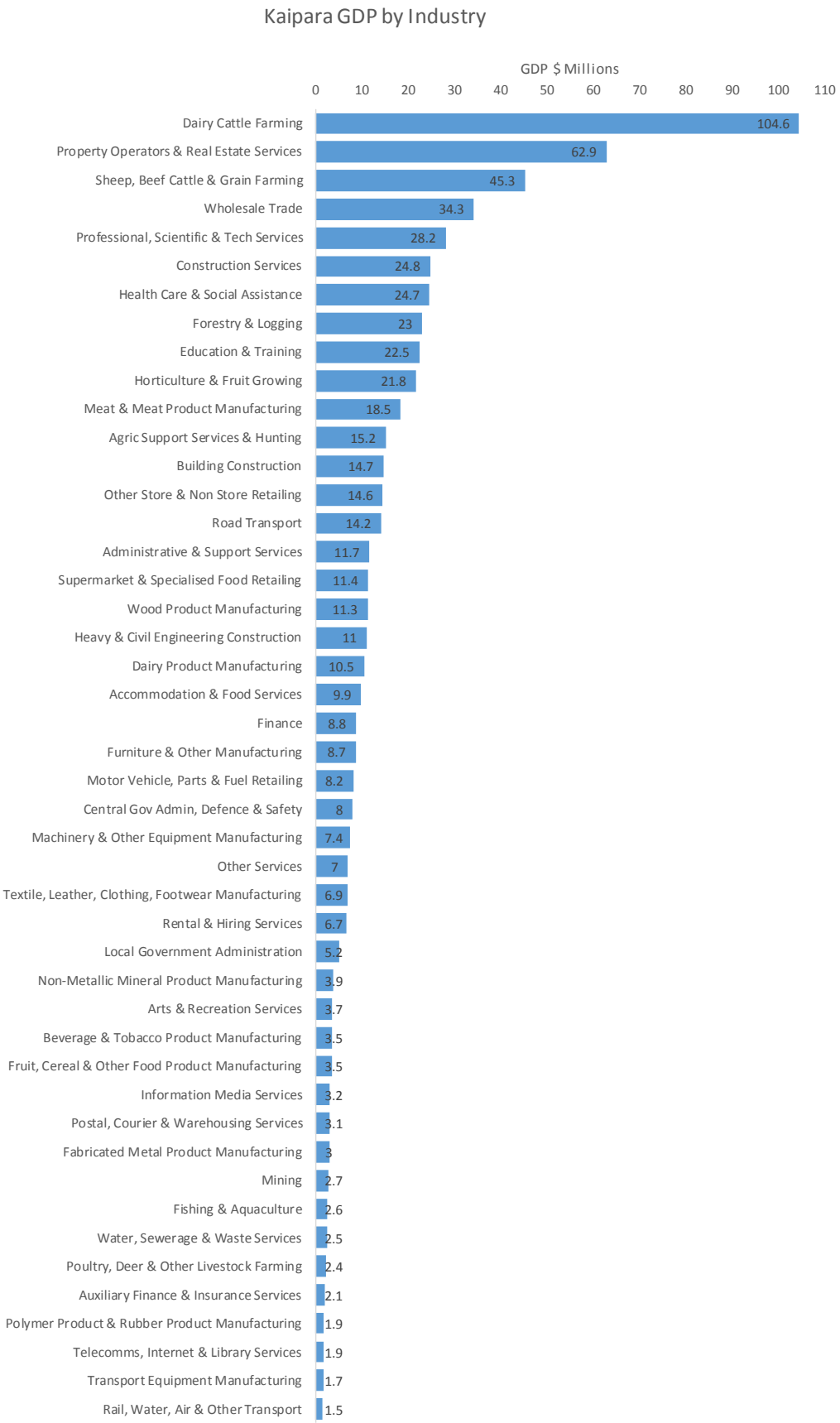


Figure 55: Contribution to Kaipara's GDP by industry, 2018 (Infometrics, 2019)

Figure 56 shows which sectors of the economy contributed most to growing Kaipara's GDP. It shows that the top five industries that made the greatest contribution to GDP growth in Kaipara from 2013 to 2018 were; the agriculture, forestry and fishing sector, construction, professional, scientific and technical services, professional, scientific and technical services and manufacturing (Infometrics, 2019).

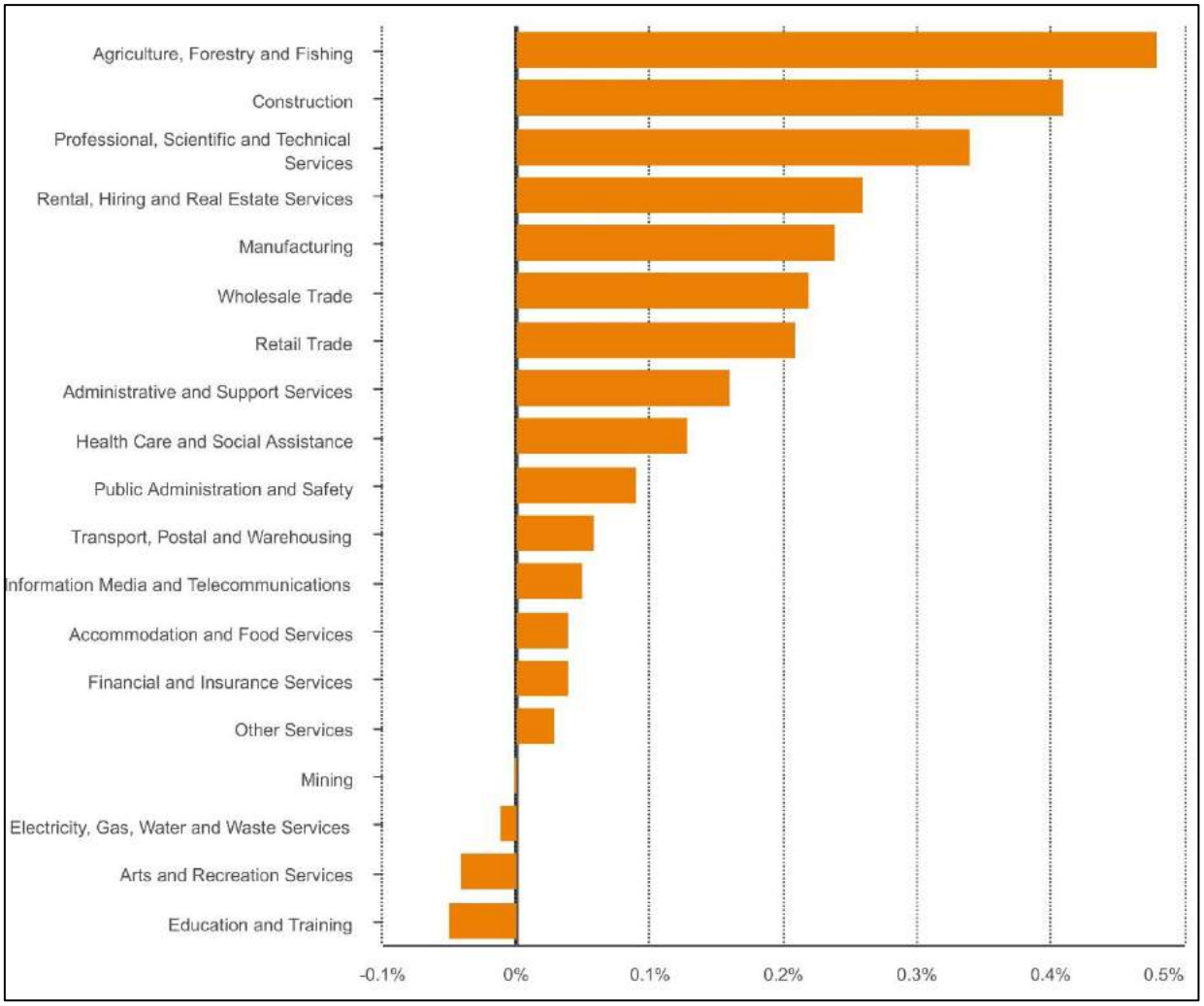


Figure 56: Contribution to GDP growth in Kaipara by industry from 2013 to 2018 (Infometrics, 2019)

The industries which contributed most to employment growth in Kaipara over the period 2013 to 2018 were construction (+285 jobs), professional, scientific and technical services (+158 jobs), agriculture, forestry and fishing (+151 jobs), administrative and support services (+128 jobs), manufacturing (+112 jobs) and wholesale trade (+97 jobs) (Infometrics, 2019).

There were a total of 8,878 filled jobs in Kaipara in 2018, a 6.1% increase on the previous year and part of an ongoing growth trend as is shown in Figure 57 (Infometrics, 2019). On average, the number of filled jobs in Kaipara grew 5% per annum over the three years to March 2018 (Patterson, 2019A). Job growth in Kaipara was split evenly between established businesses increasing their staff and new businesses establishing (Patterson, 2019A).

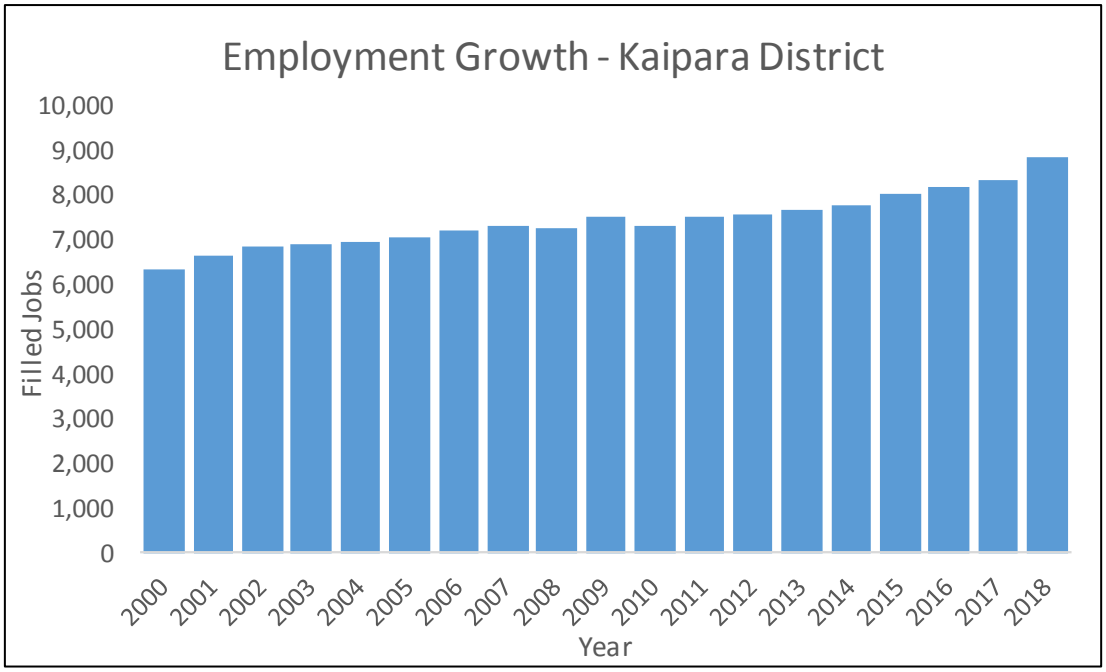


Figure 57: Number of filled jobs in Kaipara District from 2000 to 2018 (Infometrics, 2019)

The annual average unemployment rate in Kaipara district was 4.3% in June 2019, down from 4.6% a year earlier (Infometrics, 2019). The unemployment rate in Kaipara district was higher than in New Zealand (4.1%) but lower than Whāngārei (5.5%), Far North (7.3%) and Northland (6%). Over the last ten years Kaipara's unemployment rate reached a peak of 7.1% in March 2013 but is currently at its lowest point in the last decade. Figure 58 reveals Kaipara's unemployment rate is consistently lower than in other parts of Northland and typically sits near the national average. Unemployment rates across all areas of Northland can be seen to follow a similar trend to each other and the national average, suggesting trends in the wider economy are more important than local shocks (Infometrics, 2019).

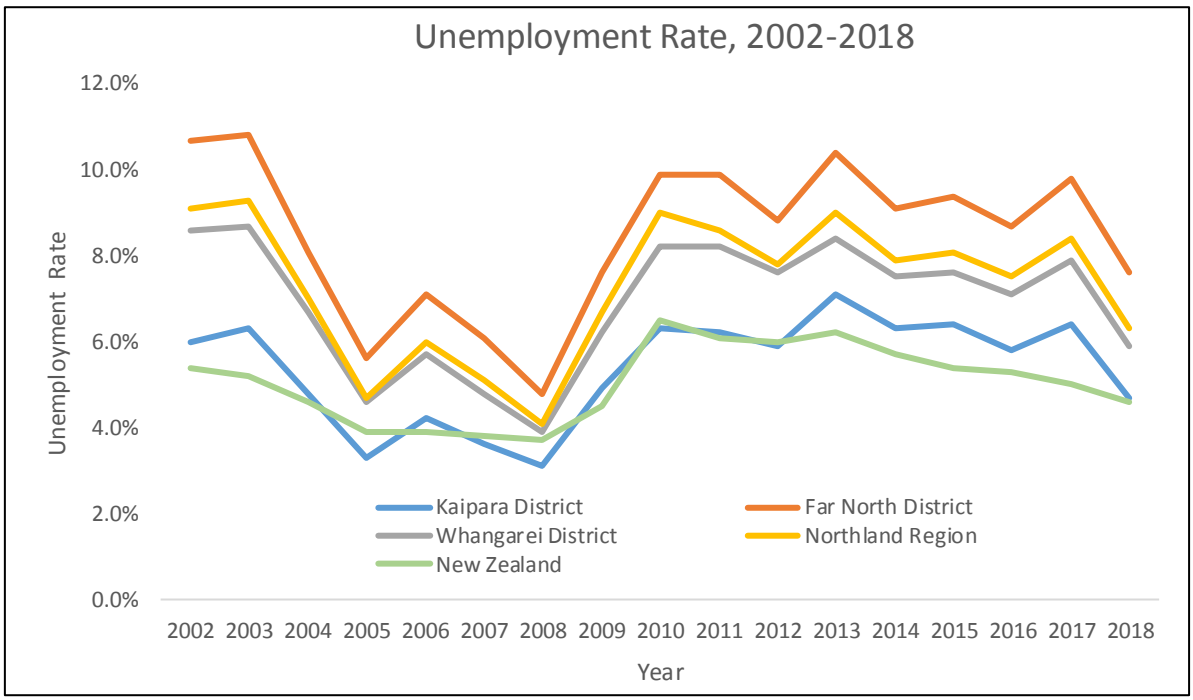


Figure 58: Changes in the unemployment rate from 2009 to 2019 (Infometrics, 2019)

Dargaville's employment increased by 576 filled jobs between 2013 and 2018 while the surrounding Northwest Kaipara area saw a net increase of 50 filled jobs over the same period (Infometrics, 2019). This employment growth coupled with strong population growth implies economic growth in the Dargaville area. The top five contributors to Dargaville's employment growth over this period were agricultural support services (+87 jobs), forestry and logging (+80 jobs), health care and social assistance (+57 jobs), construction services (+56 jobs) and local government administration (+44 jobs). The greatest contributors to job creation in Northwest Kaipara were horticulture and fruit growing (includes kumara and vegetable growing) (+101 jobs), sheep beef and grain farming (+86 jobs), building and construction (+40 jobs), construction services, agricultural support services and other services (collectively +36 jobs). The five industries which lost the most jobs in Northwest Kaipara over the 2013 to 2018 period were dairy farming (-49 jobs), forestry and logging (-48 jobs), property operators and real estate services (-28 jobs), fishing and aquaculture (-28 jobs) and wood product manufacturing (-20 jobs) (Infometrics, 2019).

Mangawhai's employment increased by 369 filled jobs over the period 2013 to 2018. This compares to population increase of 1,100 people over the same period meaning Mangawhai had a usually resident population of 4,480 people in 2018 but just 1,121 filled jobs. This suggests the town has little economy of its own. The top five industries which contributed most to job creation in Mangawhai were administrative and support services (+91 jobs), construction services (+74 jobs), professional, scientific and technical services (+69 jobs), building and construction (+54 jobs), rental and hiring services (+21 jobs) (Infometrics, 2019).

Southeast Kaipara's employment grew by 129 filled jobs between 2013 and 2018 (Infometrics, 2019). Southeast Kaipara had a total of 2,363 filled jobs in 2018. The top five industries which contributed the most to employment growth were wholesale trade (+85 jobs), professional, scientific and technical services (+50 jobs), property operators and real estate services (+39 jobs), poultry, deer and livestock farming (other than dairy, sheep and beef) (+29 jobs) and wood product manufacturing (+29 jobs). In addition, fishing and aquiculture added 23 jobs, dairy product manufacturing added 21 jobs and sheep, beef and grain farming added 20 jobs. The five industries in Southeast Kaipara which lost the most jobs were horticulture and fruit growing (-72 jobs), dairy farming (-51 jobs), agricultural support services (-46 jobs), water, sewerage and water services (-31 jobs) and road transport (-27 jobs) (Infometrics, 2019).

5.6 Performance of Kaipara's economy

Kaipara's economy is continuing to expand, however growth has slowed over the year to June 2019, in line with a slowdown in the national economy (Infometrics, 2019). Provisional estimates from Infometrics show Kaipara's economy grew 1.9% over the 12 months to June 2019 to reach a value of $791 million GDP (2010 prices). This compares to growth of 1.8% in Northland and 2.5% in the national economy. Prior to the slowdown, Kaipara's annual GDP growth had averaged 3.6% per annum from 2015 to 2018 (Infometrics, 2019).

Graphing the annual percentage change in GDP reveals Kaipara's economy experiences greater ups and downs than the regional and national economy (Infometrics, 2019). Figure 59 shows how the annual rate of GDP growth has fluctuated in Kaipara, Northland and New Zealand between 2001 and 2018. Kaipara's GDP fell by as much as -5.8% in 2008 and increased by as much as 7.7% in 2004 and

6.6% in 2012. By contrast, Northland and the national economy had more moderated ups and downs. Both saw their greatest year on year GDP increase in 2004, an increase of 5.8% and 4.6% respectively. The greatest year on year decrease for both Northland and the national economy came at the end of the global financial crisis in 2009, with GDP falling -1.1% and -1.2% respectively (Infometrics, 2019). This indicates that Kaipara can go from strong growth to weak or no growth in a very short cycle.

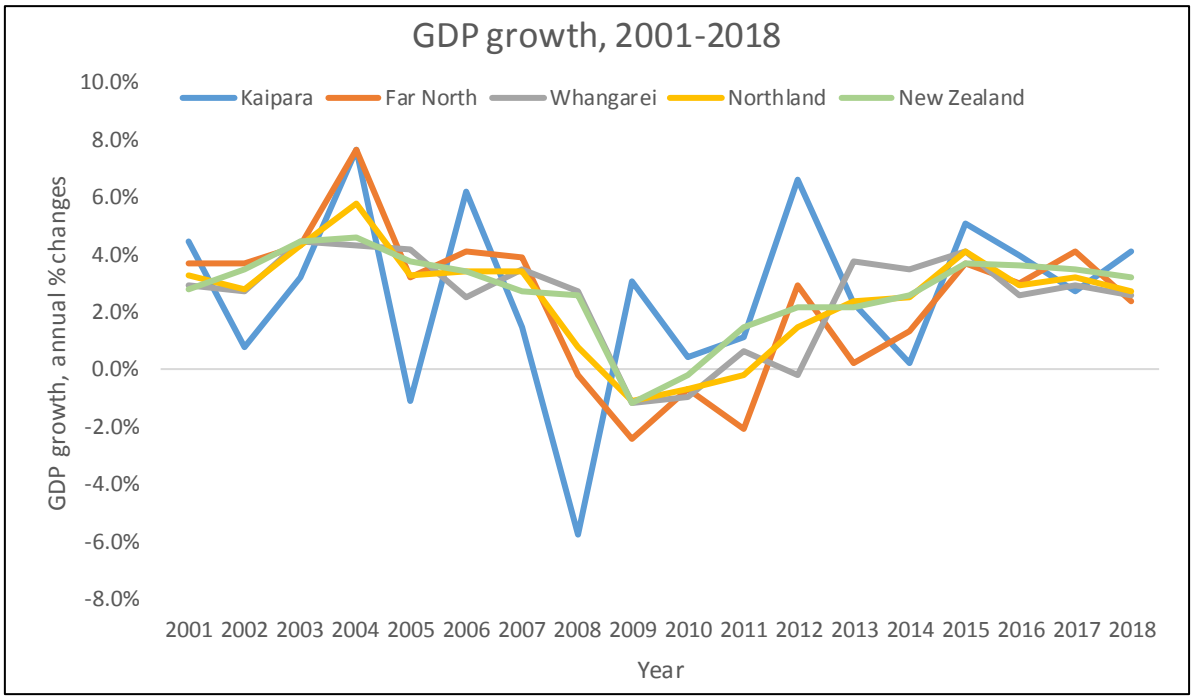


Figure 59: Year on year changes in the rate of GDP growth in Kaipara, Whāngārei, Far North, Northland and New Zealand (Infometrics, 2019).

These greater fluctuations in Kaipara's GDP may be the result of its over exposure to the primary sector, particularly the dairy industry. Seasons with good growing conditions and favourable prices for export commodities such as dairy products, meat and wood can see Kaipara's economy thrive. Conversely, droughts, floods and lower export prices have the opposite effect. Kaipara has little ability to protect itself from such shocks, having little influence on international markets and limited ability to prevent floods or store water for irrigation.

The Northland Regional Council, in partnership with Kaipara District Council and Far North District Council are currently working to investigate the potential of constructing community scale water storage schemes in the Dargaville and Kaikohe areas, as part of a Provincial Growth Fund (PGF) funded project. If successful, this project will see water harvested during peak flows and used to de-risk and expand Kaipara's primary sector. Another PGF funded initiative, Kaipara Kai, is being overseen by Kaipara District Council and aims to diversify Kaipara's primary sector into additional, higher value crops. This is intended to help make Kaipara's economy less vulnerable to market shocks affecting any one sector.

Unsurprisingly given its dependence on the primary and manufacturing sectors, Kaipara's economy is considerably more export-orientated than that of Northland and New Zealand (Infometrics, 2019). In 2018, exports accounted for 59.4% of Kaipara's GDP compared to 40.1% regionally and 31.5% nationally (Infometrics, 2019). Dairy product manufacturing contributed the largest share of Kaipara's exports by GDP value (37.7% or $172.4m) followed by meat and meat product manufacturing (22.8%

or $104.5 million), forestry and logging (12% or $54.9m) and horticulture and fruit growing (8.9% $40.7 million) (Infometrics, 2019).

A comparison of Kaipara's GDP to the number of employed persons in the district, reveals Kaipara has lower productivity per worker than the national average (Infometrics, 2019). Productivity can be measured using GDP per employed person and is a way of describing efficiency of production. While Kaipara's productivity has improved over time (from $77,046 of GDP per worker in 2000 to $86,772 in 2018) it has consistently remained below the national average (which increased from $84,404 per worker in 2000 to $97,174 in 2018). Kaipara's productivity sits near the Northland average, a little over half way between that of Far North and Whāngārei Districts (Figure 60).

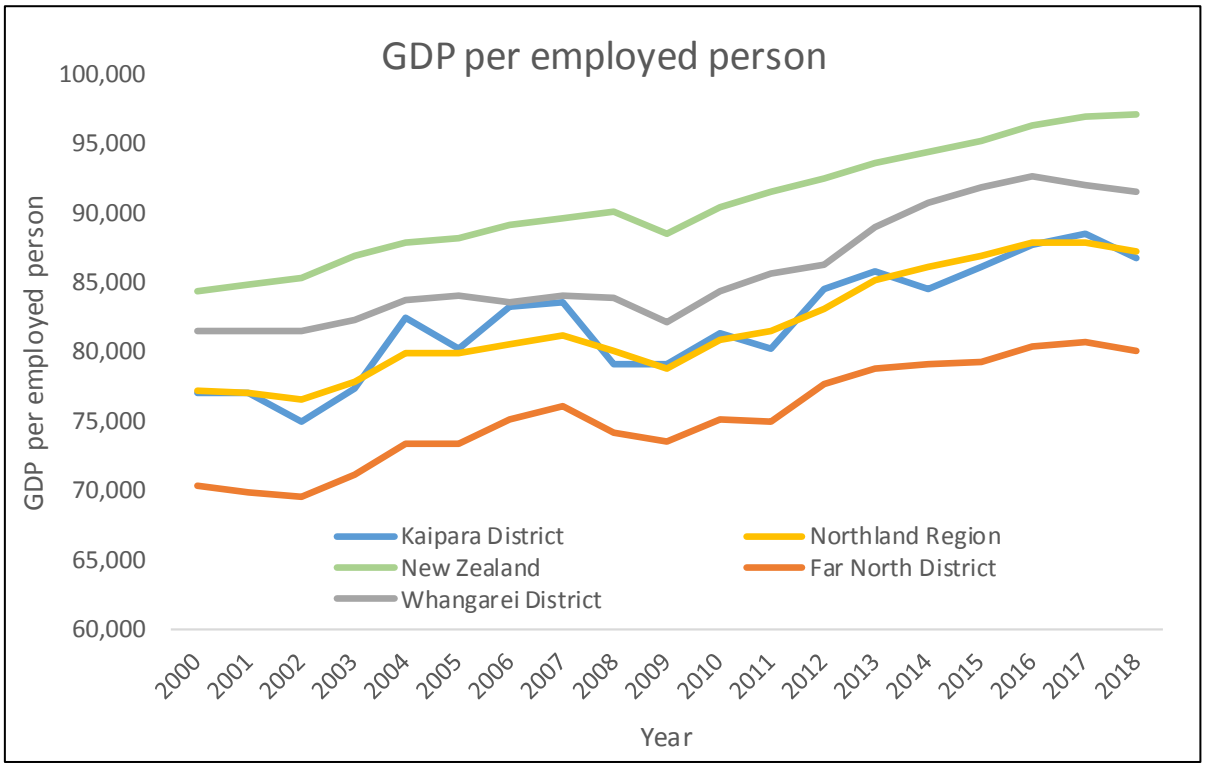


Figure 60: Changes in GDP per employed person between 2000 and 2018 (Infometrics, 2019).

Overall productivity is influenced by a number of factors such as labour and production inputs (e.g. machinery, technology and land). Kaipara's under performance could therefore be because of insufficient investment in plant and machinery as well as less skilled staff.

It can further be seen that Kaipara's lessor productivity is not restricted to a single sector. As shown in the table below, only Kaipara's agriculture, forestry and fishing sector and administrative and support services sector were more productive than the national average. This means there may be opportunities for Kaipara to lift its GDP by improving the productivity of its industries.

Table 11: Productivity by industry as measured by GDP per filled job in 2018 (Infometrics, 2019).

Industry	Productivity: GDP per filled job ($)	
	Kaipara District	New Zealand
Agriculture, Forestry and Fishing	90,467	89,850
Mining	49,155	539,916
Manufacturing	83,777	99,543
Electricity, Gas, Water and Waste Services	55,553	395,877
Construction	49,441	62,900
Wholesale Trade	72,719	99,528
Retail Trade	49,768	53,432
Accommodation and Food Services	29,696	31,831
Transport, Postal and Warehousing	78,164	107,219
Information Media and Telecommunications	70,672	192,239
Financial and Insurance Services	166,480	222,353
Rental, Hiring and Real Estate Services	246,121	271,987
Professional, Scientific and Technical Services	67,519	84,222
Administrative and Support Services	42,655	40,204
Public Administration and Safety	62,284	88,057
Education and Training	41,138	48,821
Health Care and Social Assistance	54,806	60,021
Arts and Recreation Services	39,993	67,229
Other Services	27,756	45,320
All Industries	**86,772**	**97,174**

Over the near term, the outlook for Kaipara's primary sector remains mixed. Fonterra has recently announced a $590-$675 million loss for the financial year and will pay no dividend for the 2018-2019 season due to the poor outlook for some investments. This has raised concerns over the financial outlook for the co-operative, even as the outlook for the 2019/20 farmgate milk price remains likely to be closer to the top end of the $6.25-$7.25 per kilogram of milk solids range (Infometrics, 2019). Furthermore, forestry prices have fallen in recent months but are expected to recover in 2020 (Infometrics, 2019).

Kaipara's recent GDP growth of 1.9% is therefore primarily being driven by strong household spending, a growing population, and renewed tourism activity (Infometrics, 2019). Data from Marketview shows a 9.3% increase in consumer spending over the 12 months to June 2019, highlighting confidence in the local economy and further supported by Kaipara's growing population (Infometrics, 2019). However, against the backdrop of a slowing national and global economy, households are proving cautious of larger investments as is evident by lower car registrations in Kaipara and across the country. Passenger car registrations dropped 13% in Kaipara over the June 2019 year (compared to 7% decline in Northland and 8.6% decline in New Zealand). Commercial vehicle registrations have also dropped in Kaipara, down -3.8%, possibly contributed to by lower residential construction activity and concerns over the dairy outlook. This compared to an increase of 1.8% in Northland and 0.3% in New Zealand (Infometrics, 2019).

Kaipara's tourism sector is continuing to perform well, with more visitor activity even as the outlook for tourism nationally worsens (Infometrics, 2019). International tourist arrivals are expected to continue to

fall, with weaker arrivals from China particularly. Guest nights in Kaipara rose 5.6% over the June 2019 year with a 0.9% lift in tourism spending also observed (Infometrics, 2019).

Residential construction activity has continued to decline over 2019, with residential consents down 17% over the year to June 2019 (Infometrics, 2019). This reflects that house price growth in Kaipara has now stalled, restricting future profitability of housing developments. The average current house value in Kaipara District rose just 0.6% over the year to June 2019. Growth underperformed relative to New Zealand, where prices increased by 1.4%. However, this slowdown comes at the end of a period of sustained high growth, as shown in Figure 61. As at June 2019, the average current house value in Kaipara has now reached $553,738. This is now higher than in Whāngārei ($545,364), the Far North ($451,735) and Northland ($518,615) but lower than Auckland ($1,039,023) and the New Zealand average ($686,691). Note, these prices are district averages; the average house price will vary between centres within districts.

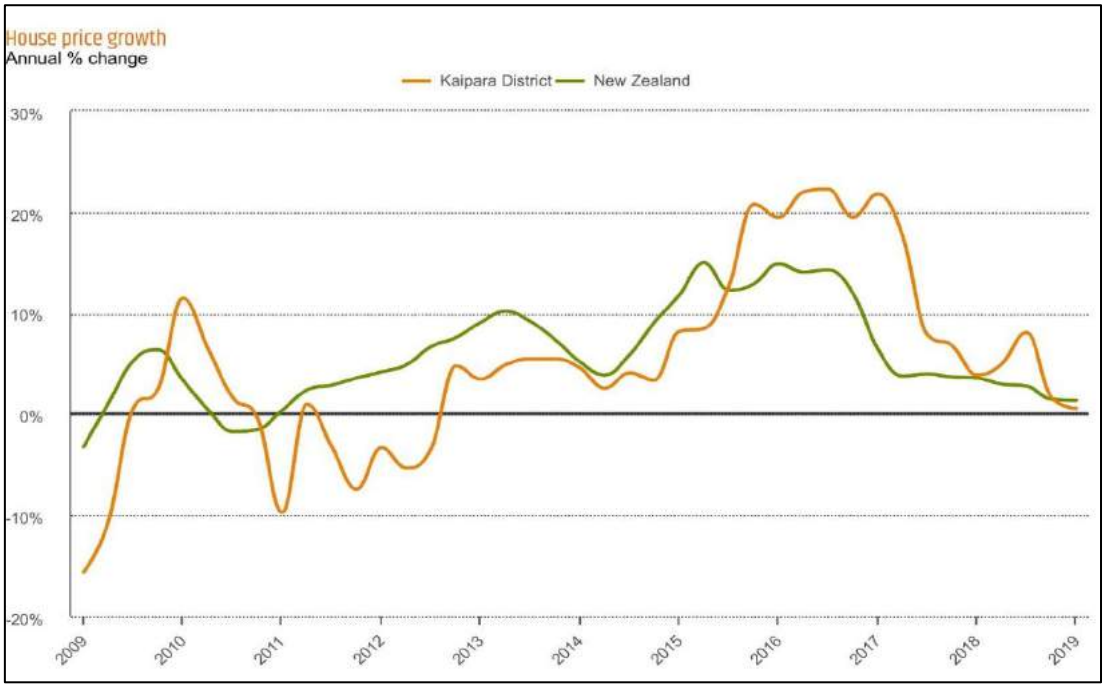


Figure 61: Variations in the rate of house price growth between 2009 and 2019, annual percentage change (Infometrics, 2019).

In contrast to residential construction, non-residential construction activity has been increasing with non-residential consent values up 14% over the year to June 2019, driven by a $1.02 million increase in office buildings and a $1.91 million increase in factory buildings (Infometrics, 2019).

Over the medium and long term, Mangawhai's continued growth and transition to a service centre, together with an influx of population to other areas of Kaipara, driven by an expanding Auckland, are likely to keep both residential and commercial construction activity high.

Reflecting on the above, it can be seen that Kaipara's economy is slowing down over the short term in line with a slowdown in the national economy. Over the longer term, shocks affecting the primary sector (particularly the dairy sector) and the rate of population outflow from Auckland will continue to be the primary drivers of Kaipara's economic performance. Opportunities to diversify and de-risk the district's primary sector, as well as lifting productivity will help to reduce shocks and improve performance.

6 Infrastructure

Infrastructure provision is a core function of local authorities and, together with a conducive regulatory framework, is often the key contribution for councils to encourage and facilitate economic development. In Kaipara, land drainage schemes protect large areas of productive land while infrastructure such as water and wastewater are key for processing and manufacturing. Roads, railway lines and ports are key in getting goods to market. In addition, infrastructure also contributes to community health and wellbeing with services such as water supply, solid waste and wastewater contributing to public health.

However, providing the infrastructure communities need to thrive is becoming more challenging. Gross debt levels in councils continue to increase at the same time as population pressures, tourism growth, and ageing infrastructure come together to stretch councils' ability to fund its services (Infometrics, 2019).

Infometrics' latest analysis shows the majority of local government gross debt levels increasing over the next decade, with a focus on renewal of existing infrastructure rather than investing to accommodate growth (Infometrics, 2019).

Right across New Zealand, local government needs to address infrastructure deficits after decades of under-investment. Planning to address this deficit will not be easy, or cheap, but is critical to aiding growth and fixing New Zealand's housing issues (Infometrics, 2019).

6.1 Transport

Transport is key both for getting goods to market and for social connectivity. The following subsections look at the road, rail, port and air transport infrastructure which service Northland. In all, this section finds Kaipara and Northland has poor connectivity via land transport (road and rail), strong opportunities to utilise international and coastal shipping via Northport and limited use of air travel.

6.1.1 Road

The road network is the primary means of travel for both passengers and freight in Northland. Northland's roads are of two kinds; state highways and local roads. State highways provide the major connections between New Zealand's districts and regions. State highways are managed and funded directly by central government through the NZ Transport Agency (NZTA). Local roads provide for local connections within districts and link to the state highway network. Local roads are administered by local territorial authorities and funded through rates with a subsidy from NZTA's Land Transport Fund. Northland is unique among New Zealand's regions in that its local authorities have come together, with support from NZTA, to form the Northland Transportation Alliance (NTA), an organisation which is jointly responsible for managing the region's roads. This allows a more holistic approach to regional transport planning.

The Kaipara district has 1,572km of local roads of which 71% or 1,119kms are unsealed and 450kms are sealed. Given its small population and the large geographic extent of the district, Kaipara finds it challenging to fund the maintenance and particularly the upgrading of this extensive roading network. The consequence of this is a limited level of service, particularly on lightly trafficked rural roads.

The key state highway linkage between Auckland and Northland is the section of State Highway 1 from the start of the Auckland motorway network at Pūhoi to the intersection with Maunu Road in Whāngārei (NZTA, 2018). This section of State Highway 1 is Northland's key route carrying 10,000 to 20,000 vehicles per day in some areas of the highway near Whāngārei. This route is supported south of Wellsford by State Highway 16, providing a higher level of network resilience at this southern end. However, few alternative routes exist between Wellsford and Whāngārei, resulting in lower resilience. Where alternative routes do exist, they are often not constructed to cope with the increased traffic in the event that a detour is put in place. This is particularly true of Cove Road between Mangawhai and Waipu and the Paparoa-Oakleigh Road which are commonly used as detours when incidents occur in the Brynderwyn Hills (NZTA, 2018).

Key points of low resilience between Whāngārei and Auckland include the Dome Valley and Brynderwyn Hills, both of which are high crash areas and restricted to 80kms per hour as well as being prone to natural hazards such as slips (NZTA, 2018). A bypass route through the Dome Valley is being planned, however there are currently no plans to bypass the Brynderwyn Hills (AECOM, 2019).

From Whāngārei, State Highway 1 continues to the Far North, Kaitaia and Cape Reinga.

State Highway 12, from Brynderwyn to the Hokianga and Kaikohe via Dargaville, is the key route linking most of the Kaipara district to State Highway 1 and Auckland beyond. In addition, State Highway 14 provides a key east to west link between Dargaville and Whāngārei.

State Highway 15 between Kaikohe and Northport is Northland's key inland freight route and runs via the Mangakahia and Otaika Valleys. The route is key for freight traffic (particularly logging traffic) moving from the Mid-North and Far-North to Northport and experiences a high level of heavy vehicle traffic. The intersection of State Highway 15 and State Highway 1 at the mouth of the Otaika Valley is currently being upgraded to cope with the increasing freight volumes going to the port. In addition, the government has recently announced that it will spend $692 million upgrading the section of State Highway 1 between Whangarei and Northport to four lanes. This section of State Highway 1 also connects State Highway 15 to Northport and is subject to high traffic volumes.

In addition to carrying freight and providing connectivity for the traveling public, Northland's state highway network is also essential for tourism in the region, allowing visitors to access the region's attractions. Northland's state highways form the basis of the Twin Coast Discovery Highway touring route which leads visitors around Northland's key attractions. This route, and Northland's wider state highway network is shown in Figure 62.

Figure 62: Route of Northland's Twin Coast Discovery Highway. Note that the route includes a number of "Byways", alternative tourist drives which can be included or excluded to tailor the trip to individual interests (Northland Inc. 2019).

The construction and maintenance of roads in Northland faces a number of challenges (NZTA, 2018). The region's challenging topography (particularly between Whāngārei and Auckland), problematic geology and high impact seasonal rainfall present particular challenges for the maintenance and operation of the road network (NZTA, 2018).

Slope instability is a common problem along much of Northland's road network, resulting in random slips, debris and drop-outs (NZTA, 2018). Small slips can often be cleared quickly, but under-slips/dropouts (which undermine the road) and larger slips can be much more complex to fix (NZTA, 2018). Northland's hilly typography also results in tight terrain and narrow alignments. This combined with heavy vehicle crash involvement, can delay re-opening of routes as specialised equipment may be required to remove crash debris, particularly through the Brynderwyn Hills. Many sections of Northland's roads are also exposed to weather events, particularly flooding (NZTA, 2018).

In addition, roading aggregates available locally in Northland are of a lower quality than available elsewhere in the country. This means they degrade quicker, particularly when exposed to high levels of heavy vehicle traffic, resulting in more frequent repairs. Given the above challenges, undertaking renewals and improvements while at the same time keeping the corridor open and available to users presents an ongoing challenge to roading engineers; especially on the high-volume sections of the network (ARUP, 2018; NZTA, 2018).

Because of these roading challenges, Northland, despite its proximity, is poorly connected to Auckland and the upper North Island (AECOM, 2019). Northland's key connections are lengthy, have higher safety risks and provide less reliable journey times (ARUP, 2018). These poor connections include the condition of the strategic intra-regional and inter-regional highway connections, as well as the ability of passenger and freight vehicles to move through the increasingly congested Auckland network. This poor and worsening connectivity is having a negative impact on access for Northland goods to international markets. These connections are also getting less reliable, more time consuming and more expensive to use as Auckland (and its congestion) grows (AECOM, 2019; ARUP, 2018).

This is concerning as the amount of freight being moved on Northland's roads is increasing (AECOM, 2019). Northport is now the second largest sea port in New Zealand by tonnage and, in the absence of a rail connection, is wholly dependent on the road network for its land transport needs (NZTA, 2018). The total freight task generated in Northland in 2012 was estimated at 16,900,000 tonnes by the National Freight Demand Study (2014). Since then, this has seen an 1.1% annual average growth to bring the 2018 freight task generated by Northland to approximately 18,000,000 tonnes per annum, approximately 98.6% of which travels by road. By 2042 the region's freight is forecast to grow to 23.2 million tonnes, with indications it could grow even faster (AECOM, 2019).

It is widely considered that improved transport connections with Auckland would assist in bolstering the Northland Economy (AECOM, 2019; NZTA, 2018). Northland's relatively low population density and geographic remoteness have constrained growth of its place-based economy. The Tai Tokerau Northland Economic Action Plan (Northland Inc., 2016) identifies the opening up of transport corridors, especially with better connectivity to Auckland, as a key opportunity to the region realising its full economic potential (NZTA, 2018).

To address this poor connectivity and safety concerns, significant planning and investment in recent years has focused on road and highway investment in Northland (AECOM, 2019). For example, the 2015–18 National Land Transport Programme Northland forecast $460 million investment for Northland roads, walking and cycling; including some $31 million for road maintenance and operations (AECOM, 2019).

Investment has generally been focused on better connecting the Auckland metropolitan area to the high-growth areas immediately to the north (AECOM, 2019). In particular, the Pūhoi to Warkworth four-lane 18.5km highway is under construction. This significant investment is located in the Auckland Region and will improve the commutability of Warkworth and its surrounds with Auckland, while also improving travel between Auckland and Northland generally (NZTA, 2018).

At a local level, the Government, through the PGF, have granted $21.0 million to assist Kaipara District Council with upgrading its roads. This includes upgrading bridges to accommodate newer heavier trucks (known as 50max or high productivity motor vehicles), improving unsealed roads and sealing currently unsealed sections of Pouto Road. These upgrades are anticipated to improve connectivity within the district, particularly to rural areas such as Pouto.

6.1.2 Rail

Northland is connected to the rest of New Zealand by rail via the North Auckland Line (NAL). The NAL begins in Westfield in Auckland and makes its way north to Whāngārei before continuing to Otiria in the Far North. In addition, the Dargaville branch links Dargaville to the NAL at Waiotira and an isolated section of railway links Kawakawa to Opua in the Bay of Islands. There is also a proposal to build a spur line to Northport at Marsden Point. These lines are shown in Figure 63 together with the state highway network. Collectively, the rail and state highway network form the region's core land transport network.

Figure 63: Northland's railway and state highway network; note this map includes all existing rail lines, including those which are currently unused or used only for tourism (AECOM, 2019).

However, not all of Northland's railways are currently operating. Services on the Dargaville branch were suspended in October 2014 due to poor track conditions and low freight volumes. The line is now used by Dargaville Rail and River for a rail tourism business. Furthermore, the NAL now only operates between Auckland and Fonterra's dairy factory at Kauri (just north of Whāngārei). The remainder of the line to the Far North is currently unused, however the government has recently announced it will reopen the line north of Kauri and build a container terminal and road-rail interchange at Otiria. Services to the Far North are therefore anticipated to be restored and enhanced soon. The isolated section of railway between Kawakawa and Opua operates as the Bay of Islands Vintage Railway.

A report released by the Ministry of Transport revealed Northland's rail system is currently not fit-for-purpose to meet today's requirements for moving people or freight and has been maintained in a state of 'managed decline' for some years (AECOM, 2019). The network is no longer port-connected since Whāngārei's port was decommissioned and operations moved to Marsden Point. As one of New Zealand's few regional ports without a rail connection, rail freight volumes in Northland fell substantially with over a million tonnes of freight moving to road transport. Compounding the decline in volumes, the line was under-maintained and saw no substantial investment for over fifty years (AECOM, 2019).

This 'managed decline' meant that businesses no longer saw rail as a feasible way of moving freight to, from or within Northland (AECOM, 2019). Consequently, just over 110,000 tonnes of freight is currently moved on the NAL, with the majority of this being processed dairy volumes from Northland, along with logs from northern Auckland (AECOM, 2019). This is just 1.4% of Northland's total freight (AECOM, 2019).

As such, the region is almost completely dependent on road transport for moving freight (AECOM, 2019). The result of this has been an increase in heavy truck movements on the main State highway corridors within Northland, and to/from Auckland (AECOM, 2019).

Given its condition, the Ministry of Transport considered it likely that rail service within Northland would cease all together without a substantial investment commitment within the next five years (AECOM, 2019).

Since these findings were released, the Government, announced it would invest $94.8 million from the PGF to maintain and improve the NAL between Swanson and Whāngārei (New Zealand First, 2019). The funding will see about 54km of the 181km track replaced or upgraded; tens of thousands of sleepers replaced, tens of thousands of cubic metres of ballast added; ageing bridges replaced; overdue maintenance work on tunnels carried out; ditches cleared and embankments stabilised (New Zealand First, 2019). Further funds have since been allocated to this project to also include a programme of works that will see tunnel heights increased to allow the movement of high-cube containers to and from Auckland. Previously, the restricted heights of the tunnels meant Northland's exporters could not use rail to move modern high-cube containers to and from Auckland (AECOM, 2019).

While this funding will help to lift train speeds and assist with moving more freight to rail; to meet the needs of freight customers in Northland and the Upper North Island, the NAL will need to be connected to Northport via a spur line to Marsden Point (AECOM, 2019). Designation (DNZRC 2) for the Oakleigh to Marsden Point Line was approved following the relocation of the port, and the Government has recently announced it will spend $40 million purchasing the land needed for the proposed line. There is however still no commitment to begin construction of the new line. Without being connected to the port, Northland's railways are unlikely to play a significant role in moving the region's freight (AECOM, 2019).

6.1.3 Ports

The Northland region is serviced by Northport at Marsden Point. This is a natural deep-water port with flexible facilities capable of handling large multipurpose vessels (NZTA, 2018). In addition, New Zealand's only oil refinery, Refining NZ, has its own wharves adjacent to Northport where it

receives shipments of crude oil and exports refined petroleum products. As New Zealand's northern most port, Northport is the closest port to New Zealand's international markets.

Northport occupies 49ha with an additional 180ha of commercially zoned land for port use outside the Northport boundary (New Zealand Government, 2019A). This allows ample room for expansion and opportunities for other industries to establish alongside the port. Northport exported approximately 3,250,000 revenue tonnes in the year ended June 2018. Northport's exports are mostly logs (approximately 85% in the year ended June 2018). The remaining exports were made up of woodchip, laminated veneer lumbar, sawn lumber, veneer, triboard, kiwifruit and steel (New Zealand Government, 2019A).

Northport's import volumes are much lower than its export volumes, at 311,000 tonnes in the year ending June 2018. In this period, Northport's imports were made up of palm kernel (46%), coal (24%), gypsum (17%), distillers dried grain (7%) and fertiliser (5%).

Northport is a key port servicing the Upper North Island, together with the other Upper North Island ports of Auckland and Tauranga. The upper North Island ports are critical to the New Zealand freight task. Together they account for approximately half of New Zealand's total export volume and two-thirds of its import volume (in tonnes) (New Zealand Government, 2019A).

Ports of Auckland is New Zealand's second largest container port, after Port of Tauranga. Together Port of Tauranga and Ports of Auckland handle 62% of New Zealand's total Twenty-foot Equivalent Units (TEU). This includes the handling of both full and empty containers (New Zealand Government, 2019A).

Ports of Auckland, being located in Auckland City, is significant for imports due to the population that it serves however its export volumes are low at approximately 6% of New Zealand's total exports in the year ended June 2018 (New Zealand Government, 2019A).

Ports of Auckland occupies 77ha on the Auckland waterfront. Its current location is generating concerns over social licence and is prompting public debate about whether there are better alternative uses for this land. This built-up inner city location also constrains the port's ability to expand (New Zealand Government, 2019A).

Port of Tauranga is New Zealand's largest container port, is New Zealand's largest container exporter (approximately 40% of total export TEU) and handles the highest volume of all New Zealand ports in tonnes (New Zealand Government, 2019A). Port of Tauranga accounted for 35% of New Zealand's total export volume in the year ended June 2018. In addition to containers, Port of Tauranga handles bulk goods such as logs. Approximately 55% of Port of Tauranga's exports are of wood and paper products, the majority of which is logs. Dairy is another key export for Port of Tauranga, accounting for approximately 12% of its exports (New Zealand Government, 2019A). Figure 64 below compares the different exports and imports of key New Zealand ports, including the Upper North Island Ports.

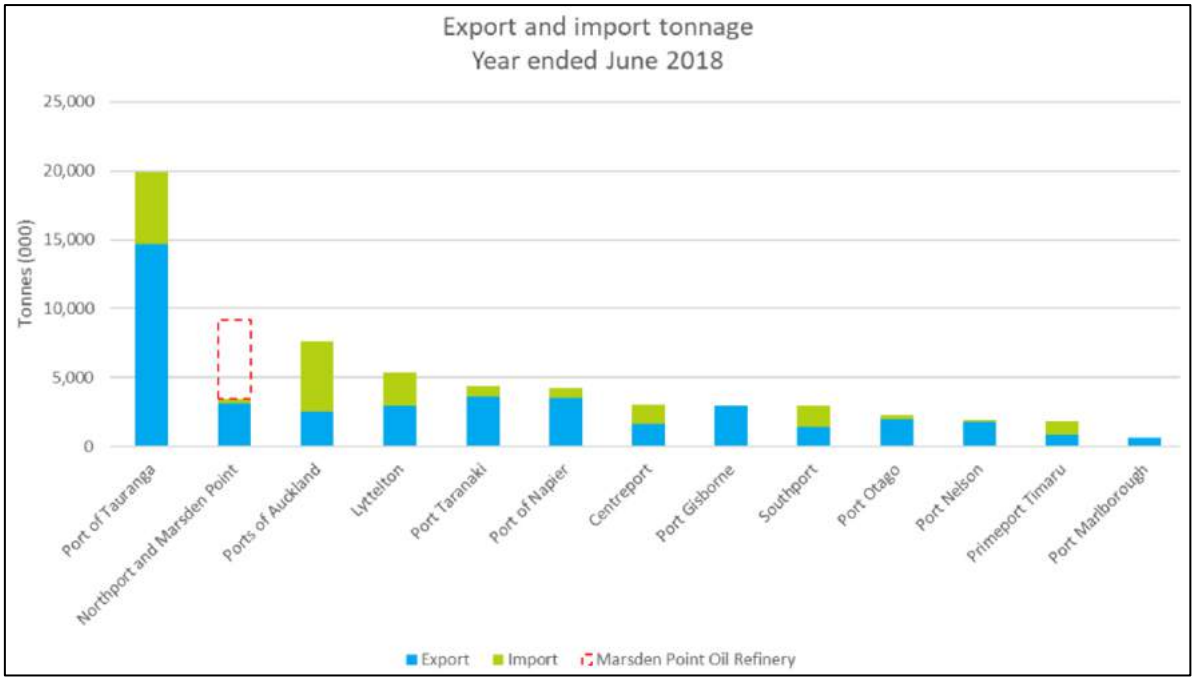


Figure 64: Comparison of export and import tonnage through New Zealand's key ports for the year ended June 2018. Note: the graph includes the 5,425,000 tonnes of import and 271,000 tonnes of export fuel oil products through Marsden Point Oil Refinery as a red dotted line (New Zealand Government, 2019A).

Due to the growth of New Zealand's international trade, much of which is managed within Auckland, and Ports of Auckland's constrained ability to expand, it has been suggested that Northport has the medium-term potential to function not just as Northland's main regional port, but also as a port that supports a portion of the trade to and from Auckland (AECOM, 2019). With its planned and proposed developments (including investing in cranes), Northport estimates it could potentially have the capacity to handle up to 400,000 (TEUs) containers a year, about the same as the Port of Lyttelton (AECOM, 2019).

However, if Northport is to increase its freight handling in this way, the Port will require a rail link (AECOM, 2019). In the year ended June 2018, there were 144,827 single truck movements to Northport, already placing considerable pressure on Northland's roads (New Zealand Government, 2019A). A rail connection from Marsden Point to Auckland would therefore be a critical pre-condition of Northport becoming an inter-regional container port (AECOM, 2019).

Given the growth of Auckland and the Upper North Island and the increasing constraints on Ports of Auckland, the New Zealand Cabinet has asked the Upper North Island Supply Chain Strategy Working Group (the Working Group) to undertake a comprehensive review of New Zealand's freight and logistics sector for the Upper North Island, including ports. This review will guide the development and delivery of a strategy for the Upper North Island to ensure the supply chain is fit for purpose in the long-term (New Zealand Government, 2019B).

The Working Group's final report is due by the end of 2019. To date, the Working Group's interim reports have concluded that the preferred option is the managed closure of the Ports of Auckland's freight operations, Northport developing to capacity equivalent to the Ports of Auckland, including appropriate levels of landside infrastructure and capacity to grow as levels of freight increase, while the Port of Tauranga continues its planned development. This scenario would also include development of a

rejuvenated North Auckland rail line and rail spur to Northport and a new inland freight hub in the Northwest of Auckland complementing Metroport in the South (New Zealand Government, 2019B).

If this shift were to eventuate, Northport would emerge as one of two strategic ports (together with Tauranga) servicing the Auckland and Upper North Island area. This would result in a high level of economic development for Northland, and would attract existing Auckland industry and businesses to relocate to Northland (AECOM, 2019). This in turn would have a high impact on the already fast growing areas of Waipu, Mangawhai, Kaiwaka and Maungaturoto.

6.1.4 Air

Northland is serviced by three commercial airports, none of which are in Kaipara.

Whāngārei Airport is located in the suburb of Onerahi, a 10 minute drive from the Whāngārei city centre. It is jointly owned by the Ministry of Transport and Whāngārei District Council and managed by Northland Aviation (Whāngārei District Council, 2019).

The airport is currently certified to take aircraft of around 50 seat capacity. Apart from the services provided by air line operators, the airport also caters to many recreational users.

Issues associated with Civil Aviation rules, runway length, and significant costs for extending the existing runway, mean the current airport has a life-span of only 10 to 15 years. Whāngārei District Council is currently considering options for where a new Whāngārei airport could be located.

Bay of Islands Airport is a 10 minute drive from Kerikeri and is connected to Auckland Airport by regularly scheduled passenger flights. The Bay of Islands Airport has recently been upgraded with a new $4.75 million terminal which opened to passengers in June 2019.

By comparison, Kaitaia Airport is small, with limited passenger facilities and is typically only staffed 30 minutes before each scheduled flight. That said, the airport is serviced by a daily flight to Auckland Airport operated by Barrier Air.

Auckland Airport is the closest international airport to Northland. In addition to receiving passengers from overseas and acting as a hub for domestic flights, it should also be mentioned that Auckland Airport is used to export high value and time critical exports from Northland, such as cut flowers (NZTA, 2018).

While Kaipara does not have any airports, it does have a number of airfields, the largest of which is located in Dargaville and operated by the Dargaville Aero Club. Dargaville Airfield has a 1,000m runway paved in rolled limestone and a second 931m runway that is maintained in grass. Dargaville Airfield has refuelling facilities and regularly receives recreational flights from around New Zealand, particularly on weekends.

6.2 Electricity

In 2017, 82% of New Zealand's electricity came from renewable sources (MBIE, 2018). New Zealand's renewable electricity percentage in 2017 was the third highest in the OECD behind Iceland and Norway (MBIE, 2018).

Hydro generation typically provides 55% to 60% of New Zealand's electricity supply (MBIE, 2018). However, New Zealand is unlikely to be able to develop additional largescale hydroelectricity supply due

largely to a lack of social license for construction of new dams. There may still be opportunities for construction of smaller hydroelectricity schemes.

In 2018, electricity generation from geothermal accounted for just under 20% of New Zealand's total electricity supply (MBIE, 2018). Most of New Zealand's installed geothermal generation (about 1,035 MW) is situated in the Taupo Volcanic Zone, and another 25MW is installed at Ngawha in Northland. Geothermal capacity is increasing with capacity at Ngawha increasing from 25MW to 53MW in 2021 (MBIE, 2018).

Wind power is also making a significant contribution (MBIE, 2018). In 2017 there were 17 wind farms operating in New Zealand, comprised of 490 turbines with a total capacity of 690MW (MBIE, 2018). 2017 was not a great year for wind generation. While wind provided over 5% (2,178GWh) of electricity supply in 2017, this was down 5% on the 2016 level and down 7% on the 2015 level. Generation from wind farms is dependent on the amount of wind and that can vary day to day and year to year (MBIE, 2018).

Solar (photovoltaic cells) remain a small contributor to New Zealand's electricity generation providing less than 0.2% of total electricity (MBIE, 2018). However, this does not consider the amount of electricity saved by solar water heating panels and passive heating by orientating homes towards the sun, the value of which should not be understated (MBIE, 2018). Photovoltaic cells are becoming increasingly popular for individual household use but are unlikely to contribute greatly to New Zealand's total electricity demands.

Due to the intermittent and sometimes unreliable nature of most renewable electricity sources (other than geothermal) the fossil fuel burning Huntly Power Station is used to provide baseload, back-up, and peak supply electricity (i.e. New Zealand uses renewable sources of electricity production first, resorting to fossil fuels when there is insufficient water stored in hydro dams, the wind is not blowing enough, etc.). This highlights the value of geothermal power generation as it is a renewable source and not dependent on the weather. The growth in geothermal baseload generation has already resulted in the replacement of some fossil fuel baseload generation. Furthermore, Genesis Energy announced in early 2018 that it would stop using coal at its Huntly Power Station by 2030, with coal not being used in normal market conditions from 2025 onwards. The plant can instead be fired by natural gas which has a lower carbon footprint (MBIE, 2018).

In terms of local generation, there are two power stations connected directly to the local distribution network which supplies power to the Kaipara and Whāngārei districts. These are Northpower's 5MW Wairua hydro power station and Trustpower's 9MW diesel powered peaking plant. In addition, as at December 2017 there were approximately 649 small privately owned solar photovoltaic generators (average installed capacity 3.7kW) connected to the local network (Northpower, 2018).

Whether if it comes from local or national sources, additional electricity generation will be needed to meet New Zealand's demands. Electricity demand is expected to grow in the future as end-uses that have historically been met by the combustion of fuel are met with electricity (MBIE, 2018). Known as "electrification", this is already being witnessed in the transport sector with increased uptake of electric vehicles (EVs). As at December 2017 there were 6,209 EVs registered in New Zealand, up from 2,550

in December 2016. Furthermore, a number of industrial companies that currently use fossil fuels for process heat have announced their plans to switch to electricity (MBIE, 2018).

Once generated, electricity is moved around the country via the "national grid" (the high voltage transmission network connecting areas of generation with towns and cities across New Zealand), before being distributed to households and businesses via the local distribution lines.

Transpower is the state-owned enterprise that operates the national grid, which conveys electricity from most of the major power stations around the country to local distribution lines. It also conveys electricity directly to some major industrial users (MBIE, 2018).

The distribution of electricity from the national grid to individual homes and communities is undertaken by Northpower in the Whāngārei and Kaipara districts and Top Energy in the Far North. These local distributers operate and maintain the local distribution networks. Northpower's electricity distribution network includes 6,380km of overhead lines and underground cables, including 3,700km of high voltage lines and cables (Northpower, 2018).

Northpower takes electricity from the national grid at three substations; Bream Bay, Maungatapere and Maungaturoto, referred to as "grid exit points" as well as from the Wairua hydro power station and Trustpower's diesel peaking plant as mentioned previously (Northpower, 2018). It then distributes this power to smaller "zone substations" via its "sub-transmission network" before redistributing it to customers, via a network of smaller local power lines. Northpower's sub-transmission network is shown schematically in Figure 65, it comprises regional substations and zone substations interconnected by 110kV, 50kV and 33kV lines and cables (Northpower, 2018).

A key feature of the sub-transmission network is a 33kV ring between Maungatapere and Kensington regional stations, which allows load to be transferred between the 110/33kV transformer banks at these stations (Northpower, 2018).

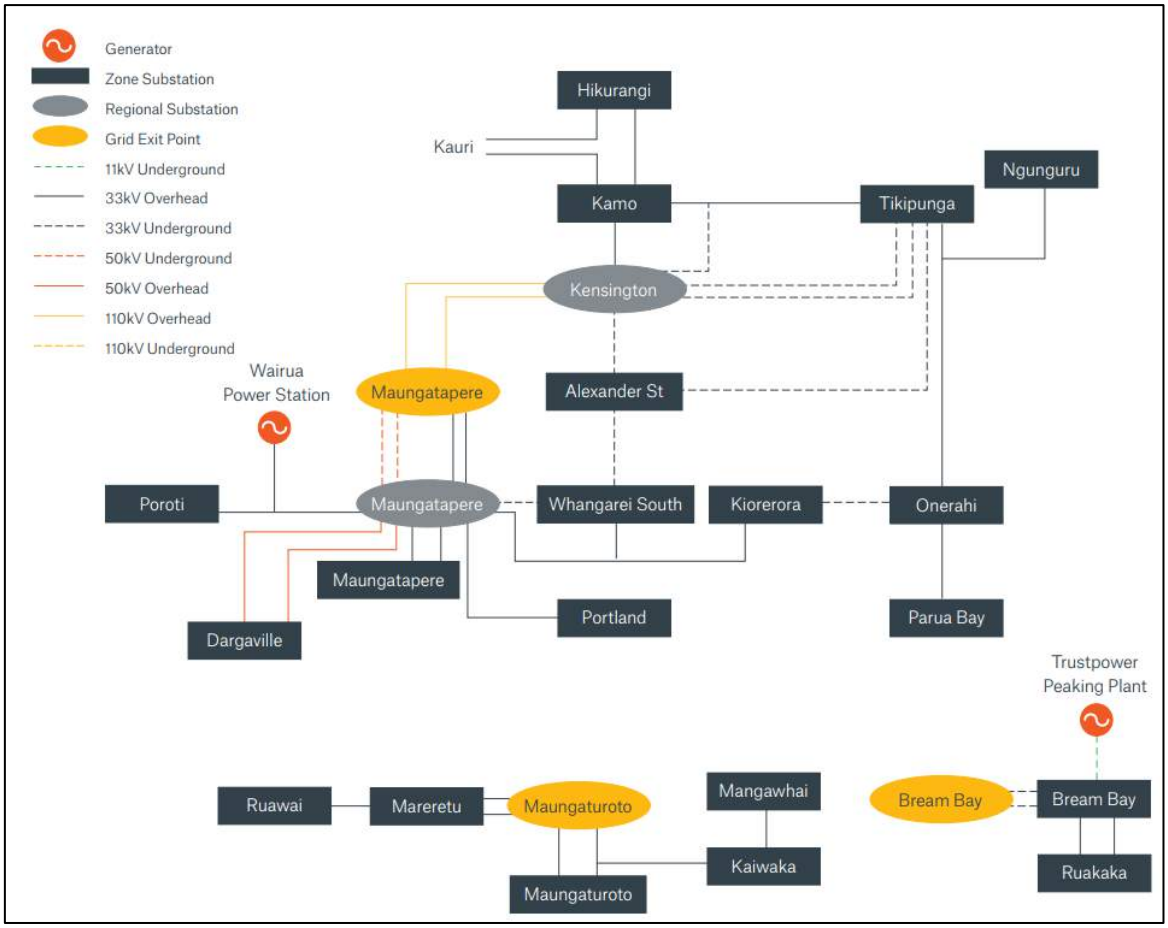


Figure 65: Northpower sub-transmission network (Northpower, 2018).

Figure 66 shows the Northpower distribution area and geographic location of zone substations (Northpower, 2018). Most remote zone substations are fed by a single 33kV line with reasonable back-feeding capability on the 11kV network. Where back-feeding capacity is not adequate, mobile generation is used for voltage support and Northpower own a 500kVA purpose designed mobile generating system (including transformer) for this purpose (Northpower, 2018).

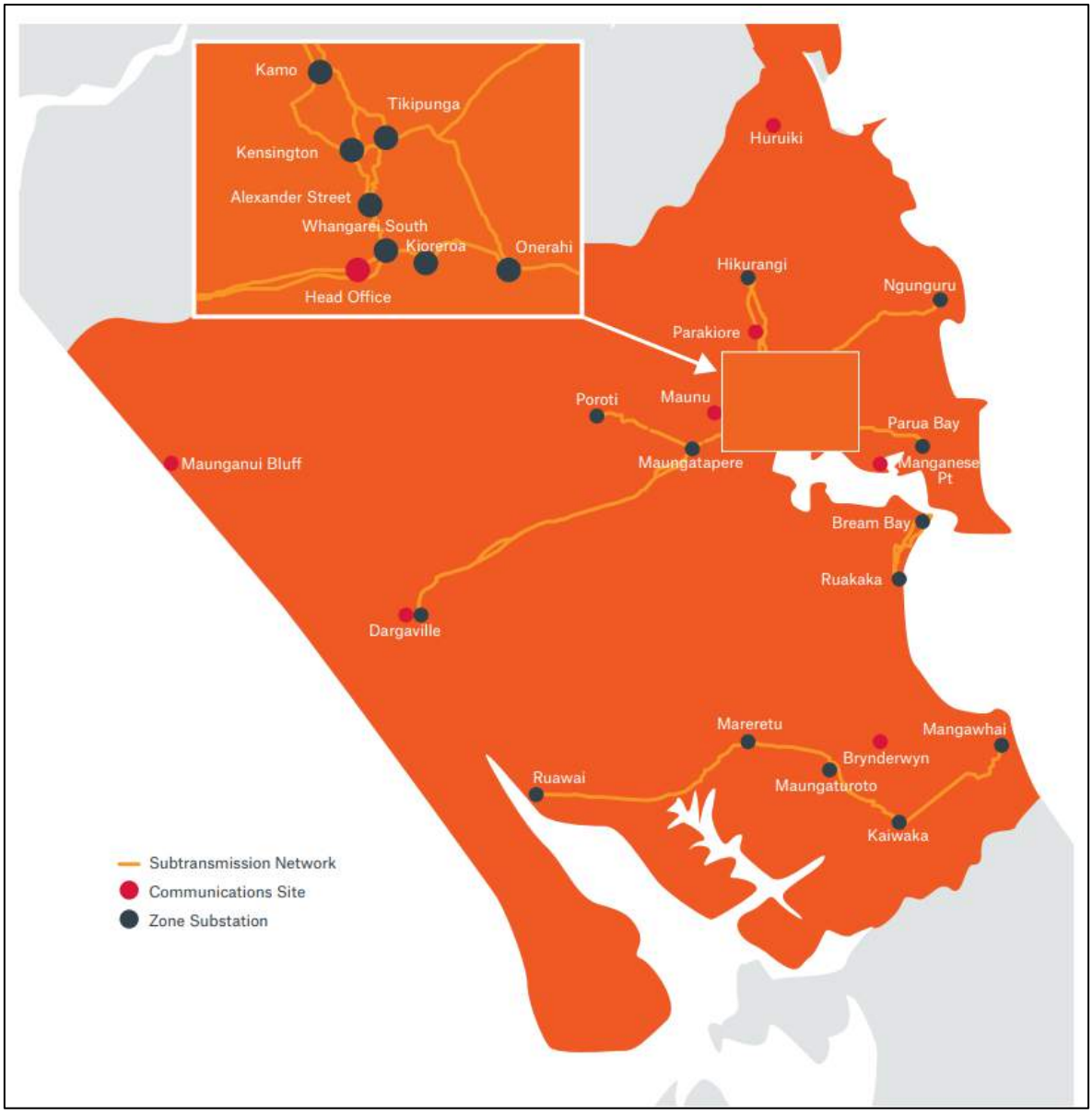


Figure 66: Northpower sub-transmission network, site locations (Northpower, 2018).

With the exception of a number of large customers supplied directly at 33kV, electricity is distributed to customers via 94 high voltage (11kV) feeders emanating from the zone substations (Northpower, 2018). Some customers are supplied directly at 11kV but the majority are supplied via 11,000/415V distribution transformers (either pole or ground mounted) (Northpower, 2018).

The Northpower low voltage (LV) network is a mix of overhead and underground circuits operating at 400/230V. The LV feeders distribute power from distribution transformers (connected to the 11kV network) to customers' service lines. In most cases this will be from poles or pillars near property boundaries (Northpower, 2018).

Over the past few years, Northpower's network has absorbed increases in connections and in demand (Northpower, 2018). The network peak demand forecast (Figure 67) shows continuing linear growth at a rate of approximately 1.5% per annum. The steady increase is driven largely by residential growth into areas around Whāngārei and there is an expected increase in 2022 due to expansion of operations at the Marsden Point oil refinery (Northpower, 2018).

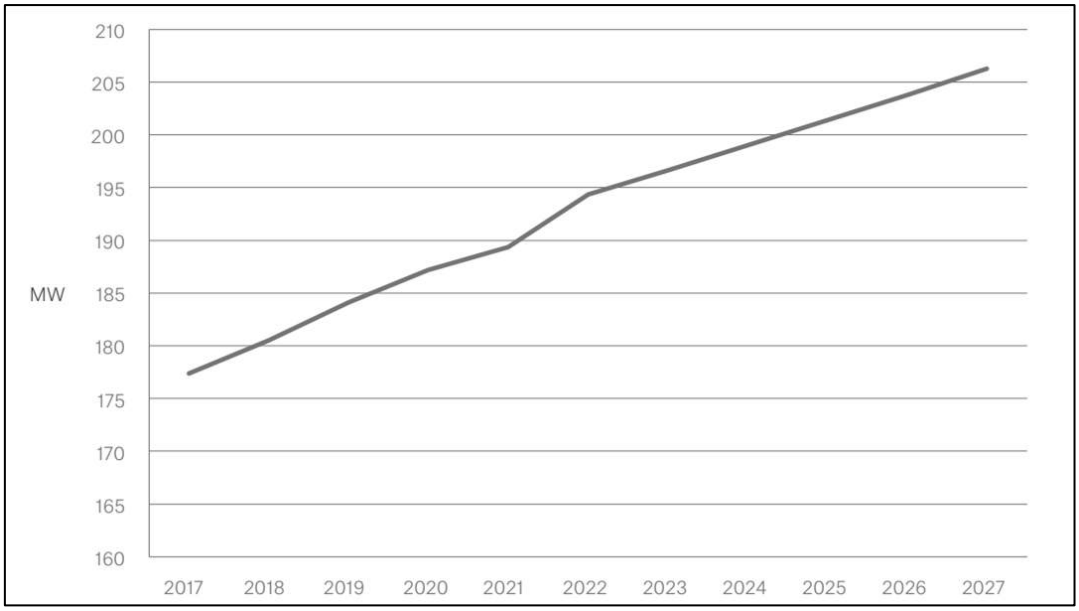


Figure 67: Northpower ten-year network load forecast 2017-2027 (peak demand) (Northpower, 2018).

Catering for this ongoing growth is a critical element of Northpower's role in supporting growth in the Northland region (Northpower, 2018). The network is now at a point where there is a need to lift investment to ensure an ongoing secure supply, including the need to build three new zone substations and maintain security through construction of new trunk feeders (Northpower, 2018). The cost of these upgrades will need to be passed on to consumers.

The weighted average domestic electricity price in Northland was 36.4c/kW in August 2019 (NRC, 2019). This is a 0.3c/kW fall since May 2019 but 2.3% higher than in August 2018. During the past five years, the average domestic electricity price in Northland has risen by 2.9% per annum. This is twice as fast as the national annual average increase of 1.4%. Assuming 7,100kW of power is used by a household per year, this price equates to an annual household power bill of $2,587. This is 21% higher than the national average of $2,144, equivalent to an additional $8.52 per week (NRC, 2019).

6.3 Telecommunications

Northland has historically had poor telecommunications infrastructure with limited broadband coverage and extensive areas of mobile phone 'black spots' (areas with no mobile phone reception). This has particularly plagued areas along Kaipara's west coast including Pouto, Ripiro Beach and adjoining settlements, and the Kai Iwi Lakes. This is because rural and remote areas are generally more expensive for commercial telecommunication network providers to serve than cities and suburban areas due to difficult terrain, geographical isolation and low population/customer densities (Crown Infrastructure Partners, 2019).

To address this infrastructure short fall, central government through Crown Infrastructure Partners has partnered with the private sector to build additional cell phone towers in rural areas, thereby reducing mobile phone black spots and extending access to mobile broadband. Importantly, all three New Zealand mobile operators (2degrees, Spark and Vodafone) have services available from these new, government-funded towers. This allows locals, tourists and the travelling public to have reception in areas serviced by these towers, regardless of which company they are with (Crown Infrastructure

Partners, 2019). The towers themselves are being constructed, maintained and operated by the Rural Connectivity Group, an independent entity established to be the infrastructure provider for this new open access network (Rural Connectivity Group, 2019).

The Rural Connectivity Group, through completion of the Mobile Black Spot Fund programme and Rural Broadband Initiative, will make enhanced broadband available to approximately 99.8% of New Zealand's population, improve mobile coverage to ~1,400km of State Highways and ~168 tourism sites nationwide (Crown Infrastructure Partners, 2019). There will also be increased broadband availability to 271 Marae. This work is scheduled to be completed in 2023 (Crown Infrastructure Partners, 2019).

Improving mobile phone coverage in these rural areas is not only important for business opportunities, tourism and social connectedness but also for safety, allowing persons in distress to contact emergency services when needed.

The Government has also been contributing funds to the expansion of fibre-optic infrastructure to facilitate ultra-fast broadband (UFB) access in the regions (Northpower, 2019). Whāngārei's UFB network was completed in May 2014 by Northpower Fibre and now has one of the highest uptake levels among New Zealand UFB networks with more than 22,700 end users now able to connect (Northpower, 2019).

The Government has since chosen Northpower Fibre to build UFB fibre networks in 12 more towns throughout the Kaipara and Whāngārei districts between April 2017 and the end of 2021 (Northpower, 2019). This will make another 9,000 Northlanders able to connect. Fibre optic broadband infrastructure has now been installed in Dargaville and areas of Mangawhai and Hakaru. The service is presently being expanded with Mangawhai, Mangawhai-Kaiwaka Road, Kaiwaka, Maungaturoto, Paparoa and Ruawai all being identified as present new build areas (Northpower, 2019).

In light of the above it can be concluded that, while Northland's telecommunications continue to have their limitations, they are steadily improving with black spots decreasing and broadband coverage increasing.

Finally, no review of Kaipara's telecommunications infrastructure would be complete without mentioning the Hawaiki submarine cable which comes ashore at its Mangawhai landing station. This is a new fibre-optic cable linking Australia, New Zealand, American Samoa, Hawaii and the United States West Coast, with branching units in place to further connect the Pacific Islands of New Caledonia, Fiji and Tonga (Hawaiki, 2019). It is presently the largest and fastest telecommunications link between Australasia and the United States (Hawaiki, 2019).

Commercial operations started in July 2018, with a guaranteed design life of 25 years, meaning the cable will be in service until at least 2043. The cable is carrier-neutral and independently owned, with capacity to double New Zealand's international communications capacity (Northland Inc., 2019).

Having both the Hawaiki submarine cable landing station and local UFB network infrastructure in Mangawhai creates opportunities for digital industries to establish in this fast growing urban area.

6.4 Water

Kaipara District Council is instrumental in the delivery of four different kinds of water services in the district. These are; potable water (also called drinking water or municipal supply), wastewater (also known as sewage), stormwater and land drainage. These services ensure people have access to clean, safe water for cooking and washing, provide for sanitation and prevent flooding. The following sections look at the state of this key infrastructure around the district.

6.4.1 Potable water

Council operates community water supply schemes in the Dargaville (including Baylys), Glinks Gully, Ruawai, Maungaturoto and Mangawhai communities. There are raw water supplies for agricultural purposes on the Kaihu (Dargaville) and Maungaturoto bulk water mains.

The assets associated with the five water supply schemes in Kaipara include:

- 15 water source points;
- 4 water treatment plants;
- 7 pump stations;
- 17 storage facilities;
- 175km of reticulated piping;
- 3,583 connections; and
- 3,828 points (fire hydrants, valves, meters).

Dargaville has approximately 108km of local distribution pipes comprised predominantly of concrete lined steel and asbestos cement pipes. The sizes range from less than 100mm to 300mm diameter and 54% are older than 50 years old.

The ***Baylys*** local distribution network consists of approximately 15.75km of polyethylene pipes.

The Dargaville water supply is used by both the Dargaville and Baylys communities. It services about 4,683 people with 2,782 connections to the system (most use water treated by the system but there are some connections to the raw water lines as well). There is a significant amount of deferred renewal work to be addressed in this scheme. Furthermore, the tendency of the main water source at Waiparataniwha Stream to dry up in droughts makes it hard to provide security of supply. Silver Fern Farms meat works is a significant employer in Dargaville and consumes on average 30% of the water supply annually (peak and off-season), security of supply is a very important issue for these production facilities in Dargaville.

Maungaturoto's local distribution network consists of approximately 35km of predominantly asbestos cement pipes. The sizes range from less than 100mm to 200mm diameter and 37% are older than 40 years old.

Maungaturoto water supply services approximately 895 people with 447 connections; 410 from the Township and 37 from the Railway Village. One of these connections is Fonterra's Maungaturoto Dairy Factory which uses the majority of the water from this scheme. Key issues are the age of the infrastructure, a backlog of deferred renewals and affordability.

Ruawai's local distribution network consists of approximately 6.7km of predominantly asbestos cement pipes. The sizes range from less than 100mm to 150mm diameter and 94% are older than 30 years old.

Ruawai's water supply system has 251 connections and services approximately 500 people. Much of Ruawai's water supply infrastructure is aged and renewals have commenced. Ruawai's relatively small population may make affordability challenging.

The ***Glinks Gully*** scheme supplies water to 85 properties. The scheme is old and in need of asset renewal work. While the scheme will continue to comply with its 'Take Consent', maintaining this ageing system for a small number of users may mean high costs.

Mangawhai has a small water scheme with only 18 connections. The scheme primarily provides potable water to Mangawhai Heads Campground, Wood Street shops and community housing. Maintaining water services for a small number of users means high costs with relatively little benefit for the wider community. Mangawhai is a relatively a new system, has an acceptable asset profile and is not an issue at this current stage.

By far the majority of Mangawhai, along with much of the district, are therefore dependent on private rainwater tanks and to a lesser extent bores for their potable water needs. This means many households must take responsibility for the provision and quality of their own water supplies.

Remaining compliant with drinking water standards represents a significant cost across all public potable water schemes in the district. There is the risk that drinking water standards will be raised in future and any raising of drinking water standards may be unaffordable for Kaipara. Current standards are already challenging though all of Kaipara district's treated drinking water systems are currently compliant.

The Northland District Health Board has submitted to Council that they would like to see Council increase the public water supply to more properties. Council has no plans to do this and in fact is not increasing connections at the periphery of towns because of supply and demand issues.

In particular, the tendency of Dargaville and Baylys' main water source at Waiparataniwha Stream (near Kaihu) to dry up in droughts makes it hard to provide security of supply to these communities and industries located in these communities (including Silver Fern Farm's Dargaville meat works which is a major local employer). There is a storage dam (located off Opanake Road) built for the Dargaville water supply, however this is not connected directly to the water supply network. The water is instead released into a stream which connects to the Kaihu River, from which Dargaville draws its water in dry periods. It is noted that this water is unlikely to make it to the Kaihu River in any significant volume to offset drought conditions. The cost of connecting this dam directly to the Dargaville system is around $4 million. There are no plans to build this connection in the short or medium term. This means that security of supply for Dargaville will require a different solution including demand management and conservation.

6.4.2 Wastewater

Council operates six community wastewater schemes in order to protect public health by providing Kaipara district with reliable wastewater service in a manner that minimises adverse effects on the

environment. These schemes service the communities of Dargaville, Glinks Gully, Kaiwaka, Maungaturoto, Te Kopuru and Mangawhai.

The assets that form Kaipara's wastewater systems include 6 treatment plants, 32 pump stations, 31km of rising mains, 107km of gravity lines, approximately 1,565 manholes and about 4,323 connections. The condition of Kaipara's wastewater assets is not well documented. There is a programme of data cleansing and condition assessments planned over the next three years. This has already begun for critical assets including those above ground. The least knowledge is in respect to underground assets. Known issues are:

- There are sections of the older schemes that have old asbestos cement pipes in poor condition;
- Dargaville has over 10,000m of pipes aged over 60 years; and
- Maungaturoto, Te Kopuru and Kaiwaka have most of their pipes aged over 30 years.

Dargaville is serviced by 40km of pipeline, 15 pump stations, 6km of rising main and a single treatment plant. Wastewater is collected from the urban area, apart from a section of the Beach Road industrial area that has onsite treatment. The wastewater system and pipelines are aged and there is a significant amount of deferred renewal work to be addressed.

Te Kopuru's wastewater treatment system and pipelines are also old and there is a backlog of renewal work to be undertaken. Te Kopuru's small population makes affordability a challenge. A full upgrade and replacement may hence be uneconomic and unaffordable under the current funding model. To its benefit, the township is built on a revetment above the Northern Wairoa River and the wastewater system uses the benefit of the elevation of the revetment to develop a reticulation network that discharges to the treatment plant without the need for pump stations or rising mains.

The wastewater scheme servicing ***Glinks Gully*** is designed to service a peak period population of 72 and the system connects to 18 septic tanks serving 24 houses located on private properties. The wastewater treatment system and pipelines are ageing and replacement work will be needed. The small population and small number of properties may make a full upgrade and replacement uneconomic.

Maungaturoto is serviced by 11km of gravity reticulation pipelines, 3 pump stations and 1.2km of rising main and a single treatment plant which was constructed in 1992. The system is ageing and there are deferred renewal works to be addressed.

Maungaturoto Station Village is serviced separately by a small scheme comprised of a series of septic tanks which discharge to a wetland that drains to a stream.

Kaiwaka's wastewater system consists of 4km of gravity pipeline, 71 manholes, 1 pump station and a single treatment plant. A significant upgrade to the treatment plant was constructed in 2019. Nonetheless, Kaiwaka's wastewater system is ageing and will need replacing.

Mangawhai's wastewater system is comparatively new, having been opened in 2010. This 'state of the art' collection, treatment and reuse system treats wastewater to a very high standard before irrigating it over a Council-owned farm. The Mangawhai wastewater treatment system currently has the capacity to cater for approximately 2,000 connections, at the current assumed growth rate of 70 connections per

year, the plant will reach its capacity around 2025-2028, this is a combination of modular systems within the plant itself and also the ability to discharge the treated water to land at the Browns Road farm.

Council is currently undergoing projects to increase capacity at the treatment plant and investigations into different disposal options to cater for the continued growth of Mangawhai and its urban area.

The biggest threat to Kaipara's wastewater systems is climate change, the majority of our treatment systems are located in areas at risk from sea level rise.

In addition, the historic failure to renew or repair our wastewater systems due to financial costs has created a large backlog of work to be completed and costs have only risen in subsequent years. While Dargaville has the biggest backlog, renewals will also be due in other schemes in 10 plus years, for some communities where populations are small funding these renewal programmes may be very difficult.

There is also the risk of unplanned sewage discharges from pump stations occurring during power failures. This creates environmental risk as overflows of raw sewage can go into waterways.

6.4.3 Stormwater

The five Council-operated community stormwater schemes in Baylys, Dargaville, Te Kopuru, Kaiwaka and Mangawhai protect the communities from localised surface flooding by removing stormwater, collecting contaminants and then discharging the stormwater in a manner that protects the environment and public health.

In addition, stormwater systems predominantly incorporated into the road network are provided in Glinks Gully, Kelly's Bay, Pahi, Whakapirau, Tinopai, Paparoa, Matakohe and Maungaturoto. There is also a Ruawai scheme that is operated under the Raupo Land Drainage scheme.

Baylys township is mainly serviced by a reticulated system consisting of a piped network with manholes and kerbside sumps discharging to the receiving environment. It is also at the lowest point of a large cultivated catchment which reaches back towards Baylys Basin Road. This has the ability to add a large amount of water runoff into the existing streams and flow paths causing scouring and other issues at the lowest point which is the Baylys Township. Many properties discharge to soakage and open drains. There is approximately 3.2km of stormwater pipeline in Baylys, and 10m of open drains, most pipes are 300mm in diameter and the predominant known pipe material is concrete.

Dargaville's urban area is serviced by a stormwater network containing 36km of piped and 35km of open drains, it is protected from river flooding by 66 floodgates and various stopbanks. A series of floodwalls were installed to protect low-lying areas in the southernmost part of Dargaville exposed to the Northern Wairoa and the Kaihu Rivers.

Te Kopuru's stormwater is primarily managed through the 4.7km of open drains associated with the roading network. There is also around 43m of stormwater pipeline in Te Kopuru.

Kaiwaka has approximately 1.65km of stormwater pipeline, and 262m of open drains. Most pipes are 300mm in diameter and the predominant known pipe material is Reinforced Concrete Rubber Ring Jointed (RCRRJ).

Mangawhai has approximately 24.8km of stormwater pipeline, and 7.3km of open drains. Most pipes are 300 or 525mm in diameter and the predominant known pipe material is RCRRJ.

6.4.4 Land drainage

Much of Kaipara's most productive land is located on the alluvial flood plains around the Northern Wairoa River and its tributaries. Protecting this land from inundation and flooding is achieved by a series of land drainage schemes consisting of drains, stopbanks and floodgates. The schemes were designed and built in the early to mid-1900's to a high standard for the time, as is demonstrated by their resilience to this day. Kaipara now has the second largest area of land protected by land drainage schemes in New Zealand (after the Hauraki plains).

Council does not operate but rather facilitates the operation and maintenance of 29 land drainage schemes within the Kaipara district. Governance of these schemes is via a number of drainage boards comprised of representatives from the landowners protected by each scheme, with support from Council. Funding is likewise provided by the beneficiaries of each scheme via a targeted rate which Council levies on the local drainage board's behalf. This means both the cost and governance of each scheme rests directly with those whose properties are protected by it.

In all, the 29 drainage schemes include 255.67km of drains (not counting adjoining private drains) and 123 floodgates. The largest of the land drainage schemes is Raupo which alone consists of 70km of tidally affected stopbanks, 52 floodgates, 137.6km of drains and canals and 1 pump. It should be noted that the drainage of individual paddocks is the responsibility of the property owner. Drainage network drains provide a connection to the drainage network only. Likewise, all floodgates located on the boundary between drainage board drains and private drainage are the responsibility of the property owner.

The greatest risk to all of the land drainage schemes within Kaipara is sea level rise and other impacts of climate change, including the possibility for more high intensity rainfall events. Currently, the schemes work by using stopbanks to prevent water from the river overflowing onto the land behind. Concurrently, rain falling on the land or flowing down from the catchment behind the stopbanks is channelled to the river via drains and released to the river at low tide via floodgates. These gates close as the tide rises to prevent water flowing back onto the land.

However, this system will no longer work if sea level rises to the extent predicted (1.5m higher than the 1986-2005 average over the next 100 years). The stopbanks already overtop in some places when a flood flow and a storm surge coincide with a king tide. Overtopping events will become more frequent and more destructive as sea level rise progresses. Heightening the stopbanks to the extent necessary to prepare for the projected sea level rise would require them to be re-engineered and would come at a considerable cost. Furthermore, as sea level rises, the period of time at which the tide is low enough to allow the floodgates to open and water to flow out of the drains will decrease, eventually resulting in the need to pump water over the stopbanks. This will result in both a capital cost as pumps are installed and an operational cost as the pumps draw power.

Responding to sea level rise is therefore a major challenge facing the Drainage Boards and is of critical importance to the wider district, with much of Kaipara's most productive land lying just above or just

below present sea level, together with a considerable length of State Highway 12, Pouto Road, Ruawai township and Dargaville's central business district.

The land drainage schemes represent a major investment by the community and are of vital importance to the district's economy and the quality of life of the district's residents. The community's expectation is that this investment in land drainage assets is secure and will be maintained into the future. However, the investment in land drainage is likely to need to increase dramatically if sea level rise is to be addressed.

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