Auckland's Spatial Plan

Evidence Base Meta-data Report

December 2010

Prepared by Research, Investigations and Monitoring Unit

Version 1
Dated 17 December 2010

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Introduction

Under the Local Government (Auckland) Amendment Act 2010 (Part Six), the Auckland Council must prepare and adopt a Spatial Plan for Auckland (referred to here as 'the Plan'). Under the Act, the central purpose of the Plan is:

> … to contribute to Auckland's social, economic, environmental, and cultural well-being through a comprehensive and effective long-term (20- to 30-year) strategy for Auckland's growth and development.

The Plan must:

- set a strategic direction for Auckland and its communities
- outline a development strategy
- enable coherent and co-ordinated decision making
- provide a basis for aligning the implementation plans, regulatory plans, and funding programmes of the Auckland Council.

Council is required to underpin the Plan with the provision of an 'evidential base' to support decision making for Auckland, including evidence of trends, opportunities, and constraints within Auckland.

Work is currently underway throughout the newly formed Auckland Council to develop the Plan, and the underlying evidence base. The Research, Investigations and Monitoring team has a central role in the development of the evidence base, as it is the centralised research body within Council.

This document is part of the evolving evidence base. It is a stand-alone document but can also be viewed as one element in a three-fold suite of information:

Part 1: Evidence Base Spider Map:
A graphic representation of the contemporary, long-term data that Auckland Council maintains or regularly accesses. The spider map presents key domains and variables only and does not (can not) show all data that Auckland Council has access to.

Part 2: Evidence Base Meta-data Report (this report):
Provides the background meta-data for each item listed on the Spider Map, and in some cases provides meta-data at more detailed sub-level.

Part 3: Evidence Base Bibliography:
A list of relevant Auckland-related technical reports, publications, and technical papers, spanning social, economic, and environmental domains.

Important notes regarding the information provided in this document

- This document presents meta-data. That is, it provides details on data sources and (where possible) clearly indicates any caveats or limits to the data or its use. Contents cover a range of data sets some created and held in-house, many that we purchase from external providers. In some cases the meta-data relates to composite indices or more specific indicators of change and progress.
- This is not an exhaustive list of all data and information that the Research, Investigations and Monitoring unit have access to as that would not be possible or practicable.
- The information provided in this report is subject to change. It is a 'living document' and will be updated regularly. Please note the date on the cover and ensure that you check with the Manager of Research, Investigations and Monitoring that you have the latest copy.

Auckland Council Evidence Base: Meta data

Work in progress
Last updated 17 December 2010

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Social, Cultural and Demographic Domain

Auckland Council Evidence Base

Domain Social, Cultural and Demographic

Socio-economic well-being

Genuine Progress Indicator

Data name:	Genuine Progress Indicator (GPI)
Definition:	The GPI is a measure of economic progress that takes into account social and environmental costs as well as the benefits of growth. Components in the Auckland region GPI include personal and public consumption, household and community work, crime, commuting, labour market costs, unemployment, loss/damage to terrestrial ecosystems, ozone depletion, loss of air quality, noise pollution and loss of soils and wetlands.
Relevance:	The GPI is a concept that is becoming increasingly popular world-wide as a measure of human welfare. Over the last decade the GPI has been promoted internationally as an alternative to the Gross Domestic Product.
Frequency:	Was prepared for Auckland in 2009 – to be updated in next 12-18 months.
Monitoring history:	The 2009 Auckland region GPI is the first regional GPI to be developed in New Zealand. As such, it is a blueprint.
Geographic coverage:	Auckland region.
Data source:	Prepared by Market Economics
Website:	http://monitorauckland.arc.govt.nz/our-economy/economic-performance/genuine-progress-indicator.cfm
Contact details:	Social and Economic Research Team
Limitations:	There are a number of outstanding theoretical, methodological and empirical issues with the Auckland region GPI which were beyond the scope of the current study, but which future work may address.

Auckland Council Evidence Base

Domain Social, Cultural and Demographic

Socio-economic well-being

NZ Deprivation Index

Data name:	NZ Deprivation Index
Definition:	The New Zealand Deprivation Index is a composite measure of relative socio-economic wellbeing. Areas are rated from 1 (least deprived) to 10 (most deprived). It is a composite of the following variables as at 2006, measured at the household level: • Income- People aged 18 to 64 years receiving a means tested benefit. • Income- People living in equivalised households with income below an income threshold. • Owned home – People not living in own home. • Support – People aged < 65 years living in a single parent family • Employment – People aged 18 to 64 years who are unemployed • Qualifications – People aged 18 to 64 years without any qualifications. • Living space – People living in equivalised households below a bedroom occupancy threshold • Communications – People with no access to a telephone
Relevance:	Based on household level information, this indicates relative socio-economic advantage across communities. Over time it is possible to see how these areas change. Deprivation index ratings can be mapped against a very wide range of elements including employment patterns, transport routes, social infrastructure (schools, churches, community halls, centres etc).
Frequency:	Once every 5 years
Monitoring history:	Has been monitored since 1996 Census. The variables in the index have changed here and there.
Geographic coverage:	National through to meshblock.
Data source:	University of Otago, Wellington School of Medicine and Health Sciences.
Website:	http://www.wnmeds.ac.nz/academic/dph/research/socioeconomicdeprivation.html
Contact details:	Social and Economic Research Team
Limitations:	As it takes into account a wide variety of variables, the drivers behind relative low decile ratings in some areas will be quite different than in other areas. For example the factors resulting in relatively low decile ratings for households in the CBD are different than low decile ratings in South Auckland. The CBD is more likely to have students who do not own a vehicle or a landline and who have not yet gained qualifications.

Income

Data name:	Income
Definition:	Income is measured at the personal, family and household level. The Census of Statistics and Dwellings provides the most comprehensive coverage, but is not the only source of information. Another source is the New Zealand Income Survey (NZIS).
Relevance:	The distribution of income across the region, by age and ethnic groups is an important part of our understanding of wellbeing and socio-economic status. It is linked to ability to purchase and provide.
Frequency:	Census: Once every 5 years New Zealand Income Survey: Run annually as a supplement to the Household Labour Force Survey (HLFS) during the June quarter (April to June).
Monitoring history:	The NZIS was run for the first time in the June 1997 quarter.
Geographic coverage:	Census: National down to meshblock. New Zealand Household Income survey: region only
Data source:	Statistics New Zealand : Census of Population and Dwellings Statistics New Zealand New Zealand Household Income survey
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Census data on income is only measured once every five years and is subject to under-reporting. It also does not measure asset wealth. The NZIS is a sample survey and subject to sampling error. Data are not available at a spatial level.

Household expenditure

Data name:	Household expenditure
Definition:	The Household Economic Survey (HES) is a data source from which we can ascertain household income and expenditure as well as a range of demographic information on individuals and households.
Relevance:	This data source is useful in assisting us to understand relative costs of transport and housing across the region, as well as other household items. It is used to measure housing affordability.
Frequency:	The full Household Economic Survey (HES) is conducted every three years. The Household Economic Survey (Income) is a shortened version of the HES, and is run in the years in between the full HES survey. The full HES started in July 2009 and will continue until the end of June 2010.
Monitoring history:	Not known
Geographic coverage:	Region only.
Data source:	Statistics New Zealand : Household Economic Survey
Website:	Fore more information on the HES refer to Stats NZ website: http://www.stats.govt.nz/browse_for_stats/people_and_communities/Households/HouseholdEconomicSurvey_HOTPYeJun10/Technical%20Notes.aspx
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore not complete coverage, and is only available every three years.

Housing demand and supply

Data name:	Housing demand and supply
Definition:	Demand and supply for housing in the Auckland region.
Relevance:	Auckland's housing costs are among the highest in the world for cities of its size. Falling home ownership, decreasing affordability and demand exceeding supply are recent trends that are all of concern.
Frequency:	Irregular
Monitoring history:	This is the first assessment to be undertaken in the country using methodology outlined in the New Zealand Manual for Housing Market Assessments (DTZ, 2009).
Geographic coverage:	Auckland Region and 14 Housing Market Areas (HMAs).
Data source:	Auckland Region Housing Market Assessment – prepared by Darroch Ltd for The Centre for Housing Research Aotearoa New Zealand (CHRANZ), 2010.
Website:	http://www.chranz.co.nz/pdfs/auckland-region-housing-market-assessment-report.pdf
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	Does not provide spatial detail below Housing Market Area level. Some of these are quite large areas having considerable diversity within (e.g., North Shore, Waitakere, Rural North).

Domain Social, Cultural and Demographic

Housing

Housing type and location

Data name:	Housing type and location
Definition:	Number of dwellings, occupied and unoccupied, by type (stand-alone or unit).
Relevance:	The measurement of the number of dwellings by type, their occupation rates, and household composition, is central to the development of the Spatial Plan.
Frequency:	Every 5 years
Monitoring history:	Not known.
Geographic coverage:	National down to meshblock level.
Data source:	Statistics New Zealand: Census of Population and Dwellings.
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	There are issues affecting the comparability of the 2006 data on occupied dwellings with 1996 and 2001 Census data, due to a number of classification changes and some definitional changes. Refer to Statistics New Zealand's overview of these issues. http://www.stats.govt.nz/Census/about-2006-census/information-by-variable/occupied-dwelling-type.aspx.

Housing quantity

Data name:	Housing quantity
Definition:	Number of dwellings, occupied and unoccupied.
Relevance:	The measurement of the number of dwellings by type, their occupation rates, and household composition, is central to the development of the Spatial Plan.
Frequency:	Every 5 years
Monitoring history:	Not known.
Geographic coverage:	National down to meshblock level.
Data source:	Statistics New Zealand: Census of Population and Dwellings.
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	There are issues affecting the comparability of the 2006 data on occupied dwellings with 1996 and 2001 Census data, due to a number of classification changes and some definitional changes. Refer to Statistics New Zealand's overview of these issues. http://www.stats.govt.nz/Census/about-2006-census/information-by-variable/occupied-dwelling-type.aspx.

Domain Social, Cultural and Demographic

Housing

Housing affordability: Expenditure

Data name:	Housing affordability
Definition:	The proportion of households in the Auckland region that spend more than 40 per cent of net income on housing costs.
Relevance:	Residents' access to quality affordable housing is fundamentally important to successful economic growth and stability across the region, and for good social outcomes and healthy communities.
Frequency:	The full Household Economic Survey (HES) is conducted every three years. The Household Economic Survey (Income) is a shortened version of the HES, and is run in the years in between the full HES survey. The full HES started in July 2009 and will continue until the end of June 2010.
Monitoring history:	Not known
Geographic coverage:	See below
Data source:	Statistics New Zealand : Household Economic Survey
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore not complete coverage, and is only available every three years.

Housing affordability: Perceptions

Data name:	Perceptions of housing affordability
Definition:	The proportion of respondents who agree or disagree that their housing costs are affordable.
Relevance:	Residents' access to quality affordable housing is fundamentally important to successful economic growth and stability across the region, and for good social outcomes and healthy communities.
Frequency:	Was last included in the 2010 ARC residents survey (the 'EAS'). Sample size for Auckland was 1,600 residents aged 18 years and over.
Monitoring history:	Has been included as a question in the Auckland Regional Council's residents survey (EAS) overt the last few years. The frequency with which it will be asked in the new Auckland Council has yet to be determined.
Geographic coverage:	As this is generally collected though a survey, coverage will depend on the timing, size and scope of the survey. Generally, this is able to be reported at the regional and TA level, but not adequate coverage to report at neighbourhood or community level (unless this was specifically surveyed).
Data source:	See above
Website:	Refer to Monitor Auckland http://monitorauckland.arc.govt.nz/our-economy/economic-standard-of-living/perceptions-of-housing-affordability.cfm
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore subject to sampling error, and not able to provide complete geographic coverage.

Domain Social, Cultural and Demographic

Housing

Social housing

Data name:	Social housing
Definition:	Housing provided by central or local government agencies
Relevance:	Social housing provides shelter for some of the population unable to pay market rates for housing.
Frequency:	5-yearly
Monitoring history:	Unknown
Geographic coverage:	Auckland region, census area unit and meshblock
Data source:	Census
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Relies on accurate questionnaire responses.

Domain Social, Cultural and Demographic

Housing

Tenure

Data name:	Tenure
Definition:	Dwelling owned (or partly owned), or not owned by usual resident
Relevance:	Home-ownership in New Zealand is an indicator, to some extent, of a household's financial situation, and a key variable to watch in the housing market.
Frequency:	5-yearly
Monitoring history:	1996, 2001, 2006
Geographic coverage:	Auckland region, census area unit and meshblock
Data source:	Census
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Time-series information complicated by different handling of Family Trusts in 2006

Domain Social, Cultural and Demographic

Housing

Household crowding

Data name:	Household crowding
Definition:	This indicator monitors the proportion of people living in crowded housing (i.e. requiring one or more additional bedrooms, as defined by the Canadian Crowding Index).The Canadian National Occupancy Standard states that: No more than two people shall share a bedroom; Parents or couples may share a bedroom; Children under 5 years, either of the same sex or of the opposite sex, may share a bedroom ; Children under 18 years of the same sex may share a bedroom ; A child aged 5–17 years should not share a bedroom with a child under 5 years of the opposite sex ; Single adults 18 years and over and any unpaired children require a separate bedroom.
Relevance:	The living arrangements and requirements of the population have changed over time, but much of the existing housing stock remains static. Understanding where there are relatively high levels of households that are 'crowded' can provide an indication of housing need.
Frequency:	Once every 5 years
Monitoring history:	Unknown
Geographic coverage:	Available on request to CAU level.
Data source:	Statistics New Zealand: Census of Population and Dwellings. Note - this index is not a standard output.
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Ideas about crowding and room use can be culturally and context dependent. For example, traditional Japanese households may use living rooms as bedrooms at night - no real concept of separate bedrooms. Apartments in New Zealand and overseas increasingly have pull-over couches for regular sleeping use in living areas.

Median sales prices

Data name:	Median sales price
Definition:	The median sales price of dwellings
Relevance:	Provides an indicator of growing demand and supply issues in the region.
Frequency:	This could be a customised request with QV
Monitoring history:	Not known
Geographic coverage:	The whole region
Data source:	Quotable Value
Website:	http://www.qv.co.nz/
Contact details:	Social and Economic Research Team
Limitations:	None identified.

Obesity

Data name:	Obesity
Definition:	The proportion of the population aged 15 years and over who are obese and the proportion of children aged 5–14 years who are obese, as measured in the 2002 National Children's Nutrition Survey and the 2006/2007 New Zealand Health Survey. Ministry of Social Development in their 2010 Social Report uses the following definitions: for adults aged 18 years and over, obesity is defined as having a body mass index (BMI) greater than or equal to 30 kg/m2 (for all ethnic groups). For those aged under 18 years, internationally defined sex and age specific BMI cut-off points have been used.
Relevance:	Obesity has negative implications for personal quality of life and public health costs. Obesity is associated with a long list of adult health conditions, including heart disease, high blood pressure and strokes, type 2 diabetes, various types of cancer, and psychological and social problems. Obese children are likely to be obese into adulthood.
Frequency:	Previously the New Zealand Health Survey has consisted of individual surveys conducted once every three or four years. The wider survey programme has also included Adult and Child Nutrition Surveys, Tobacco, Alcohol and Drug Use Surveys, Te Rau Hinengaro (the New Zealand Mental Health Survey) and an Oral Health Survey (Ministry of Health 2009). From 2011 the NZHS and the various surveys that are part of the wider survey programme will be integrated into a single survey which will be in continuous operation. The sample design and mode of data collection will be similar to the 2006/07 NZHS (Ministry of Health 2008).
Monitoring history:	From May 2011, the New Zealand Health Survey will be made up of a consistent core questionnaire with a flexible programme of rotating thematic / topic modules.
Geographic coverage:	National and Auckland region
Data source:	Ministry of Health
Website:	http://www.socialreport.msd.govt.nz/health/obesity.html http://www.moh.govt.nz/moh.nsf/indexmh/nz-health-survey-objectives-and-topic-areas-august2010?OpenDocument&Click=
Contact details:	Social and Economic Research Team
Limitations:	Refer above websites

Domain Social, Cultural and Demographic

Health

Access to GPs

Data name:	Access to General Practitioners (GPs)
Definition:	Rate of GPs per 100,000 population.
Relevance:	Accessibility to a GP is an important part of the health infrastructure. The service provided by GPs is important to the treatment and prevention of poor health outcomes.
Frequency:	Every 2 years
Monitoring history:	Data to 2010
Geographic coverage:	National, regional and by Local Board.
Data source:	Medical Council of New Zealand
Website:	http://monitorauckland.arc.govt.nz/our-community/health/rate-of-general-practitioners-per-100000-people.cfm
Contact details:	Social and Economic Research
Limitations:	Accessibility is not only related to distance but also to availability of time and money.

Domain Social, Cultural and Demographic

Health

Communicable diseases

Data name:	Incidences of communicable diseases
Definition:	Communicable diseases include a wide range of diseases. Include gastroenteritis among children, meningococcal disease and tuberculosis.
Relevance:	Rates of some communicable diseases have a strong link to crowded and unhealthy housing, and are part of a suite of indicators that assist in understanding the wider quality of life context.
Frequency:	Not known.
Monitoring history:	Not known.
Geographic coverage:	To be discussed further with Ministry of Health and DHBs.
Data source:	Ministry of Health.
Website:	-
Contact details:	Social and Economic Research
Limitations:	To be discussed further with Ministry of Health and DHBs.

Domain Social, Cultural and Demographic

Health

Location of fast food outlets and liquor stores

Data name:	Location of fast food outlets and liquor stores
Definition:	Measures the number and location of fast food outlets and licensed liquor outlets in the region. This can be used spatially to calculate proximity to population.
Relevance:	Part of the health infrastructure of Auckland.
Frequency:	As per Licensing and Compliance timeframes
Monitoring history:	From 2010
Geographic coverage:	Region to local board level
Data source:	Auckland Council Licensing and Compliance
Website:	Not applicable
Contact details:	Social and Economic Research Team
Limitations:	Refer Licensing and Compliance

Perceptions of health

Data name:	Perceptions of health
Definition:	Residents self-rating of their own health as excellent, very good, good, fair or poor.
Relevance:	Self reported health status is a global measure of health. It complements other health outcome measures. Part of a suite of indicators that assist in understanding the wider quality of life context.
Frequency:	Approximately annually.
Monitoring history:	Has been measured in several residents' surveys. Is included in the 2010 Quality of Life Survey. Sample size will be 2,500 residents aged 15 years and over.
Geographic coverage:	As this is generally collected though a survey, coverage will depend on the timing, size and scope of the survey. Generally, this is able to be reported at the regional and TA level, but not adequate coverage to report at neighbourhood or community level (unless this was specifically surveyed).
Data source:	Included in 2010 Quality of Life survey, results to be available mid 2011.
Website:	www.bigcities.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore subject to sampling error, and not able to provide complete geographic coverage.

Disability

Data name:	Disability
Definition:	Statistics about New Zealanders with disabilities are available from 1996, 2001 and 2006 surveys. These surveys collected information on the prevalence, nature, duration and cause of disability, and on the barriers that people with disability encountered in everyday life. Statistics are available for children (0–14 years) and adults living in households, and for adults living in residential facilities.
Relevance:	It's important that those living with a disability in the Auckland region are able to fully participate in society and the economy.
Frequency:	Every five years
Monitoring history:	A post-censal Disability Survey is being developed for 2011 by Statistics New Zealand.
Geographic coverage:	National. Customised data for the Auckland region may be available on request.
Data source:	Statistics New Zealand: Household Disability Survey.
Website	http://www.stats.govt.nz/browse_for_stats/health/disabilities.aspx
Contact details:	Social and Economic Research Team
Limitations:	Refer www.stats.govt.nz

Population size

Data name:	Population size
Definition:	The number of people living in the region. This information can be gleaned from a variety of sources.
Relevance:	The measurement of the number of people living in the region is central to the development of the Spatial Plan.
Frequency:	Census: every 5 years or annual population estimates. Both are produced by Statistics New Zealand.
Monitoring history:	1996, 2001, 2006 at current meshblock geography
Geographic coverage:	National down to meshblock level
Data source:	Statistics New Zealand
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	There can be considerable discrepancies between the population size as at the census and the annual population estimates. This is because the population at 30 June in each census year (1996, 2001 and 2006) is based on the census usually resident population count, updated for residents missed or counted more than once by the census (net census undercount); residents temporarily overseas on census night; and births, deaths and net migration between census night and the date of the estimate.

Population projections

Data name:	Population projections
Definition:	The projected number of people living within the region in the future. Statistics New Zealand's 2006 sub-national projections have as a base the estimated resident population of each area at 30 June 2006. This population was based on the census usually resident population count of each area at 7 March 2006 and adjusted for: net census undercount; residents temporarily overseas on census night; births, deaths, and net migration between census night (7 March 2006) and 30 June 2006; reconciliation with demographic estimates at ages 0–4 years.
Relevance:	An understanding of the possible number of people living in the region, by age group, is central to the development of the Spatial Plan.
Frequency:	Statistics New Zealand
Monitoring history:	Unknown
Geographic coverage:	National down to Census Area Unit level. Data are available by low, medium and high series, and by 5 yearly age groups.
Data source:	Statistics New Zealand
Website:	http://www.stats.govt.nz/browse_for_stats/population/estimates_and_projections/SubnationalPopulationProjections_HOTP2031/Technical%20Notes.aspx
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	Demographic projections are designed to meet both short-term and long-term planning needs, but are not designed to be exact forecasts or to project specific annual variation. These population projections are based on assumptions made about future fertility, mortality, and migration patterns of the population. Although the assumptions are carefully formulated to represent future trends, they are subject to uncertainty. Therefore, the projections should be used as guidelines and an indication of the overall trend, rather than as exact forecasts.

Life expectancy

Data name:	Life expectancy
Definition:	The number of years a newborn could expect to live if they were subject throughout their lives to the age-specific mortality patterns prevailing over a three year period centred on their birth year. Life tables are constructed from registrations of births and deaths and population estimates.
Relevance:	Life expectancy is a key indicator of the general health of the population. Improvements in life expectancy reflect improvements in social and economic conditions, lifestyle, access to health services and medical advances. Could be part of the monitoring programme.
Frequency:	Sub-national abridged period life tables are produced every five years for the male and female populations. They are available for all 16 regions and most territorial authority areas (where death and population numbers are sufficient to construct reliable life tables). The latest sub-national abridged period life tables are for 2005–07.
Monitoring history:	Not known
Geographic coverage:	By region certainly, would have to talk with Stats NZ about provision at lower levels.
Data source:	Statistics New Zealand: Life tables
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Not known

Language

Data name:	Language
Definition:	Language spoken' data from the Census. This provides information on whether a person can speak and understand spoken or sign language. The question asks 'In which language(s) could you have a conversation about a lot of everyday things?'
Relevance:	Not absolutely central to the development of the Spatial Plan, but can be part of understanding the cultural landscape in the region and help inform planning for social infrastructure.
Frequency:	Once every 5 years
Monitoring history:	Not known
Geographic coverage:	National down to MB level. Data at MB level is subject to rounding and suppression due to very small numbers.
Data source:	Statistics New Zealand: Census of Population and Dwellings
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Not known

Ethnic identity

Data name:	Ethnic identity
Definition:	'Ethnicity' is the ethnic group or groups that people identify with or feel they belong to. Ethnicity is a measure of cultural affiliation, as opposed to race, ancestry, nationality or citizenship. Ethnicity is self-perceived and people can belong to more than one ethnic group.
Relevance:	A good understanding of the ethnic composition and trends in ethnic composition by locale is fundamental to the region's ability to provide appropriate opportunities and services in the future. It is linked strongly to community.
Frequency:	Once every 5 years
Monitoring history:	Refer to Stats NZ Website
Geographic coverage:	National down to Census Area Unit level. Data by ethnic group (Level 1) is available at MB level but subject to rounding and suppression due to very small numbers.
Data source:	Statistics New Zealand: Census of Population and Dwellings
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Statistic NZ caution that time series comparisons should include all four censuses from 1991 to 2006, as there are issues affecting the comparability of the 2006 data with the 1991, 1996 and 2001 Census data. These issues are around classification. For more information go to Stats NZ website: http://www.stats.govt.nz/Census/about-2006-census/information-by-variable/ethnicity.aspx

Gender

Data name:	Gender
Definition:	We use the data on 'sex' from Census - the distinction between males and females based on the biological differences in sexual characteristics.
Relevance:	A good understanding of the sex composition and trends, by cohort and area is fundamental to the region's ability to provide appropriate opportunities and services in the future. It is linked strongly to community and employment.
Frequency:	Once every 5 years
Monitoring history:	Refer to Stats NZ Website
Geographic coverage:	National down to Census Area Unit level.
Data source:	Statistics New Zealand: Census of Population and Dwellings
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	None identified

Domain Social, Cultural and Demographic

Population

Age structure

Data name:	Age structure
Definition:	The age structure is the number and proportion of residents in each age group. This is often also presented by sex and across broad ethnic groups.
Relevance:	A good understanding of the age-sex structure and trends in structures within the region, at local levels and by ethnic group is fundamental to the region's ability to provide appropriate opportunities and services in the future.
Frequency:	Once every 5 years
Monitoring history:	Refer to Stats NZ Website
Geographic coverage:	National down to Census Area Unit level. Data by age group is available at MB level but subject to rounding and suppression due to very small numbers.
Data source:	Statistics New Zealand: Census of Population and Dwellings
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Only available once every five years.

Migration: Internal

Data name:	Migration: Internal
Definition:	Internal migration refers to the movement of residents within New Zealand. It does not include migration to, or from, overseas.
Relevance:	Internal migration patterns show the dynamics of population change. Helps us to understand who moves in and out of the region, and where people are moving to, or come from, especially with respect to neighbouring regions.
Frequency:	Once every five years.
Monitoring history:	Refer to Stats NZ Website
Geographic coverage:	By region and possibly by local board areas on request from Stats NZ.
Data source:	Statistics New Zealand: Census of Population and Dwellings
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Only available between Censuses. Not available at Census Area Unit due to Statistics NZ confidentiality rules.

Domain Social, Cultural and Demographic

Population

Migration: External

Data name:	Migration: External
Definition:	Long-term and permanent arrivals
Relevance:	Permanent and long-term arrivals from overseas bring labour, skills and other benefits but also increase demand for services including housing.
Frequency:	Quarterly
Monitoring history:	From 2000
Geographic coverage:	Auckland Region
Data source:	Statistics New Zealand
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Collected from traveller-completed arrival cards outlining intended residence.

Household size

Data name:	Household size
Definition:	Household size refers to the number of people living together in a dwelling.
Relevance:	Assists understanding of housing supply and demand now and in the future.
Frequency:	Once every 5 years
Monitoring history:	Unknown
Geographic coverage:	National down to MB level. Data at MB level subject to rounding and suppression due to very small numbers.
Data source:	Statistics New Zealand: Census of Population and Dwellings
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	-

Household composition

Data name:	Household composition
Definition:	'Household composition' is a derived variable that classifies households according to the relationships between usually resident people. Households are classified according to the presence, number and type of family nuclei, and the presence of related and unrelated people.
Relevance:	The population of the region is constantly changing. While the majority of households in the region are one family, the number of one family and multi family households are on the rise. We monitor to be aware of the number and type of households in the region and trends in household composition. This will enable the Auckland Council to ensure growth is accommodated in a way that meets the best interests of the inhabitants of the Auckland region.
Frequency:	Once every 5 years
Monitoring history:	Refer to Stats NZ website
Geographic coverage:	National down to MB level. Data at MB level subject to rounding and suppression due to very small numbers.
Data source:	Statistics New Zealand: Census of Population and Dwellings
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	There are issues comparing 2006 with 2001 and 1996 census data. Certain aspects of the household composition data are not comparable over time, because of classification changes. This affects analysis at the more detailed levels of the classification, but not at the least detailed level. For more information go to Stats NZ website:

Labour force participation

Data name:	Labour force participation rate
Definition:	The total labour force expressed as a percentage of the working-age population.
Relevance:	The spatial plan has to take into account employment patterns across the region, both present and future, and the labour force participation rate is an important part of that.
Frequency:	Quarterly
Monitoring history:	Not known
Geographic coverage:	See below
Data source:	Statistics New Zealand's Household Labour Force Survey (HLFS) The HLFS is a national sample survey undertaken by Statistics New Zealand. It is primarily designed for national estimates. The national sample contains about 15,000 private households and about 30,000 individuals each quarter. Households are sampled on a statistically representative basis from rural and urban areas throughout New Zealand, and information is obtained for each member of the household. Each quarter, one-eighth of the households in the sample are rotated out and replaced by a new set of households.
Website:	Link to technical notes on the HLFS: http://www.stats.govt.nz/browse_for_stats/work_income_and_spending/Employment/HouseholdLabourForceSurvey_HOTPJun09qtr/Technical%20Notes.aspx
Contact details:	Social and Economic Research Team
Limitations:	As the HLFS is a sample survey, all statistics are subject to sampling error. Sub-variable levels should be treated as indicative only

Domain Social, Cultural and Demographic

Labour force

Employment rate

Data name:	Employment rate
Definition:	The number of employed, expressed as a percentage of the labour force.
Relevance:	The spatial plan has to take into account employment patterns across the region, both present and future, and the employment rate is an important part of that.
Frequency:	Quarterly
Monitoring history:	We have data back to 2000.
Geographic coverage:	Comes from the Household Labour Force Survey (HLFS), a national sample survey undertaken by Statistics New Zealand. The national sample contains about 15,000 private households and about 30,000 individuals each quarter.
Data source:	Statistics New Zealand: Household Labour Force Survey
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	The HLFS is a sample survey, therefore subject to sampling error, and not able to provide complete geographic coverage. The Census has self reported employment data available to meshblock level, however this is measured only once every 5 years.

Employment: Full time/part time

Data name:	Type of employment
Definition:	The number and percentage of residents employed full-time or part-time
Relevance:	The spatial plan has to take into account employment patterns across the region, both present and future, and the type of employment is an important part of that.
Frequency:	Quarterly
Monitoring history:	We have data back to 2000.
Geographic coverage:	Comes from the Household Labour Force Survey (HLFS), a national sample survey undertaken by Statistics New Zealand. The national sample contains about 15,000 private households and about 30,000 individuals each quarter.
Data source:	Statistics New Zealand: Household Labour Force Survey
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	The HLFS is a sample survey, therefore subject to sampling error, and not able to provide complete geographic coverage. The Census has self reported employment data available to meshblock level, however this is measured only once every 5 years.

Employment: Under-employment

Data name:	Under-employment
Definition:	There is no single definition of under-employment. It refers here generally to the under-utilisation of labour. The Household Labour Force Survey (HLFS) measures the steps that people take to find more work hours – this provides a proxy measure.
Relevance:	'Under-employment' exists when people's skills and labour are not adequately utilised. This has implications for Auckland's economic growth.
Frequency:	Quarterly
Monitoring history:	Not known
Geographic coverage:	Comes from the Household Labour Force Survey (HLFS), a national sample survey undertaken by Statistics New Zealand. The national sample contains about 15,000 private households and about 30,000 individuals each quarter.
Data source:	Statistics New Zealand: Household Labour Force Survey
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	The HLFS is a sample survey, therefore subject to sampling error, and not able to provide complete geographic coverage.

Employment: Travel to work patterns

Data name:	Travel to work
Definition:	There are two elements to this: - where people travelled to work on Census day - their mode of transport for the main part of the journey.
Relevance:	Understanding travel patterns and modes of transport is an essential component to the Spatial Plan.
Frequency:	5 yearly
Monitoring history:	Not known
Geographic coverage:	Whole of Auckland region down to meshblock.
Data source:	Statistics New Zealand: Census of Population and Dwellings
Website:	
Contact details:	Social and Economic Research Team
Limitations:	The timing between data collections.

Skills shortages

Data name:	Skills shortages
Definition:	Occupations in which Auckland has a significant shortage of skilled workers.
Relevance:	A skill shortage exists when there are not enough people with a particular skill to meet demand. This has implications for Auckland's economic growth.
Frequency:	Unknown
Monitoring history:	Unknown
Geographic coverage:	National and Region
Data source:	New Zealand Immigration Service produces a long term skill shortage list and an immediate skill shortage list. The Long Term Skill Shortage List (LTSSL) identifies those occupations where there is an absolute (sustained and ongoing) shortage of skilled workers both globally and throughout New Zealand. People who gain employment in one of these areas may be granted a work permit under the LTSSL Work to Residence Policy. The Immediate Skill Shortage List (ISSL) is for occupations that have an immediate shortage of skilled workers in New Zealand. It is designed to facilitate the approval of temporary work visa and permit applications. Roles are listed by region on this list. See also the methodology behind the 'Auckland Regional Skills Assessment' undertaken by Infometrics in 2009.
Website:	http://www.immigration.govt.nz/migrant/stream/work/skilledmigrant/LinkAdministration/ToolboxLinks/essentialskills.htm?level=1
Contact details:	Social and Economic Research Team
Limitations:	Designed for immigration purposes and by occupation.

Unpaid work

Data name:	Unpaid work
Definition:	Number and percentage of residents aged 15 years and over who worked without pay in the week prior to Census. Measures work done for people living in the same household as the respondent, and for people living outside the household.
Relevance:	Part of understanding how the Auckland economy works.
Frequency:	Every 5 years
Monitoring history:	Not known how long this has been included in the Census.
Geographic coverage:	National down to meshblock level.
Data source:	Statistics New Zealand: Census of Population and Dwellings
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	There are issues affecting the comparability of the 2006 data with the 1996 and 2001 Census data.

Perceptions of local area

Data name:	Perceptions of local area
Definition:	Resident's perceptions of aspects of the area in which they live. This includes aspects such as access to parks and other open space, noise levels, distance to work or study, graffiti etc.
Relevance:	There are strong and interconnected relationships between residents' sense of place, pride of place, community cohesion, desirability of location, housing affordability, and community participation.
Frequency:	Approx once every two years
Monitoring history:	These have been measured in the ARC's resident's survey annually from 2001.
Geographic coverage:	As this is generally collected though a survey, coverage will depend on the timing, size and scope of the survey. Generally, this is able to be reported at the regional and TA level, but not adequate coverage to report at neighbourhood or community level (unless this was specifically surveyed).
Data source:	Yet to be determined if these questions are included in the Auckland Councils residents survey.
Website:	www.bigcities.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore subject to sampling error, and not able to provide complete geographic coverage.

Domain Social, Cultural and Demographic

Civic pride

Perceptions of Auckland as a place to live

Data name:	Residents' perceptions of Auckland as a place to live.
Definition:	Resident's perceptions of whether the Auckland region is a 'great', 'good', 'okay', 'not so good', or 'terrible' place to live.
Relevance:	There are strong and interconnected relationships between residents' sense of place, pride of place, community cohesion, desirability of location, housing affordability, community participation.
Frequency:	Was last included in the 2010 ARC residents survey (the 'EAS'). Sample size for Auckland was 1,600 residents aged 18 years and over.
Monitoring history:	Has been measured annually in ARC's residents survey (the 'EAS') since 2003.
Geographic coverage:	As this is generally collected though a survey, coverage will depend on the timing, size and scope of the survey. Generally, this is able to be reported at the regional and TA level, but not adequate coverage to report at neighbourhood or community level (unless this was specifically surveyed).
Data source:	Included in 2010 Quality of Life survey, results to be available mid 2011.
Website:	www.bigcities.govt.nz (from mid-2011)
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore subject to sampling error, and not able to provide complete geographic coverage.

Domain Social, Cultural and Demographic

Civic pride

Sense of pride in Auckland

Data name:	Sense of pride
Definition:	Residents' perceptions of a sense of pride in their local neighbourhood, or across the region as a whole.
Relevance:	There are strong and interconnected relationships between residents' sense of place, pride of place, community cohesion, desirability of location, housing affordability, and community participation. This is a broad level contextual indicator that has been used by some councils as part of their outcomes monitoring programme. It is an indicator of sense of place and liveability of Auckland. It may be an indicator in the Spatial Plan Monitoring framework.
Frequency:	Was last included in the 2010 ARC residents survey (the 'EAS'). Sample size for Auckland was 1,600 residents aged 18 years and over. Will be included in the 2010 Quality of Life survey, across a sample of 2,500 Auckland residents.
Monitoring history:	The 2010 Quality of Life survey has included two questions for Auckland residents that fall in this category. Residents are asked if they agree or disagree with the following two statements: 'I feel a sense of pride in the way the Auckland region looks and feels' and 'I feel a sense of pride in the way my local area looks and feels'.
Geographic coverage:	As this is generally collected though a survey, coverage will depend on the timing, size and scope of the survey. Generally, this is able to be reported at the regional and TA level, but not adequate coverage to report at neighbourhood or community level (unless this was specifically surveyed).
Data source:	Included in 2010 Quality of Life survey, results to be available mid 2011.
Website:	www.bigcities.govt.nz (from mid-2011)
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore subject to sampling error, and not able to provide complete geographic coverage.

Domain Social, Cultural and Demographic

Civic pride

Perceptions of diversity

Data name:	Perceptions of diversity
Definition:	Residents' perceptions around increasing diversity. measured by responses to the following question: 'The Auckland region is becoming home for an increasing number of people with different lifestyles and cultures from different countries. Do you think this makes the region a much worse place to live, a worse place to live, makes no difference, a better place to live or a much better place to live?'
Relevance:	With the significant changes to Auckland's ethnic and cultural composition over the last two decades, it is vital that we have a handle on public perceptions around this, whether positive or negative. This is a broad level contextual indicator that has been used by the Quality of Life in New Zealand's Biggest Cities project and many councils as part of their outcomes monitoring programme. It is an indicator of social cohesion in and across Auckland. It may be a relevant indicator in the Spatial Plan Monitoring framework.
Frequency:	Was last included in the 2010 ARC residents survey (the 'EAS'). Sample size for Auckland was 1,600 residents aged 18 years and over.
Monitoring history:	Was also measured in ARC's residents survey (the 'EAS') in 2007/08.
Geographic coverage:	Currently available regionally and by TA. As this is generally collected though a survey, coverage will depend on the timing, size and scope of the survey.
Data source:	See above. Will also be included in the 2010 Quality of Life survey, across an Auckland sample of 2,500 residents.
Website:	http://monitorauckland.arc.govt.nz/our-community/ethnicity-and-diversity/acceptance-of-cultural-diversity.cfm
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore subject to sampling error, and not able to provide complete geographic coverage.

Contact with neighbours

Data name:	Contact with neighbours
Definition:	The type of contact people have had with their neighbours in the last 12 months.
Relevance:	This is an indicator that was reported for Auckland and across the country in the Quality of Life in NZ's Biggest Cities report, and has been used by some councils as part of their outcomes monitoring programme. It is an indicator of social connectedness. It may be an indicator in the Spatial Plan Monitoring framework. A well-functioning and integrated society is underpinned by trust and caring at the neighbourhood community level. Neighbourhoods in which people keep an eye out for each other, take an interest in maintaining ties and networks and have a shared pride of place are more likely to be safe and fulfilling environments than neighbourhoods where there is little, or negative, interaction.
Frequency:	Was included in the 2010 ARC residents' survey. Sample size for Auckland was 1,600 residents aged 18 years and over.
Monitoring history:	Included in the Quality of life survey to 2004
Geographic coverage:	As this is generally collected though a survey, coverage will depend on the timing, size and scope of the survey. Generally, this is able to be reported at the regional and TA level, but not adequate coverage to report at neighbourhood or community level (unless this was specifically surveyed).
Data source:	for 2009 - ARC EAS survey (residents survey)
Website:	http://monitorauckland.arc.govt.nz/our-community/neighbourhoods/perceptions-of-a-sense-of-community.cfm
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore not complete coverage, and is only available when included in a survey.

Domain Social, Cultural and Demographic

Connectedness

Contact with family and friends

Data name:	Contact with family and friends
Definition:	The proportion of people aged 15 years and over who say the amount of contact they have with family and friends who don't live with them is "about right", as measured by the New Zealand General Social Survey. Contact includes face-to-face meetings as well as telephone calls, letters, emails, texting, and other forms of electronic communication.
Relevance:	This is an indicator that was reported for Auckland and across the country in the Ministry of Social Development's Social Report. It is an indicator of social connectedness. It may be an indicator in the Spatial Plan Monitoring framework. Families and friends are key sources of social support and give people a sense of belonging. Staying in touch with family and friends who live elsewhere helps maintain social connectedness between households and across geographical boundaries
Frequency:	Not known.
Monitoring history:	Not known
Geographic coverage:	As this is generally collected though a survey, coverage will depend on the timing, size and scope of the survey. Generally, this is able to be reported at the regional and TA level, but not adequate coverage to report at neighbourhood or community level (unless this was specifically surveyed).
Data source:	Statistic New Zealand: General Social Survey
Website:	www.stats.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore not complete coverage, and is only available when included in a survey.

Levels of formal education

Data name:	Levels of formal education
Definition:	Highest formal educational qualification among residents aged 18 years and over. 'Highest qualification' is derived from the Census for people aged 15 years and over, and combines highest secondary school qualification and post-school qualification, to derive a single highest qualification. 'Highest secondary school qualification' is the highest secondary school qualification gained for people aged 15 years and over. 'Post-school qualification' is the highest qualification gained apart from secondary school qualifications for people aged 15 years and over. Included are qualifications awarded by training and educational institutions, as well as those gained from on-the-job training. Post-school qualification data is produced by level of attainment and by field of study.
Relevance:	At the individual and household level, there are strong inter-dependencies and connections between the attainment of formal education and the ongoing development of skills that can be applied in the contemporary economy, with opportunities for meaningful and secure employment, a good income and quality of life.
Frequency:	Every 5 years
Monitoring history:	Not known how long this has been included in the Census.
Geographic coverage:	National down to meshblock level.
Data source:	Statistics New Zealand: Census of Population and Dwellings
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	There are no significant issues that users need to be aware of.

Student participation

Data name:	Student participation
Definition:	The Ministry of Education provides data on participation in early childhood education, schooling and tertiary education. Data is available by ethnicity and gender, across school deciles and by area.
Relevance:	Relevant to our understanding of social wellbeing.
Frequency:	Annual.
Monitoring history:	Not sure
Geographic coverage:	Available on the 'Education Counts' website, currently by TA. We can find out from the Ministry of Education what they can make available on request.
Data source:	Ministry of Education.
Website:	http://www.educationcounts.govt.nz/indicators/student_participation
Contact details:	Social and Economic Research Team
Limitations:	There are no significant issues that we are aware of.

Domain Social, Cultural and Demographic

Education

School leavers

Data name:	School leavers
Definition:	This refers to a broad data set. The Ministry of Education provides data on the number of school leavers as well as their levels of educational achievement. Data is available by ethnicity and gender, across school deciles and by area. It also records educational achievements of school leavers.
Relevance:	Relevant to our understanding of future labour force and skills requirements.
Frequency:	Annual.
Monitoring history:	Unknown
Geographic coverage:	We can find out from the Ministry of Education what they can make available on request.
Data source:	Ministry of Education.
Website:	http://www.educationcounts.govt.nz/statistics/schooling/school_leavers2/school_leavers
Contact details:	Social and Economic Research Team
Limitations:	There are no significant issues that we are aware of.

Perceptions of personal safety

Data name:	Perceptions of personal safety
Definition:	How safe or unsafe residents feel in a variety of situations, such as in their home or in their local area, after dark and during the day.
Relevance:	Crime, and the fear of crime, can reduce the social cohesion within communities. It can restrict people's choices about how to live and may reduce the desirability of local areas as places to live, work or shop. Monitoring perceptions of personal safety is an important part of the wider quality of life context.
Frequency:	Approximately annually.
Monitoring history:	Has been measured in several residents surveys. Was last included in the 2010 ARC residents survey (the 'EAS'). Sample size for Auckland was 1,600 residents aged 18 years and over. Is also included in the 2010 Quality of Life Survey. Sample size wil be 2,500 residents aged 15 years and over.
Geographic coverage:	As this is generally collected though a survey, coverage will depend on the timing, size and scope of the survey. Generally, this is able to be reported at the regional and TA level, but not adequate coverage to report at neighbourhood or community level (unless this was specifically surveyed).
Data source:	See above
Website:	http://monitorauckland.arc.govt.nz/our-community/safety-and-crime/perceptions-of-safety.cfm
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore subject to sampling error, and not able to provide complete geographic coverage.

Road safety

Data name:	Road safety
Definition:	The number of deaths and casualties that occur on the Auckland region's roads.
Relevance:	The number of deaths and causalities on Auckland's roads is a direct reflection of levels of road safety and security. This includes driver behaviour as well as road maintenance and conditions.
Frequency:	The Crash Analysis System (CAS) database is continually updated, however Auckland Council collects and reports this data annually.
Monitoring history:	Unknown
Geographic coverage:	Auckland region and nationally
Data source:	NZTA New Zealand Transport Agency: Road Safety data
Website:	Crash Analysis System (CAS) http://www.nzta.govt.nz/resources/crash-analysis-system/index.html
Contact details:	Land-use, Built Environment and Infrastructure Research Team
Limitations:	-

Crime rates

Data name:	Crime rates
Definition:	Rate of reported crime per 10,000 population: there are several categories of crime, including violence, sexual assaults, abductions, robbery, and others.
Relevance:	Crime, and the fear of crime, can reduce the social cohesion within communities. It can restrict people's choices about how to live and may reduce the desirability of local areas as places to live, work or shop. Monitoring crime rates across the region is part of the wider quality of life context.
Frequency:	Data is available annually (calendar year or fiscal year) on the NZ Police website - or more frequently, if we order a customised request.
Monitoring history:	From 2000.
Geographic coverage:	National, police district or by other boundaries as a customised order, using data at police station level.
Data source:	NZ Police
Website:	http://www.police.govt.nz/service/statistics/index.html
Contact details:	Social and Economic Research Team
Limitations:	This uses reported crime data only. We do not know the number and types of crimes that are not reported to Police.

Land Use and Built Environment Domain

Emissions by sector

Data name:	Emissions by sector
Definition:	Air emissions inventory
Relevance:	Air pollutants emitted from all sources are estimated, including domestic (home heating, lawn mowing, solvent use etc.), transport (vehicles, shipping and port activities, aircraft etc.) and industrial sectors. The information allows us to identify the greatest sources of air pollution, and provides sound evidence for policy development to effectively reduce air pollution in Auckland. The emissions trends also allow us to evaluate the policy effectiveness and test policy scenarios.
Frequency:	Information is updated from time to time when new data are available, particularly after census update.
Monitoring history:	Ongoing (started from1993)
Geographic coverage:	The information covers whole Auckland. Emissions are grouped into point sources (e.g., industry), line sources (e.g., roads) and area sources (e.g., home heating). The data are collected from different sources, including transport model, census and surveys.
Data source:	Auckland Council and other organisations
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science Team
Limitations:	- There are uncertainties in emissions estimates. Other information (i.e., air quality monitoring and air-shed modelling) need to be considered in order to give an accurate estimate of air pollution from various sources. - Rely on other models, such as transport model, vehicle emissions prediction model and domestic emissions model. - Emissions factors and activity data for minor sources were last updated for 1998.

Motor vehicle fuel sales

Data name:	Motor vehicle fuel sales
Definition:	Motor vehicle fuel sales
Relevance:	Vehicle emissions are a major air pollution source in Auckland. Motor vehicle fuel sales provide a good indicator of actual vehicle usage (e.g., how many kilometres were travelled by vehicles), therefore, the pollution caused by vehicle emissions. The information allows us to evaluate and crosscheck estimates of vehicle emissions in the air emissions inventory. Together, they provide sound evidence for policy development to effectively reduce air pollution from vehicle emissions in Auckland.
Frequency:	Information is updated from time to time when new data are available.
Monitoring history:	Ongoing (started from1996)
Geographic coverage:	The information covers whole Auckland. The data are collected from various surveys.
Data source:	Auckland Council and other organisations
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science Team
Limitations:	Other information (i.e., fuel efficiency, vehicle fleet composition, vehicle kilometres travelled (VKT) and speed) also need to be considered in order to give an accurate estimate of vehicle emissions.

Use of coal and wood for home heating

Data name:	Use of coal and wood for home heating
Definition:	Use of coal and wood for home heating
Relevance:	Emissions from domestic fires for home heating are a major air pollution source in Auckland (the greatest source in winter). Use of coal and wood for home heating, including the amount of consumption, by what types of appliances (e.g., old or new wood burners) and the spatial distribution, provides a good indicator of air pollution from domestic fires. The information allows us to calculate home heating emissions in the air emissions inventory. Together, they provide sound evidence for policy development to effectively reduce air pollution from domestic fires in Auckland.
Frequency:	Information is updated from time to time as required, usually every five years after Census update.
Monitoring history:	Ongoing (started from 1993)
Geographic coverage:	The information covers whole Auckland, and is presented for each Census Area Unit (CAU) or meshblock. The data are collected from Census, home heating survey and wood burner testing, and other sources.
Data source:	Auckland Council and other organisations
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science Team
Limitations:	There are uncertainties in estimates of use of coal & wood for home heating and emissions from domestic fires.

Home heating

Data name:	Home heating
Definition:	Emissions from home heating
Relevance:	Emissions from domestic fires for home heating are a major air pollution source in Auckland (the greatest source in winter). Air pollutants emitted from home heating are estimated for each Census Area Unit (CAU) in the air emissions inventory. The information allows us to identify the "hotspots" (the greatest emission areas). This provides sound evidence for policy development to effectively reduce air pollution from home heating in Auckland.
Frequency:	Information is updated from time to time as required, usually every five years after Census update.
Monitoring history:	Ongoing (started from 1993)
Geographic coverage:	The information covers whole Auckland for each CAU or Census Mesh Block. The data are collected from the Census, home heating surveys, wood burner testing and other sources.
Data source:	Auckland Council and other organisations
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science Team
Limitations:	There are uncertainties in emissions estimates from home heating. Other information (i.e., air quality monitoring and airshed modelling) need to be considered in order to give an accurate estimate of pollution from home heating.

Consented air discharges

Data name:	Consented air discharges by amount and type of emissions
Definition:	Emissions from industrial sources
Relevance:	Air discharges from consented industry are an important air pollution source in Auckland. Air pollutants emitted from these sources are estimated in the air emissions inventory, including the type of pollutants (e.g., fine particulates and nitrogen dioxide) and the amount of discharges (e.g., kilograms per day). The information allows us to identify the major industrial emitters. This provides sound evidence for policy development to effectively control air pollution from industrial sources in Auckland.
Frequency:	Information is updated from time to time as required.
Monitoring history:	Ongoing (started from1993)
Geographic coverage:	The information covers whole Auckland. Emissions are presented as point sources. The data are collected from industry consents database, emissions testing and surveys.
Data source:	Auckland Council and other organisations
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science Team
Limitations:	- There are uncertainties in emissions estimates from consented industry. Other information (e.g., air quality monitoring, air dispersion modelling and pollution complaint database) need to be considered in order to give an accurate estimate of pollution from these sources. - Consented industry accounts for only a portion of industrial emissions and non-consented industry is not yet accounted for.

Industrial sources

Data name:	Industrial sources
Definition:	Emissions from industrial sources
Relevance:	Industry is an important air pollution source in Auckland. Air pollutants emitted from all industrial sources (including consented and non-consented industry) are estimated in the air emissions inventory, including the type of pollutants (e.g., fine particulates and nitrogen dioxide) and the amount of discharges (e.g., kilograms per day). The information allows us to identify the major industrial emitters. This provides sound evidence for policy development to effectively control air pollution from industrial sources in Auckland.
Frequency:	Information is updated from time to time as required
Monitoring history:	Ongoing (started from1993)
Geographic coverage:	The information covers whole Auckland. Emissions are presented as point or area sources. The data are collected from industry consents database, emissions testing and surveys.
Data source:	Auckland Council and other organisations
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science Team
Limitations:	There are uncertainties in emissions estimates from industrial sources. Other information (e.g., air quality monitoring, air dispersion modelling and pollution complaint database) need to be considered in order to give an accurate estimate of pollution from industrial sources.

Growth management

Data name:	Growth management
Definition:	Location and capacity of new development areas within the region, based on expansion to the Metropolitan Urban Limit (MUL). Information is in numerous forms, including spatial extents of areas as well as accompanying information as outlined in associated documentation.
Relevance:	Understanding the location and timing of land development is central to the spatial plan
Frequency:	Ad hoc
Monitoring history:	MUL changes have been monitored since 1999 (initiation of the Regional Growth Strategy)
Geographic coverage:	Auckland region
Data source:	Auckland Council
Website:	
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	Growth Management

Land resource: Future and current capacity

Data name:	Capacity for growth
Definition:	The availability of residential, business and rural land within the region for development as at March 2006. See Chapter 3 of the 2006 Capacity for Growth Study (ARC)
Relevance:	The Regional Policy Statement (RPS) requires that Capacity for Growth surveys be undertaken once every five years for the purposes of managing urban containment. This capacity is used to monitor the implementation of the Regional Growth Strategy. The RPS has a requirement to ensure there is 15 years supply of residential and business development available in the region at all times. We monitor to understand the stock of residential and business development available by type and location. Land supply is an important factor in the rate of housing development and is a major influence on the costs and location of businesses in the region.
Frequency:	Five yearly
Monitoring history:	1996, 2001 & 2006
Geographic coverage:	1996 and 2001 - Auckland Region Metropolitan Urban Area, 2006 - Auckland Region Metropolitan Urban Area, Rural Settlements and Rural and Countryside Living
Data source:	Capacity for Growth Study 1996 (ARC) Capacity for Growth Study 2001 (ARC) Capacity for Growth Study 2006 (ARC)
Website:	http://www.arc.govt.nz/auckland/built-environment-and-land-use/capacity-for-growth-study-2010_home.cfm
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	The capacity results are based on authorised the permitted and controlled activities in district plans. Any non-complying activities will affect the final outcomes (generally by exceeding identified capacity).

Heritage: Number and type of heritage items

Data name:	Historic heritage
Definition:	As defined in the Resource Management Act, historic heritage: (a) means those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, deriving from any of the following qualities: (i) archaeological (ii) architectural (iii) cultural (iv) historic (v) scientific (vi) technological (b) includes— (i) historic sites, structures, places, and areas (ii) archaeological sites (iii) sites of significance to Māori, including wāhi tapu (iv) surroundings associated with the natural and physical resources.
Relevance:	Under the RMA, Auckland Council has responsibility to protect historic heritage from inappropriate subdivision, use and development as a matter of national importance. This is therefore a matter that must be taken into consideration in the development of the Auckland Spatial Plan.
Frequency:	Not known
Monitoring history:	Auckland Regional Council's State of Cultural Heritage in the Auckland Region 200. Data used to prepare State of the Auckland Region Report 2010, which forms the basis of this metadata report.
Geographic coverage:	Site specific
Data source:	Auckland Regional Council's State of the Auckland Region Report 2010
Website:	http://www.arc.govt.nz/plans/reports/state-of-the-auckland-region-report-2010_home.cfm
Contact details:	Built Heritage team
Limitations:	There has been little systematic survey of identified and even scheduled historic heritage resources across the region. SOE information in relation historic heritage across the new city is superficial and inadequate. Although some authorities have undertaken monitoring from time to time, there is currently no regular monitoring programme. Data from the Cultural Heritage Inventory provides a useful overview of historic heritage resource, it should not be considered as a comprehensive survey.

Land zoning: Changes over time

Data name:	Generalised zoned land area
Definition:	Shows the amount in hectares (ha) and extent of land and its underlying zoning (residential, business, open space and rural) within the region and change over time.
Relevance:	This data base will help inform discussions about identifying the location and mix of land use activities and if the generalised underlying zoning is currently suitable and appropriate.
Frequency:	Yearly (proposed)
Monitoring history:	Undertaken once in April 2009
Geographic coverage:	Entire Auckland region
Data source:	Auckland Council (and preceding territorial authorities) (ARC analysis from TA provided data)
Website:	-
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	This zoning data is sourced from all territorial authorities within the Auckland region. Zoning changes take place all the time, so for this analysis, a snapshot technique is used. This data is taken on April 2009. Updates will likely be required as plan changes progressed and are finalised.

Land zoning: Public open space

Data name:	Zoned land area
Definition:	Show the amount in hectares (ha) of zoned land (open space) within the region
Relevance:	Public open space is a piece of critical infrastructure that is required to be shown in the spatial plan
Frequency:	Ad hoc (This analysis has only been undertaken once in April 2009)
Monitoring history:	No history (This analysis has only been undertaken once in April 2009)
Geographic coverage:	Entire Auckland region
Data source:	Auckland Council
Website:	Not available
Contact details:	Land use, Built Environment and Infrastructure Research Team
Limitations:	This zoning data is sourced from all territorial authorities within the Auckland region. Zoning changes take place all the time, so for this analysis, a snapshot technique is used. This data is taken on April 2009

Land zoning: Business

Data name:	Zoned Land Area
Definition:	Show the amount in hectares (ha) of business zoned land within the region
Relevance:	Business land is a piece of critical infrastructure that is required to be shown in the spatial plan
Frequency:	Ad hoc (This analysis has only been undertaken once in April 2009)
Monitoring history:	No history (This analysis has only been undertaken once in April 2009)
Geographic coverage:	Entire Auckland region
Data source:	Auckland Council
Website:	Not available
Contact details:	Land use, Built Environment and Infrastructure Research Team
Limitations:	This zoning data is sourced from all territorial authorities within the Auckland region. Zoning changes take place all the time, so for this analysis, a snapshot technique is used. This data is taken on April 2009

Land zoning: Residential

Data name:	Zoned land area
Definition:	Show the amount in hectares (ha) of residential zoned land within the region
Relevance:	Residential land is a piece of critical infrastructure that is required to be shown in the spatial plan
Frequency:	Ad hoc (This analysis has only been undertaken once in April 2009)
Monitoring history:	No history (This analysis has only been undertaken once in April 2009)
Geographic coverage:	Entire Auckland region
Data source:	Auckland Council (and it's preceding territorial authorities) (ARC analysis from TA provided data)
Website:	Not available
Contact details:	Land use, Built Environment and Infrastructure Research Team
Limitations:	This zoning data is sourced from all territorial authorities within the Auckland region. Zoning changes take place all the time, so for this analysis, a snapshot technique is used. This data is taken on April 2009

Urbanisation: Historic

Data name:	Historic urban extent
Definition:	Displays geographically the extent of the Auckland urbanised area over time.
Relevance:	Shows how the Auckland region's urban expansion has occurred over time, offering insight into how the urban area of the region had developed
Frequency:	Inconsistent frequency
Monitoring history:	1842, 1871, 1915, 1940, 1945, 1964, 1975, 1987, 2001, 2006 and 2008.
Geographic coverage:	Entire Auckland region
Data source:	Base historical extents (1842 to 1964) sourced from "Auckland in Ferment" (1967, Whitelaw, J.S. (editor)), later extents captured from ortho-aerial photography by Auckland Regional Council.
Website:	
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	This data is best used as an indication only, and is generalised, as such may be unsuitable for use at low scales. Access to aerial photography for some peri-urban areas and rural settlements is limited; as such the representation of their development over time is limited.

Housing: Existing and new housing: Type and location

Data name:	Building consent database
Definition:	Database of building consents issued by TAs in the Auckland region recording numerous variables including: • Constructions and demolitions • Date of consent issue • Address/location of site • Issuing TA • Type of structure (or demolition) being consented to • Floor area when structure is completed • Value of the structure being constructed • Number of structures being built • Classification – eg house, apartment, retail store, service station The building consents are also represented spatially and stored in the Auckland Council GIS SDE database
Relevance:	A good understanding of the number, and trends, of dwellings and commercial sites in the region is fundamental to the region's ability to manage growth and land use and provide opportunities in the future. Monitoring the number of building consents can also give an indication on the state of the economy.
Frequency:	Monthly
Monitoring history:	Dataset begins 1 April 1991
Geographic coverage:	Building consent information is collected monthly by Statistics New Zealand from all territorial authorities in New Zealand. Auckland Council (prior to its formation this data was maintained by the ARC) purchases a copy of this information for the region and receives it monthly.
Data source:	Statistics New Zealand
Website:	http://www.stats.govt.nz/browse_for_stats/industry_sectors/Construction/building-consents-issued-info-releases.aspx
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	1) Not all consents issued result in the construction of the associated structure. 2) See Statistics New Zealand's technical notes on the topic http://www.stats.govt.nz/browse_for_stats/industry_sectors/Construction/BuildingConsentsIssued_HOTPSep10/Technical%20Notes.aspx

Business: Existing and new business development: Type and location

Data name:	
Definition:	
Relevance:	Building consent database
Frequency:	Database of building consents issued by TAs in the Auckland region recording numerous variables including: • Constructions and demolitions • Date of consent issue • Address/location of site • Issuing TA • Type of structure (or demolition) being consented to • Floor area when structure is completed • Value of the structure being constructed • Number of structures being built • Classification – eg house, apartment, retail store, service station The building consents are also represented spatially and stored in the Auckland Council GIS SDE database
Monitoring history:	Dataset begins 1 April 1991
Geographic coverage:	Building consent information is collected monthly by Statistics New Zealand from all territorial authorities in New Zealand. Auckland Council (prior to its formation this data was maintained by the ARC) purchases a copy of this information for the region and receives it monthly.
Data source:	Statistics New Zealand
Website:	http://www.stats.govt.nz/browse_for_stats/industry_sectors/Construction/building-consents-issued-info-releases.aspx
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	1) Not all consents issued result in the construction of the associated structure. 2) See Statistics New Zealand's technical notes on the topic http://www.stats.govt.nz/browse_for_stats/industry_sectors/Construction/BuildingConsentsIssued_HOTPSep10/Technical%20Notes.aspx

Perceptions

Data name:	Resident's perceptions of built environment
Definition:	Residents' perceptions around the built environment measured by responses to the following question: On a scale of one to five where one is satisfied and five is dissatisfied, how would you rate the Quality and style of new buildings in your neighbourhood? (This question is only an example and may of course be further developed into a series of questions that measure residents perceptions).
Relevance:	Residents' perceptions of the environment in which they live work and play have an flow-on effect with community engagement, civic participation and general pride in their area.
Frequency:	Was included in the 2010 ARC residents' survey. Sample size for Auckland was 1,600 residents aged 18 years and over.
Monitoring history:	Included in the EAS from 2003/04.
Geographic coverage:	As this is generally collected though a survey, coverage will depend on the timing, size and scope of the survey. Generally, this is able to be reported at the regional and TA level, but not adequate coverage to report at neighbourhood or community level (unless this was specifically surveyed).
Data source:	for 2009 - ARC EAS survey (residents survey)
Website:	-
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore not complete coverage, and is only available when included in a survey.

Social infrastructure: Location and type

Data name:	Social infrastructure
Definition:	Social infrastructure includes both physical facilities and services, and community development processes that are provided by council, government and community groups to support and sustain the wellbeing of communities. Examples of physical facilities and services include libraries, community centres, schools, health centres, leisure centres and emergency services. Examples of community development processes include networks of people and organisations, events; and community building, brokering and development programmes. This metadata refers to the information we hold on the first aspect – namely physical facilities and services.
Relevance:	The places, spaces and buildings in which health, education, cultural and community activities occur are an essential aspect of the wider infrastructure of any city or region.
Frequency:	Ad hoc
Monitoring history:	Static dataset, so no monitoring undertaken
Geographic coverage:	Entire Auckland region
Data source:	Auckland Council GIS database Datasets: • Facility – Hospitals, Accident and Medical, Universities and Institutes • Location – Schools, Early Childhood Centres, Marae • Parks – Location (former ARC parks only) Note: There is not currently am official consolidated data set for the region for either recreational facilities or parks (regional or local).
Website:	
Contact details:	Land use, Built Environment and Infrastructure Research Team
Limitations:	The data relating to social infrastructure is sourced from the Auckland Council GIS database. Data for social infrastructure is not located in one distinct data source, and is across many data sets in GIS There is not currently one official consolidated data-set for the region for either recreational facilities or parks (regional or local).

Energy: Transformation and Use: Non-transport energy use

Data name:	Non-transport energy use
Definition:	Type of energy used for non transport functions. Data includes sales volume, value and price and energy quantity and carbon dioxide quantity.
Relevance:	Energy consumption patterns can provide an understanding of how existing infrastructure is used and the possible effects of consumption on the environment (e.g. CO2 emissions).
Frequency:	Data not regularly reported.
Monitoring history:	Data was collected over the period July 2005 to June 2008.
Geographic coverage:	Auckland region
Data source:	Auckland Council
Website:	Not currently applicable.
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	Data has not been updated since June 2008.

Energy: Transformation and use: Transport energy use

Data name:	Transport Energy Use
Definition:	Type of energy used for transport functions. Data includes sales volume, value and price and energy quantity and carbon dioxide quantity.
Relevance:	Energy consumption patterns can provide an understanding of how existing infrastructure is used and the possible effects of consumption on the environment (e.g. CO2 emissions). Note petrol and diesel sales are also collected but have been reported under a separate indicator.
Frequency:	Data not regularly reported.
Monitoring history:	Data was collected over the period July 2005 to June 2008.
Geographic coverage:	Auckland region
Data source:	Auckland Council
Website:	Not currently applicable.
Contact details:	Land use, Built Environment and Infrastructure Research Team
Limitations:	Data has not been updated since June 2008.

Energy: Transformation and Use: Electricity use

Data name:	Electricity Energy Use
Definition:	Electricity usage by residential, commercial and industrial sub categories. Data includes sales volume (MWh), value ($) and price ($/kWh) and energy quantity and carbon dioxide quantity.
Relevance:	Energy consumption patterns can provide an understanding of how existing infrastructure is used and the possible effects of consumption on the environment (e.g. CO2 emissions).
Frequency:	Data not regularly reported.
Monitoring history:	Data was collected over the period July 2005 to June 2008.
Geographic coverage:	Auckland region
Data source:	Auckland Council
Website:	Not currently applicable.
Contact details:	Land use, Built Environment and Infrastructure research
Limitations:	Data has not been updated since June 2008.

Energy: Utilities: Stormwater

Data name:	Stormwater/ Impermeable Surface Area (ISA)
Definition:	ISA are artificial structures (e.g. roads, buildings) that cover permeable land. ISA enable water runoff which is managed by the stormwater network. The stormwater network consists of naturally occurring and manmade structures. The built network is mapped throughout the region.
Relevance:	The stormwater network is in place throughout the urban area of Auckland. The network is one piece of critical infrastructure which must be identified in the spatial plan.
Frequency:	Ongoing – the extent of the network is updated as it's extended.
Monitoring history:	Ongoing
Geographic coverage:	Auckland region- although storm water issues are predominantly urban in nature
Data source:	Auckland Council
Website:	Not available
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	Data is only viewable at a certain scale.

Utilities: Wastewater

Data name:	Waste water
Definition:	The waste water network carries sewage generated across the region to a number of treatment facilities throughout the region. The network includes a range of components such as wholesale pipes, retail pipe, pump station etc...
Relevance:	The network is one piece of critical infrastructure which must be identified in the spatial plan.
Frequency:	Ongoing – the extent of the network is updated as its extended.
Monitoring history:	Ongoing
Geographic coverage:	Auckland region
Data source:	Watercare Services Limited Auckland Council – available from GIS viewer
Website:	Not currently applicable.
Contact details:	Watercare Services Limited
Limitations:	Data is only viewable at a certain scale.

Utilities: Potable water

Data name:	Potable water
Definition:	The network includes a range of components such as retail pipes, pump station etc...
Relevance:	The network is one piece of critical infrastructure which must be identified in the spatial plan.
Frequency:	Ongoing – the extent of the network is updated as its extended.
Monitoring history:	Ongoing
Geographic coverage:	Auckland region
Data source:	Watercare Services Limited
Website:	Watercare Services Limited
Contact details:	Land use, Built Environment and Infrastructure research
Limitations:	Data is only viewable at a certain scale.

Utilities: Electricity

Data name:	Electricity shape file
Definition:	Electricity – Transpower lines 110 and 220kv and Mercury u/g and Transpower 33 kv
Relevance:	The network is one piece of critical infrastructure which must be identified in the spatial plan.
Frequency:	Ongoing – the extent of the network can be updated as its extended.
Monitoring history:	Ongoing
Geographic coverage:	Auckland region- stored in GIS
Data source:	Transpower
Website:	Not currently available
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	

Utilities: Communications: Broadband

Data name:	Fibre Optic Cables
Definition:	Fibre Optic ducts along the ARTA suburban railway network.
Relevance:	The network is one piece of critical infrastructure which must be identified in the spatial plan.
Frequency:	Ongoing – the extent of the network can be updated as its extended.
Monitoring history:	Ongoing
Geographic coverage:	Auckland region- stored in GIS
Data source:	Auckland Council
Website:	Not currently available
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	-

Location: Road network and public transport services

Data name:	Road network
Definition:	The location of transport infrastructure in the region.
Relevance:	An essential aspect of planning for the future urban form, economic development, social policy and resource allocation.
Frequency:	Report completed for the Auckland region in 2008
Monitoring history:	One off
Geographic coverage:	Auckland Region
Data source:	NZTA
Website:	http://www.nzta.govt.nz/resources/regional-summaries/auckland/index.html
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	-

Safety

Data name:	Transport – safety
Definition:	There are a number of components to transport safety. • Fatal and serious vehicle crashes • Fatal and serious vehicle crashes involving pedestrians and cyclists • Fatal and serious road causalities
Relevance:	Data is collected to monitor the incidence of road crashes in New Zealand and to guide road safety policy. Data also serves an operational purpose, assisting engineers to identify problem areas on the road.
Frequency:	Ongoing
Monitoring history:	Ongoing. The data is sourced from the Crash Analysis System (CAS) which is run by New Zealand Transport Agency (NZTA).
Geographic coverage:	Auckland Region
Data source:	NZTA – but data was provided by TAs.
Website:	http://monitorauckland.arc.govt.nz/transport/road-safety/crash-statistics.cfm
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	NZ Police are not properly qualified to assess the type and severity of injuries. The information collected for a TCR has implications for a prosecution. This may affect the willingness of the people involved in a crash to provide police with complete and accurate information. Police do not attend and report on all injury crashes. It is estimated that crash details for about two-thirds of hospitalised casualties are recorded in the CAS.

Fleet composition

Data name:	Fleet composition
Definition:	The number of road vehicles registered.
Relevance:	We monitor the number of road vehicles to look at trends in use and compare this to the various initiatives in public transport.
Frequency:	Annual
Monitoring history:	Since 2005
Geographic coverage:	Auckland Region
Data source:	NZ Transport Agency Motor Vehicle Register
Website:	http://www.transport.govt.nz/ourwork/TMIF/Pages/TV004.aspx
Contact details:	Land-use, Built Environment and Infrastructure Research team
Limitations:	These numbers are not the same as NZTA data. NZTA regards vehicles as being in the fleet for a year after the owner does not relicense them, whereas MoT is removing them from the statistics as soon as they are not relicensed and their WoF/CoF is overdue by 6 months. This produces a lower but more realistic fleet estimate .

Motor vehicle ownership

Data name:	Motor vehicle ownership
Definition:	Technical definitions of the data collected This indicator shows the number of vehicles that are available for use by household members in the Auckland region on Census Day.
Relevance:	An increase in the vehicle numbers in the region has the potential to intensify traffic congestion in the region. Congestion is one of the key issues affecting Aucklanders, and it is important to monitor and reduce congestion in the region if we are to improve the quality of life and prosperity of the Auckland region and to the well-being of Aucklanders.
Frequency:	5-yearly
Monitoring history:	1996, 2001, 2006
Geographic coverage:	Auckland regional
Data source:	Statistics NZ
Website:	Monitor Auckland, http://monitorauckland.arc.govt.nz/
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	Refer to Statistics NZ

Use: Vehicle kilometres travelled

Data name:	Transport – Vehicle kilometres travelled (VKT)
Definition:	The distance travelled by motorised vehicles on roads.
Relevance:	The pressure road transport places on the environment is assessed by measuring the distance travelled (also known as vehicle kilometres travelled, or VKT) by motorised vehicles on New Zealand roads. VKT is a widely used international proxy for the pressures of road transport on the environment and human health
Frequency:	Reports completed for all individual local authorities in 2006 and 2007 however data is provided for all years beginning 2001.
Monitoring history:	Annual
Geographic coverage:	Auckland region
Data source:	NZTA – but data was provided by TLAs.
Website:	http://www.nzta.govt.nz/resources/results.html?catid=161 http://www.mfe.govt.nz/environmental-reporting/report-cards/transport/2009/index.html
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	

Use: Traffic counts

Data name:	Traffic counts
Definition:	This measure counts the number of private cars crossing nine predetermined screenlines on a single day, during the morning peak hour (7am-9am).
Relevance:	We monitor private vehicle movements to see if numbers are increasing or declining over time. Private vehicle movements are monitored in the Regional Land Transport Strategy and this data can help set regional transport objectives and policies.
Frequency:	2001 and 2010
Monitoring history:	Since 2001
Geographic coverage:	Auckland region
Data source:	Auckland Council
Website:	-
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	This is only a single day survey, during the morning peak (7am-9am)

Use: Public transport patronage

Data name:	Public transport patronage
Definition:	The number of passengers that have taken public transport over the last financial year.
Relevance:	Passenger transport boardings provide information on the relative success or otherwise of routes in the region. This information also has the ability to influence the amount of investment in public transport.
Frequency:	Annual
Monitoring history:	Data since 1990
Geographic coverage:	Regional
Data source:	The data is sourced from operators who file returns of the total number of passengers that have taken services over the past financial year. Compiled by Auckland Transport.
Website:	See Monitor Auckland: http://monitorauckland.arc.govt.nz/MonitorAuckland/index.cfm?94084641-1279-D5EC-ED94-AFED80EBA608
Contact details:	Land Use, Built Environment and Infrastructure Research team
Limitations:	

Use: Perceptions of public transport

Data name:	Perceptions of public transport
Definition:	This refers to a wide range of data that was collected in the ARC's Transport Perceptions Survey. Issues covered included perceptions of transport for trips to work or study. It is assumed that this survey will continue.
Relevance:	Perceptions of the efficiency of various forms of transport for getting around the region can impact on people's travel opportunities and choices
Frequency:	Was annual.
Monitoring history:	Since 2000
Geographic coverage:	Auckland region
Data source:	ARC Transport Perceptions Survey: a telephone survey of 1,000 residents across the Auckland region.
Website:	See Monitor Auckland: http://monitorauckland.arc.govt.nz/transport/perceptions-of-transport/perceptions-of-transport-modes-for-trips-to-work-or-study..cfm
Contact details:	Land Use, Built Environment and Infrastructure Research team
Limitations:	Sample survey, therefore not complete coverage, and is only available when included in a survey.

Vehicle engine size

Data name:	Vehicle engine size
Definition:	The size of engines of light road vehicles.
Relevance:	We monitor the size of engines of light road vehicles to look at trends in engine size and compare this to the price of fuel.
Frequency:	Annual
Monitoring history:	Since 2005
Geographic coverage:	Auckland region
Data source:	NZ Transport Agency Motor Vehicle Register
Website:	http://www.transport.govt.nz/ourwork/TMIF/Pages/TV030.aspx
Contact details:	Land Use, Built Environment and Infrastructure Research Team
Limitations:	

Urban: Stormwater and wastewater network overflows

Data name:	Stormwater and wastewater network overflows
Definition:	The number of wastewater overflows events discharging to the environment
Relevance:	'Wet weather' wastewater overflows (those occurring due to the wastewater system exceeding capacity during rain events) can contribute pathogens into freshwater and marine environments, rendering some areas unsafe for contact recreation or food-gathering for a period after heavy rain. 'Dry weather' overflows, which occur due to blockages in the wastewater system, tend to have greater acute effects. These can include deoxygenation of freshwater environments and high levels of ammonia and other toxins, leading to fish mortality. The contribution of pathogens can also render freshwater and marine environments unsafe for human contact.
Frequency:	Annually
Monitoring history:	Data has on wet-weather overflows has been supplied for the 2008 calendar year, data on dry-weather overflows has been averaged for 2004-2008.
Geographic coverage:	Regionally by wastewater service provider
Data source:	Auckland Water Group, wastewater service providers
Website:	http://www.watercare.co.nz
Contact details:	Watercare
Limitations:	Numbers of overflows are likely to be under-reported as not all wet-weather overflows are detected. Vagaries in reporting between different wastewater service providers may also affect the accuracy of data.

Urban: Contaminant loads in stormwater discharges

Data name:	Contaminant loads in stormwater discharges
Definition:	Total loads for suspended sediment, zinc, copper and Enterococci bacteria were modelled for two main subcatchments, the middle Waitemata Harbour and Pahurehure in the Manukau Harbour. Contributions of stormwater contaminants from both business and residential land uses for each of the seven former local authorities were assessed.
Relevance:	Stormwater contaminants, such as sediment, zinc, copper and enterococccci, have both acute and chronic effects on organisms in the freshwater and marine receiving environments. This can influence the range of organisms that are present in these environments and also the ability of people to gather food and recreate.
Frequency:	The contaminant model has been run to estimate data for the 2009 calendar year. Any updates of the model will occur when resources allow.
Monitoring history:	The model has only been run to estimate contaminant loads for the 2009 calendar year.
Geographic coverage:	Modelling is carried out for sub catchments draining to the middle Waitemata Harbour and Pahurehure in the south-east Manukau Harbour.
Data source:	Stormwater Action Team, ARC
Website:	http://www.arc.govt.nz/environment/water/stormwater/stormwater-action-plan.cfm
Contact details:	Stormwater Team, Auckland Council
Limitations:	Data has been modelled, rather than measured in real-time, and is therefore subject to the limitations of the modelling processes used.

Urban: Wastewater treatment volumes

Data name:	Wastewater treatment volumes
Definition:	Data on the volumes of wastewater treated annually at the various wastewater treatment plants throughout the Auckland region.
Relevance:	The volume and quality of wastewater discharged to the marine receiving environment from wastewater treatment plants has an impact on water quality and biota in these areas.
Frequency:	Annually
Monitoring history:	Monitoring information is held by external agencies (Watercare)
Geographic coverage:	Data is collected from the various wastewater treatment plants around the region (Mangere, Rosedale, Drury, Beachlands-Maraetai, Waiheke Island).
Data source:	Wastewater treatment plant records
Website:	http://www.watercare.co.nz
Contact details:	Watercare
Limitations:	Information is held by external agencies

Marine: Marine pollution events

Data name:	Marine pollution events
Definition:	Number of recorded oil spill events, and volumes discharged, in marine waters immediately surrounding the Auckland region
Relevance:	Marine oil spills have negative effects on water quality and can impact on biota, property and recreational values in the marine environment.
Frequency:	Annually
Monitoring history:	Data presented from 2005-2008
Geographic coverage:	Information on marine oil spills is collected via notification of Auckland Council Harbourmaster's Office. Data is for spills in waters immediately surrounding the Auckland Region.
Data source:	Auckland Council Harbourmaster's Office
Website:	http://www.arc.govt.nz/environment/coastal-and-marine/harbourmaster/harbourmaster_home.cfm
Contact details:	Auckland Harbourmaster
Limitations:	Not all marine oil spills will be reported to the Harbourmaster's Office, especially those that occur on a relatively small scale.

Rural: Fertiliser applications

Data name:	Fertiliser applications
Definition:	Annual fertiliser use (kg/hectare) in the Auckland region
Relevance:	Excessive use of fertilisers can contribute to the degradation of freshwater environments through eutrophication and the promotion of conditions that favour algal blooms.
Frequency:	5 yearly
Monitoring history:	Data is presented for fertiliser use in the Auckland region in 2002 and 2007.
Geographic coverage:	Region-wide
Data source:	Statistics New Zealand: Agricultural Production Survey, 2002 and 2007
Website:	http://www.aucklandcouncil.govt.nz/EN/environment/Land_water/Pages/Landandsoilconservation.aspx
Contact details:	Environmental Services team
Limitations:	Data is gathered via postal survey, so non-responses and self-reporting bias may affect results.

Solid waste to landfill

Data name:	Total solid waste to landfill
Definition:	An estimate of the volume of solid waste sent to landfills by households and businesses within the Auckland region
Relevance:	The amount of solid waste generated in the Auckland region is important in planning for new landfills to ensure that capacity remains for regional growth.
Frequency:	Annually
Monitoring history:	Data is from 1998/99 to 2007/08
Geographic coverage:	Data is collected from Redvale and Whitford landfills within the Auckland region, as well as historical data from Greenmount landfill, which closed in 2005. Some waste from Auckland is also sent to Hampton Downs landfill in the Waikato region.
Data source:	Auckland Council
Website:	http://www.aucklandcouncil.govt.nz/EN/Services/rubbish_recycling/Pages/home.aspx
Contact details:	Solid Waste team
Limitations:	Some of the waste received by landfills in the Auckland region is generated outside the region, while a proportion of the waste generated within the Auckland region is sent outside the Auckland region for disposal. This means that the volume of waste received by Auckland's landfills is not, by itself, a full measure of the pressure generated by solid waste from Auckland households and businesses. Therefore this data is an estimate of the solid waste sent to landfills that is generated solely by households and businesses in the Auckland region.

Total recycling by type of waste

Data name:	Total recycling by type of waste
Definition:	Volume of solid waste recycled, by type of waste and former territorial authority
Relevance:	Being able to track the effectiveness of recycling schemes is important in efforts to reduce the amount of solid waste going to landfills.
Frequency:	Annually
Monitoring history:	Data is provided for the period 2004-2008
Geographic coverage:	Data covers areas of the former territorial authorities, excluding Franklin district.
Data source:	Territorial authorities' recycling records
Website:	http://www.aucklandcouncil.govt.nz/EN/Services/rubbish_recycling/Pages/home.aspx
Contact details:	Solid Waste Team.
Limitations:	Data is only available on the volumes of recycled waste recorded by the former territorial authorities (excluding Franklin district). Some commercial waste recycling operations are not included.

Economic Domain

Domain Economic

Economic futures

Data name:	Economic Futures Model (EFM)
Definition:	Outlines the possible trajectories that the regional economy and industry sectors will take over the next 25 year period. The data shows projected employment expressed in modified employee counts (MECs), over 5 year intervals to 2031.
Relevance:	The model is based on a multi-regional economic input-output table, and it maps growth paths for 48 industry sector. Three scenarios Horizon 20131, Digital Auckland and Energy Efficiency and for households.
Frequency:	Ongoing
Monitoring history:	2007 base year and forecasts out to 2031
Geographic coverage:	Auckland Region and Local Board
Data source:	Market Economics Ltd and Auckland Council
Website:	
Contact details:	Social and Economic Research Team
Limitations:	As this is a forecasting tool, there are levels of uncertainty associated with forecasts. It is important to note that the EFM is not a crystal ball – no model can predict the future. Rather, the EFM simply evaluates economic and environmental impacts under a restricted set of consumption assumptions formulated as a scenario. Nevertheless, evaluation of each scenario provides critical insights into the potential economic and environmental trade offs which may exist.

Gross Domestic Product (GDP) growth rates

Data name:	GDP growth rate
Definition:	The percentage growth rate of the Auckland region economy per year, compared with the national growth rate.
Relevance:	GDP growth rate shows the year on year growth, which indicates on-going stability and progress of the economy.
Frequency:	Quarterly
Monitoring history:	Data from 1998
Geographic coverage:	Auckland region and nationally
Data source:	Quarterly Regional GDP, Infometrics Ltd
Website:	www.infometrics.co.nz
Contact details:	Social and Economic Research Team.
Limitations:	The currency exchange rate has a stronger influence on the national economy while Auckland regional economic performance is fuelled by strong population growth, a buoyant housing market and a vibrant retail sector.

Gross Domestic Product (GDP) per capita

Data name:	GDP per capita
Definition:	Percentage change of GDP per capita for the Auckland region. It is calculated as the aggregate of production (GDP) divided by the population size.
Relevance:	GDP per capita change, which indicates the average prosperity of the region's people, is the most common indicator of economic performance. Growth in GDP is being considered as a central indicator in the development of an economic development strategy.
Frequency:	Annually
Monitoring history:	Data from 1998
Geographic coverage:	Auckland region and nationally
Data source:	Quarterly Regional GDP, Infometrics Ltd; Population Estimates, Statistics New Zealand Ltd.
Website:	www.infometrics.co.nz; http://www.stats.govt.nz/browse_for_stats/population/estimates_and_projections/subnational-population-estimates-info-releases.aspx
Contact details:	Social and Economic Research team at Auckland Council.
Limitations:	Infometrics data is consistent with Statistics New Zealand's chain volume series of National GDP, which is also expressed in 1995/1996 prices. The series is technically an annual re-weighted chained Laspeyres volume index. The series is not seasonally adjusted, therefore changes between quarters are not necessarily statistically meaningful. Chain volume series are not additive (i.e. the chain volume series for an aggregate will not equal the sum of the values of its components). For further information, see Statistics New Zealand's Chain Volume Measures in National Accounts. Hyperlink: http://www.stats.govt.nz/Publications/WorkKnowledgeAndSkills/chain-volume-measures-in-national-accts.aspx Population estimates used to calculate GDP per capita are an estimate of the population rather than an actual count. However, these are more accurate than Census counts of usual residents given they account for the undercount in the census and estimate growth since the last Census year.

Businesses

Data name:	Number of geographic units by industry sector (ANZSIC) in the Auckland region. (Geographic units are defined as a separate operating unit engaged in New Zealand in one, or predominately one kind of economic activity from a single physical location or base.)
Definition:	Business Demographic statistics (also sometimes referred to as Business Directory) provide an annual snapshot (as at February) of the structure and characteristics of New Zealand businesses. The series covers economically significant individual, private-sector and public-sector enterprises that are engaged in the production of goods and services in New Zealand. This generally includes all enterprises with GST turnover greater than $30,000 per year. The Business Demography data is based on the Longitudinal Business Frame (LBF). The LBF contains data from two main sources: Statistics New Zealand's Business Frame (BF) and payroll tax records drawn from the Linked Employer-Employee Database (LEED). Of these, the BF is the predominant source. It covers businesses that are registered with Inland Revenue and meet the criteria for economic significance.
Relevance:	The number of businesses by industry is a useful indicator to monitor industry growth against targeted industry initiatives associated with the economic development strategy. While regional economic policies are not industry specific, it is anticipated that growth sectors will be selected in the next financial year.
Frequency:	Annually (as at February)
Monitoring history:	Data from 2000
Geographic coverage:	Auckland region, local boards, census area unit and meshblock.
Data source:	Statistics New Zealand: Business Directory data.
Website:	www.statistics.govt.nz/
Contact details:	Social and Economic Research team at Auckland Council.
Limitations:	Note that the number of property business units is inflated by the large number of property trusts, which typically do not create any employment.

Business confidence

Data name:	Business confidence: Survey
Definition:	The survey reports on the net percentage of business respondents (in the Auckland region) that expect business conditions to improve (+) or deteriorate (-) over the next six months, compared to the current situation. The survey samples manufacturers, builders, architects, wholesalers and retailers, and service sector firms. Information from these industries provides useful indicators of future investment patterns, and the likely direction and composition of economic growth in coming quarters. Firms are surveyed regarding both their recent experience and expectations for the next three to six months. Results cover: • General business conditions • Output, sales and orders • Costs, prices and profits • Investment levels • Staffing levels • Difficulty finding skilled and unskilled labour • Constraints on production.
Relevance:	The level of business confidence shows business's perception of economic activity in the near future and indicates business owners' intentions regarding future investment and recruitment decisions.
Frequency:	Quarterly
Monitoring history:	Data from 1990
Geographic coverage:	Auckland region
Data source:	Quarterly Survey of Business Opinion, New Zealand Institute of Economic Research.
Website:	http://nzier.org.nz/
Contact details:	Social and Economic Research Team.
Limitations:	This data is based on a survey and therefore faces limitations based on the survey size.

Income distribution

Data name:	Income distribution
Definition:	This indicator monitors the extent of income disparity across Auckland's households by using the GINI coefficient. Census data also measures income distribution of households.
Relevance:	It is implicitly assumed that a certain level of equity is desirable, on social justice grounds. An equitable distribution of incomes amongst a population is assumed to increase the cohesion within a society. Personal consumption expenditure of households is dependent on income sources, and while acknowledging that household size, composition and preferences differ markedly and affect utility from incomes, it is important to monitor how incomes are spread between high and low income households.
Frequency:	Annually
Monitoring history:	Census (1991, 1996, 2001 and 2006)
Geographic coverage:	Auckland region; (down to meshblock for Census)
Data source:	Market Economics Ltd, using Statistics New Zealand's Household Economic Survey Data; Statistics New Zealand Census of Population and Dwellings.
Website:	http://monitorauckland.arc.govt.nz/our-economy/economic-standard-of-living/income-distribution.cfm http://www.statistics.govt.nz/
Contact details:	Social and Economic Research Team.
Limitations:	This is a headline indicator, and for example, it measures current income rather than lifetime income. A society in which everyone earned the same over a lifetime would appear unequal because of people at different stages in their life. The Census income measure is only available at five yearly intervals.

Labour productivity

Data name:	Labour productivity
Definition:	Change in labour productivity per hour worked in the Auckland region. Labour productivity is measured by the value of output produced for each hour worked. It shows how effectively human capital is utilised.
Relevance:	Labour productivity is estimated to account for only about one third of New Zealand's economic growth. Overall economic growth has been maintained largely by increases in the total number of hours worked. New Zealand's low level of labour productivity is the primary reason for its relative low ranking within the OECD in terms of material living standards or income. Increasing labour productivity is therefore crucial for the sustainable development of both New Zealand and the Auckland region.
Frequency:	Annually
Monitoring history:	Data from 1998
Geographic coverage:	Auckland region and nationally
Data source:	New Zealand Institute of Economic Research.
Website:	www.nzier.org.nz
Contact details:	Social and Economic Research Team
Limitations:	Note that labour productivity in the Auckland region relative to other New Zealand's regions attracted considerable attention in recent years because of conflicting results from different sources. The methodology used by NZIER is based on productivity level by industry sector and does not take into account any agglomeration effects.

Household economic activity

Data name:	Household expenditure
Definition:	The Household Economic Survey (HES) is a data source from which we can ascertain household income and expenditure as well as a range of demographic information on individuals and households.
Relevance:	This data source is useful in assisting us to understand relative costs of transport and housing across the region, as well as other household items.
Frequency:	The full Household Economic Survey (HES) is conducted by Statistics New Zealand every three years. The Household Economic Survey (Income) is a shortened version of the HES, and is run in the years in between the full HES survey. The full HES started in July 2009 and will continue until the end of June 2010.
Monitoring history:	Not known
Geographic coverage:	Region only.
Data source:	Statistics New Zealand : Household Economic Survey
Website:	Fore more information on the HES refer to Stats NZ website: http://www.stats.govt.nz/browse_for_stats/people_and_communities/Households/HouseholdEconomicSurvey_HOTPYeJun10/Technical%20Notes.aspx
Contact details:	Social and Economic Research Team
Limitations:	Sample survey, therefore not complete coverage, and is only available every three years.

Tourism: Number of visitor nights

Data name:	Number of visitor nights
Definition:	The number of visitor nights in the Auckland region per month. Also, the number of guest nights spent in commercial accommodation in the Auckland region.
Relevance:	The visitor industry is a major contributor to Auckland region's economy. Infrastructure developed to serve the visitor market can also benefit local residents and adds to the quality of life in the region.
Frequency:	Monthly
Monitoring history:	Data from 1997; from 2000 for commercial accommodation
Geographic coverage:	Auckland region and nationally
Data source:	Accommodation Survey, Statistics New Zealand; Commercial Accommodation Monitor, Ministry of Tourism.
Website:	http://www.statistics.govt.nz/ http://www.tourismresearch.govt.nz/Data--Analysis/Accommodation/Commercial-Accommodation-Monitor/
Contact details:	Tourism Strategy Group, Ministry of Economic Development.
Limitations:	The overall response rate for the Accommodation Survey is between 76 and 80 percent, with remaining units imputed. This introduces unknown errors into the estimates, size of which are difficult to quantify. Other errors occur for reasons such as respondent error, frame quality, and errors in processing. Generally the data quality of the CAM is considered to be good. The main weakness is in the hosted accommodation type as many small establishments are not covered by the survey. Imputed values are used where data is missing, based on the characteristics of similar establishments in the same or similar regions. Imputation introduces unknown errors into the estimates, and this should be borne in mind by users of the data. The size of these unknown errors is difficult to quantify. Other non-sampling errors occur for reasons such as respondent error, frame quality and errors in processing. While every effort is made to minimise these types of error they will still occur. It is not possible to quantify their effect. Also, there is under coverage of small accommodation providers that are outside the scope of the survey

Tourism: Number of business trips

Data name:	Number of business trips
Definition:	Number of business visitors to New Zealand per month
Relevance:	Business visitors support the tourism industry and help forge economic links with other nations.
Frequency:	Monthly
Monitoring history:	1978
Geographic coverage:	Nationally and Auckland International Airport
Data source:	International Travel and Migration, Statistics New Zealand.
Website:	http://www.statistics.govt.nz/infoshare
Contact details:	Social and Economic Research Team
Limitations:	Prior to 1997 data was collected at the first port of arrival in New Zealand, whereas post 1997 data collects data from the port at which they were processes by customs.

Tourism: Visitor expenditure

Data name:	Visitor expenditure
Definition:	Estimated total visitor spend (international and domestic visitors) in the Auckland region.
Relevance:	Visitor expenditure provides an estimation of the scale of the sector.
Frequency:	Annually
Monitoring history:	Data from 2004
Geographic coverage:	Auckland region and nationally
Data source:	New Zealand Regional Tourism Forecasts 2010-2016, Auckland Regional Tourism Office
Website:	http://www.tourismresearch.govt.nz/Data--Analysis/Forecasts/2010---2016--Forecasts---Regional/NZ-Regional-Forecast-Pivot-Tables-2010---2016/
Contact details:	Tourism Strategy Group, Ministry of Economic Development
Limitations:	Data constraints prevent detailed segmentation beyond total international and domestic spend.

International trade

Data name:	Value of exports
Definition:	Value of goods and services exported each year from New Zealand. Value of goods exported through Auckland's sea and air ports.
Relevance:	Given the size of the domestic market, New Zealand's firms need to look for opportunities in overseas markets to grow. Typically, small countries operate very open economies. This data also provides information on the relative scale of exports by destination and how these area changing which are critical to understand for economic growth strategies.
Frequency:	Monthly
Monitoring history:	Data to 2000 (by port), Nationally to 1984
Geographic coverage:	Nationally, Auckland's ports
Data source:	Overseas Cargo Statistics, Statistics New Zealand.
Website:	http://www.statistics.govt.nz/
Contact details:	Social and Economic Research Team
Limitations:	Overseas trade and cargo data is provided by exporters/importers and their agents to the New Zealand Customs Service. Considerable reliance is placed on the exporters/importers and their agents submitting correct codes and information. Before the data is released for statistical purposes it is validated and detected errors corrected. However Statistics New Zealand gives no warranty that this information contains no errors.

Foreign Direct Investment

Data name:	Inward and Outward Foreign Direct Investment
Definition:	Understanding Auckland's role in New Zealand's global engagement: Foreign Direct Investment (2009)
Relevance:	This data interrogates how successful has Auckland been in attracting foreign direct investment; where Auckland's comparative advantages lie in relation to attracting FDI; what the future opportunities for attracting more inward investment are and what the effect of migration is on FDI.
Frequency:	Base line data 2010. Frequency to be determined.
Monitoring history:	2009
Geographic coverage:	Auckland Region
Data source:	Knowledge Matrix Asia Pacific Ltd; BERL; Price Waterhouse Coopers for ARC
Website:	http://www.knowledgeauckland.org.nz/home/publications/publications_home.cfm?oID=93B5145B-14C2-3D2D-B913-AD5BD1E6BAF1
Contact details:	Social and Economic Research Team
Limitations:	There are limitations with capturing a comprehensive dataset of FDI in firms in the Auckland region, particularly around mergers and acquisitions. Also, business frame data has greater coverage of larger firms in relation to FDI than smaller firms.

Migration

Data name:	Migration flows and international travel
Definition:	International Travel and Migration is a monthly release that provides information on the number of overseas visitors, New Zealand resident travellers and permanent and long-term migrants entering or leaving New Zealand. These statistics are based on final counts of arrivals to and departures from New Zealand.
Relevance:	Migration and tourist flows affect the NZ economy from many different aspects (income, skills, investments, fiscal contribution). Net migration, if positive, contributes significantly to population growth, especially of the productive part of it. Migration is a major economic engine of economic growth for NZ.
Frequency:	Monthly
Monitoring history:	Data from June 1998
Geographic coverage:	National
Data source:	Statistics New Zealand
Website:	www.stats.govt.nz/browse_for_stats/population/Migration/international-travel-and-migration-info-releases.aspx
Contact details:	Social and Economic Research Team.
Limitations:	

Firm level linkages

Data name:	Auckland region firm level linkages within Australasia and the Asia-Pacific Region
Definition:	This data investigates how Auckland's firms are linked to wider Australasian, Asia-Pacific and international networks and therefore how the Auckland region is structured into these spatial scales at the firm-level.
Relevance:	It is important to determine how Auckland is structured into the Australasian and international economies to understand how the economy operates and identify potential growth opportunities. A firm-level approach provides empirical evidence of how this occurs and is also the level at which these linkages occur.
Frequency:	2006 with 2003-2006 data.
Monitoring history:	2006
Geographic coverage:	Auckland Region
Data source:	Fairgray, S., 2006: Auckland's Role in the Australasian Economy: Implications for the Auckland Regional Economic Development Strategy, unpublished Masters thesis, University of Auckland.
Website:	n/a
Contact details:	Social and Economic Research Team
Limitations:	Various error sources are present within this methodology and are described in detail within the document. Most current data is 2006 and is likely to have changed since then.

Domain Economic

Employment

Unemployment

Data name:	Unemployment
Definition:	The percentage of unemployed people in the Auckland region's labour force (people aged 15 years or older). Unemployment is measured by the percentage of the labour force that is without a paid job but is actively seeking work.
Relevance:	While a certain level of unemployment is natural in any labour market as people change jobs, unemployment signals structural unbalance or a low level of economic activity. Unemployment constrains the ability to secure a living income, and is associated with a number of social and health issues.
Frequency:	Quarterly
Monitoring history:	Data from 1998
Geographic coverage:	Auckland region and national
Data source:	Household Labour Force Survey, Statistics New Zealand.
Website:	http://www.statistics.govt.nz/
Contact details:	Social and Economic Research Team .
Limitations:	Definition of employed includes all people in the working-age population who, during the reference week worked for one hour or more for pay or profit in the context of an employee/employer relationship or self-employment. It excludes people living in non-private dwellings, in prison, in the armed forces or living on an offshore island. As this is a survey, it is subject to sampling error and categories containing less than 1,000 responses are not useful for practical purposes due to the expected level of sampling error.

Labour force participation

Data name:	Labour force participation rate
Definition:	The percentage of the working-age population either employed or looking for work.
Relevance:	High labour force participation has a positive impact on the region's average prosperity as measured by GDP per capita. Participation in the labour market tends to decrease when jobs are hard to find (high unemployment rate) or when household incomes are sufficiently high to provide people with more choices (for example, to work or not). Labour force participation also has many social outcomes.
Frequency:	Quarterly
Monitoring history:	Data from 1985
Geographic coverage:	Auckland region and nationally
Data source:	Household Labour Force Survey, Statistics New Zealand.
Website:	http://www.statistics.govt.nz/ http://monitorauckland.arc.govt.nz/our-economy/business-and-employment/labour-force-participation.cfm
Contact details:	Social and Economic Research Team
Limitations:	As this is survey data, it potentially has sampling and non-sampling error. Refer to Statistics New Zealand for further information http://www.stats.govt.nz/browse_for_stats/work_income_and_spending/employment_and_unemplo unemployment/HouseholdLabourForceSurvey_HOTPSep10qtr/Technical%20Notes.aspx.

Employment by industry sector

Data name:	Employment by industry sector
Definition:	The number of employees by industry sector in the Auckland region.
Relevance:	Employment by sector of industry indicates which industry sectors are growing, and where there may be growing or declining work opportunities. Changes in employment number might also reflect the changing nature of an industry sector or structural changes in an economy, which can be driven by a number of factors.
Frequency:	Annually
Monitoring history:	Data from 2000
Geographic coverage:	Auckland region, local board, census area unit and meshblock
Data source:	Business Demography Survey, Statistics New Zealand.
Website:	http://www.statistics.govt.nz/ http://monitorauckland.arc.govt.nz/our-economy/business-and-employment/employment-change-by-sector.cfm
Contact details:	Social and Economic Research Team
Limitations:	The categories are aligned to the Australia New Zealand Standard Industry Classification 2006 (ANZSIC). Due to changes in employee data collection method, data before 2000 is not comparable. Employment is measured as an employee count as at February each year and therefore, underestimates total people working as it does not count employers or proprietors and does not capture seasonality of the labour force.

Domain Economic

Employment

Linked employer-employee database

Data name:	Linked employer-employee database (LEED)
Definition:	Number of employees, earnings, job creation/destruction and employee turnover.
Relevance:	Changes in employment within the Auckland region and earnings provide important data for understanding Auckland's labour market dynamics and performance, compared to the rest of New Zealand.
Frequency:	Quarterly
Monitoring history:	Data from 1999
Geographic coverage:	Auckland region and national
Data source:	Linked Employer-Employee Database, Statistics New Zealand
Website:	http://www.statistics.govt.nz/
Contact details:	Social and Economic Research Team
Limitations:	There is a time-delay in publishing this data as it involves the combination of several different datasets that have been produced for different purposes.

Job futures

Data name:	Jobs Futures in Auckland 2006 to 2016
Definition:	Jobs Futures in Auckland 2006 to 2016 – an analysis of past, current and future employment by industry sector in the Auckland region.
Relevance:	Guide providing background information on industry and occupational trends in Auckland and the key factors that determine industry and occupational employment over time.
Frequency:	To be determined
Monitoring history:	2009
Geographic coverage:	Auckland region
Data source:	Auckland Regional Council, 2009: Jobs Futures in Auckland 2006 to 2016
Website:	http://www.knowledgeauckland.org.nz/home/publications/publications_home.cfm?oID=89F8698A-145E-173C-984D-86B6A352E3B6
Contact details:	Social and Economic Research Team
Limitations:	It is unclear what impact the recent economic slowdown will have on forecast trends in this report. As this report involves forecasting, it is subject to forecasting error.

Domain Economic

Employment

Occupational structure

Data name:	Occupational structure of the labour force
Definition:	Number of employees in the Auckland region by occupation.
Relevance:	A high-value added, knowledge-based economy requires a highly skilled labour force. Occupational structures provide an estimate of the labour force's skill level.
Frequency:	5 yearly
Monitoring history:	1996, 2001 and 2006
Geographic coverage:	Auckland region
Data source:	Statistics New Zealand, Census of Population and Dwellings
Website:	http://www.statistics.govt.nz/
Contact details:	Social and Economic Research Team
Limitations:	Changes to the categorisation of occupation type have affected time series data. .

Domain Economic

Employment

Labour force projections

Data name:	Labour force projections by age group and gender, Auckland region, 2006 to 2031
Definition:	This data shows projections of the number of people in the labour force within each age group by gender in the Auckland region from 2006 to 2031, at five-year intervals. Figures given are medium projections, assuming medium fertility, medium mortality, medium migration and medium labour force participation. The projections have as a base the estimated resident population in the labour force at 30 June 2006.
Relevance:	Understanding the labour force composition and size is essential for understanding future employment and economic growth in the Auckland region. It also contributes to conceptualising Auckland's role in New Zealand and the future location and mix of employment. Labour force projections have important implications for economic growth in the region.
Frequency:	Every 5 years
Monitoring history:	2006 base year
Geographic coverage:	Auckland region, TA, possibly to more detail on request from Statistics New Zealand.
Data source:	Statistics New Zealand
Website:	http://www.knowledgeauckland.org.nz/home/data/data_home.cfm?oID=EDF6911F-1279-D5EC-ED97-DEEA7FDC4C6E
Contact details:	Social and Economic Research Team
Notes/Limitations:	As these are projections, they are subject to a level of uncertainty. It is not possible to fully predict future occurrences.

Auckland Council Evidence Base

Domain Economic

Employment

Labour utilisation: Hours worked

Data name:	Quarterly Employment Survey (QES)
Definition:	The QES is a sample survey of businesses that employ more than two people. This survey is carried out every three months. It is designed to produce estimates of average hourly and weekly earnings, average weekly paid hours, and the number of filled jobs and full-time equivalents, by industry. Estimates can also be broken down by sex, ordinary and over-time paid hours, and can be produced for most regions.
Relevance:	It is the only source of information on paid hours by industry, which can be broken down by ordinary time and over-time. The QES also provides information on the number of part-time and full-time jobs and full-time equivalents each quarter. Information from the QES is an economic indicator of the volume of labour used in each quarter, and measures from the QES, such as hours and earnings, are used in the production of quarterly gross domestic product (GDP) and in productivity statistics. Movements in the QES measures 'average hourly earnings' and 'average weekly earnings', which are used in legislation to benchmark figures such as the level of National Superannuation, Accident Compensation Corporation (ACC) levies and payments, paid parental leave, and the calculation of Child Support. This provides context to the development of the Spatial Plan and Economic Development Strategy.
Frequency:	Quarterly
Monitoring history:	Feb 1998
Geographic coverage:	National and regional
Data source:	Statistics New Zealand: Quarterly Employment Survey
Website:	www.statistics.govt.nz
Contact details:	Social and Economic Research Team
Limitations:	Weighted averages are used to adjust numbers according to the different degrees of importance of the items these numbers represent. Examples of weighted averages are the average hourly earnings and average weekly earnings in the QES. This is why it is also useful to look at the drivers behind the changes in the average hourly earnings and average weekly earnings in the QES.

Broadband uptake

Data name:	Broadband uptake
Definition:	Internet connection type (dial up or broadband) as a percentage of total subscribers in New Zealand.
Relevance:	Broadband usage has the ability to accelerate the contribution of ICT to economic growth. Broadband in itself will not drive the growth in the economy. It is the opportunities that are opening up from having access to faster, cheaper broadband that will drive our development. People and businesses use the Internet for a wide range of applications - broadband allows for new and smarter applications to be developed to meet the wants and needs of these users.(Digital Stategy2005)
Frequency:	Annually
Monitoring history:	Data from 2005
Geographic coverage:	National
Data source:	Internet Service Provider Survey, Statistics New Zealand.
Website:	http://www.statistics.govt.nz/
Contact details:	Social and Economic Research Team
Limitations:	This data is usually from a survey and therefore subject to sampling and non-sampling error. However, the June 2010 data is based on a census and therefore, only faces non-sampling error. There is a 15 month gap between 2008 and 2009 as the reference period for the survey was changed to align with OECD surveys. For more information, refer to Statistics New Zealand http://www.stats.govt.nz/browse_for_stats/industry_sectors/information_technology_and_communications/ISPSurvey_HOTPJun10/Technical%20Notes.aspx.

Domain Economic

Infrastructure

Energy intensity and reliability

Data name:	Energy intensity and reliability
Definition:	**Energy intensity:** The number of gigajoules of energy required (GJ/$000) for every thousands dollars contributed towards the national economy (constant price GDP). **Energy reliability:** The national average number of system outages and the average duration of outages. Note that the national average doesn't reflect the localised issue of system reliability, nor does it provide a true picture of the economic cost caused by disruptions in the largest economic centres.
Relevance:	Sustainable development requires decoupling economic development from energy demand. In particular fossil fuel is a major cause of air pollution and widely attributed as a driver of climate change. A reliable energy supply is critical to Auckland's economic future.
Frequency:	Annually
Monitoring history:	Data from 1997
Geographic coverage:	Nationally
Data source:	Environmental Accounts, Statistics New Zealand, New Zealand Energy Indicators, Ministry of Economic Development.
Website:	http://www.statistics.govt.nz/
Contact details:	Statistics New Zealand (environment@stats.govt.nz)
Limitations:	Estimates of total energy demand for large energy consumers are relatively robust. However, estimates for smaller energy consumers require further modelling due to limited data availability. The data presented in this report was subjected to various levels of modelling, therefore the use of absolute figures requires care and trends in the figures are deemed to be indicative.

Auckland Council Evidence Base

Domain Economic

Infrastructure

Transport congestion

Data name:	Transport congestion
Definition:	Average minutes of delay per kilometre on a sample of Auckland's strategic road network at various time of day during the working week. Note that travel time between growth nodes by private vehicle, and public transport accessibility are currently being considered as more suitable indicators to measure transport accessibility.[1]
Relevance:	Ease of movement along Auckland's roading network is central to the efficient movement of people and goods, and to supporting the region's economic development. The average amount of time to travel around the region is an indicator of reliability of using the road network.
Frequency:	Annually
Monitoring history:	Data from 2002
Geographic coverage:	Auckland region
Data source:	Transport Choices Survey, Auckland Regional Council.
Website:	
Contact details:	Social and Economic research team
Limitations:	

[1] For more details on progress towards achieving transport objectives, please refer to *Auckland Regional Land Transport Strategy Annual Report 2005/06*.

Housing affordability

Data name:	Housing affordability
Definition:	Ratio of median dwelling price by average weekly earnings and the mortgage interest rate. It denotes the amount of income which households are expected to pay to access home ownership.
Relevance:	Housing affordability reflects households' capacity to pay for housing. The lack of housing affordability has an economic and social cost. Real household income has a strong bearing on their ability to access home ownership.
Frequency:	Quarterly
Monitoring history:	Data from 1998
Geographic coverage:	Auckland region and nationally
Data source:	Home Affordability Report, Massey University
Website:	http://commerce.massey.ac.nz/homeaffordability.php
Contact details:	Kathryn Farrow, Communications and Marketing, Massey University
Limitations:	The average weekly earnings and mortgage interest rate figures are drawn from Statistics New Zealand and Reserve Bank data. Housing prices are released by the Real Estate Institute of New Zealand (REINZ). The combination of this data provides the opportunity to calculate a reliable and useful summary index.

Domain Economic

Infrastructure

Business land capacity

Data name:	Business land capacity
Definition:	Quantity (in hectares) of vacant business zoned-land in the Auckland region.
Relevance:	In addition to re-use and development, vacant business zoned-land provides potential for economic growth and development.
Frequency:	Every 5 years
Monitoring history:	Data from 1996
Geographic coverage:	Auckland region
Data source:	Auckland Metropolitan Area: Capacity for Growth 1997, 2001 and 2006, Auckland Regional Council
Website:	www.knowledgeauckland.org.nz
Contact details:	Land Use and Built Environment Research Team.
Limitations:	The 2006 figure is not comparable to previous years as this figure includes categories previously excluded from Vacant land definition.

Qualifications of labour force

Data name:	Qualification levels of labour force
Definition:	The highest level of education attained for the Auckland regional labour force (aged 15 and over). This Includes NCEA Level 1, 2 and 3 school qualifications: Honours, Masters and Doctorate degrees and Highest Qualification unidentifiable, Other NZ Secondary School Qualification, and Qualification Not Stated.
Relevance:	A highly qualified and skilled labour force drives an innovative and well - performing economy.
Frequency:	Every 5 years
Monitoring history:	Data from 1996
Geographic coverage:	Auckland region and nationally; some meshblock and census area unit data
Data source:	New Zealand Census, Statistics New Zealand.
Website:	http://www.statistics.govt.nz/
Contact details:	Social and Economic Research Team.
Limitations:	These averages hide considerable variations amongst age and ethnic groups.

Number of tertiary students by sector

Data name:	Number of tertiary students by sector
Definition:	The number of tertiary students by sector (Polytechnics, Universities, Colleges of Education, Wananga, Private Tertiary Providers) in New Zealand from 2002 – 2009.
Relevance:	The number of tertiary students by sector shows short term trends of participation in tertiary education and changes in tertiary sectors. Participation in tertiary education is crucial for increasing human capital, which is an important driver for economic growth.
Frequency:	Annually
Monitoring history:	Data from 2002
Geographic coverage:	Auckland region
Data source:	Ministry of Education
Website:	http://www.educationcounts.govt.nz/statistics/tertiary_education/participation
Contact details:	Social and Economic Research Team
Limitations:	Data is provided at the educational institution level and therefore, it is difficult to estimate the number of students within each region as some providers have campuses in more than one region, For a full list of inclusions and exclusions of this data refer to the Ministry of Education http://www.educationcounts.govt.nz/statistics/tertiary_education/participation.

Business difficulty finding skills

Data name:	Business difficulty finding skills
Definition:	The Quarterly Survey of Business Opinion (QSBO) reports on the net percentage of business respondents (in the Auckland region) that find it easier, harder or the same level of difficulty in finding skilled and unskilled labour than three months ago. The survey samples manufacturers, builders, architects, wholesalers and retailers, and service sector firms. Information from these industries provides useful indicators of future investment patterns, and the likely direction and composition of economic growth in coming quarters.
Relevance:	The difficulties businesses encounter when looking for labour is a major impediment to their growth and innovation performance.
Frequency:	Quarterly
Monitoring history:	Data from 1990
Geographic coverage:	Auckland region
Data source:	New Zealand Institute of Economic Research, Quarterly Survey of Business Opinion.
Website:	www.nzier.org.nz
Contact details:	Social and Economic Research Team.
Limitations:	This data is based on a survey and therefore faces limitations based on the survey size.

Skilled/business migrants

Data name:	Number of skilled/business migrants approved for residency
Definition:	The number of skilled/business category migrants approved for residence in New Zealand per year. (Under the Immigration Programme, 60% of all residency applications are allocated to skilled/business migrants. The total number over resident applications allowed is adjusted from year to year.). Also, the number of skilled/business applicants approved each year by region of employment
Relevance:	Migrants are a valuable source of labour. They also bring new businesses opportunities into the region as well as contribute new and different ideas and practices into the business world. The two main sources of additional labour are migrants approved for residence, and temporary migrants on work permit.
Frequency:	Annually; per month for number of approvals
Monitoring history:	Data from 2003/2004
Geographic coverage:	Nationally and regionally for employment region
Data source:	Migration Trends Key Indicators Report, Department of Labour.
Website:	http://www.dol.govt.nz/publications/general/monthly-migration-trends/index.asp http://www.immigration.govt.nz/migrant/general/generalinformation/statistics/
Contact details:	IMSED Research, Department of Labour
Limitations:	Applications for business/skilled migrants data includes counts of individuals rather than applications as individuals often submit more than one application. Therefore, these counts are likely to be lower than other data sources. Region of employment is only presented for principal applicants, and is displayed as (blank) for secondary applicants.

Temporary migrants

Data name:	Temporary migrants
Definition:	Number of temporary work and student arrivals to New Zealand, per year.
Relevance:	Temporary permits for work help to meet New Zealand's skill shortages and have been shown to often lead to residency through the skilled/business category.
Frequency:	Annually
Monitoring history:	Data from 1999
Geographic coverage:	Nationally
Data source:	Migration Trends & Outlook 2008/2009, Department of Labour.
Website:	http://www.dol.govt.nz/publications/research/migration-outlook-200809/index.asp
Contact details:	Department of Labour
Limitations:	There is no tracking of where temporary migrants locate, although it is estimated that around 40% of migrants settle in the Auckland region.

Industry growth

Data name:	Number of geographic units by industry sector (ANZSIC) in the Auckland region. (Geographic units are defined as a separate operating unit engaged in New Zealand in one, or predominately one kind of economic activity from a single physical location or base.)
Definition:	Business Demographic statistics (also sometimes referred to as Business Directory) provide an annual snapshot (as at February) of the structure and characteristics of New Zealand businesses. The series covers economically significant individual, private-sector and public-sector enterprises that are engaged in the production of goods and services in New Zealand. This generally includes all enterprises with GST turnover greater than $30,000 per year. The Business Demography data is based on the Longitudinal Business Frame (LBF). The LBF contains data from two main sources: Statistics New Zealand's Business Frame (BF) and payroll tax records drawn from the Linked Employer-Employee Database (LEED). Of these, the BF is the predominant source. It covers businesses that are registered with Inland Revenue and meet the criteria for economic significance.
Relevance:	The number of businesses by industry is a useful indicator to monitor industry growth against targeted industry initiatives associated with the economic development strategy. While regional economic policies are not industry specific, it is anticipated that growth sectors will be selected in the next financial year.
Frequency:	Annually (as at February)
Monitoring history:	Data from 2000
Geographic coverage:	Auckland region and local boards
Data source:	Business Directory data, Statistics New Zealand.
Website:	http://www.statistics.govt.nz/
Contact details:	Social and Economic Research Team.
Limitations:	The number of property business units is inflated by the large number of property trusts, which typically do not create any employment.

R and D expenditure

Data name:	Expenditure on research and development
Definition:	Expenditure on research and development by sector in New Zealand.
Relevance:	Research and development (R&D) increases the stock of knowledge and is crucial to the innovation process
Frequency:	Biennially
Monitoring history:	Data from 2004
Geographic coverage:	Nationally
Data source:	Research & Development Survey, Statistics New Zealand.
Website:	http://www.statistics.govt.nz/ http://monitorauckland.arc.govt.nz/our-economy/business-and-employment/number-of-businesses-by-sector.cfm
Contact details:	Social and Economic Research team at Auckland Council.
Limitations:	The sampling error on the total R&D expenditure figure has been measured at 2.1 percent at the 95 percent confidence level. There is no sampling error for the higher education (universities) sector due to the full coverage of this sector. While the government sector also had full coverage, the method of handling non-response through weight adjustments generates sampling error. Sampling errors for individual sectors or industries can be supplied upon request. The R&D Survey results are subject to measurement errors. Refer to Statistics New Zealand for more information: http://www.stats.govt.nz/browse_for_stats/businesses/research_and_development/ResearchandDevelopmentSurvey_HOTP2008/Technical%20Notes.aspx.

Private sector capital formation

Data name:	Private sector capital formation
Definition:	Gross capital formation ($million) per year within New Zealand's private sector. It is defined as the outlays of producers on durable fixed assets, such as buildings, motor vehicles, plant and machinery, hydro-electric construction, roading, and improvements to land. (Land is excluded from gross fixed capital formation. Included is the value of construction work done by a firm's own employees. The term "gross" indicates that consumption of fixed capital has not been deducted from the value of the outlays.)
Relevance:	Capital formation is a measure of business investment in productive equipment. Investment in new capital increases the amount and quality of machinery, equipment and infrastructure to be used in the production process. It also enables the adoption of new technologies. The amount of physical capital in an economy is an important factor in economic growth and a key determinant in productivity levels.
Frequency:	Annually
Monitoring history:	Data from 1998
Geographic coverage:	Nationally
Data source:	National Accounts, Statistics New Zealand.
Website:	http://www.stats.govt.nz/browse_for_stats/economic_indicators/NationalAccounts/info-releases.aspx
Contact details:	Statistics New Zealand
Limitations:	

Retail

Data name:	Retail specific data – Retail Snapshot Report
Definition:	This report provides a snapshot on the Auckland region's and New Zealand's retail sector including information on employment (past, present and future), retail spend, gross output and value added (GRP) (current and future), retail sales, exports, concentration in retail sectors, household spend and growth in relation to population (Census).
Relevance:	Provides a snapshot of the retail sector in Auckland and its contribution to the economy. This informs sector development strategies, the economic development strategy and the spatial plan.
Frequency:	To be determined
Monitoring history:	From 2010
Geographic coverage:	Auckland Region and National
Data source include:	Statistics New Zealand, Market Economics Ltd, Infometrics Ltd and Auckland Council
Website:	www.knowledgeauckland.org.nz
Contact details:	Social and Economic Research Team
Limitations:	Refer to Retail Snapshot Report.

Retail spend

Data name:	Retail specific data – Retail Spend database
Definition:	This is data on the electronic transactions of BNZ cardholders in New Zealand. It details the place of residence of the cardholder, the place of spend, amount spend and spend category.
Relevance:	It is essential to understand patterns of consumer expenditure as it is a key driver of the spatial economy. The level of detail in this dataset enables the identification of fine-level geographic spend patterns, which creates a picture of urban amenity, form and function.
Frequency:	To be determined
Monitoring history:	To be determined
Geographic coverage:	Meshblock, Census Area Unit, Auckland Region and National
Data source include:	Marketview Ltd
Website:	www.marketview.co.nz
Contact details:	Social and Economic Research Team
Limitations:	This data is essentially a survey based on electronic transactions of BNZ cardholders. While this provides a very detailed picture of spend, it does not include all consumers and non-electronic purchases. It also does not include non-domestic spend, although this can be obtained from a separate dataset also available from Marketview Ltd.

Marine

Data name:	Marine specific data – Marine Snapshot Report
Definition:	This report provides a snapshot on the Auckland region's marine sector including information on employment (past, present and future), turnover, GRP (past, present and future), exports, businesses, training and development, the Marine Industry Association Survey, ARC monitoring data and the Census.
Relevance:	Provides a snapshot of the marine sector in Auckland and its contribution to the economy. This informs sector development strategies, the economic development strategy and the spatial plan.
Frequency:	To be determined
Monitoring history:	From 2009
Geographic coverage:	Auckland Region and National
Data source include:	Statistics New Zealand, Market Economics Ltd, Infometrics Ltd, Auckland Regional Council and Auckland Council
Website:	http://www.knowledgeauckland.org.nz/home/publications/publications_home.cfm?oID=E102AD28-145E-173C-9842-E5750E65249F
Contact details:	Social and Economic Research Team
Limitations:	Refer to Marine Snapshot Report.

Auckland Council Evidence Base

Domain Economic

Industry sectors

Tourism

Data name:	Tourism specific data – Tourism Snapshot Report
Definition:	This report provides a snapshot on the Auckland region's tourism sector including information on employment (past, present and future), GDP/GRP (past, present and future), spend, visitor numbers, visitor nights, domestic and international tourists, arrivals by port and reasons for travel.
Relevance:	Provides a snapshot of the tourism sector in Auckland and its contribution to the economy. This informs sector development strategies, the economic development strategy and the spatial plan.
Frequency:	To be determined
Monitoring history:	From 2009
Geographic coverage:	Auckland Region and National
Data source include:	Statistics New Zealand, Market Economics Ltd, Ministry of Tourism, Auckland Regional Council and Auckland Council
Website:	http://www.knowledgeauckland.org.nz/home/publications/publications_home.cfm?oID=ED628816-1279-D5EC-ED71-A917B20784F8
Contact details:	Social and Economic Research Team
Limitations:	Refer to Tourism Snapshot Report.

Construction

Data name:	Construction specific data – Construction Snapshot Report
Definition:	This report provides a snapshot on the Auckland region's construction sector including information on employment (past, present and future), GDP/GRP (past, present and future), businesses, building consents, investment, house prices, industry training, ARC monitoring data and population (Census).
Relevance:	Provides a snapshot of the construction sector in Auckland and its contribution to the economy. This informs sector development strategies, the economic development strategy and the spatial plan.
Frequency:	To be determined
Monitoring history:	From 2009
Geographic coverage:	Auckland Region and National
Data source include:	Statistics New Zealand, Market Economics Ltd, Infometrics Ltd, various industry training organisations, Real Estate Institute of New Zealand, Auckland Regional Council and Auckland Council
Website:	http://www.knowledgeauckland.org.nz/home/publications/publications_home.cfm?oID=ED60695D-1279-D5EC-EDC2-63502C2E550A
Contact details:	Social and Economic Research Team
Limitations:	Refer to Construction Snapshot Report.

Food and beverage

Data name:	Food and beverage specific data – Food and Beverage Snapshot Report
Definition:	This report provides a snapshot on the Auckland region's food and beverage sector including information on employment, GDP/GRP, businesses, labour productivity, wages and income.
Relevance:	Provides a snapshot of the food and beverage sector in Auckland and its contribution to the economy. This informs sector development strategies, the economic development strategy and the spatial plan.
Frequency:	To be determined
Monitoring history:	From 2010
Geographic coverage:	Auckland Region and National
Data source include:	Statistics New Zealand, BERL Ltd and Auckland Council
Website:	http://www.knowledgeauckland.org.nz/home/publications/publications_home.cfm?oID=90456E80-145E-173C-988E-4208A66B2FC8
Contact details:	Social and Economic Research Team
Limitations:	Refer to Food and Beverage Snapshot Report.

Bioscience

Data name:	Bioscience specific data – Bioscience Snapshot Report
Definition:	This report provides a snapshot on the Auckland region's bioscience sector including information on employment, GDP/GRP, businesses, exports, the Biotechnology Survey, sector concentrations and firm specific data.
Relevance:	Provides a snapshot of the bioscience sector in Auckland and its contribution to the economy. This informs sector development strategies, the economic development strategy and the spatial plan.
Frequency:	To be determined
Monitoring history:	From 2010
Geographic coverage:	Auckland Region and National
Data source include:	Statistics New Zealand, Market Economics Ltd, Knowledge Matrix Asia Pacific Ltd, fDi markets database and Auckland Council.
Website:	http://www.knowledgeauckland.org.nz/home/publications/publications_home.cfm?oID=E06DE687-145E-173C-9849-9955164C5018
Contact details:	Social and Economic Research Team
Limitations:	Refer to Bioscience Snapshot Report.

Manufacturing

Data name:	Manufacturing specific data – Manufacturing Snapshot Report
Definition:	This report provides a snapshot on the Auckland region's manufacturing sector including information on employment (past, present and future), GDP/GRP (past, present and future), businesses, exports and sector concentrations.
Relevance:	Provides a snapshot of the manufacturing sector in Auckland and its contribution to the economy. This informs sector development strategies, the economic development strategy and the spatial plan.
Frequency:	To be determined
Monitoring history:	From 2009
Geographic coverage:	Auckland Region and National
Data source include:	Statistics New Zealand, Market Economics Ltd, Infometrics Ltd and Auckland Council.
Website:	http://www.knowledgeauckland.org.nz/home/publications/publications_home.cfm?oID=89FA717C-145E-173C-980E-F51B03E580BF
Contact details:	Social and Economic Research Team
Limitations:	Refer to Manufacturing Snapshot Report.

Aquaculture

Data name:	Aquaculture specific data – Aquaculture economic impact Report
Definition:	This report provides a snapshot on the Auckland region's aquaculture sector including information on employment, businesses, sales, economic impacts/multipliers, production/harvest data, land use, exports and an industry survey.
Relevance:	Provides a snapshot of the aquaculture sector in Auckland and its contribution to the economy. This informs sector development strategies, the economic development strategy and the spatial plan.
Frequency:	To be determined
Monitoring history:	From 2009/2010
Geographic coverage:	Auckland Region and National
Data source include:	Murray, C.; and McDonald, G.; (2010). Aquaculture: Economic impact in the Auckland region. Jointly prepared by the Auckland Regional Council and Market Economics Ltd for Auckland Regional Council. Auckland Regional Council Document. Technical Report no. 009, 2010. Statistics New Zealand Environment Waikato – economic study of mussel farms Aquaculture New Zealand - databases
Website:	http://www.knowledgeauckland.org.nz/home/publications/publications_home.cfm?oID=46089C4A-145E-173C-98AF-9BA9984AF470
Contact details:	Social and Economic Research Team
Limitations:	Refer to Aquaculture economic impact Report.

Natural and Physical Environment Domain

Concentrations of NO_2

Data name:	Concentrations of nitrogen dioxide (NO_2)
Definition:	Nitrogen dioxide monitoring data
Relevance:	Nitrogen dioxide is an air pollutant and is known to endanger human health and well-being. Nitrogen dioxide monitoring is required under the Resource Management Act (1991) and the National Environmental Standards for Air Quality. Its levels can be compared to the air quality standards, guidelines and regional targets, and give an idea of the exposure of Auckland population. The long term trends are used to examine whether air pollution is getting worse or better.
Frequency:	Currently eight continuous sites, occasional surveys (passive sampling) at multiple sites
Monitoring history:	Ongoing (started from1987)
Geographic coverage:	The monitoring sites in Auckland are selected to represent a range of situations to give an idea of the exposure of Auckland population to air pollution depending on the type of environment they are in (e.g. near roads, in residential areas, near industry etc.). The continuous data are collected in accordance with NZ ambient air quality monitoring good practice guides. The passive sampling data are collected in accordance with relevant overseas guidelines.
Data source:	Auckland Council and other organisations
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science Team
Limitations:	– The Auckland Council cannot monitor every air pollutant. A range of different pollutants are released into the air and the main pollutants monitored are only a subset of this range. – Pollutants may undergo chemical reactions in the air, producing other types of pollutants that may be more harmful to human health. – Any synergistic effects on human health from two or more pollutants are not considered. – Monitoring is carried out only at 'typical' locations that are chosen to best represent the whole Auckland and therefore may not cover other locations where people are exposed to relatively high levels of air pollution. – Ministry for the Environment owns the continuous data at Penrose and other organisations own some passive sampling data.

Concentrations of SO_2

Data name:	Concentrations of sulphur dioxide (SO_2)
Definition:	Sulphur dioxide monitoring data
Relevance:	Sulphur dioxide is an air pollutant and is known to endanger human health and well-being. Sulphur dioxide monitoring is required under the Resource Management Act (1991) and the National Environmental Standards for Air Quality. Its levels can be compared to the air quality standards, guidelines and regional targets, and give an idea of the exposure of Auckland population. The long term trends are used to examine whether air pollution is getting worse or better.
Frequency:	Currently one continuous sites, occasional surveys (passive sampling) at multiple sites
Monitoring history:	Ongoing (started from 1975)
Geographic coverage:	Currently there is a continuous monitoring site in Auckland. Multiple passive sampling sites are selected to investigate spatial distribution and represent a range of situations to give an idea of the exposure of Auckland population to air pollution depending on the type of environment they are in (e.g. near roads, in residential areas, near industry etc.). The continuous data are collected in accordance with NZ ambient air quality monitoring good practice guides. The passive sampling data are collected in accordance with relevant overseas guidelines.
Data source:	Ministry for the Environment, Auckland Council
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science team
Limitations:	– The Auckland Council cannot monitor every air pollutant. A range of different pollutants are released into the air and the main pollutants monitored are only a subset of this range. – Pollutants may undergo chemical reactions in the air, producing other types of pollutants that may be more harmful to human health. – Any synergistic effects on human health from two or more pollutants are not considered. – Monitoring is carried out only at 'typical' locations that are chosen to best represent the whole Auckland and therefore may not cover other locations where people are exposed to relatively high levels of air pollution. – Ministry for the Environment owns the continuous data.

Annual averages of benzene and 1-3 butadiene

Data name:	Annual averages of benzene and 1-3 butadiene
Definition:	Benzene and 1-3 butadiene monitoring data
Relevance:	Benzene and 1-3 butadiene are the two volatile organic compound (VOCs) that are considered to be most hazardous to human health. Benzene monitoring and 1-3 butadiene monitoring are required under the Resource Management Act (1991). Their levels can be compared to the air quality guidelines and regional targets, and give an idea of the exposure of Auckland population. The long term trends are used to examine whether air pollution is getting worse or better.
Frequency:	Currently one continuous site, occasional surveys (passive sampling) of benzene at multiple sites
Monitoring history:	Ongoing (started from 2001 for passive sampling, from 2005 for continuous monitoring)
Geographic coverage:	Currently there is a continuous monitoring site in Auckland for benzene and 1-3 butadiene. Multiple passive sampling sites are selected to investigate spatial distribution of benzene and represent a range of situations to give an idea of the exposure of Auckland population to air pollution depending on the type of environment they are in (e.g. near roads, in residential areas, near industry etc.). The data are collected in accordance with NZ ambient air quality monitoring good practice guides.
Data source:	Auckland Council, Ministry for the Environment
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science team
Limitations:	– The Auckland Council cannot monitor every air pollutant. A range of different pollutants are released into the air and the main pollutants monitored are only a subset of this range. – Pollutants may undergo chemical reactions in the air, producing other types of pollutants that may be more harmful to human health. – Any synergistic effects on human health from two or more pollutants are not considered. – Monitoring is carried out only at 'typical' locations that are chosen to best represent the whole Auckland and therefore may not cover other locations where people are exposed to relatively high levels of air pollution. – Ministry for the Environment owns some of the benzene passive sampling data.

Concentrations of carbon monoxide (CO)

Data name:	Concentrations of carbon monoxide (CO)
Definition:	Carbon monoxide monitoring data
Relevance:	Carbon monoxide is an air pollutant and is known to endanger human health and well-being. Carbon monoxide monitoring is required under the Resource Management Act (1991) and the National Environmental Standards for Air Quality. Its levels can be compared to the air quality standards, guidelines and regional targets, and give an idea of the exposure of Auckland population. The long term trends are used to examine whether air pollution is getting worse or better.
Frequency:	Continuous
Monitoring history:	Ongoing (started from1991)
Geographic coverage:	Currently there are six sites in Auckland that are selected to represent a range of situations to give an idea of the exposure of Auckland population to air pollution depending on the type of environment they are in (e.g. near roads, in residential areas, near industry etc.). The data are collected in accordance with NZ ambient air quality monitoring good practice guides.
Data source:	Auckland Council
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science team
Limitations:	– The Auckland Council cannot monitor every air pollutant. A range of different pollutants are released into the air and the main pollutants monitored are only a subset of this range. – Pollutants may undergo chemical reactions in the air, producing other types of pollutants that may be more harmful to human health. – Any synergistic effects on human health from two or more pollutants are not considered. – Monitoring is carried out only at 'typical' locations that are chosen to best represent the whole Auckland and therefore may not cover other locations where people are exposed to relatively high levels of air pollution.

Concentrations of lead

Data name:	Concentrations of lead
Definition:	Lead monitoring data
Relevance:	Lead is a heavy metal which can be absorbed by humans through the air, water and soil. High lead exposure can affect the nervous system, brain, kidneys, metabolic processes and reproductive systems. In 1996 lead was eliminated from petrol in NZ. Consequently, there has been a significant long-term decline in the amount of lead in the air and lead levels in Auckland are now well below the air quality guideline. Lead concentrations are measured on a long-term basis. This provides data for trend analysis.
Frequency:	Monthly
Monitoring history:	Ongoing (started from1964)
Geographic coverage:	Currently there is monitoring site in Auckland. The data are collected in accordance with NZ ambient air quality monitoring good practice guides.
Data source:	Ministry for the Environment
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science team
Limitations:	- Data are collected only at one site to investigate long term trends. - Ministry for the Environment owns the data.

Concentrations of ozone (O_3)

Data name:	Concentrations of ozone (O_3)
Definition:	Ozone monitoring data
Relevance:	Ozone occurs naturally in the air and is a vital component of the upper atmosphere where it protects the earth from ultraviolet (UV) radiation from the sun. However, Ozone at ground level is one of the main components of photochemical smog that is known to endanger human health and well-being. Ozone monitoring is required under the Resource Management Act (1991) and the National Environmental Standards for Air Quality. Its levels can be compared to the air quality standards, guidelines and regional targets, and give an idea of the exposure of Auckland population. The long term trends are used to examine whether air pollution is getting worse or better. Ozone monitoring data can also be used to understand the chemistry process relating to the production and depletion of nitrogen dioxide (NO_2) (another air pollutant).
Frequency:	Continuous
Monitoring history:	Ongoing (started from 1995)
Geographic coverage:	Currently there are three sites in Auckland that are selected to represent a range of situations to give an idea of the exposure of Auckland population to air pollution depending on the type of environment they are in. The data are collected in accordance with NZ ambient air quality monitoring good practice guides.
Data source:	Auckland Council
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science team
Limitations:	- The Auckland Council cannot monitor every air pollutant. A range of different pollutants are released into the air and the main pollutants monitored are only a subset of this range. - Pollutants may undergo chemical reactions in the air, producing other types of pollutants that may be more harmful to human health. - Any synergistic effects on human health from two or more pollutants are not considered. - Monitoring is carried out only at 'typical' locations that are chosen to best represent the whole Auckland and therefore may not cover other locations where people are exposed to relatively high levels of air pollution.

Number of exceedences of standards, guidelines and regional targets

Data name:	Number of exceedences of standards, guidelines and regional targets
Definition:	Air quality monitoring data
Relevance:	Air quality monitoring is required under the Resource Management Act (1991) and the National Environmental Standards for Air Quality. The concentrations of measured air pollutants can be compared to the air quality standards, guidelines and regional targets, and gives an idea of the exposure of Auckland population. The number of exceedences of standards, guidelines and regional targets provides an indication of air pollution problems in Auckland. The long term trends are used to examine whether air pollution is getting worse or better.
Frequency:	Continuously
Monitoring history:	Ongoing (started from 1975)
Geographic coverage:	Currently there are sixteen sites in Auckland and nine air pollutants are measured at one or more sites. The monitoring sites are selected to represent a range of situations to give an idea of the exposure of Auckland population to air pollution depending on the type of environment they are in (e.g. near roads, in residential areas, near industry etc.). The data are collected in accordance with NZ ambient air quality monitoring good practice guides.
Data source:	Auckland Council, Ministry for the Environment
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science team
Limitations:	- The Auckland Council cannot monitor every air pollutant. A range of different pollutants are released into the air and the main pollutants monitored are only a subset of this range. - Pollutants may undergo chemical reactions in the air, producing other types of pollutants that may be more harmful to human health. - Any synergistic effects on human health from two or more pollutants are not considered. - Monitoring is carried out only at 'typical' locations that are chosen to best represent the whole Auckland and therefore may not cover other locations where people are exposed to relatively high levels of air pollution. - Ministry for the Environment owns some of the data.

Concentrations of fine particulates (PM_{10} and $PM_{2.5}$)

Data name:	Concentrations of fine particulates (PM_{10} and $PM_{2.5}$)
Definition:	Fine particulates monitoring data
Relevance:	PM_{10} particulates are solid or liquid particles less than 10 micrometres in diameter. $PM_{2.5}$ particulates are a smaller fraction of the larger PM_{10} particulates, with a diameter under 2.5 micrometres. Fine particulates are air pollutants and are known to endanger human health and well-being. $PM_{2.5}$ particulates have the same effects as PM_{10} particulates but, because they are much smaller, can penetrate more deeply into the tiny air sacs in the lungs so their adverse health effects are greater. Fine particulates monitoring is required under the Resource Management Act (1991) and the National Environmental Standards for Air Quality. Their levels can be compared to the air quality standards, guidelines and regional targets, and give an idea of the exposure of Auckland population. The long term trends are used to examine whether air pollution is getting worse or better.
Frequency:	Continuous (some are one-in-three-day)
Monitoring history:	Ongoing (started from 1995)
Geographic coverage:	Currently there are sixteen PM10 and six PM2.5 sites that are selected to represent a range of situations to give an idea of the exposure of Auckland population to air pollution depending on the type of environment they are in (e.g. near roads, in residential areas, near industry etc.). The data are collected in accordance with NZ ambient air quality monitoring good practice guides.
Data source:	Auckland Council and other organisations
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science team
Limitations:	- The Auckland Council cannot monitor every air pollutant. A range of different pollutants are released into the air and the main pollutants monitored are only a subset of this range. - Pollutants may undergo chemical reactions in the air, producing other types of pollutants that may be more harmful to human health. - Any synergistic effects on human health from two or more pollutants are not considered. - Monitoring is carried out only at 'typical' locations that are chosen to best represent the whole Auckland and therefore may not cover other locations where people are exposed to relatively high levels of air pollution. - Other organisations own some of the data. - Not all monitoring methods will give the same results

Annual number of brown haze days

Data name:	Annual number of brown haze days
Definition:	Visibility photos
Relevance:	Visibility is a measure of how far the human eye can see through the air. Air pollution can lead to poor visibility, therefore, visibility is widely used to indicate the air quality and amenity value. A brown haze caused by air pollution can form over Auckland and reduce visibility. Annual number of brown haze days, obtained by analysing photographs of the Auckland skyline, provides a useful indication of the amount of discolouration of the air and a rough indication of air clarity. The long term trends are used to indicate whether air pollution is getting worse or better.
Frequency:	Photographs are taken automatically every 30 minutes
Monitoring history:	Ongoing (started from 2000)
Geographic coverage:	Currently there are three camera sites in Auckland to monitor the skyline of the CBD and south Auckland and give an idea of visibility in Auckland.
Data source:	Auckland Council
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science team
Limitations:	The frequency of these brown hazes depends on pollutant sources and weather conditions. Concentrations of measured air pollutants need to be used to directly represent whether the air quality is good or bad.

Land stability: Bare soil

Data name:	Percentage of bare soil by natural processes
Definition:	Natural processes revealing bare soil include surface erosion, riparian erosion, gully erosion, slop failure and at waterbodies and coastlines.
Relevance:	Bare soil exposed through disturbance from natural processes covers 1.8% of the Auckland region of a total 3.26 percent.
Frequency:	Calculation of this indicator is repeated every time there is new aerial photographic coverage of the Auckland region. New aerial photography was taken over the summer of 2006/07 so the survey was repeated in 2007. The 2007 survey also examined the amount of changes that had occurred since the 1999 survey.
Monitoring history:	This point sample survey was completed for the first time in 1999 and repeated with aerial photography from 2007.
Geographic coverage:	5277 one hectare sample areas spread over a 1km grid pattern across the Auckland region.
Data source:	The data is collected under contract for the AC.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/land-management/land-stability.cfm#tabs-2
Contact details:	Environmental Science Team
Limitations:	If a sample area is recorded as disturbed this does not necessarily mean that the entire sample area is bare soil.

Land stability: Soil disturbance

Data name:	Soil disturbance by land use type
Definition:	The survey assigned each sample area to a land use type, based on the predominant land use at that sample area.
Relevance:	Urban land use placed the most pressure on the soil followed by tracks through production land and grazing pressure. Of land used for production, sheep-beef farming resulted in the greatest disturbance (Land use type >30% of Auckland region). Native vegetation had the lowest amount of human induced disturbance Land (use type >25% of Auckland region).
Frequency:	Calculation of this indicator is repeated every time there is new aerial photographic coverage of the Auckland region. New aerial photography was taken over the summer of 2006/07 so the survey was repeated in 2007. The 2007 survey also examined the amount of changes that had occurred since the 1999 survey.
Monitoring history:	This point sample survey was completed for the first time in 1999 and repeated with aerial photography from 2007.
Geographic coverage:	5277 one hectare sample areas spread over a 1km grid pattern across the Auckland region.
Data source:	The data is collected under contract for the AC.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/land-management/land-stability.cfm#tabs-2
Contact details:	Environmental Science Team
Limitations:	Note that 0.9% of the Auckland region had no aerial photography coverage and was excluded from analysis.

Land stability- by surface type

Data name:	Land stability by surface type
Definition:	Stable surfaces show no signs of past natural erosion, have a smooth appearance and are completely vegetated (unless the topsoil is disturbed by land use). Unstable surfaces may not always have active erosion but have been subject to natural erosion in the past. Unstable surfaces are split into three categories: Erosion-prone surfaces – these show signs of past erosion but are not eroding at present, Eroded surfaces – these are erosion scars that are partially vegetated but still rough, Eroding surfaces – these are active erosion scars with no vegetation.
Relevance:	Stable land can be used for a wide range of production purposes. Unstable land is prone to natural erosion due to topography and geology and needs to be managed carefully if used for production purposes so that erosion is not accelerated.
Frequency:	Calculation of this indicator is repeated every time there is new aerial photographic coverage of the Auckland region. New aerial photography was taken over the summer of 2006/07 so the survey was repeated in 2007. The 2007 survey also examined the amount of changes that had occurred since the 1999 survey.
Monitoring history:	This point sample survey was completed for the first time in 1999 and repeated with aerial photography from 2007.
Geographic coverage:	5277 one hectare sample areas spread over a 1km grid pattern across the Auckland region.
Data source:	The data is collected under contract for the AC.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/land-management/land-stability.cfm#tabs-2
Contact details:	Environmental Science Team
Limitations:	The point sample analysis technique has been designed to provide statistical data for regions. Region-wide samples are sufficiently large that they can also provide valid data for reasonably large subdivisions within a region. However, data analysis will not be reliable for soil intactness/disturbance in an area of land any smaller than 100 km^2, or for land use/vegetation cover/soil stability in an area smaller than 500 km^2.

Land stability: Changes in land stability

Data name:	Changes in land stability
Definition:	Changes in land stability are changes between stable and unstable surface conditions – Erosion prone, Eroded and Eroding surfaces.
Relevance:	The Auckland region has a large proportion of unstable surfaces that have eroded in the past or are currently eroding. It is important to monitor the percentages of different surface types to determine if these are changing, and whether land management practices are working and if more resources are required to help manage soil erosion.
Frequency:	Calculation of this indicator is repeated every time there is new aerial photographic coverage of the Auckland region. New aerial photography was taken over the summer of 2006/07 so the survey was repeated in 2007. The 2007 survey also examined the amount of changes that had occurred since the 1999 survey.
Monitoring history:	This point sample survey was completed for the first time in 1999 and repeated with aerial photography from 2007.
Geographic coverage:	5277 one hectare sample areas spread over a 1km grid pattern across the Auckland region.
Data source:	The data is collected under contract for the Auckland Council .
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/land-management/land-stability.cfm#tabs-2
Contact details:	Environmental Science Team
Limitations:	The point sample analysis technique has been designed to provide statistical data for regions. Region-wide samples are sufficiently large that they can also provide valid data for reasonably large subdivisions within a region. However, data analysis will not be reliable for soil intactness/disturbance in an area of land any smaller than 100 km^2, or for land use/vegetation cover/soil stability in an area smaller than 500 km^2.

Soil quality

Data name:	Soil quality (by land use)
Definition:	
Relevance:	This soil quality indicator lets us know whether current land use practices are beneficial or are having adverse impacts on soil.
Frequency:	Soil quality is often defined as the capacity to sustain biological production, maintain environmental quality, and promote plant and animal health. It is assessed using seven soil quality parameters that measure physical, chemical and biological functions of the soil. Changes in soil quality can be both positive and negative.
Monitoring history:	Measurements of soil quality in the Auckland region began in 1995 and continued until 2001, with each of the 88 sites being sampled once. Sampling of sites is now being repeated, with data collected in 2008 and 2009. The soil quality programme will continue, with sites being re-sampled and new sites added as required.
Geographic coverage:	The first programme with Landcare Research ran from 1995 to 1998 to identify 'preferred soil quality parameters'. The second programme was the 500 Soils Project that ran from 1999 to 2000 and was developed by the Ministry for the Environment (MfE) and Landcare Research
Data source:	Between 1995 and 2000, a total of 88 sites were sampled across rural land in the Auckland region. These sites were considered to be a representative cross-section of the major soil and land use types, as it is not possible to measure all combinations of land use and soil classes within the Auckland region. The five broad types of land use were: dairying, sheep-beef pasture, horticulture, forest plantations and native vegetation.
Website:	ARC was involved in two programmes with Landcare Research and MfE, during which time the soil quality data was collected for this indicator. http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/land-management/soil-quality-by-land-use.cfm
Contact details:	Environmental Science Team
Limitations:	Soil quality indicators and guideline ranges are still being developed and have not yet been validated for all soil and land use combinations. Therefore, guideline ranges may be refined over time

Soil erosion

Data name:	Sediment yield
Definition:	Measurements of suspended sediment yields during storms at nine basins in Waitemata Formation terrane, under various land uses in the Auckland region, were analysed to determine event sediment yields and mean annual sediment yields.
Relevance:	Land disturbance activities that expose bare earth surfaces can significantly increase the generation and discharge of elevated levels of sediment to waterways.
Frequency:	The data has been collected on a project by project basis and there is no standard monitoring frequency.
Monitoring history:	The nine sites have been monitored (with various lengths of monitoring) since 1994.
Geographic coverage:	There were nine sites monitored. The catchments are: Wylie Road, Redwood Forest, Mahurangi College, Awanohi Stream, Weiti Forest, Barwick, Lower Vaughan-Long Bay, Lower Awaruku-Long Bay, Mangemangeroa. Catchment areas range from 0.2 to 48.8 km2.
Data source:	Catchment lithology data have been calculated from the Land Resource Inventory (LRI) shape file. The land use breakdown is based on the Land Cover DataBase (LDCB), with either the LDCB1 (1996/1997) or LDCB2 (2000/2001) used, depending on the time of sediment data collection Catchment slope data were calculated by creating a slope surface in ArcGIS using the Digital Elevation Model (DEM.img). Mean annual rainfall data were calculated by creating a rainfall surface (mm/yr). Mean annual runoff was calculated based on the mean water discharge over the period of the flow record (in m3/s), divided by the catchment area (in m2), and multiplied by the number of seconds in a year. This is multiplied by 1000 to give runoff in mm/year.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/land-management/sediment-yield.cfm
Contact details:	Environmental Science Team
Limitations:	The flow records for some sites are limited and the data needs to be interpreted with caution. The mean annual sediment yields from specific catchments were investigated using three approaches to compensate for the limited flow record for most of the study sites. The data has been pulled together for this analysis and was not the original purpose for the study sites.

Land cover

Data name:	Land cover
Definition:	This indicator is a measure of the land cover in 2002 for the Auckland region. Land cover is the actual distribution of forests, water, pasture and other physical features of the land, including those created by human activities. The land cover categories reported in this indicator have been re-classed, from the original 35 classes represented in the Auckland region to six high level land cover classes.
Relevance:	Land cover can serve as a critical indicator of ecosystem functions and biodiversity. It is also vital to catchment management where the land cover patterns can have an influence on receiving environment health. Land cover is also a measure of availability of food or other resources required for human function and can also be used as a proxy for land use
Frequency:	The AC is dependent on the Ministry for the Environment to update the Land Cover Database for monitoring purposes and MfE intends to update the LCDB every five years.
Monitoring history:	LCDB1 data was collected in the summer of 1996/1997 and made available for use in 2000. LCDB2 data was collected in the summer of 2001/2002 and made available for use in 2004.
Geographic coverage:	The land cover classes were re-classed to six broad level categories and Geographic Information System (GIS) tools were used to clip the dataset to the Auckland Regional boundary and then analysed to calculate the extent of land cover classes within the Auckland Region.
Data source:	Data from the Ministry for the Environment's Land Cover Database (LCDB1 and 2) is used to monitor land cover. LCDB1 was completed in June 2000 and used Spot II satellite imagery from 1996/1997. It used 16 land cover classes covering artificial, cultural and natural classes in most regions with a 17th class (riparian willows) added in some regions. LCDB2 was completed in 2004 and used Landsat 7 satellite imagery from 2001/2002. It used 43 land cover and land use classes. The polygon features contain a code and boundary representing the land cover type for the time period.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/land-management/land-cover.cfm
Contact details:	Environmental Science Team
Limitations:	The LCDB database has classification errors of plus or minus 10 per cent. Any changes in land cover less than this cannot be identified with confidence. Therefore, a large change in regional land cover (plus or minus 50,000 ha) must occur before it can be detected using this method. LCDB1 adopted a one hectare (ha) minimum mapping unit (MMU) and to maintain compatibility between LCDB1 and LCDB2 this MMU has been retained.

	There have been many noted errors in the data, especially with extent and type of native vegetation classes at the detailed level. When aggregated up to the broad reporting level, it is of less concern and the broad patterns of change can be assessed. The LCDB datasets give a 'snapshot' of vegetation when the data were collected and should not be considered the definitive current vegetation cover. The MMU of 1ha means that smaller areas of indigenous vegetation are not mapped. The classification system is not mutually exclusive and exhaustive as it contains a mixture of land cover classes, land use classes and hydroclasses. Some areas can fit into more than one of the defined cover classes. Estimates of wetland extent are not reliable. Some types of wetland vegetation may be mapped as scrub and others are mapped as wetland.

Land use: Soil loss to urbanisation

Data name:	Soil loss to urbanisation
Definition:	This indicator reports the loss of soil classed as 'elite' or 'prime agricultural land' to urbanisation between 2001 and 2006.
Relevance:	Auckland already has lost significant areas of soil resource to urban development. The continued urban and rural growth in Auckland can often be at the expense of high quality areas of versatile soils, which have the greatest capability for intensive food production.
Frequency:	Monitoring is dependent on the when new photography is available to generate an urban area polygon.
Monitoring history:	This is the first time the indicator has been compiled and data was processed for the years 1979 (base urban area from NZLRI), 1987, 2001, 2006.
Geographic coverage:	The main urban area of Auckland is the monitoring area and has been mapped over several time periods.
Data source:	The productive capability of land is assessed using the Land Use Capability (LUC) classes. These classes are derived from the New Zealand Land Resource Inventory (NZLRI). There are eight classes, ranging from Class I (flat land with good soil and few limitations) to Class VIII (land with severe physical limitations). The main Auckland urban area has been digitised from aerial photography for the dates 1987, 2001 and 2006 and is used to distinguish the change in urban area at each date.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/land-management/soil-loss-to-urbanisation.cfm
Contact details:	Environmental Science Team.
Limitations:	The NZLRI was mapped at a scale of 1:63 000 initially and the second edition at a scale of 1: 50 000. At this scale it is useful for regional planning purposes and therefore has some limitations of scale and reliability of data and interpretations. It is implicit in mapping that the information recorded will not adequately describe some parts of the map polygon. A rule-of-thumb assumption for users of the information is that up to 20% of any map polygon might be poorly described.

Land use: Urbanisation: Extent of impervious surfaces

Data name:	Extent of impervious surfaces
Definition:	This indicator is a measure of change in impervious surface over time as a proportion of total mapped area. The mapped area is defined as the Metropolitan Urban Area, urban expansion areas, and the rural catchments that drain into the urban area.
Relevance:	Impervious surfaces have been identified as a quantifiable indicator of environmental degradation in urban areas. The scientific literature indicates that catchments with < 10 % impervious surface (IC) may support aquatic communities that are at or near reference condition. However, when %IC increases beyond 10 % most studies indicate that stream health is reduced, and beyond 25 % streams become highly disturbed. These thresholds, which should be regarded as fuzzy boundaries, are embodied in ARC's urban stream management framework (Chapter 3.5 (Urban Rivers and Stream Management Areas) of the Auckland Regional Plan; Air, Land, and Water).
Frequency:	N/A.
Monitoring history:	2009 was the first year this indicator was compiled.
Geographic coverage:	The impervious fraction for the years 2000 and 2008 were mapped and a change comparison analysis completed. The impervious surface indicator is a map of the percentage increase in impervious surfaces between the two dates. Tabular data for each of the territorial authorities was calculated between the two dates.
Data source:	SPOT satellite imagery is used to determine the impervious surface fraction for 2000 and 2008 and was provided from three separate images. One image covered the required area for 2000, but two images were required for 2007 coverage, one dated in 2007 and a second in 2008. Aerial photography for 2001 and 2007 in digital form as orthorectified tiles of variable sizes.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/land-management/extent-of-impervious-surfaces.cfm
Contact details:	Environmental Science Team
Limitations:	Several national and international studies have defined bare earth as both pervious and impervious. In this case bare earth was considered impervious. Therefore when the bare earth is subsequently covered with vegetation the data will show a slight reduction in impervious surfaces.

Land use: Urbanisation: Land disturbance - earthworks

Data name:	Land disturbance associated with earthworks
Definition:	Sediment is a pollutant caused by erosion and works near our waterways. Eroded soils discharge into Auckland's waterways, causing problems for animals and plants in the water and people wanting to enjoy the environment.
Relevance:	In the urban and peri-urban parts of Auckland, earthworks associated with building projects are a major cause of soil disturbance. Earthworks typically strip the vegetation and topsoil from the land surface and recontour the site so that it is more suitable for the proposed land use. During this process, the soil is compacted, buried or displaced.
Frequency:	Monthly data is recorded.
Monitoring history:	2009 is the first time this indicator has been compiled.
Geographic coverage:	This indicator is tabular data retrieved from the consents database for all current earthworks consents for February 2007. The location and attribute data are loaded into the GIS and a dot density map is created to display the data.
Data source:	This data is supplied by consent holders or collected during site inspection by AC staff. The data is entered into the consents database.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/land-management/land-disturbance---earthworks.cfm#tabs-2
Contact details:	Environmental Science Team
Limitations:	The data is provided from the consents database and relies on both compliance visit information and information supplied by the earthworks consent holders. It is not an accurate snapshot assessment on one date, it covers the whole month of February. It is hard to determine whether the data represents the amount actually exposed during that month or whether it's the amount that is permitted in the consent.

Coastal Management Areas: Coastal structures: number and type

Data name:	Coastal structures – number and type
Definition:	Coastal structures include boardwalks, breakwaters, jetties, boat ramps, bridges and groynes.
Relevance:	Structures are necessary in order to meet the recreational and safety requirements of a growing population and the resource demands of a growing economy. However, such structures may adversely impact the natural values and visual amenity values of an area or result in exclusive use limiting public access to open space.
Frequency:	During the RMA consent process
Monitoring history:	During the RMA consent process
Geographic coverage:	Auckland region
Data source:	Individual RMA consents
Website:	N/A
Contact details:	Coastal, Environmental Strategy and Policy
Limitations:	No consistent monitoring process

Coastal Management Areas: Coastal structures – proportion consented

Data name:	Coastal structures – proportion consented
Definition:	Coastal structures include boardwalks, breakwaters, jetties, boat ramps, bridges and groynes.
Relevance:	Although many structures are beneficial, adverse effects on natural values and amenity require careful consideration of applications to prevent excessive proliferation of structures.
Frequency:	Conditions of RMA consents
Monitoring history:	As of 2008 1,327 consented coastal structures existed in the Auckland region with a further 264 under application.
Geographic coverage:	Auckland region
Data source:	RMA consents
Website:	N/A
Contact details:	Coastal, Environmental Strategy and Policy
Limitations:	No consistent monitoring process

Coastal Management Areas: Moorings and marinas – Number and type

Data name:	Moorings and marinas – number and type
Definition:	Moorings are established within specifically designated Mooring Management Areas (MMAs). Auckland also has eight major marinas
Relevance:	Pressure on the CMA for moorings and marinas is predicted to increase with additional subdivision and development. Marinas and moorings are sources of disturbance from human activities.
Frequency:	6 months
Monitoring history:	In the Auckland region, 4610 moorings are currently located within specifically designated Mooring Management Areas (MMAs).
Geographic coverage:	Auckland region
Data source:	Harbourmaster's office
Website:	N/A
Contact details:	Harbourmaster's office
Limitations:	No consistent monitoring process

Coastal Management Areas: Moorings and marinas – Proportion consented

Data name:	Moorings and marinas – proportion consented
Definition:	Moorings are established within specifically designated Mooring Management Areas (MMAs). Auckland also has eight major marinas
Relevance:	Demand for moorings and marinas is expected to increase, however wastewater, heavy metals, organochlorines and other contaminants are a significant problem requiring consents to be considered carefully.
Frequency:	Harbourmaster's office
Monitoring history:	In addition to the 4610 consented moorings, there are about 450 unconsented outside MMA's though this figure is likely underestimated as many more unknown moorings probably exist.
Geographic coverage:	Auckland region
Data source:	Harbourmaster's office
Website:	N/A
Contact details:	Harbourmaster's office
Limitations:	No consistent monitoring process for authorised and unauthorised moorings

Coastal Management Areas: Dredging/ Land reclamation

Data name:	Dredging/ Land reclamation
Definition:	Land reclamation and drainage is often undertaken to increase the area of useable land or to improve access to the coast. Dredging is often required for the development and maintenance of facilities such as marinas and navigational channels.
Relevance:	Both activities can adversely affect the natural character, amenity, and biodiversity values of an area.
Frequency:	Conditions of RMA consents
Monitoring history:	There are currently 47 consents for land reclamation with a further 9 pending, and 32 consents for dredging with a further 3 pending.
Geographic coverage:	Auckland region
Data source:	RMA consents
Website:	N/A
Contact details:	Team Leader, Coastal, Environmental Strategy and Policy
Limitations:	No historic monitoring process

Coastal Management Areas: Mining – sand extraction

Data name:	Mining – sand extraction
Definition:	Sand extraction is necessary for use by the construction industry and for replenishment of Auckland beaches.
Relevance:	Large scale sand extraction can adversely impact nearby beaches that rely on offshore sand for natural replenishment; natural character and amenity may also be affected by mining works.
Frequency:	Conditions of RMA consents
Monitoring history:	There are currently nine consents for sand extraction in the Auckland region with one pending.
Geographic coverage:	Auckland region
Data source:	RMA consents
Website:	N/A
Contact details:	Team Leader, Coastal, Environmental Strategy and Policy
Limitations:	

Coastal Management Areas: Mining - Other

Data name:	Mining- other
Definition:	Mineral prospecting, exploration, extraction and processing.
Relevance:	Adverse effects on natural character, amenity, biodiversity and recreational values should be avoided wherever possible. Mitigation and environmental compensation are required where avoidance is not possible.
Frequency:	Conditions of RMA consents
Monitoring history:	Conditions of RMA consents
Geographic coverage:	Auckland region
Data source:	RMA consents
Website:	N/A
Contact details:	Team Leader, Coastal, Environmental Strategy and Policy
Limitations:	

Coastal Management Areas: Disposal – Historic areas for disposal

Data name:	Historic areas for disposal
Definition:	Sites that have historically been used for dumping
Relevance:	The state of the ecosystems affected
Frequency:	N/A
Monitoring history:	By RMA consent
Geographic coverage:	Auckland region
Data source:	N/A
Website:	N/A
Contact details:	Team Leader, Coastal, Environmental Strategy and Policy
Limitations:	No historic monitoring has occurred as most was not consented and unrecorded

Coastal Management Areas: Disposal – active sites for disposal

Data name:	Active sites for disposal
Definition:	One active site – Pine Harbour
Relevance:	The impact the disposal is having on teh midediate and surrounding habitats
Frequency:	By conditions of RMA consent
Monitoring history:	By RMA consent
Geographic coverage:	Auckland region
Data source:	By RMA consent
Website:	N/A
Contact details:	Team Leader, Coastal, Environmental Strategy and Policy
Limitations:	Monitored through RMA consent

Coastal Management Areas: Aquaculture – type and location

Data name:	Aquaculture – type and location
Definition:	Aquaculture is the practice of cultivation marine organisms for harvesting and sale. Green lipped mussels and Pacific oysters are farmed in the Auckland region.
Relevance:	Aquaculture is a growth industry with 70 farms spanning 341 ha in the Auckland region. Aquaculture occupies public space and can impact recreation activities, natural character and amenity values and public access.
Frequency:	By RMA consent
Monitoring history:	Applications for a further 51 farms (pending from 2001) are on hold until regional plan provisions are finalised.
Geographic coverage:	Auckland region
Data source:	By RMA consent
Website:	N/A
Contact details:	Team Leader, Coastal, Environmental Strategy and Policy
Limitations:	Monitored through RMA consent

Coastal Management Areas: Aquaculture – Environmental effects

Data name:	Aquaculture – environmental effects
Definition:	Aquaculture is the practice of cultivation marine organisms for harvesting and sale. Green lipped mussels and Pacific oysters are farmed in the Auckland region.
Relevance:	Potential environmental effects of aquaculture include; modification of the water column and seabed habitats (with associated impacts on biota), promoting the growth of marine algae, and biosecurity risks.
Frequency:	N/A
Monitoring history:	N/A
Geographic coverage:	Auckland region
Data source:	N/A
Website:	N/A
Contact details:	Team Leader, Coastal, Environmental Strategy and Policy
Limitations:	Provisions and expectations of the community and industry are not set yet.

Climate and meteorology

Data name:	Climate and meteorology
Definition:	Climate and meteorology data
Relevance:	Climatic and meteorological conditions, such as wind speed and direction, rainfall, temperature and relative humidity, can have significant social, economic and environmental impact. For example, heavy rainfall events increase the risk of flooding. Air quality is directly influenced by meteorology. Stable weather conditions and low wind speeds can limit dispersal of air pollutants and contribute to high levels of air pollution in the morning at night. The information about climate and meteorology, and the long trends, provides sound evidence for policy development to effectively reduce their adverse effects and make the most of any opportunities they bring.
Frequency:	Continuously
Monitoring history:	Ongoing (started from 1945)
Geographic coverage:	Currently there are twenty monitoring sites that are selected to represent climatic and meteorological conditions in Auckland. The data are collected in accordance with relevant monitoring standards or guidelines.
Data source:	Auckland Council, NIWA, MetServices and other organisations
Website:	http://www.aucklandcouncil.govt.nz
Contact details:	Environmental Science Team
Limitations:	Monitoring is carried out only at 'typical' locations that are chosen to best represent the whole Auckland or specific areas, therefore, may not cover other locations where local terrain or ground surface has great effects.

Rivers: Water quality: WQI for ecological health

Data name:	River water quality for ecological health
Definition:	An assessment of some of the key water quality measures in our rivers. The results allow us to grade the water quality and assess how suitable our rivers are for supporting plant and animal life.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the state of water quality in our rivers. It also allows us to identify and address issues affecting water quality, such as stormwater, wastewater and agricultural inputs.
Frequency:	The water quality data is collected monthly and reported immediately to the web. The data is analysed and summarised in annual reports, the most recent of which was published in 2010 (TR2010/030) using data collected during 2009.
Monitoring history:	The river water quality programme commenced in 1977 and ran until 1981; it was re-started in 1986 and has been running continuously ever since. The programme has evolved during its duration and the current 31 site network has been operating since January 2009.
Geographic coverage:	Regional coverage using a regionally representative sampling network of 31 sites.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Report 2009/030 and previous reports referenced therein.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/freshwater-ecosystems/river-water-quality-for-ecological-health.cfm
Contact details:	Environmental Science Team
Limitations:	The data from a site relates to that location only, not the whole river system.

Rivers: Water quality: WQI for contact recreation

Data name:	River water quality for contact recreation
Definition:	This indicator reports on the microbiological properties of the water in our rivers. The results allow us to grade the water quality and assess how suitable our rivers are for human recreational activities.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the microbiological water quality of our rivers, which is important for human recreation. It also allows us to identify and address issues affecting water quality, such as stormwater, wastewater and agricultural inputs.
Frequency:	The water quality data is collected monthly and reported immediately to the web. The data is analysed and summarised in annual reports, the most recent of which was published in 2010 (TR2010/030) using data collected during 2009.
Monitoring history:	The river water quality programme commenced in 1977 and ran until 1981; it was re-started in 1986 and has been running continuously ever since. The programme has evolved during its duration and the current 31 site network has been operating since January 2009. The preferred indicator for recreational quality has changed in recent years as a result of scientific and technological advances. The current recommended indictor is Escherichia coli, and this has been measured at all sites since July 2006.
Geographic coverage:	Regional coverage using a regionally representative sampling network of 31 sites.
Data source:	State of the Auckland Environment Report 2009. TR2009/030 and previous reports referenced therein.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/freshwater-ecosystems/river-water-quality-for-recreation.cfm
Contact details:	Environmental Science Team
Limitations:	The data from a site relates to that location only, not the whole river system.

Rivers: Water quality: WQI for stock drinking water

Data name:	River water quality for stock watering
Definition:	This indicator reports on the microbiological properties of the water in our rivers. The results allow us to grade the water quality and assess how suitable our rural rivers are as sources of stock drinking water.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the microbiological water quality of our rivers, which is important for stock watering. It also allows us to identify and address issues affecting water quality, such as stormwater, wastewater and agricultural inputs.
Frequency:	The water quality data is collected monthly and reported immediately to the web. The data is analysed and summarised in annual reports, the most recent of which was published in 2010 (TR2010/030) using data collected during 2009.
Monitoring history:	The river water quality programme commenced in 1977 and ran until 1981; it was re-started in 1986 and has been running continuously ever since. The programme has evolved during its duration and the current 31 site network has been operating since January 2009. The 13 rural sites used in this indicator have been operating since 2003. The indicator of choice for stock drinking water quality has changed in recent years as a result of scientific and technological advances. The current recommended indictor is Escherichia coli, and this has been measured at all sites since July 2006
Geographic coverage:	Regional coverage using a subset of 13 rural sites from the regionally representative sampling network of 31 sites.
Data source:	State of the Auckland Environment Report 2009. TR2009/030 and previous reports referenced therein.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/freshwater-ecosystems/river-water-quality-for-stock-watering.cfm
Contact details:	Environmental Science Team
Limitations:	The data from a site relates to that location only, not the whole river system.

Rivers: Water quality: Trends by land use type

Data name:	Water Quality trends by land use type
Definition:	An assessment of the change in key water quality measures over time by land use type (forested, rural and urban).
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource, but also the direction of any changes (i.e. getting better or worse, no change); this data provides information on the direction of change.
Frequency:	The water quality data is collected monthly; the analysis and reporting of trends is carried out at 5 yearly intervals. The most recent trends report was published in 2007 (TP336) using data up to 2005; the previous report using the data up to 2000 was published in 2000 (TP132).
Monitoring history:	The river water quality programme commenced in 1977 and ran until 1981; it was re-started in 1986 and has been running continuously ever since. The programme has evolved during its duration and the current 31 site network has been operating since January 2009.
Geographic coverage:	Regional coverage using a regionally representative sampling network of 31 sites.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Publication 336.
Website:	n/a
Contact details:	Environmental Science Team
Limitations:	The data from a site relates to that site only, not the whole river system

Rivers: Ecosystem diversity and resilience: Hydraulic function

Data name:	Hydraulic function
Definition:	The indicator is based on ecological functions associated with water storage, movement and transport in rivers. It is assessed as part of the Stream Ecological Valuation monitoring.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the state of the hydraulic functioning in our rivers. It also allows us to identify and address issues affecting rivers, such as stormwater, wastewater and agricultural inputs.
Frequency:	The data is collected bi-annually. The data will be analysed and summarised in reports, the first of which will be published in 2011.
Monitoring history:	ARC began using the Stream Ecological Valuation methodology for SoE monitoring in 2009. The current 66 site network has been operating since January 2009.
Geographic coverage:	Regional coverage using a regionally representative sampling network of 66 sites.
Data source:	Report in preparation
Website:	n/a
Contact details:	Environmental Science Team
Limitations:	The data from a site relates to that location only, not the whole river system. The collection of this measure is in its early stages and we have little understanding of how it varies over time.

Rivers: Ecosystem diversity and resilience: Biophysical process

Data name:	Biophysical processes
Definition:	The indicator is based on ecological functions associated with the processing of minerals, particulates and water chemistry in rivers. It is assessed as part of the Stream Ecological Valuation monitoring.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the state of the biophysical functioning in our rivers. It also allows us to identify and address issues affecting rivers, such as stormwater, wastewater and agricultural inputs.
Frequency:	The data is collected bi-annually. The data will be analysed and summarised in reports, the first of which will be published in 2011.
Monitoring history:	ARC began using the Stream Ecological Valuation methodology for SoE monitoring in 2009. The current 66 site network has been operating since January 2009.
Geographic coverage:	Regional coverage using a regionally representative sampling network of 66 sites.
Data source:	Report in preparation
Website:	n/a
Contact details:	Environmental Science Team
Limitations:	The data from a site relates to that location only, not the whole river system. The collection of this measure is in its early stages and we have little understanding of how it varies over time.

Rivers: Ecosystem diversity and resilience: Macro-invertebrate abundance and diversity

Data name:	Macroinvertebrate abundance and diversity
Definition:	The indicator is based on monitoring of the type and number of macroinvertebrates (such as worms, crustaceans, snails and insects) found at each monitoring site. The type and number of macroinvertebrates found at a site are used to produce an index (Macroinvertebrate Community Index or MCI) which indicates the ecological quality of the site.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the state of ecological communities in our rivers. It also allows us to identify and address issues affecting water quality, such as stormwater, wastewater and agricultural inputs.
Frequency:	The ecological data is collected annually and reported to the web once the samples are processed. The data is analysed and summarised in reports, the most recent of which was published in 2008 (TR2008/010) using data collected between 2003 and 2008.
Monitoring history:	ARC began a macroinvertebrate community monitoring programme in 1999, although there have been methodological developments and programme changes since then. The current 66 site network has been operating since January 2009.
Geographic coverage:	Regional coverage using a regionally representative sampling network of 66 sites.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Report 2008/010
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/freshwater-ecosystems/river-ecological-quality-macroinvertebrates.cfm
Contact details:	Environmental Science Team
Limitations:	The data from a site relates to that location only, not the whole river system

Rivers: Ecosystem diversity and resilience: Index of biotic integrity

Data name:	Quantile index of biotic integrity (native freshwater fish)
Definition:	This indicator reports on the quality of freshwater sites in the Auckland Region based on the fish species that live there. This is done using a mathematical modelling tool known as the Quantile Index of Biotic Integrity (QIBI) that scores a site within a range from 0 (no native fish found) to 60 (the full range of species predicted for that site are present).
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the state of ecological communities in our rivers. It also allows us to identify and address issues affecting water quality, such as stormwater, wastewater and agricultural inputs.
Frequency:	It is planned that the fish communities at ARC sites will be monitored on a rolling basis, with each site sampled approximately every 3 years.
Monitoring history:	ARC began monitoring fish communities in 2009, although this data has not yet been included in this indicator. Further monitoring in 2010 and onwards will provide a picture of the health of fish communities across the Auckland region.
Geographic coverage:	Regional coverage using a regionally representative sampling network of 66 sites.
Data source:	State of the Auckland Environment Report 2009.
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/freshwater-ecosystems/river-ecological-quality-native-fish.cfm
Contact details:	Environmental Science Team
Limitations:	A limitation of the QIBI is its inability to specifically identify the influence of fish passage barriers from other factors that may influence the distribution of fish species. For example, a site might have a low QIBI score due to a weir or large waterfall that prevents some or all fish species from migrating upstream.

Rivers: Network extent

Data name:	River network extent
Definition:	An assessment of the size and location of the river network in the Auckland region.
Relevance:	The effective management of natural resources relies, in part, on knowing the size (Strahler order) and location of the resource; this data provides this information.
Frequency:	Irregular.
Monitoring history:	First assessment using the current methodology was carried out by ARC in 2009 using LIDAR data collected in 2006. The assessment will be refined in 2010/1 using the same 2006 LIDAR data. Previous estimates of the resource size were based on NZMS260 topomaps (digitised from aerial photography) and the River Environment Classification (REC) Both of these approaches substantially underestimated the extent of the river resource in Auckland.
Geographic coverage:	Regional coverage using remote sensing information (LIDAR)
Data source:	State of the Auckland Environment Report 2009. ARC Technical Report 2009/028 and associated GIS files
Website:	n/a
Contact details:	Environmental Science Team
Limitations:	The current version (2009) of this data should be used to estimate the size and general location of the resource only, it should not be relied upon to determine the exact location of a river channel. This will be remedied during the 2010/1 refinement project.

Lakes: Water quality: WQ1 for contact recreation

Data name:	Lake water quality for contact recreation (cyanobacteria)
Definition:	This indicator reports on the microbiological properties of the water in our lakes. The results allow us to grade the water quality and assess how suitable our lakes are for human recreational activities.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the microbiological water quality of our lakes, which is important for human recreation. It also allows us to identify and address issues affecting water quality, such as stormwater, wastewater and agricultural inputs.
Frequency:	All sites are sampled six times per lake monitoring year. The data is analysed and summarised in annual reports, the most recent of which was published in 2008 (TP343) using data collected during 2006 and 2007.
Monitoring history:	The lake water quality programme commenced in 1988 on a quarterly basis, and was increased to 6 times per year in 2005.
Geographic coverage:	Regional coverage using a sampling network of 7 lakes.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Publication 343
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/freshwater-ecosystems/lake-water-quality-for-recreation-blue-green-algae.cfm
Contact details:	Environmental Science Team
Limitations:	The AC monitors the level of cyanobacteria in the lake water quality monitoring programme; it is important to note that our monitoring measures the levels of (potentially toxin producing) cyanobacteria, not the presence or levels of any toxins.

Lakes: Water quality: WQ1 for ecological health

Data name:	Lake water quality for ecological health
Definition:	An assessment of some of the key water quality measures in our rivers. The results allow us to grade the water quality and assess how suitable our lakes are for supporting plant and animal life.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the state of water quality in our lakes. It also allows us to identify and address issues affecting water quality, such as stormwater, wastewater and agricultural inputs.
Frequency:	All sites are sampled six times per lake monitoring year. The data is analysed and summarised in annual reports, the most recent of which was published in 2008 (TP343) using data collected during 2006 and 2007.
Monitoring history:	The lake water quality programme commenced in 1988 on a quarterly basis, and was increased to 6 times per year in 2005.
Geographic coverage:	Regional coverage using a sampling network of 7 lakes.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Publication 343
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/freshwater-ecosystems/lake-water-quality-for-ecological-health.cfm
Contact details:	Environmental Science Team
Limitations:	

Lakes: Water quality: Trends in water quality

Data name:	Lake water quality trends
Definition:	An assessment of the change in key water quality measures over time in the seven monitored lakes.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource, but also the direction of any changes (i.e. getting better or worse, no change); this data provides information on the direction of change.
Frequency:	The water quality data is collected six times per year; the analysis and reporting of trends is carried out at 5 yearly intervals. The most recent trends report was published in 2005 (TP268) using data up to 2005.
Monitoring history:	The lake water quality programme commenced in 1988 on a quarterly basis, and was increased to 6 times per year in 2005.
Geographic coverage:	Regional coverage using a sampling network of 7 lakes.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Publication 268.
Website:	n/a
Contact details:	Environmental Science Team
Limitations:	

Lakes: Ecosystem diversity and resilience: Lake SPI

Data name:	Lake ecological quality (Lake SPI)
Definition:	This indicator is based on monitoring of the type, distribution and abundance of macrophytes (submerged aquatic plants) found at each monitored lake site. The information about the macrophytes found in a lake is used to produce a LakeSPI index, which indicates the ecological quality of the site. The higher the index the better the ecological quality.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the ecological state of our lakes. This allows us to identify the impacts of land use activities on the environment, evaluate the health of Auckland's lakes and detect the direction and magnitude of trends.
Frequency:	Irregular.Lakes are likely to be sampled at intervals of not greater than 5 years.
Monitoring history:	Macrophyte surveys have been carried out intermittently in the Auckland region in relation to specific lake management issues. LakeSPI is a relatively new assessment and reporting technique for lake macrophytes, but it can be applied to historical data and has been used in Auckland to calculate LakeSPI scores on data collected since 1950. AC has directly commissioned NIWA to carry out LakeSPI assessments on a case by case basis since 2005; a comprehensive regional survey was undertaken in 2008 to supplement the previous assessments.
Geographic coverage:	The current network of sites is made of 32 lakes throughout the region. LakeSPI assessments are carried out by NIWA staff under contract from AC.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Report 2009/011
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/freshwater-ecosystems/lake-ecological-quality-macrophytes.cfm
Contact details:	Environmental Science Team
Limitations:	The collection of this measure is in its early stages and we have little understanding of how it varies over time.

Lakes: Ecosystem diversity and resilience: Rotifer Index

Data name:	Lake ecological quality (rotifers)
Definition:	The indicator is based on monitoring of the type and number of rotifers, small animals comprising part of the zooplankton community, found at each monitored lake site. The type and number of rotifers found at a site are used to produce an index, which indicates the ecological quality of the site.
Relevance:	The effective management of natural resources relies, in part, on knowing the state of the resource and this indicator tells us about the ecological state of our lakes. This allows us to identify the impacts of land use activities on the environment, evaluate the health of Auckland's lakes and detect the direction and magnitude of trends.
Frequency:	The rotifer samples are collected six times per year, with the samples processed on an intermittent basis. The data is analysed and summarised in reports, the most recent of which was published in 2009 (TR2009/001) and included data up to 2008.
Monitoring history:	The lake water quality programme began in 1988, and sampling for rotifers was added to this programme in 2002.
Geographic coverage:	Regional coverage using a sampling network of 7 lakes.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Report 2009/001
Website:	http://monitorauckland.arc.govt.nz/natural-environment-and-heritage/freshwater-ecosystems/lake-ecological-quality-rotifers.cfm
Contact details:	Environmental Science Team
Limitations:	

Groundwater: Water quality: WQI for marine receiving environments

Data name:	Groundwater quality Indicator for Marine Ecological Health
Definition:	This indicator monitors the physical and chemical nature of our groundwater within the regions High Use and Quality Sensitive aquifers and relates this to the suitability of the water to support and protect marine plant and animal life. The indicator is derived from the Groundwater Quality Monitoring Programme which focuses on contaminants such as metals, pesticides, nutrients and biological wastes and physical parameters such as temperature, salinity, pH, oxygen levels and water clarity.
Relevance:	Understanding the effect of population growth and the pressures urbanisation and rural activities places on our groundwater resources, is of upmost importance. This indicator evaluates of the state of the groundwater quality and emerging trends of concern. It also allows us to link how activities on land affect the groundwater quality and ultimately the marine environment. This indicator is used to assist in provision of strategic direction and advice into policy development, implementation and policy effectiveness. The Groundwater Quality Monitoring Programme is directly integrated with the National Groundwater Monitoring Programme and National Groundwater Pesticides Survey (both 1990-current) and the Rivers Water Quality Monitoring Programme. The baseline data and groundwater quality trends have been directly used to develop associated ALW Plan policies and rules and strategies in the LTCCP, and also provides an operational tool for Land and Water Resource Consents, Licensing and Compliance.
Frequency:	Groundwater samples are collected quarterly, bi-annually, annually and 4 yearly from 27 sites
Monitoring history:	The programme commenced in 1998, monitoring groundwater quality within the region's High Use Aquifers. 25 boreholes and 2 groundwater springs are currently monitored. Regular programme reviews have optimised sampling frequencies and revised parameters tested to enable comparison with appropriate guidelines and standards (ANZECC 2000 and DWS 2005, revised 2008). The most recent programme review (2010) has revised the programme objectives and optimised and revised sampling locations, frequencies and parameters in accordance with ARC policy objectives, in particular the ALW Plan. 12 additional sampling locations are recommended to provide a minimal coverage of the pressures (contamination, over-use, seawater intrusion, etc.) on the regions Quality Sensitive Aquifers and High Use Aquifers. Hydrocarbons are also proposed to be included into the monitoring programme.
Geographic coverage:	Currently, 27 sites are monitored across the Auckland region within the main aquifer types (based on geology). There are four sites in the Auckland Volcanics, eight sites in the South Auckland Volcanics, two sites in Pleistocene Alluvial Sediments, one site in the Pliocene Dune Sands, three sites in the Pliocene Kaawa Formation, seven sites in the Waitemata Group Sediments and two geothermal sites at Waiwera and

	Parakai. A minimum of 39 sites are recommended.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Reports TP352 and WR130 and previous reports referenced therein. Review of Groundwater Monitoring Programme 2010.
Website:	www.monitorauckland.arc.govt.nz
Contact details:	Environmental Science Team
Limitations:	The groundwater quality sampling programme provides regional information representative of the main aquifer types. Sampling density is too small to adequately monitor local or individual aquifers. The data is limited to the specific aquifer location and the age of the groundwater. Sampling is routine based and not designed to sample specific events such as storm recharge events.

Groundwater: Water quality: WQI for river ecological condition

Data name:	Groundwater Quality Indicator for River Ecological Health
Definition:	This indicator monitors the physical and chemical nature of our groundwater within the regions High Use and Quality Sensitive aquifers and relates this to the suitability of the water to support and protect river plant and animal life. The indicator is derived from the Groundwater Quality Monitoring Programme which focuses on contaminants such as metals, pesticides, nutrients and biological wastes and physical parameters such as temperature, salinity, pH, oxygen levels and water clarity.
Relevance:	Understanding the effect of population growth and the pressures urbanisation and rural activities places on our groundwater resources, is of upmost importance. This indicator evaluates of the state of the groundwater quality and emerging trends of concern. It also allows us to link how activities on land affect the groundwater quality and ultimately our rivers and streams. This indicator is used to assist in provision of strategic direction and advice into policy development, implementation and policy effectiveness. The Groundwater Quality Monitoring Programme is directly integrated with the National Groundwater Monitoring Programme and National Groundwater Pesticides Survey (both 1990-current) and the Rivers Water Quality Monitoring Programme. The baseline data and groundwater quality trends have been directly used to develop associated ALW Plan policies and rules and strategies in the LTCCP, and also provides an operational tool for Land and Water Resource Consents, Licensing and Compliance.
Frequency:	Groundwater samples are collected quarterly, bi-annually, annually and 4 yearly from 27 sites
Monitoring history:	The programme commenced in 1998, monitoring groundwater quality within the region's High Use Aquifers. 25 boreholes and 2 groundwater springs are currently monitored. Regular programme reviews have optimised sampling frequencies and revised parameters tested to enable comparison with appropriate guidelines and standards (ANZECC 2000 and DWS 2005, revised 2008). The most recent programme review (2010) has revised the programme objectives and optimised and revised sampling locations, frequencies and parameters in accordance with ARC policy objectives, in particular the ALW Plan. 12 additional sampling locations are recommended to provide a minimal coverage of the pressures (contamination, over-use, seawater intrusion, etc.) on the regions Quality Sensitive Aquifers and High Use Aquifers. Hydrocarbons are also proposed to be included into the monitoring programme.
Geographic coverage:	Currently, 27 sites are monitored across the Auckland region within the main aquifer types (based on geology). There are four sites in the Auckland Volcanics, eight sites in the South Auckland Volcanics, two sites in Pleistocene Alluvial Sediments, one site in the Pliocene Dune Sands, three sites in the Pliocene Kaawa Formation, seven sites in the Waitemata Group Sediments and two geothermal sites at Waiwera and

	Parakai. A minimum of 39 sites are recommended.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Reports TP352 and WR130 and previous reports referenced therein. Review of Groundwater Monitoring Programme 2010.
Website:	www.monitorauckland.arc.govt.nz
Contact details:	Environmental Science Team
Limitations:	The groundwater quality sampling programme provides regional information representative of the main aquifer types. Sampling density is too small to adequately monitor local or individual aquifers. The data is limited to the specific aquifer location and the age of the groundwater. Sampling is routine based and not designed to sample specific events such as storm recharge events.

Groundwater: Water quality: WQI for public health

Data name:	Groundwater Quality Indicator for Drinking Water
Definition:	This indicator monitors the physical and chemical nature of our groundwater within the regions High Use and Quality Sensitive aquifers and relates this to the suitability of the groundwater for drinking. The indicator is derived from the Groundwater Quality Monitoring Programme which focuses on contaminants such as metals, pesticides, nutrients and biological wastes and physical parameters such as temperature, salinity, pH, oxygen levels and water clarity.
Relevance:	Understanding the effect of population growth and the pressures urbanisation and rural activities places on our groundwater resources, is of upmost importance. This indicator evaluates of the state of the groundwater quality and emerging trends of concern. It also allows us to link how activities on land affect the groundwater quality and whether it is acceptability to drink (without treatment). This indicator is used to assist in provision of strategic direction and advice into policy development, implementation and policy effectiveness. The Groundwater Quality Monitoring Programme is directly integrated with the National Groundwater Monitoring Programme and National Groundwater Pesticides Survey (both 1990-current) and the Rivers Water Quality Monitoring Programme. The baseline data and groundwater quality trends have been directly used to develop associated ALW Plan policies and rules and strategies in the LTCCP, and also provides an operational tool for Land and Water Resource Consents, Licensing and Compliance.
Frequency:	Groundwater samples are collected quarterly, bi-annually, annually and 4 yearly from 27 sites
Monitoring history:	The programme commenced in 1998, monitoring groundwater quality within the region's High Use Aquifers. 25 boreholes and 2 groundwater springs are currently monitored. Regular programme reviews have optimised sampling frequencies and revised parameters tested to enable comparison with appropriate guidelines and standards (ANZECC 2000 and DWS 2005, revised 2008). The most recent programme review (2010) has revised the programme objectives and optimised and revised sampling locations, frequencies and parameters in accordance with ARC policy objectives, in particular the ALW Plan. 12 additional sampling locations are recommended to provide a minimal coverage of the pressures (contamination, over-use, seawater intrusion, etc.) on the regions Quality Sensitive Aquifers and High Use Aquifers. Hydrocarbons are also proposed to be included into the monitoring programme.
Geographic coverage:	Currently, 27 sites are monitored across the Auckland region within the main aquifer types (based on geology). There are four sites in the Auckland Volcanics, eight sites in the South Auckland Volcanics, two sites in Pleistocene Alluvial Sediments, one site in the Pliocene Dune Sands, three sites in the Pliocene Kaawa Formation, seven sites in the Waitemata Group Sediments and two geothermal sites at Waiwera and

	Parakai. A minimum of 39 sites are recommended.
Data source:	State of the Auckland Environment Report 2009. ARC Technical Reports TP352 and WR130 and previous reports referenced therein. Review of Groundwater Monitoring Programme 2010.
Website:	www.monitorauckland.arc.govt.nz
Contact details:	Environmental Science Team,
Limitations:	The groundwater quality sampling programme provides regional information representative of the main aquifer types. Sampling density is too small to adequately monitor local or individual aquifers. The data is limited to the specific aquifer location and the age of the groundwater. Sampling is routine based and not designed to sample specific events such as storm recharge events.

Groundwater: Water quantity: Groundwater levels

Data name:	Groundwater Quantity Indicator Applications for New Bores
Definition:	This indicator is an indirect measure of increasing water demand in the Auckland region and is based on the number of applications to drill new water supply bores.
Relevance:	Understanding the effect of population growth and the pressures urbanisation and rural activities places on our groundwater resources, is of upmost importance. This indicator provides a measure of major increases in demand for groundwater supply and the use for which it is required such as domestic or stock water supply. Over abstraction from groundwater takes, lowers groundwater levels and can lead to saltwater intruding into the aquifer and contamination of the water source, and reductions in surface water flow and wetlands as natural seepages and springs dry up. This indicator is used to assist in provision of strategic direction and advice into policy development, implementation and policy effectiveness. This indictor has been used to help develop associated ALW Plan policies and rules and strategies in the LTCCP, and also for Water Resource Consents, Licensing and Compliance.
Frequency:	Water supply borehole applications as applied for.
Monitoring history:	Water supply borehole consents have been required since ? to date.
Geographic coverage:	All water supply bores and their intended use across the entire region are captured as long as a consent application is submitted.
Data source:	-
Website:	-
Contact details:	Principal Specialist Water, Air, Land, Water and Coastal Unit
Limitations:	Any bores drilled and used without consent are not captured. Applications for takes can be different to that actually used and also vary seasonally.

Volcanic: Number and impact of volcanic eruptions

Data name:	Auckland volcanic field and Distant North Island source
Definition:	The Auckland Volcanic Field (AVF) covers an area of 360km2 and comprises a minimum of 49 scattered volcanic centres in the form of maars, tuff rings, scoria cones and associated lava fields. Activity dates from 250,000 years ago to the most recent eruption forming Rangitoto Island 700 years ago.
Relevance:	Auckland is built directly on the AVF. Although the volcanoes are small and their eruptions have been infrequent, the risk associated with future activity is very high, given the high physical and economic vulnerability of Auckland City. A future eruption could occur anywhere within the AVF making land-use planning for this hazard impossible. Auckland is also at risk from ash fall from large volcanoes in the central North Island and Taranaki regions which may severely impact infrastructure.
Frequency:	Constantly
Monitoring history:	Volcanic seismic monitoring network established mid 1980's
Geographic coverage:	Auckland volcanic field/ Central North Island Volcanic Plateau
Data source:	GNS Science
Website:	http://www.geonet.org.nz/
Contact details:	Hazard Advisor, Environmental policy
Limitations:	Scientific knowledge, vulnerability assessments, warning systems and recovery options require development.

Coastal: Amount and impact of cliff erosion

Data name:	Hard shoreline erosion and cliff instability
Definition:	Coastal cliffs are essentially landforms created by erosion. A number of environmental and anthropogenic factors can contribute to the erosion and instability of coastal cliffs in the Auckland region including geology, aspect, groundwater conditions, vegetation and earthworks. Marine processes control destabilisation of the cliff by removing loose sediment deposits at the cliff toe, leading to gravitational slop failure.
Relevance:	Identification of hazardous areas will assist land use planning along Auckland's hard shorelines. Urban development and lifeline infrastructure facilities situated within or adjacent to sedimentary coastal cliffs are most vulnerable to losses from cliff failure.
Frequency:	Intermittent – Research and RMA consent Investigations
Monitoring history:	~30 studies related to cliff research
Geographic coverage:	Auckland region – most research within the MUL
Data source:	http://www.arc.govt.nz/plans/technical-publications/technical-publications_home.cfm, University Thesis/ Peer reviewed journals
Website:	http://www.arc.govt.nz/plans/technical-publications/technical-publications_home.cfm,
Contact details:	Hazard Advisor, Environmental policy
Limitations:	Long term vulnerability indices do not include vegetation and human influences.

Coastal: Number and impact of tsunamis

Data name:	Tsunami
Definition:	A tsunami is a series of waves typically created by sudden movement or rupturing of the ocean floor, from earthquakes, underwater landslides and underwater volcanic eruptions.
Relevance:	Tsunamis arriving at the shore in New Zealand are generally less than 1m in height and barely observed, however tsunami are perhaps one of the most underrated natural hazards of New Zealand. Large tsunami events are capable of causing widespread coastal flooding, erosion, damage to infrastructure and loss of life. Regional costs from damage to property and infrastructure could exceed millions of dollars when tsunami heights are >1m and coincide with high tides.
Frequency:	Monitoring occurs daily
Monitoring history:	Historic record of tsunami occurrence exists
Geographic coverage:	Waitemata Harbour
Data source:	GeoNet, Pacific Tsunami Warning Centre
Website:	http://www.geonet.org.nz/
Contact details:	Hazard Advisor, Environmental policy
Limitations:	Understanding of timing and frequency of large events, and the impacts of tsunamis from different source areas on the coastline is limited.

Coastal: Number and impact of coastal flooding events

Data name:	Sea level rise and coastal flooding
Definition:	Sea level is the position or elevation where the sea's surface (at still water level) intersects land (datum). It varies due to the influence of tides, weather, large scale ocean-atmospheric interactions (ENSO) and longer term climate changes and tectonic movements.
Relevance:	Sea level rise has the potential to exacerbate common coastal hazards such as flooding and erosion.
Frequency:	Daily
Monitoring history:	110 year record of mean sea level information recorded at the Ports of Auckland tide gauge, 6 year record and Anawhata
Geographic coverage:	Ports of Auckland/NIWA
Data source:	http://www.arc.govt.nz/plans/technical-publications/technical-publications_home.cfm,
Website:	http://www.arc.govt.nz/plans/technical-publications/technical-publications_home.cfm,
Contact details:	Hazard Advisor, Environmental policy
Limitations:	Projected change depends on global social, economic and environmental policies and the extent of available scientific knowledge. Regional coverage of sea level measurements from tide gauges is limited

Coastal: Amount and impact of beach erosion

Data name:	Soft shoreline erosion
Definition:	Coastal erosion is the process of removal of material at the shoreline leading to loss of land as the shoreline retreats landward. Soft shorelines refer to sandy beaches and dunes comprised of unconsolidated or very weakly consolidated materials.
Relevance:	The Auckland region has 1500km of shoreline and is extensively urbanised, exposing the Auckland population to hazardous coastal processes.
Frequency:	6-12 Monthly Beach Profile Surveys
Monitoring history:	10-40 Year records at 16 Sandy beaches
Geographic coverage:	Auckland region -16 Beaches (2 west coast -14 East Coast sites)
Data source:	Environmental Services - RIM
Website:	http://www.arc.govt.nz/plans/technical-publications/technical-publications_home.cfm
Contact details:	Environmental Science Team
Limitations:	Frequency or record unable to identify short term (daily/weekly)trends in sand volume fluctuation, No post storm event monitoring carried out

Earth stability: Number and impact of earthquakes

Data name:	Earthquake
Definition:	Movement of the tectonic plates creates faulting at the ground surface; these may move and potentially rupture, causing an earthquake. The Richter Magnitude scale(M) is a measure of earthquake energy release. The Modified Mercalli Intensity scale (MMI) reflects the level of shaking felt at the surface.
Relevance:	The Auckland region has two faults; the Wairoa North Fault and the Drury Fault. Neither have been active in the last 10,000 years and recurrence intervals are >2000 years. The Auckland region is still at risk from earthquakes, but is in the lowest hazard zone. To create hazardous effects earthquake intensity generally needs to reach MMI VI. Building and infrastructure damage is the primary earthquake risk.
Frequency:	Constantly
Monitoring history:	Network of seismometers established in 1995
Geographic coverage:	Auckland region
Data source:	http://www.geonet.org.nz/
Website:	http://www.geonet.org.nz/
Contact details:	http://www.geonet.org.nz/
Limitations:	Data held by GNS Science

Climactic hazards: Number and impact of fires

Data name:	Wildfire
Definition:	A wildfire is an uncontrolled fire which can destroy infrastructure and devastate agricultural resources. The most common causes are lightning, human carelessness, arson and volcanic eruptions. Risk is affected by heat waves, droughts and cyclical climate changes.
Relevance:	Although the number of wildfires occurring annually in the Auckland Region is low, the large number of loves, forestry, horticulture and property exposed to the wildfire hazard increases the overall threat. Impacts are largely in the rural and exotic forests of the Auckland region.
Frequency:	Event
Monitoring history:	Rural Fire service
Geographic coverage:	Regional
Data source:	Fire Weather Index System
Website:	http://nrfa.fire.org.nz/firenet/regions/rural
Contact details:	Hazard Advisor, Environmental policy
Limitations:	Information on the vulnerability of urban development to wildfire is absent in the Auckland region. Future hazard and risk assessments are required.

Climactic hazards: Number and impact of floods

Data name:	Flooding
Definition:	A flood is an overflow of water that submerges land; occurrence depends on rainfall intensity and duration, soil moisture conditions, river levels and physical characteristics of the catchment.
Relevance:	Flooding is the most common natural hazard in New Zealand and poses the greatest risk in terms of potential loss of human life, social disruption, economic cost and infrastructure damage.
Frequency:	Daily
Monitoring history:	
Geographic coverage:	Regional
Data source:	High Intensity rainfall Design System (HIRDS) allows analysis of extreme rainfall and flooding events., Hydrotel, NIWA
Website:	http://intermaps.arc.govt/AucklandCouncilViewer/
Contact details:	Hazard Advisor, Environmental policy
Limitations:	Current knowledge of warning benefits is limited, Due to Auckland's large number of rivers and streams. All water bodies cannot be monitored for flooding.

Climactic hazards: Number and impact of cyclones

Data name:	Cyclones
Definition:	Tropical cyclones are severe low pressure systems that form in the tropics. These revolving storms gain their energy from heat that is released when water vapour from the warm ocean surface condenses into rain, releasing latent heat. Severity is described in terms of categories 1 to 5 in relation to the zone of maximum winds. Storms of this type are also known as hurricanes and typhoons. Ex-tropical cyclones are tropical cyclones that re-intensify in the mid-latitudes following a decay of energy when moving over cooler seas. This type commonly passes near New Zealand most years during December-April.
Relevance:	Tropical cyclones have three major meteorological hazards; heavy rainfall, high winds and storm surge. Ex-tropical cyclones lead to extensive flooding, wind damage and storm surges exacerbate damage in coastal areas.
Frequency:	Daily (precipitation/wind/barometric pressure)
Monitoring history:	Up to 46 years of climate station records for cyclone parameters (e.g. Auckland Airport)
Geographic coverage:	Auckland region climate station coverage
Data source:	Clioflo- Hydrotel, NIWA, Met Service
Website:	http://www.metservice.com/national/index http://www.aucklandcouncil.govt.nz/EN/Pages/default.aspx
Contact details:	Hazard Advisor, Environmental policy
Limitations:	Data held by external sources as well as council

Climactic hazards: Number and impact of tornadoes

Data name:	Tornado
Definition:	A tornado is a rapidly-rotating vortex or narrow column of air, extending from the base of a cumulonimbus cloud (or thunderstorm) to the ground.
Relevance:	Tornado's occur infrequently in the Auckland region (1-2 events annually) and typically produce narrow and short tracks. Inability to predict events means people in the path of a tornado are highly vulnerable to injury or death.
Frequency:	Event based
Monitoring history:	None
Geographic coverage:	Regional
Data source:	Damage reports media
Website:	http://www.arc.govt.nz/council/civil-defence-emergency-management/natural-hazards/natural-hazards_home.cfm
Contact details:	Hazard Advisor, Environmental policy
Limitations:	Infrequency of events means detailed tornado research in the Auckland region is minimal. Detecting formation is almost impossible.

Auckland Council Evidence Base

Domain Natural and Physical Environment

Marine

Sediment contamination: heavy metals in sediment

Data name:	Heavy metals in marine sediments
Definition:	The council has two complimentary programmes that monitor the levels of chemical contaminants in coastal sediments. The regional discharges programme (RDP) and the contaminants in marine sediments programme (SoE) A large amount of these chemical contaminants come from land-based human activities. The level of each contaminant is graded using the ARC's Environmental Response Criteria (ERC) or the Sediment Quality Guidelines from the Australian and New Zealand Environment and Conservation Council (ANZECC). The guidelines are used to assess whether the measured contaminant concentrations are likely to cause adverse environmental effects on marine life.
Relevance:	This data provides spatial information on the quality of the marine environment and can be used to track changes in quality through time. The seabed of our harbours, estuaries and coasts provides vital habitats and feeding grounds for many marine species. However, the human activities that occur on land bordering these marine habitats produce a wide variety of chemical contaminants. The main sources of chemical contaminants are vehicle emissions, runoff from roads, roofs and buildings, and soils that contain chemical residues associated with applications of pesticides and fertilisers. Chemical contaminants can also be discharged directly from shipping. When any of these chemical contaminants enter the marine environment they can adversely impact the health of marine organisms and degrade water quality. These contaminants are known to accumulate in marine sediments
Frequency:	Sampling frequency is biennial (i.e. every 2 years) in the SoE programme, and 2–5 yearly in the RDP programme – in the RDP programme highly contaminated sites are monitored more frequently than cleaner sites
Monitoring history:	The RDP monitors the concentrations of contaminants in surface sediments derived from stormwater discharges at 72 sites around the Auckland region. This includes 21 of the sites also monitored in the SoE programme. The sites are spread around the region as follows: eighteen sites in the Manukau, five sites on Auckland's east coast, nine sites in the Tamaki estuary and forty sites in the Waitemata Harbour. The RDP commenced in 2002. The SoE programme monitors the concentrations of urban-derived contaminants in surface sediments at 27 sites in estuaries and the coastal zone of the Auckland region. This includes: six sites in the Manukau, five sites on Auckland's east coast, one site on Waiheke Island, three sites in the Tamaki estuary and twelve sites in the Waitemata Harbour. The SoE programme started in 1998.
Geographic coverage:	Both programmes have a regional focus but concentrate on Auckland's urban area.
Data source:	Auckland Council. Heavy metals in marine contaminants are report every two years. The latest report was produce in 2009 reporting data up to 2007 (TR2009/098)
Website:	www.monitorauckland.arc.govt.nz
Contact	Marine Scientist, Research Investigations and Monitoring. Environmental

details:	Science
Limitations:	For the RDP, the more heavily contaminated sites are sampled more frequently than the less contaminated sites. There is an over-representation of degraded sites compared to the number of reference sites in the programme. Laboratory and analysis variations are a potential source of variation in the estimates of contaminant concentrations

Ecosystem diversity and resilience: Benthic health model

Data name:	Benthic Health Model
Definition:	This programme describes the health of estuaries and harbours based on the types of animals and the levels of heavy metals (copper, lead and zinc) found in the sediment. The indicator uses a 1 to 5 scale with 1 meaning the environment is a healthy one while 5 means it is unhealthy.
Relevance:	This data provides spatial information with regional coverage on the quality of the marine environment and can be used to track changes in quality through time. This programme is important as it is the first method in which we can monitor the response of complex communities to more than one impact at a time. Traditionally we have only assessed the effect of one impact on an organism or community
Frequency:	Sites are monitored every 2 – 5 years with sites that have higher contaminant levels being monitored more frequently.
Monitoring history:	When developing the Benthic Health Model the ecological community at 85 sites was sampled in 2002, and the model used to assign an overall rank to each site. Since 2002 sites have been monitored on a rotational basis.
Geographic coverage:	Eighty five sites have been sampled as part of the Benthic health model indicator. These sites are positioned in the majority of harbours and estuaries in the Auckland region to give a regional overview of the health of these environments. Sites are selected to cover a range of locations within each harbour or estuary which are influenced by various activities in the surrounding catchment. These catchments include modified urbanised catchments to more natural rural catchments.
Data source:	Auckland Council, Reports are produced biennially for each programme
Website:	www.monitorauckland.arc.govt.nz
Contact details:	Marine Scientist, Research Investigations and Monitoring. Environmental Science,
Limitations:	As sites are monitored on a rotational basis and each site is only monitored every 2 – 5 years, few sites currently have enough data points to look at trends or changes through time. The model is currently being developed further to take account of the effect of sediment change (increased muddiness) which will increase the models usefulness.

Ecosystem diversity and resilience: Changes in soft sediment communities

Data name:	Changes in soft sediment communities
Definition:	This programme (as part of ARC's broader Benthic Ecology Monitoring Programme) monitors changes over time, in the numbers and types of organisms, which live in and on muddy and sandy sediments that represent harbours and estuaries of the Auckland region. Organisms in these communities form a significant component of the region's biodiversity and also provide an important food source for birds, fish and people. The marine environment is extremely variable and, in order to determine whether changes in species or habitats are due to human-induced activities (e.g. increased sedimentation), natural processes or climatic variation, the ARC needs to understand this natural variability. Therefore, it is important to use consistent, long-term monitoring methods so that natural biological and climatic variation can be filtered out.
Relevance:	This data provides spatial information on the quality of the marine environment and can be used to track changes in quality through time. Changes in the composition of ecological communities can result from improving or declining environmental conditions. These changes may be related to natural factors such as cyclical patterns in recruitment (the addition of new individuals to a population) or a change in water temperature. However, other types of change may result from human activities. For example, some marine species are known to be more sensitive to sedimentation and chemical contaminants than others, so a change in their abundance at a site can indicate the quality of the benthic environment at that site.
Frequency:	Intertidal sandflats in the central Waitemata, Manukau Harbours and Kaipara Harbours are monitored bimonthly, and in upper Waitemata and Mahurangi Harbours trimonthly. Intertidal sandflats in east coast estuaries and Whangateau Harbour are monitored twice yearly.
Monitoring history:	The duration of monitoring varies with location. The longest data set is for Manukau Harbour established in 1987, followed by Mahurangi Harbour established in 1994. Monitoring of central Waitemata began in 2000 and of upper Waitemata began in 2005. Monitoring of east coast estuaries began in 2000 and the number of estuaries included has increased through time. Monitoring of Kaipara and Whangateau Harbours began in 2009.
Geographic coverage:	This programme covers Manukau, Waitemata (central and upper), Kaipara, Mahurangi Harbours. Eight east coast estuaries Whangateau, Puhoi, Waiwera, Orewa, Okura, Mangemangeroa, Waikapoua and Turanga.
Data source:	Auckland Council, Reports are produced biennially for each programme
Website:	www.monitorauckland.arc.govt.nz
Contact details:	Marine Scientist, Research Investigations and Monitoring. Environmental Science,
Limitations:	Monitoring for each harbour is set up to detect effects within that harbour and a specific suite of species is monitored in each. Physical conditions also vary among locations. These differences can make it difficult to

	compare monitoring results across the region. This is being addressed by monitoring all species found in October each year and by developing indicators like the benthic health model which allow us to compare among different harbours. Monitoring in central and upper Waitemata Harbour and in Kaipara and Whangateau Harbours is relatively new so it is difficult to separate anthropogenic induced change from natural variation.

Ecosystem diversity and resilience: Changes in sub-tidal reef communities

Data name:	Changes in subtidal communities
Definition:	This programme (as part of the Auckland Council's broader Benthic Ecology Monitoring Programme) monitors changes over time, in the numbers and types of organisms, which live on intertidal (The Meola Reef monitoring programme) and shallow subtidal (The Meola Reef monitoring programme and the Long Bay monitoring programme) reef habitats. The marine environment is extremely variable and, in order to determine whether changes in species or habitats are due to human-induced activities, natural processes or climatic variation, the ARC needs to understand this natural variability. Consequently, it is important to use consistent, long-term monitoring methods so that natural biological and climatic variations can be filtered out.
Relevance:	This data provides spatial information on the quality of the marine environment and can be used to track changes in quality through time. Changes in the composition of ecological communities can result from improving or declining environmental conditions. These changes may be related to natural factors such as cyclical patterns in recruitment (the addition of new individuals to a population) or a change in water temperature. However, other types of change may result from human activities. For example, some marine species are known to be more sensitive to sedimentation and chemical contaminants than others, so a change in their abundance at a site can indicate the quality of the benthic environment at that site.
Frequency:	Annual sampling of shallow subtidal reef communities along the east coast of the Hauraki Gulf has been conducted since 1999, with sampling occurring in February/March each year. Underwater sediment traps are collect monthly. Annual sampling of intertidal and shallow subtidal rocky reef communities on Meola Reef has been conducted since 2001, with sampling occurring in October each year. Underwater sediment traps are collect monthly.
Monitoring history:	Since 1999, the ARC monitored six subtidal rocky reefs (Waiwera, Stanmore Bay, Little Manly, Long Bay, Torbay and Campbells Bay) annually along the east coast of the Hauraki Gulf in order to detect any changes in ecological communities, particularly in relation to potential development pressure along this coast. Intertidal and shallow subtidal sites are also monitored at Meola Reef within the Waitemata Harbour. Meola Reef was chosen because it is a unique environment within Auckland and because it is located near the mouth of the Waitemata Harbour (and should consequently integrate pollutant effects from the surrounding water body). The west coast of the Auckland region has very limited subtidal rocky reef and little is known about these particular habitats because the wild, exposed nature of this coastline makes it very difficult to study. As a consequence of this the ARC does not monitor any west coast reefs.
Geographic coverage:	This programme is only carried out at six subtidal rocky reefs (Waiwera, Stanmore Bay, Little Manly, Long Bay, Torbay and Campbells Bay) and intertidal and shallow subtidal sites at Meola Reef within the Waitemata Harbour.

Domain Natural and Physical Environment

Data source:	Auckland Council, Reports are produced biennially for each programme, the latest Meola Reef monitoring report (TR2010/031) and Long Bay monitoring reports were produce in 2010 (TR 2010/032)
Website:	www.monitorauckland.arc.govt.nz
Contact details:	Marine Scientist, Research Investigations and Monitoring. Environmental Science,
Limitations:	Although subtidal reef sampling at Long Bay originated in 1998, the methodology has generally been consistent since 1999. Sediment trap data from east coast reefs is often affected by poor retrieval of traps due to bad weather, or public interference with traps. The sampling methods used for Meola intertidal reef sites from 2002 onwards are different to those used previously.

Water quality: WQI for ecological health

Data name:	Marine Water Quality for ecological health
Definition:	This indicator monitors the physical and chemical nature of our marine waters found in estuaries and coastal areas. This indicator focuses on contaminants such as sediment, nutrients and biological wastes in the water. It also looks at physical parameters such as temperature, salinity and water clarity.
Relevance:	This data provides spatial information on the quality of the marine environment and can be used to track changes in quality through time. Understanding the effect of population growth and the pressure urbanisation places on the marine environment is of upmost importance. This indicator enables the identification of emerging trends of concern but also allows us to link how activities on land affect marine water quality. Furthermore, this indicator provides basic information on the health of our marine waters and their ability to support the diverse habitats, the wide array of marine species that live in the marine environment, while ensuring the general public can also enjoy the marine area
Frequency:	Water samples are collected monthly from all sites at approximately 1 hr after high tide. Data reports are produced annually. The latest report is up to 2008 (TR 2009/100)
Monitoring history:	Sampling of six sites in the Manukau began in 1987. Another site at the mouth of the harbour was established in 2009 Sampling of the six east coast sites were initiated between 1991 and 1993. One site in the Kaipara was established in 1991 and another six sites were established in 2009. All eleven sites in the Waitemata were started between 1991 and 1993. Two sites in the Tamaki estuary were started in 1992 Two sites were established in the Tamaki Strait (Turanga estuary and Wairoa river) in 2009
Geographic coverage:	We monitor sites across the Auckland region with seven sites in the Manukau, six sites on Auckland's east coast, seven sites in the Kaipara, two sites in the Tamaki estuary, two sites in the Tamaki strait and eleven sites in the Waitemata harbour.
Data source:	Auckland Council, TR2009/100
Website:	www.monitorauckland.arc.govt.nz
Contact details:	Marine Scientist, Research Investigations and Monitoring. Environmental Science,
Limitations:	These data are collected on a routine basis and is not designed to sample large events such as storms, although the sampling is so frequent and long term that sampling may coincide with a storm event.

Water quality: WQI for contact recreation

Data name:	Water quality for contact recreation
Definition:	Bacterial concentrations are monitored at many popular swimming areas around the Auckland region. Auckland's waterbodies (including beaches, lakes and estuaries) are highly valued and extremely popular for recreation during the summer months. Bathing beach water quality testing for microbial contamination is carried out to ensure that public health is not put a risk from pathogens, including bacteria, viruses and protozoa. The risk to health from all 3 of these is inferred from counts of bacterial. Enterococci are used to assess marine waters, while E. coli are used to assess freshwater contamination. Bacterial levels can be elevated as a result of wastewater/stormwater overflows or septic system failure that enters marine and freshwaters systems. The bacterial results are interpreted using 3 levels of risk: "safe", "alert" or "action". "Safe" describes low, or undetectable, bacterial numbers. "Action" describes high bacterial counts, and denotes further sampling requirements. When high counts occur, monitored swimming beaches may be closed, and shellfish gathering banned. The safety of shellfish for harvesting is monitored by the New Zealand Food Safety Authority.
Relevance:	This indicator allows the health of the public to be protected from exposure to bacteria contamination (contaminants include bacteria, viruses and protozoa, which can lead to stomach bugs and other illness) by informing the public as to which beaches are safe for swimming. By monitoring coastal water quality, the council can identify beaches that may not be suitable for contact recreation. The Auckland council can then work towards managing the sources of contaminants, such as runoff from land.
Frequency:	The suitability of beach water for any human contact recreation (such as swimming) is routinely monitoring at beaches across the Auckland region during each summer season (November to March / April).
Monitoring history:	The ARC undertook extensive studies to determine the level of microbiological contaminants at Auckland's beaches, and therefore the risk to public health. Approximately 300 sites were surveyed to gather microbiological data. Furthermore, the ARC commissioned experts in the field to provide recommendations with regards to the correct organisms or parameters to use as indicators. Once enterococci had been identified as the primary indicator of faecal contamination for the marine environment, the ARC then commissioned the required epidemiological research to ensure that the indicator could be validated and therefore endorsed for use. The Bathing Beach monitoring program was then finalised by the ARC and the organisation continued to monitor the beaches, sampling from a helicopter, for many years. In 1994, the ARC investigated public health legislation and subsequently passed the responsibility for bathing beach monitoring to the local councils. The local councils were under no obligation to monitor. If they chose to monitor recreational water quality, the number of sites and the locations were at the discretion of each council. Similarly, there has been some variation in the techniques used for sampling, and reporting.

Geographic coverage:	For ease of geographical reference the previous local territorial authorities are reference here for site locations. North Shore City 26 beaches Auckland City 15 beaches Manukau City 15 beaches Franklin District 5 beaches Waitakere City 15 beaches Rodney District Council terminated its bathing beach programme in 2007 and no longer monitors any beaches. Each council undertook the sampling in a slightly different way. In general, the sampling protocols are: sample weekly if the results are returned as "Safe" or "Alert", no action is required, though the results are reported through the council's website if the results are return as "Action", resampling is undertaken 24 hrs later if the resample results are still in the "Action" category, the beach is closed for all forms of water activities, and signs warning the public and erected until which time the beach is declared safe
Data source:	Auckland Council
Website:	www.monitorauckland.arc.govt.nz
Contact details:	Environmental Science Team
Limitations:	There are a number of inconsistencies in how the programme was carried out by each council, which make it very difficult to compare water quality for contact recreation across the Auckland region. The results of re-tests were not always available when compiled the data for this report, and some results have been interpreted using an earlier and now outdated Action threshold (one exceedance of 277 enterococci per 100 ml). It is also important to note that routine monitoring is performed only once a week during the summer season, meaning that unsafe bathing beach water may occur on a greater number of occasions than detected by routine monitoring. In addition, monitoring is only carried out in spring and therefore won't detect occurrences of unsafe bathing beach water in other seasons. Samples are only taken at one location per beach, so contamination (on a smaller scale) may not be identified. The sampling is undertaken at a regular temporal basis, so it does not account for tidal state, site hydrography, or weather patterns. Sampling at low level from helicopters is also limited to wind conditions below 25 knots, so there is some bias towards fair weather. Data is only collected for bacterial water quality. There are other water quality issues that could affect the public health risks associated with recreational use of coastal waters such as viruses, protozoa, toxic algal blooms or other pollutants such as heavy metals

Water quality: Trends in water quality

Data name:	Trends in marine water quality
Definition:	This indicator monitors the physical and chemical nature of our marine waters found in estuaries and coastal areas. This indicator focuses on contaminants such as sediment, nutrients and biological wastes in the water. It also looks at physical parameters such as temperature, salinity and water clarity
Relevance:	This data provides spatial information on the quality of the marine environment and can be used to track changes in quality through time. Understanding the effect of population growth and the pressure urbanisation places on the marine environment is of upmost importance. This indicator enables the identification of emerging trends of concern but also allows us to link how activities on land affect marine water quality. Furthermore, this indicator provides basic information on the health of our marine waters and their ability to support the diverse habitats, the wide array of marine species that live in the marine environment, while ensuring the general public can also enjoy the marine area
Frequency:	The water quality data is collected monthly; the analysis and reporting of trends is carried out at 5 yearly intervals. The most recent trends report was published in 2008 (TR 2008/005) using data up to 2007
Monitoring history:	Sampling of six sites in the Manukau began in 1987. Another site at the mouth of the harbour was established in 2009 Sampling of the six east coast sites were initiated between 1991 and 1993. One site in the Kaipara was established in 1991 and another six sites were established in 2009. All eleven sites in the Waitemata were started between 1991 and 1993. Two sites in the Tamaki estuary were started in 1992 Two sites were established in the Tamaki Strait (Turanga estuary and Wairoa river) in 2009
Geographic coverage:	We monitor sites across the Auckland region with seven sites in the Manukau, six sites on Auckland's east coast, seven sites in the Kaipara, two sites in the Tamaki estuary, two sites in the Tamaki strait and eleven sites in the Waitemata harbour.
Data source:	Auckland Council, TR 20008/005
Website:	www.monitorauckland.arc.govt.nz
Contact details:	Marine Scientist, Research Investigations and Monitoring. Environmental Science,
Limitations:	These data are collected on a routine basis and is not designed to sample large events such as storms, although the sampling is so frequent and long term that sampling may coincide with a storm event.

Water quality: Shellfish condition

Data name:	Shellfish condition
Definition:	The Shellfish Contaminant Monitoring Programme was established to allow the detection of long-term trends in bioavailable suspended and dissolved seawater contaminants. Filter-feeding shellfish, process large amounts of water from a fixed location, and have the tendency to accumulate a wide range of contaminants in their tissues. For these reasons, they are used to provide an integrated history of seawater contaminant exposure at a particular site. The programme targets urban harbour areas likely to be affected by stormwater and wastewater runoff. Reference sites are also included to provide comparative data from less contaminated areas. Shellfish condition is monitored to enable greater assessment of a shellfish's ability to grow and put on condition while exposed to and accumulating contaminants in their tissue.
Relevance:	This data provides spatial information on the quality of the marine environment and can be used to track changes in quality through time. Contaminants primarily enter the sea through stormwater discharges and are derived from sources such as vehicle emissions, wear from tyres and brake linings, pesticide use (including soils historically contaminated by chemicals such as organochlorines that are no longer legally used), industrial activity and roof runoff. Obtaining a reliable measure of contaminant levels in coastal seawater through direct measurement of water samples is difficult. Concentrations are generally very low in the water column which means that reliable analysis is complicated, concentrations also vary rapidly due to water movement, and additionally contaminant inputs into the marine environment are patchy in nature. Shellfish provide an integrated history of contaminant exposure at a particular site. Consequently, contaminant levels in mussels and oysters provide a good proxy for overall levels in the surrounding water body
Frequency:	Shellfish condition is monitored annually. Natural populations of pacific oysters are collected at five sites in the Manukau Harbour. Mussels are transplanted to three sites in the Manukau Harbour, two sites in the Waitemata Harbour, one site in the Tamaki estuary and one site near Rangitoto Island.
Monitoring history:	Shellfish condition was first started in 2007 and in ongoing. Annual reports of shellfish condition are produced with the latest report produce in 2010 (Haggitt unpublished)
Geographic coverage:	This programme is only undertaken in the Manukau and Waitemata Harbours, Tamaki estuary and near Rangitoto Island
Data source:	Auckland Council. see report by Haggitt (unpublished)
Website:	N/A
Contact details:	Marine Scientist, Research Investigations and Monitoring. Environmental Science
Limitations:	There is only 3 years of data and these data need a more robust assessment to better link decline in shell condition as shellfish are exposed to and accumulate more contaminants

Habitat loss I

Data name:	**Habitat Loss I**
Definition:	Difference in indigenous cover between the 1996/97 and 2001/02 Land Cover Database layers
Relevance:	This data gives an indication of the distribution of native vegetation, and highlights locations where there has been a relatively high amount of clearance
Frequency:	One off comparison between two data sets at specific points in time
Monitoring history:	Comparison of different vegetation maps is done when the data is published. It had been intended to continue the work by comparing LCDB 2 with LCDB3 (funded through central government agencies and due out around 2010) but the word on the street is that LCDB3 has been shelved for the moment
Geographic coverage:	National, including larger offshore islands. This database is a thematic classification of 42 land cover and land use classes. The polygon features contain a code and boundary representing the land cover type for the period Summer 1997/98 and Summer 2001/02. In addition shelterbelts exceeding 150m have been captured as line features.
Data source:	Ministry for the Environment
Website:	www.mfe.govt.nz/issues/land/land-cover
Contact details:	GIS have both these layers in their system, the calculation is a straightforward one that can be done on the basis on any area required (e.g. by Ecological District, suburb etc.)
Limitations:	The resolution of different vegetation types is poor in these two datasets, particularly for urban areas where patches of vegetation are below the resolution of the mapping. For this reasons no actual data on changes between these two datasets was presented in the latest SOE report. There is also better data on distribution of indigenous ecosystems than what is contained within LCDB2

Habitat loss II

Data name:	**Habitat Loss II**
Definition:	Changes in the amount of significant indigenous vegetation on the North Shore between 2001 and 2006
Relevance:	Directly addresses the impact that consenting/ development policies and decisions have had on the size of the most important patches of habitat within the (ex) North Shore City Council boundaries
Frequency:	One off project carried out for the ARC by Andrea Julian comparing vegetation in ecologically significant sites between 2001 and 2006 aerial photographs. Sites examined included all the significant sites identified in a PNA style survey of North Shore City in 2001
Monitoring history:	None, one-off study. Would be very useful to repeat with 2010 (or later) aerials to see if the clearance pressures have eased
Geographic coverage:	Sub-regional, within the ex North Shore City Council boundary only
Data source:	Auckland Regional Council
Website:	www.arc.govt.nz/albany/fms/main/Documents/Plans/Reports/Full%20report%202009/Chapter%204_5%20-%20Terrestrial%20biodiversity.pdf
Contact details:	Data layers in the council GIS system. Report on file, see Matt Baber for more information about details of scope etc.
Limitations:	Good data that clearly shows the practical implications of a policy environment that routinely allows the clearance of native vegetation. The main problem with this dataset is its limited geographical coverage, it would be great to extend the number of case studies to other parts of the city where more severe development pressures have also been identified as being a potential problem

Habitat fragmentation I

Data name:	**Habitat fragmentation I**
Definition:	Habitat statistics (such as average patch size and edge to interior ratio) calculated from indigenous forest patches mapped in LCDB2
Relevance:	This data gives an indication of the fragmentation of indigenous vegetation within Auckland, compared with other parts of New Zealand
Frequency:	One off calculation of standard spatial statistics based on the LCDB2
Monitoring history:	None, one-off study. Would be worth doing the same thing with LCDB3, should this become available
Geographic coverage:	Region wide and national dataset
Data source:	Auckland Regional Council
Website:	www.arc.govt.nz/albany/fms/main/Documents/Plans/Reports/Full%20report%202009/Chapter%204_5%20-%20Terrestrial%20biodiversity.pdf
Contact details:	GIS have this layer and the associated 'patch' statistics
Limitations:	The resolution of LCDB2 is very poor for some indigenous vegetation types, particularly for urban areas. There is better data on distribution of indigenous ecosystems than what is contained within LCDB2(see below) and it is this dataset that should be used to calculate edge/ interior ratios etc. (but would still need to make the national comparison back to LCDB 2)

Habitat condition

Data name:	**Habitat condition**
Definition:	Over 200 High Conservation Value (HCV) sites were assessed between 2004 and 2009 using a standard methodology. This data summarises a one-off assessment of their condition
Relevance:	Direct relevance as it shows the condition of vegetation patches that have been identified as being the most ecologically significant. With a repeat survey this work could show change in condition over time
Frequency:	One off indicator of the condition of some of the best quality (but not all) ecological sites within the region. No plans to repeat this study as biodiversity is now measured using a different programme
Monitoring history:	One off study, a repeat is likely to use Auckland Council standard biodiversity plots, as opposed to FORMAK plots, to assess habitat condition
Geographic coverage:	Region wide (but scattered in high value sites)
Data source:	Auckland Regional Council
Website:	www.arc.govt.nz/albany/fms/main/Documents/Plans/Reports/Full%20report%202009/Chapter%204_5%20-%20Terrestrial%20biodiversity.pdf
Contact details:	GIS have this layer and values of the sites (as determined by FORMAK)
Limitations:	Good number of sites, but they are concentrated in the highest value locations and might not therefore be useful for tracking biodiversity generally (they are also biased towards public land, which has the largest area of high quality habitat on it). The methodology of FORMAK is more simplistic than our current monitoring standard for plots, but probably still able to compare some measures between the two datasets

Number of threatened species

Data name:	**Number of threatened species**
Definition:	The absolute number of threatened plants and animals within the region
Relevance:	Theoretically (but see caveats below) the total number of threatened species indicates what proportion of native species are likely to require more intensive management to deal with immediate threats to their long term sustainability. Historical comparison can also show if species management is working (i.e. is the list growing or shrinking)
Frequency:	Threat rankings are updated at irregular intervals by DoC. Distributional information should be constantly updated as part of the ongoing survey work by council, private and amateur ecologists.
Monitoring history:	Hitchmough 2007 is latest version and there are more recent updates for plants (De Lange et. al. 2009) and birds (Miskelly et. al. 2008), and an older list Hitchmough (2001) to compare changes against
Geographic coverage:	Region wide (but quality of data for different taxa is highly variable)
Data source:	DoC are responsible for publishing these lists
Website:	http://www.doc.govt.nz/publications/science-and-technical/products/series/older-series/threatened-species-occasional-publication-archive/
Contact details:	Craig Bishop is the best source of what the latest versions of these lists are
Limitations:	A fairly crude indicator. Because taxonomic revision is ongoing, and there has been a recent change to the way threatened species are classified, many of the changes that will be detected by this analysis might not be an accurate picture of the real situation on the ground. Important to show data as threatened species are an important component of biodiversity and (in some cases) a national priority for biodiversity protection

Distribution of threatened species

Data name:	**Distribution of threatened species**
Definition:	The actual density of threatened species within the region (densities are presented by general ecosystem type)
Relevance:	Theoretically (but see caveats below) monitoring the density of threatened species is an excellent way of showing if biodiversity management/ policies are working (i.e. are the absolute numbers growing or shrinking)
Frequency:	Threat rankings are updated at irregular intervals by DoC. Distributional information should be constantly updated as part of the ongoing survey work by council, private and amateur ecologists.
Monitoring history:	Hitchmough 2007 is latest version and there are more recent updates for plants (De Lange et. al. 2009) and birds (Miskelly et. al. 2008), and an older list Hitchmough (2001) to compare changes against
Geographic coverage:	Region wide (but quality of data for different taxa distribution is highly variable)
Data source:	DoC are responsible for publishing these lists, GIS data layer of species densities is held by old ARC GIS team. Layer includes data from the observations of many different council and external ecologists, experts and interest groups
Website:	No applicable
Contact details:	Craig Bishop and/or the Auckland Council GIS team
Limitations:	A fairly crude indicator. Because taxonomic revision is ongoing, and there has been a recent change to the way threatened species are classified, many of the changes that will be detected by this analysis might not be an accurate picture of the real situation on the ground. Density (as opposed to presence/ absence data) is even more unreliable as these species are, by there very nature, patchy and rare and can be very cryptic and difficult to locate. Nevertheless, it is important to show this data as threatened species are a key component of biodiversity and (in some cases) a national priority for biodiversity protection

Type distribution and abundance of pests and weeds

Data name:	**Type distribution and abundance of pests and weeds**
Definition:	The absolute number and density of exotic organisms (generally plants and vertebrates, but including some invertebrates) in terrestrial organisms within the Auckland Region
Relevance:	Weed and pest expansion is an important driver of the degradation and displacement of indigenous ecosystems. It is critical for native biodiversity that weed and pest numbers are tracked and compared to the density of indigenous vegetation in co-located sites
Frequency:	The ARC was the main organisation responsible for biodiversity and has good database information on new weeds and pests, the distribution of key (in terms of their negative effects) pests
Monitoring history:	Constantly updated through the fieldwork of biosecurity rangers, park staff and other observations. Biosecurity data is recorded spatially in the field and up-loaded on return to base
Geographic coverage:	Auckland wide
Data source:	Legacy datasets of ARC, DoC and old TLA's. GIS weed and pest layer held by the old ARC GIS team. Many of the volunteer co-ordinators and parks staff also have data on weed and pest numbers within their interest areas. DoC also have a weed inventory and management system
Website:	http://www.arc.govt.nz/environment/biosecurity/biosecurity_home.cfm
Contact details:	Auckland Council GIS team, Biosecurity Team in operations
Limitations:	Limited distributional data for some key weed and pest species. Distributions are constantly changing with new invasions and control work and the information may be out of date for some organisms or locations. 'Pure' distribution data does not necessarily incorporate information on which species pose the greatest threat to biodiversity, which may vary from place to place.

Location and condition of significant freshwater wetland vegetation

Data name:	**Location and condition of significant freshwater wetland vegetation**
Definition:	Location and other biologically relevant information about wetlands in the Auckland Region. Not a full inventory of all sites, but includes almost all wetlands over 1 ha in size. Based on an existing data source (WERI = Wetlands of Representative and Ecological Importance, Cromarty and Scott (compilers) 1995), but with major additions from field data and council ecologists since the WERI layer was published
Relevance:	Very high. Wetlands are a national priority for protection, contain a number of threatened species and are very much in the public eye in terms of their special nature and values. Water quality (to which they contribute) is a key issue for Auckland
Frequency:	DoC did the initial work on WERI, but there have significant changes and updates through survey work done by DoC, council and other ecologists
Monitoring history:	See frequency. Information is continually updated in the Auckland Council wetland layer in GIS (held by the old ARC GIS department)
Geographic coverage:	Auckland wide, and WERI covers large parts of the rest of the country as well (with the data quality dependant on how many fieldchecks etc. have been completed in specific regions)
Data source:	GIS layer held by ex ARC GIS Team
Website:	http://www.doc.govt.nz/upload/documents/science-and-technical/nzwetlands00.pdf
Contact details:	Craig Bishop, Stacey Byers or Matt Baber
Limitations:	Data quality is determined by who and how recently a site has been visited. The layer may also have gaps in terms of small wetlands and time lags in some parts of the region (e.g. more recent constructed wetlands and ponds are a feature of the urban parts of the city). Some wetland types (e.g. ephemeral seepages) are poorly represented as they are hard to locate in the field, mostly on private land and/or not suitable for identification in desk-top analysis.

Wetland loss

Data name:	**Wetland loss**
Definition:	Spatial layer showing the loss/ modification of WERI wetlands (see above) between the mid 1980's and 2006/07 aerial photograph run
Relevance:	Highly relevant. Wetlands are a national priority and have been heavily modified in the past. What remains is also often very vulnerable to further modification
Frequency:	One-off analysis of changes in a specific dataset. However, the information could be expanded to include more wetlands and/or use of more recent aerial photography (e.g. 2010/11 run)
Monitoring history:	See frequency. Information on wetland distribution, external boundaries and values is updated as council ecologists visit these sites, and their notes are used to update the layer.
Geographic coverage:	Selected wetlands (important sites over 1 ha in size) in the Auckland Region
Data source:	Ex Auckland Regional Council GIS team have the layer with this data in it
Website:	http://www.arc.govt.nz/albany/fms/main/Documents/Plans/Reports/Full%20report%202009/Chapter%204_5%20-%20Terrestrial%20biodiversity.pdf
Contact details:	Craig Bishop, Matt Baber, Stacey Byers or Wendy Gomwe
Limitations:	Variability of the data

Location of originally rare ecosystems

Data name:	Location of originally rare ecosystems
Definition:	Originally rare ecosystem types are particular ecosystems types that were uncommon in pre-human New Zealand. They are defined as those having a total extent less than 0.5% (i.e. < 134 000 ha) of New Zealand's total area.
Relevance:	Highly relevant. These habitats contain a high proportion of unusual species and/or genotypes and their restricted distribution means they are vulnerable to external disturbance. They are a national priority for the protection of biodiversity.
Frequency:	Landcare did the initial work that identified these ecosystems, but there has been little surveys of their distribution etc. DoC Auckland recently commissioned a desk-top identification of these ecosystems in the Auckland Conservancy, and a GIS layer was created from this analysis
Monitoring history:	See above. First cut only has been completed, which needs to be confirmed through field survey of all the locations identified in the desktop work
Geographic coverage:	Auckland Conservancy boundary, which includes all the of the Auckland Region
Data source:	Department of Conservation, Auckland Conservancy, publication is Lindsay et. al. (2009) Auckland Protection Strategy.
Website:	http://www.landcareresearch.co.nz/research/ecosystems/rare/index.asp
Contact details:	Craig Bishop or Stacey Byers are the best contacts within Auckland Council. GIS team may have this as a digital layer (if not we will source this from DoC)
Limitations:	See comments in frequency above. There has been no field checking of the desktop work (done on the basis on geological and topographical maps, historical records, interviews with ecologists etc.) this needs to be commenced to check the accuracy of this data layer and the boundaries of the various sites (which are often just points on a map, rather than any attempt to accurately delineate the ecosystem boundaries)

General ecosystem distribution

Data name:	**General ecosystem distribution**
Definition:	GIS layer showing the distribution of indigenous vegetation/ecosystems across the region, split into major structural and compositional classes (coastal forest, brackish estuarine, dune vegetation, freshwater wetlands, kauri forest, lava forest, podocarp forest and shrubland are the major classes)
Relevance:	Highly relevant as it shows the actual distribution of native ecosystems, which is the basis for key biodiversity related activity/ decisions/ projects (e.g. designating significant sites, selection of biodiversity monitoring sites, mapping changes in distribution of habitat with time series data etc. etc.)
Frequency:	Not applicable. The layer used by DoC in the Auckland Protection Strategy (Lindsay et. al. 2009) is the most up-to-date as it includes data combined from a variety of different sources
Monitoring history:	See frequency. There has been no specific programme of regular updates to this map. Rather the current layer represents a hybrid of the best available knowledge from past PNAP surveys, LCDB2 and conversations with local experts. It would be very valuable to update this layer through one-on-one interviews with Auckland Council ecologists who may have recent experience with some of the mapped sites and/or some targeted fieldwork in locations where the data is very out of date.
Geographic coverage:	Auckland Conservancy boundary, which includes all the of the Auckland Region
Data source:	Department of Conservation, Auckland Conservancy, publication is Lindsay et. al. (2009) Auckland Protection Strategy.
Website:	http://www.doc.govt.nz/publications/getting-involved/volunteer-join-or-start-a-project/start-or-fund-a-project/nature-heritage-fund/auckland-protection-strategy/
Contact details:	Craig Bishop or Stacey Byers are the best contacts within Auckland Council. GIS team may have this as a digital layer (if not we will source this from DoC)
Limitations:	Variability of the data

Detailed vegetation map of Tamaki Ecological District

Data name:	**Detailed vegetation map of Tamaki Ecological District**
Definition:	GIS layer showing the distribution of indigenous vegetation/ecosystems within the Tamaki Ecological District. The amount of detail on individual polygons is very high and in most cases includes vegetation composition and condition information. This is a hybrid layer, based on a number of existing datasets.
Relevance:	Highly relevant as it shows the actual distribution of native ecosystems, which is the basis for key biodiversity related activity/ decisions/ projects (e.g. designating significant sites, selection of biodiversity monitoring sites, mapping changes in distribution of habitat with time series data etc. etc.) The Tamaki ED currently has now combined data layer, despite being the most heavily developed ED in New Zealand
Frequency:	Not applicable. The separate datasets have been compiled and checked at various times over the previous two decades by council and contract ecology staff from the previous four city councils in Auckland (see below for most recent survey dates)
Monitoring history:	See frequency. North Shore data is based on a 2000/01 survey field checked and updated in 2009/10, old Auckland City base c.2000, updated 2009/10, old Waitakere City base = 1988, updated c.2008, old Manukau City no base, but park survey dates to 2005
Geographic coverage:	Coverage of the Tamaki Ecological District, although there maybe some gaps in the coverage of private owned land in the ex Manukau City area
Data source:	Includes unpublished datasets and published North Shore & ARC (2001) Vegetation Survey of North Shore City
Website:	http://www.northshorecity.govt.nz/Services/Environment/EcologicalStudy/Documents/ecological-survey-part1.pdf
Contact details:	Craig Bishop (Auckland), Peter Anderson (North Shore), Danielle Hancock (Waitakere), Michael Ngatai (Manukau)
Limitations:	Variability of the data

Location of chronically and acutely threatened LENZ environments

Data name:	**Location of chronically and acutely threatened LENZ environments**
Definition:	LENZ (Land Environments of New Zealand) is an environmental classification intended to underpin a range of conservation and resource management issues. LENZ capitalises on the species-environment relationships by identifying climatic and landform factors likely to influence the distribution of species. LENZ uses these factors to define a landscape classification that groups together sites that have similar environmental conditions.
Relevance:	Native vegetation on acutely and chronically threatened level IV LENZ environments (those with <20% cover of indigenous vegetation) are a national priority for protection and help to ensure the widest range of indigenous ecosystems and genotypes are protected (as per the National Biodiversity Strategy 2000)
Frequency:	Because LENZ is based on historical climatic data, soils, geology etc. it is the result of a one-off analysis of this dataset, rather than a series of data collected over time. The analysis can be re-done when better source data becomes available
Monitoring history:	See frequency. The LENZ classifications we use today are the result of analysis done in early 2000's, and summarised in Leathwick et. al. (2003) the LENZ Technical Guide
Geographic coverage:	New Zealand wide
Data source:	Landcare research provide GIS layers of LENZ level I, II, II and IV environments free of charge
Website:	http://www.landcareresearch.co.nz/databases/LENZ/about.asp
Contact details:	Craig Griggs or Graham Anderson at Landcare Research
Limitations:	There is still some contreversary amongst professional ecologists over how biologically relevant some of the LENZ environments are (e.g. any sites are mapped at a level of detail that is very fine). Could be opening a can of worms; large parts of the Auckland Isthmus are classified as threatened, so even very poor quality vegetation could be regarded as significant using this system.

Historical changes in the distribution of native ecosystems

Data name:	**Historical changes in the distribution of native ecosystems**
Definition:	A calculation based on comparing a historical vegetation layer, with the current vegetation layer (see General Ecosystem Distribution above). The historical vegetation layer was presented in Lindsay et. al. (2009) and is based on a computer model of pre-human vegetation, modified by consultation with local botanical experts
Relevance:	Highly relevant as it shows the loss rates of different types of ecosystem in Auckland since human colonisation of the area. Lots of information about the representativeness of different types of indigenous biodiversity
Frequency:	One off measure
Monitoring history:	One off measure
Geographic coverage:	Auckland Conservancy, which includes all of the Auckland Region
Data source:	GIS layer will need to be sourced from the DoC GIS team
Website:	n/a
Contact details:	Stacey Byers, Craig Bishop
Limitations:	Data quality and accuracy

Natural landforms

Data name:	**Natural landforms**
Definition:	A place characterised by indigenous species or ecosystems, or a place or landform not or scarcely modified from an indigenous condition.
Relevance:	Natural landforms provide and important reference point and sense of identity for the people of the region. They contribute to quality of life and provide the context in which people use and enjoy their environment.
Frequency:	N/A
Monitoring history:	N/A
Geographic coverage:	Auckland region
Data source:	Auckland Regional Policy Statement
Website:	http://www.arc.govt.nz/plans/regional-policy-and-plans/auckland-regional-policy-statement/auckland-regional-policy-statement_home.cfm
Contact details:	Team Leader, Natural Heritage Planning & Policy
Limitations:	No consistent monitoring regarding the public's perception of what constitutes an natural character

Coastal marine areas

Data name:	**Coastal marine areas**
Definition:	The coastal marine area means the foreshore, seabed, , the coastal waters and the air space above the water around New Zealand. The seaward boundary is 12 nautical miles and the landward boundary is the mean high water spring tide mark.
Relevance:	The relative prominence or dominance, integrity, and intactness of areas of the coastal marine area are significant factors in determining natural character.
Frequency:	N/A
Monitoring history:	N/A
Geographic coverage:	Auckland region
Data source:	Auckland Regional Policy Statement
Website:	http://www.arc.govt.nz/plans/regional-policy-and-plans/auckland-regional-policy-statement/auckland-regional-policy-statement_home.cfm
Contact details:	Team Leader, Natural Heritage Planning & Policy
Limitations:	No consistent monitoring regarding the public's perception of what constitutes an natural character

Indigenous/exotic vegetation

Data name:	**Indigenous/ exotic vegetation**
Definition:	The presence and intactness of indigenous and exotic vegetation, including terrestrial, freshwater and marine vegetation, but not including pest species.
Relevance:	The botanical biodiversity of an area is a significant factor in determining natural character.
Frequency:	N/A
Monitoring history:	N/A
Geographic coverage:	Auckland region
Data source:	Auckland Regional Policy Statement
Website:	http://www.arc.govt.nz/plans/regional-policy-and-plans/auckland-regional-policy-statement/auckland-regional-policy-statement_home.cfm
Contact details:	Team Leader, Natural Heritage Planning & Policy
Limitations:	No consistent monitoring regarding the public's perception of what constitutes an natural character

Rural/ urban landforms

Data name:	**Rural/ Urban landforms**
Definition:	Qualities which make an area perceived as rural rather than urban include the dominance in the landscape of natural vegetation or primary production regimes and the absence or subservience or manmade structure other than those related to primary production. Rural lands lie outside the metropolitan urban limit.
Relevance:	Correct management of the elements patterns and processes that are significant contributors to natural character or landscape and amenity values in rural and urban areas can help accommodate subdivision, use, and development and avoid, remedy or mitigate adverse physical, visual and perceptual effects.
Frequency:	N/A
Monitoring history:	N/A
Geographic coverage:	Auckland region
Data source:	Auckland Regional Policy Statement
Website:	http://www.arc.govt.nz/plans/regional-policy-and-plans/auckland-regional-policy-statement/auckland-regional-policy-statement_home.cfm
Contact details:	Team Leader, Natural Heritage Planning & Policy
Limitations:	No consistent monitoring regarding the public's perception of what constitutes an natural character