

Wellington Region Genuine Progress Index 2001-2010: Environmental Well-being

June 2011

Greater Wellington and all the territorial authorities in the region are partners in the development of the Wellington Region Genuine Progress Index (GPI).



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1. Introduction

For more information on the background and methodology of the WR-GPI please refer to the paper “The approach to the Wellington region genuine progress index (WR-GPI) 2001-2010” which can be downloaded from: www.gpiwellingtonregion.govt.nz

Background

For well over half a century the well-being of nations has been inferred by measuring Gross Domestic (or National) Product (GDP) – the total amount of cash flowing in an economy. GDP and other related market statistics are economic measures that measure the market value of goods and services produced within a country in a given period. They are not indicators of social progress and were never intended to be used as measures of well-being.

Internationally there is now considerable interest in developing wider measures of progress and well-being that do not rely solely on GDP (Talberth, J., et al., 2007; Neumayer, 2000; Colman, 2004; Anielski, 2001; Michalos, A., et al., 2010). These measures are not intended to replace GDP, but challenge the misuse of GDP as a measure of progress and well-being. One of the emerging new measures from the fields of green economics is the Genuine Progress Index (GPI). The GPI is an accounting system that attempts to measure whether a nation’s or community’s growth, increased production of goods, and expanding services have actually resulted in the improvement of the well-being of the people in that nation or community.

The decision to develop a GPI for the Wellington region (WR-GPI) was made as part of the development of the Wellington Regional Strategy (WRS). The WRS is a growth strategy that has been developed by greater Wellington’s nine local authorities,¹ in conjunction with central government and the region’s business, education, research and voluntary sector interests.

During the development of the WRS, the public said that prosperity in the Wellington region meant more than monetary wealth. They said it was about quality of life for all members of society and that economic growth should not be sought at the expense of the community or the environment.

As a result it was decided to use a GPI framework that measures our progress across all areas of life. The GPI has been developed to measure the economic, social, environmental and cultural well-being of the region. The framework is based on the nine WRS community outcomes, which are identified in the WRS as the well-being goals of the region.

Methodology

The goal is for the WR-GPI to be a set of accounts that are based on an indicator framework that measures progress across all areas of life. To achieve this goal the development of the WR-GPI comprises two parts:

¹ The nine local authorities in the Wellington region include Greater Wellington Regional Council, Kapiti Coast District Council, Porirua City Council, Wellington City Council, Hutt City Council, Upper Hutt City Council, Carterton District Council, Masterton District Council and South Wairarapa District Council.

- an indicator framework that assesses progress and trends over time, and
- a set of accounts that assess the economic value of non-market social, cultural and environmental assets that relate to the data and evidence provided by the indicator framework.

The majority of work to date on the WR-GPI has focused on the development of an indicator framework. The WR-GPI 2001-2010 framework is shown in Figure 1. The methodology used to develop the WR-GPI 2001-2010 indicator framework is described in this section.

Indicators provide specific information on the state or condition of something, with the purpose of measuring change or trends over time. Good indicators provide essential information about the health and functioning of a system and can tell us whether progress is being made. However, not all indicators are ideal for use in a monitoring framework. For the WR-GPI a set of criteria was developed to determine the value or usefulness of potential indicators of well-being. The criteria included such things as whether the data came from a reliable or official source, whether it clearly showed change over time and whether it was easily understood.

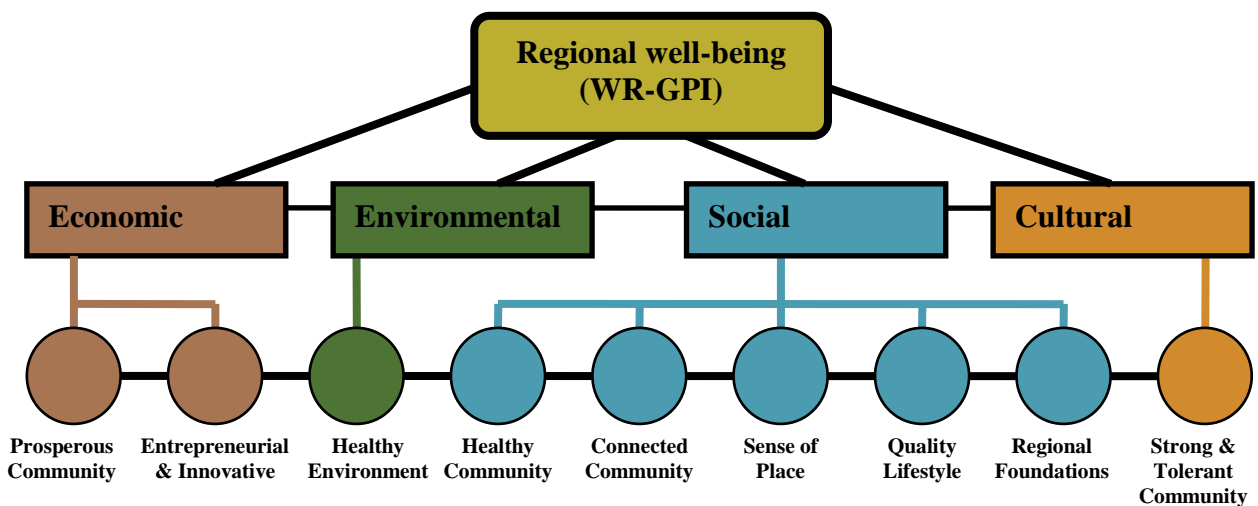


Figure 1. WR-GPI framework

A paper entitled “*The approach to the Wellington region genuine progress index (WR-GPI) 2001-2010*” (Durling, 2011) provides a comprehensive description of the indicators and methodologies employed to construct the WR-GPI 2001-2010 framework, and readers are directed to this for further information.

Indicator and GPI trends

There are two types of trends presented in this report:





- Individual indicator trends, and
- GPI trends for sets of indicators.²

Throughout this report symbols are used to represent the trends in indicator and GPI results.

Individual indicator trends

The trend for each indicator shows an improvement, no clear progress, or a decline in well-being. The well-being trend may also be uncertain due to no or insufficient trend data available. The relevant well-being trend is represented by one of the symbols shown in Table 1. For example, an upward arrow shows that the change in indicator data over the study period results in an improvement in well-being. It is possible that the indicator data may show a negative trend over the study period but still be represented by an upward arrow as the indicator itself may have a negative influence on well-being, for example unemployment rates, road injuries, and crime rates.

Table 1. Indicator trend symbols




Symbol	Explanation
	The indicator data trend indicates an improvement in well-being
	The indicator data trend indicates no clear well-being progress
	The indicator data trend indicates a decline in well-being
	Uncertain, no or insufficient trend data available to assess well-being progress

GPI trends for sets of indicators

The trend for each GPI over the study period indicate improving conditions of well-being, no significant change in well-being, or declining well-being conditions, and are identified by one of the symbols shown in Table 2. A cross, for example, shows that there has been a negative change over the study period in relation to the relevant well-being goals.

² Indicators have been grouped under the nine community outcomes and the four aspects of well-being.

Table 2. GPI trend symbols

Symbol	Explanation
	The GPI trend indicates an improving condition over the study period
	The GPI trend indicates no significant trend or insufficient information to assess conditions
	The GPI trend indicates a declining condition over the study period

2. Environmental well-being and healthy environment GPI



The environmental well-being and healthy environment GPI increased over the 2001 to 2010 period

Overview

Under the Local Government Act (2002), one of the purposes of local government is to promote the social, environmental, economic, and cultural well-being of communities, in the present and for the future. The Act does not define environmental well-being but allows for councils to develop their own definitions relevant to the local context. The Act also emphasises the need for strategic planning, democratic decision-making, and a sustainable development approach that meets all four aspects of well-being, noting that sustainable development will only be achieved if a council deals with all four aspects of well-being.

We are aware that there are interactions amongst many aspects of the WR-GPI framework, including the four aspects of well-being, as shown in Figure 1. For ease of presentation of results, and to keep reports to a manageable size for the reader, the findings for the WR-GPI 2001-2010 are presented as separate reports for each aspect of well-being.

The concept of well-being is widely used, but often without being clearly defined (King, 2007). The evidence from large national and cross-national studies shows that individuals with higher levels of well-being as indicated by such measures as life satisfaction or happiness, tend to be more productive, have higher incomes, more stable marriages and better health and life expectancy (Diener, 2000; Judge et al., 2001).

While there is not a regional definition of environmental well-being it can be considered that environmental well-being is about meeting the environmental needs of today's generation, without reducing the ability of future generations to meet their own needs.

Under the WRS community outcomes the area of environmental well-being is represented by only one community outcome called healthy environment. This means that the GPI for environmental well-being is the same as the healthy environment GPI.

Healthy environment includes 17 indicators that were selected to measure progress towards the healthy environment outcome definition (shown below). Currently one of the healthy environment indicators does not have a data source attributable to it, so only 16 indicators are included in this report.

OUTCOME DEFINITION:

We have clean water, fresh air and healthy soils. Well functioning and diverse ecosystems make up an environment that can support our needs. Resources are used efficiently. There is minimal waste and pollution.

This definition connects to the principles of environmental well-being through its focus on aspiring to have high quality water, air and soils, well-functioning ecosystems and sustainable resource use.

The outcome definition covers different aspects of the physical environment but focuses on the quality aspect of the environment with less emphasis on having resources in sufficient quantity. Section 3 of this report shows the raw data available over the 2001 to 2010 study period for each of the healthy environment indicators. For some indicators, data is not available for the whole 2001 to 2010 study period. For details on our approach for dealing with this, see the approach paper referred to earlier (Durling, 2011).

To avoid repeating the same information, the findings shown below for environmental well-being are also the same as the healthy environment community outcome GPI.

Findings

As shown in Figure 1 the WR-GPI 2001-2010 framework is made up of four well-being aspects: Economic, Environmental, Social and Cultural. This report focuses on findings related to the environmental well-being aspect of the WR-GPI.

In total 16³ of the 86 indicators in the WR-GPI 2001-2010 framework form part of the environmental well-being aspect of the framework. Section 3 of this report shows the raw data available over the 2001 to 2010 study period for each of these 16 indicators. Using the available data, individual index values for each indicator have been calculated for each year over the 2001 to 2010 study period. Figure 2 shows the average of these individual index values, and represents the environmental well-being (and healthy environment) GPI for the Wellington region from 2001-2010.

Over the 2001 to 2010 time period, the environmental well-being GPI was found to be highest in 2010 and lowest in 2003. The environmental well-being GPI remained relatively unchanged from 2001 to 2003, gradually increased between 2003 and 2008, then increased much more rapidly from 2008 to 2010. Overall there has been a 12.5% increase in the region's environmental well-being GPI from 2001 to 2010.

The environmental well-being GPI has increased gradually between 2001 and 2008. Over this time there were some slight decreases in a couple of indicators, but overall increases were observed for the majority of indicators. The largest increases over this time are observed for fresh water suitability for recreation, QEII covenanted land, and soil quality of dairy farm sites. The main decrease over this time was observed for stream and river health.

³ There are 17 indicators included in the WR-GPI framework that form part of the healthy environment community outcome area, however, one of these indicators does not currently have a data source attributable to it so is not included in this report.

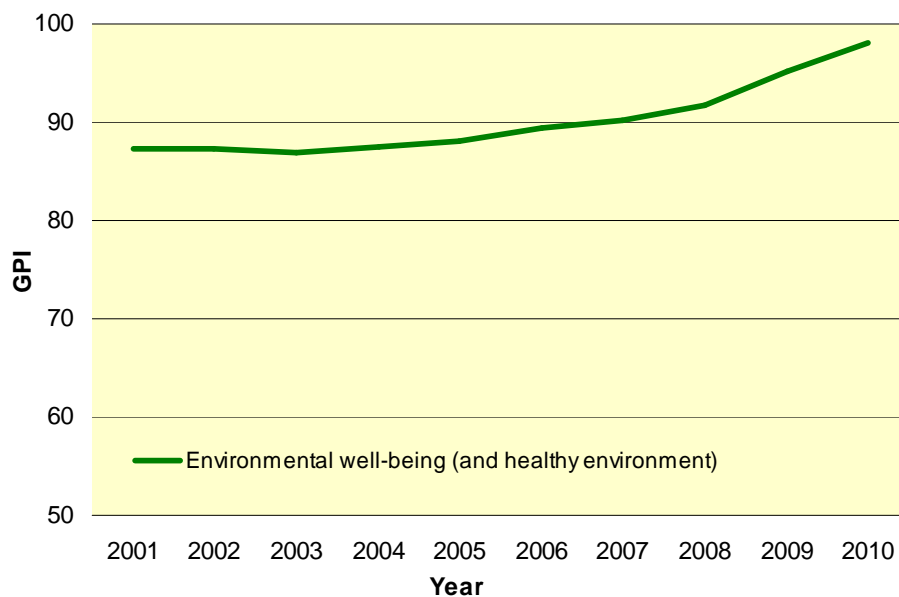


Figure 2. Environmental well-being (and healthy environment) GPI, 2001-2010

Over the last few years (2007 to 2010) a rapid increase in the environmental GPI was observed. Over these few years increases were observed in nearly all indicators. The greatest gains were observed for residents rating of air pollution as a city problem (ie, less residents thought it was a problem), fresh water suitability for recreation and volume diverted from landfills per capita.

The indicators within the WR-GPI framework indicate that good progress has been made towards some of the region’s environmental goals, but there is still much room for improvement. For example further improvements to fresh water suitability for recreation and improvements to coastal/marine water for recreation, could potentially result in large gains to the healthy environment and environmental well-being GPI. Three of the indicators only have one year of data currently available, so as further data becomes available these are also likely to affect GPI values, but whether this is a positive or negative impact remains to be seen.

Discussion

Over the study period there were improvements to ten indicators, no change to three indicators, and for three indicators it is not possible to identify a trend as only one year of data is currently available.

The indicators within the environmental well-being (and healthy environment) GPI indicate that good progress has been made towards the healthy environment community outcome goals and improving our environmental well-being. There is always likely to be environmental concerns or specific isolated issues in the region that may not get captured within the indicators. However, the indicators give us a general picture and currently show that the environment in the Wellington region is in a relatively healthy state.

Good air quality is fundamental to our well-being and prevents damage to our ecosystems, our health, and our economy. The region's air quality is within acceptable limits in most places, most of the time and has improved over time. Alongside this, residents' rating of air pollution as a problem has also decreased and in 2010 only 8% of residents rated air pollution as a problem in the region.

In addition to air quality, good water and soil quality, reducing waste, and improving energy efficiency are all essential to maintaining a healthy environment and ensuring the sustainability of the resources in the region. The indicators show good progress in most of these areas; however an area of relative weakness is our fresh water and coastal/marine water quality for recreation. The grading of freshwater and coastal/marine sites for recreational purposes is greatly affected by rainfall in the three days before sampling, and the majority of occasions when water quality in the region was unsuitable for recreational purposes were during and shortly after heavy rainfall periods.

Water-based recreational activities are part of our outdoor-focused way of life and it is essential that the water is of a high quality. This is fundamental if enjoyment is to be gained from these activities and ensuring that people are not exposed to significant health risks.

Water quality also has a direct impact on the ecological health of our rivers and streams. In the region our "healthiest" rivers and streams are located in catchments dominated by indigenous forest cover and where human influences are minimal. Stream and river health can therefore be viewed as an indicator of wider catchment health.

As a region we need to find a balance between human influences, land use activities and sustaining the natural ecosystems, not only relating to our water systems but also across other aspects of the environment.

For example, primary land uses such as agriculture, dairying and cropping are key contributors to the economy of the region but they can have a negative influence on the environment. Primary land use tends to decrease organic matter and increase nutrient levels. Nutrients do not harm soils but if they are present at higher levels than can be used, they can leach from the soil to groundwater or rivers where they can make water unsafe for drinking and affect freshwater ecosystems. It is encouraging to see that the health of the region's dairy farm and drystock soils is found to be mainly intact and has improved over time.

Protecting land through open space covenants also helps maintain our ecosystem diversity, along with our natural and cultural heritage. Other forms of protection in relation to our erosion-prone hill country, prevents damage to both rural and urban businesses, communities and infrastructure.

It appears that Wellington residents are becoming increasingly aware of their role in waste reduction. The amount of waste going to landfills is decreasing, and the amount of recycling in the region is increasing, indicating the community's commitment to sustainable practices.

The ecological footprint of a place is an estimate of the amount of biologically productive land and sea area needed to regenerate (if possible) the resources a human population consumes and to absorb and render harmless the corresponding waste. The Wellington region's ecological footprint is below the New Zealand average. The main factor that seems to contribute to the relatively low per capita footprint is the efficiency achieved through the concentration of the urban population in the Wellington region. However, even with this relatively low ecological footprint, the Wellington region does have an ecological deficit, that is, it uses more land in domestic consumption than there is available land.

In the areas of energy use, greenhouse gas emissions and total ecological footprint, it is currently not possible to assess our progress. However, compared to national results, corresponding figures for the Wellington region show that we appear to be performing relatively well. Energy production and consumption patterns are linked to global climate change, local health effects, and regional impacts such as air and water pollution, damage to marine and other wildlife, land-use conflicts, security concerns, resource depletion, and soil contamination. In order to continue to improve our region's environmental well-being we must aim to reduce or at a minimum, keep our energy use and greenhouse gas emissions low.

3. Healthy environment indicators

OUTCOME DEFINITION:

We have clean water, fresh air and healthy soils. Well functioning and diverse ecosystems make up an environment that can support our needs. Resources are used efficiently. There is minimal waste and pollution.

Healthy environment indicators have been selected to measure progress towards the healthy environment community outcome definition goals for the region. The outcome definition covers different aspects of the physical environment but focuses on the quality aspect of the environment with less emphasises on having resources in sufficient quantity.

In total 16 indicators⁴ are included in the WR-GPI 2001-2010 framework that form part of the healthy environment community outcome area. Each indicator is assigned a symbol to represent how the data trend relates to well-being progress (refer to the symbol key in Table 1, section 1).

For a full list of healthy environment indicators, including the indicator definition, its influence on well-being and the data sources refer to Appendix 2 in the paper titled *“The approach to the Wellington region genuine progress index (WR-GPI) 2001-2010”* (Durling, 2011).

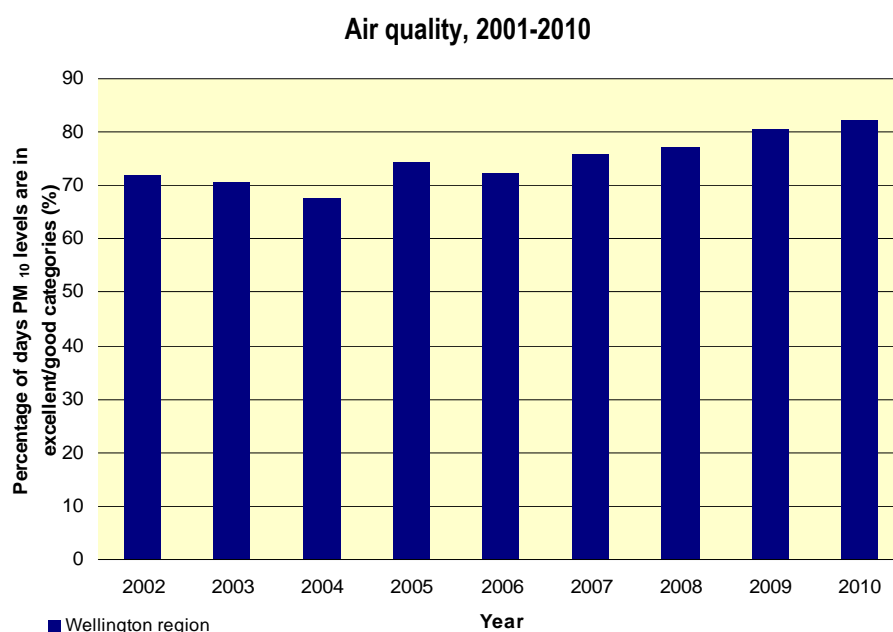
⁴ There are 17 indicators included in the WR-GPI framework that form part of the healthy environment outcome area, however one of these indicators does not currently have a data source attributable to it so is not included in this report.

3.1 Air quality



Air quality is within acceptable limits most of the time, and has improved slightly since 2001

Without clean air, we can expect ongoing damage to our health, our ecosystems and our economy. Long-term exposure to suspended particles (PM₁₀) is linked to adverse health effects in the population. Air quality varies from year-to-year and from place to place due to the effect of weather and topography on the dispersion of air pollutants.



Source: Greater Wellington Regional Council⁵

Findings

- Air quality in the region is within acceptable limits in most places, most of the time.
- In 2010, PM₁₀ concentrations at monitored sites in the Wellington region were at good/excellent levels on 82.2% of days.
- Even though the number of monitoring sites has changed over the study period, long-term trends show a slight improvement in the region's air quality.

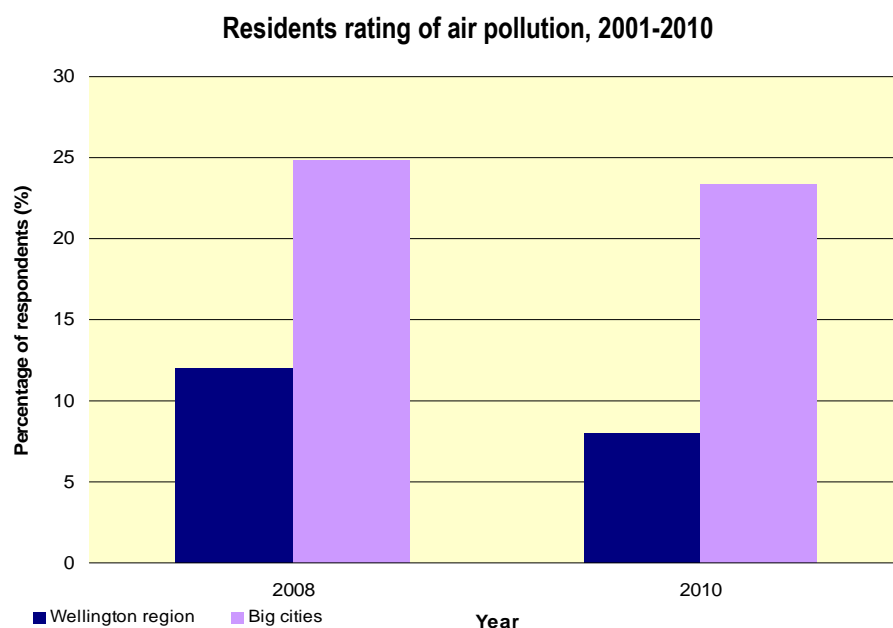
⁵ Note that only selected sites are monitored around the region, and the number of sites monitored has changed over the study period.

3.2 Residents rating of air pollution



The proportion of residents perceiving that air pollution had been a problem in the last 12 months decreased between 2008 and 2010

Good air quality is fundamental not only to people's health and well-being but also to the quality of the natural and physical environment. Air pollution can reduce our level of enjoyment of a place and affect the overall perception of our region.



Source: Quality of Life survey

Findings

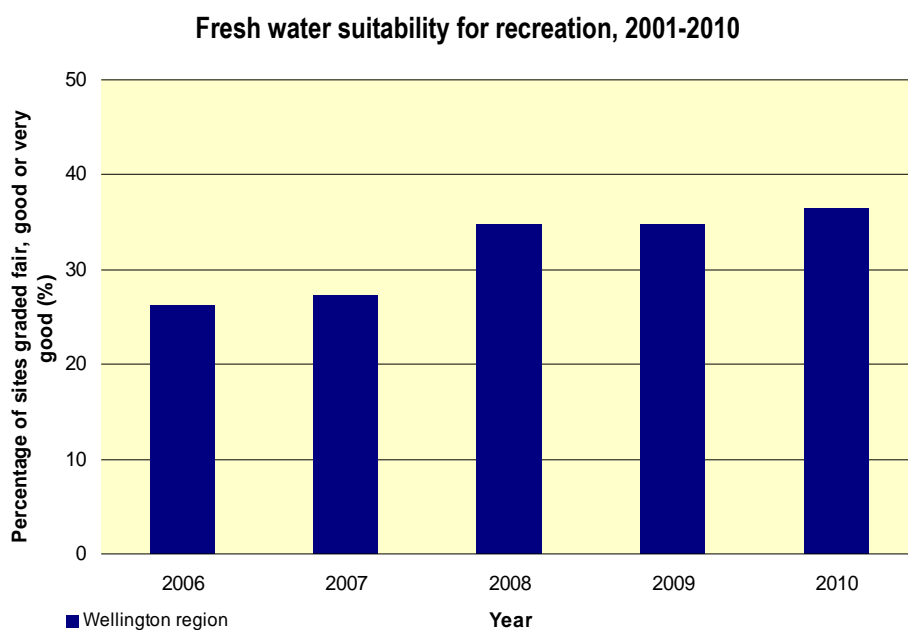
- In 2010, 8% of the Wellington region adult population thought that air pollution had been a problem within the last 12 months.
- The percentage of the Wellington region that thought that air pollution had been a problem within the last 12 months decreased from 2008 to 2010 (12% to 8%).
- Compared to the population of the participating eight big cities, in both 2008 and 2010 much lower percentages of the Wellington region adult population thought that air pollution had been a problem within the last 12 months.

3.3 Fresh water suitability for recreation



Freshwater sites with a suitability for recreation grading of fair, good or very good have increased between 2006 and 2010

Clean water for recreational purposes is fundamental to enjoyment of life and ensuring people are not exposed to significant health risks. Clean fresh water is also important for tourism as well as fishing activities.



Source: Greater Wellington Regional Council⁶

Findings

- In 2010, 36% of monitored fresh water recreation sites were given suitability for recreation grades of fair, good or very good over the summer bathing months.
- Even though the number of monitoring sites has changed slightly over the study period, long-term trends show an increase in the number of freshwater sites with a suitability for recreation grading of at least fair.

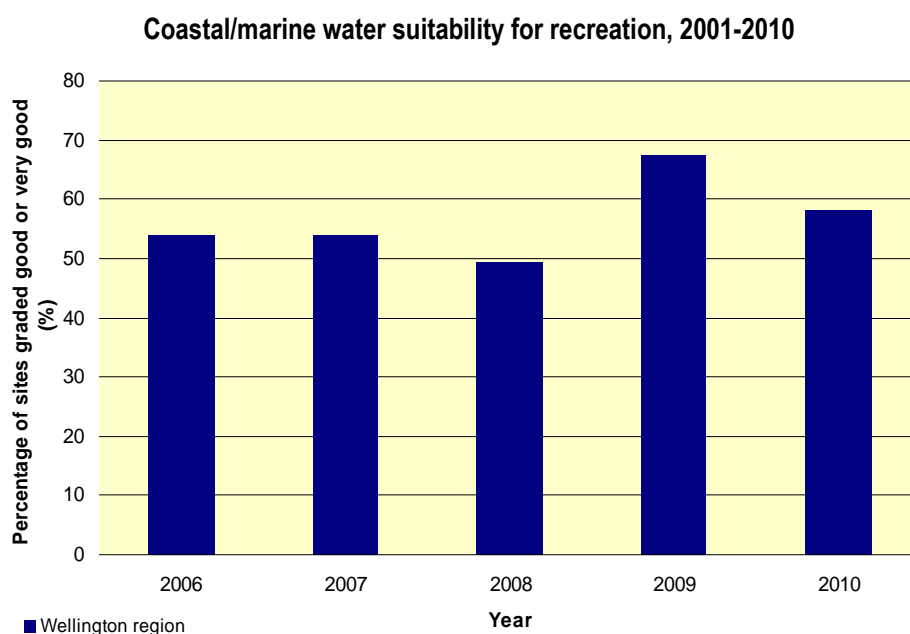
⁶ Note that only selected sites are monitored around the region, and the number of sites monitored has changed over the study period. Measurements are only taken over the summer bathing months.

3.4 Coastal/marine water suitability for recreation



Coastal/marine water sites with a suitability for recreation grading of good or very good have fluctuated between 2006 and 2010

The region's coastal beaches are widely used for a range of recreational activities such as swimming, sailing, surfing, water skiing and underwater diving. Clean coastal water is important for tourism and is fundamental to enjoyment of life. Maintaining and protecting coastal water quality is therefore an important public health and resource management issue.



Source: Greater Wellington Regional Council⁷

Findings

- Coastal/marine recreation sites show better suitability for recreation grades than freshwater sites.
- In 2010, 58% of monitored coastal/marine recreation sites were given suitability for recreation grades of good or very good over the summer bathing months.
- The percentage of coastal/marine recreation sites with a suitability for recreation grading of good or very good has fluctuated over the monitoring period, so little long-term change is evident.

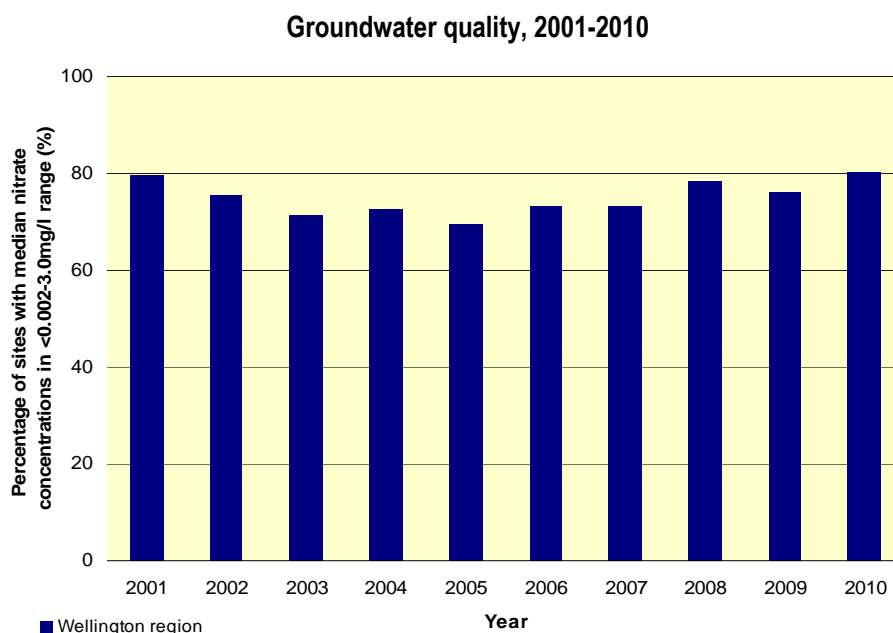
⁷ Note that only selected sites are monitored around the region, and the number of sites monitored has changed over the study period. Measurements are only taken over the summer bathing months.

3.5 Groundwater quality



There has been little change in groundwater quality between 2001 and 2010

Nitrate is a commonly measured indicator of groundwater quality. Compliance with the national drinking water standard should ensure that it is safe for the water to be used for human (and stock) consumption. Elevated nitrate concentrations may indicate a health risk as well as a risk of adverse impacts on the water quality in rivers and lakes, and in freshwater ecosystems. Greater Wellington Regional Council uses a threshold of less than 3mg/L of nitrate (measured as nitrate nitrogen) as their indicator of good water quality.



Source: Greater Wellington Regional Council⁸

Findings

- In 2010, median nitrate concentrations were low ($< 3\text{mg/L}$) in 80% of monitored bores.
- There has been little change in groundwater quality over the 2001 to 2010 study period.

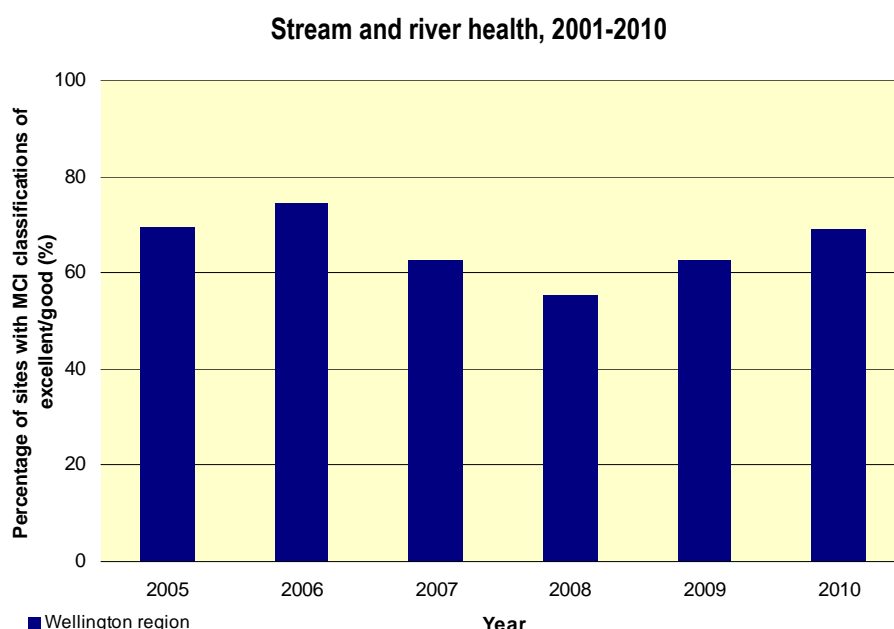
⁸ Note that only selected sites are monitored around the region, and the number of sites monitored has changed over the study period. Groundwater quality, particularly in shallow aquifers, is also strongly influenced by rainfall and river flows.

3.6 Stream and river health



The proportion of sites with a macroinvertebrate community index class of good or excellent has fluctuated, with the proportion in 2010 similar to that recorded in 2005

Macroinvertebrates are good indicators of the life-supporting capacity of streams and rivers as well as the ecological health of a stream or river. The condition of stream and river systems also represents an integration of land use activities. Stream and river health is therefore an effective indicator of wider catchment health and the sustainability of land uses. Safeguarding freshwater systems is essential to providing for human uses and protecting biodiversity.



Source: Greater Wellington Regional Council⁹

Findings

- In 2010, 69% of monitored sites had a macroinvertebrate community index (MCI) classification of good or excellent.
- The majority of sites in the excellent MCI class are located in catchments dominated by indigenous forest cover.
- The percentage of sites with an MCI of good or excellent has fluctuated over the monitoring period, with the percentage in 2010 similar to that recorded in 2005.

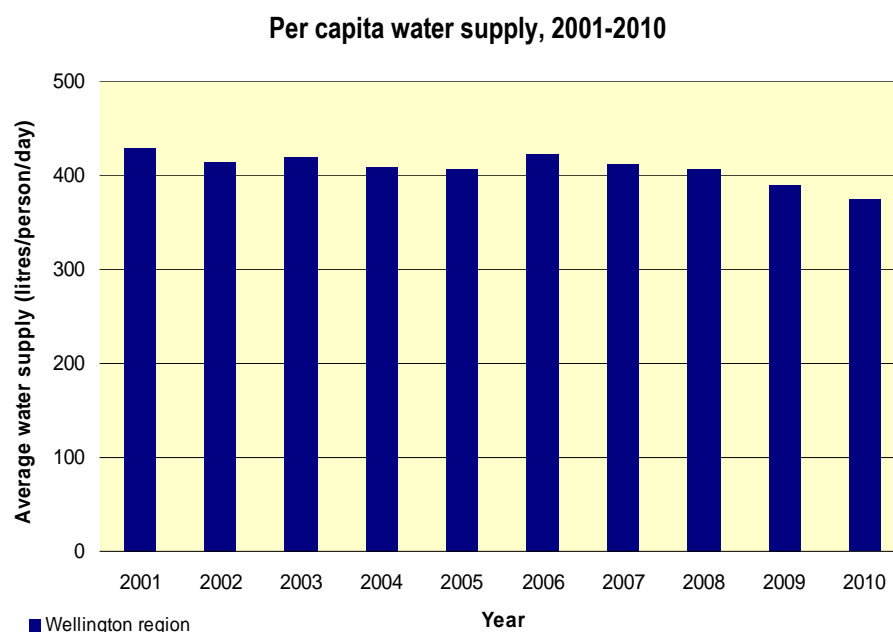
⁹ Note that only selected sites are monitored around the region, and the number of sites monitored has changed over the study period.

3.7 Per capita water supply



The average daily water supply per person fluctuated at the start of the century but decreased between 2006 and 2010

Water is crucial to our welfare, and to much of the environment and economy. The efficient management of water resources is essential to individual and community well-being, and to the protection of biodiversity and ecological systems.



Source: Greater Wellington Regional Council, Kapiti Coast District Council,¹⁰ Masterton District Council, South Wairarapa District Council and Carterton District Council¹¹

Findings

- In 2010, average daily water supply¹² in the Wellington region was 374.3 litres/person.
- Average daily water supply per capita fluctuated between 2001 and 2006, but has gradually decreased since this time.
- The average daily water supply per capita was 13% lower in 2010 compared to 2001.

¹⁰ Water supply from Kapiti Coast District Council only includes Paraparumu and Waikanae.

¹¹ Water supply from Carterton District Council only includes residential town supply, CBD and Waingawa.

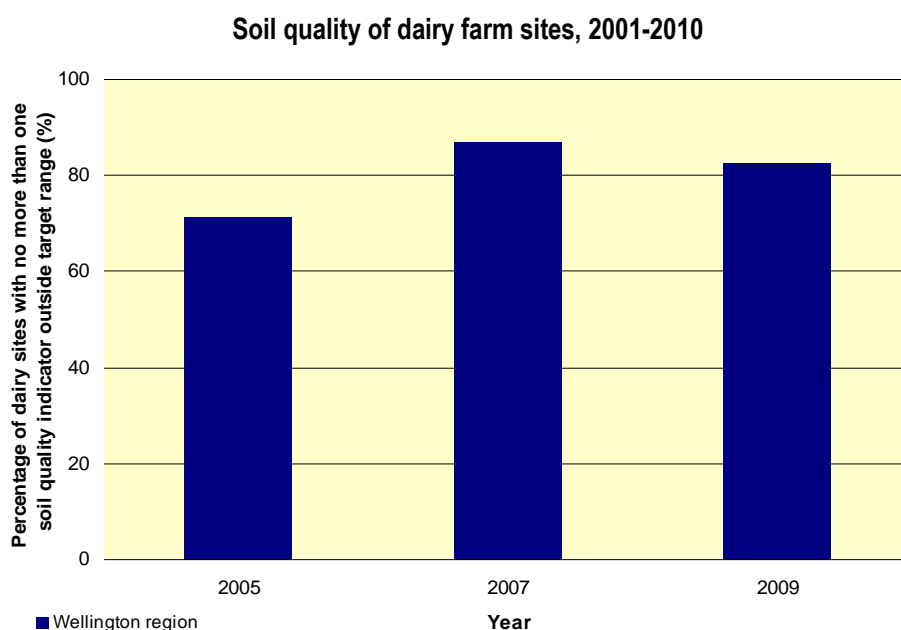
¹² Water leaks are also included in these figures.

3.8 Soil quality of dairy farm sites



The percentage of dairy farm sites with no more than one soil quality indicator outside the target range increased between 2005 and 2009

The health of the region's high quality soils is integral to primary land uses such as dairying, cropping and horticulture. Soil health can be affected by loss of organic matter, a breakdown of soil structure, erosion by wind and water or chemical contamination. If more than one of the core physical or chemical soil quality indicators is outside the target range for a particular land use, soil quality may be compromised for that land use with potential adverse effects on ground or surface water quality. Dairy farming is one of the most intensive land uses so it is deemed important to monitor the soil at these sites.



Source: Greater Wellington Regional Council¹³

Findings

- In 2009, 83% of dairy farm sites had no more than one soil quality indicator outside the target range.
- The percentage of dairy farm sites with no more than one soil quality indicator outside the target range decreased between 2007 and 2009, however 2009 levels remain higher than those observed in 2005.

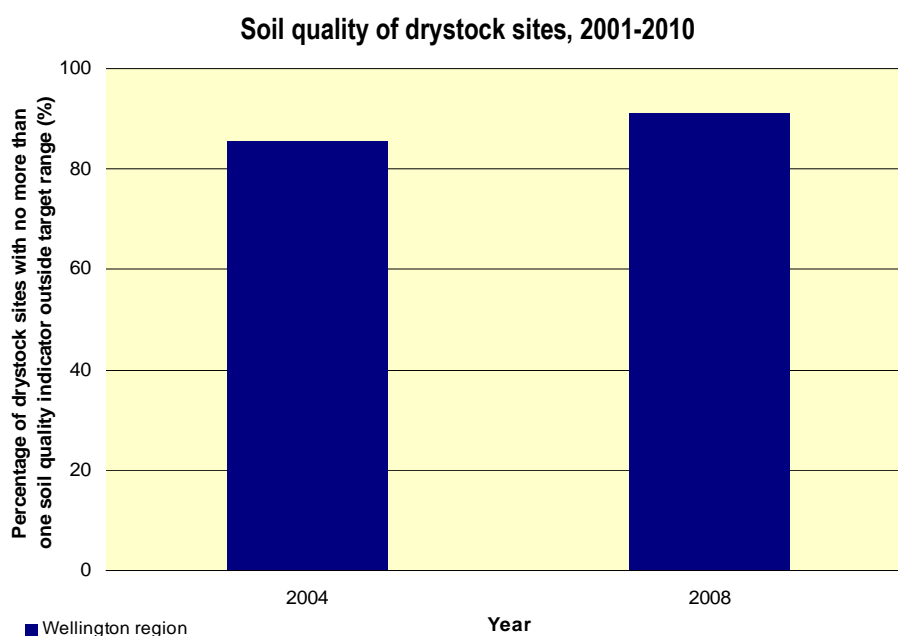
¹³ Note that only selected sites are monitored around the region, and the number of sites monitored has changed slightly over the study period.

3.9 Soil quality of drystock sites



The percentage of drystock sites with no more than one soil quality indicator outside the target range increased between 2004 and 2008

The health of the region's high quality soils is integral to primary land uses such as dairying, cropping and horticulture. Soil health can be affected by loss of organic matter, a breakdown of soil structure, erosion by wind and water or chemical contamination. If more than one of the core physical or chemical soil quality indicators is outside the target range for a particular land use, soil quality may be compromised for that land use with potential adverse effects on ground or surface water quality. Drystock sites were selected as these cover the greatest land area across the Wellington region.



Source: Greater Wellington Regional Council¹⁴

Findings

- In 2008, 91% of drystock sites had no more than one soil quality indicator outside the target range.
- The percentage of drystock sites with no more than one soil quality indicator outside the target range increased between 2004 and 2008. However with only two data points available this trend should be treated with caution.

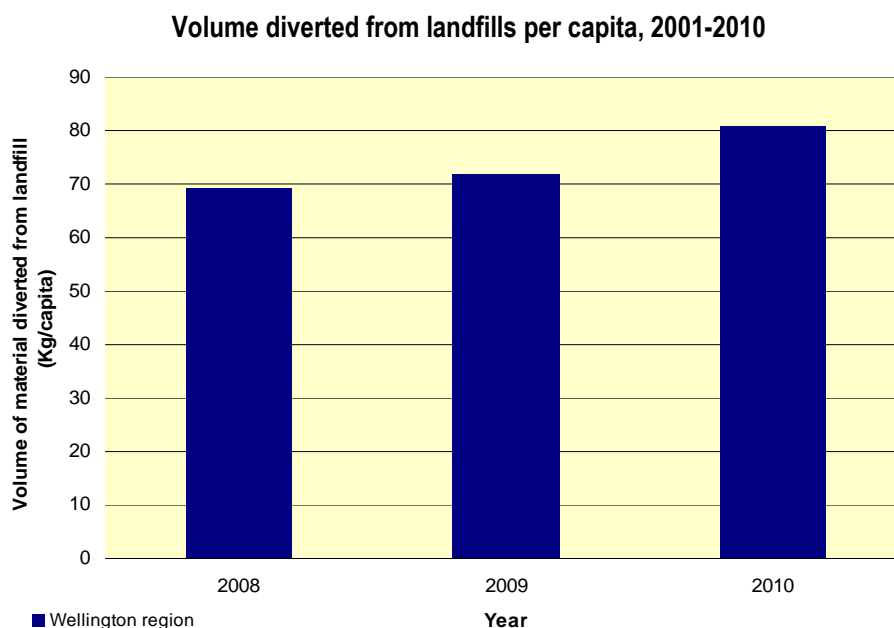
¹⁴ Note that only selected sites are monitored around the region, and the number of sites monitored has changed slightly over the study period.

3.10 Volume diverted from landfills per capita



The volume of material recycled per person has increased since 2008

Material diverted from landfill is a measure of recycling, and is indicative of the community's commitment to sustainable practices. Recycling reduces waste disposal, which is expensive and may cause environmental problems, it also saves landfill space and reduces the demand for raw materials and energy used to make the product in the first place.



Source: Wellington regional waste assessment report, 2011

Findings

- 39,100 tonnes of material was diverted from landfill in 2010, resulting in 80.9 kg of material recycled per person.
- Recycling in the region has increased steadily from 2008 to 2010, from 69.2 kg/person to 80.9 kg/person.

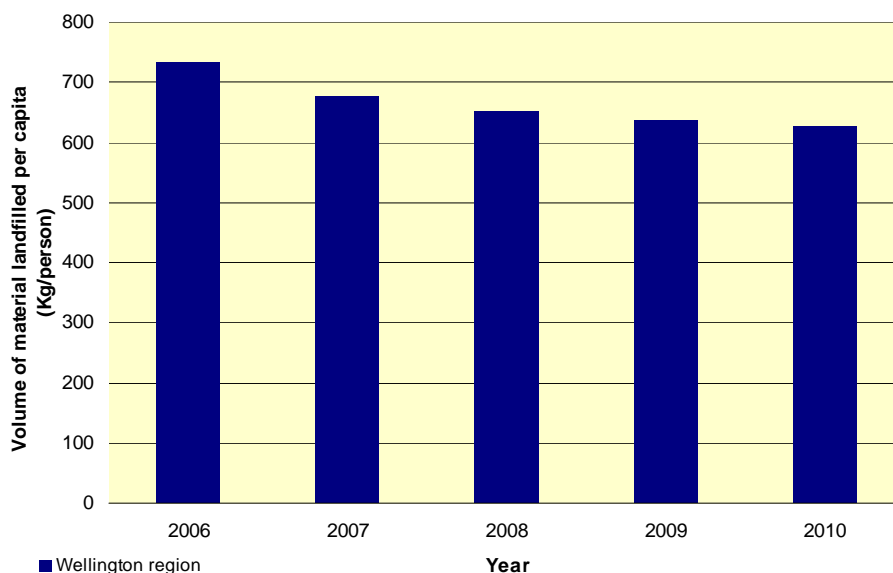
3.11 Landfill waste per capita



The amount of material landfilled per person has decreased steadily since 2006

Waste represents a loss of resource, both in the form of material and energy. The treatment and disposal of waste may cause environmental pollution and expose humans to harmful substances and bacteria that affect human health. Landfill waste is an indicator of the volume of resources being consumed. Waste to landfill generates offensive odours, greenhouse gases, and may cause pollution.

Landfill waste per capita, 2001-2010



Source: Wellington regional waste assessment report, 2011

Findings

- In 2010, around 302,500 tonnes of material was landfilled, meaning 625.9 kg of material was landfilled per person.
- The amount of landfill waste and the amount of landfill waste per person has decreased each year from 2006 to 2010.

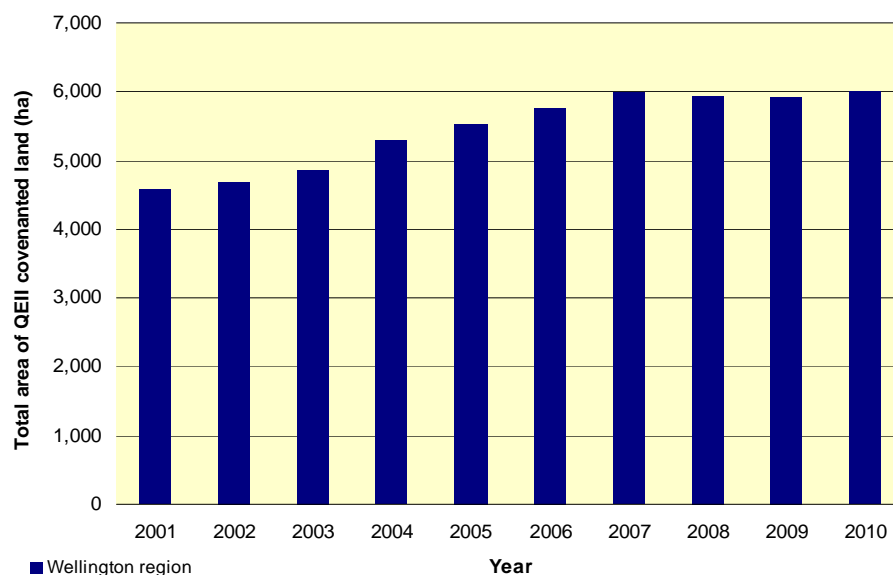
3.12 QEII covenanted land



Land under QEII covenant has increased from 2001 to 2007 and has remained relatively unchanged since this time

The loss of natural habitats and the declining diversity of our indigenous flora and fauna are regarded as one of our biggest environmental problems. A number of indigenous species are already extinct and many others are under threat. Open space covenants help to protect New Zealand's unique natural and cultural heritage. This heritage helps to define our sense of national identity and contributes to our enjoyment and appreciation of New Zealand.

QEII covenanted land, 2001-2010



Source: QEII Trust

Findings

- 6,011ha of land in the Wellington region was registered under QEII covenant in 2010.
- The area of land registered under QEII covenant increased steadily between 2001 and 2007, but has remained relatively unchanged since this time.

3.13 Erosion prone land under effective management



The area of erosion prone land under effective management has increased from 2001 to 2010

Protecting erosion-prone hill country prevents damage to both rural and urban businesses, communities and infrastructure. Heavy rain and other adverse weather events can increase the risk of erosion in the hill country. Erosion leads to flooding, which in turn can devastate farm production and cause adverse environmental effects off-site.



Source: Greater Wellington Regional Council

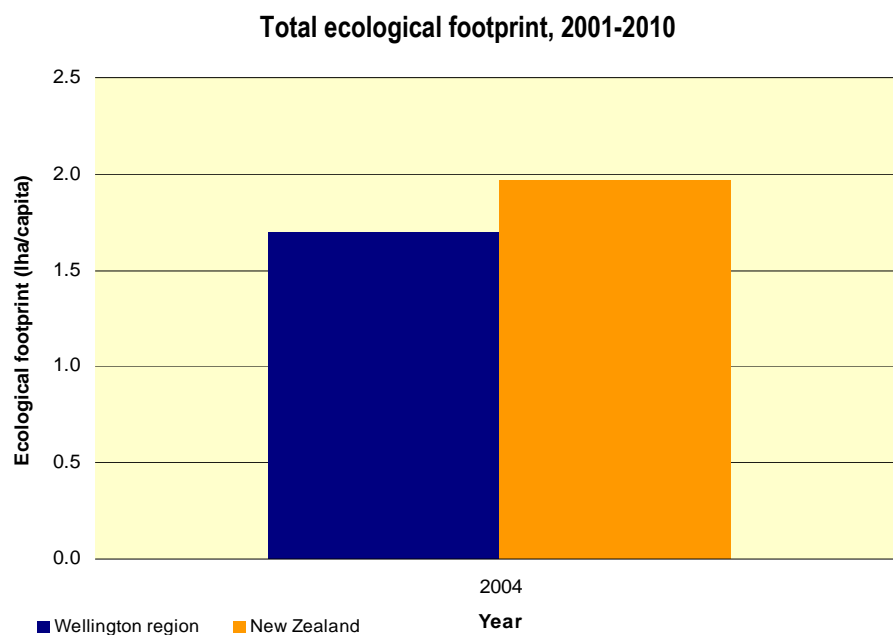
Findings

- In 2010, 64.9% of erosion prone land in the Wellington region was under effective management.
- The area of erosion prone land under effective management has increased from 2001 to 2010.

3.14 Total ecological footprint

? No trend data is currently available

Ecological footprint is widely used as an indicator of environmental sustainability. It is an estimate of the amount of biologically productive land and sea area needed to regenerate (if possible) the resources a human population consumes and to absorb and render harmless the corresponding waste. Understanding the ecological footprint may help safeguard our ecosystems and life-supporting services that enable the biosphere to provide for all in the long-term.



Source: Ministry for the Environment

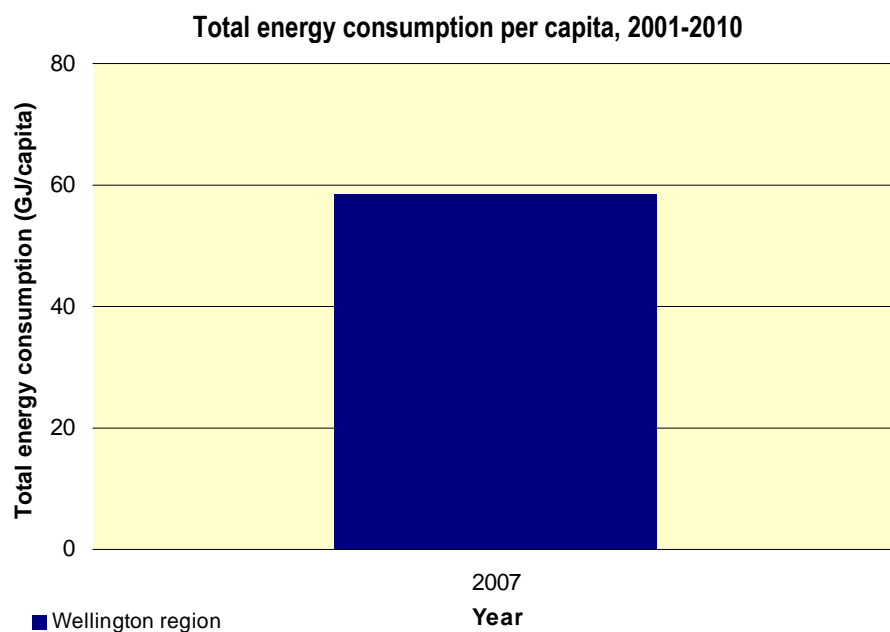
Findings

- The Wellington region had an ecological footprint of 1.70 lha/capita in 2004. This is below the New Zealand average of 1.97 lha/capital.

3.15 Total energy consumption per capita

? No trend data is currently available

The intensive use of energy, especially energy obtained from fossil fuels, is also the primary cause of a number of environmental, social, and economic concerns which negatively affect our general well-being. Current energy production and consumption patterns have been linked to global climate change, local health effects, and regional impacts such as air and water pollution, damage to marine and other wildlife, land-use conflicts, security concerns, resource depletion, and soil contamination.



Source: Greater Wellington Regional Council

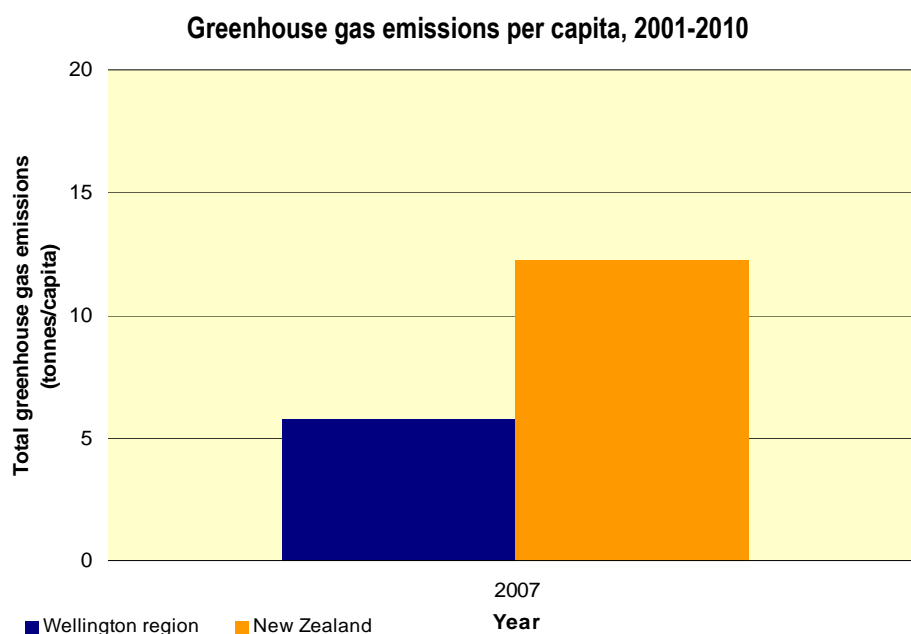
Findings

- In 2007, fuel consumption (from liquid, solid and gaseous fossil fuels) in the Wellington region was 58.4 GJ/capita.

3.16 Greenhouse gas emissions per capita

? No trend data is currently available

This indicator gives a measure of contributions to climate change and is a proxy for resource depletion. Climate change is now widely acknowledged as the most serious environmental challenge of the century and perhaps the most serious economic and social challenge. Reduced greenhouse gas emissions would indicate improvements in well-being across a number of areas.



Source: Greater Wellington Regional Council

Findings

- In 2007, greenhouse gas emissions in the Wellington region were 5.75 tonnes/capita. This is below the New Zealand average of 12.23 tonnes/capita.
- The region's largest emissions came from the energy sector (61.9%), followed by agricultural emissions (30.9%).

4. Comparison of regional GPI and environmental well-being GPI

The GPI was conceived as a way to measure the region's collective well-being in terms of assessing progress towards each of the nine community outcomes. Where necessary the indexes for each community outcome indicator have been averaged to form the four composite well-being GPI's, and the four well-being GPIs have been brought together and averaged to form one composite regional GPI. Figure 3 shows the regional GPI from 2001 to 2010. The four well-being GPI's are also shown for comparison.

Other than a slight decrease between 2001 and 2002, and little change between 2009 and 2010, the regional GPI has increased over the study period. Regional GPI was at its highest in 2010 and is 5% higher in 2010 compared to 2001.

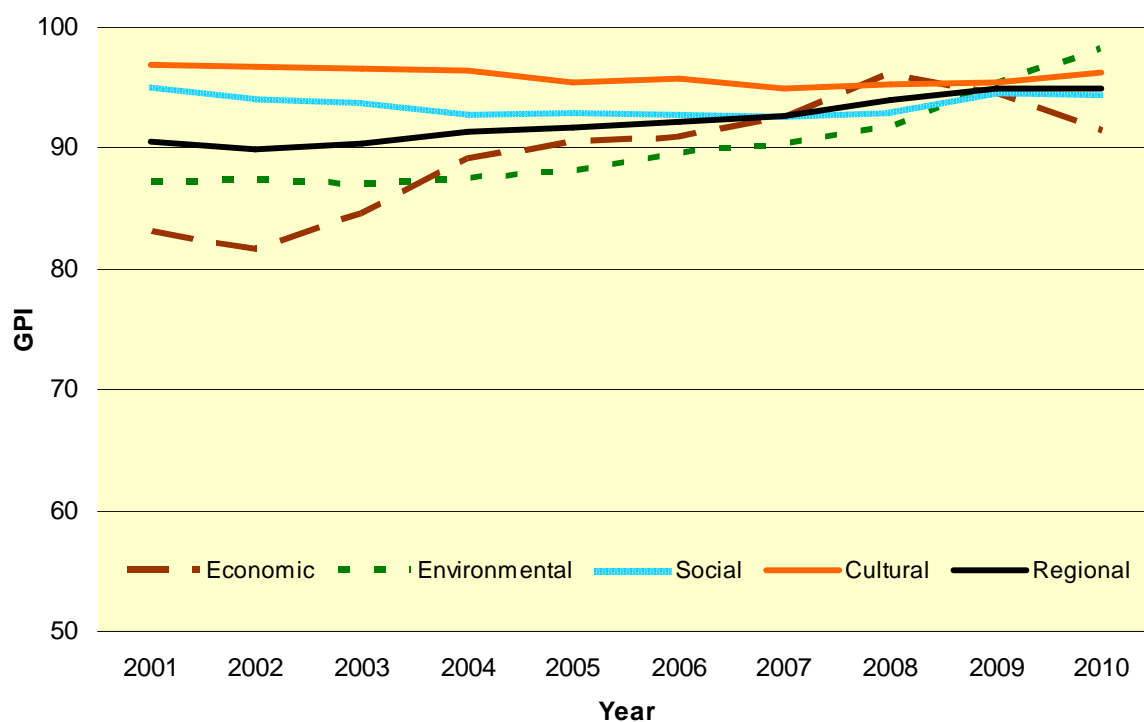


Figure 3. Comparison of overall regional GPI and the four well-being GPI's, 2001-2010

The GPI is about measuring progress and this needs to be remembered when comparing GPI's. Just because an area has a higher GPI value it does not necessarily mean that as a region we are performing better in that area. For example if we compare the environmental well-being GPI with the cultural well-being GPI, it is intuitive to think that until 2010 we were performing better in cultural-well-being as this has a higher GPI value. What the GPI actually tells us is that between 2001 and 2010 little progress was made in the region on cultural well-being, whereas we have made some progress on environmental well-being.

5. Conclusion

Looking at the indicators used to measure the regions progress towards our healthy environment community outcomes and measure our environmental well-being it is found that some good progress has been made, especially over the last three years. Of the 16 indicators used to measure our progress, ten showed improvements, three remained unchanged and three indicators only had one year of data available over the 2001 to 2010 period. No indicators showed declines over this time.

The changes to the indicators meant that once converted to index values, from 2001 to 2010, there was an increase in the region's GPI for healthy environment and environmental well-being. This means that as a region we have made some progress towards the healthy environment community outcome goals and improving our environmental well-being.

The region has good quality air, soils and water most of the time in most places. The region's residents are also becoming more aware of environmental issues. This has resulted in reduced waste, increased recycling and reduced water use.

Lastly, it must not be forgotten that a GPI is a long term monitoring tool. As a region we are just in the early stages of data collection, and have been faced with numerous challenges to get to where we are today. Over time, the data available for monitoring our progress will increase making it easier to monitor any changes to our well-being. While the results cannot always show what is driving these changes, it can help identify adverse trends at an early stage, and if necessary point us to where there needs to be further analysis to help understand the changes and how we address them.

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