



Snapshot of the environment domain plan

New Zealand's economic activity is largely based on its natural environment. For example, agriculture, forestry, tourism, and much of our power generation depends on the environment. Our environment is also important from social and cultural perspectives. For example, many New Zealanders highly value our rivers, lakes, beaches, forests, and mountains, and most of these are culturally and spiritually significant to Māori.

The state of our environment is therefore of great interest to many New Zealanders, who recognise the value of these resources and services to our economy and society, and are concerned about how using these resources will affect our environment (Pawson, 2012).

This domain plan looks at the statistical information currently available and determines whether this information answers the big questions about the state of our environment.

Purpose

The purpose of the environment domain plan is to develop a shared understanding of the strengths, gaps, overlaps, and deficiencies within environmental statistics. It aims to develop agreement between major users and data custodians on the prioritised initiatives needed to address the environment sectors' statistical needs.

The primary purpose of this report is to present the initiatives that were identified in consultation with expert data gatherers and users to address our environmental information needs.

These initiatives aim to guide us on how environmental information collection and use should progress. Unlike Tier 1 statistics, where there are agreed obligations and timeframes for delivery of the statistics, the environment domain plan initiatives are aspirational.

The key challenge for us is to realise the initiatives outlined in this domain plan. The [Domain plan for energy sector 2006–16](#) is a good example of what a domain plan can achieve. It proposed some future development initiatives, one of which was on measuring energy end-use. This led to the formation of the [New Zealand Energy Use Survey](#), which is currently produced by Statistics NZ.

The next phase of the environment domain plan will start in late 2013. This work will involve a broad range of stakeholders from the [Natural Resources Sector](#) to further scope and then act on the initiatives.

Process for developing this domain plan

This domain plan was developed by subject experts from central and local government, Crown research institutes, Māori, and other key experts from business and non-government organisations (see appendix 5 for list of participants).

There are four steps in this domain plan:

1. develop the enduring questions and the supplementary enduring questions
2. compile a stocktake of official data currently available
3. analyse the stocktake with respect to the questions
4. run 10 topic area workshops to identify and prioritise initiatives.

Summary of domain plan process

Enduring questions were developed for each of the 10 topic areas:

1. atmosphere
2. climate change
3. coastal and marine environment
4. ecosystems and biodiversity
5. energy
6. freshwater
7. land
8. Māori environmental statistics
9. materials and waste
10. mineral resources.

These questions are the ‘big picture’ questions – those you’d likely still be asking in 20 years. Sixty-one supplementary enduring questions were also formulated, which focus at a more detailed level within each topic. An initial list of questions was developed with key Crown agencies, including Crown research institutes and Māori representatives. These were then refined and shortlisted by the advisory group comprising Statistics NZ, Ministry for the Environment, Department of Conservation, Ministry for Primary Industries, local government, and a Māori representative.

The primary scope of the questions was to look at the biophysical issues while acknowledging the links with cultural, social, and economic areas.

Most of these supplementary enduring questions are broad and complex, and require significant amounts of information to answer.

In the opinion of the experts, nearly half of the enduring questions had a medium- to high-level of information relevant to answering the questions. Four of the 61 questions could be regarded as well informed. The conclusion from this is that there is a significant need for more environmental information.

The workshops helped identify over 150 initiatives to address these information needs. There were several common themes in the initiatives, namely those around governance, common reporting frameworks, centralised or federated data storing, and baseline information.

Examination of the supplementary enduring questions showed that all of them are aligned to at least one Tier 1 environmental statistic (see [Tier 1 statistics](#)). Around 40 percent of the environment domain plan initiatives are aligned with a Tier 1 statistic. This result is not surprising as Tier 1 statistics were developed before the domain plan initiatives, that is, the initiatives were often identified to support or extend the Tier 1 processes. There were common themes in the environment domain plan initiatives, such as governance and creating information portals that do not link to any particular Tier 1 statistic, but which will be useful nevertheless.

It is intended that action on the environment domain plan will primarily occur through the Natural Resources Sector (NRS) information work stream. The domain plan will provide a useful foundation for the information framework the NRS is developing in consultation with Statistics NZ. There are other actions currently under way across the NRS that will help inform these domain questions. These actions include those around Tier 1 environmental statistics, the National Land Resource Centre, freshwater information, and information for the marine regulations.

Enduring questions

Enduring questions were developed for each of the 10 topic areas.

The primary scope of the questions was to look at the biophysical issues while acknowledging links with cultural, social, and economic areas.

Each topic includes a Māori-themed question. These questions generally have a 'Crown view' flavour to them. The Māori environmental statistics topic captures the wider Māori view. The scope of this topic was purposely broader than the other nine topics to include the cultural aspects of the environment from a Māori perspective.

The 10 sets of enduring questions are listed below, and are listed with the supplementary enduring questions in appendix 1. They have also been published in [Stocktake for the environment domain plan 2012](#).

Atmosphere

What are the levels of air pollution in New Zealand and what is the consequential impact on ecosystems and human health?

To what extent has the stratospheric ozone layer over New Zealand been depleted, and what is the consequential impact on ecosystems and human health?

Climate change

How is New Zealand's¹ climate changing?

How are New Zealand's greenhouse gas levels² changing?

How are we adapting to the physical impact³ of climate change?

Which environments are most likely to be affected by climate change?

Notes

1. Includes the Ross Dependency and the Chatham Islands.

2. Refers to emissions and sinks.

3. Includes physical impact on sea temperature, sea level, ocean currents, river flows, and winter snow cover.

Coastal and marine environment

How is the quality and use of our marine environment changing and what is the impact of human activity, including resource use, on the marine environment?

Ecosystems and biodiversity

To what extent is the native (indigenous) biodiversity of New Zealand being protected and sustained?

Energy

What is the environmental impact of New Zealand's generation, distribution, and use of energy, and to what extent are renewable options taken?

Freshwater

How is the quality, abundance, and use of New Zealand's freshwater changing, and what is the impact on ecosystems and humans?

Land

What are our land cover and land use profiles, how are they changing, what is driving these changes, and what is the consequential impact on New Zealand's soils, and natural and cultural landscapes, including urban environments and conservation lands?

Māori environmental statistics

From a Māori¹ perspective, why, where, and how is New Zealand's environment changing, and what impact is this having on Māori aspirations² and well-being?³

Notes

1. Māori includes individuals with a Māori cultural identity and ancestry (whakapapa); including Māori belonging to iwi / hapū / whānau (tribe / subtribe / family), marae, Māori organisations, urban authorities, kaitiaki (caretaking) groups, Māori landowners, Māori businesses, and Māori networks.

2. Aspirations include, but are not limited to, desired goals, preferences, and outcomes based on cultural values.

3. Well-being refers to, but is not limited to, cultural, spiritual, social, physical, economic, and political well-being.

Materials and waste

How do production and consumption patterns in New Zealand affect waste generation and minimisation?

Mineral resources

What are New Zealand's onshore and offshore mineral resources, and what is the environmental impact of prospecting, exploration, production, refining, processing, and transporting the resources?

Stocktake of official information on our environment

To see how much we knew about these questions, we undertook a stocktake of official information on our environment.

[Stocktake for the environment domain plan 2012](#) provides an overview of the national-level environmental statistics and data currently available in 10 environmental topic areas. Information in the stocktake was used to help identify the strengths, gaps, overlaps, and deficiencies in current data. The stocktake was compiled with the cooperation of many data custodians, including government agencies and Crown research institutes (CRIs).

Keeping to the domain plan's scope, the stocktake is limited to official statistics produced within New Zealand's Official Statistics System, statistics produced by CRIs, and the data used to compile these statistics. The scope is also limited to statistics that can be used to build a national picture.

Gap analysis

As part of a qualitative assessment based on expert opinion, subject experts were asked, for each of the supplementary enduring questions and for each of the datasets, 'How well does this dataset inform us about that question?' They were also asked, overall considering all datasets, 'How well informed is this question?' The summary of the results of that analysis are presented below.

Table 1 summarises the analysis of how well official information (including CRI data) informs the supplementary enduring questions. See appendix 3 for details of the analysis process.

Table 1

How well official data informs supplementary enduring questions

Topic	Supplementary enduring question ⁽¹⁾						
	A	B	C	D	E	F	G
Atmosphere	Medium	Medium	Low	Medium	Medium		
Climate change	High	High	Medium	Medium	Medium		
Coastal and marine environment	Medium	Low	Low	Low	Low	Low	
Ecosystems and biodiversity	Medium	Medium	Low	Medium	Low	Low	Low
Energy	Medium	Low	Low	Medium	Low	Low	
Freshwater	Medium	Medium	Low	Medium	Low	Low	
Land	High	High	Low	Medium	Medium	Medium	Low
Māori environmental statistics	Low	Medium	Low	Low	Low	Medium	Low
Materials and waste	Medium	Medium	Medium	Low	Low	Medium	
Minerals	Low	Low	Low	Low	Low	Low	

1. See appendix 1 for a full list of the supplementary enduring questions.

From table 1 we can see a significant information deficit in environmental information.

Of the 61 supplementary enduring questions, four were assessed by our panel of experts as highly informed, with 25 assessed as medium informed.

The two areas with highly-informed questions are climate change and land. The highly-informed questions on climate change cover atmospheric composition and greenhouse gas emissions; for land, they are about land cover and land use. These two areas have had significant investment as reflected in the amount of high-quality information available.

Interestingly, atmosphere is moderately well-informed. This shows that air quality and ozone/UV issues, having been studied for a long time, are relatively well known and understood. Information needs here may lie around the detailed impacts on human health, particularly on vulnerable communities.

The least informed topic was mineral resources. This shows that mineral resources are small and complex systems that are inherently difficult to discover, define, and develop. Particular areas with a low level of information relate to environmental constraints and the effects of attaining mineral resources. The low level of information also shows that

seafloor mineral resources are included in this area, and there is little seafloor mineral resource information currently available.

The coastal and marine topic was also lowly informed, showing there is still a lot to discover and understand about the large fraction of New Zealand's territory that is the marine environment.

Māori environmental statistics appear to be poorly informed, reflecting the little information currently available.

The top-priority initiatives

Table 2 contains a list of the three or four highest-ranked initiatives from each of the 10 topic area workshops. The topic chapters detail the complete list. The table also shows the complexity of the initiative in terms of its implementation.

Table 2

Top initiatives by topic area

Initiative number	Initiative name	Complexity	Helps inform which supplementary enduring question
Atmosphere			
AT1	Identify key non-standard air pollutants	Complex	A, B
AT2	Gather evidence to support future review of the National Environmental Standards for Air Quality	Complex	E
AT3	Develop a national database of emissions inventories and concentrations	Moderate	A
AT4	Develop health indicators for air quality	Complex	B
Climate change			
CC.A1.1	Gather information on national climate change adaptation responses	Moderate	D
CC.i1.1	Assess the climate change impacts on ecosystem services	Highly complex	D
CC.i1.2	Gather national infrastructure topography data – LIDAR for sea level change projections	Moderate	C, D
CC.A2.1	Develop a map of projected sea level rise around NZ's coastline	Moderate	C, D
CC.i1.3, CC.i1.4	Assess the impacts of climate change on Māori	Highly complex	C
Coastal and marine environment			
CM1	Identify baseline habitat state	Highly complex	A, B, D, E
CM2	Expand statistical governance over coastal and marine data	Highly complex	All
CM3	Review existing datasets	Moderate	All

Table continued next page

Table 2 continued

Top initiatives by topic area

Initiative number	Initiative name	Complexity	Helps inform which supplementary enduring question
Ecosystems and biodiversity			
EB1	Establish an ecosystems and biodiversity data forum	Complex	All
EB2	Invest in key databases, collections, and systems	Complex	All
EB3	Identify repeat measures to answer supplementary enduring questions	Complex	All
Energy			
EN1	Establish baseline knowledge of energy supply and environmental impacts	Highly complex	All
EN2	Conduct research into distributed energy generation	Complex	A
EN3	Explore underlying resource data	Complex	All
EN4	Quantify environmental impacts	Highly complex	B, C, E
Freshwater			
FW1	Create a national geo-spatial platform	Highly complex	All
FW2	Identify and assess freshwater values	Complex	D, E
FW3	Reassess information to answer supplementary enduring questions	Complex	All
Land			
LN1 group	Improve land data access and use	Complex	All
LN2	Establish multi-sector facilitation group.	Highly complex	All
LN3	Conduct soil assessment	Highly complex	A, D, E
LN4	Undertake ecosystem services assessment	Highly complex	D

Table continued next page

Table 2 continued

Top initiatives by topic area

Initiative number	Initiative name	Complexity	Helps inform which supplementary enduring question
Māori environmental statistics			
MES1	Develop an engagement programme for Māori environmental statistics	Complex	All
MES2	Develop a strategy and mandate for Māori environmental statistics	Complex	All
MES3	Establish governance for Māori environmental statistics	Highly complex	All
MES4	Identify data sources for Māori environmental statistics	Complex	B, C, G
Materials and waste			
MW1	Conduct waste-stream data collection	Highly complex	A, B, C, D, E
MW2	Assess data needed for a material flow analysis	Highly complex	A, B, C, D, E
MW3	Support improved governance over waste to improve coordination of waste information	Complex	All
Mineral resources			
MR1	Accelerate seafloor mapping	Complex	A, B
MR2	Undertake an airborne national geophysical survey	Complex	A, B, E
MR3	Undertake a geochemical national survey	Complex	A, B, C, E, F



1 Introduction

This chapter explains the purpose of the environment domain plan and the process undertaken to develop it. It begins with why the environment is important to New Zealand.

The importance of our environment

New Zealand's economic activity is largely based on its natural environment.

In 2012, 70 percent of the NZ\$46 billion of all goods exported were primary products (Statistics NZ, 2013). This proportion includes milk powder, butter, and cheese (25 percent), meat (11 percent), logs and wood (7 percent). Another NZ\$9.6 billion of export earnings came from international tourism – the main attraction for visitors being New Zealand's natural environment. Seafood exports consistently rank as New Zealand's fourth or fifth largest export earner. Our seafood industry sustainably harvests about \$1.2 to \$1.5 billion each year worth of fish, of which the aquaculture industry contributes about \$200 million per year (Statistics NZ, 2013; Ministry for Primary Industries, 2013).

Our environment is also important from social and cultural points of view. For example, New Zealanders highly value our rivers, lakes, beaches, and forests. Throughout the country there are mountains, rivers, lakes, and other sites that are of great importance to Māori.

In this domain plan, we look at the statistical information currently available and determine whether they answer the big questions about the information on the state of our environment.

What is a domain plan?

The primary purpose of a domain plan is to:

- achieve clarity and agreement about the main statistical priorities required to support that domain, and the strategy required to deliver on these priorities over the next five to eight years
- advance the integration and coordination of resources, technology and thinking within that domain and across the New Zealand Official Statistics System.

Statistics NZ has developed a number of domain plans over the years. Two recent ones with strong links to the environment domain plan are [Agriculture, horticulture, and forestry domain plan 2009](#) and [Domain plan for energy sector 2006–2016](#).

The energy domain plan is a good example of what a domain plan can achieve. It proposed some future development initiatives, one of which was on measuring energy end-use. This led to the formation of the [New Zealand Energy Use Survey](#), which is currently produced by Statistics NZ.

Purpose of the environment domain plan

The objective of the environment domain plan is to develop a shared understanding of the strengths, gaps, overlaps, and deficiencies within environmental statistics. It aims to develop agreement between major users and data custodians on the prioritised initiatives needed to address these needs. The primary purpose of this report is to present these initiatives.

These initiatives will provide some clear guidance about our needs in the gathering and using of environmental information. Unlike Tier 1 statistics, where there are agreed

obligations and timeframes for delivery of the statistics, the environment domain plan initiatives are aspirational.

Process for developing this domain plan

The first part of the development process was to engage with subject experts from central and local government and Crown research institutes, and with Māori stakeholders and other key experts to seek the enduring questions across the 10 topic areas (atmosphere, climate change, coastal and marine environment, ecosystems and biodiversity, energy, freshwater, land, Māori environmental statistics, materials and waste, and mineral resources; see appendix 5 for a list of the participants in the environment domain plan process). We sought advice to define the enduring questions New Zealanders would like to ask about our environment, with particular focus on the questions relating to Māori environmental statistics. To provide a more detailed focus, supplementary enduring questions were developed under these broad enduring questions.

The next step was to look at the official data that addresses those questions. An analysis was undertaken to look at the strengths, gaps, overlaps, and deficiencies of these datasets. Finally, 10 stakeholder workshops were conducted to develop the initiatives that will address the issues identified by that analysis (see appendix 2 for more detail on these processes).

The process to develop the domain plan had four steps:

1. develop the enduring questions and the supplementary enduring questions
2. compile a stocktake of official data currently available
3. analyse the stocktake with respect to the questions
4. run 10 topic area workshops to identify and prioritise initiatives.

The domain plan was split into 10 topic areas to make the scope of each of the topics achievable. However, this created artificial boundaries. For example, issues identified in the freshwater topic almost certainly would produce issues to be dealt with in the land topic. Where possible, an issue was dealt with as it arose.

Similarly, the scope of the environment domain plan was limited primarily to biophysical information issues, with a lesser focus on economic, social, and cultural dimensions. Again, this was an artificial boundary, and often issues around the other three components were discussed, particularly around water and with Māori environmental information needs

Enduring questions

The enduring questions were developed for each of the 10 topic areas in consultation with experts from across government, Crown research institutes, and Māori. For each area a principal enduring question (or questions) was developed as well as a set of around six supplementary enduring questions. The principal questions are broad in nature, and are likely to still be relevant in 10–20 years. The supplementary enduring questions focus on the detail of specific issues, but in many cases are still very broad questions. The principal and supplementary enduring questions were published on 22 August 2012 as part of the [Stocktake for the environment domain plan 2012](#) and are replicated in this plan.

Each topic includes a Māori-themed question. Additionally, there is a Māori environmental statistics topic. The scope of this topic was purposely broader than the other nine topics to include the cultural aspects of the environment from a Māori perspective.

Official data stocktake

[Stocktake for the environment domain plan 2012](#) provides an overview of the environmental statistics and data currently available in 10 environmental topic areas. It is a collection of metadata for the datasets that inform the enduring questions.

Keeping to the domain plan's scope, the stocktake is limited to official statistics produced within New Zealand's Official Statistics System, statistics produced by Crown research institutes (CRIs), and the data used to compile these statistics.

The stocktake was compiled with the cooperation of many data custodians, including government agencies and CRIs.

The focus of the environment domain plan is on national statistics, so regional statistics are out of scope. For example, a database of water quality records from across New Zealand is included, but a database of water quality records for just the Central Otago region is not. In practice, national statistics may be consolidated from regional data and the process of compilation should consider standardisation of methods and practices across regions.

Research reports, previously compiled stocktakes, lists of databases or metadata in any storage formats, and planned or incomplete work, are out of scope for this stocktake.

The stocktake also primarily focuses on data that is actively maintained, to promote ongoing time series of environmental statistics.

Gap analysis

To assess the strengths, gaps, overlaps, and deficiencies of the data in the stocktake experts analysed each of the datasets. This was to reveal the differences between what we know against what we want to know.

The gap analysis process asked subject experts to assess, for each of the supplementary enduring questions and for each of the datasets, 'How well does this dataset inform us about that question?' Given all the datasets, an additional question was also asked, 'How well informed is this question?' See appendix 3 for details on this process.

10 topic workshops

Workshops with subject matter experts were held for each of the 10 topics. These workshops aimed to identify and prioritise the initiatives that will address the issues identified by the gap analysis. Over 150 initiatives were generated by this process. See appendix 4 for details on the workshop process.

The initiatives in this report are presented in the form they were developed in the workshops. There may be value in combining a number of them together and then adjusting the work under the new combined initiative.

The next steps would be to determine which agencies might lead each of the high-priority initiatives, and to work together to develop a plan of action, including time scales and costs. Possible lead agencies have already been identified for some of the initiatives. This does not imply agreement or consent by these agencies to do this work.

The initiatives are about gathering data. For those initiatives asking for governance, it is about how we would work together to gather the required data.

Before further work is undertaken on the initiatives, an assessment is needed to determine the costs to implement them and how long they would take to complete. This is part of the scoping process that will follow from here.