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Manatū Mō Te Taiao

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A Framework for Environmental Reporting in New Zealand

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Contents

About this document

This document explains the proposed new approach for environmental reporting in New Zealand.

In August 2013, Cabinet agreed to introduce legislation to overhaul the way environmental reporting is undertaken in New Zealand to improve credibility, certainty and independence. The Environmental Reporting Bill was tabled in February 2014, and proposes greater clarity over the roles and responsibilities for environmental reporting, outlines the scope for environmental reporting, and defines reporting products and their timing. The next sections outline these proposed changes.

For further information on the Bill and its progress, please see: http://www.mfe.govt.nz/environmental-reporting/about-environmental-reporting/reporting-programme/environmental-reporting-bill-and-framework.html

Note: A number of terms used in this document have multiple meanings. The most common definitions are used wherever possible. A glossary of key terms is provided in Appendix 1.

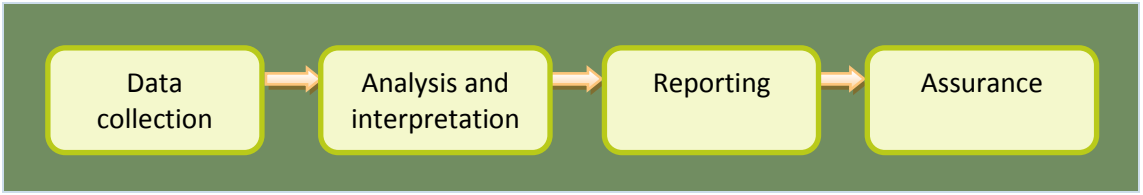
Purpose of environmental reporting

What is environmental reporting?

Environmental reporting involves the collection, analysis and publication of information about the environment. The purpose of this information is to provide a snapshot of the current *state* of the environment and to allow *trends* to be identified through time and across space. The environment includes our climate and atmosphere, air, land, fresh water and marine resources, incorporating their physical, chemical and biological elements. Environmental reporting also recognises the interaction of the environment with society: it provides an understanding of how human actions affect changes in the biophysical environment; and in turn, how changes in the biophysical environment affect society.

Environmental reporting is one part of a broader environmental information system (figure 1). Producing high quality reports is dependent upon the quality of the underpinning monitoring data and its analysis and interpretation. An assurance function supports trust and integrity through verification of the other three components of the system.

Figure 1: End-to-end environmental information system



Why do we do environmental reporting?

The purpose of national-scale environmental reporting is to inform the public and decision-makers of the current state and long-term trends in the environment. Reporting helps us identify and understand national-scale environmental problems and opportunities, along with their causes and significance.

In New Zealand, reporting is also carried out at the regional-scale, allowing a detailed understanding for regional and local management issues. National-scale reporting is intended to complement, not duplicate, regional-scale reporting.

A wide range of audiences are interested in national-scale environmental reporting, including the following:

General public – Environmental reporting raises public awareness of environmental issues and problems and promotes more informed public debate about the trade-offs between environmental, economic, cultural, and social dimensions.

Central and local government decision-makers and policy advisers – For those responsible for operational and strategic planning decisions about the environment, broad national-scale reporting can help identify and prioritise significant problems and opportunities which might require policy intervention. A broad approach to environmental reporting can help us understand the dependencies and impacts between the environment and society.

Industry – Environmental information may inform decisions at an individual business or industry level. At a broader scale, information on the quality of New Zealand's environment can enhance the credibility of international branding.

Researchers – The data underpinning reporting can inform research initiatives. Reporting can help prioritise research effort.

International bodies – New Zealand reports to a number of international organisations (eg, the Organisation for Economic Co-operation and Development, United Nations, and Intergovernmental Panel on Climate Change). Participation in these initiatives contributes to the transparency and accountability of reporting, and allows us to make international comparisons on environmental performance.

Design principles for environmental reporting

A set of design principles have been developed to ensure environmental reporting is:

- fit-for-purpose
- meets the needs of audiences
- ensures high quality data, analysis and interpretation.

These principles are outlined in table 1.

Table 1: Design principles for environmental reporting

Principle	Description
Credibility	Reporting needs to be based on monitoring data and analysis which is robust and can be trusted.
Ease of communication	To be accessible to a wide range of end-users, reports need to be understood by a non-technical audience. Information should be clear and not open to mis-interpretation.
Certainty of publication timing	Reporting needs to be produced on a regular basis to provide certainty to users about information availability.
Trustworthiness	Reporting needs to be independent from the government of the day to avoid any perception of political interference in report content or messaging. The scope of reporting should be shielded from changing political preferences.
Durability	The reporting framework should be consistent through time to identify long-term trends. The environmental reporting framework should be sufficiently broad to encompass measures that can help identify emerging issues, or areas of improvement.
International comparability	The reporting framework should facilitate international comparisons and integrate with our agreements to provide environmental information to international agencies.
Practicality	The development of the reporting framework and underlying indicators should take into account information that is currently available. The identification of data sets not currently held, but which would enrich reporting, can help prioritise resources for future collection.
Relevance	The scope of reporting should encompass not only the state and trends in the environment, but the relationship with society's use of, and impact upon, natural resources. Therefore, reporting should integrate environmental information with social and economic information. This allows the public and decision-makers to consider the trade-offs inherent in policy making, and incorporate these considerations into broader policy decisions.
Efficiency	A range of government agencies report on aspects of environment-society relationships. Information sharing should be facilitated to maximise data value and ensure clarity and consistency of messaging.

Proposed changes to environmental reporting in New Zealand

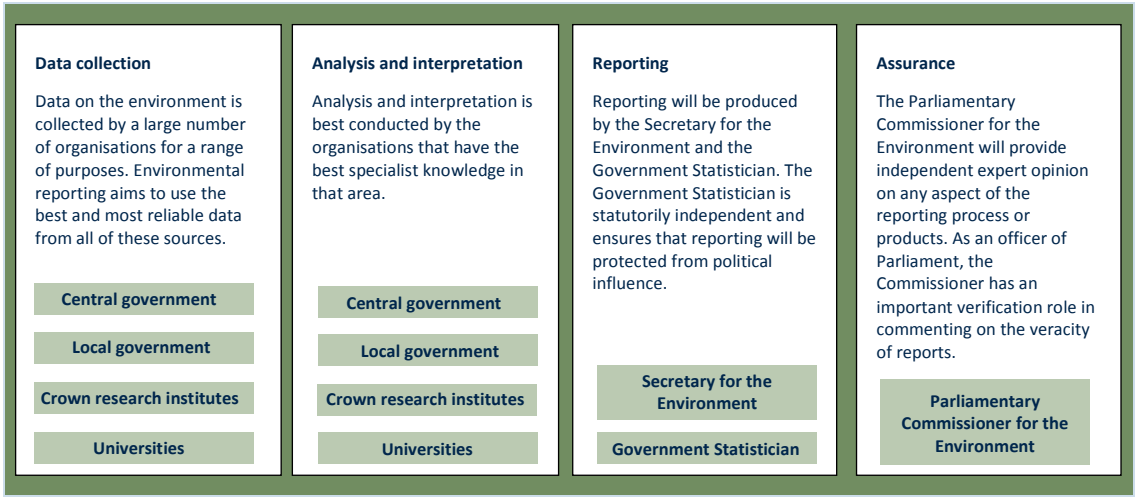
In New Zealand, the Government has periodically published national-scale information about the environment. In 1997, the Ministry for the Environment released the first New Zealand state of the environment report. A second report was released 10 years later, in 2007. Following the 2007 report, the Ministry has regularly released indicator updates on 22 key indicators on individual topic areas.

The Environmental Reporting Bill seeks to provide consistency and certainty to environmental reporting, by legislating roles and responsibilities for reporting along with setting the scope and timing of reports. These changes are outlined in more detail below.

Roles and responsibilities for environmental reporting

Reporting is just one component of the wider environmental information system in New Zealand. A number of agencies are involved throughout the system (figure 2).

Figure 2: Roles and responsibilities in the environmental information system



Data collection

Environmental information is collected by a large number of organisations, including central government, local government, Crown research institutes and universities.

Environmental reporting has drawn, and will continue to draw, upon the best and most reliable data available from these sources.

Analysis and interpretation

As reporting encompasses a wide scope, relevant expertise is held across a range of central and local government agencies, Crown research agencies and universities, and these agencies will be drawn on to support report production. Relevant information is collected by agencies,

including the Ministry for the Environment, Department of Conservation (DOC), Ministry for Primary Industries (MPI), Ministry of Health, and others. As well as drawing upon these information sources, the Ministry for the Environment and Statistics New Zealand will rely on expertise held by these agencies to help analyse and interpret information.

These agencies will continue to report on specific aspects of the environment for their purposes. For example, DOC will continue to report on biodiversity across the DOC estate and MPI will continue to report on biosecurity. There will be instances where data other agencies collect for their reporting purposes can also be used for environmental reporting.

Reporting

Reports will be jointly prepared by the Secretary for the Environment and the Government Statistician. To provide assurance of independence from the government of the day, reports will be developed and released in line with the Principles and Protocols in place for Tier 1 statistics.

A co-production approach by the Ministry and Statistics NZ will build upon the relative strengths of each agency. Co-production by Ministries and the Government Statistician is already used in New Zealand for the production of economic development reporting. This model is also used in other countries for environmental reporting.

Assurance

The Parliamentary Commissioner for the Environment (PCE) will have an important function in providing independent expert commentary and assurance. The Environmental Reporting Bill affirms the PCE's existing mandate by reinforcing the role the PCE will play in providing independent commentary, at his/her discretion, on matters relating to, but not limited to:

- the analysis of environmental data and reports
- identification of trends
- discussion of implications and responses.

Reporting products

The types of reporting products published will change under the Environmental Reporting Bill. There will be a shift from the consolidated reports and indicator report cards, to regular domain reports. The Ministry and Statistics NZ will adhere to a cycle of reporting on one of five environmental domains every six months, followed by a synthesis report every three years.

Domain reports

Reports will be released on each of the following five domains:

- air
- atmosphere and climate
- land
- fresh water
- marine.

Ecosystems and bioversity are cross-cutting aspects that will be considered as a component in relevant domain reports, and will be comprehensively covered in each synthesis report (see below).

The scope of each report will focus on a set of topics. Each report will present the best available statistics on each topic, in the form of indicators. Where sufficient data is not available to report on a given indicator, case studies will be used to present available information. Where neither robust, representative data nor meaningful case studies are available at the time the report is published, the topic will not be reported, but will remain part of the environmental reporting framework for future reports. A key focus of these reports will be on analysis and interpretation, providing the reader with an understanding of the state and trends of the domain, insights into why the domain is in that state, and the consequences of the changes in state on the benefits and uses of the environment.

The release of reports by domain has a number of advantages. First, it brings a focus on each domain individually, allowing more space for public debate on each area. Second, by releasing information by domain, a coherent picture can be built about the state, impacts and pressures across each domain, compared to the periodic release of information on individual indicators. Last, staggering domain reports is more efficient for the agencies involved, spreading workloads more evenly between years.

Synthesis reports

Dividing the reports between domains has one disadvantage; there may be topics that are relevant across multiple domains, and considering each domain in isolation will not present the full picture of cross-domain issues. One example is biodiversity and ecosystems. The synthesis report will bring together a coherent picture of the pressures, state and impacts of biodiveristy and ecosystems as a coherent whole. The synthesis report will also include analysis of cumulative and lag effects, environmental processes that occur across domains and discussion of cross-domain pressures and impacts to give a clearer picture of the environment as a whole.

Underlying data

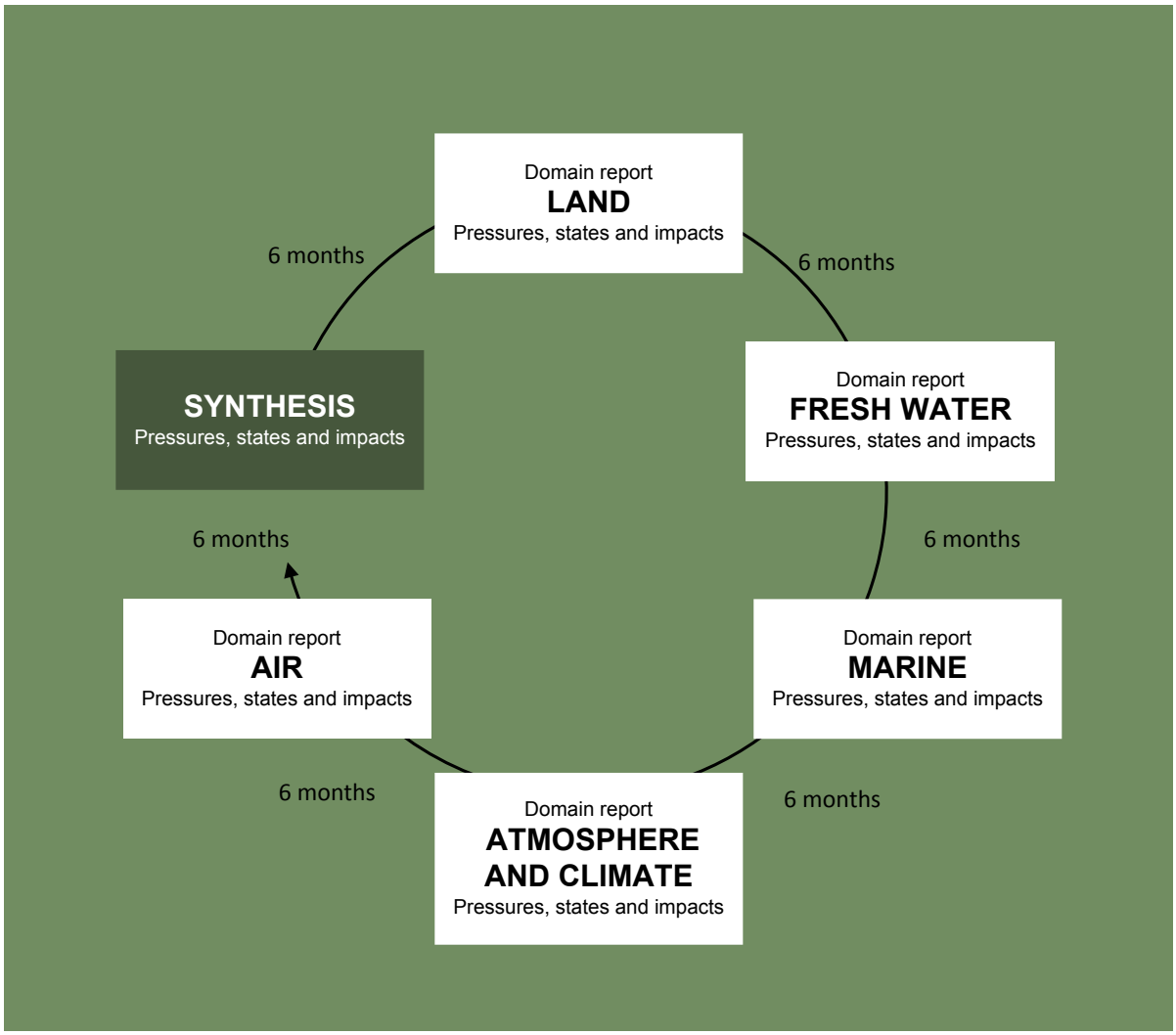
In line with the Government's Open Data Strategy (GOAL), the Ministry and Statistics NZ are working with data producers to ensure that where possible, environmental monitoring data – which underpins environmental reporting – is made available to the public promptly and in an easy-to-access format. This will allow researchers and the public to use the data that has been collected, and to use the most up-to-date data sets.

Timing of reporting

Until now, environmental reporting has not followed a particular release schedule. The first two state of the environment reports were produced 10 years apart, and there was significant change in many areas between the 1997 and 2007 reports. More recent Ministry for the Environment indicator updates have been produced on a timeframe appropriate to the relevant indicator (varying between annually and five-yearly).

In the new approach, reports will be released on a three-year reporting cycle. Figure 3 shows the pattern of report releases with a report on an individual domain (one of the five domains) every six months, and a synthesis report summarising trends across all environmental domains released once every three years. The order for domain reports shown in figure 3 is indicative only.

Figure 3: Timing of the production of domain and synthesis reports



A framework for reporting: pressures, states and impacts

A framework is a way of organising information. It sets the scope and the bounds for what is reported on. For environmental reporting, a framework was chosen and developed to enable a full and comprehensive story to be told about New Zealand's environment and natural resources. If a sound organising framework is used, the most relevant indicators can be selected to provide a coherent picture about our environment, and our interactions with it.

Previous reporting frameworks

The 1997 consolidated report included a large number of indicators which covered a range of pressure, state, impact and response measures. The 2007 report focussed on 21 key indicators, for which the highest quality data was available. These indicators largely covered measures of state, with a few pressure, impact and response measures included. While this reduced the range of data sources required, these indicators did not provide a coherent overview of changes in state and what was driving those changes, or why those changes were important. It was recognised in this report that indicators would be expanded over time.

To develop an enduring framework that captures the complexity of the state and trends of the environment, along with our interactions with it, a number of environmental reporting frameworks used internationally were considered (see Appendix 2 for a full description of those frameworks).

Pressures, states and impacts

The new framework for environmental reporting will include three main types of information: pressures, states and impacts.

Pressures – explain both human activities and natural factors that influence the environment (positively or negatively). These topics answer the "why?" questions about the environment – why are the domains in the state that they are in?

States – describe the biophysical condition of the environment. These topics answer the "what?" questions about the environment – what are the physical, chemical and biological characteristics of that domain, and how are they changing over time?

Impacts – explain what the state and changes in the state mean by informing the "so what?" questions about the environment; what are the consequences of changes in the state for the New Zealand economy and society? Impacts are purely *descriptive* – topics reflect the main uses and benefits New Zealanders currently obtain (but in no way make evaluative judgements about how New Zealanders *should* use the environment). The Environmental Reporting Bill confines reporting on impacts to ecological integrity; public health; economic benefits derived from utilising natural resources; and culture and recreation.

The information produced for each domain aims to provide a clear picture of trends in the state of each domain, what is driving these changes in state, and why such trends are important to society, using a manageable number of indicators to measure over time.

The use of the Pressure-State-Impact framework in other jurisdictions has commonly incorporated 'responses' in addition to, or in place of impacts (see Appendix 2 for further discussion). The framework being used by New Zealand has intentionally excluded any information on *responses*. Relevant responses to issues raised in domain and synthesis reports constitute policy advice, and are likely to be included in documents such as the Ministry's *Briefing to Incoming Ministers* following an election. Response measures also typically include evaluation of the effectiveness of policy interventions. Relevant agency internal programmes evaluate the implementation and effectiveness of policy responses for which they are responsible. Environmental reporting will not include evaluation or assessment of policy responses. This will help maintain environmental reporting at arm's length from the government of the day.

Rationale for selecting this framework

In developing a framework for environmental reporting in New Zealand, the Ministry for the Environment and Statistics NZ considered a range of local and international models (summarised in Appendix 2 and 3). The Pressure-State-Impact framework best satisfies the purpose and design criteria for environmental reporting in New Zealand.

A key factor in choosing this framework was the need to go beyond the biophysical state of the environment to include the dependencies and impacts related to social, economic and cultural use and management of our natural resources. In addition to the state of our natural resources, this framework offers the scope to:

- provide information on the relationship between resource use and environmental thresholds and sustainability, linking pressures with changes in condition
- include measures of the economic productivity of resource use as well as information on the decoupling of resource use from economic growth (such as energy intensity)
- include measures of social and cultural use of our natural resources (eg, public health or recreation).

To show long-term national trends, the framework will need to be sufficiently enduring to facilitate the collection of consistent time series data. While some indicators themselves may change over time, an attempt will be made to ensure key sets of time series data are maintained.

The most stable aspects of the framework are the domains. The domains are sufficiently broad to accommodate those aspects of the environment that are important internationally and domestically. Collecting information on condition and change in condition in those domains is something that will be of enduring interest and will persist as a significant aspect of decision-making.

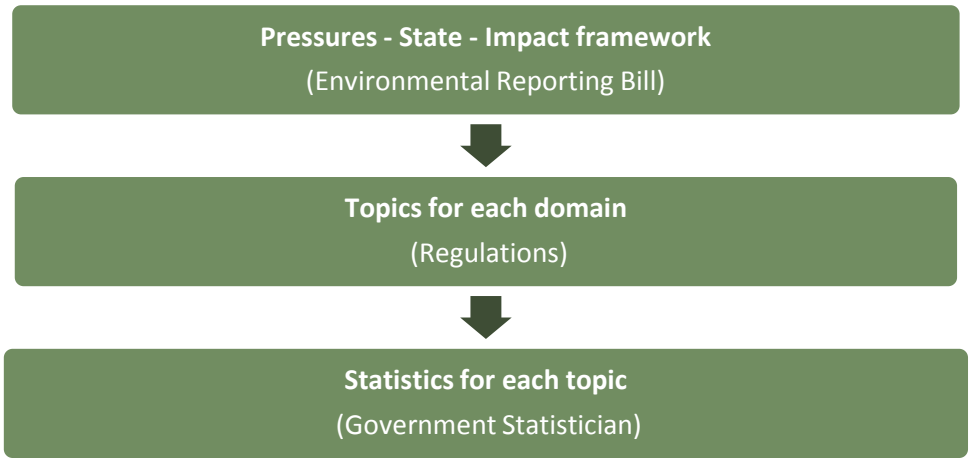
The pressures and impacts identified may change over time or new information may indicate changes to significant pressures and impacts. The framework at a broad scale is conceptually enduring; however, the precise list of topics may change. This is not an issue with the framework, but recognition of the dynamic nature of the environment and of future improvements to our understanding.

Both pressures and impacts can represent opportunities as well as challenges to maintaining or improving the state of a given domain. A relevant framework needs to be able to identify opportunities and successes as well as problems, so the organising framework should help identify new and emerging positive trends.

Populating the framework

Within the Pressure-State-Impact framework, high-level questions have been identified that environmental reporting should seek to answer. A list of topics will be developed which seek to answer each question. Statistics (in the form of indicators) will be developed to provide a measure for each topic (figure 4). The broad framework will be set out in primary legislation, with the finer details of the framework being set out in regulations or approved by the Government Statistician.

Figure 4: Relationship between the reporting framework, topics and statistics

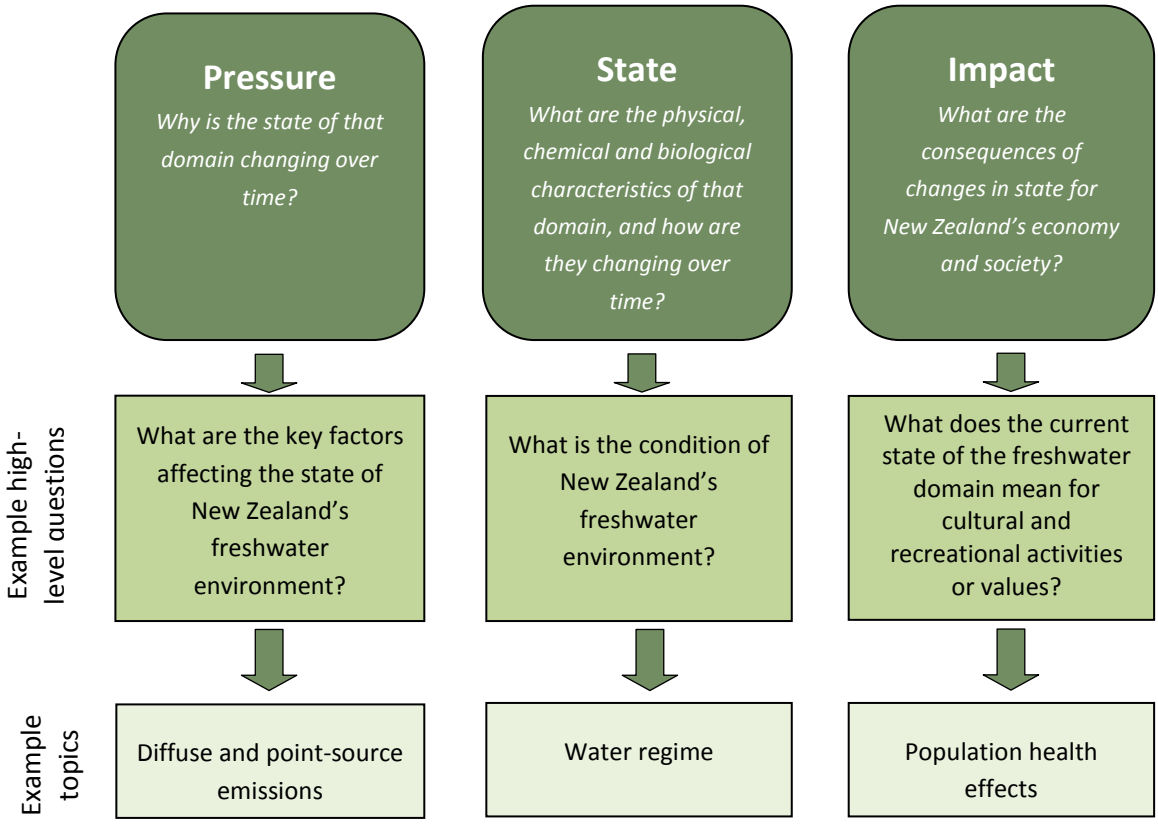


The Pressure-State-Impact framework is set out in the Environmental Reporting Bill. The Bill contains criteria for selecting topics, with the topic list being included in regulations under the Act. The Minister for the Environment and the Minister of Statistics will determine which topics are reported on. Responsibility for statistic selection and development has been delegated to the Government Statistician.

Topics for environmental reporting

Topics will guide what specific areas environmental reporting will cover. Topic selection will be guided by a list of high-level questions that we seek to answer for each domain, as well as criteria for topic selection. These are outlined within the Environmental Reporting Bill, and explained below. Figure 5 provides an example of topics from the fresh water domain.

Figure 5: Example topics for environmental reporting from the freshwater domain



The list of topics will be included within regulations supporting the Environmental Reporting Bill. The Ministry for the Environment will consult on the proposed list of topics in the development of the regulations.

Criteria for topics

The criteria for topics is set out within the Environmental Reporting Bill. These criteria ensure reporting is limited to those topics that are quantifiable, nationally significant and relevant to that domain. These criteria are expanded upon below.

Significance

Environmental reporting does not aim to catalogue all measures of state, pressures and impacts for each domain; rather, just those that are most significant to each domain on a national scale. A topic may be deemed to be significant due to its magnitude (measured or perceived), spatial extent, rate of change, impact upon society, or significance to Māori. Any topic which is included must meet at least one of these descriptors.

Statistical rigour

The topics to be reported should be able to be quantified using a statistically robust measure. Topics for which a suitable measure is unlikely to be developed will not be included in reporting. To meet the statistical rigour criteria, it needs to be demonstrated that a statistically robust indicator could be developed for that topic.

More specific criteria for statistical rigour will be applied in selecting the indicators and case studies for each topic and assessing the adequacy of available data. This process will align with the Principles and Protocols Statistics New Zealand has developed for Tier 1 statistics, and all statistics and processes will be approved by the Government Statistician.

There will be instances where conceptually, a topic could have a indicator, but there is not currently the data or modelling tools available to measure the topic (for example, there may be an indicator used internationally, but in New Zealand, there is not sufficient or appropriate data coverage to report). These will be prioritised for development, and incorporated into reports once methodologies and data are sufficiently consistent, representative and robust.

Relationship between topics

Any pressures and impacts reported on must have a demonstratable relationship to the change in state of that domain. This ensures consistency and coherency across the framework.

Environmental reporting will not be used to statistically determine or prove relationships between pressures, impacts and state, but will instead rely on external research to establish those relationships.

Indicators for environmental reporting

The environmental reporting framework will be populated by a set of statistics, in the form of indicators. These indicators will provide measures of each of the topics. Where data is not available to provide national coverage of an indicator, but some local data is available, case studies will be used.

A key feature of the new approach to environmental reporting is independence from the government of the day. To ensure the process and detail of what is reported on is arm's length from Ministers, the Government Statistician will be responsible for developing the specific indicators and, with the Secretary for the Environment, for reporting against them.

The development of indicators will be guided by the Statistics NZ's Principles and Protocols for Tier 1 Statistics. The criteria set out in these Principles and Protocols ensures that the data used is robust and current, indicators provide a relevant measure of the topic, and that indicators are easily understood.

What will success look like?

To gain a picture of how the Ministry for the Environment and Statistics NZ will know if reporting is meeting the design principles set out earlier, targets to inform feedback on the performance of reporting have been developed. These targets are summarised in table 2.

Table 2: Targets to achieve design principles for environmental reporting

Design principle	Targets
Credibility	• Indicators are based on robust data and are tested through independent peer review.
Ease of communication	• Formal/informal feedback from end users show reporting is easily understood, and increases understanding of environmental issues.
Certainty of publication timing	• Timeline for publication is clear and accessible to the public. • Reports are delivered on time.
Trustworthiness	• Statistics NZ's Tier 1 protocols are applied to maintain integrity of reporting. • Reporting informs the policy priorities for the government of the day.
Durability	• Over a 10-year period, there is minimal change to the framework structure.
International comparability	• Data can be easily extracted from the framework to inform international reporting obligations. • Indicators have been benchmarked internationally, where appropriate.
Practicality	• Existing available information has populated the framework. • Priority data sets have been identified to improve the scope of reporting over time.
Relevance	• Reporting supports informed debate and discussion in the public arena of the relevance and prioritisation of environmental issues. • Reporting identifies where improvements in the state of the environment are occurring.
Efficiency	• Relevant government agencies are working together to share underlying data and contributing to data analysis. • Transaction costs to regional councils and other data collectors are minimised.

Appendix 1: Glossary

Wherever possible, terminology has been adopted as it is commonly used, internationally or domestically.

Domain – for environmental reporting, the environment has been divided into five domains: atmosphere and climate, air, land, fresh water and marine. These domains were chosen to break the total information into more manageable sizes and were split where logical divisions could be selected. Nonetheless, there are significant overlaps and interdependencies between the domains (eg, the relationship between land and groundwater, which is part of the fresh water domain), and these boundary issues will be discussed in the synthesis report. Ecosystems and biodiversity will be reported based on the physical space in which they occur (land, fresh water or marine) and comprehensively in the synthesis reports.

> *Air* – includes the composition of gases, vapours and particulates that surrounds the earth. Excludes stratospheric ozone and the effects of greenhouse gases on the earth's climate.
>
> *Atmosphere and climate* – this domain extends from the surface of the earth to the outer layer of the stratosphere, and includes gases, particulates and meteorological conditions. Climate is the pattern of variation in temperature, humidity, atmospheric pressure, wind, precipitation, and other meteorological variables in a given region over long periods. This domain will also include discussion of greenhouse gases and stratospheric ozone, but not localised air quality.
>
> *Fresh water* – includes water in all its physical forms. This includes but is not limited to fresh water or geothermal water in a river, lake, stream, pond, wetland, or aquifer. It does not include atmospheric water or water in the marine domain.
>
> *Land* – includes two tiers: the first is land use and land cover, which are considered important aspects of the state or condition of land at a macro scale; and the second is soil, minerals and associated elements.
>
> *Marine* – includes New Zealand's Territorial Sea (from the shore out to 12 nm), the Exclusive Economic Zone (from 12 nm from the shore to 200 nm from the shore) and the extent of the continental shelf. It includes estuaries, the seabed, subsoil and the air space above the sea. It also includes the cultural and historic heritage within the marine domain (*based on the New Zealand National Coastal Policy Statement*).

Environmental data – large amounts of unprocessed observations and measurements about the environment and related processes. They can be collected or compiled by statistical surveys (censuses or sample surveys) by national statistics offices or other parts of the national statistical system, or they may originate from administrative records, registers, inventories, monitoring networks, remote sensing, scientific research, and field studies (*based on Framework on the Development of Environmental Statistics 2013).*

Environmental statistics – describe, aggregate, synthesise and structure environmental and other data according to statistical methods, standards and procedures. It is the role of environment statistics to process environmental data into meaningful statistics that describe the state and trends of the environment and the main processes affecting them (*based on Framework on the Development of Environmental Statistics 2013).*

Framework – a way of organising data, statistics or information for the purposes of making explicit links and facilitating analysis (*based on Framework on the Development of Environmental Statistics 2013).*

Impact – in this framework, an impact describes a change in the uses or benefits to society caused by a change in environmental state.

Indicator – an indicator is used to synthesise and present complex statistics and is used to summarise, simplify and communicate information. Environmental indicators can be used for a variety of purposes including assessing present and future direction of goals and values, demonstrating progress, measuring changes in a specific condition or situation over time, determining impact of programmes, and conveying messages (*based on Framework on the Development of Environmental Statistics 2013).*

Pressure – in this framework, pressure is used to indicate the influence that arises from an activity or interaction that has the potential to cause a change in state of any one of the domains. Pressure can exist without causing an immediately observable impact, or it can cause either a positive or negative change. Pressure can originate from human activities or natural processes.

Response – in the OECD pressure-state-response model, responses are individual and collective actions and reactions intended to mitigate, adapt to or prevent negative impacts; halt or reverse negative impacts; or apply positive pressure to create a positive impact (*based on OECD Measuring Material Flows and Resource Productivity 2008).*

State – in this framework, the physical, chemical and biological components of a domain together describe the current condition of that domain. The condition of the domain is changed when any one of these three components is significantly changed through the exertion of either natural or human pressures. For example, the condition of fresh water can be changed by altering the patterns of flow (physical component). The flow patterns can be changed by a decrease in precipitation (natural pressure) or by increased abstraction (human activity).

Tier 1 Statistic – key official statistics produced by a number of government agencies, and essential to understand how well New Zealand is performing across all sectors. There are currently three Tier 1 Statistics relating to the environment, with a further nine under development.

Appendix 2: Alignment with other frameworks

An important design principle influencing our thinking was the ability for the information we produce in New Zealand to be internationally comparable where possible. We were also mindful of the need to keep the domestic reporting landscape as simple and coherent as possible. This appendix outlines the dominant international models in the environmental reporting field, as well as key New Zealand initiatives.

International reporting

The myriad of international frameworks for organising environmental information include the following well-supported models:

- the Pressure, State, Response (PSR) model used by the OECD
- the Driving Force, Pressure, State, Impact, Response (DPSIR) model used by the European Environment Agency
- the Ecosystem Services framework used by the Millennium Ecosystem Assessment and National Ecosystem Assessment carried out by the UK.

After consideration against the purpose and design principles for environmental resporting in New Zealand, a modified 'Pressure-State-Impact' framework was thought to suit New Zealand's needs best.

Reflections on the 'Pressure-State-Response' and 'Driver-Pressure-State-Impact-Response' models

The Pressure-State-Impact framework we have proposed does not include 'response' in terms of recommended responses or evaluation of responses already undertaken. Other programmes evaluate the implementation and effectiveness of policy responses, and environmental reporting will not duplicate this. We recognise that responses can also operate as pressures. However, we concluded it may be difficult to report on policy evaluation in a way that is perceived as politically neutral. Discussion of policy responses to the environment can be taken up by other commentators and by the Ministry in a more appropriate context (for example, in a *Briefing to the Incoming Minister)*.

The framework does not include 'drivers' as described by the European Environment Agency's DPSIR model. Drivers are social, demographic and economic developments (eg, population growth and changes in people's needs and activities) which change lifestyles and overall levels of production and consumption, which in turn exert pressures on the environment. Driving forces are likely to be discussed in narrative form in an environmental report, but are not likely to be included in any comprehensive way in the suite of indicators that populate the framework. Tracing attribution from a change in natural resource condition back through pressure to driving force (and in particular attributing a percentage change in condition to any particular driver) is a level of complexity that could be accommodated in future iterations, but is not considered vital to the framework.

'Impacts' as defined in the DPSIR model are the effects that environmental changes have on environmental or human health. In the New Zealand environmental reporting framework,

'impact' is broadened to also include impacts on social, economic and cultural use of natural resources.

Reflections on the ecosystem services framework

Ecosystem services is a useful concept for thinking about and identifying the links between the environment, the economy and society. It is also a useful framework for describing the reasons we care about environmental condition, helping us balance our extractive or production activities against all the other benefits (monetised or not) that we rely on natural resources to provide. The ecosystem services approach focuses on the relationship between state and impact. Although the framework is useful for some considerations and descriptions, and may in time be used by the Department of Conservation for a national assessment of ecosystem services, it does not include all the framework design principles we require. In particular, the assessment of ecosystem services on a national level is a data intensive exercise, particularly if the purpose of the assessment is to enable decision-making. The reporting framework must be implementable now with existing data and with a plan for continuous refinement and improvement.

In the environmental reporting framework, we have included the links and interactions of the environment with economy and society by including both pressures and impacts. These concepts are at the heart of ecosystem services valuation, and all four of the categories of ecosystem services, (provisioning, regulating, supporting and cultural) are accommodated in that aspect of the framework (although not explicitly stated as such).

Future-proofing the framework

We expect that future international efforts can be accommodated in the framework, creating opportunities to align information needs for international reporting obligations with those needs of the reporting framework. The development of Green Growth indicators by the Organisation of Economic Co-operation and Development (OECD) are likely to be compatible with those used in the environmental reporting framework. Other work being contemplated by the OECD in identifying the costs and consequences of inaction can also be accommodated as an impact on society or the economy resulting from environmental degradation.

Domestic frameworks

Several frameworks for organising information and supporting decision-making have been developed in New Zealand over the past few years. Some of these are specific to elements of the environment while others seek more holistic, strategic links between the environment and the economy. The major initiatives are summarised below.

Although government agencies will analyse different questions or use a different lens for viewing information, it is critical that the range of frameworks in use across government deliver consistent narratives for policy making. This requires reliance on the same information base wherever possible. Natural Resources Sector[1] agencies will continue to work together to ensure alignment of narratives and consistency of underlying statistics.

[1] The Natural Resources Sector consists of the Ministry for the Environment, Department of Conservation, Ministry of Primary Industries, Ministry of Business, Innovation and Employment, Land Information New Zealand, Te Puni Kōkiri and Department of Internal Affairs.

Living Standards Framework

The Treasury has developed and launched its Living Standards Framework, which provides analysts and decision-makers within Treasury with a tool for considering dimensions of human activity and value that lie outside of the economy. Treasury's framework includes consideration of issues such as social capital (indicated by institutions and trust) and increasing human equity (indicated by skills and health), whereas the environmental reporting framework focuses on society only as it relates to interactions with the environment, so although human health is a consideration, skills and education are not.

The Treasury has identified sustainability as one of its concerns and has included at the centre of the Living Standards Framework natural, human, social and financial/physical capital. As part of sustainability, the framework includes aspects of water, climate and biodiversity as areas of analysis. The information base used for the analysis ought to be the same as that used by the Ministry for the Environment and Statistics NZ in its analysis of state, impact, and pressures, and we will seek to align the indicators for these elements wherever possible. Likewise, we will explore the use of the same or similar statistics for elements of economic growth, increasing equity, and reducing macro-economic vulnerability wherever these are useful to the environmental reporting framework.

Measuring New Zealand's progress using a sustainable development approach

Statistics NZ is planning to review and refresh the report *Measuring New Zealand's Progress Using a Sustainable Development Approach*, last published in 2008. The publication follows the framework and suggested statistics prepared by the joint UN Economic Commission for Europe/Eurostat/OECD Task Force on measuring sustainable development, approved in May 2013. Many of the indicators, particularly those associated with natural capital and with land and ecosystems, will also be used in the environmental reporting framework. The environmental reporting framework will not, however, include statistics on nutrition, labour, physical safety, or any other topic not directly related to the use, management or enjoyment of natural resources.

Tier 1 Statistics

Tier 1 Statistics are the priority official statistics for New Zealand and represent statistics on the most important issues for the country. Designation as a Tier 1 Statistic means that the statistic produced is of the highest quality and can be relied on as authoritative, relevant and trustworthy. New statistics were introduced to the Tier 1 list in 2012 including 10 new environmental statistics under the topics of atmosphere, climate change, fresh water, and marine. Wherever possible, the environmental reporting framework will align statistics with Tier 1 Statistics and in many cases the statistics will be published through a domain report or synthesis report.

Environmental Domain Plan

The *Environment Domain Plan*, developed by Statistics NZ, Ministry for the Environment and Department of Conservation, lists enduring questions about the environment and natural resources, and identifies strengths, weaknesses and gaps in the information currently available. This document helps identify existing information and prioritise new investments to populate the environmental reporting framework.

System of Economic-Environment Accounts (SEEA)

Statistics NZ is implementing the international System of Economic-Environment Accounts (SEEA), which is a multi-purpose, conceptual framework that describes the interactions between the economy and the environment. It includes stocks and flows of environmental and economic assets, but does not draw on or report social or cultural aspects. Statistics NZ is redeveloping its SEEA accounting programme to align publications with the new domain reporting schedule and reflect the priorities identified by the Environment Domain Plan.

Natural Resources Framework (Natural Resources Sector)

The Ministry for the Environment and the central government Natural Resources Sector have developed an analytical framework to help understand the intersection between ecological and social systems. Environnmental reporting will help provide an evidence base for any analysis undertaken using this framework apporach. Further information is available at http://nrs.mfe.govt.nz/content/natural-resources-framework.

Appendix 3: Key reports reviewed in developing the environmental reporting framework

Fundamentals of sustainability and consideration of sustainable development:

- The *Report by the Commission on the measurement of economic performance and social progress* (Stiglitz et al., 2009) which sets out recommended principles for consideration when attempting to identify links between the environment, the economy and society for better decision-making.
- The *Economics of Ecosystems and Biodiversity (TEEB) synthesis report* (Sukhdeve et al., 2010) which synthesises the approach, conclusions and recommendations of the TEEB studies.

Construction and purpose of relevant frameworks:

- The Yale publications on the Environmental Performance Index.
- The UN publications on the Framework for Development of Environmental Statistics.
- The UK National Ecosystem Assessment conceptual framework and supporting documents.
- NZ Treasury working papers on the development of the Living Standards Framework.
- Statistics NZ Framework for Measuring Sustainable Development and the *Framework and Suggested Indicators to Measure Sustainable Development 2013*.

Development of statistics:

- Background papers on the meaning and aims of Green Growth and OECD publications on the development of the Green Growth headline indicators.
- Statistics New Zealand *Good practice guidelines for the development and reporting of indicators.*
- The UN Publication *Environment statistics and sustainable development at Rio+20: promoting environment statistics as the foundation for improved monitoring of sustainable development.*
- International work on the *System of Environmental-Economic Accounting: Central Framework.*