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A Review of Current Regional-Level Environmental Monitoring Reporting and Enforcement in Aotearoa New Zealand

Abstract

Environmental monitoring helps us take stock of our natural environment. Clear, coordinated and consistent regional-level monitoring and reporting are required to assess the state of our environment and protect important sociocultural and economic assets. This article reviews and summarises the key issues affecting regional-level environmental monitoring, reporting and enforcement in Aotearoa New Zealand. These include weak legislation, lack of independent monitoring, patchy data coverage, misuse and distortion of data, insecure funding and inappropriate political interference. Solutions include legislative reform, consolidation of funding and centralisation of some roles, and establishing a centralised research council.

Keywords enforcement, environment, monitoring, regional, reporting

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Our natural environment provides us with important goods and services, such as freshwater and food. It is also the place where we stand – our *tūrangawaewae*. The loss of our natural capital poses a threat not only to Aotearoa New Zealand's economic stability, but also to important sociocultural assets (Petrie, 2018; van Zyl and Au, 2018). Moreover, environmental degradation can lead to negative health outcomes, such as an increased cancer risk and respiratory illness (Gwangndi, Muhammad and Tagi, 2016; Richards, 2020). Environmental monitoring and reporting are ways to take stock of important sociocultural and economic assets. Clear, coordinated, consistent monitoring and reporting enables the public, local and central government, and scientists to track environmental progress (improvement or decline). It also facilitates peer learning and dialogue, and increases accountability among the regions and to the public.

This article builds upon previous national-level reports (e.g., Parliamentary Commissioner for the Environment, 2019; Brown, 2017; Ministry for the Environment, 2011; 2015; 2019; 2022) by focusing on

environmental monitoring, reporting and enforcement at the regional rather than the national level. In this review I provide an overview of regional-level monitoring, reporting and enforcement in Aotearoa New Zealand, and identify key issues. Specifically, the article outlines the legal requirements for regional-level environmental monitoring and reporting in Aotearoa New Zealand; reviews current regional-level environmental reporting in Aotearoa New Zealand; outlines issues with compliance, monitoring and enforcement; discusses regional-level data coverage; and summarises the limitations and problems with regional-level environmental monitoring and reporting in Aotearoa New Zealand, with recommendations for improvement.

Legal requirements

Regional councils and local authorities operate under several pieces of environmental legislation: the Resource Management Act 1991 (RMA), the Environmental Reporting Act 2015, the Hazardous Substances and New Organisms Act 1996 and the Soil Conservation and Rivers Control Act 1941. In this section I examine the two main pieces of legislation relevant to regional-level monitoring and reporting: the RMA and the Environmental Reporting Act.

Resource Management Act

The primary piece of legislation relevant to the management of Aotearoa New Zealand's natural resources is the RMA. It has been criticised for its complexity, lack of national direction, weak implementation, poor monitoring and enforcement, and failure to manage cumulative effects and long-term issues (Brown, Peart and Wright, 2016). The RMA is set to be replaced with three new pieces of legislation: a Climate Change Adaptation Act, a Strategic Planning Act and a Natural and Built Environments Act (Ministry for the Environment, 2021c).

Currently, local authorities are required to monitor '[t]he state of the whole or any part of the environment of its region or district to the extent that is appropriate to enable the local authority to effectively carry out its functions under this Act' (RMA, s35(2) (a)). This wording is problematic because there are no clearly outlined requirements for what aspect of the environment should be monitored or how often. Without clearly outlined monitoring requirements it is difficult to know if regional authorities are breaching their obligations to maintain

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pollutants below the levels outlined in the national environmental standards. Moreover, applying the RMA is complicated because decision makers (courts and councils) must weigh competing environmental, economic and sociocultural concerns when interpreting the Act (Hammond, 2018). Because there is no clear definition of economic wellbeing in the RMA, decision makers are permitted to consider financial benefit to an individual. To illustrate, consents have been granted for a meat processing plant (*Martin v Far North District Council*, 1999) and a hotel (*Armstrong v Central Otago*, 2008) based on the economic wellbeing of the applicants (Lowe, 2010).

Furthermore, issues arise when local councils make decisions based on vested interests represented by their electorate. Councillors for city, district and regional councils are democratically elected by communities every three years. In regions where the economy is reliant on environmental exploitation, elected councillors may be strongly influenced by the interests of resource users in their electorate. Consequently, economic considerations and farming interests are often at the forefront of environmental consent assessments under the RMA (Brown, Peart and Wright, 2016; Hammond, 2018; Hanning, 2010).

National environmental standards

Between 2004 and 2021 the central government has brought into force nine

national environmental standards, which are regulations under the RMA (Ministry for the Environment, n.d.). The first standards covered air quality and landfill gas emissions, while further standards stipulate requirements for the technical standards and methods for monitoring rivers and lakes, coastal marine areas, water take and use, land use and subdivision, discharge and noise. National environmental standards place a legal requirement on councils to test and to maintain concentrations of certain pollutants below given levels. While there are minimum standards set, councils can impose stricter standards in their own plans. For example, Horizons Regional Council and Hawke's Bay Regional Council have both set stricter standards for nitrate than the minimum standard set out in the regulations (Hawke's Bay Regional Council, 2021; Roygard and McArthur, 2008). However, there are limitations to councils imposing stricter standards. Under the RMA, if the 'rule is more stringent than the provision ... and the standard does not expressly specify a rule may be more lenient ... the local authority must amend the plan or proposed plan to remove the publication or conflict' (RMA s44A).

There are currently nine national environmental standards in force: for air quality, freshwater management, marine aquaculture, soil, plantation forestry, sources of drinking water, telecommunications facilities, electrical transmission activities and storing tyres outdoors. Expert scientists have criticised many of the pollutant levels set under the standards as being meaningless because they have been set at levels far higher than the point at which ecological impacts are observed. For example, the Freshwater Science and Technical Advisory Group recommended a limit of 1mg/L for dissolved inorganic nitrogen in rivers (Freshwater Science and Technical Advisory Group, 2020) and the Australia New Zealand guidelines for fresh and marine water quality have a limit of 0.44mg/L (Australian and New Zealand Governments, 2000, 2018). At levels above 0.44 and 1mg/L the health of a waterway declines, eutrophication (algal bloom) sets in and fish die from lack of oxygen. Despite this, the National Policy Statement for Freshwater Management bottom line for nitrate toxicity is set at 2.4mg/L. This is the level at which nitrate would directly kill fish – if they had not already died from lack of oxygen.

The national environmental standards for freshwater and air pollutants are the most

pertinent to environmental quality; the remaining national environmental standards largely concentrate on impacts to human health and infrastructure. Thus, in the following sections, I concentrate on the standards for freshwater and air pollutants.

National environmental standards for freshwater

In 2011 the National Policy Statement for Freshwater Management was enacted, with supporting guidelines (the National Objectives Framework) implemented in 2013–14. The National Objectives Framework sets national bottom lines for freshwater quality to achieve the national policy statement goals. Subsequently, in 2018 the Labour-led government set up three expert advisory groups: the Freshwater Science and Technical Advisory Group, Kahui Wai Māori/the Māori Freshwater Forum, and the Freshwater Leaders Group. The Freshwater Science and Technical Advisory Group was charged with overseeing the scientific evidence for freshwater policy development and provided reports to the minister for the environment in June 2019 and April 2020. New policies were announced for freshwater in August 2020; however, crucial advice from the expert panels was not accepted (Joy and Canning, 2020; Science Media Centre, 2013). For instance, the implementation of nutrient limits, such as for inorganic nitrogen nutrients, was either weakened or postponed (Joy and Canning, 2020; Parker and O'Connor, 2020).

The National Policy Statement for Freshwater Management has been strongly criticised by freshwater scientists, including members of the technical advisory group. These critiques include that many of the numerical limits stipulated in the statement allow for greater environmental deterioration rather than maintenance or improvement, that measures for ecosystem health (e.g., invertebrate health measures) and contaminants (e.g., heavy metals and organic contaminants) are absent, and that no limits are set for wetlands or estuaries (Joy, 2015; Joy and Canning, 2020; Science Media Centre, 2013). For example, Joy (2018) has criticised the periphyton limits for rivers as being meaningless, because 17% of samples can exceed these limits. Periphyton is a natural feature of rivers; however, periphyton blooms can smother riverbeds, changing invertebrate communities, reducing the availability of food for fish, and changing natural conditions such as pH and oxygen levels (Kilroy and

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Stoffels, 2019). With a 17% allowance to exceed set limits, any given river could be considered compliant (and 'healthy') even when periphyton growth is negatively affecting ecosystem health. The policy statement also allows for some discretion to be applied: infrastructure, for example, may be allowed on wetlands if it has economic benefits (Science Media Centre, 2013). However, the statement lacks detail on how this economic benefit is measured and how it stacks up against the environmental, sociocultural or recreational benefits of a wetland.

Another issue is that the monitoring of freshwater management has been delegated to local authorities. This means that local authorities are effectively monitoring themselves. From 1989 to 2012 freshwater quality monitoring was largely conducted by the National Institute of Water and Atmospheric Research (NIWA), a Crown research institute which operates as a stand-alone company. Physical, chemical and biological variables have been publicly reported through the National River Water Quality Network from its inception in 1989. Originally the network covered 77 sites, which included both baseline (upstream) and indicator (downstream) sites. But from 2012 onwards, 18 of the 77 original sites were transferred to local authorities, due to a reallocation of resources within NIWA and the requirement for local authorities to conduct water quality monitoring under the RMA (Parliamentary Commissioner for the Environment, 2019). At present only five of the 18 sites NIWA transferred to regional authorities are still being monitored (LAWA, 2021b, 2021c, 2021d; NIWA, 2022). Thus, we no longer have valuable long-term data to track the long-term impacts of intensive dairy farming. Government reporting commonly

combines (NIWA and regional council) data for baseline and impact sites, which misrepresents the actual state of freshwater environments (i.e., the most polluted impact sites are 'masked' by the best baseline sites). Objective A2 of the National Policy Statement for Freshwater Management is that 'the overall quality of fresh water within a region is maintained or improved' (Ministry for the Environment, 2015, p.30). Currently, freshwater quality for regions of Aotearoa New Zealand cannot be properly assessed; therefore, objective A2 cannot be achieved.

National environmental standards for air pollutants

The national environmental standards for air pollutants were introduced in 2004, with amendments in 2011. Regulations include: five standards for outdoor air quality; seven standards banning activities that discharge significant quantities of dioxins and other toxins into the air; a requirement for landfills of a certain size to collect greenhouse gas emissions; and a design standard for new wood burners. Regional councils and unitary authorities are responsible for managing air quality and are required to monitor areas where there are likely (or known) problems with air pollution. If it is likely that air quality standards will be breached in a particular airshed (region or area), the regional council must monitor 'in that part of the airshed where – (A) there are one or more people; and (B) the standard is breached by the greatest margin or the standard is breached most frequently' (Resource Management (National Environmental Standards for Air Quality) Regulations 2004, s15). This wording is problematic. While there is a requirement to monitor areas with likely or known air quality issues, there are no clear requirements outlining the minimum number of sites that should be monitored in a region, or how often monitoring should take place.

Air quality experts have raised issues with the national environmental standards for air pollution (G. Coulson (NIWA), personal communication). First, there is limited temporal and spatial coverage. To illustrate, in some regions (e.g., Gisborne, Taranaki and the West Coast) air quality has only been monitored in a single location. Second, few regional councils measure air quality indicators other than particulate matter, because there is no legal compulsion for them to do so. Third, the limit values which have been set can help drive the concentrations of

air pollutants down in non-compliant areas. However, reductions often stop once limits are complied with. For compliant regions, the limits are seen as a ‘target’ to pollute up to because there is no further pressure to reduce emissions of air pollutants (G. Coulson (NIWA), personal communication). For instance, there is no incentive for the Auckland region to reduce emissions of pollutants because the region is largely compliant; thus, people in areas such as the central city are exposed to legal concentrations of air pollutants that are still high enough to have a negative impact on human and ecosystem health (Talbot and Crimmins, 2020). It is important to note that the national environmental standards for air quality have yet to be updated in line with the World Health Organization (WHO) guidelines. The WHO guidelines now recommend that concentrations of particulate matter (PM10) should not exceed an annual mean of 15µg/m³ (World Health Organization, 2021); PM10 concentrations across Auckland are consistently at, and above, 15µg/m³ (Talbot and Crimmins, 2020). Finally, as previously discussed, there is an exemption in the RMA where local authorities are required to monitor ‘to the extent that is appropriate’ (s35(2)(a)(i)).

Environmental Reporting Act

Environmental reporting in Aotearoa New Zealand can be separated into two periods. Before 2015 there were periodic reports based on 22 indicators, and five key state of the environment reports: (Ministry for the Environment, 1997, 2007, 2015, 2019, 2022). Some indicator updates were reported annually, while others were intermittent, according to data availability. In 2007 the Ministry for the Environment defined a core set of national-level indicators, with indicators updated and added over time as data became available.

The Environmental Reporting Act came into force in 2015, with the purpose ‘to require regular reports on New Zealand’s environment’. Statistics New Zealand and the Ministry for the Environment are required to report on the state of different aspects of the environment (freshwater, marine, air, atmosphere and climate, and land) at a national level every six months. A synthesis report for the environment as a whole is required every three years. However, at present there is no legislative requirement for regional-level monitoring and reporting beyond drinking water supplies and certain

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air pollutants (Parliamentary Commissioner for the Environment, 2019).

Agencies responsible for monitoring and reporting

Agencies that collect regional level-data (or data that can be disaggregated to a regional level) include NIWA, the Ministry for the Environment, Statistics New Zealand, regional councils and unitary authorities, Manaaki Whenua Landcare Research, Waka Kotahi NZ Transport Agency, the Ministry for Primary Industries, Water New Zealand, the Energy Efficiency and Conservation Authority and the Fertiliser Association of New Zealand. At a regional level, the responsibility for data collection lies mostly with regional council, which are also tasked with achieving economic growth. Because several agencies collect data for different reasons, there are inconsistencies in the methodology used and the resulting data sets. For example, the Environmental Monitoring and Reporting Initiative (EMaR) was established in 2014 as a partnership between the Ministry for the Environment and regional councils. The goal of the EMaR was to set up integrated regional- and national-level data collection networks, with reports to be publicly available on accessible platforms, such as the Land Air Water Aotearoa (LAWA) website. While the LAWA website is a useful means of communicating environmental information to the public, there are several issues with it. For example, LAWA requires nationally consistent data sets, which means that topics on the LAWA website are those with the most consistent data sets. There are many topics of public interest, such as waste generation and recovery, that are not

available on LAWA.

An issue raised by environmental scientists is the use of misleading data (Joy, 2015; Miller, 2011; Science Media Centre, 2013). In particular, freshwater reports by Statistics New Zealand, the Ministry for the Environment and regional councils have been criticised by freshwater experts for several reasons: data for baseline and impact sites are commonly combined instead of being reported separately, and this obscures impacts from polluting industries; the time periods used for analysis are often too short; and erroneous calculation and interpretation of data (Joy, 2015; Miller, 2011). As an example of issues with calculation and interpretation of data, in 2013 the Ministry for the Environment stated that water quality had been stable or had improved at most monitored sites, in contradiction to data published by NIWA (Ballantine and Davies-Colley, 2009; Ministry for the Environment, 2013). After some probing by freshwater scientist Mike Joy, it was revealed that there was no statistically significant change in water quality. The statistical power of the analysis had been compromised because the data set did not include enough sites and ten years was not a long enough time period to gather meaningful data. When data was analysed for 20 years instead of ten, most of the trends disappeared and it was clear that water quality at most sites had worsened, not improved. More than a year later the ministry finally removed the errors from its website, but refused to make a public correction (Joy, 2015).

Enforcement

Under the RMA, regional authorities and the Ministry for the Environment are jointly responsible for compliance, monitoring and enforcement. While regional authorities are the primary agency responsible for enforcement of the RMA, the Act provides no specific detail on how councils should carry out compliance, monitoring and enforcement. Instead, councils are permitted to use their discretion. The Ministry for the Environment published its first (and only) report on compliance, monitoring and enforcement 25 years after the enactment of the RMA (Ministry for the Environment, 2022) and provides minimal oversight and support for regional authorities (Brown, 2017). Many regional authorities face funding issues and have limited resources to conduct monitoring and enforcement activities (Brown, 2017; Local Government New Zealand, 2015). Furthermore, councils are excluded from the definition of ‘public

prosecution' in the Criminal Procedure Act 2011. Therefore, the solicitor-general has weak oversight over the activities of regional authorities. Thus, there is little in the way of checks and balances for regional authorities.

Past research has revealed that there is variation in the approach of different regional authorities to compliance, monitoring and enforcement. Some regional authorities report that they take a 'prosecution as last resort' approach because they lack the monetary resources to pursue prosecutions; others take a 'business-friendly' approach, with policies of not issuing fines (Brown, 2017). A survey of compliance, monitoring and enforcement officers in 2016 found that 65% of council staff reported that council departments do not address compliance consistently, and 45% of the staff felt that their council did not have effective and comprehensive monitoring programmes (de Silva and Besier, 2016). The issue of vested interests for regional authorities is compounded when councils invest in enterprises in their region. For example, Nelson City Council owns and operates plantation forestry holdings in the region. Theoretically, the same compliance, monitoring and enforcement requirements apply to council-owned enterprises, but there is a clear conflict when the owners are also the regulators (Brown, 2017).

While the Crown Law Office's prosecution guidelines state that prosecutions should be free from political influence, such interference is an issue for many regional councils (Brown, 2017; de Silva and Besier, 2016). The auditor-general's report into regional management of freshwater found that 'councillors in all the regional councils we audited had some involvement in deciding whether the council should prosecute or investigate cases after the decision to prosecute had been made' (Office of the Auditor-General, 2011, p.60). Both the auditor-general's report and the Environmental Defence Society have called for a clear division between governance and executive representatives so that elected councillors do not interfere with compliance, monitoring and enforcement action (Brown, 2017; Office of the Auditor-General, 2011).

Regional-level data coverage

Data collection for environmental monitoring in Aotearoa New Zealand has largely been a passive harvest, using whatever data is available. This has led to a situation where indicators are chosen to fit the available data, rather than active decisions being made about

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what indicators should be used and then data collected accordingly (Parliamentary Commissioner for the Environment, 2019). Data coverage for regions is fragmented, with gaps for many of Aotearoa New Zealand's most pressing environmental issues (Baisden, 2020; Parliamentary Commissioner for the Environment, 2019). To illustrate, while the national environmental standards set out minimum requirements for five air pollutants (carbon dioxide, nitrogen dioxide, sulphur dioxide, particle matter, ozone), none of these five indicators has publicly available data for all of Aotearoa New Zealand's regions. Only one air, atmosphere and climate indicator (artificial night sky brightness) has data for all 17 regions (Ministry for the Environment, 2021a, 2021b). Furthermore, there are issues with coverage within regions. In many cases, there are not enough monitoring sites to reliably identify changes in environmental quality across the entire region. For example, PM10 is monitored at a single site in the Gisborne, Taranaki and West Coast regions (Statistics New Zealand, 2018); therefore, it is only possible to track changes in PM10 for a single location in one town or city in each region.

The marine domain has the worst coverage at a regional level: only two indicators (chlorophyll-a and *E. coli*) have nationwide coverage (LAWA, 2021a; Statistics New Zealand, 2021a). The land domain suffers from similar issues. While land cover changes and fertiliser use are well documented for each

region of Aotearoa New Zealand, coverage for soil health is limited, with no publicly available data for five regions (Statistics New Zealand, 2021b). Agricultural intensification is a major environmental issue in this country, with direct impacts on soil (Foote, Joy and Death, 2015; Moller et al., 2010). It is therefore deeply concerning that there is no coordinated, nationwide soil health data.

One of the key challenges in gathering data for all regions of Aotearoa New Zealand is the lack of systematic investment in consistent long-term monitoring programmes (Baisden, 2020; Parliamentary Commissioner for the Environment, 2019). Nowhere is this more evident than in freshwater monitoring. Because monitoring is now conducted by several different agencies, there are inconsistencies in the methods used (Our Land and Water National Science Challenge, 2021). Furthermore, even though continuous monitoring technology is available, monthly monitoring is still the predominant method of data collection (Hudson and Baddock, 2019; M. Joy, personal communication). Continuous monitoring – where high-frequency measurement equipment is left to operate over extended periods of time – is more useful in identifying water quality drivers and contaminant 'hotspots' (Hudson and Baddock, 2019). Continuous monitoring incurs additional outlay and set-up costs, but is less expensive in the long term (Acevedo, 2015; Hudson and Baddock, 2019). Central government investment in continuous monitoring devices would facilitate independent reviews of the performance of local councils at the central government level. Data sets from continuous real-time monitoring could be made available to the public and researchers; this would facilitate public engagement and encourage accountability of regional authorities to their constituents. Air pollution and freshwater pollution can both have significant impacts on human health: for example, nitrate in drinking water is associated with colorectal cancer risk (Richards, 2020) and particulate matter is associated with respiratory illness (EHINZ, n.d.). Continuous monitoring for air and freshwater quality would be helpful to close the link between environmental pollution and human health.

For some regional authorities, resourcing issues mean that they lack the technical expertise or equipment to conduct robust environmental monitoring (Parliamentary Commissioner for the Environment, 2020). A solution to this issue is to consolidate funding and centralise some roles. This is particularly important for freshwater because

freshwater pollution is one of Aotearoa New Zealand's most serious environmental issues (Foote et al., 2015; Joy, 2018). Therefore, it is imperative that regional-level monitoring for key indicators such as nitrogen and phosphate is conducted for each region, with consistent methodology and public reporting.

Summary and recommendations for the future

In this article I have outlined the legal requirements for regional-level environmental reporting in Aotearoa New Zealand; reviewed that reporting; outlined issues with compliance, monitoring and enforcement; and discussed regional-level data coverage. Here, I summarise the key limitations and problems with regional-level environmental monitoring, reporting, compliance and enforcement in Aotearoa New Zealand, with recommendations for improvement.

Our natural environment is an important sociocultural and economic asset; to protect this asset, five key issues need to be addressed in terms of regional-level monitoring and reporting. First, Aotearoa New Zealand's current environmental legislation is weak, and the wording of the RMA and national environmental standards is problematic. For example, beyond a general 'requirement to monitor', the RMA does not provide specific requirements for what regional authorities should be monitoring, where they should be monitoring, or how often. Moreover, the National Policy Statement for Freshwater Management allows exemptions to build infrastructure when it has 'significant economic benefit' (without necessarily defining what constitutes 'significant' or describing how this benefit stacks up against the damage done to the environment). Furthermore, the limits set out for nutrients, such as nitrogen in freshwater systems, allow for greater deterioration rather than maintenance or improvement. It is essential that the legislation replacing the RMA clearly outlines the responsibilities of regional authorities and how 'significant economic benefit' is defined (and when it is deemed to be more important than environmental, sociocultural and recreational benefits). Expert advice must be followed when setting numerical limits. Currently, the Environmental Reporting Act has no legislative requirement for regional-level monitoring and reporting beyond drinking water supplies and certain air pollutants. The Environmental Reporting Act should be amended, with clearly outlined requirements for regional-level reporting for important indicators such as nitrogen in freshwater and marine environments.

Without clearly outlined indicators for monitoring and legislative requirements for reporting at a regional level, it is difficult for policymakers, science providers, conservation executors and the general public to assess performance differences between the regions.

Second, the responsibility for environmental monitoring and reporting lies mostly with regional councils, which are also tasked with achieving economic growth, and largely monitor themselves. Environmental monitoring should be conducted by independent agencies so that the central government and the public can assess whether regional authorities are fulfilling their environmental obligations. The parliamentary commissioner for the environment, Simon Upton, made recommendations for the development of an environmental research strategy (to be led by the Ministry for the Environment) and the establishment of an Environmental Research Council (Parliamentary Commissioner for the Environment, 2020). A centralised research council with the necessary experts could develop a standardised methodology for environmental monitoring and reporting at the regional level.

Third, there are problems with enforcement and political interference. Compliance, monitoring and prosecution action vary widely between councils. Because

the RMA lacks specific detail on how councils should carry out enforcement action, councils are permitted to use their discretion. This is concerning, because political interference is an issue for many regional councils, where councillors interfere in decisions to investigate or prosecute cases (Brown, 2017). Local councillors are elected by constituents, and this means that in regions where the economy is reliant on environmental exploitation, councillors are more likely to represent the objectives and values of resource users in their electorates. Thus, economic benefits may be prioritised ahead of environmental protection. There needs to be a clear division between governance and council executives so that elected councillors do not interfere with compliance, monitoring and enforcement action. The Criminal Procedure Act should be amended to include councils under the definition of 'public prosecution'.

Fourth, there are problems with the way data is analysed and reported, an issue that is particularly relevant for the freshwater domain. Despite repeated communication from freshwater experts about the misuse and distortion of data sets, data has consistently been analysed in a manner that misrepresents the actual state of our freshwater systems. Statistics New Zealand, the Ministry for the Environment and regional authorities should work more closely with experts in respective fields so that data is analysed appropriately, and rectify any issues raised by expert scientists in a timely fashion.

Finally, many agencies tasked with environmental monitoring, reporting and enforcement have issues with insecure funding (Parliamentary Commissioner for the Environment, 2019). In 2021 the government committed \$25 million to establish a national-level monitoring and reporting network (Treasury, 2021). This initiative should be expanded to plug data and knowledge gaps at both a national and regional level so that long-term monitoring and reporting is consistent across Aotearoa New Zealand's regions, with mandatory reporting of public data. Data should be made publicly available to both researchers and the public so that it can be independently audited to identify any issues with the calculation and interpretation of data. For some regional authorities, issues with resourcing means that they lack technical expertise or equipment to conduct robust environmental monitoring (Parliamentary Commissioner for the Environment, 2020).

A solution to this issue is to consolidate funding and centralise some roles. At present, the Crown and regional authorities are not fulfilling their obligations under the Tiriti o Waitangi or the RMA. If adequate resources are not allocated to compliance, monitoring and enforcement, the significant resources put into reforming the RMA will be wasted.

Without clearly outlined indicators for monitoring and legislative requirements for reporting at a regional level, it is difficult for policymakers, science providers, conservation

executors and the general public to assess performance differences between the regions. It is imperative that we develop a clear, coordinated and consistent environmental monitoring and reporting system for Aotearoa New Zealand's regions so that we can take stock of an important sociocultural and economic asset.

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