

Annual Environmental Monitoring Report 2001-2002 Highlights

Air Quality

- In general, Northland has a high standard of natural air quality.
- In March 2000, a particulate matter (PM₁₀) high volume sampler was installed in Robert St, Whangarei. Sample results reveal that the PM₁₀ concentration varies considerably on a daily basis, and according to national air quality guidelines are either good or adequate 80% of the time. The results also indicate that at times the PM₁₀ concentration is approaching or exceeding recommended guidelines.
- An investigation using radioisotopes has identified that approximately half of the PM₁₀ air pollution in the central city area is sourced from motor vehicles with the rest coming from domestic wood fires. It's a different story in Morningside with around 70% of the PM₁₀ air pollution coming from domestic wood fires.
- Northland has completed an emission inventory of anthropogenic sources (from human activities) which reveals that industrial sources discharge most of the sulphur dioxide, nitrous oxides and PM₁₀ while motor vehicles are responsible for most of the carbon monoxide and Volatile Organic Compounds (VOC's). Residential home heating also makes modest contributions to PM₁₀, CO and VOC's although these latter emissions vary seasonally.
- Measurements of ambient levels of pesticides are being undertaken during the 2002/03 year. Levels of sulphur dioxide have previously been reported in the State of the Environment Report 2002.

Surface Water Quality

- Water quality in the Northland region varies greatly from pristine in upper native forest catchments through to highly impacted in modified lowland catchments. Aquatic ecosystem guidelines are regularly not met in developed areas, including the Wairua, Whakapara, Mangakahia, Awanui and Waitangi Rivers.
- Results for 2001-02 show that many lower reaches of rivers and streams in developed areas are unsuitable for swimming in terms of microbiological contamination. Pressures on surface water quality include both point source discharges (such as those from dairy shed oxidation ponds and other wastewater discharges), septic tank seepage and faecal material from runoff or stock wading in streams.
- Nutrient levels vary between catchments, however many have high enough concentrations to promote excessive algal growths. Levels are regularly high in developed catchments, including the Wairua, Whakapara, Mangakahia, Awanui and Waitangi Rivers. In some rivers, such as the Mangere, levels are extremely high. It is likely that a significant proportion of nitrogen is derived from point and non-point agricultural sources in these catchments.

Water Quality – Macroinvertebrate Monitoring

- Generally, habitat quality is excellent in forested headwaters, but declines further downstream.
- Macroinvertebrate Community Index (MCI) scores have been stable or increased. Significant increases in the SOE sites were noted at Awanui-School cut and Mangahuru Stream at Apotu Rd bridge. The only decline in MCI of note was at Mangakahia-Gorge and this decline was not a significant linear trend.
- There seems to be a trend at most sites of an overall decrease in the numbers of species. However, indicators of macroinvertebrate stream health at sites monitored show stable or improving trends. This loss of diversity is related to the loss of species that prefer poor water quality (such as worms and snails).

- Biological health along the length of the Waiarohia River seems to be moderately good and appears to be stabilising with improved although more uniform conditions.

Water Quantity and Flows

- The Northland Regional Council operates a hydrometric network consisting of 15 automatic rainfall stations and 29 automatic water level stations. In addition, a daily rainfall reader network provides a further 63 manual rainfall stations, 35 manual groundwater stations and 15 lake level stations water-level sites. Out of these 157 sites, 10 rainfall sites and 14 water level stations form part of a radio telemetry network.
- The Hydrology unit maintains a quality management system ISO 2000\9001 for the collection, processing and archiving of hydrometric data. Data from the Northland Regional Council's hydrometric database was transferred to the NIWA National Hydrometric Database in Christchurch. This includes data from all open and closed water level (both groundwater and surface), flow and rainfall stations (data from a total of 310 stations).
- During 2001-02 a total of 16 weather bulletins were issued for the year of which 8 resulted in heavy rain warnings. There were five significant rainfall events that resulted in severe flooding, two in early September 2001, one in December 2001 and two in June 2002 (including 'The Weather Bomb').
- Annual rainfall amounts varied from near average at Bayley's Beach (91%) to above average at Aupouri (163%) from July 2001 to July 2002. Generally, the Northland region was 20% above the expected annual rainfall. The wettest months were December 2001 and June 2002 and the driest February to March 2002.
- A total of 173 flow measurements were carried out during 2001-02.

Lakes

- The invasion of aquatic weeds in Northland Lakes is a significant problem and is likely to become worse over time.
- Five nationally endangered aquatic plants were found in Northland Lakes.
- Pest fish are a threat to aquatic vegetation and water quality.
- Catchment management efforts have resulted in improved water quality in some selected lakes.

Lake Omapere Monitoring and Management

- An additional 20 000 grass carp have been released.
- The weed *Egeria densa* has declined.
- An algal bloom is present in the lake water.
- New Lake Omapere Trustees have been appointed
- Work has begun on an integrated long-term management plan.

Groundwater

- Groundwater levels in Northland are recorded continuously at six sites and monthly at another 40 sites.
- Groundwater quality is monitored quarterly at 7 sites throughout Northland.
- Groundwater quality at sampling sites meets ANZECC guidelines for the human consumption of water.
- NRC is currently undertaking investigations into the Ruawai, Taipa and Russell aquifers. Monitoring at Taipa has indicated elevated nitrate levels in a number of

boreholes in the Taipa settlement area. The Taipa School borehole has exceeded the nitrate concentration guidelines in the New Zealand Drinking Water Standards 2000 on several occasions.

- Future groundwater monitoring work includes an expansion of the groundwater quality monitoring network.

Coastal Monitoring

- Bacteriological water quality was monitored at a selection of popular marine bathing areas during summer 2001/2002 to assess suitability for recreational bathing. Seventy-nine percent of sites were considered safe for bathing, 18% potentially unsafe and 3% highly likely to be unsafe.
- The study of sand resources and associated coastal processes of the Kaipara Harbour (the 'Kaipara Sand Study') was nearing completion.
- The national estuarine monitoring protocol being developed to assess the state of 'health' of estuarine ecosystems was nearing completion. The next stage of implementation involves a preliminary assessment of estuary condition for prioritising estuaries for monitoring.
- The Coastal Hazard review for Far North sites was continued. Fieldwork has been completed for most selected areas. Recommendations have been made for the Omapere coastal hazard zone.

Land Use Sustainability Monitoring

- Soils were assessed for their quality by comparing the current chemical and physical condition of the soils against target values for that soil order and land use, and by identifying outlier values.
- The majority of soils were of suitable quality for the various land uses.
- A small number of soil properties were outside the recommended limits for that soil and land use. In most cases, the property could be remedied by suitable soil management.
- Arable cropping presents the greatest risk to loss of organic resources through loss of soil structural stability.
- There was one instance of low macroporosity (resulting from compaction) under dairy farming.

Farm Dairy Effluent Monitoring

- During the year 543 non-consented farm discharges were visually inspected. There were 367 systems not inspected, due to good performance in the past.
- From both the consented and non-consented farm dairy effluent systems, there were 144 instances of significant non-compliance identified during the season that required follow up action. Fifty-five of those were inspected, with the remaining number still to be visited (as at the end of the 2001/02 season).
- During the year 216 resource consents were issued, bringing the total number of farm dairy effluent consents to 460.

Environmental Incidents

- Seven hundred and forty seven incidents were reported during the year. This is slightly less than the annual average amount of 827 incidents received per year since the environmental hotline began operating.
- During the year 35% of incidents involved air-related complaints. Odour, burning/smoke nuisance and agricultural spraydrift are the most commonly received complaints.

- Coastal incidents comprised 29% of complaints received by the Council. Generally, there is a high incidence of oil spills, sewage, refuse, various contaminant discharges and farm-related wastes.

Ngawha Geothermal Field

- The geothermal power station operating at Ngawha is subject to a comprehensive environmental monitoring programme.
- The monitoring carried out over the period 1 July 2001 to 30 June 2002 did not indicate any significant changes to the local environment in terms of air, water and soil quality as a result of the geothermal fluid take or discharges from the power station.
- The vegetation in the wetland area immediately below the holding pond at the NG9 well site, which had been damaged or killed as the result of early discharges from the pond, is recovering. Populations of mudfish in the area also seem to be increasing, however, this is more related to higher water levels during 2001 and therefore better conditions for mudfish breeding.

Joint Iwi/NRC Monitoring Projects

- The Ngatiwai Trust Board Resource management Unit has carried out macroinvertebrate monitoring in Whangarei streams.
- Te Whanau Rangi Whakaahu has monitored pipi populations in two Matapouri rivers.
- The Waikare Inlet Taiapure Committee is monitoring nutrient pollution of the Waikare Inlet.

Waste Hazardous Substances and Contaminated Sites

- During 2001-2002 9.0 tonnes of waste hazardous substances were collected from throughout the Northland Region.
- 840 kg of intractable material was collected during 2001-2002.
- Since 1993 over 30 tonnes of waste hazardous substances have been collected, recycled, disposed of or placed into long-term storage.
- All or part of the Councils stockpile of intractable wastes will be disposed of overseas during the 2002-2003 financial year.
- During 2001-2002 approximately 200 sites listed on the Selected Landuse Register were visited and inspected.
- Site assessments were undertaken at a number of animal dip and timber treatment sites.
- The monitoring of underground storage tank removal and site contamination programme continued.
- Work continued with the National Working Group on having a consistent approach to the management of contaminated sites in New Zealand.