

Output Class 31: Land Use, Flora and Fauna

- a Development of integrated information bases on the properties, potentials and limitations of natural land resources and on the ecological, physiological and genetic characteristics of flora and fauna, particularly unique indigenous species; accessible, coordinated network systems enabling access to data bases.
- b Description and analysis of the properties, potentials, interactions, and limitations of natural land resources and natural and modified eco-systems and their biota; their interactions with other systems; improved environmental monitoring; the past and present impact of natural degradation or human intervention and their implications for present and future sustainable management of natural and physical resources.
- c Description and analysis of the adaptive ecology of introduced flora and fauna and their impact on indigenous biota, for purposes of management and evaluation of proposed future imports of organisms.
- d Classification and recording of inadequately researched groups of indigenous flora and fauna.
- e Description and analysis of biodiversity in indigenous ecosystems and the management requirements for effective maintenance of their genetic resources.

Output Class 32: Marine and Fresh Waters

- a Integrated, multidisciplinary studies of the key biological and physical processes taking place within the water environments of the New Zealand region including interactions with the atmosphere and land; energy flows between key biota; the relationships between primary productivity and new and recycled inorganic nutrients.
- b Description and analysis of the relationship between key environmental processes and human impacts, including the recovery of water-based ecosystems from pollution episodes and other effects.
- c The biosystematics and biodiversity of benthic organisms, particularly taxa which are abundant, speciose or ecologically significant.
- d Description and analysis of the hydrology and hydraulics of gravel-bed, braided river systems; including research predicting flood risk and mitigating flood damage.
- e Development of a national information resource compiling new and existing inventories of data on aquatic systems.

Output Class 33: Climate and Atmosphere

- a Description and analysis of stratospheric ozone and of other gases aimed at understanding the chemistry determining ozone concentrations in the atmosphere; ultraviolet measurement and analysis including detailed spectral measurements.
- b Description and analysis of sources, sinks, chemistry (including isotopic studies), physics and radiative effects of tropospheric gases, aerosols and clouds which contribute directly or indirectly to radiative forcing of the atmosphere.
- c Description and analysis of climate and weather dynamics and past climates (including paleoclimate research), and development and validation of climate and weather modelling techniques, aimed at describing and understanding past and present New Zealand and South Pacific climate and weather, and predicting future variations in atmospheric circulation.
- d The monitoring and recording of climate and the development of accessible databases containing high quality climate information.
- e Description and analysis of interactions between the atmosphere and land and sea surfaces, including the biosphere, with an emphasis on the impacts on the atmosphere.

Output Class 34: Properties, Uses and Technologies for Space

- a Maintenance, advancement and application of astronomical knowledge for the benefit of New Zealand's social and economic development.
- b Identification, maintenance, advancement and application of current and proposed space based projects to advance New Zealand's economic and environmental interests.

Output Class 35: Antarctica

- a Description and analysis of the physical properties, dynamics and chemical constituents of the Antarctic atmosphere, sea ice and ocean.
- b Description of the Antarctic pristine environmental state and the changes occurring in order to recognise, evaluate and predict local and global human impact.
- c Description and analysis of the history and structure of the Antarctic lithosphere and relationships to the other southern continents, particularly New Zealand.
- d Description and analysis of the Antarctic weather, climate and climate change in the recent and geological past.
- e Description and analysis of the biota and functioning of the ecosystems of the Antarctic.

Note: These themes apply from the 1993-94 funding round onwards.

Cross-Output Themes*1. Control of Possums and the Threat of Bovine Tb*

- a The epidemiology of Tb in farmed and feral animal species and control of Tb through biological means.
- b The ecology of possums and other feral animals which may be vectors for Tb.
- c Development of systems for controlling the possum population in New Zealand emphasising biological control systems and toxins alternative to 1080.

*2. Climate Change**a Fundamental Climate Knowledge:*

- (i) improving understanding of physical and chemical processes and constituents in the atmosphere and oceans, including long term research, monitoring and modelling of atmospheric and climate variables; (output 33, although some work on oceans may fall within output 32)
- (ii) investigating interactions between the atmosphere and land and ocean surfaces including the biosphere; (various outputs)
- (iii) collection and use of instrumental, historical, and proxy data in the New Zealand, South Pacific and Antarctic Region to assess climate variability; (various outputs)
- (iv) collaboration in developing and validating computer models for predicting regional scale changes; (output 33)
- (v) trace gas budgets for radiatively active molecules and aerosols, including their sources and sinks in terrestrial and aquatic ecosystems and soil (output 33).

This work is a priority both nationally, regionally and globally, and priority should be given to those programmes which are part of larger efforts directed at increasing fundamental knowledge of climate change parameters, both locally and internationally. Fundamental climate knowledge is the basis for all climate change research.

b Adaptation to Climate Change:

- (i) impact studies, including sensitivity and adaptive responses of natural and managed ecosystems and responses by the agricultural, horticultural and forestry sectors; (various sector specific outputs)
- (ii) assessment and mitigation of climatically influenced hazards (various sector specific outputs).