

**Queensland**

**James Cook University**

**DP0986537** Prof RA Alford; Dr M Hagman

**Approved Project Title** **Understanding and managing resistance to the amphibian chytrid fungus Batrachochytrium dendrobatidis in Australian tropical rainforest frogs**

**2009 :** \$ 180,000

**2010 :** \$ 155,000

**2011 :** \$ 155,000

**Primary RFCD** 2707 ECOLOGY AND EVOLUTION

APD Dr M Hagman

**Administering Organisation** James Cook University

**Project Summary**

The fungal disease chytridiomycosis can infect at least 48 Australian native frog species and is listed as a threatening process under the federal Environment Protection and Biodiversity Conservation Act. It caused catastrophic declines in 12 frog species in Queensland between 1979 and 1994, and is probably responsible for continuing declines in many more species in most states. A few species and populations have recovered following declines, indicating that they have increased their resistance to the disease. Understanding these increases in resistance should allow us to develop ways to control the disease in other species, helping to protect Australia against this invasive and highly destructive disease.

**DP0987740** Dr TG Blenkinsop; Prof NH Oliver; Prof DJ Sanderson; Dr JG McLellan

**Approved Project Title** **Modeling fluid flow and mineralisation at crustal interfaces**

**2009 :** \$ 100,000

**2010 :** \$ 100,000

**2011 :** \$ 85,000

**Primary RFCD** 2601 GEOLOGY

APD Dr JG McLellan

**Administering Organisation** James Cook University

**Project Summary**

Several types of mineral resources, including some uranium, iron, and base metal ore deposits, may be created by fluid flow through and around interfaces in the Earth's crust. By understanding how, where and why such deposits form, we will assist exploration for future resources of these metals. Insights will also be gained into petroleum resource generation and extraction, the distribution of seismicity and volcanoes in time and space, the problems of underground nuclear waste disposal and sequestration of CO<sub>2</sub>, and the potential for geothermal energy, with benefits in resource identification and/or hazard assessment in these areas.

**DP0987537** Dr SJ Foale; A/Prof MA MacIntyre; Dr D Nakashima

**Approved Project Title** **An Assessment of Social-Ecological Resilience in the Context of Marine Resource Management in Melanesia**

**2009 :** \$ 70,000

**2010 :** \$ 80,000

**2011 :** \$ 50,000

**Primary RFCD** 3703 ANTHROPOLOGY

**Administering Organisation** James Cook University

**Project Summary**

Papua New Guinea and Solomon Islands are part of the so-called 'Arc of Instability'. Despite enjoying relatively high levels of food security, mainly due to low human population densities, both countries have low Human Development Indices, particularly in Health and Education, and sustainable development is hindered by a range of problems, including complex and often socially destructive responses to global markets. Meanwhile fishery resources of both countries are being rapidly depleted by accelerating global commodity demand, threatening food security and undermining progress towards sustainable human development. Targeted, socially-informed resource management policy can prevent these problems from becoming ours as well.

## Summary of Discovery Projects Proposals for Funding to Commence in 2009

**DP0986894** Dr PJ Franks; Dr JA Holtum; Prof DJ Cantrill; Dr D Royer; Prof DJ Beerling; Dr J McElwain; Dr J Berry; Prof P Chamberlain

**Approved Project Title** **450 Million year history of plant gas exchange capacity and the role of atmospheric carbon dioxide**

**2009 :** \$ 180,000  
**2010 :** \$ 160,000  
**2011 :** \$ 160,000

**Primary RFCD** 2799 OTHER BIOLOGICAL SCIENCES

**Administering Organisation** James Cook University

### Project Summary

Our planet faces an increase in atmospheric carbon dioxide that is unprecedented in human history, but has occurred in ancient times. By studying the relationship between past changes in atmospheric carbon dioxide, plant gas exchange and climate we will gain powerful global insight into future scenarios of continental carbon and water fluxes. This global perspective is essential for Australia to assess its vulnerability to global climate change in relation to other nations, thereby informing national planning of landscape resource use, including primary industry, water infrastructure and carbon trading.

**DP0987178** Prof FR Keene; A/Prof JG Collins; Prof PJ Steel

**Approved Project Title** **Development of New Materials Based on Multinuclear Ruthenium Complexes**

**2009 :** \$ 140,000  
**2010 :** \$ 90,000  
**2011 :** \$ 90,000

**Primary RFCD** 2502 INORGANIC CHEMISTRY

**Administering Organisation** James Cook University

### Project Summary

The program aims to design new materials for use in applications such as catalysis and light-activated devices (including light harvesting or solar energy conversion), for the detection and analysis of specific small molecules and anions of particular interest, and to provide an insight to the operation of biological systems such as metal-containing enzymes. The particular molecules will also be investigated for the development of a new type of therapeutic agent for the treatment of a range of diseases, with a particular interest in this work on a drug for the treatment of HIV-AIDS.

**DP0985015** A/Prof MI McCormick; Prof DP Chivers; Dr MC Ferrari; Prof Dr LA Fuiman

**Approved Project Title** **Catch me if you can: predator recognition and anti-predator behaviour in marine fishes**

**2009 :** \$ 75,000  
**2010 :** \$ 55,000  
**2011 :** \$ 55,000

**Primary RFCD** 2707 ECOLOGY AND EVOLUTION

**Administering Organisation** James Cook University

### Project Summary

Increased understanding of the interactions between prey and their predators that have shaped the fish communities that inhabit today's coral reefs will aid in predicting how they will respond to future perturbations such as increased fishing pressure, range shifts caused by climate change, or species introductions. This will provide national economic benefits by increasing our ability to manage coral reefs, such as the Great Barrier Reef, a World Heritage Site of great economic importance for fisheries and ecotourism.