

## **2010 - NZIDRS Successful Recipients by Country of Origin**

### **Canada – 3**

Jesse T. KELLY – AUT University (Marine Biology)

*Qualifying degree from Dalhousie University, Canada*

- ✎ Octopoteuthidae is a family of mid to deep-water squid that plays an important role in open-ocean food webs, yet the taxonomic status of octopoteuthid species is largely uncertain. As a result, the basic biology and ecology of these squids is unknown and represents a major gap in understanding how oceanic food webs function. The purpose of this project is to undertake a morphology-based revision of the family Octopoteuthidae concurrent with population genetics analysis. Specimens from New Zealand will be examined first before turning to international collections. The genetic relatedness within the family will be quantified as will the relation between it and the closely related families Lepidoteuthidae and Pholidoteuthidae. The results of this research programme will resolve major taxonomic issues, provide a guide to the accurate identification of octopoteuthid species, and tie directly into global Barcode of Life initiatives in which open-ocean cephalopods are currently underrepresented.

Kyle W. MORRISON – Massey University (Biological Sciences)

*Qualifying degree from – Simon Fraser University, Canada*

- ✎ In the past 30 years, the global population of the Southern Rockhopper Penguin (*Eudyptes chrysocome*) has declined by 30-55%. Campbell Island, New Zealand's southernmost Antarctic territory, formerly supported a large colony of 800,000 breeding pairs, but from 1942 to 1985, the population declined by a startling 94%. The leading hypothesis to explain the species rapid decline is that global warming of the oceans has altered the amount or availability of the penguins' food supply. Thereby resulting in poor reproductive success or elevated mortality of juveniles or adults, but there is currently very little information on Rockhopper Penguin demography or diet from Campbell Island. Kyle's proposed research will seek to reveal the populations current trend, which demographic drivers are driving the trend, how the foraging behaviour of adults and diet of adults and chicks relates to their physiological condition and survival.

Tami J. NICOLL – University of Auckland (Geography)

*Qualifying degree from – Simon Fraser University, Canada*

- ✎ Predicting response to disturbance within a river system, whether natural or human-induced, is of utmost importance to river management yet remains a great challenge worldwide. While progress has been made on determining what type of challenges can be expected following a given disturbance, many questions remain on the temporal and spatial variations of the response. Tami's research would examine the spatial and temporal variability of disturbance response and relate this to connectivity of runoff and sediment within the system at scales ranging from channel reach to catchment. Understanding river dynamics at human lifetime scales is clearly important for successful river management and in the development of rehabilitation projects. This field-based research seeks to address these practical issues whilst advancing our understanding of geomorphic instability, landscape evolution and temporal and spatial variations of sediment flux at the catchment scale.

## Colombia – 1

Juan Carlos GARCIA RAMIREZ – Massey University (Natural Resources)

*Qualifying degree from – Universidad Del Valle, Colombia*

- ✎ In this study, Juan Carlos will generate a comprehensive phylogeny for the Avian family Rallidae (coot, crane, weka, rail, pukeko, takehe) in New Zealand using mitochondrial DNA (mtDNA) sequences to explore the phylogenetic relationships of genera and most species within this cosmopolitan avian radiation. This clade is part of a large radiation having Gondwanan origins. With indications of Gondwanan histories, the rails offer a unique opportunity to examine the biogeographic history of radiation in Oceania. Using mtDNA sequences from the species with distribution in the Oceanic region, he plans to present a molecular phylogenetic analysis and reconstruction of the evolutionary relationships and history of the Rallidae, with the following objectives:
  - ✎ To develop a well-supported phylogenetic hypothesis for the group, including placement of the extinct adzebills of the genus *Aptornis*;
  - ✎ To estimate a timescale for the diversification of the rails in Oceania; and
  - ✎ To reconstruct their biogeographic history

## Germany - 1

Christian ROSCHAK – University of Canterbury (Forestry)

*Qualifying degree from Georg August Universität Göttingen, Germany*

- ✎ The increasing importation of sawn hardwood and softwood in New Zealand highlights the potential for indigenous forestry, a demand for high quality specialty timbers that cannot be fulfilled by current exotic plantations. Sustainable forestry ventures in New Zealand based upon high-value native tree species offer a potential 'win-win' opportunity for being profitable for the landowner as well as beneficial for native biodiversity. It is crucial to develop financially viable and attractive strategies for sustainable forest management practices as establishing native plantations requires significant upfront cost with a long-intermittent period until revenue is realised from timber harvest. Christian's research on the establishment and sustainable management of native plantations and native forests as a future source of high ecological and economical value is an excellent opportunity to develop schemes to increase tree growth during the first 10 years as this is key to a significant diminution of high upfront costs.

## Iran – 1

Hanieh SAEEDI – University of Auckland (Marine Biology)

*Qualifying degree from Shahid Beheshti University, Iran*

- ✎ The majority of our planet surface is oceanic. Knowing the distribution of species and their causes is essential in order to understand ecosystems, manage invasive species, select reserves and predict the impacts of environmental changes on natural resources. So far, the distribution of ocean life has only been described as surface patterns or depth transects, and biogeographic patterns are largely based upon anecdotal evidence. At present no available classifications cover the entire ocean, and all await substantiation from analysis of species distribution data. In this study, Hanieh intends to identify the ideal locations of MPA as part of a global network in the context of marine biogeography and the consequences of climate change shifts in species distribution for such networks. The study will utilise both a large global species database and a selected taxon which will be studied in more detail.

## Turkey – 1

Zerrin TURKELI RAMADAN – University of Auckland (Mechanical Engineering)

*Qualifying degree from the University of Tokyo, Japan*

- ✎ Micro combustors are one of the key components of an Ultra Micro Gas Turbine (UGMT). In order to realise UMG as a viable power source for portable small electronic and mechanical miniature devices, it is necessary to develop a micro combustor with higher efficiency and improved flame stability using hydrocarbons. HEX-Combustor is an innovative micro combustor with an integrated heat-exchanger which consists of a triple tube system, and was proposed in order to enhance the

flame stability and efficiency by heating the reactants with the combustion products and turbine exit gasses. However, the experimental analysis of the heat transfer mechanism in this small scale triple tube system is very difficult. Therefore, a CFD simulation of the heat transfer mechanism of HEX-Combustor will aid in understanding the systems effectiveness and will be a step on the way to developing UGMT as a viable power source for small electronic and mechanical devices.

## **United Kingdom – 1**

Katy J. CHAMBERLAIN – Victoria University of Wellington (Earth Sciences)

*Qualifying degree from University of Leeds, UK*

☞ The Bishop Tuff eruption, about 760,000 years ago in eastern California is one of the great eruptions on Earth in the last 2 million years and is representative of a type of event known as supereruptions. The information contained in the crystals that were growing in the Bishop Tuff magma at the time of the eruption has only sketchily outlined for selected portions of the deposits. Katy's project will take advantage of advances in crystal-specific analytical techniques to yield a uniquely detailed picture of magma chamber processes prior to the eruption. She will use the records of compositional zonation in the different minerals in samples collected from the earliest to latest parts of the Bishop deposits to establish the pre-eruptive state of the magma chamber and follow the processes that finally gave rise to the onset of eruption.

## **United States of America – 2**

Mark L. GALATOWITSCH – University of Canterbury (Ecology)

*Qualifying degree from University of Georgia Athens, GA, USA*

☞ Generalist organisms exploit habitats that can be highly variable and unpredictable. New Zealand offers an excellent opportunity to test if unpredictable habitat conditions (due to highly variable rainfall) can promote generalists and discourage specialisation. Mark will study a suite of known aquatic invertebrate generalists and how they are able to exploit a wide range of habitat and environmental conditions. He plans to use field and laboratory experiments to evaluate their flexible life history traits across gradients of water permanence and predator presence in alpine ponds. The role of dispersal between habitats in maintaining regional populations will also be evaluated via molecular techniques to determine the role of migration, genetic drift and natural selection. Understanding how unpredictable habitat conditions influence speciation and species distributions will allow us to better manage local human impacts on aquatic diversity and the influence of larger scale global climate change that will likely lead to less predictable weather patterns.

Nicholas R. SMITH – University of Auckland (Philosophy: Virtue Theory)

*Qualifying degree from Stony Brook University, New York, USA*

☞ Nicholas will provide a topology of contemporary virtues theories in order to clarify all of the options one may take in contemporary virtue theory and how these options are related to one another, what they imply for virtue theories of right action, epistemic warrant and aesthetic appreciation. Using this classification, he will argue for what he takes as the best of these theories and then use this theory to answer standard objections posed to virtue ethicists and virtue epistemologists by their critics.