Climate Adaptation

SCIENCE AND
INDUSTRY
ENDOWMENT
FUND

SIEF is supporting the Genomic basis of adaptation to climate change Project

the **challenge**

It is becoming clear that some species have little or no capacity to adapt to climate change while others have substantial capacity to adapt, either by 'plastic' physiological responses or by genetic change. Significantly, early evidence indicates substantial differences in the adaptive potential of species groups; for instance, 'climate specialists' in the wet tropics appear to have much less potential than other species. It has been proposed that this is due to 'DNA decay' versus 'DNA duplication'; the specialists have somehow lost the genetic architecture encoding the metabolic systems required to adapt, whereas generalists have the ability to evolve new genes that acquire new functions.

the **response**

Understanding the genetic characteristics of species with various capacities to adapt to climate change and testing the generality of these signatures across multiple groups and environments, will build this knowledge into predictive models of biodiversity response to climate change. Insects will be the focus of much of the experimental work as they are experimentally tractable, highly diverse, and widely used as indicators of environmental health and biodiversity.

the **collaboration**

In order to address these challenges, the Climate Change Project brings together a strong collaboration between CSIRO, The University of Melbourne and Monash University.

projected **impact**

By introducing evolutionary perspectives and incorporating genomics into biodiversity conservation , this strategic research will assist policy makers and planners predict species winners and losers under climate change; identify proactive management strategies to preserve diversity across multi-species groups and landscapes; and assist with the management of key species which are current or potential pests, disease vectors and/or invasives.

- Widespread application of the Climate Change Project tools and models will enable key species of conservation, economic or public health concern to be managed more effectively.
- Identification of candidates that should be monitored for adaptive responses in threatened and keystone species.
- The project will help to indicate potential resilience present in Australia's flora and fauna to adapt to climate change.
- Linking this improved understanding of adaptive capacity with spatial modelling tools will enable shifts in the distribution of species and ecological communities under climate change to be predicted more reliably.

Contact us

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What is SIEF?

Spanning a history of over 85 years, the Science and Industry Endowment Fund (SIEF) provides grants to science and scientists for the purposes of assisting Australian industry, furthering the interests of the Australian community and contributing to the achievement of Australian national objectives. In 2009 this unique and esteemed funding arrangement was rejuvenated by a gift from CSIRO, made possible due to the commercial success of CSIRO's fast WLAN, or Wi-Fi technology. Thus past accomplishments are reinvested into new science and innovation for the nation.