Climate Change and Biosecurity

Dr Liwan Liyanage from the School of Computing and Mathematics, along with colleagues in the School of Natural Sciences and at the University of Wollongong, has developed a computational framework to manage biosecurity information and is looking at the effects of climate change on biosecurity. This research has been funded by the Australian Centre of Excellence for Risk Analysis.

'A large part of the Australian economy depends on primary agricultural produce and with globalisation happening at a rapid rate, the opportunities for the spread of pests and diseases are also increasing' says Dr Liyanage. 'Biosecurity refers to how well we can control and prevent unwanted plant, human and animal disease and other biological threats', Dr Liyanage explains. 'To identify biosecurity risks, analysts gather information and collate data on a large number of factors from areas such as the environment, agriculture and public health. But with this level of complexity, traditional statistical approaches are not sufficient. The team will aim to establish a "biosecurity intelligence framework" as an effective way of identifying useful and previously undiscovered information. The framework will provide a system of analysis that will hopefully provide better ways of addressing biosecurity risks and form part of an integrated biosecurity research infrastructure.'

The researchers have integrated agriculture and environmental chemistry through an innovative data mining analysis to create a model which has been tested using a case study for long-term climate change prediction. Based on the climate change data, the researchers have looked at how to optimise future crop choice, biodiversity and land use and considered detailed factors such as pollution characteristics, crop yield and disease outbreaks for a variety of crops.

The development of a computational biosecurity framework model is part of urgently needed research infrastructure for a number of issues, such as Australia's preparedness for diseases and their management in instances of disease outbreak. A good level of national preparedness is essential for public health, agriculture and the environment and the new model will contribute to informing biosecurity strategic policies and decisions across Australia.

Project Title: Biosecurity information sharing and data mining for building a biosecurity intelligence and decision making framework
Funding has been set at: $30,000
Contact Details: l.liyanage@uws.edu.au
http://www.uws.edu.au/computing_mathematics
August 2009