Overview of CLIMsystems Staff, Software and Training

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Professor Richard Warrick (Director)
Dr. Wei Ye (Director and Head of Software Development)
Dr. Yinpeng Li (Senior Climate Scientist)
Dr. Peter Kouwenhoven (Senior Climate Scientist)
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Appointment Pending (Staff Assistant)
Meng Wang, Salem Sarwar (PhD Scholars)

Associates (Global)

Professor Tom Wigley (USA, Australia), Mr. Joel Smith (USA), Dr. Graham Sem (Pacific), Dr. Rex Cruz (Philippines/Asia), Dr. John Pulhin (Philippines/Asia), Dr. Sennye Masike (Botswana/Southern Africa), Dr. Jason Vogel (USA), Mr. Donovan Burton (Australia), Mr. Graham Ashford (Australia), Ms. Patrice Day (USA), Ms. Olivia Warrick (New Zealand/Pacific), Mr. David Bishop (New Zealand/Pacific), Mr. Brian Lazar (USA), Mark Evans (Australia)

Scientific Advisory Panel

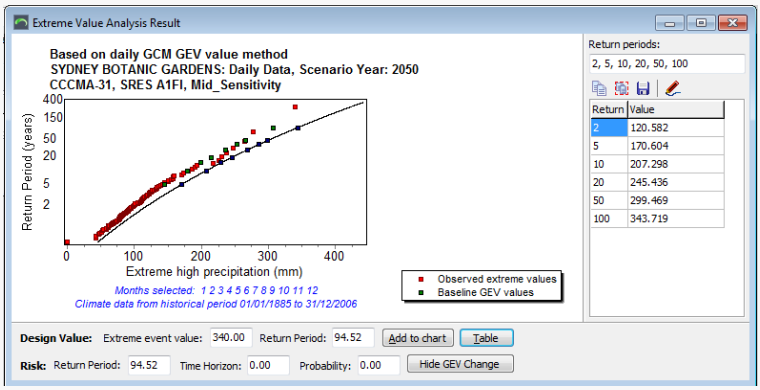
Professor Tom Wigley (Chair), Jerry Meehl (NCAR), Bruce Hewitson (University of Cape Town), Martin Manning (University of Victoria), John Hunter (CSIRO), Robert Wilby (Loughborough University), Mike Manton (Monash University)

ABOUT CLIMsystems, New Zealand

- ✓ CLIMsystems Ltd designs, develops and markets advanced, user-friendly software systems for assessing impacts and adaptation to climate variability and change.

- ✓ CLIMsystems offers software licenses and associated training services, technical assistance and consultation to a range of national and local governments, planners, educators, students, international agencies, private consultants and companies throughout the world in order to meet their needs for addressing climate risks.

- ✓ CLIMsystems strives to empower individuals, organizations and communities to reduce the risks posed by climatic variability and change, through the provision of software tools and scientific information for better decision-making. It is dedicated to ensuring that its customers receive the highest quality products and support required to successfully use and benefit from its software and services.



- ✓ CLIMsystems has assembled an excellent team of climate change adaptation and risk assessment experts with a combined experience of over 200 years. Six members of staff are Nobel Laureates and, as such, represent the strong scientific underpinning of the CLIMsystems suite of software and services. Five members of staff are registered in the UNDP National Communications Support Programme (NCSP) Roster of Experts. Staff have worked in over 50 countries. CLIMsystems maintains an array of international associates. Our staff is multilingual with capabilities in several languages including English, French, Dutch, German, Spanish, Filipino, Cantonese, and Mandarin.

RECENT PUBLICATIONS

Li, Y., Ye, W., Yan, X.. (2011). Development of a Co-evolutionary Decision Support System - Food and Water Security Integrated Model System (FAWSIM). APN Science Bulletin. Issue 1. March 2011: 23-28.

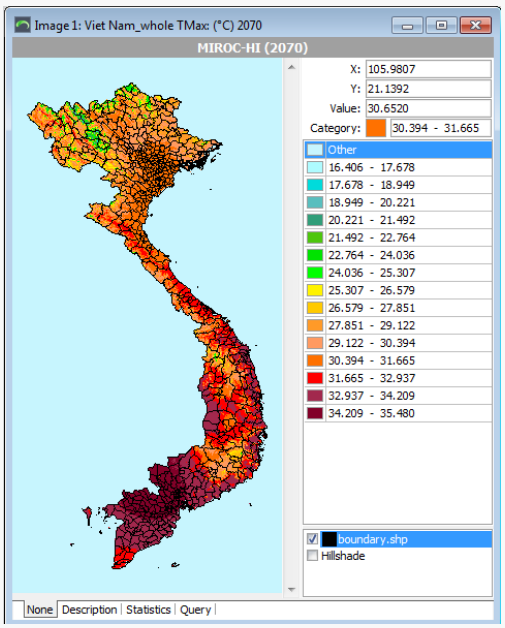
Urich, P., Li, Y., Kouwenhoven, P., Ye, W. (2011). Analysis of the January 2011 extreme precipitation event in the Brisbane River Basin. A CLIMsystems Technical Report. http://www.climsystems.com/downloads/CLIMsystemsBrisbaneBasinExtremePrecipitation_2011.pdf

Li, Y., Ye, W. (in press). Applicability of Ensemble Pattern Scaling Method on Precipitation Intensity Indices at Regional Scale. *International Journal of Climatology.*

Urich, P. (2010). CLIMsystems Works with the Nauru Government in its Second National Communication for the United Nations. Press Release. http://www.prweb.com/releases/2010/08/prweb4425224.htm

Li, Y., Ye, W. (in press). Food Security and Environmental Sustainability with the Changing Climate in Jilin Province, China. *Journal of Sustainability*.

Pulhin, J. (2010). Training in the concepts of climate change impacts and vulnerability and the use of SimCLIM. Proceeding of the training conducted under the APN project: Capacity Development on Integration of Science and Local Knowledge for Climate Change Impacts and Vulnerability. Tabaco City, Albay, Philippines 26-29 April, 2010. http://www.apn.gr.jp/newAPN/activities/CAPaBLE/2009/CIA2009-02-Pulhin/SimClim%20Training_ProceedingsAPN.pdf



Urich, P. (2010). Preliminary Climate and Sea Level Changes for Vanuatu Through the Application of SimCLIM. http://www.adaptationlearning.net/project/preliminary-climate-and-sea-level-changes-vanuatu-through-application-simclim

Kouwenhoven, P. et al. (2010). An overview of modeling climate change: impacts in the Caribbean Region with contribution from the Pacific Islands. UNDP. P.266. http://www.adaptationlearning.net/reasearch/overview-modeling-climate-change-impacts-caribbean-region-contribution-pacific-islands

Warrick, R. 2009. From CLIMPACTS to SimCLIM: development of an integrated assessment model system. In: *Integrated Regional Assessment of Global Climate Change.* Editors: C. Gregory Knight, Jill Jäger. Cambridge University Press. Pgs. 280-311.

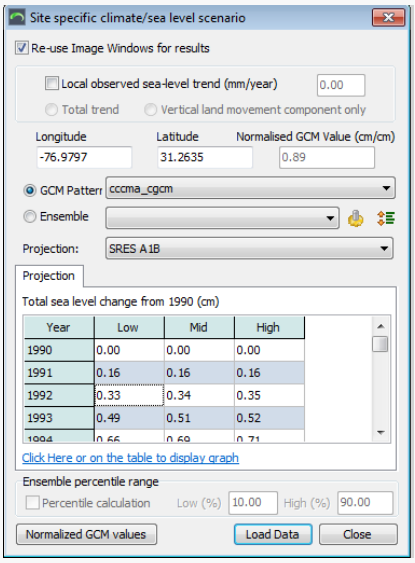
ABOUT SIMCLIM

SimCLIM is a computer model system for examining the effects of climate variability and change over time and space. Its "open-framework" feature allows users to customise the model for their own geographical area and spatial resolution and to attach impact models.

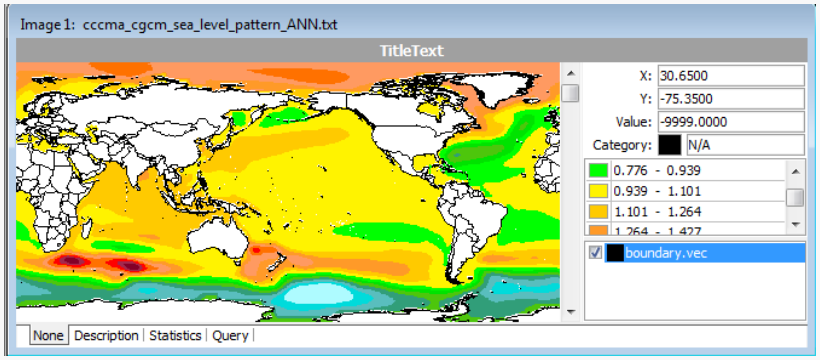
SimCLIM is designed to support decision making and climate proofing in a wide range of situations where climate and climate change pose risk and uncertainty. A user customised SimCLIM Open Framework System software package has the capacity to assess baseline climates and current variability and extremes. Risks can be assessed both currently and in the future. Adaptation measures can be tested for present day conditions and under future scenarios of climate change and variability. With the program, users can conduct sensitivity analysis and examine sectoral impacts of climate change. SimCLIM supports integrated impact analysis at various scales.

Some of the salient features of SimCLIM are:

- **Uniqueness.** So far, there is no system in the world comparable to SimCLIM. There are some specialized software systems that can perform parts of what SimCLIM can do, but not in the comprehensive, user-friendly fashion of SimCLIM. For example, the MAGICC/SCENGEN system generates scenarios of climate change at the global and regional scales, but does not have the capacity to link to data and impact models at the national to local scales where impact and adaptation assessments are required. There are also a range of integrated assessment models (IAMs, of which SimCLIM is one), but these tend to focus on mitigation issues (i.e. reducing greenhouse gas emissions, as opposed to impacts and adaptation) at global-regional scales. One external assessment of the SimCLIM system (by a large engineering firm) concluded that SimCLIM was unique and powerful and was at least two years ahead of any competitor.



- **Integration.** The key feature of each of the CLIMsystems products is the unique *integration* of data and models that allow simulations of the effects of climate variability and change (from global to local) which can be performed simulations in a quick, seamless manner. The ease and rapidity of operation are the key advantages to these system simulations, which otherwise would have to be performed separately in a tedious, time-consuming fashion. Increasingly, users are discovering that SimCLIM can provide them with the capacity to add a "climate change layer" to their existing assessments across a range of fields – land use planning, water resource planning, flood risk reduction, health risk, crop yield assessments, etc. In a world that is has just recently awakened to the potential threats posed by a changing climate, the demand for this kind of capacity is high and growing.

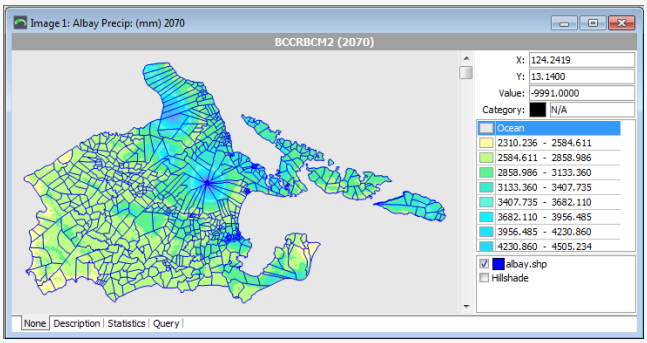


- **Multiple runs and sensitivity analyses:** In the absence of a system like SimCLIM, climate change impact and adaptation analyses typically involves an "input/output" mode of analysis. In this mode, the outputs of climate models are fashioned into scenarios, which, in turn, provide the input to impact models, the output of which is input to evaluation of adaptation options -- a very linear, one-way, cumbersome and time-consuming process. For large projects

or assessments, these tasks are often allocated to separate teams or task groups. It is very difficult to 'back-track" and re-run the analysis with a different scenarios or to conduct sensitivity analyses.

In contrast, with the SimCLIM system these steps are integrated. There is flexibility to construct a myriad of scenarios under various assumptions and uncertainties concerning GHG emission scenarios, AOGCM model results, and climate sensitivities emanating from climate feedbacks. The scenario generation tools are linked to impact models, so that impact analyses can be conducted in a seamless manner. This means that analyses can be run quickly and efficiently in an internally-consistent fashion. Importantly, there is complete scope for re-running the system under different assumptions and to explore alternative scenarios. Finally, because the system provides a platform for model and data integration, it encourages the kind of inter-disciplinary integration of expertise required to understand the "big picture", instead of the "silos" of task teams.

- **Easily updated:** In the absence of a system like SimCLIM, the results of impact and adaptation study are usually hard-copy reports with limited "shelf-life". The "use-by" date of these reports is often relatively short, due to rapid improvements in scientific knowledge, the availability of new global climate model runs, extended and improved databases, and so on. It is not long before the results and conclusions of the study need to be re-visited. But it becomes prohibitively expensive and demanding to do so in the conventional mode of analysis.



In contrast, it is a relatively simple matter to update SimCLIM by importing new spatial and time-series data and by modifying component impact models. The implications of such changes can then be easily examined by re-running the system. In effect, SimCLIM become an evolving tool, changing as the science changes.

- **Part of the decision-making process:** Rather than "science apart", SimCLIM is specifically designed for bridging the gap between science and policy/planning. While remaining a tool that is scientifically rigorous, it is nevertheless sufficiently user-friendly, transparent and intuitively visual to be understood, and even used, by non-scientists in planning and policy-making situations. Because of this flexibility, SimCLIM can become integrated as part of the planning process itself. For example, in regional council workshops in Australia, SimCLIM is run "live" during workshop sessions in order to do "on-the-spot"

analyses that can help illuminate the implications of, for example, different GHG scenarios, global climate models results or impact model parameters. Importantly, this encourages planners and decision-makers to become engaged in the science themselves, and not simply to be the recipients of a scientific report.

ABOUT OUR TRAINING PROGRAM

TOPICS COVERED

- Overview of user-interface (menus, toolbars, area selection, options, help)
- Global climate change projection (baseline, emission scenarios, time-horizon)
- Spatial scenario generation (climate, GCMs, ensembles)
- Image tools (legend, palette, synchronisation, reclassification)
- Map calculator
- Site specific scenario generation (climate, sea level rise)
- Site data analysis (plots, trends, exporting)
- Extreme events (historical, projected)
- Impact models (rainwater tank design)
- Extras (pattern browser, shape files, site manager, area browser, batch processing, linking with other tools)
- Future developments (AR5, GCM daily outputs, multiple stations)

The Key Topics listed above are covered through presentations and the application of the SimCLIM modelling system for climate change risk and adaptation assessment.

Adaptation Options

Impact Models

Risk Assessments

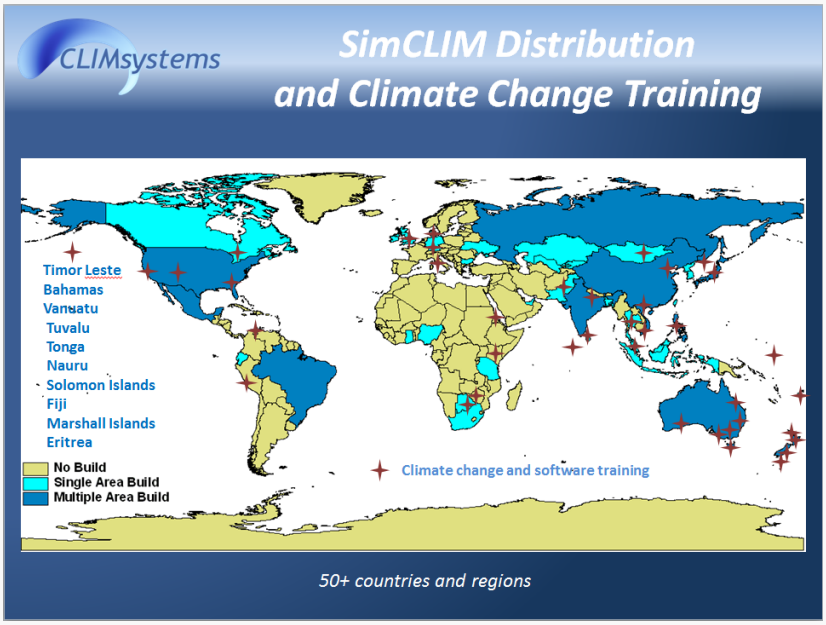
Sea Level Rise

Climate Data Management

Extreme Event Analysis

BENEFITS FROM PARTICIPATING

The program relies heavily on "hands-on," "learning-by-doing" practical exercises. Together with a set of hypothetical situations, problems and datasets, SimCLIM is used by participants to examine current climate variability and extremes, create scenarios of climate changes, analyse sectoral impacts and assess adaptation options.



EXPRESSIONS OF PARTICIPANTS

"Loved the training and the people and have really enjoyed getting to know the system."

"I just wanted to express our gratitude to you and your team for the excellent training."

"Much more user friendly than GIS and with applications relevant for planners and policy makers."

"The training and the discussions have been great."

"A very useful and practical tool and a very committed, diligent and experienced staff."