UNSW SYDNEY | Australia's Global University

Mapping UNSW Impact
Global Development

Primary SDG	**13: CLIMATE ACTION**
Broad theme	Climate projections for the Southwest Pacific
Research	Modelling climate in the Southwest Pacific region and making projections for individual countries
Impact region	Southwest Pacific (Fiji, Vanuatu, Samoa, Solomon Islands, Tonga)
Faculty	Science
School/Institute	Climate Change Research Centre (CCRC)
Academic	Professor Jason Evans
Project partners	Tbc – potentials include French Government/NGOs, CSIRO, Pacific Island Governments. Funding of around $3 million for three years required
Related SDGs	15: Life on Land
	2: Zero Hunger
	6: Clean water and sanitation

Elevator pitch

UNSW can model regional climate in the Southwest Pacific and make climate projections for up to 50 years ahead for individual countries, helping them to better plan for farming and extreme conditions and to ensure they have enough food, water and shelter.

The Challenge: What effect will climate change have on poor, vulnerable Pacific Island countries?

Many Pacific Island countries rely on local crops to feed their population. These crops need reliable weather and rainfall. Each island has its own unique ecosystem, depending on its topography, and climate can vary from high to low-lying areas.

Climate change is creating uncertainty for many Island communities. Extreme conditions like cyclones, heatwaves and flash flooding threaten local agriculture and the integrity of housings and buildings. Many of these countries have basic weather stations but these stations do not have the capacity to simulate and project climate conditions in their region.

UNSW's solution: Model regional climate and make projections for each island

Jason worked with the CSIRO to make regional climate projections in the Southwest Pacific region in 2011-2013. For various reasons, the model was on a 50-kilometre scale, making the outputs irrelevant for islands that are smaller than 50 kilometres wide or long. From 2012-2015, Jason worked with the NSW Government to produce regional climate projections for Southeast Australia at a 10-kilometre resolution.

Jason would like to return to the Pacific region to make modelling projections at a 2-kilometre scale, a much higher resolution than the prior project that will enable more accurate and relevant projections to be made for smaller countries. For larger islands with diverse topography, a higher resolution means projections can be made for different parts of the island. Projection outputs include future temperatures, winds, rainfall, ocean currents, ocean water temperatures and humidity, as well as the likelihood of extreme weather events like cyclones, heatwaves and flash flooding. This higher resolution model requires more data and manpower: Jason estimates $3 million of funding will be required over three years.

In a self-funded project, Jason is currently modelling at this high-resolution level for large tropical cities around the Pacific to determine the impact these hot cities are having on regional weather. Developing cities like Jakarta, Kuala Lumpur, and Manilla are heating up because of human activity and buildings resulting in extreme weather conditions, like flash flooding, that threaten poor inhabitants and suburbs. The next step is to look at potential solutions, such as increasing green space and using reflective surfaces, to cool these cities down.

The Impact: Protect food and water supply, and prepare for extreme events

With these projections, Pacific Island governments and industries can anticipate the impact of climate change on their country and adjust their plans. Will conditions ensure they have enough food and fresh water? Modelling will also help them to better prepare for extreme weather events. Factors like the degree of flooding, the speed of winds and length of projected heatwaves can be factored into key decisions around farming, infrastructure and planning.

Modelling of tropical cities allows for solutions on how to cool them down to be tested. Cooler cities will experience less severe climate conditions, helping to make the poor inhabitants of these cities less vulnerable.

Researcher

Professor Jason Evans specialises in regional climate, particularly water cycle processes over land and how they change because of land use and climate. His focus includes river flow, evaporation/transpiration, water vapor transport and precipitation. He is inspired to help some of the world’s most vulnerable communities at modelling scales that are conducive to making a practical impact.

Ben Falkenmire 27.09.17