

NCCARF provided me with a PhD Travel Grant to visit academics in USA. Originally I had planned to visit Prof Don Miles (U. Ohio) and Prof Ray Huey (U. Washington), but with a small amount of additional funds, I was also able to visit Prof Michael Angilletta (U. Arizona) and Prof Michael Sears (Bryn Mawr College, Pennsylvania). Interestingly, I had no agenda in visiting Profs Angilletta and Sears. The only link I had was that they study similar systems to me. I was able to spend a week with each, discussing various aspects of thermal ecology, ectotherm physiology and experimental design. Ultimately, we established a collaborative project to examine the utility of a spatial model in studying lizard thermoregulation, in particular, in developing a model to examine the importance understanding spatial heterogeneity relative to the organism of interest. This paper will form a chapter of my PhD thesis.

I then visited Prof Don Miles in Ohio, where we established a study to examine the effects of habitat structure, lizard physiology and environmental temperature fluctuations on the evolution of foraging mode in lizards. This study may not form a chapter of my thesis. It will, however, rely on information from the collaboration with Prof Sears, incorporating the importance of spatial thermal heterogeneity, and will provide essential information for my penultimate thesis chapter, and final model.

With Professor Huey, I discussed methods and strategies to sample thermal heterogeneity in way that optimises the information content of the data relative to the effort invested. Importantly, if we calibrate this technique appropriately, we will be able to examine historic studies and assess the confidence of their results. It may have the ultimate effect of reducing our confidence in studies where technology or the serendipitous nature of studies necessitated small sample sizes, but even if this is true, it will at least provide an honest insight to the confidence of those studies, and hence the best understanding possible of systems studied.

Taken together, these collaborations will be useful to my PhD, which focuses on using a mechanistic model of a behavioural thermoregulator to assess the effect of climate change on small ectotherms. The spatial concepts discussed with Sears and Angilletta will provide the skeleton of the model: a 3D matrix of environmental temperature in a spatially and temporally explicit arrangement. Behaviour and foraging mode information from my study with Miles will inform the behaviour of a putative behavioural thermoregulator living in the model, and discussions and study with Huey will allow me to assess the accuracy of my thermal model and to predict the sampling effort required to gather the thermal data necessary to answer questions posed in my study.

The model I develop will examine the capacity for behavioural thermoregulation to buffer the negative impact that climate change is likely to have on the fitness and survival of small ectotherms. The most recent correlative models predict 20% of lizards will be extinct by 2080, an alarming number. A mechanistic model may be useful in determining the accuracy of this estimate. More accurate estimates will obviously benefit conservation and adaptation efforts in protecting Australia's unique biota.

This opportunity was, without a doubt, one of the most influential parts of my PhD thus far, and has improved my ideas and hypotheses without end. Being able to spend time with the people I did has provided me with an entry point into the field I ultimately hope to become a professional in. I am now on personal terms with some of the biggest names in my research field, which is invaluable. The professors I met were all impressed with the fact that I was able to travel to meet people without

needing to necessarily enrol in a course or have preconceived, concrete, tangible outcomes that must dictate the nature of our discussions: having a highly flexible agenda allowed our discussions and ideas to develop organically, ultimately with the effect of improving my studies and forging strong collaborations.