



# Award Details

## Evolution and Diversity Dynamics of Late Cretaceous Dinosaurs

### Research Details

<b>Competition Year:</b>	2013	<b>Fiscal Year:</b>	2013-2014
<b>Project Lead Name:</b>	Evans, David	<b>Institution:</b>	University of Toronto
<b>Department:</b>	Ecology and Evolutionary Biology (St. George Campus)	<b>Province:</b>	Ontario
<b>Award Amount:</b>	33,000	<b>Installment:</b>	1 - 5
<b>Program:</b>	Discovery Grants Program - Individual	<b>Selection Committee:</b>	Geosciences
<b>Research Subject:</b>	Paleontology, paleobiology	<b>Area of Application:</b>	Earth sciences
<b>Co-Researchers:</b>	No Co-Researcher	<b>Partners:</b>	No Partners

### Award Summary

The pattern of terrestrial biodiversity leading to the terminal Cretaceous mass extinction event continues to be hotly debated. The long-term goal of this research program is to investigate large scale evolutionary and biodiversity patterns in large-bodied terrestrial vertebrates, specifically Cretaceous dinosaurs, and evaluate their relationship to climatic and environmental change. This program aims to integrate comparative anatomy, growth and bone histology, and phylogenetic systematics of dinosaurs with emerging paleoclimatic and paleoenvironmental data to evaluate the role of these Earth systems changes on terrestrial vertebrate evolutionary and ecological dynamics, biogeography, and biodiversity leading up to the end-Cretaceous extinction event. Fieldwork associated with this program will extend knowledge of the distribution of Cretaceous terrestrial vertebrates in paleontologically poorly known regions of Canada. The systematics research in this proposal will have a long-lasting impact because it will provide fundamental data requisite for more sophisticated, larger meta-analyses of paleoecological and biodiversity change. This work will apply new modeling methods to correct for sampling biases in the context of high-resolution geological data to test hypothesized biodiversity patterns in the Late Cretaceous more rigorously than ever before. This research will therefore provide a better understanding of the role of climate and environmental change on patterns of dinosaur evolution, biogeography, and diversity leading up to the end-Cretaceous extinction event. As such, it will shed new light on the causes and consequences of mass extinctions in general, which is pertinent to the biodiversity crisis we are facing today. Finally, this research has broader implications for understanding the historical relationship between evolution and environment, and will contribute to our knowledge of terrestrial ecosystem evolution.