

Peter David Smits

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<https://psmits.github.io/>

Experience

- **University of Chicago** Chicago, IL
Doctoral Researcher Sept 2012 – June 2017
 - Analyzed datasets of fossil occurrence information covering 65-250 million years of geologic time in both terrestrial and marine settings
 - Developed new hierarchical Bayesian models using Stan for describing species extinction risk and regional species ecological composition which resulted in 2 publications and 6 presentations
 - Mentored graduate and undergraduate students in statistics, Bayesian modeling, Stan, and R
- **Monash University** Melbourne, AUS
Postgraduate Researcher Sept 2010 – Aug 2012
 - Collected and analyzed three-dimensional scans of mammals tooth kinematics using R, resulted in one paper
 - Analyzed crocodile feeding biomechanical data in R, resulted in one paper
- **Macquarie University** Sydney, AUS
Paleobiology Database Intensive Workshop in Quantitative Paleobiology July 2011 – Aug 2011
 - 5 week intensive workshop on statistical and analytical methods and their applications in paleobiology
 - Trained in using R for birth-death modelling, basic Gaussian processes, exploratory multivariate data analysis, phylogenetic comparative methods, and geometric morphometrics
- **American Museum of Natural History** New York, NY
NSF Research Experience for Undergraduates Internship June 2009 – Aug 2009
 - Analyzed similarities in bat tooth shape in a phylogenetic context, resulted in one publication
- **University of Washington** Seattle, WA
Undergraduate Research Assistant Jan 2008 – June 2010
 - Analyzed relationship between mammal tooth size and body size using linear regression in order to predict body sizes of extinct mammals, resulted in one publication

Education

- **University of Chicago** Chicago, IL
Ph.D. in Evolutionary Biology Sept 2012 – June 2017
- **Monash University** Melbourne, AUS
M.Sc. in Biological Sciences Sept 2010 – Aug 2012
 - Vice-Chancellor's Commendation for Master's Thesis Excellence
- **University of Washington** Seattle, WA
B.S. in Evolutionary and Ecological Biology Sept 2006 – June 2010

Technical Skills

Statistical/Analytical: Bayesian data analysis, multilevel/hierarchical/mixed-effects models, generalized linear models, time-series analysis, survival analysis, longitudinal and cross-sectional data, discrete-time hidden Markov models, network analysis/graph theory, exploratory multivariate data analysis, clustering, machine learning techniques (e.g. random forests), measurement error/missing data modeling, model and variable selection

Technologies: R (ggplot2, knitr, parallel, caret, igraph), Stan, JAGS, L^AT_EX, git, Linux command line

Other: near-fluency French, dual US–Australian citizen, radio experience

Publications

- Stewart M Edie, **Peter D Smits**, David Jablonski. Probabilistic models of species discovery and biodiversity comparisons. *Proceedings of the National Academy of Sciences*, 114(14):3666-3671, 2016. **IF 9.423**
- Peter D Smits**. Expected time-invariant effects of biological traits on mammal species duration. *Proceedings of the National Academy of Sciences*, 112(42):13015-13020, 2015. **IF 9.423**
- Liliana M Davalos, Paul M Velazco, Omar M Warsi, **Peter D Smits**, Nancy B Simmons. Integrating Incomplete Fossils by Isolating Conflicting Signal in Saturated and Non-Independent Morphological Characters. *Systematic Biology*, 63(4):582-600, 2014. **IF 14.387**
- Christopher W Walmsley, **Peter D Smits**, Michelle R Quayle, Matthew R Mc-Curry, Heather S Richard, Christopher C Oldfield, Stephen Wroe, Phillip D Clausen, and Colin R McHenry. Why the fong face? The mechanics of mandibular symphysis proportions in crocodiles. *PLoS ONE*, 8(1):e53873, 2013. **IF 3.234**
- Peter D Smits**, Alistair R Evans. Functional constraints on tooth morphology in carnivorous mammals. *BMC Evolutionary Biology*, 12(1):146, 2012. **IF 3.407**
- Gregory P Wilson, Alistair R Evans, Ian J Corfe, **Peter D Smits**, Mikael Fortelius, and Jukka Jernvall. Adaptive radiation of multituberculate mammals before the extinction of dinosaurs. *Nature*, 483:457-460, 2012. **IF 39.138**

Selected Conference Presentations (last 3 years)

- Speaker** Geological Society of America Annual Meeting, "Taxon occurrence as a function of both biological traits and environmental context: the changing North American species pool," Denver, CO, Sept 2016
- Speaker** Evolution Meetings, "How macroecology affects macroevolution: the interplay between extinction intensity and trait-dependent extinction in brachiopods," Austin, TX, June 2016
- Speaker** Geological Society of America Annual Meeting, "How do biological traits affect brachiopod taxonomic survival? A hierarchical Bayesian approach," Baltimore, MD, Nov 2015
- Speaker** Evolution Meetings, "Death and taxa: time-invariant differences in mammal species duration," Guarujá, Brazil, June 2015
- Speaker** Geological Society of America Annual Meeting, "Gambling with Australian brachiopods," Vancouver, BC, Oct 2016
- Speaker** Evolution Meetings, "Cenozoic mammals and the biology of extinction," Raleigh, NC, June 2014