

**Application of quantitative vegetation reconstruction techniques
to Late Holocene records at Inshriach Forest**

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Submitted by Claire Twiddle to the University of Exeter as a thesis for the degree of Doctor of Philosophy, March 2010

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Signed.....

Acknowledgements:

I have many people to thank for their advice and help, both at the University of Exeter and Forest Research without which I would not have got to this stage. Firstly, my thanks go to my supervisors: Dr. Richard Jones for answering all my questions and providing me with constant enthusiasm and frequent confidence boosts; Prof. Chris Caseldine for constructive comments made throughout my project and willingness to read multiple drafts of my chapters; and Dr. Chris Quine for many valuable suggestions and introducing me to Inshriach. Also, to Dr. Karen Anderson for superb advice on remote sensing issues.

During my PhD I was fortunate enough to undertake visits to two institutions which were invaluable experiences. Firstly, to Anne-Brigitte Nielsen at GUES who spent many an hour going through data with me without complaint. Secondly, sincere thanks go to Shinya Sugita and all at the University of Tallinn where I spent the most valuable week of my PhD. Finally, to all involved in the PolLandCal network who have constantly advised and encouraged me along the way. Thank you.

My thanks also go to the laboratory technical staff at the University of Exeter for their patience with me and Neville England for building corers and samplers to make my life easier. At Forest research Michal Petr, Graham Bull, Kirsten Hutchinson, Bill Raynor and Ian MacLeod. To Neil McInnes, Jim Giles, and Michael Walker for allowing me access to Inshriach and Lochan Geal.

Finally, I have to thank my family and friends who have always encouraged me. In particular, my parents for their support and constant interest in my work. Steven, for his experiences in making it through the three years unscathed. Jonathan, your unwavering support and positive outlook on everything helped me through the tough times. I could not have done this without you.

Abstract:

This thesis considers some of the main issues surrounding the quantitative models that have been developed to reconstruct vegetation from pollen assemblages. Conducted within a pine dominated woodland, a palynologically difficult landscape, to determine vegetation changes over the late Holocene the results highlight the complexities of undertaking such studies in these contexts.

Pollen productivity estimates were calculated from moss samples over the woodland using complete sets and derived subsets to detect influences of sampling design on resultant model output. Differences in the PPE sets were compared using reconstructions from simulation models in comparison to observed vegetation patterns. The results indicate that both parameter calculation and model reconstructions were influenced by the landscape form and composition. Sensitivity of the models to such small variations in parameter values heightens the need for robust data generation and increased investigation to controlling factors on pollen productivity.

Performance of the reconstruction models experienced variation with respect to deposition basin size and site specific characteristics. Overall, the regional reconstructions proved to generate more confident estimates of vegetation cover whilst local scale reconstructions were subject to greater variability. Comparison of the quantitative modelling to standard interpretation and the modern analogue approach shows contrasts between the results obtained with respect to limitations associated with each method and the time frames, recent (*ca.* 100 years) and longer (*ca.* 3000 years), over which they were applied. Consequently, no one quantitative approach could be identified as being superior as site specific variations were recognised in relation to the most suitable approach. In response, a hierarchical technique is proposed to utilise the benefits of each technique and to obtain detailed information to strengthen interpretations. However, it is stressed study specific constraints that determine the available resources will influence the ability to fully apply this composite approach.

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