

A house with a view? Multi-model inference, visibility fields, and point process analysis of a Bronze Age settlement on Leskernick Hill (Cornwall, UK).

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A house with a view? Multi-model inference, visibility fields, and point process analysis of a Bronze Age settlement on Leskernick Hill (Cornwall, UK)

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Highlights

- â€¢ Conflicting hypotheses for spatial distribution of Bronze Age dwellings are tested.
- â€¢ Covariates are generated from morphometric analyses of a Digital Elevation Model.

- â€¢ Visibility fields' are derived from innovative viewshed analysis.
- â€¢ Point process models are generated from existing hypotheses about dwelling location.
- â€¢ Candidate models are compared through information criterion.

Abstract

This paper combines point-process modelling, visibility analysis and an information criteria approach to infer the reasons behind the Bronze Age settlement pattern of Leskernick Hill in Cornwall, UK. We formalise three alternative hypotheses as point process models characterised by different combinations of covariates. In addition to using traditional topographic variables, we use a form of affordance viewsheds, which we refer to as *visibility fields*, to investigate the visual properties of different parts of the landscape, both cultural and natural. We compare these three models by means of information criteria, and generate a fourth hybrid model by recombining variables drawn from each. The results reveal that a mixture of covariates drawn from the three hypotheses combined with a spatial interaction model provides the best overall model for the settlement pattern. We show that the settlement on Leskernick Hill was most likely the result of two separate decision-making processes, one to optimise the visibility of ritual monuments and important natural landmarks, and the other to optimise the visibility of nearby tin-extraction areas. We conclude that by using an information criterion approach it is possible to easily compare the models and identify which among these is the most satisfying in the present state of our knowledge.



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Keywords

Multi-model selection; Point-process models; Settlement pattern; Bronze Age; Visibility analysis; GIS

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