Kolloquium „Statistische Methoden in der empirischen Forschung"

Wann: 19. Dezember 2023, 17:00 – 18:30 Uhr

Wo: [Campus Charité Mitte | Hörsaal der Nervenklinik | Bonhoefferweg. 3, 10117 Berlin](#)

Online-Übertragung: der Link wird auf der [Website](#) zur Verfügung gestellt

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Understanding Forest Damage in Germany: Finding Key Drivers to Help with Future Forest Conversion of Climate Sensitive Stands

Recently climate change has contributed to the decline in forest health, and yearly European forest health monitoring data are increasingly being used to investigate the effects of climate change on forests in order to decide on forest management strategies for mitigation. Forests in Germany have been badly affected and climate change now appears to be the major cause of defoliation (Eickenscheidt et al., 2019; Augustin et al., 2009). Thus, large scale forest conversions to more mixed forests with drought and heat resistant species are planned in some areas of Germany. This talk will cover the statistical aspects of a modelling project which has been informing decisions regarding this future forest conversion. Model selection is a challenge because of spatial confounding and the large number of correlated time varying environmental predictors. In addition there are computational challenges due to the large number of parameters and large sample sizes. A generalized additive mixed model is used for estimating spatio-temporal trends of defoliation, an indicator for tree health. Defoliation is modelled as a function of site characteristics (topography, soil and climate) with the aim of identifying the main factors associated with tree damage. The minimal model contains a space-time smoother and an AR1 process for temporal correlation. To eliminate predictors with negligible effects in the remaining set of predictors we use stability selection. Variable selection using integrated backward selection is carried out repeatedly with resampled data yielding selection inclusion frequencies. The final set of predictors are the predictors with selection inclusion frequencies above a certain threshold.

Literatur

Eickenscheidt, N., Augustin, N. H., and Wellbrock, N. (2019). Spatio-temporal modelling of forest monitoring data: Modelling german tree defoliation data collected between 1989 and 2015 for trend estimation and survey grid examination using gamms. iForest Biogeosciences and Forestry, 12:338– 348.

Augustin, N., Musio, M., von Wilpert, K., Kublin, E., Wood, S., and Schumacher, M. (2009). Modelling spatio-temporal forest health monitoring data. Journal of the American Statistical Society, 104(487):899–911.