Siegrist, D., Clivaz, C., Hunziker, M. & Iten, S. (eds.) (2006). Exploring the Nature of Management.
Proceedings of the Third International Conference on Monitoring and Management of Visitor Flows in Recreational and Protected Areas.
University of Applied Sciences Rapperswil, Switzerland, 13-17 September 2006. Rapperswil.

Mapping the Attractiveness of the Dutch Landscape: A GIS-Based Landscape Appreciation Model (Glam-2)

Sjerp de Vries, Janneke Roos-Klein Lankhorst & Arjen E. Buijs

Alterra Green World Research, The Netherlands

sjerp.devries@wur.nl
janneke.roos@wur.nl
arjen.buijs@wur.nl

Keywords: Landscape appreciation, GIS, regression, naturalness, urbanisation, historical distinctiveness, skyline disturbance, validation.

Introduction

The main objective of Dutch nature policy is to make an essential contribution to a liveable and sustainable society through the conservation, restoration, development, and sustainable use of nature and landscape. One of the motives of the Dutch government behind this objective is that 'we want a beautiful country to live and work in' (LNV 2000). To accommodate this desire, it is necessary to know where people like the landscape in their environment and where they do not. It is also important to know which physical characteristics of the landscape contribute to this attractiveness. To provide such information in a cost-efficient way, a GIS-based model was developed to map, monitor, and simulate the attractiveness of the landscape in one's living environment. The first version of this model, entitled "GIS-based Landscape Appreciation Model (GLAM)", was strongly based on existing theoretical insights. However, it was only moderately successful, one of the problems being the overlap of the GIS-indicators for several of the theoretically important characteristics of the landscape (De Vries & Gerritsen 2003). The Netherlands Environmental Assessment Agency commissioned a second, improved version on the model. In this paper this second version is presented, as well as its validation.

Model

The model predicts landscape attractiveness based solely on nationally available GIS-data on the landscape for each 250 x 250 meter cell. GLAM-2 distinguishes three positive GIS-indicators: Naturalness, Historical distinctiveness, Relief, and three negative ones: Skyline disturbance, Urbanisation, Noise level. Each indicator has five levels signifying how positive (or negative) the physical state of the landscape is thought to be evaluated by the average Dutch resident with regard to this aspect. The outcomes of a national survey among almost 3000 Dutch residents were used to determine the optimal weights for the different indicators (De Vries & Van Kralingen 2002). In the survey people were asked to rate the countryside surrounding their place of residence. To bring the GLAM-predictions at the same level as the rated surrounding countryside, an average predicted value was calculated over all cells within a five kilometre radius of the respondents' postcode. The six indicators 'explained' 36% of the variance in attractiveness scores (averaged over 3 or more respondents with the same postcode). Actually the regression analysis showed that only four of the six indicators were needed to achieve this result: Relief and Noise level had no added predictive value.

Validation study

GLAM-2 has been validated using data from another, more recent survey on landscape attractiveness (SNM 2005). Almost 5000 people living in or nearby one of 52 delineated areas were asked to rate the landscape within this delineated area. Results showed that GLAM-2 explained 47% of the variance in the average attractiveness rating of the 52 areas. So, rather than shrinkage, an increase in explained variance was observed. This increase is thought to be due to the averages per area being based on a larger number of people (between 42 and 142, rather than 3 or more). Also the fact that the area to be rated was clearly delineated may have helped. Of course the model (still) has its limitations. For example, we do not consider GLAM to be suited for use at a very detailed, local level. On the other hand, comparisons of GLAM-predictions and judgements made by landscape experts clearly show that landscape quality and its attractiveness to lay people are two separate things. All in all, although we intend to develop the model further, we think GLAM-2 already constitutes a useful tool for policy makers and spatial planners.

References

De Vries, S. & Gerritsen, E. (2003). Van fysieke kenmerken naar landschappelijke schoonheid; de voorspellende waarde van fysieke kenmerken, zoals vastgelegd in ruimtelijke bestanden, voor de schoonheidsbeleving van Nederlandse landschappen. In: Alterra-rapport 718/Reeks Belevingsonderzoek 7. Wageningen.

De Vries, S. & Van Kralingen, R.B.A.S. (2002). De beleving van het Nederlandse landschap door haar bewoners; de geschiktheid van het SPEL-instrument voor monitoringsdoeleinden. In: Alterra-rapport 609. Wageningen.

LNV. (2000). "Nature for people, people for nature", policy document on nature, forest and landscape in the 21st century. The Hague.

Roos-Klein Lankhorst, J., De Vries, S., Buijs, A., Bloemmen, M. & Schuiling, C. (2005). BelevingsGIS versie 2; waardering van het Nederlandse landschap door de bevolking op kaart. In: Alterra rapport 1138/Reeks Belevingsonderzoek 14. Wageningen.

SNM. (2005). Nederland kan zo mooi zijn; onderzoek naar de beleving van 52 gebieden door omwonenden. Deel I: landelijke conclusies en resultaten. Utrecht.