

Is PPGIS always an effective management tool? Reflections based on the Tatra National Park case study.

Marcin Rechciński, Institute of Geography and Spatial Management, Jagiellonian University in Krakow, Poland, marcin.rehcinski@uj.edu.pl

Agata Pietrzyk-Kaszyńska, Institute of Nature Conservation, Polish Academy of Sciences, Poland

Agnieszka Olszańska, Institute of Nature Conservation, Polish Academy of Sciences, Poland

Barbara Peek, Institute of Nature Conservation, Polish Academy of Sciences, Poland

Joanna Cent, Institute of Environmental Sciences, Jagiellonian University in Krakow, Poland

Małgorzata Grodzińska-Jurczak, Institute of Environmental Sciences, Jagiellonian University in Krakow, Poland

Public Participation GIS (PP GIS) defined both as 1) a field of geographic information science (ref. Tulloch 2008) or 2) the use of variety of GIS methods and techniques to increase public participation in decision-making processes (ref. Sieber 2006) may result in contradictory interpretations. While science-based processes are to be fully consistent in terms of the adopted methodology, management-driven initiatives are expected to be more methodologically flexible to better capture a broad spectrum of information potentially useful for the managers.

The presented study, realized within the LINKAGE (LINKing systems, perspectives and disciplines for Active biodiversity GovernancE) project between November 2014 and February 2015, aimed to identify landscape values of Tatra district in Poland. The whole project was to improve biodiversity governance in Poland and Norway by developing innovative protocols and technologies for biodiversity governance. In order to meet that challenge, we used the same carefully designed Internet-based PP GIS application in the socio-ecological context of three national parks: Jotunheimen and Saltfjellet–Svartisen NP in Norway and Tatra NP in Poland (Brown et al. 2015). Both the case studies and adopted methodology were selected to maximise possibility of further comparisons of the results – all the sites were of high-mountain character and protected as national parks. The PPGIS application was based on a tool already widely-used worldwide (see landscapevalues.org for further references) which additionally suggested its broad applicability. The tool uses points as spatial representations of the measured variables. Thus, the mapping exercise required from the respondent to place several markers on the provided basemap to inform about a) landscape values, b) preferred activities and c) unpreferred activities connected to certain places. The task was identical in both Polish and Norwegian applications.

Unexpectedly, the results obtained in the Polish study sites turned out to be much less informative compared to the former applications of the tool elsewhere. It was due to a very low return-rate of the survey which has reached only 1.2% despite deepened and broad recruitment process adopted for the research: we used 1) a ran-

dom sampling, directed only to the residents of the Tatra district (n=3000), based on a profiled mailing service, and 2) a voluntary sampling, that used public media and other channels of public information, directed both to residents and visitors of the district. Although common response rates for similar PP GIS studies which use random sampling are not high, they are still an order of magnitude higher (10-20%) compared to our studies (ref. Brown, Pullar 2012). Thus, it was only the engagement of respondents who voluntarily accessed the survey (with a total number of all participants = 287) that made spatial analyses possible to be performed.

This suggests not only an urgent need to rethink methods of recruitment for future similar studies, especially in specific social contexts in terms of respondents willingness to participate in PPGIS processes. It also generates an imperative to take a broader use of variety of PPGIS methods and techniques and in order to reduce their vulnerability to the sample size (see – fig. 1. for visualisation of the problem based on the results of the original study). The following presentation provides description of alternative PPGIS research processes realized within the same project afterwards, as well as some post-factum specific improvements to the original point-mapping study. We deeply believe that a fully critical and flexible approach better addresses management needs of the Tatra National Park – one of the potential beneficiary of the study results.



- Brown, G. & Pullar, D. (2012). An evaluation of the use of points versus polygons in public participation geographic information systems (PPGIS) using quasi-experimental design and Monte Carlo simulation, *International Journal of Geographical Information Science*, 26(2), 231-246.
- Brown, G., Hausner, V.H., Grodzińska-Jurczak, M., Pietrzyk-Kaszyńska, A., Olszańska, A., Peek, B., Rechciński, M., & Lægreid, E. (2015). Cross-cultural values and management preferences in protected areas of Norway and Poland, *Journal for Nature Conservation*, 28, 89-104.
- Sieber, R. (2006). Public participation geographic information systems: A literature review and framework, *Annals of the Association of American Geographers*, 96(3), 491-507.
- Tulloch, D. (2008). Public participation GIS (PPGIS). In K. Kemp (Ed.), *Encyclopaedia of Geographic Information Science* (pp. 352-355). Thousand Oaks, CA: SAGE Publications, Inc.
- www.landscapevalues.org

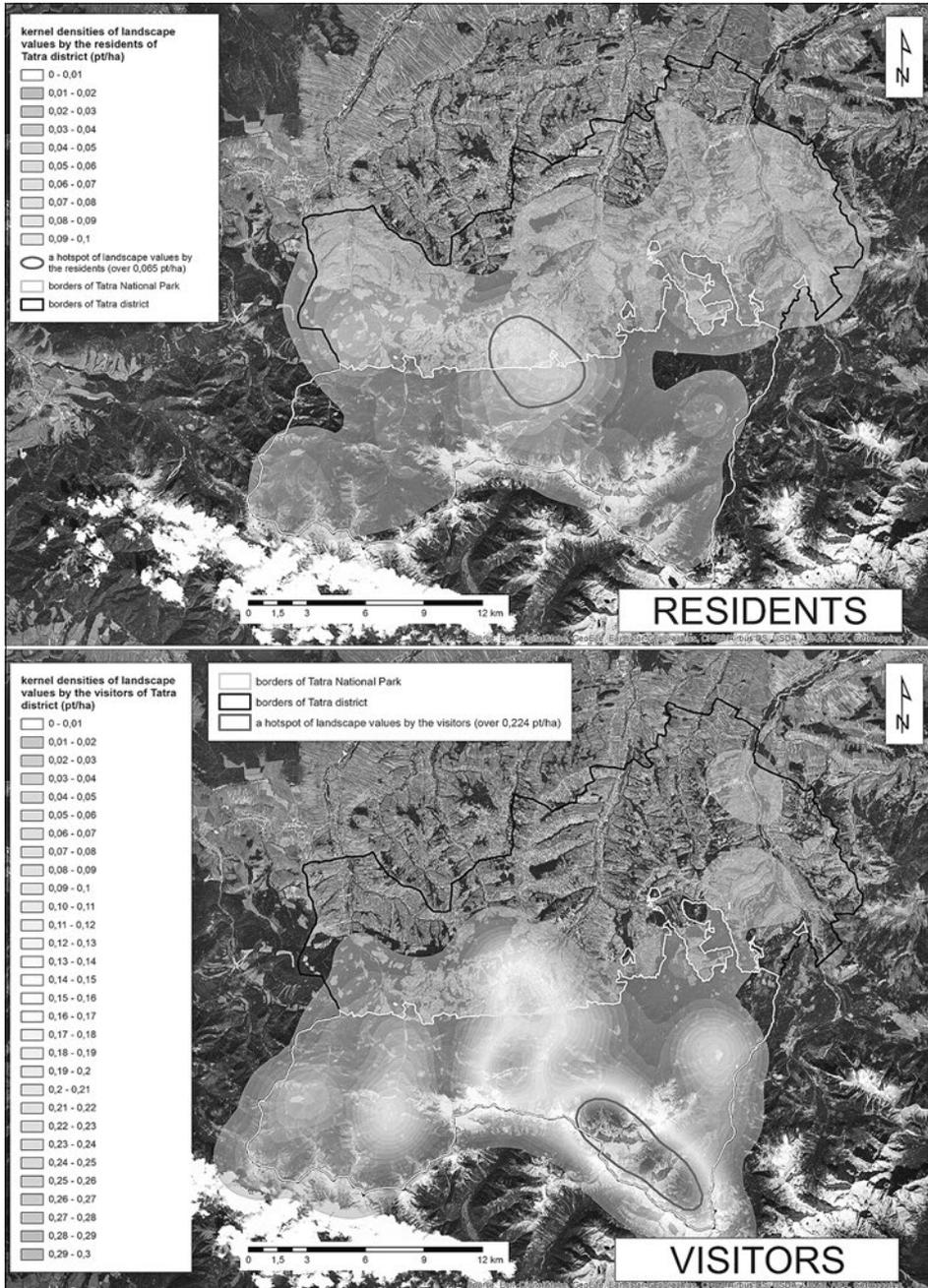


Figure 1. An illustration of the point-mapping technique's vulnerability to the sample size. Kernel density analyses presented on the figure were performed for responses of a total of a) 67 residents and b) 191 visitors recruited for the study.