Social media data for analysing spatio-temporal patterns and nature-based preferences of people in national parks

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Abstract

The use of social media has been rocketing during the past years and many platforms provide interfaces for mining the openly posted status updates and pictures. The wealth of social media data is both spatially and temporally sensitive as people are frequently sharing their geotagged experiences and thoughts with their friends/followers via social media platforms. In nature conservation, there is an increasing need to understand the patterns of human activities from the viewpoint threats and opportunities for conservation planning and management. In this poster, we explore the usability of geotagged social media data as an information source about human patters in space and time, and content to derive further information on the spatial patterns. First, we assess the relationship between social media posts and visitation rates in protected areas. For this purpose, we use data on visitation rates in 16 parks in South Africa and 38 parks in Finland plus Instagram data from the same areas. Secondly, we assess the spatial patterns of visitation of tourists within national parks and, thirdly, their preferences using content analysis. Our preliminary results are promising as the temporal patterns of social media users within parks are strongly correlating with official visitation rates. The amount of social media posts reveal the popularity of national parks quite similarly as more traditional visitation statistics. Furthermore, the content of social media posts are relatively well in line with the preferences of visitors surveyed with more traditional methods. Overall, social media data is a promising source of additional information both for researchers and practitioners.

Keywords: Social media data, big data, spatial analyses, mobility, social media data, conservation, nature-based tourism

1 Background

While social media data has been used for some research fields already for some time already, in conservation science only few examples are found: ecosystem services mapping [1], species distributions [2], ecosystems [3] and management [4].

We have suggested that social media data could provide a novel source for collecting information on threats, such as land use pressure or hunting, and conservation opportunities, such as nature-based tourism. Collecting such data with traditional methods (surveys, interviews) is expensive and resources are inadequate. It has been proposed that social media data could provide a source not only to spatial questions but also those more related to the preferences and values of people [5, 6]. Here, we present some of the first results of our project concentrating on developing the use of social media data for analyses of spatial patterns and mobility of individuals in the context of nature-based tourism and conservation.

Figure 1: Social media may be useful in understanding the spatiotemporal patterns of people, but also provide deeper understanding on who they are and what do they value (modified from [6]).

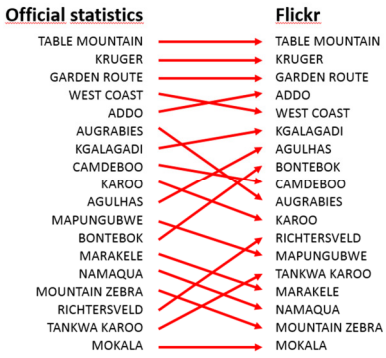
2 Methods

We collected all openly published, geotagged Instagram and Flickr posts from 2014 and 2015 from the national parks of Finland (N=38) and in South Africa (N=16, those managed by South African National Parks. We counted the yearly and monthly number of social media users in each park and compared those to the official visitor statistics provided by Metsähallitus and SanParks. We took Kruger park as an example for content analysis and classified the 30 000 Instagram photos based on their content. We then compared the photo content to previously surveyed preferences of tourists [7,8]. We also analysed the mobility trajectories of users within and to and from the parks.

3 Results

The results show a clear correlation between the official visitor counts and the number of users of social media in the parks. In case the park popularity is being evaluated using social media users and the official visitor statistics, the correlation is relatively high both in Finland (with Instagram 0.69) and South Africa (with Flickr 0.91), see Figure 2.

Figure 2. The popularity of South African national parks based on official visitor statistics and the number of Flickr users. Spearman's rank correlation is high (0.91).



Also, the temporal patterns in the park visits are clearly depicted by the amount of monthly social media users (Figure 3). The content analysis revealed that social media posts demonstrate the studied preferences of people, although easily photographed targets are overrepresented (Figure 4).

4 Conclusions

The results presented in our poster suggest that social media data may act as an additional information source for conservation planning as well as managing national parks and understanding nature-based tourism.

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Figure 3. The relationship between the recorded number of visitors (red line) and social media users (blue line) within the Kruger national park in South Africa 2014.

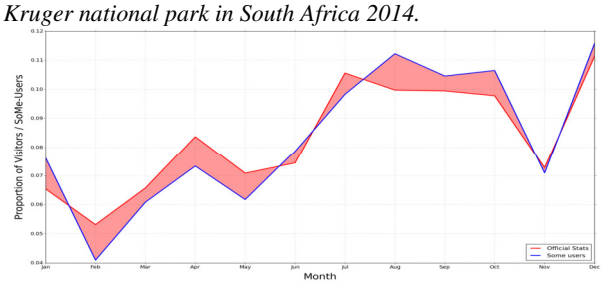
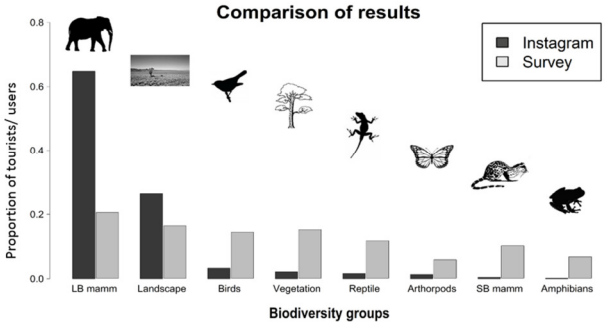


Figure 4. Comparison between surveyed preferences of tourists in terms of seeing different animal species, and what they posted about in Instagram. While the proportions are skewed, the order is roughly the same. (LB = Large bodied, SB = Small bodied)



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