

107 Using Mobile Big Data to assess visits to national parks before and during COVID-19

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The mobility restrictions related to COVID-19 pandemic have resulted in the biggest disruption to individual mobilities in modern times. The crisis is clearly spatial in nature, and examining the geographical aspect is important in understanding the broad implications of the pandemic (Oliver et al. 2020). Visitations to national parks or other natural areas have experienced a tremendous change during the pandemic. In some areas, like in Finland, visitors seeking for experiences or less crowded places have crowded national parks. This has caused a need for national park managers to add services to the parks. In other places attracting high numbers of international tourists, like Madagascar, the visitor numbers have dropped drastically leading to problems of local livelihoods and even pressure to use land for alternative purposes like food production (Eklund et al. 2020).

To understand these changes and their impact, there is a need to monitor how and where people use natural areas. Mobile big data (data collected by mobile phone operators or various apps) has been considered valuable for conservation already for some time (Di Minin et al. 2015; Tenkanen et al. 2017; Toivonen et al. 2019). The pandemic has highlighted the high potential of mobile big data even further (Poom et al. 2020). Mobile Big Data makes it possible to study the spatial effects of the crisis with spatiotemporal detail at the national and global scales. The data is being collected continuously, allowing monitoring change over time. The importance has not been left unnoticed: Some companies, like Google and Apple, have shared previously inaccessible information about people's mobility patterns openly online, allowing, for a limited time period, new analyses also about visits to nature.

In this presentation, we discuss the usability of Mobile Big Data in the context of monitoring the use of green areas during the pandemic. We base our

presentation on two analyses that examines the disruptions caused by the pandemic at the global and at more local scale.

In the global scale analysis our main objective is to understand the impact of the covid-19 pandemic on visits to national parks across global regions demonstrating the differences between the Global South and North. We use social media posts made on Flickr platform as our source. Despite many gaps, limitations, and regional biases, Flickr is one of the few available data sources that allows global analysis of visits to protected areas (Tenkanen et al. 2017; Toivonen et al. 2019). We examine the changes in visitor numbers overall and compare how visitation of international and domestic visitors have changed in the Global South and North.

Our second example employs mobile phone data from a Finnish mobile phone operator. The data has previously been used for analyzing the use of urban parks (Heikinheimo et al. 2020). With the detailed mobile data, we are able to show the changes in park visitation, the demographics of visitors as well as the origins of the visitors compared to pre-covid times. We compare the results to surveys made by the national park authority Metsähallitus.

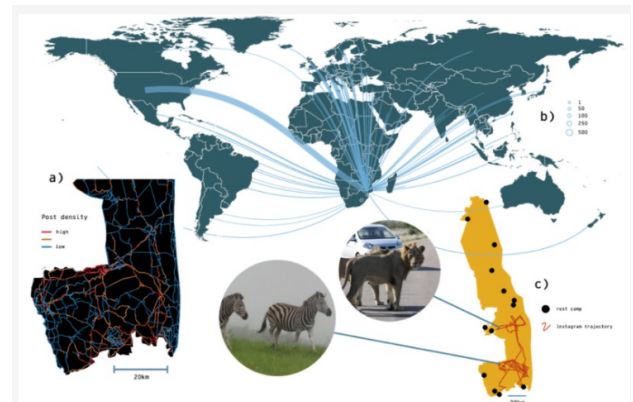


Figure 1. Mobile big data allows analyses of national park use from global to local scales (figure adopted from Toivonen et al. 2019. In this presentation, we provide examples at the global scale (using Flickr

data) and at the local scale using mobile phone data provided by a mobile operator.

Based on the example studies and our previous works, we broaden the discussion to the added value and challenges of Mobile Big Data in covid analytics. In addition to the promise that these data sets hold, they also come with many challenges. Many of the challenges have to do with the ownership of the data. The data sets are collected and managed by private companies unlike many data sets traditionally used in environmental sciences. If released for research use, they are often produced without detail on how they have been collected or aggregated, causing a lack of transparency in details that may fundamentally impact the interpretations (see an example in Willberg et al. 2020). Furthermore, for those data sets that have been made accessible, it is unclear how long these data products will be available for research use. The analyses with mobile big data during the pandemic have made us call for change in mobile big data management and access. In this presentation (see also Poom et al. 2020), we therefore call for:

- harmonized and representative data about human mobility for better crisis preparedness and social good in general
- methodological transparency about mobile Big Data products are vital for open societies and capacity building;
- access to mobile Big Data to develop feasible methodologies and baseline knowledge for public decision-making is needed before the next crisis occurs;
- recognizing the fundamental spatiality of the current COVID-19 crisis and crises more generally is the most relevant of all.

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