

MAPPING LANDSCAPE VALUES USING SOCIAL MEDIA



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abstract

Social media data are providing scientists with a variety of new ways to examine how and why individuals value particular natural landscapes. In this fact sheet, we review cutting edge research that used millions of photos posted to Instagram, Flickr and Panoramio to examine which European landscapes individuals value most. The research is the first of its kind to use social media data to identify the public's most valued landscapes across an entire continent. The research is also the first to compare the spatial agreement between geotagged imagery uploaded to different platforms.

Around the world, landscape integrity is threatened, altering the personally meaningful connections people have toward natural places. The traditional research methods, such as social surveys and proxy variables, that scientists use to study these meaningful connections are expensive and cannot be applied across large geographic extents. Social media data, on the other hand, provide a seemingly inexhaustible stream of information about which landscapes are personally meaningful to individuals across the globe.

In a new article appearing in the *Proceedings of the National Academy of Sciences*, the Institute of Outdoor Recreation and Tourism's director, Dr. Jordan W. Smith, and his colleagues from NC State University and VU University in Amsterdam, used social media data from across Europe to identify the non-urban locations from which most images were being uploaded. They made a rigorous comparison between three social media platforms' suitability for mapping and quantifying landscape values.

"This is really exciting because it allows us to identify, in an objective way, which natural

landscapes are valued and used by the public. This is something that we haven't been able to do with traditional social science research methods," stated Smith.

Panoramio, Flickr and Instagram have been used by tens of millions of people across Europe to upload information and photos about their activities. Panoramio (a former photo sharing site owned by Google) and Flickr enable users to upload and display geo-referenced photos; these applications tend to attract photography enthusiasts. Panoramio is the most landscape-focused application, while Flickr users tend to contribute more diverse subject matter. Instagram has a broader user base who upload images and descriptive content (captions and hashtags).

The researchers used spatial concentrations of relevant social media content as indicators of landscape value derived from aesthetic enjoyment and outdoor recreation use. They assumed that landscape values increased as more people photographed, posted and shared information about that location.

The researchers found similar patterns across all three platforms. Mountainous areas including the Alps, Pyrenees and Scottish Highlands tended to have high concentrations of photos. Coastal areas such as the Costa Brava and Liguria in Italy also stood out. Photo “deserts” occurred in the agricultural inlands of Spain and France as well as sparsely populated areas in Nordic and Baltic countries. Disagreements across platforms did occur in a few places and were likely caused by differences in where each platform is used most.

On all three platforms, hills and mountains were the strongest predictors of high aesthetic and outdoor recreation values. Distance to the nearest water body was also a strong predictor on one platform, while the presence of hedges and tree rows had a strong and positive effect on another. Across all three platforms, as distance

from urban centers increased, the amount of uploaded content tended to decrease. Notably, protected areas had high concentrations of uploads.

Because the work was completed across a continental scale, the researchers were not able to capture site-specific factors that influenced the enjoyment of the natural environment. Questions also remain about whether data generated via different social media platforms are biased, given each platform tends to be used by specific sociodemographic groups.

In the future, scientists will continue to mine social media platforms for information about landscape values while controlling for variations in platform use between countries and specific sociodemographic groups.

reference

van Zanten, B. T., Van Berkel, D. B., Meentemeyer, R. K., Smith, J. W., Tieskens, K. F., & Verburg, P. H. (2016). Continental-scale quantification of landscape values using social media data. *Proceedings of the National Academy of Sciences*, 113 (46), 12974–12979.

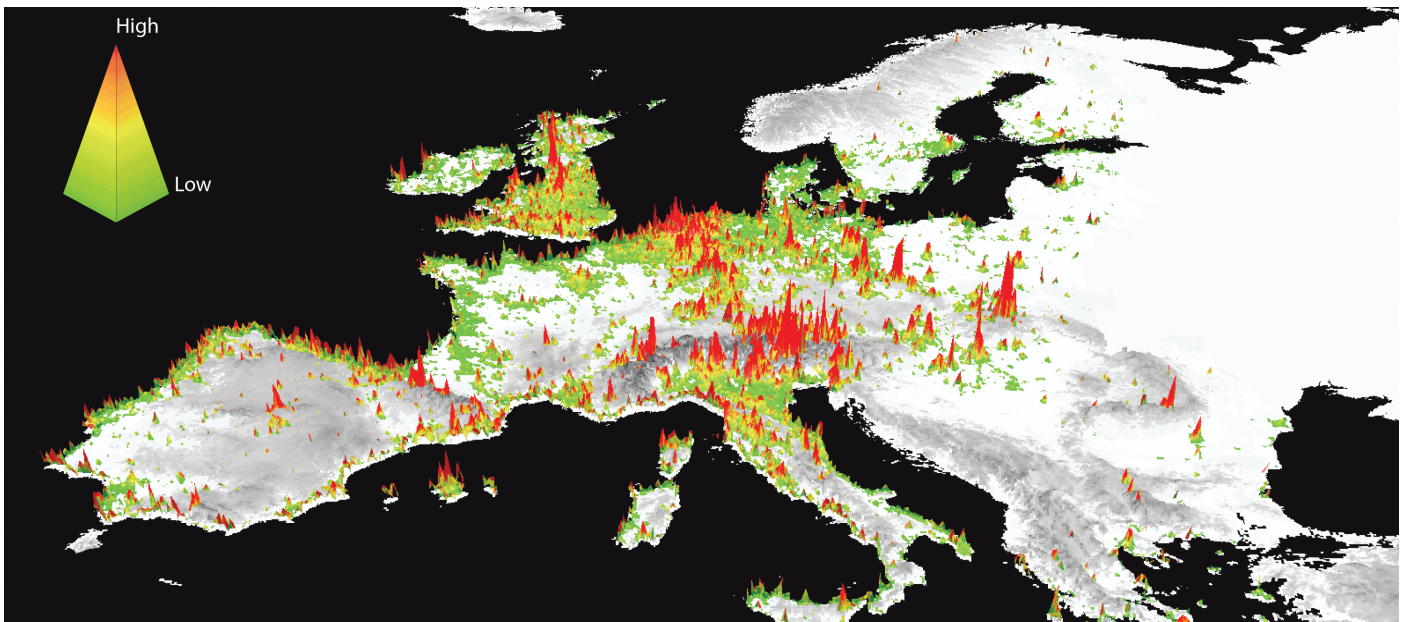


Figure 1. Red values indicate landscapes with the highest concentrations of uploaded photos.

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