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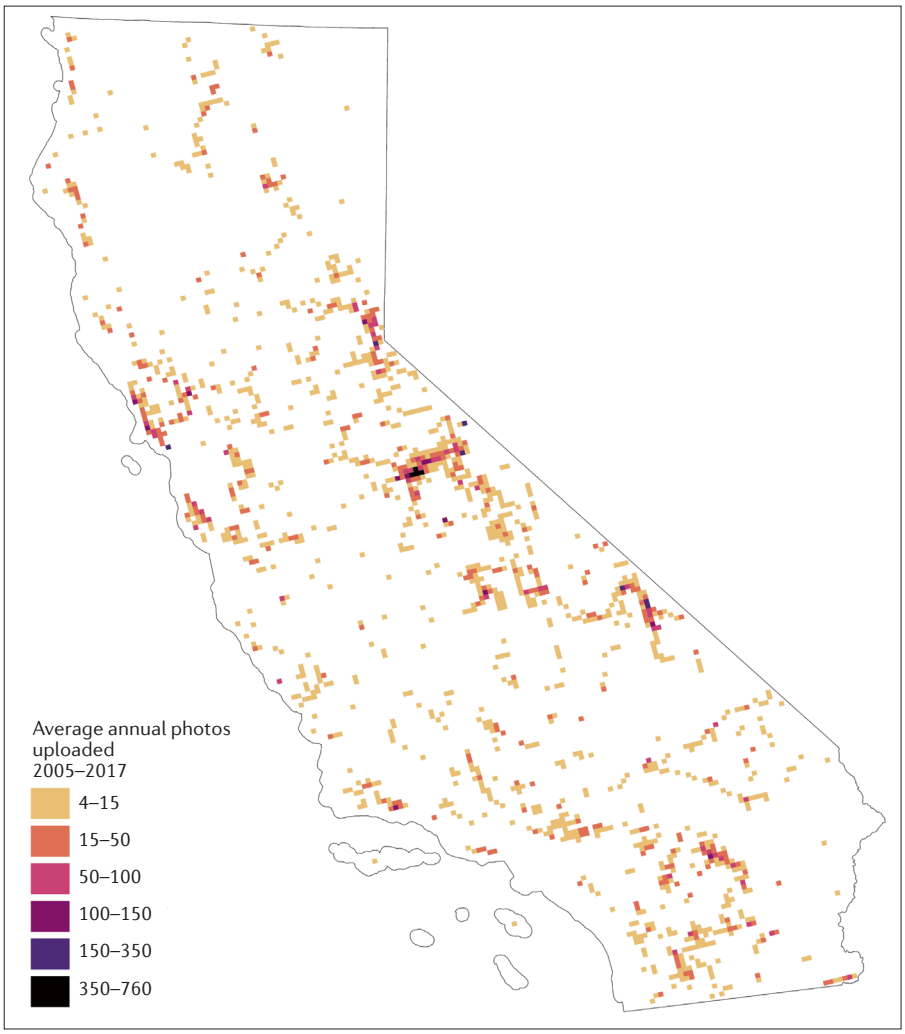
TOOLS OF THE TRADE

Understanding social–ecological systems using social media data

Ecosystem services are the contributions of nature to human well-being — for example, the provision of raw materials, carbon sequestration and recreation. Although relatively new, the study of these essential services has developed rapidly and is now included in many global policies and assessments. However, mapping and modelling these services is restricted by the availability of data that can account for the multidimensional traits of ecosystem services and model coupled social–ecological systems. Traditional datasets, including surveys, interviews, and focus groups, are often not viable on the scale necessary for many ecosystem service assessments.

Social media provides a large geolocated data set with high spatiotemporal resolution that offers insights into the social aspect (demand) of ecosystem services. Different platforms provide different insights and uses. For example, specific areas of interest (geolocation) and their features can be identified from image-sharing sites. Sport-related social media can show what specific services are being provided and how they are being used. For example, data from Strava, Wikiloc, and Geocaching can provide information on biking, hiking, and geocaching-related ecosystem services respectively. Text-oriented social media sites provide data on social values relating to ecosystem services. Twitter post data, for instance, can be used to evaluate people's sentiment towards ecosystem services through time. These insights enable analysis of the interactions, feedbacks, and dependencies between human and ecological systems. This information can be integrated into models and extrapolated through space and/or time, for example, into the future to assess forthcoming vulnerability.

Ultimately, models that include social media data can help to better understand the current state of ecosystem services, how they benefit people, and how they could be affected in the future by anthropogenic influences such as climate change and land use change. For example, the geolocation and classification of images from image-sharing sites such as Instagram and Flickr have been used as a proxy for the demand of aesthetic, tourism, and recreational ecosystem services within protected areas across the world. Such insights are essential for the sustainable management of social–ecological systems under a future of global change.



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Competing interests
The author declares no competing interests.