"photosearcher" package in R: An accessible and reproducible method for harvesting large datasets from Flickr

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Introduction

Flickr (*flickr.com*) contains a large database of photographs, with up to 25 million new uploads a day (Ding & Fan 2019)

The metadata of the photographs can contain both spatial and temporal information

Metadata is accessible through the Flickr Application Programming Interface (API)

Overcomes many of the limitations of extensive large-scale social and ecological surveys

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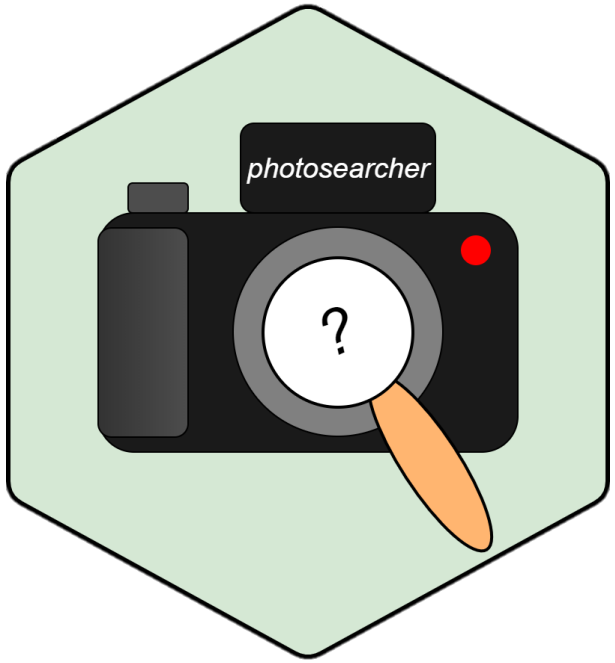
photosearcher R package

We developed the photosearcher R package (Fox *et al.* 2020; https://doi.org/10.1016/j.softx.2020.100624)



The package provides accessible and reproducible functions for searching for photograph metadata

Designed to overcome the limitations of the Flickr API

Current version available from rOpenSci at: https://github.com/ropensci/photosearcher

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Overcoming Flickr API limitations

Limitation of API	***photosearcher* r package**
Accessibility is limited by the need for advanced coding skills	Provides a relatively simple method, accompanied by a user guide
Studies often do not share reproducible code	Method is easily shareable and reproducible
Maximum of 4,000 unique photographs returned per search	Automatically and dynamically splits searches to overcome the 4,000 results limit
You cannot search Flickr for images within a shapefile (Lee *et al*. 2019)	Provides functionality to search for any images that are within a shapefile

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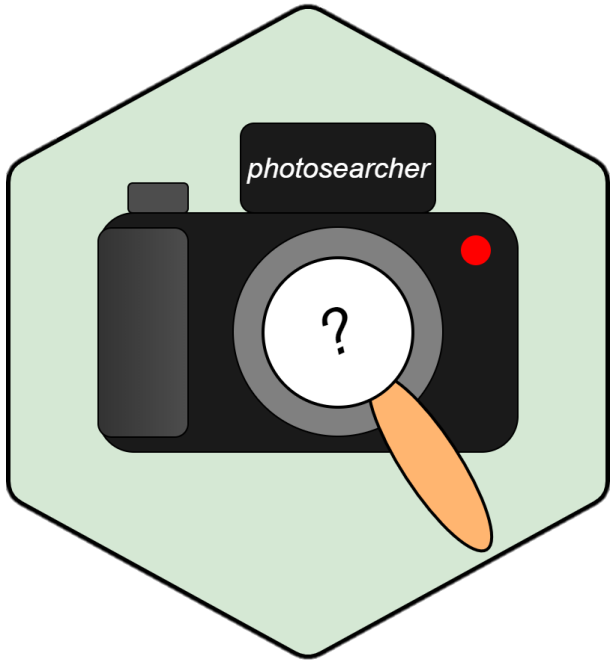
Uses of Flickr data from photosearcher

Assessing cultural ecosystem services:

- Recreational services (Graham & Eigenbrod 2019) *
- Wildlife watching (Mancini *et al*. 2019) *
- Assessing changes in cultural values (Thiagaraja *et al*. 2015)
- Visitation rates in protected areas (Kim *et al*. 2019)

Species distribution data:

- Identifying floral species (August *et al.* 2020) *
- Monitoring migratory and hibernation patterns (Fox *et al.* 2020)
- Tracking the spread of invasive species (Allain 2019)
- Assessing niche segregation (Peña-Aguilera *et al*. 2019)



* used early releases of photosearcher

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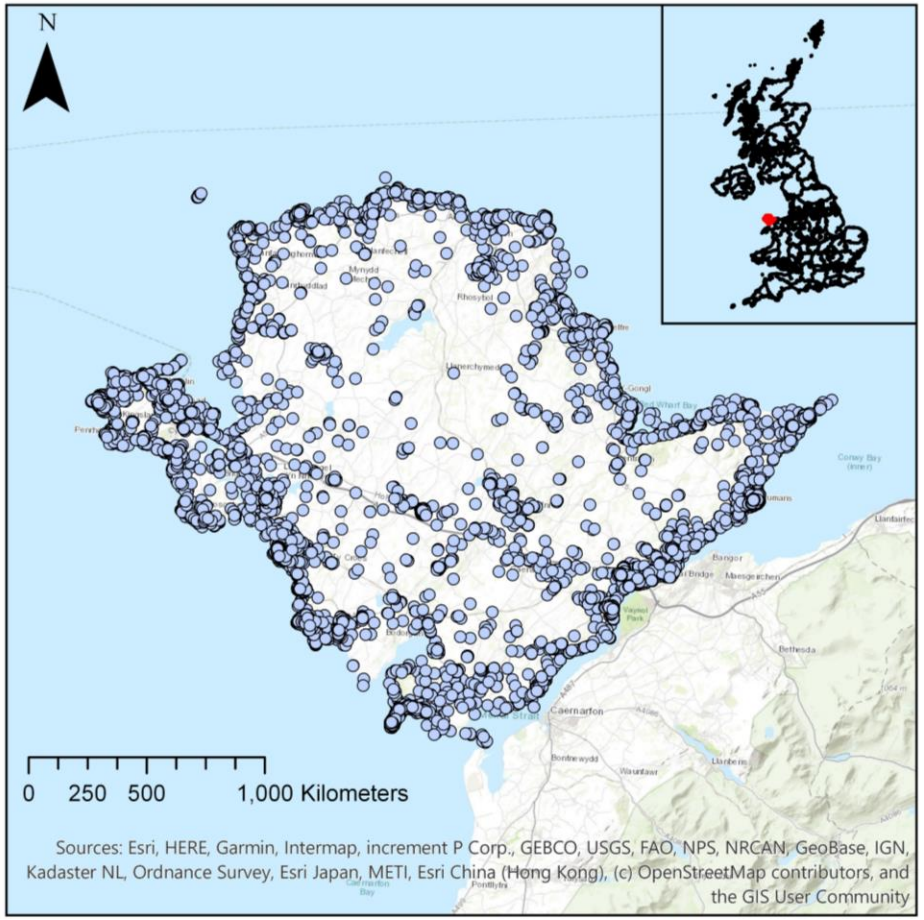
Example – Anglesey Geopark, Wales

Searches for spatial metadata are relatively straight forward and quickly provide large quantities of data:

```
photo_search(mindate_taken = “2000-01-01”,
        maxdate_taken = “2020-01-01”,
        sf_layer = sf::read_sf(“.\\area.shp”))
```

This search returned thousands of points in just a few minutes



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Future Direction

- Add other API functions to the package If other available metadata is useful for environmental research
- Add searches for other social media sites: currently working on Reddit and Tumblr
- Please reach out to me if you would be interested in helping develop the package

Thank you for listening; I welcome any questions

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