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Disentangling socio-ecological interactions using geo-tagged photographs

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HAL Authorization

Disentangling socio-ecological interactions using geo-tagged photographs

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CCS 2017 | Cancùn, Mexico

September 18, 2016

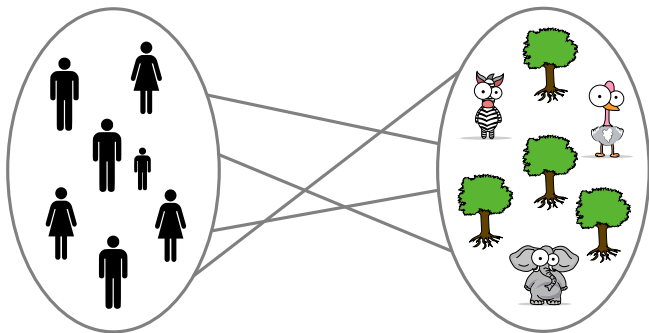


ALTER-Net High Impact Actions

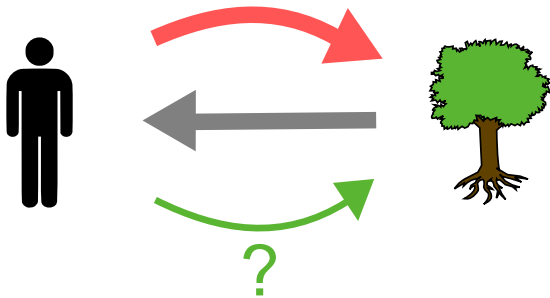


Motivation

How can we use **ICT data** to model and visualize **complex socio-ecological interactions** to better understand how **people** interact with **natural spaces**?



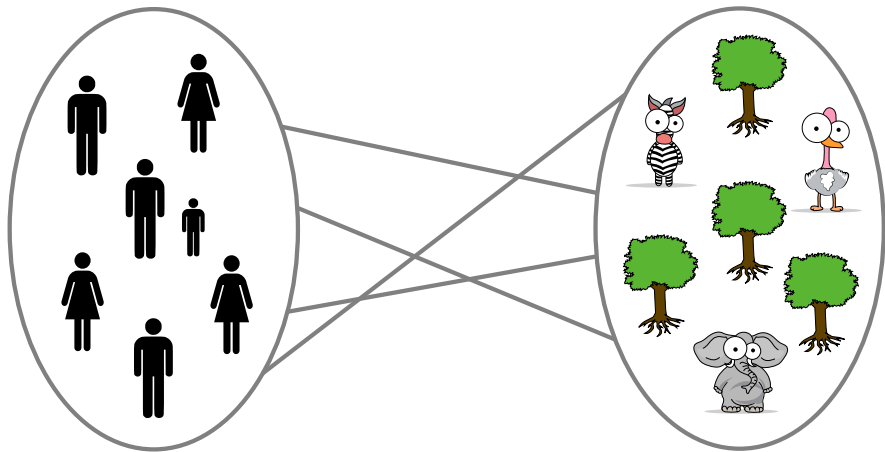
Cultural ecosystem services



"Nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences"

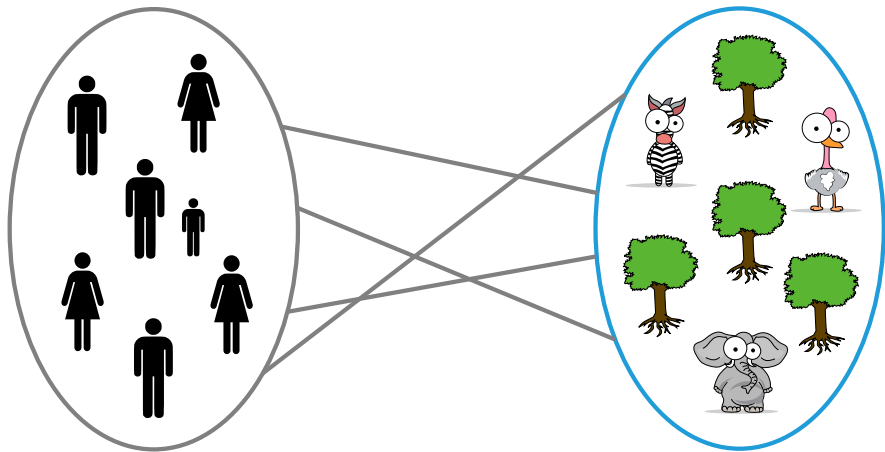
Millennium Ecosystem Assessment (2005) *Ecosystems and Human Well-Being: Synthesis*. Island Press, Washington.

Spatio-temporal network



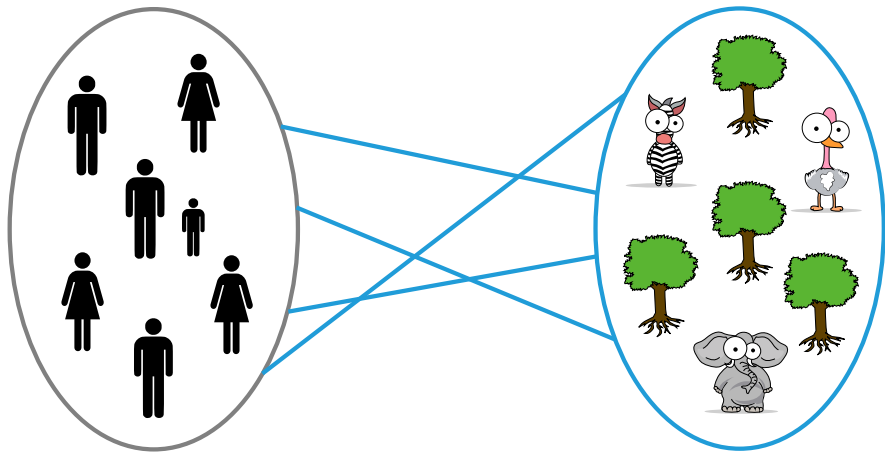
Δ_t Time window

Spatio-temporal network



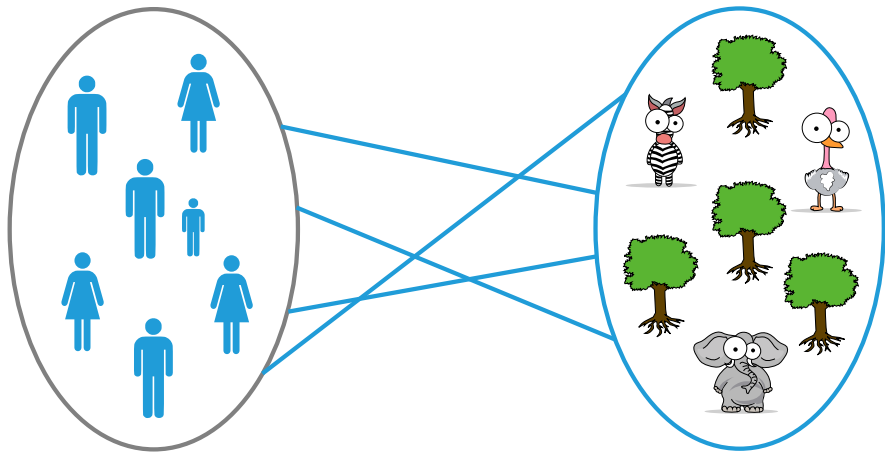
Δ_t Time window

Spatio-temporal network



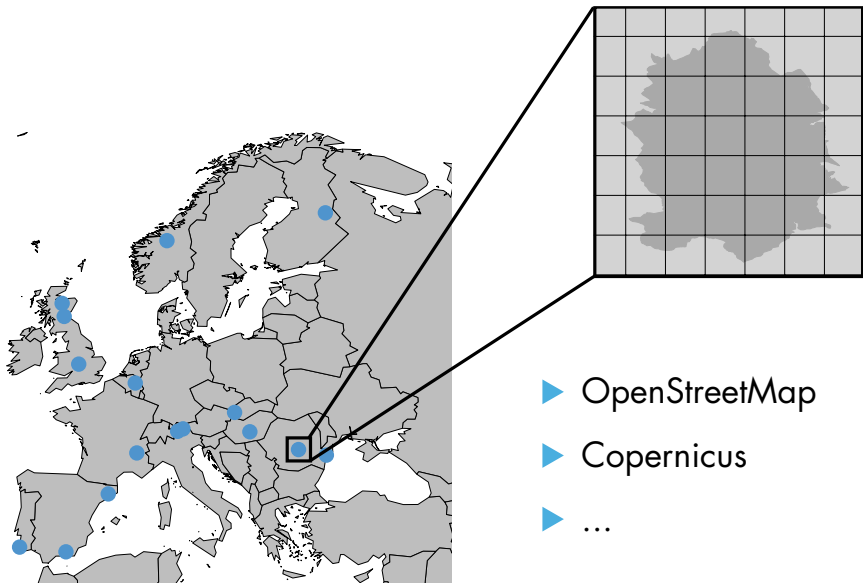
Δ_t Time window

Spatio-temporal network




Δ_t Time window


Ecosystems



Modeling CES flows using Flickr

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 eMammal [+ Follow](#)

[PRO](#) eMammal 219 Followers • 3 Following 206,458 Photos Joined 2010

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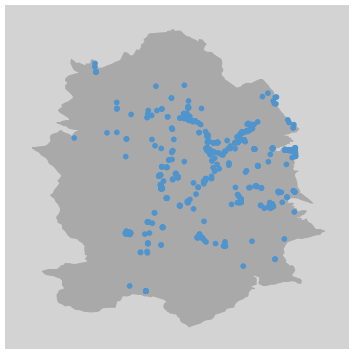
[Groups](#)

[More](#) ▾



Cultural ecosystem services

From more than **100,000** to **17,500** photos

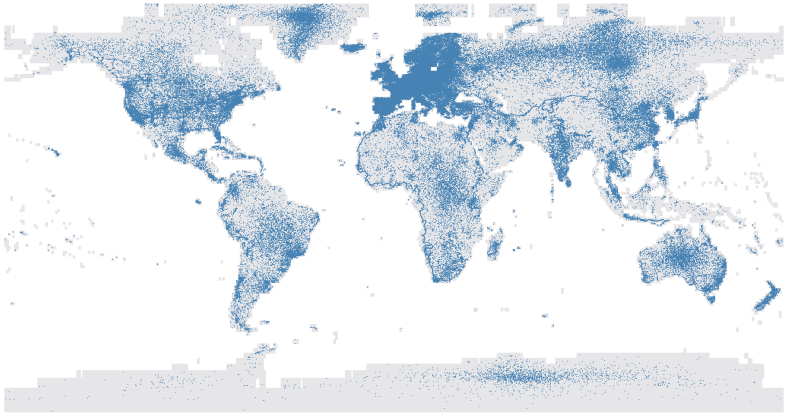


Every Flickr photos has been classified and validated following the Common International Classification of Ecosystem Services



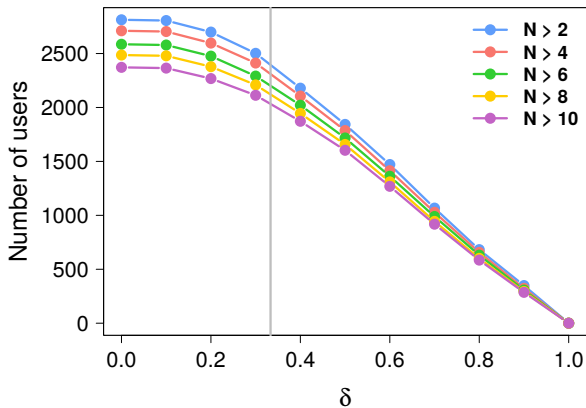
Flickr users

Identification of users' place of residence



Flickr users


Identification of users' place of residence




13,000 photos taken by **2,300** users

Flickr group & survey

flickr Explore Create Log In [Sign Up](#)



 Help us to protect the environment! [+ Join Group](#)

416 Members • 5.8K Photos • 3 Discussions Group Since June 11, 2017

[Overview](#) [Discussions](#) [Photos](#) [Members](#) [Map](#)

Photo pool

[View 5,800 photos](#)

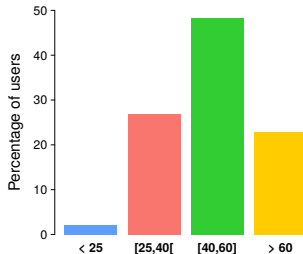
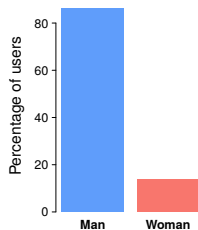
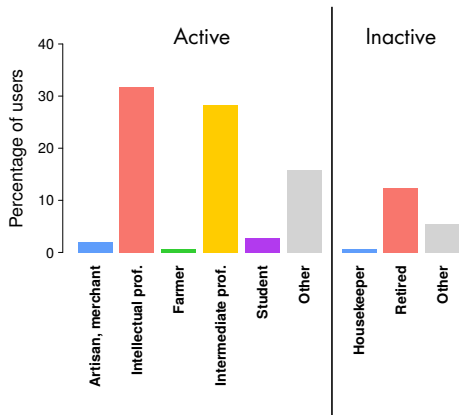


Discussions

Title	Author	Replies	Last Replier	Latest Post
Clarification about the study	SP.Pictures	4	Fouaustral PRO	2 months ago
ⓘ	joepdeumes PRO	2	joepdeumes PRO	3 months ago
FAQ	SP.Pictures	3	SP.Pictures	3 months ago

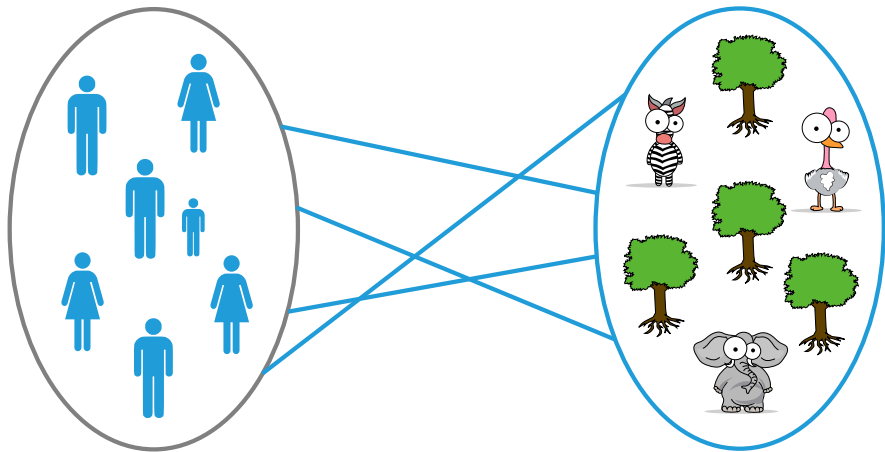
Flickr group & survey

8% response rate



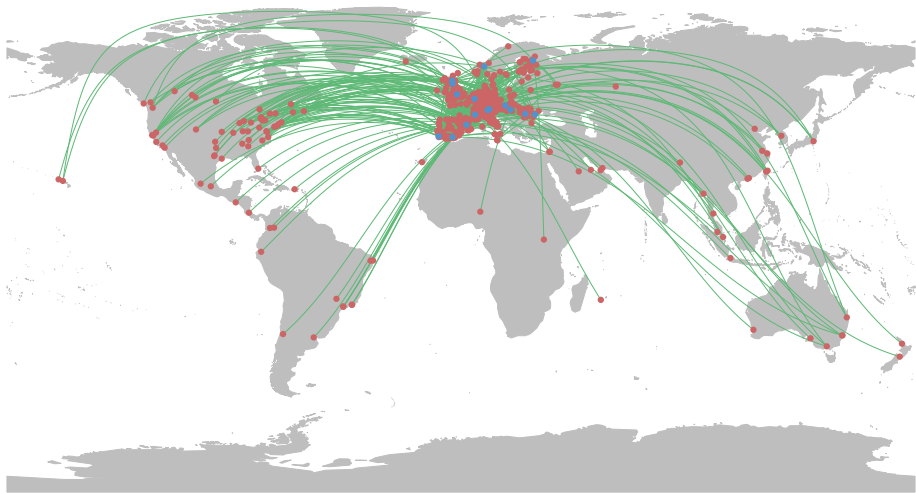
90% of accuracy in the users' place of residence detection!

Spatio-temporal network



Δ_t Time window

Spatio-temporal network



Take home messages

- ▶ Modelling of social-ecological interactions with a spatio-temporal network & ICT data

Take home messages

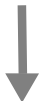
- ▶ Modelling of social-ecological interactions with a spatio-temporal network & ICT data

**Diversity of spatio-temporal contexts,
individuals and CES**

Take home messages

- ▶ Modelling of social-ecological interactions with a spatio-temporal network & ICT data

**Diversity of spatio-temporal contexts,
individuals and CES**



Resilience planning

Take home messages

- ▶ Modelling of social-ecological interactions with a spatio-temporal network & ICT data
- ▶ Strong emphasis on the biases and uncertainties associated with Flickr data

Acknowledgements

