Data Diversification: Measuring & Mapping Recreational Use with Social Media

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Traditional methods for counting visitors
Traditional methods for counting visitors
Where do people recreate?
Who are they?
What do they do?
GEOLOCATED SOCIAL MEDIA
GEOLOCATED SOCIAL MEDIA

The last three months on Foursquare

Take a look at our last 500,000,000 check-ins. Trace your commute, find your favorite landmark, and check out some of our favorite places, like New York, London, Paris, Tokyo, Amsterdam, Melbourne, and Moscow.

Or, find your own city.

Then find out what we’re working on for the future of Foursquare.

Tweet
GEOLOCATED SOCIAL MEDIA
WHERE DO PEOPLE RECREATE

n ~ 200 million
WHERE DO PEOPLE RECREATE

n = 73,000
WHERE DO PEOPLE RECREATE
WHERE DO PEOPLE RECREATE
WHERE DO PEOPLE RECREATE

(wood et al 2013 Sci Rep)
WHERE DO PEOPLE RECREATE

( wood et al 2013 Sci Rep )
WHERE DO PEOPLE RECREATE

US National Forests

$r^2 = .80$

(surveyed visitor-days vs. photo-user-days)

( Fisher et al. in prep )
WHERE DO PEOPLE RECREATE

Western US National Parks

(month) (sessions et al 2016 J Env Man)
Mount Baker-Snoqualmie National Forest

Monthly visitor use models
NATIONAL FOREST TRAIL USE

16 Trails
trail-cam & infrared
hiker & vehicle counts
3 months

n ~ 250,000 (1 yr)

n ~ 330,000 (10 yrs)

n ~ 97,000
NATIONAL FOREST TRAIL USE

Flickr comparison

\[ r = 0.725 \]

16 Trails
trail-cam & infrared
hiker & vehicle counts
3 months
**NATIONAL FOREST TRAIL USE**

- **Flickr comparison**
  - $r = 0.725$

- **Online forum comparison**
  - $r = 0.877$

- **16 Trails**
  - Trail-cam & infrared
  - Hiker & vehicle counts
  - 3 months
Jeju Island, Korea Tourism Planning

Sustainable development to support tourism
DEVELOPMENT PLANNING IN KOREA

(fisher et al in prep)
DEVELOPMENT PLANNING IN KOREA

(fisher et al in prep)
DEVELOPMENT PLANNING IN KOREA

VISITATION RATE = PREDICTOR + PREDICTOR + PREDICTOR + PREDICTOR

(fisher et al in prep)
DEVELOPMENT PLANNING IN KOREA

- photo-user-days
- twitter-user-days
- mobile population

- beaches
- sea cliffs
- roads
- natural monuments
- distance to airport
- commercial zones
- viewpoints
- forests
- trails

( fisher et al in prep )
Do People Value Clear Lakes?

How visitation depends on water quality
HOW FAR DO RECREATORS TRAVEL

visits

home

(wood et al 2013 Sci Rep)
HOW FAR DO RECREATORS TRAVEL

(wood et al 2013 Sci Rep)
Over 1,000 Lakes

- Population
- Lake size
- Lake clarity
- Lake depth
- Chlorophyll $a$
- Phosphorus
- Boat launch
- BWCA
- State parks
- Invasive species

43,000 Photos

3,200 visitors
6,400 trips

(keeler et al. 2015 Front Ecol Env)
VISITORS TO MIDWESTERN LAKES

Over 1,000 Lakes
population
lake size
lake clarity
lake depth
chlorophyll a
phosphorus
boat launch
BWCA
state parks
invasive species

43,000 Photos
3,200 visitors
6,400 trips

(keeler et al 2015 Front Ecol Env)
1 m increase in clarity...
additional 56 min travel time and $22 per trip

(keeler et al 2015 Front Ecol Env)
Social media are data on visitor use, that reveal peoples preferences, and inform recreation management.

Where do people recreate? 
How far do recreators travel? 
What do recreators do?
WHERE DO PEOPLE RECREATE

(predicted visitation)

(survey visitation)

ARCH  BLCA  BRCA  CANY  CARE  CAVE

CHIS  CRLA  DEVA  GLAC  GRBA  GRCA

GRSA  GRTE  JOTR  KICA  LAVO  MEVE

MORA  NOCA  OLYM  PEFO  PINN  REDW

ROMO  SAGU  SEQU  YELL  YOSE  ZION

( sessions et al 2016 J Env Man )
Potential Applications: Program Evaluation
Potential Applications: Transportation
Potential Applications: Forecasting & Resources
Thank you!