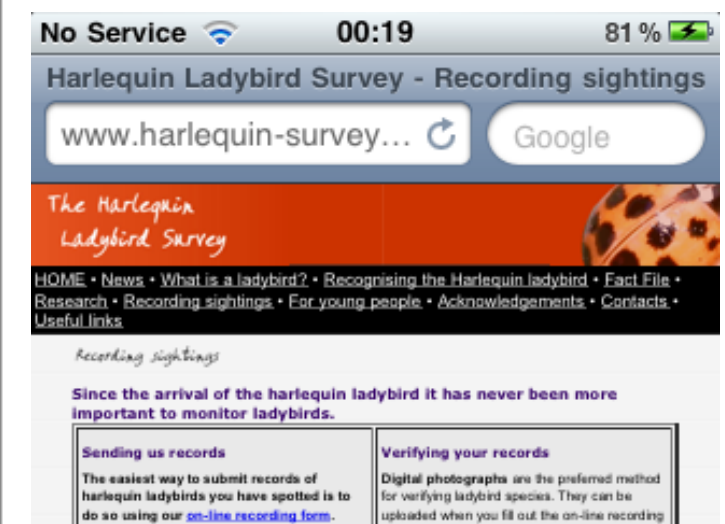




Better reception in the ivory
tower: academia and the
smartphone naturalist

richard.grenyer@ouce.ox.ac.uk



Smartphones' main role in biodiversity informatics usually thought to be as a data source

Scale is based on the average traffic of **3g -iphone** from United Kingdom in all years. [Learn more](#)

3g -iphone

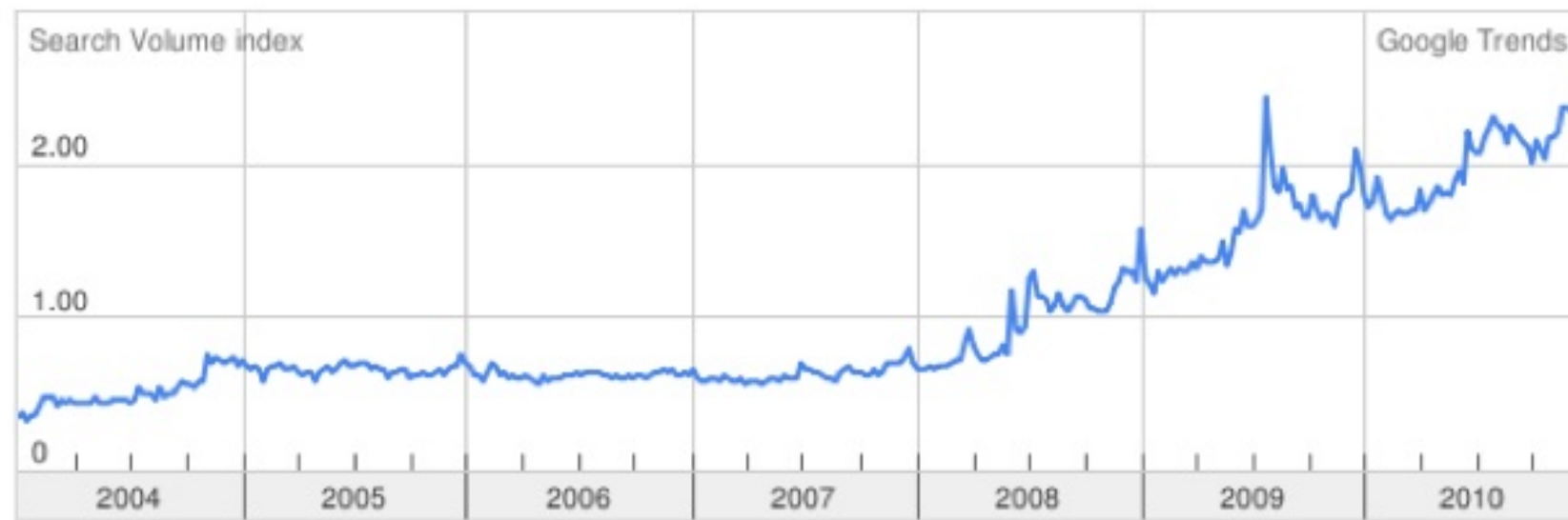
1.00



Scale is based on the average worldwide traffic of **3g -iphone** in all years. [Learn more](#)

3g -iphone

1.00



Mobile Internet use, the defining feature of smartphones is ubiquitous in the EU, and nearly so in much of the rest of the world

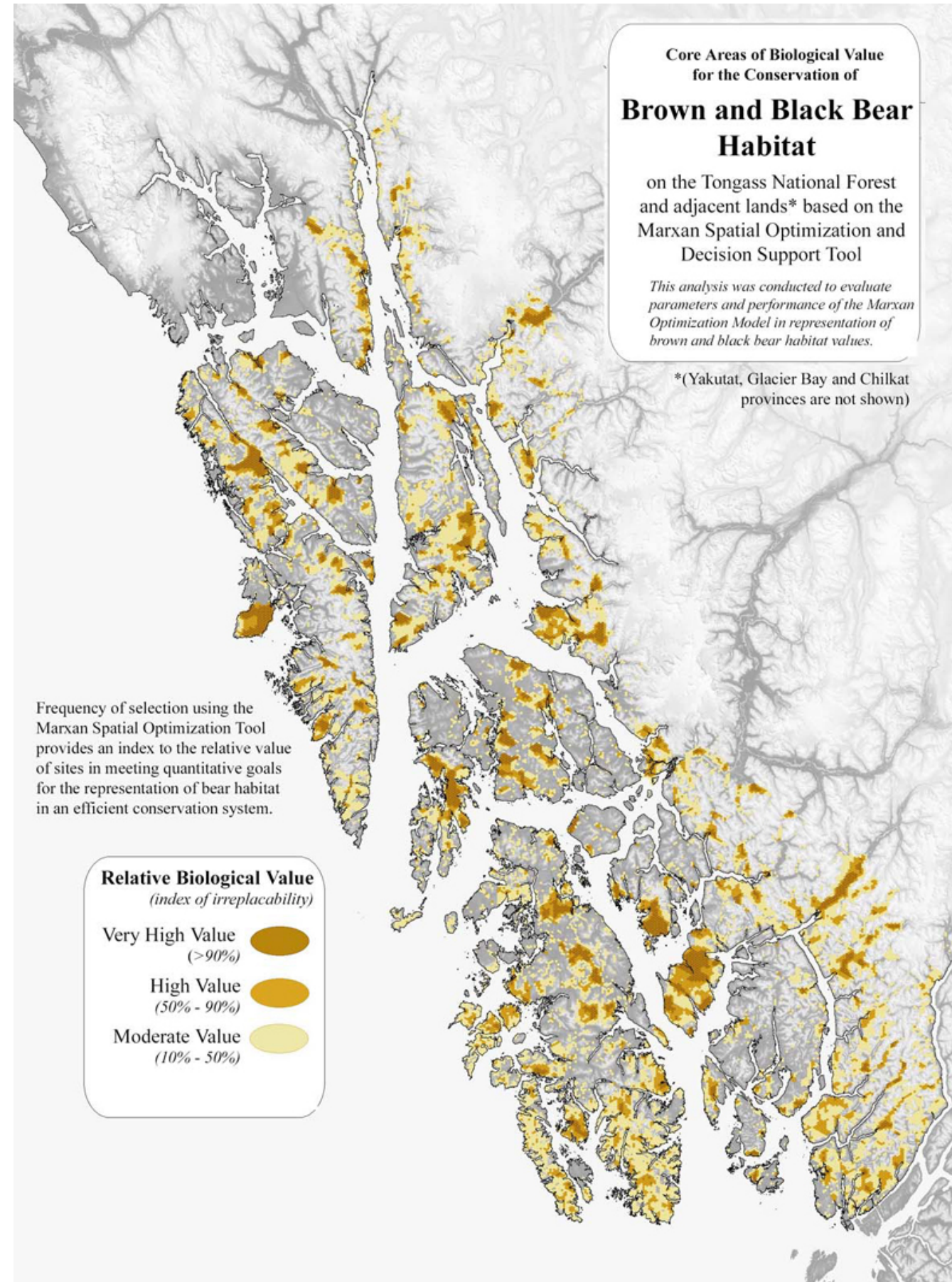
Biodiversity science

- Broadly speaking, one of two analyses:
- Either testing a model of how a biological system functions - say predicting the distribution of a species based on biology and observations,



Biodiversity science

- Broadly speaking, one of two analyses:
- Either testing a model of how a biological system functions - say predicting the distribution of a species based on biology and observations,
- Or a theory-free pattern/phenomenon based analysis to determine a practical result - say deciding how to most efficiently allocate conservation effort.



Tapping the cloud of geo-explicit biodiversity data

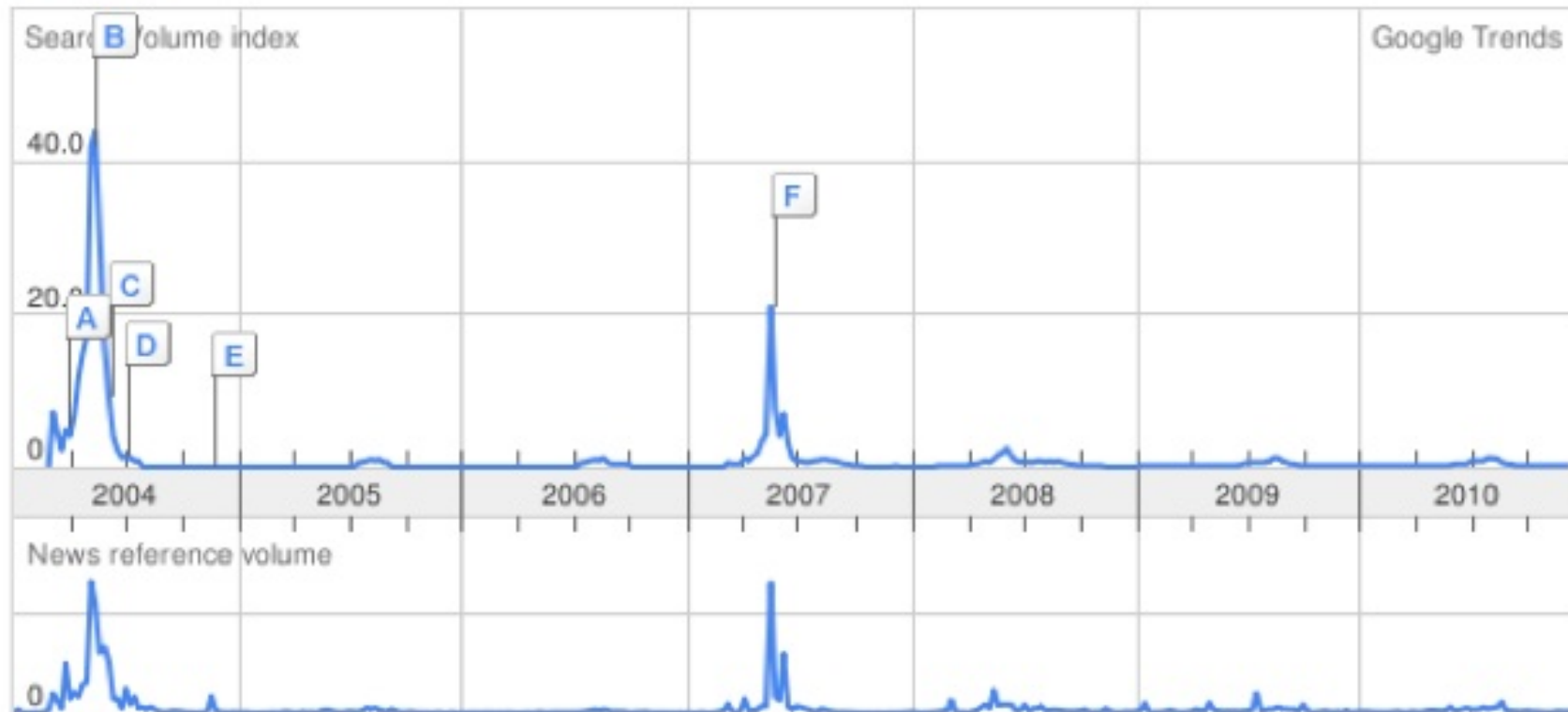
- To improve my work I'd like to know:
- Am I missing distribution data? Can I augment, or even get new data sets, from what others are saying?
- Are distributions of species changing? At what scale? Can I see it in real time?
- Can we just mine Internet content and deal with the mess?



Scale is based on the average traffic of [cicadas](#) from United States in all years. [Learn more](#)

cicadas

1.00



Rank by

cicadas

Subregions

1. [Illinois](#), United States
2. [Maryland](#), United States
3. [Kentucky](#), United States
4. [Ohio](#), United States
5. [District of Columbia](#), United States
6. [Indiana](#), United States
7. [Tennessee](#), United States
8. [Iowa](#), United States
9. [Wisconsin](#), United States

[Pennsylvania](#), United States

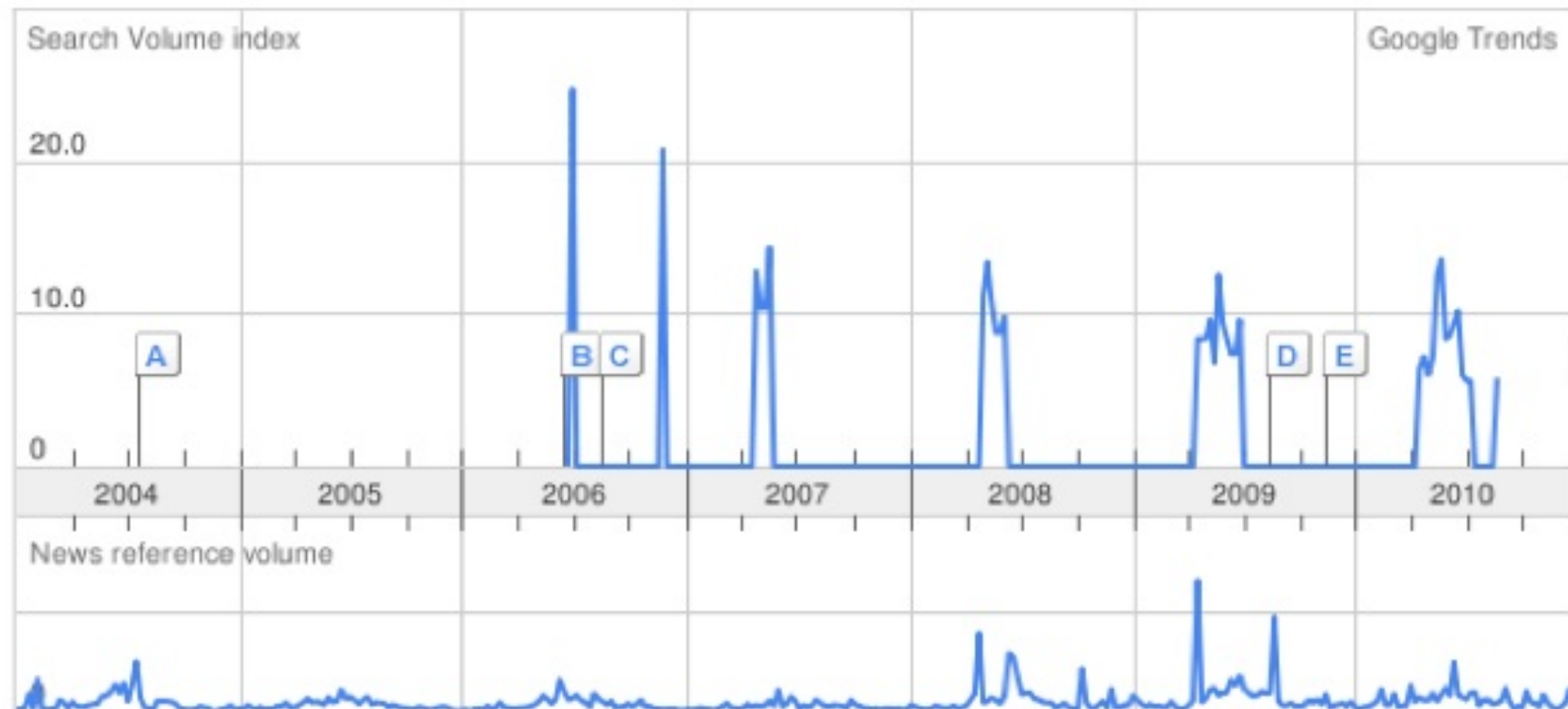
Cities

1. [Elmhurst, IL, USA](#)
2. [Cincinnati, OH, USA](#)
3. [Rockville, MD, USA](#)
4. [Chicago, IL, USA](#)
5. [Baltimore, MD, USA](#)
6. [Washington, DC, USA](#)
7. [Louisville, KY, USA](#)
8. [Nashville, TN, USA](#)
9. [Reston, VA, USA](#)
10. [Indianapolis, IN, USA](#)

Scale is based on the average traffic of [mayfly](#) from United Kingdom in all years. [Learn more](#)

[mayfly](#)

1.00



Rank by

Subregions

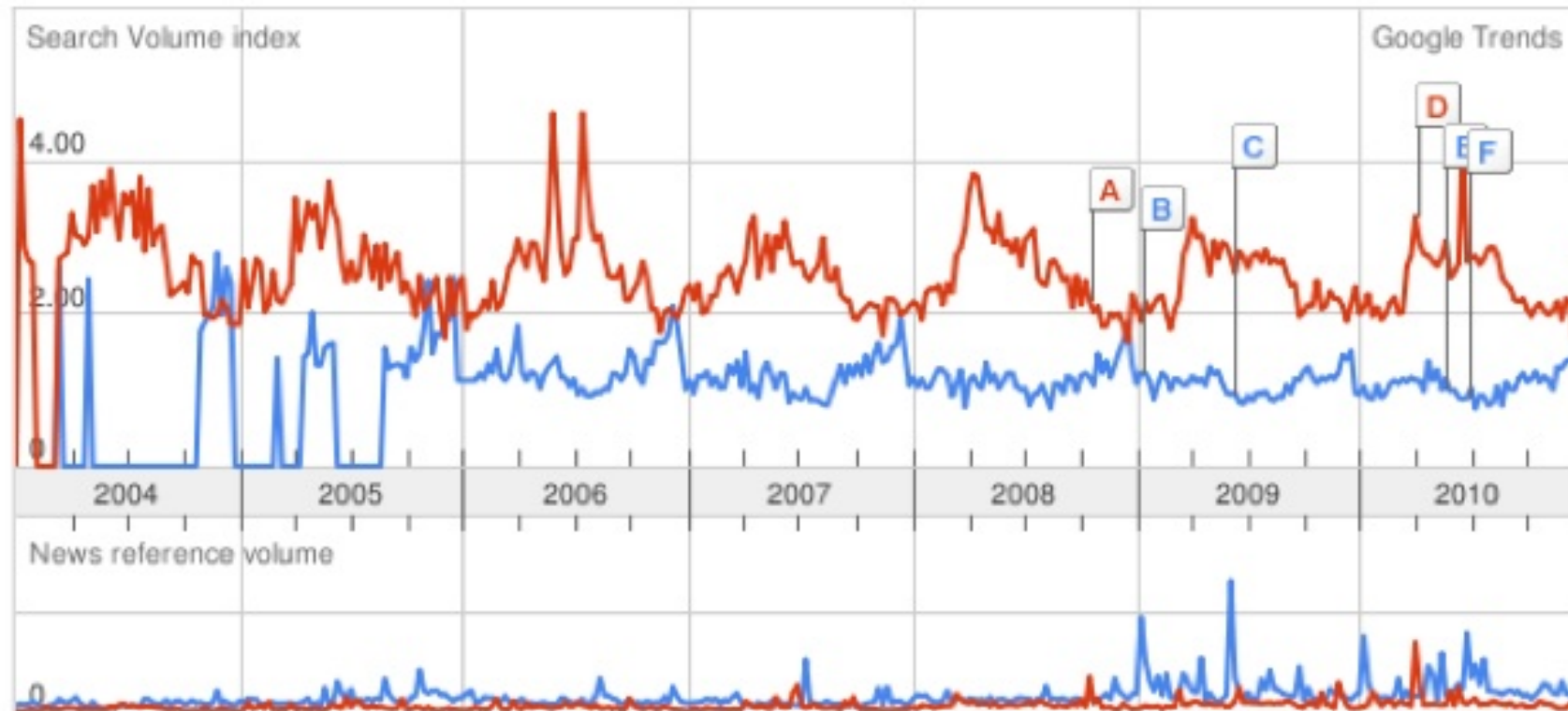
1. [Northern Ireland](#), United Kingdom
2. [Wales](#), United Kingdom
3. [England](#), United Kingdom
4. [Scotland](#), United Kingdom

Cities

1. Southampton, United Kingdom
2. Farnborough, United Kingdom
3. Reading, United Kingdom
4. Watford, United Kingdom
5. Thames Ditton, United Kingdom
6. Milton Keynes, United Kingdom
7. Birmingham, United Kingdom

Scale is based on the average traffic of **geese** from United Kingdom in all years. [Learn more](#)

geese 1.00 **osprey** 2.50



Rank by **geese**

Subregions

1. [Northern Ireland](#), United Kingdom
2. [Scotland](#), United Kingdom
3. [Wales](#), United Kingdom
4. [England](#), United Kingdom

Cities

1. Inverness, United Kingdom
2. Belfast, United Kingdom
3. Milton Keynes, United Kingdom
4. Edinburgh, United Kingdom
5. Brighton, United Kingdom

Scale is based on the average traffic of [spiders](#) from United Kingdom in all years. [Learn more](#)

[spiders](#)

1.00



Rank by

Subregions

1. [Northern Ireland](#), United Kingdom
2. [Wales](#), United Kingdom
3. [Scotland](#), United Kingdom
4. [England](#), United Kingdom

Cities

1. [Farnborough](#), United Kingdom
2. [Hull](#), United Kingdom
3. [Belfast](#), United Kingdom
4. [Leeds](#), United Kingdom
5. [Cardiff](#), United Kingdom
6. [Portsmouth](#), United Kingdom
7. [Nottingham](#), United Kingdom

Waxwing

 **HawkandOwlTrust**
HawkandOwlTrust


Reply ReTweet Favorite Share

RT @BristolOrniClub: 1 Waxwing still present at Saab garage Kingsweston Ave, Shirehampton

Sent Jan 08, 12:56 AM
From txt

 **HawkandOwlTrust** 1 day ago
RT @BristolOrniClub: 1 Waxwing still present at Saab garage Kingsweston Ave, Shirehampton

...nominations: The most outstanding contributors to microblogging site Twi...

 **Bammers1954**
Bammers1954

Reply ReTweet Favorite Share

off to a great start, waxwing on the roof of my house

Sent Jan 04, 11:55 PM
From web

geographers to chat and listen
<http://bit.ly/6ZMjil>

twitpic Click here to



there is a huge bird nest in the tree outside my house what kind of bird make this lol

Waxwing

HawkandOwlTrust
HawkandOwlTrust

Reply ReTweet Favorite

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nominations: The most outstanding contributors to microblogging site Twi...

Bammers1954



geographers to chat and listen
<http://bit.ly/6ZMjil>

twitpic

Click here to



2011/01/08 1

there is a huge bird nest in the tree outside my house what kind of bird make this lol

Data quality issues and efficiency

- Mining unsanitised, uncurated social media data is going to involve:
- Unsupervised classification
- Intensive contextual analysis and fuzzy matching
- Biodiversity informatics ontologies (which don't always exist, or work if they do)
- Time



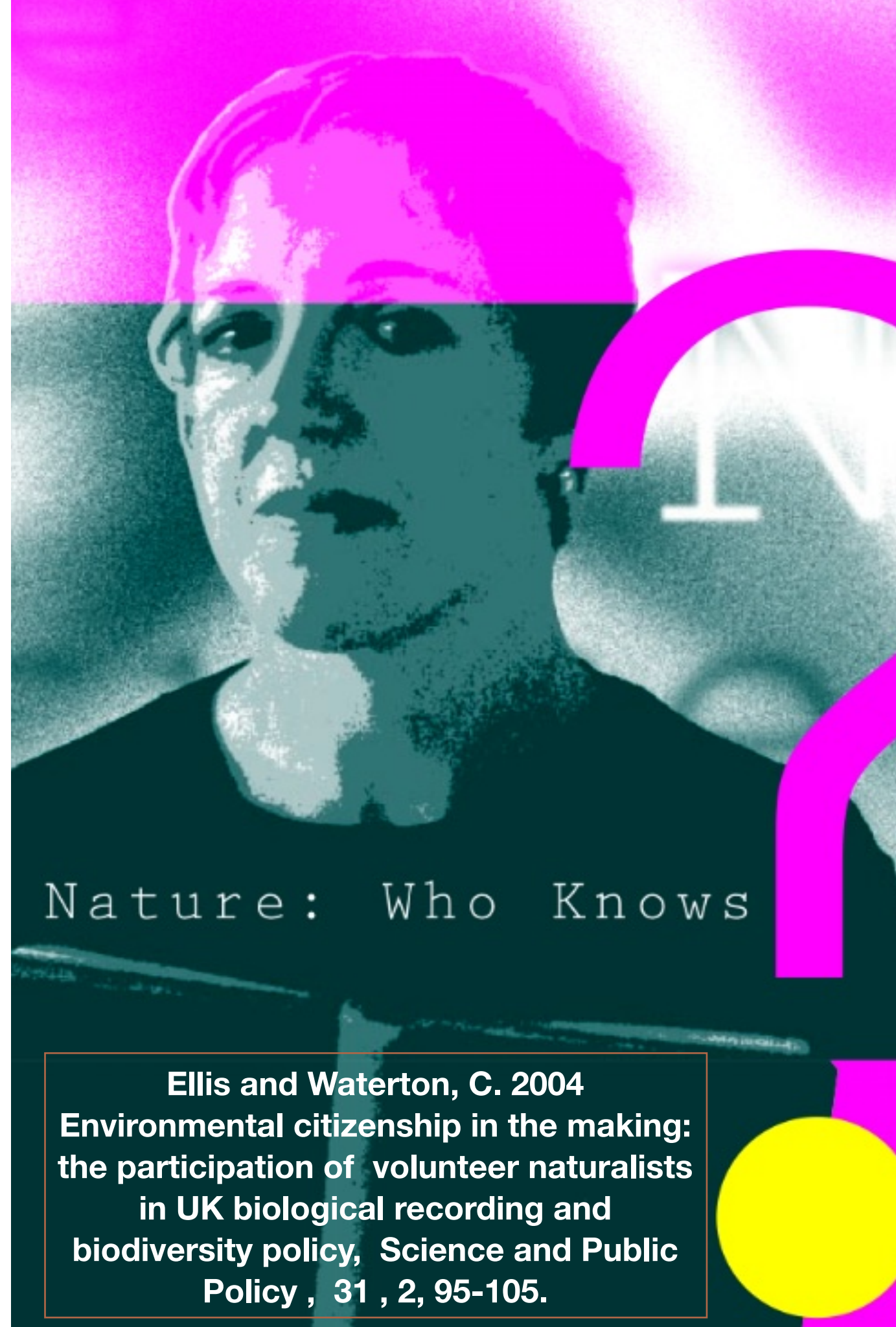
Expert sources of information

- Unsupervised mining might eventually be very interesting.
- Mining expert sources of information may be more practical in the short term
- Expert naturalists are increasingly trailing high quality biodiversity data through social networking media.
- But ubiquitous smartphones might provide another solution



The chequered relations of professional & amateur naturalists

- "Amateur-expert" naturalists are fully aware of the value and uses of their data.
- There were 100,000 amateurs involved in biodiversity data collection in the UK in 2002.
- The majority of the UK's biodiversity distribution data holding was collected by unpaid effort.
- Relations between collectors of data and the sponsors/users/curators/policy makers involved with the data are not always good.



Nature: Who Knows

**Ellis and Waterton, C. 2004
Environmental citizenship in the making:
the participation of volunteer naturalists
in UK biological recording and
biodiversity policy, Science and Public
Policy , 31 , 2, 95-105.**

Conflict- "Professionals" & "Naturalists"

- Naturalists are nerds
- Naturalists can and should hand over data to inform science or policy
- This can just happen without effort or disruption.
- Professionals are "suits" with no natural history understanding.
- Data users will lose or not attribute data
- No say over data use
- Users doesn't care about people, only data
- Using other data which is so poor that naturalists are devalued

Caveat: Ellis' study refers to professional conservationists not scientists

Ellis' conclusion:

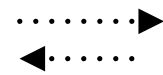
- "Passion and wonder are alive and kicking"
- Holding onto passion and wonder is a challenge when negotiating conflicted data use agreements (!)
- Arrangements can work but only by playing to the two parties' retrospective strengths.



Some thoughts

- Science needs data free from encumbrance, but not attribution or goodwill.
- Naturalists value good tools that improve the experience of being a naturalist.
- Smartphone technology - of all things - might be a partial solution to data use and dissemination conflicts.
- The most important thing a smartphone does is not transmit data, but be able to *receive* it.

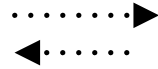
Existing data



Biodiversity model

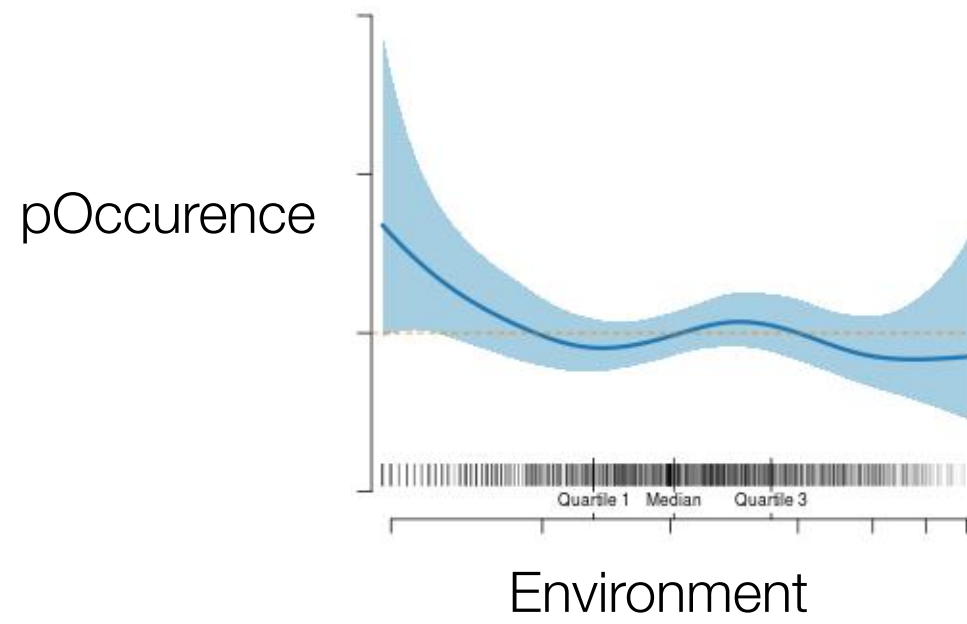


Existing data

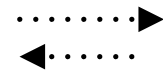


Biodiversity model

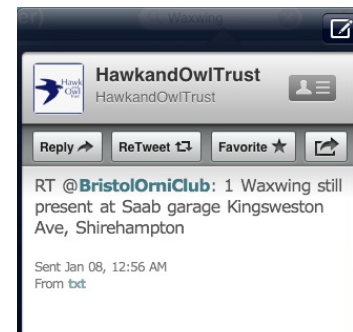


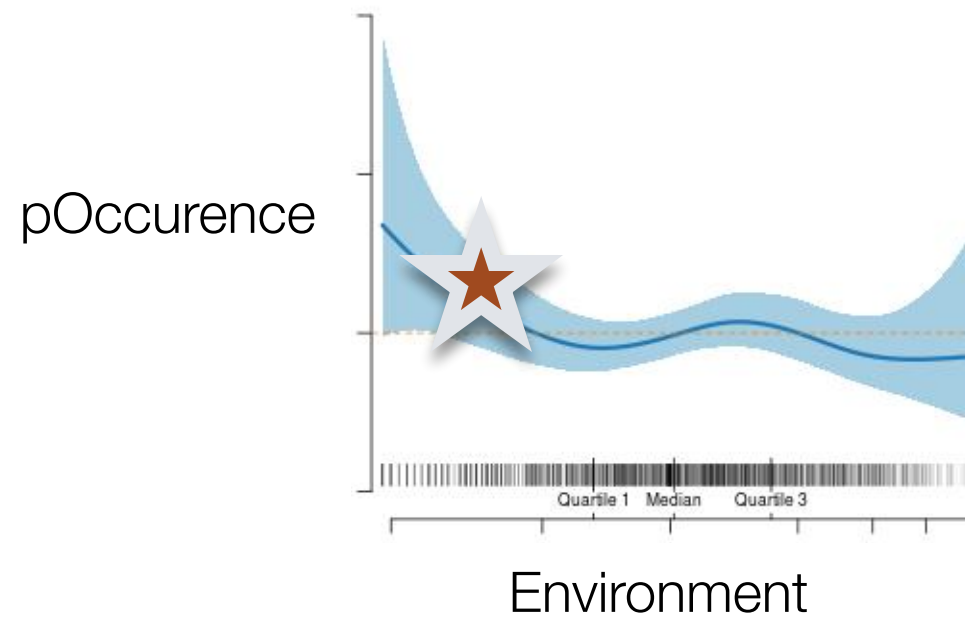


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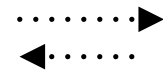


Biodiversity model

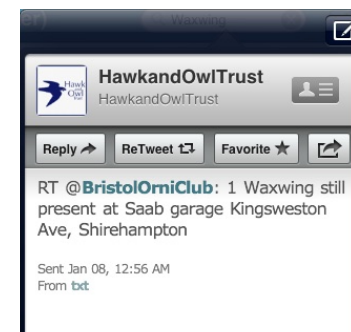


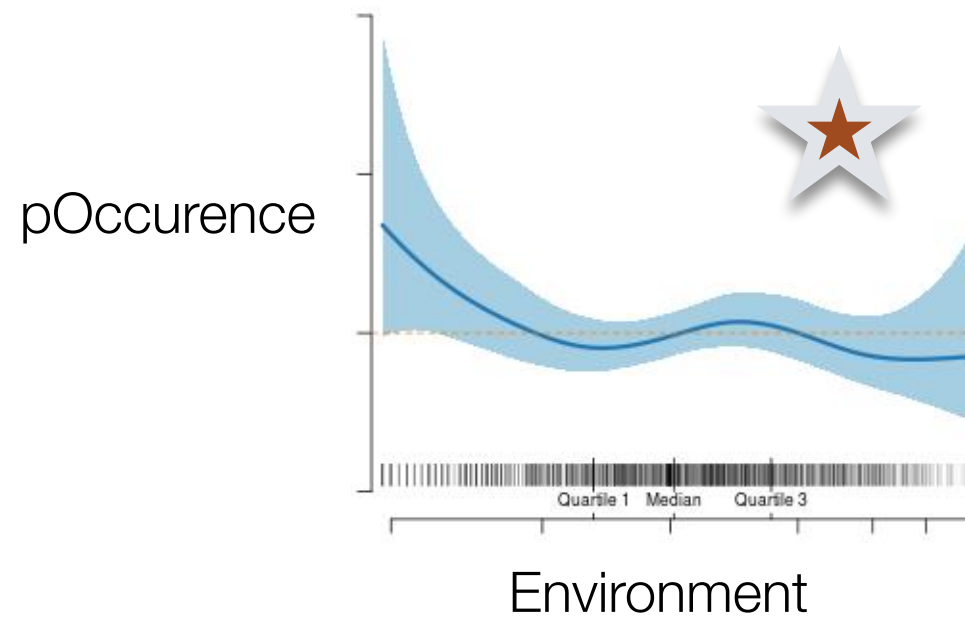


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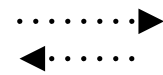


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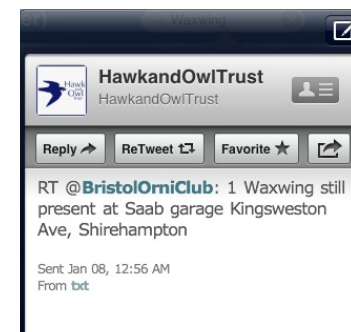


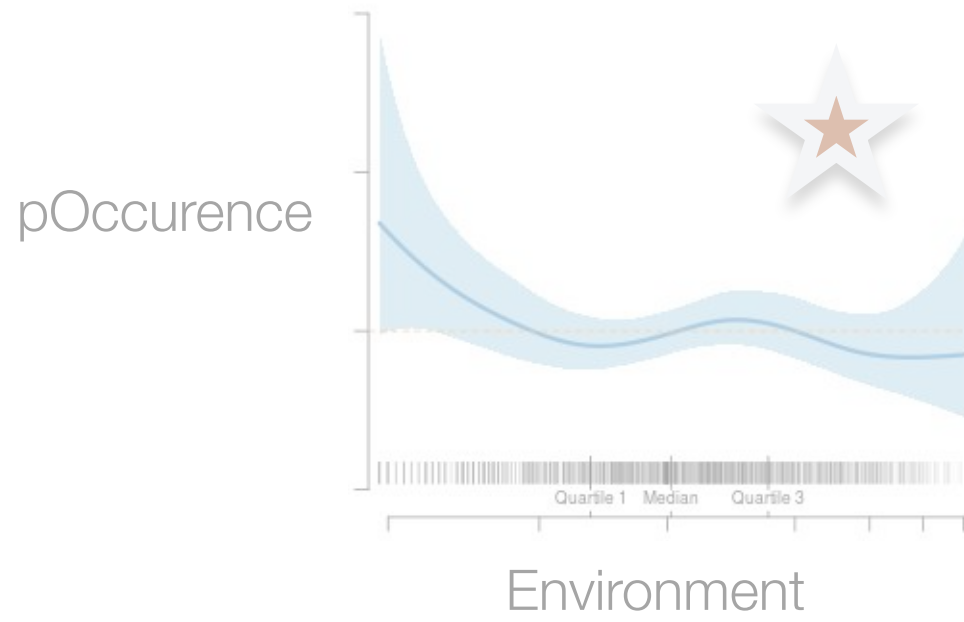


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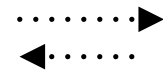


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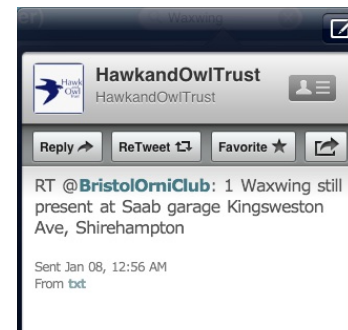


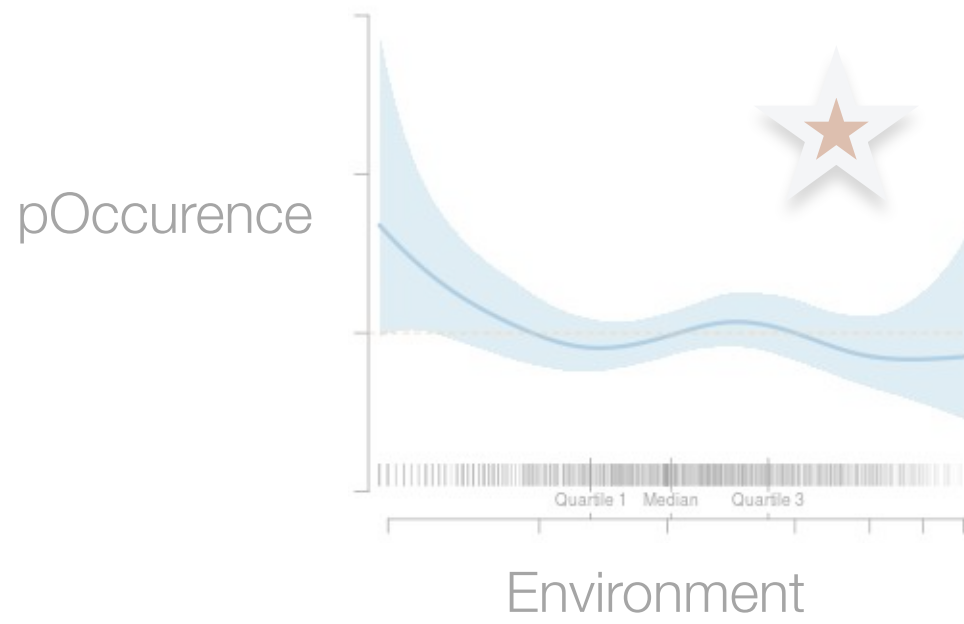


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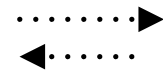


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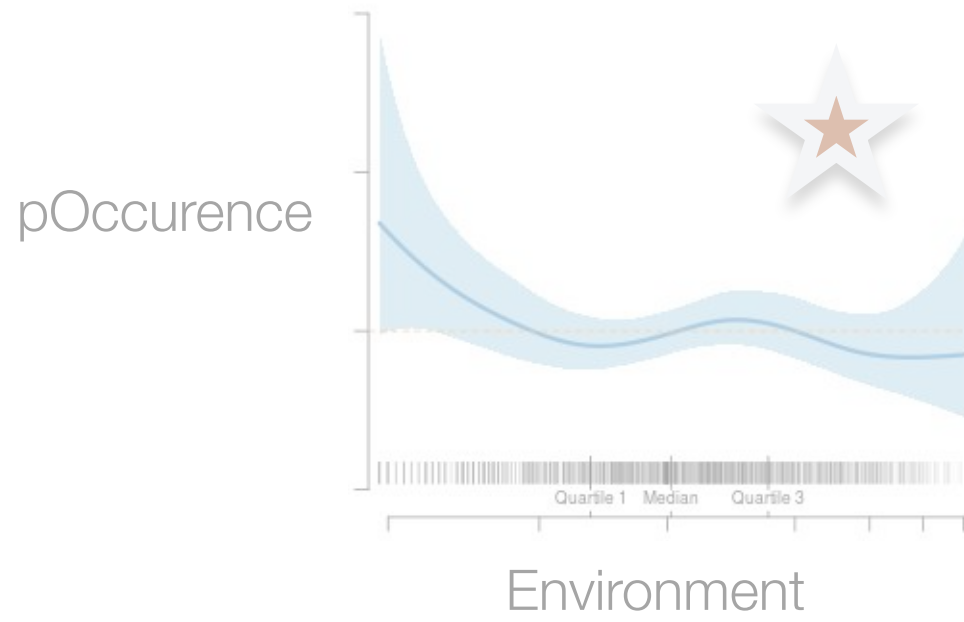


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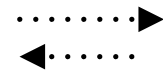


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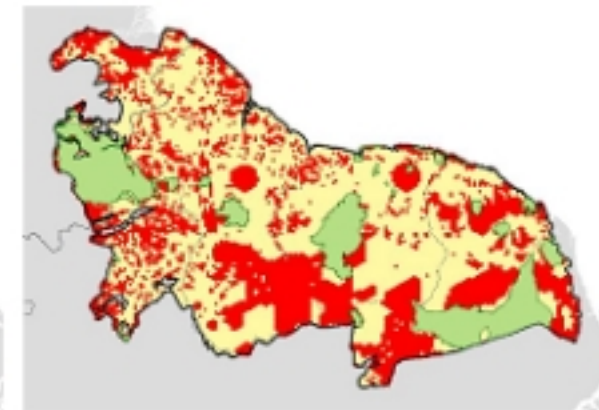
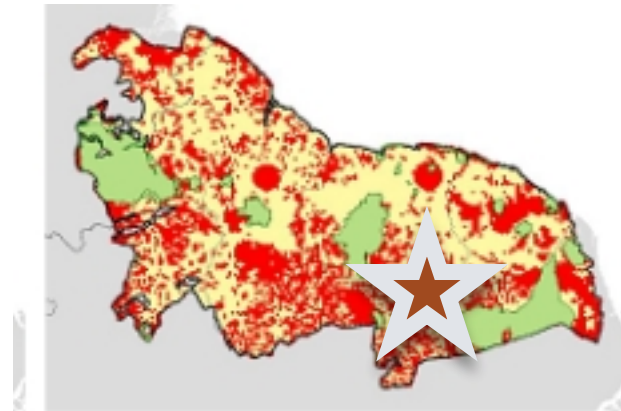
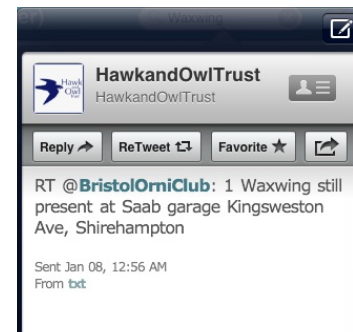


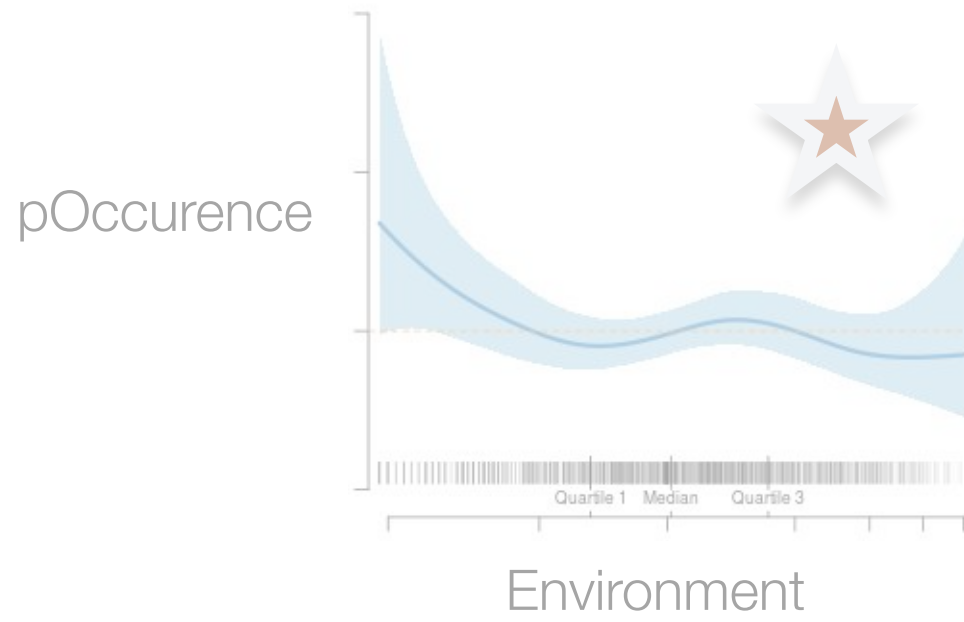


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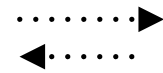


Biodiversity model

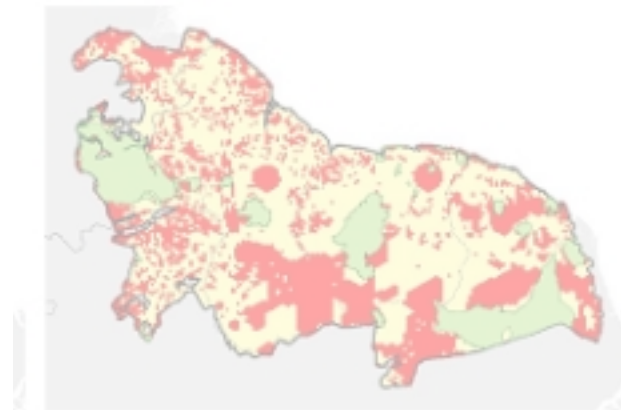
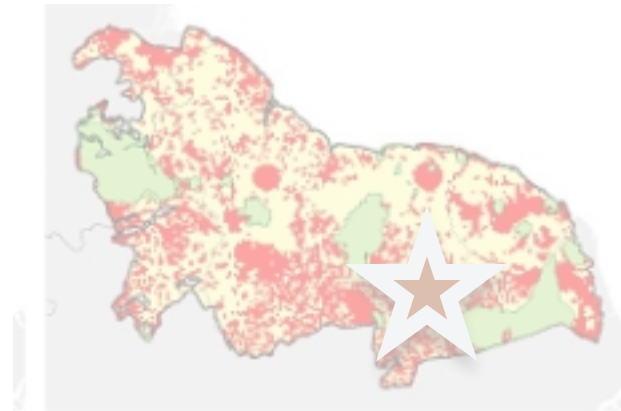
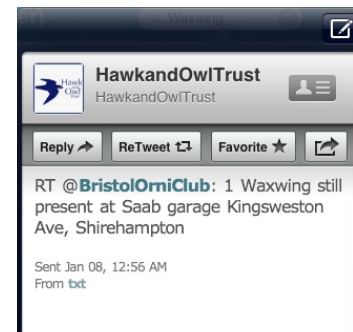




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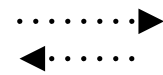


Biodiversity model

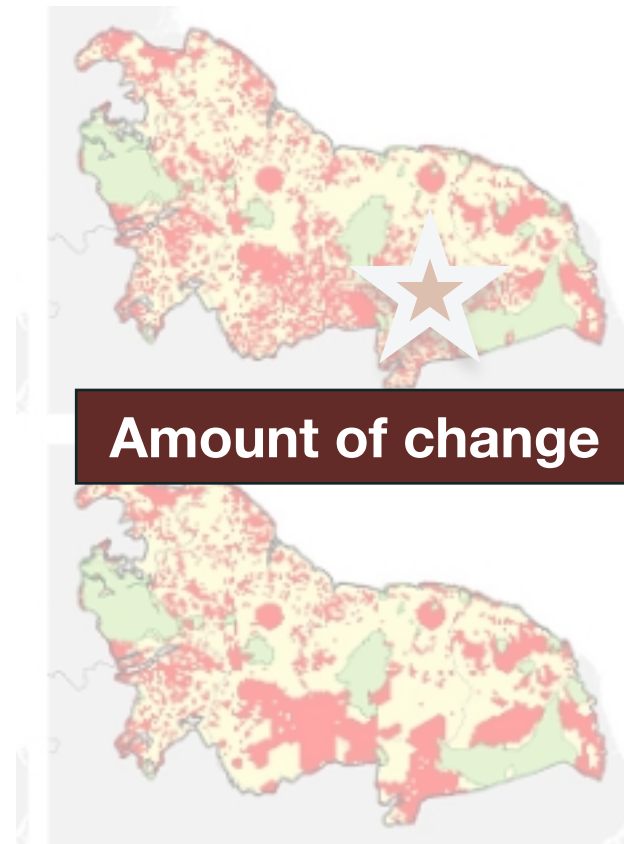




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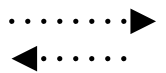
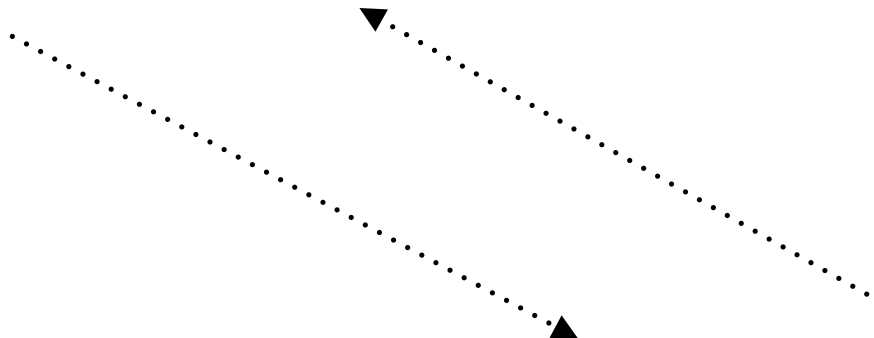
Biodiversity model



Amount of change

Existing data

Biodiversity model



Amount of change

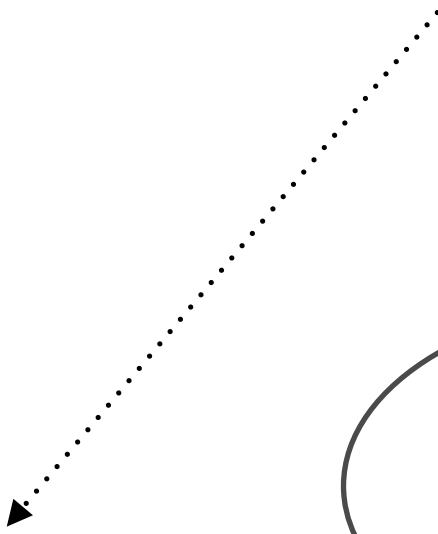
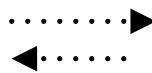
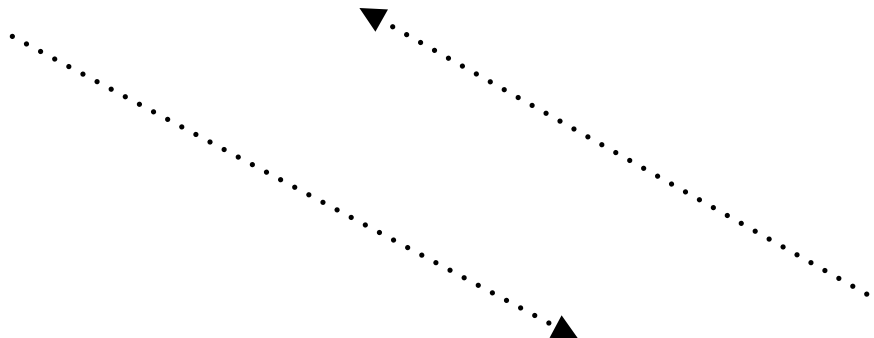
Existing data

Biodiversity model



Are you sure?

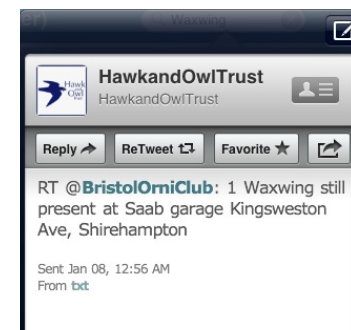
Possible error



Amount of change

Existing data

Biodiversity model



Possible error

Are you sure? Possible alternatives are...

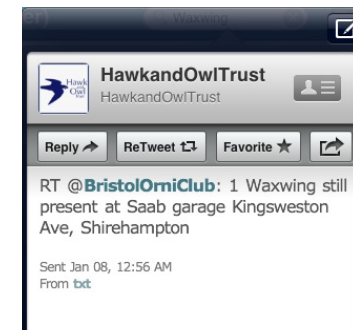


Value added to eNaturalist

Amount of change

Existing data

Biodiversity model



Are you sure? Possible alternatives are...



Possible error



CUT THE ROPE LITE

Last Played 16 OCTOBER 2010

Rank

#1 of friends
#1,489,382 overall

Achievements

1 earned
20 points

Recently Played

Tell A Friend

Leaderboard:

CARDBOARD...ARD (LITE) ▼

TODAY

THIS WEEK

ALL TIME

» 1 FRIEND «

1	cro_mag_non Top 5%	44,200
---	-----------------------	--------

» ALL 2,365,226 PLAYERS «

1	monyet	2,000,036,897
2	Juan805	1,302,033,300
3	ErykHalas	510,043,700
4	鄧紫棋	179,999,991
5	Mantuz	203,200
6	fq938	102,300
7	Chris Masterson	51,400



Different rewards for different users

- ID confirmation
- Unadulterated academic/theoretical benefit
- Transform to some kind of score:
 - X% knowledge increased!
 - X km new range suggested!!
 - You Increased the conservation value by X ranks!
- Make this a social network tool : " X just found another unusual observation! You're getting left behind - get your binoculars and get out there!"

The screenshot shows the 'CUT THE ROPE LITE' game interface. At the top, there are buttons for 'Leaderboard' and 'Achievements'. The game title 'CUT THE ROPE LITE' is prominently displayed, along with the text 'Last Played 16 OCTOBER 2010'. Below this, there are two columns: 'Rank' and 'Achievements'. The 'Rank' column shows '#1 of friends' and '#1,489,382 overall'. The 'Achievements' column shows '1 earned' and '20 points'. Below the rank and achievements, there are tabs for 'CARDBOARD...ARD (LITE)', 'TODAY', 'THIS WEEK', and 'ALL'. A section for '1 FRIEND' is visible, showing a score of 44,200. To the right, a table lists the top 7 players:

Rank	Player Name
1	monyet
2	Juan805
3	ErykHalas
4	鄧紫棋
5	Mantuz
6	fq938
7	Chris Masterson

At the bottom of the screen, there are navigation icons for 'Me', 'Friends', 'Games', and 'Requests'.

Biodiversity Spam!?

- The users of social networks are more forgiving than others - targeted advertising is the the *sine qua non* of Google and Facebook.
- But Twitter is particularly amenable to automated contact with users.
- "Bot" following on keywords is a tolerated activity, to a degree.
- Why not offer the reward to people who didn't ask for it, in exchange for better observation quality?



Conclusions

- Mining unsanitized cloud data is going to be fun, but hard.
- A reciprocal mutualism between more expert users and biodiversity science might be more interesting in the very short term.
- Idea 1: provide a (transformed) science-outcome return to users in real time to provide recompense for what is actually a liberated, unencumbered data set.
- Idea 2: the reward needs to a) match the type and interests of the naturalist and b) augment the passion and wonder of being a naturalist - something we all feel.



Better reception in the ivory
tower: academia and the
smartphone naturalist

richard.grenyer@ouce.ox.ac.uk