Gamify biodiversity monitoring to fuel citizens' participation

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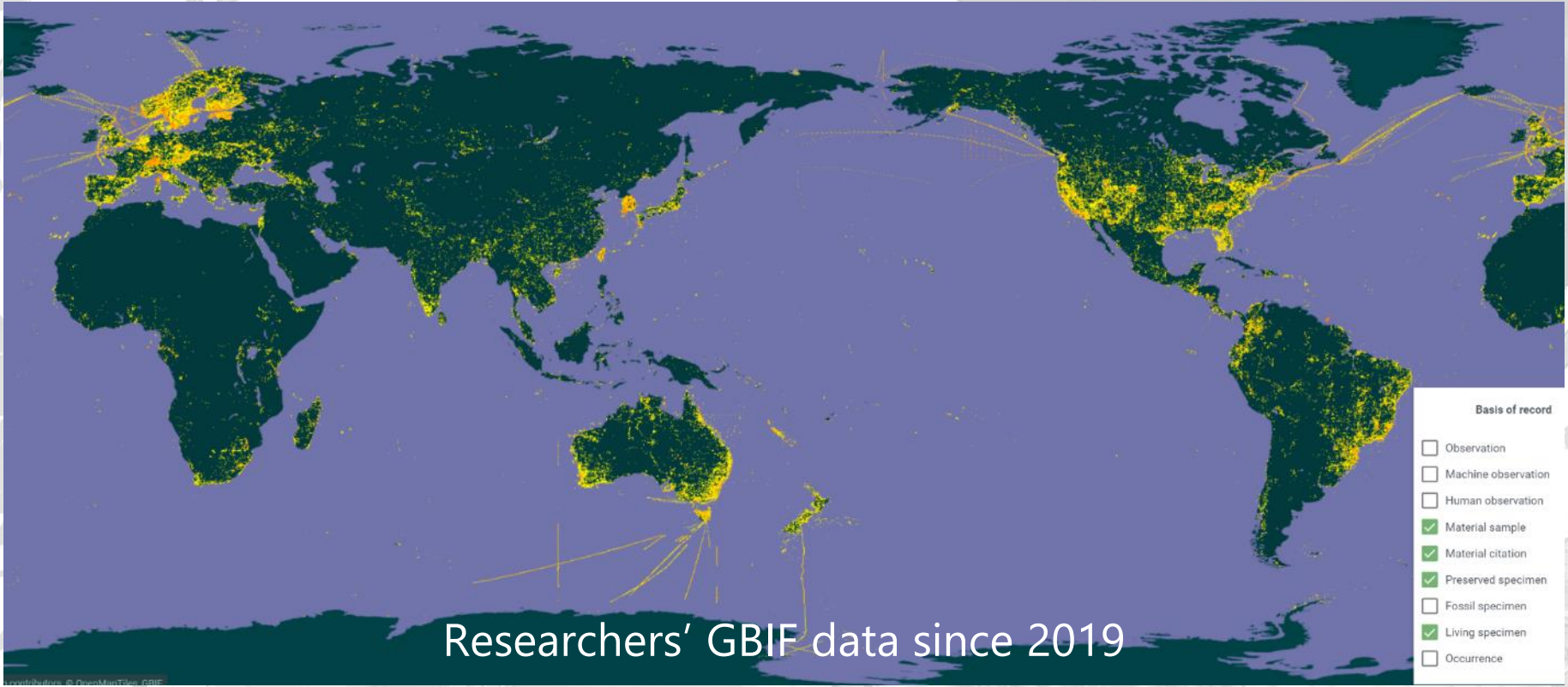
from
BIOME

Limit of biodiversity survey by researchers



Researchers' GBIF data since 2019

Biodiversity monitoring needs citizens

Biome | App to gamify biodiversity monitoring

Photo GPS/timestamp
→ Occurrence locality

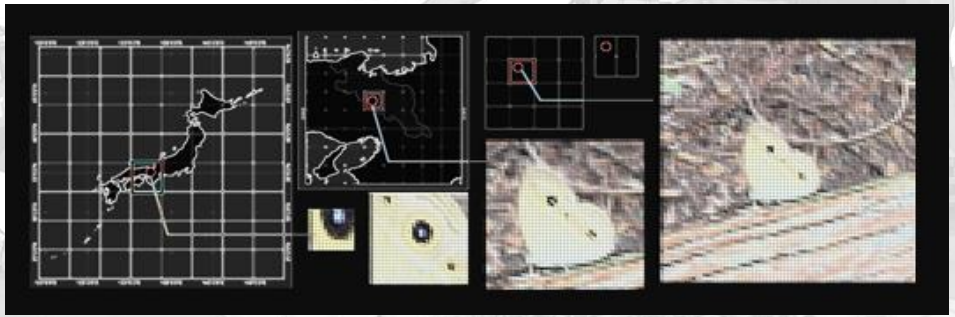
AI suggests species

Image recognition × Ecological niche

→ Identify >100,000 species

Animals family-level Top1: 88.71% Top3: 95.81% correct

Plants family-level Top1: 81.50% Top3: 90.04% correct



Patents: JPN 6590417, US 11,048,969

Do not trust AI…? Ask other users!

Users' suggestions:

>96% correctly identified

Philosophy | Biodiversity survey should be…

~~Obligation..?~~

Fun

Fun! | Find wildlife as *micro-outdoor* activities

SNS!

Level up!

By posting wildlives

Quest for wildlife!

Micro-outdoor adventure

Map!

Check your neighbor wildlives
*endangered species are hidden

Growing species catalogue!

Covers all species in Japan
*not for fungi

Users’ voice | Enjoying get more knowledge

Started to enjoy stay-home activities. **Not just have a look at plants, it’s a great way to gain knowledge**.

I became more enjoy walking around by using the app. It **widens my view of nature because now I can know the name of tiny insects and plants**.

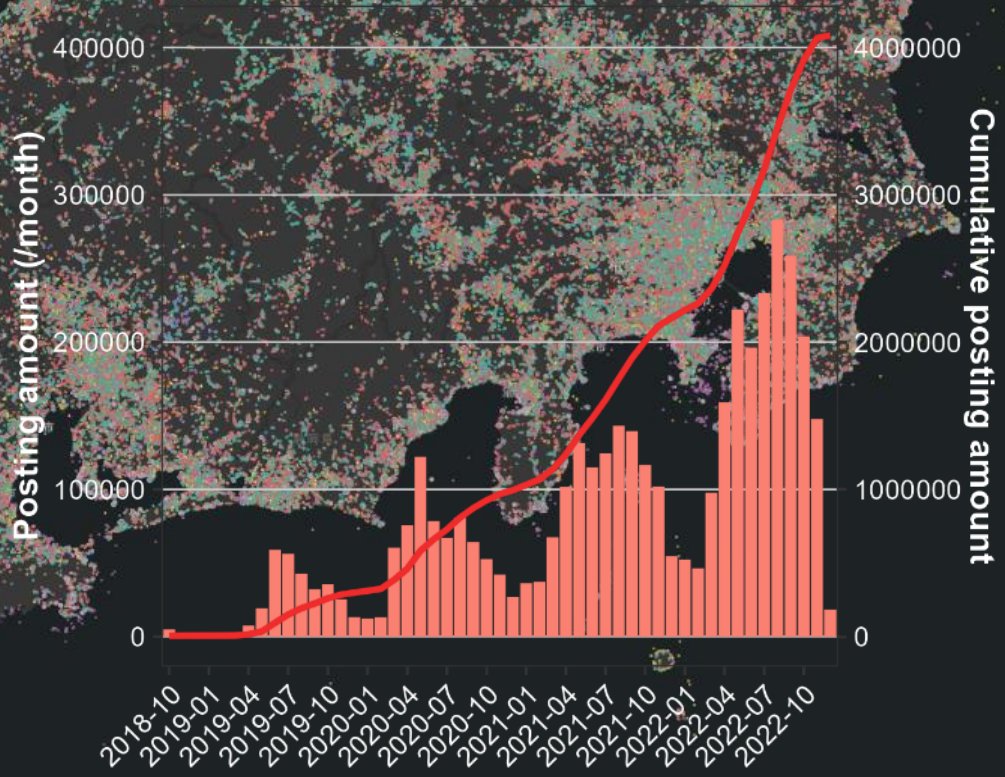
The app made finding wildlife more fun and convenient. I enjoy making collections of wildlife that I've found. Now **I got interested in many lives that I overlooked before**.
I will continue **using the app with my son**.

Users' findings → Species occurrence big data

種子植物
昆虫・クモ
鳥類
魚類
哺乳類
は虫類
軟体動物
その他植物
甲殻類
両生類

37,662 species
4,070,124 photos
at 7th Dec. 2022

from
>**380,000 users**



Findings | Range expansion of invasive species

中国などアジア地域が原産の外来種。2、3

シタベニハゴロモ、備前で採集　中国地方で初確認、標本公開へ

地域経済　倉敷市　備前市

シェア　ツイート

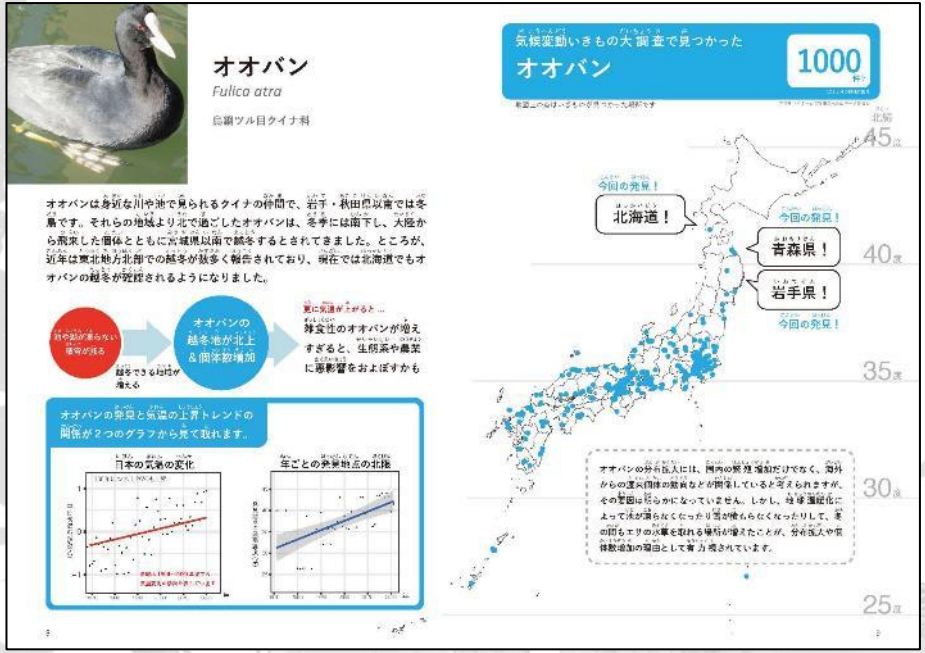
倉敷市立自然史博物館（同市中央）は１９日、中国などに分布する昆虫・シタベニハゴロモが備前市で見つかったと発表した。岡山大環境理工学部２年の水井颯麻さん（２０）が採集した。同博物館によると、中国地方での生息確認は初めて。同館で２１日～来年２月９日に標本を公開する。

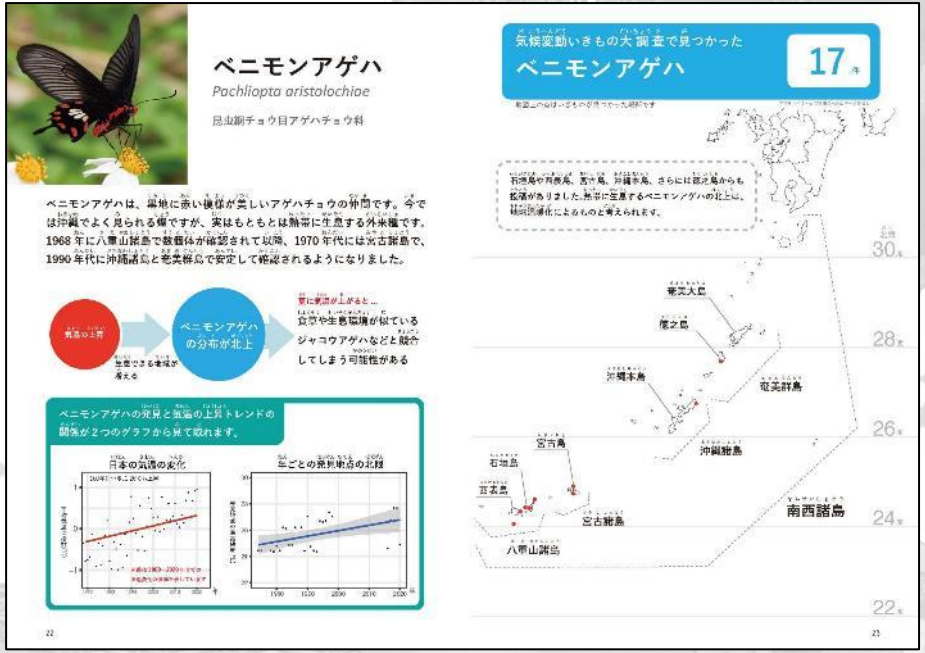
シタベニハゴロモはカメムシの仲間で、体長約１・５～２センチ。南方系の外来種で赤い後ろ羽を持つ。水井さんは８月４日、同市南部で成虫を発見。１０日に４匹を捕まえて同博物館に持ち込んだ。２００９年以降、石川、福井県、大阪

備前市で採集されたシタベニハゴロモ。羽が青みがかった個体（左）も見つかった

Findings | Range expansions, due to global warming?

Citizen science x Reporting → Effective **nature education**!





Collaborate with Japan’s Ministry Of Environment

Data analysis | Estimate species distribution

Useful for

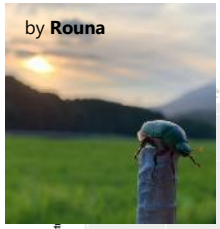
- Scanning OECM potential
- Locate the company's interaction with important biodiversity area for TNFD

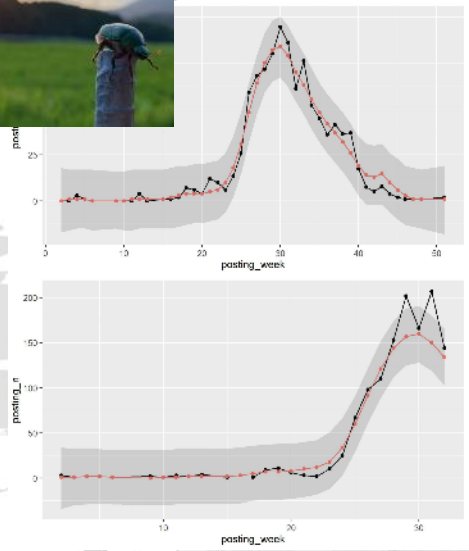
Open data from GBIF is also used

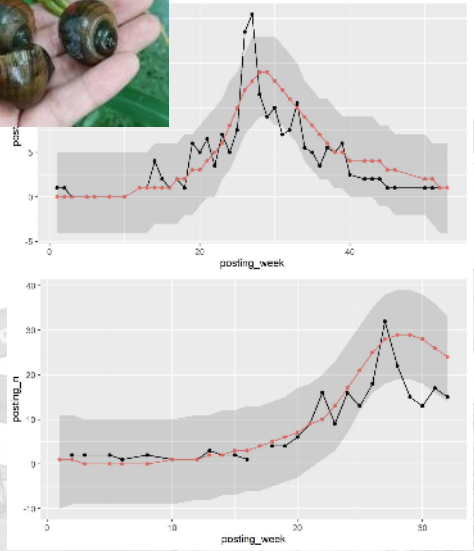
Data analysis | Forecast emergence timing

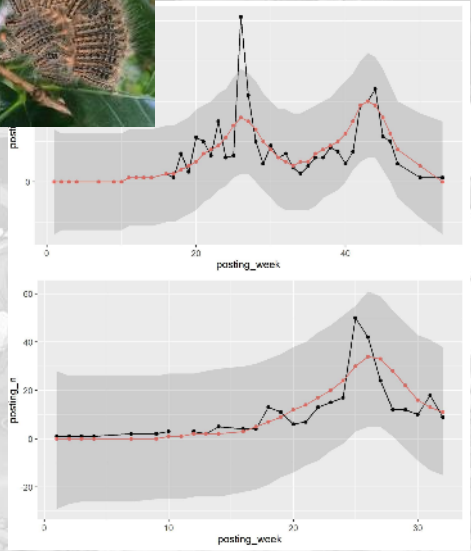
From temporal trends of posting frequency

— actual data — forecast



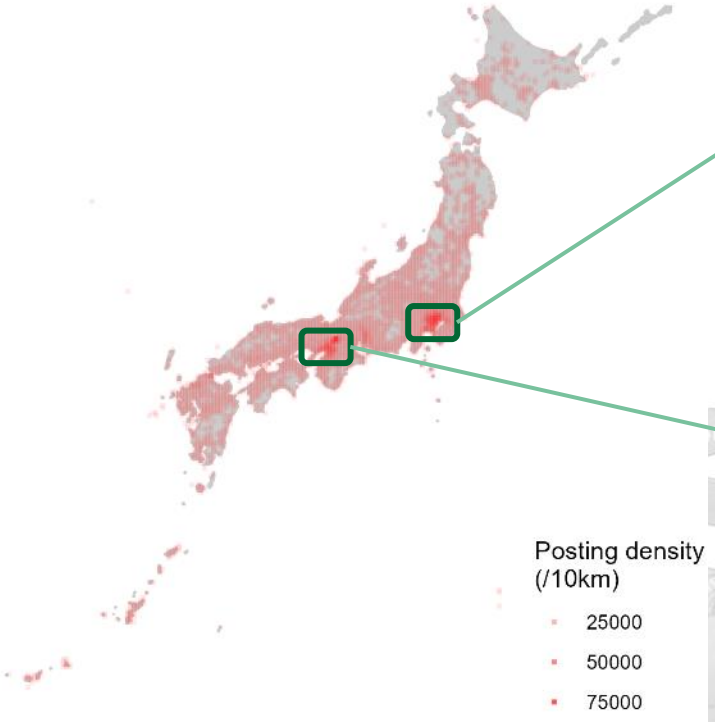


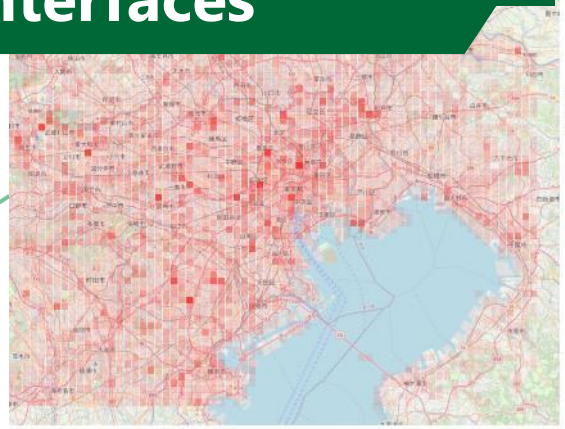


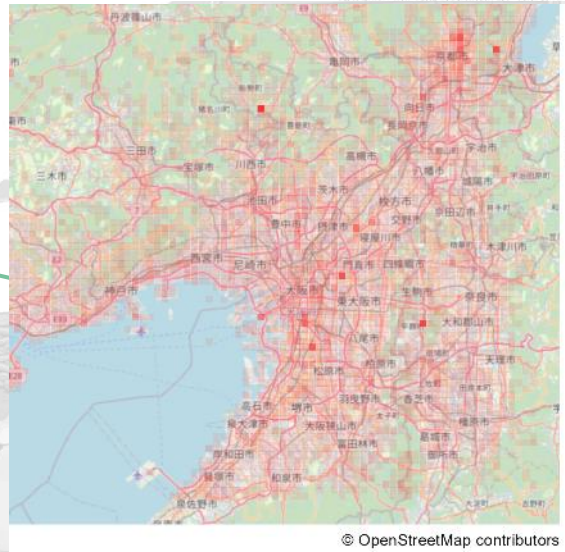


Data analysis | Human-nature interfaces

Detect hotspots of
nature related activities







Upcoming app | *Biome Survey*

Support environmental assessment for non-experts team

- Assist TNFD's **Evaluate** & **Assess** based on **ground-truth data**
- Can input abundance, size etc…

Summary | Gamified citizen science yields real-time bigdata

- **Citizen science**
  Essential tool for ground-truthing/monitoring biodiversity

- **Gamification**
  Effective for stimulating people's interest in wildlife

- **Micro-outdoor**
  Finding lives nearby is an easy & fun activity

- **Real-time biodiversity big data**
  Allow analysis of species occurrence across time & space

BIOME