Measuring the number of insects: past, present and future perspectives

Theo Zeegers, EIS Kenniscentrum Insecten

www.eis-nederland.nl

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- More than 40 years experience in dutch arthropods

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- Traditionally, taxon-driven

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- More than 40 years experience in dutch arthropods
- Traditionally, taxon-driven
- Recently, also topic-driven
  - Pollinators
  - Trends in biomass
  - Agriculture

Content talk

- Alarming news: strong decline insects

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- Alarming news: strong decline insects
- Monitoring 21th century: new techniques

Only one year ago: Hallmann et al.

PLOS ONE

RESEARCH ARTICLE

More than 75 percent decline over 27 years in total flying insect biomass in protected areas

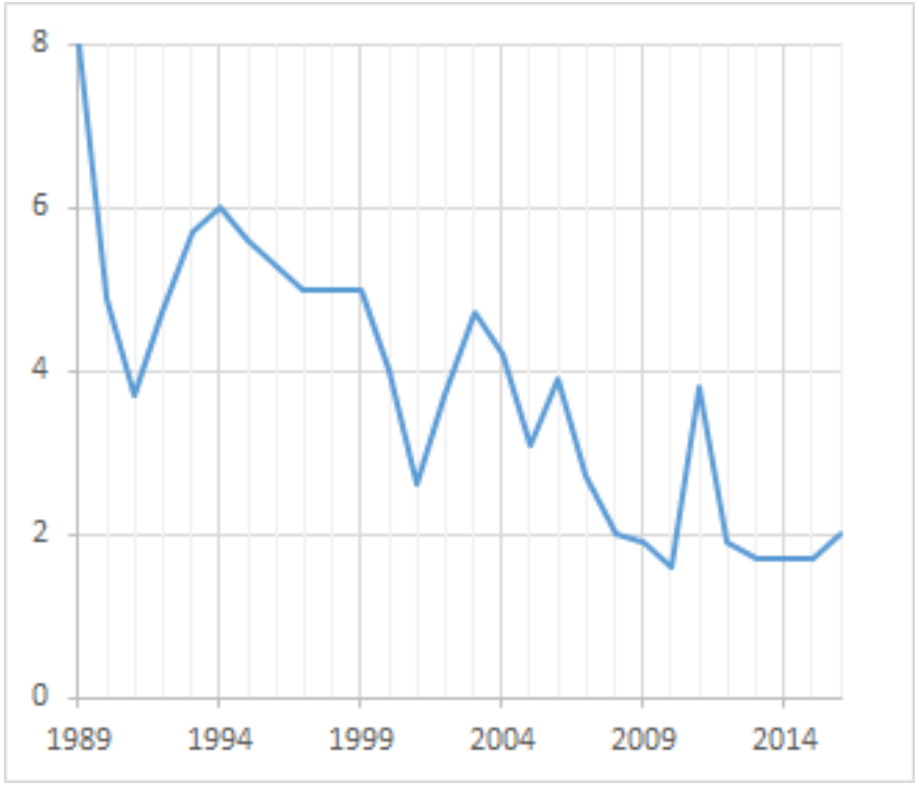
Caspar A. Hallmann[1]*, Martin Sorg[2], Eelke Jongejans[1], Henk Siepel[1], Nick Hofland[1], Heinz Schwan[2], Werner Stenmans[2], Andreas Müller[2], Hubert Sumser[2], Thomas Hörren[2], Dave Goulson[3], Hans de Kroon[1]

1 Radboud University, Institute for Water and Wetland Research, Animal Ecology and Physiology & Experimental Plant Ecology, PO Box 9100, 6500 GL Nijmegen, The Netherlands, 2 Entomological Society Krefeld e.V., Entomological Collections Krefeld, Marktstrasse 159, 47798 Krefeld, Germany, 3 University of Sussex, School of Life Sciences, Falmer, Brighton BN1 9QG, United Kingdom

* c.hallmann@science.ru.nl

Check for

'Insecten zijn aan het verdwijnen'

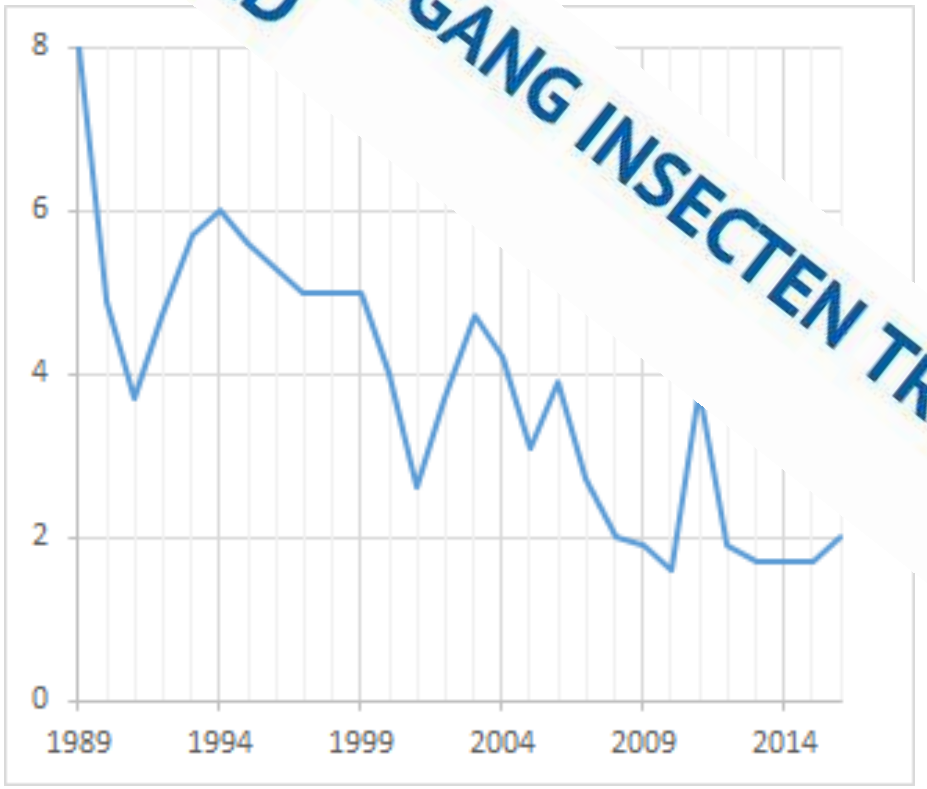


Bron: Hallmann et al. (2017), PlosOne

titel

'Insecten aan het verdwijnen'

ACHTERUITGANG INSECTEN TREFT VOGELS KEIHARD



Vrij Nederland “Silence spring revisited”

PLOS ONE

RESEARCH ARTICLE

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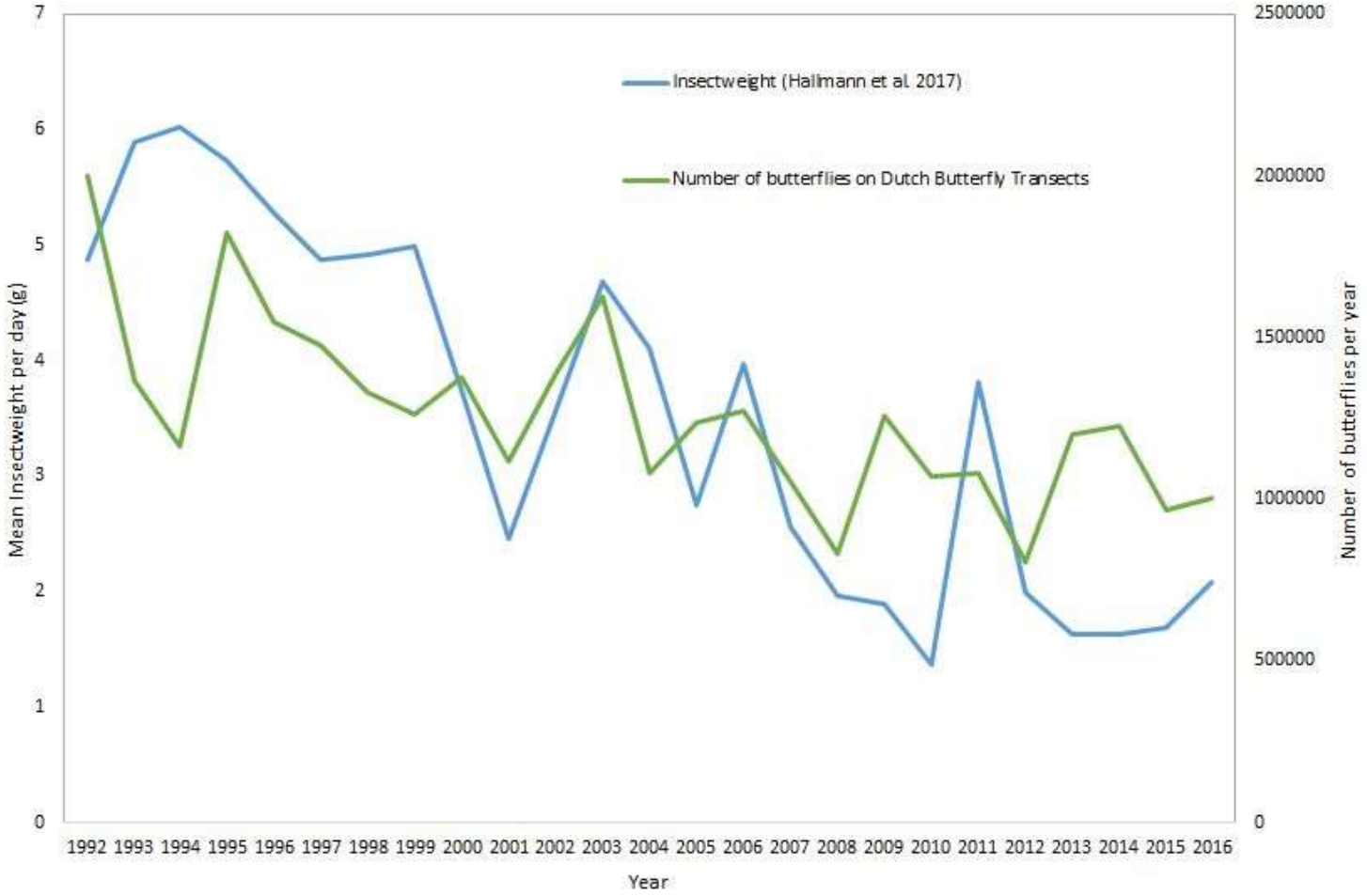
Is this also happening in the Netherlands ?



Analysis on dutch data

- Client: Natuurmonumenten
- Done by: Radboud Universiteit en EIS Kenniscentrum Insecten

Result NL:

- Different sampling techniques
- Hence: different species

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- Hence: different species
- Two areas: Kaaistoep & Wijster

Kaaistoep (Tilburg): Light trap

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Wijster: Pitfalls (Carabid beetles)

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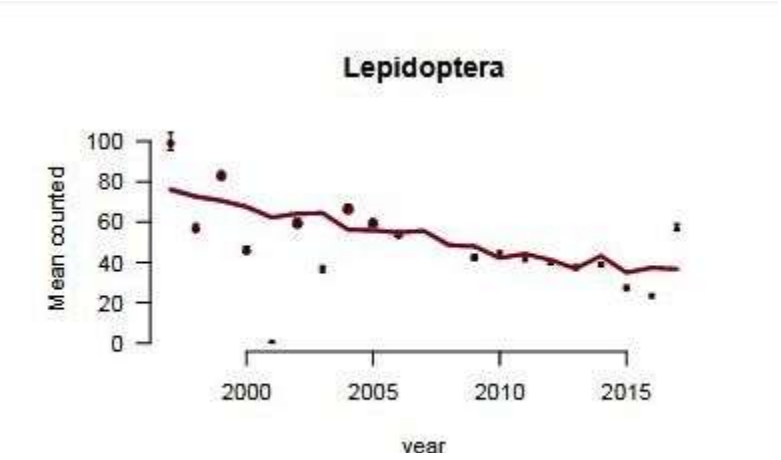
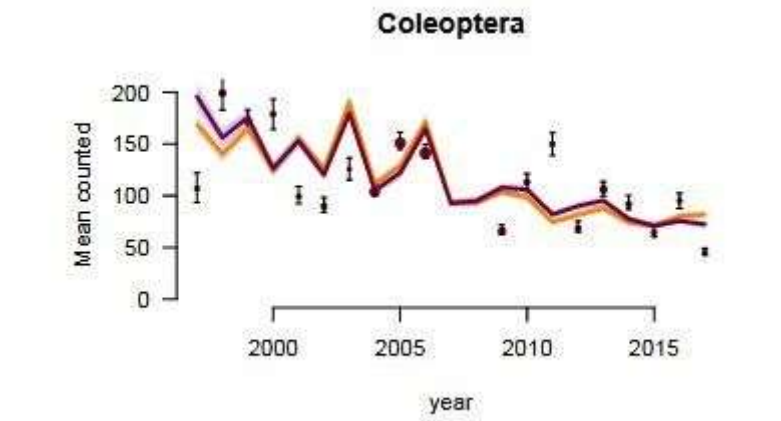
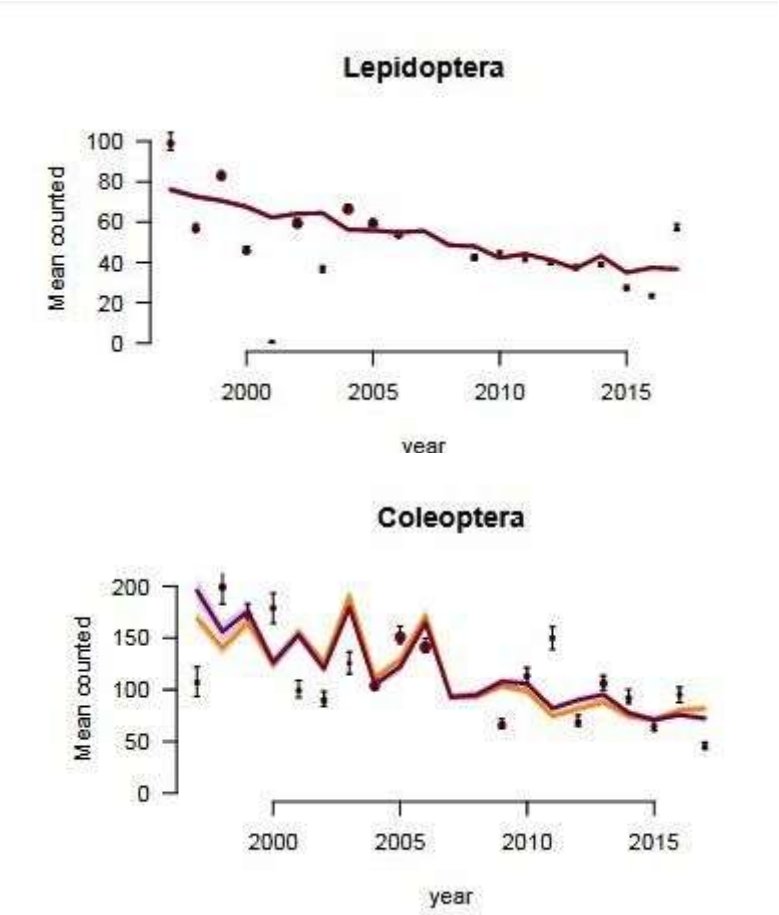
- Kaaistoep: nocturnal insects



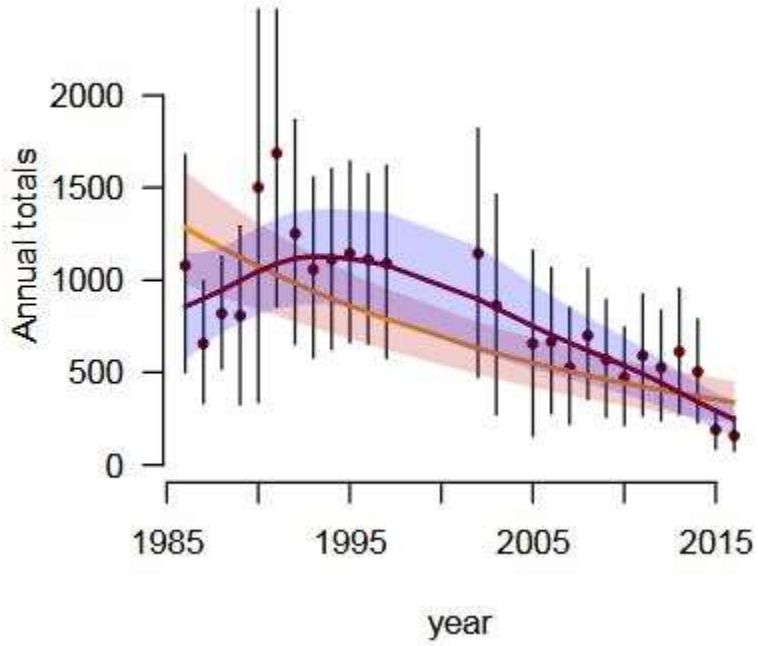


- Wijster: Carabid beetles

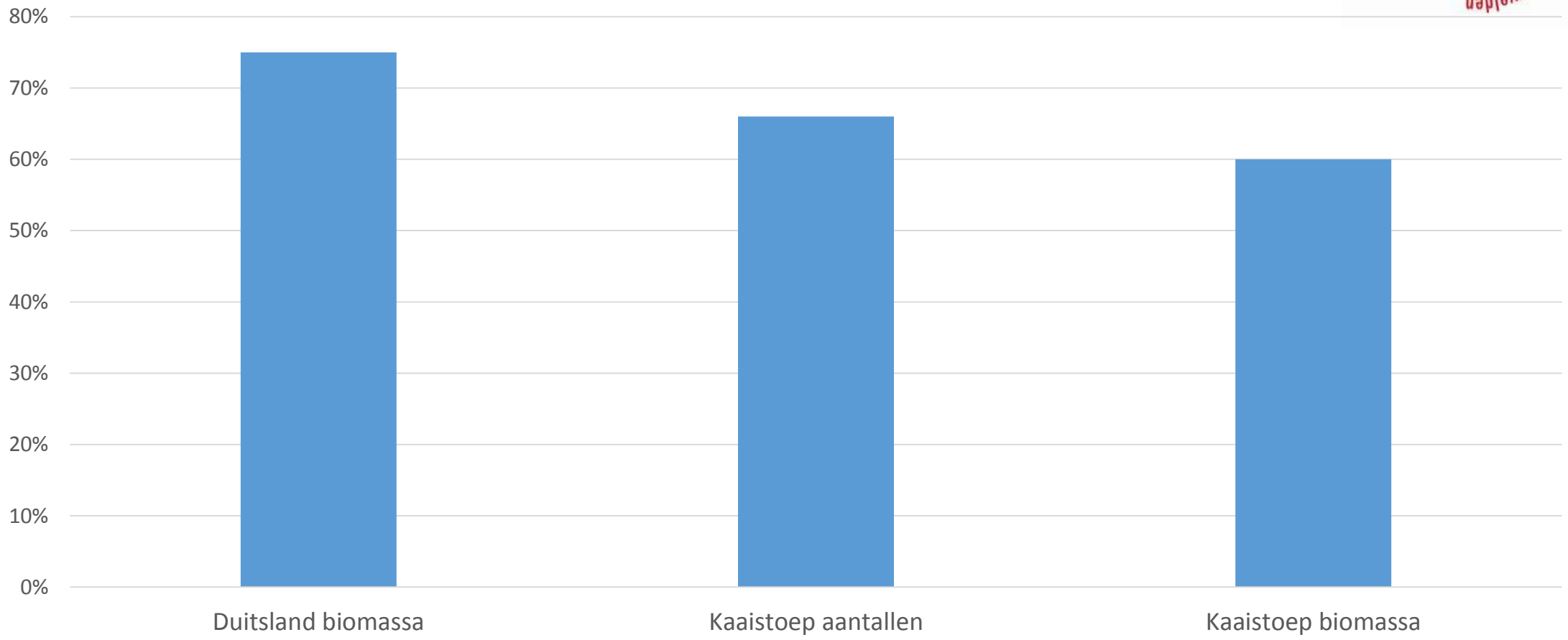
- Kaaistoep: noctural insects



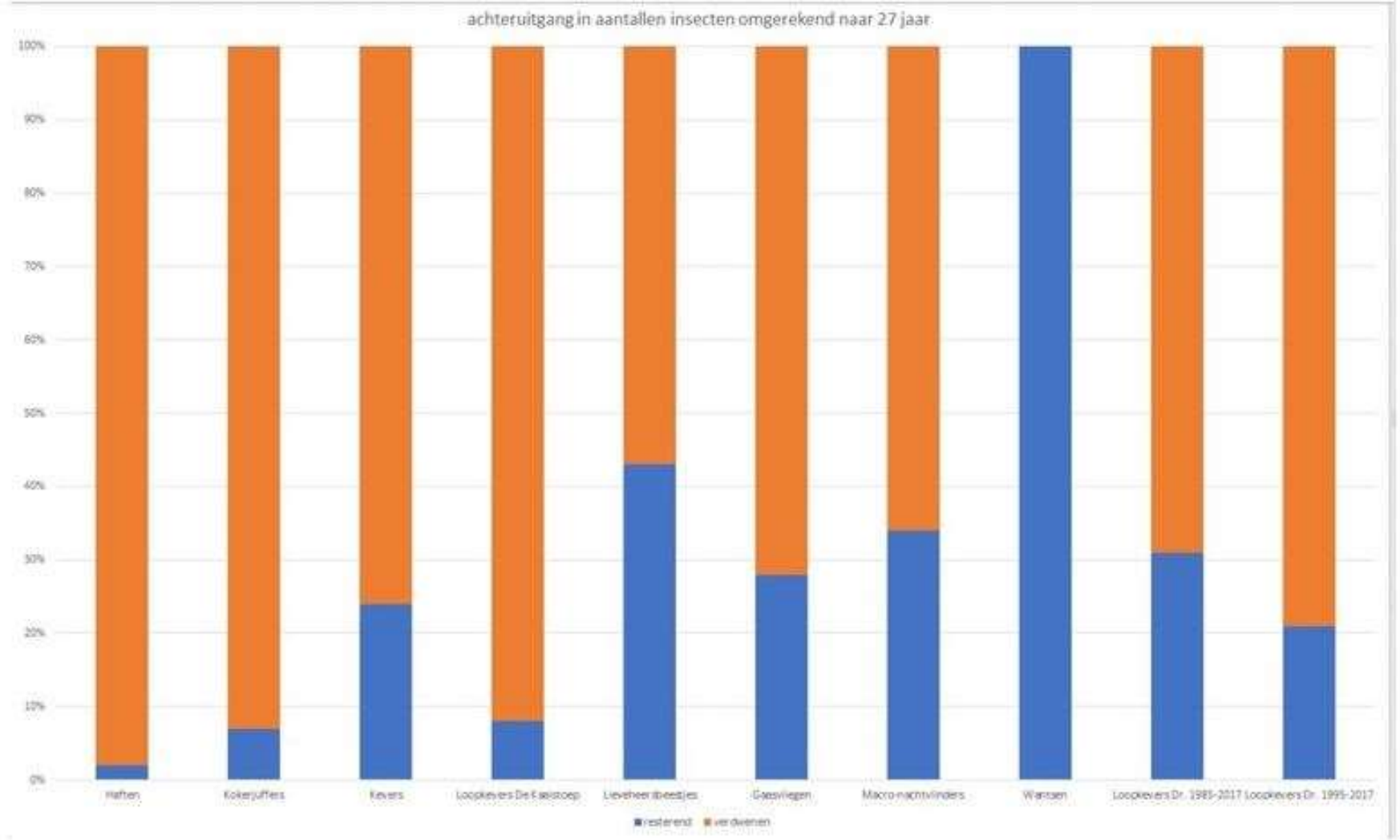
- Wijster: Carabid beetles



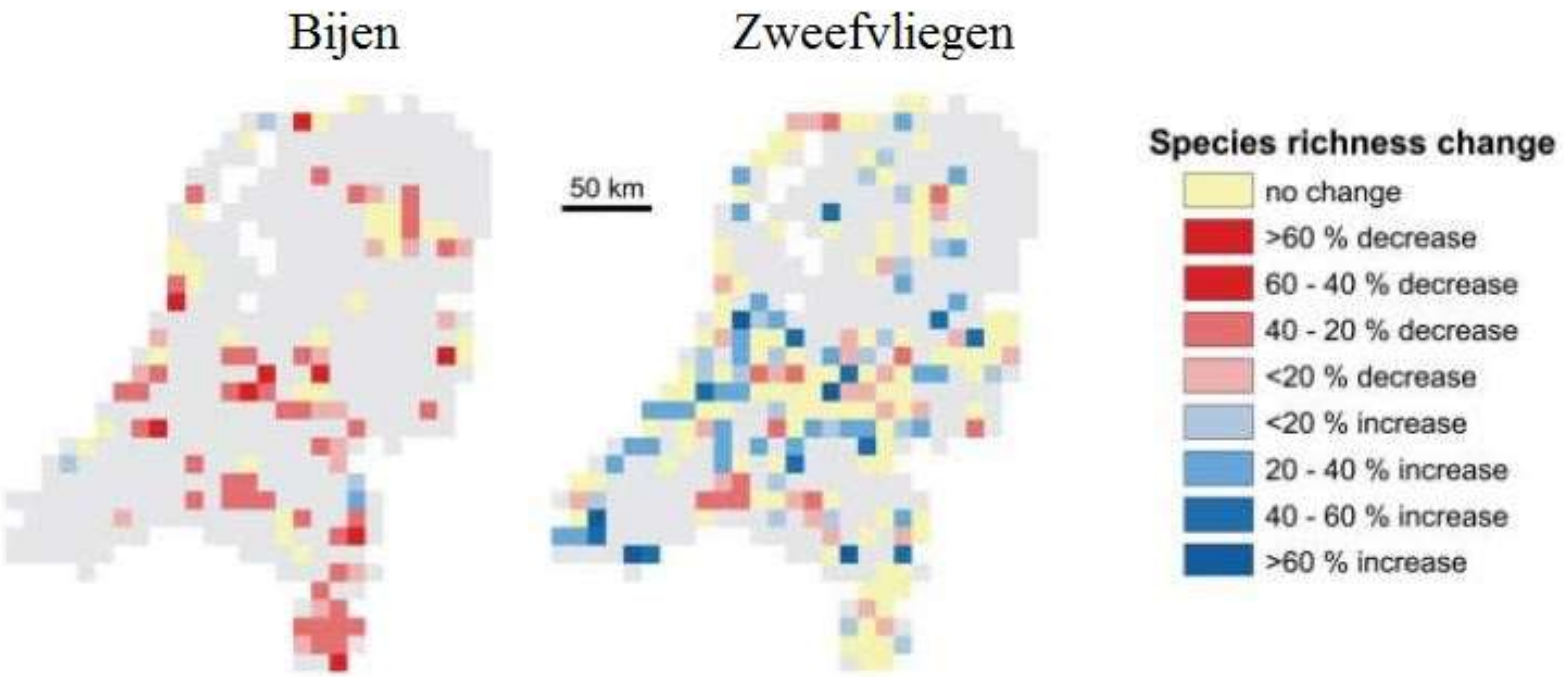
Results: Trends over 27 years



Trends (orange) per insect order

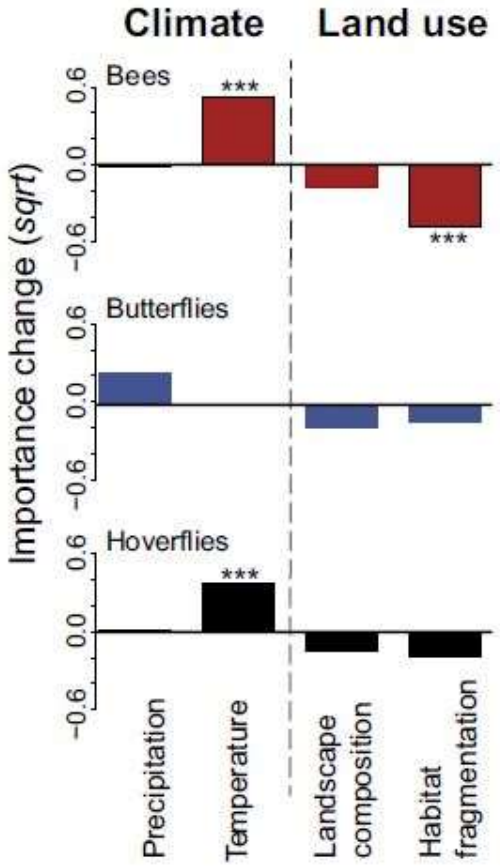


Some groups more effected than others



Bron: Biesmeijer et al. (2006), Science

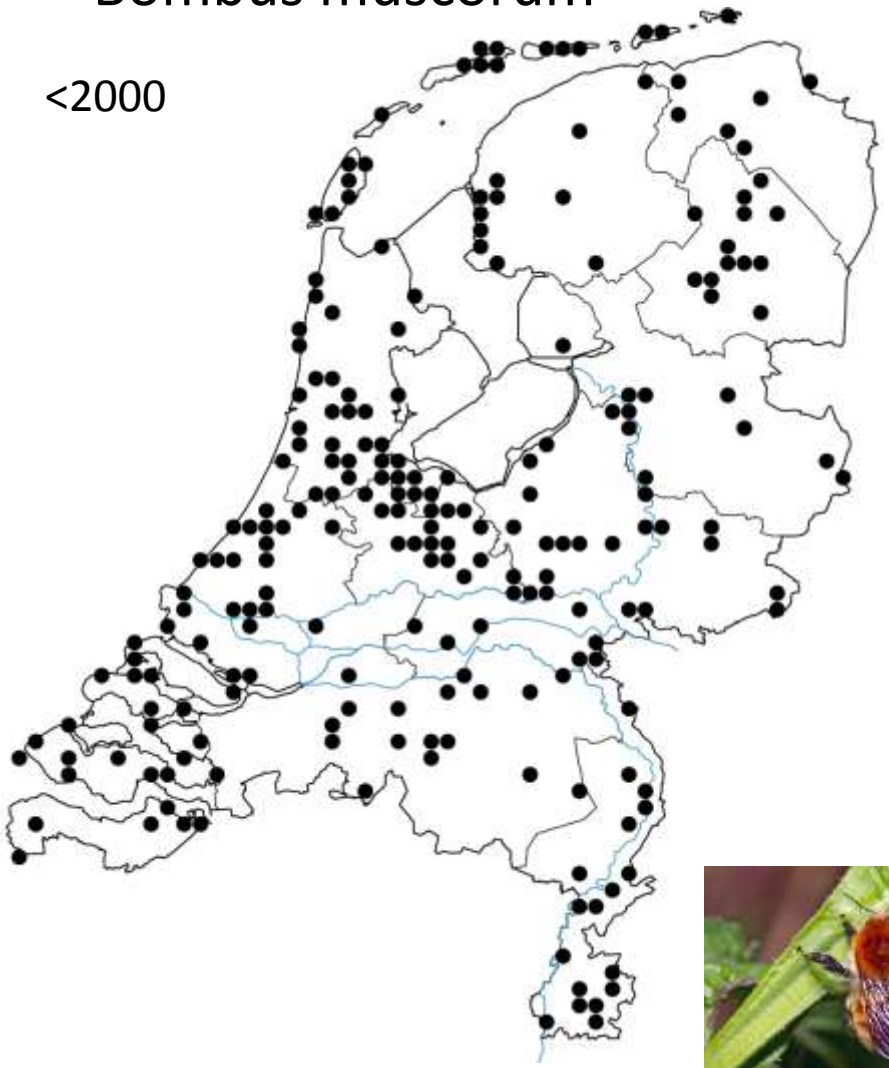
Some insights in causes



Bron:
Aguirre-Gutierrez et al. (2017), Journal of Biogeography

Bombus muscorum

<2000



Bombus muscorum

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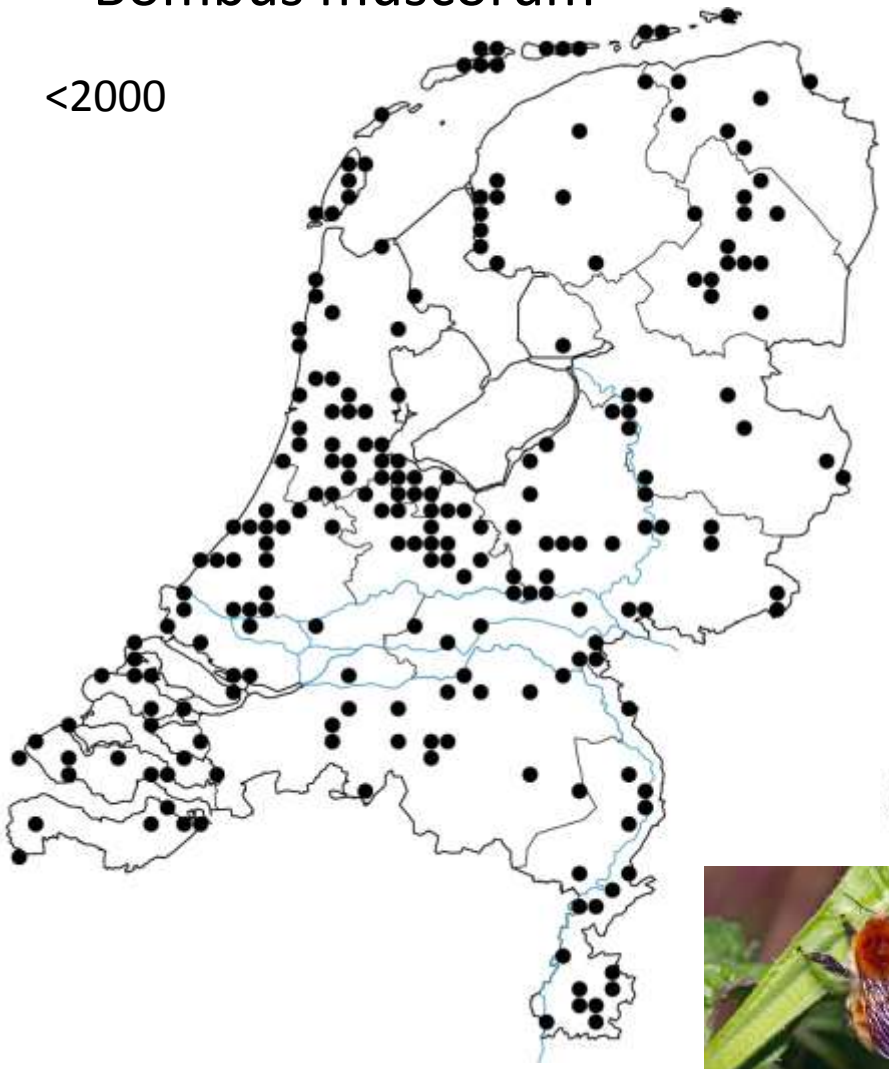

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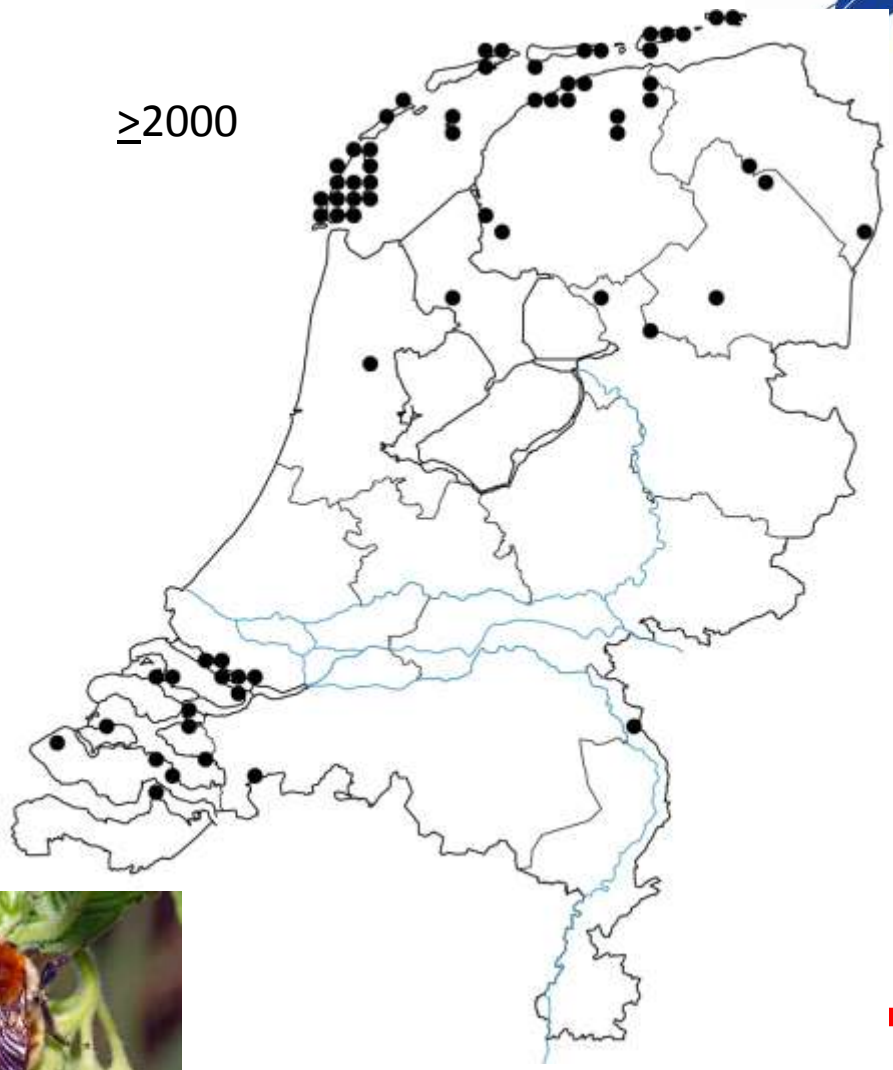

Bombus humilis

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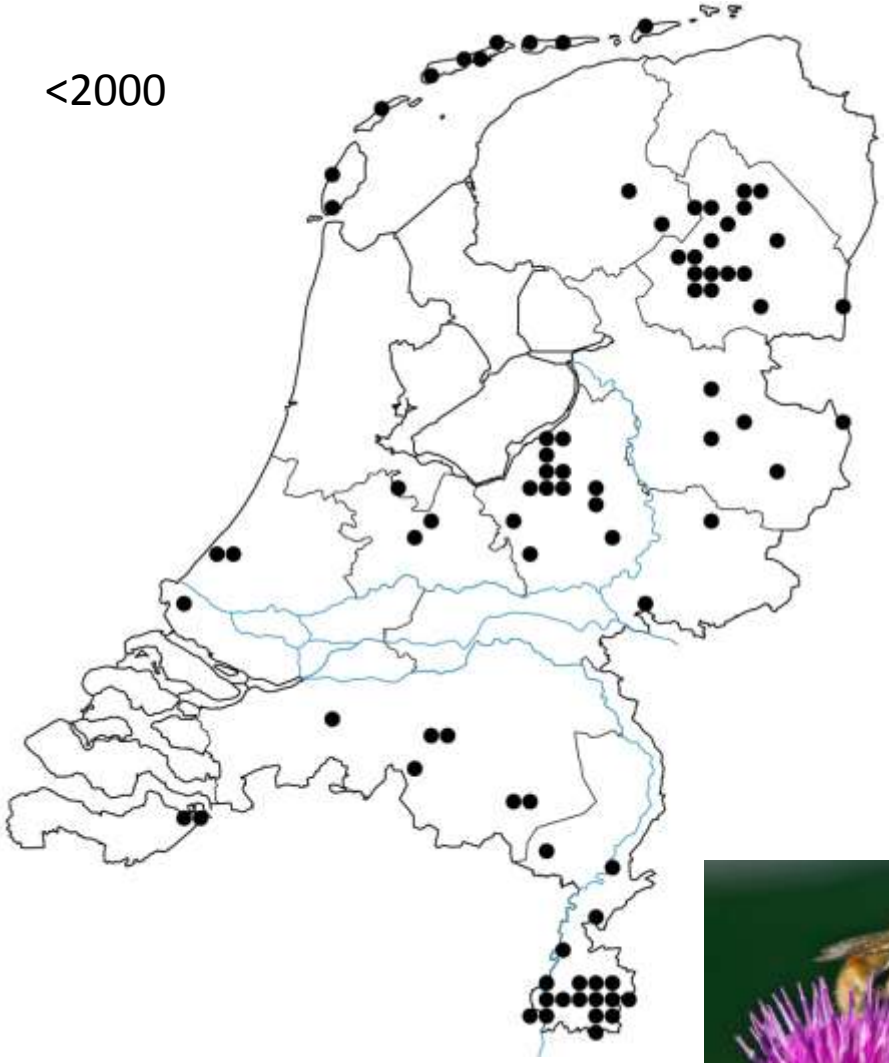

Bombus humilis

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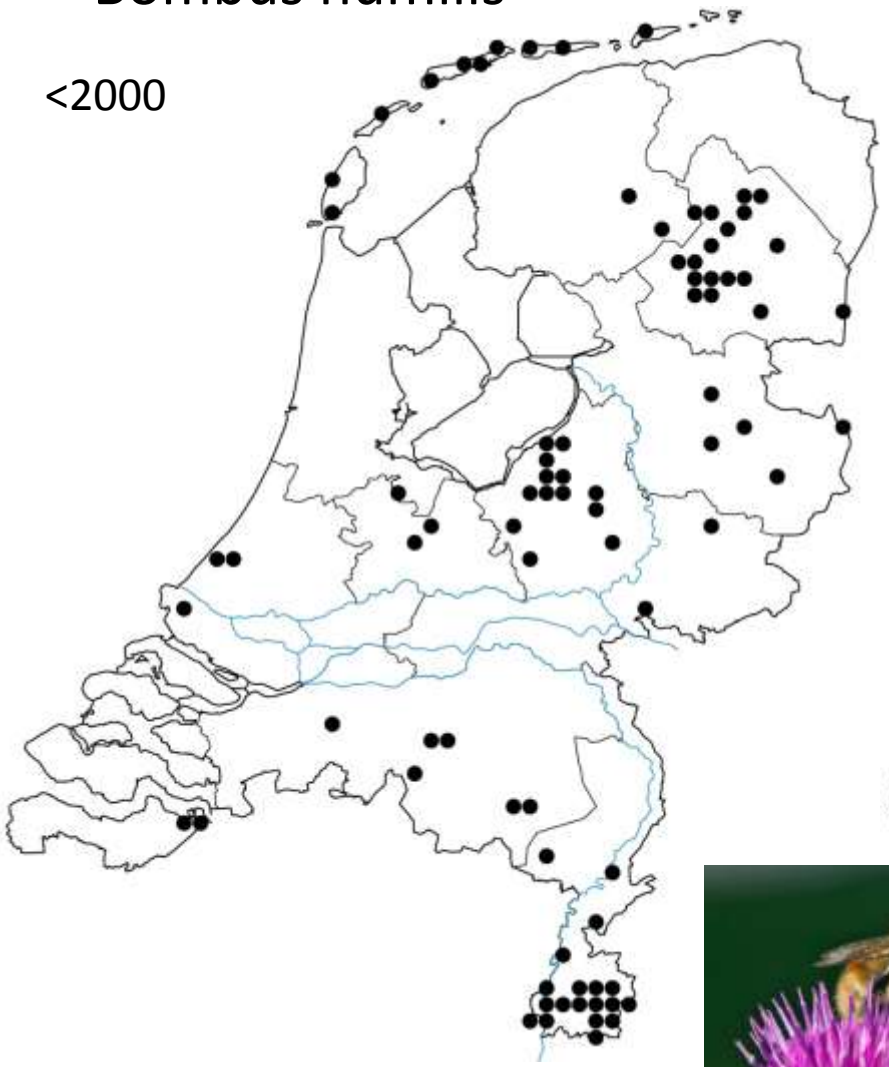

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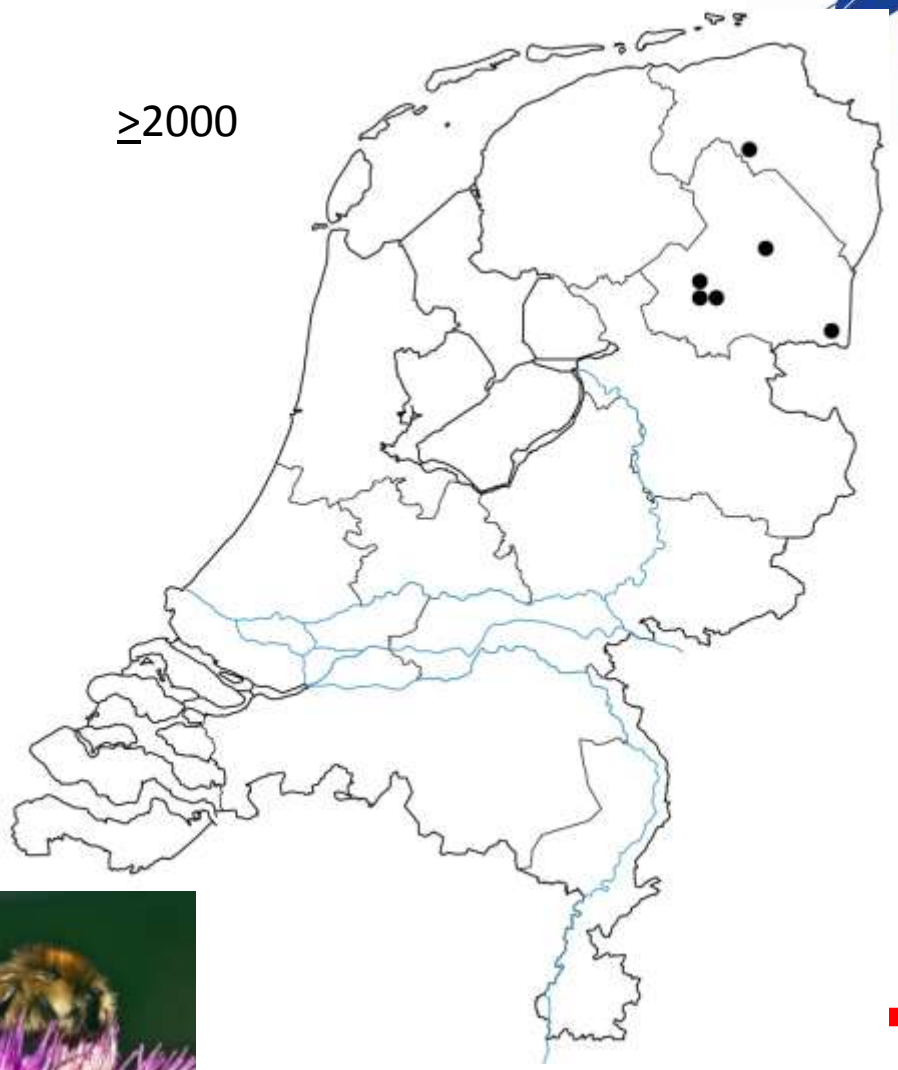

Bombus veteranus

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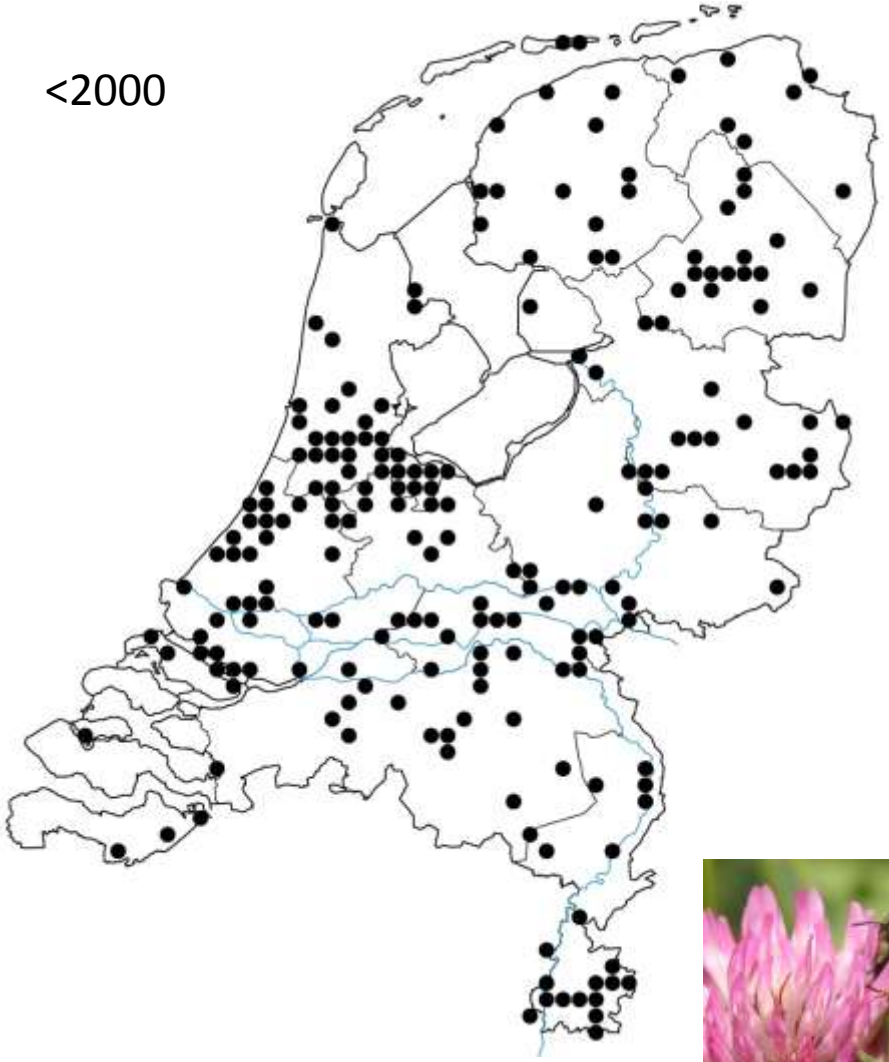

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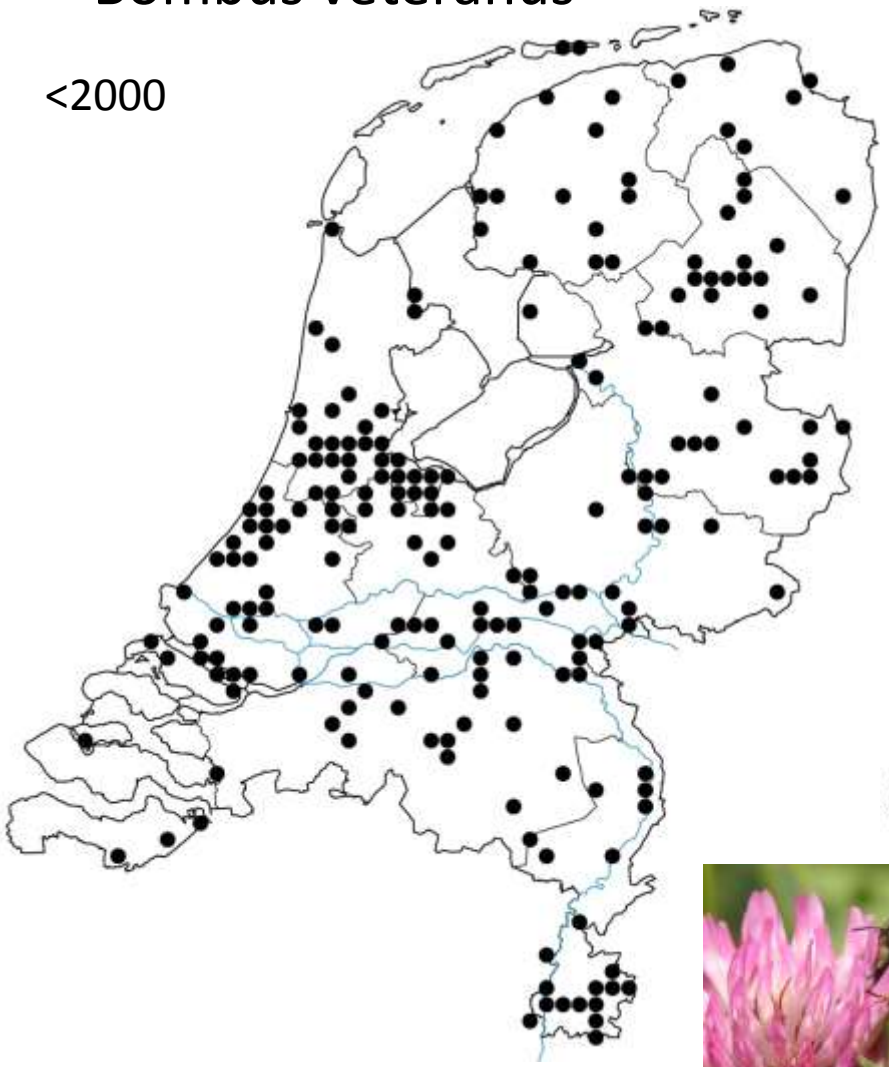

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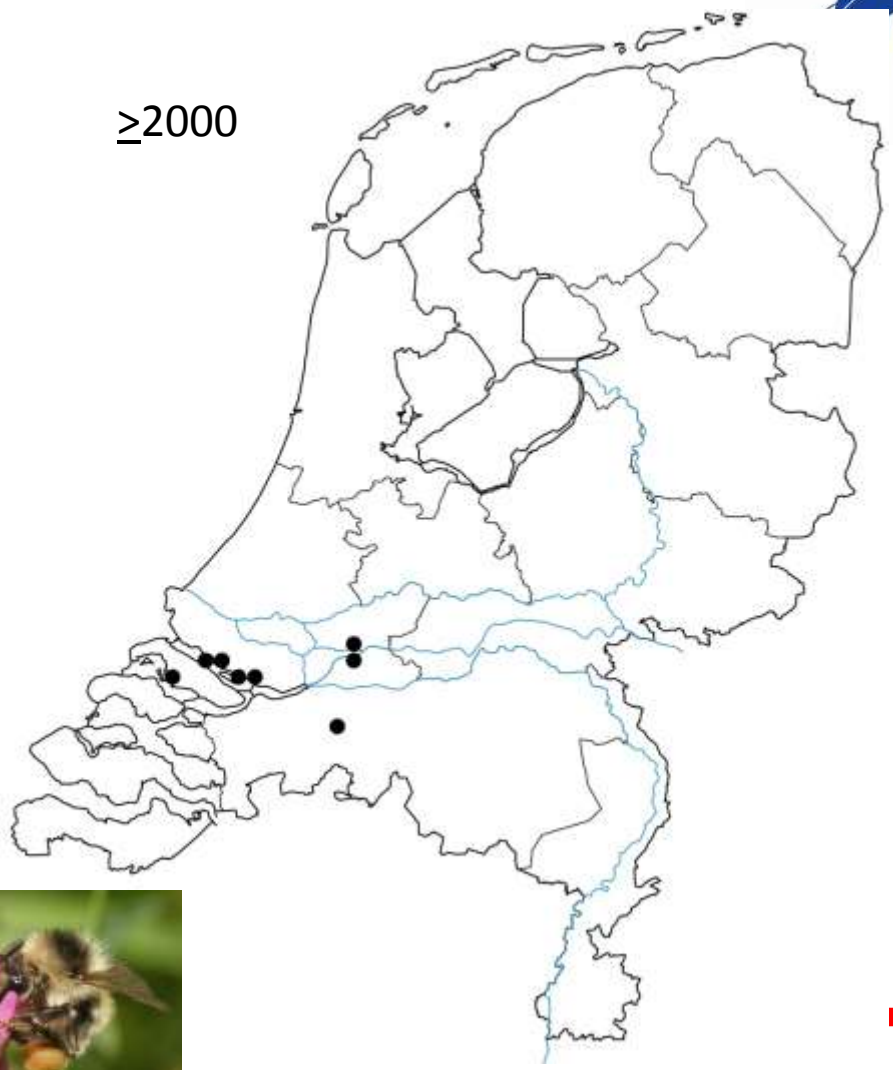

This type of work only possible by

- Decades of work by dedicated amateurs
- With extremely high quality
- And high degree of precision / consistency

Monitoring 21th century style ?

•

Monitoring 21th century style ?

- Introducing

Camera trapping for insects !

-

Day

… and night

Main features

- Observation

Main features

- Observation (photo … automated!)

Main features

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- Counting

Main features

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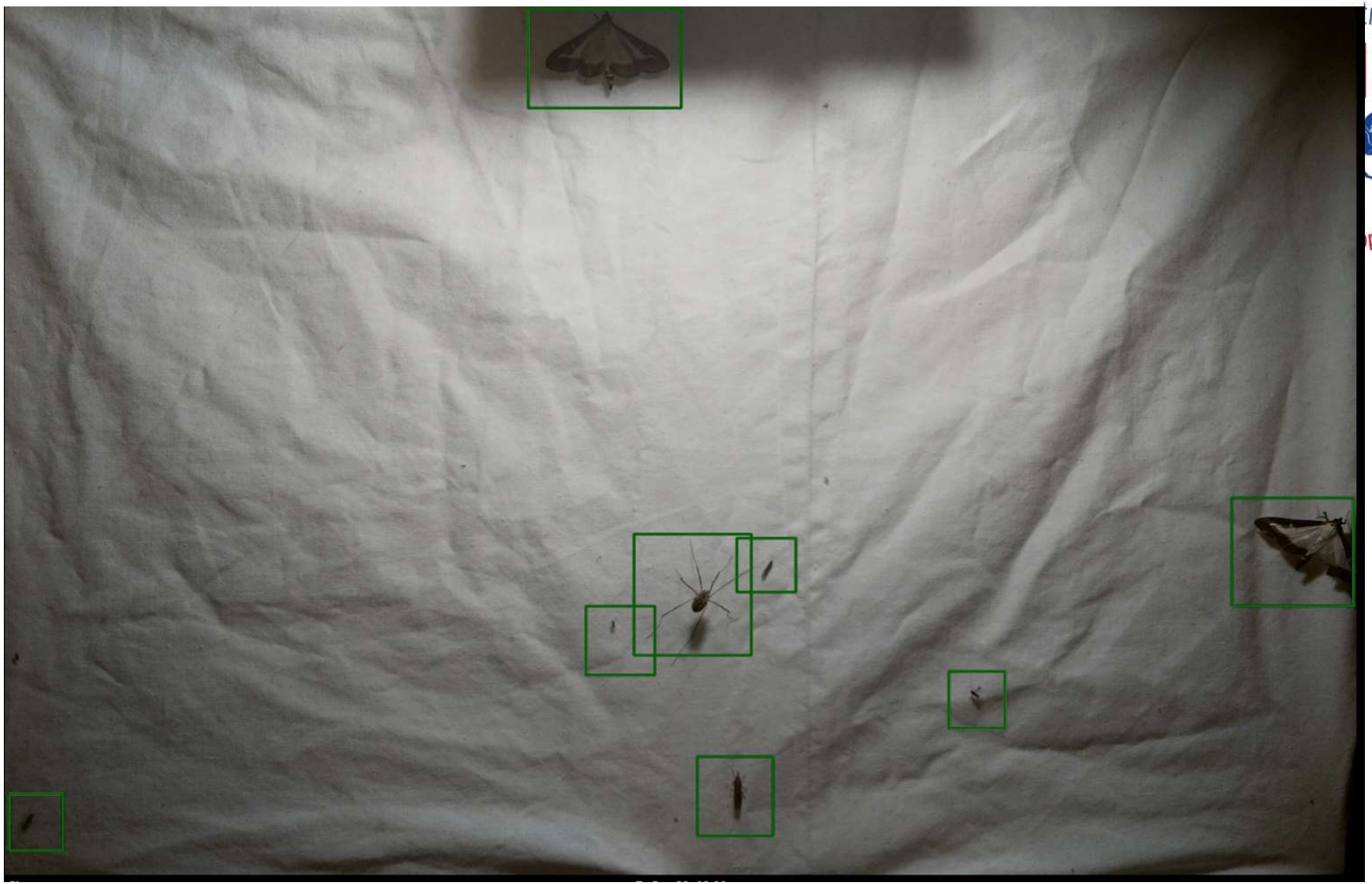
- Counting … automated!



Main features

- Observation (photo … automated!)
- Counting … automated!
- Biomass

Main features

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Main features

- Observation (photo … automated!)
- Counting … automated!
- Biomass … automated !
- … and now for the really big fun

Main features

- Observation (photo … automated!)
- Counting … automated!
- Biomass … automated !
- Recognition

Main features

- Observation (photo … automated!)
- Counting … automated!
- Biomass … automated !
- Recognition … automated!

Identificatie: Obsidentify

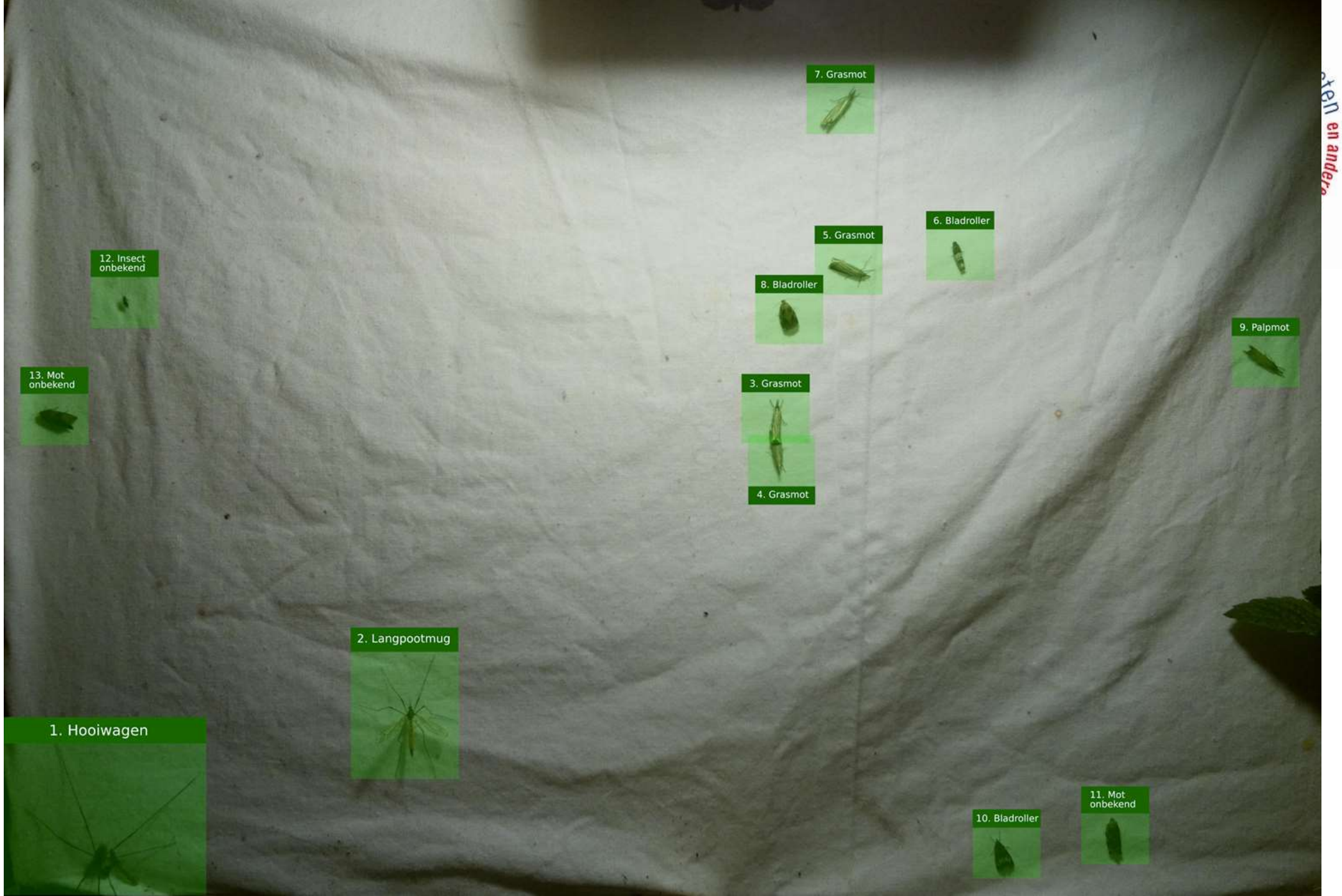
ObsIdentify

Observation International Onderwijs ★★★½☆ 126

PEGI 3

Je hebt geen apparaten.

Toevoegen aan verlanglijstje Installeren


7. Grasmot
6. Bladroller
5. Grasmot
12. Insect onbekend
8. Bladroller
9. Palpmot
13. Mot onbekend
3. Grasmot
4. Grasmot
2. Langpootmug
1. Hooiwagen
11. Mot onbekend
10. Bladroller

Camera trapping

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Camera trapping

- It is proven technique !
- It is cheap (500 euro / trap)
- Much interested by scientists and public
- And …
- Non-existing due to lack of funding

kenniscentrum insecten
EIS
en andere ongewervelden