

# Virtueel vogelen

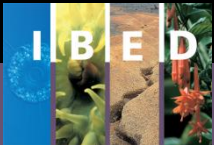
Willem Bouten  
Camilla Dreef & Alice Driesen  
en vele anderen

Instituut voor Biodiversiteit en Ecosysteem Dynamica  
Universiteit van Amsterdam



# Nederland van Boven

vpro



# Virtueel vogelen

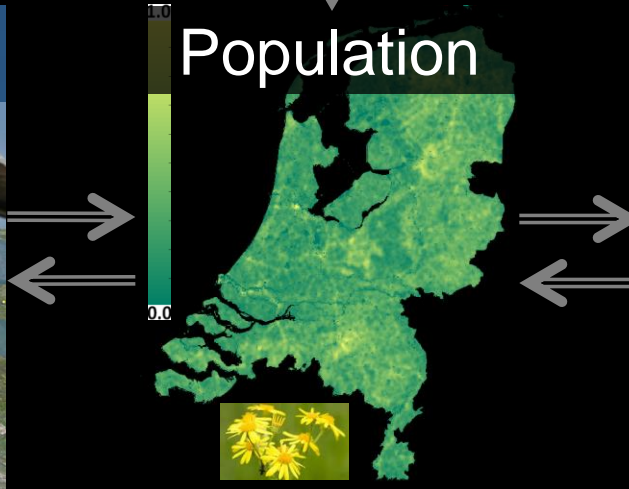
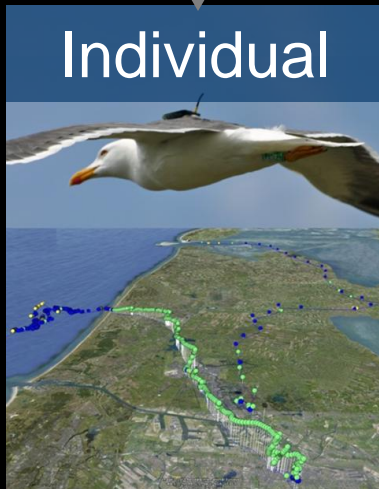
## Willem Bouten

0. Korte introductie
1. Het GPS-rugzakje: de techniek
2. Een onderzoeksvoorbeeld

## Camilla Dreef & Alice Driesen

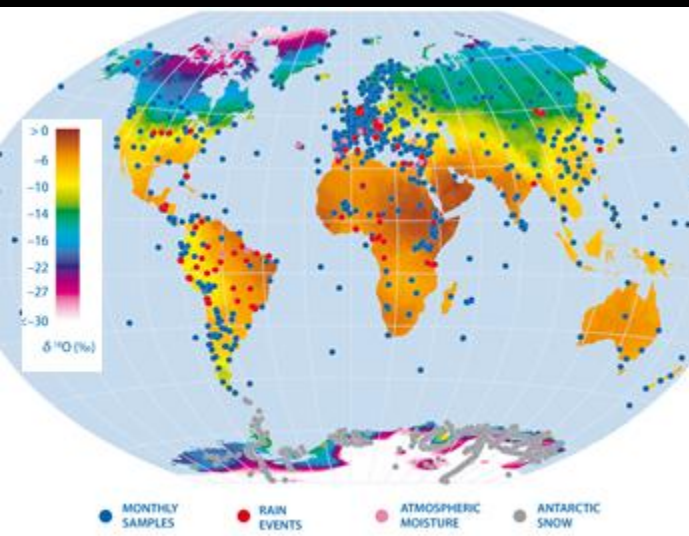
3. Vogels in een mensenwereld
4. Academische jaarprijs: *Vogel het uit!*
5. Meer onderzoeksvoorbeelden





# Methoden om vogels te volgen

Stabiele isotopen



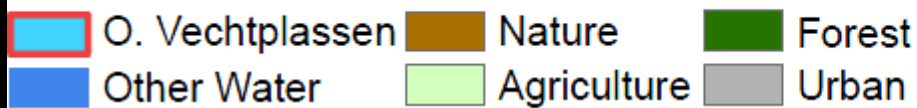
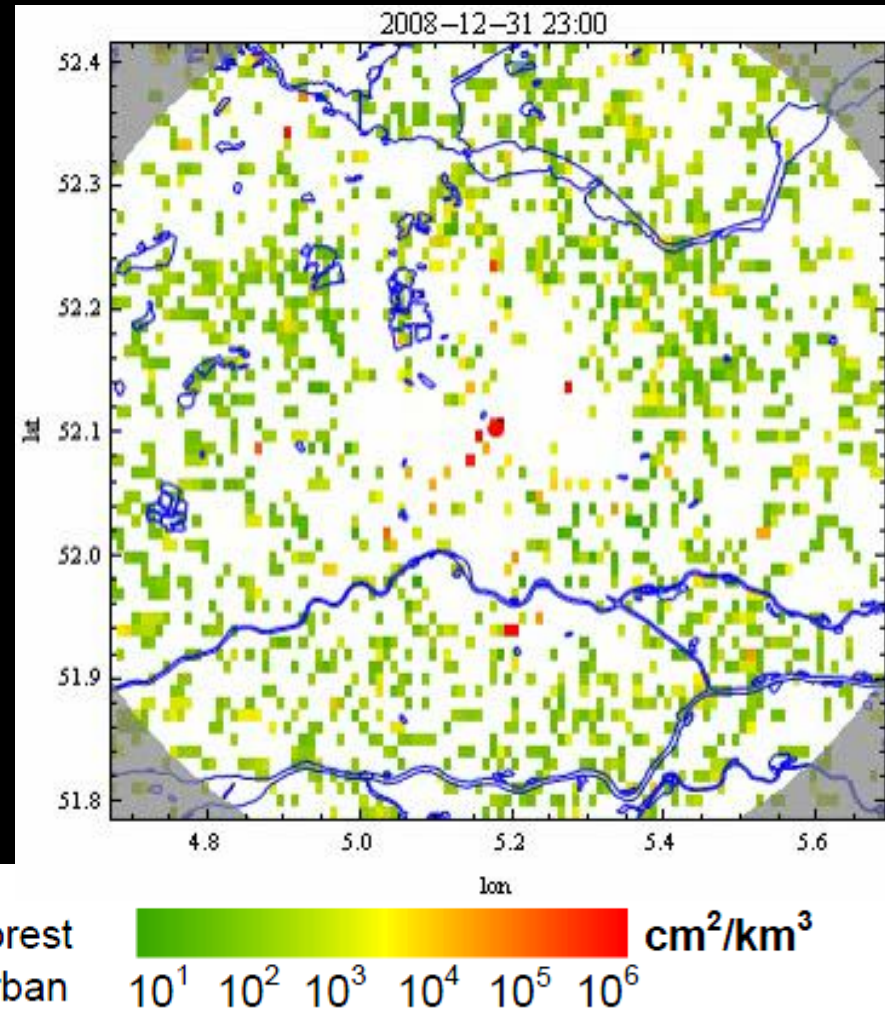
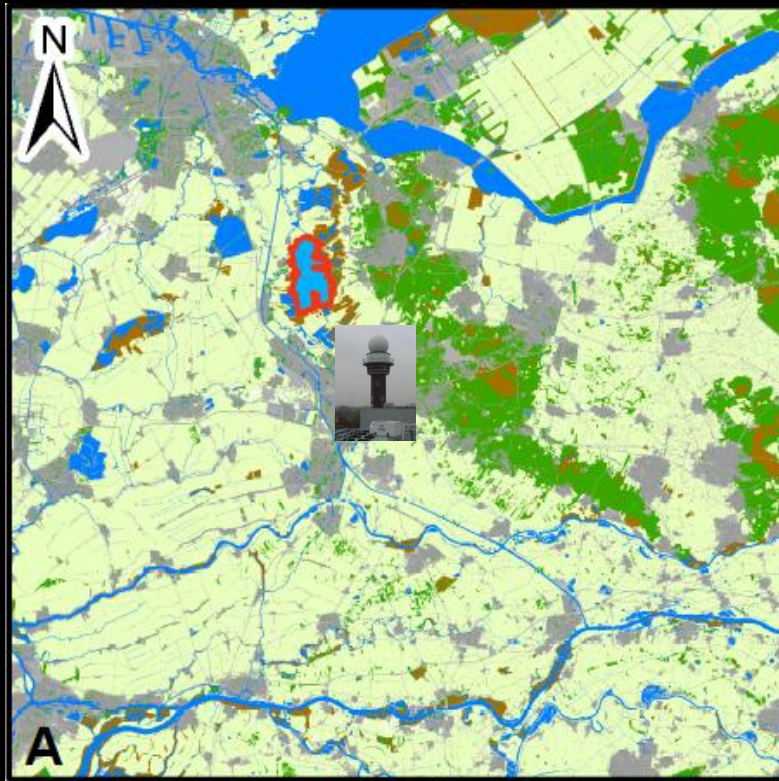
Geo-locators



Satelliet zenders



# Radar Nieuwjaarsnacht

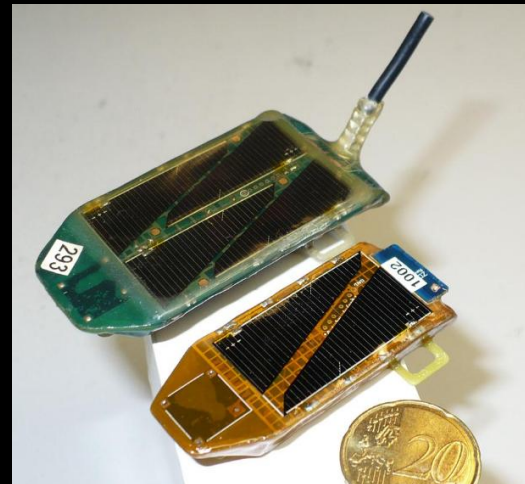


Shamoun-Baranes et al., IBIS 2011



# UvA Bird Tracking System

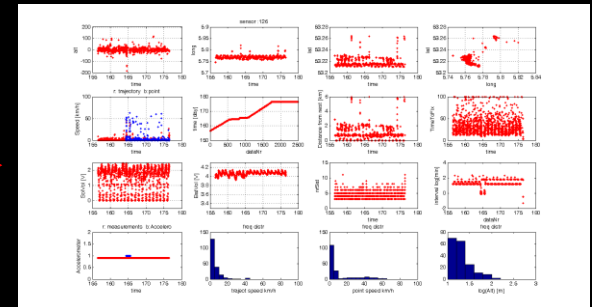
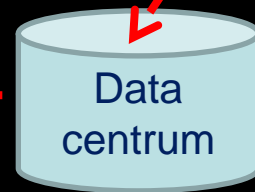
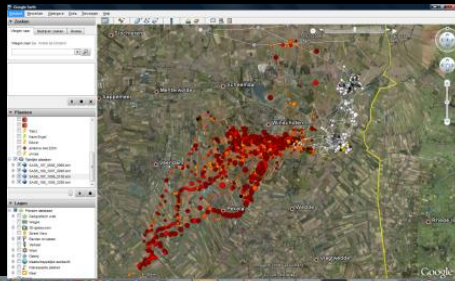
- GPS logger 5.8 – 44 g
- zonnecellen
- hoge resolutie: 3 sec
- tot 10.000 metingen per dag
- 3D versnellingsopnemer
- extra sensoren
- draadloos data download
- upload nieuw meetschema
- basis station & (mobiel) antenne netwerk



# UvA Bird Tracking System



Overall vandaan





# Virtueel laboratorium

[www.UvA-BiTS.nl/virtual-lab](http://www.UvA-BiTS.nl/virtual-lab)



UvA  
Bird Tracking System

Home System Projects Virtual Lab Contact



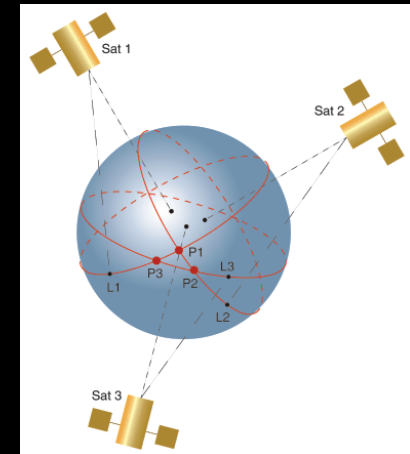
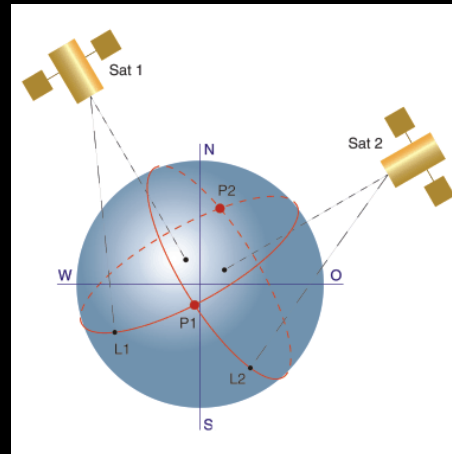
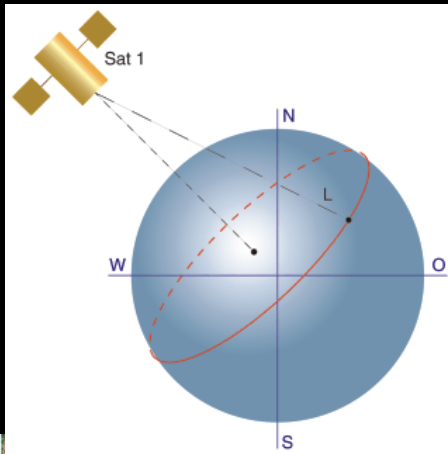
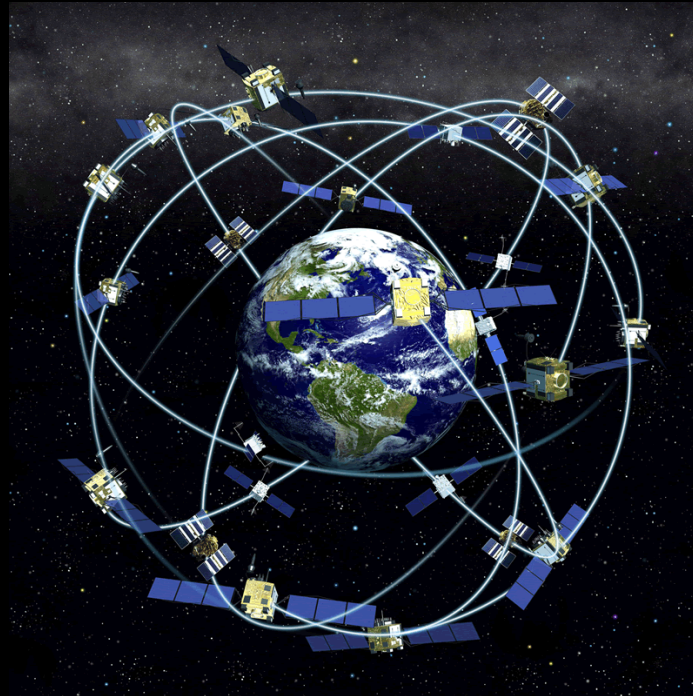
[Script wrapper](#)

[Bird view](#)

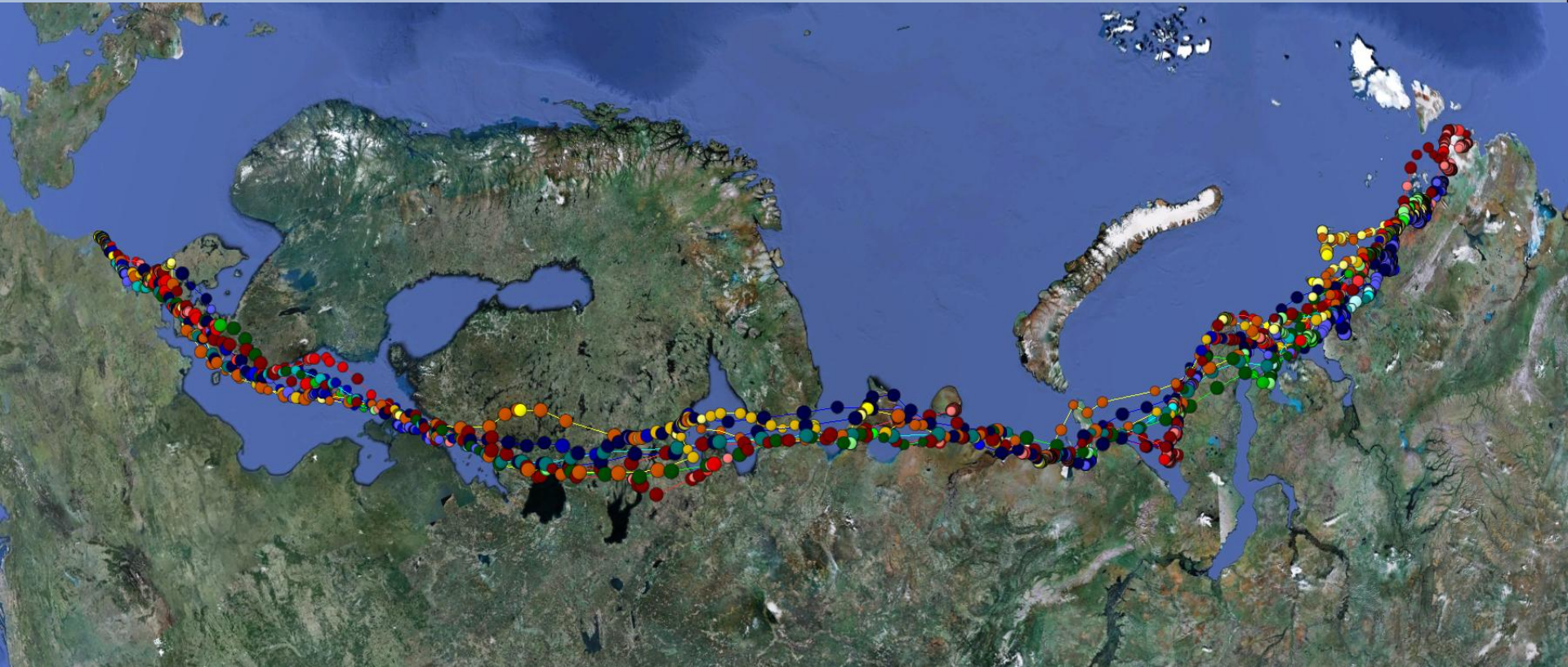
[Wiki & manuals](#)

[Our sponsors](#)

# GPS Global Positioning System



# Rotgans: Waddenzee als stopover



# Grauwe kiekendief: akkerranden beheer



# 3D versnellingsopnemer voor de classificering van gedrag

**Info**

sample: 22 / 179  
device: 536  
date: 30-5-2011 / 10:16:34  
Inst. speed: 0.4859

vid frame: 6547  
vid stamp: 10:16:33.990

**Control**

<< Run >>

Select goto

Speed: [ ] [ ]

Scale: [ ] [ ] [ ] hold

use buffer

**Annotation**

File: C:\willem2012\onderwijs\SCGE\films\7juli\Acc\_LBBG\LBBG536.csv

- 1 -stand
- 2 -flap
- 3 -soar
- 4 -walk
- 5 -fight
- 6 -clean fur
- 7 -brood
- 8 -float
- 9 -Xflap

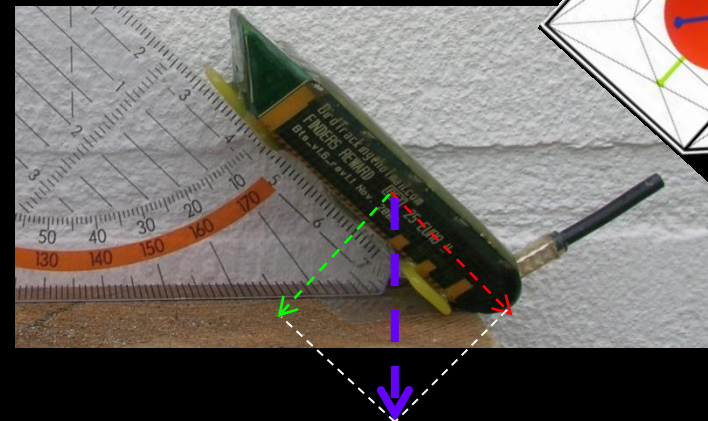
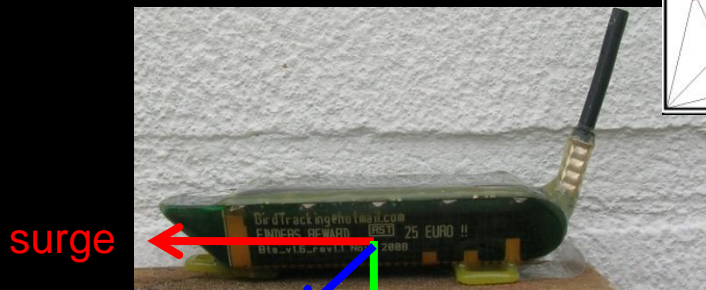
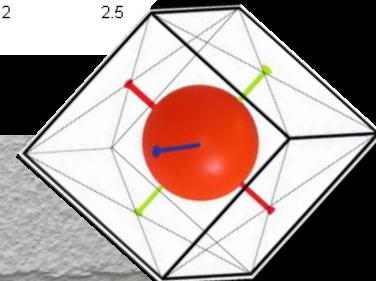
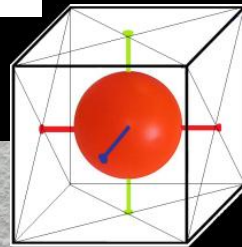
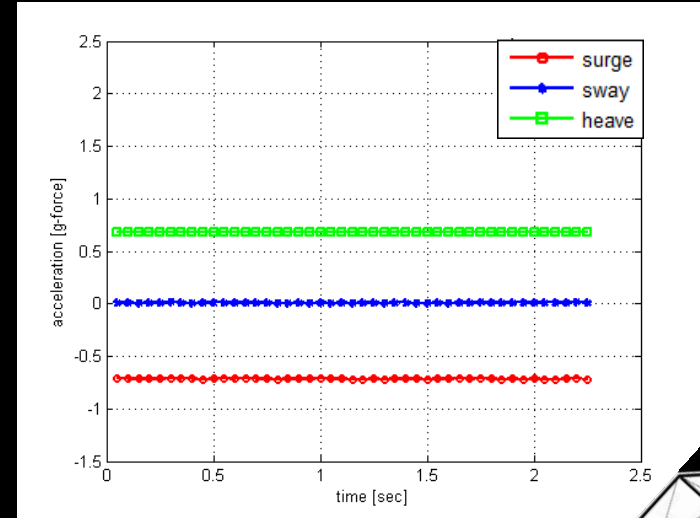
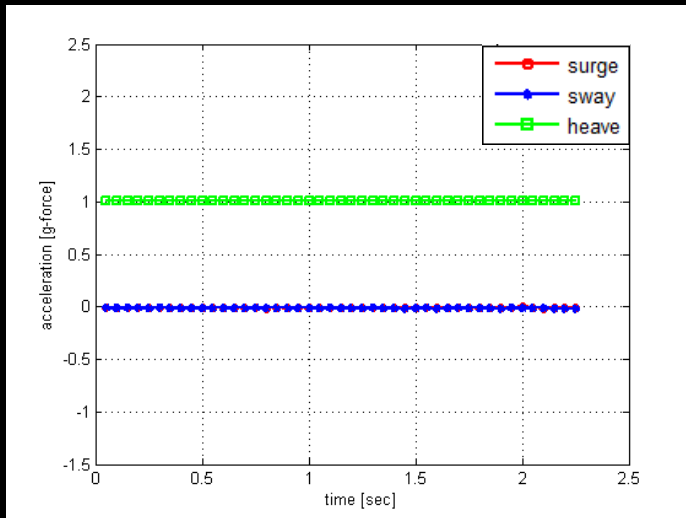
clear colors manage

GPS speed  
 Correct  Incorrect

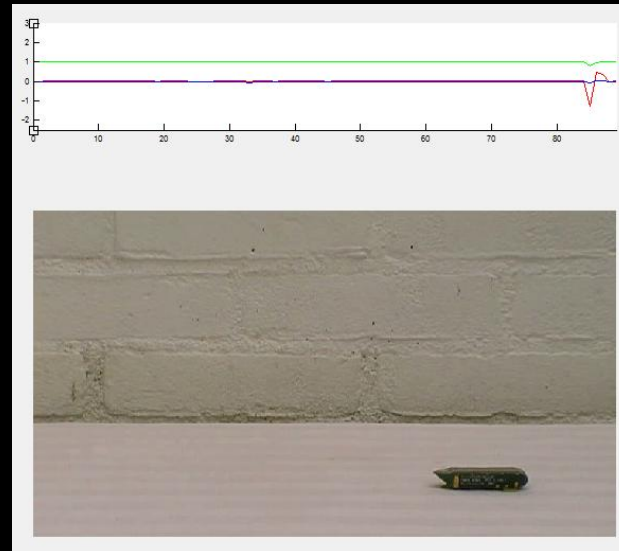
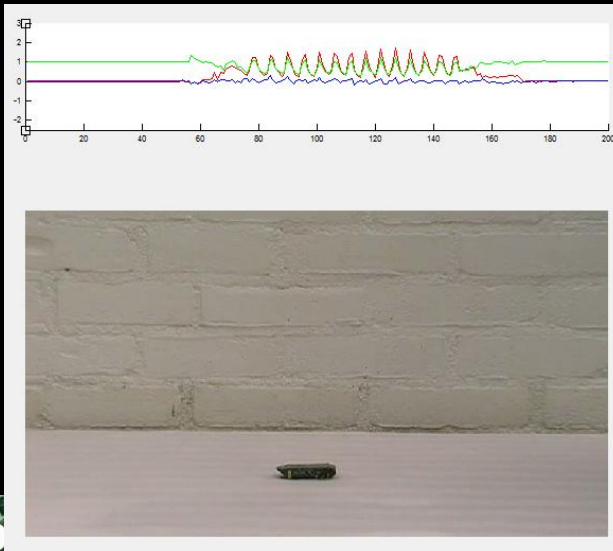
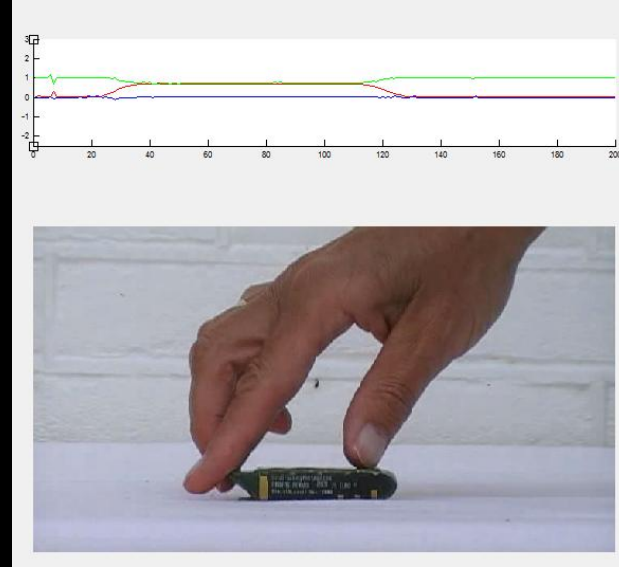
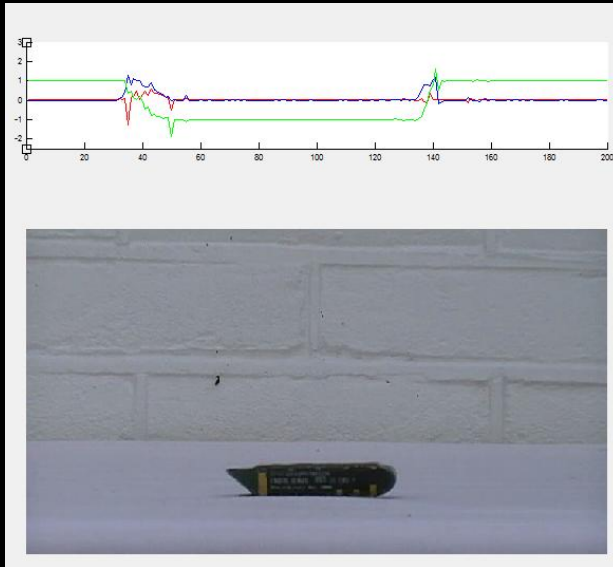
Data: C:\willem2012\onderwijs\SCGE\films\7juli\Acc\_LBBG\LBBG536.csv  
Movie: C:\willem2012\onderwijs\SCGE\films\7juli\Acc\_LBBG\536.avi



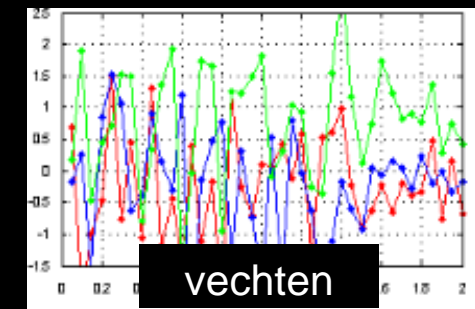
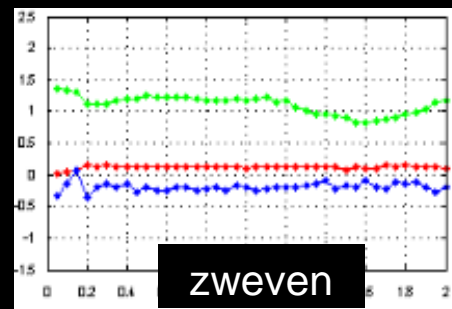
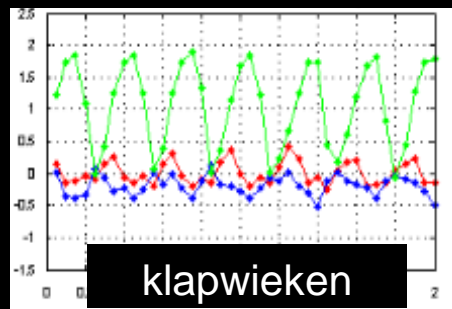
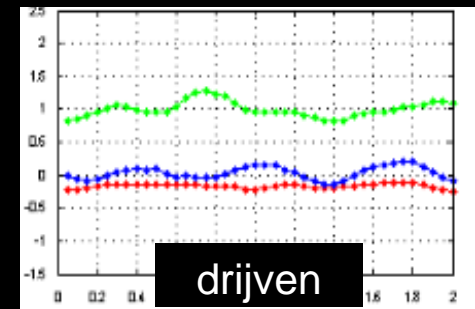
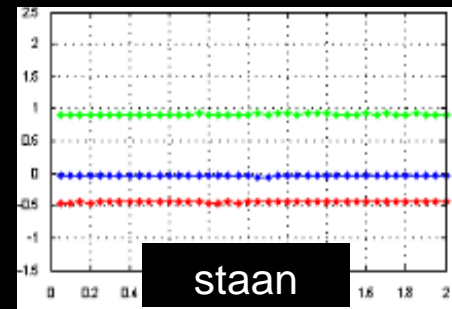
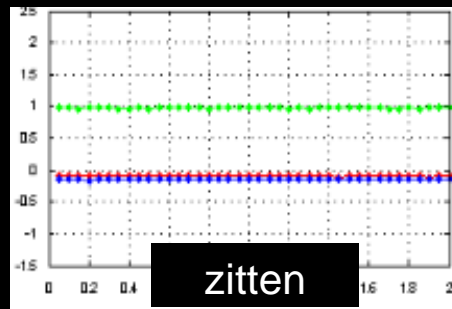
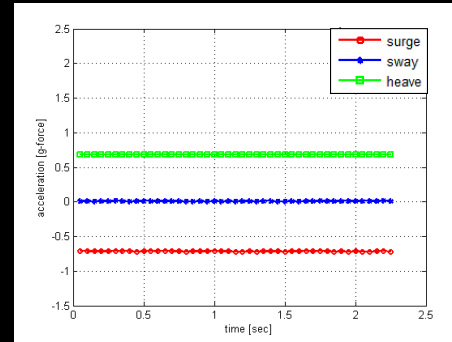
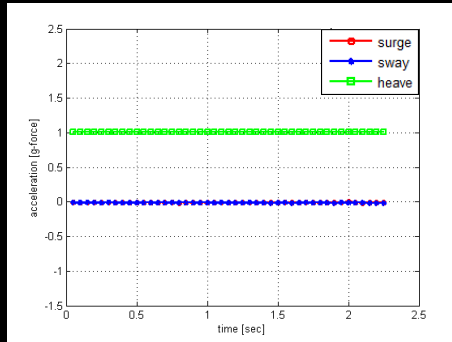
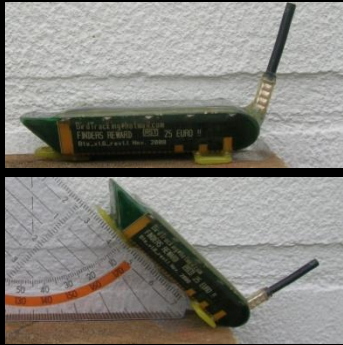
# 3D versnellingsopnemer



# 3D versnellingsopnemer



# 3D versnellingsopnemer





# 3D versnellingsopnemer

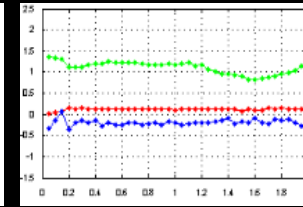
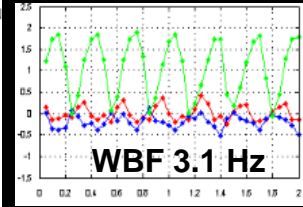
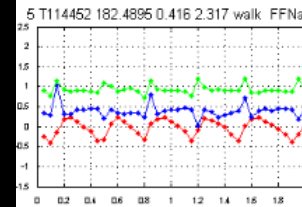
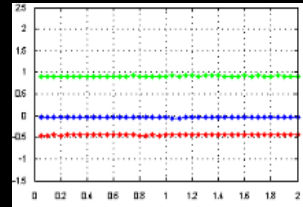
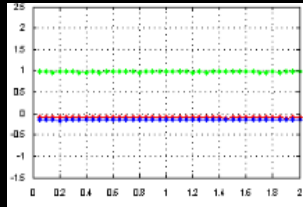
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staan

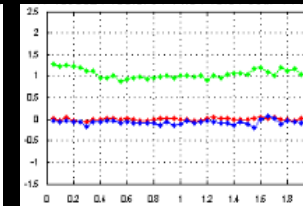
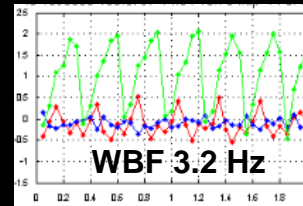
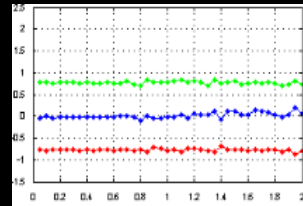
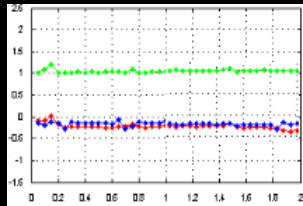
lopen

klapwieken

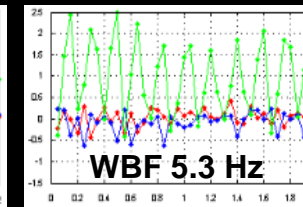
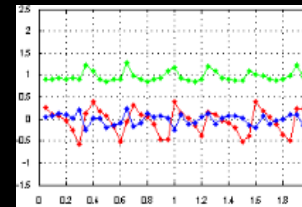
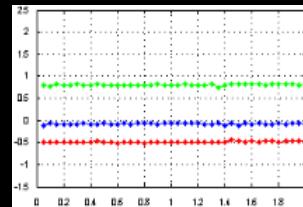
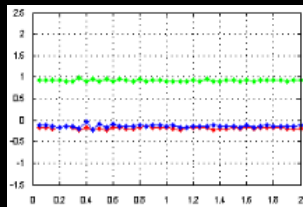
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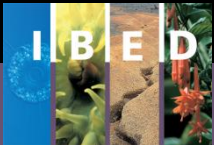
Kleine mantelmeeuw



Grauwe kiekendief

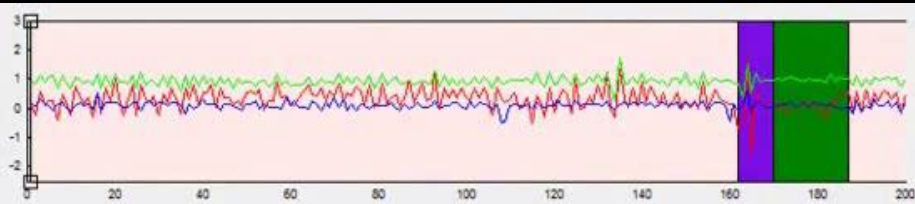


Scholekster

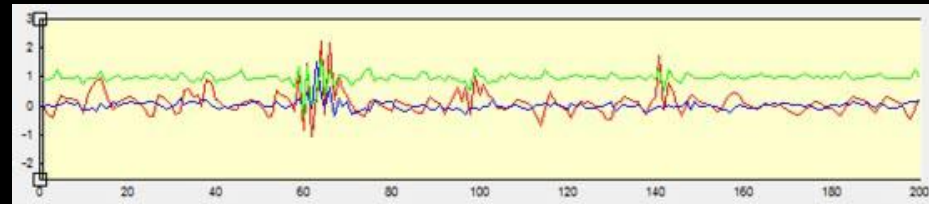


# Scholekster gedrag

foraging by touch ingestion walk



foraging by sight



# Ooievaar



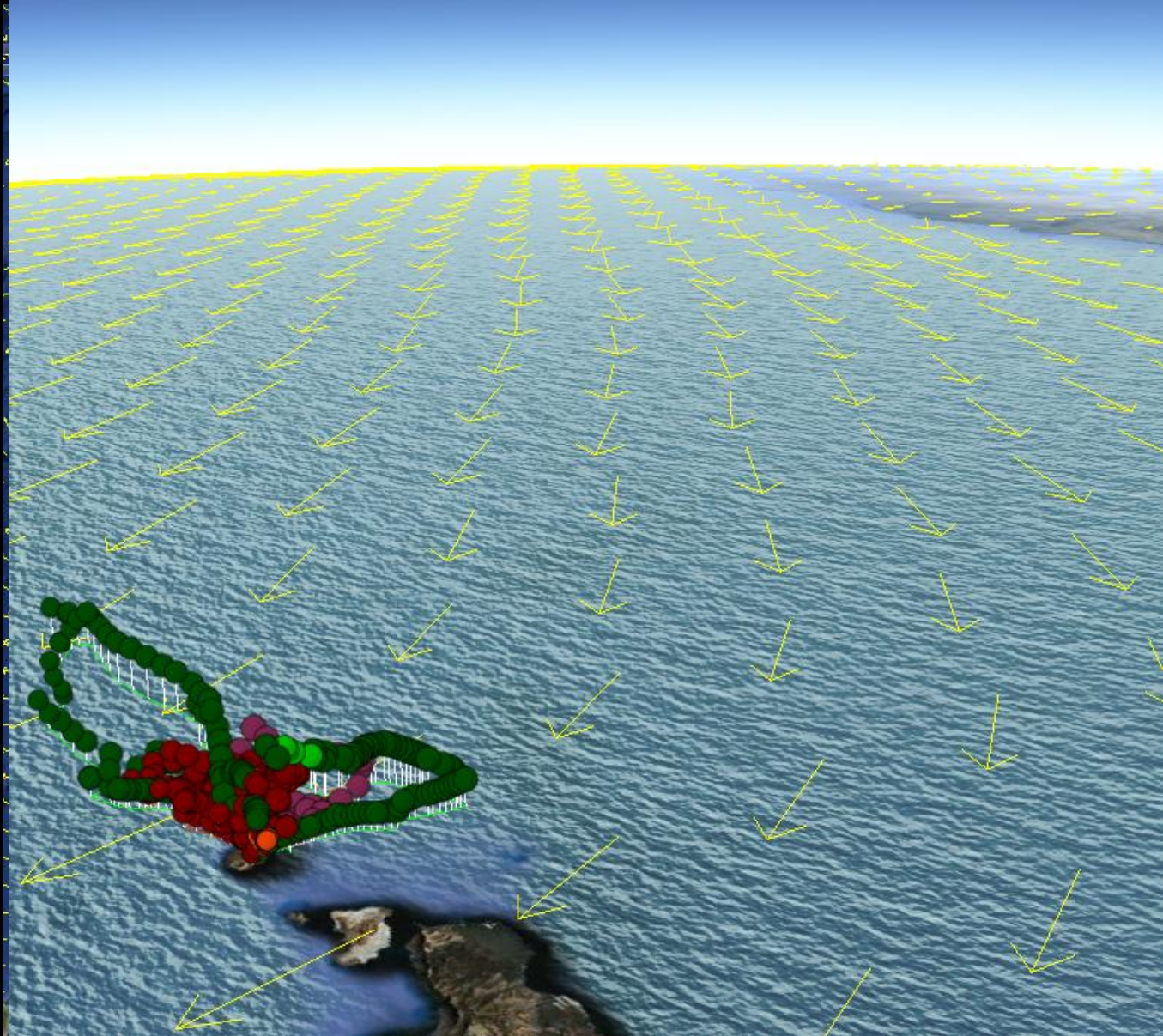
# Eleonora's Valk



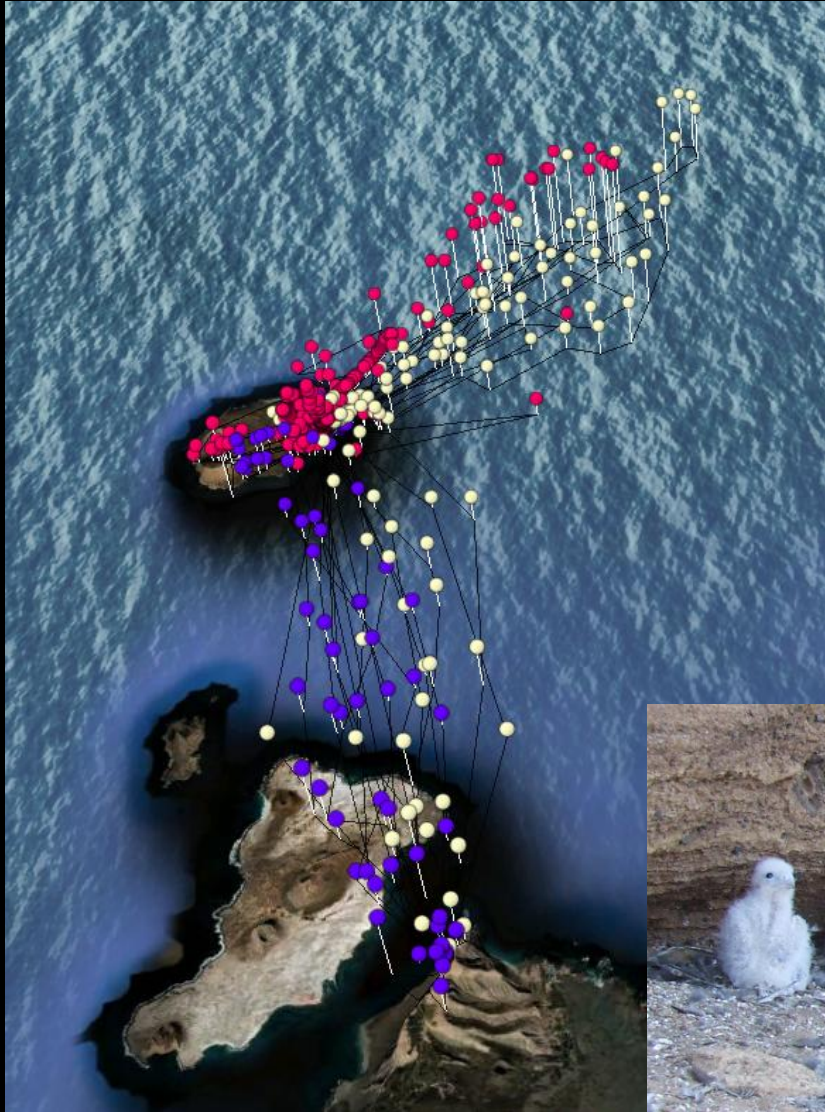
Alegranza



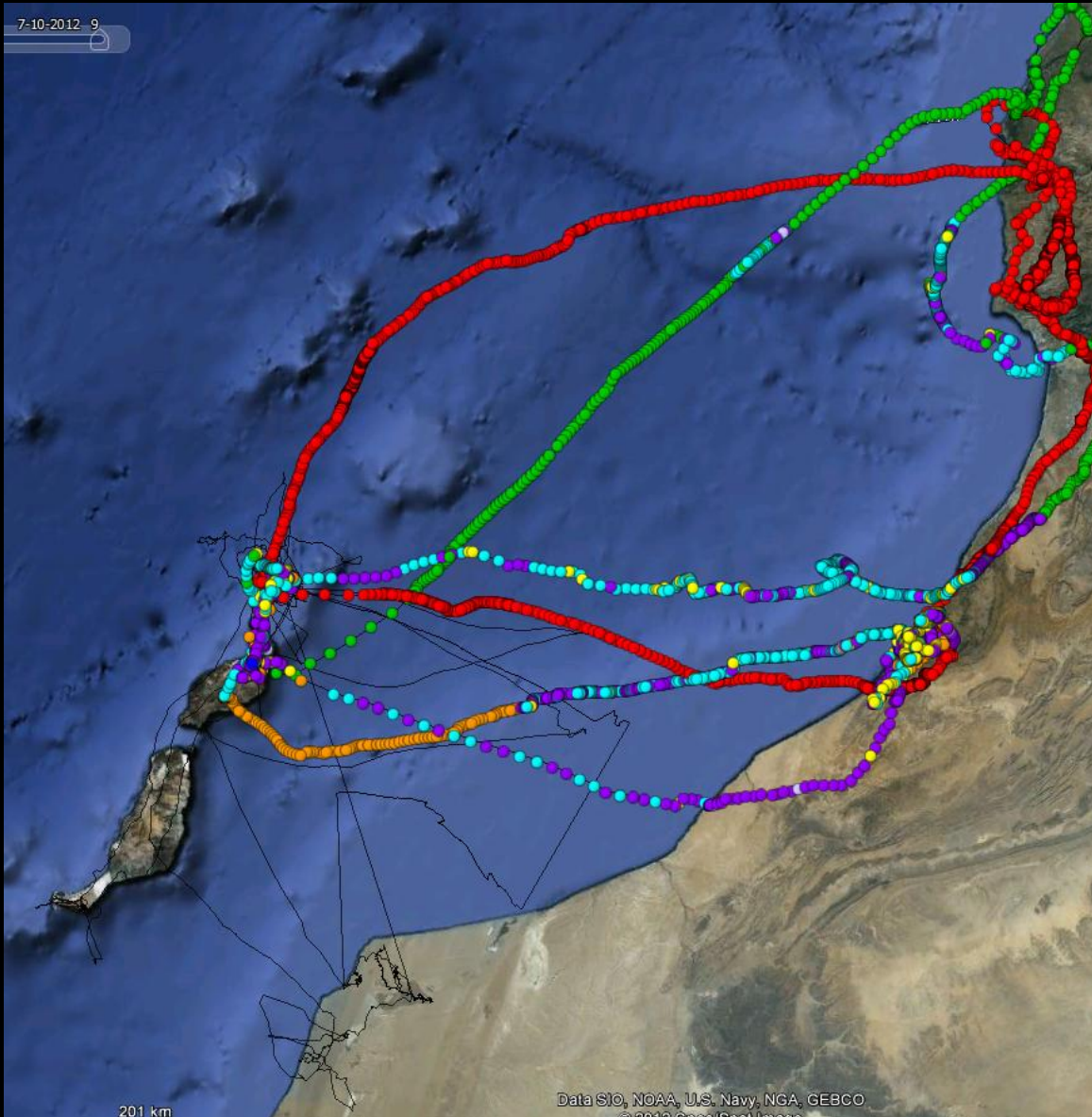
# Eleonora's Valk



# Eleonora's Valk



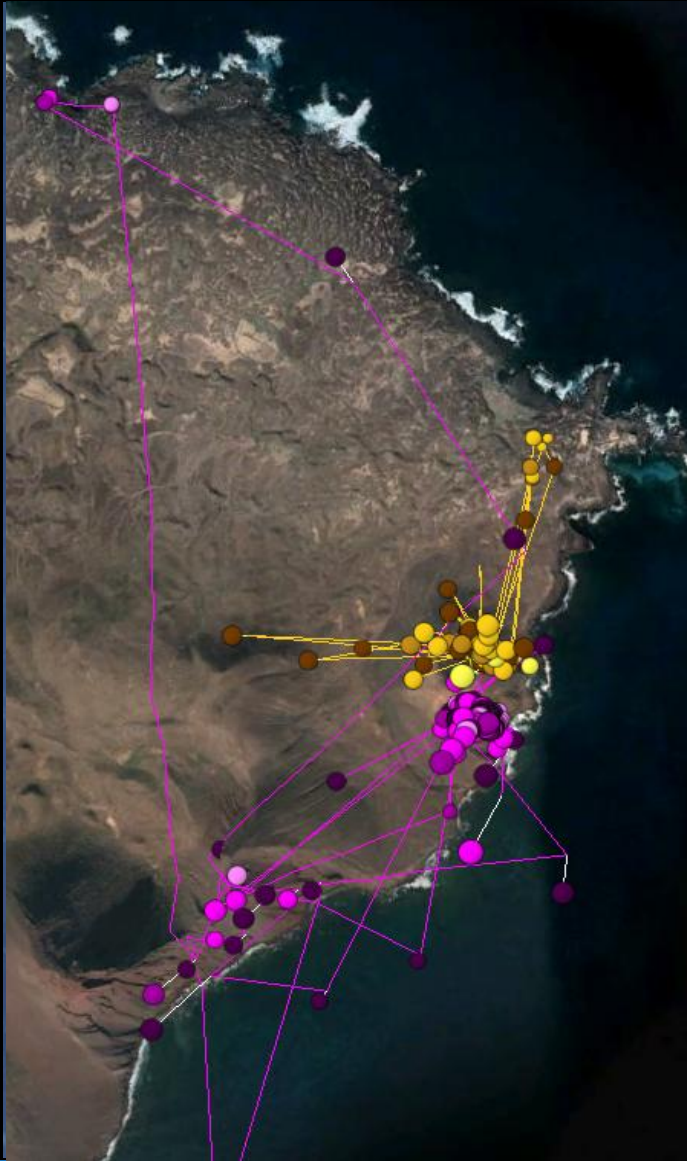
# Eleonora's Valk



Alegranza



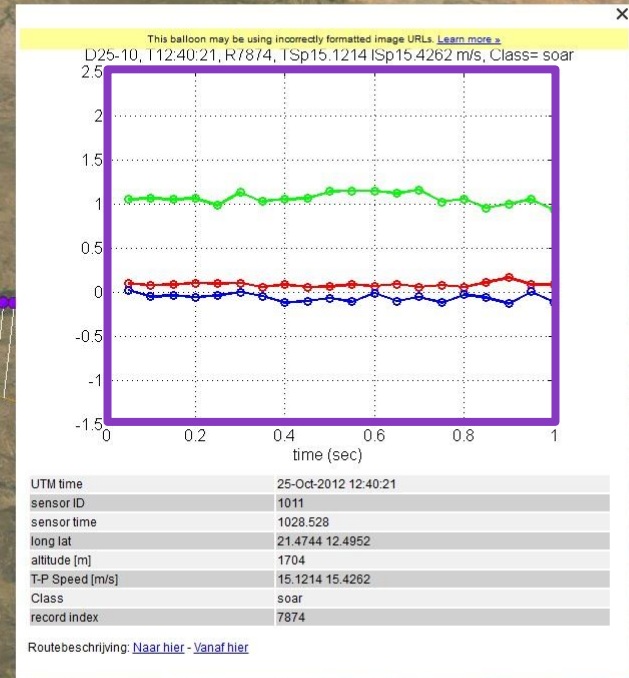
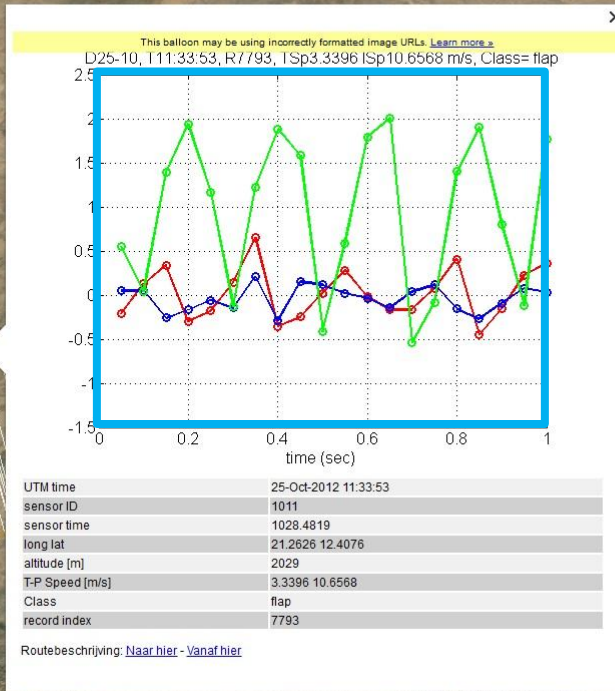
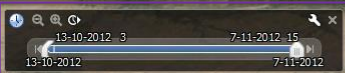
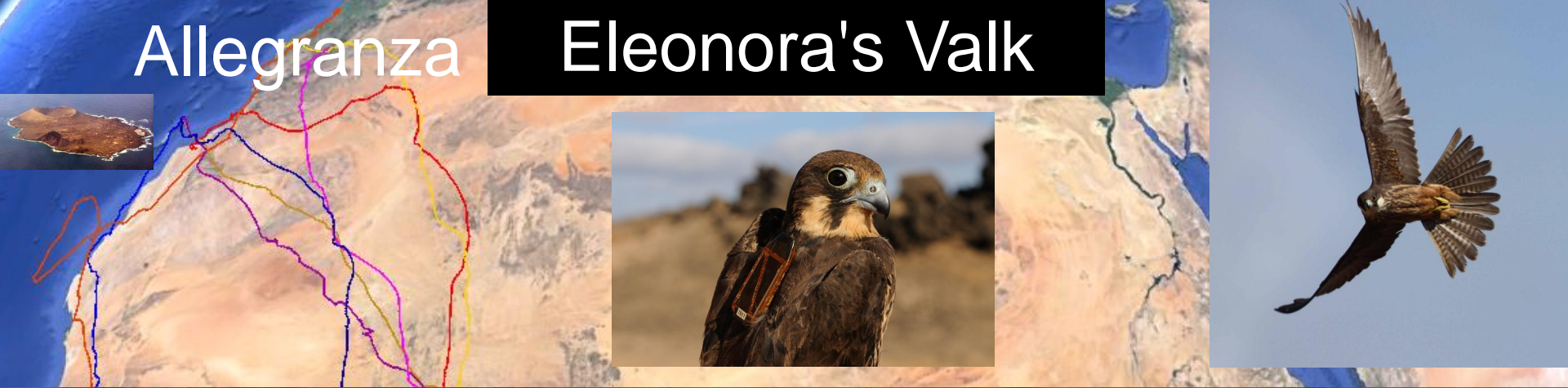
# Eleonora's Valk





# Allegranza

# Eleonora's Valk



# Vogels in een mensenwereld

een reizend sciencelab





## Its academy

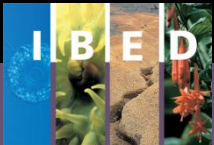
- Voor HAVO en VWO, onder- en bovenbouw
- Leerlingen enthousiast maken voor bèta-onderwijs
- Individueel en klassikaal
- Lesmateriaal, leskisten, masterclasses, profielwerkstuk begeleiding, excursies,
- [www.itsacademy.nl](http://www.itsacademy.nl)



# Reizend sciencelab

- Duur: 4 uur
- Klassikaal
- Op school of op UvA
- Onder begeleiding van studenten
- Verdieping op lesstof

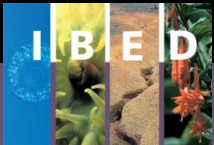
Onderdeel	Duur
Introductie presentatie + filmpje	½ uur
GPS demo met smartphone	1 uur
Vogelverhalen in groepjes + presentaties voorbereiden	1½ uur
Presentatie per vogelverhaal + <i>Vogel het uit!</i>	1 uur



# Introductie reizend sciencelab

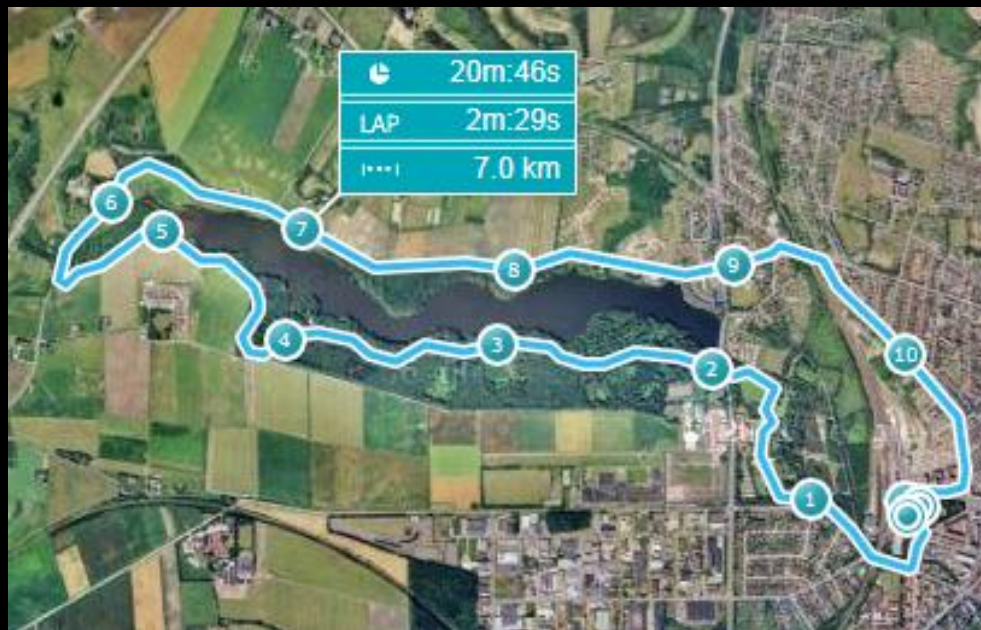


BBC – Earthflight clip – Crane migration (<http://www.earthflight.co.uk>)



# GPS demo

- Naar buiten met je smartphone
- Gebruik van sport tracking app
- Vergelijking met UvA-BiTS



# 4 vogelverhalen

## Organisatieniveaus in ecologie



Populatie



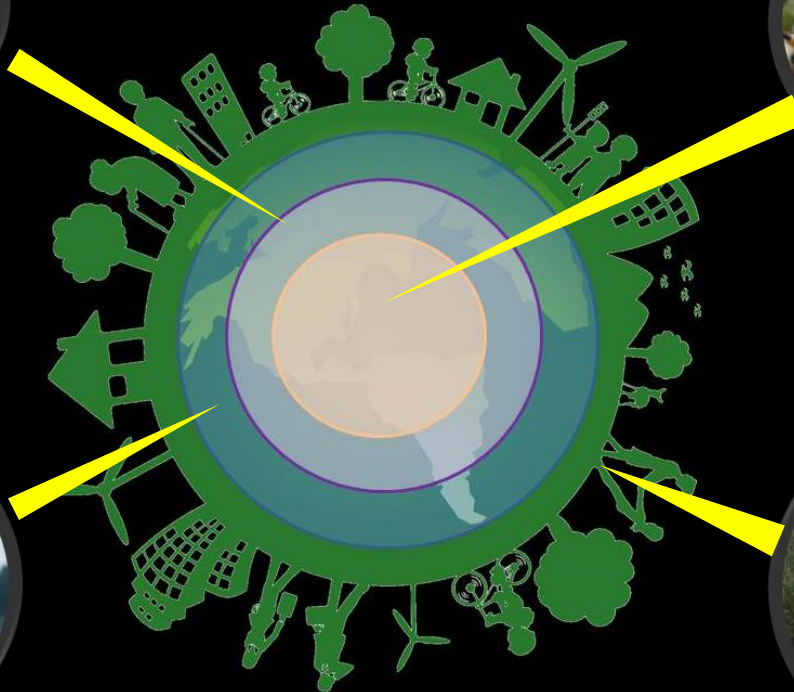
Individu



Ecosysteem

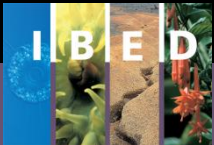


Biosfeer



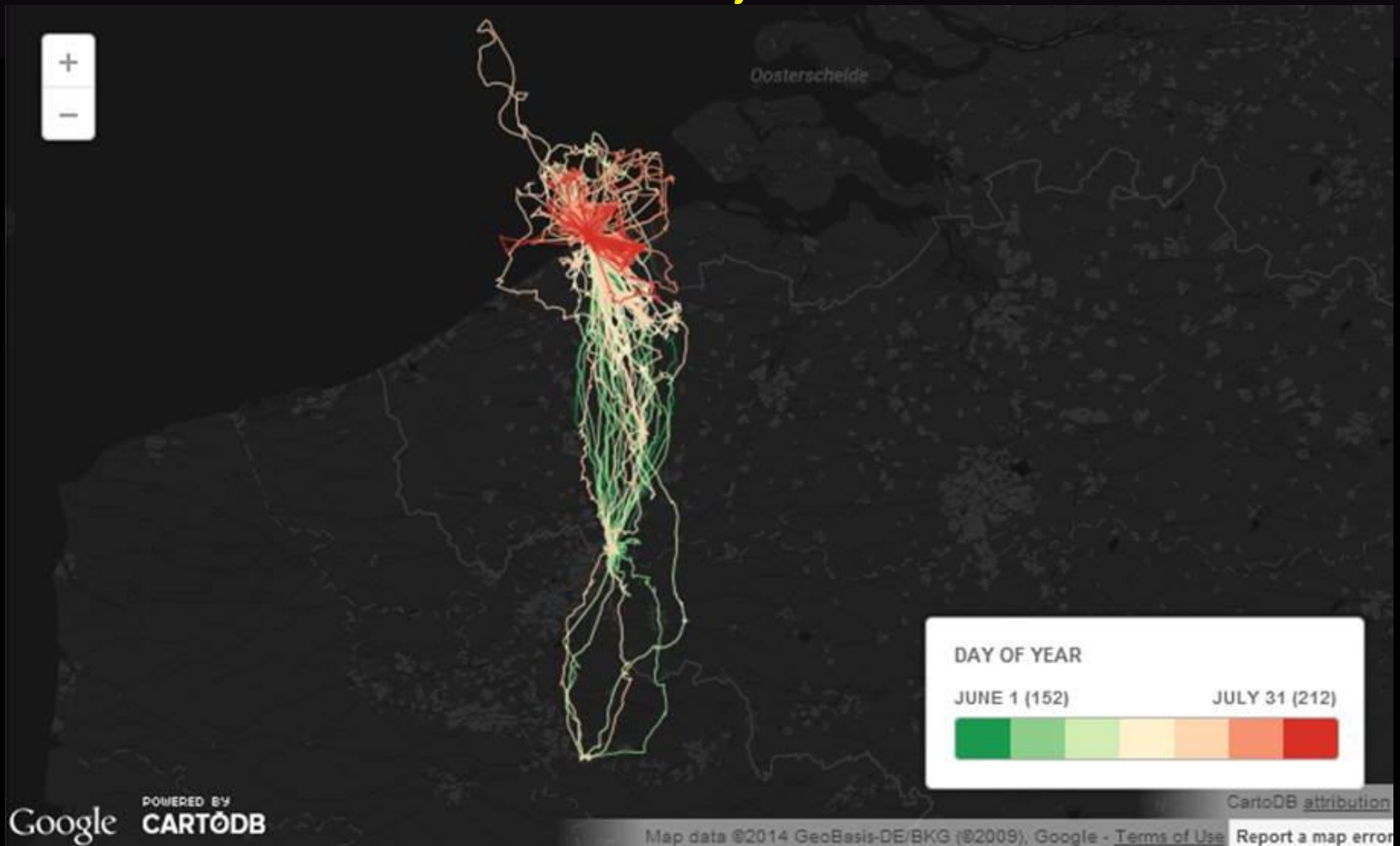
# Werkwijze

- Zelf gegevens van vogels visualiseren
- Interpretatie van beelden
- Informatie hieraan linken
  - *Snelheid*
  - *Verspreiding*
  - *Migratieroutes*
  - *Foerageergedrag*
  - *Hoogtes*
  - *Natuurbeheer*
  - *Dag/nacht ritme*
  - *Etc.*





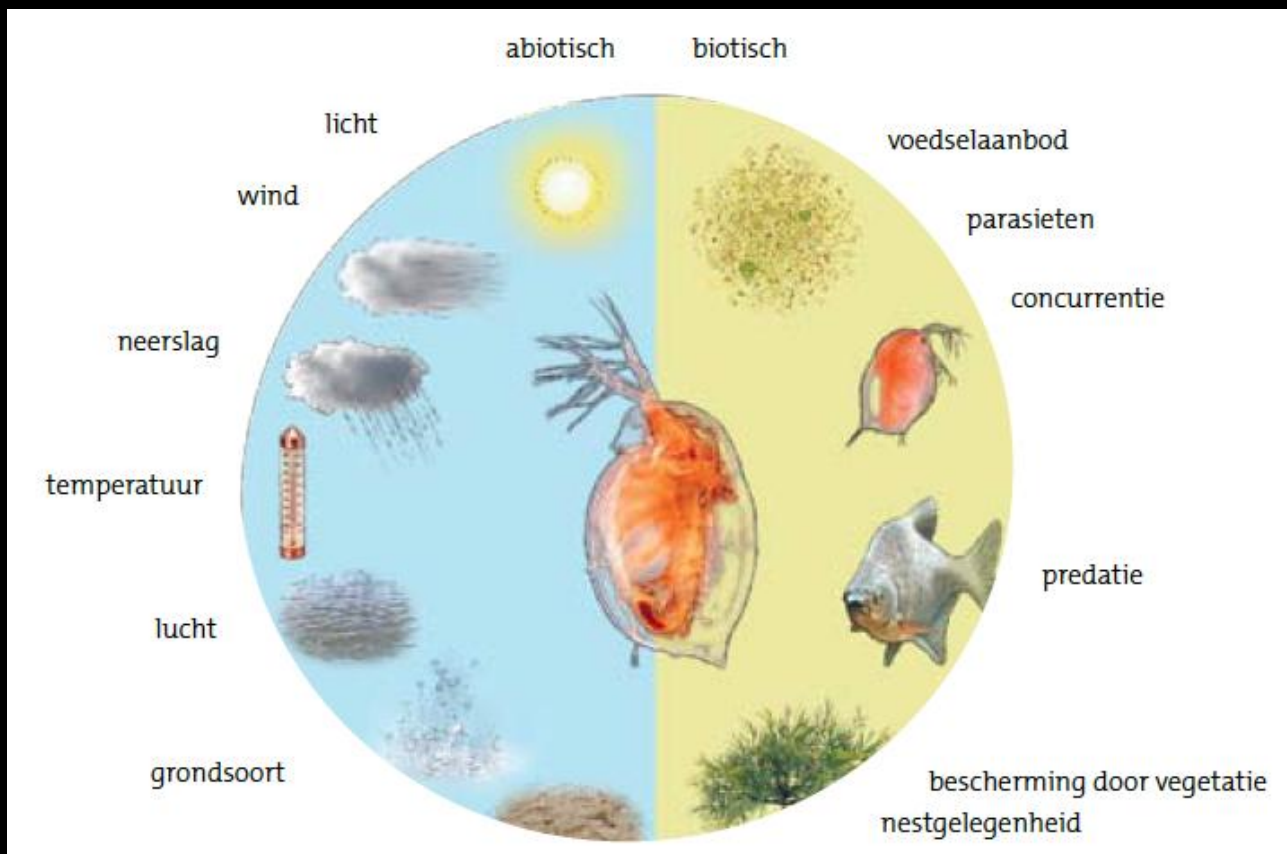
# Werkwijze



Visualisatie van Kleine mantelmeeuw Eric in Zeebrugge

# Individu

- Wisselwerking tussen individu en zijn omgeving
- Biotische en abiotische factoren bepalen gedrag



Bron: BVJ 5



# Wespendief (Nederland van Boven)

vpro



Bron: UvA

# Populatie

- Individuen van dezelfde soort vormen samen een populatie
- Onderling verband tussen individuen
  - *Concurrentie (voedsel, voortplanting, ruimte)*
  - *Samenwerking (verdediging predatoren, samen prooien vangen)*



# Populatie

Kleine mantelmeeuwen vs. Zilvermeeuwen



# Ecosysteem

- Verzameling van populaties in een begrensd gebied
- Ecosystemen zijn dynamisch
- Gedrag van vogels beïnvloed door biotische en abiotische factoren
- Bijvoorbeeld: Invloed van landgebruik op vogels:
  - *Intensieve landbouw*
  - *Akkerranden met gras- en kruidenmengsels*



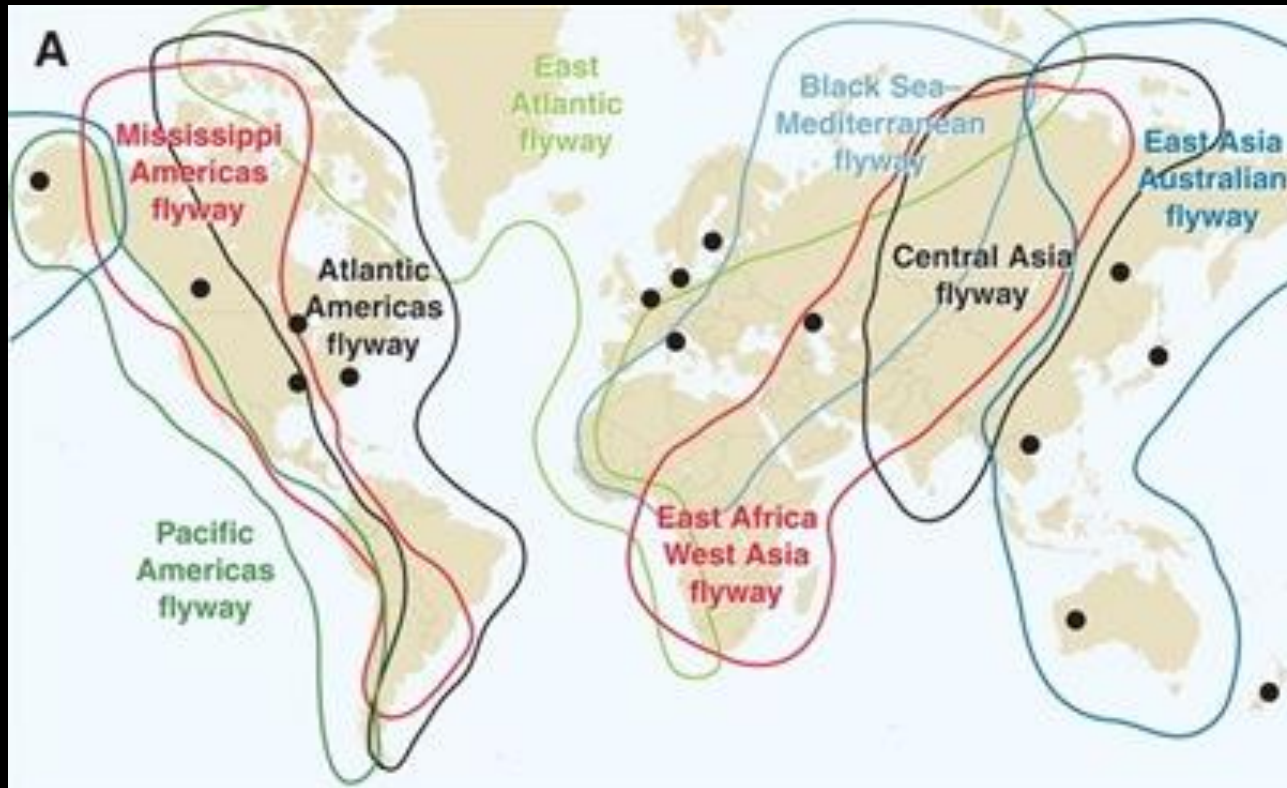
# Grauwe Kiekendief

- Nodig in omgeving:
  - *Veilige broed- en rustplaats* → *Graanakkers + kooi*
  - *Voedsel* → *vooral muizen in akkerranden*



# Biosfeer = Wereld

- Vogels migreren langs vliegroutes
- Verbinding tussen ecosystemen
- Natuurbescherming kan niet alleen binnen landgrenzen



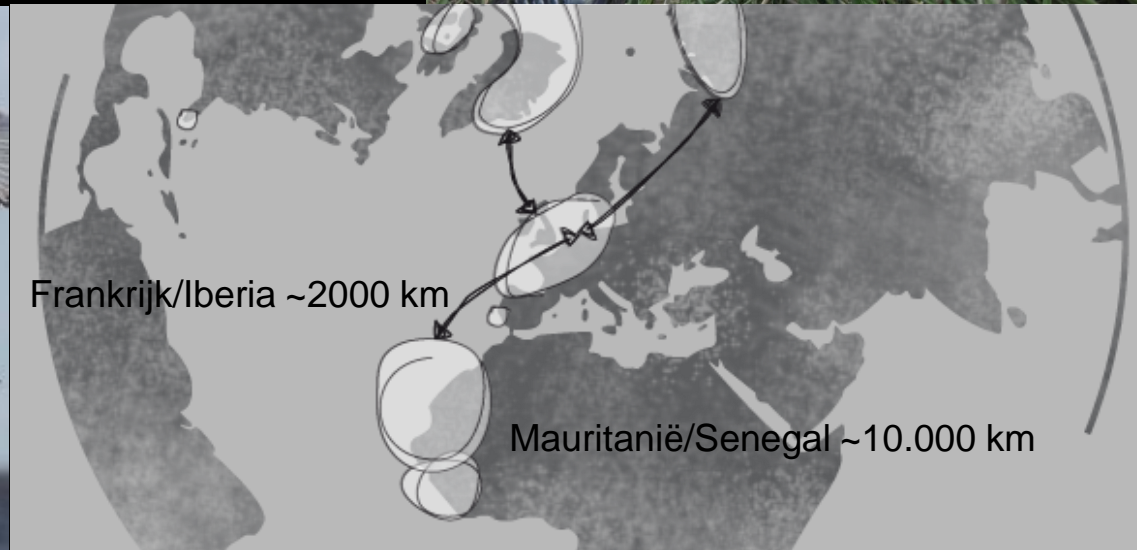


# Lepelaars

- Oost-Atlantische Vliegrouete
- Overwinteren:
  - *Frankrijk & Iberisch schiereiland*
  - *Mauritanië & Senegal*
- Overleving en broedsucces
- Draagkracht gebieden

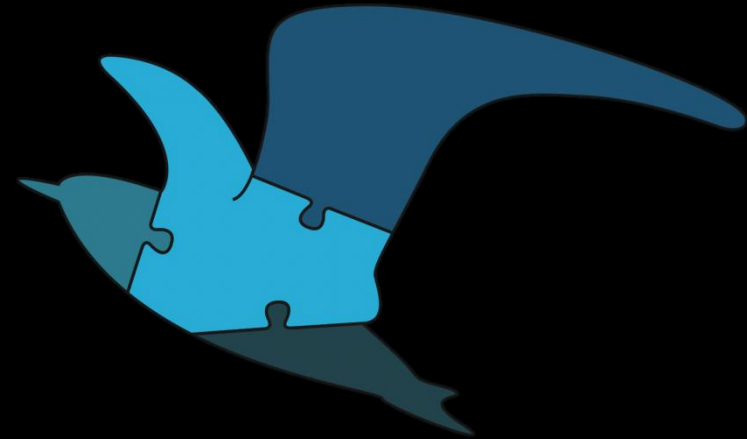


Jan van de Kam

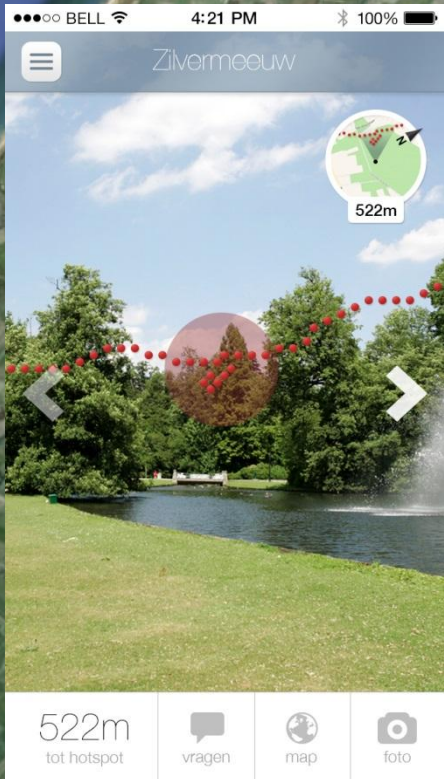


# Presentaties en bespreking

- Overleg tussen groepjes met dezelfde vogel
- Presentatie voor andere groepjes
- Klassikale bespreking
  - *Wisselwerking tussen mens, vogels en omgeving op verschillende ecologische organisatieniveaus*
  - *Alles is met elkaar verbonden*
  - *Belang van technologie*
- Tot slot – Kennismaking met *Vogel het uit!*



Texel



Opperdoes



# Wespendief

[http://www.youtube.com/watch?v=2y\\_3OBxT42I](http://www.youtube.com/watch?v=2y_3OBxT42I)

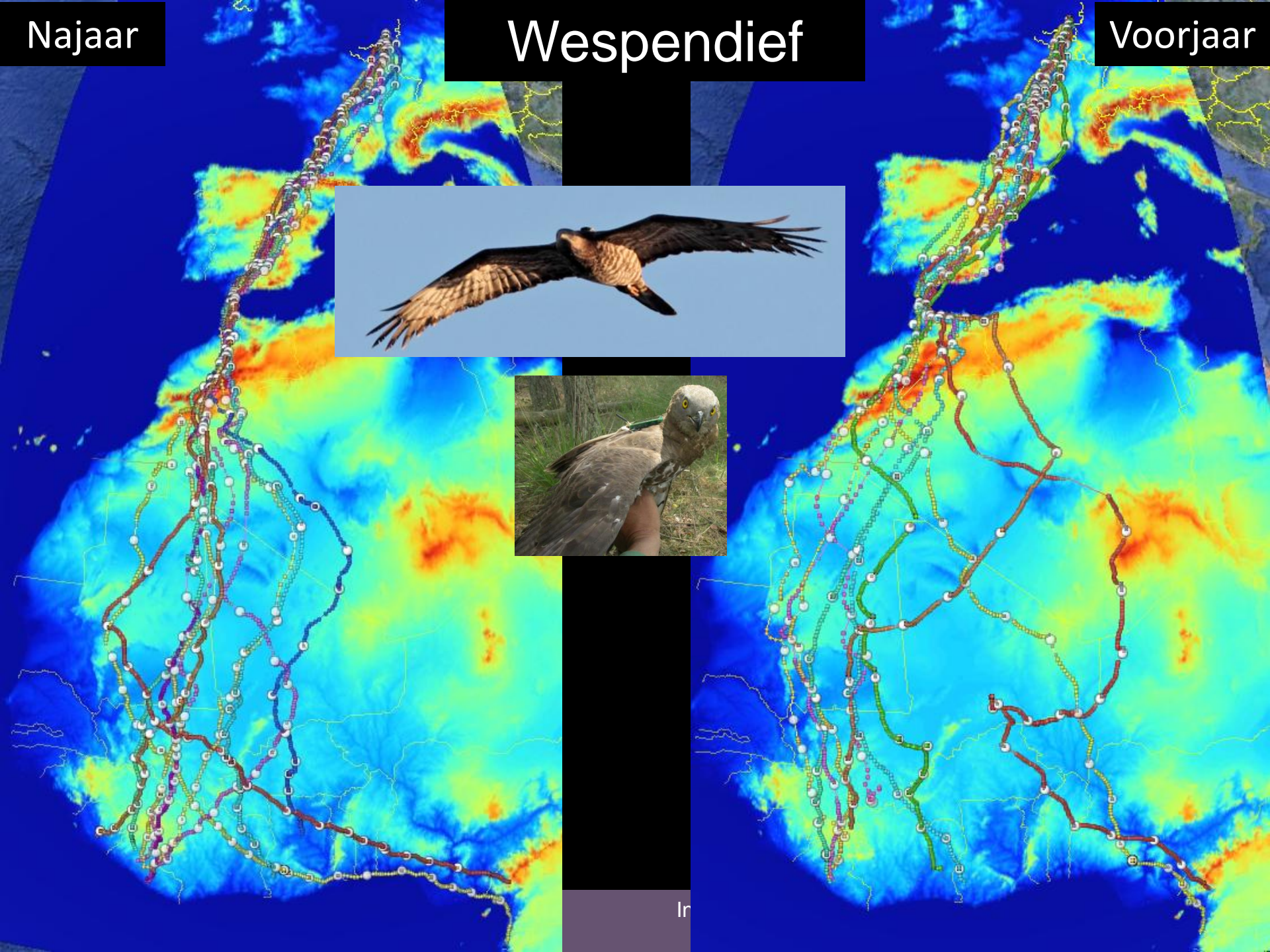
<http://www.youtube.com/watch?v=6UBSGboWivw>



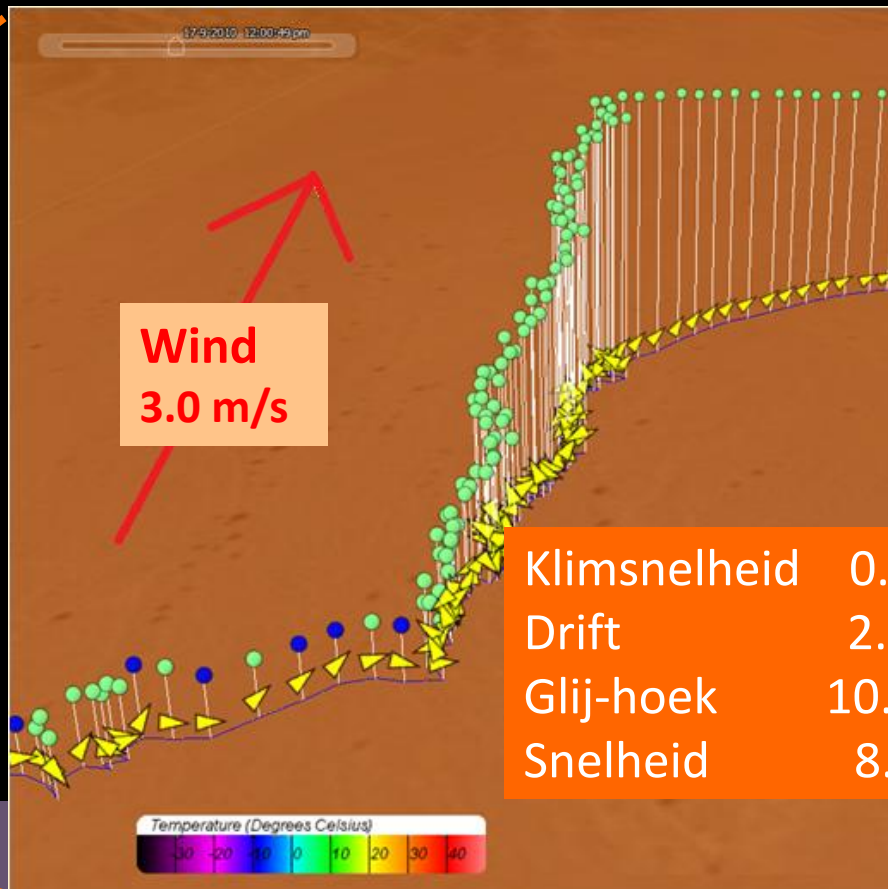
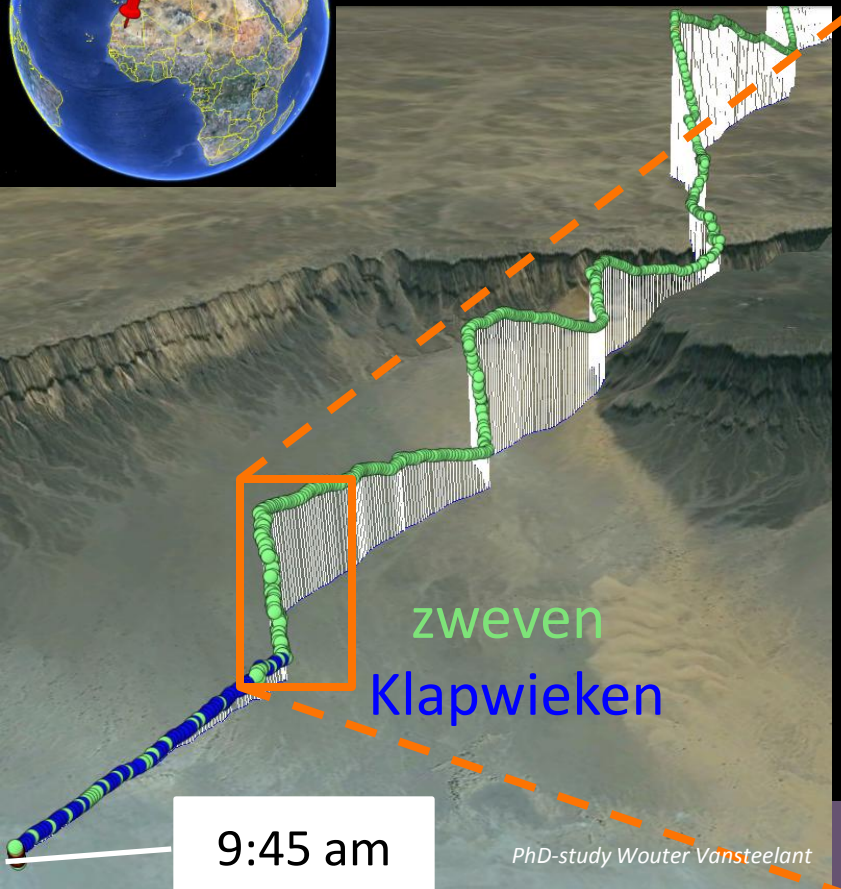
Najaar

Wespendief

Voorjaar



# Vliegedrag wespendingief



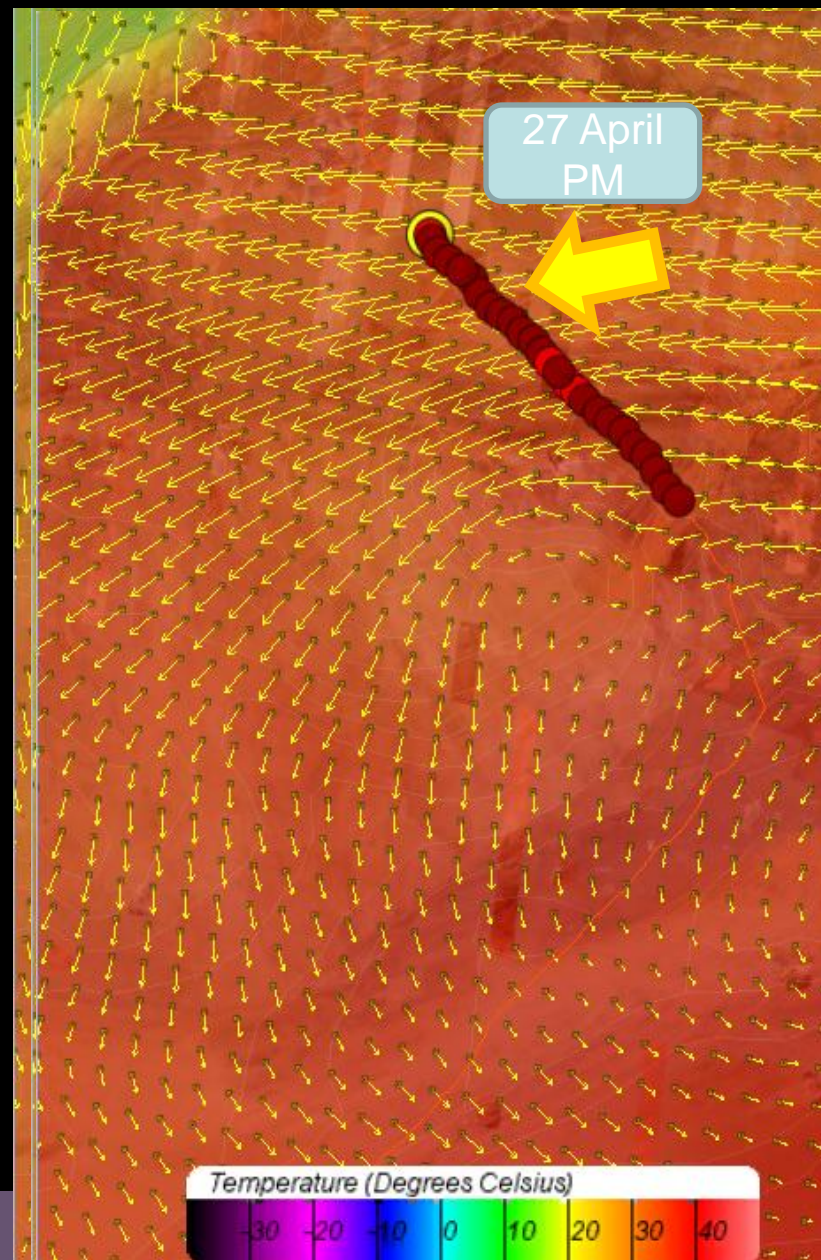
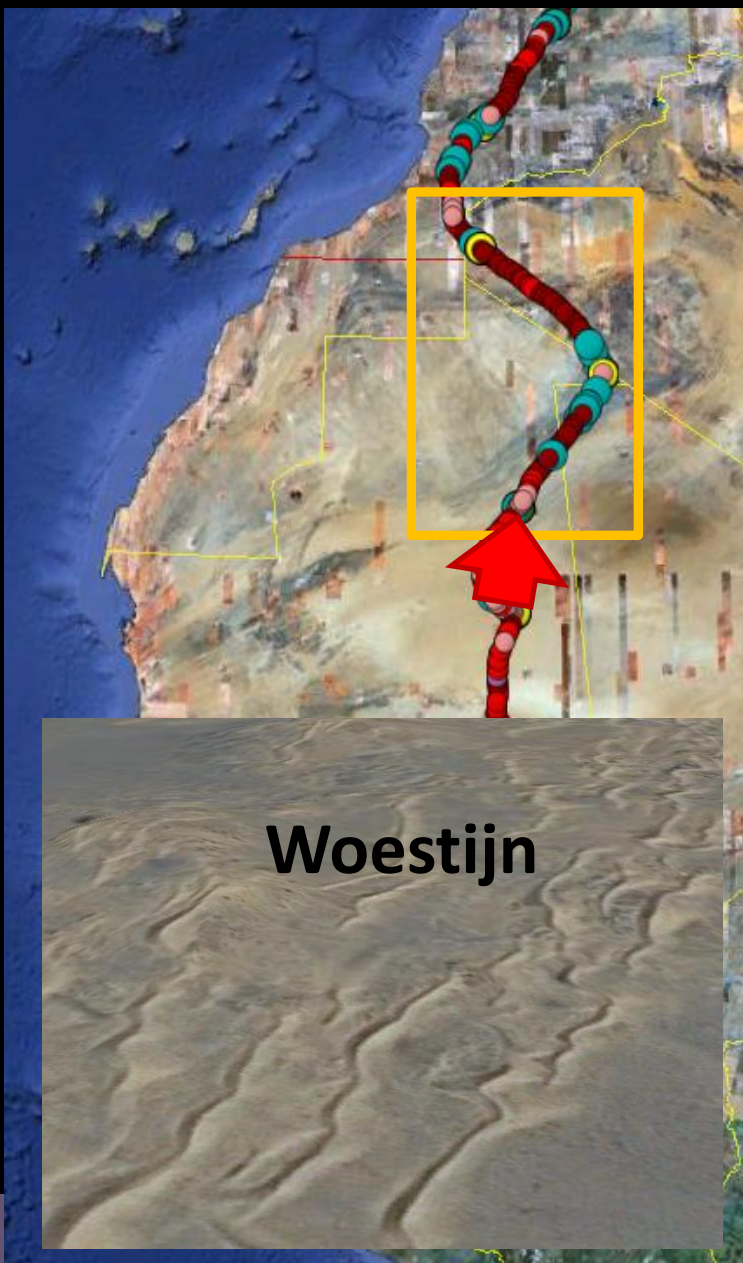
# Vliegstrategie

Gedurende trek:  
Klapwieken: 7.8%  
Zweven: 92.2%

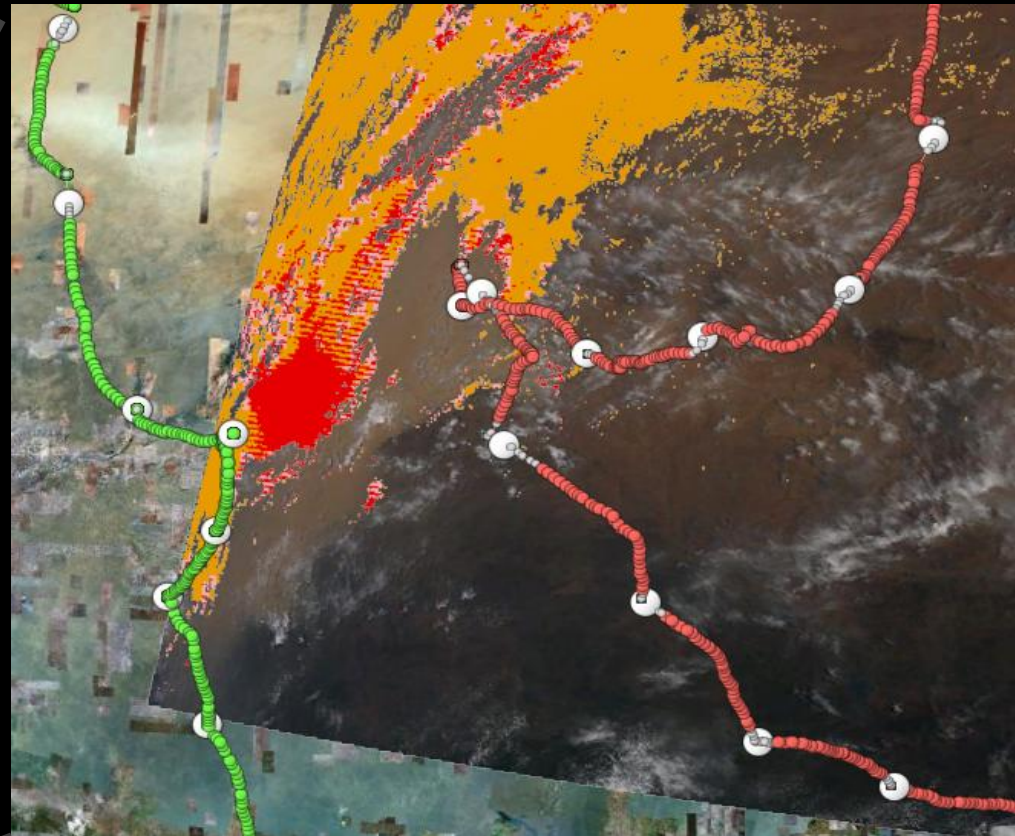
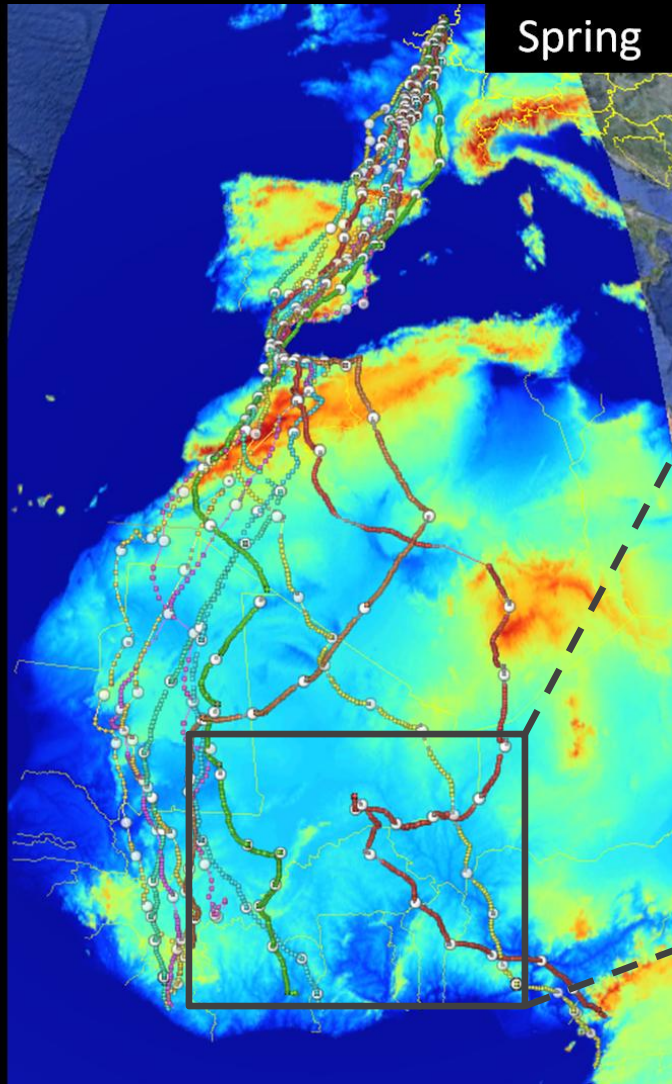
- Klapwieken
- Zweven
- Staans



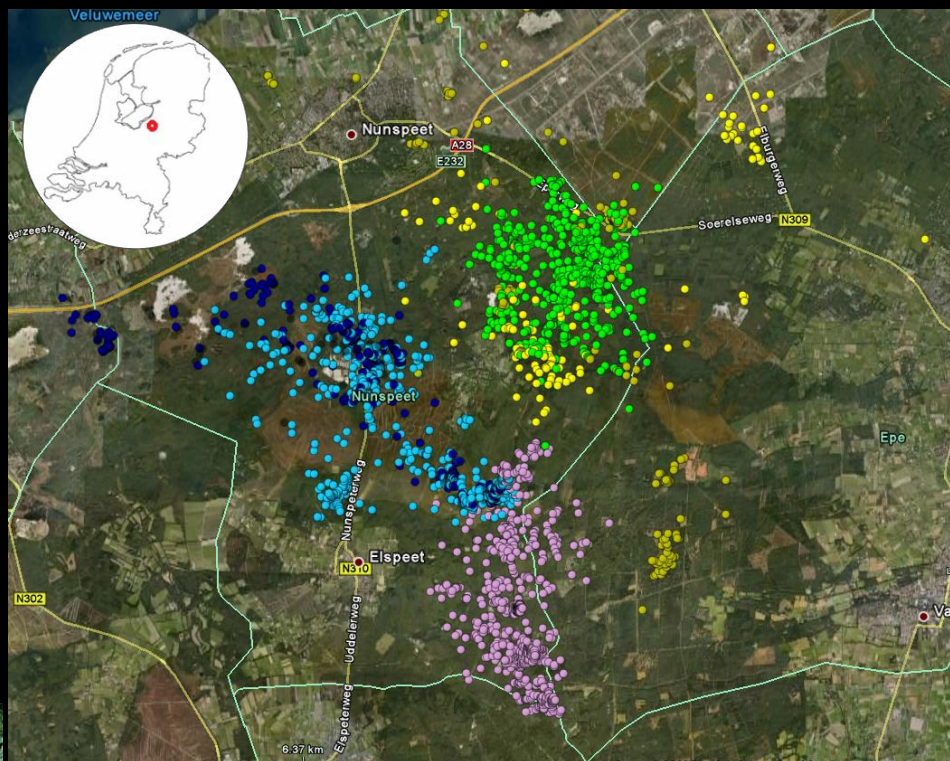
# Omweg en atmosferische omstandigheden



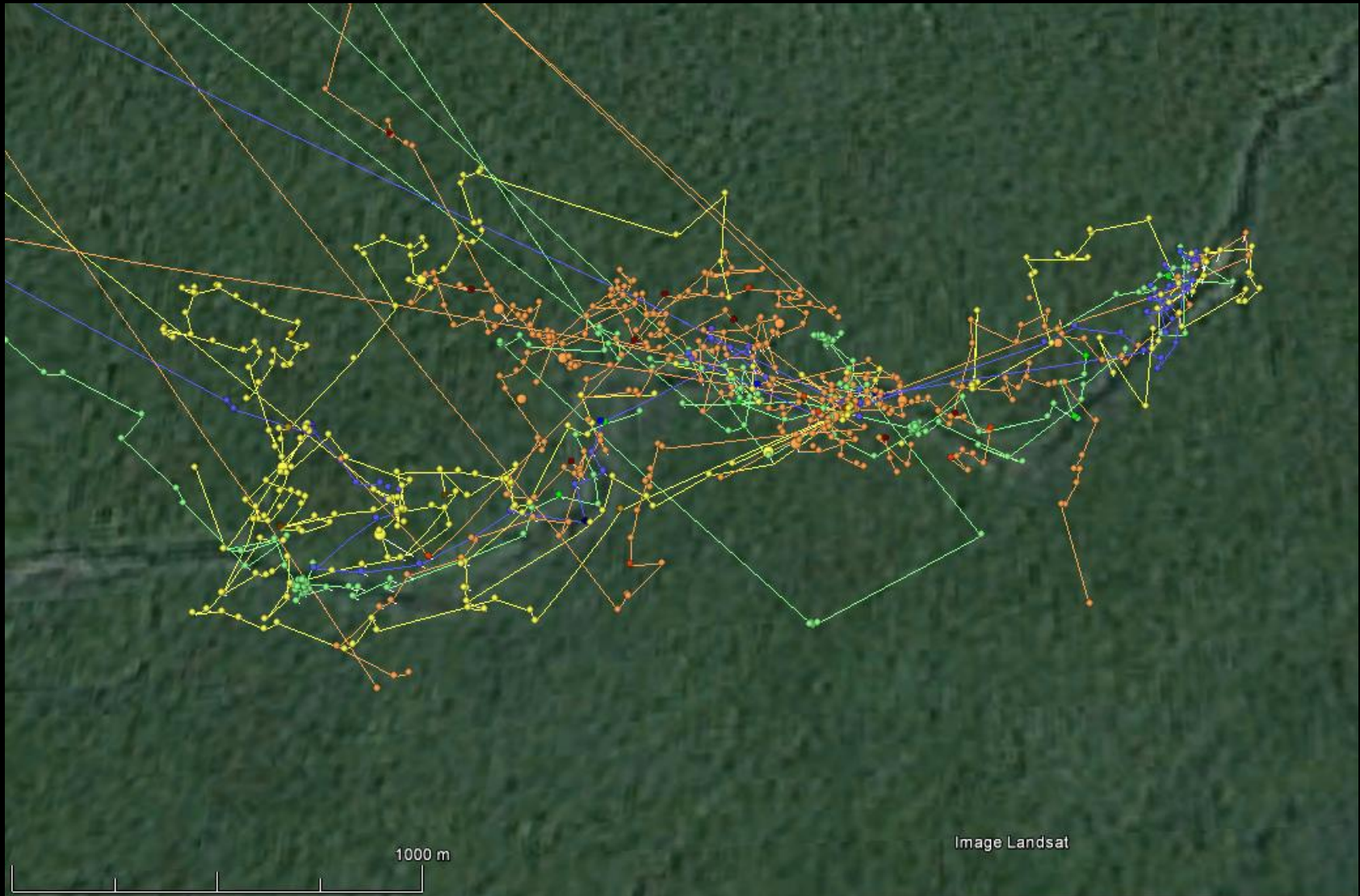
# Omweg en stofstormen



# Timing en reproductie succes

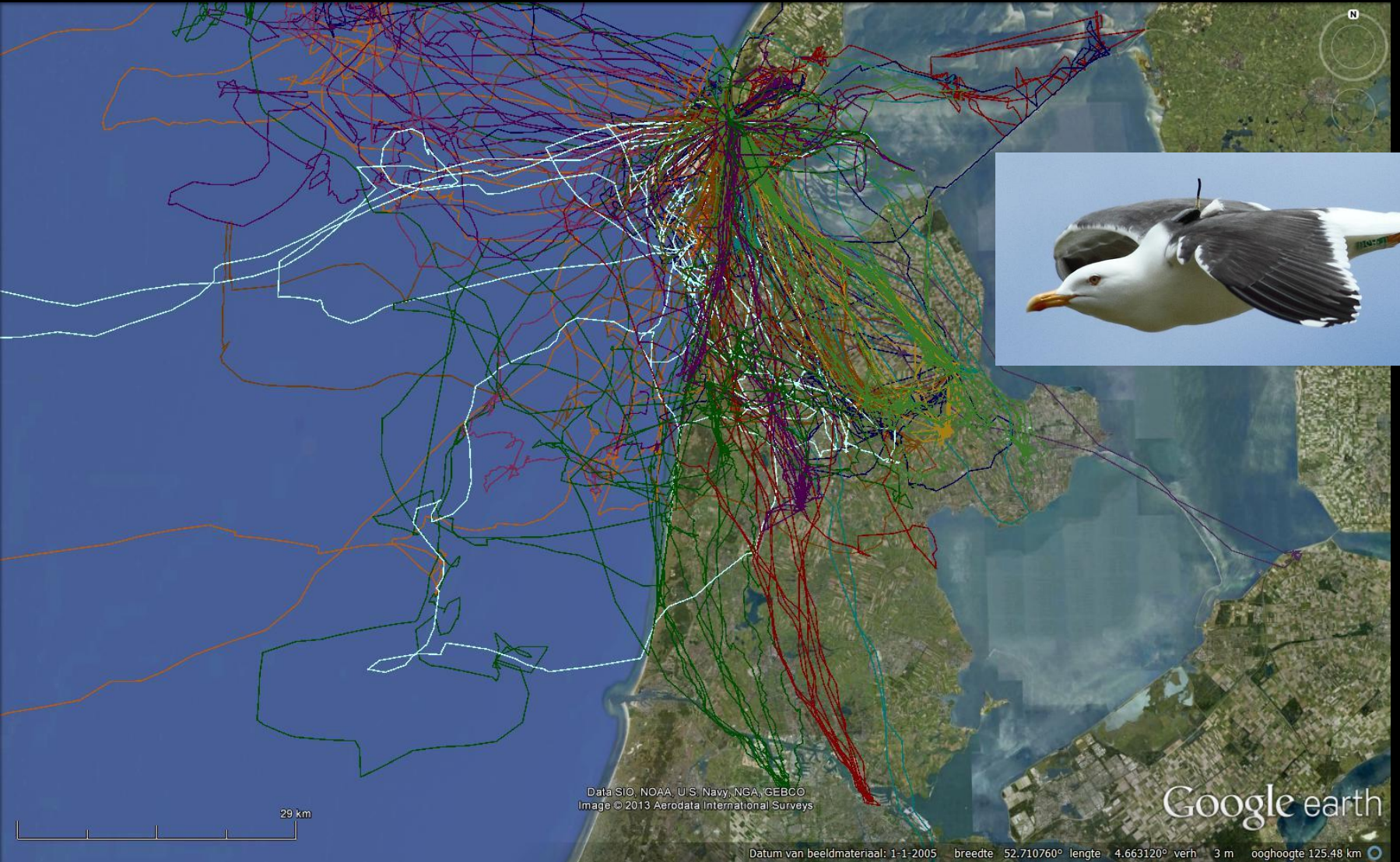


# Overwinteringsgebied

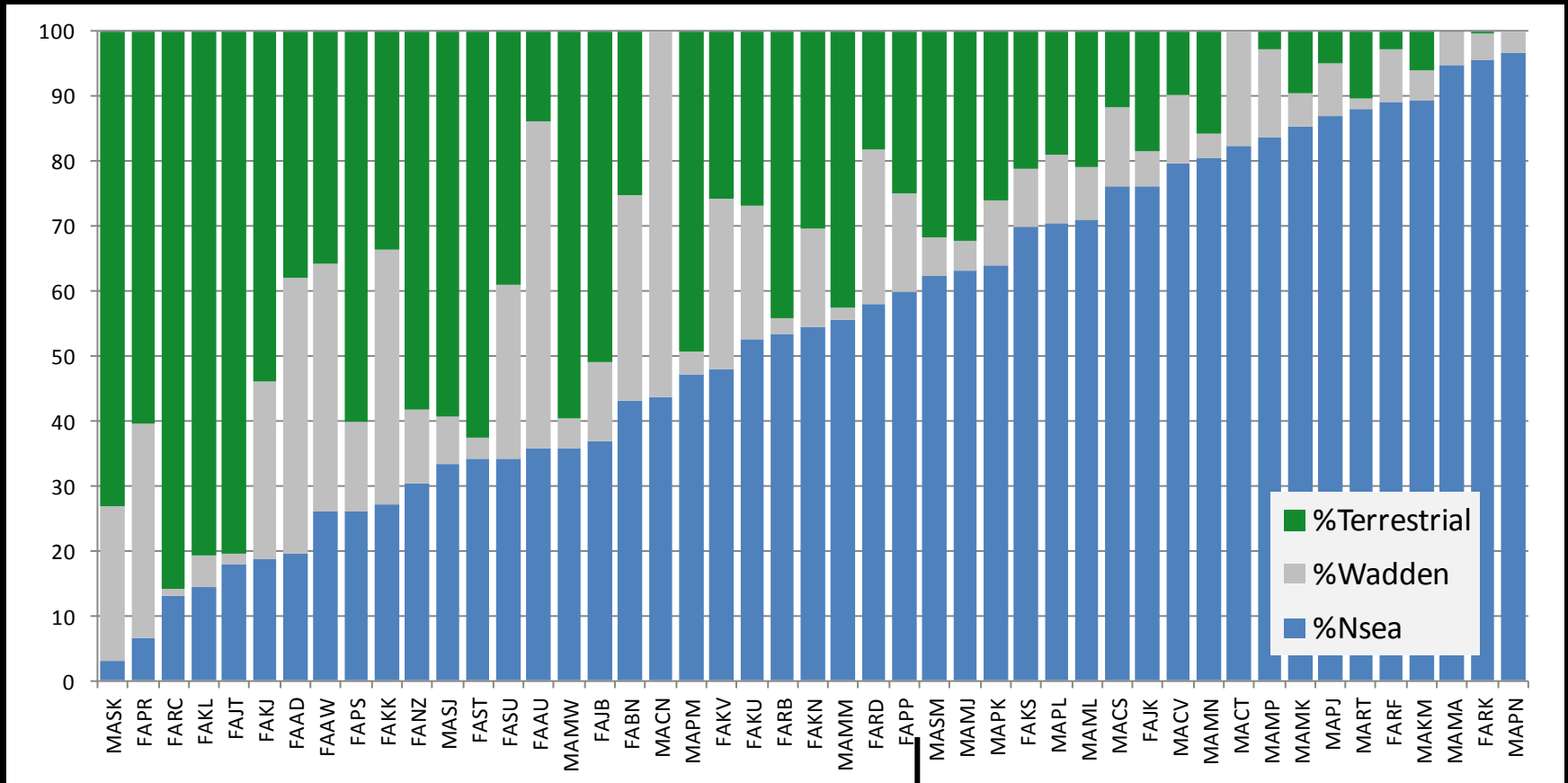




# Fourageergedrag Kleine Mantelmeeuw



# Fouragegedrag : specialisatie



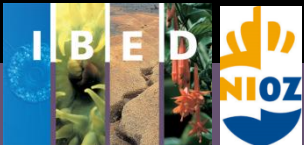
Kleine Mantelmeeuw, 2008-2013

<60% op zee

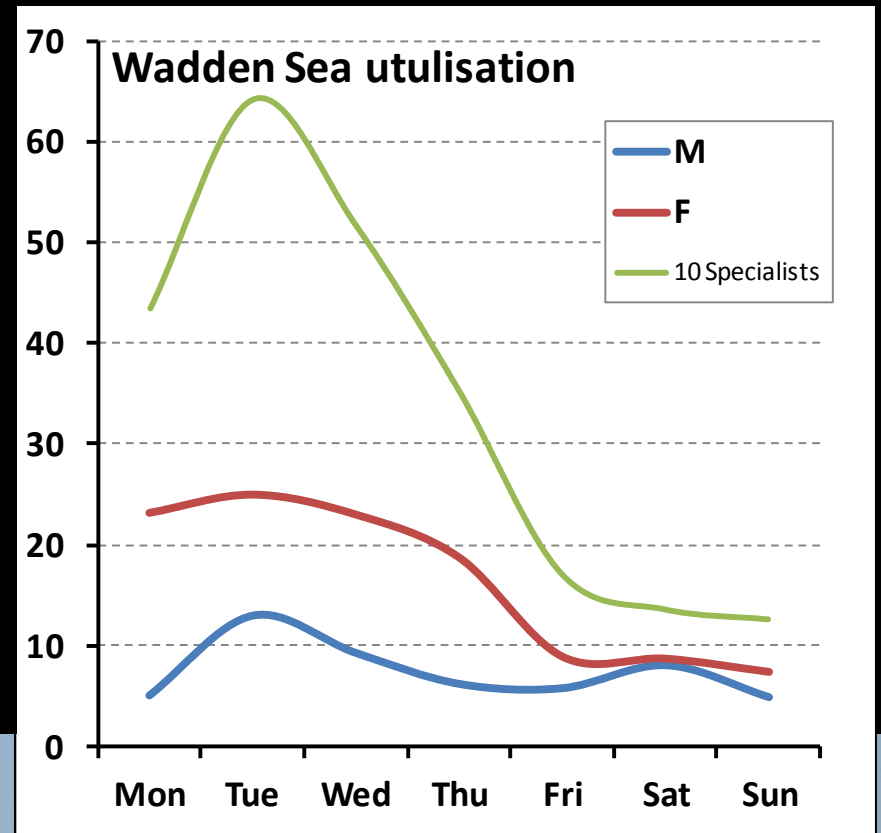
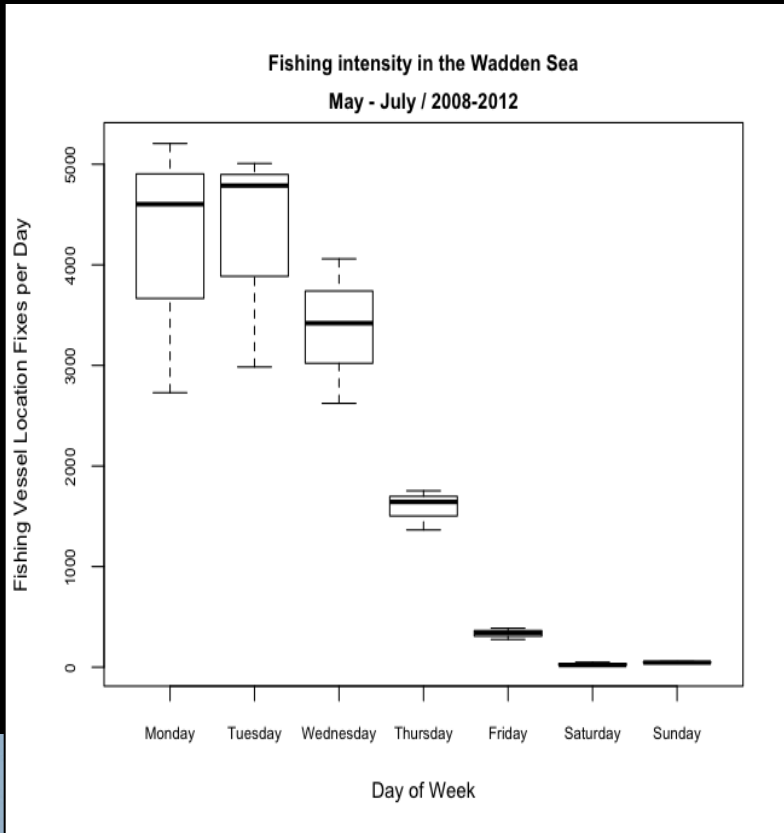
85% ♀♀

>60% op zee

80% ♂♂



# Fourageergedrag : specialisatie

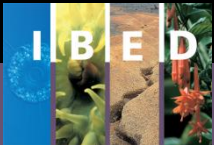
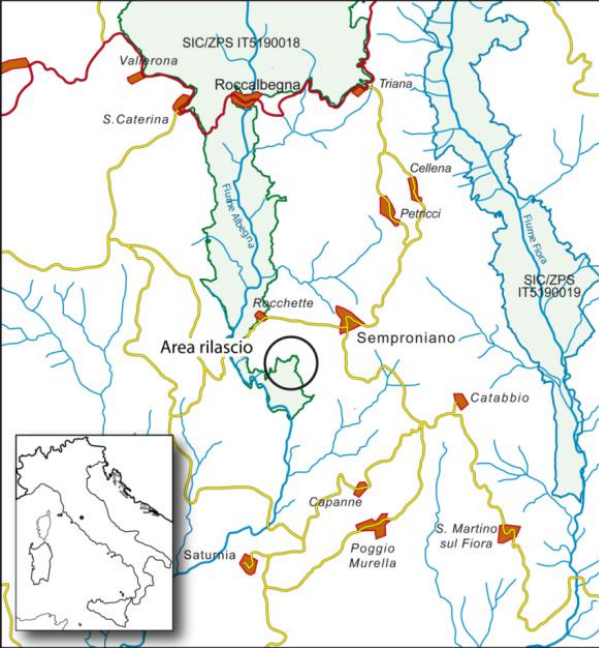




# Fouragegedrag : specialisatie

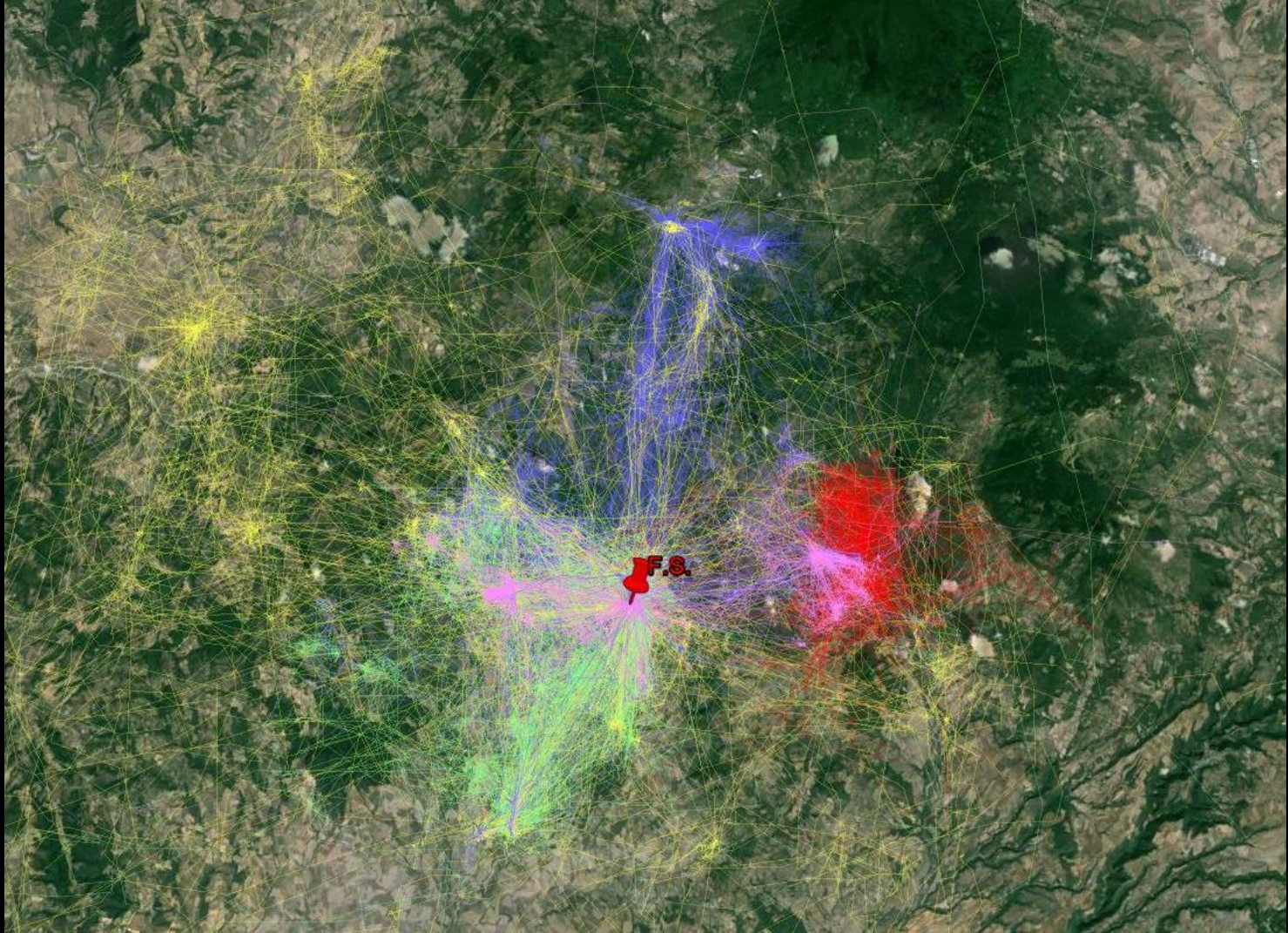


# Rode wouw Re-introductie in Toscane

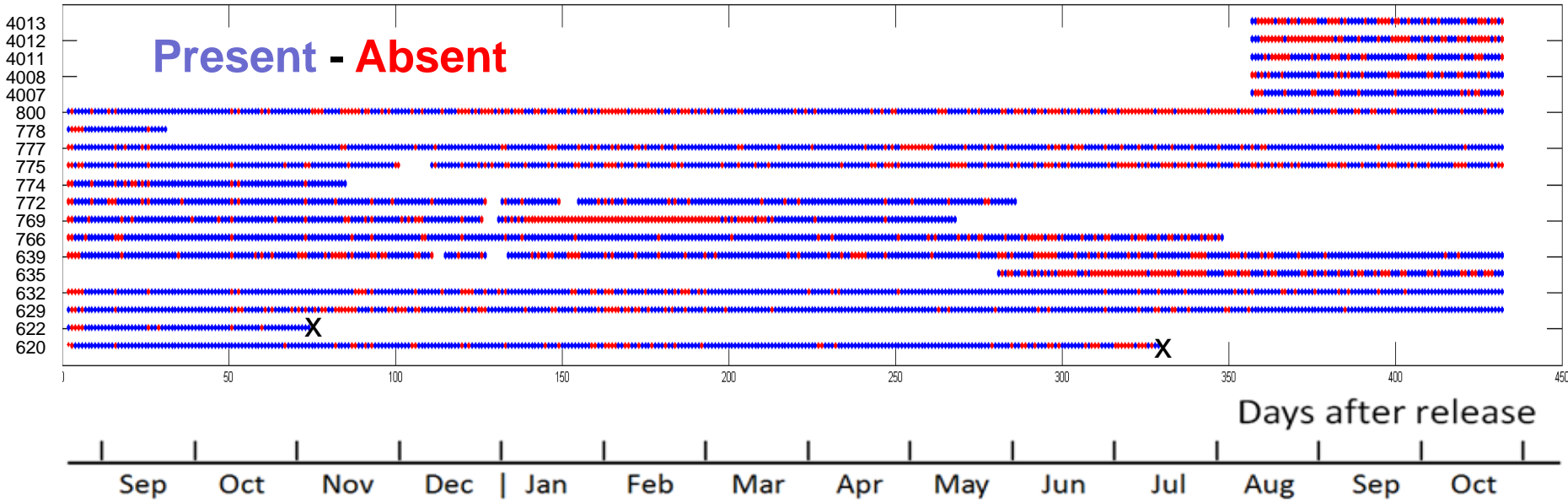


# Rode wouw

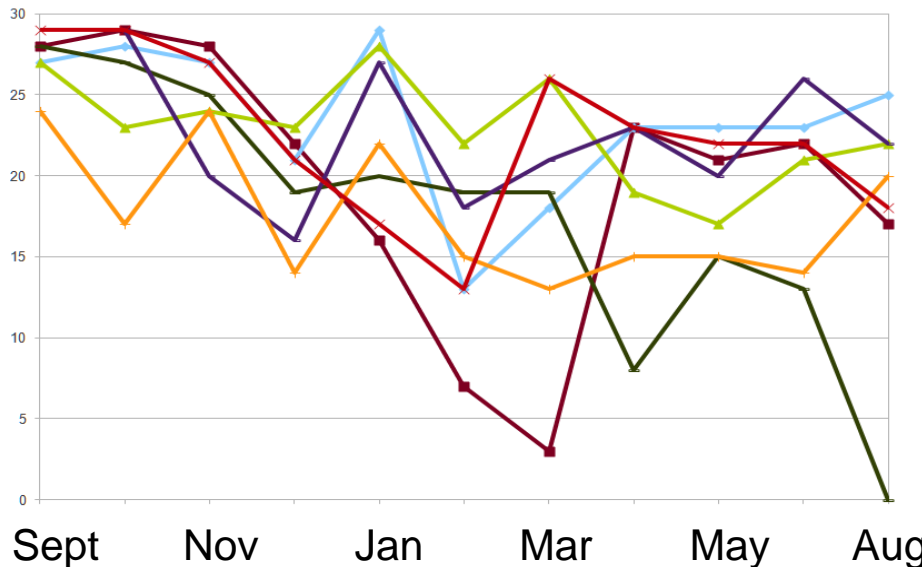
## Re-introductie in Toscane



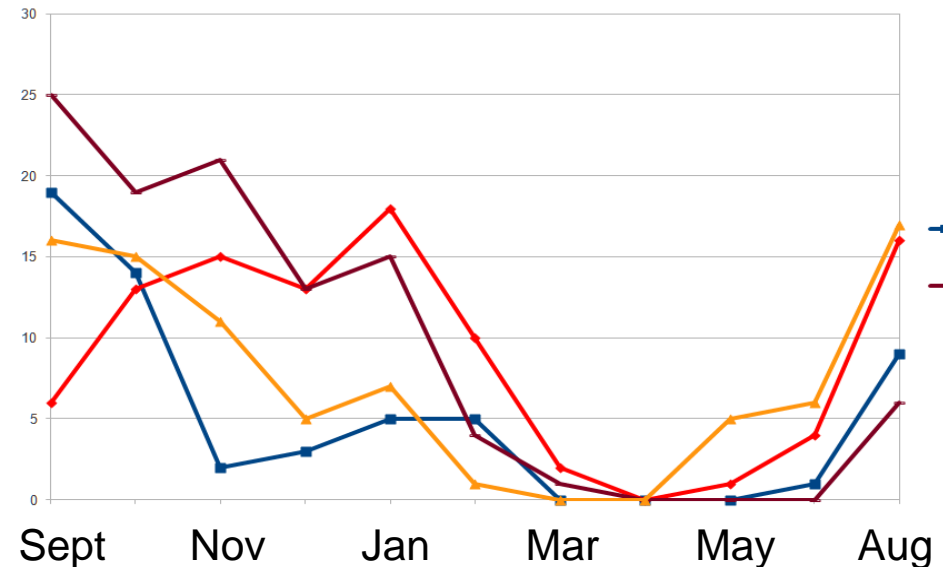
# Dagelijks bezoek voedselstation



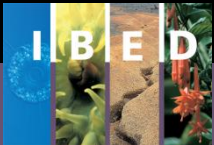
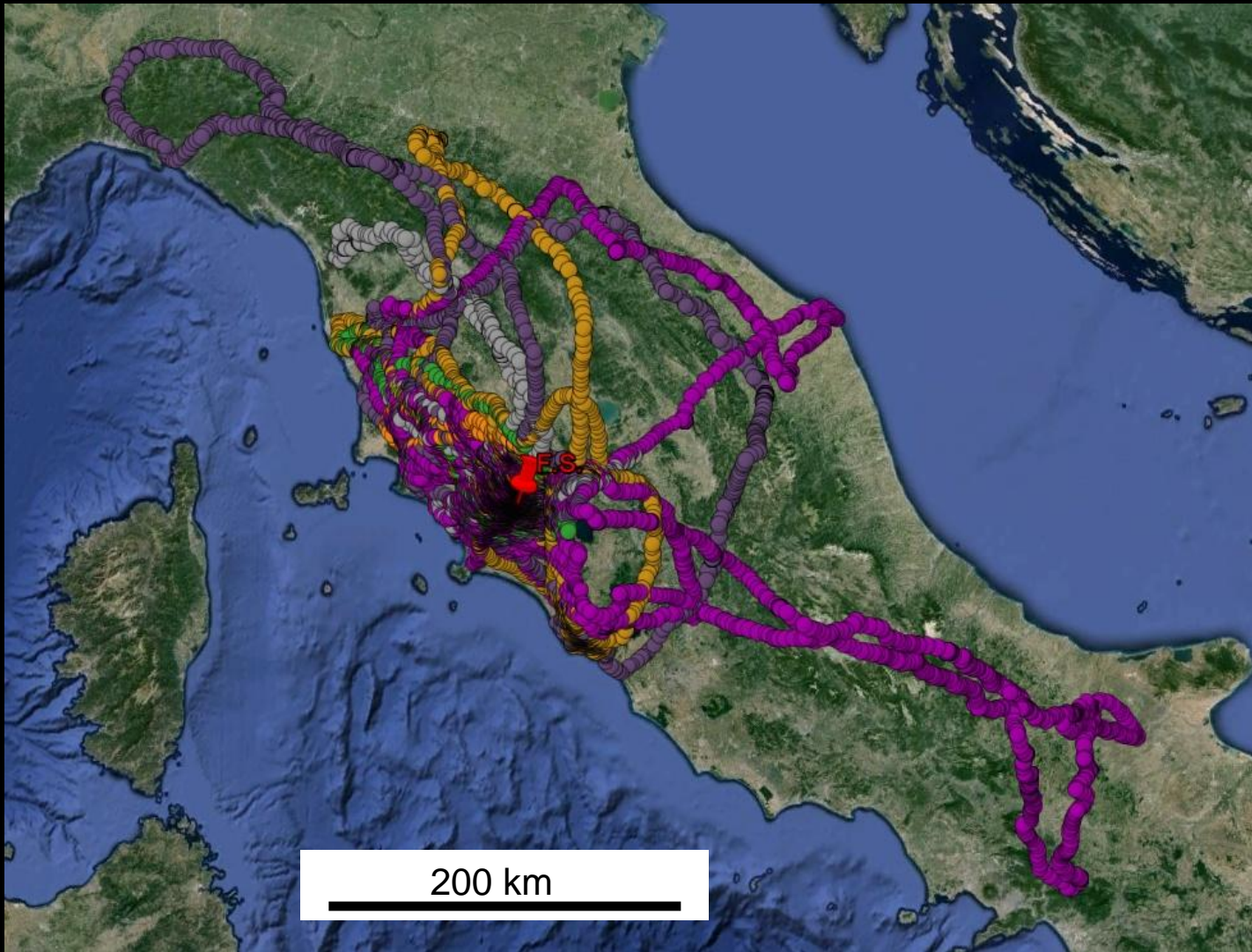
## 1 year old females



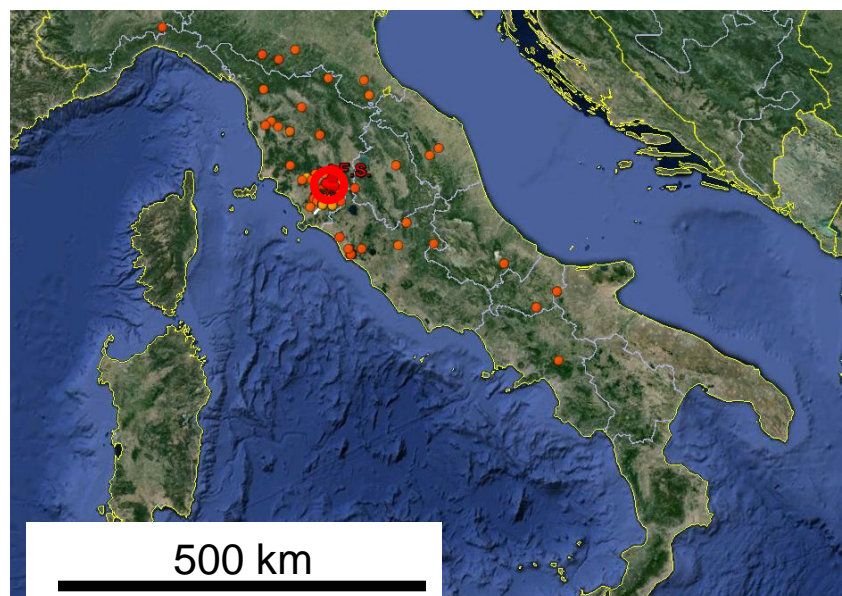
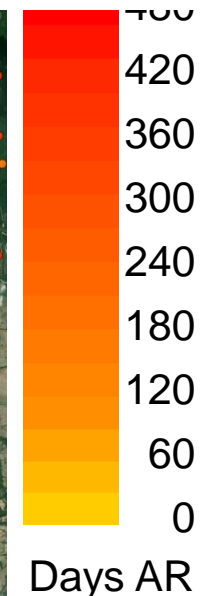
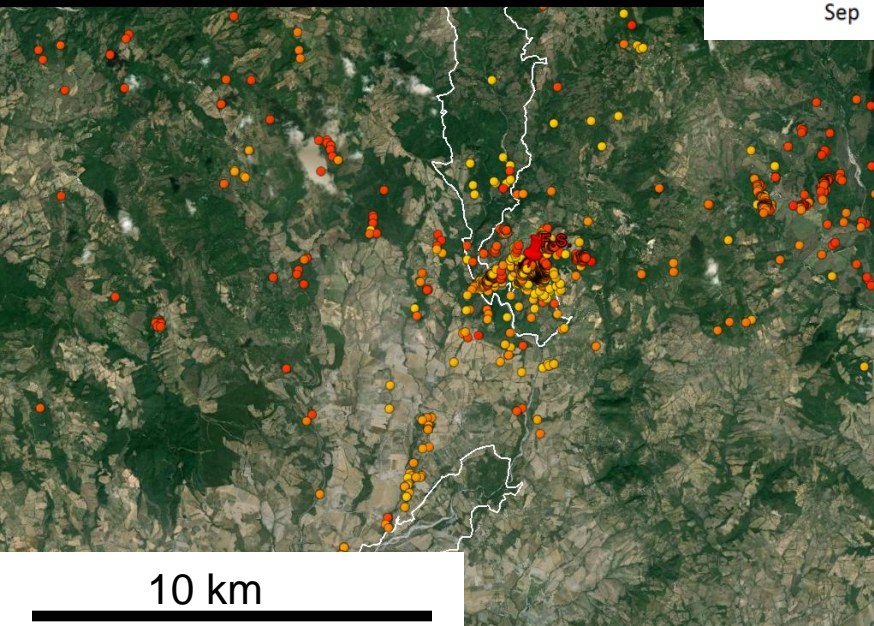
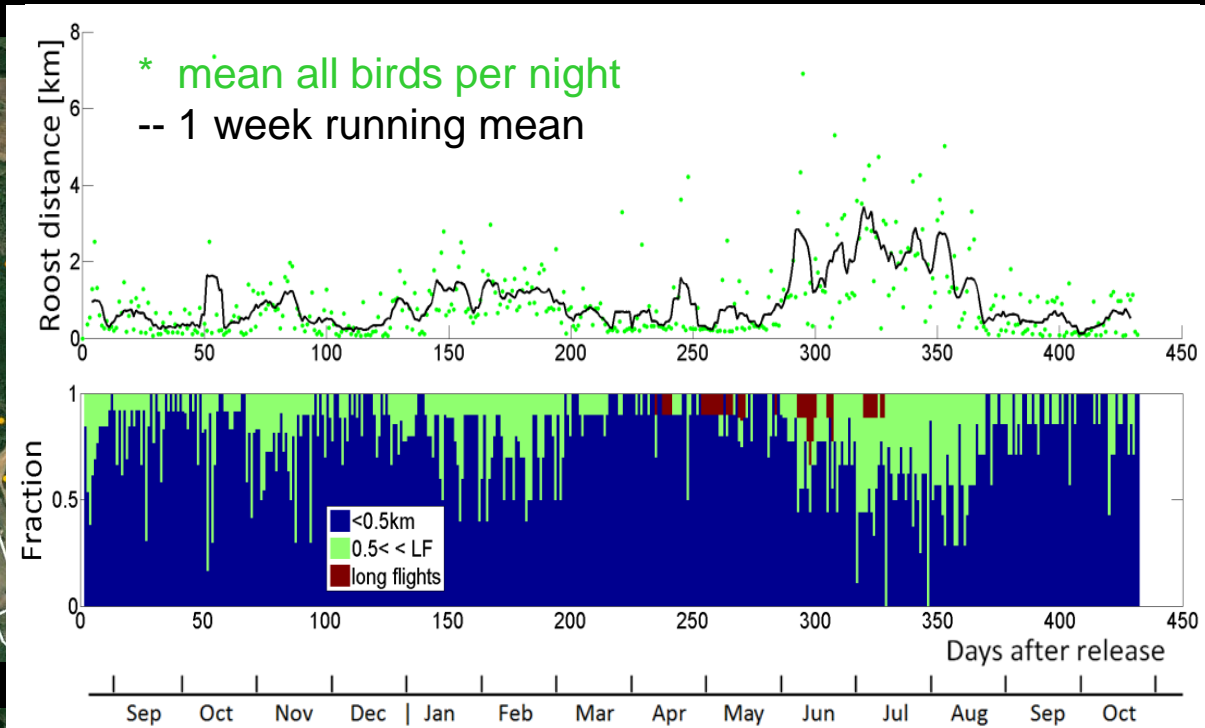
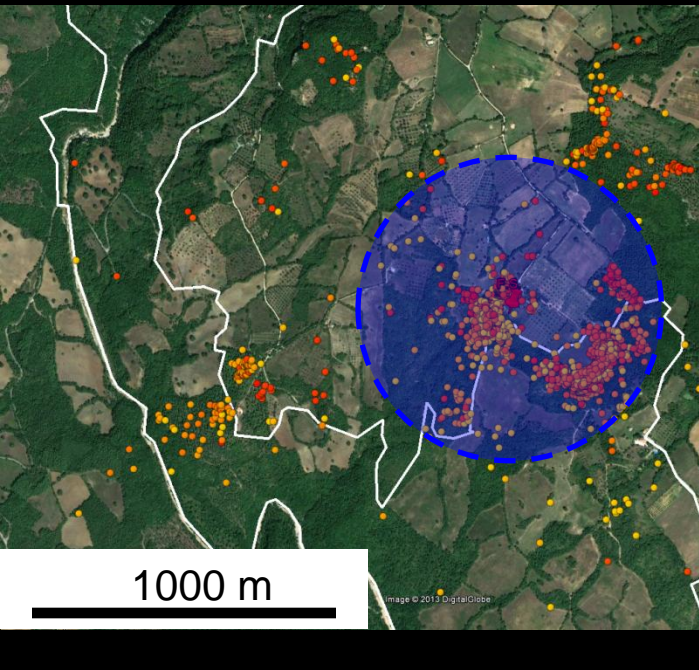
## 3-4 year old females



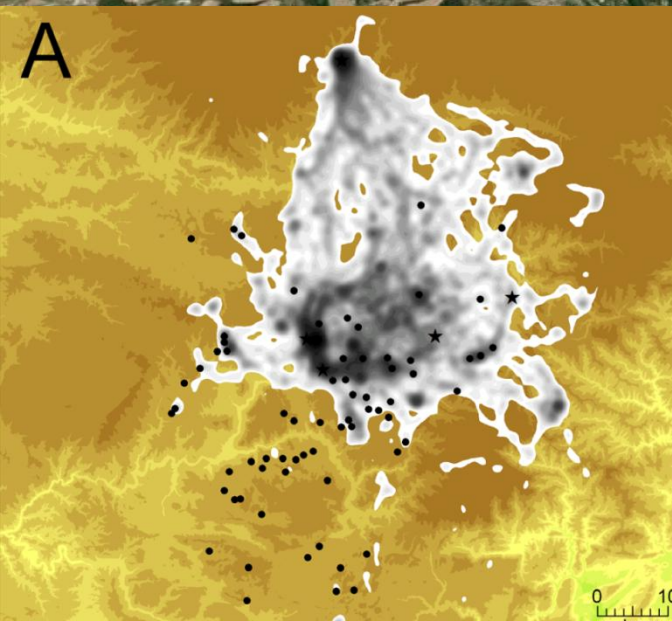
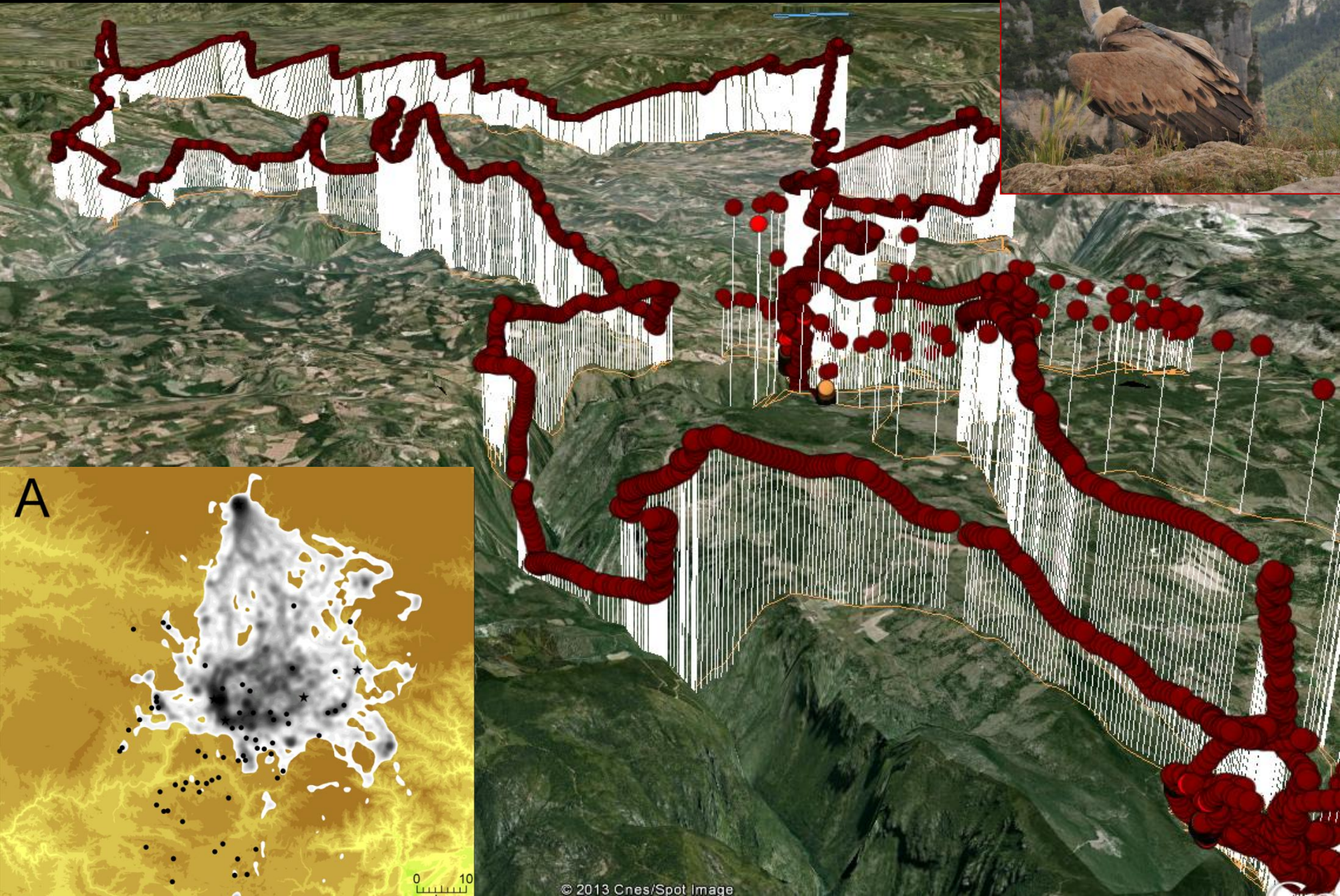
# Uitstapjes



# Slaapplaatsen

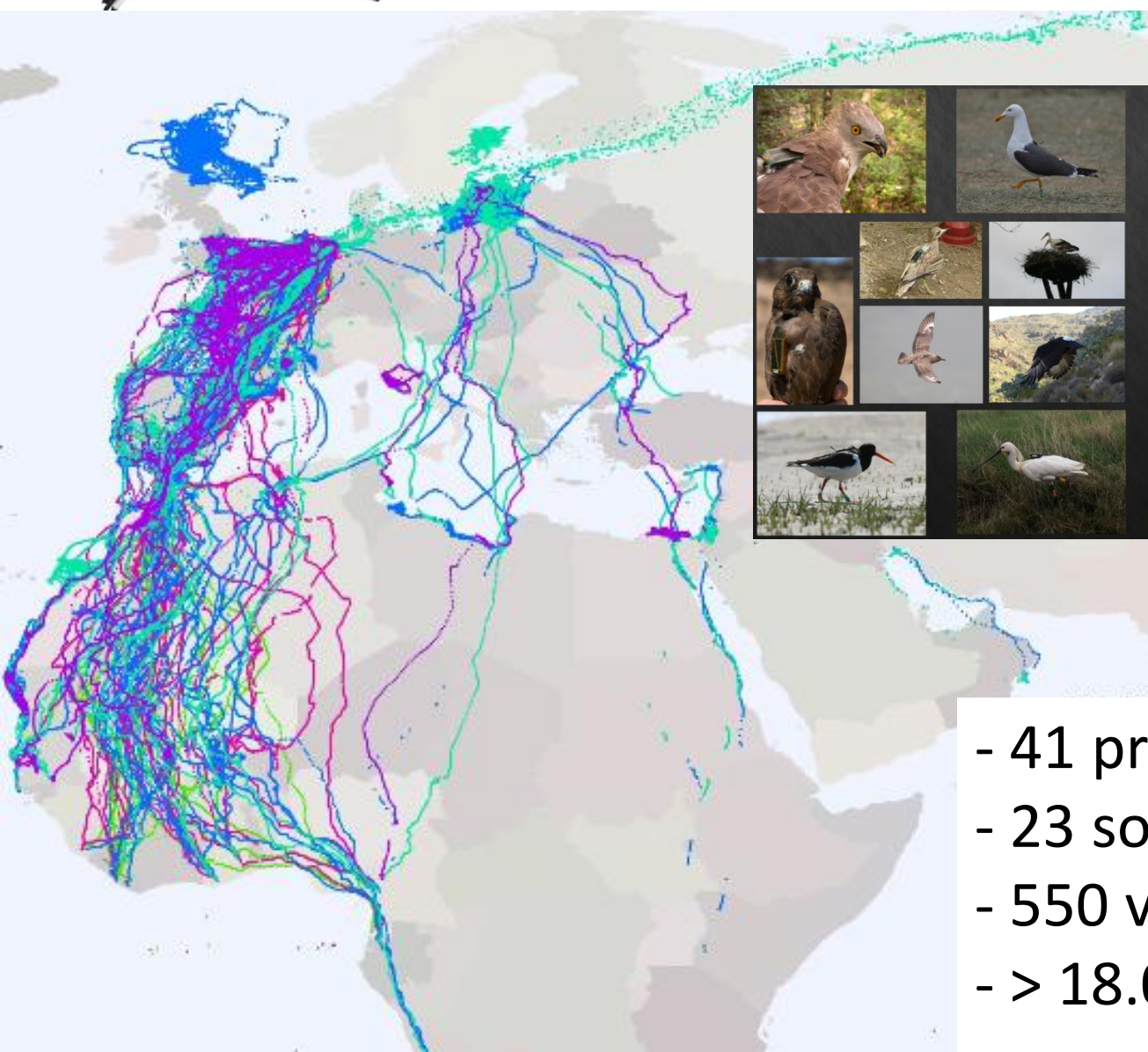


# Vale gier – Grand Causses





# UvA Bird Tracking System



- 41 projecten
- 23 soorten
- 550 vogels
- > 18.000.000 GPS-Loc's



# Wat komen we te weten?

- Fundamenteel

Hoe gaan vogels om met hun omgeving  
(vnl weer en landschap)?

- Toegepast

Vliegvelden

Windmolenparken

Visserij en Landbouw

Natuurbeheer



# Vragen?