eBioScience toepassingen in de ecologie in vogelvlucht

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Computational Biogeography & Physical Geography

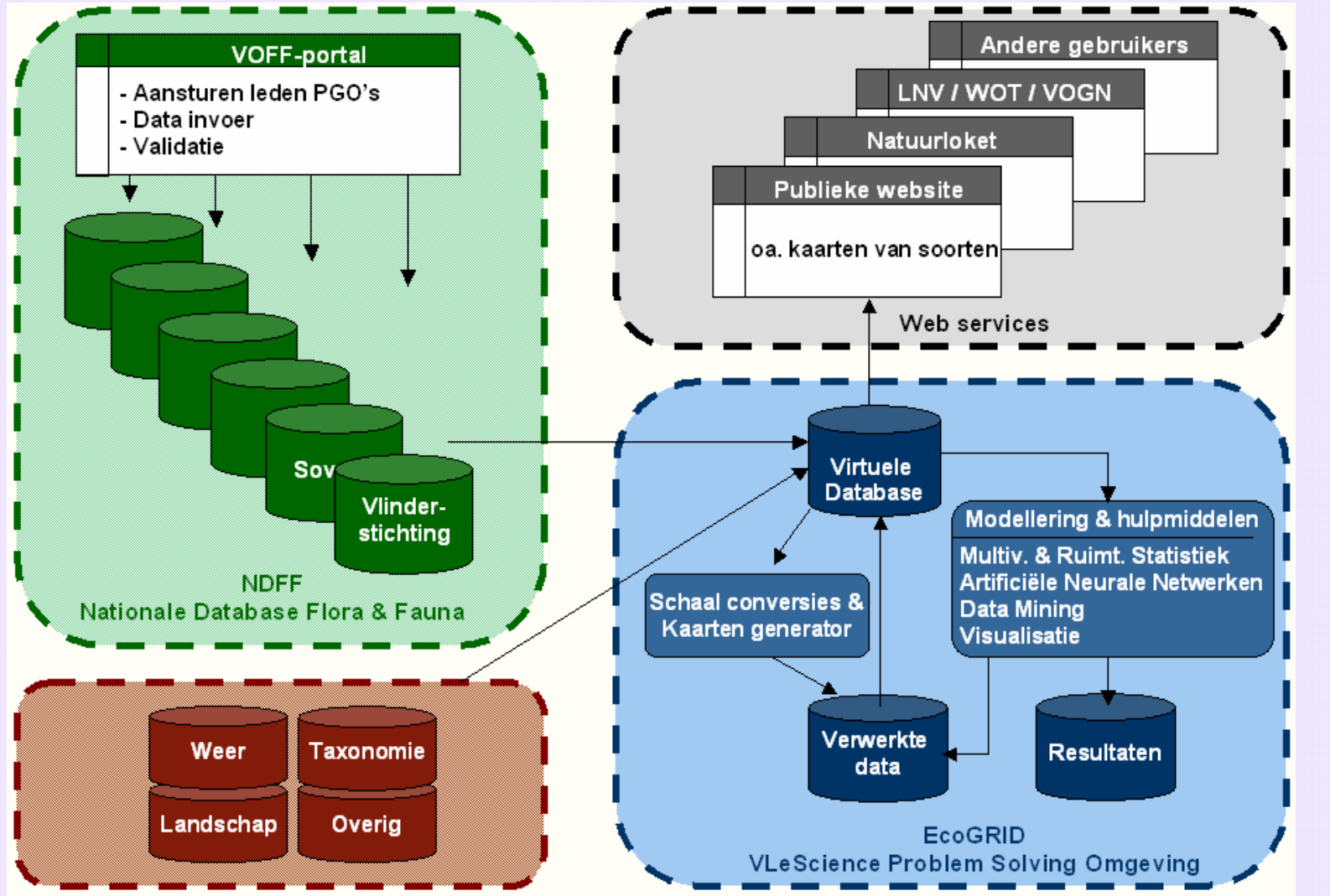
Doel: begrijpen van de ruimtelijk-dynamische interacties tussen levende en abiotische componenten aan het aardoppervlak

'Niet modelleren zonder te meten, maar ook niet meten zonder te modelleren

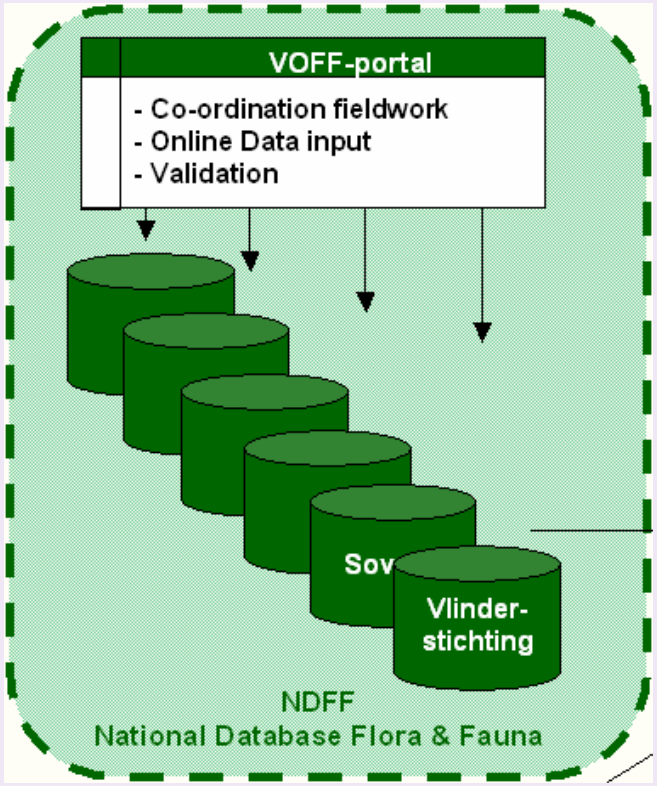
Drie voorbeelden eBioScience

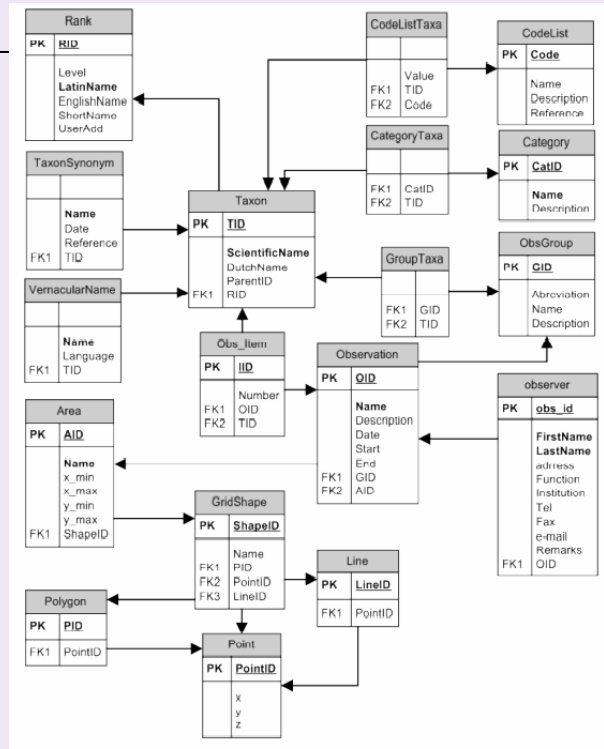
1. Waarnemingen gedreven modellering:
   - EcoGRID
   - Nationale Data Autoriteit Natuur
2. Concept gedreven modellering:
   - Combineren van waarnemingen en modellen in de Iteratieve Onderzoek Cyclus
3. Virtual Lab for Bird Migration

NDFF - EcoGRID



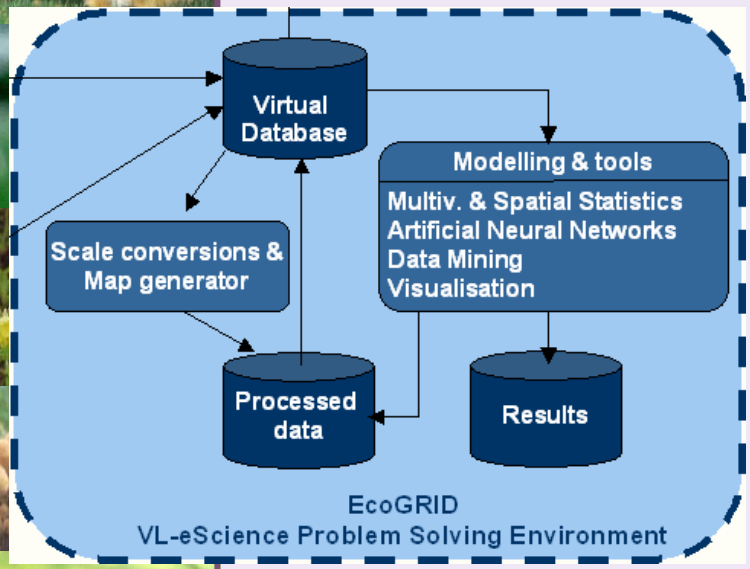
NDFF - EcoGRID

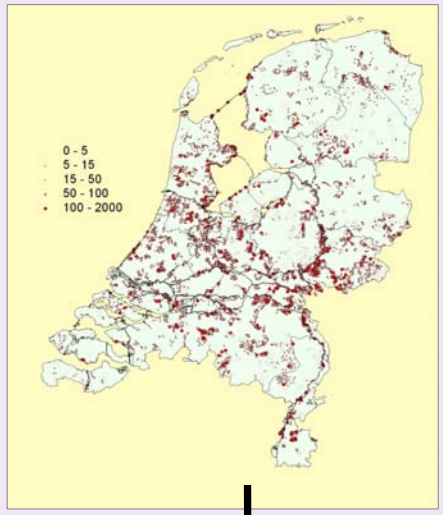


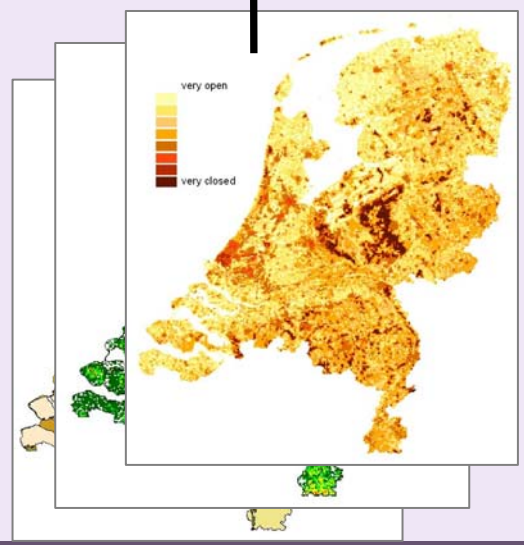


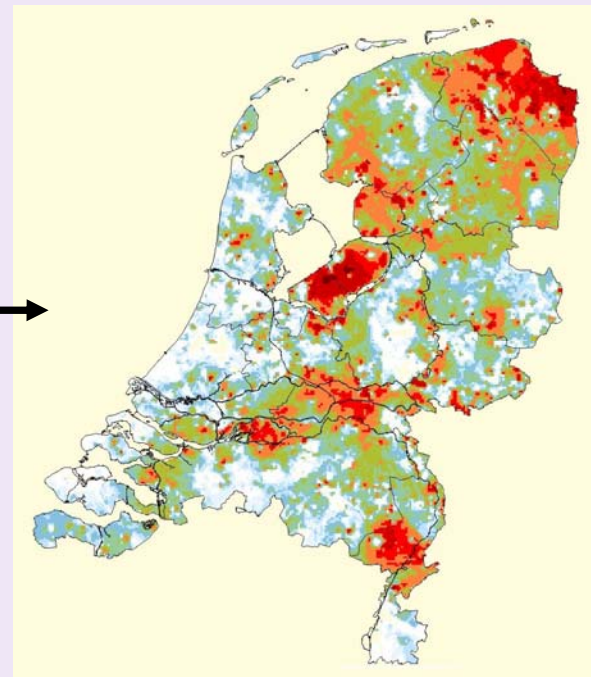
- Uniform datamodel
- PostgreSQL Spatial database
- Organisaties onderhouden hun eigen DB
- 20.000.000 records

NDFF - EcoGRID

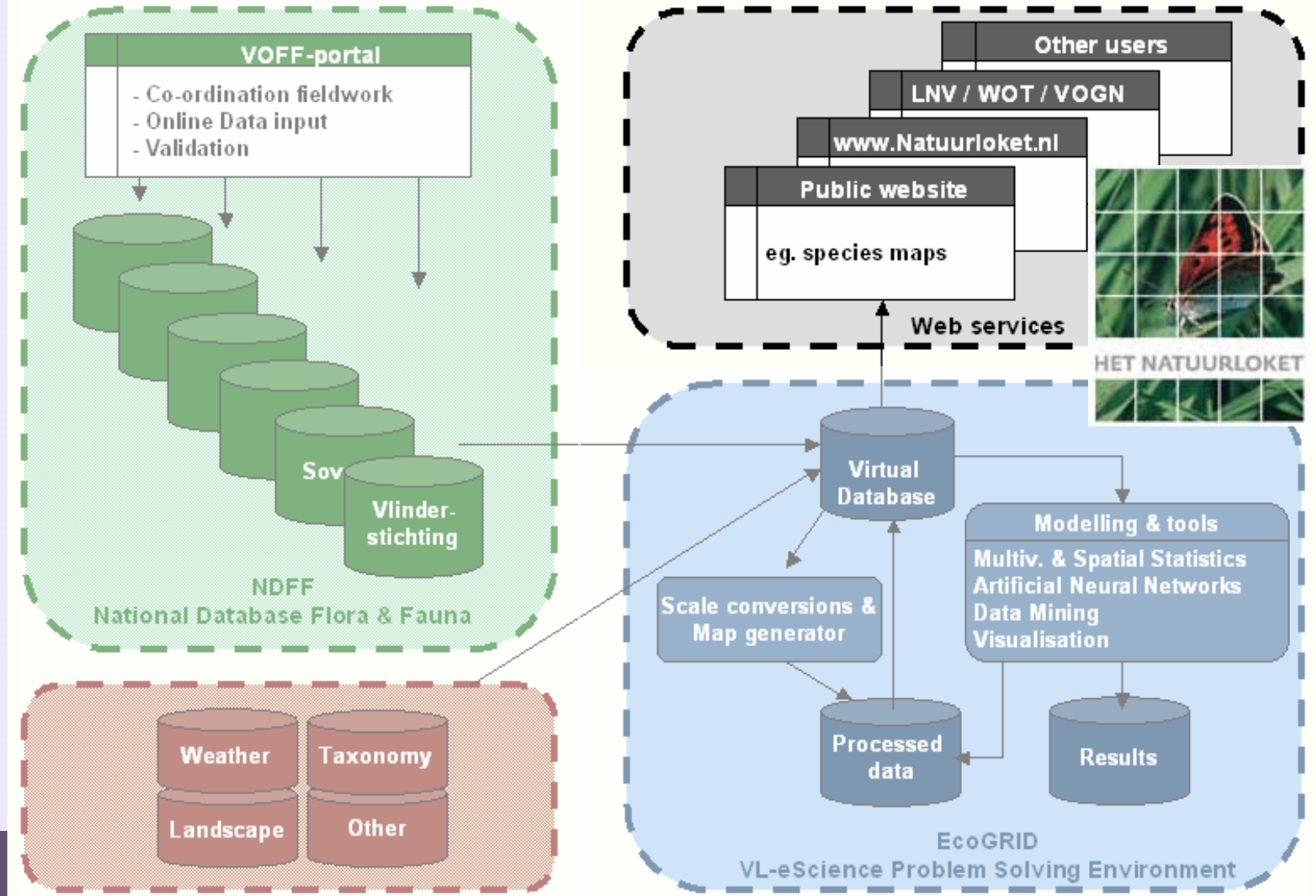








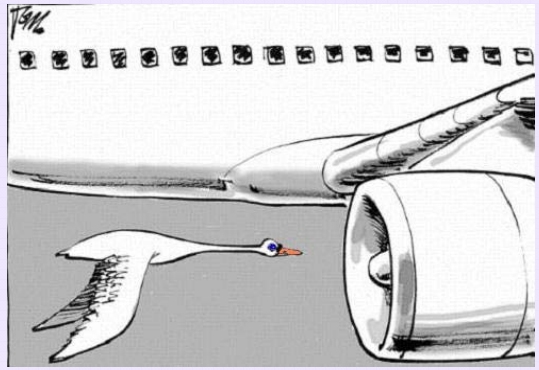
NDFF – EcoGRID & Nationale Data Autoriteit Natuur



Webservice
voor het vergroten van de vliegveiligheid

Bird Avoidance Models

doel: voorspellen van 3D+tijd dichtheid van vogels



Twintig doden bij vliegtuigongeluk

Van onze correspondent
Rob Gollin
BRUSSEL

Een vliegtuigongeluk bij de luchthaven van Luxemburg heeft woensdag het leven gekost aan twintig inzittenden v Fokker 50. De piloot en e sagier overleefden de c zijn zwaar gewond.

Het toestel van de maatschappij Luxair voor de landing in d gen de grond, op zo ter afstand van he ploegde zich do kwam tot stilst drukke verkeer volgens vlam. komstig uit Be offers zijn Du zittenden kv en Frankr overleefde later in h werkers het sm De p geval woo het ne ce geen

Hoewel he minder dan hond

had de piloot toestemming gekregen om te landen. Luchtvaartdeskundigen houden rekening met een menselijke fout. Volgens hen moet de piloot van een Fokker 50 in zo'n situatie volledig op zijn instrumenten kunnen vliegen. Niet uitgesloten wordt dat vogels een van de twee motoren zijn komen.

mankement is
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t eerste in de
nis van Luxair.
deels in handen
en het Duitse
t met zeventien
laatste ernstige in-
uchthaven van Lu-
eert van september
en vliegtuig van Aero-
de landing van de baan
n in een bosperceel be-

(AP)

maandag 2 juni 2003

Vliegtuigje stort neer in Milaan

MILAAN — Een ongeluk met een klein vliegtuigje heeft gisteren in Milaan aan de twee inzittenden het leven gekost. Het toestel stortte kort nadat het was opgestegen van de luchthaven Linate neer op een leeg gebouw in een buitenwijk van Milaan. Kort voor het toestel, een Lear, neerstortte, meldde een van de piloten dat het in botsing was gekomen met een zwerm vogels.

Het toestel stortte neer op een paar honderd meter afstand van de route waarlangs de laatste etappe van de Ronde van Italië liep.

Webservice
Bird Avoidance Models

Radar
RNLAF

Visual
SOVON

Weather

Landscape

Migrating birds

Flight altitudes

Staging birds

Predictions

THE NETHERLANDS
BIRD AVOIDANCE MODEL

Welcome to The Netherlands Bird Avoidance Model (NL-BAM).

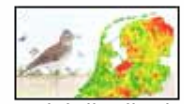
The NL-BAM is primarily designed for use by the experts of the Royal Netherlands Air Force. The main objective of the NL-BAM is to predict the density of birds in the air above the Netherlands by modelling the relationship between migration and spatial distribution of birds, and environmental conditions such as weather and landscape properties. These predictions can be used to reduce the risk of collisions between birds and aircrafts, through application for flight planning, to issue advance warnings to pilots and to inform airfield bird control units of expected bird conditions.

The NL-BAM consists of two modules:

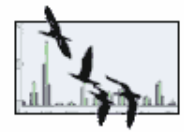
1. Spatial distribution, a geographic information system (GIS) mapping the densities of birds at different times of year, day and altitudes;
2. Bird migration, predictions of bird migration up to 3 days in advance based on weather forecasts.

Terms of use:

Unless authorized by the project partners, this site is only for personal use. NL-BAM was developed to the best of our ability and with the best available data. Although its use can reduce the chance of a bird-aircraft collision it will not eliminate the risk. The NL-BAM developers cannot be held liable for any losses incurred as a result of bird strikes.

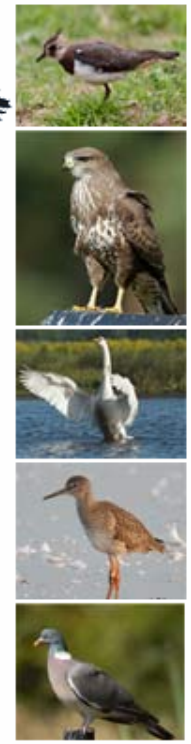


Spatial distribution



Migration

Spatial distribution (authorized access only)



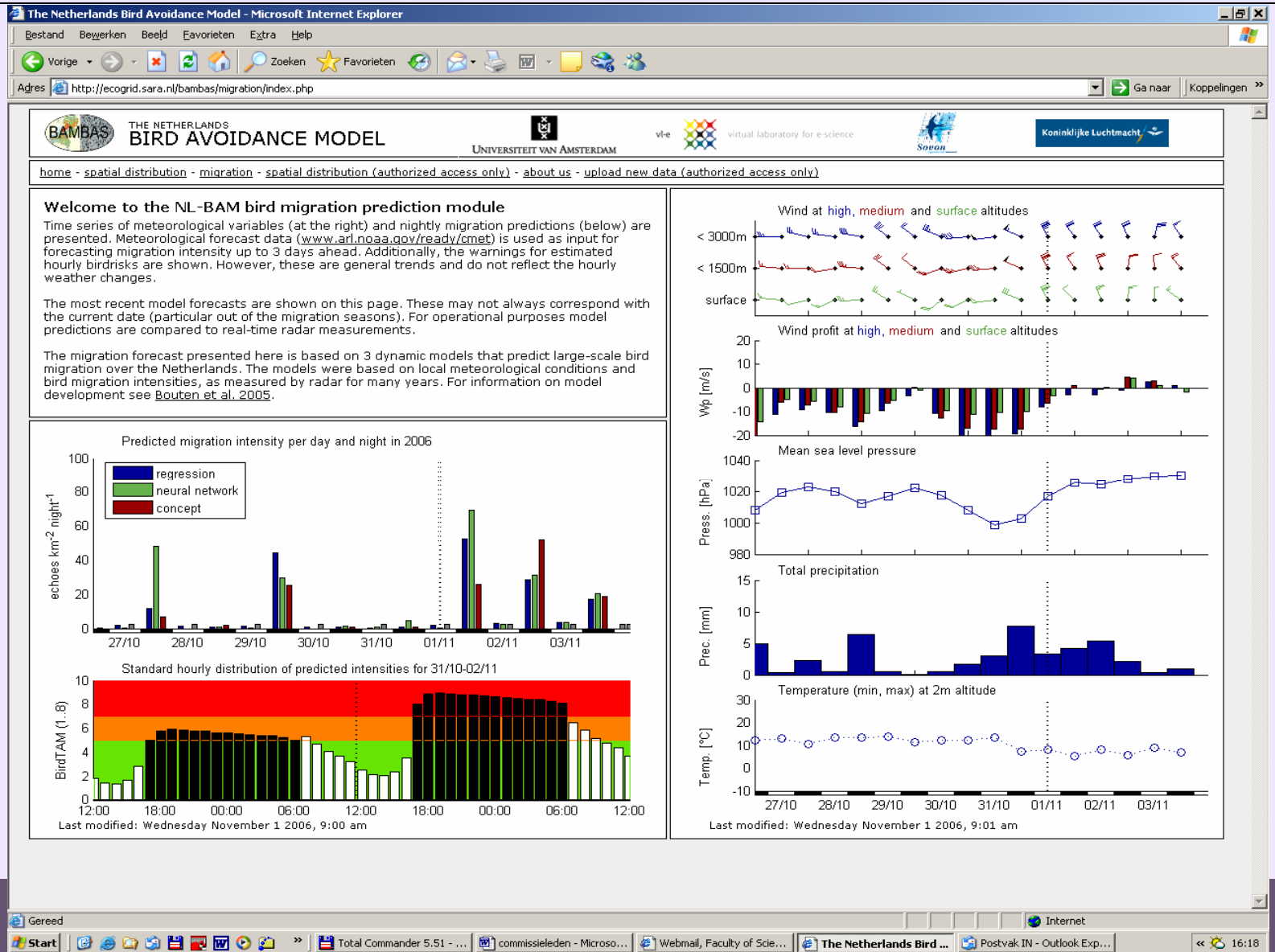
UNIVERSITEIT VAN AMSTERDAM

vl-e virtual laboratory for e-science

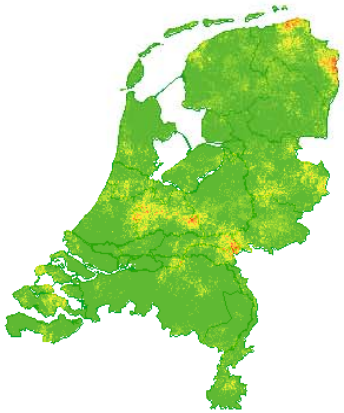
Sovon

Koninklijke Luchtmacht

Bird Avoidance Model: Vogeltrek



THE NETHERLANDS
BIRD AVOIDANCE MODEL



classification:

- > 1500 birds
- 1300 - 1500
- 800 - 1300
- 600 - 800
- 400 - 600
- 200 - 400
- 50 - 200
- 0 - 50

Summary table:

The table below provides a list of the top 10 most abundant species (number per km³) for each selected combination of time of year, time of day and altitude for three regions in the Netherlands. Clicking on a particular species will automatically load the relevant species specific maps.

Low Netherlands	High Netherlands	Riverine
Barn Swallow (16232)	Common Crane (3101)	Bar-tailed Godwit (14222)
Northern Lapwing (16228)	Black-headed Gull (3079)	Dunlin (14165)
Black-headed Gull (16211)	Fieldfare (3065)	Redwing (14161)
Eurasian Hobby (16202)	Common Tern (3063)	Barn Swallow (14154)
Common Kestrel (16199)	Black-tailed Godwit (3054)	Red Knot (14152)
Mew Gull (16180)	Meadow Pipit (3054)	Rook (14151)
Song Thrush (16171)	Dunlin (3049)	European Golden Plover (14143)
Common Snipe (16164)	Redwing (3046)	Eurasian Curlew (14142)
Western Jackdaw (16161)	Barn Swallow (3041)	Northern Lapwing (14142)
European Golden Plover (16154)	Stock Dove (3038)	Song Thrush (14136)

Welcome to the NL-BAM spatial bird distribution module.

The maps show the distribution of 65 bird species relevant for flight safety as well as the combined density of all species in bi-weekly intervals, 4 time periods per day and at five altitude layers.

This model is based on historic data and represents the density distribution expected in average circumstances. Therefore, it is possible that the situation in the field deviates from predictions presented here. For operational purposes these maps are combined with output from the bird migration module, real-time radar measurements and observations from bird control units on airbases.For information on the development of the spatial models see Shamoun-Baranes et al. 2005

User instructions: Select the species of interest or the distribution map format (kg/km³ or number of birds/km³), a bi-weekly period and a time of day.

The five maps below indicate different altitude layers. Click on the altitude layer of interest.Use the navigational map to the left to zoom/browse the selected altitude layer in detail. The current area of interest can be also be viewed at other times or altitudes by selecting alternative combinations of date, time and altitude.

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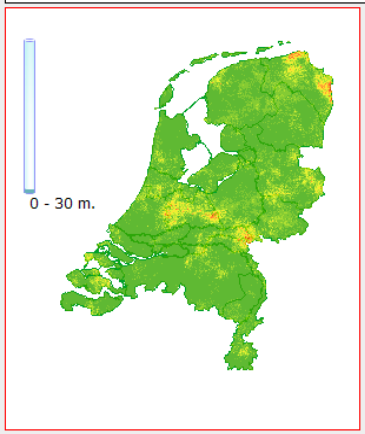
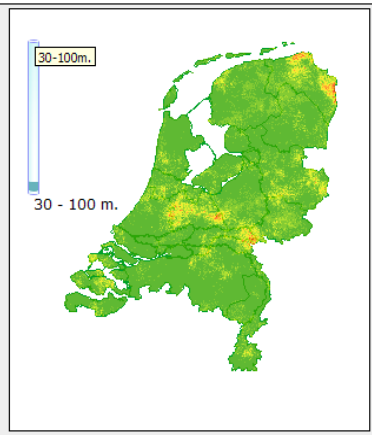
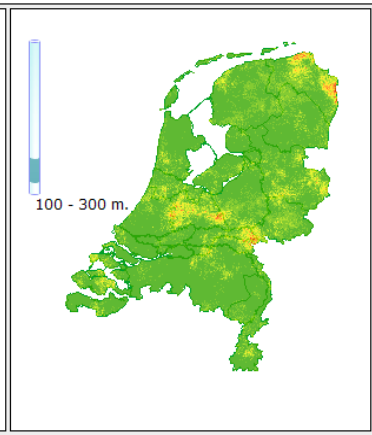
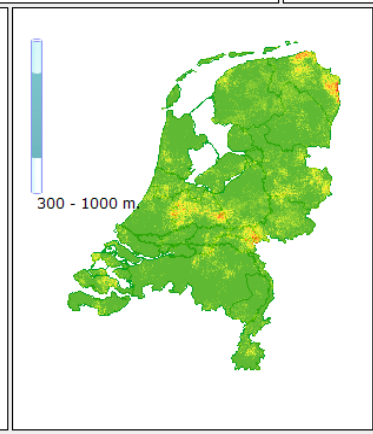
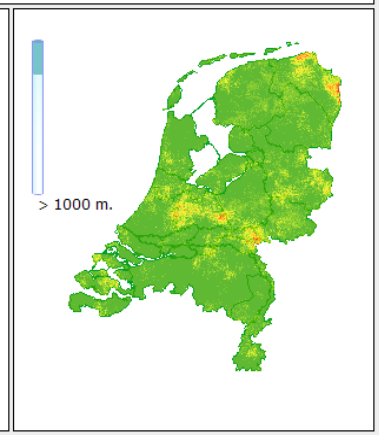
make your selections: Number of birds / km³ | 16th of Nov - 30th of Nov | Day | English names





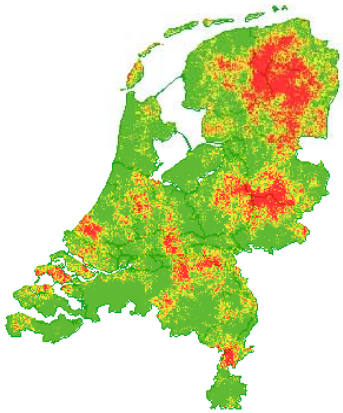






THE NETHERLANDS
BIRD AVOIDANCE MODEL

UNIVERSITEIT VAN AMSTERDAM



classification:

> 1.7 birds
1.5 - 1.7
1.3 - 1.5
1.1 - 1.3
0.64 - 0.85
0.42 - 0.64
0.21 - 0.42
0 - 0.21

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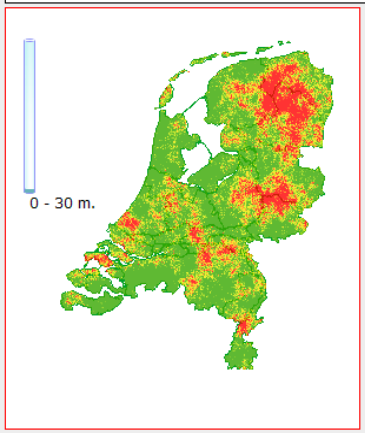
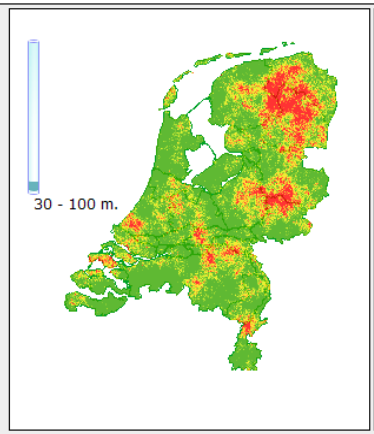
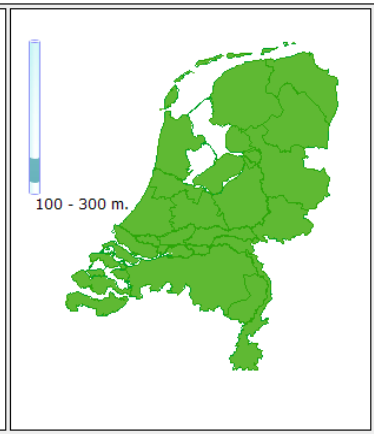
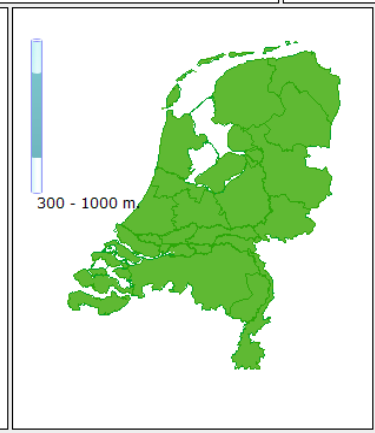
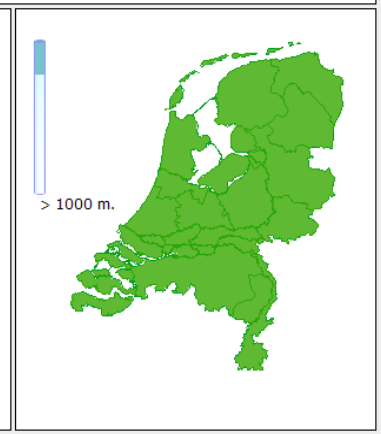
make your selections: Western Jackdaw | 16th of Nov - 30th of Nov | Dusk | English names



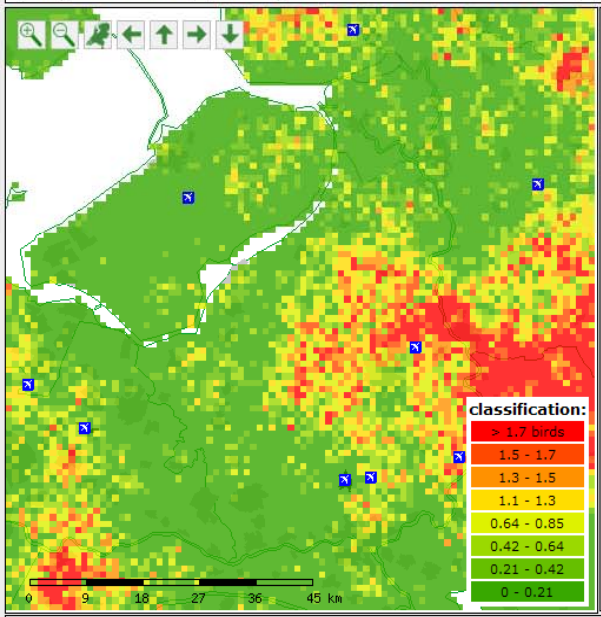








THE NETHERLANDS BIRD AVOIDANCE MODEL



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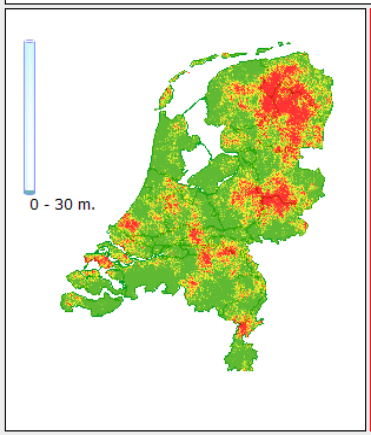
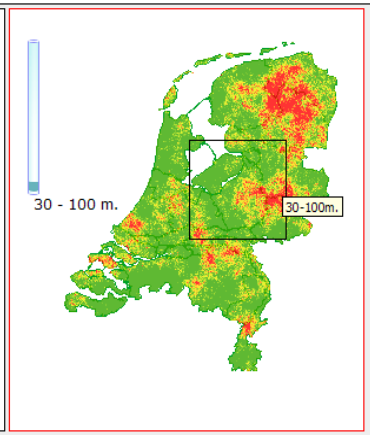
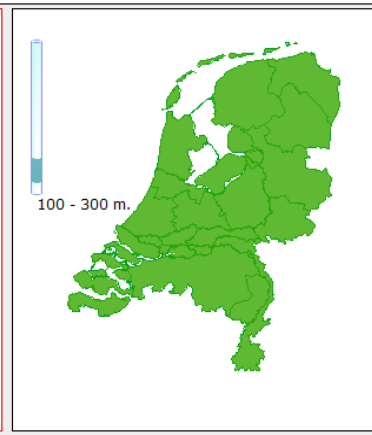
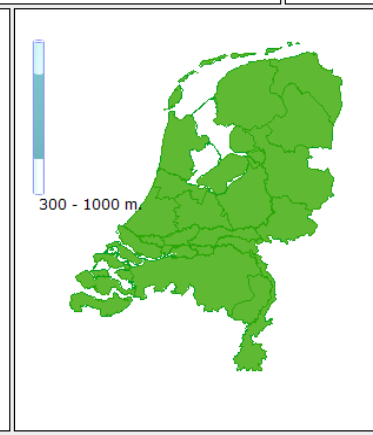
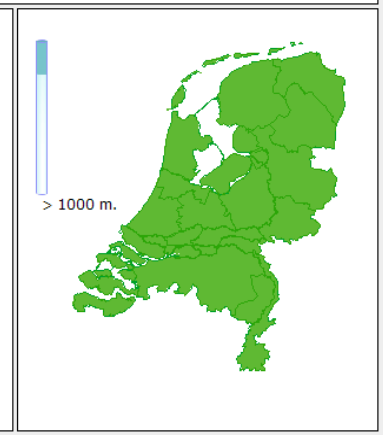
make your selections: Western Jackdaw | 16th of Nov - 30th of Nov | Dusk | English names











Kaarten:

- 2*12 perioden per jaar

- 4 perioden per dag

- 5 hoogten

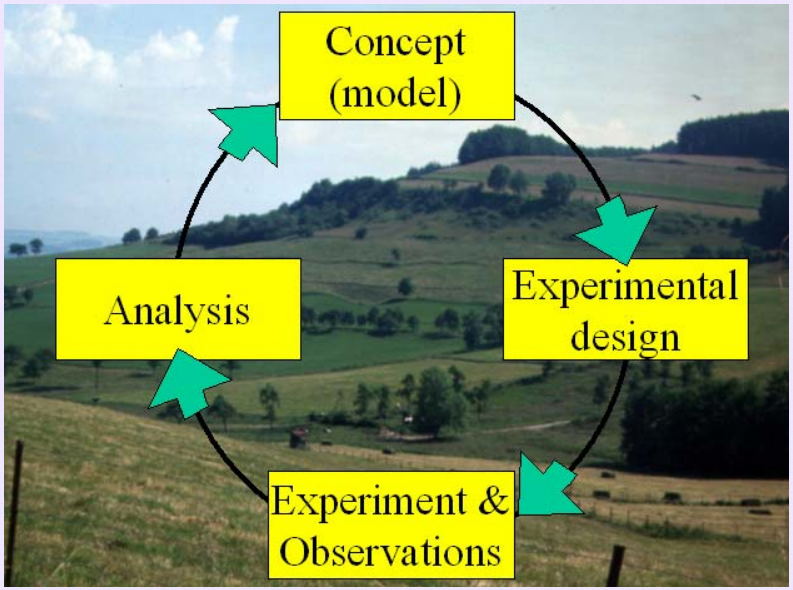
- 65 vogelsoorten

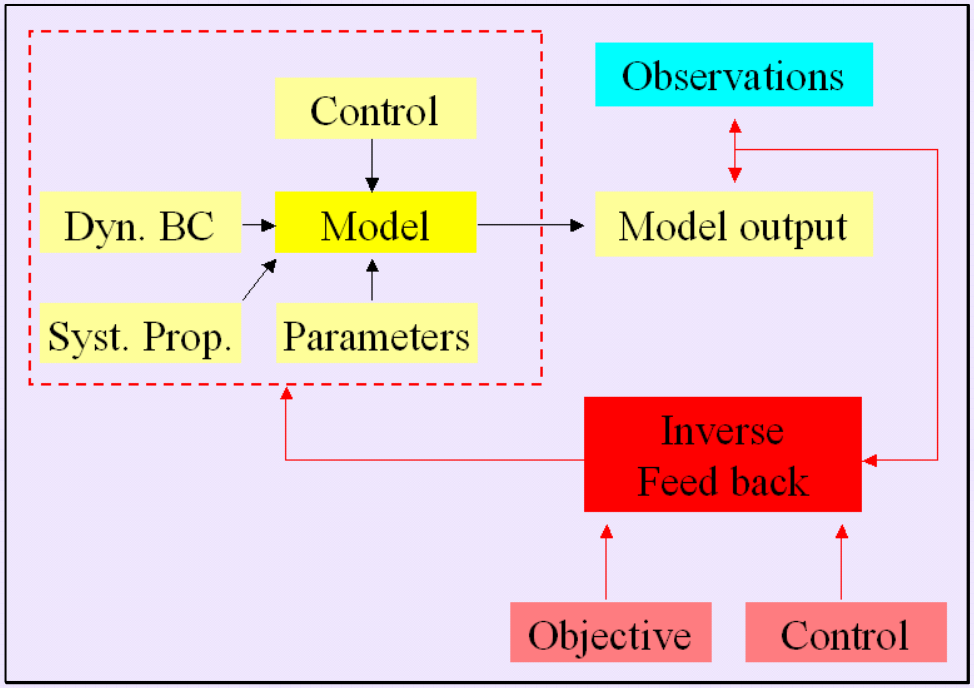
= 65 * 2 *12 * 4 * 5

= 31.200 kaarten

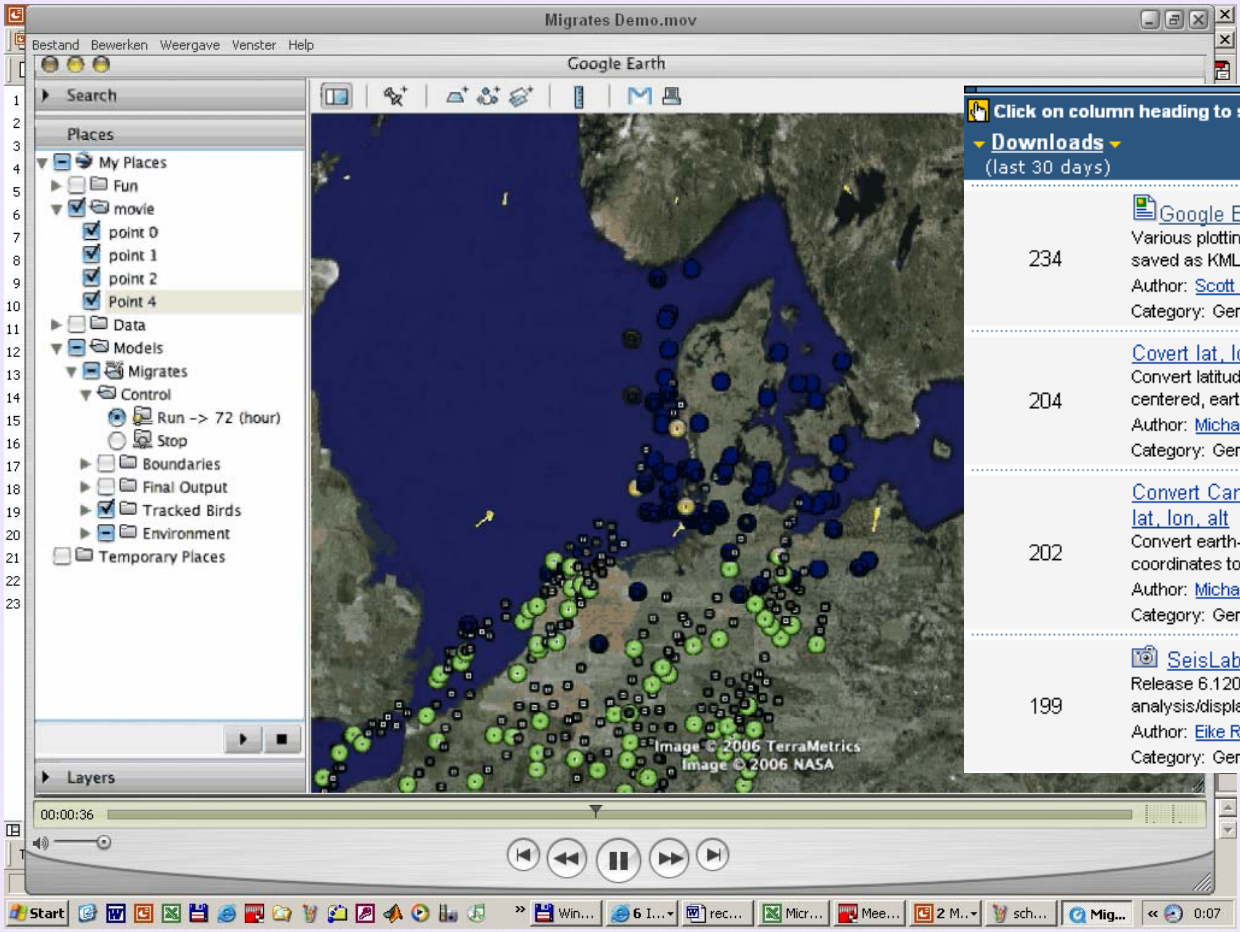
- 1 kaart is 33.881 km^2

PSE Iteratieve Onderzoek Cyclus
Combineren van Waarnemingen en Modellen

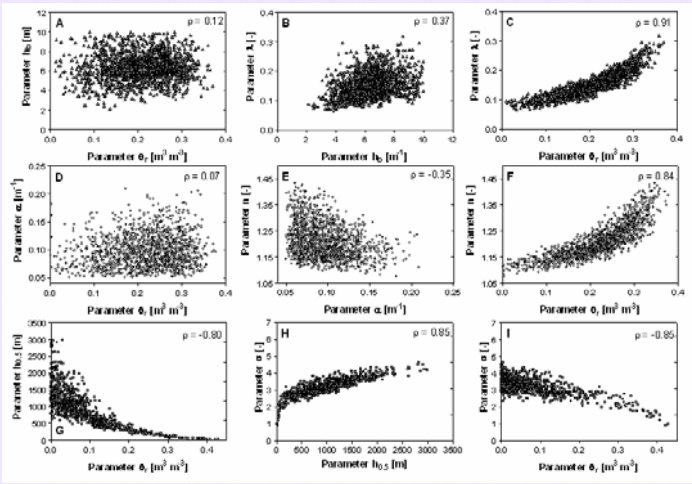


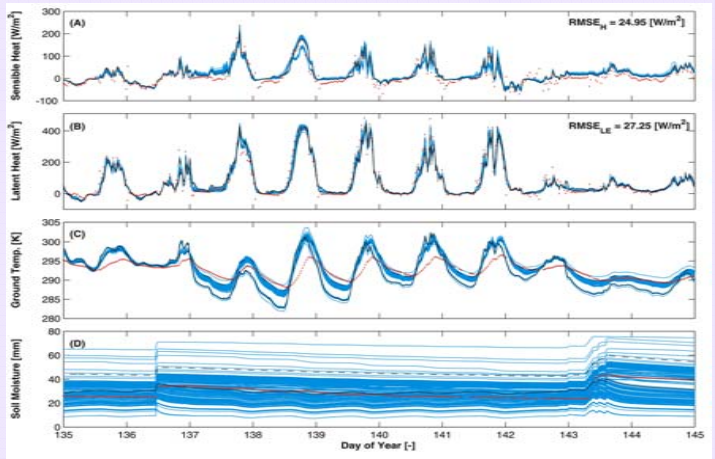


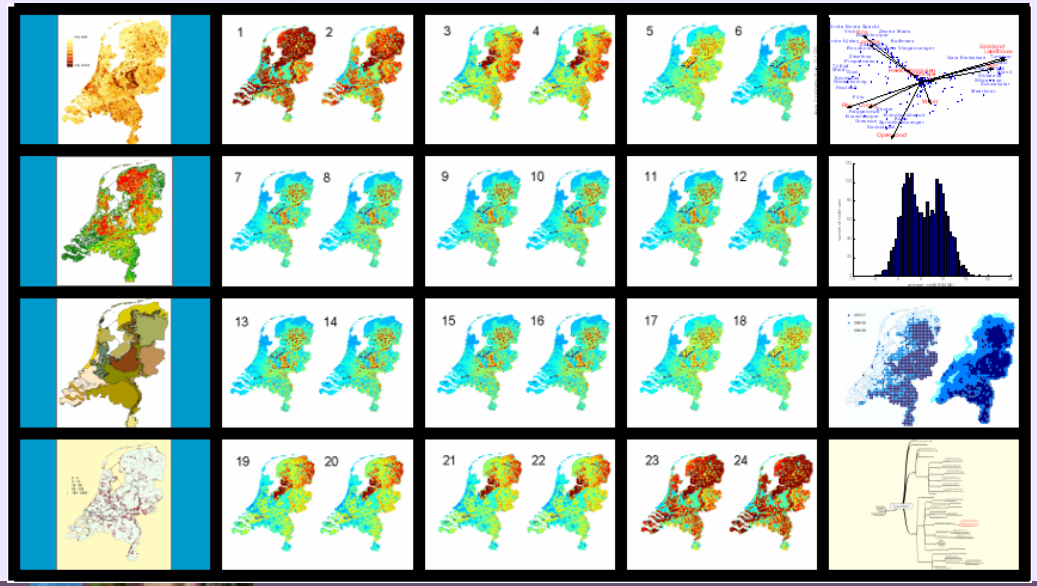
Visualisatie Matlab2GoogleEarth

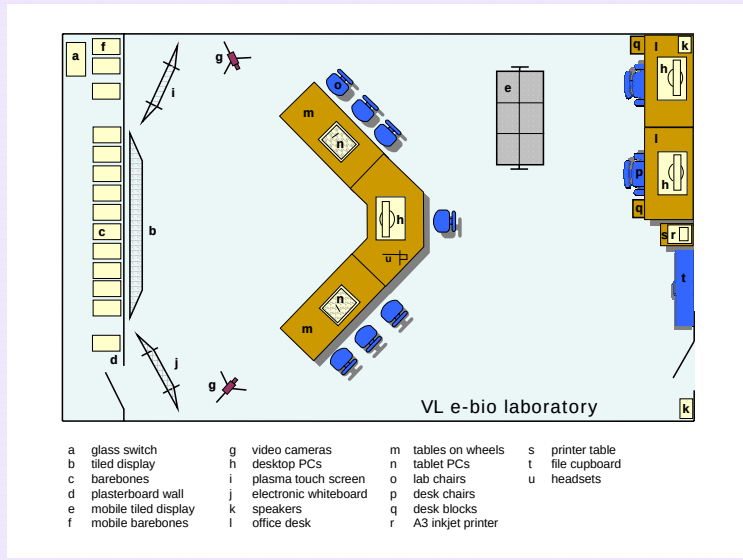


PSE Iteratieve Onderzoek Cyclus
Combineren van Waarnemingen en Modellen







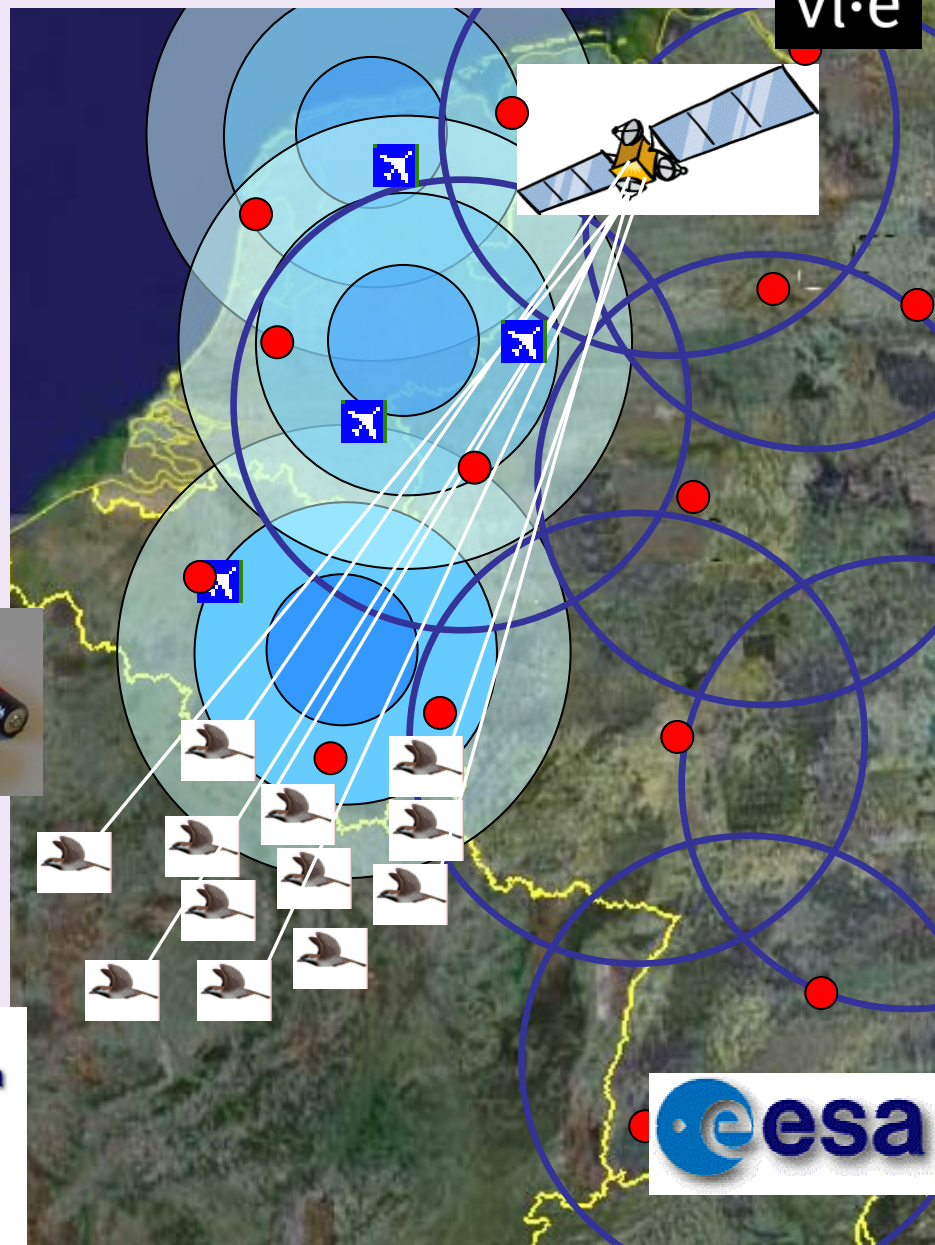


a glass switch
b tiled display
c barebones
d plasterboard wall
e mobile tiled display
f mobile barebones
g video cameras
h desktop PCs
i plasma touch screen
j electronic whiteboard
k speakers
l office desk
m tables on wheels
n tablet PCs
o lab chairs
p desk chairs
q desk blocks
r A3 inkjet printer
s printer table
t file cupboard
u headsets

Institute for Biodiversity and Ecosystem Dynamics
Universiteit van Amsterdam

System of Systems: Avian Alert (2006-2013)
Monitoring and Modelling Bird Behaviour and Migration

- Militaire bewaking radars
  (straal 150 km, vogeltrek)
- Weer radars voor vogeltrek
  (hoogte verdeling)
- Mobiele radars op vliegvelden
  (Lokaal vogelgedrag 5-20 km)
- GPS op individuele vogels
  (soort specifieke informatie)
- Virtual Laboratory voor
  Ontwikkeling Modellen



vl·e

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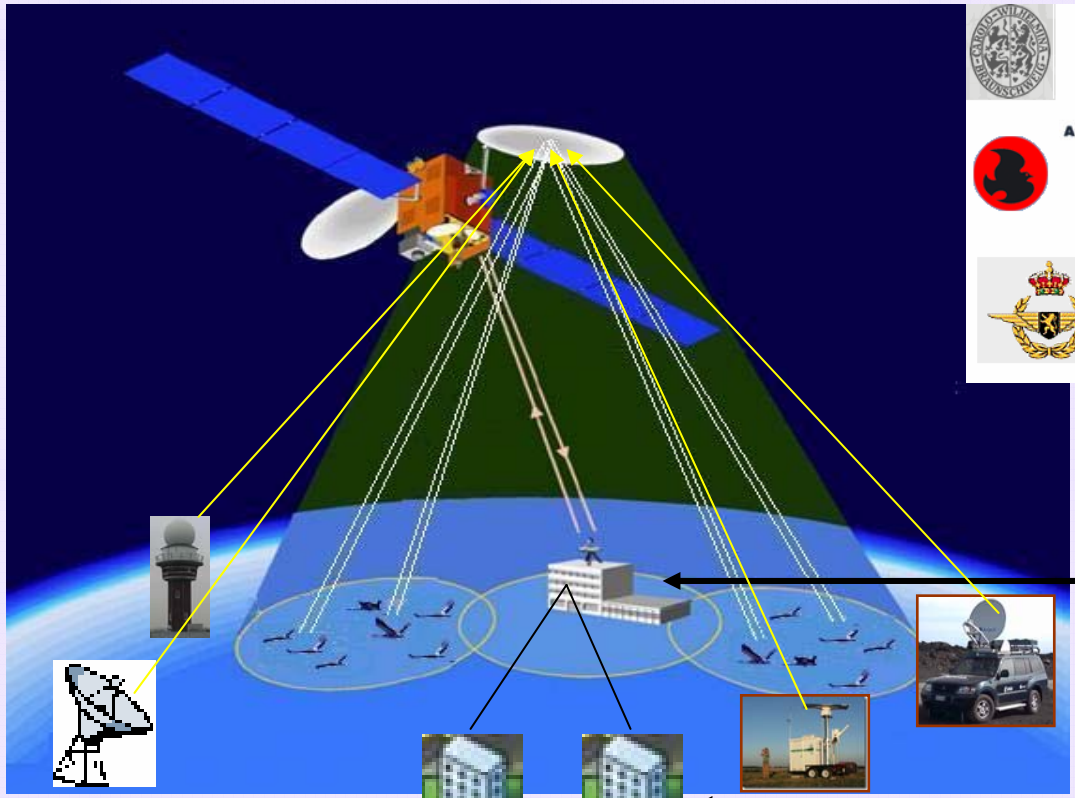
Koninklijke Luchtmacht
ARMÉE DE L'AIR
sara
esa
IBED
Institut für Vogelforschung
Bundeswehr
SOVON

System of Systems: Avian Allert (2006-2013)
Monitoring and Modelling Bird Behaviour and Migration



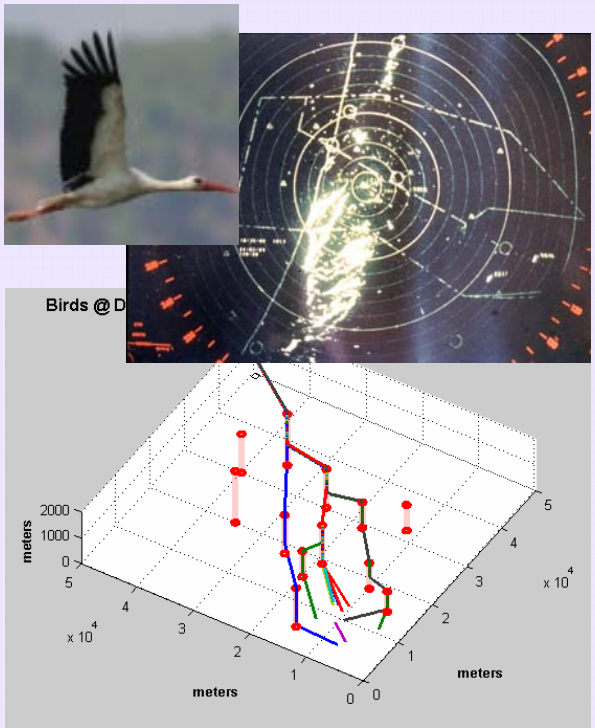
Data Warehouse

Model Ontwikkelaars & Service Providers

Gebruikers

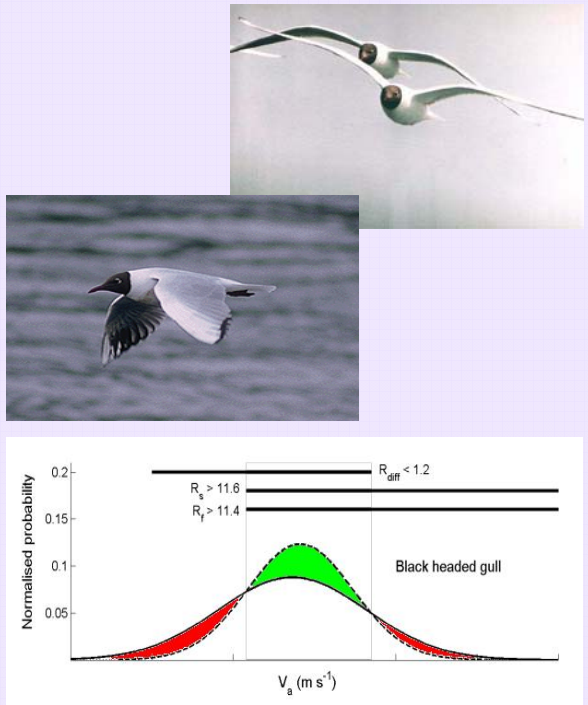
Toegepast en fundamenteel onderzoek

Sociaal gedrag en gebruik thermiek



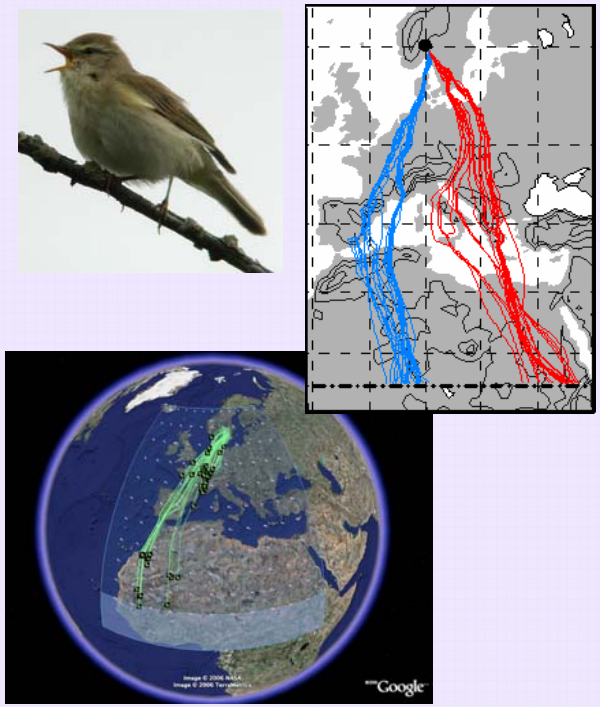
(Biology Letters, in prep)

Vliegstrategie & Wind compensatie



Bul. Am Soc. Meteo (2006)
J. Exp.B. (2006), J. Exp.B. (in press)

Optimalisering bij vogeltrek



J. Avian. B. (in press)

Enkele karakteristieken

- Doel: begrijpen van de ruimtelijk-dynamische interacties tussen levende en abiotische componenten in het landschap vanuit het perspectief van een modelleur

- Combineren van waarnemingen en modellen

- Toegepast onderzoek & methodologie ontwikkeling & fundamenteel onderzoek

- Onze eScience benadering geeft ons een unieke positie in de wereld van de ecologie

Bedankt voor uw belangstelling