

Atlas Werkconferentie donderdag 16 mei 2019

Avans Ambities, Acties met de Atlas



**ENVIRONMENTAL
GEOGRAPHY AT AVANS**

Putting the Environment on the Map



Maurits Dorlandt & Lonne van Doorne
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Programma

avans

Introductie

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Ambitie van Avans

*

Atlas leefomgeving voor en door studenten in de minor

*

Case study “Stikstof depositie in de Loonse en Drunense Duinen”

*

Case study “Ploggen voor data in de Zwerfafval-kaart”

*

Do-it-yourself: Hoe kunnen de bovenstaande initiatieven kunnen worden versterkt
cq. Impact worden vergroot

*

Heeft u zelf een idee of initiatief i.s.m. de atlas die gelanceerd wil worden?



Who are we?

avans

Maurits Dorlandt

Lecturer Environmental Sciences
Researcher Biobased Economy
GIS hobbyist



Lonne van Doorne
Student Environmental Sciences
Specialism:
Hobbies:

Avans Ambitie 2016- 2019

Ontwikkeling op de volgende gebieden:

- Professionaliseren Atlas Leefomgeving
- Partijen samenbrengen
- Onderwijs
- Onderzoek
 - Produceren van relevante Atlas data

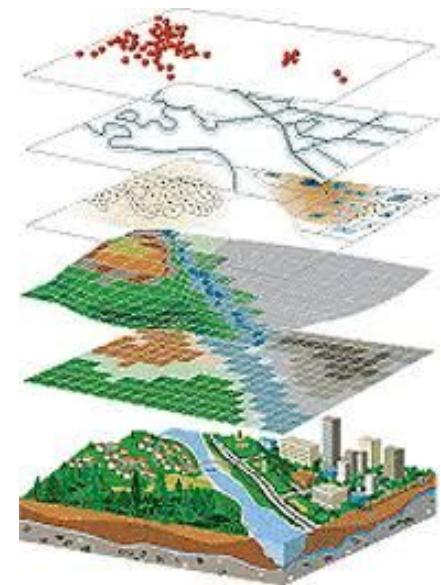


Onze rol:

- Onderwijs
- Onderzoek
- MvO
- Awareness Programma's
- Kennishub

Nu vraag ik me af wie jullie zijn?

1. Pak uw telefoon en ga naar:
2. <https://www.menti.com/>
3. Vul de code in: 146605
3. Schuif de slider naar links of naar rechts



Minor Environmental Geography

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Try types of practical experiences:

- Field work
- GIS work
- Laboratory work

Project Environmental Change

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Monitor the impact of nitrogen deposition on the ecology in the Dutch inland Dunes

Example blog: <https://mysteryofsand.wordpress.com/>



Archived Photos of the dunes: 1950 (left) and 2007 (right)

Exploration and investigation

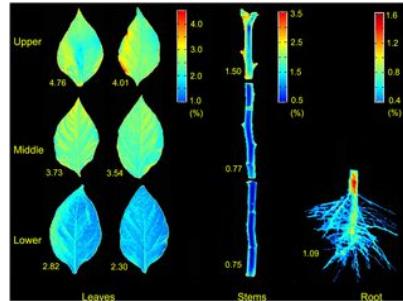
Working with drones



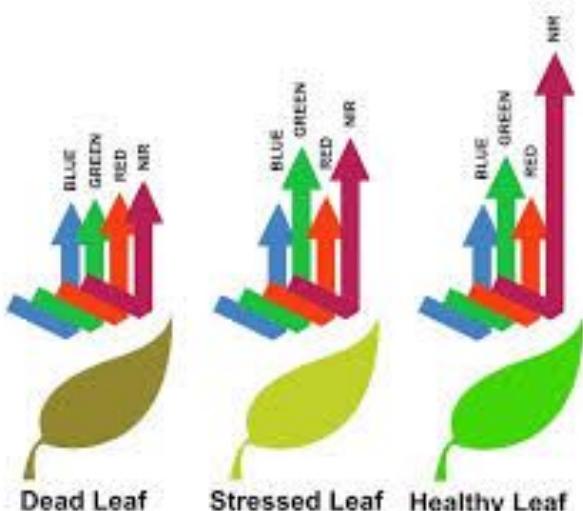
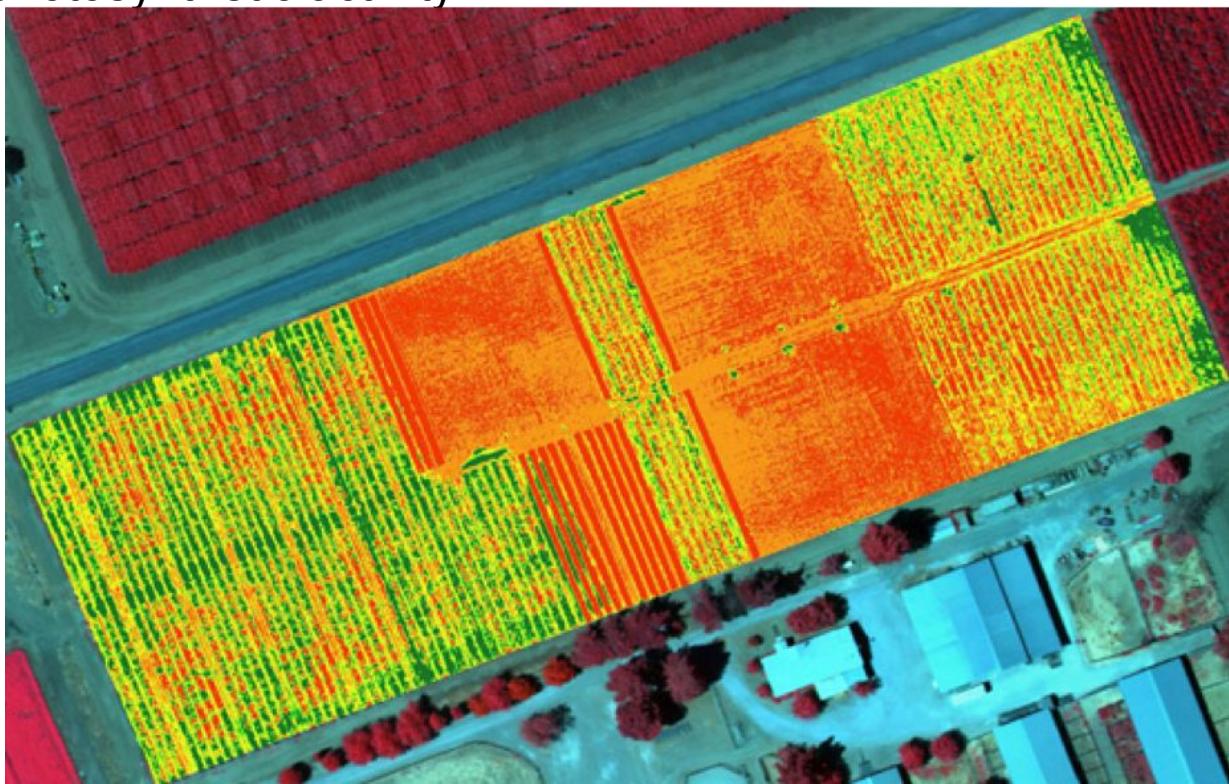
Sensors & Sensing

Multispectral imaging

video



The Normalized Difference Vegetation Index ([NDVI](#)) is an index of plant “greenness” or photosynthetic activity



The basic principle of NDVI relies on the fact that, due to their spongy layer found on their backside, leaves reflect a lot of light in the near infrared, or scars overlap with most non-plant objects. When the plant becomes dehydrated or senescent, the spongy layer collapses and the leaves reflect less NIR light, but the same amount in the visible range. Thus, mathematically combining these two signals can help differentiate plants from non-plant and healthy plants from sickly plants.

(Image courtesy of Agroclimatic.com)

Nitrogen deposition in the Loonse and Drunense Duinen

Minor Environmental Geography 02

Lonne van Doorne, Lukas Gerhards, Elvira Pilotti, Ben Sinnige



Introduction - Background information

Loonse and Drunense Dunes

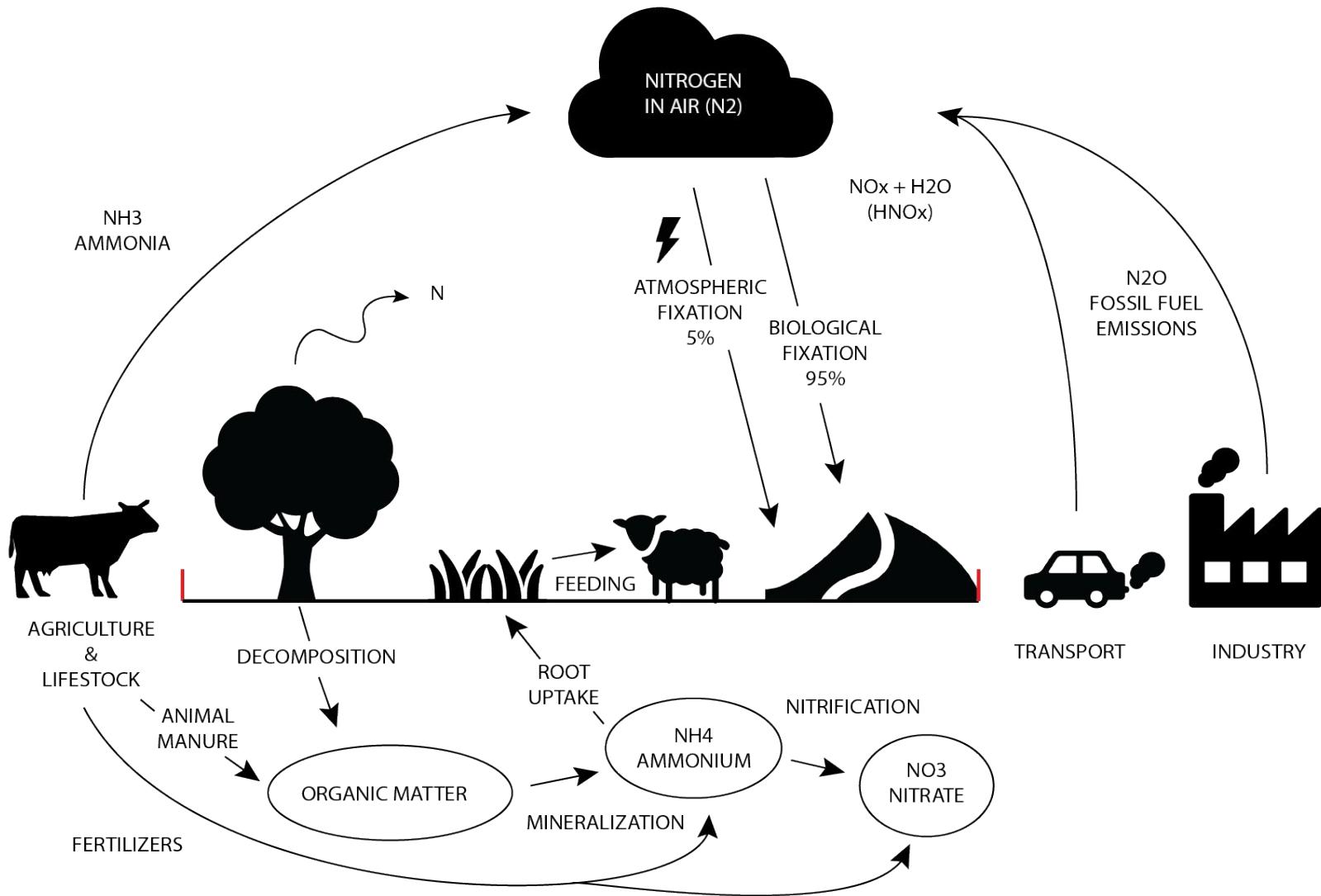
- Natura 2000 area located in NB - between Tilburg and 'S Hertogenbosch
- 39km², national park & open for recreational use.

Natura 2000

- Network of protected areas, in which rare species / habitats
- 28 EU countries
- Ensure long-term survival of Europe's most valuable and threatened species / habitats.

Nitrogen Cycle & Plant succession

- Growth rates disrupted by offset C:N ratio
- Contributors to nitrogen depositions: traffic, industry and livestock.





Introduction - Goals

Main goal :

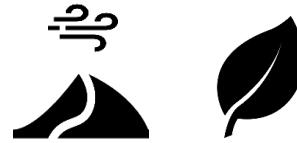
To deduce the largest contributing source of Nitrogen in the Loonse and Drunense dunes, through experimentation on Ammonium and Nitrate concentrations in the North-West corner of the dunes, in order to realize management techniques to mitigate the excess Nitrogen.

Sub-goals :

RIVM



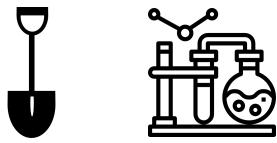
Natuurmonumenten



Provintie



Methodology

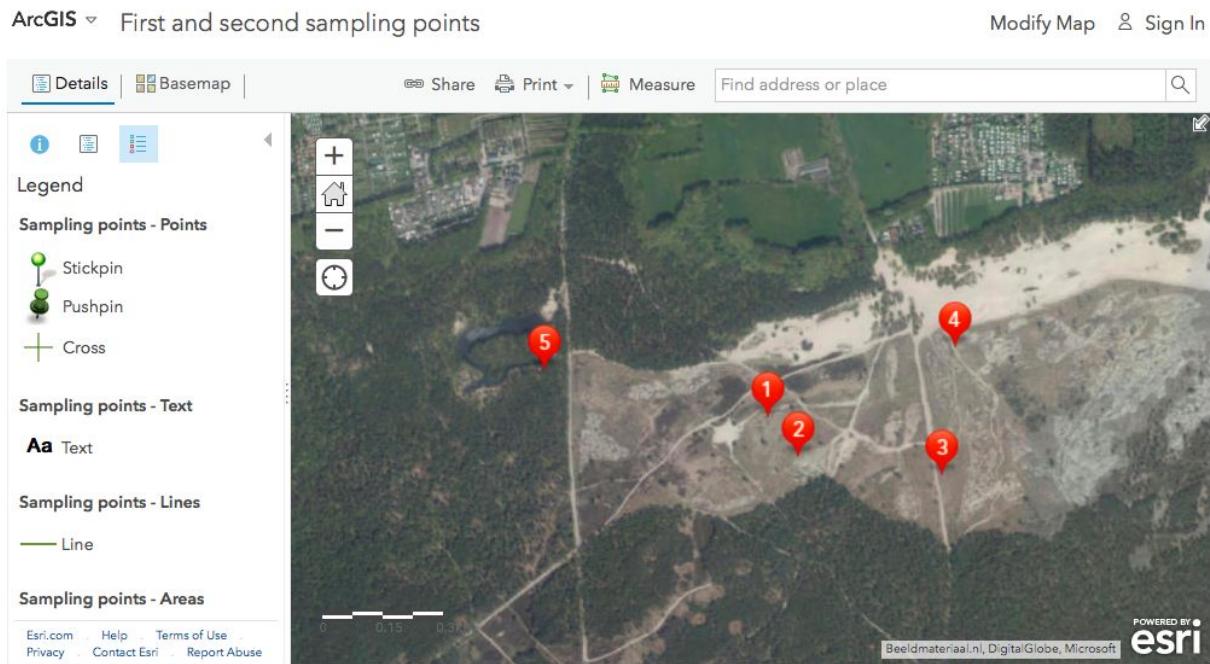


Fieldwork

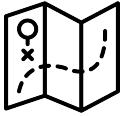
- Boreholes 2 - 3m deep
- Total 7 sites - last year
 - TS, DS, GW

Lab work

- Wet and dry deposition
- pH, Ammonium, Nitrate
- Tests kits & IC

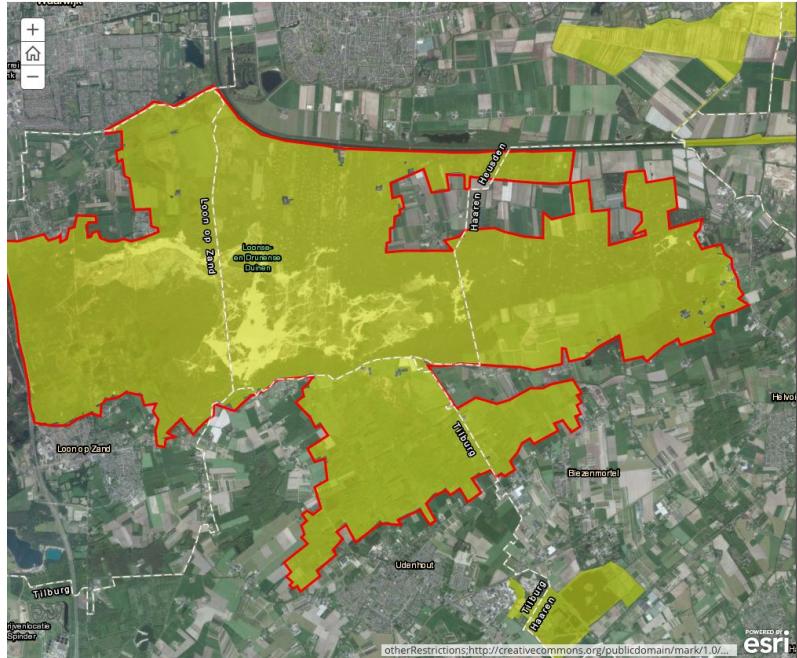


Methodology



GIS

- Data gathered & provided;
- Lab results attached to location



Story Ma... [Edit](#) [avans university of applied sciences](#)
No issues detected

Loonse and Drunense Dunes

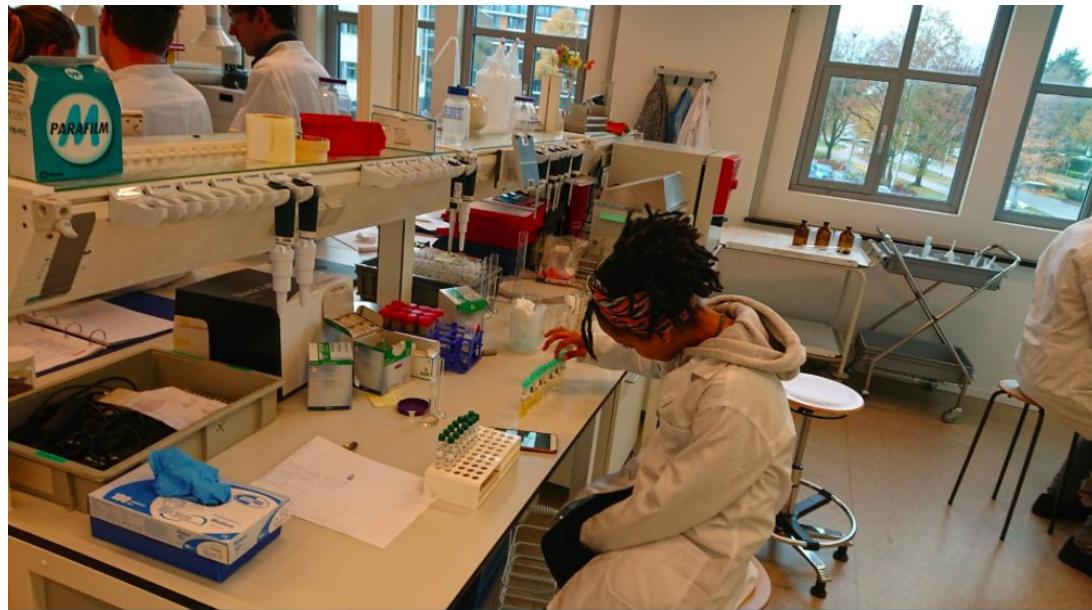
Nitrogen deposition in the Inland Dunes of the Netherlands, 2018

Background Information

In recent years, with an increase of nitrogen deposition highlighted as an issue, nitrogen-rich flora is beginning to dominate the Loonse en Drunense area, diminishing the natural dune landscape. The current project aims to find the largest Nitrogen contributor; where experiments and sampling will be carried out to verify the project's hypothesis. This team's area of investigation will be the Western section of the dunes.

This story-map will give weekly updates about the teams, what they get up to and their work over the coming weeks.

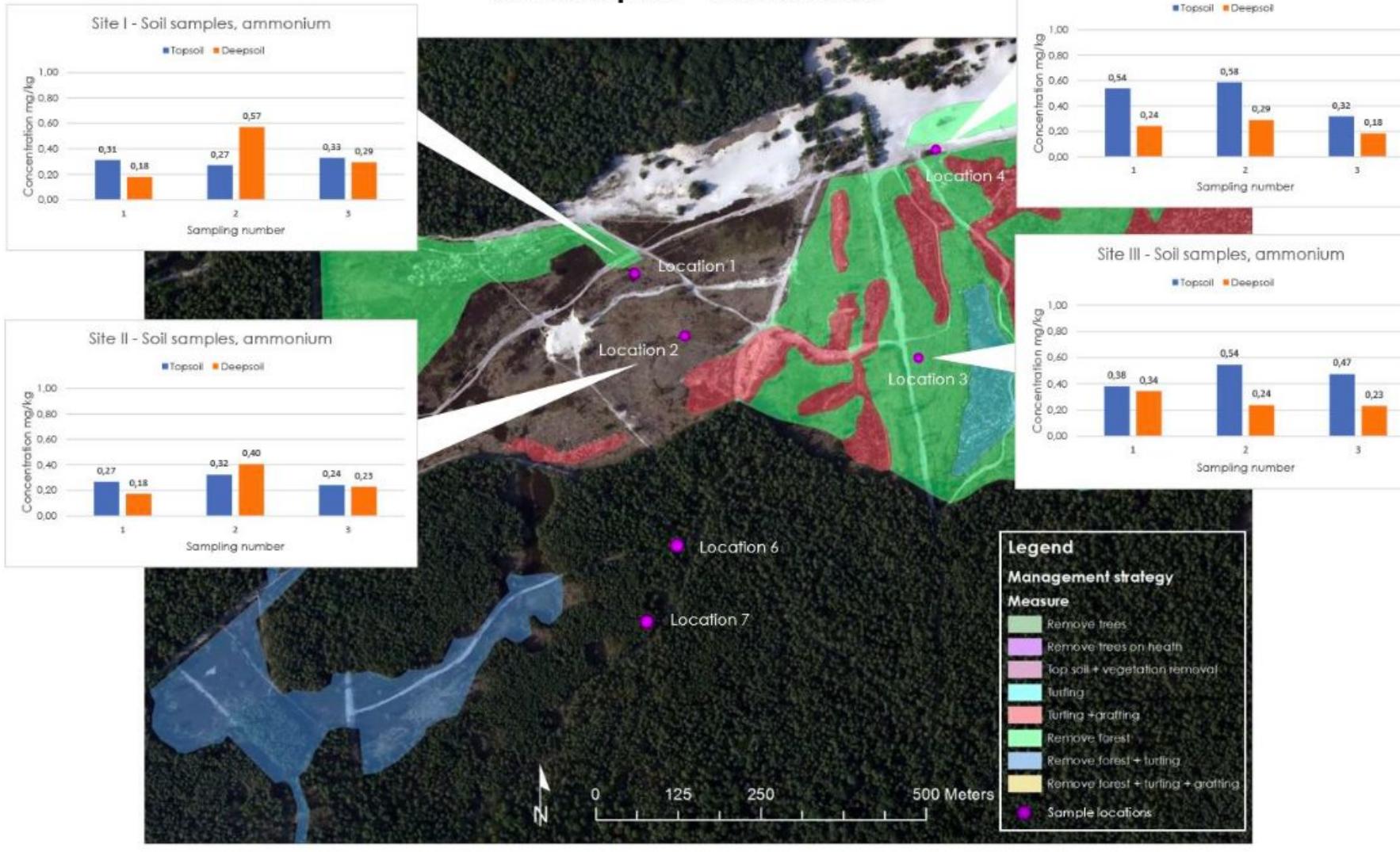
In the making!



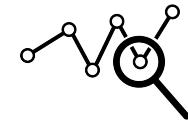
Results



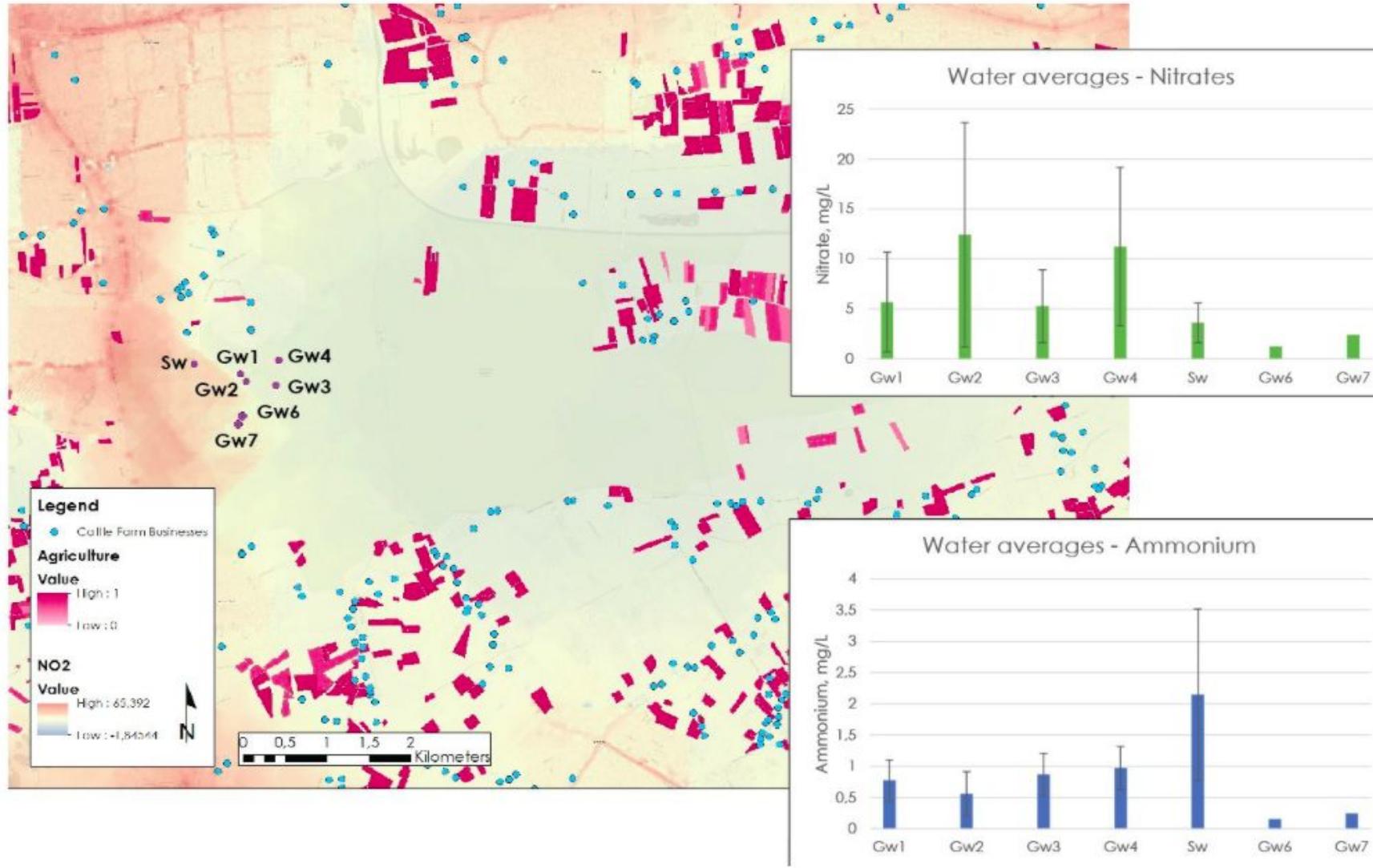
Soil samples - ammonium



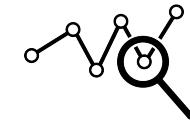
Results



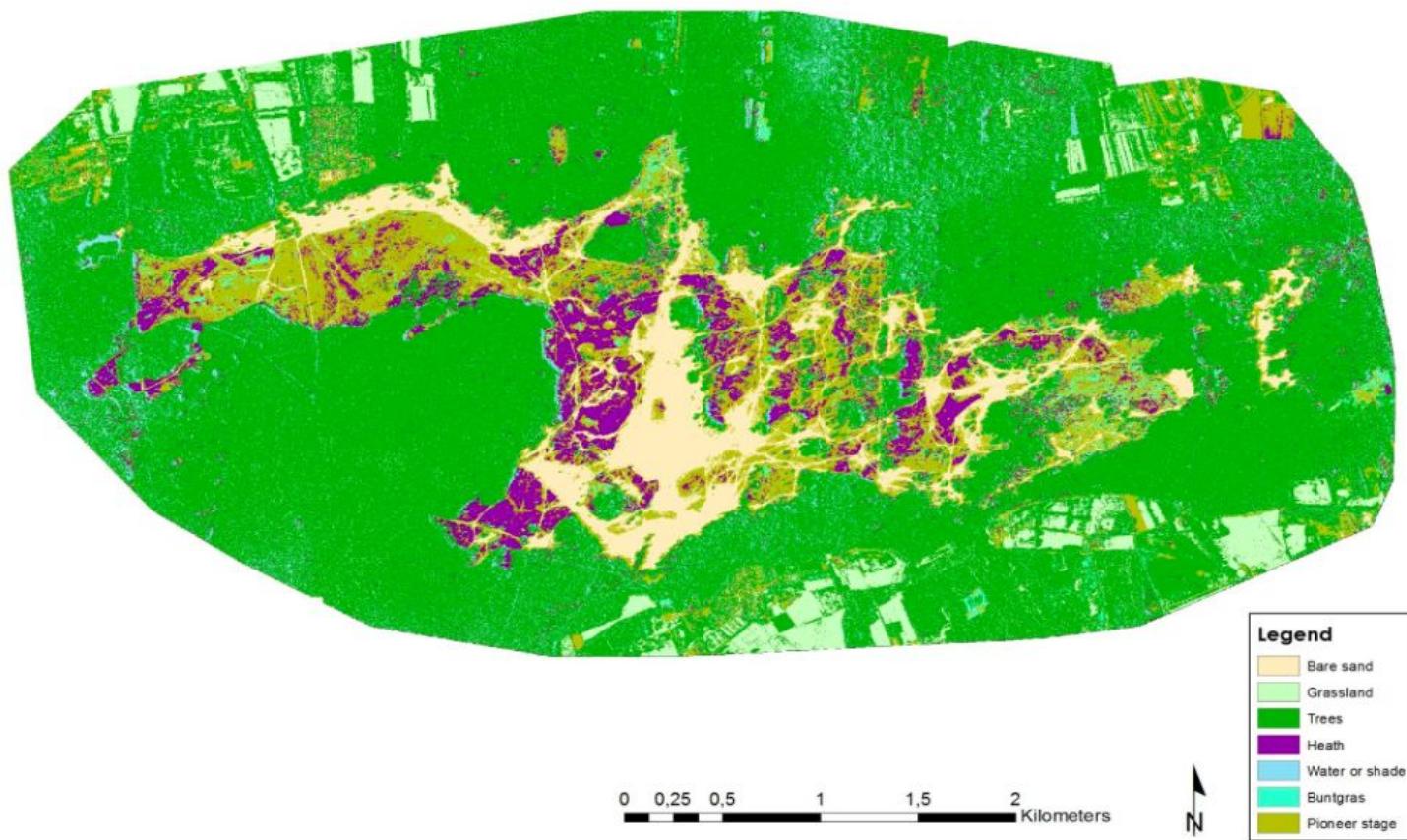
Loonse and Drunense dunes - Possible Nitrogen Sources



Results



LDD - Soil Cover Classification



Conclusion & Advice

Largest contributor :

- Atmospheric deposition by traffic
 - Higher TS readings
 - Overall increase between wet & dry measurements

Recommendations :

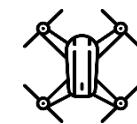
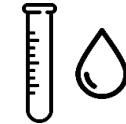
- Further investigation other pollutants, P
- Increasing depth & location points

Imaging:

- Fixed wing UAV for broader aerial photographs
- Drone for more detailed
- NOx monitoring through UAV

Management

- Continuation of sheep grazing
 - No influential effect, increase drifting sands
- Awareness at entrance
- "Milieuzone" around the area





NITROGEN DEPOSITION - SHEEP, SAND AND SUCCESSION

Lonne van Doorme, Lukas Gerhards, Elvira Pilotti, Ben Sinnige

Minor Environmental Geography

Scan for
story map!



INTRODUCTION

Increasing nitrogen levels affecting:

- Vegetation
- Drifting sands
- Natura 2000

Goals

Mapping the largest contributing source of nitrogen in the Loosne and Dunesne dunes, through experimentation on nitrates and ammonium concentrations in the northwestern corner of the dunes.

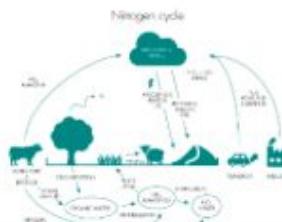
Province	Naturemonumenten	RIVM
Weight or drone usage	Hall biodiversity list	GIS layer regulation
Monitor drone giving	Map height difference	Map height difference
Investigate water samples	Newsletter	Newsletter

Boundaries

- Physical:** Maps and study area are limited to the Loosne and Dunesne dunes
- Time:** Project is carried out within a period of 13 weeks
- Topic:** Research focuses on the effect of nitrogen levels
- Drone:** Drone flying can only be done when granted permission by the province
- Equipment:** Experiments that can be done with Avans lab equipment

Theoretical background

General vegetation succession			
Sand	Pioneer vegetation	Heath/ forest	
Open sand	Acacia, grasses	Heath	Forest



METHODS



- Sampled isolines:
 - Topsoil soil = 50 cm
 - Deep soil = 200 cm
 - Groundwater = 250-300 cm



- Experiments conducted:
 - Nitrate/Hoch (long)
 - Ammonium (Hoch long)
 - pH (meals)



RIVM GIS layer regulation:
 - Hall biodiversity list
 - Map height difference
 - Newsletter

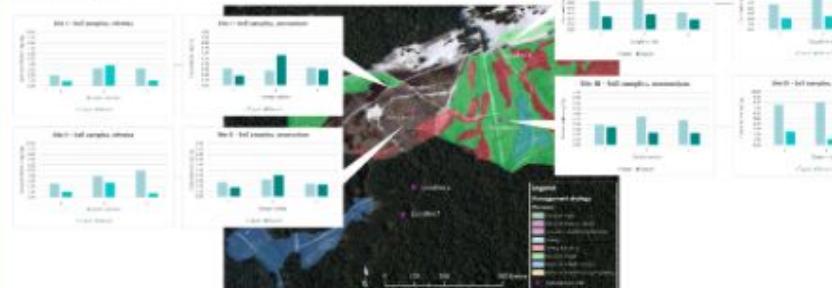
The methodology was devised in cooperation with the GIS layer assignments.



LAB & GIS RESULTS

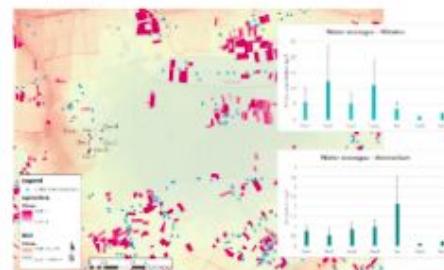
Soil samples - nitrates and ammonium

Management strategies



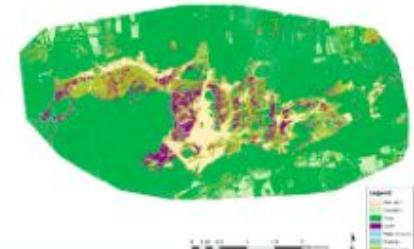
Water samples - nitrates and ammonium

Possible nitrogen sources



Classification map

Soil cover classification



CONCLUSION



The largest contributing source of nitrogen is speculated to be atmospheric deposition, caused by emissions from traffic and industry.

ADVICE

- Further investigations to be done on this topic
- Conversion of grazing sheep; explore option of cows
- Awareness of erosion points of the dunes
- Use drone imagery for more detailed aerial pictures

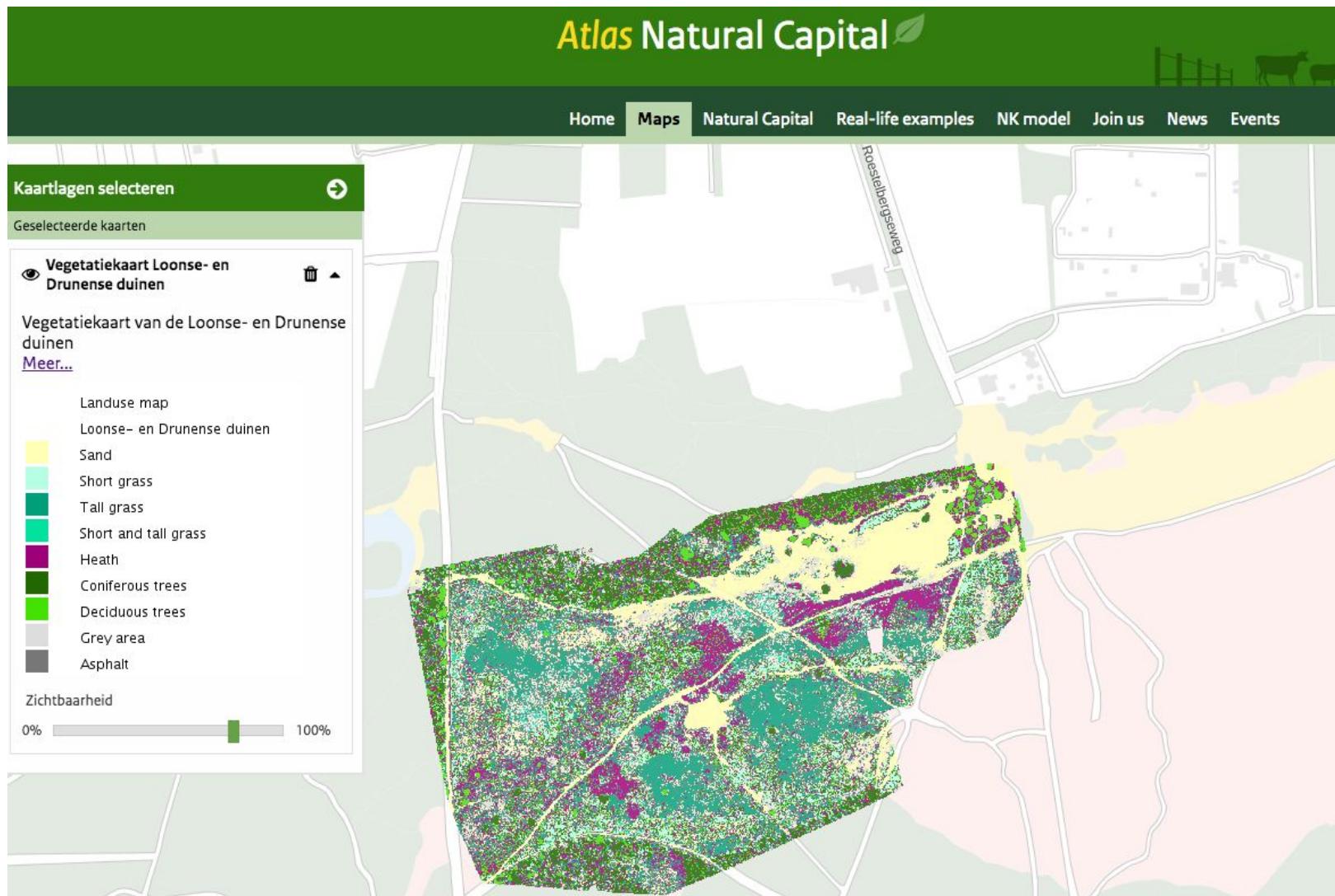
RECOMMENDATIONS

- Collect air monitor & soil and deposit into higher level groundwater
- Invest in proper drones for aerial photographs e.g. fixed wing drones
- Research other elements in the area – e.g. phosphorus
- NO_x monitoring through Unmanned Aerial Vehicle (UAV) sensors
- Measuring around the area

Impression of the research area, the Loosne and Dunesne dunes



Data halen en data brengen

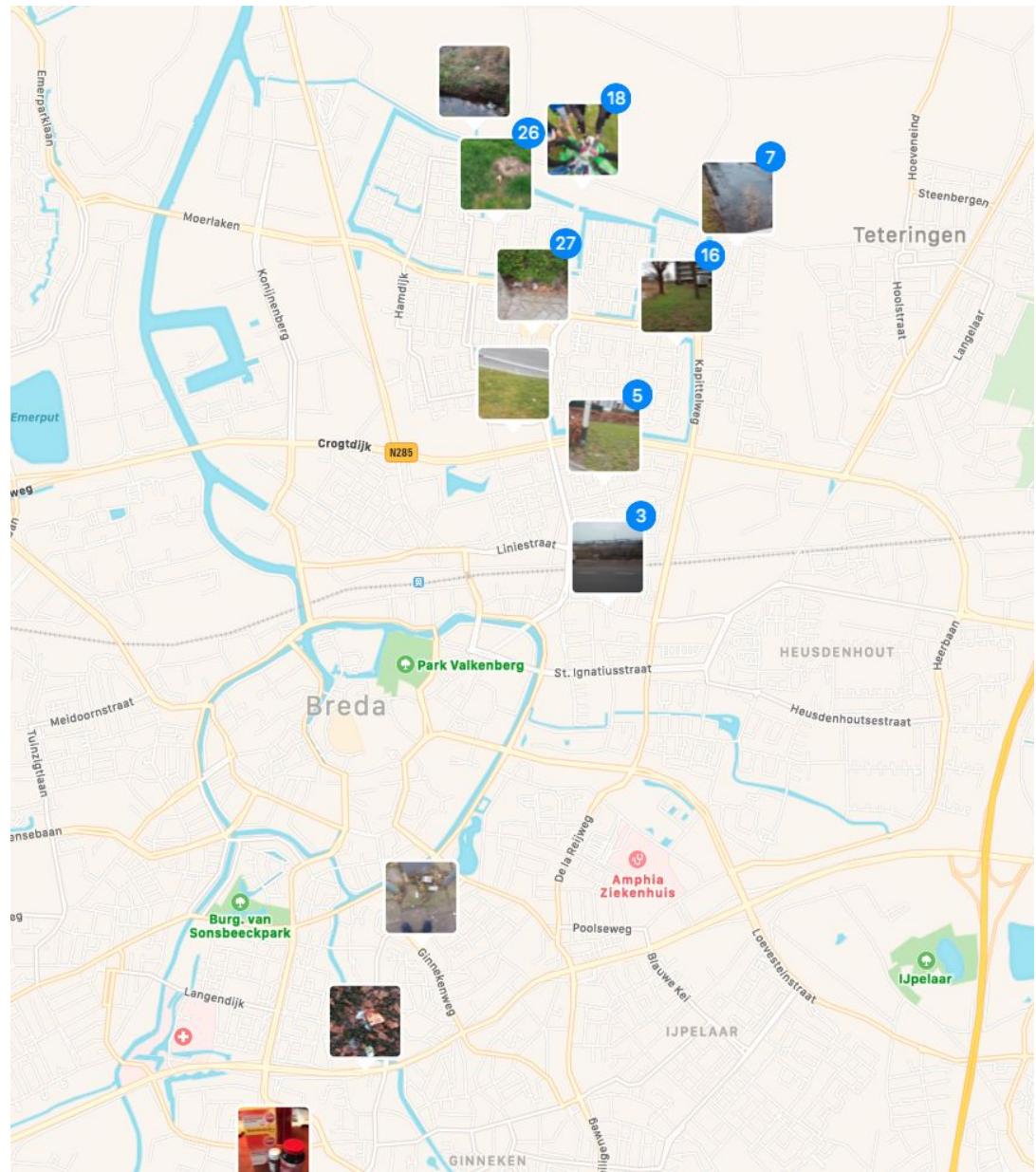


Zwerfafval Kaart (Breda)

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Plogging is het nieuwe
gezonde afvalrapen!

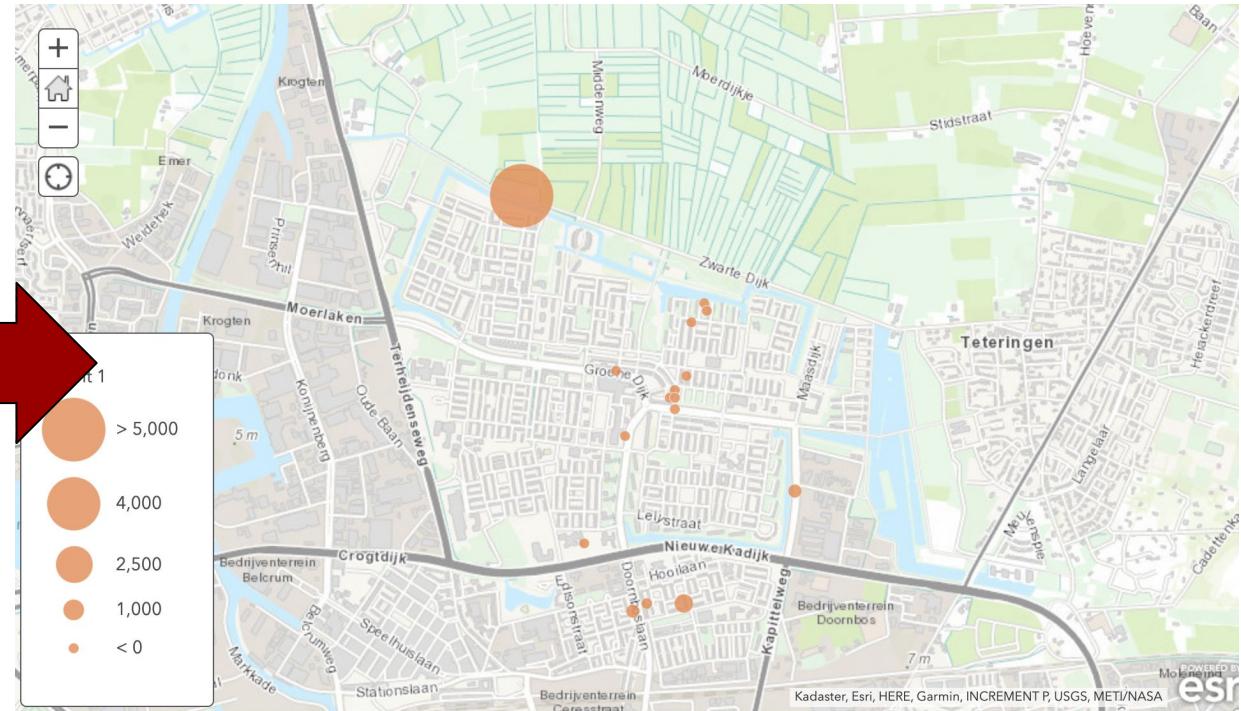
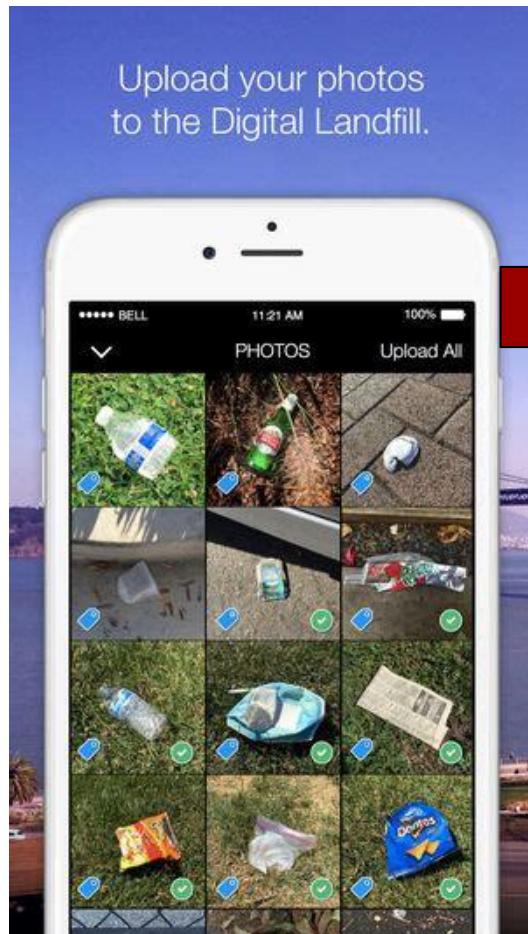
(Plastic soup foundation
Carina van Uffelen.)



Data collectie met Litterati

JOIN US!!!

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1. Download litterati in de app store
2. Maak een account
3. Kom je uit de omgeving Breda, Join de groep "stadsjutters Breda"

Methodology ontwikkeling

Hoe zou het gebruik van de atlas bij kunnen dragen aan zwerfafval vermindering?

Go to www.Menti.com use the
code:
14927