



Statistics Netherlands, PEOPLE-EA and Earth Observation

Validation and Vision

Patrick Bogaart, Shaya van Houdt
pw.bogaart@cbs.nl

PEOPLE-EA workshop; 22 Mei 2024

Part I: Some validation results

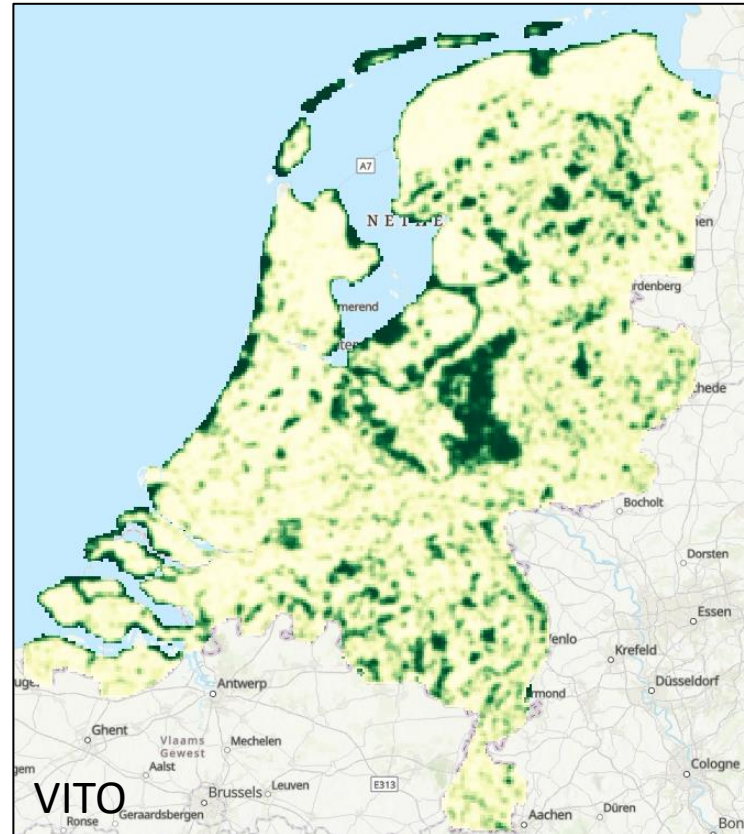
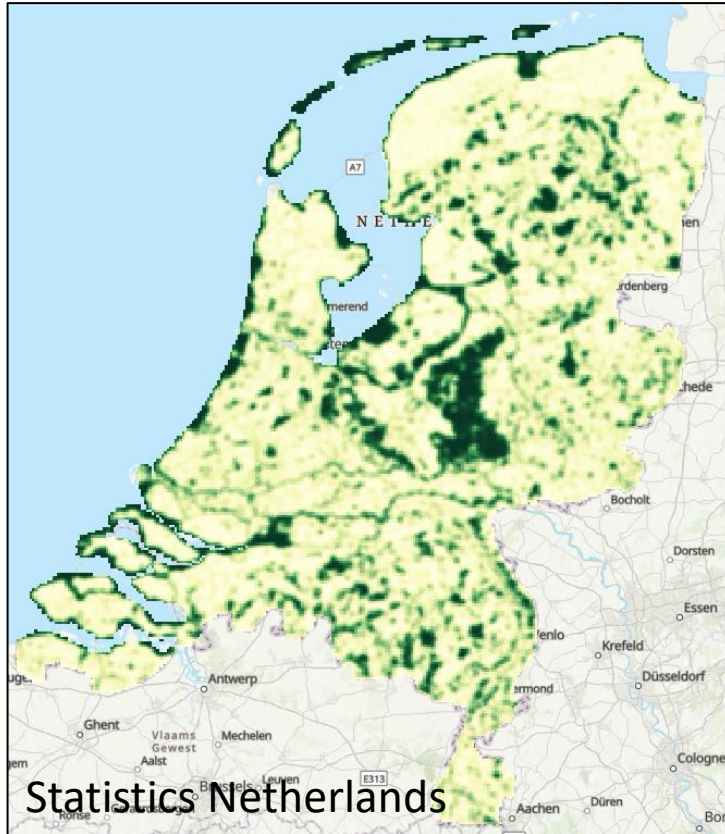


Naturalness- Method

- Ecosystem map (10m resolution)
- Reclassified to nature/non-nature
- Focal statistics with a radius of 130 cells (eq. 529 ha)
- Raster calculator – convert to percentages
- Aggregate cells to VITO cell size (e.g. approx. 100m)
- Extract by mask for similar extent



Naturalness -results

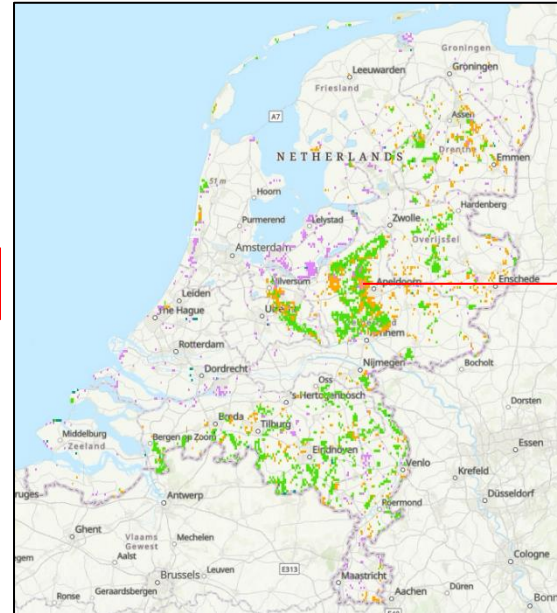


Forest Type – Spatial pattern and resolution



Polygons

Statistics Netherlands

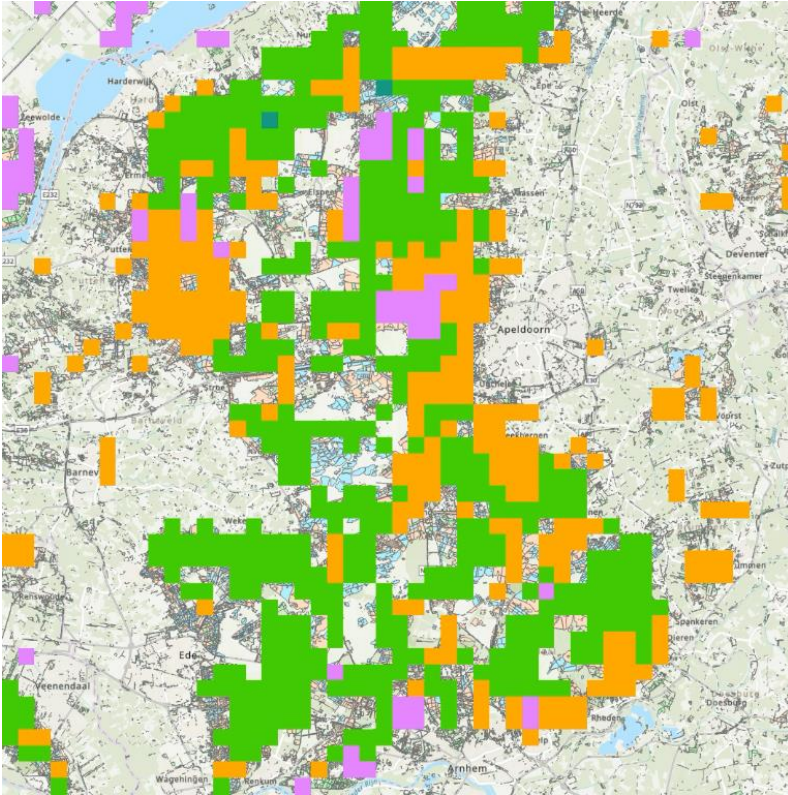


~1km Raster

VITO



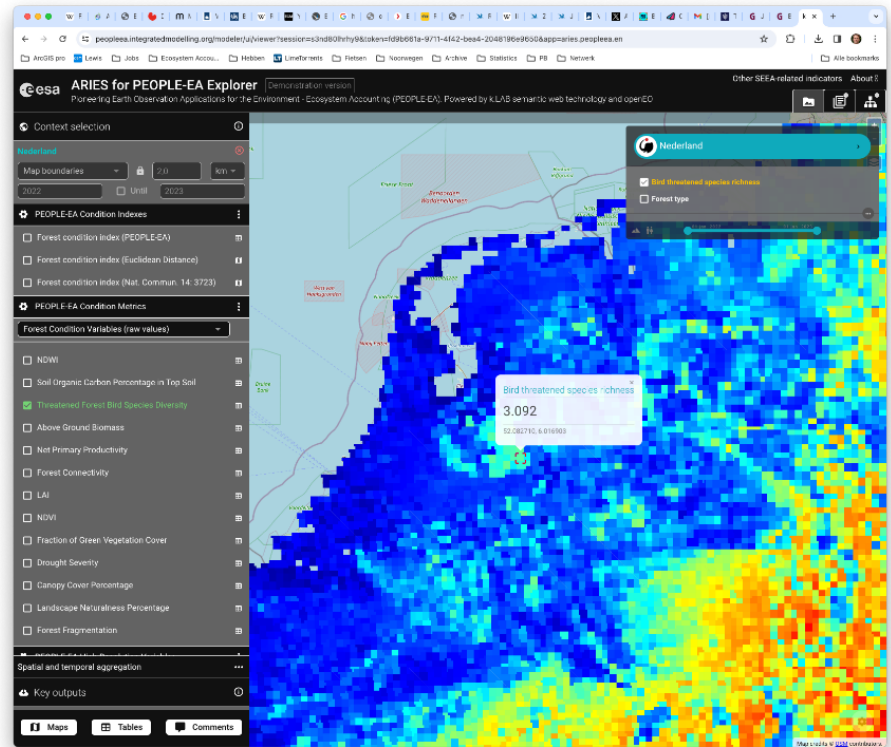
Forest Type: issues with coverage



- Systematic comparison:
 - Deciduous: 71%
 - Mixed: 60%
 - Coniferous: 48%
- No understory

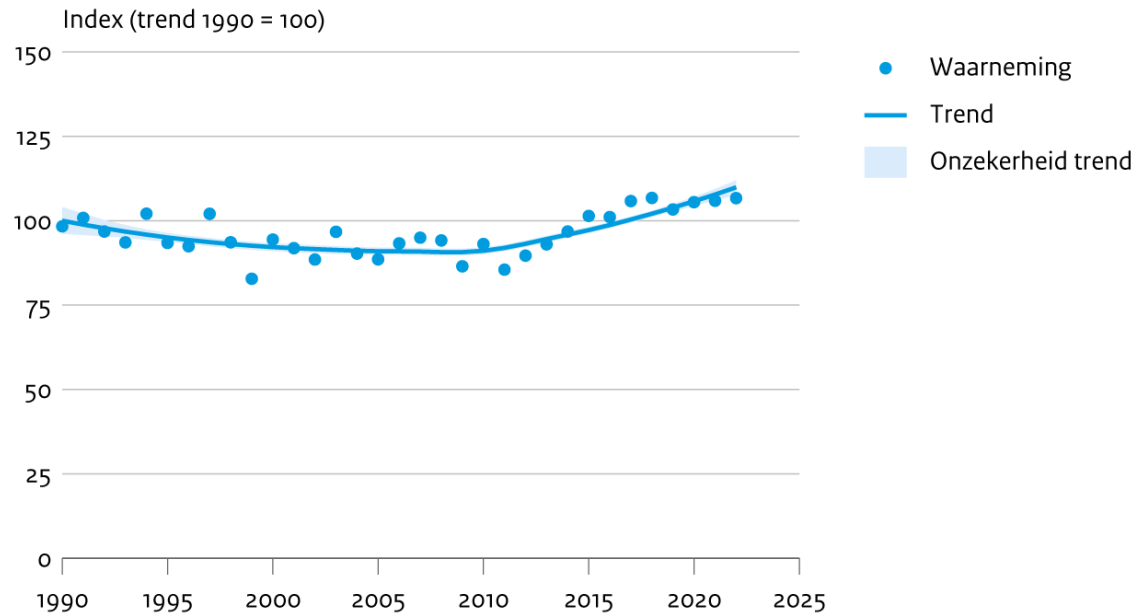
Threatened Forest Bird Species Richness

- Extreme low values found in NL due to only a few of the bird species found in NL
- Scaled indicator value not representative of reality, or useful for policy purposes
- Unclear how species list was derived



Netherlands' Common Forest Bird Indicator

Broedvogels van bossen



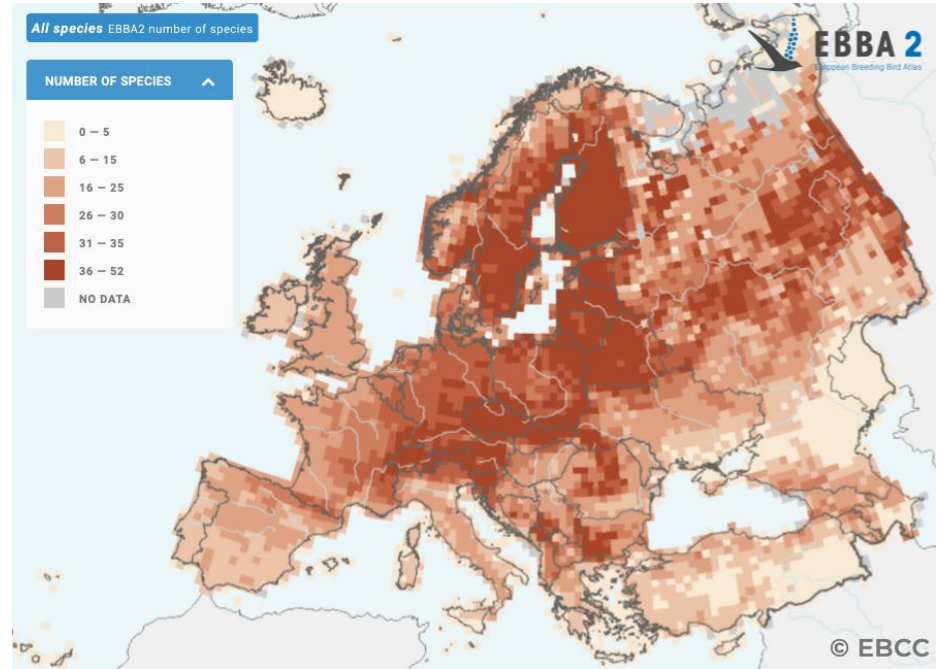
Bron: NEM (Sovon, CBS)

CBS/dec23
www.clo.nl/nl161807



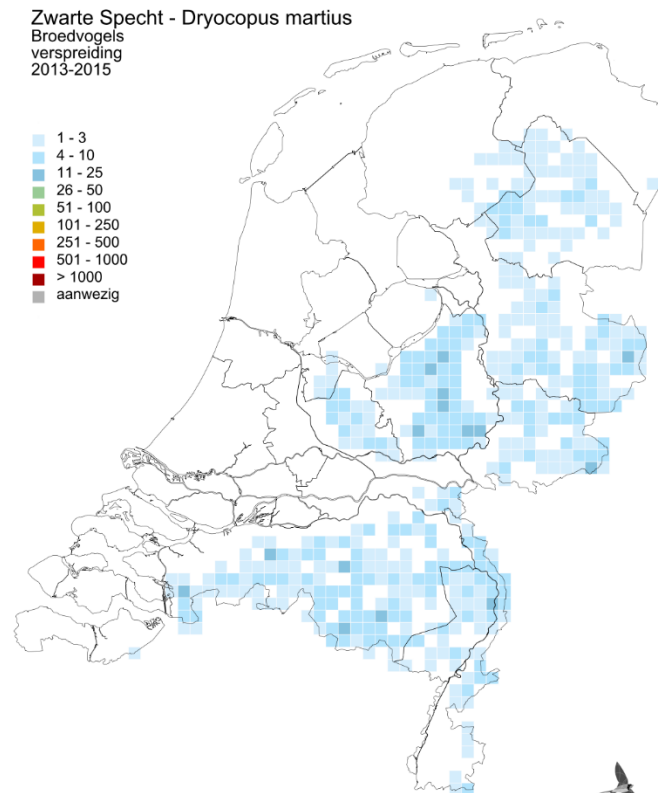
PEOPLE-EA vs EBBA and IUCN

- Much less species in PEOPLE-EA / Maes (24) compared to EBBA Boreal and Temperate Forest (73)
- Level of (red-list) threat as used by Maes et al. unclear: many species on their list are “*least concern*” for EU28
 - Black woodpecker
 - Brambling
 - Eagle-Owl
 - ...



PEOPLE-EA vs Bird Directive

- Annex 1 species differ by county
 - NL: only 2 species in Maes list
 - Black Woodpecker →
 - Honey Buzzard
 - (difficult to monitor)
- National data more precise and useful
 - And: abundance more relevant than occurrence



Overall conclusions

- Earth Observation data products are useful, but gaps exist compared to national mapped data
 - Which is not beyond doubt, so the truth is not always known.
 - **Advice: independent check with ground truths**
- EU-wide biodiversity data are much less useful
 - Often more based on expectation rather than observations
 - **Advice: rigorous validation against monitoring data**

Part II: Vision on Earth Observation and NSI's



The case for Earth Observation

- Increasing focus on societal challenges:
 - Sustainability and Green Deal; inequality, etc
- These challenges require interdisciplinary information:
 - Socio-economical vs Environment
 - Requires statistics on system level
 - (feedback between domains)
 - Requires data-linking on micro level
 - (because of non-linear dependencies)
- Required micro-data not always available from registers
- **Earth Observation could be an auxiliary data source**



Processing

- Methods:
 - Direct derivation based on physical properties (e.g. NDVI) on raster level
 - Indirect derivation based in (bio) physical models e.g. impact of solar radiation on NOx)
 - Manual classification (e.g. land use)
 - Classification based on (deep) machine learning (e.g. land cover or solar panels)
- Requires specialist knowledge. What do want to do ourselves

Collaboration

- *Observation: EO is demanding, both in knowledge, skills, infrastructure and storage*
- Collaboration where possible
 - Teaming-up with external partners
 - Prefer analysis- and account-ready products
 - **Q: define the position of NSI within EO landscape. What distinguishes us from other players (time series; consistency; statistical framework) – Requires minimum level of expertise**
- Roll-our-own where there is added values
 - Build-up of expertise
 - Privacy-sensitive data



Infrastructure

- *Observation: EO is demanding, both in knowledge, skills, **infrastructure** and storage*
- Discussion:
 - On-premise processing vs external / cloud solutions
 - Difference experimental / production / sensitive data

Knowledge and skills

- *Observation: EO is demanding, both in **knowledge, skills,** infrastructure and storage*
- StatNL capacity will be focused on R&D
 - Outsourcing of production
- Collaboration with external partners
 - Commercial
 - Research institutes (grants)
 - Education (internships; MSc/PhD theses)

Final conclusions

- Earth Observation are a new data source for Statistics Netherlands (and probably many other NSI's)
- Many challenges ahead: requires build-up of experience
- Huge added value in projects like PEOPLE-EA.

- *Questions: pw.bogaart@cbs.nl*



Facts that matter