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Use of landscape data/GIS for biological hazards RA at EFSA: examples from animal and plant health

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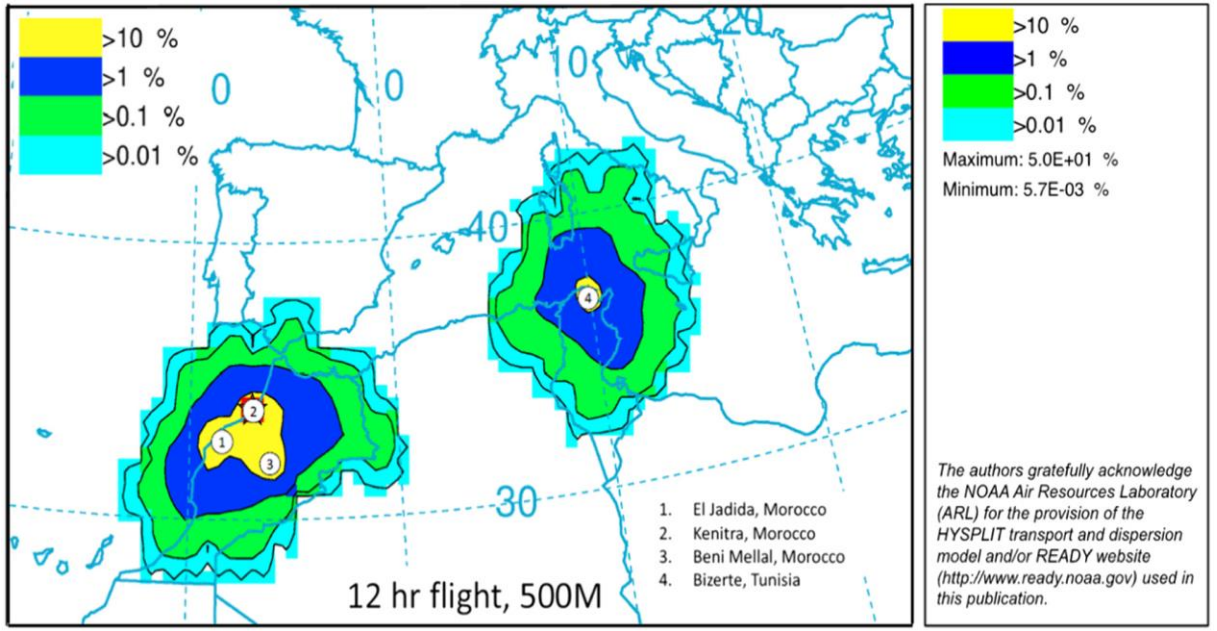
Outline

- Intro on Animal and Plant Health Unit (ALPHA) RAs and on spatial explicit data
- Examples from Plant Health (PLH) and Animal Health (AHAW) risk assessments
- Internal project on data management and data services

Animal and plant health (ALPHA) risk assessments

- ALPHA RAs are not ERA but include spatial and temporally explicit environmental aspects
- Risk is often expressed as maps showing environmental or landscape associated risks
- e.g. presence of entry points, elements enhancing spread, presence of hosts, type of livestock production



Study on the flight distance of the maize pest *Spodoptera frugiperda* (fall armyworm) (EFSA, 2018)

ALPHA Pest risk assessment

ALPHA RAs deals with the risks related to quarantine plant pest and to emerging and contagious animal diseases

RAs typically includes the evaluation of

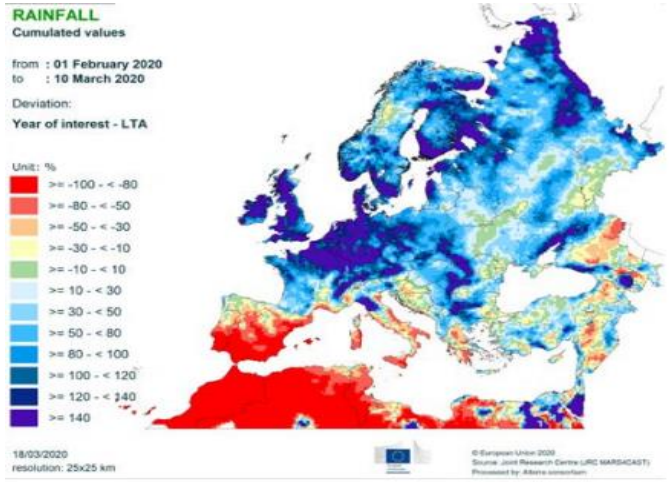
- entry
- establishment
- spread
- impact

in the EU territory

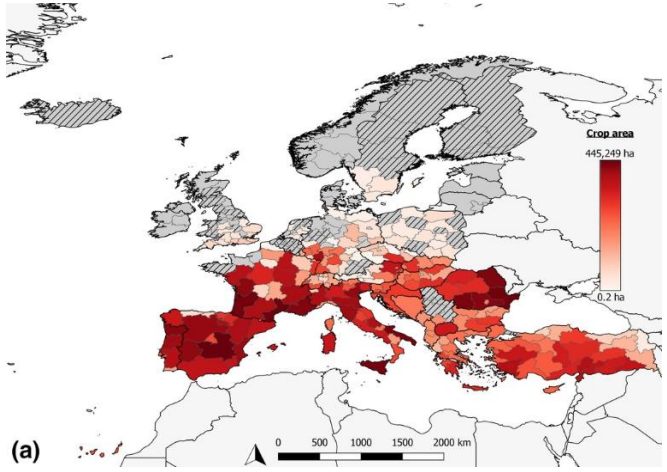
ALPHA risk assessments data (examples)

Spatial and temporally explicit data used for such assessments include:

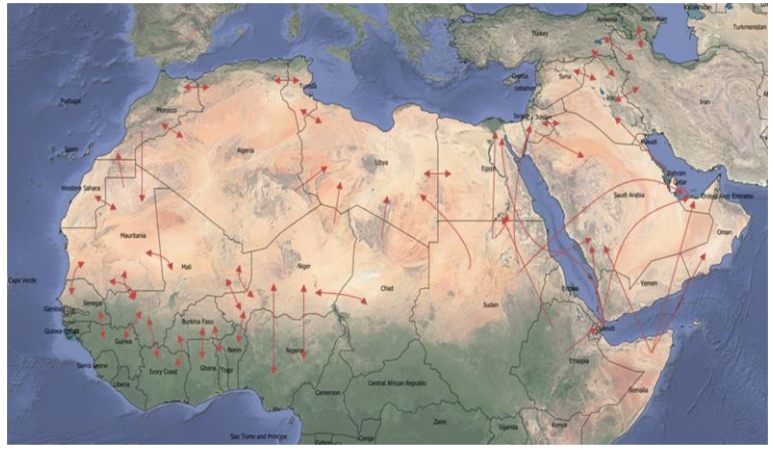
Weather and climate data at different spatial and temporal resolution



Crop/forest data at different resolutions (from 1km to 25 km grid, NUTS 2/3)

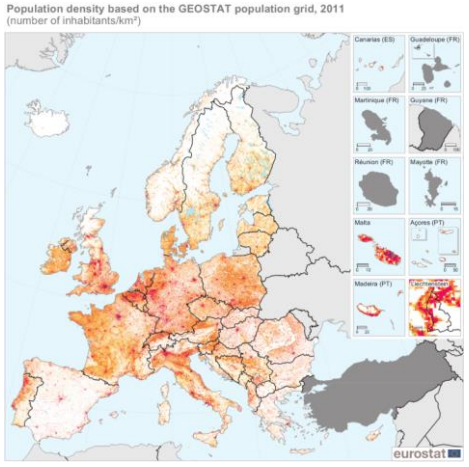


Animal/plant movement data

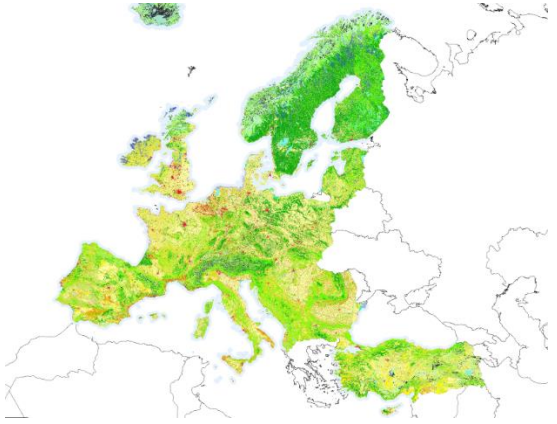


Micrometeorological data from fields (e.g. orchards, vineyards, …)

Population data



Land use/cover



Examples from Plant Health and Animal Health risk assessments

Plant Health RAs:
Potential establishment of *Xylella fastidiosa* (2019)

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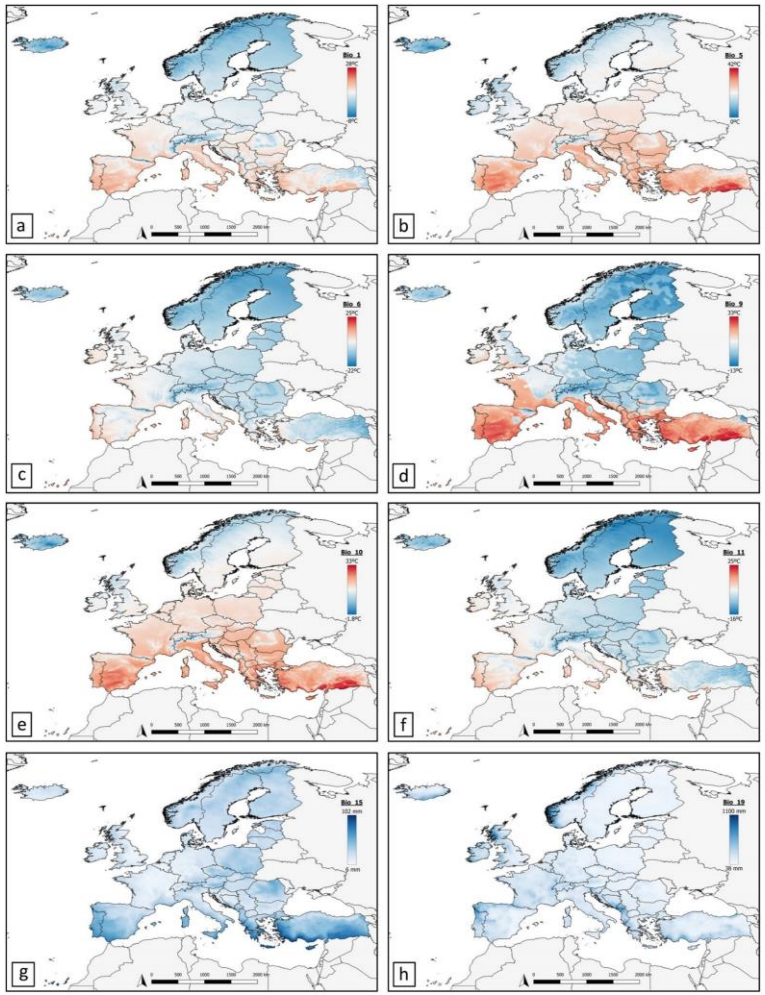
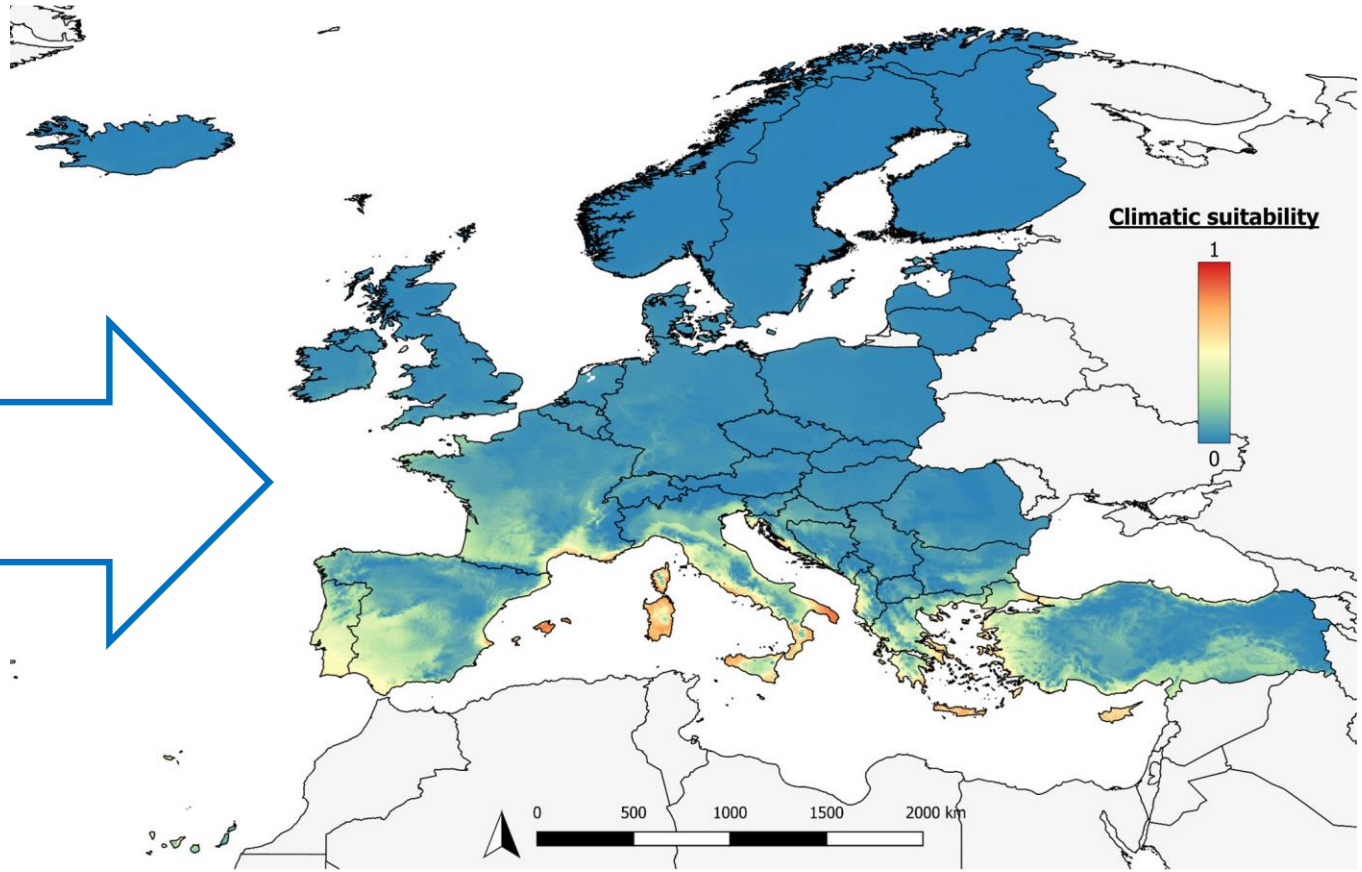
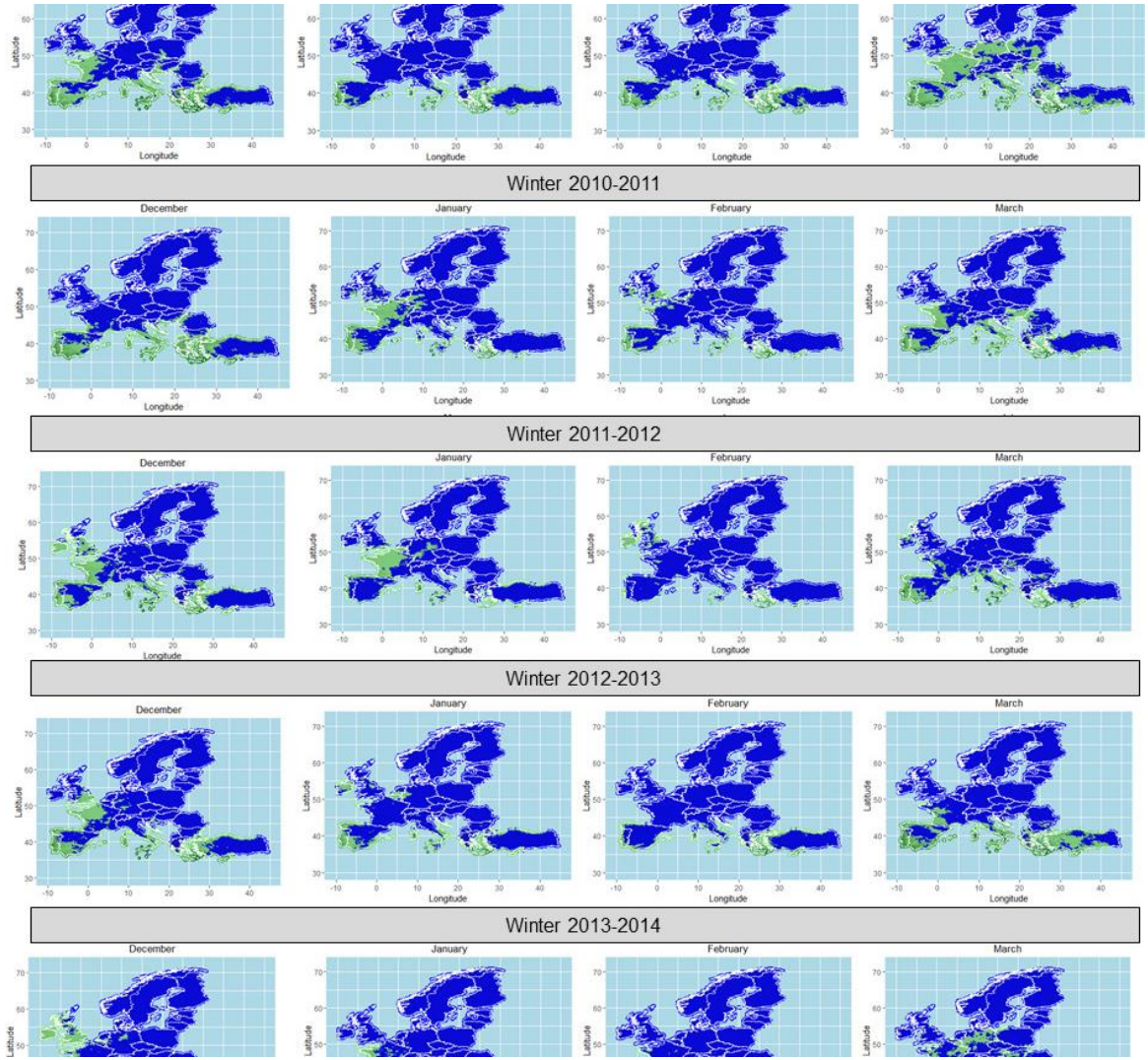
Analysis based on world climate CHELSA dataset (www.chelsa-climate.org) and SDM models





(a) annual mean temperature; (b) maximum temperature of warmest month; (c) minimum temperature of coldest month; (d) mean temperature of driest quarter; (e) mean temperature of warmest quarter; (f) mean temperature of coldest quarter; (g) precipitation seasonality; and (h) precipitation of coldest quarter.

Animal Health RAs:
Bluetongue:Vector in funcion of Temperature (2017)

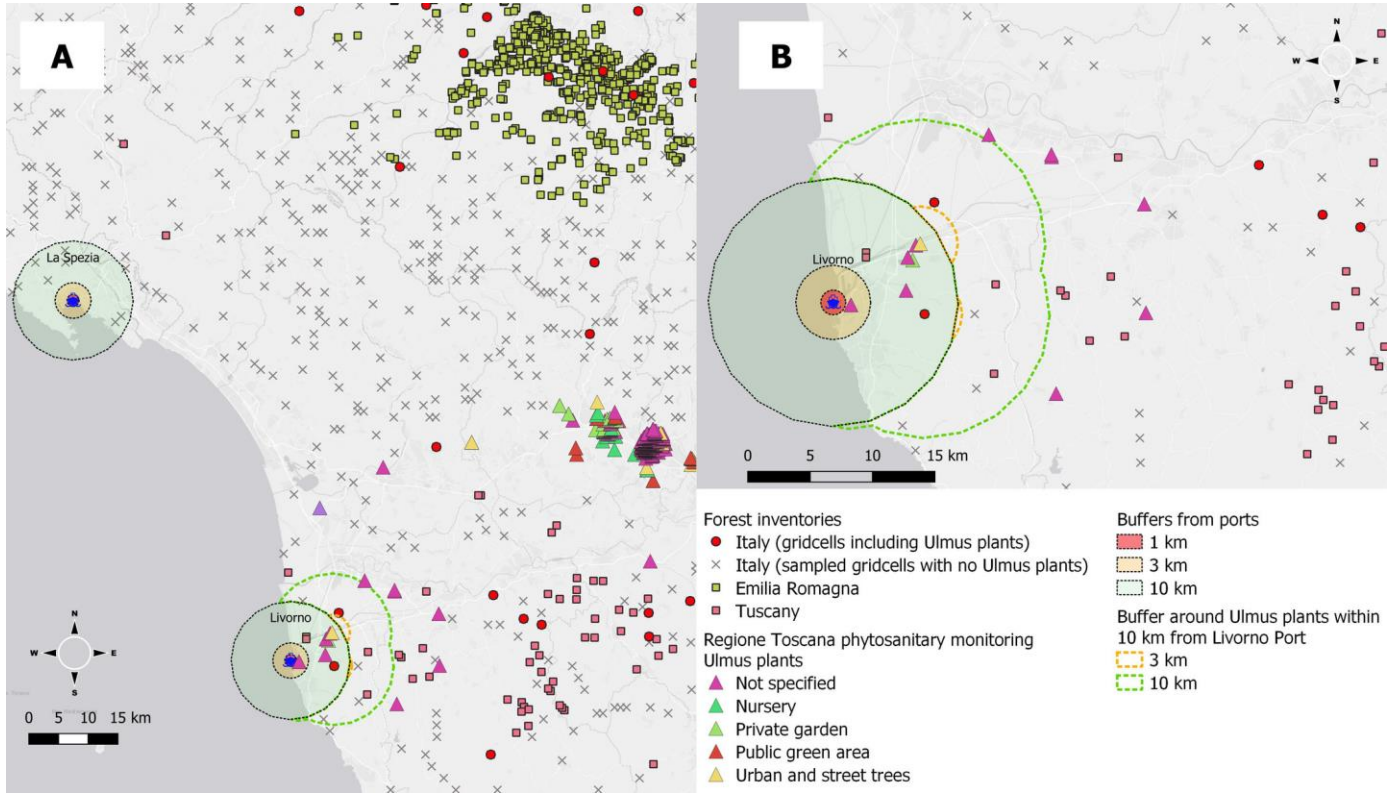


- Opportunity map for vector activity in Europe considering minimum temperature
- Blue zones: areas not suitable to *Culicoides* spp. life cycle
- Shades of green: favorable conditions for completing the life cycle
- Black: regions with no information on temperature for that year

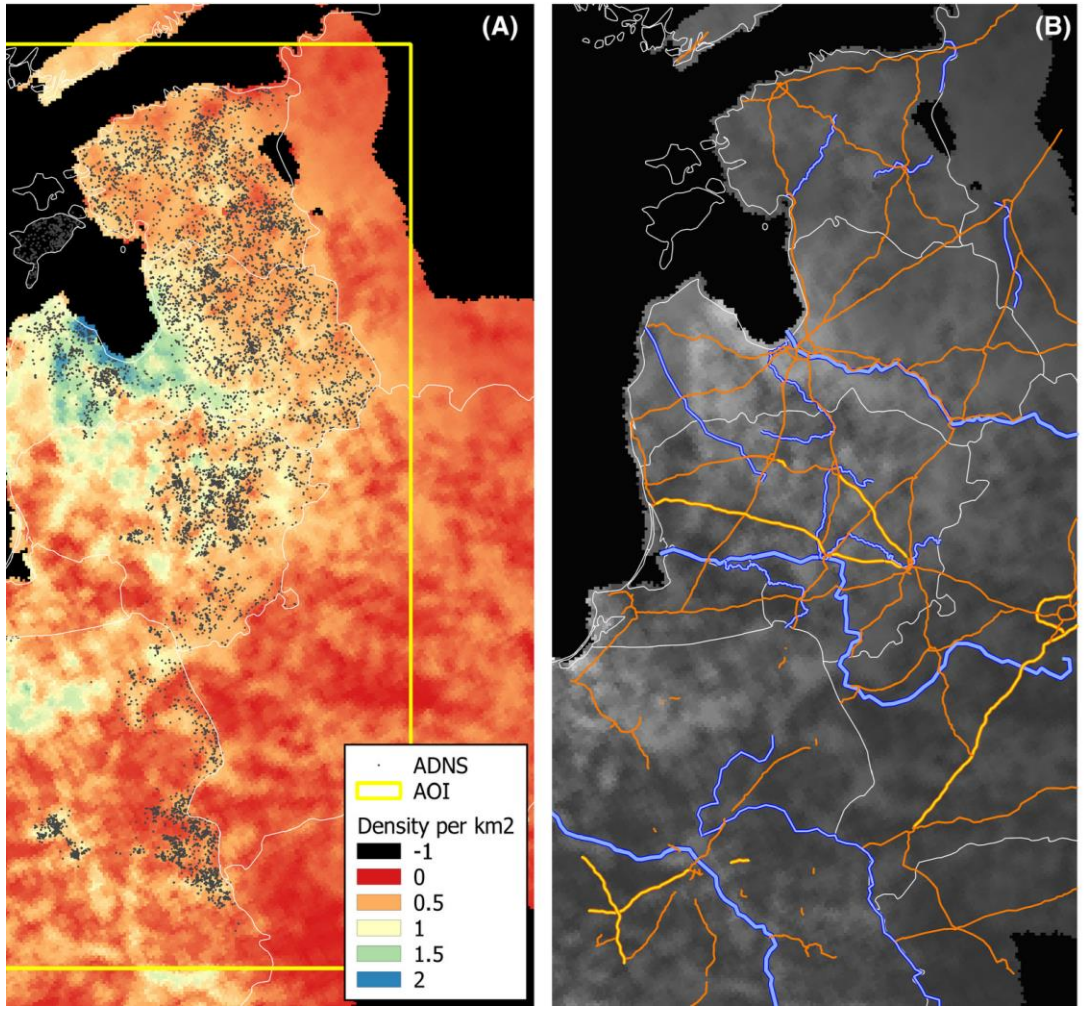
Plant Health RAs:
entry and spread of Elm borer (2019)

Simple analysis based on data of:

- Geolocalization of elm trees (national and regional forest inventories)
- ports geolocalization (i.e. point of entry)
- information on the potential flight distance of *Saperda tridentata*



Animal Health RAs:
Habitat model for ASF in Baltic States (2018)



- Landscape and GIS data
- Habitat model of wild boar and physical barriers for the Baltic countries
- Left: Carrying capacity values (expressed in density per km2) according to the distribution model
- The carrying capacity overlaid with barriers.

Internal project on environmental spatial explicit data management and data services

New EFSA project on environmental data management

Objectives and expected outcomes

- Focus on spatial and temporal explicit landscape and environmental data
- Increase transparency of EFSA methodologies and outputs
- develop structured procedures for data storage (cloud based), versioning control, metadata
- Develop tools to support user for data access and use

State of development

To be started soon

Thank you!

INTERNATIONAL YEAR OF
PLANT HEALTH
2020