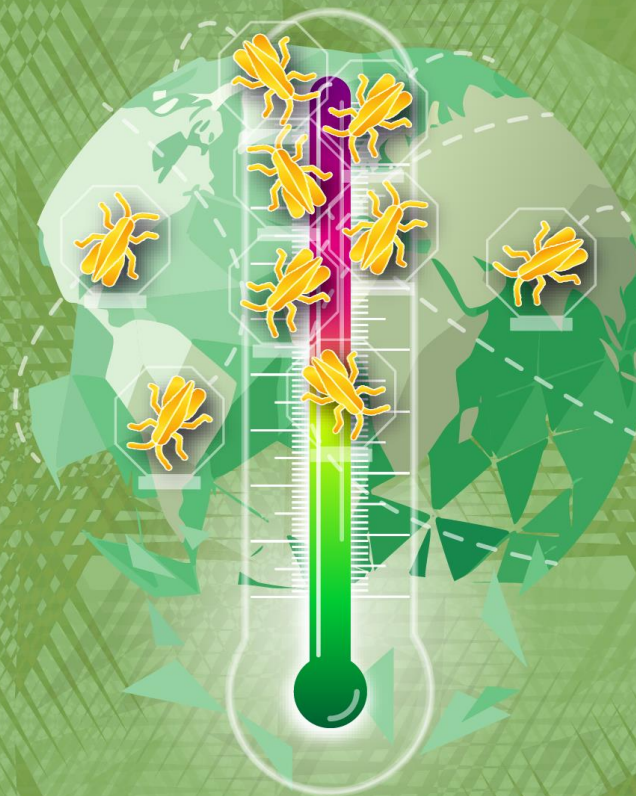


IPPC Webinar Series

Climate Change and Phytosanitary Issues

1–2 October 2025 | 14:00–16:00 CET



Pest risk assessment in a changing climate: EFSA case studies and strategic framework evolution

Andrea Maiorano

European Food Safety Authority

andrea.maiorano@efsa.europa.eu



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Climate Change and
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WHAT EFSA DOES and HOW. What EFSA does not



EU
Commission



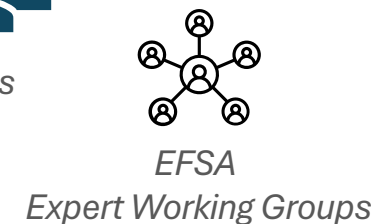
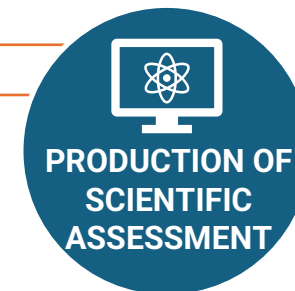
EU
Parliament



Member
States



EFSA self-
mandate



Pest risk assessment

Entry
Establishment
Spread

Impact on:
crops
environment

Risk Reducing
Options
evaluation

EFSA **is not** a research centre

We **collaborate** with research centre and scientific experts to provide **scientific support to the EU**



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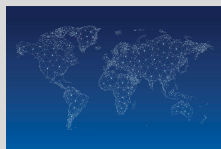
Climate Change and Phytosanitary Issues



From systematic literature search to bibliometrics



Climate suitability analysis including climate change



Strategic framework evolution: continuous development and the SEED Project

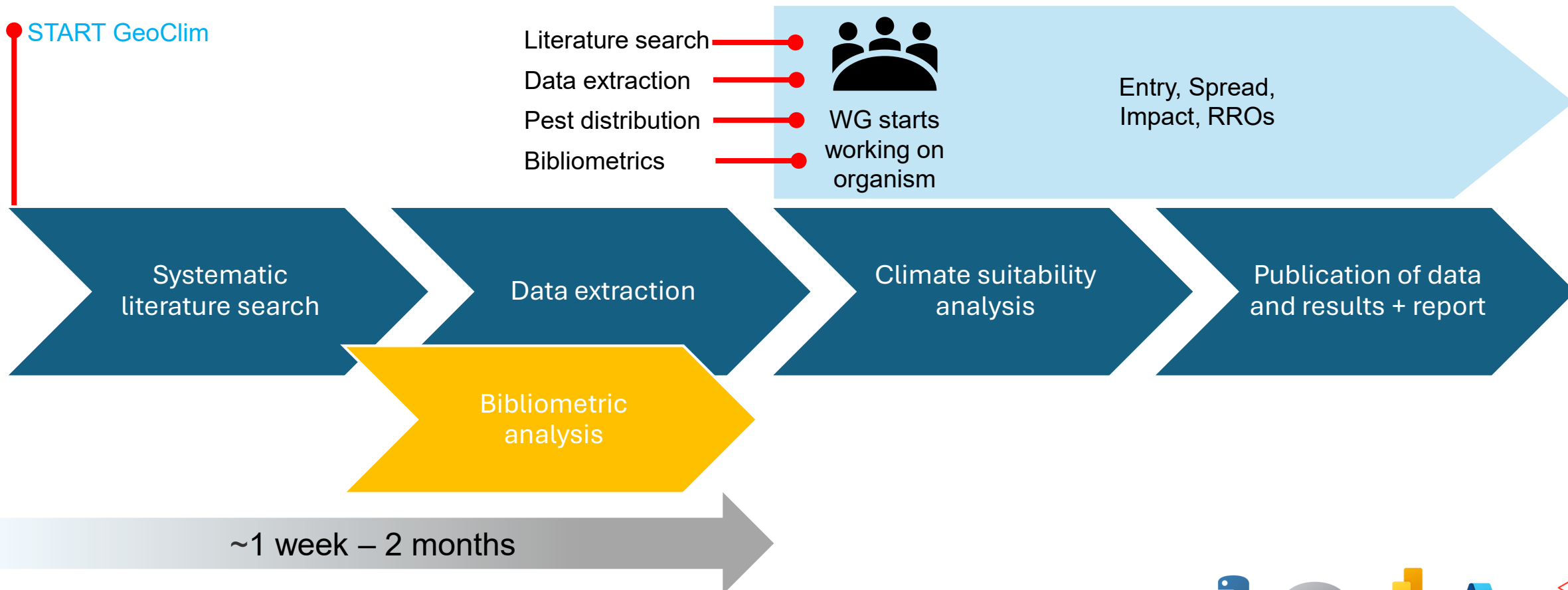


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GeoClim group

A semi-automated workflow from systematic literature search to climate suitability





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Climate Change and
Phytosanitary Issues

From systematic literature search to bibliometrics





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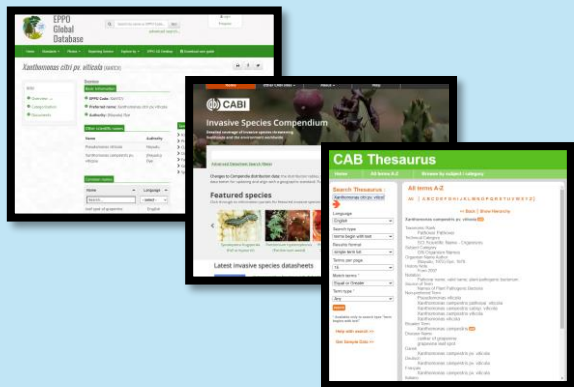
Climate Change and Phytosanitary Issues

Literature Search

Very generic search string using scientific name(s) and international common names from EPPO and CABI



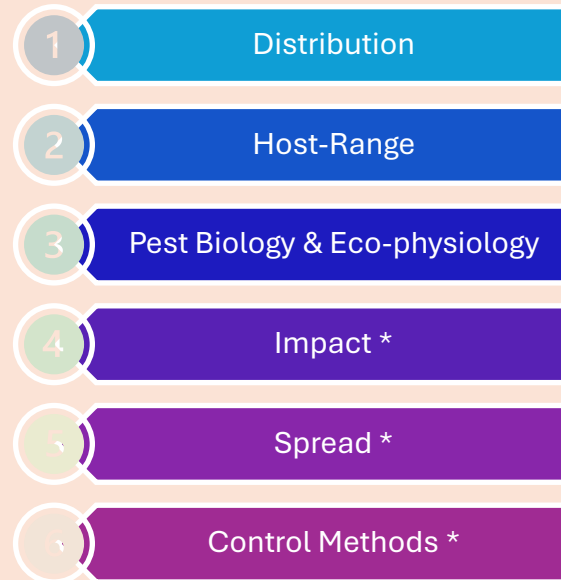
Check on other databases + info from experts



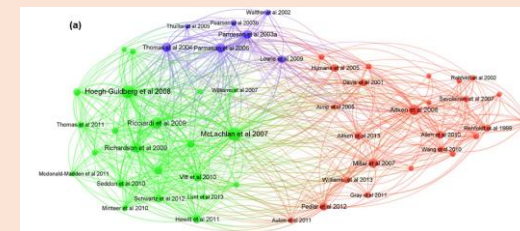
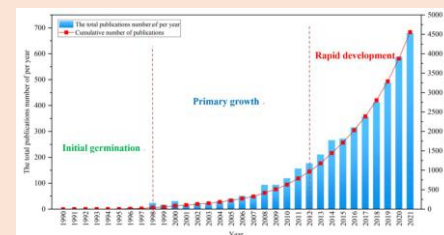
Data extraction

Two-Level screening:

- Title and Abstract
- Full Text



Bibliometric analysis (under development)





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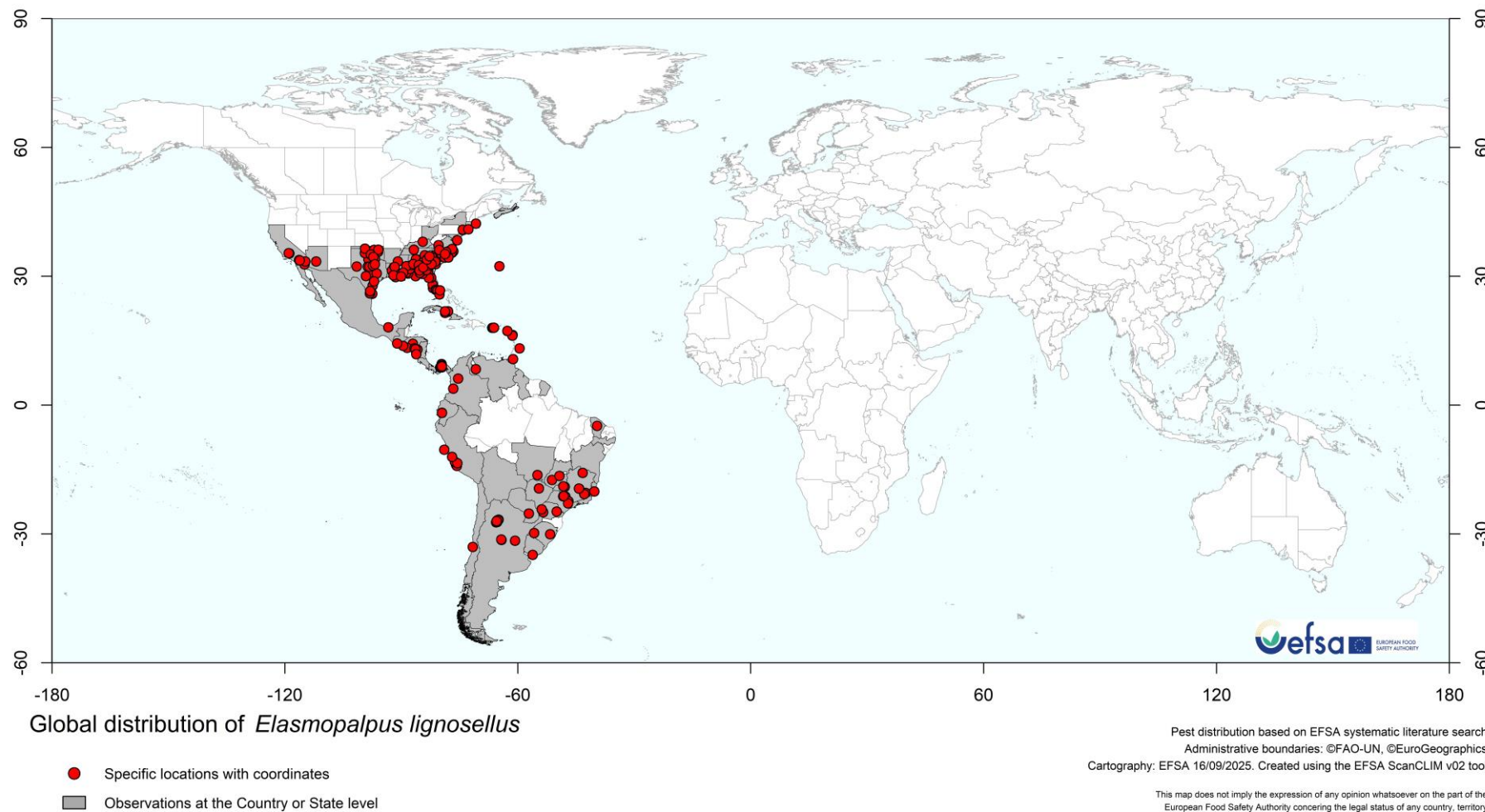
EFSA Global pest distribution

Elasmopalpus lignosellus (EFSA, 2023)
Leucinodes orbonalis (EFSA, 2023)





The lesser corn borer *Elasmopalpus lignosellus*



David Riley, University of Georgia, Bugwood.org

Pyralidae

Polyphagous, including asparagus, maize, sugarcane, peanuts, wheat, sorghum, ...

Larvae boring in stems or roots

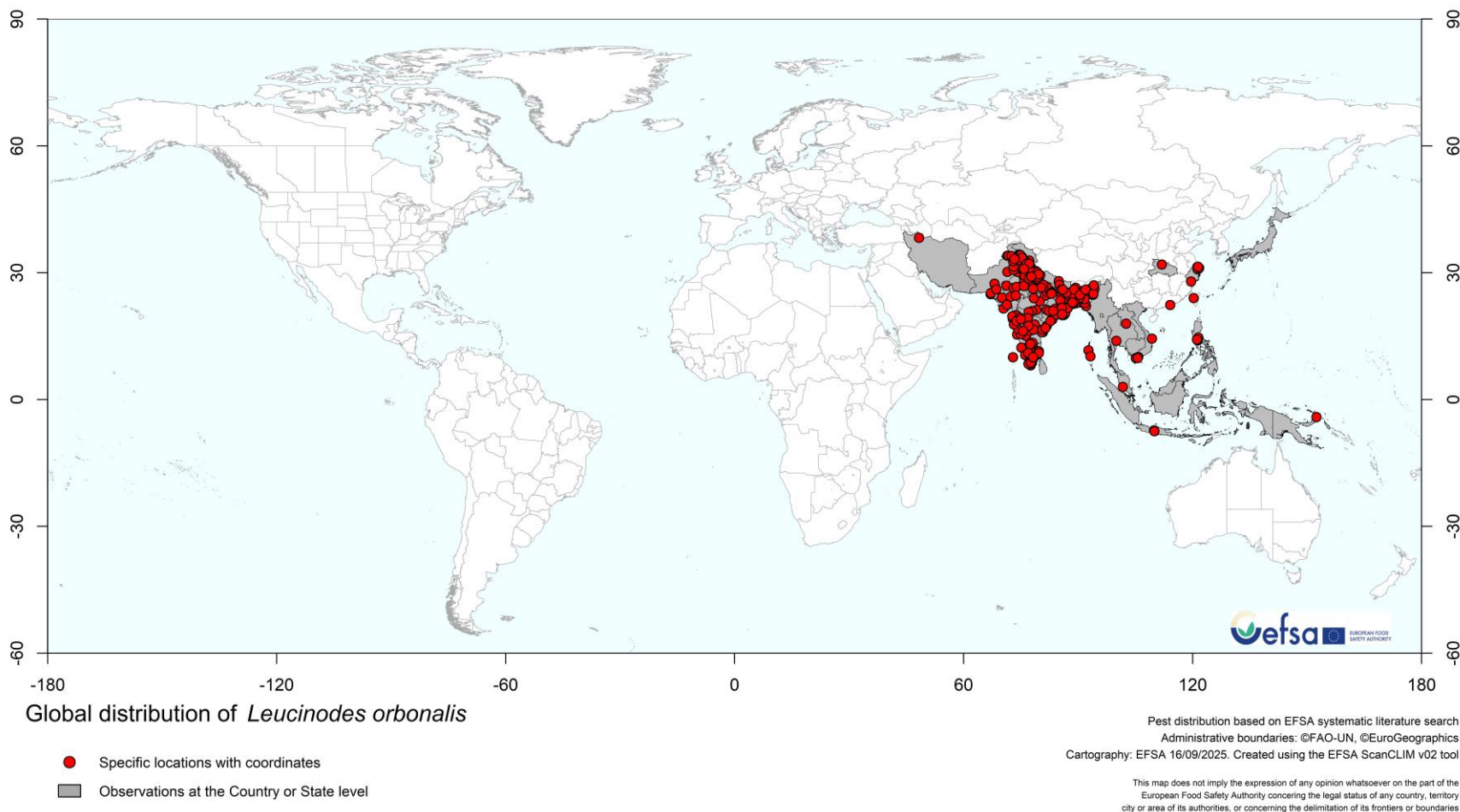
Found in semi-arid, tropical and subtropical areas of North, Central, and South America



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The eggplant fruit and shoot borer, *Leucinodes orbonalis*



Kurt Ahlmark, Microlepidoptera on
Solanaceae, USDA APHIS PPQ, Bugwood.org

Oligophagous on Solanaceae
Most impacted host: Eggplants
Present in tropical and sub-tropical areas
of Asia with India and Bangladesh thought
to be its centre of origin

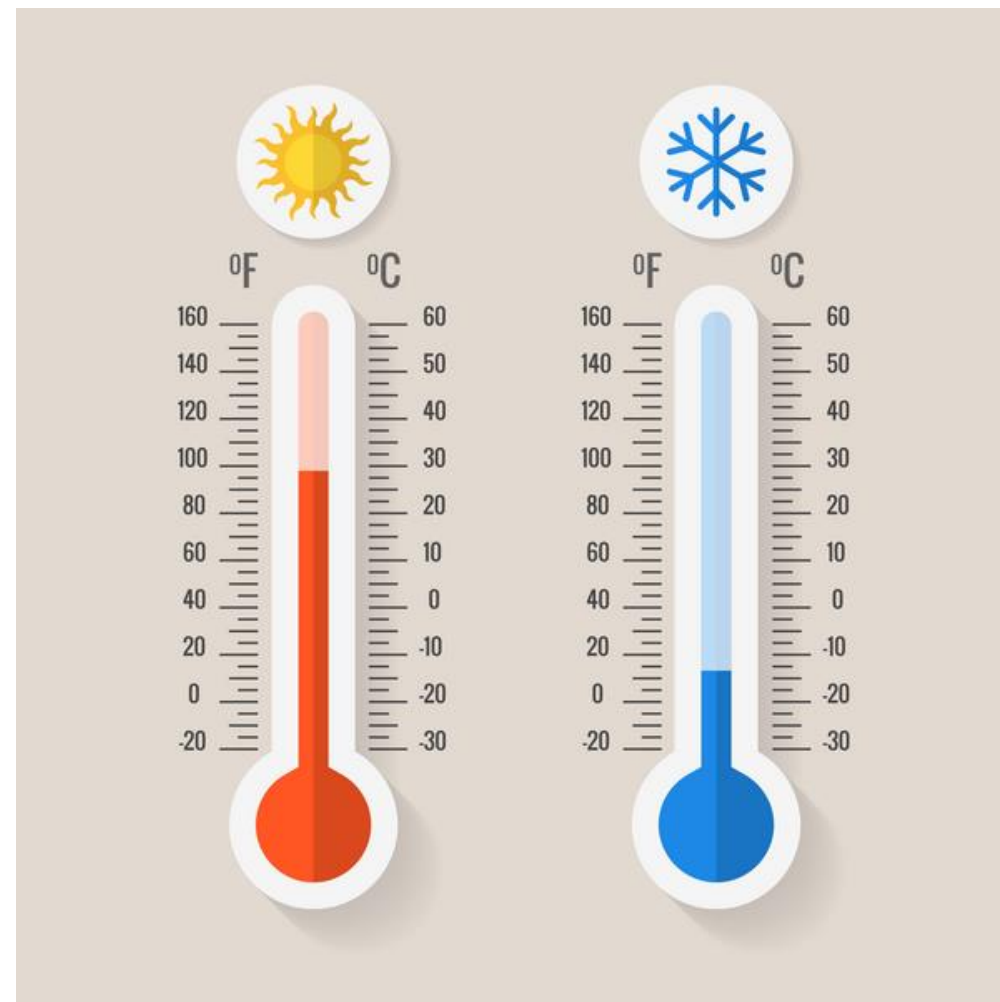


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Climate suitability and climate change

Elasmopalpus lignosellus
Leucinodes orbonalis





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Climate Change and Phytosanitary Issues

Climate suitability

CLIMEX model (version 4.1.0.0, Kriticos et al., 2015)

Ecoclimatic index: 0 - 100

Observed climate data: 30 years centered on 1995 (Climate Research Unit, UK)

Climate change

Relatively near-term period (2040-2059)

RCP8.5, «business as usual»

Data from four regional climate models: ACCESS 1.0, CNRM-CM5, GFDL-ESM-2M, NorESM1-M

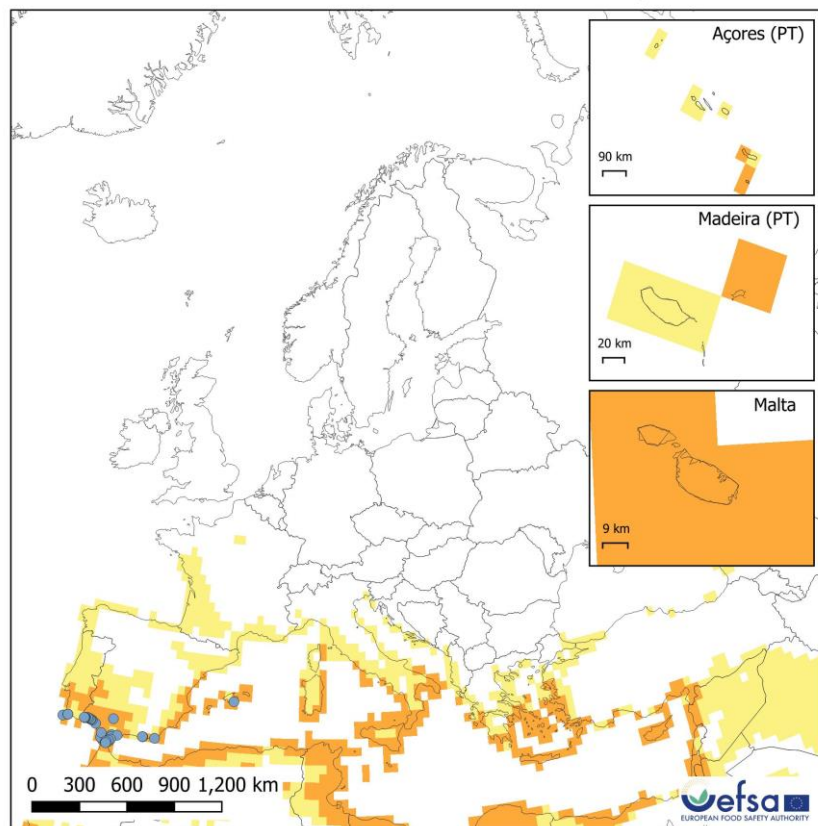
Input to CLIMEX → Average of Els





Leucinodes orbonalis

CLIMEX Ecoclimatic Index in Europe



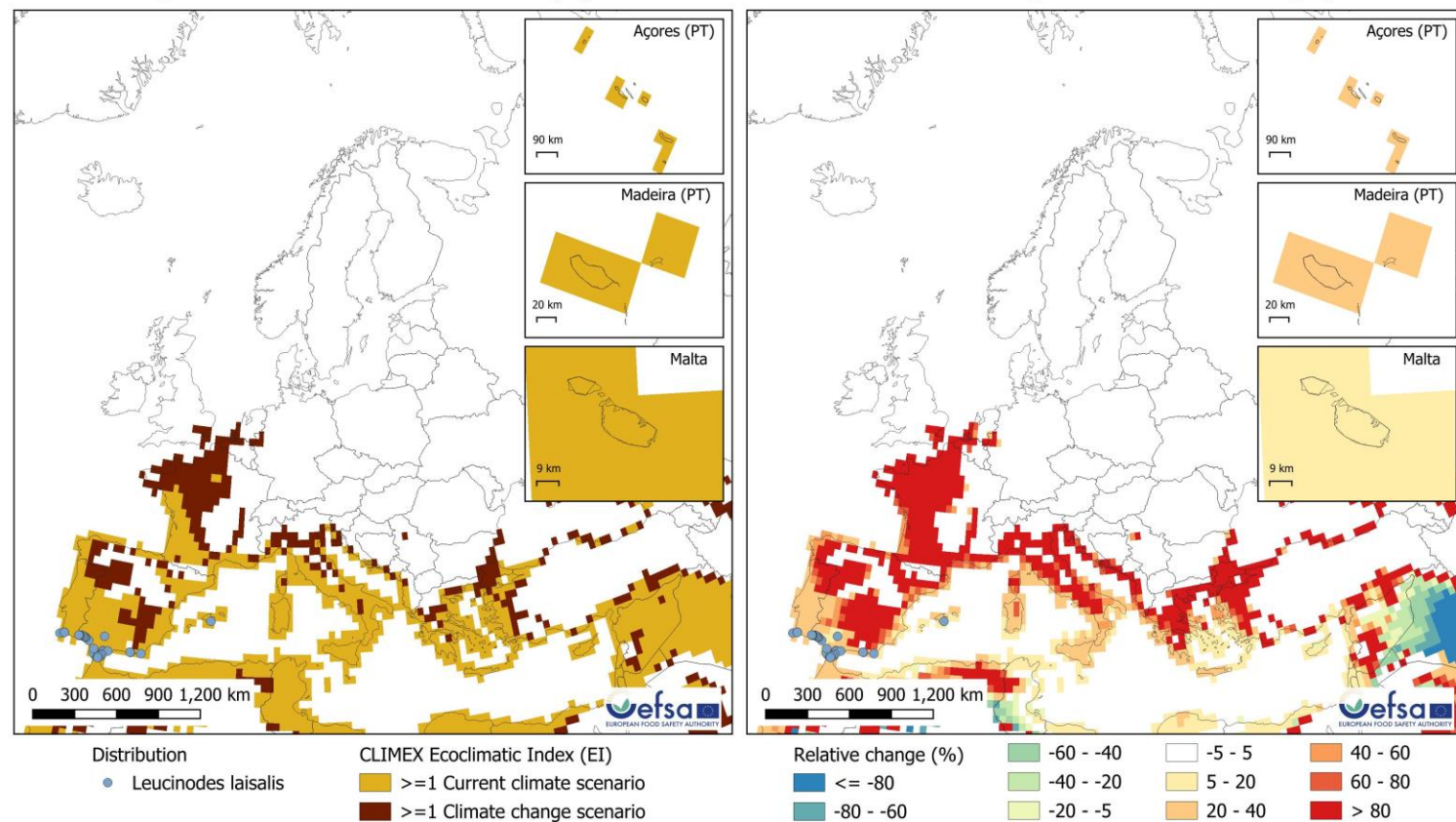
Distribution
• *L. laisalis*

CLIMEX Ecoclimatic Index (EI)
 <1
 1 - 30
 30 - 75
 75 - 100

CLIMATE CHANGE (2040 – 2059)

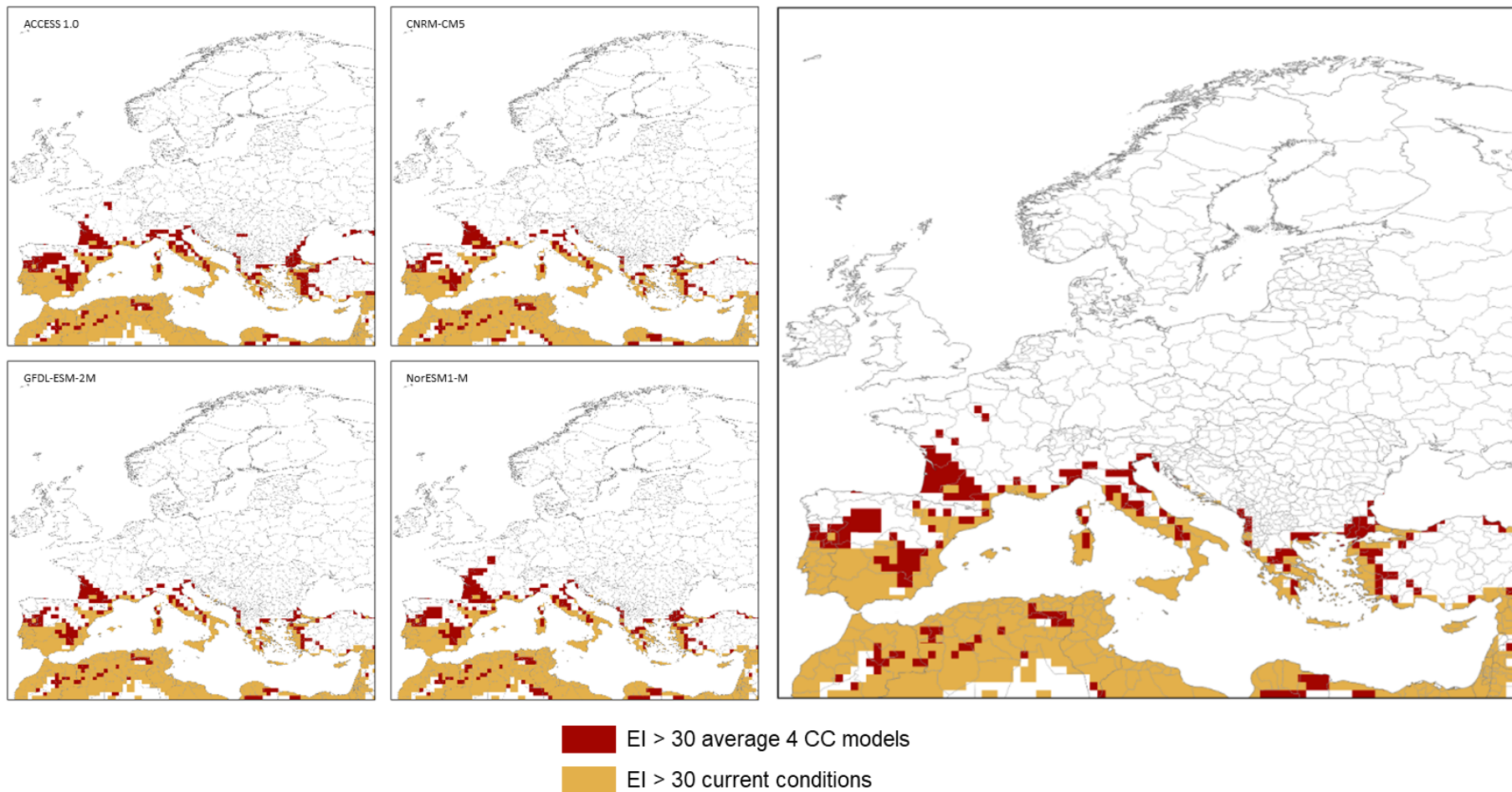
Change in Areas with Ecoclimatic Index (EI) ≥ 1

Relative change in Ecoclimatic Index (%)





Elasmopalpus lignosellus





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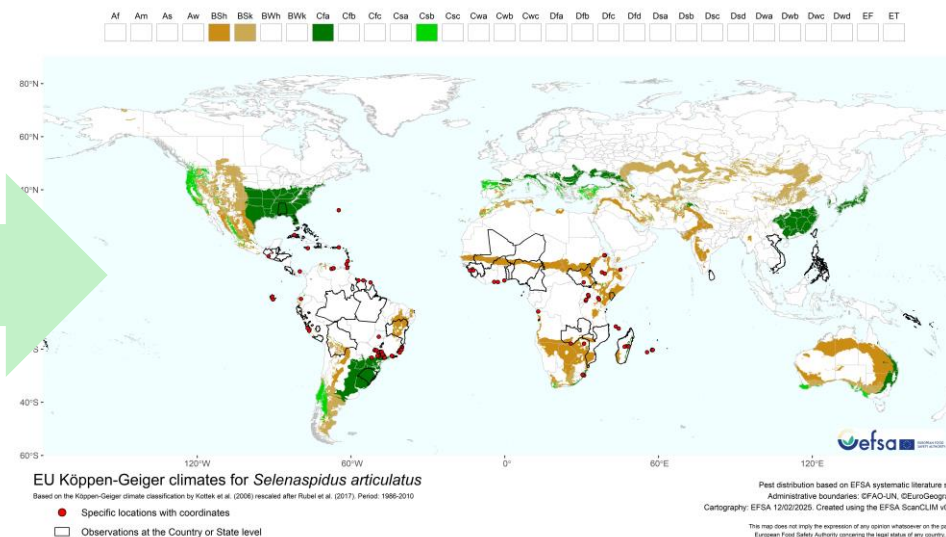
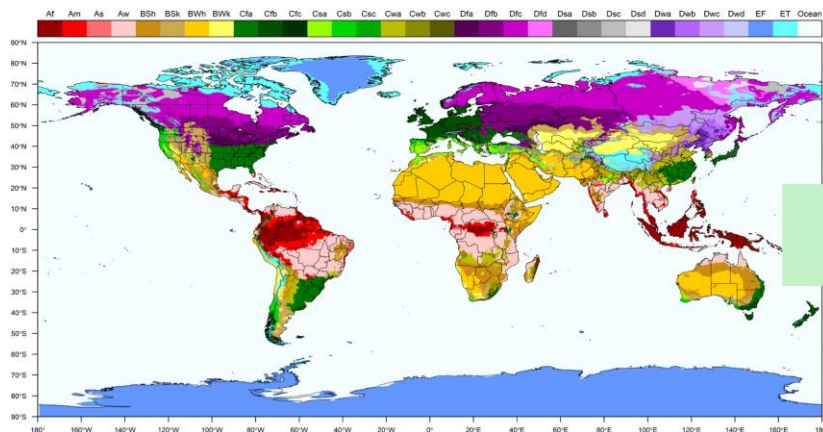
Continuous development and strategic framework evolutions





Development of user-friendly tools to support analysis: SCANClim

Identifies and maps Köppen-Geiger climate types suitable for the organism based on its distribution, including under climate change



Old version available: [Source code](#)

Web based tool: EFSA [R4EU \(ClimMAP tool, select SCAN-Clim tab\)](#)

**New version soon
available!**



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Climate Change and Phytosanitary Issues

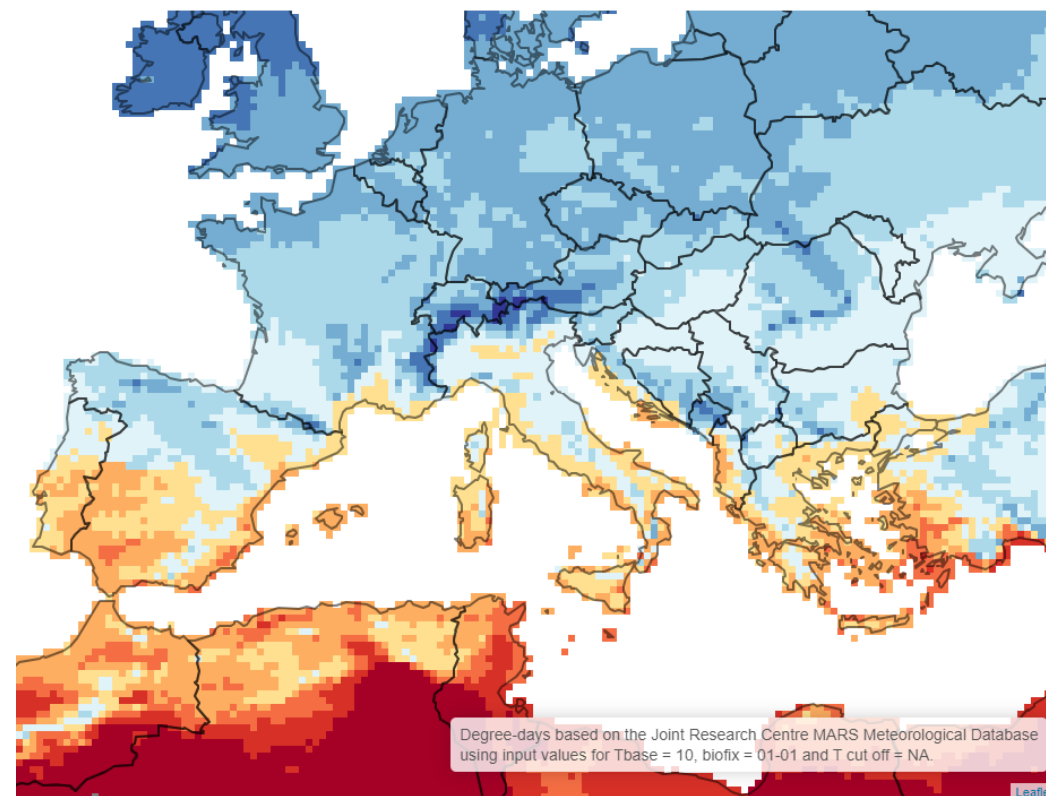
Development of user-friendly tools to support analysis: DD-Map



Biofix		Cutoff temperature for organism development	Insect Generations
<input type="text" value="01-01"/>		<input type="text"/>	
Start year	Ending year	Base temperature for organism development	
<input type="text" value="2017"/>	<input type="text" value="2020"/>	<input type="text" value="10"/>	

Links:

Web based tool [R4EU \(ClimMAP tool, select ClimMAP tab\)](#)





Strategic framework evolution: the SEED Project

Spatially **E**xplicit **E**nvironmental **D**ata



Operational cloud-based, user-friendly digital services to:

- support mapping of agro-climatic indicators and bioclim
- running simulation models
- visualizing geospatial products of EFSA Risk Assessments



Findable, Accessible, Interoperable and Reusable (FAIR) models and datasets



Collaborative cloud platform for EFSA experts and scientific contractors for geospatial data analysis and modelling

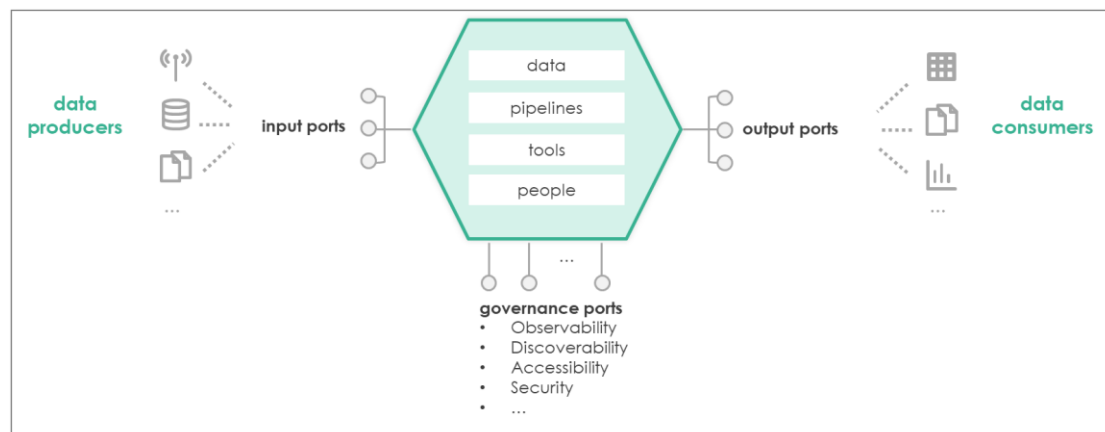


Analysis, indicators, bioclim and climate classification based on observed and projected **climate data series from EU Copernicus Programme and ECMWF**





SEED, a collaborative cloud platform for scientific development and improvement of risk assessment: faster, reproducible, extensible, transparent



- EFSA scientific units, scientific expert and/or scientific contractors can **use, develop and/or implement** models, geospatial data analysis, map visualization
- **collaborative and secure environment** based on Databricks® (development in Python, R)
- Models and data are managed → **reproducible and auditable**
- Tools, analysis, and models are **extensible**



databricks



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Climate Change and
Phytosanitary Issues

SEED: Enhancing collaboration!!



Very soon:

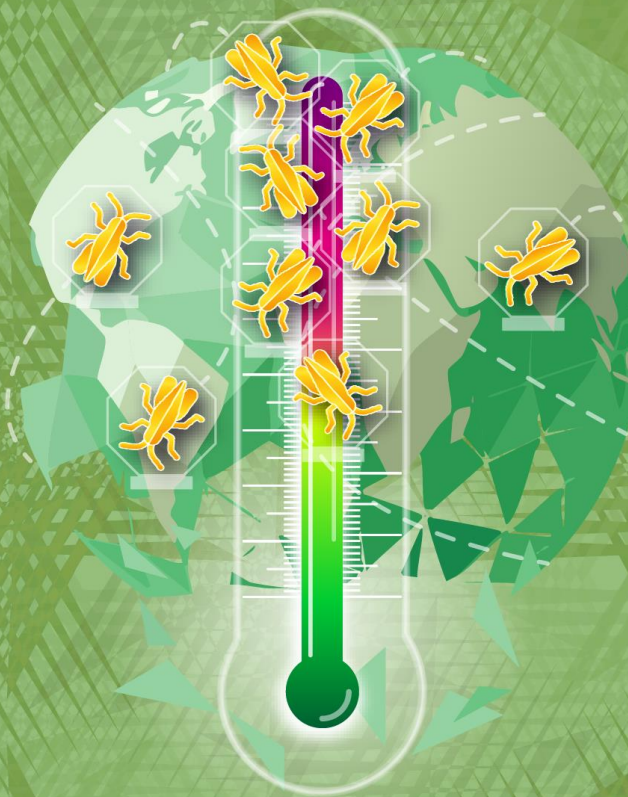
Grant call for development/implementation of
Generic simulation models for climate
suitability analysis of new and emerging plant
pests

STAY TUNED!

IPPC Webinar Series

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Thank you!!

Andrea Maiorano

European Food Safety Authority (EFSA)

andrea.maiorano@efsa.europa.eu