

What's the Buzz About?

A closer look into Colony Collapse Disorder and beekeeping suitability in Europe

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Projection: Lambert Azimuthal Equal Area

Vanishing Bees

Bees have experienced unusually high declining population rates. This phenomenon that has been occurring is referred to as Colony Collapse Disorder. The objective of this project is to visually represent countries where Colony Collapse Disorder is prevalent in Europe and compare it to environmental factors in those countries that could account for the decline in bee populations. This project also shows the suitability of bee keeping in Europe in order to compare bee loss rates with the suitability of bee keeping in Europe.



Bees help pollinate at least 30% of the crops that produce food we eat, and 90% of the wild plants in the world.

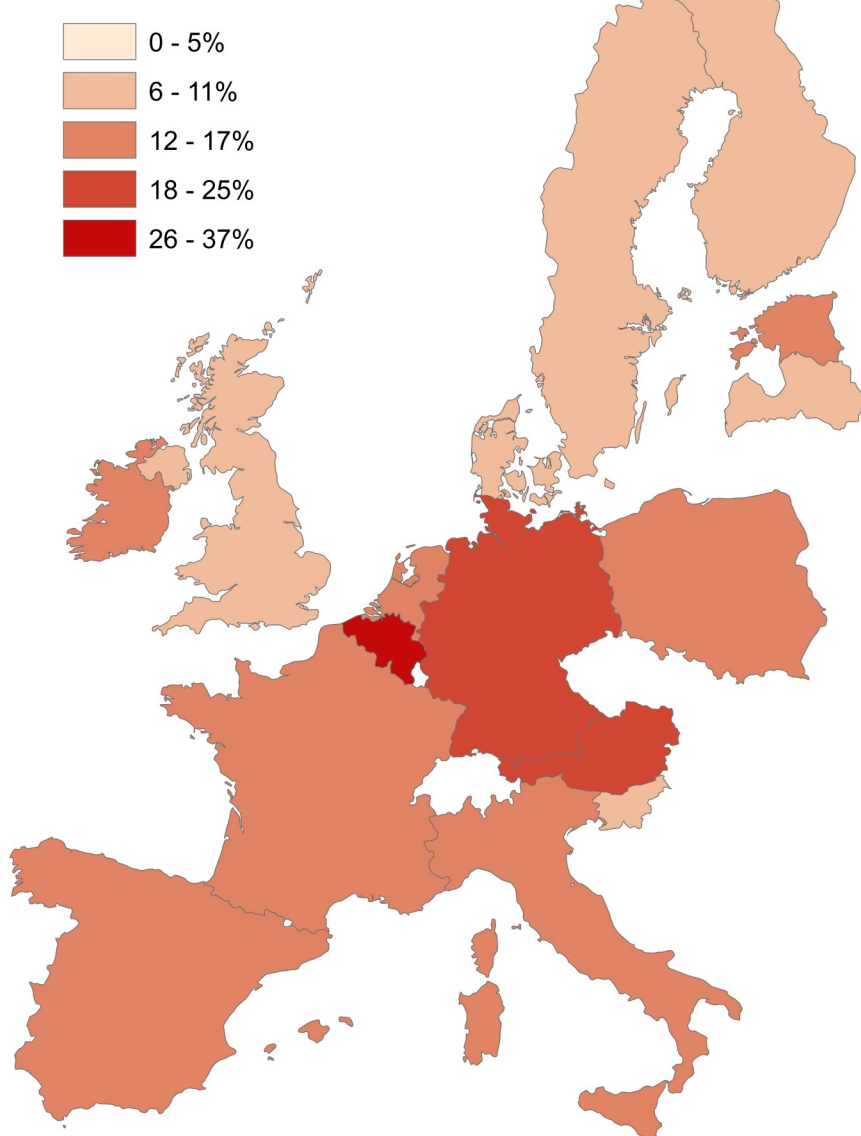
Suitability

We created a suitability map to determine if there was a correlation between the bee loss rates in each country and how adequate the country was for beekeeping. The factors used to determine the suitability were maximum temperatures, precipitation levels, land cover, and pesticide use. Maximum temperatures, precipitation and land cover were all raster files. Each raster was clipped to only keep data pertaining to the section of Europe we have bee data on. Each raster was then reclassified based on the importance of the suitability factor. Raster math then added the datasets used in suitability to find overall suitability.

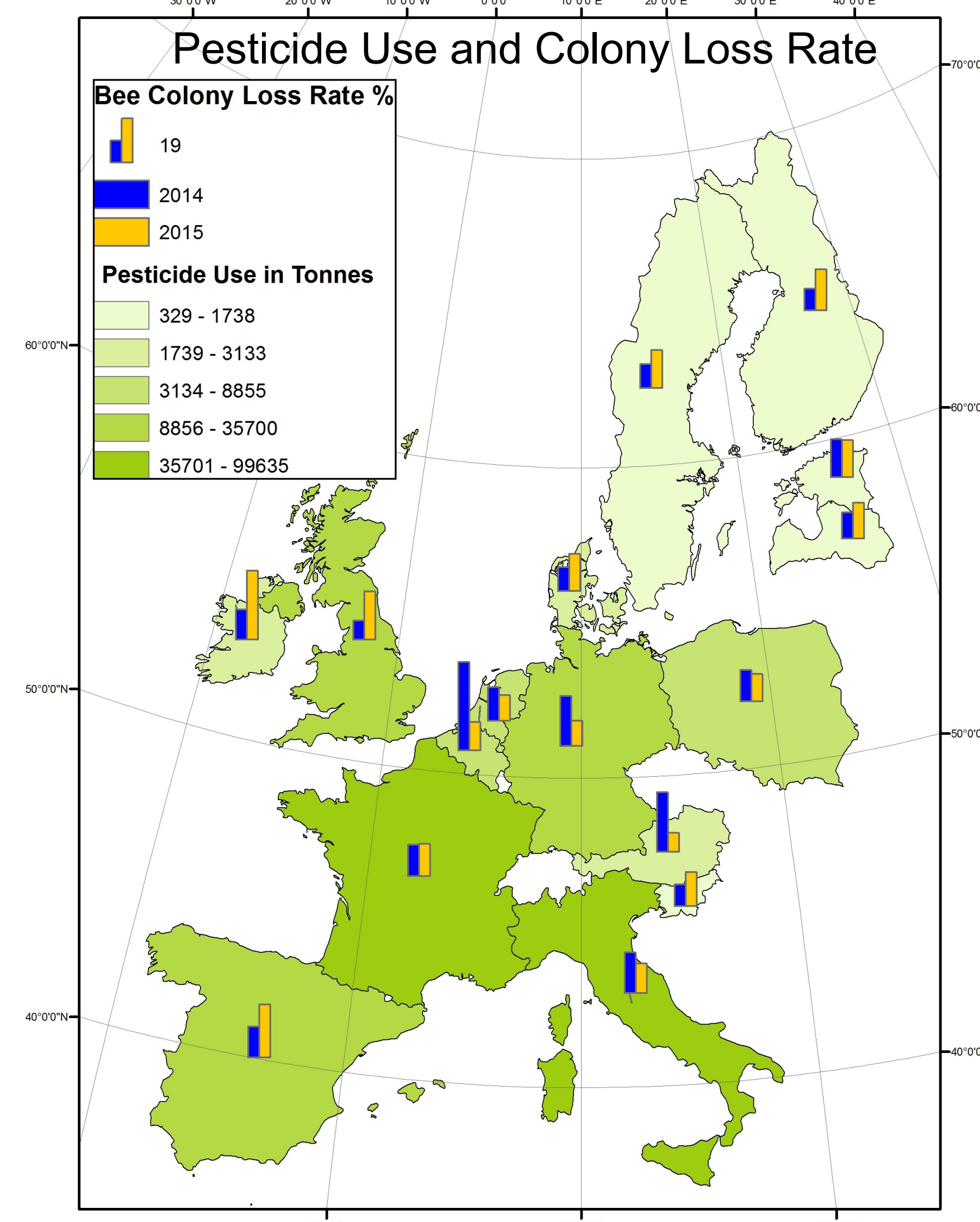
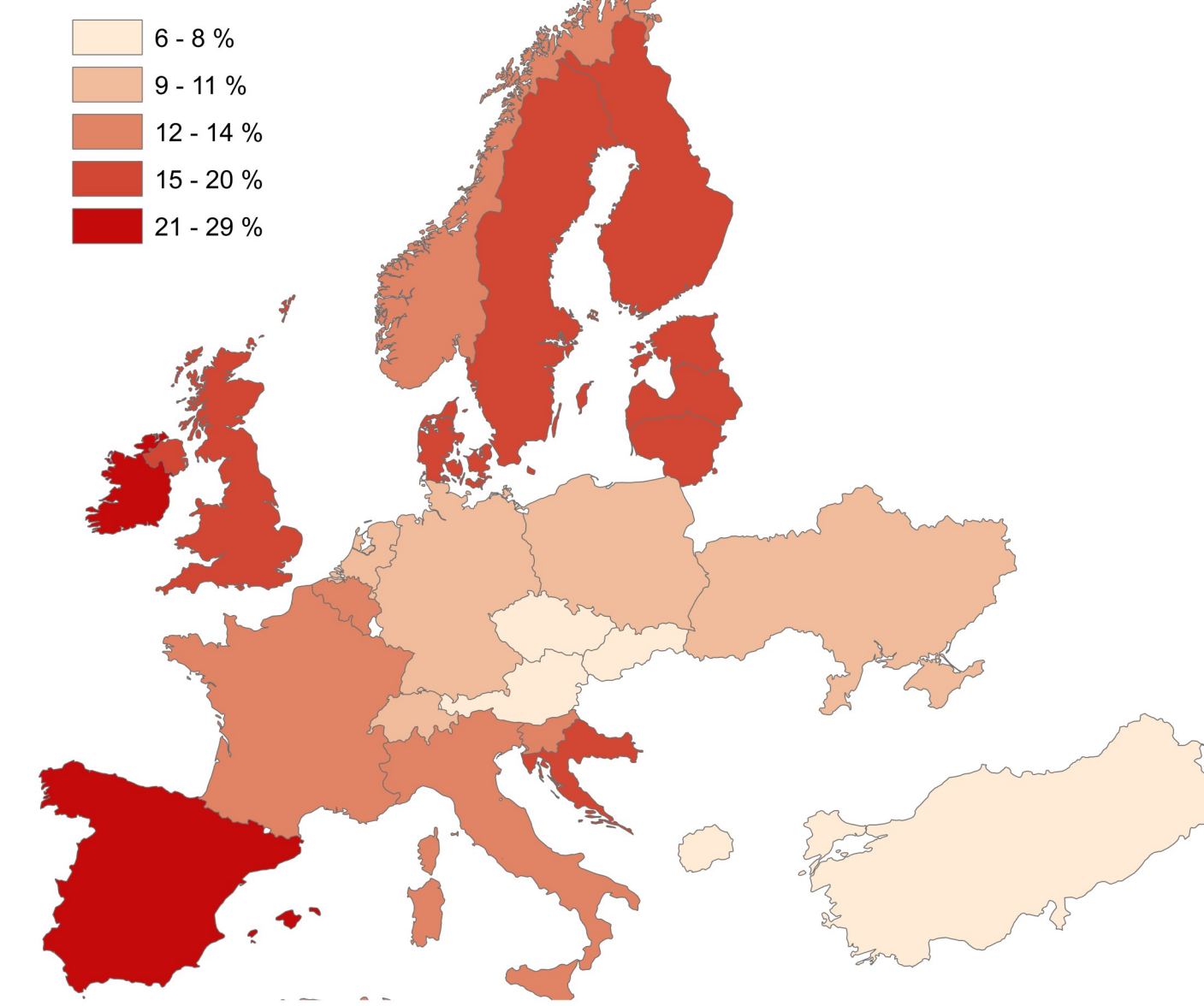
Current Pesticide Use and Bee Loss Rates In Europe

Data on Europe beekeeping from 2014 and 2015 were used to create a polygon layer that shows the bee loss rates for each country of Europe. Pesticide data from Eurostat was used to create a polygon layer with each country assigned the amount of pesticide used. This was normalized based on the square footage of the country. We superimposed a bar chart showing a breakdown of the bee loss rates in 2014 and 2015 in each country and pesticide use. This shows if there is a correlation between bee loss rates and pesticide use.

2014 Bee Colony Loss Rate



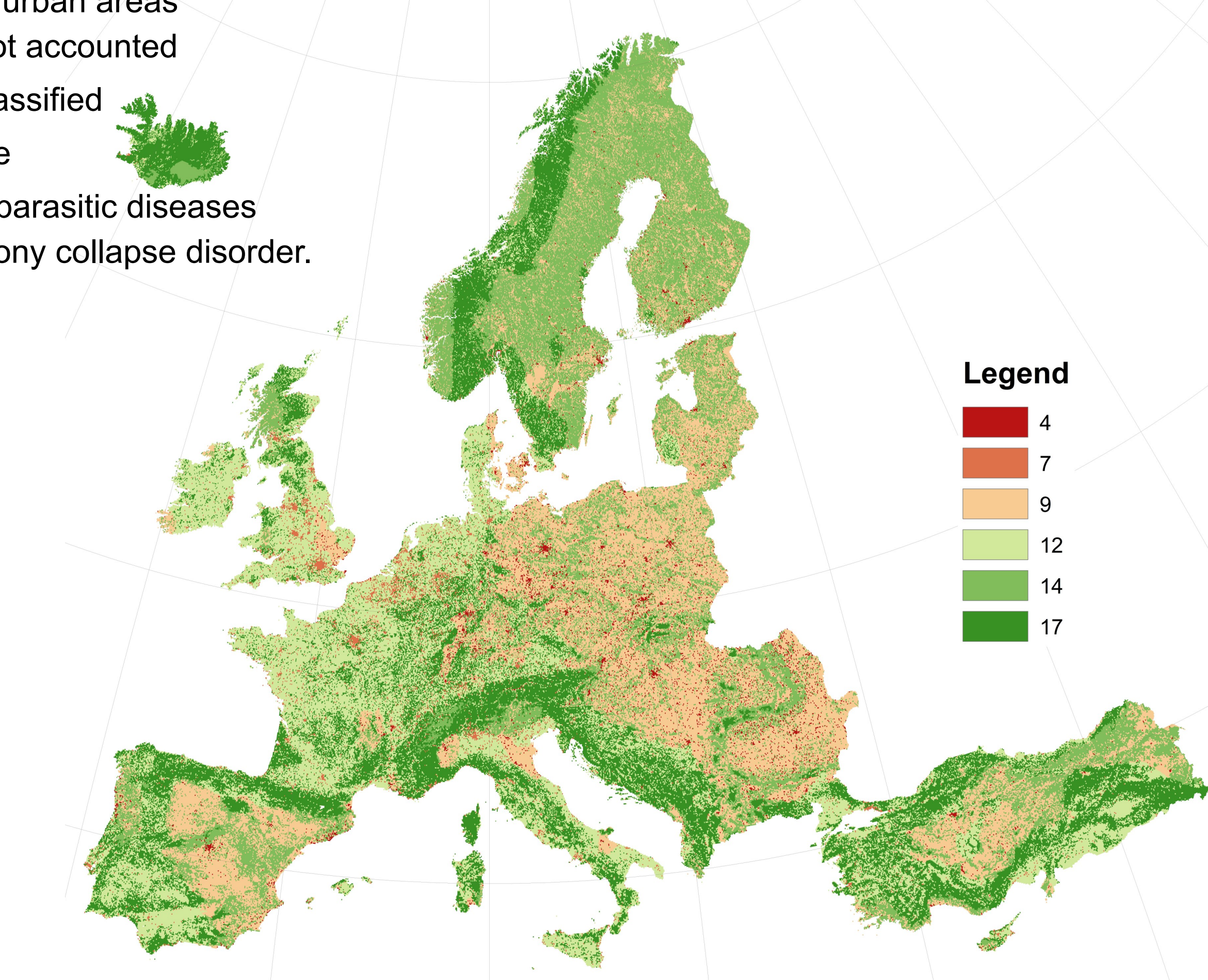
2015 Bee Colony Loss Rate



Conclusions

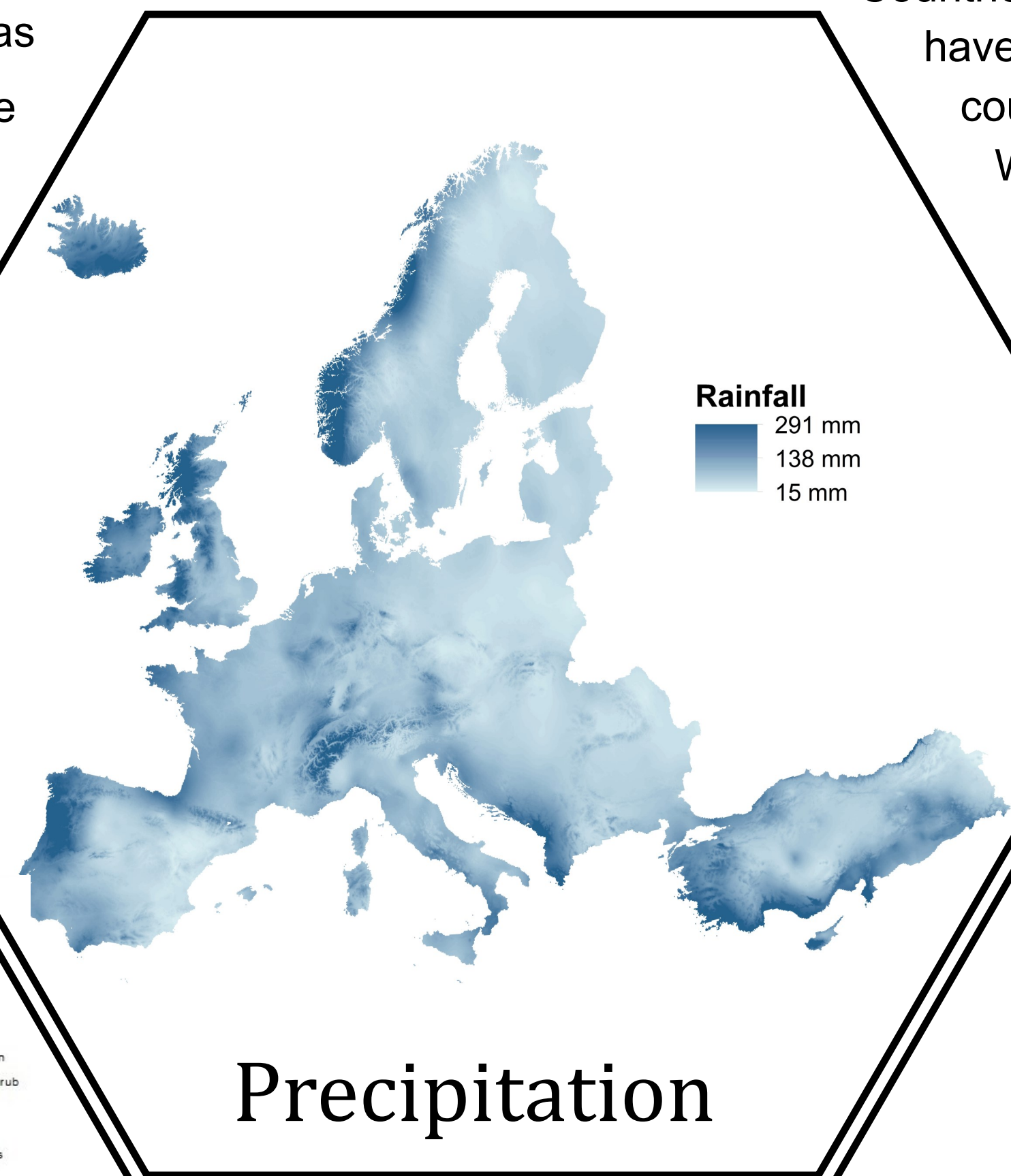
Countries in Europe that use more than 3000 Tonnes of pesticide per square foot tend to have higher bee loss rates. However, the graphs from 2014 and 2015 show that countries experiencing high levels of bee loss are not consistent from year to year. While many factors such as land cover, pesticide use and temperature help determine the suitability of bees, recent studies have shown that urban areas with floral diversity are most suitable for bee keeping. This is not accounted for in our studies because urban, artificial surfaces were reclassified as unsuitable. Further studies that take into account a more in-depth urban analysis, pesticide use, habitat loss, and parasitic diseases in bees might give insight on the recent increase in colony collapse disorder.

Overall Suitability

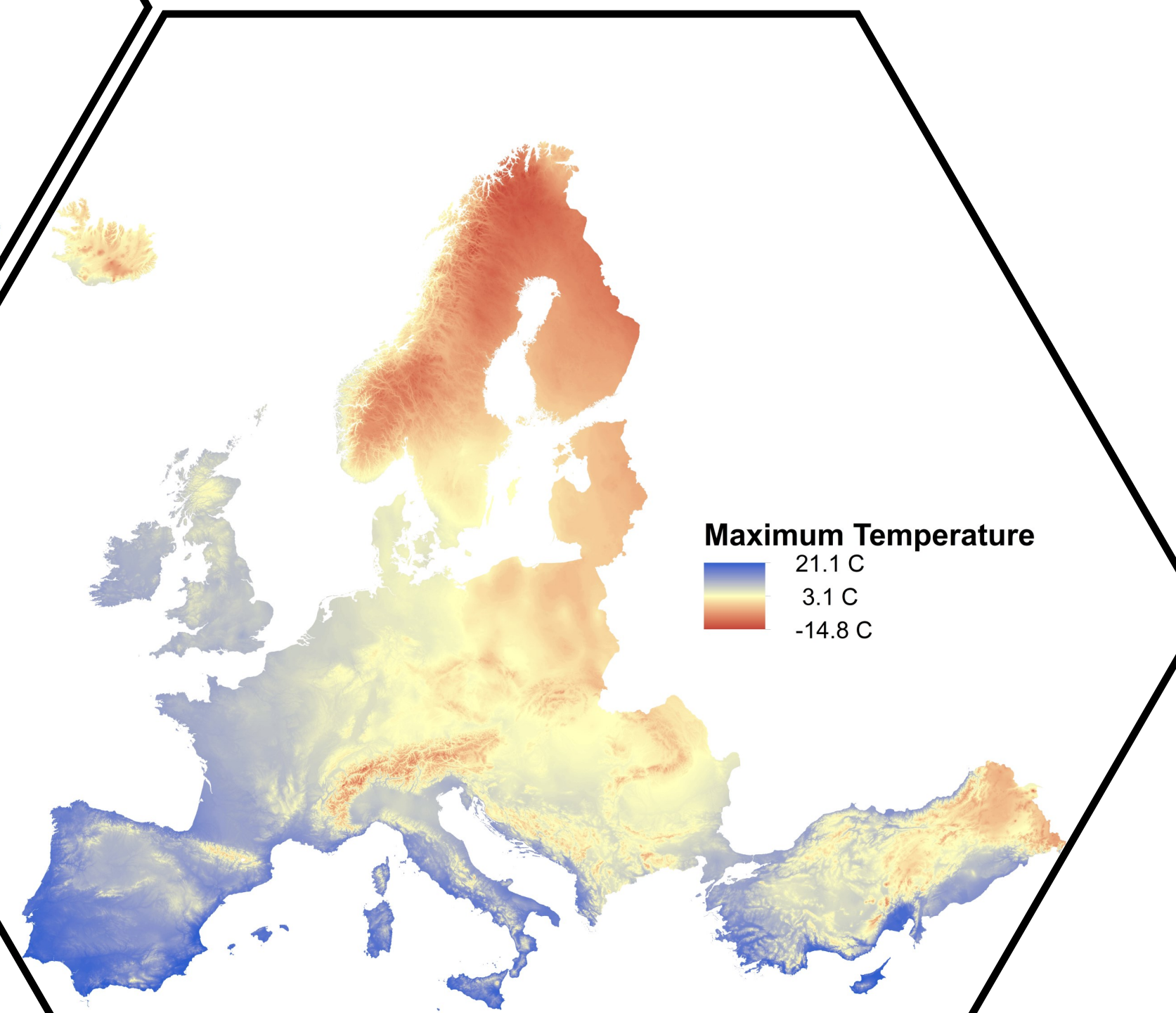


Suitability = Maximum Temperature (reclassified) + Precipitation (reclassified) + Land Cover (reclassified) – Pesticide Use

Precipitation

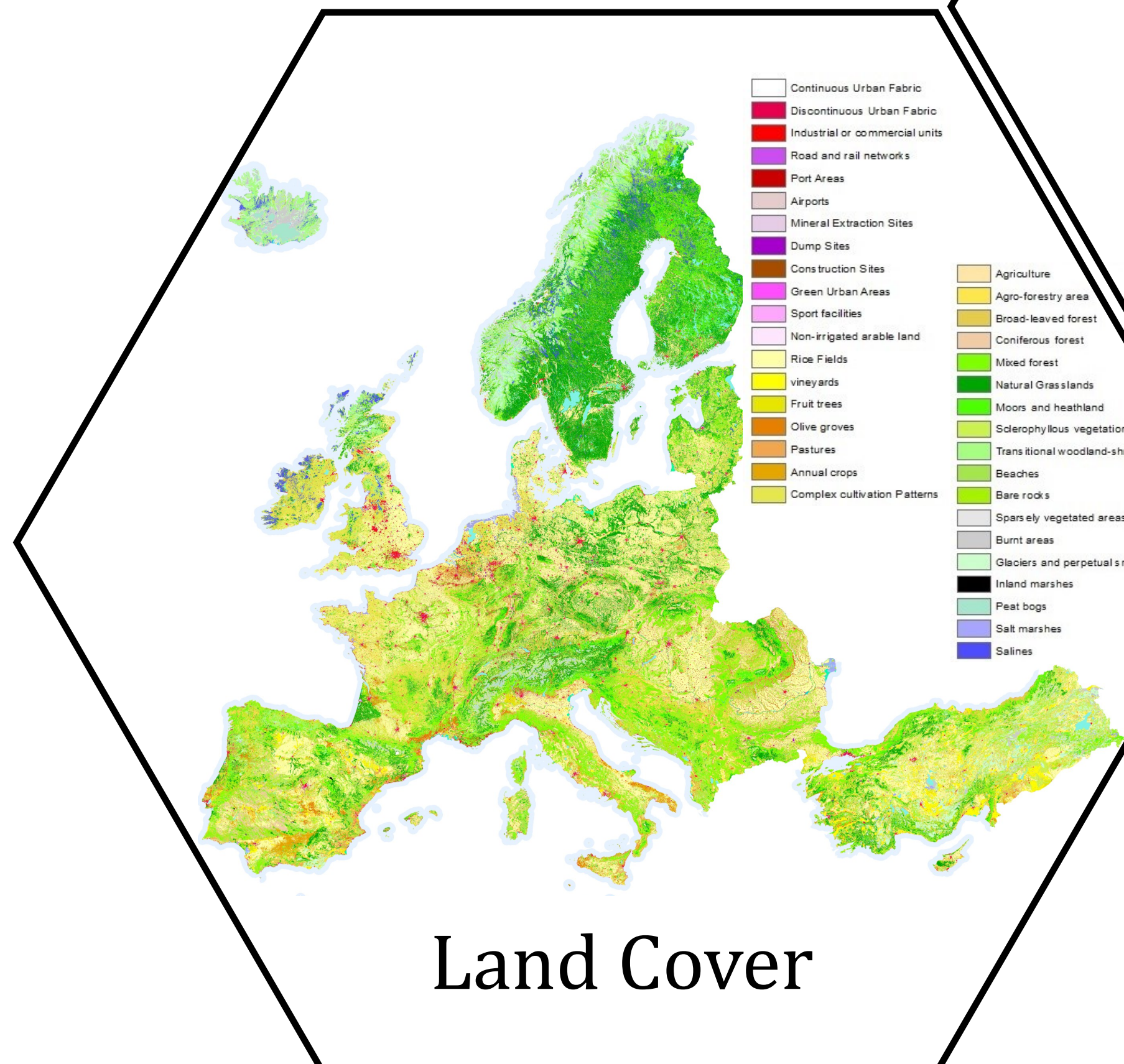


Maximum Temperature



Temperature

Land Cover



Data set	Range	Description
Land use	Artificial Surfaces	Unsuitable
	Agricultural Areas	More Suitable
	Forests and Wetlands	Suitable
Precipitation	>250mm	Unsuitable
	15-249mm	Suitable
Temperature	>38 C	Unsuitable
	<38 C	Suitable
Pesticide Use	>3000 Tonnes	Unsuitable
	<3000 Tonnes	Suitable