

# Impact of agricultural management changes on the risk for habitat conservation in protected areas in Spain



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- ✓ **Ammonia** is a highly reactive gas emitted mostly from agroecosystems, being fertilized crops one of the main sources.
- ✓ Abating losses of volatilized ammonia is imperative to avoid **detrimental effects** on human and environmental health.
- ✓ Nitrogen deposition (resulting partly from ammonia emissions) causes environmental problems in the form of eutrophication or acidification of natural ecosystems that negatively affect **biodiversity**.



## FRAMEWORK AND OBJECTIVES



AgroGreen-SUDOE is a transnational cooperation project for the design of more sustainable agricultural production strategies, and quantifying the potential environmental impacts in terms of crop management practices in Spanish, French and Portuguese watersheds.

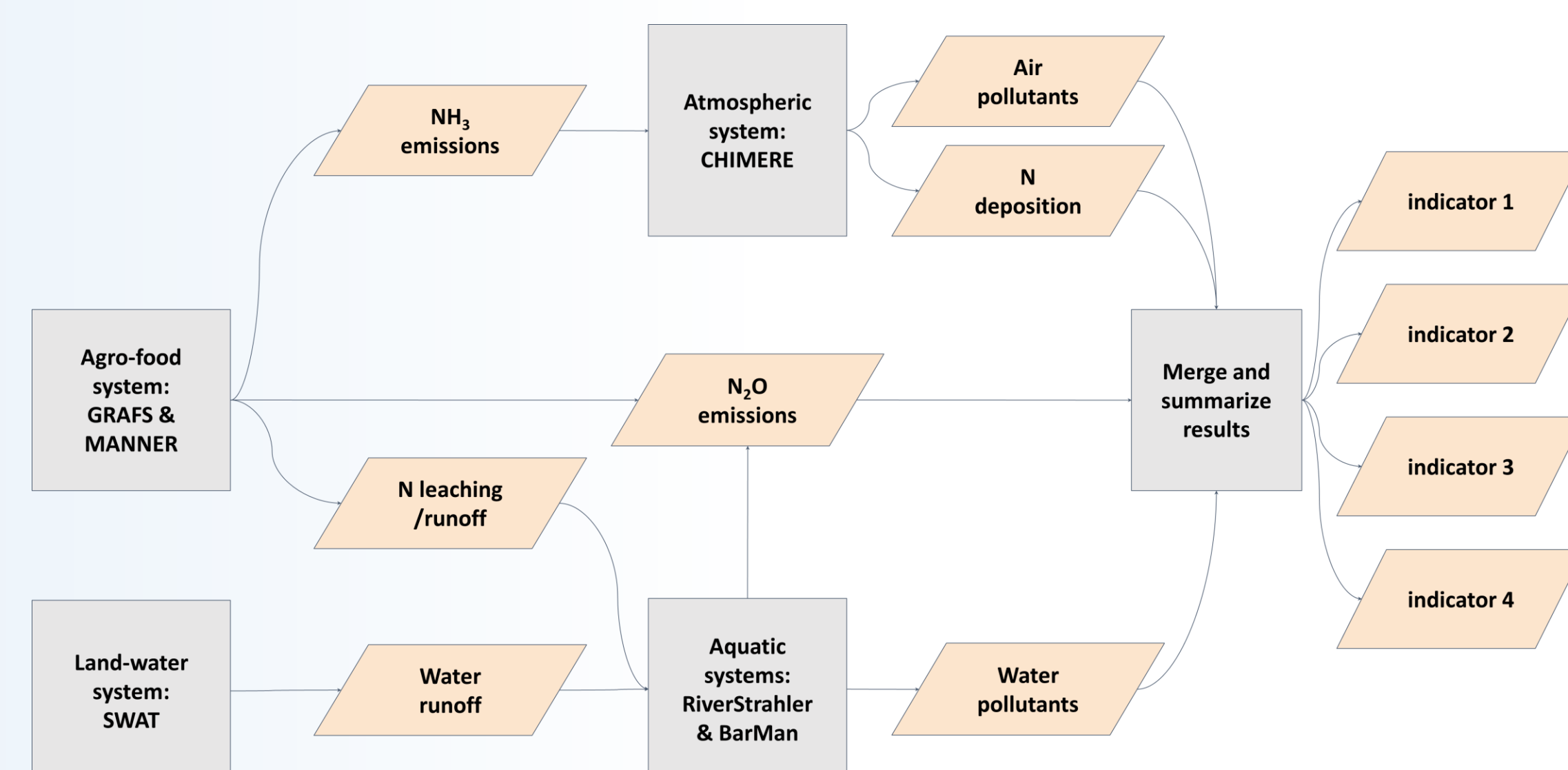
Within the framework of this project, the potential beneficial effects of the different ammonia emission mitigation strategies in terms of biodiversity conservation in Spanish territory will be quantitatively explored.

## METHODOLOGY

### Modeling platform

AgroGreen-SUDOE has developed a platform that favors the confluence of efforts and knowledge in the management of modeling tools that lead to estimate the agri-environmental impacts on water and air quality.

Using modeling tools, modeling experts from the UPM, CIEMAT and CNRS make estimates of the sources, transformation and **fluxes of nutrients** in the agricultural land-river continuum.

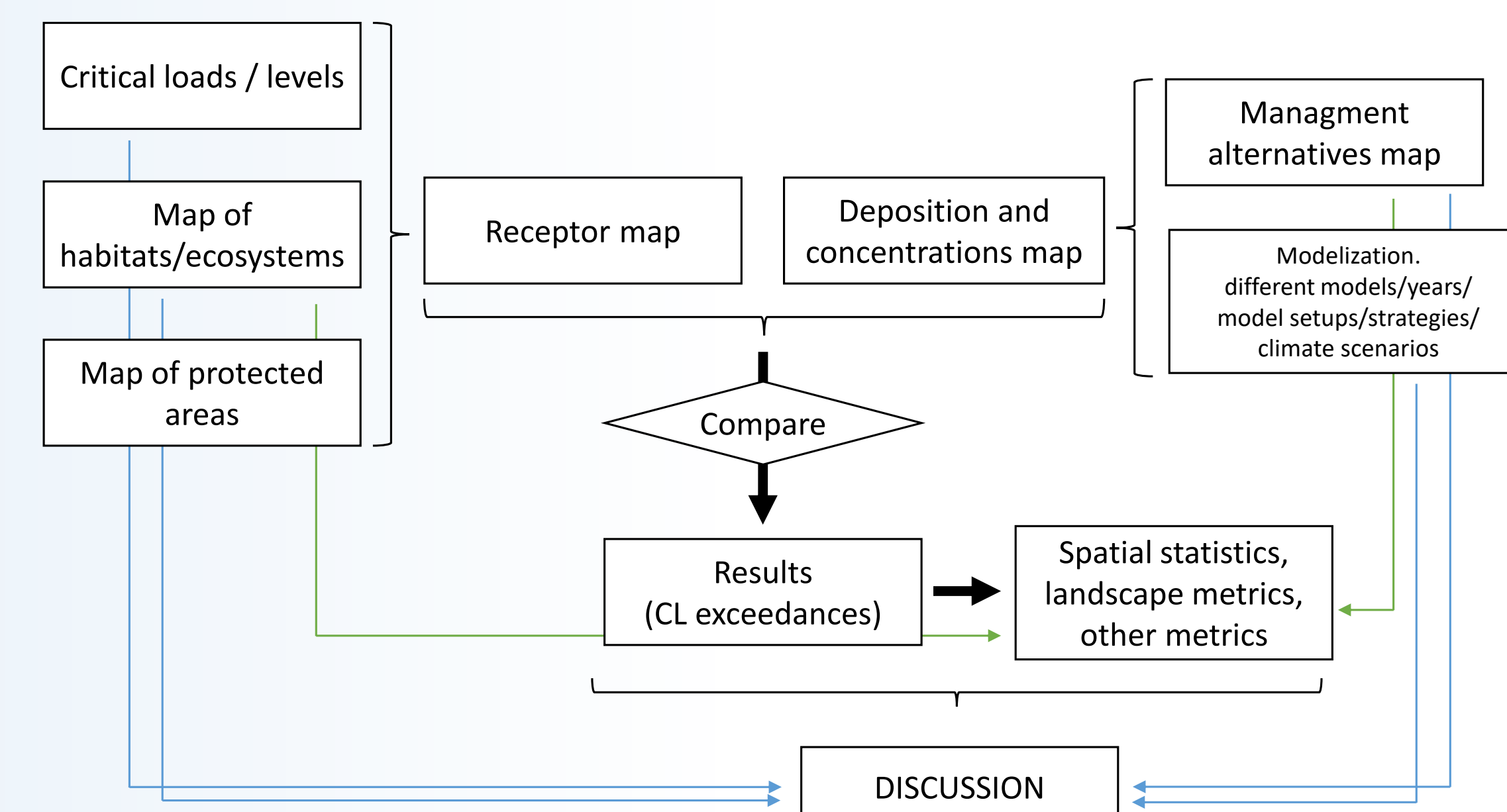


### Risk assessment

The Working Group on Effects of the Air Convention (CLRTAP-UNECE) has developed through international scientific cooperation the methodology of **critical loads** to evaluate the risk that nitrogen (N) deposition -among other atmospheric pollution threats- poses to ecosystems.

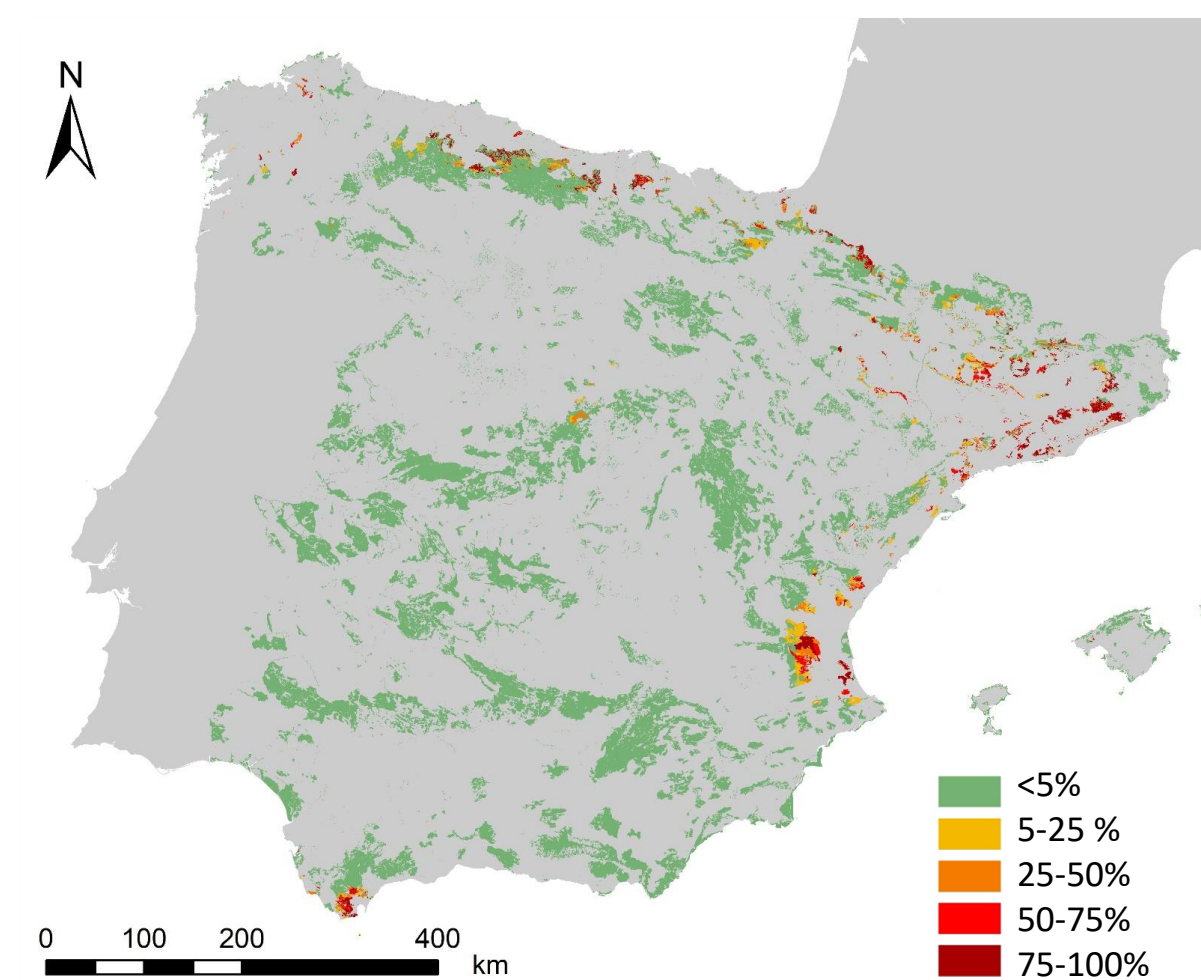
A critical load (CL) is the quantitative estimate of the level of exposure of natural systems to pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge.

Useful indicators from the modelling platform of AgroGreen-SUDOE, such as N deposition, will be used to apply the CL methodology in the Spanish territory.

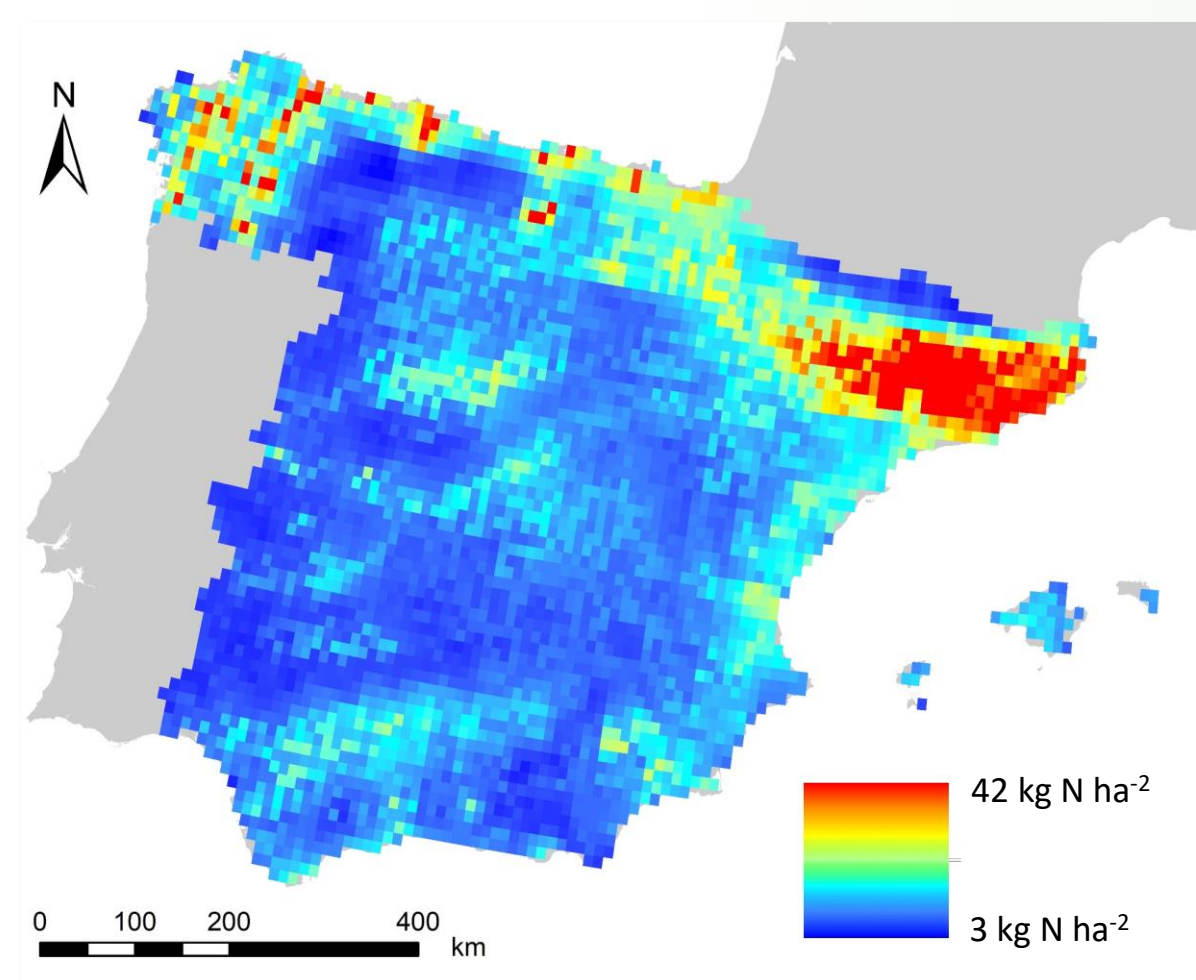


## CURRENT INFORMATION AND NEXT STEPS

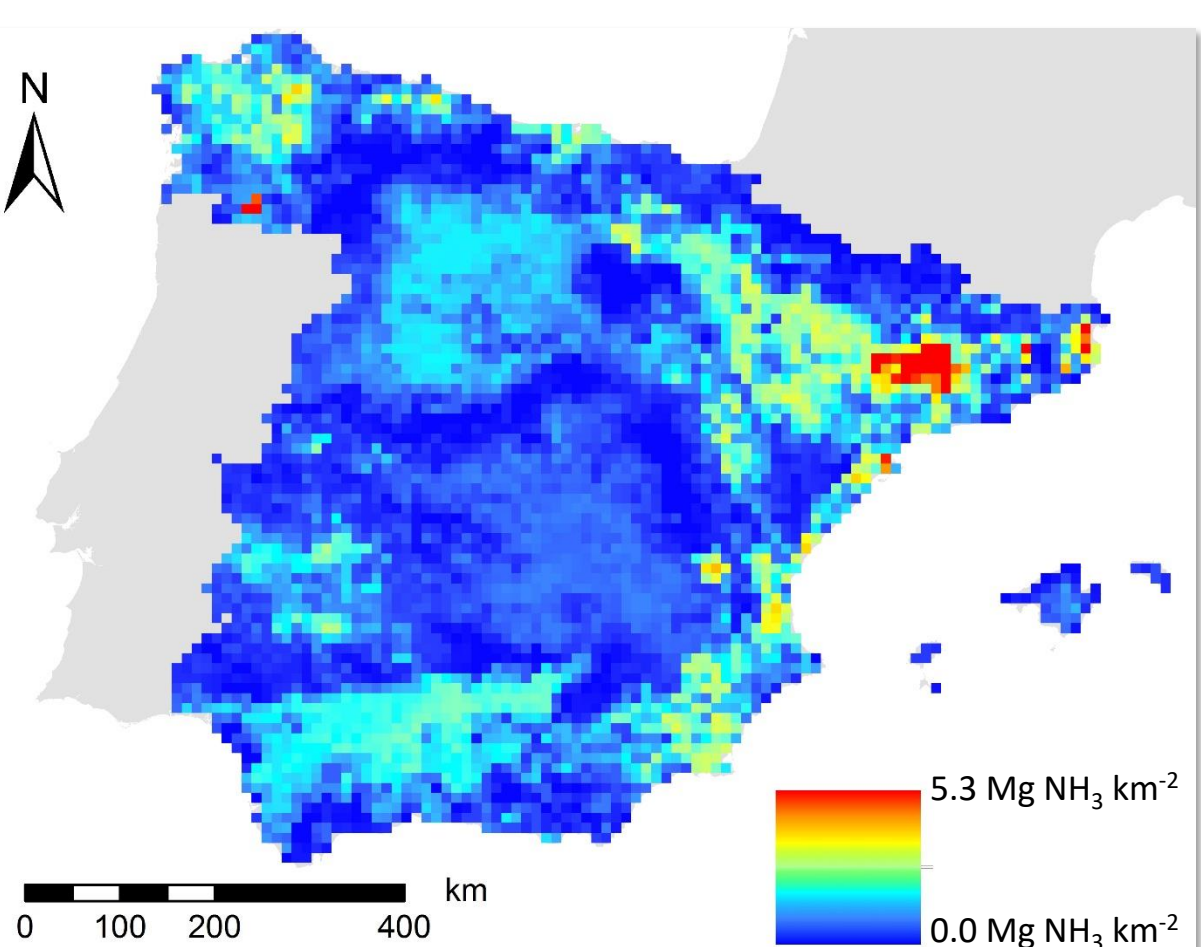
### Area at risk in N2K network



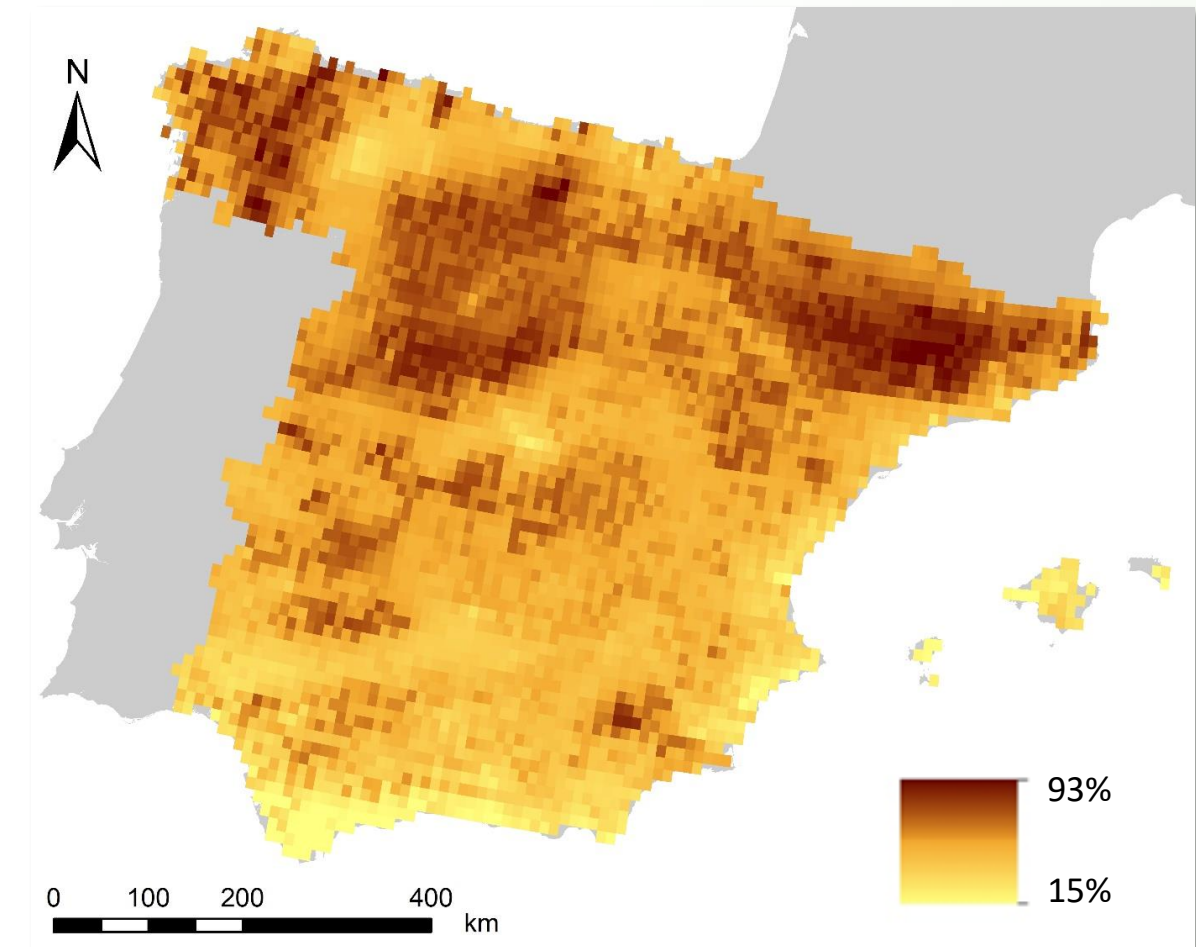
### Nitrogen deposition



### Ammonia emissions



### Share of reduced N in deposition



The most endangered areas within the Natura 2000 network in Spain are represented here by the percentage of the habitat surface showing a positive value of CL exceedance (i.e. where N deposition is greater than the habitat-specific CL).

The regions of high ammonia emissions in Spain coincide spatially (to a great extent) with the areas in which the habitats withstand high deposition of total N (sum of oxidized and reduced forms).

This is why the reduction of these emissions is expected to be reflected in N deposition in these areas, particularly in the northern half of the Peninsula, where the reduced N represents a large part of the total N deposition.

The present situation will be compared to scenarios with mitigation of ammonia emissions from field application of fertilizers.

Detailed and accurate representation of mitigation options and impact pathways will ensure **policy-relevant results** specific to Spanish conditions.