

Robinia pseudoacacia

Description of model and ensemble projections

The current distribution of *Robinia pseudoacacia* is projected to primarily occur in Southern Switzerland in the lowest regions of the Ticino. This is the region where this invasive North American species has started to become naturalized. North of the Alps this tree, often planted for ornamental reasons, has not that much invaded the forests yet. Across the whole Alps, it is mostly the sub-mediterranean forests at low altitudes South of the Alps that have mostly been invaded and colonized.

Under projected climate change using the A1B scenario, most combinations of statistical and regional climate models predict a spread of *R. pseudoacacia* farther North in the Ticino, into low elevations of interior and dry valleys (Valais, Chur basin) and finally rapidly onto the whole Plateau. This means that these regions will soon harbor climate conditions, under which *R. pseudoacacia* will find habitats that are comparable to its current range.

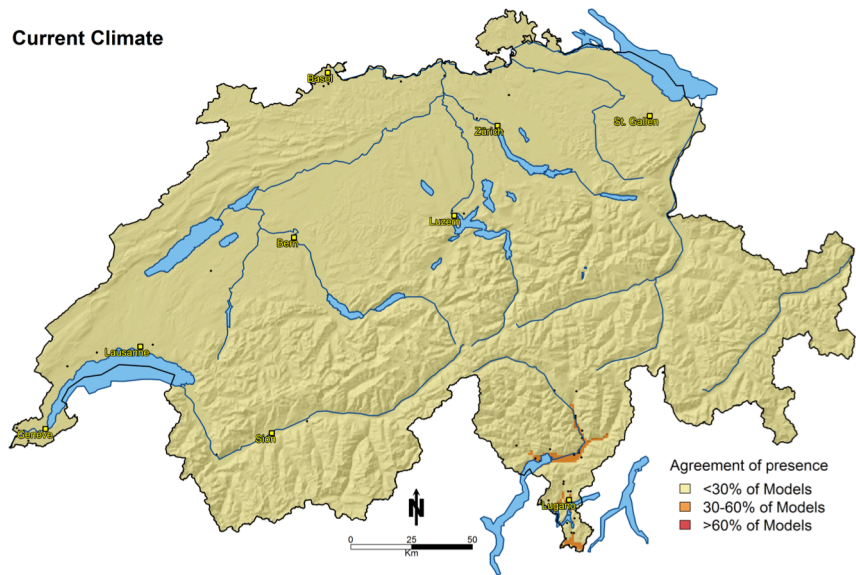


Figure 1. Current distribution (black dots) from the Swiss National Forest inventory (LFI 1) and simulated habitat suitability under current climate as calibrated from forest inventory data across the Alps (MANFRED project).

Synthesis and Conclusions

The Alps-wide model (not shown here) fits the distribution of *R. pseudoacacia* quite well, and can therefore be considered a credible model to project the future habitat suitability of the species. The range statistic from this species is not very meaningful, due to the fact that pan-European models have not been fitted (no data available for ICP Level I data), and huge range expansions are projected under future climate conditions in Switzerland.

The species will likely spread, once the climate becomes warmer and drier in summers, as it has in many sub-mediterranean and colline regions already. It is an invasive, light-demanding species that rapidly colonizes ruderal habitats and forest canopy gaps. Due to its nitrogen high fixation (*Fabaceae*), it can generate nutrient rich soils that – in combination with the high light levels on the ground under *R. pseudoacacia* canopies – are soon overgrown by dense herb and liana coverage, which inhibits further the regeneration of other forest trees.

The species might become a massive pest in these warm-dry, yet not Mediterranean climates. This might require specific management actions to avoid massive spreads once the climate becomes suitable for this species specifically on the Swiss Plateau.

Range change statistics		
	CH	Europe
Current range size [km²]	197	–
Future (2080) range size	13'776	–
Range Change 2080/2000 [%]	>999%	–
Overlap 2000/2080 [km²]	197	–
Overlap/current range [%]	100%	–

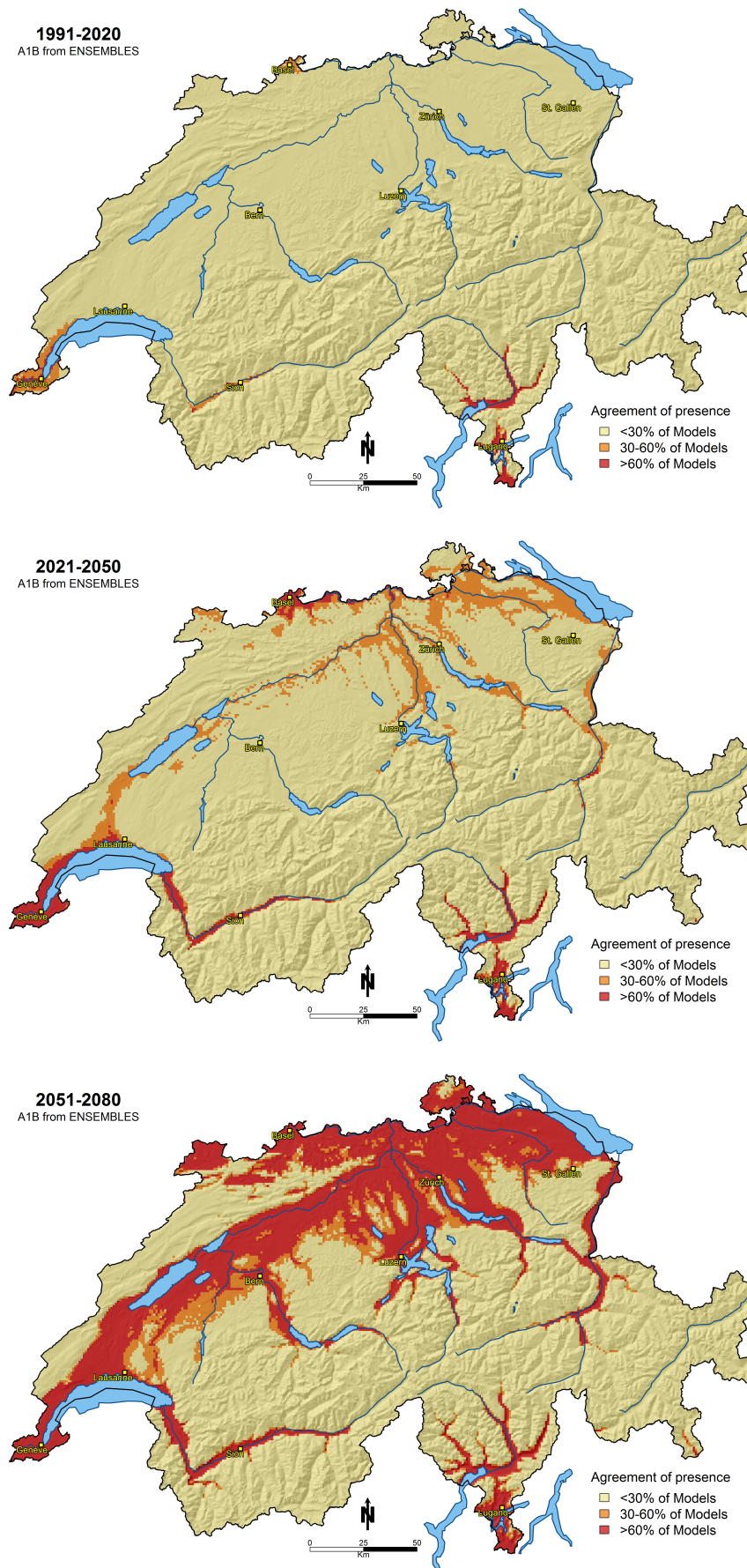


Figure 2: Ensemble of projected future ranges of suitable habitat as modeled from six RCMs and six statistical models. Light yellow colors indicate that all climate & statistical model combinations project absence of the species, while dark red colors indicate presence. Orange colors indicate uncertainty regarding habitat suitability.