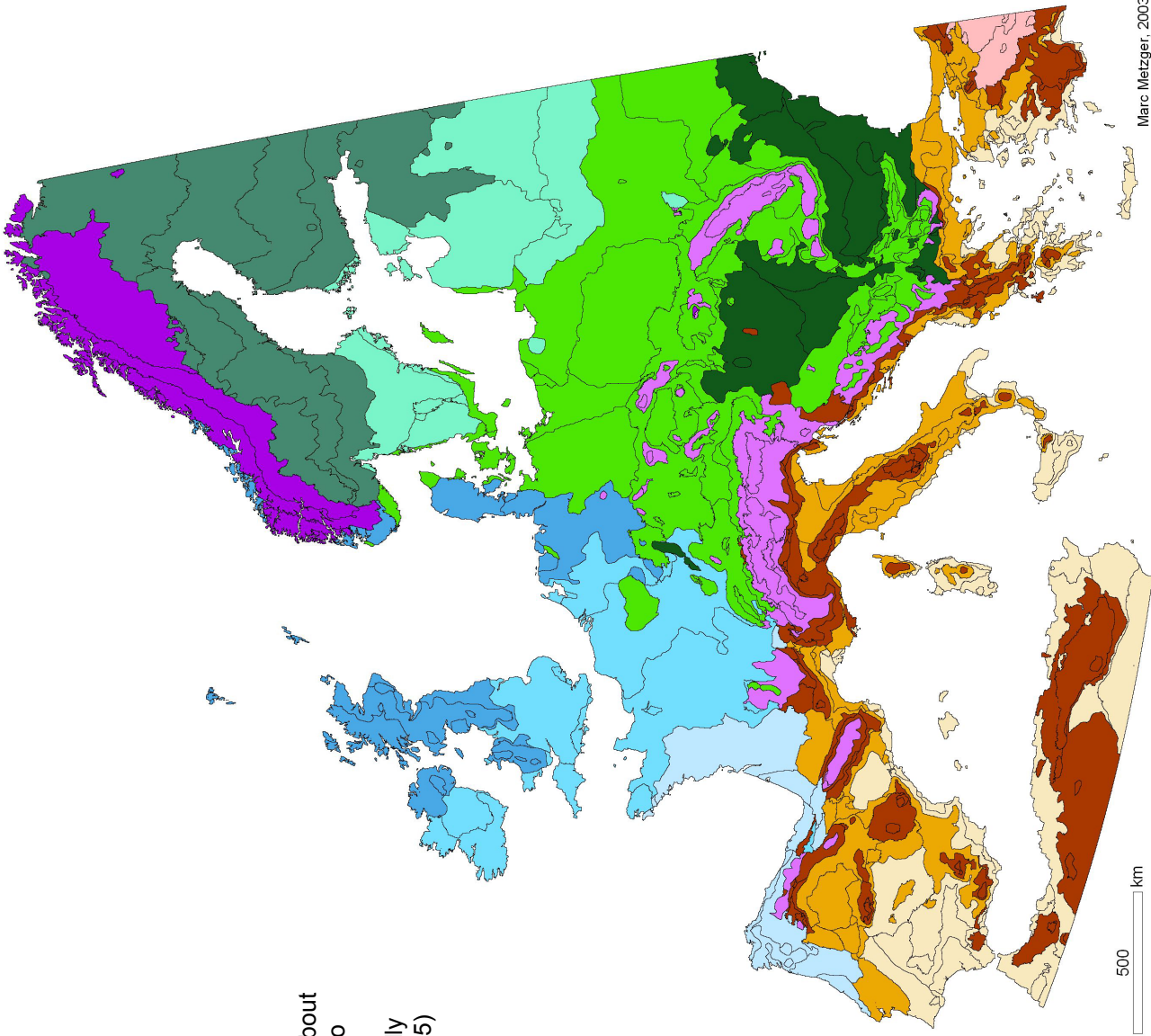
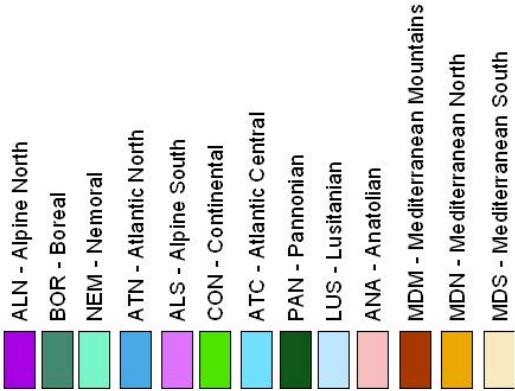


# Comparison by Environmental Zone

## Introduction

This Annex gives an overview of the variability in the ATEAM climate and land use scenarios. Europe-wide summaries of variability are of limited value because they do not inform us about how the variability differs across the European environment. To overcome this problem the variability was summarised per Environmental Zone (EnZ). The EnZs are part of the statistically derived Environmental Stratification (EnS) (Metzger *et al.*, 2005) which is used in the Vulnerability Assessment.

## Environmental Zone



# Comparison of climate change scenarios

For the comparison of the climate change scenarios we followed the approach by Ruosteenoja *et al.*<sup>1</sup> and plotted mean temperature and precipitation change against each other for four seasons.

As can be seen from the examples on this page, there is strong agreement between GCMs and scenarios for some EnZs and seasons. In other cases there is considerable disagreement in the extent of change, and for precipitation sometimes also in the trend. In many cases the variability between GCMs is greater than the variability between scenarios.

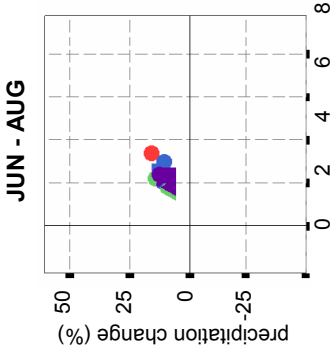
SCENARIO



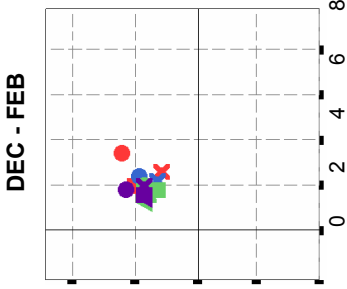
GCM



Alpine North

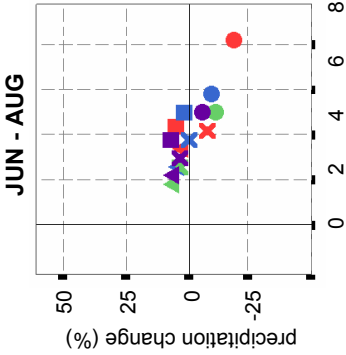


Lusitanian

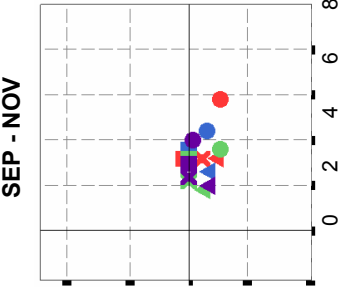


agreement  
between  
GCMs /  
scenarios

Alpine South

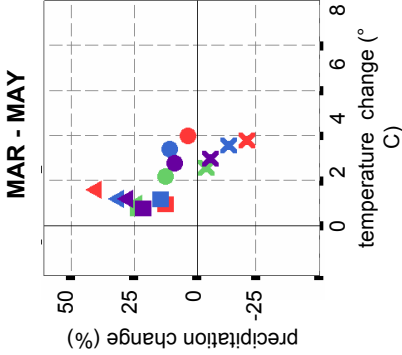


Mediterranean South

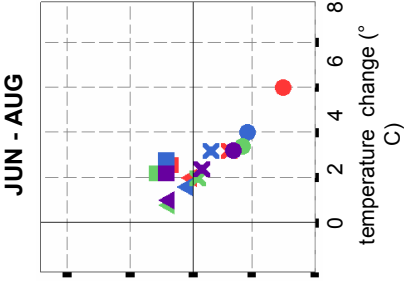


considerable  
variability

Pannonian



Atlantic South



variability  
between GCMs  
greater than  
between  
scenarios

<sup>1</sup>Ruosteenoja, K., T.R. Carter, K. Jylhä & H. Tuomenvirta, 2003: Future climate world regions: an intercomparison of model-based projections for the new IPCC emissions scenarios. *The Finnish Environment* 644, Finnish Environment Institute.

# Comparison of land use change scenarios

## Variability between land use scenarios for 2080

The variability between the SRES scenarios has been plotted in a clustered pie chart. The area-percentage covered by the main land uses are plotted per scenario. There are clear differences between the scenarios and between the EnZs, as can be seen here for the three Atlantic EnZs.

## Variability between GCMs on the land use scenarios for 2080

The land use change scenarios were calculated for the all SRES scenarios using the HadCM3 GCM data. In order to incorporate the variability between GCMs, the A2 scenario was calculated for all ATEAM GCMs. Clustered pie charts for the A2 scenarios express the variability between GCMs per EnZ. The variability is not very great, as shown here for the Atlantic EnZs.

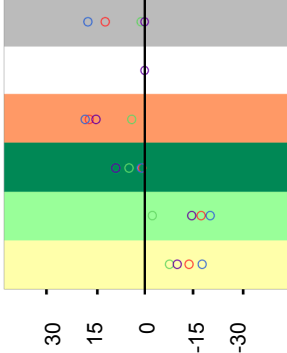
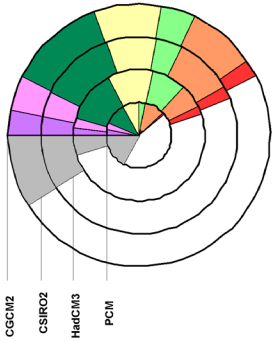
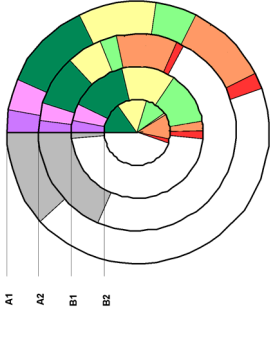
## land use change

The different scenarios have very different impacts on the actual land use change. The change in main land use types between 1990 and 2080 is plotted for the different scenarios and the HadCM3 GCM.

## Please note

The land use change scenarios are only created for the EU+ countries (EU15 + Switzerland + Norway). The statistics can therefore only be calculated for the EU+ part of the EnZs. Because the Pannonian EnZ covers only a very limited part of the EU+ in was merged with the Continental EnZ for the land use change statistics.

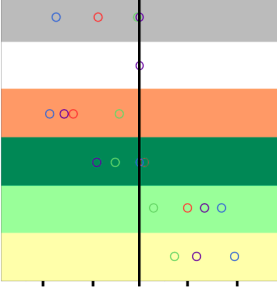
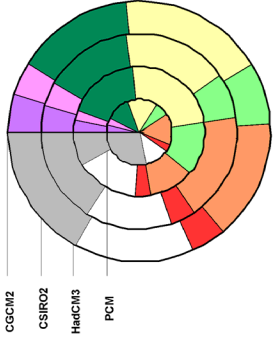
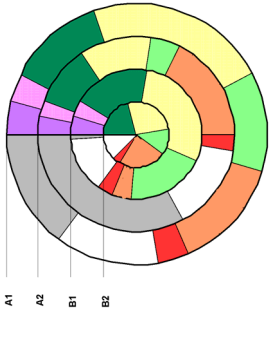
### Atlantic North



### PIE CHARTS LEGEND



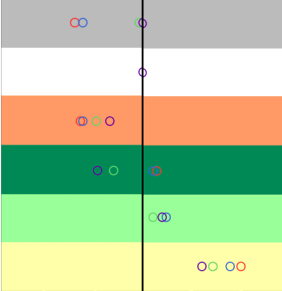
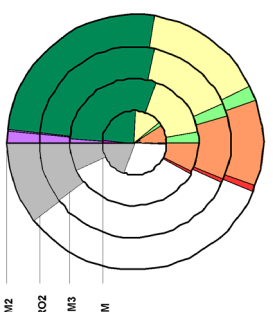
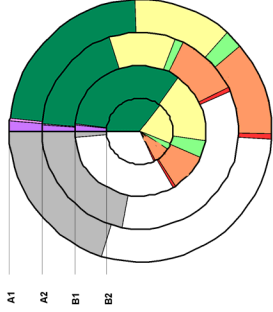
### Atlantic Central



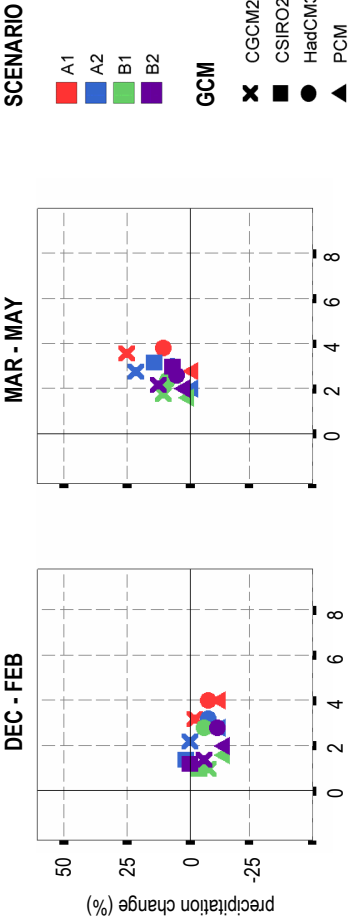
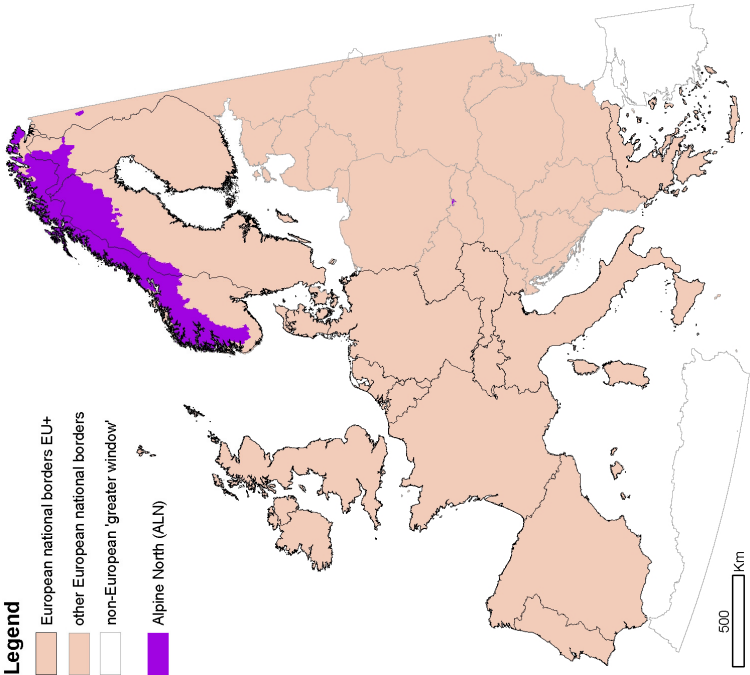
### LAND USE CHANGE LEGEND



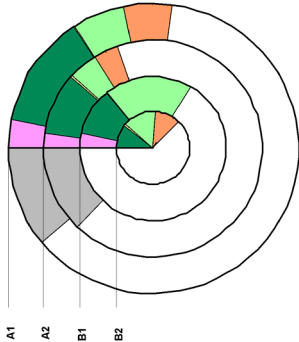
### Lusitanian



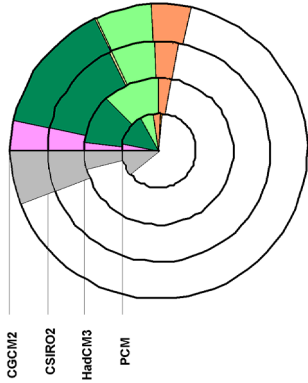
# Alpine North - ALN



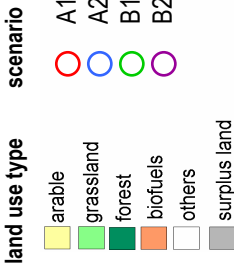
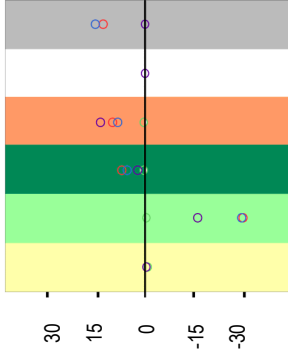
2080 variability  
LAND USE SCENARIOS



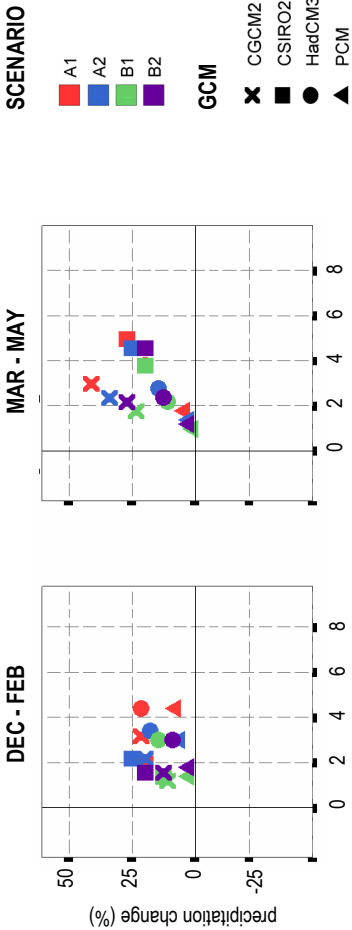
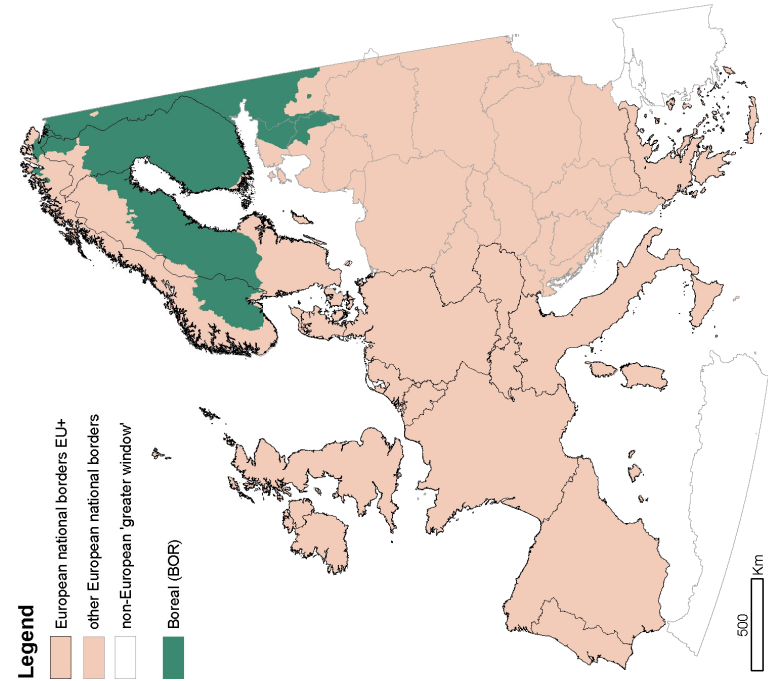
2080-A2 variability  
GCMs on LAND USE



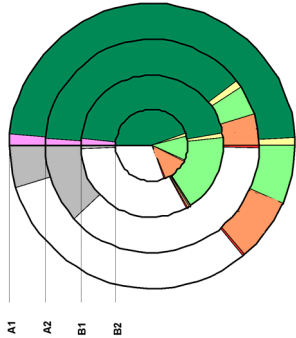
LAND USE CHANGE (%)  
1990 - 2080



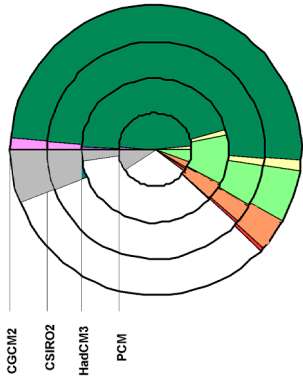
# Boreal - BOR



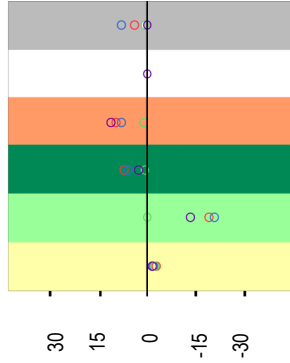
2080 variability  
LAND USE SCENARIOS



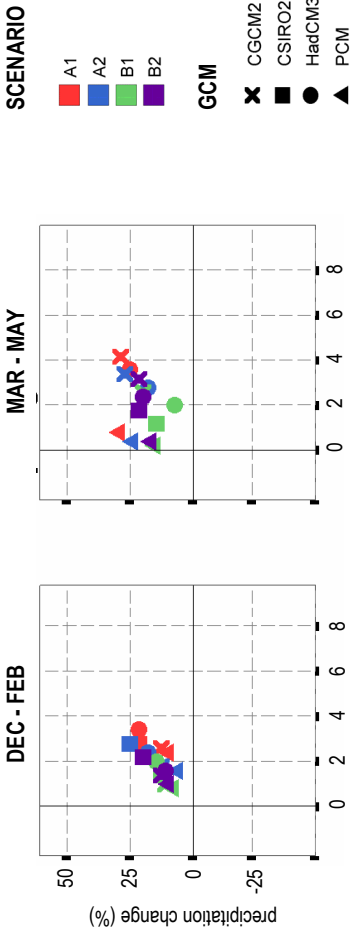
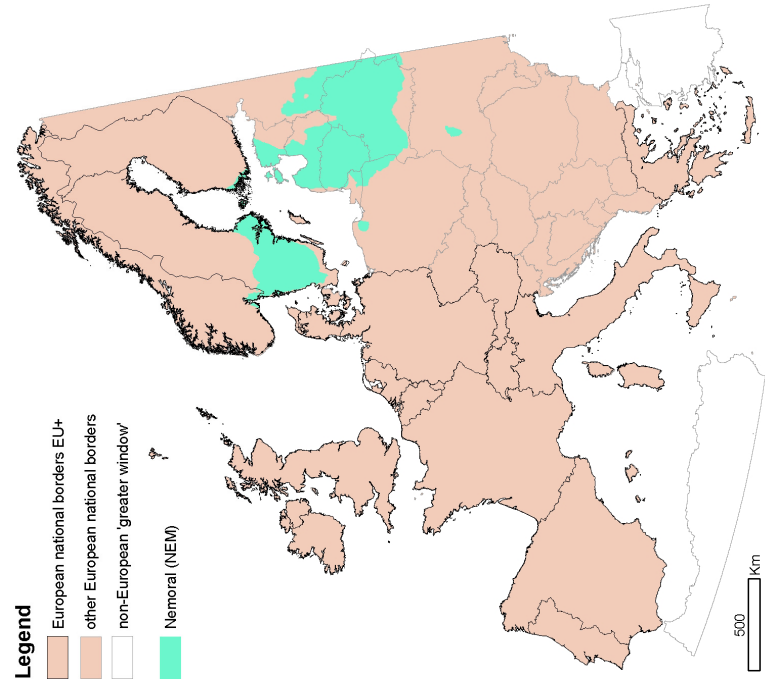
2080-A2 variability  
GCMs on LAND USE



LAND USE CHANGE (%)  
1990 - 2080



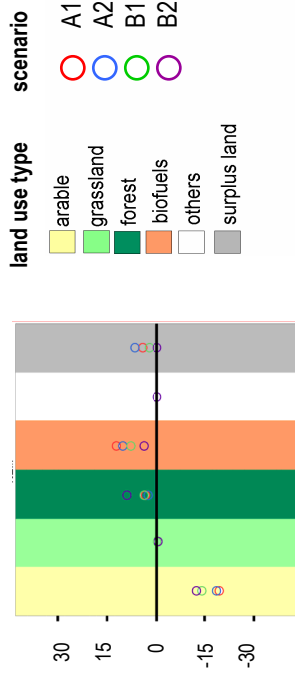
# Nemoral - NEM



2080 variability  
LAND USE SCENARIOS

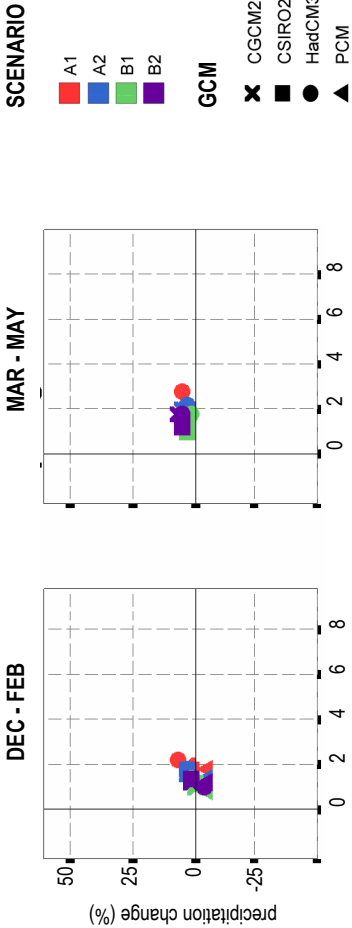
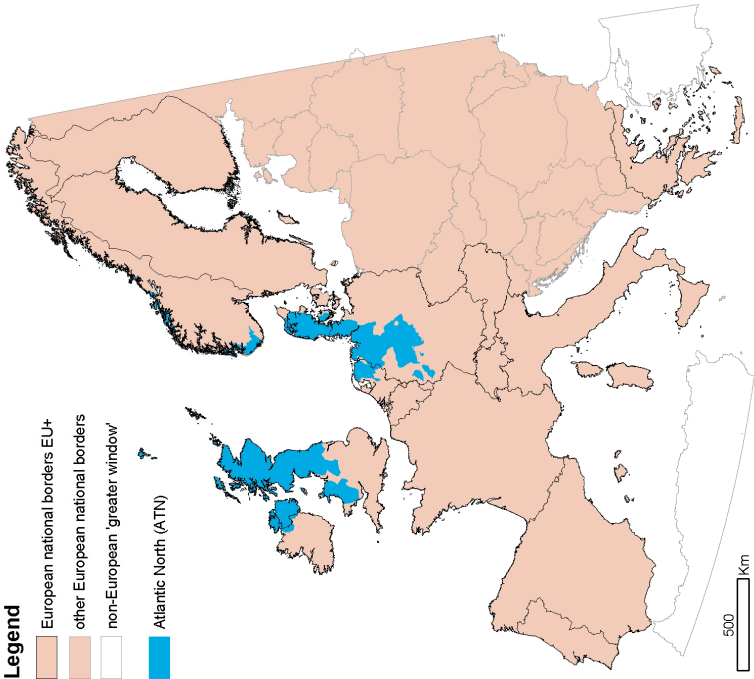


LAND USE CHANGE (%)  
1990 - 2080

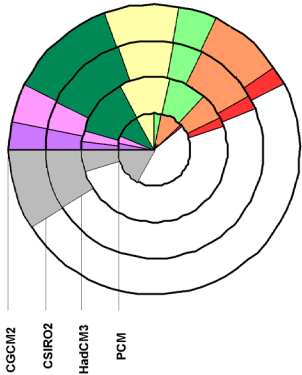




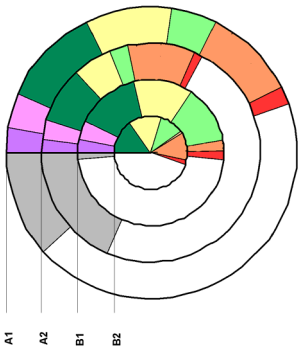
# Atlantic North - ATN



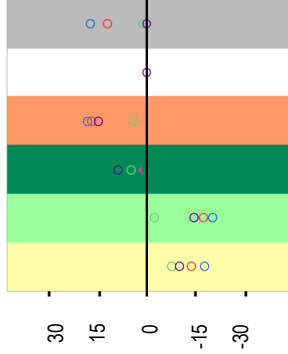
2080-A2 variability  
GCMs on LAND USE



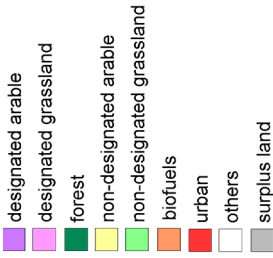
2080 variability  
LAND USE SCENARIOS



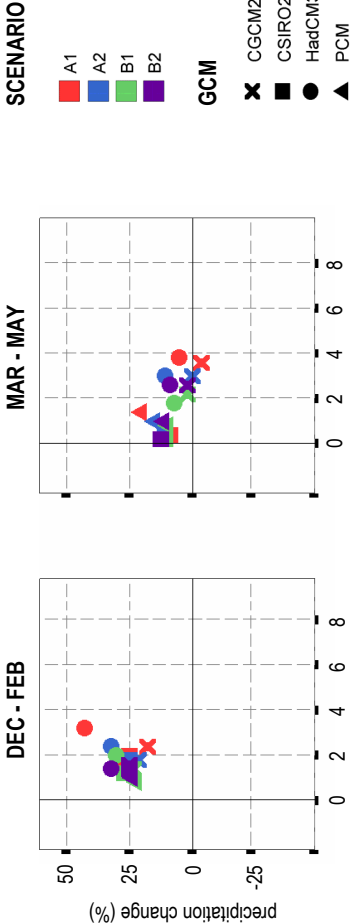
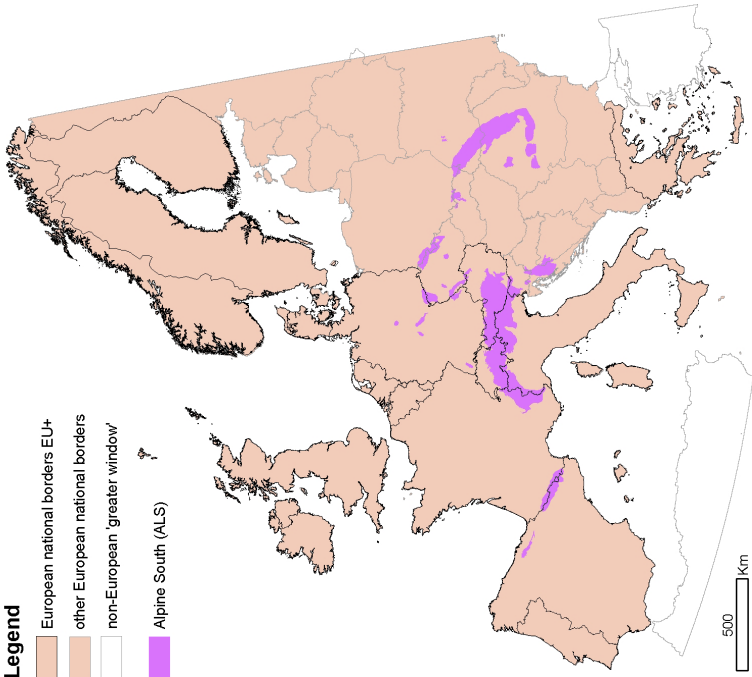
LAND USE CHANGE (%)  
1990 - 2080



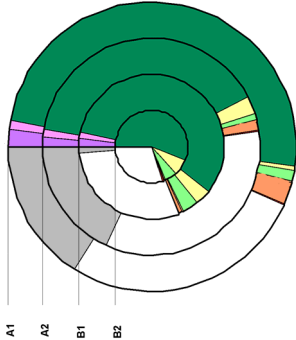
pie chart legend



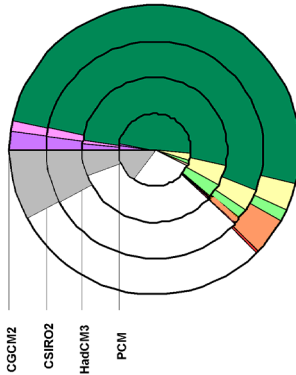
# Alpine South - ALS



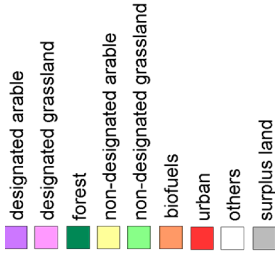
2080 variability  
LAND USE SCENARIOS



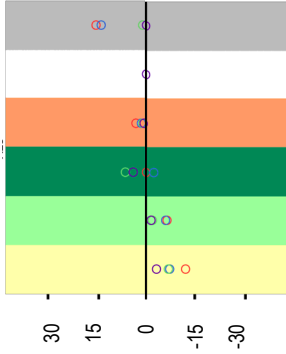
2080-A2 variability  
GCMs on LAND USE



pie chart legend

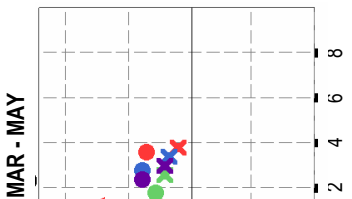
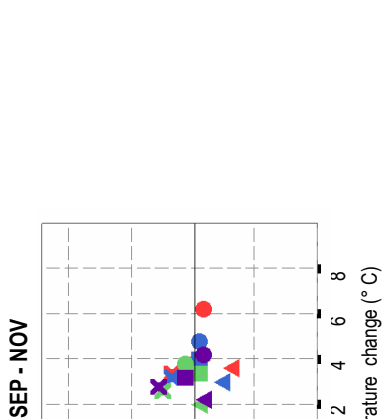
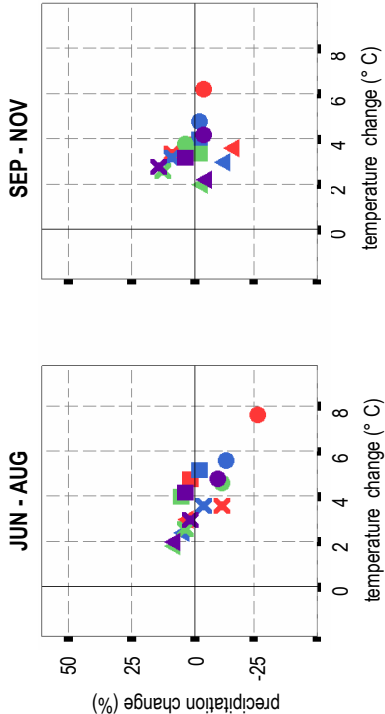
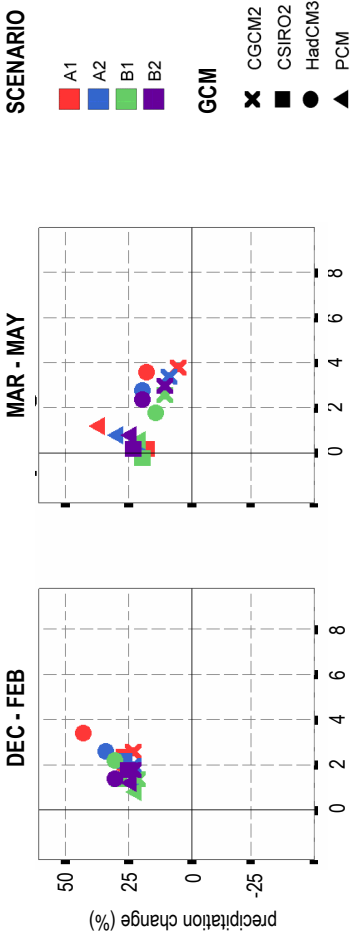
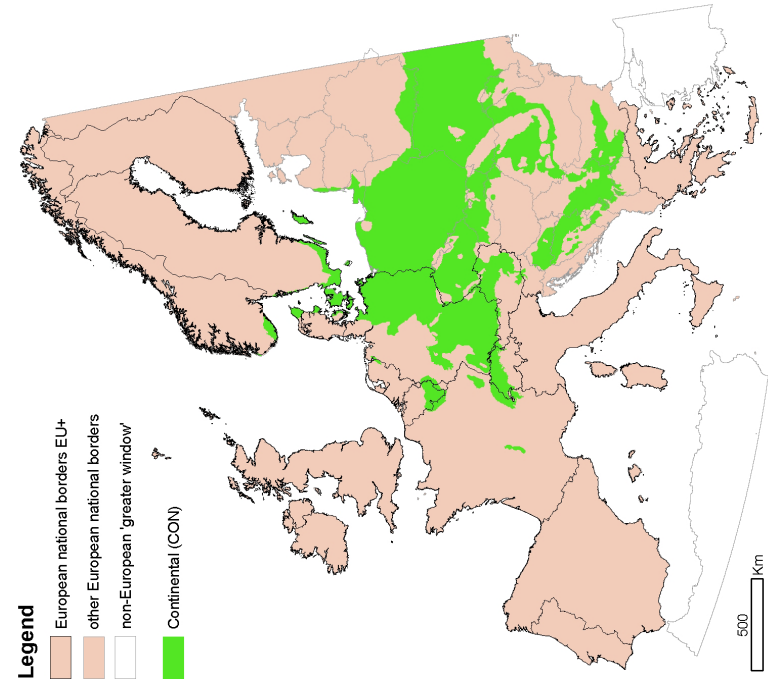


LAND USE CHANGE (%)  
1990 - 2080

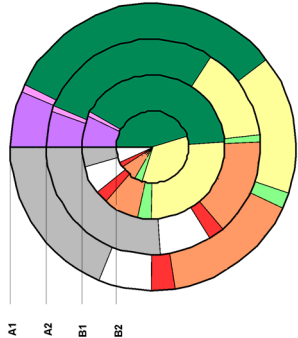




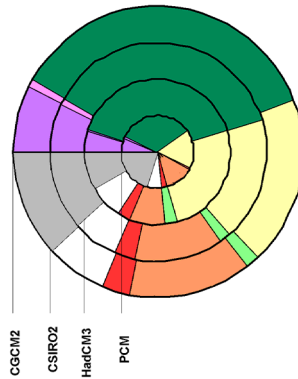
# Continental - CON



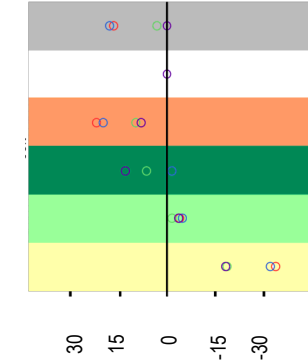
2080 variability  
LAND USE SCENARIOS



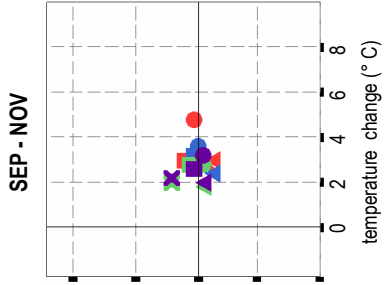
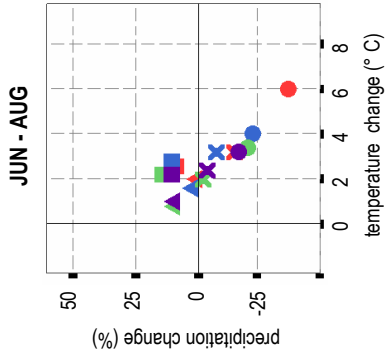
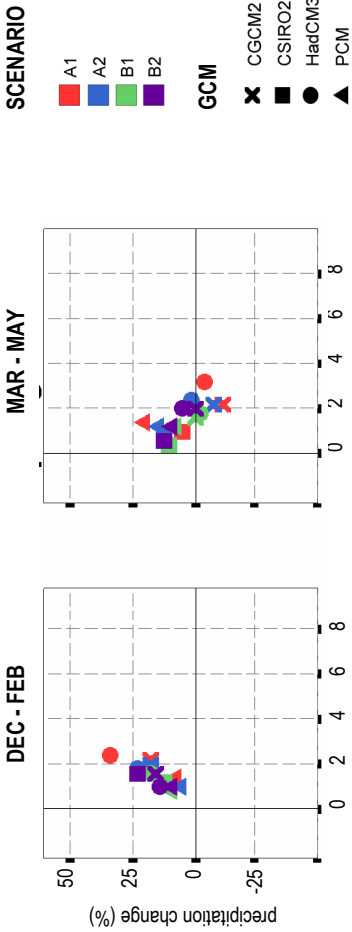
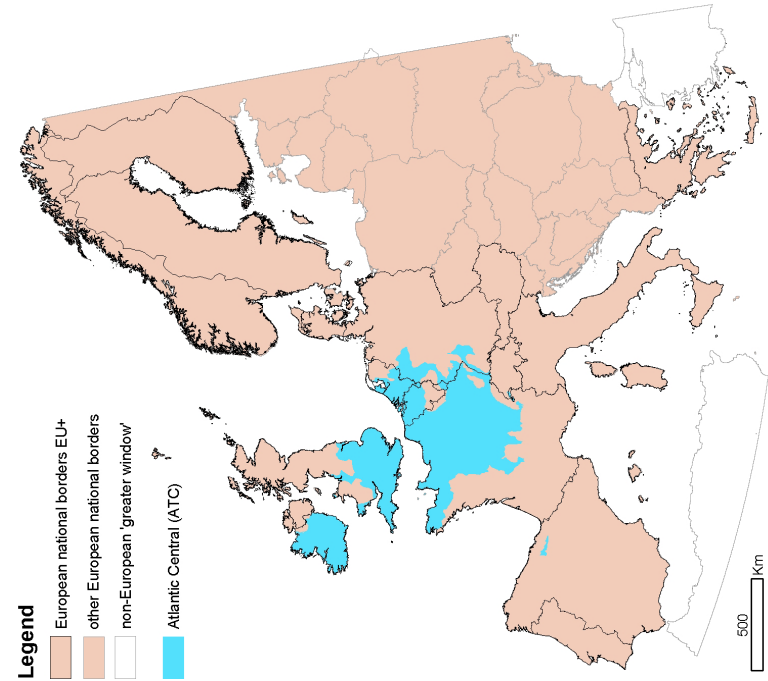
2080-A2 variability  
GCMs on LAND USE



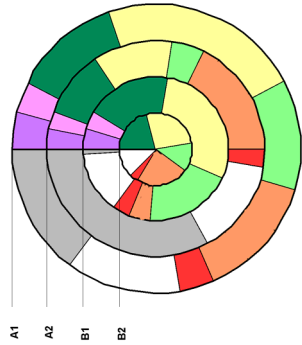
LAND USE CHANGE (%)  
1990 - 2080



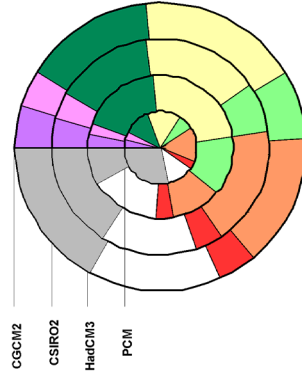
# Atlantic Central - ATC



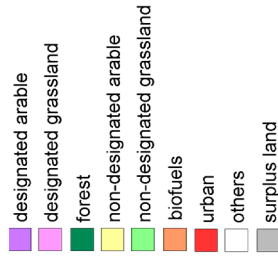
2080 variability  
LAND USE SCENARIOS



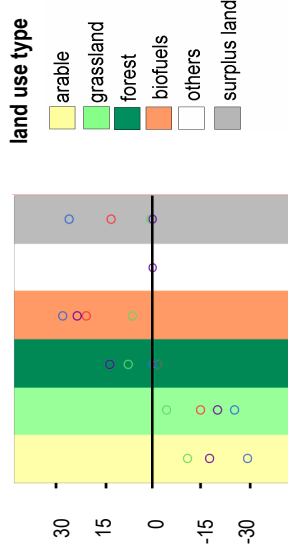
2080-A2 variability  
GCMs on LAND USE



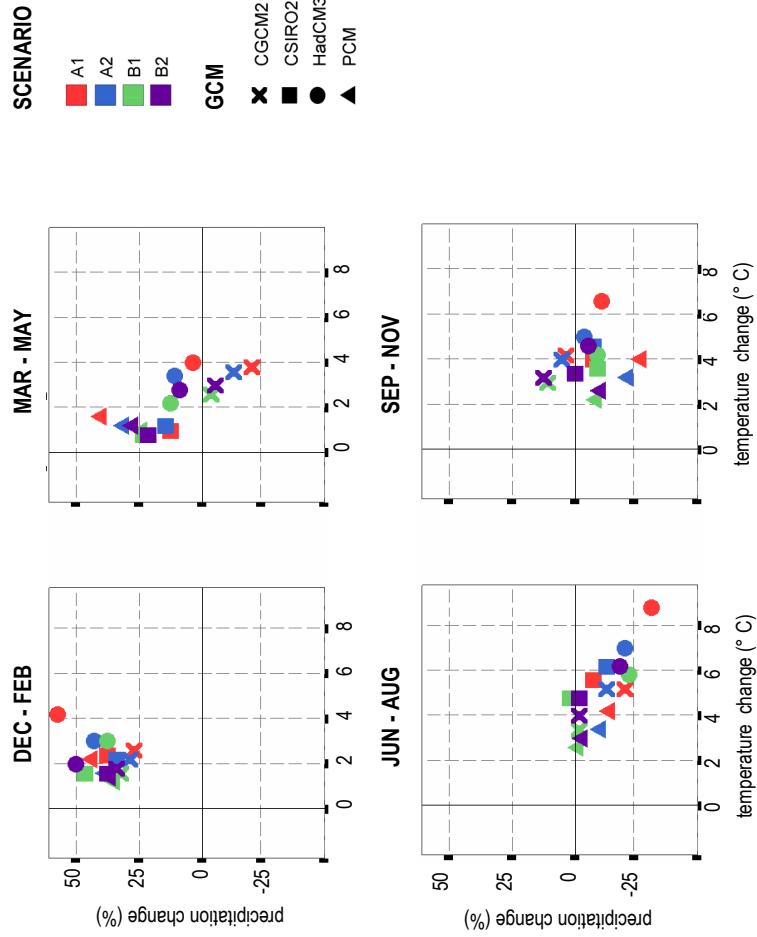
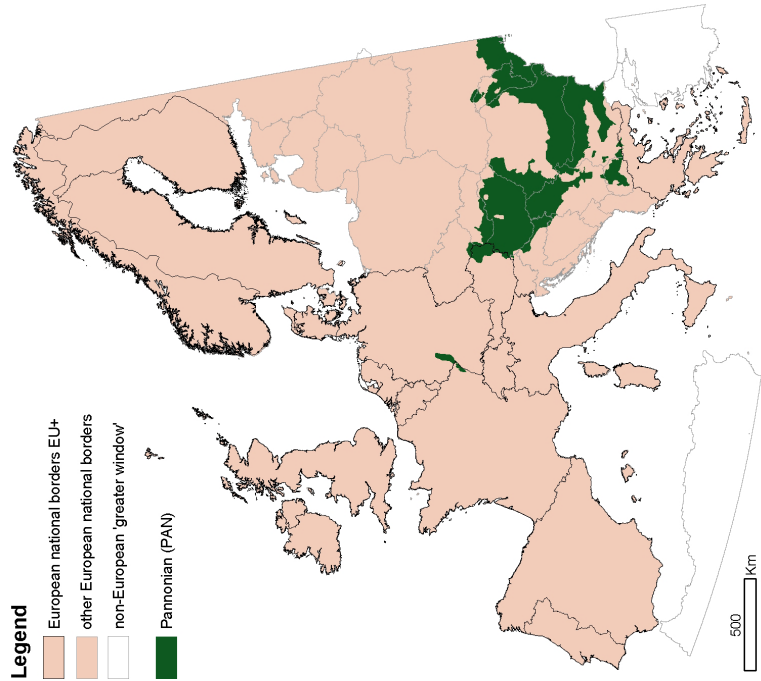
pie chart legend



LAND USE CHANGE (%)  
1990 - 2080

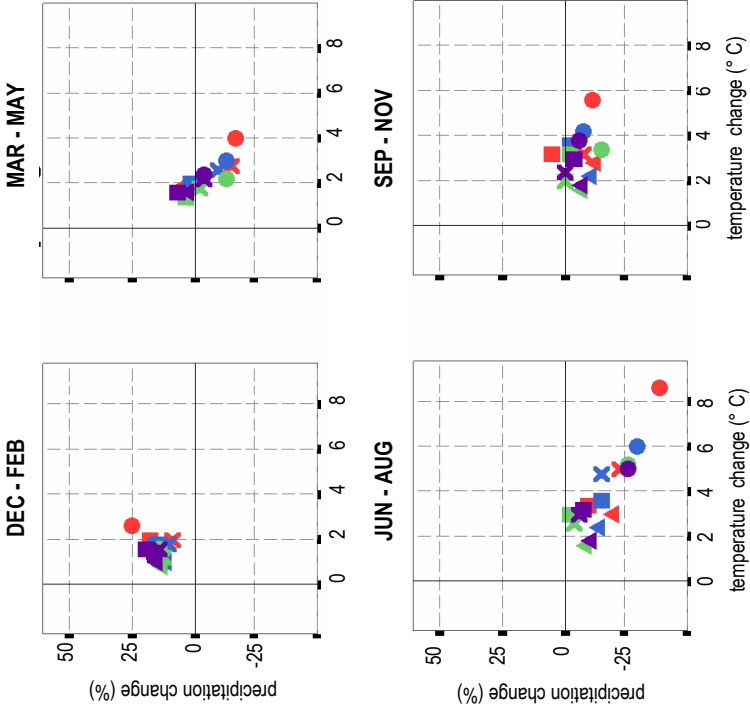
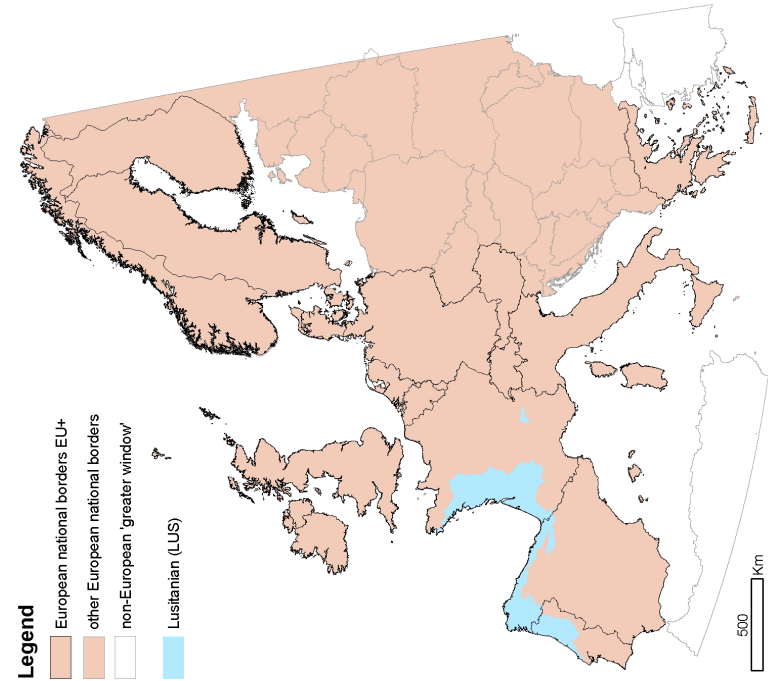


# Pannonian - PAN

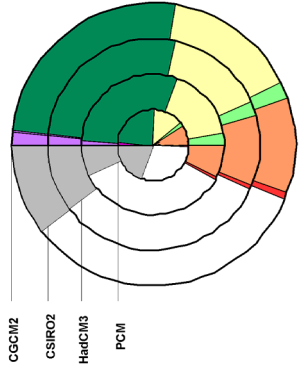


Please note that the land use change scenarios are only created for the EU+ countries. The statistics can therefore only be calculated for the EU+ part of the EnZs. Because the Pannonian EnZ covers only a very limited part of the EU+ it was merged with the Continental EnZ for the land use change statistics.

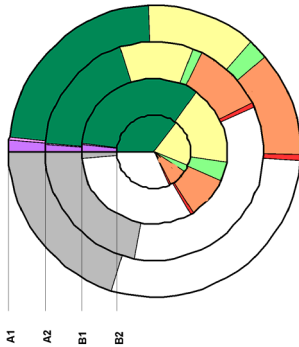
# Lusitanian - LUS



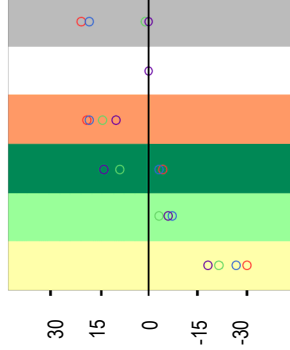
2080-A2 variability  
GCMs on LAND USE



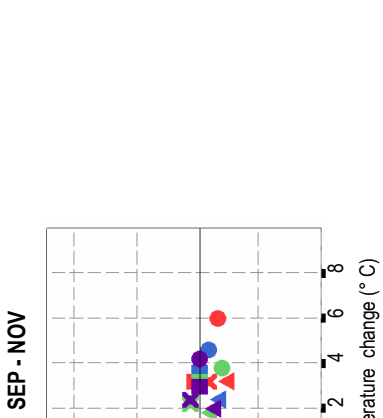
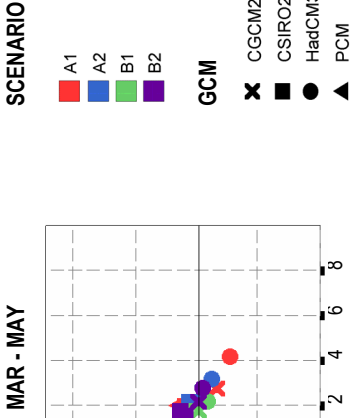
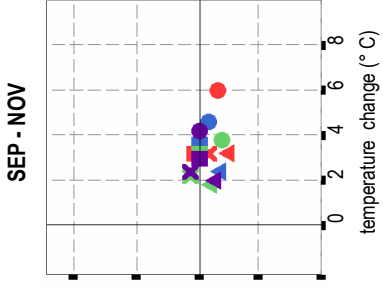
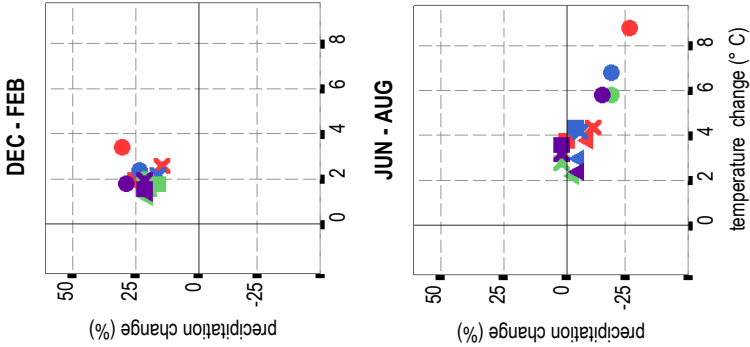
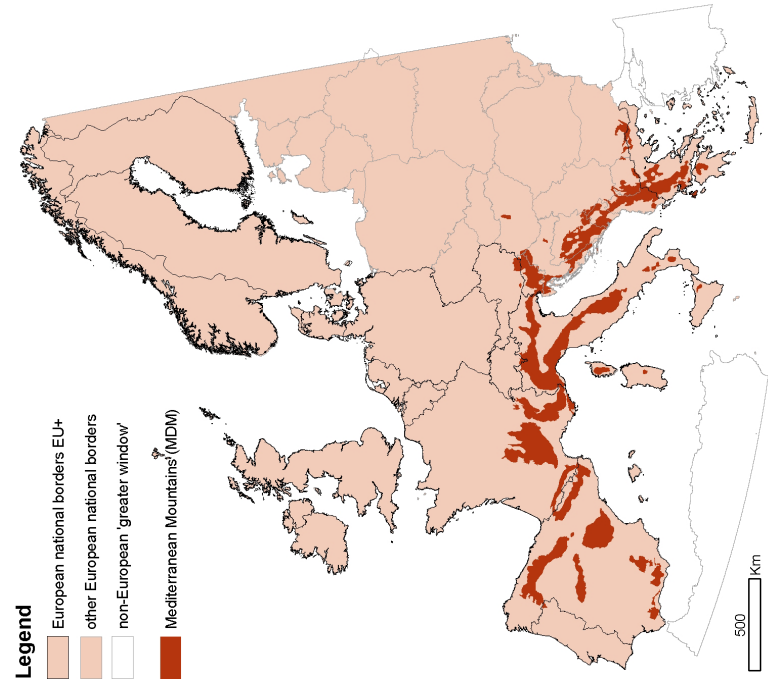
2080 variability  
LAND USE SCENARIOS



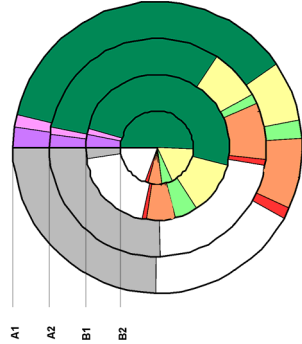
LAND USE CHANGE (%)  
1990 - 2080



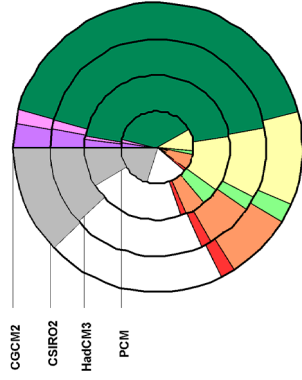
# Mediterranean Mountains - MDM



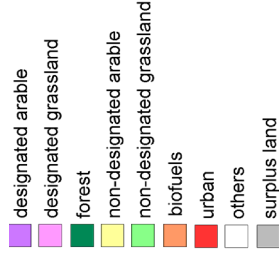
2080 variability  
LAND USE SCENARIOS



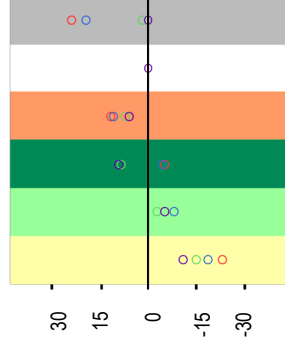
2080-A2 variability  
GCMs on LAND USE



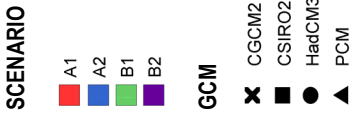
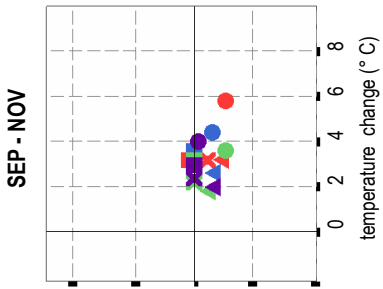
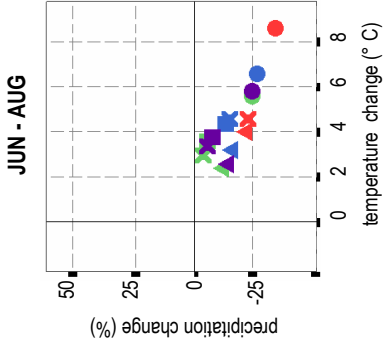
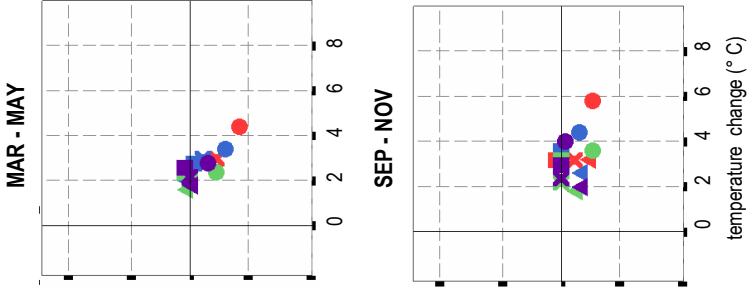
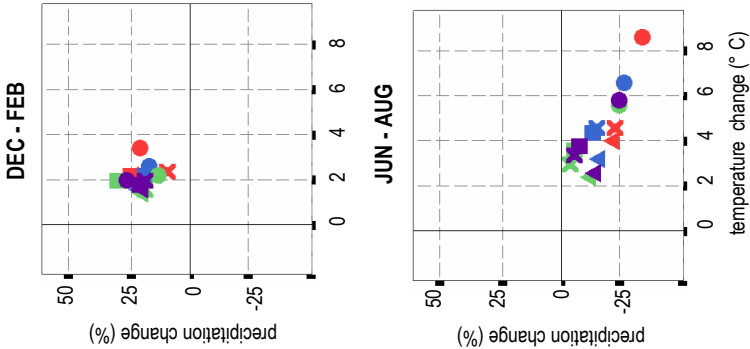
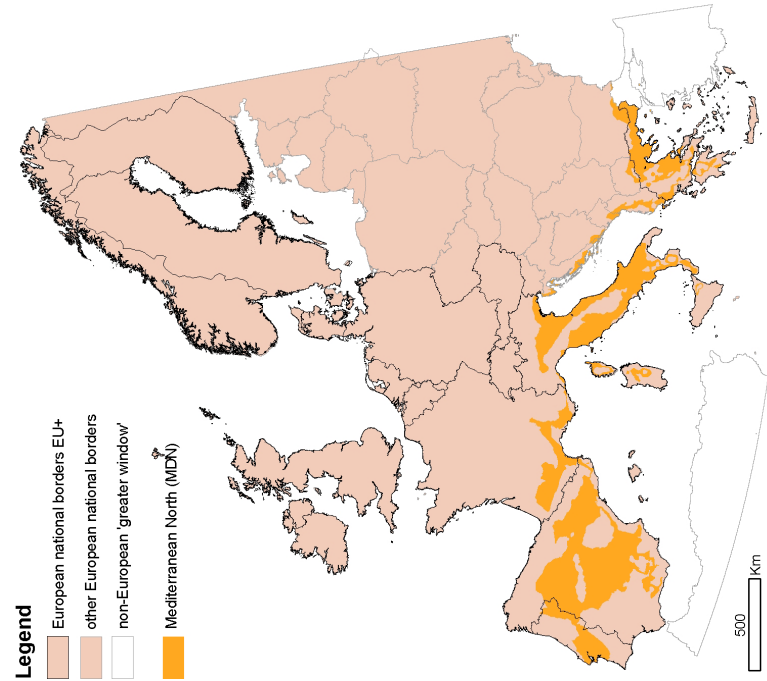
pie chart legend



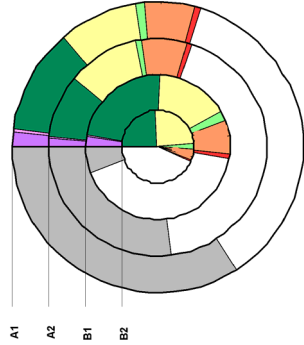
LAND USE CHANGE (%)  
1990 - 2080



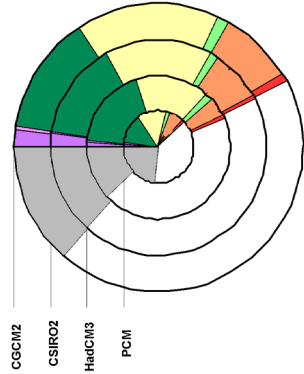
# Mediterranean North - MDN



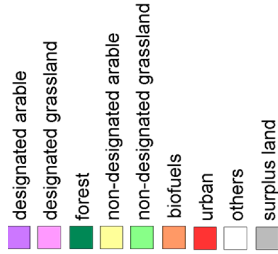
2080 variability  
LAND USE SCENARIOS



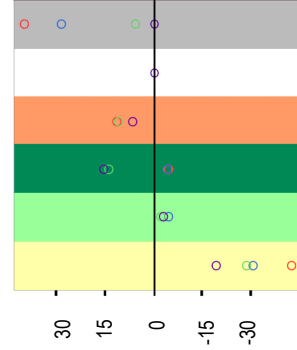
2080-A2 variability  
GCMs on LAND USE



pie chart legend



LAND USE CHANGE (%)  
1990 - 2080





# Mediterranean South - MDS

