

Future projections

Future climate data

WorldClim data

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0. Periods: 2021-2040, 2041-2060, 2061-2080, 2081-2100
1. **G**lobal **C**irculation **M**odel (GCM) = climate model
2. **S**hared **S**ocio-economic **P**athway (SSP) = geopolitical model

pause

SSP3: A resurgent nationalism, concerns about competitiveness and security, and regional conflicts push countries to increasingly focus on domestic or, at most, regional issues.

Load data

```
library(terra)
library(mgcv)

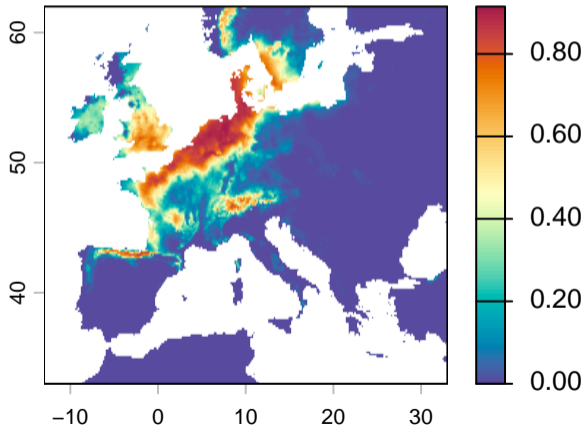
enm <- readRDS("../data/enm.rds")
enm$formula

occ ~ s(wc2.1_10m_bio_1, k = 5) + s(wc2.1_10m_bio_4, k = 5) +
      s(wc2.1_10m_bio_12, k = 5) + s(wc2.1_10m_bio_15, k = 5)

r <- rast("../data/wc2.1_10m_bioc_MPI-ESM1-2-HR_ssp370_2081-2100.tif")
r <- r[[c("bio01", "bio04", "bio12", "bio15")]]
names(r) <- paste0("wc2.1_10m_bio_", c(1, 4, 12, 15))
```

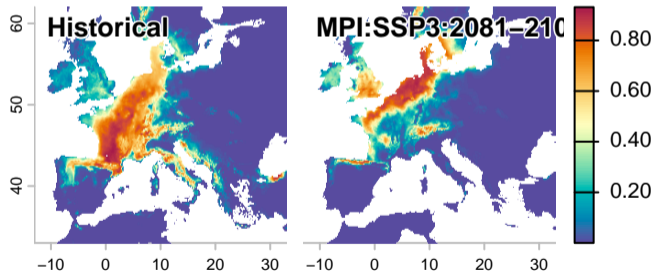
Predict

```
sdm_future <- predict(r, enm, type = "response")  
plot(sdm_future, col = hcl.colors(100, "Spectral", rev = TRUE))
```

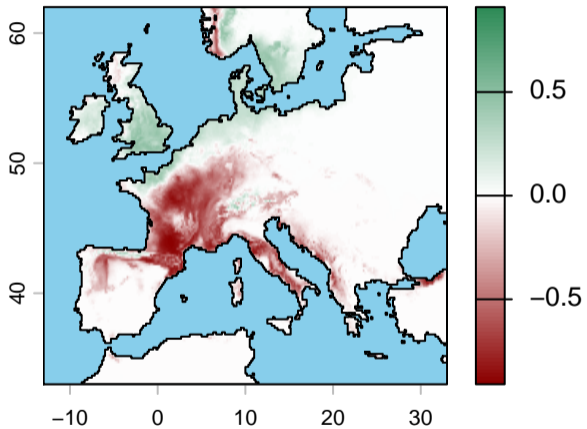


Compare

```
sdm <- rast("../data/hist-sdm.tif")  
comp <- c(sdm, sdm_future)  
names(comp) <- c("Historical", "MPI:SSP3:2081-2100")  
panel(comp, col = hcl.colors(100, "Spectral", rev = TRUE))
```



Change



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You should run projections for many combinations of GCMs and SSPs and ensemble the results.