



## **Climate variability and changes in Estonia, climate change scenarios for future and their impacts in the coastal zone of the Baltic Sea**

J. Jaagus

University of Tartu, Geography, Tartu, Estonia (jaak.jaagus@ut.ee)

Estonia is located in the eastern coast of the Baltic Sea in the transition zone between the maritime climate in the west and the continental climate in the east. It has been characterised by a very high climate variability and sensitivity to climate change. There have been significant climatic changes in Estonia during the last decades that are in a good correspondence with global changes.

Warming has taken place, first of all, in winter and spring. Winter warming was caused by the intensification of westerlies that have carried more warm air from the North Atlantic. The winter change has influenced also on spring via thermal inertia. Prevailing of high pressure conditions with low temperature, wind speed, cloudiness and precipitation have been replaced with low pressure, i.e. cyclonic conditions characterised by higher temperature, wind speed, cloudiness and precipitation. This change is followed by trends in several climatic and other natural variables in Estonia. Spring phenological phases have moved much earlier, the growing season has lengthened, the duration of the cold season, of snow and ice cover has shortened remarkably.

Climate change scenarios for Estonia based on various emission scenarios and regional climate model outputs indicate a general continuation of the climate change tendencies until the end of the 21st century. The climate change projections show overall temperature increase but the estimates of precipitation changes are not similar. Some models project an increase and the others decrease in summer precipitation while a general increase is projected for precipitation of the cold half-year.

The coastal zone of the Baltic Sea is found to be a region most affected by the climate change. In case of mild winters there are few sea ice near the coast that is able to protect sandy beaches against storm surges and coastal erosion. Storminess as well as mean and maximum sea levels have increased significantly in winter. Coastal zone is at maximum risk in case of continuing climate warming.