



Present and Historical Climate Variability and its Ecological Impact on Vegetation in South West England

Aleksandra (Sasha) Kosanic (1), Stephan Harrison (2), Karen Anderson (2), and Thea Turkington (3)

(1) University of Exeter, United Kingdom, (2) University of Exeter, United Kingdom, (3) University of Twente, Netherlands

West Cornwall is the most south westerly part of the United Kingdom with a strong maritime climate. This study analyses the earliest archived instrumental meteorological records collected in West Cornwall (SW England). Records were obtained from the Met Office archive (Camborne 1957-2010; Culdrose 1985-2011), Trengwainton Garden (1940-2010), and from the Royal Cornwall Polytechnic Society, data for Falmouth (1880-1952) and Helston (1843-1888). Homogeneity tests were used (Levene and Brown-Forsythe tests) to exclude any trends not related to climate variability. The data exhibit trends in annual mean and maximum temperatures over the timescales analysed, and show a general temperature increase in the 20th and 21st century. Annual and seasonal temperature changes are found to vary locally with strongly positive trends in autumn, spring and summer seasons. Trends in precipitation are positive only for the 19th century and only for one station. Correlation with the North Atlantic Oscillation (NAO) index shows negative results for precipitation data. However correlation with the NAO index is positive with temperature, especially in the winter season. Return period analysis showed a decrease in intensity and frequency of extreme precipitation events in the post-1975 period (Camborne and Trengwainton Garden stations). Climate change in the 20th century, and future continued warming is likely to have major implications on biodiversity in this region. The second part of this research analyses changes in the geographical distribution of plant species over West Cornwall using herbarium and current vegetation records. Also we examine whether Ellenberg values could be used as an environmental change indicator. This research will clearly contribute to a better identification of the climate change impact in West Cornwall, but will also benefit policy developing strategies to identify areas at risk of climate impacts at the regional and local scale.