

Soil microclimate monitoring in forested and meadow sites

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It is well known fact that forest microclimate differs from open area microclimate (Geiger 1965). Less attention is paid to soil temperatures and their long-term monitoring. To evaluate and compare these two environments from the soil microclimate point of view, Institute of Geophysics in Prague monitors soil and air temperatures in Bedřichov in the Jizerské Hory Mountains (Czech Republic). The soil temperatures are measured in three depths (20, 50 and 100 cm) in forest (700 m a. s. l.) and meadow (750 m a. s. l.). Air temperatures are measured at 2m height both in forest and meadow. Nowadays, we have more than three years long time series. The most of studies and experiments described in literature are short-term ones (in order of days or weeks). However, from short-term experiments the seasonal behaviour and trends can be hardly identified and conclusions on soil temperature reaction to climatic extremes such as heat waves, drought or freeze cannot be done with confidence. These drawbacks of the short-term experiments are discussed in literature (eg. Morecroft et al. 1998; Renaud et al. 2011). At the same, with progression of the global warming, the expected increasing frequency of climatic extremes will affect the future form of forest vegetation (Von Arx et al. 2012).

The soil and air temperature series, both from the forest and meadow sites, are evaluated and interpreted with respect to long term temperature characteristics and seasonal trends. The emphasis is given on the soil temperature responses to extreme climatic situations. We examine variability between the localities and depths and spatial and temporal changes in this variability. This long-term monitoring allows us to better understand and examine the behaviour of the soil temperature in extreme weather situations. Therefore, we hope to contribute to better prediction of future reactions of this specific environments to the climate change.

Literature

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