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Palsa is a form of discontinuous permafrost in the circumpolar zone. Palsa are peat mounts with a core of permanently frozen peat, ice and mineral soil. The palsa can be from one to several meters high. There are several studies which indicate that palsa's are melting and decaying as a result of climatic warming. Generally palsa decay is relatively slow process, which is difficult to distinquish in the landscape. The research palsas of this study are located in the Kilpisjärvi area, Finland, about 470 m.a.s.l. (lat 68° 54' lon 20° 58) (Laassaniemi and Peera). Here we present the development of two palsa's and their active layer depth in Kilpisjärvi Finland based on our field investigations with high accuracy RTK GPS between 2007-2012.

Two palsa were measured using Real Time Kinematic GPS with XYZ accuracy of one cm. A measurement grid with two meter interval was defined over each palsa, both have approximately 200 points. Measurements were carried out yearly in the last days of August (2007-2012). Active layer depth of each point was measured with an active layer probe. With ArcGIS we created 3-D models of palsa and yearly active layer surfaces. Weather data used is from the Kilpisjärvi climate station allocated about 15 km north of the study sites (1951-2011). The internal structure of palsa was studied with Ground Penetrading Radar (GPR).

We also used a time serie of aerial photographs to detect the decay process of palsas (1959, 1985, and 2000. Both palsa's has experienced significant decay especially along the edges. The palsa in Laassaniemi has large collapsing side towards a thermokarst pond, here the core has collapsed more than one meter during the study period. In the 1959 image there are no signs of a thermokarst pond.

With detailed RTK high accuracy GPS based monitoring of palsa for 6 years we can follow accurately the development of palsa and its correlation to local climatic factors. Combining historical aerial photographs the time span of the study can be stretched up to 50-60 years. Both palsa's investigated were experiencing significant decay during the study period.