ADAPT Borehole Monitoring standard protocol

The ADAPT Borehole monitoring protocol must be applied at all sites where drilling with recovery has been performed. In some cases however, drilling and instrumentation of boreholes were done before the establishment of ADAPT standard protocols. Consequently, the sensors used and the depth distribution described hereafter may vary from site to site. ADAPT monitoring sites will be set up according to the protocol below.

Only one borehole is instrumented for each drilled site. For newly drilled ADAPT sites, the choice of sensors and the brand of data acquisition systems may vary from site to site, but the sensors are always distributed at the same depths as shown on Figure 1. However, the number of thermistors deployed (i.e. 14 in the ground and 2 above the ground) has been determined according to the number of available entries on a CR1000 datalogger (Campbell Scientific) without the need of adding a multiplexer.

Soil moisture sensors (TDR) are deployed at 5 depths in the active layer and are doubled (optional) with thermistor sensors. The TDR sensor no 5 (i.e. the deepest one) can be deployed at different depths (i.e. at -60, -80 or -100 cm) according to the approximate depth of the permafrost table. The objective is to monitor soil moisture as close to the active layer-permafrost interface as possible.

Two thermistors are deployed above the ground surface. One is at 20 cm to monitor snow cover temperature during winter and vegetation cover during summer. The other is deployed in a radiation shield between 1,5 m to 3m for air temperature monitoring. The choice of the height depends on field characteristics.

Once the thermistor cable is installed in the borehole and in the soil pit, the hole is carefully filled with the original material.

Note: ADAPT is designing its own thermistor cables using YSI thermistors (precision = 0.1 °C).

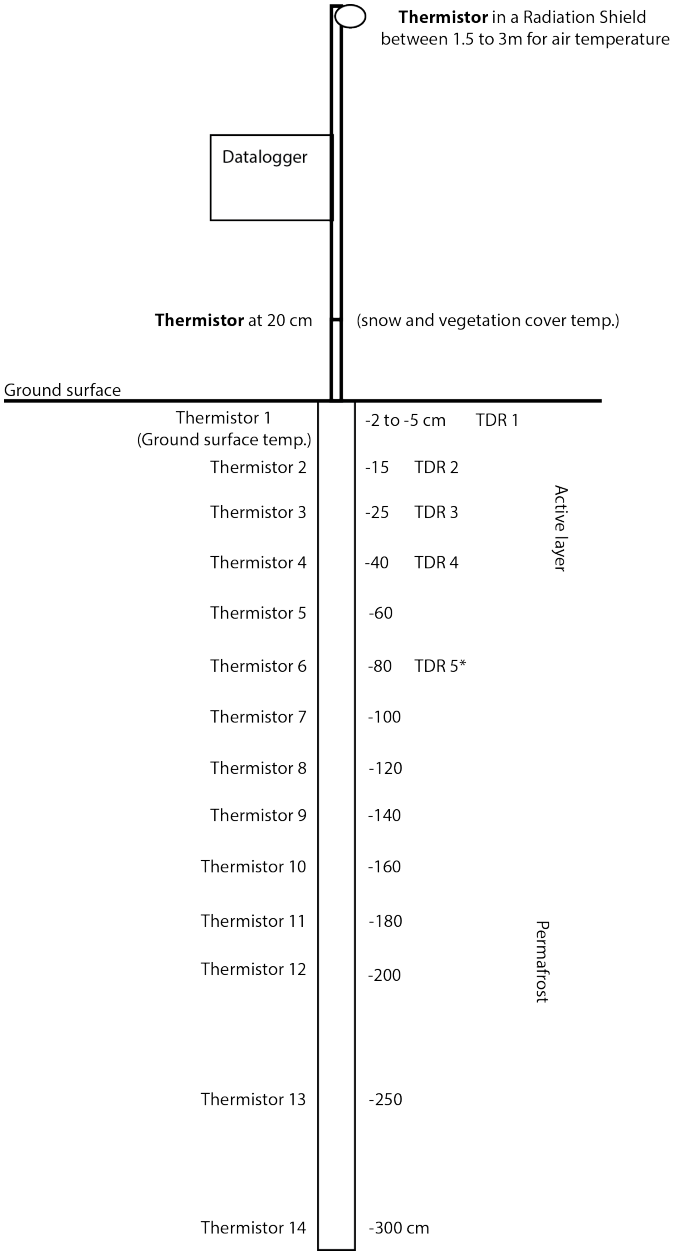

Figure 1. *Distribution of sensors for the ADAPT Permafrost Monitoring standard protocol.*