

What Is An Automatic Snow Weather Station (ASWS)?

Our British Columbia snow pillows consist of three-metre-diameter bladders containing antifreeze solution. As snow accumulates on the pillow, the weight of the snow pushes an equal weight of the antifreeze solution from the pillow up a standpipe in the instrument house. This weight of the water content of the snow is termed **Snow Water Equivalent (SWE)**. The distance the antifreeze is pushed up the standpipe is recorded by a float connected to a shaft encoder.

As well as the vertical standpipe from the pillow, the instrument shelter contains the electronics, consisting of a Data Collection Platform (DCP), a shaft encoder which tracks the movement of the float in the standpipe from the pillow, 12-volt wet-cell batteries for powering the electronic equipment, and regulators for the externally mounted solar panels for recharging the batteries. The DCP contains a transmitter to send the recorded data to the GOES satellite (**Geostationary Operational Environmental Satellite**). The GOES satellite then transmits the data to the River Forecast Centre's satellite data receiving system in Victoria. On the outside of the instrument shelter are the solar panels for the charging system, and an air temperature sensor.

At most snow pillow sites, precipitation gauges and snow depth sensors are also installed. The precipitation gauges consist of a 380 mm diameter PVC standpipe varying from 1.2 to 1.8 m in length, depending on the amount of precipitation expected in the area. A pressure transducer is mounted externally to the bottom of the standpipe, its output giving a reading of the total amount of fluid in the gauge. To inhibit freezing, the precipitation gauges are "charged" with propylene glycol. A 12-volt pump is used to circulate the fluid inside the precipitation gauge to further inhibit the potential for freezing. The gauges are mounted on top of a 3 m high tower to keep them above the snow pack.

The snow depth sensor is mounted on an arm extending from a 6 m high tower, and points toward the ground above the pillow. The ultrasonic sensor works similarly to an autofocus sensor in a camera in that it measures the distance from the sensor to the surface below it. As the snow depth increases the distance measured decreases. All of the Ministry of Environment's ASPs are installed and maintained by staff of the River Forecast Centre. Our data base and graphs also include ASPs operated by B.C. Hydro and Alcan.



Tumeka ASP Station