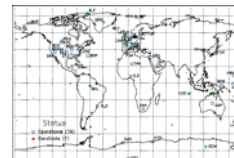


# BSRN (Baseline Surface Radiation Network) and Meteorological Observations in Ny-Ålesund

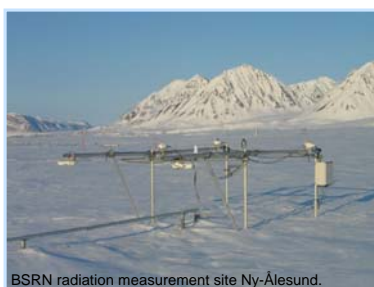
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## The Baseline Surface Radiation Network (BSRN)

BSRN is a project of the World Climate Research Programme (WCRP) and the Global Energy and Water Experiment (GEWEX) and as such is aimed detecting important changes in the earth's radiation field at the earth's surface which may be related to climate changes. The data are of primary importance in supporting the validation and confirmation of satellite and computer model estimates of these quantities. At a small number of stations (currently fewer than 40) in contrasting climatic zones, covering a latitude range from 80°N to 90°S (see station map), solar and atmospheric radiation is measured with instruments of the highest available accuracy and with high time resolution (1 to 3 minutes). In 2004, BSRN was designated as the global baseline network for surface radiation for the Global Climate Observing System (GCOS).



Solar tracker.



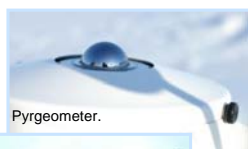
BSRN radiation measurement site Ny-Ålesund.

## Ny-Ålesund Contribution

The Alfred Wegener Institute for Polar and Marine Research operates the BSRN station Ny-Ålesund together with the Norwegian Polar Institute (NP). Continuous radiation measurements started in 1992. In addition, synoptic weather observations as well as daily upper air soundings and weekly ozone soundings are provided.

## Radiation Measurements

Global Radiation  
Reflex Radiation  
Diffuse Sky Radiation  
Direct Solar Radiation  
Long-Wave Up  
Long-Wave Down  
Sunshine Duration



Pyrogeometer.



Pyranometer.



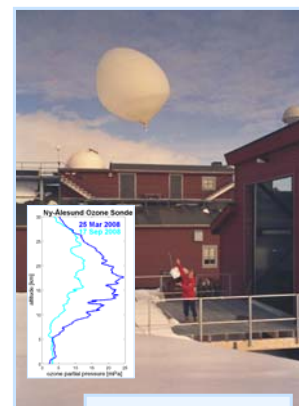
Meteorological Tower.



Ceilometer:  
Measurement of cloud base altitude.

## Meteorological Tower

Air Pressure  
Air Temperature (2m + 10m)  
Wind Vector (2m + 10m)  
Relative Humidity

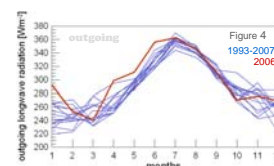
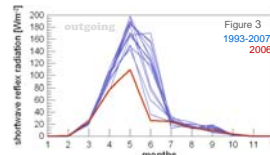
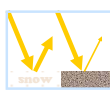
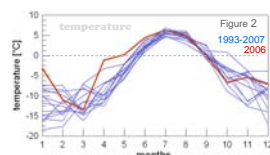
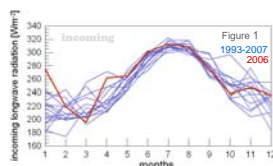


## Upper Air Soundings

Air Temperature  
Wind Vector  
Relative Humidity  
Ozone

## Data Examples

In Ny-Ålesund, the mean annual global radiation since 1993 varies around  $76.7 \pm 6 \text{ Wm}^{-2}$ . The observation period obviously is too short for trend analysis, and the 0.6 % decrease per decade found for the period between 1993 and 2007 is clearly not significant. Variability between the years occurs due to different meteorological conditions and the according changes in cloud amount. The year 2006 provides an evident example.



Figures 1 to 4: The incoming longwave radiation (Fig.1) indicates a rather high cloud amount in April 2006, probably causing -or at least supporting- the much higher temperatures during April-May-June 2006 compared to other years (Fig.2). In fact, temperatures were above 0°C already in April, leading to a much earlier onset of snow melting. The effect of this change in surface structure is observed both in the lower shortwave reflex radiation (Fig.3) and in the higher outgoing longwave radiation (Fig.4) during the otherwise snow covered period April to May (even beginning of June).