

DENMARK

Stratospheric ozone monitoring

Daily observations of total ozone are performed by the Danish Meteorological Institute (DMI) in Denmark and Greenland:

Station	Location	Instrument	Start of observations
Copenhagen	56°N, 12°E	Brewer Mark IV	May 1992
Sondre Stromfjord (Kangerlussuaq)	67°N, 51°W	Brewer Mark II	September 1990
Thule Air Base (Pituffik)	77°, 69°W	SAOZ 1024 diode array	September 1990

On non-regular basis, total ozone has also been measured from Qaanaaq (78°N, 69°W), using the DMI Dobson #92 instrument since early 2000.

Weekly ozone soundings have been performed using balloonborne EEC sensors from Scoresbysund (Illoqqortoormiut, 71°N, 22°W) since January 1993. Ozone soundings have also been performed on campaign basis from Thule Air Base each winter since January 1992 and occasionally from Copenhagen.

The measurements are reported to databases under Network for the Detection of Stratospheric Change (NDSC) and World Ozone and UV-radiation Data Center under the WMO-programme Global Atmosphere Watch.

Thule and Sondre Stromfjord are primary Arctic stations within the Network for the Detection of Stratospheric Change. In addition to the DMI instrumentation, aerosol lidars are operated at these stations by the University of Rome (Italy) and SRI International (USA), respectively, together with an FTIR spectrometer at Thule, operated by National Center for Atmospheric Research (USA). DMI also collaborates with Service d'Aeronomie du CNRS (France) for daily total ozone measurements by a SAOZ instrument at Scoresbysund.

Ozone research

DMI has participated in all major European/US Arctic ozone research campaigns throughout the 1990'es such as ESSOE, SESAME, THESEO, and THESEO-2000/SOLVE. In addition, DMI has participated in numerous research project, funded by the European Commission and Danish research agencies. The ozone research at DMI relates to transport studies of stratospheric ozone, including dilution effects at mid-latitudes from Arctic ozone depletion, studies of polar stratospheric clouds by microphysical simulations and balloon-borne experiments from Greenland and Northern Scandinavia, modelling studies of mountain lee waves, and ozone and UV trend assessments. Climate modelling, relating to the influence of ozone on the stratospheric circulation and climate, is also performed at DMI.

Ultraviolet radiation

Daily measurements of the surface UV-B radiation are performed by DMI at Thule, using a high resolution spectroradiometer, since summer 1994.

At the Botanical Institute, University of Copenhagen, effects of enhanced UV-B radiation on terrestrial ecosystems have been studied during the 90's starting with arctic heath ecosystems, but in the last years the studies have concentrated on the effects on forest trees (beech and oak).

Effects of UV-B radiation on marine phytoplankton in the Greenlandic waters have recently been studied in a cooperation between DMI, DHI - Water and Environment and ASIAQ in Nuuk, Greenland.

The DMI participates in EUMETSAT's Satellite Application Facility on Ozone Monitoring, aiming at the development of operational UV-index products, based on satellite measurements of the ozone layer. UV-B index forecasts, based on Danish total ozone measurements, were initiated at DMI in summer 1992. This public service runs every summer season, made public on the Internet and in several media.
