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The Nimbus THIR: Recovering a Paleo-Satellite Dataset

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In 2013, researchers from the National Snow and Ice Data Centre rediscovered data from instruments flown on Nimbus series satellites. The Nimbus series was composed of seven satellites launched into polar orbit between 1964 and 1978. Data from the 30 instruments onboard provide some of the earliest satellite observations available to meteorological researchers, but the data must be robustly quality controlled before it can be used.

This presentation details my efforts to recover the Nimbus IV-VII Temperature-Humidity Infrared Radiometer (THIR) dataset, which features brightness temperature observations in channels centred at 11.5 μm (the atmospheric window) and 6.7 μm (water vapour absorption band), with spatial resolutions of 7.5 km and 20 km respectively, covering the period 1970-85. We describe how magnetic data tapes were converted to netCDF4; how issues with the underlying data were identified and, where possible, corrected; how the noise characteristics of the dataset were quantified; and we demonstrate the stability of the dataset against simulations. Many climate events of the 1970s may potentially be investigated with THIR data, and a number of these applications are discussed.