



Rescuing paleo-satellite surface temperature observations for the 1970s

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In the early (pre-1980) satellite era, the pioneering Nimbus series of Earth observing satellites used over 30 instruments to record huge quantities of data concerning the fundamental Earth system and climate. Owing to the limited computational capacity of the day, this data has since been gathering dust, archived in film canisters. Only in the last several years has much of the data been rescued, providing a unique opportunity to investigate the climate of the past from the perspective of low-Earth orbiters.

In this presentation, I introduce a long-running Nimbus instrument: the Temperature Humidity Infrared Radiometer (THIR), a scanning radiometer flown on Nimbus IV-VII. The THIR was designed to make surface temperature- and atmospheric humidity observations covering the 1970s in channels centred on 11.5 microns and 6.7 microns respectively. I pick up the story where the Nimbus Data Rescue Project left off, showing how digitised film strips were converted to an industry standard format (netCDF) and demonstrating the detective work which must be applied to rescuing pre-satellite era data. The result is a dataset spanning 1970-77 inclusive, to which I have added value by quantifying the geolocation uncertainty and NEDT on window channel observations.

The potential applications of the THIR dataset are myriad. In the final section of my talk, I will discuss some of these applications for climate scientists, before describing the work that I have undertaken investigating the representation of clouds in some of the reanalysis products (CERA-20C, JRA-55, NCEP-NCAR) which cover the 1970s.