



Assimilating NOAA-21 Satellite Observations into the NCUM Data Assimilation System

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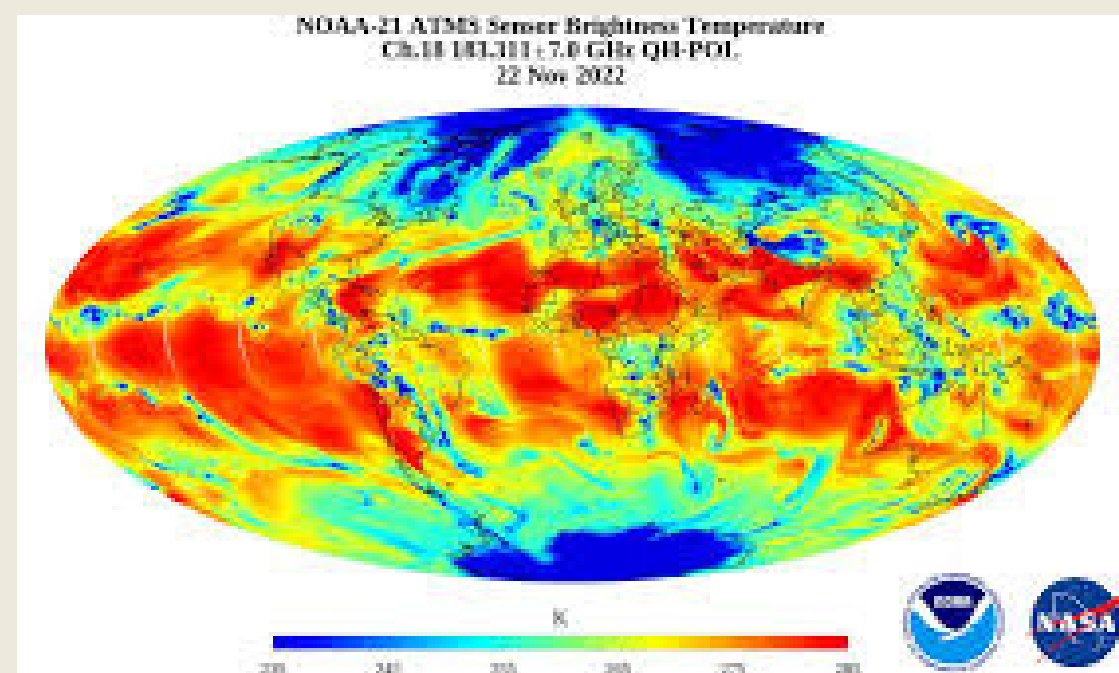


NCMRWF receives NOAA-21 ATMS and CrIS data via EUMETCast and has recently begun assimilating them into the NCUM data assimilation system

- The Advanced Technology Microwave Sounder (ATMS) provides information about the physical properties of our atmosphere.
- The Cross-track Infrared Sounder (CrIS) instrument measures moisture, pressure, and temperature etc.
- Together, CrIS and ATMS data contribute key observations of the water cycle, including water vapor, clouds and precipitation.

Observing System Experiments were conducted using a combination of conventional observations along with ATMS and CrIS data from (i) NOAA-20 (CNTL) and (ii) both NOAA-20 and NOAA-21 (EXPT), to assess the additional impact of NOAA-21 observations during two deep depression events (7-11 & 15-20 Sept 2024) over India.

Fig.1 NOAA-21 ATMS global coverage



SUMMARY

- NCMRWF routinely receives NOAA-21 satellite observations, with regular quality control to ensure data reliability.
- Two deep depression events from September 2024 were used for analysis preparation: a CNTL and an EXPT run.
- Their differences in analyses have been examined.
- Results reveal that assimilation of NOAA-21 data resulted in improved forecast accuracy.
- The ATMS had a more pronounced positive impact on forecasts compared to CrIS.
- Results underscore the usefulness of NOAA-21 observations due to their unique capability to capture key atmospheric physical properties.

Fig.2 Mean O-A of NOAA-21 ATMS

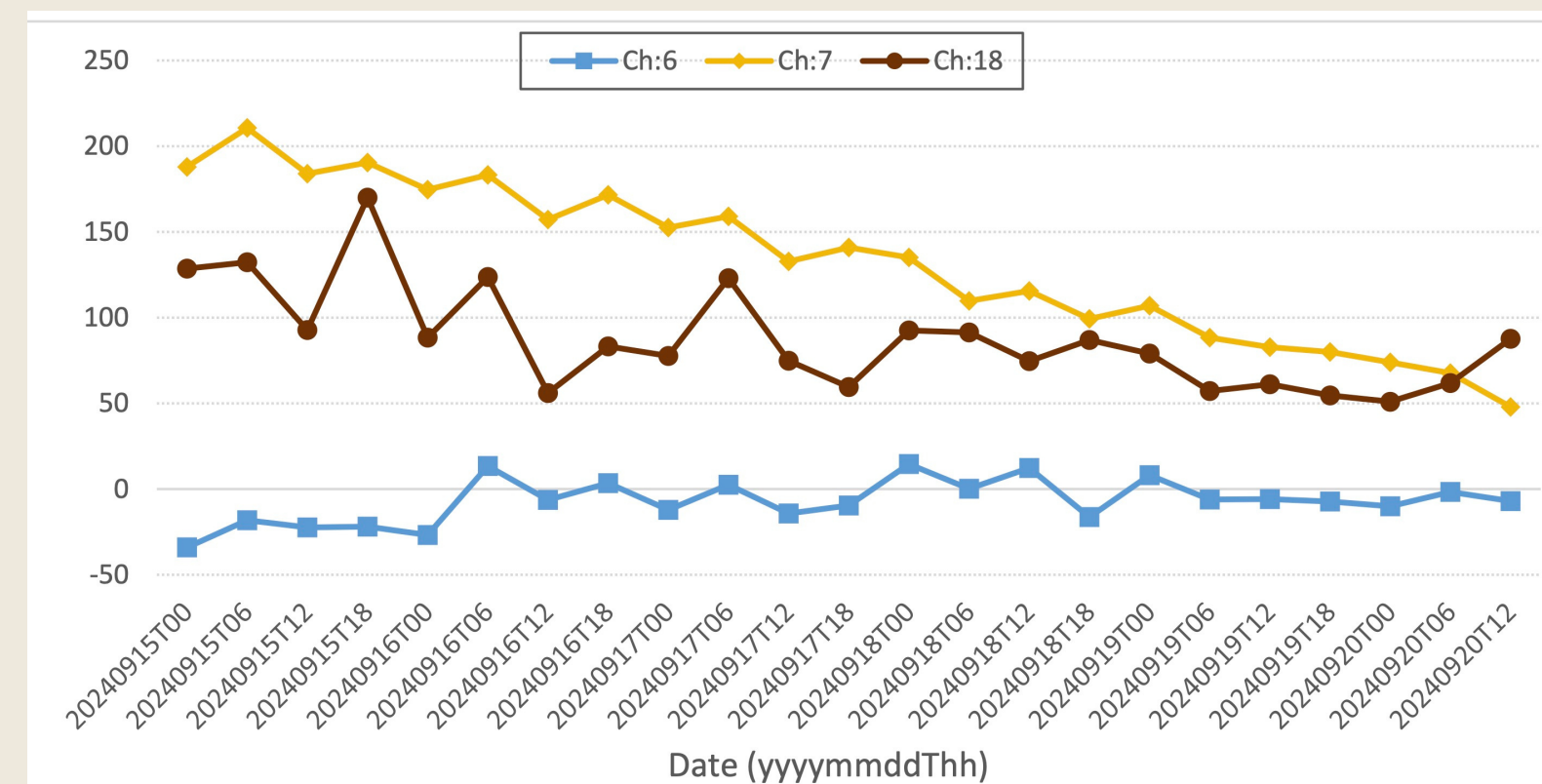


Fig.3 Hovmoller diagram of rainfall from CNTL, EXPT & ERA5

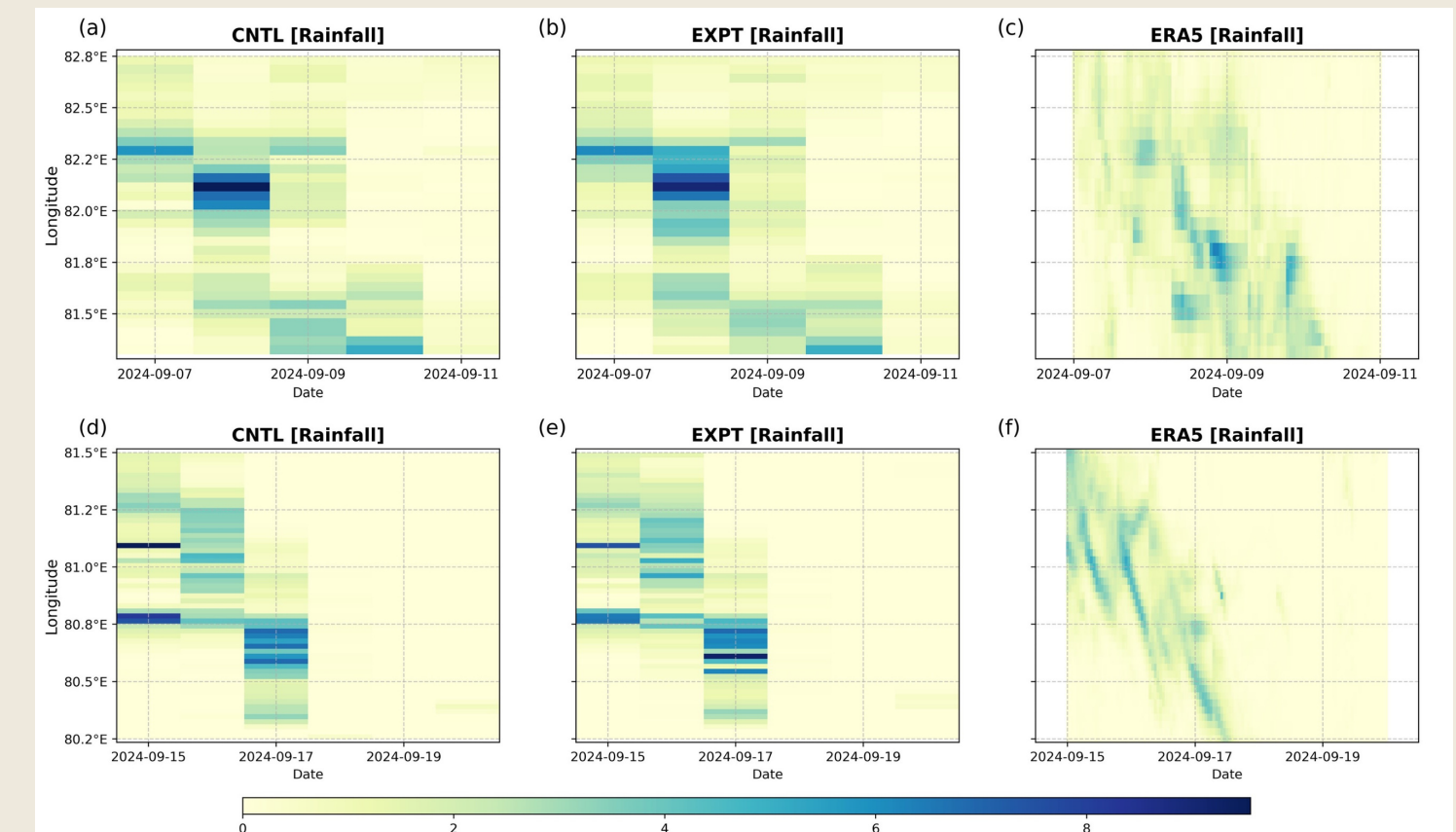


Fig.4 Surface Air Temp EXPT-CNTL : Case Study

