Developing an Upper-Air Climate Monitoring Capability

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"A Comparison between Circulation Statistics Computed from Conventional Data and NMC Hough Analyses", Rosen and Salstein (1980)

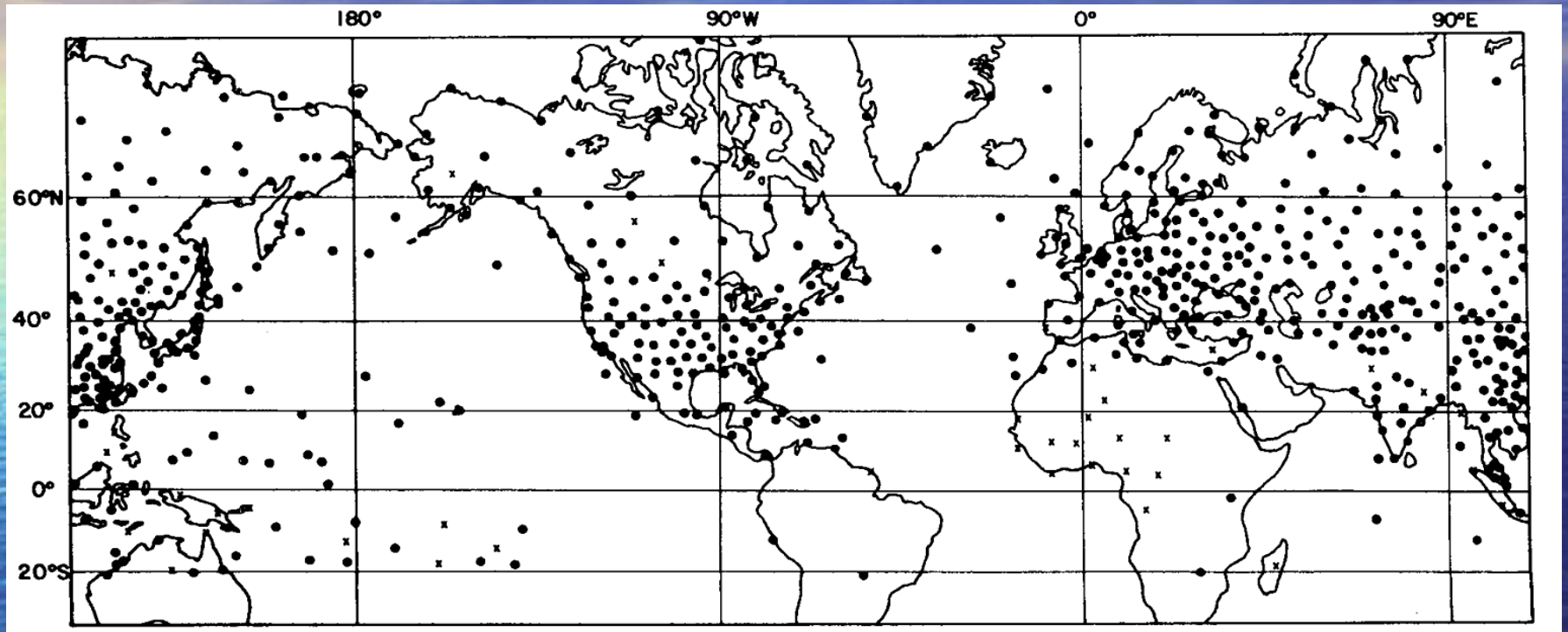
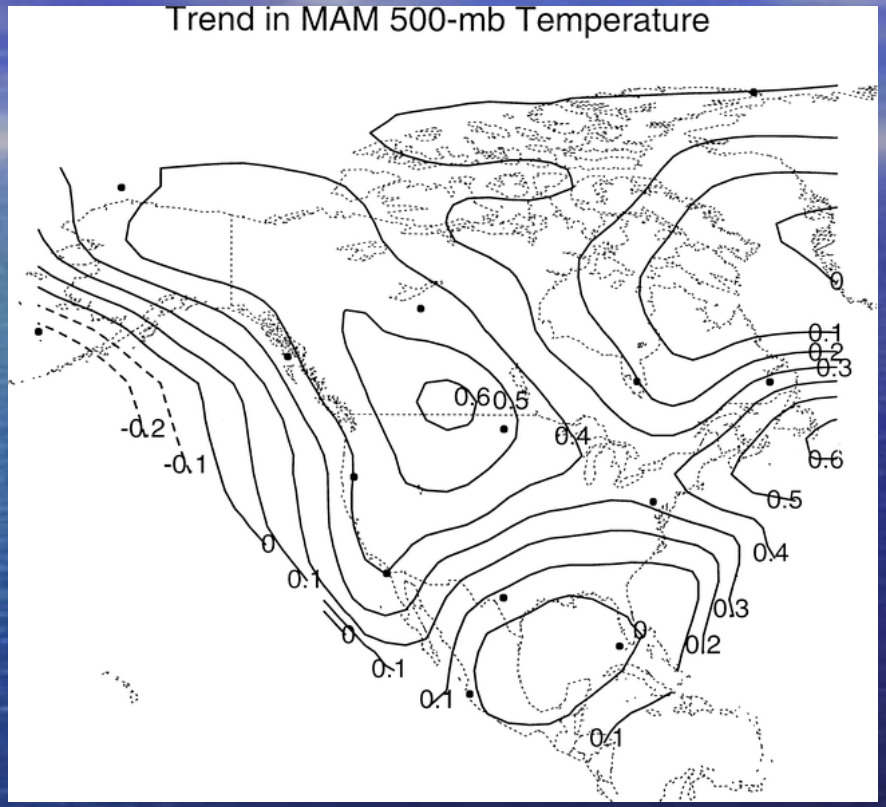


FIG. 1. Map of rawinsonde stations (dots) which passed cutoff criterion for 0000 GMT wind and temperature data at 850 mb for the 1976–77 winter. Pilot balloon stations (crosses) provided wind data only.

- Radiosondes as a touchstone for upper-air climate monitoring
- Spatial sampling issues

"Sensitivity of Continental-Scale Climate Trend Estimates to the Distribution of Radiosondes over North America", Rosen et al. (2003)



Map of the trend in seasonal mean 500-mb temperature over North America during MAM 1959–96 based on the full NCEP–NCAR reanalysis with isolines drawn every 0.1 K (decade)−1 and negative contours dashed. Closed circles indicate grid points lying near radiosonde stations in the GCOS network.

- Continental-scale temperature trends can be adequately sampled with a small network of stations

Requirements

Need to address:

1) Quantities : *temperature, humidity, wind, ozone, trace species, tropopause height, cloud properties, radiation…* ⟶ priorities?
2) Accuracy : *means, variability, and trends; benchmark observations*
3) Precision : *level needed to achieve desired accuracy*
4) Spatial/Temporal Resolution : *biases, aliasing*
5) Long-term stability
6) Climate monitoring principles : *parallel testing, metadata, historical significance, data access, …*

Challenges to Developing Requirements for Climate Monitoring

- Relative inexperience with operational climate services to help refine requirements
- Diverse nature of the “climate community” in reaching a consensus on requirements
- Multiplicity of scientific problems under the climate umbrella

➡ Workshop Agenda

NOAA Approaches to Coordinating Activities

Internal

Mission Goals: Climate, Ecosystems, Weather & Water, Commerce & Transportation

Cross - cutting programs

NOAA Councils: Observing Systems Council (chaired by NESDIS & NWS)
– *Strategic Direction for NOAA's Global Integrated Environmental Observation and Data Management System*

Research Council (chaired by OAR)
– *5-yr Research Plan and 20-yr Research Vision*

Ocean Council (chaired by NOS & NMFS)

External

Coordinated Observation and Prediction of the Earth System (COPES)/World Climate Research Program (WCRP)

Global Earth Observation System of Systems (GEOSS)