



Enhanced Data Coverage in Version 2 of the Integrated Global Radiosonde Archive

Fourth WCRP International Conference on Reanalyses

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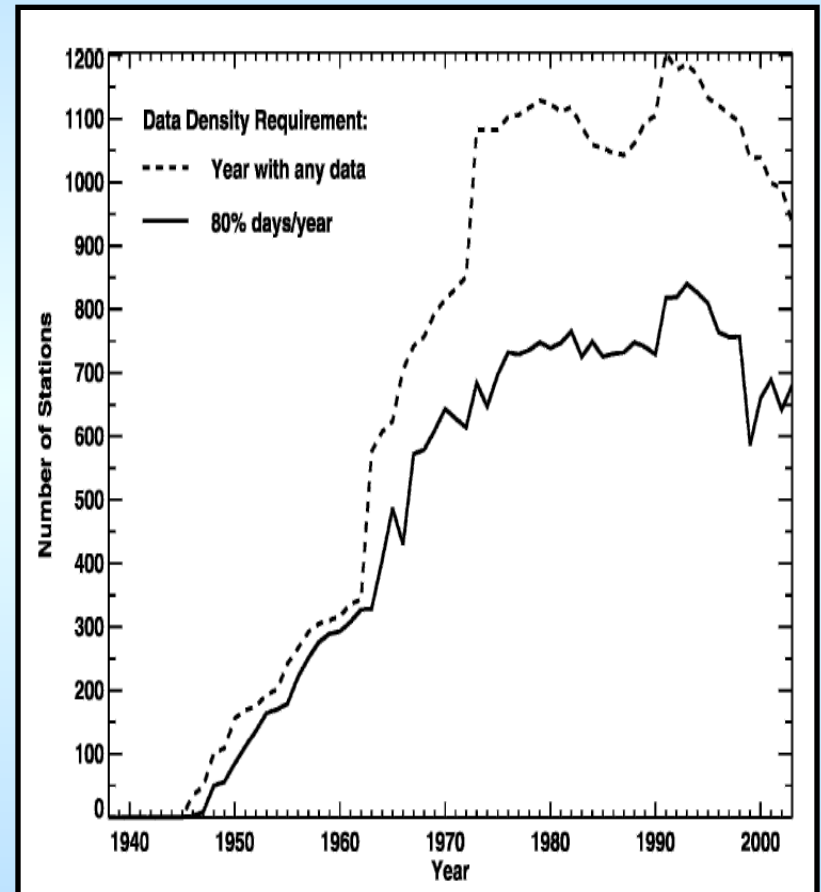
Xungang Yin - STG, Inc.

Jeff Arnfield - NCDC

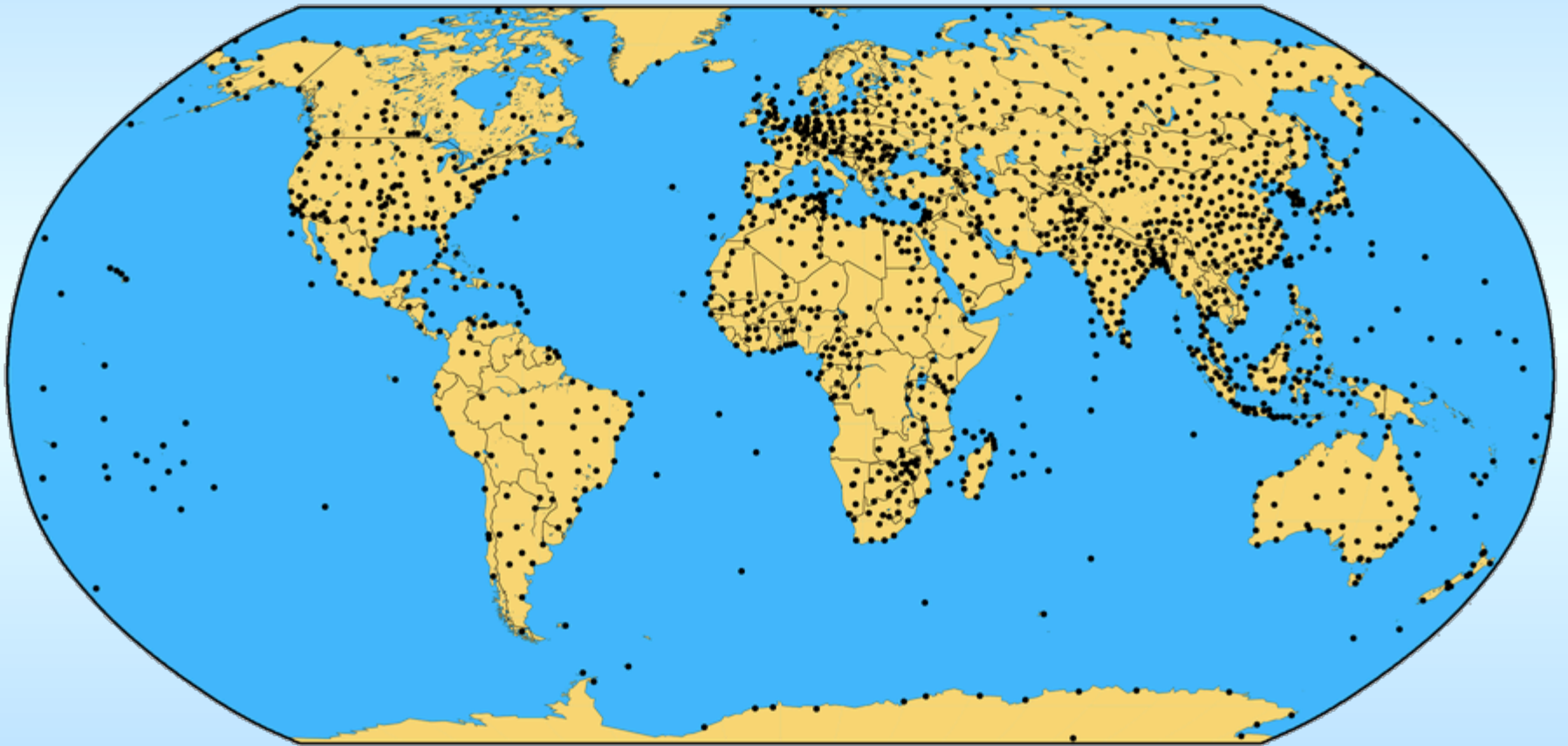
Russell S. Vose - NCDC

IGRA version 1

- Released in 2005
- 1538 stations
- 33×10^6 soundings
- 11 data sources
- 1 daily update
- 2 access points
 - FTP
 - NOMADS



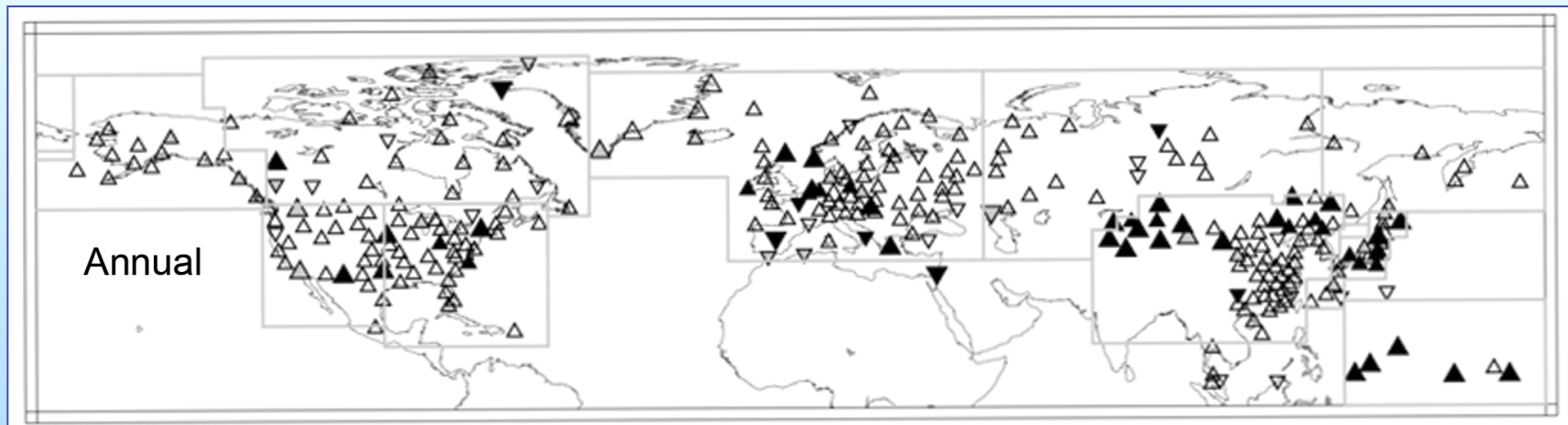
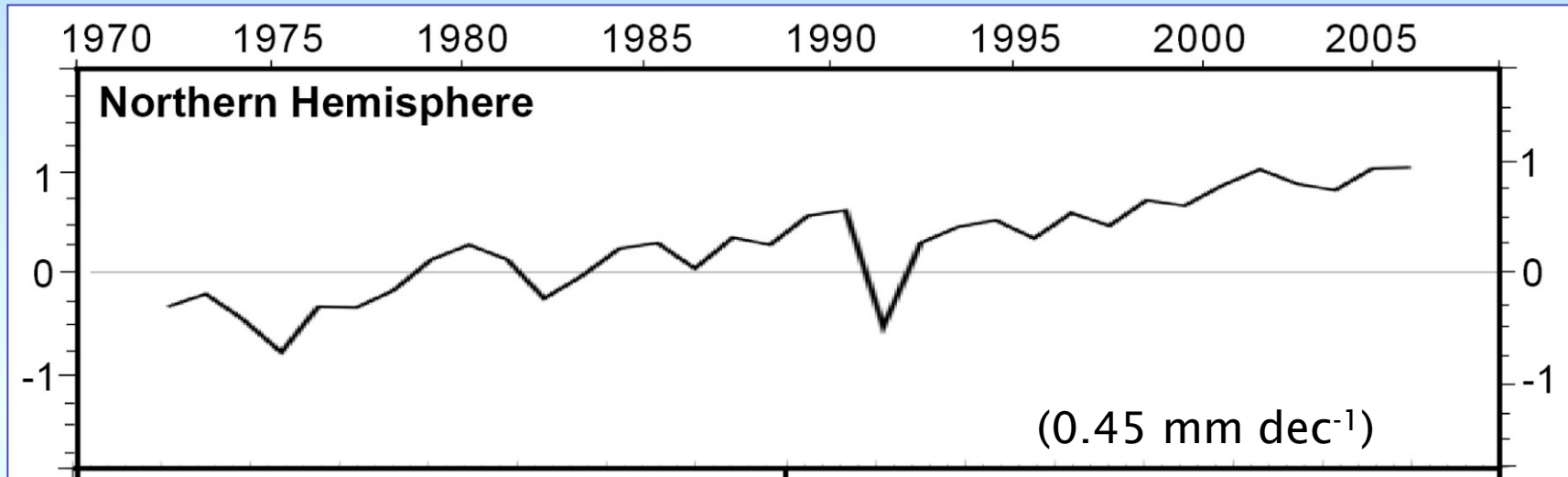
IGRA version 1



Publications

- Durre, I., R.S. Vose, and D.B. Wuertz, 2006: Overview of the Integrated Global Radiosonde Archive. *Journal of Climate*, **19**, 53-68.
- Durre, I., R.S. Vose, and D.B. Wuertz, 2008: Robust automated quality assurance of radiosonde temperatures. *Journal of Applied Meteorology and Climatology*, **47**, 2081-2095.
- Durre, I. and X. Yin, 2008: Enhanced radiosonde data for studies of vertical structure. *Bulletin of the American Meteorological Society*, **89**, 1257-1262.
- Durre, I., C.N. Williams, Jr., X. Yin, and R.S. Vose, 2009: Radiosonde-based trends in precipitable water over the Northern Hemisphere: An update. *Journal of Geophysical Research – Atmospheres*, **114**, doi:10.1029/2008JD010989.

Trends in Precipitable Water



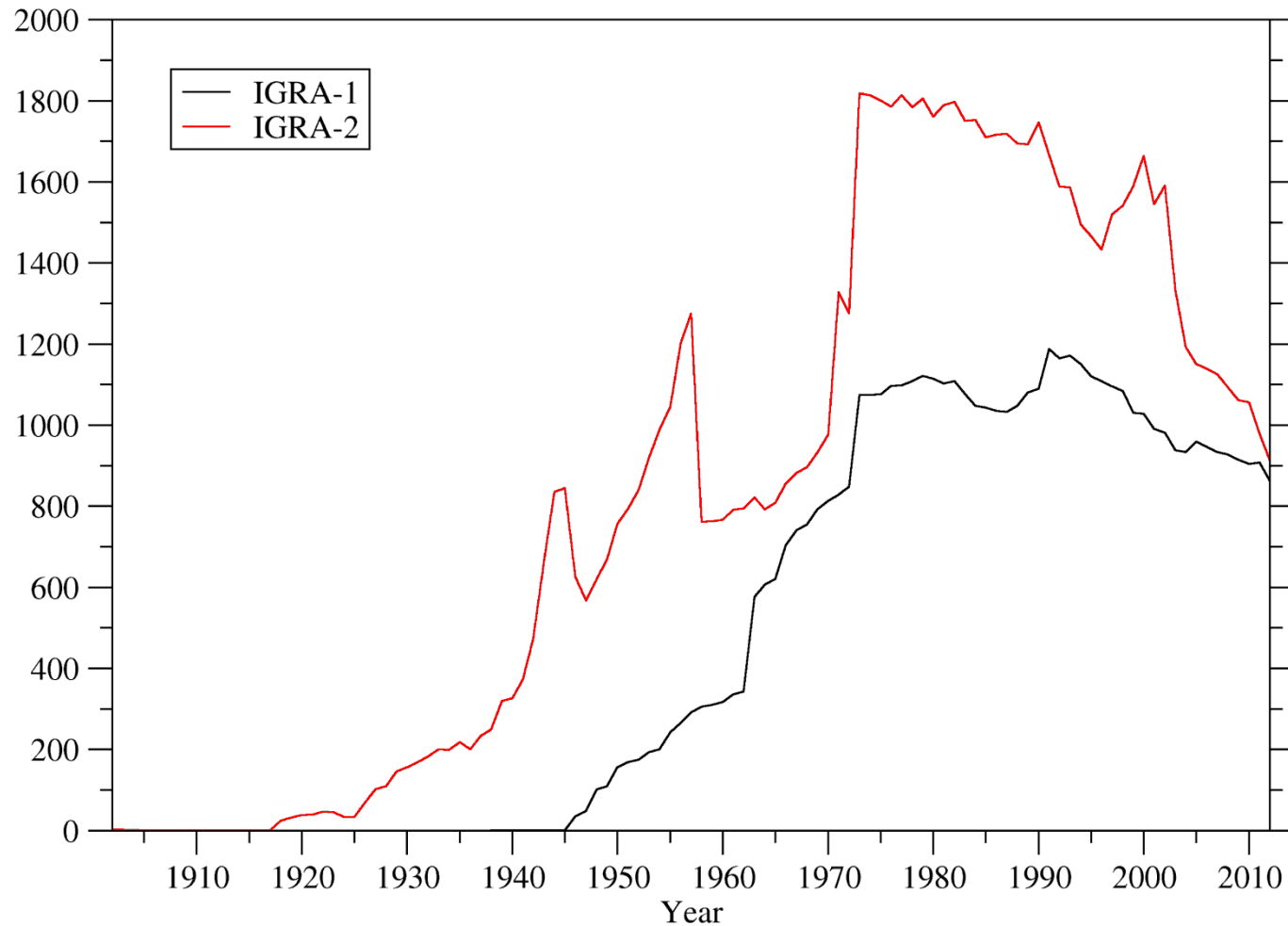
Why IGRA version 2?

- To enhance coverage before 1963 and in data-sparse regions
- To include:
 - Ships
 - Additional pilot balloon observations
 - Relative humidity
 - Recently digitized data
 - Data sets used in reanalyses
- To simplify data integration algorithms

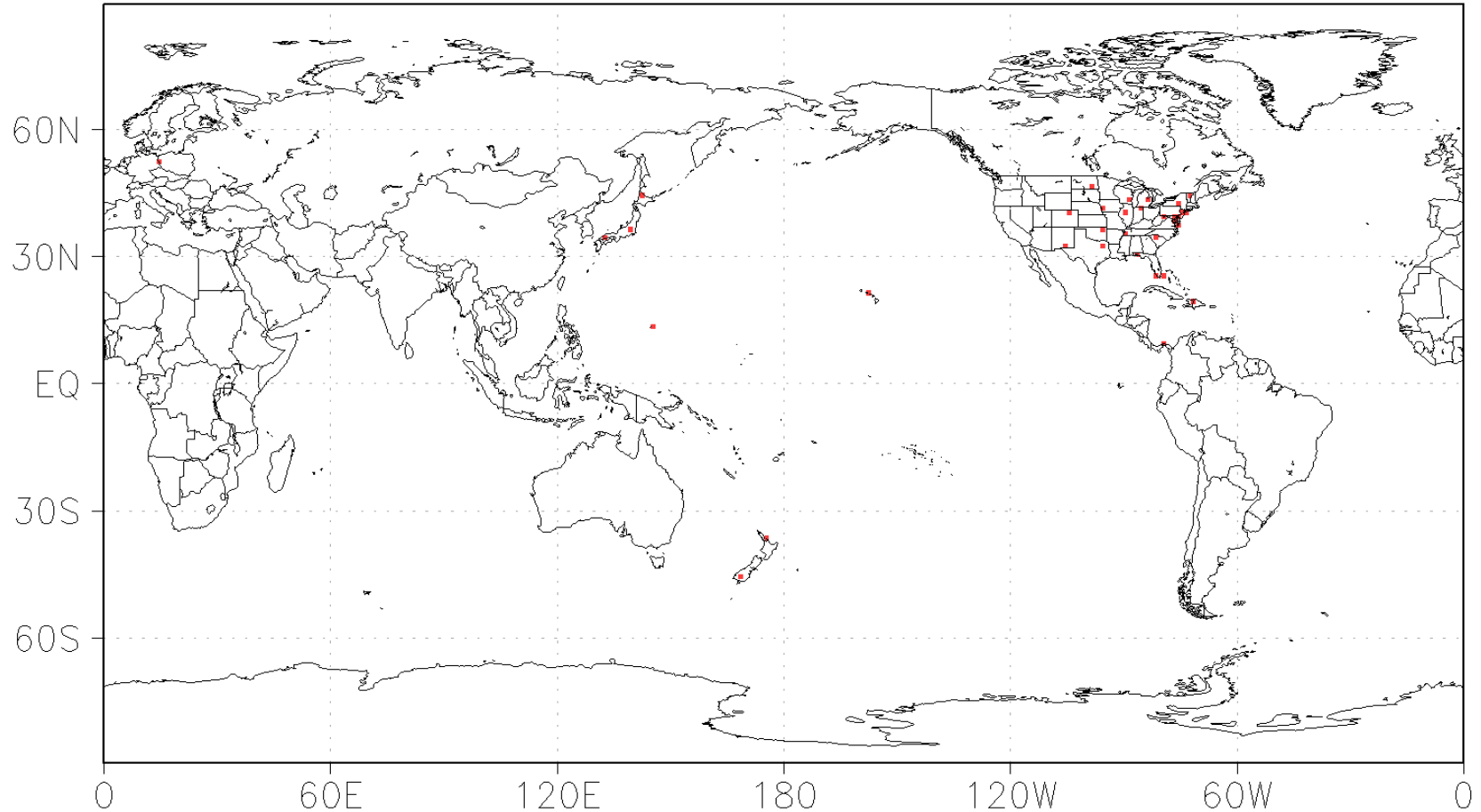
New Source Data Sets

- 92 data sets considered
- 42 collections reformatted (major effort)
- Highlights
 - MIT and C-CARDS from NCAR
 - Bronnimann acquisitions
 - CDMP data for U.S. and Africa
 - French West African data
 - Additional China data from NCDR & NCAR
 - Russian Ice Island and other marine data

IGRA v2 vs IGRA v1 Stations By Year

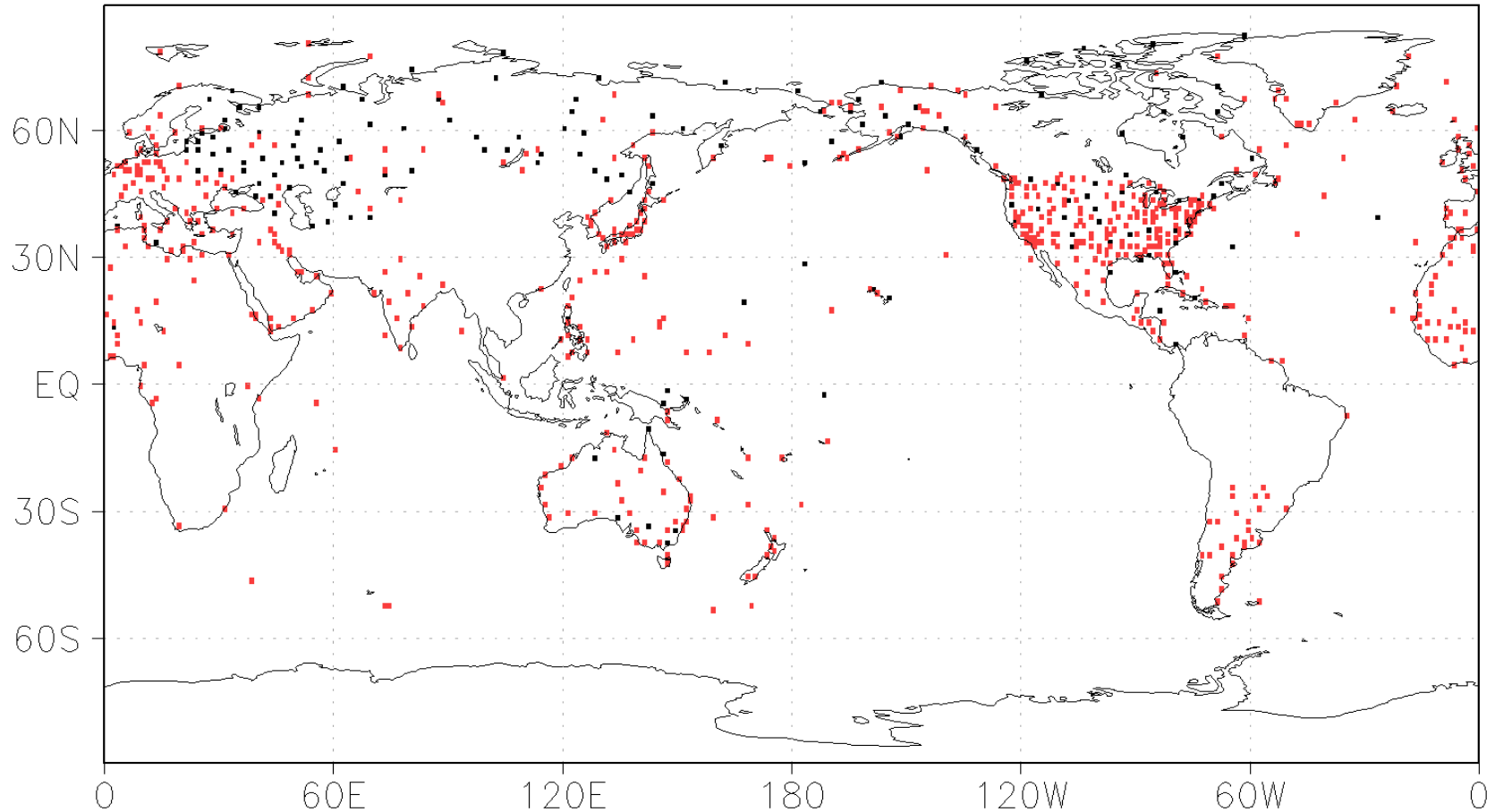


IGRA v2 & IGRA v1 Coverage - 1925



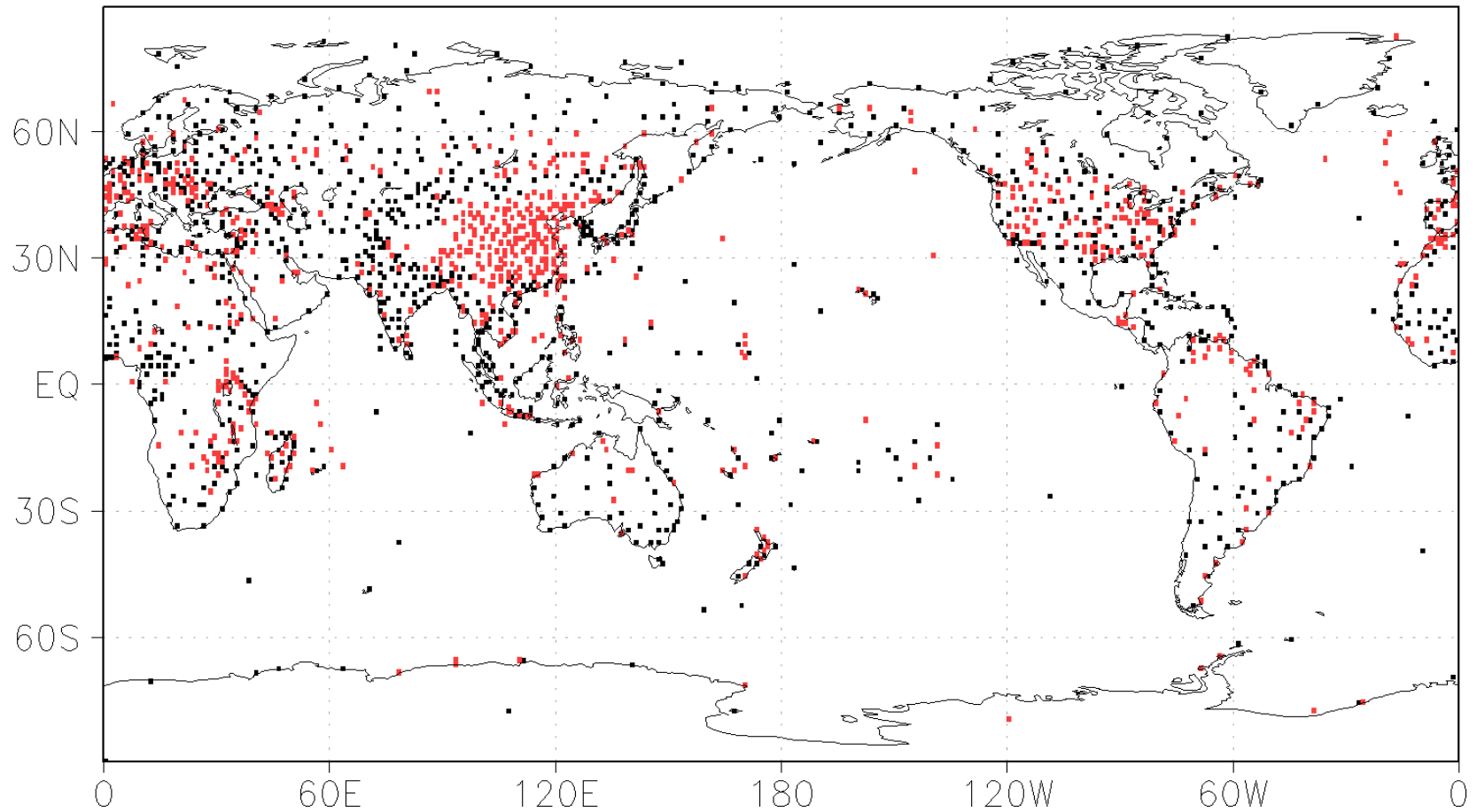
- IGRA v1 station
- Added in IGRA v2

IGRA v2 & IGRA v1 Coverage - 1950



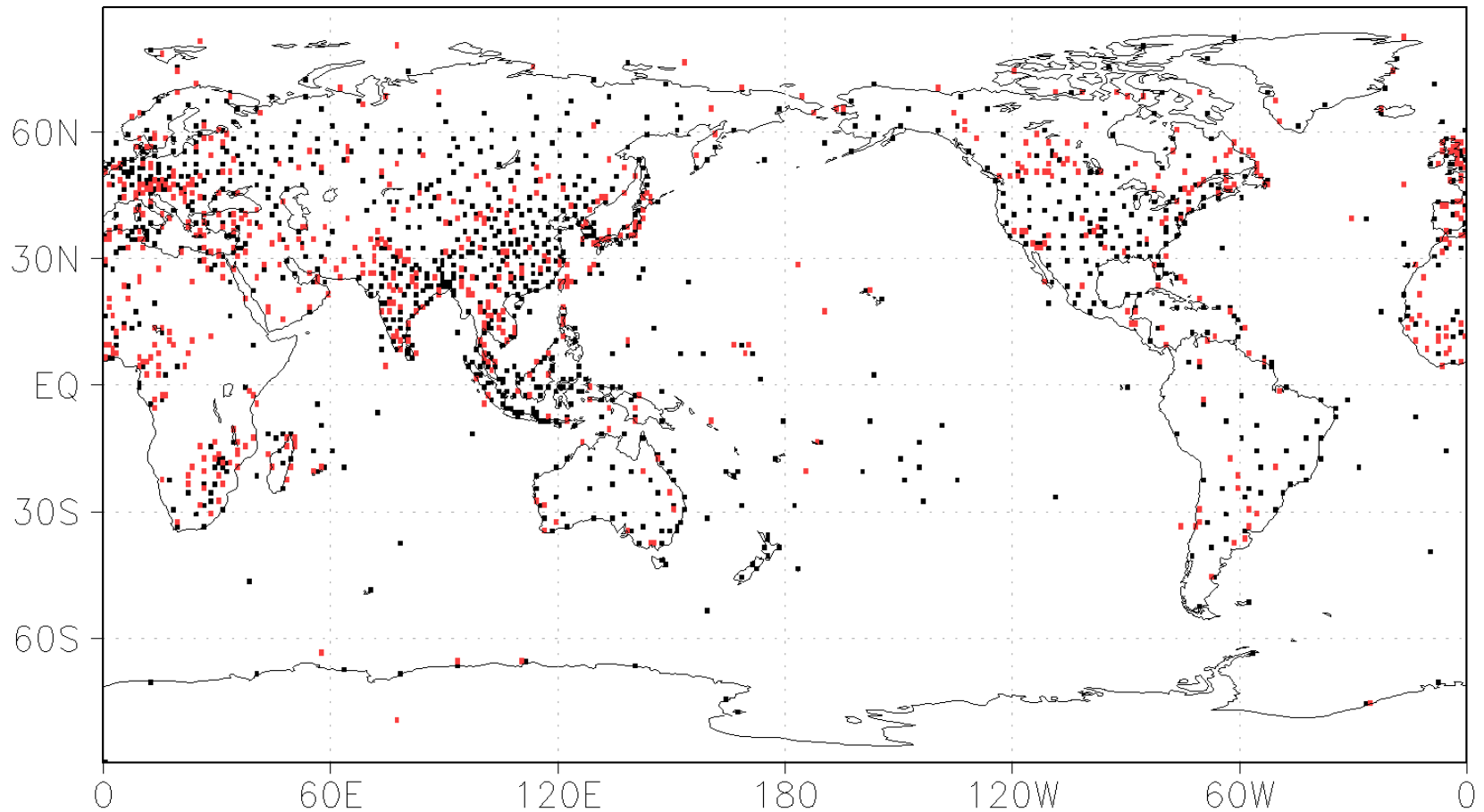
- IGRA v1 station
- Added in IGRA v2

IGRA v2 & IGRA v1 Coverage - 1975



- IGRA v1 station
- Added in IGRA v2

IGRA v2 & IGRA v1 Coverage - 2000



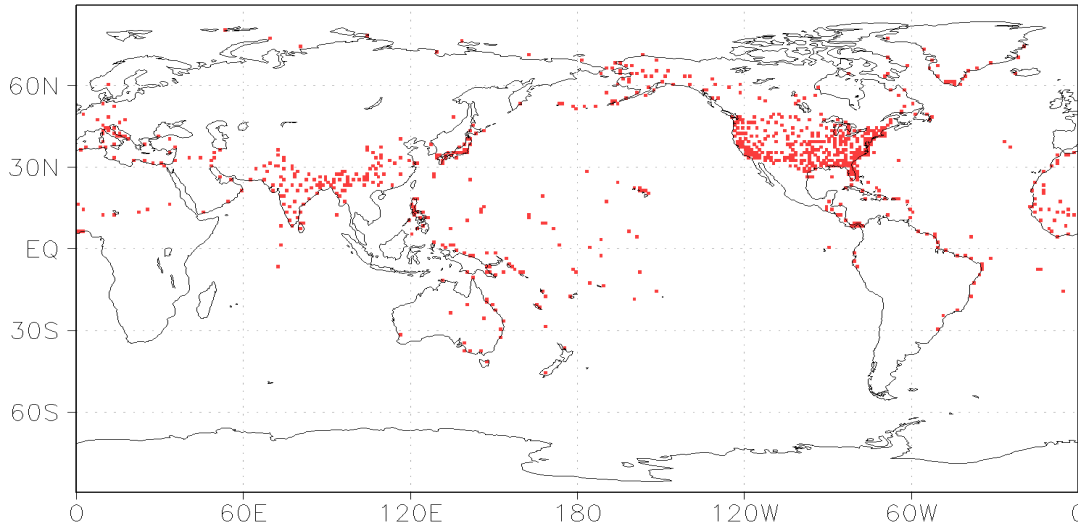
- IGRA v1 station
- Added in IGRA v2

IGRA v2 Status and Plans

- Currently in development
- Acquisition/reformatting (2010)
- Preprocessing/standardization (2011)
- Integration (station matching) (2012)
- QA and update system (2013)

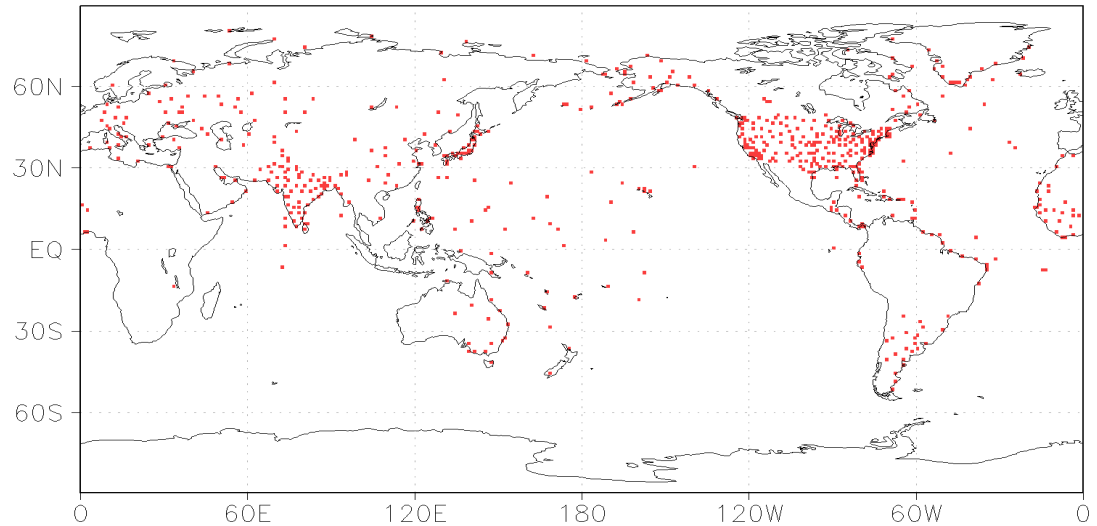
IGRA v2 Spatial Coverage Over Time

• IGRA v2 station



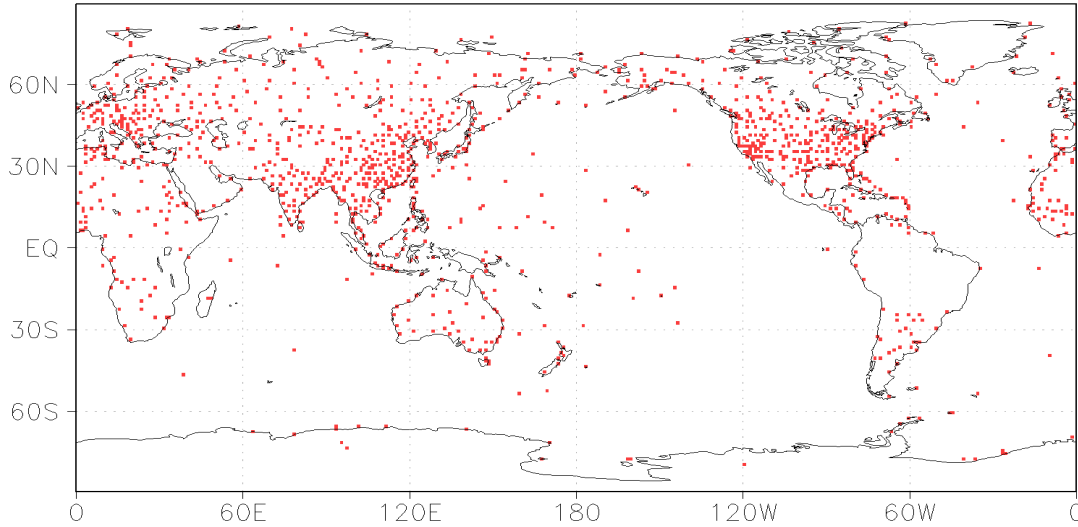
1945

1946



IGRA v2 Spatial Coverage Over Time

• IGRA v2 station



1957

1958

