



**imgw**

Institut für Meteorologie  
und Geophysik



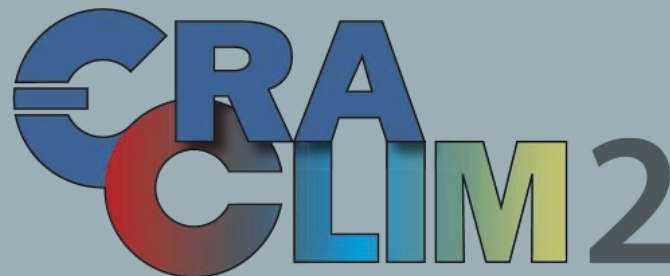
**universität  
wien**

# BIAS CORRECTIONS FOR RADIOSONDE HUMIDITY

Application of/for reanalysis

M. Blaschek

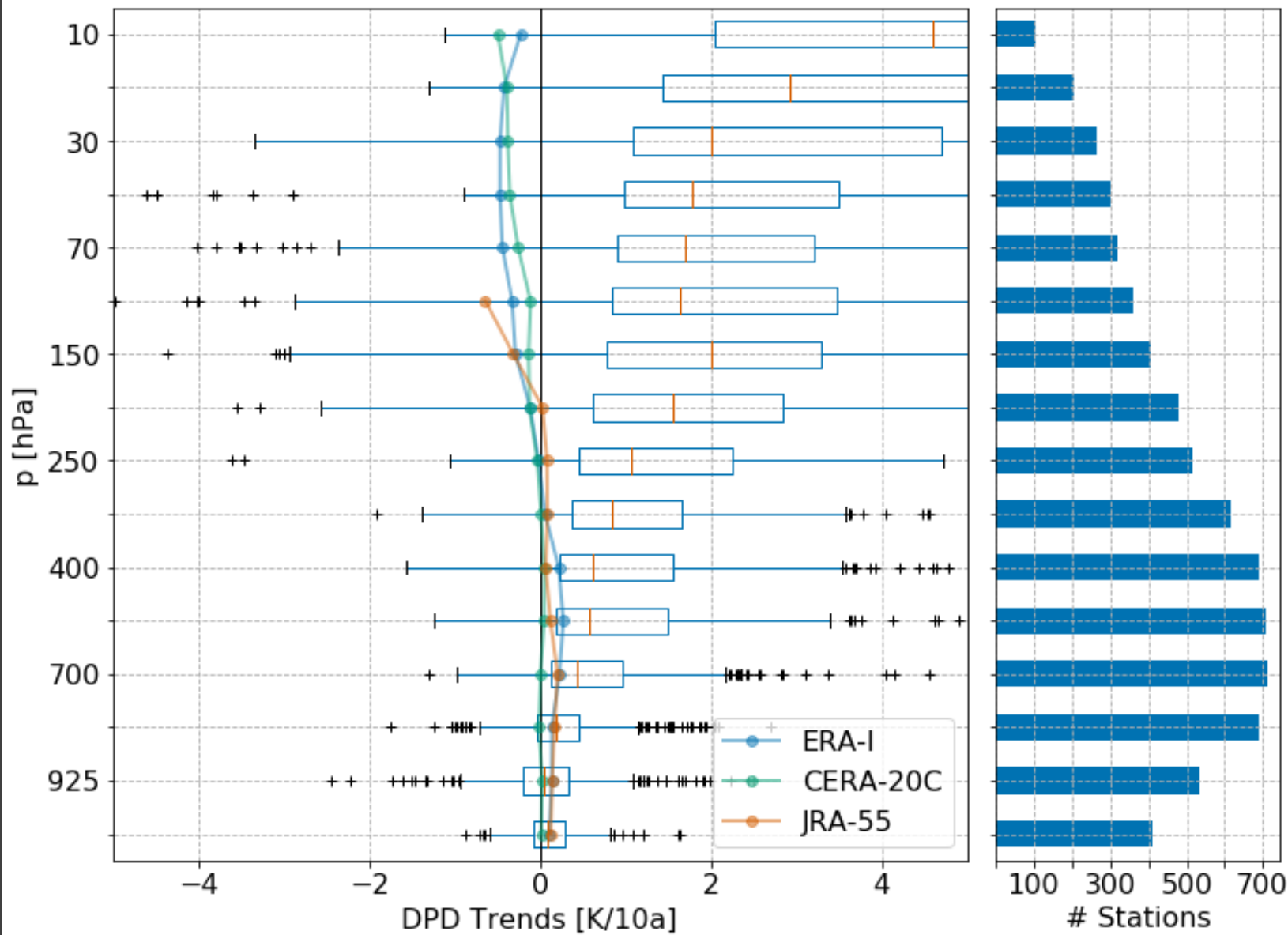
L. Haimberger



# OUTLINE

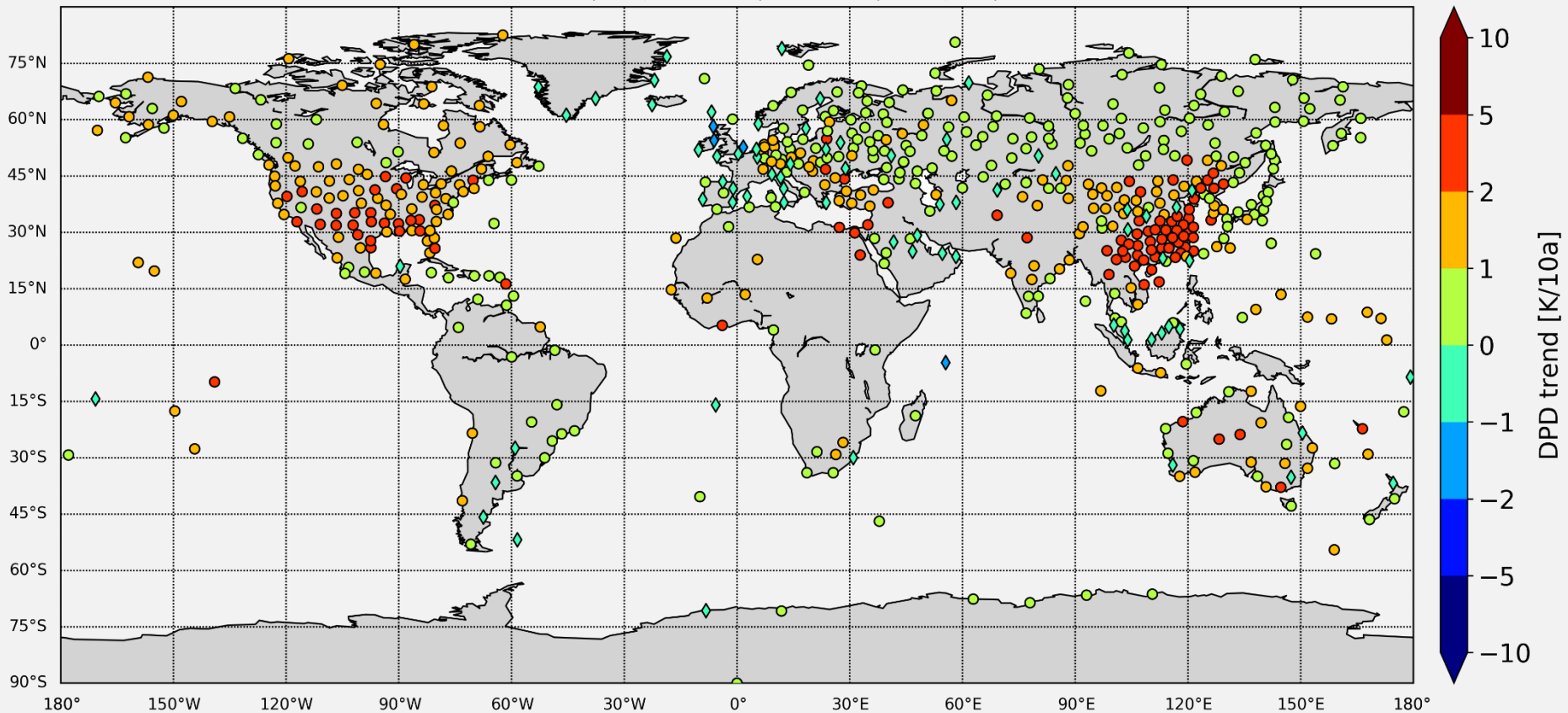
- Humidity problems
- Reanalysis for breakpoint detection (Application)
- Other measurements of humidity
  - Total column water vapour (TCWV)
  - BT from SSMI / SSMIS, SSM-T2
- Consolidated homogenized version of RASO humidity for reanalysis (error estimate ?) as an application for reanalysis efforts

# RASO Trends 1979-2016



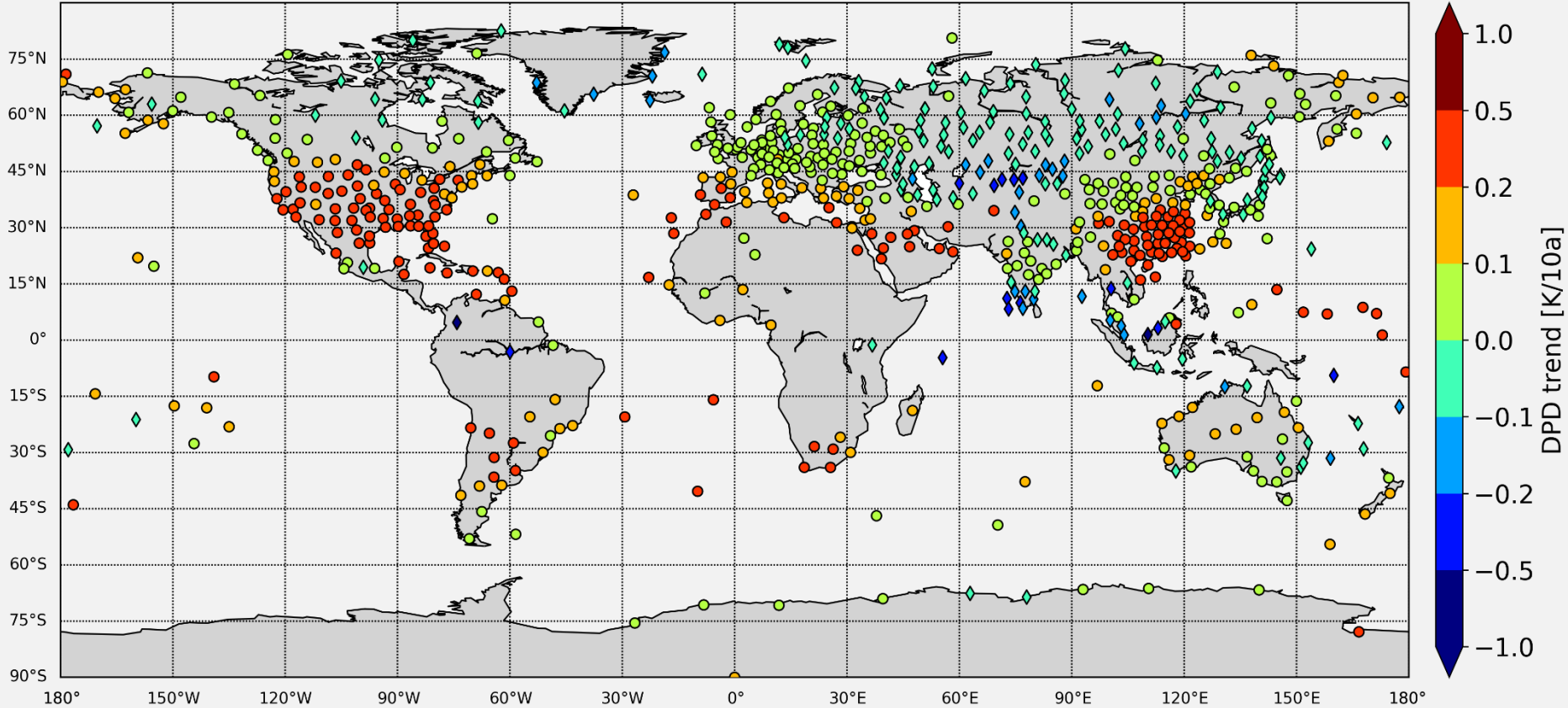
# RASO DPD TRENDS

Global Radiosonde Trends (UCor, 1979-2016) at 300 hPa (# 622 / 737) Cost: 2518.70



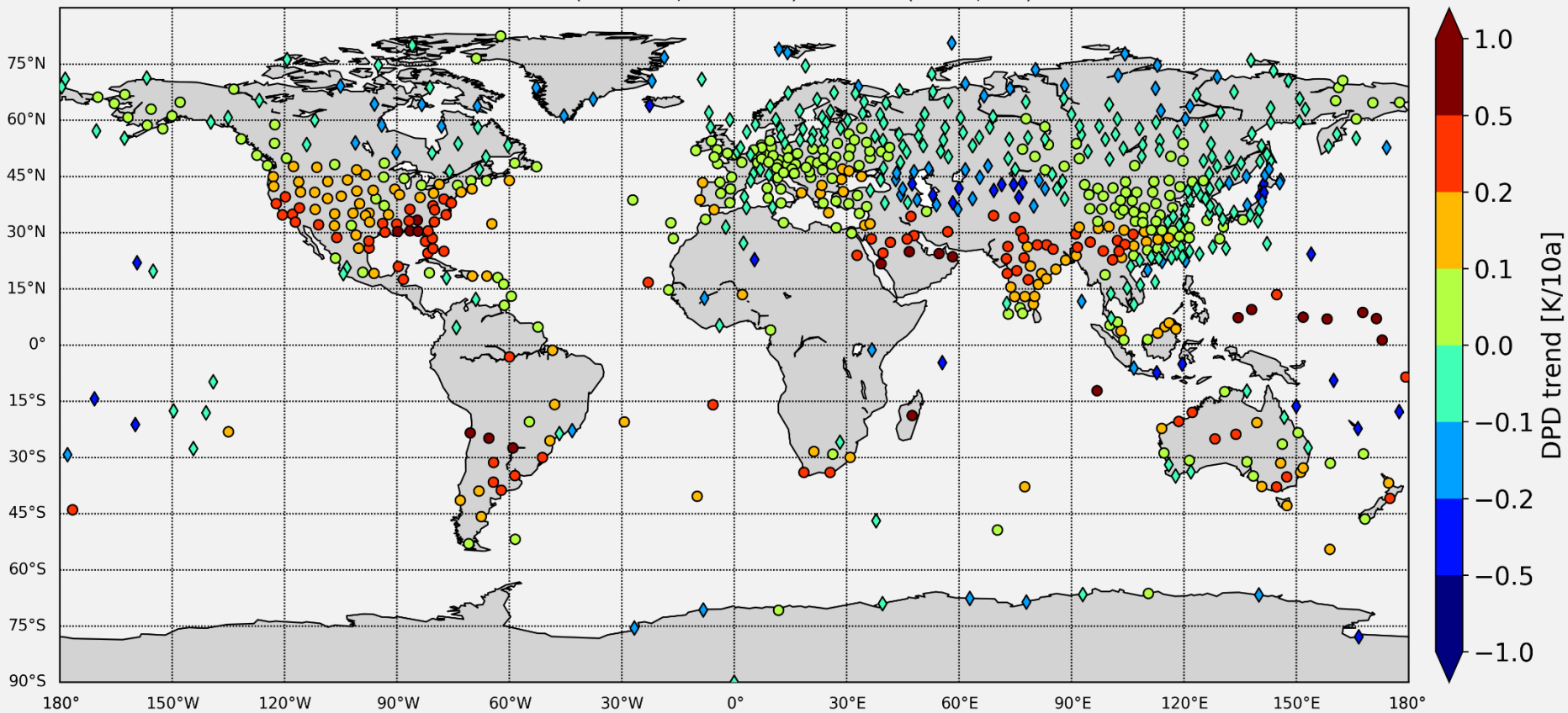
# ERA INTERIM DPD TRENDS

Global Radiosonde Trends (ERA, 1979-2016) at 300 hPa (# 736 / 737) Cost: 75.28



# CERA-20C DPD TRENDS

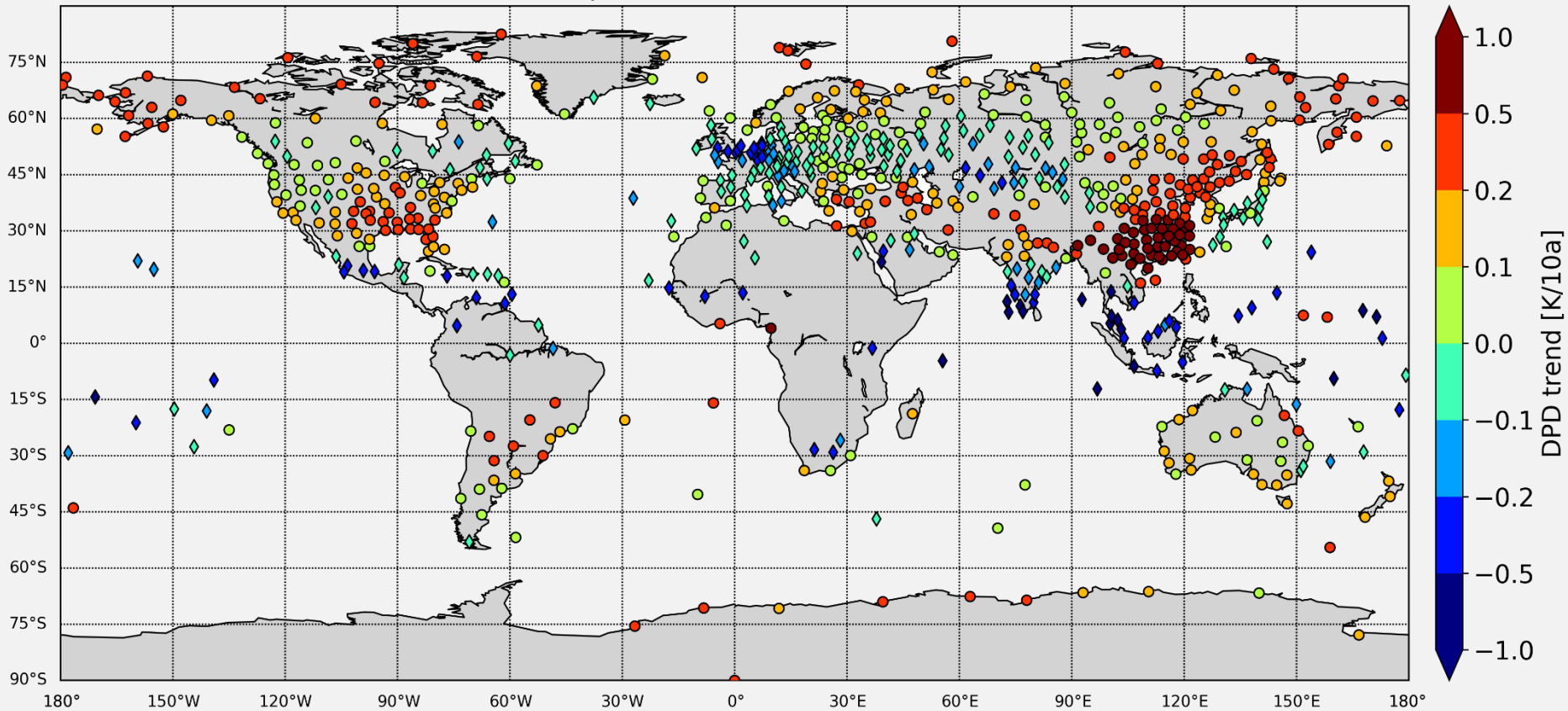
Global Radiosonde Trends (CERA-20C, 1979-2016) at 300 hPa (# 736 / 737) Cost: 97.74





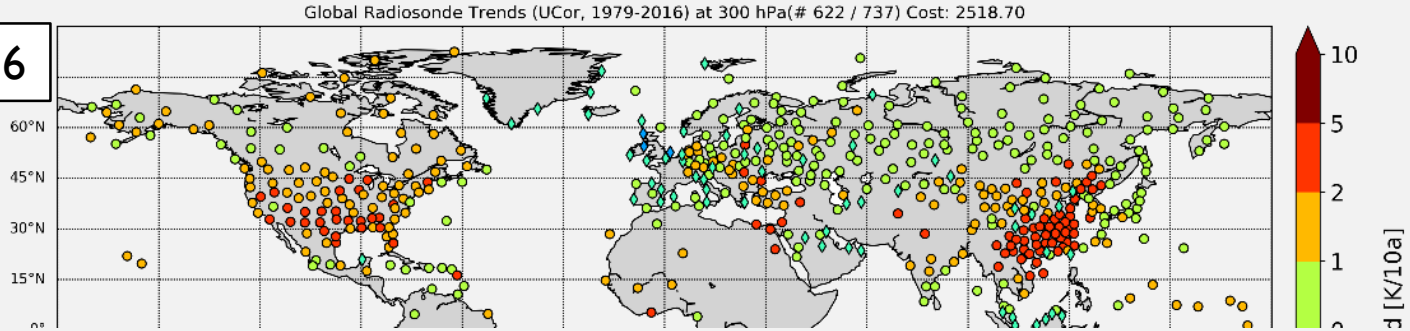
# JRA-55 DPD TRENDS

Global Radiosonde Trends (JRA-55, 1979-2016) at 300 hPa(# 731 / 737) Cost: 224.72

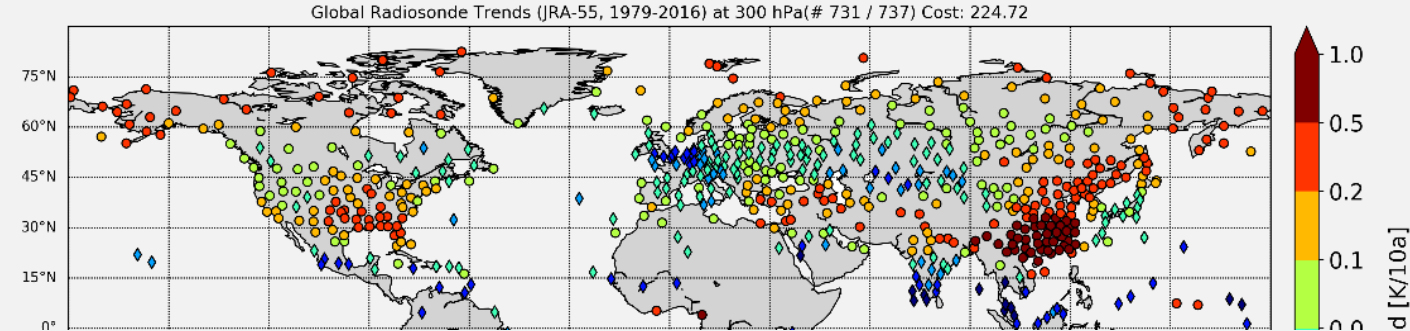


# DPD Trends 1979 - 2016

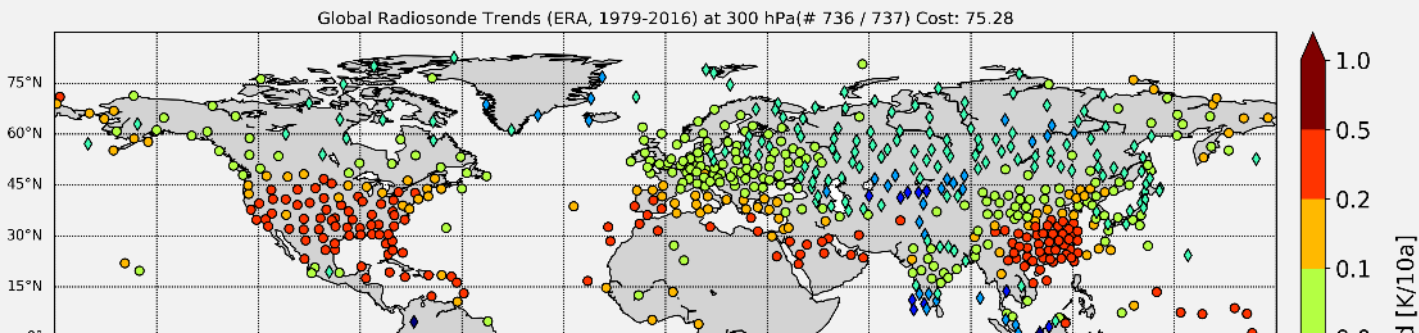
RASO - RAW



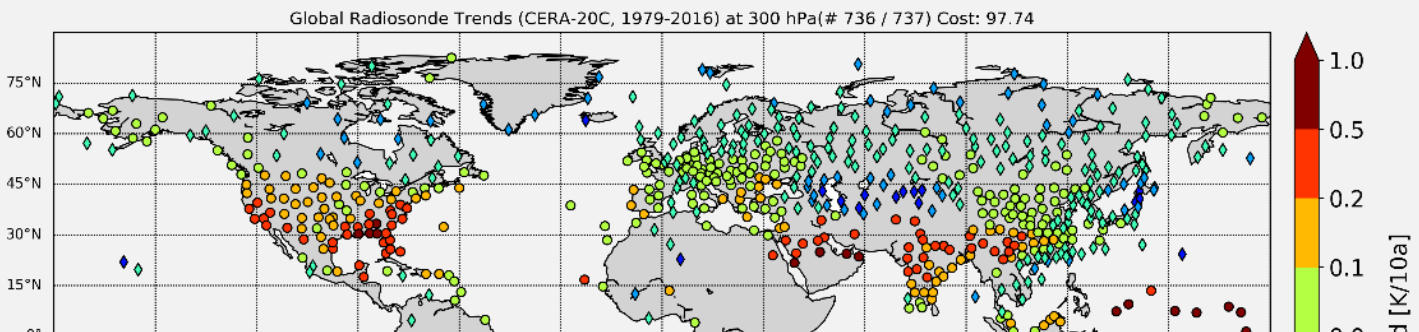
JRA-55



ERA-Interim



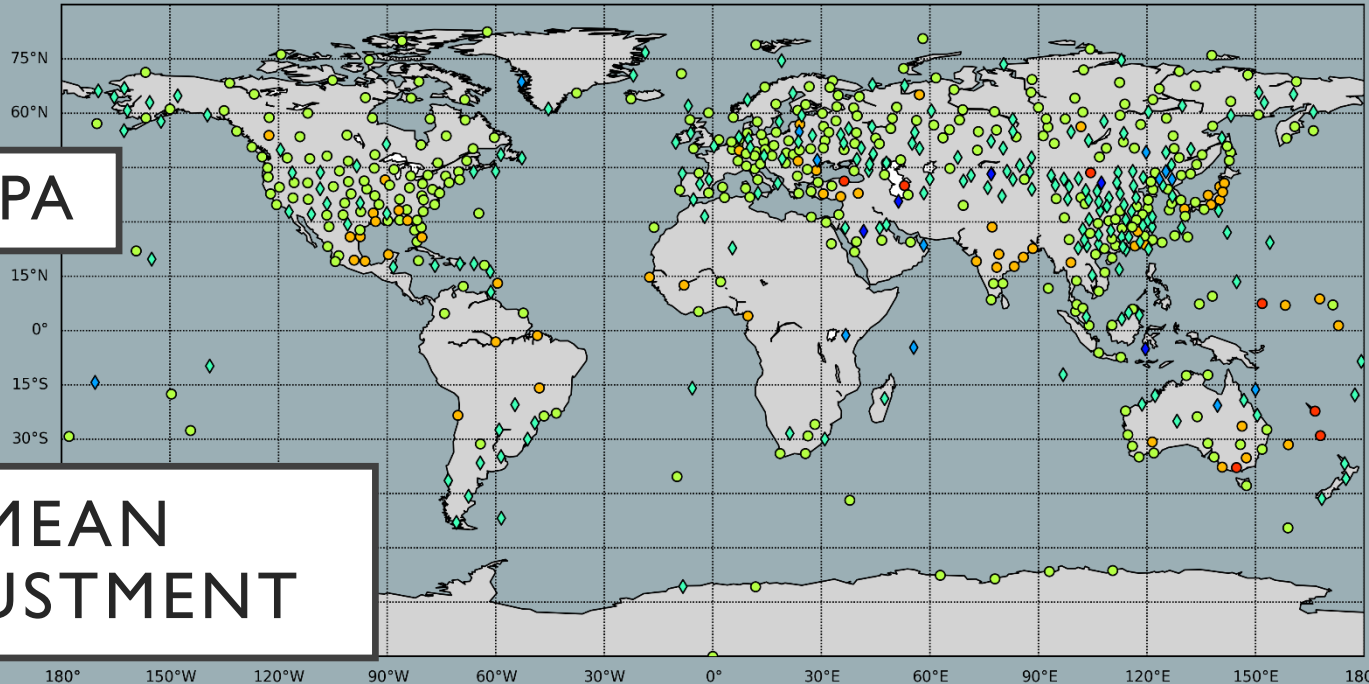
CERA-20C





Global Radiosonde Trends (MCor, 1979-2016) at 300 hPa(# 618 / 737) Cost: 1311.63

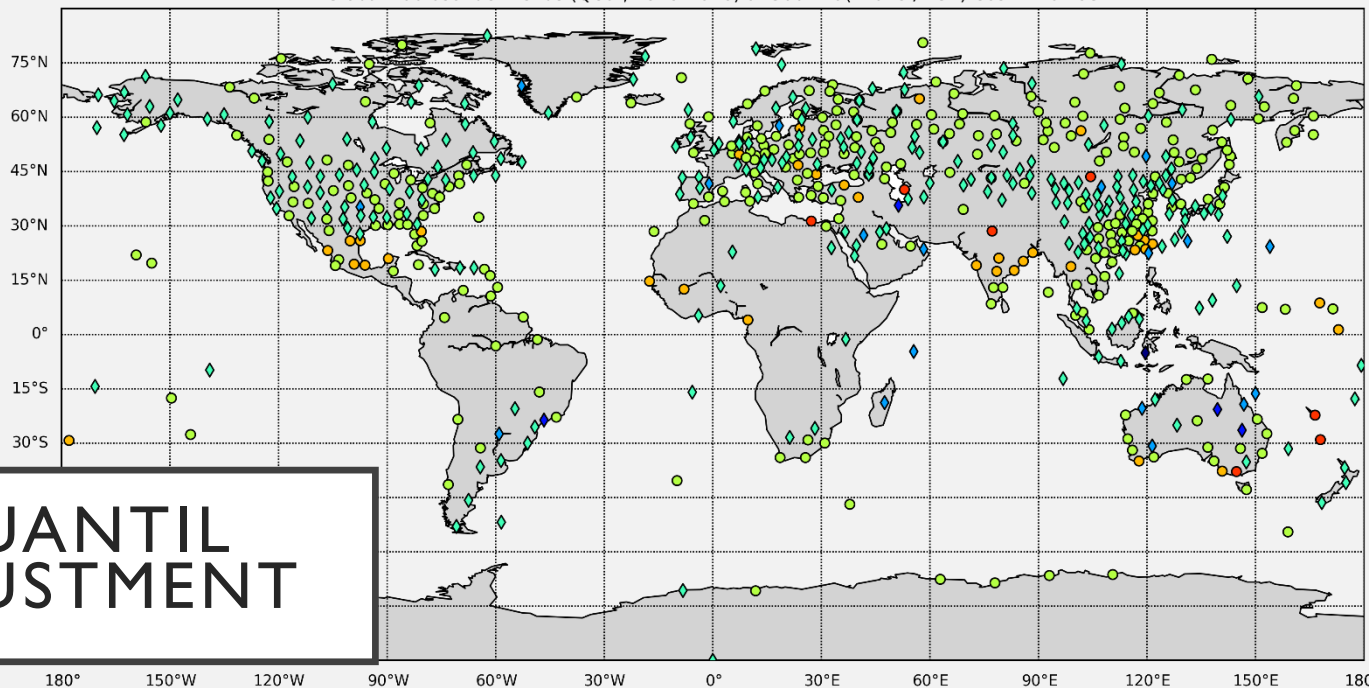
300 HPA



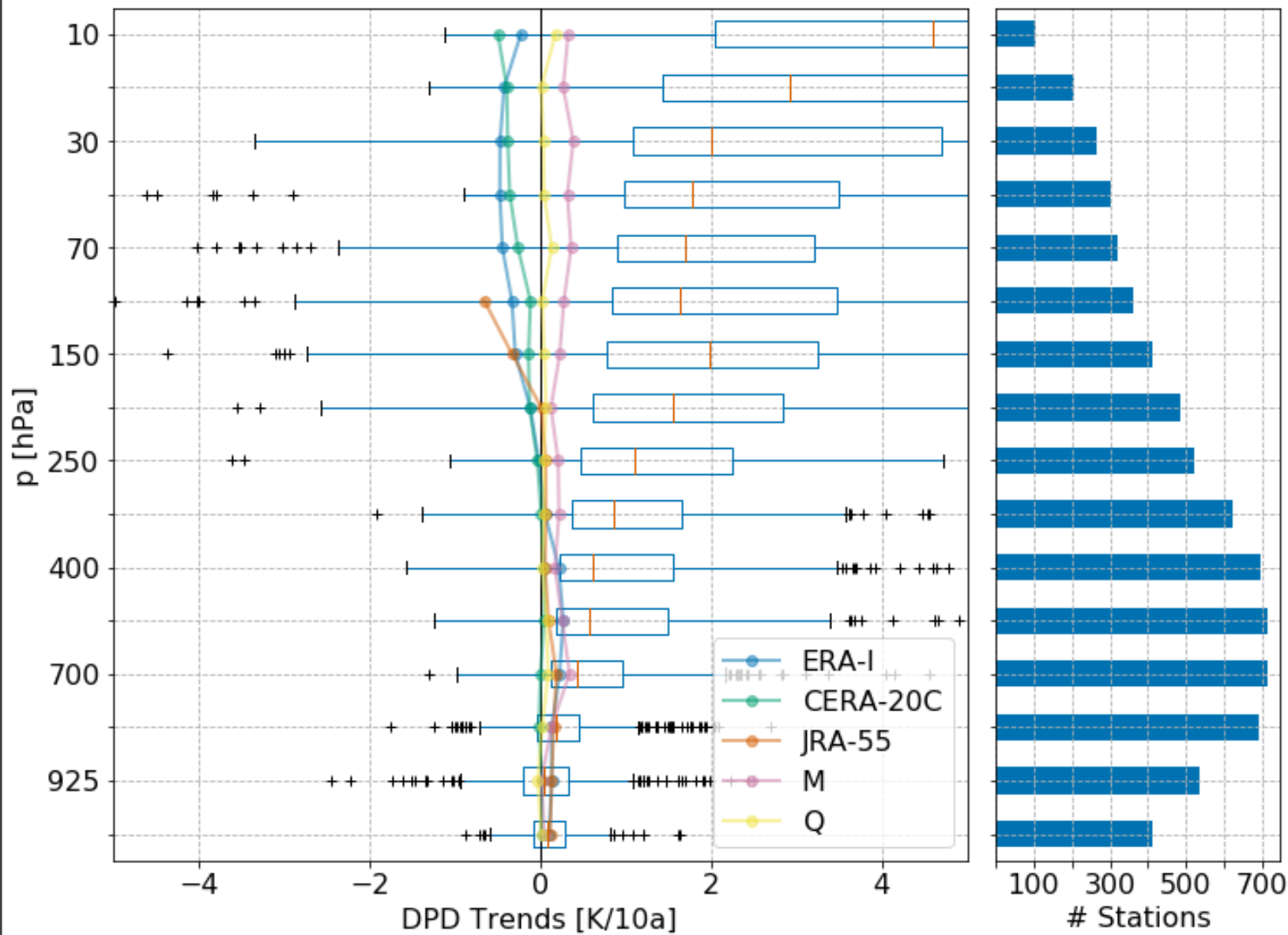
MEAN  
ADJUSTMENT

Global Radiosonde Trends (QCor, 1979-2016) at 300 hPa(# 618 / 737) Cost: 1461.93

QUANTIL  
ADJUSTMENT



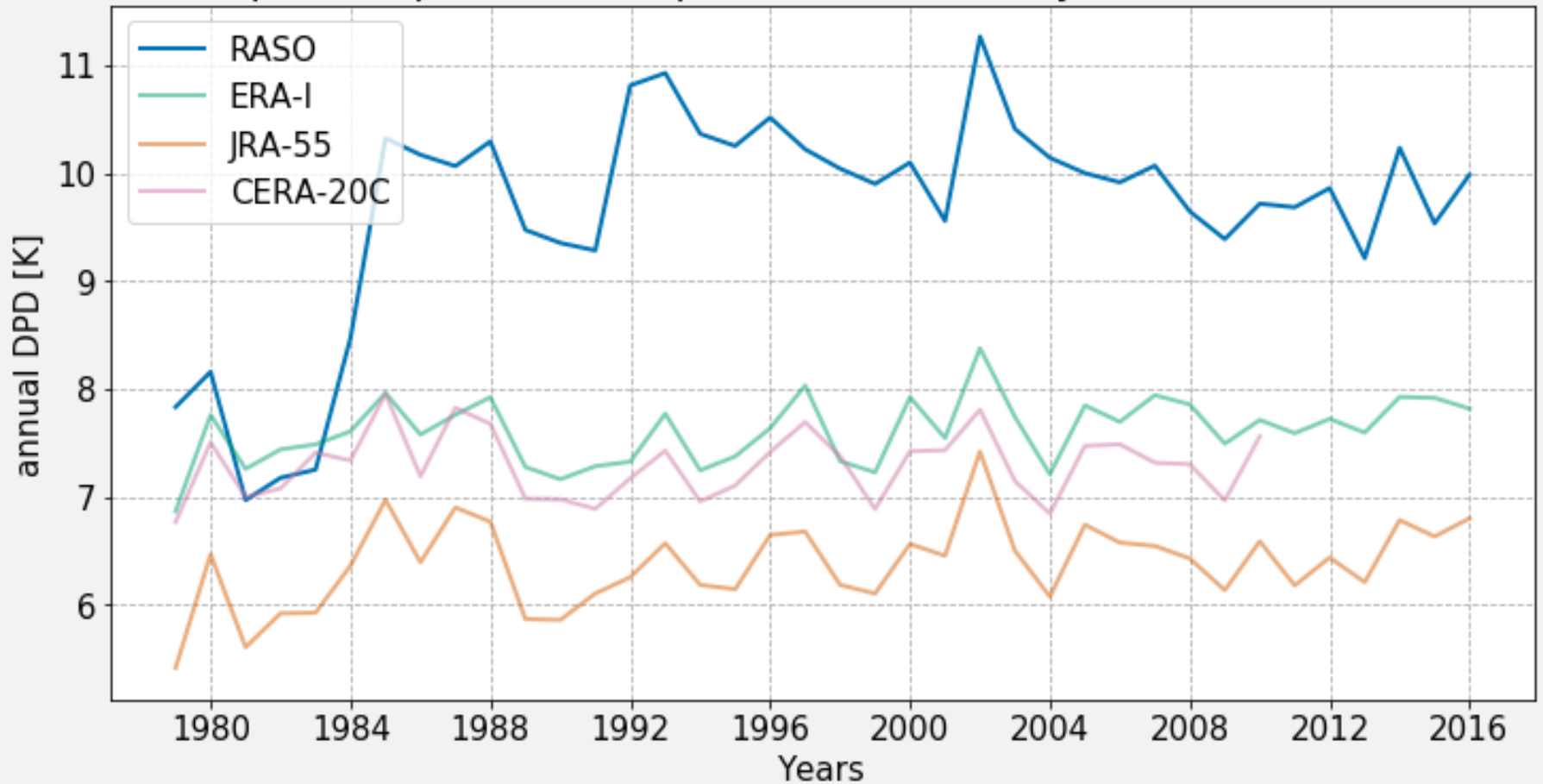
# RASO Trends 1979-2016



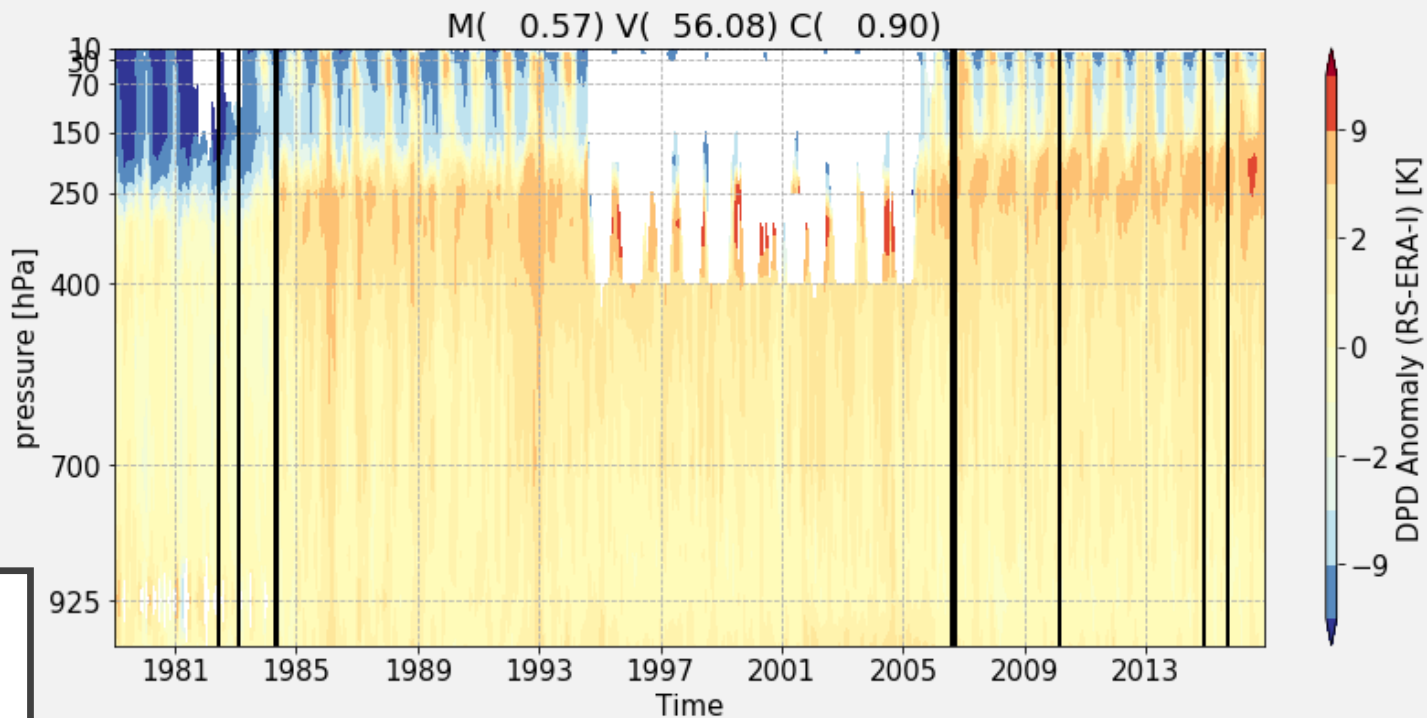
# THE USE OF DIFFERENT REANALYSIS

# DIFFERENT REANALYSIS

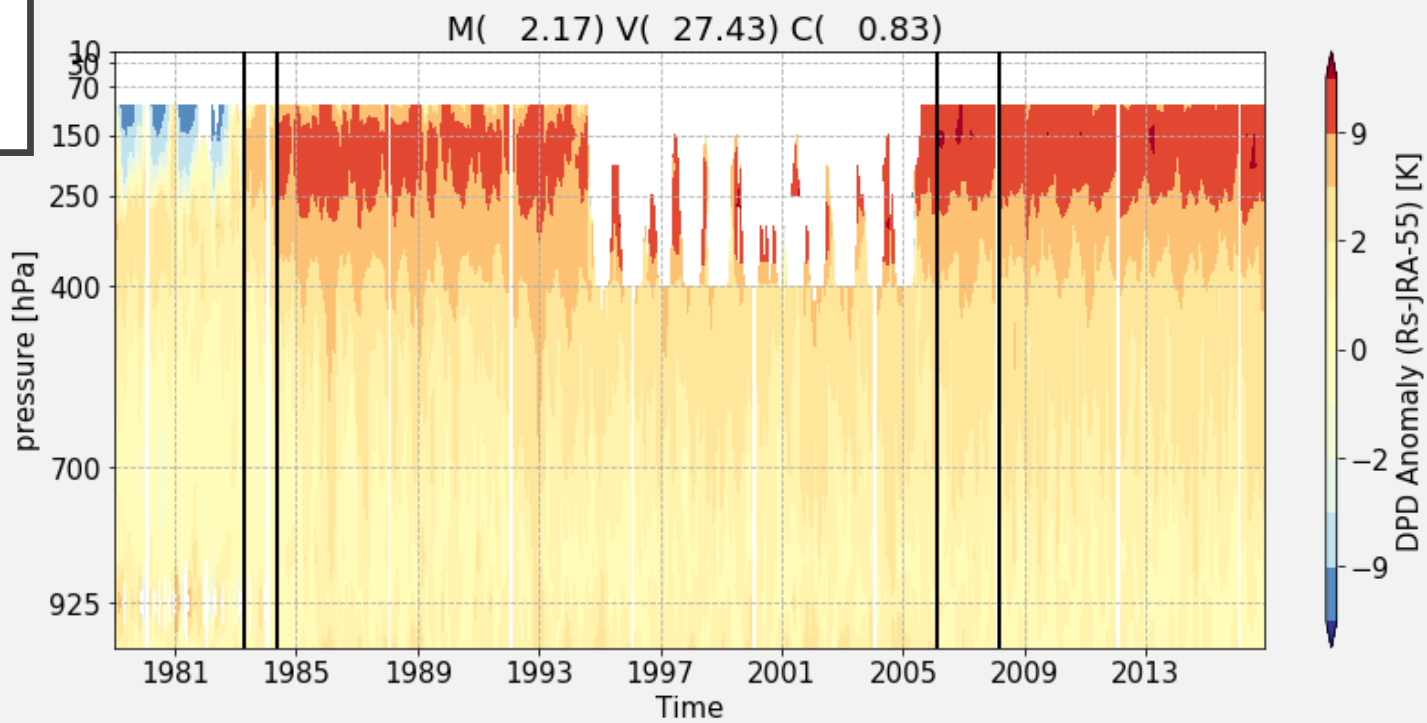
Dewpoint Depression Comparison with Reanalysis, 001001, 400 hPa



ERA-I



RS 100I (JAN  
MAYEN)  
ANOMALIES



JRA-55

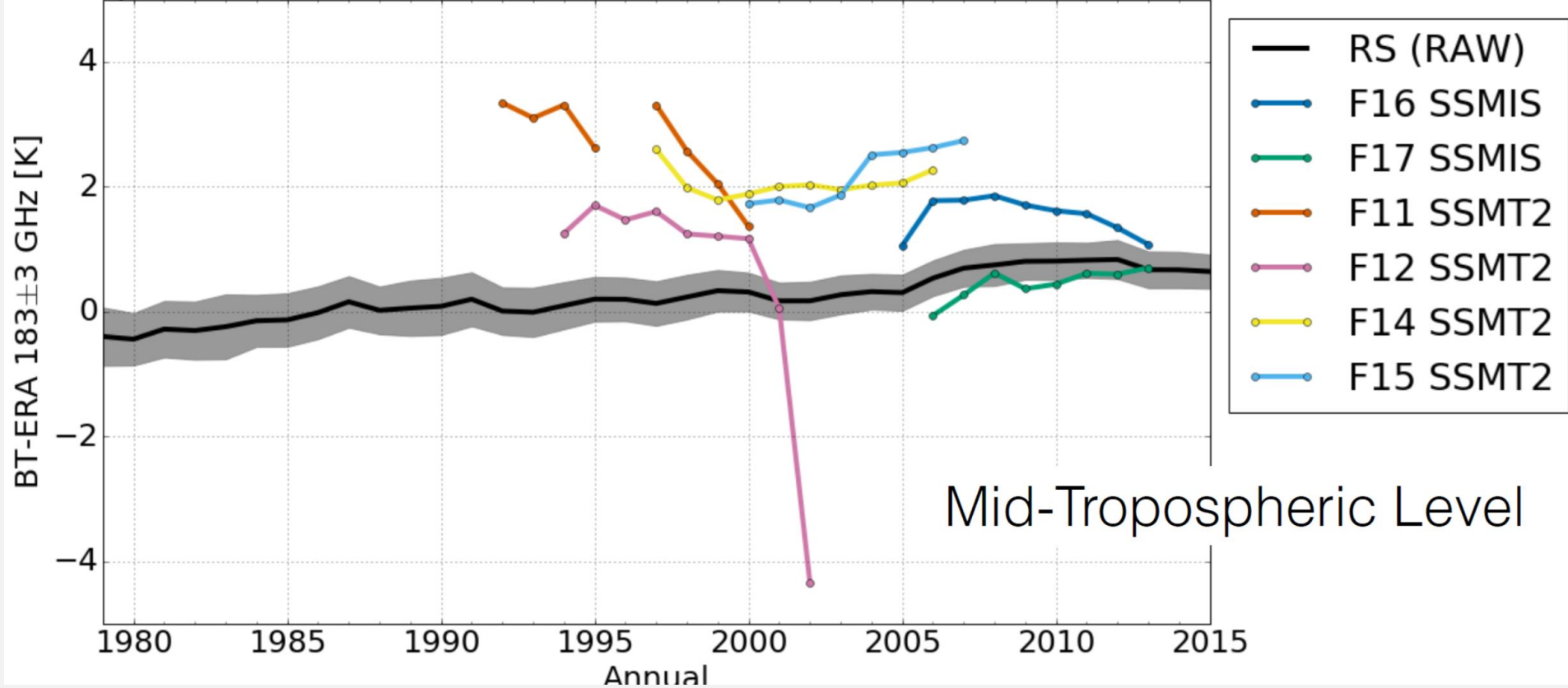


# OTHER SOURCES OF HUMIDITY MEASUREMENTS

COMPARISON / VALIDATION

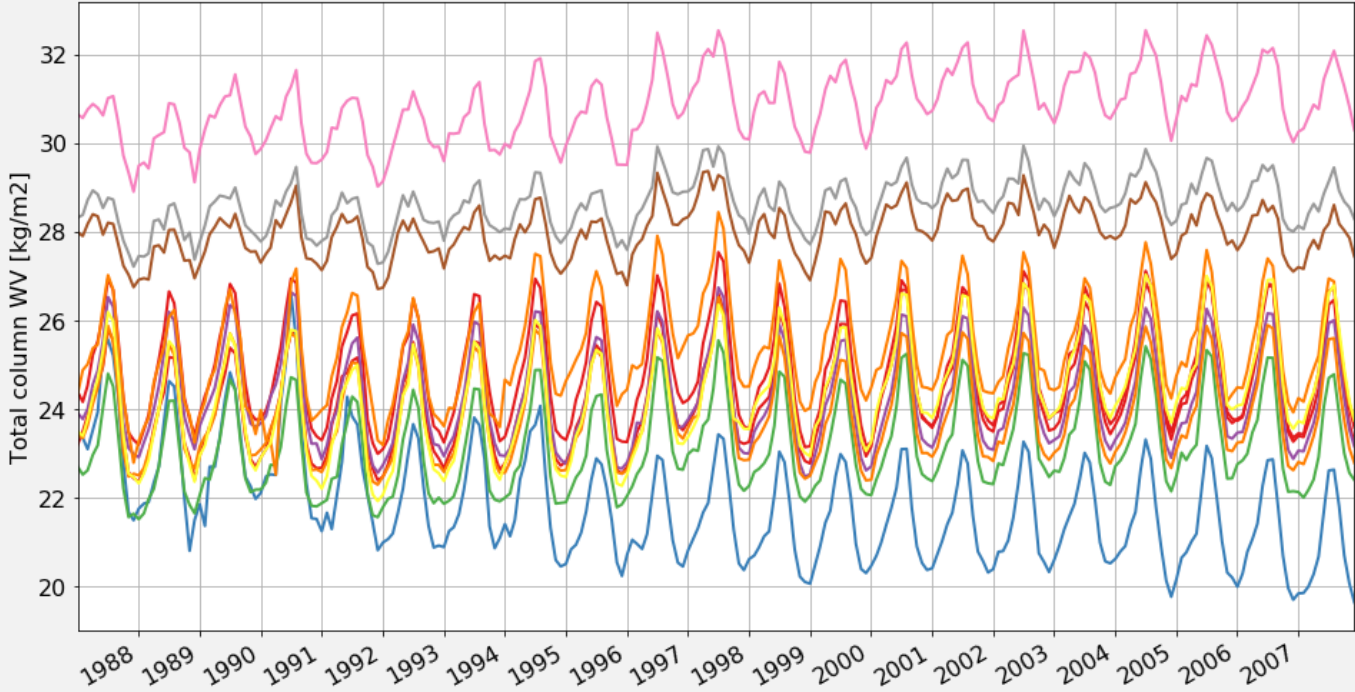
# HUMIDITY SENSING SATELLITES – SSMI(S)

Departures of RS-BT to ERA-Interim at RS locations, RTTOV v11



# TOTAL COLUMN WATER VAPOR – GEWEX /GVAP

Global Mean TCWV for SSMI, Reanalysis 1988 - 2008 (Schröder et al., 2016)

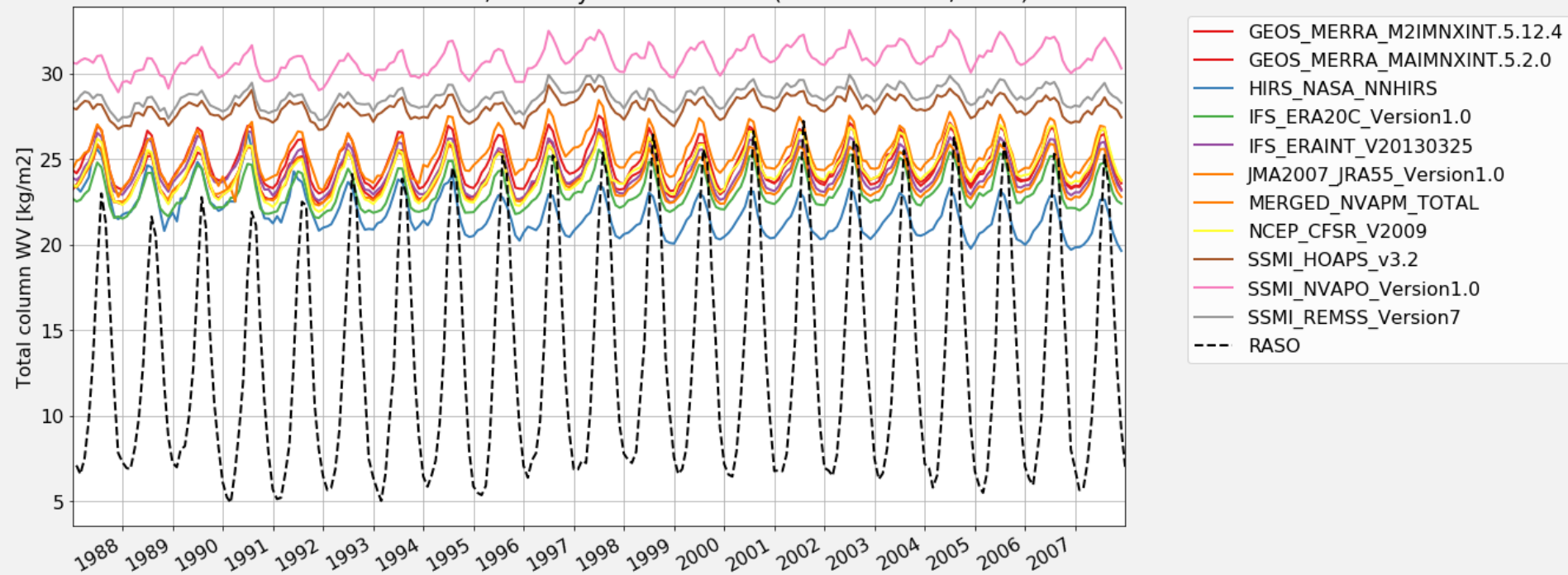


- GEOS\_MERRA\_M2IMNXINT.5.12.4
- GEOS\_MERRA\_MAIMNXINT.5.2.0
- HIRS\_NASA\_NNHIRS
- IFS\_ERA20C\_Version1.0
- IFS ERAINT\_V20130325
- JMA2007\_JRA55\_Version1.0
- MERGED\_NVAPM\_TOTAL
- NCEP\_CFSR\_V2009
- SSMI\_HOAPS\_v3.2
- SSMI\_NVAPO\_Version1.0
- SSMI\_REMSS\_Version7

OCEAN ONLY

# TOTAL COLUMN WATER VAPOR

Global Mean TCWV for SSMI, Reanalysis 1988 - 2008 (Schröder et al., 2016)



# SUMMARY

- Breakpoint detection from multiple reanalysis (uncertainty)
- Comparison with TCWV

Future:

- New Version of SSM/T2
- GPS RO (wet retrievals)
- Publish a version of bias adjustments for RASO humidity
- Lots of papers ... 😊

THANKS