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### **New in ECA&D**

Adequate climate services and research rely on well designed and maintained observational databases. To meet the changing requirements at the European scale the database system of the European Climate Assessment & Dataset project (ECA&D) has seen a major update in July 2009. Many of the programs and scripts leading to the data products in ECA&D are made computationally more efficient in order to shorten the time for updating the database when new data is added. Additionally, the procedure for blending data from different participants has been modified to strengthen the consistency between the station metadata and the blended time series. Blended series are now produced for each individual station rather than station groups, for which no specific location exists, as was done before. This necessitated a change in the use of internal ECA&D station numbers on the website, namely the individual station numbers instead of the station group numbers. Consequently, climate extreme indices, which are calculated on the basis of the blended time series, are now also related to one specific station rather than the station groups. Furthermore, the amount of metadata in the database has been increased and made accessible via the webpages. This information is required for the interpretation of the observational series. The metadata now includes not only station location, but also pictures of the observing site, surface coverage information, station relocations, (changes in) observing practices, etc. The ECA&D infrastructure is used in several related EUMETNET activities and progress has been made towards a status of Regional Climate Centre for daily station data and extremes indices in WMO Region VI (Europe and the Middle East).

# New in ECA&D

Else van den Besselaar

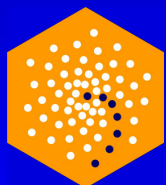
Royal Netherlands Meteorological Institute

*ECA&D Project team:*

Albert Klein Tank

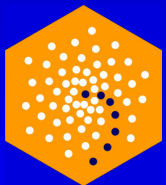
Gerard van der Schrier

Aryan van Engelen



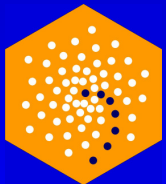
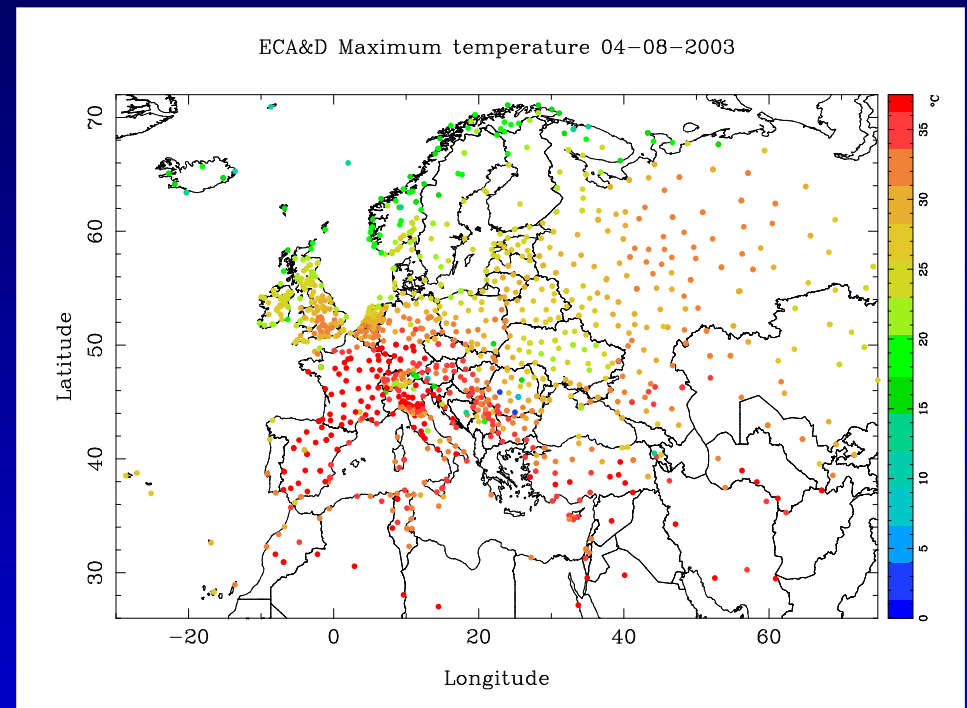
# Outline

- Current status of the project
- Update cycle
- E-OBS gridded dataset
- Future prospects



# Current status (Oct 2009)

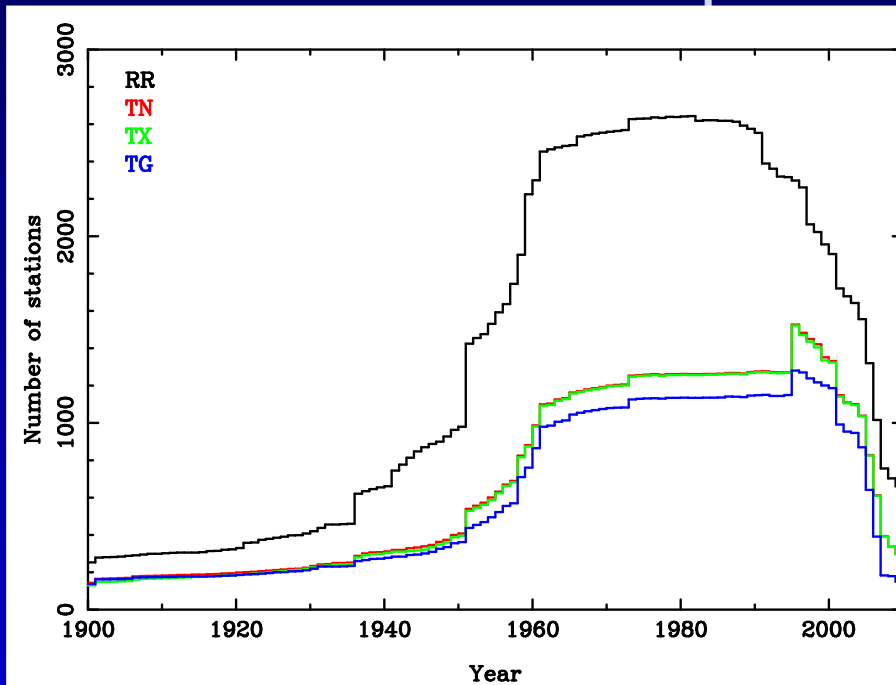
- Daily clim. data from 2967 stations
- 62 countries in Europe and Mediterranean
- RR, TN, TG, TX, PP, SD, HU, SS, CC (11111 series)
- 54 Participants



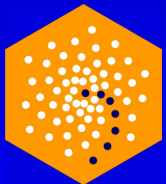
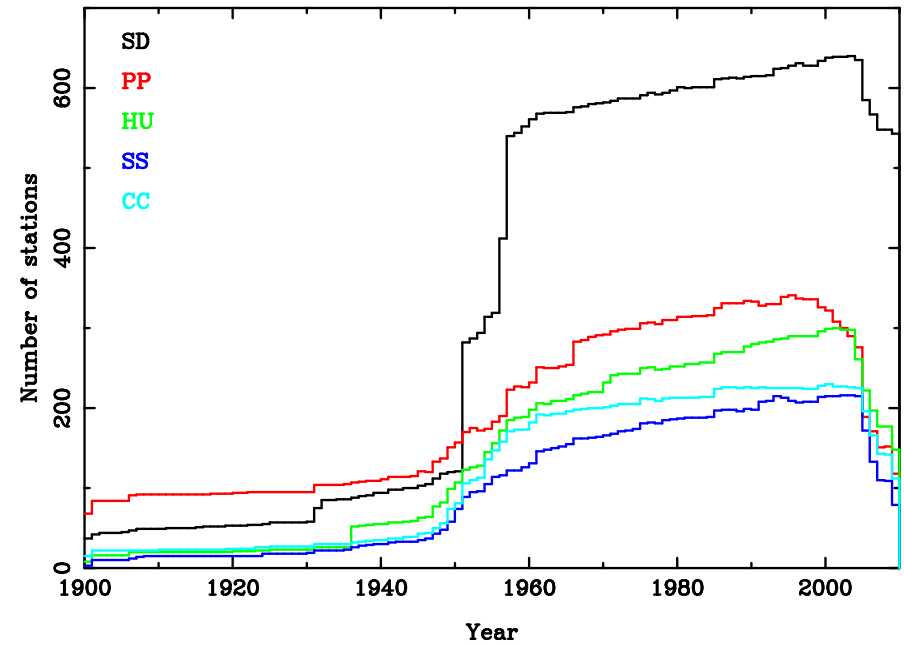
# Current status: II

Number of stations per element per year

RR & Temp:



Other elements:



# Current status: III

## Metadata:

### Station details for De Bilt, NETHERLANDS

Latitude	52:06:03 N	WMO identifier	06260
Longitude	05:10:39 E	GCOS station	Yes
Elevation	2.0 m		
Opened	1901-01-01		
ECA Station ID	162		
Land use	Partly open landscape. Broad transition zone between the low sandy hills of the Utrechtse Heuvelrug and the basin of the river Kromme Rijn. Meadows and arable land alternate with built-up areas and woodlands.		
Soil type	Sand		
Surface coverage	Grass		



[Show location using Google Maps](#)  
(Green arrow, but could be out of view)  
(not part of ECA&D, opens a new window)

### Station history

19500916 relocation westwards  
19510827 relocation southwards (300m)  
20080925 relocation eastwards (230m)

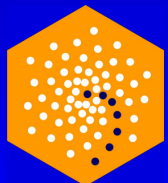
#### Temperature:

19010101-19500516 thermograph in large pagodehut (2.2 m),  
19500517-19610628 thermograph in Stevensonhut (2.2 m),  
19610629-19930625 electronic measurement in Stevensonhut (1.5 m),  
19930326-present electronic sensors in round-plated screen

#### Pressure:

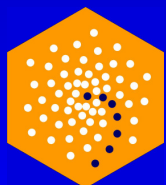
18481201-18951231 pressure as mean value of the 7:40, 13:40 and 21:40 GMT air pressures  
18481201-18961231 pressure measured at Utrecht 52°05(N), 05°08(E)  
18960101-19011231 pressure as mean value of the 7:40, 13:40 and 18:40 GMT air pressures  
19020101-present pressure as mean value of 24 hourly measurements

19020101-19731015 barograph and mercury barometer,  
19731016-19930625 barograph en digital aneroid barometer,  
19930626-electronic measurement



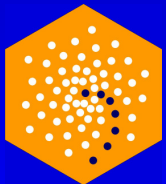
# Current status: IV

- RCC for daily station data and extremes indices in WMO Region VI
- 2 systems: development + operational
- MySQL database
- Webpages: PHP with direct access to MySQL database
- Webpages: Mapserver
- Scripts for updating database (Bash, Fortran, C)
  - Individual station numbers
  - ECA stations numbers (not all have WMO numbers)



# Update cycle

- Including new data (Netherlands, Norway, Germany, Luxembourg Airport every month)
  - Quality control
  - Blending with nearby stations
  - Indices calculation
  - Homogeneity check
  - Trend calculation
- ⇒ Runtime ~4.5 days

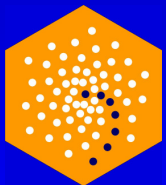




# Update cycle: QC

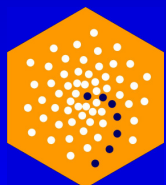
Basic quality control on station level, e.g.:

- $TN < TG < TX$
- $RR \geq 0 \text{ mm}$
- Value in possible range for that element
- No repetitive values



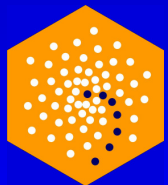
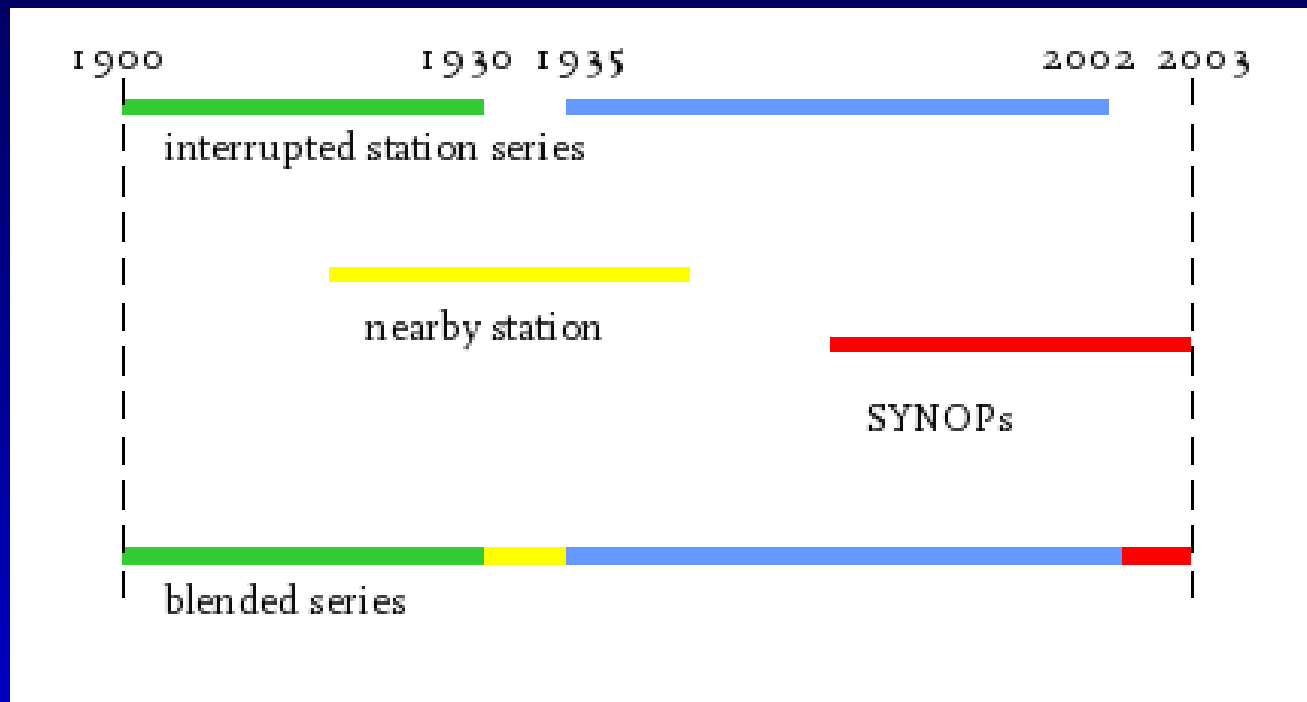
# Update cycle: Blending I

- Take series that continues furthest to present time
- Infill missing/suspected values and extend with series from other participants (if exist)
- Find stations within 25 km and 50m height difference
- Infill and extend with nearby station series
- Data originating from other projects or networks are chosen last in each step



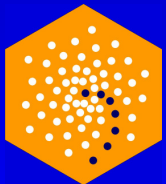
# Update cycle: Blending II

- Infill and extend to present time with synoptical data from nearby stations (possibly same station)



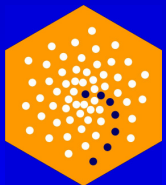
# Update cycle: Indices

- Blended series
- 38 indices
  - TN10p
  - RR10mm
  - DTR
  - RR1
  - ...
- Annual, half-years, seasons, months



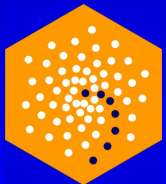
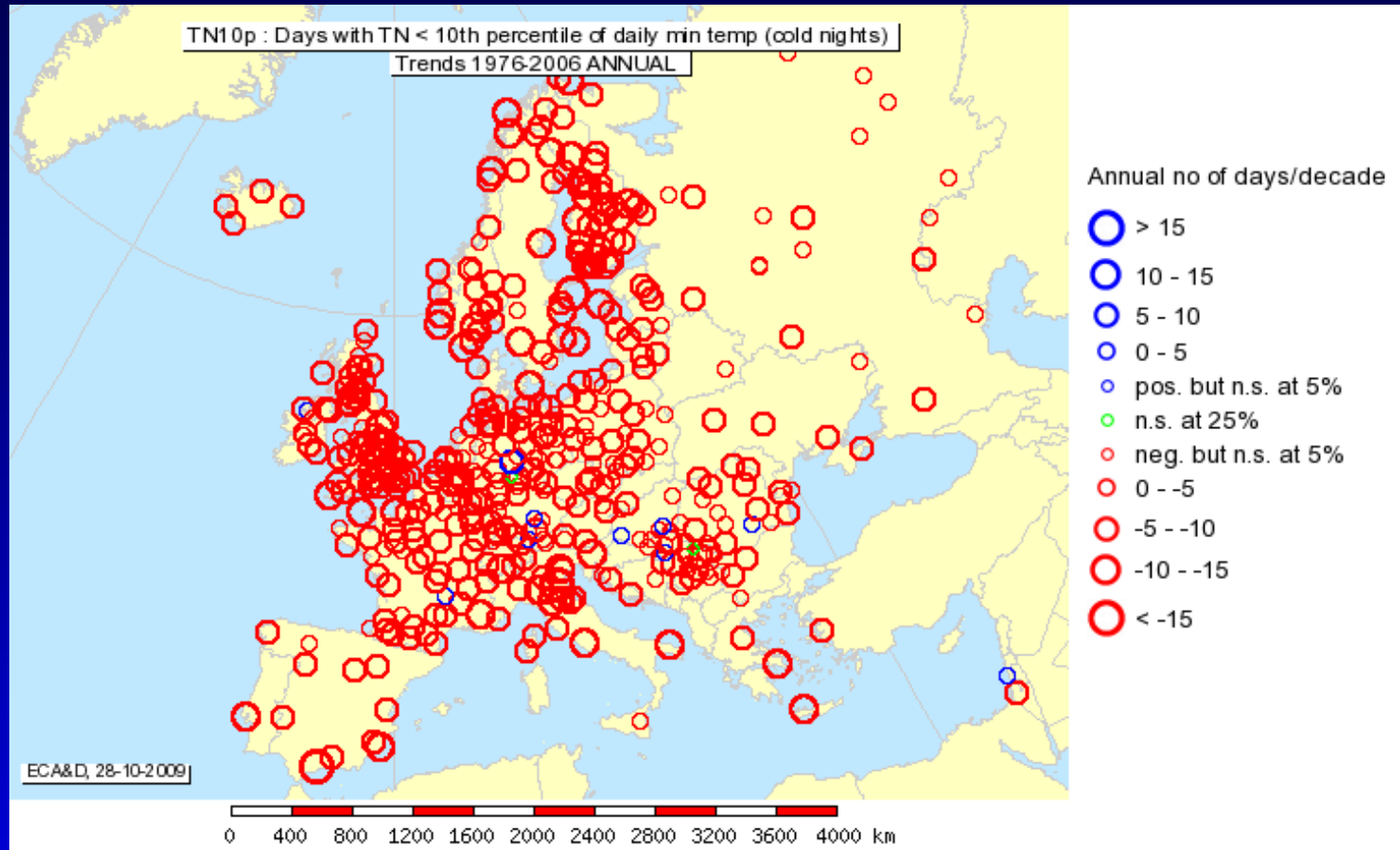
# Update cycle: Homogeneity

- On individual stations only
- DTR, vDTR and RR1
- 4 tests applied More details: Wijngaard et al., 2003, Int. J. Climatol. 23: p679
  - 0 or 1 test failed: useful
  - 2 tests failed: doubtful
  - 3 or 4 tests failed: suspect
- Fixed time periods
- Website: trend shown if homogeneity useful or doubtful



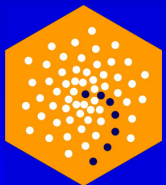
# Update cycle: Trend

## TN10p: 1976-2006, Annual

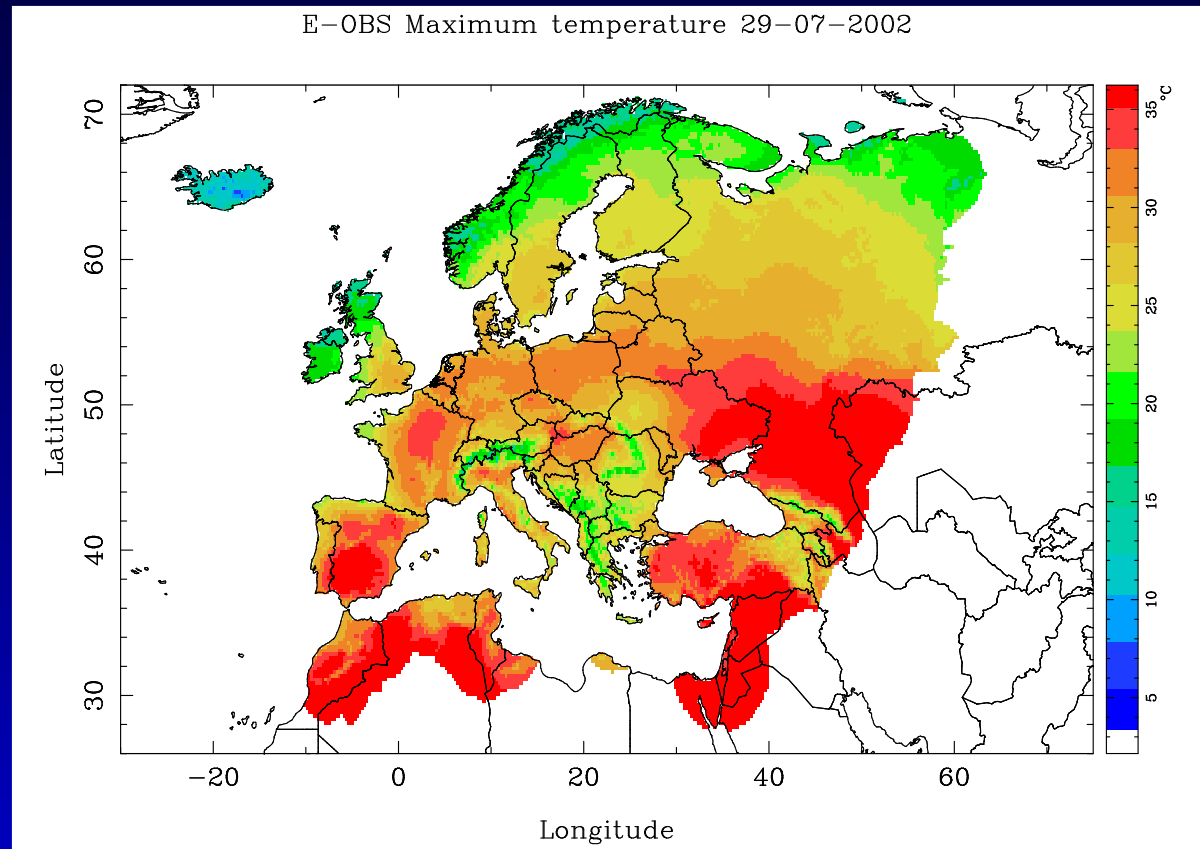


# E-OBS gridded dataset

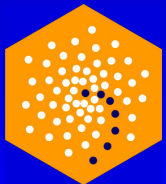
- Blended ECA&D station series
- Daily values for TN, TG, TX, RR
- 0.22 and 0.44° rotated grid (North Pole at 39.25N, 162W)
- 0.25 and 0.50° regular grid
- 25N – 75N x 40W – 75E
- 1950 – 2008
- Monthly updates for 2009



# E-OBS gridded dataset: II



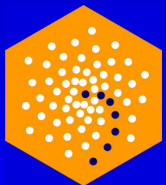
- 1: 29 Jul 2002 29.6 °C
- 2: 4 Aug 2003 29.5 °C
- 3: 3 Aug 2003 29.4 °C





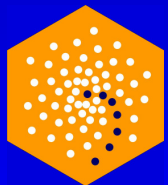
# Future prospects

- Contact participants to update series (all elements)
- Ask for metadata
- Wind parameters (pilot study)
- Meteo alarm criteria
- Extreme value theory on indices



# Future prospects: II

- Continuation of E-OBS after ensembles
- E-OBS Gridded indices
- Euro4M
  - Best possible & up-to-date (gridded) climate change time series
  - near-real time reporting for emerging extreme events
  - Sub-daily data

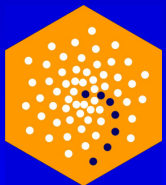


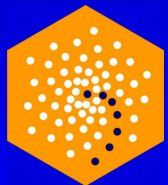
# More info and contact

Website: <http://eca.knmi.nl>

E-mail: [eca@knmi.nl](mailto:eca@knmi.nl)

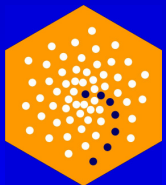
Folder





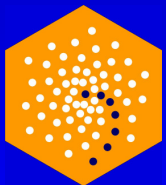
# QC Details: Temp

- $-90.0\text{ }^{\circ}\text{C} < T < 60.0\text{ }^{\circ}\text{C}$
- $TN \leq TG \leq TX$
- T not repetitive for 5 days
- $T < \text{the long term } T \text{ for that day} + 5 \text{ std dev}$
- $T > \text{the long term } T \text{ for that day} - 5 \text{ std dev}$



# QC Details: RR & PP

- $RR \geq 0$  mm
- $RR < 300.0$  mm
- RR not repetitive for 10 days if  $RR > 1.0$  mm
- RR not repetitive for 5 days if  $RR > 5.0$  mm
- $PP > 900.0$  hPa
- $PP < 1080.0$  hPa
- PP not repetitive for 5 days
- PP station elev  $< 1000$  m



# QC Details: SD, CC, HU & SS

- $SD \geq 0.0$  cm
- $SD < 300.0$  cm if station elev  $\leq 400$  m
- $SD < 800.0$  cm if  $400$  m  $<$  station elev  $< 2000$  m
- $SD < 1500.0$  cm if station elev  $\geq 2000$  m
- $0 \leq CC \leq 8$  octas
- $0.0 \leq HU \leq 100.0$  %
- $0.0 \leq SS \leq 24.0$  hours

