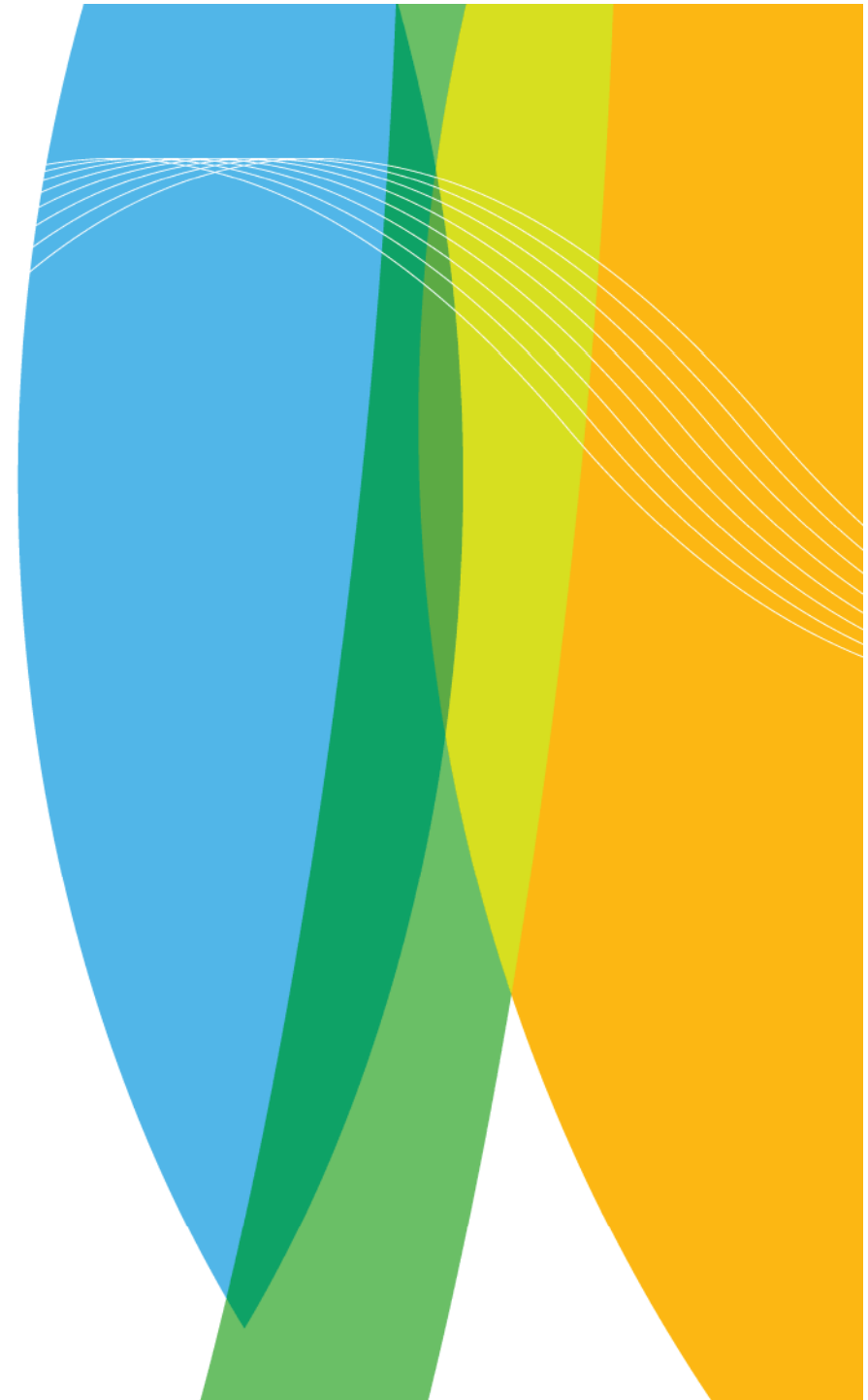




# Data flow from stations to data archives

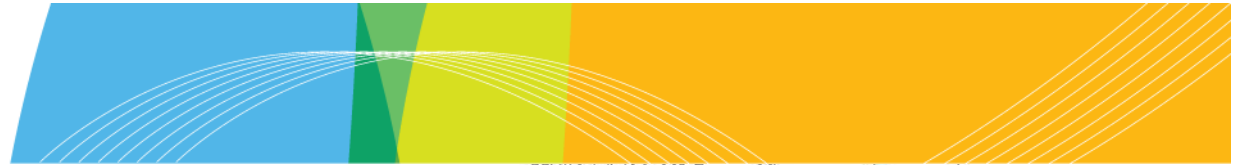
- **Pauli Rissanen**
- TECHNICAL SERVICES /  
Observation services /





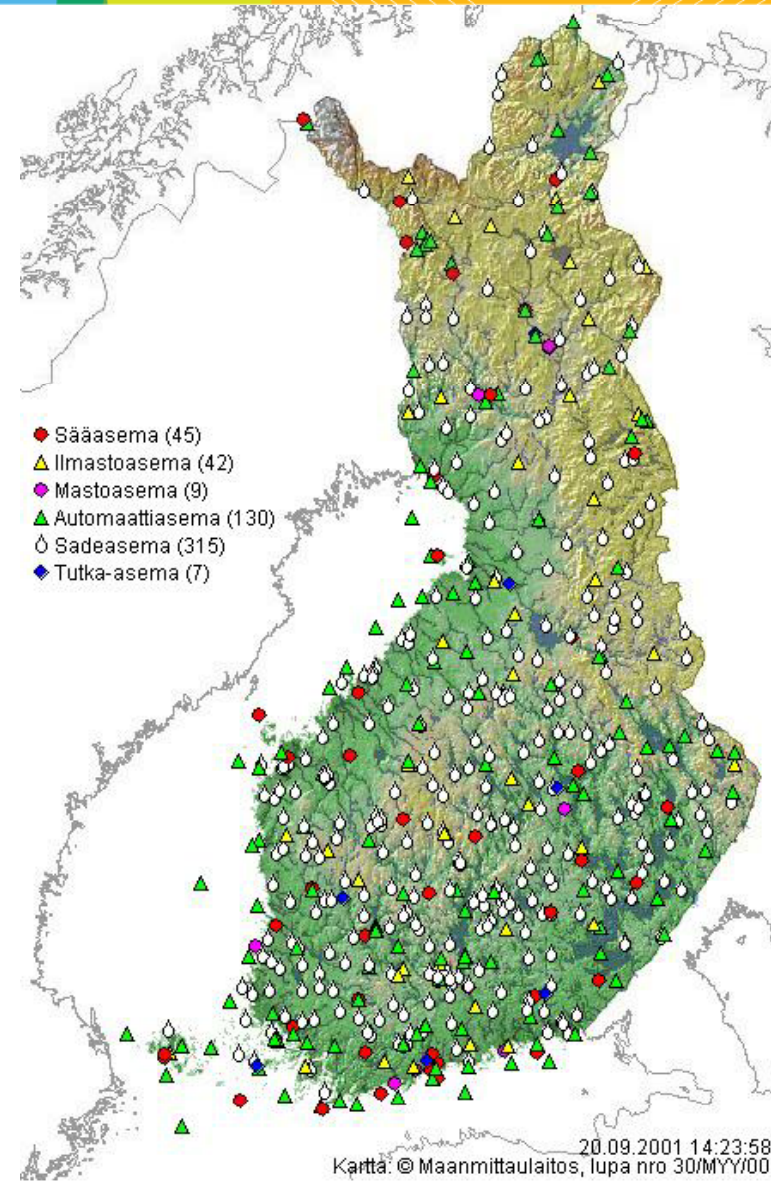
# Data flow from stations to data archives

- **Stations**
  - **Data acquisition – MetMan - others**
  - **Quality control**
  - **Flagging**
  - **Climate database**
  - **Demonstrations**



# FMI Weather Observation Network

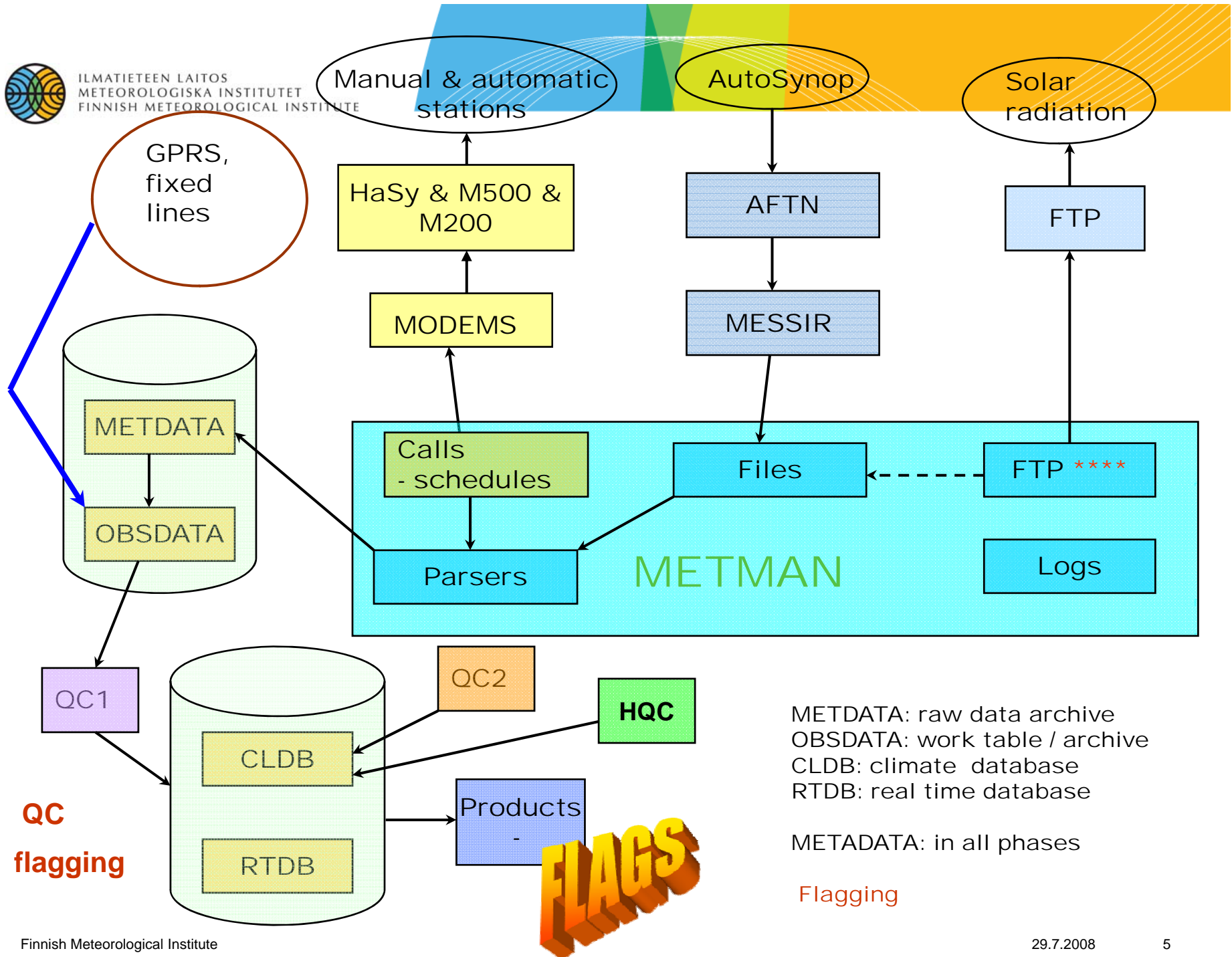
■ in operative use	600
■ upper air soundings	3
■ weather radar	8
■ lightning detection	5 + 3
■ air pollution measurements	30
■ surface observations	180
■ precipitation	420
- reporting daily	~ 130





## Station groups in data acquisition

- 1) **GPRS / fixed lines: 47 + 8 stations (M500)**
- 2) **MetMan 100 – 140 stations**
  - **manual (synoptic stations) ~20 st**
  - **climate stations ~30 st**
  - **AWS (M200 & M500) ~ 80st**
  - **2 nuclear power plant mast stations**
  - **AWS / AFTN – airport stations ~20 st**
  - **solar radiation 8 + 26 sunshine duration measuring stations**
- 2) **ENVIDAS / Air quality & radioactivity**
- 3) **TELE**
  - **calling precipitation stations ~ 130 st**
- 4) **Mast stations 3**
- 5) **Sounding stations 3**
- 6) **Radars**
- 7) **Satellite**
- 8) **Lightning location data**



METDATA: raw data archive  
 OBSDATA: work table / archive  
 CLDB: climate database  
 RTDB: real time database  
 METADATA: in all phases

Flagging

QC  
 flagging



# QC of Surface Observations

## QC0

### QC / MEASUREMENTS AT SITES

- HASY / HAAWE
  - VisualBasic
- M500 internal
  - YourWay
- others(M200, PC ...)
  - solar radiation
  - masts ...
  - LabView

- Station level QC
- Limits for parameters
- Internal consistency between different parameters



real time

## QC1

### REAL TIME AUTOMATIC QC AT FMI

- Station level QC
- Limits for parameters
- Internal consistency between different parameters
- Time and range checks
- HIRLAM / fields ?
- Quick data delivery

- Programming languages
  - PL\*SQL
  - PERL



5 – 30 minutes  
after observation

## QC2

### AUTOMATIC QC AT FMI non-real time

- comparison to neighbouring stations
- calculations for missing or wrong data
- Kriging
- HIRLAM / fields ?
- Quick data delivery
- Programming languages
  - PL\*SQL
  - PERL
  - Fortran-90 / 97



10 – 30 minutes  
after observation

## HQC

### MANUAL QC AT FMI

- Errors or suspicious data found by QC0 – QC2
- Errors found by users ...
- Programming languages
  - www / JAVA / PERL / SQL



1 – 48 h (?)  
after observation





## FLAG VALUES FOR END USERS / normal weather data

Each parameter should have a flag, a value that defines the quality of the parameter.

### Quality of data (error severity level):

No check	OK	Suspected, small difference	Suspected, big difference	Calculated	Interpolated (spatial)	...	Missing	Deleted
0	1	2	3	4	5	...	8	9

### Control level:

HQC	QC2	QC1	QC0
1000	100	10	1

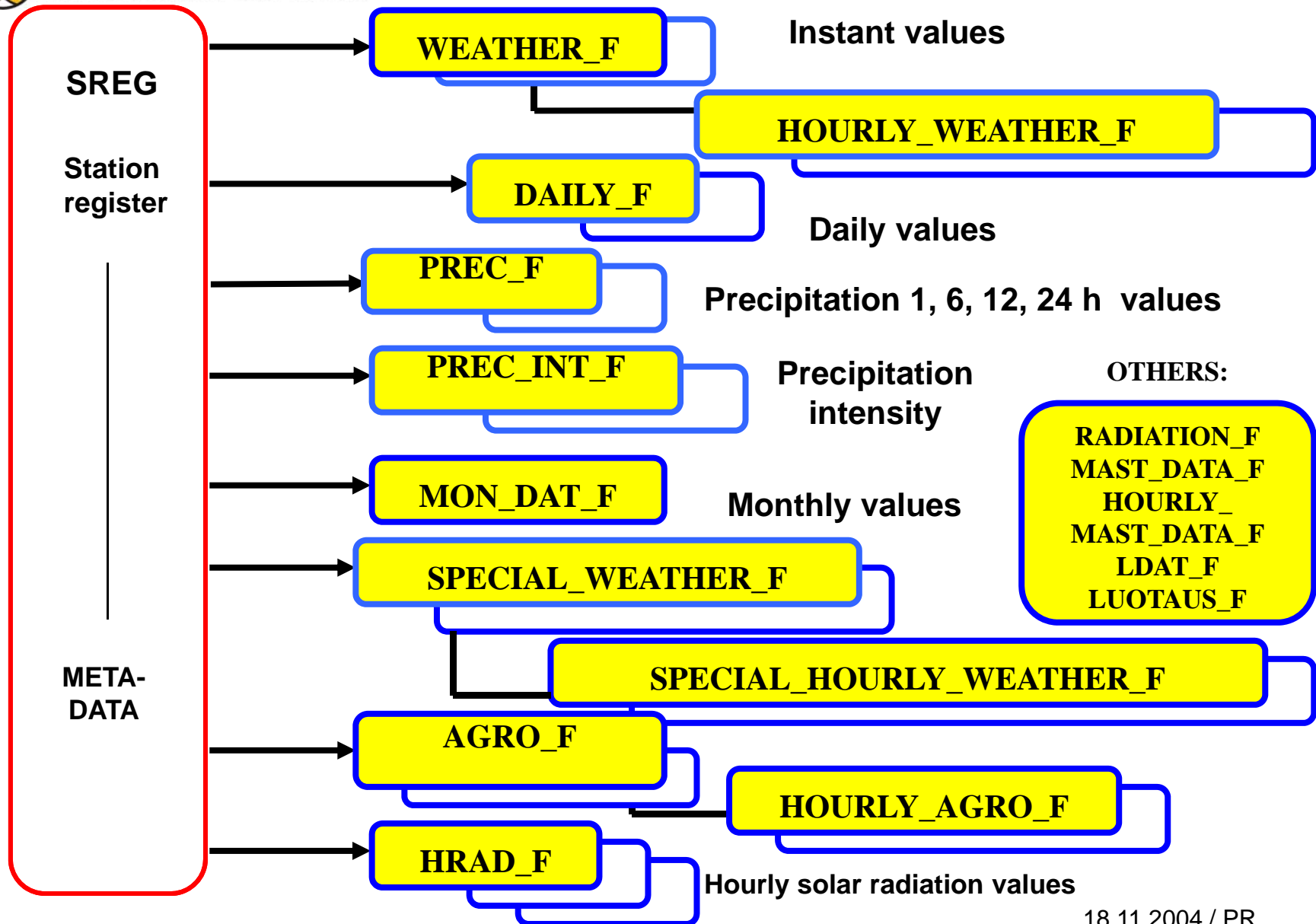
### Example:

- 1) By combining as a sum different control levels and quality of data one can get for instance the several code (for instance for temperature):

$$1531 = 1000 + 500 + 30 + 1 \Rightarrow$$



# CLIMATE DATABASE 2005







## DEMONSTRATIONS:

### 1) METADATA

Examples in intranet:

<http://dev.hav.fmi.fi/asetat/index.php>

### 2) HQC – tool for QC people