Status of Meteorological Data Collection Center: Experiences, Issues, Challenges

Emergency Management

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GPCC: Markus Ziese, Armin Rauthe-Schöch, Jakub Walawender, Kira Rehfeldt

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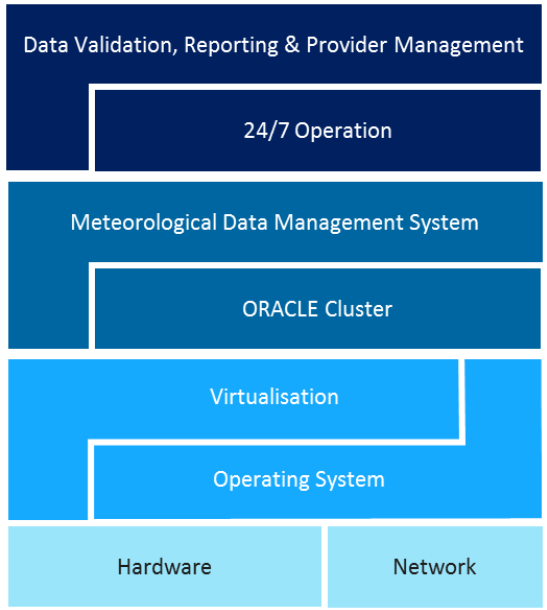
Outline

- CEMS Meteo DCC Team – Who are we
- CEMS Meteo DCC System – Current Status
- Recent Evolution
- Planned Developments

Operated by KISTERS and GPCC

KISTERS

Deutscher Wetterdienst
Wetter und Klima aus einer Hand
DWD



Christoph

Kira

Armin

Markus

Damien

Jakub

… and many more in the background …

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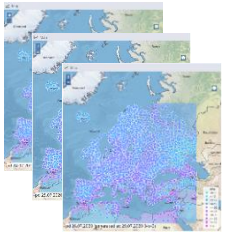
System Overview – Dataflow and Processing



Data provider

70,000

sensors *measuring cloud cover, dew point temperature, evaporation, relative air humidity, solar radiation, precipitation, sunshine duration, air temperature, water vapour pressure, wind speed and wind direction*

real time
24/7

KISTERS

8

interpolated maps

at a spatial resolution of 5 km by 5 km
daily: precipitation, min/max temperature, solar radiation, wind speed and water vapour pressure
6-hourly: mean temperature, precipitation

ECMWF

Final gridded data products

4 parameter

point lists for EFFIS

2 parameter

point lists for EDO

Automatic Import format consistency checks

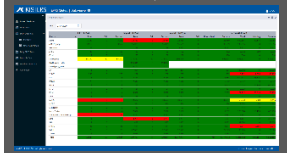
Temporal consistency checks

Cross validations

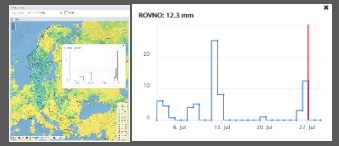
Spatial Temporal consistency checks e.g. cloud cover

Check against background statistics

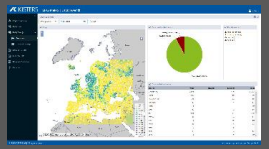
Calculation and dissemination of gridded data products



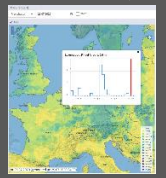
Overview failed imports
Non delivered data



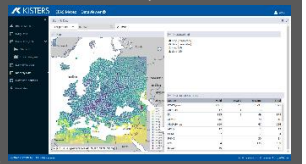
List validation results
Quality Flags & Error Correction



Visualization of questionable data with background information



Quality Flags & Error Correction



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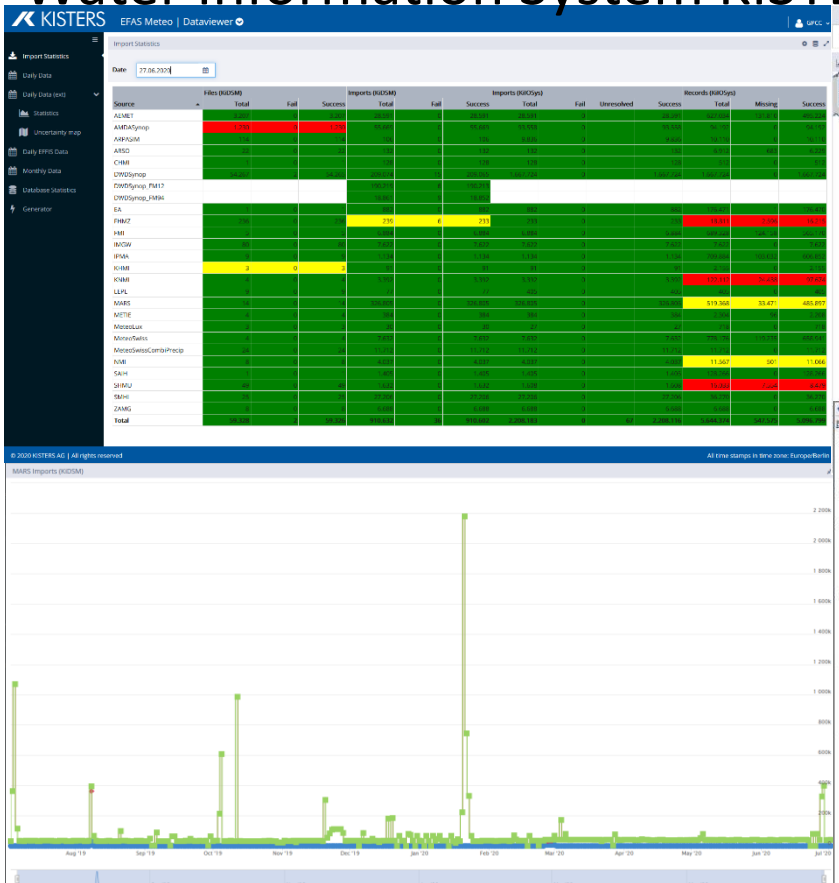
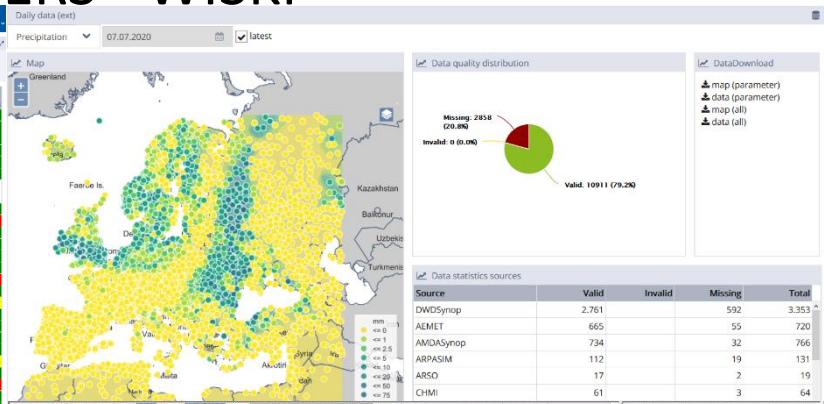
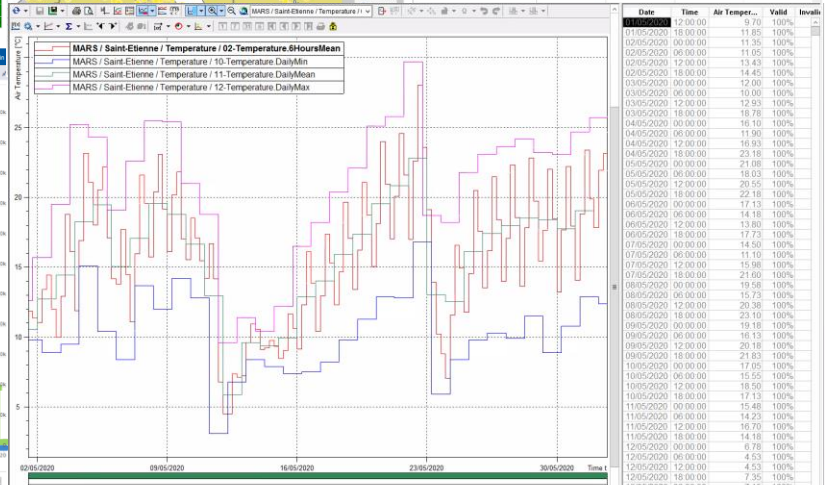
Water Information System KISTERS - WISKI







CEMS Meteo DCC System – Current Status

22 currently active data providers

Environment Agency

IMGW

AEMet Agencia Estatal de Meteorología

KNMI

MeteoLux

INSTITUTI HIDROMETEOROLOGJIK I KOSOVËS
KOSOVO HYDROMETEOROLOGICAL INSTITUTE

ČESKÝ HYDROMETEOROLOGICKÝ ÚSTAV

DWD

FINNISH METEOROLOGICAL INSTITUTE

SHMÚ SLOVENSKÝ HYDROMETEOROLOGICKÝ ÚSTAV

SMHI

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Bundesamt für Meteorologie und Klimatologie MeteoSchweiz

arpae emilia-romagna

ZAMG Zentralanstalt für Meteorologie und Geodynamik

WAGENINGEN UNIVERSITY & RESEARCH 100years

MET éireann

საქართველოს ეროვნული სააგენტო

Meteorologisk institutt

ipma instituto português do mar e da atmosfera

REPUBLIC OF SLOVENIA
MINISTRY OF THE ENVIRONMENT AND SPATIAL PLANNING
SLOVENIAN ENVIRONMENT AGENCY

Bosna i Hercegovina
Federacija Bosne i Hercegovine
FEDERALNI HIDROMETEOROLOŠKI ZAVOD

CONFEDERACIÓN HIDROGRÁFICA DEL EBRO

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Some statistics – Current situation in the EFAS domain

24 data streams from active data providers	Active stations in EFAS domain
AEMET	750
AMDASynop	829
ARPASIM	135
ARSO	21
CHMI	64
DWDSynop	3728
EA	906
FHMZ	31
FMI	281
IMGW	62
IPMA	97
KHMI	7
KNMI	50
LEPL	19
MARS	4871
METIE	24
MeteoLux	1
MeteoSwiss	159
MeteoSwissCombiPrecip	488 (virtual)
NMI	808
SAIH	384
SHMU	64
SMHI	695
ZAMG	836 (virtual)
Total	**15310**

11 parameter types	Active stations in EFAS domain	6 daily grids, 8 6-hourly grids + point lists
Cloud cover	4409	
Dew point temperature	6095	
Evaporation	178	
Precipitation	15208	EFAS GRIDS + EFFIS
Relative air humidity	4488	EFFIS
Solar radiation	5295	EFAS GRIDS
Sunshine duration	2970	
Temperature (min/mean/max)	12583	EFAS GRIDS + EFFIS + EDO
Water vapour pressure	4932	EFAS GRIDS
Wind direction	6342	
Wind speed	11260	EFAS GRIDS + EFFIS

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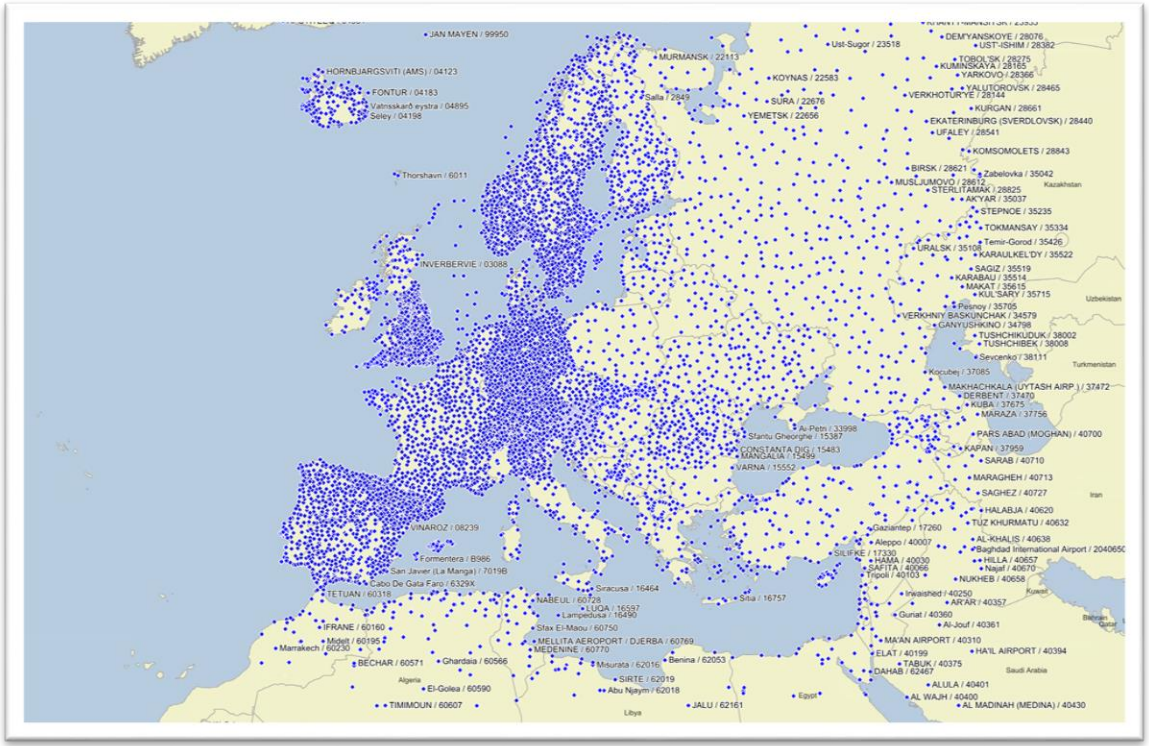
Active stations in CEMS-MDCC database (EFAS domain)



Number of stations:

- Total: 44641
- Active: 15459
  - thereof 1324 virtual stations
- Inactive: 29182
  - thereof 9308 virtual stations

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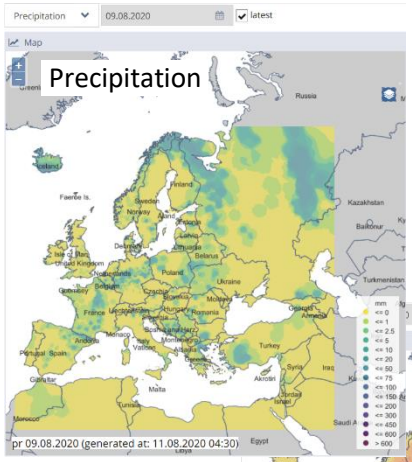
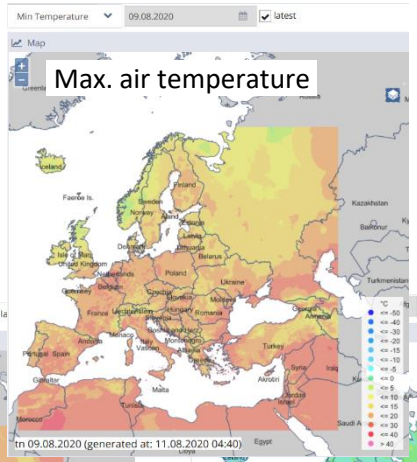
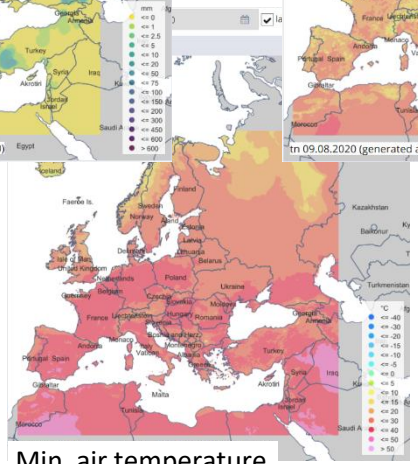
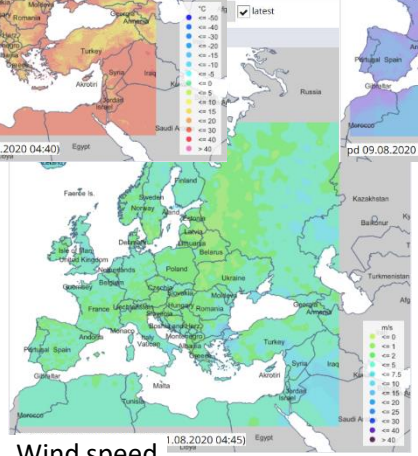
Interpolated grids for LISFLOOD model

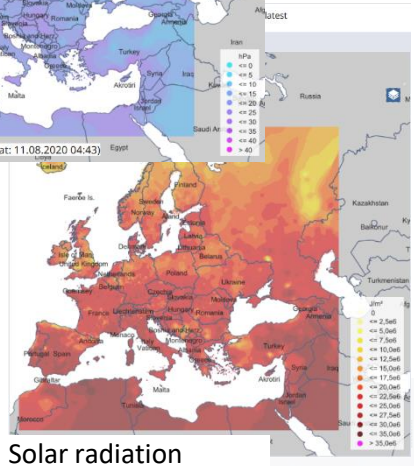
- Daily grids produced by CEMS-MDCC






Min. air temperature


Wind speed


Solar radiation

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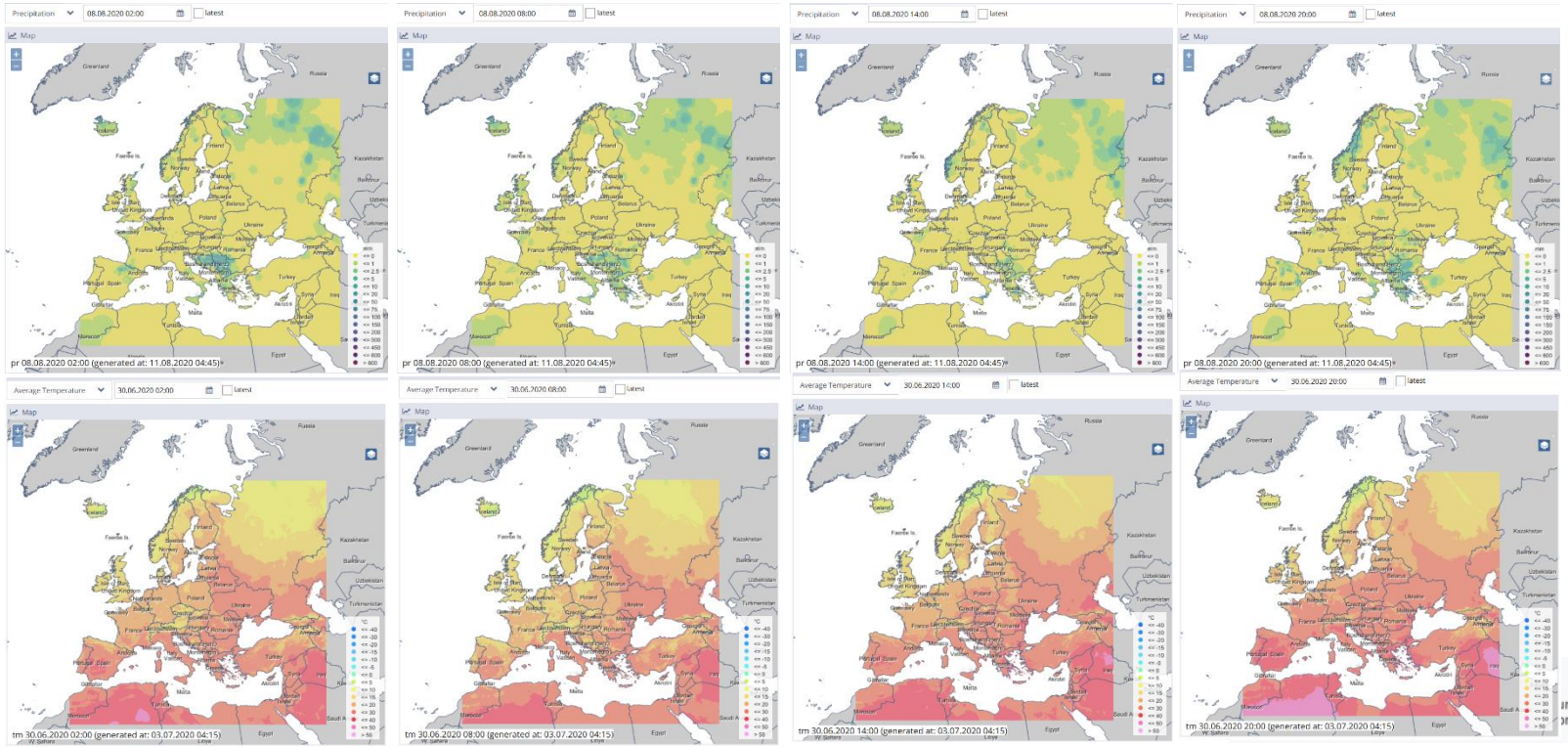
Interpolated grids for LISFLOOD model

- 6-hourly precipitation and temperature grids produced by CEMS-MDCC



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Recent Evolution

- Integration of new data providers
  - Agencia Estatal de Meteorología (AEMET, Spain)
  - Federal Hydrometeorological Institute (FHMZ, Bosnia-Herzegovina)
  - National Environmental Agency (LEPL, Georgia)
  - Royal Netherlands Meteorological Institute (KNMI, The Netherlands)
  - Swedish Meteorological and Hydrological Institute (SMHI, Sweden)

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Recent Evolution

- Improvements in data processing to take changing reporting behaviour into account, e.g. precipitation observations from ‘odd’ dates: 12hourly aggregated at 3 UTC or 15 UTC (common 6 & 12 UTC) → make more data available for gridded products

- Data license for data providers who are not EUMETNET-members is now available

Ongoing and planned developments

- Avoid duplicate stations in grids
  (same stations from different data providers, due to redundant data deliveries)
  → improving the quality of gridded data products

- Improve performance of grid creation
  (faster pre- and post-processing, interpolation)
  → getting ready for future higher spatial resolution
  (1.8 x 1.8 km^2 instead of 5 x 5 km^2)

Ongoing and planned developments

- Integration of new data providers:
  - Confirmed:
    - Civil Protection Agency of the Lazio Region (Lazio/Italy, EFAS partner)
    - Hydrological Information Centre (Flanders /Belgium, EFAS partner)
    - Israel Meteorological Service (Israel)
  - Data request ongoing:
    - Országos Meteorológiai Szolgálat (Hungary)
    - MeteoFrance (France)

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Ongoing and planned developments

- Integrate more parameters and stations from existing data providers, e.g.
  - solar radiation from DWDSynop FM94+FM12
  - DWDSynop WIGOS-ID stations in Israel
  - additional parameters available from ARPASIM in new open data portal
  - many more stations available from ARSO new data portal

- If you have additional meteorological observation data available:
  Please contact us, we are looking forward to work with you !

Contact details

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