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OESCHGER CENTRE
CLIMATE CHANGE RESEARCH

ERA
CLIM2

ERA-CLIM2 Review Meeting

WP3 Overview

Stefan Brönnimann

Overview

- > Work achieved during last 9 months
 - D.3.3
 - D.3.6, 3.7
 - D.3.10, 3.13, 3.14
 - D.3.19
- > Outreach and publications

Registry -> Updated, Delivered

Sign Up **Login** Português

ERA CLIM2 FCIências[®]

Global Climate Data Registry

Surface Data

Upper Air Data

Moving Upper Air Data

Maritime Data

Data Submission Guidelines

Need some guidance on how to send us metadata information?

[Click Here!](#)

Applications

[Go!](#)

European Reanalysis of Global Climate Observations 2 - ERACLIM2

Global Inventory of Historical Climate Data

This website holds the archive for the inventory of historically-sourced data from meteorological surface-station observations, upper-air observations and from maritime sources for the ERA-CLIM2 project. The purpose of this website is twofold:

- To enable researchers who are actively digitising historical weather records to update the online inventory with their progress. The database is instantly backed up, and multiple authors may edit it. As such, the inventory provides a global overview of data to be rescued/imaged and digitised.
- To allow anyone with an interest in the raw and/or homogenised data to be able to use this inventory to analyse the source of historical climate data sources, and find the link/contact source for the data.

Meteo Database

Data base with meteorological information.

[Click Here!](#)

Related Links

[I-DARE](#) [MEDARE](#)

Upper-air data (fixed platforms)



Cross-searchable

Search Map Loc Table Info: Default 50 100 50 100 Go to bottom

Searching on ...

Station Info

Name	Country
Bern	switzerland

End/Máx End/Máx

Variable Info Recover Data Level

Air Pressure	No field
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Search Reset Close

D3.6/D3.7: QC'ed version of rescued data

- > Surface data QC'ed by FCIências.ID
- > Upper-air data sent to RIHMI for QC, then distributed to UVIE, UBERN and ECMWF
- > Data and report delivered....

- > ... but data rescue will go on

Observations for reanalyses

- > Initial disappointment (“our data are not used”) is now resolved
- > Observations are one cycle ahead of production
- > Data will be used in ERA5 extension
- > No “ERA-CLIM2” data sets, but rather contributions of ERA-CLIM2 to updates of many individual data sets (ISPD, CHUAN, HadISST, etc.)
- > Session on observations at IRC5 conference
- > Overview paper on “Observations for Reanalysis” submitted

QC'ed Data

Table 2: Upper-air observations (in station days) digitized and processed within ERA-CLIM and ERA-CLIM2 (CHUANv2.1, <http://giub-torrent.unibe.ch/eraclim2>).

Source	Imaged	Digitized	QC'ed
Russian radiosonde data, for 41 stations, 1938-1964	167401	167401	167401
Daily Weather Report, Germany, 1903-1934	118020	117837	114187
India Meteorol. Dept., 1928-1936	113779	113779	113779
Indian Daily Weather Report, 1938-1942	106379	106379	106379
Pakistan daily Weather report, 1949-1956	101714	101714	101714
Daily Weather Report, Cairo, 1920-1953	68184	68184	68184
Aerological Observations, Netherlands, 1909-1940	59054	59054	59054
Internatioanl Days, 1923-1928	53883	53883	53725
Monthly Bulletin, Portugal, 1938-1956	27402	23292	23292
Annual Bulletin, Finland, 1919-1934	19583	19583	19583
Moving upper-air data, 1888-1947	9000	9000	9000
MétéoFrance Data Base, 1948-1958	0	33818	33818
Comptes Rendus, 1923-1957	216608	86476	67201
Other French sources, 1900-1957	98894	35375	25210
Spanish data, 1913-1961	15239	5011	5011
Portuguese Annals, 1912-1972	28772	28772	28772
Other sources, upper-air	77632	75746	75762

Data Rescue and QC: FCIências.ID

Point of situation - Digitization of surface data from Chile (1950-1958)									
1950	1951	1952	1953	1954	1955	1956	1957	1958	Period
						Alla Palena	Alla Palena		2 years period
					Arauco	Arauco	Arauco	Arauco	4 years period
						Arauco	Arauco	Arauco	3 years period
						Arauco	Arauco	Arauco	3 years period
								Daja Palena	1 years period
						Dalmeida	Dalmeida	Dalmeida	3 years period
Dellala	Dellala	Dellala	Dellala	Dellala	Dellala	Dellala	Dellala	Dellala	3 years period
					Cautin	Cautin			3 years period
						Chañaral	Chañaral	Chañaral	3 years period
						Chile Chico	Chile Chico	Chile Chico	3 years period
			Chillán			Chillán	Chillán	Chillán	1-3 years period
Colina	Colina	Colina	Colina	Colina	Colina	Colina	Colina	Colina	3 years period
			Concepción		Concepción	Concepción	Concepción		1-3 years period
						Copiapó	Copiapó	Copiapó	3 years period
						Copiapó	Copiapó	Copiapó	3 years period
Criola Reducida	Criola Reducida	Criola Reducida	Criola Reducida	Criola Reducida	Criola Reducida	Criola Reducida	Criola Reducida	Criola Reducida	3 years period
Curió	Curió	Curió	Curió	Curió	Curió	Curió	Curió	Curió	2-6 years period
				Isla de Pascua	Isla de Pascua	Isla de Pascua	Isla de Pascua	Isla de Pascua	5 years period
El Dique	El Dique	El Dique	El Dique	El Dique	El Dique	El Dique	El Dique	El Dique	3 years period
					Falatrufa	Falatrufa	Falatrufa	Falatrufa	4 years period
					Iquique - Casaca	Iquique - Casaca	Iquique - Casaca	Iquique - Casaca	4 years period
					Iquique - Los Co	Iquique - Los Co	Iquique - Los Co	Iquique - Los Co	4 years period
			La Serena	La Serena	La Serena	La Serena	La Serena	La Serena	5 years period
					Linares	Linares	Linares	Linares	3 years period
					Llanquihue	Llanquihue	Llanquihue		3 years period
			Los Angeles		Los Angeles	Los Angeles	Los Angeles	Los Angeles	1-3 years period
Los Cerrillos	Los Cerrillos	Los Cerrillos	Los Cerrillos	Los Cerrillos	Los Cerrillos	Los Cerrillos	Los Cerrillos	Los Cerrillos	3 years period
					Oaxaca	Oaxaca	Oaxaca	Oaxaca	4 years period
Osalle	Osalle	Osalle	Osalle	Osalle	Osalle	Osalle	Osalle	Osalle	3 years period
						Parral Agua	Parral Agua	Parral Agua	3 years period
						Parral Edfo		Parral Edfo	1-1 years period
						Parral Maull	Parral Maull	Parral Maull	4 years period
					Quellón	Quellón	Quellón	Quellón	4 years period
Quintero	Quintero	Quintero	Quintero	Quintero	Quintero	Quintero	Quintero	Quintero	3 years period
Ransón	Ransón	Ransón	Ransón	Ransón	Ransón	Ransón	Ransón	Ransón	3 years period
					Río Cautin	Río Cautin	Río Cautin	Río Cautin	3 years period
			Temuco		Temuco	Temuco	Temuco	Temuco	1-4 years period
				Talca	Talca	Talca	Talca	Talca	5 years period
					Valdivia	Valdivia	Valdivia	Valdivia	4 years period
					Vallenar	Vallenar	Vallenar	Vallenar	3 years period
				Viñaria	Viñaria	Viñaria	Viñaria	Viñaria	1-4 years period
3	3	3	15	12	25	48	33	37	Number of 3

	Digitized
	In Progress
	Redigitized
	No Data

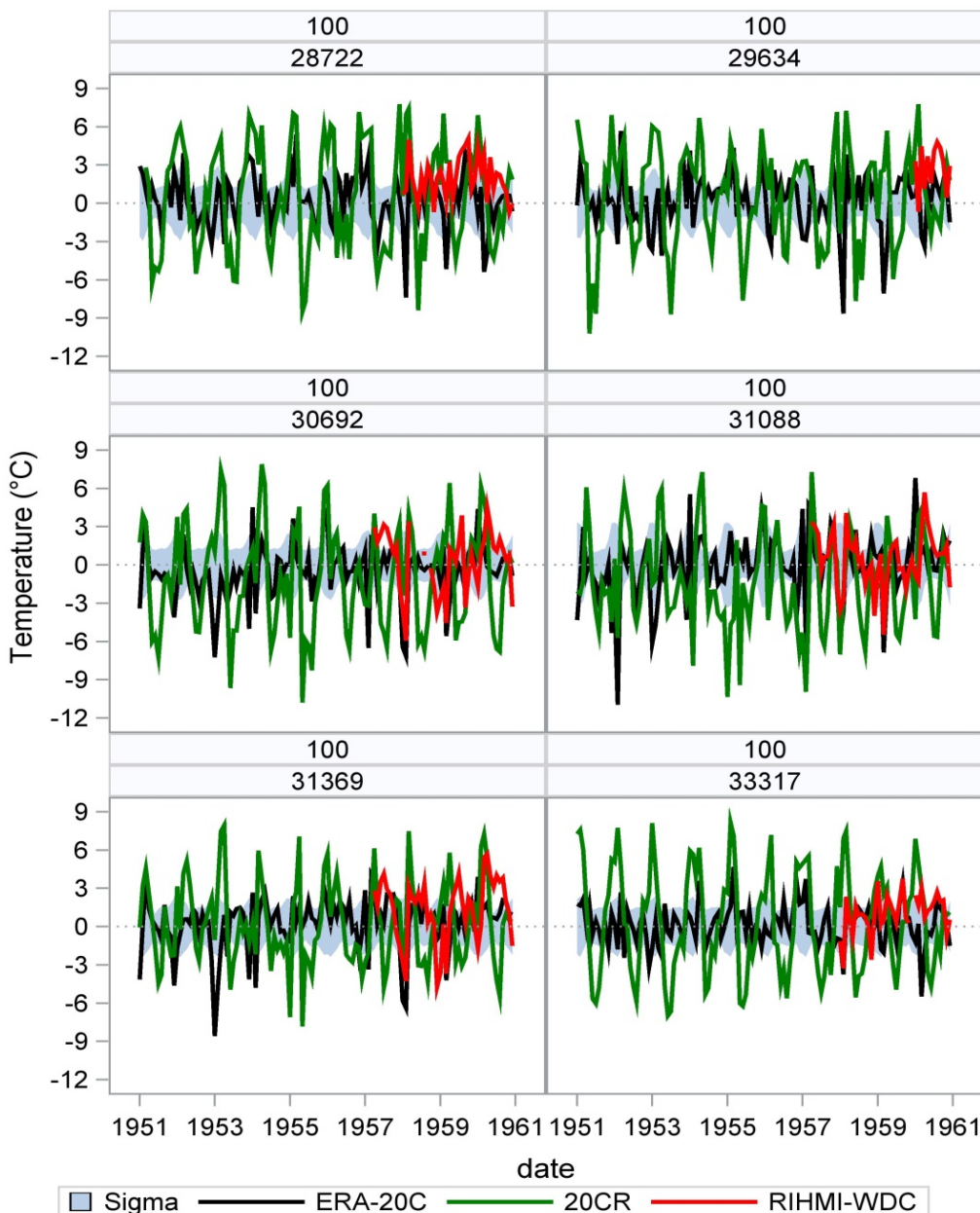
MeteoFrance

- > **Data rescue has become an internal activity that is continued**
- > Involves many MeteoFrance offices overseas
- > Keying is mainly outsourced
- > Basic QC before delivery (unit, thresholds)
- > 176 out of 413 lines of ERA-CLIM2 inventory identified as high priority
- > Two deliveries of QC'ed series in 2017 (June and October)
- > Status today:
Upper-air digitising has been completed for 145 high priority lines of ERA-CLIM2 inventory (82 % of high priorities lines). Few digitised series have not been supplied (QC in process)

RIHMI: Upper-air data

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Panel: monthly anomalies for 100hPa Temperature for group of 6 stations for 1951-1960
 Grey shaded – monthly climatology sigmas
 ERA-20C – black
 20CR v2 – green
 RIHMI digitized - red
 ERA-20C better corresponds to climatology!

Continuation within Copernicus

- > Several partners now in Copernicus C3S “Data Rescue Services” (together with UERRA, etc.)
- > No data rescue funded (except Southern Extratropics)
- > But registry, QC code, formatting tools, etc.
- > New link to data holdings (Lot 2)

D3.11 - FCDR SSM/T2 and AMSU-B/MHS radiances (1991-2012)

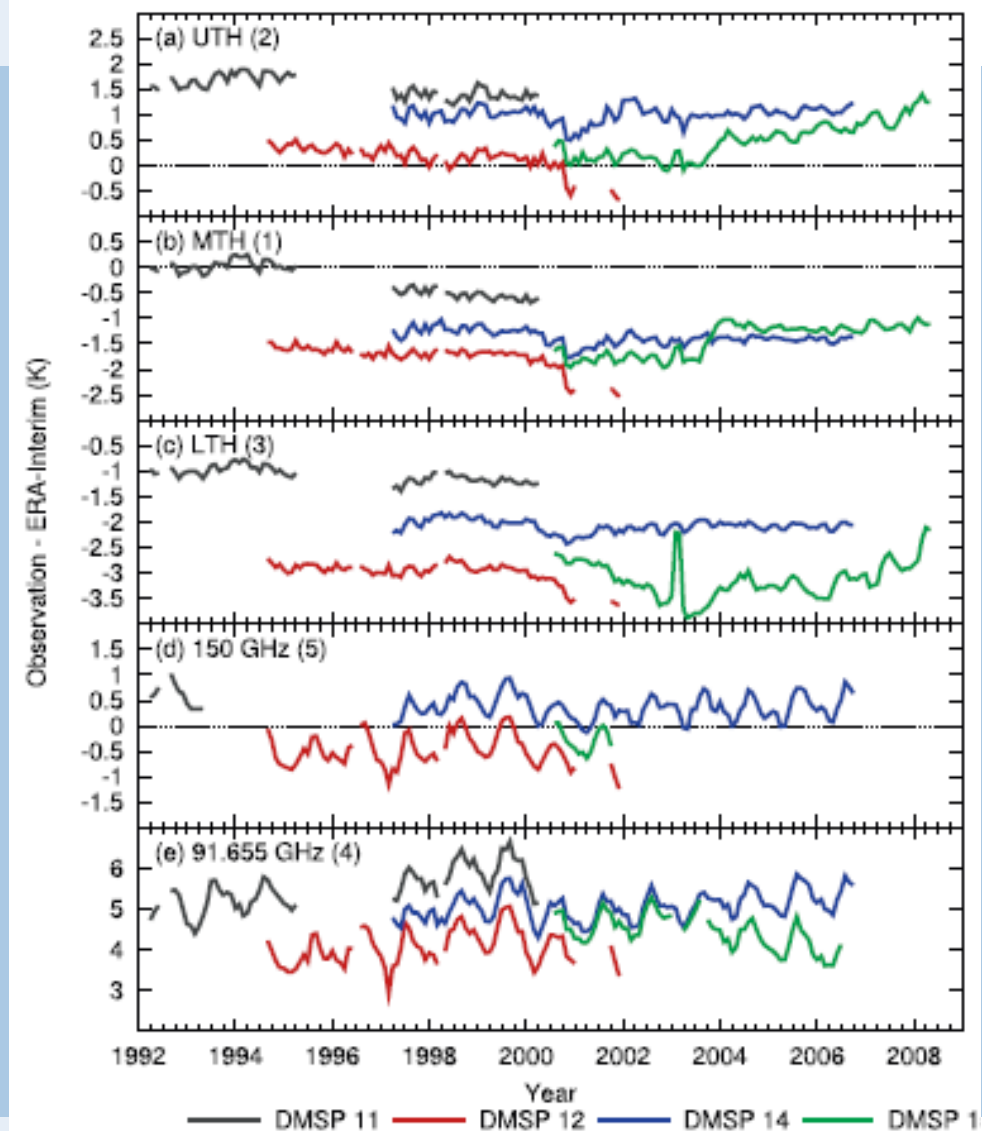
In collaboration with CM SAF (MetOffice)

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Done:

- CM SAF evaluated the following issues: scan & time dependent biases, diurnal cycle aliasing (orbit drift), assessment of inter-calibration method;
- CM SAF prepared inter-calibration ATBD for SSM/T2, AMSU-B and MHS, and delivered first data record which had not the quality expected;
- Revised the method for all instruments using the ERA Interim feedback archive and generated FCDR;
- Validated and delivered D3.11 in August 2017.



D3.12 - FCDR MFG and MSG radiances (1982- 2014)

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Done:

- Developed infra-red (IR) and water vapour (WV) re-calibration method;
- Generated IR and WV re-calibration coefficients for each individual MFG and MSG instrument (could not finish until end of 2016 because of not enough disc space for IASI data in the old compute environment);
- Generated band adjustment factor matrix (to enable homogenisation of the time series to any of the Meteosat satellites);
- Presented method in several conferences (EUMETSAT, ESA Living Planet, SPIE Asia), publication in preparation;
- Verified impact of re-calibrated IR/WV data for land surface temperature retrieval (CM SAF);
- Defined standard NetCDF format of the FCDR of MFG and MSG radiances;
- Generated the MFG and MSG image files containing the re-calibration coefficients in standard NetCDF format and standalone calibration coefficient files;
- Wrote report and submitted D3.12 in August 2017.

D3.10 - AVHRR polar winds (1982-2011)

Done

- Collected AVHRR GAC data (1982-2014) from the CM SAF (based on NOAA PATMOS-X AVHRR L1b data);
- Implementation, testing and verification of AVHRR-GAC based polar winds;
- Ingestion of AVHRR GAC data into EUMETSAT algorithm;
- Adaptation of EUMETSAT algorithm to AVHRR GAC resolution. Verified that GAC data do not look different compared to LAC data
- Implementation, test and verification of EUMETSAT algorithm;
- Processing and validation with EUMETSAT algorithm (ongoing);
- Drafting of report (ongoing);
- **D3.10 expected on 12 January 2018.**

D3.13 - TCDR MFG and MSG AMVs (1982 - 2014)^b

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Item	Development	Integration	Processing
Processing Environment	Modified framework on new infrastructure	Completed	N/A
Cloud Detection	Integration of CM SAF algorithm for MFG/MSG	Completed	Completed
Cloud Top Height	MFG development, MSG exist (based on EUMETSAT method)	Completed	Completed
ASR	None (reuse of EUMETSAT method)	Completed	Completed
CSR	None (reuse of EUMETSAT method)	Completed	Completed
AMV	Adaptation of MSG algorithm to MFG	Completed	Ongoing

- Uses new images from D3.12;
- AMV processing will need until early January 2018;
- Final report can only be finished by 25 January 2018.

D3.14 –FCDR Radio Occultation (2001-2014) (GRAS/CHAMP/COSMIC/GRACE)

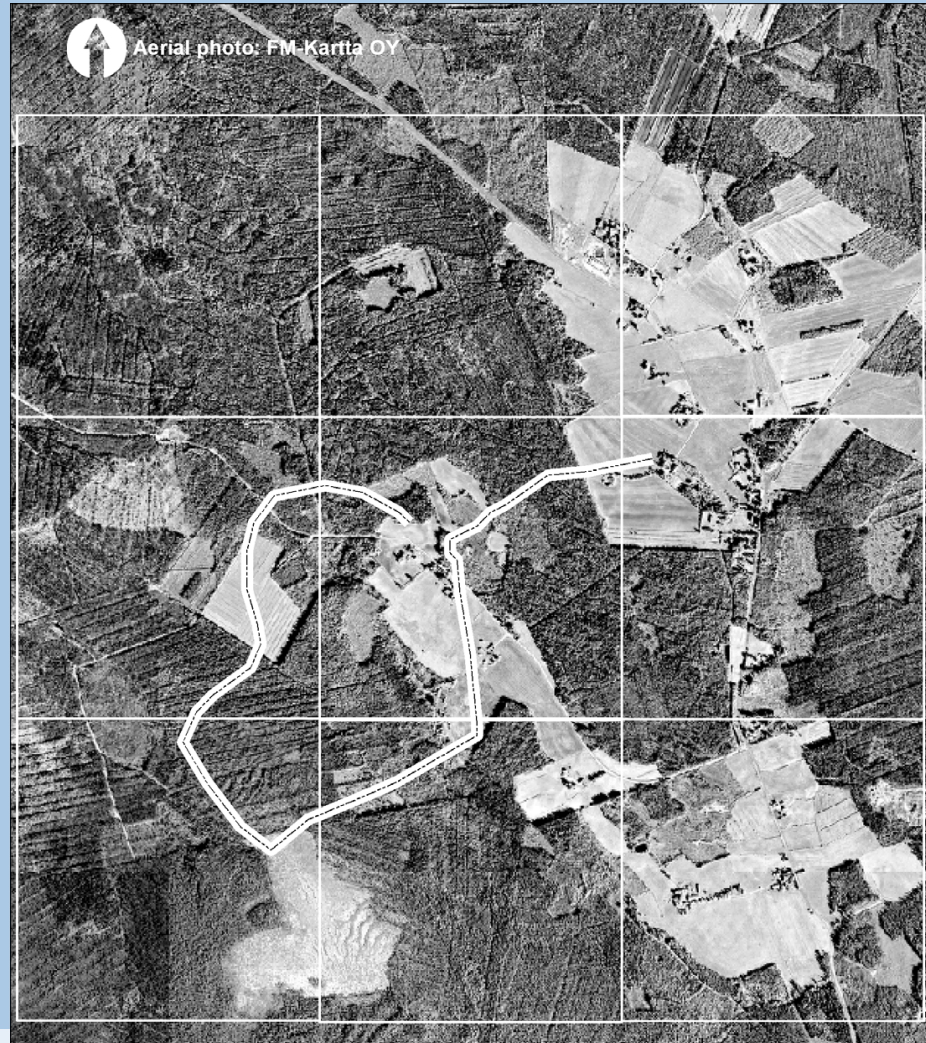
Done

- Completed the update to WaveOptics based processor for GRAS on Metop;
- Processed GRAS data (Metop-A and Metop-B) with the WaveOptics processor;
- Validation of GRAS bending angles revealed systematic error in height referencing due to non consideration of 26,000 year Earth precession;
- Corrected and reprocessed Metop-A (27/10/2016-31/12/2015) and Metop-B (29/09/2012-31/12/2015) with a further improved WaveOptics processor (improved vertical smoothing);
- Processed whole COSMIC mission data;
- Processed whole CHAMP mission data;
- Still work on validation items for COSMIC and CHAMP;
- **Drafted deliverable report – to be finished by 12/01/2018.**
- **News from 9:58 today: report already finalised – Joerg reviews it on the train and submits next week.**

D3.18/D3.19 – Snow Data Products

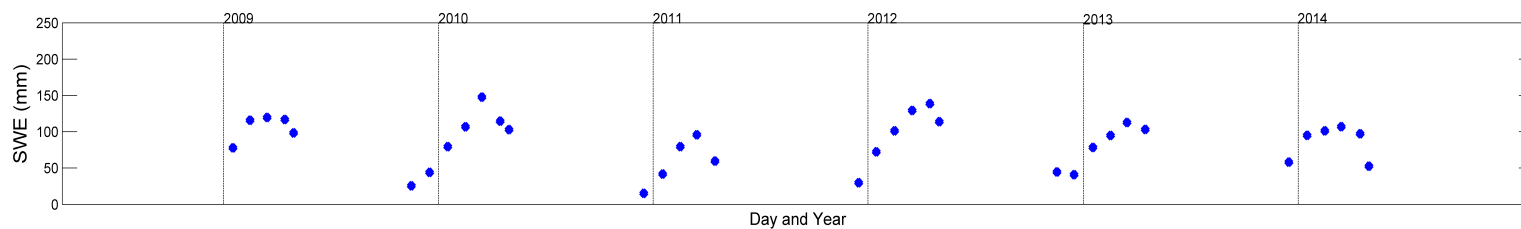
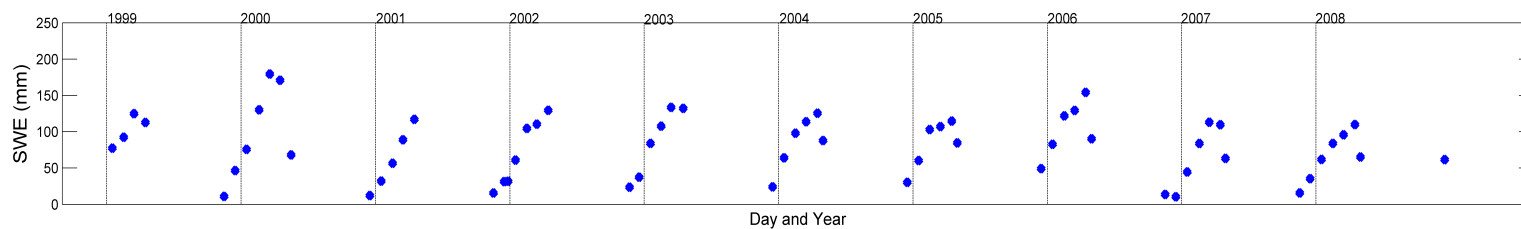
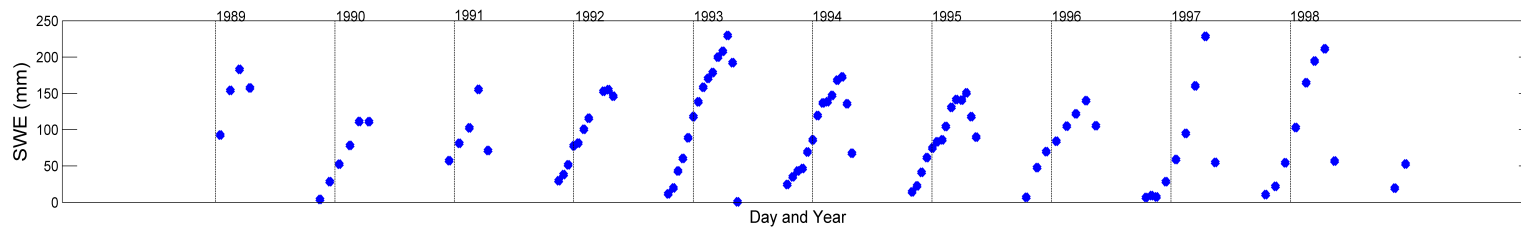
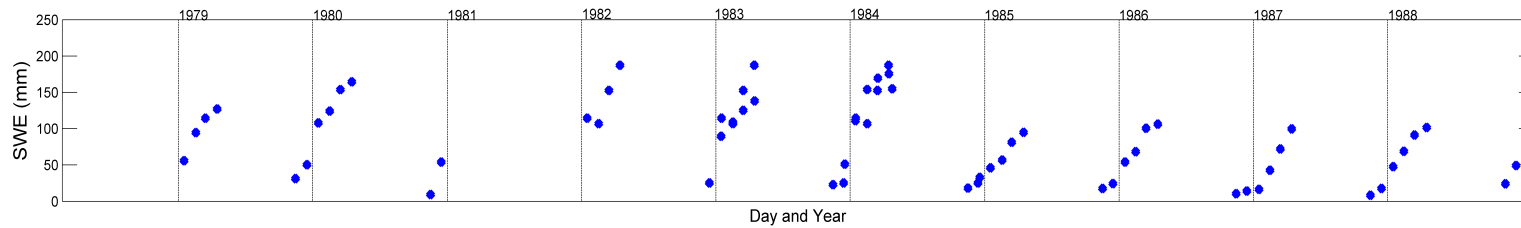
D3.19: What is a snow course

- > A typical Eurasian snow course (from Finland)



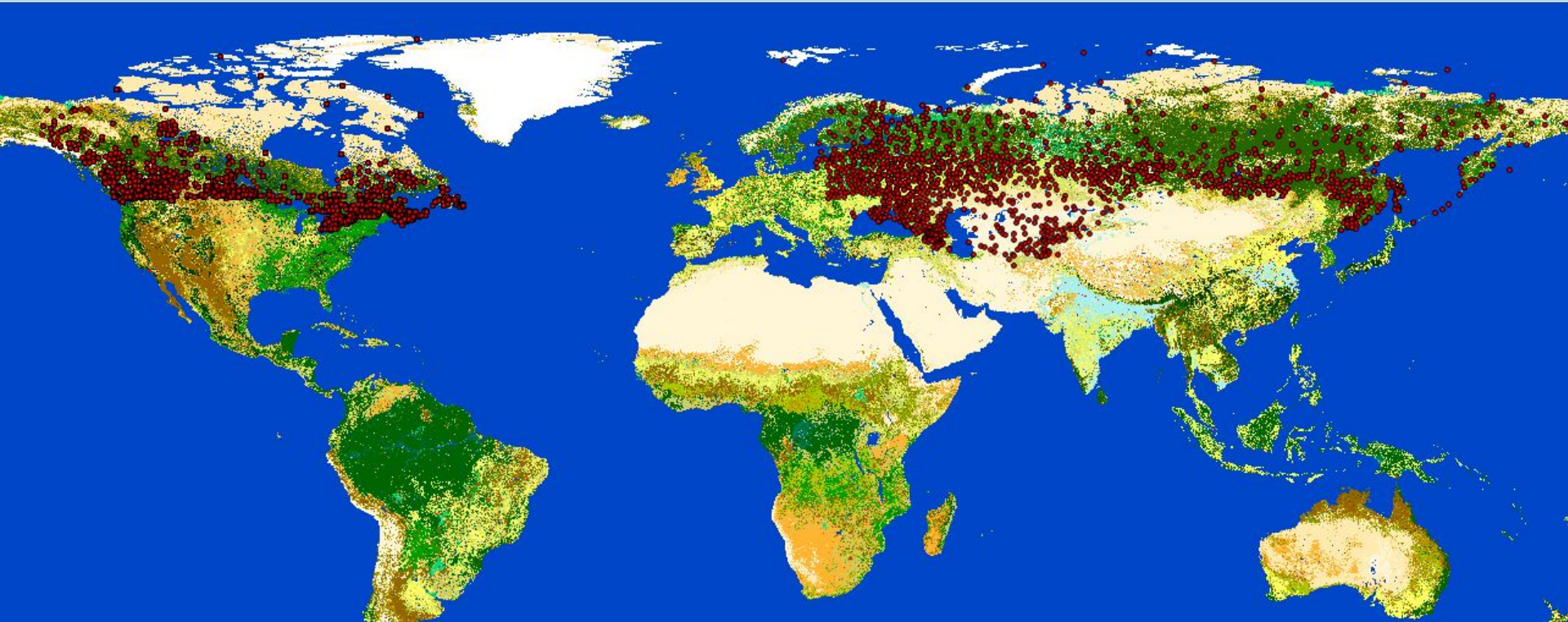
D3.19 – Snow Course Data

Example on Finnish snow course data



Deliverable D3.19: Quality controlled in situ snow data base (from snow courses)

<http://litdb.fmi.fi/eraclim2.php>



- Time period 1935-2009 (30 000 snow courses)
- Total number of observations around 1 million
- Variables (average values from distributed samples):
 - Snow Water Equivalent (SWE)
 - Snow Depth (SD)
 - Snow Density



OBSERVATIONS AT THE ARCTIC RESEARCH CENTRE SODANKYLÄ, FINLAND, (67.367°N, 26.629°E, 179M)

ERA-CLIM2



Description: Northern Hemisphere Snow Water Equivalent (SWE) data compiled by FMI-ARC for the [ERA-CLIM2](#) project.

Data file columns:

1. Course (WMO station number or value based on national numbering or running number)
2. LAT (decimal degrees)
3. LON
4. DOY (day of year)
5. SWE (snow water equivalent, mm)
6. rho (snow bulk density, g/cm³)
7. SD (snow depth, cm)
8. Julian day
9. Year
10. Snow course altitude (m)
11. Data Source (1=INTAS-SCCONE/RIHMI-WDC, 2 = Finnish Environment Institute, 3 = Environment Canada)

DATA FILES:

[MAT-file](#)
[TXT-file](#)

METADATA FILE:

[TXT-file](#)

For more information contact Miia Salminen (firstname.lastname@fmi.fi).

HOME

CAMPAIGNS

SATELLITE ACTIVITIES

Measurement fields:

PALLAS

SAARISELKÄ

AUTOMATIC WEATHER
STATION

CO₂ FLUX MAST

INTENSIVE OBSERVATION
AREA

LICHEN FENCE

MICROMETEOROLOGICAL
MAST

MICROMETEOROLOGICAL
MAST FIELD

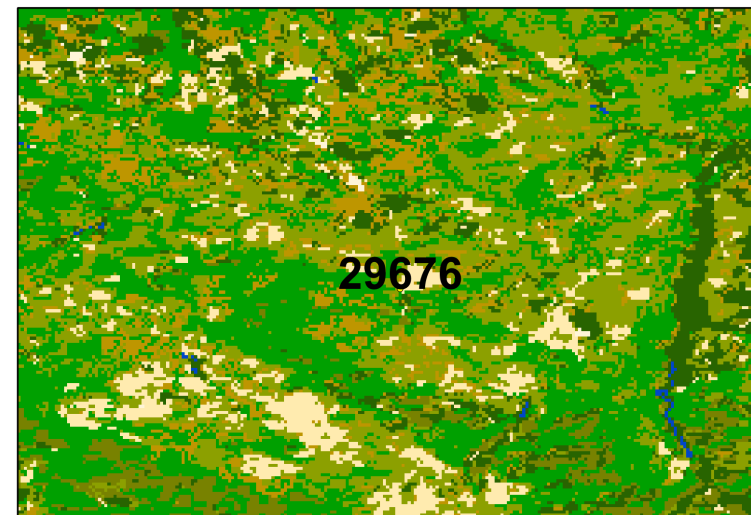
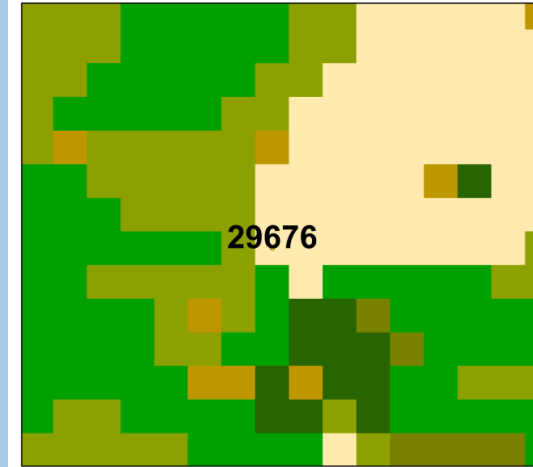
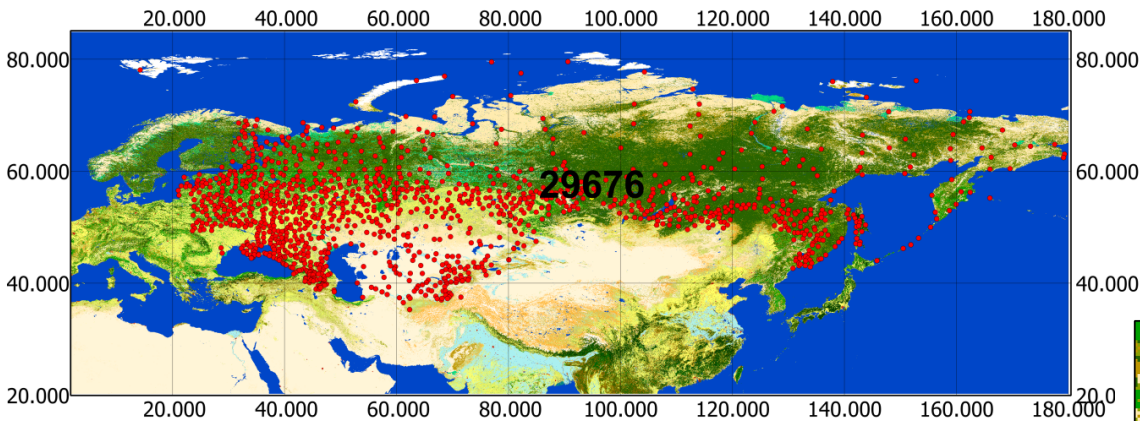
PEATLAND FIELD

RADIATION TOWER

ROAD WEATHER STATION

D3.19 – Snow Course Data

Example: WMO station 29676



Deliverable D3.18: Prototype snow data product (GlobSnow development product) for reanalysis

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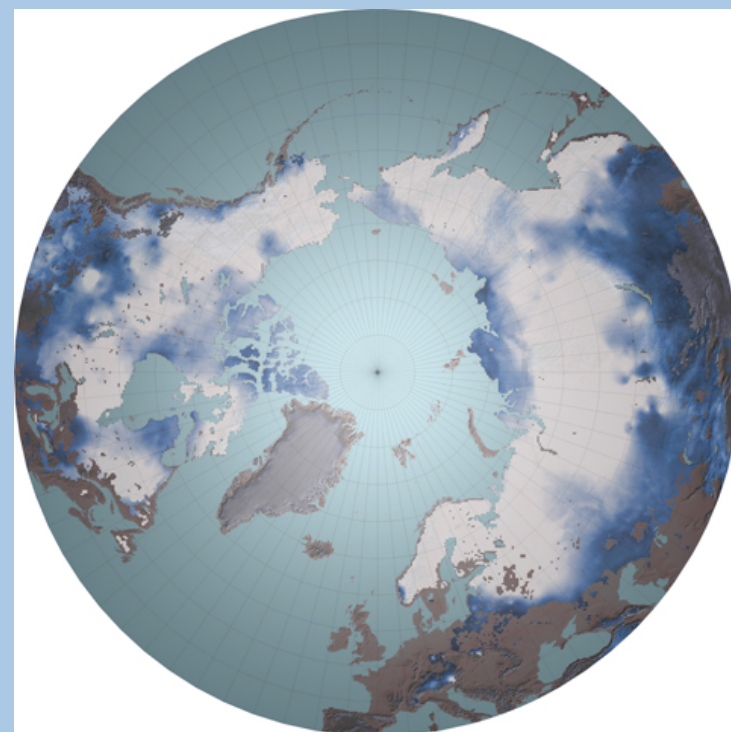
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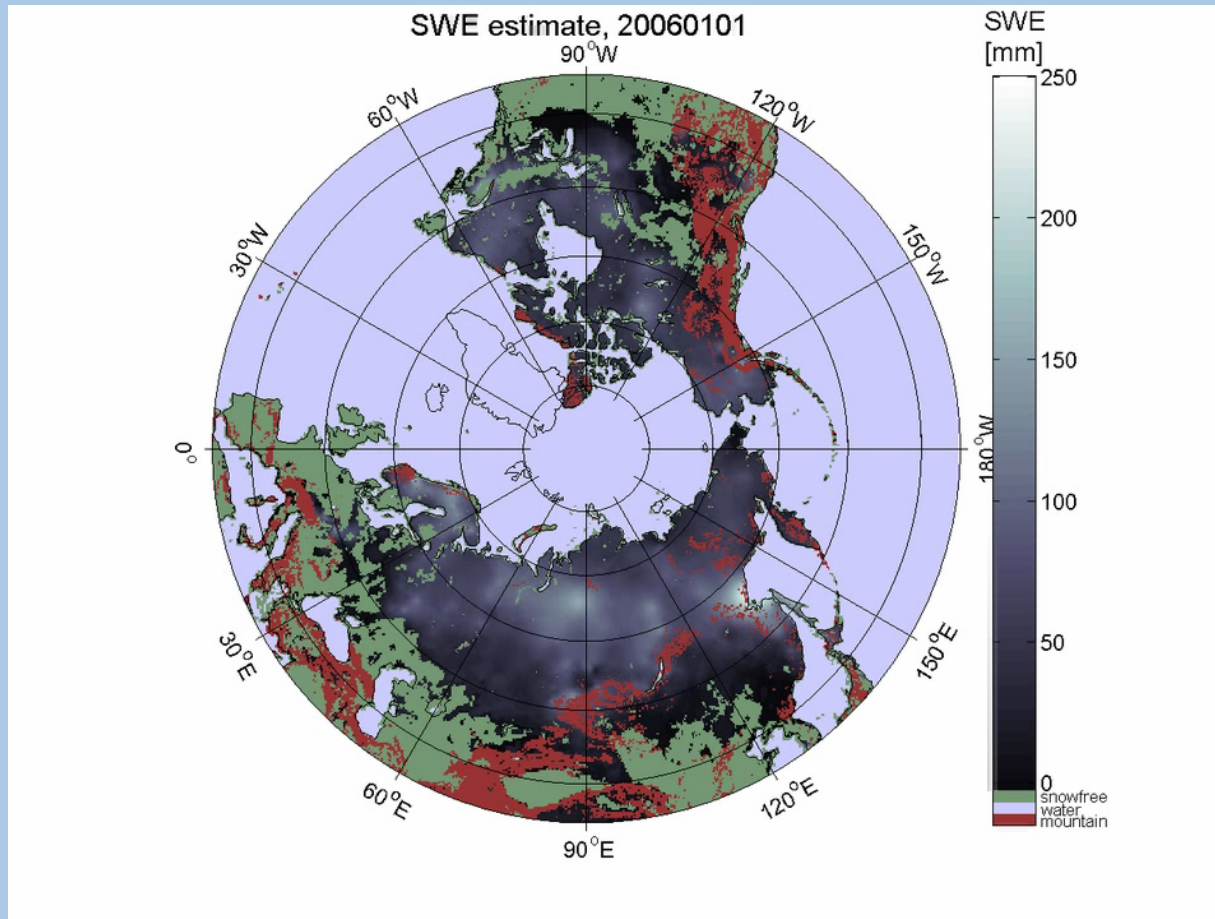
Climate Data Record on snow cover:

- > Hemispheric snow mass given by Snow Water Equivalent (SWE)
- > Validated ERA-CLIM-2 data record giving daily values for the period 1979-2016
- > Product based on combination of spaceborne microwave radiometer data, optical satellite data and *in situ* observed synoptic snow depth observations
- > Data set available at: http://www.globsnow.info/swe/archive_v2.1_Eraclim

Snow water equivalent
(example for 19.2.2017, white
color indicating SWE>200 mm)



D3.18 – Snow Water Equivalent



Outreach

- > Common WP3 Publication: Submitted to BAMS
- > Researcher's night: video
- > Researcher's night: website
- > Book publication
- > Many other publications