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**UNIVERSITÄT
BERN**

**OESCHGER CENTRE
CLIMATE CHANGE RESEARCH**

ERA-CLIM2 GA, Darmstadt

WP3: Earth System Observations and UBERN contribution



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Outline

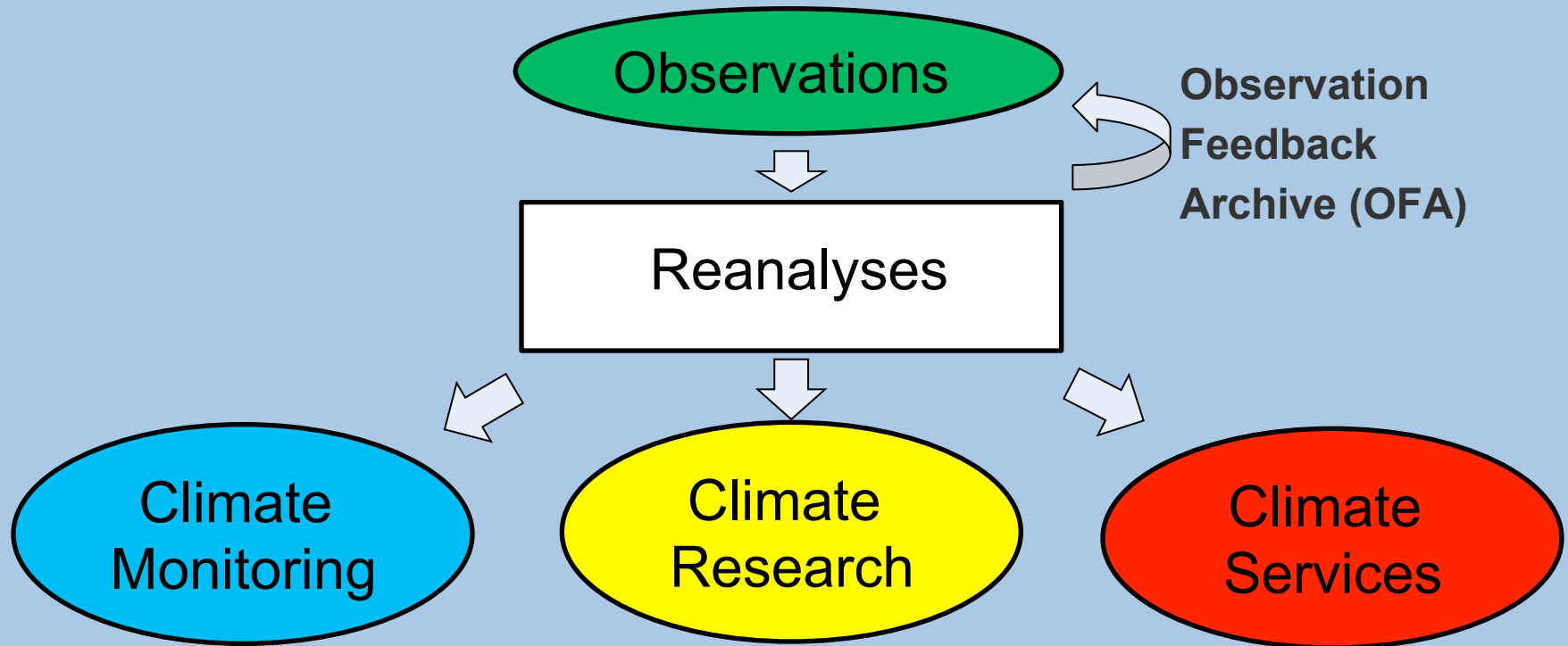


- > Overarching goal of WP activities
- > Deliverables and Amendments
- > UBERN Work
- > Outlook

Overarching goal of WP activities



- > **Core objective of ERA-CLIM2: Extending the current global reanalysis capability in Europe, in order to meet the challenging requirements for climate monitoring, climate research, and the development of climate services**



WP deliverables / amendments



	Description (Lead beneficiary)	Original	Amend	Comment
D3.1	Data catalogue (UBERN)	6	6	delivered
D3.2	Priorities for data rescue (UBERN)	6	6	delivered
D3.3	Meta-database update (UBERN)	36	48	continuous
D3.4	In-situ data for reanalysis (UBERN)	75% 24	36	Spanish Ebro and North African upper air not in time
D3.5	In-situ data (other) (UBERN)	75% 30	42	Chile data not in time
D3.6	Quality-controlled version of D3.4 (UBERN)	75% 36	48	Allows more data from French overseas, Intl. days
D3.7	Quality-controlled version of D3.5 (UBERN)	75% 33	48	Allows more data from French overseas, Intl. days
D3.8	RTTOV updates (METO)	36	36	No change in deadline required
D3.9	Early satellite data (METO)	36	36	No change in deadline required
D3.10	AVHRR polar winds (EUMST)	80% 24	36	Slower due to dependence on other EUMST activities
D3.11	SSM/T2 and AMSU-B/MHS radiance data (EUMST)	24	24	No change in deadline required
D3.12	Geostationary radiance data (EUMST)	36	36	No change in deadline required
D3.13	AMV from MFG (EUMST)	80% 36	42	Slower due to small resources
D3.14	Radio occultation data (EUMST)	36	36	No change in deadline required
D3.15	HadISST2 update (METO)	18	18	delivered
D3.16	Ice thickness data (METO)	12	12	delivered
D3.17	Ocean database update (METO)	24	30	Extension allows higher quality deliverable
D3.18	Snow data product (FMI)	24	36	Extension allows higher quality deliverable
D3.19	QC version of snow data base (in situ) (FMI)	36	48	Extension allows higher quality deliverable
D3.20	HadISD update (METO)	12	12	delivered

Overarching goal of WP activities



> Spatial distribution of recovered observational in situ data

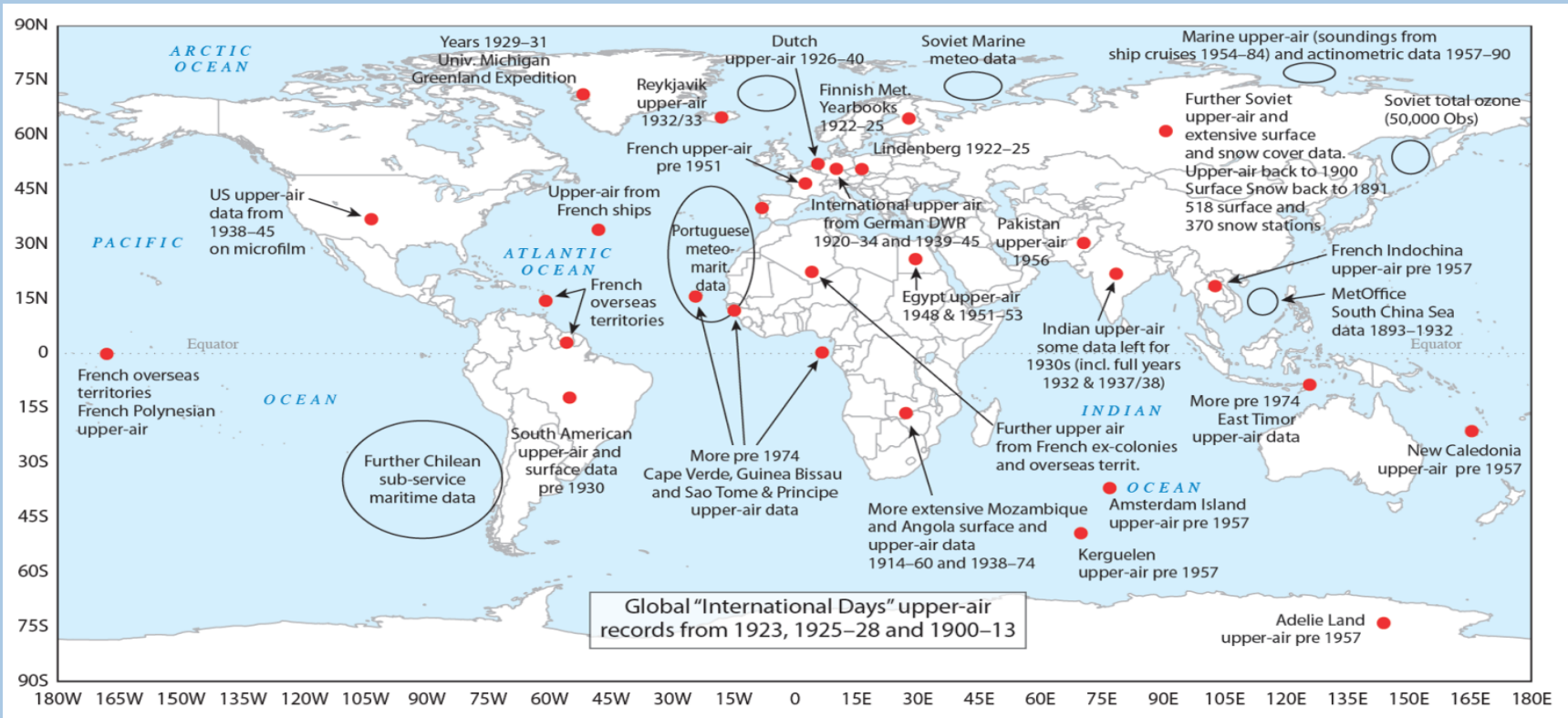
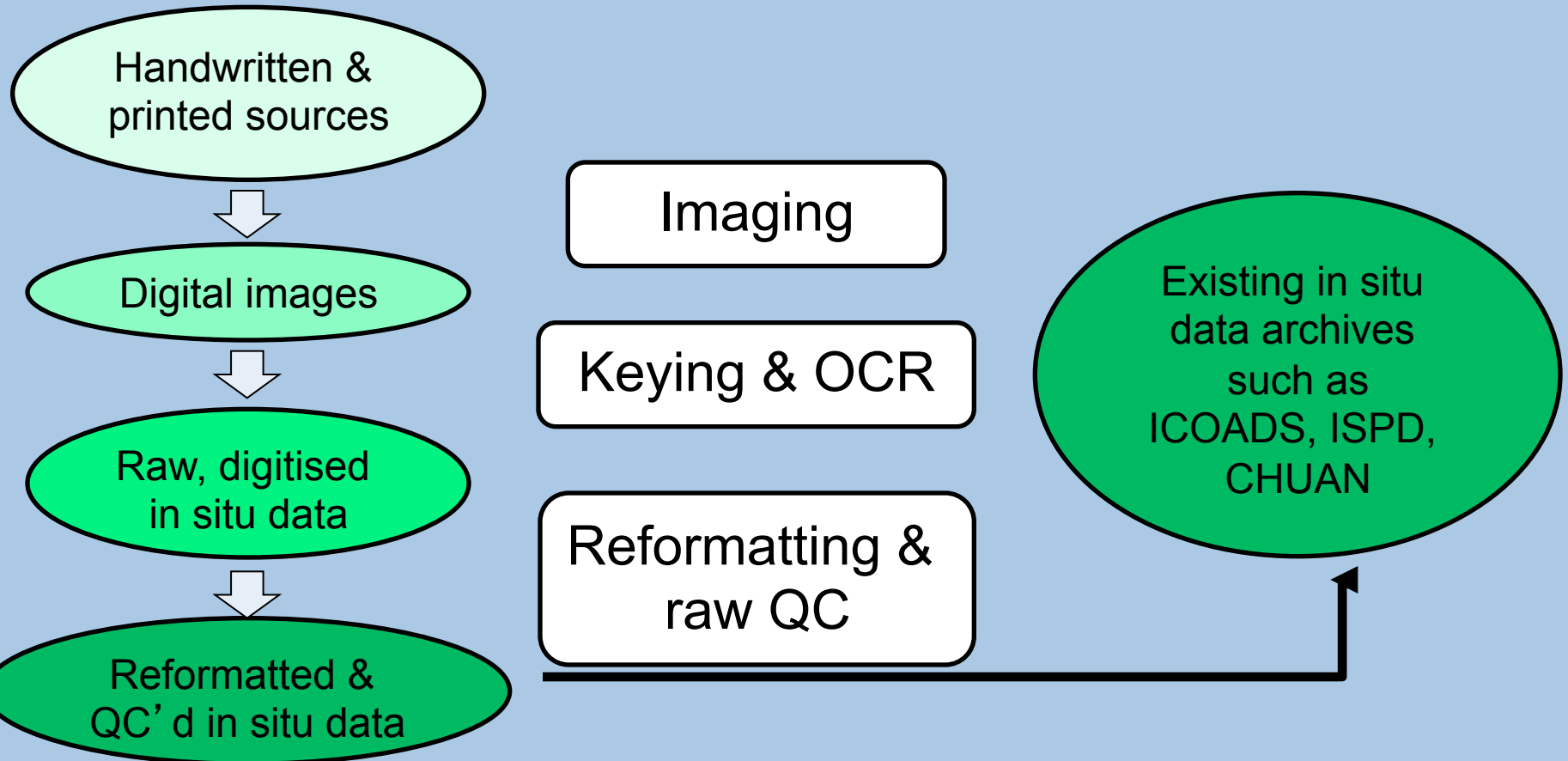


Figure 6: Global in-situ data rescue activities to be conducted in ERA-CLIM2

Overarching goal of WP activities



> **WP3: Schematic workflow of data & metadata recovery, data reprocessing, and quality control**



Status of WP deliverables (early July)



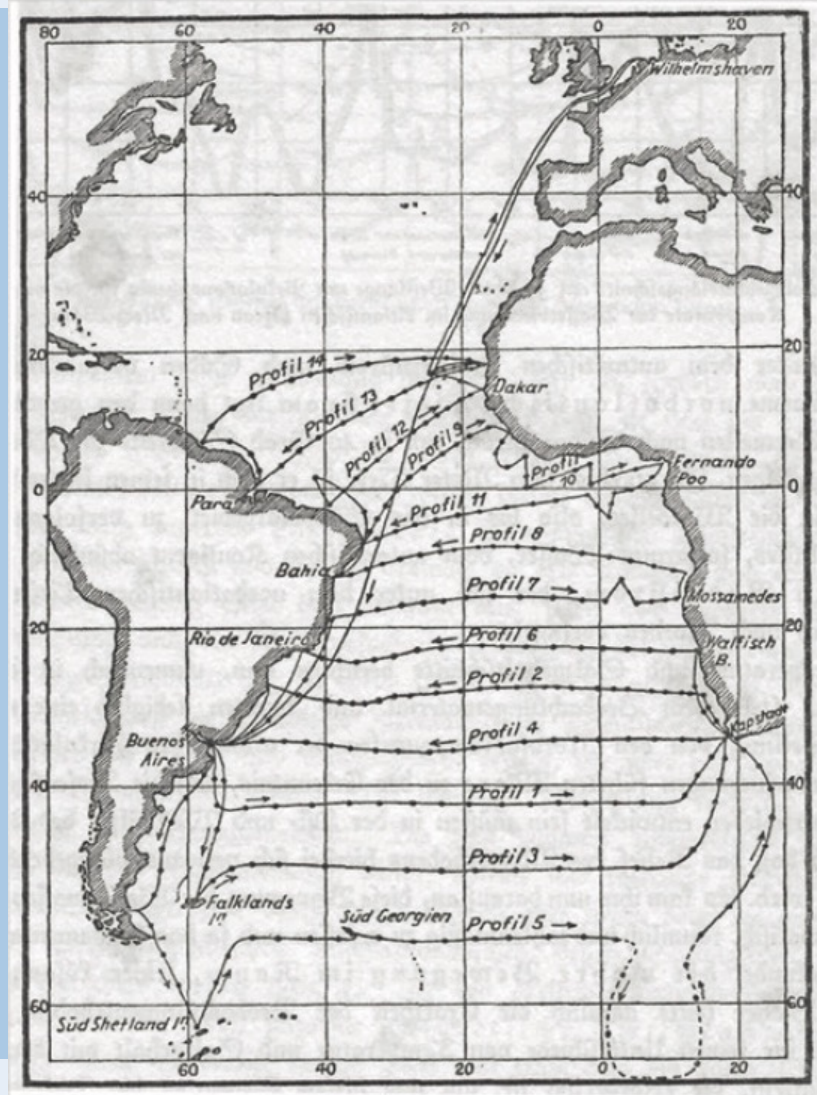
- > **Est. total amount of digitised data in ERA-CLIM & ERA-CLIM2**
 - **FFCUL: 68.9%** of the inventoried 41,000 station days of **upper-air data**, and **94.3 %** of the inventoried 1,688,000 station days of **surface data digitised**
 - **METFR: 41.4 %** of the inventoried 643,000 station days of **upper-air data digitised**
 - **RIHMI: 90.1%** of the inventoried 33,000 station days of **upper-air data digitised**
 - **UBERN: 99.9%** of the inventoried 9,000 station days of **moving upper-air data**, and **98.6%** of the inventoried ca. 746,000 station days of **fixed station upper-air data digitised**

UBERN example: «Meteor» Cruise 1925-27 (thousands of profiles)



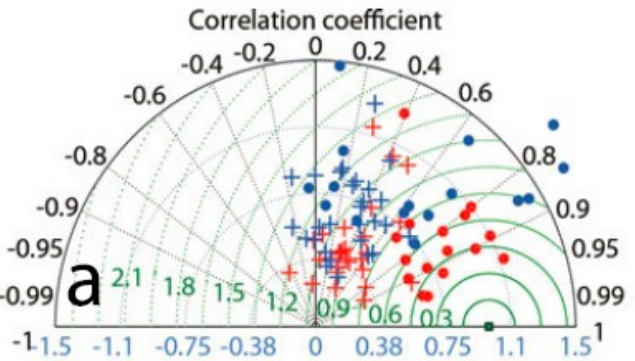
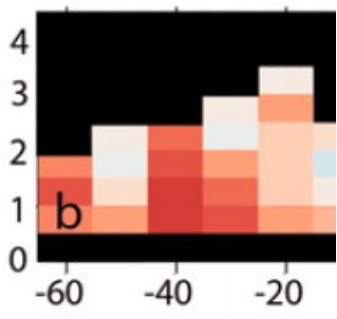
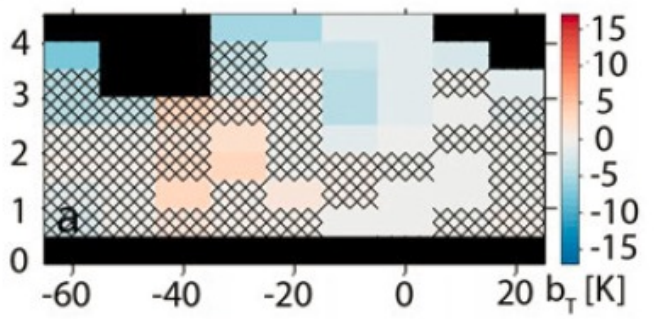
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Stickler et al. 2015



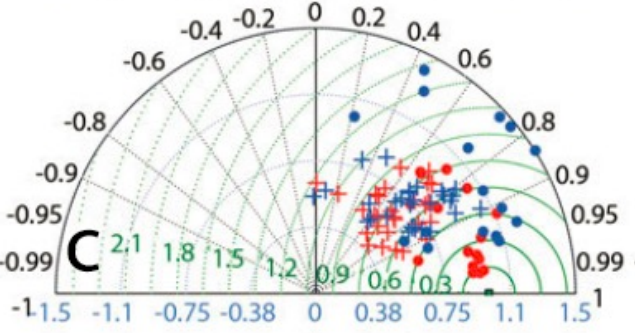
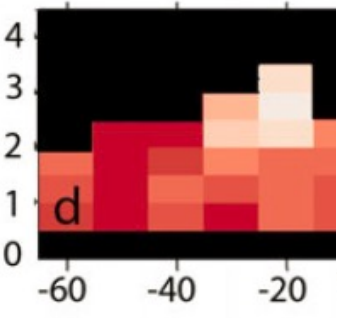
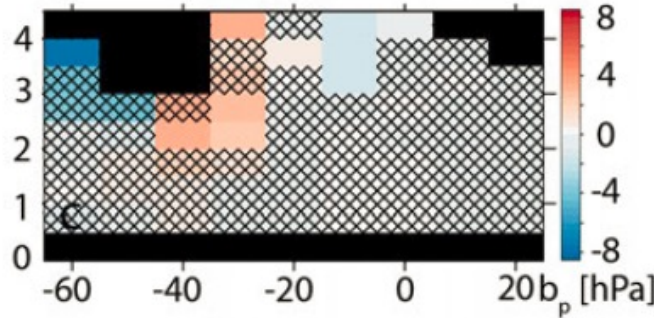
Kite: Anomaly correlations w ERA20C

Temp.

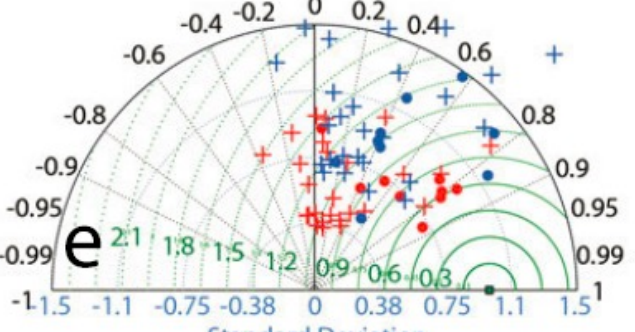
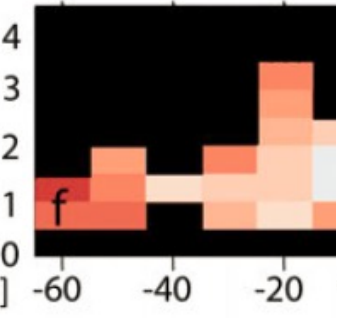
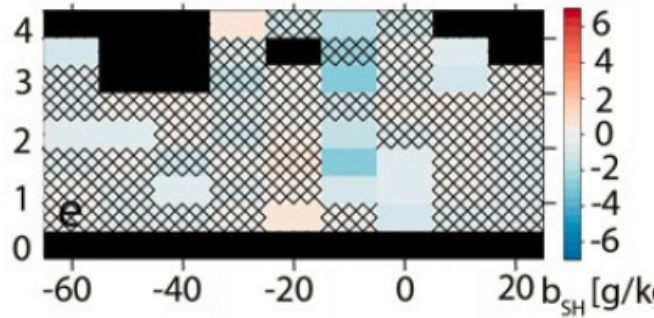


Press.

Altitude [km above sea level]



rH



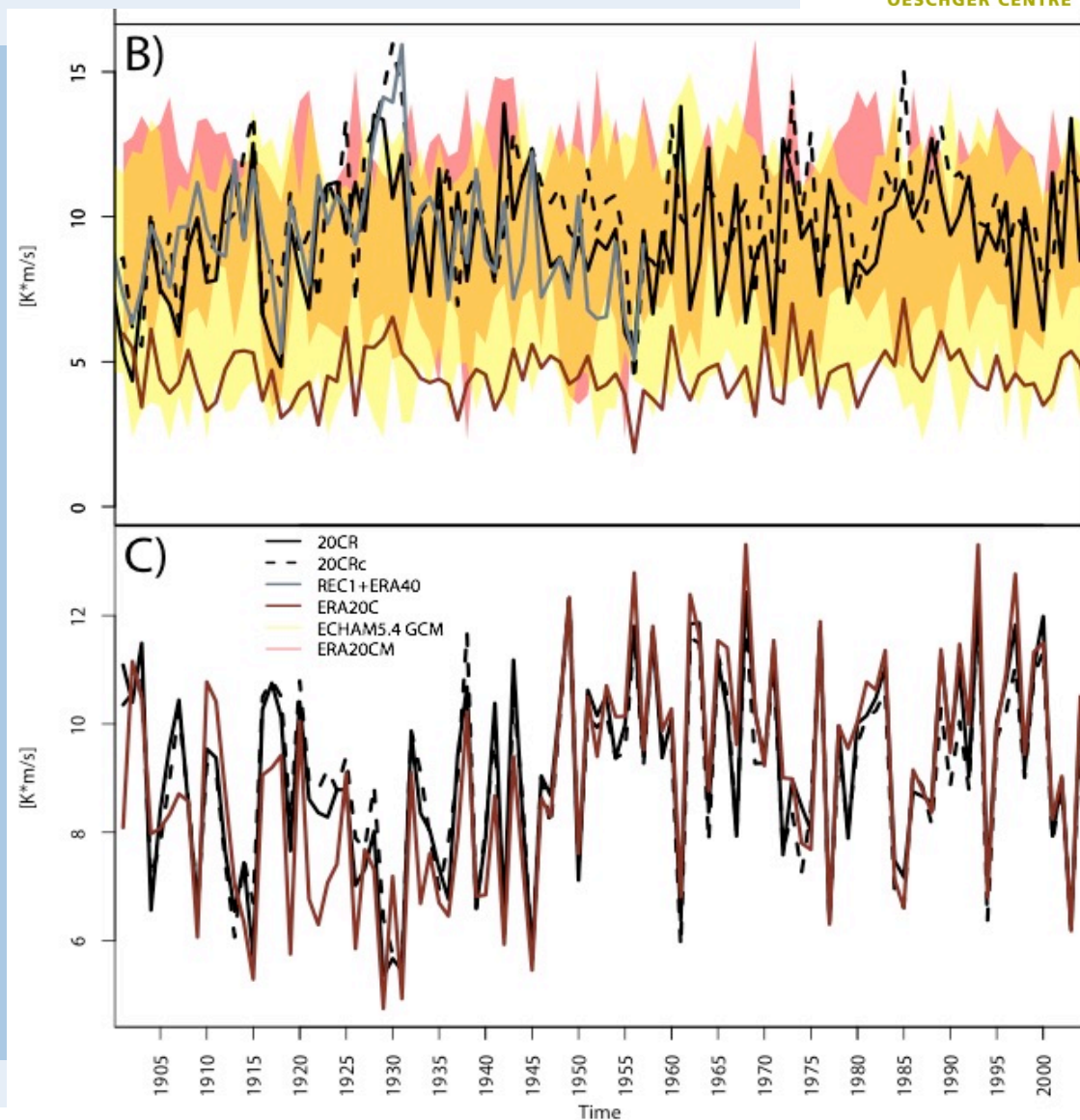
Stickler et al. 2015

Latitude [°]

Meridional Heat flux, 60N, 700 hPa, DJF

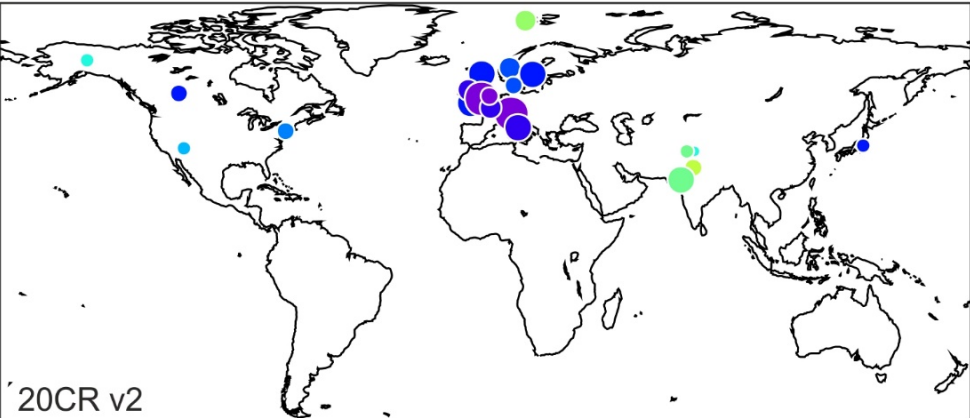
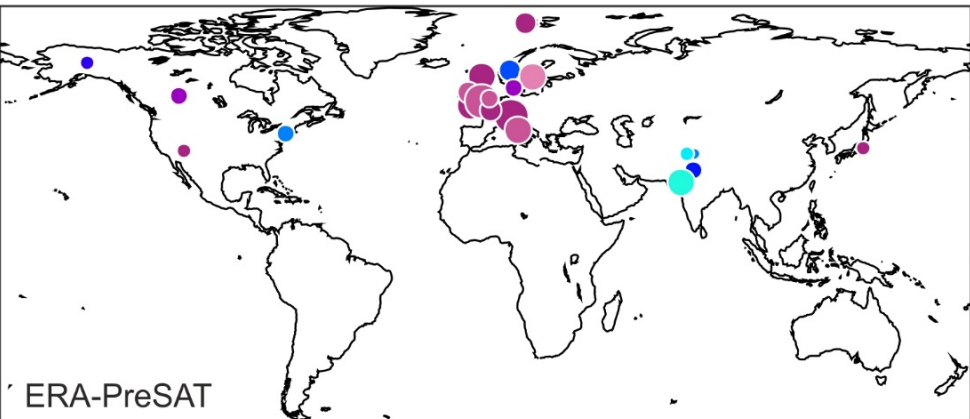
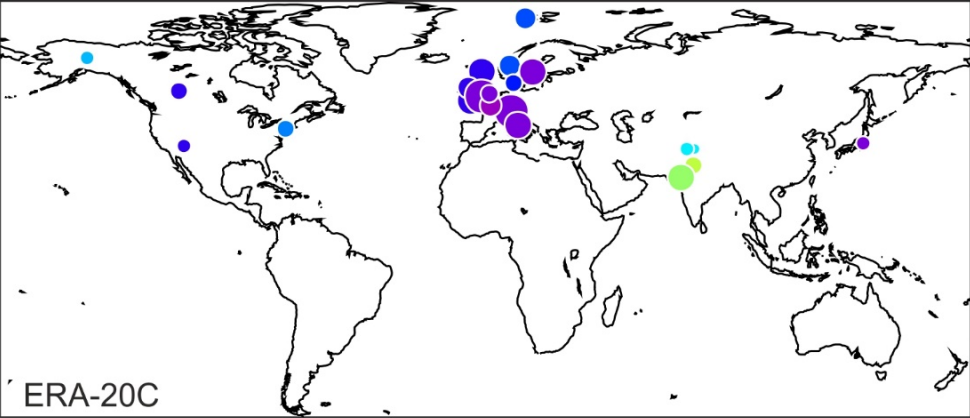
> Stationary (>1 mon):
ERA-20C very low

> Transient (<1 mon):
Good agreement



Day-to-Day Correlation of Total Column Ozone

- > Correlation with historical observations, 1939-1963, seasonal cycle removed
- > ERA-PreSAT clearly the best



Fate of digitised upper-air observations

- > ERA-CLIM/2 huge efforts in upper air data rescue, **they are not used in production reanalyses**
- > ERA-20C often **worse** than 20CR (plus: **misses tropical cyclone**)
- > ERA-PreSAT is much better
- > Historical upper-air data could be the leading edge of Europe

- > **ERA-CLIM2 SHOULD PRODUCE A REANALYSIS THAT INCLUDES UPPER-AIR DATA (AND REDO ERA-20C)**

Published UBERN Publications with ERACLIM2 Acknowledgements

Surface Data

Brugnara Y et al (2015) A collection of sub-daily pressure and temperature observations for the early instrumental period with a focus on the “year without a summer” 1816. *Clim Past* **11**:1027-1047

Upper-air data

Stickler A et al (2014) Description of the ERA-CLIM historical upper-air data. *Earth Sys Sci Data* **6**:29-48

Stickler A et al (2014) ERA-CLIM: Historical Surface and Upper-Air Data for Future Reanalyses. *B Am Meteorol Soc* **95**:1419–1430

Stickler A et al (2015) Upper-air observations from the German Atlantic Expedition (1925–27) and comparison with the Twentieth Century and ERA-20C reanalyses. *Meteorol Z* **22**:349-358

Comparison of Reanalyses

Schmocker et al (2015) Trends in mean and extreme precipitation in the Mount Kenya region from observations and reanalyses. *Int J Climatol* doi:10.1002/joc.4438.

Analyses

Brönnimann S (2015) *Climatic Changes Since 1700*. Springer, Adv Global Change Res **55**, 375 pp.

Brönnimann S, Fischer AM, Rozanov E, Poli P, Compo GP, Sardeshmukh PD (2015) Southward shift of the Northern tropical belt from 1945 to 1980. *Nature Geoscience* **8**:969-974.

ERA-CLIM3

- > Produce also new cycle of long reanalysis (pre-1979)
- > Some targeted UA data rescue
- > Surface data rescue (including long pressure series)
- > Add new platform: Air ships
- > Use other than in-situ (total column ozone? spectra?)



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**Thank you for
your
attention!**

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CLIM**