

Verification of regional reanalyses with station and tower measurements

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Outline

- Common evaluation methods: wind speed
- R-package published on GitHub
- Comparison against mast measurements
- Access of EURO4M data on MARS archive
- Comparison against station measurements

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ERRA common evaluation procedure: assessing uncertainties in reanalysis by evaluation against station observations

189 commits

2 branches

1 release

1 contributor

Branch: master

New pull request

New file

Find file

MichaelBorsche add plotting RRAs extremes

DWD_station_data

EVAstatobsR

data

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.Rbuildignore

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AnalyseTowerWindspeed.R

AnalyseWindspeed.R

AnalyseWindspeedManyRRAs.R

README.md

Settings.R

SettingsManyRRAs.R

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HTTPS

https://github.com/UERRA-EVA/EVA_stationobs

Download ZIP

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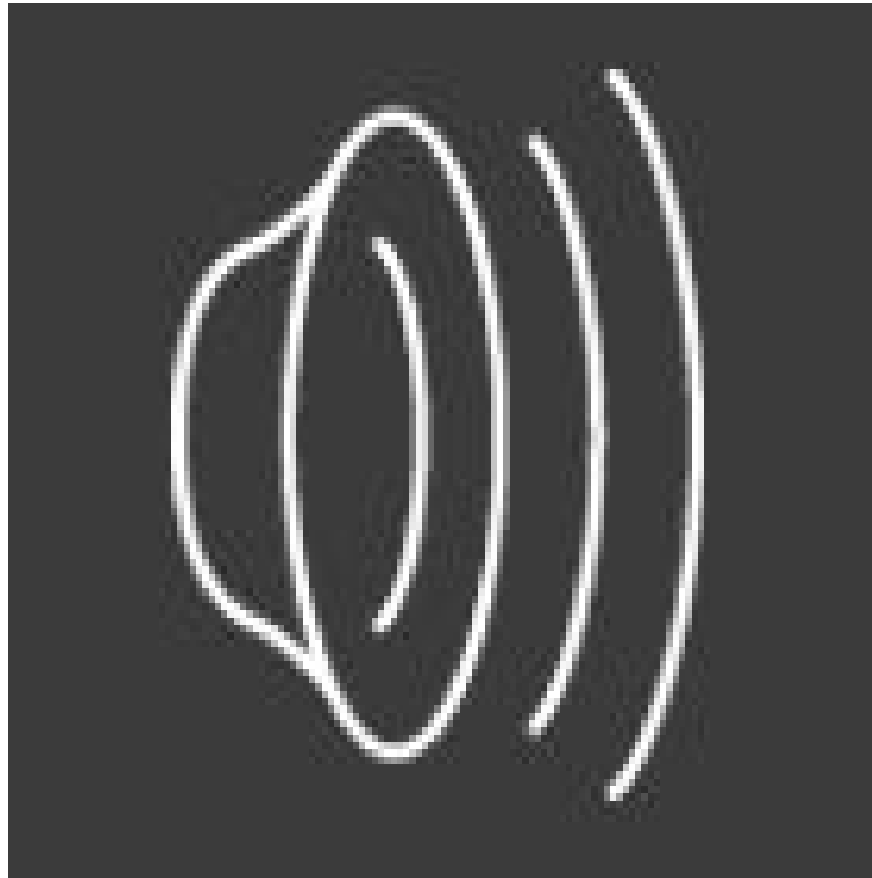
bug fix

7 months ago

6 days ago

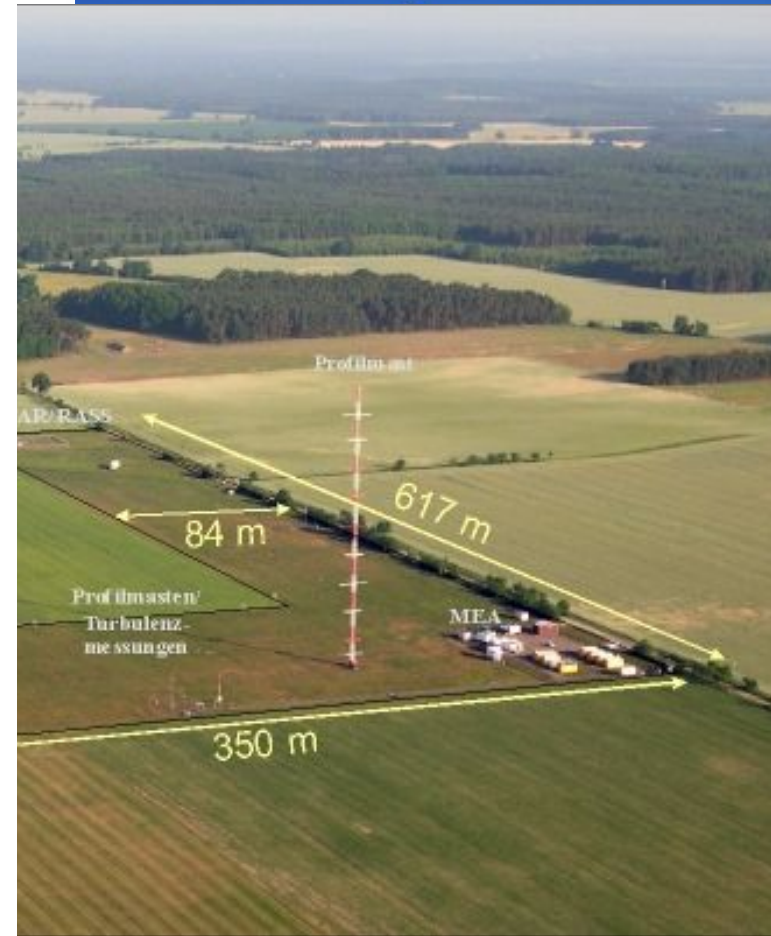
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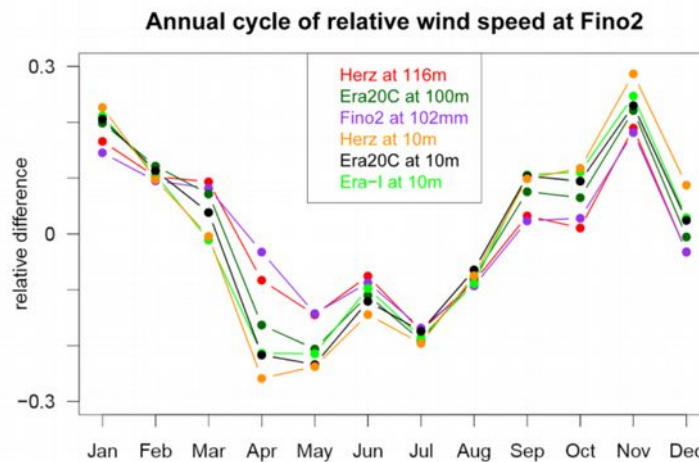
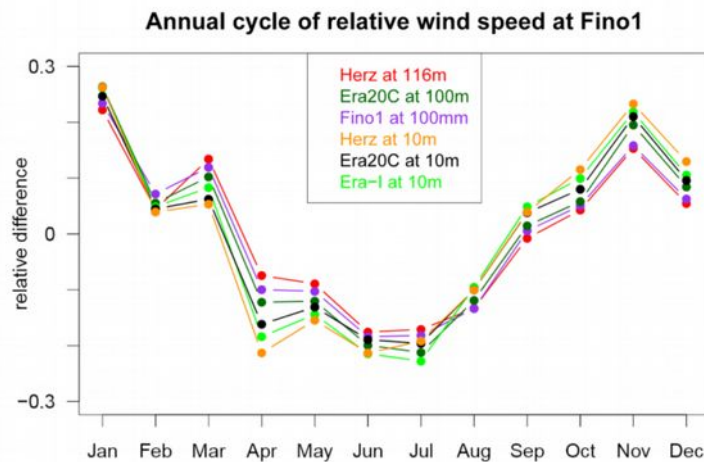
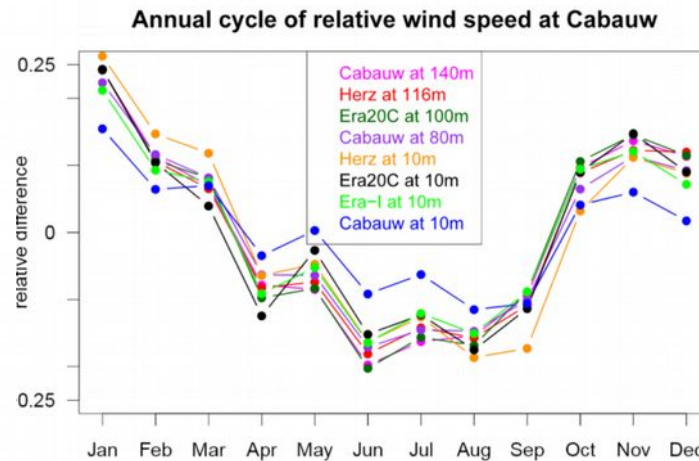
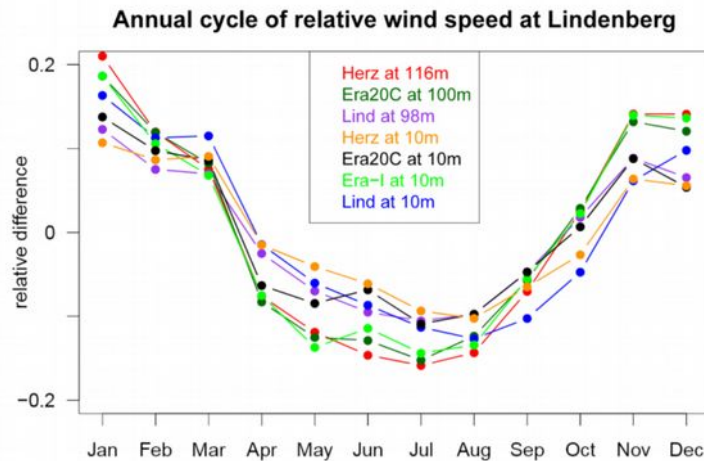
8 days ago



Comparison against mast measurements

- Comparison of wind speed against COSMO-REA6 reanalysis
- Lindenberg data from DWD
- FINO 1,2,3 data from DWD
- Cabauw data from Cesar site

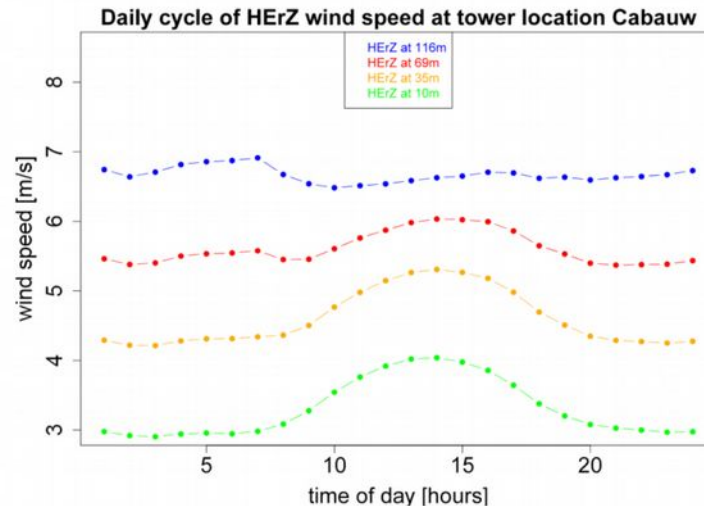
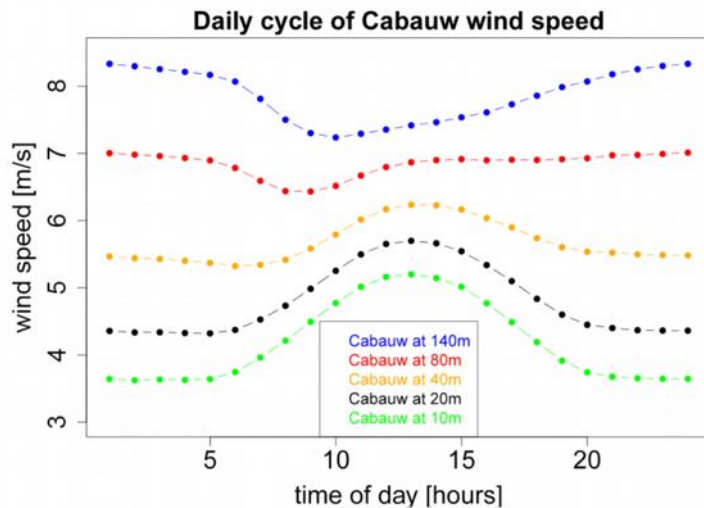
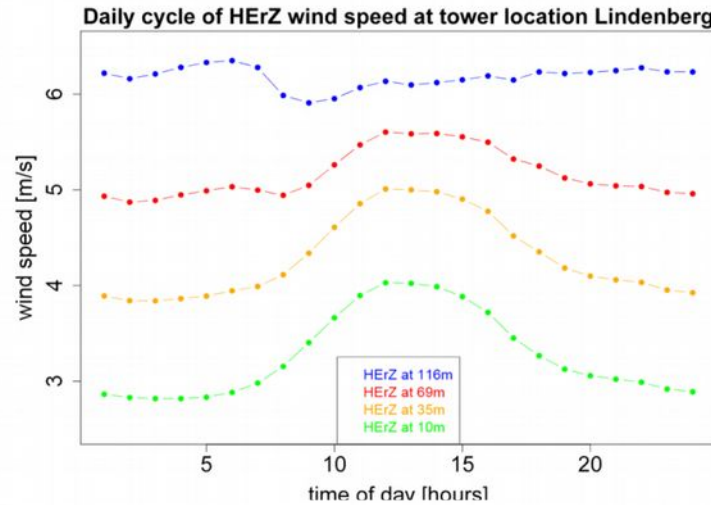
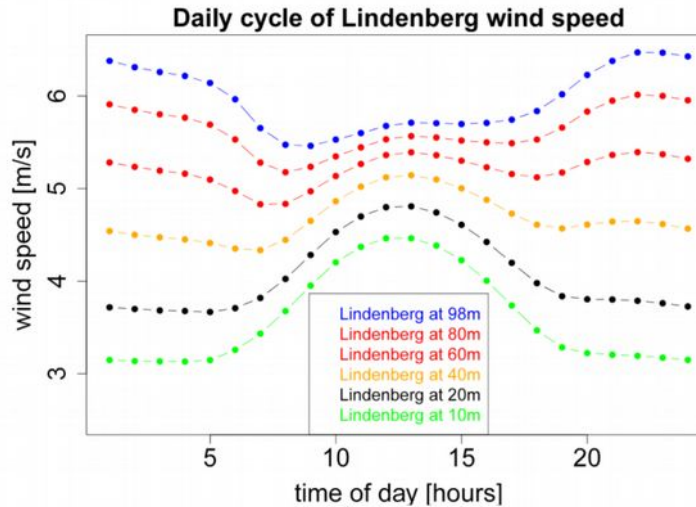




- Annual variability consistent for RRA and observations
- max WS in winter
min WS in summer
- Annual variability about 20% to 30%
- No height dependent WS variability

Borsche et al., 2016 (submitted)

Diurnal Cycle



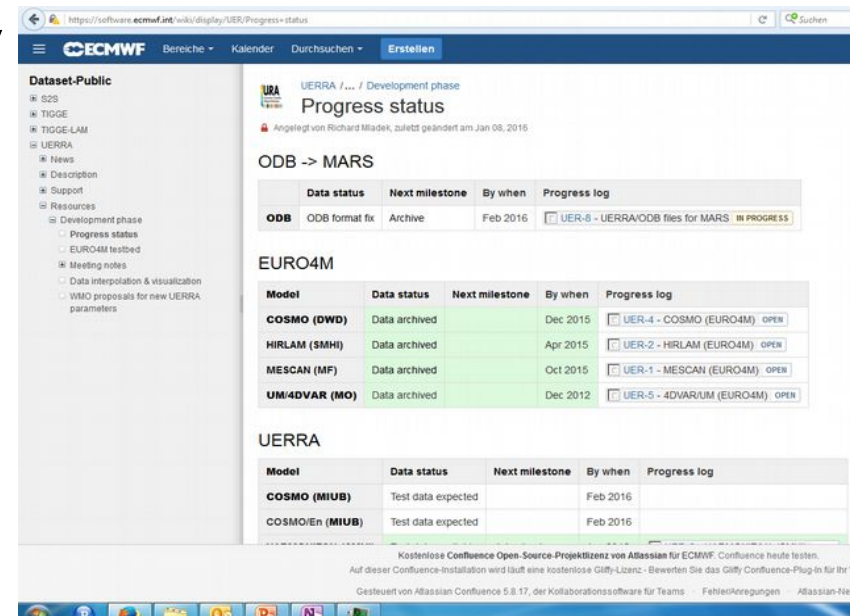
- Consistent diurnal cycle present in COSMO-REA6 and obs
- Amplitude lower in COSMO-REA6 at 10m
- Reversal above not seen in COSMO-REA6
- BL parametrization optimized for 10m

Borsche et al., 2016 (submitted)

Access to regional reanalyses

- MARS archive now holds four regional reanalyses (see talk by Richard Mladek)
- Downloaded 10m wind speed
- Grid information (2D fields) provided by Richard
- Compare against German station data:

<ftp://ftp-cdc.dwd.de/pub/CDC/>



UERRA / ... / Development phase
Progress status
Angelegt von Richard Mladek, zuletzt geändert am Jan 08, 2016

ODB -> MARS

Model	Data status	Next milestone	By when	Progress log
ODB	ODB format fix	Archive	Feb 2016	UER-5 - UERRA/ODB files for MARS IN PROGRESS

EURO4M

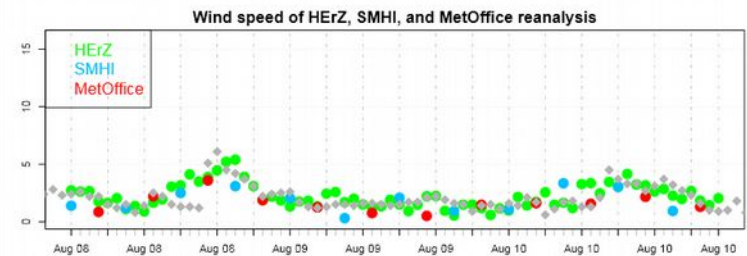
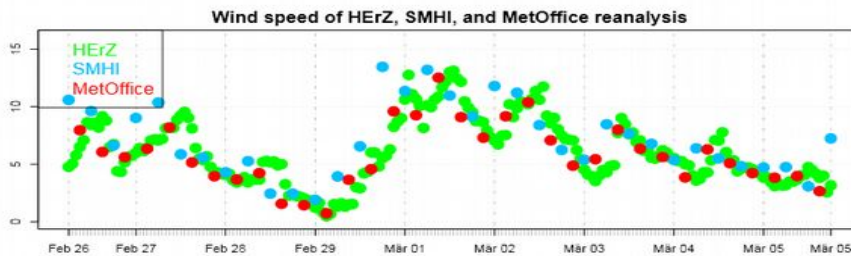
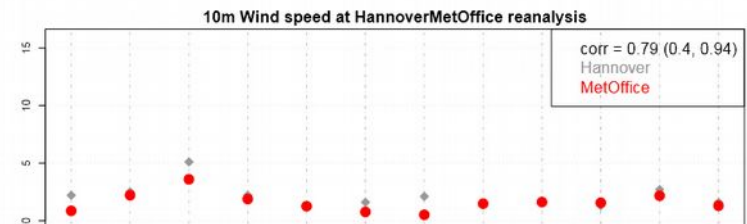
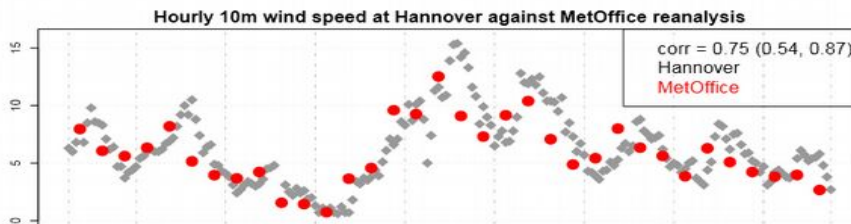
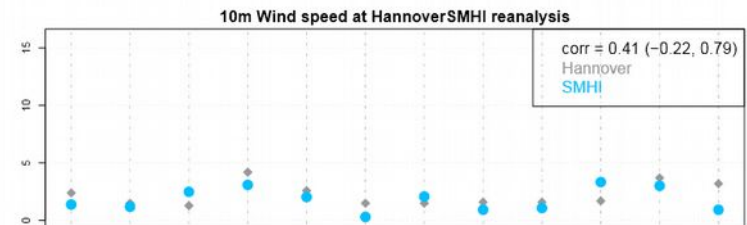
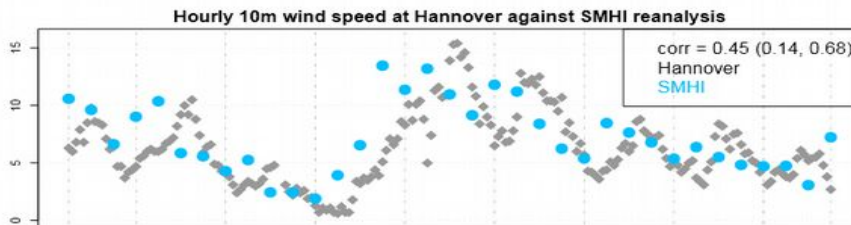
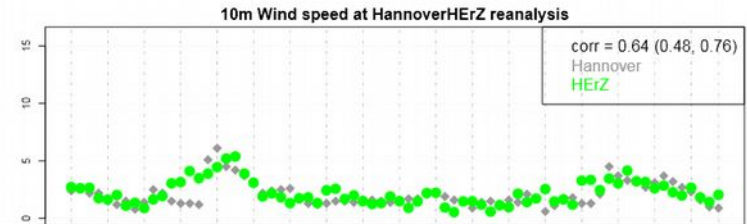
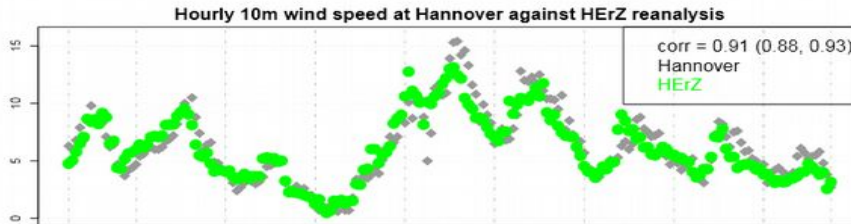
Model	Data status	Next milestone	By when	Progress log
COSMO (DWD)	Data archived		Dec 2015	UER-4 - COSMO (EURO4M) OPEN
HIRLAM (SMHI)	Data archived		Apr 2015	UER-2 - HIRLAM (EURO4M) OPEN
MESCAN (MF)	Data archived		Oct 2015	UER-1 - MESCAN (EURO4M) OPEN
UM/4DVAR (MO)	Data archived		Dec 2012	UER-5 - 4DVAR/UM (EURO4M) OPEN

UERRA

Model	Data status	Next milestone	By when	Progress log
COSMO (MIUB)	Test data expected		Feb 2016	
COSMO/En (MIUB)	Test data expected		Feb 2016	

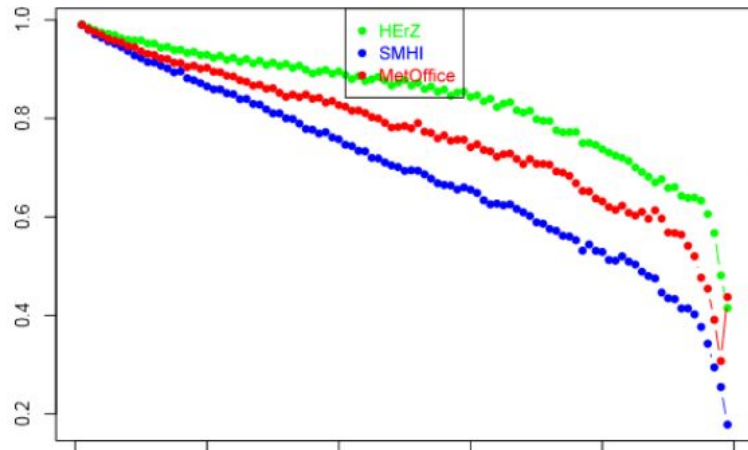
Kostenlos Confluence Open-Source-Projektlizenz von Atlassian für ECMWF. Confluence heute testen.
Auf dieser Confluence-Installation wird eine kostenlose Giphy-Lizenz - Bewerten Sie das Giphy Confluence-Plug-In für Ihr V...
Gesteuert von Atlassian Confluence 5.8.17, der Kollaborationssoftware für Teams - Fehler/Anregungen - Atlassian-New...

Storm and calm period

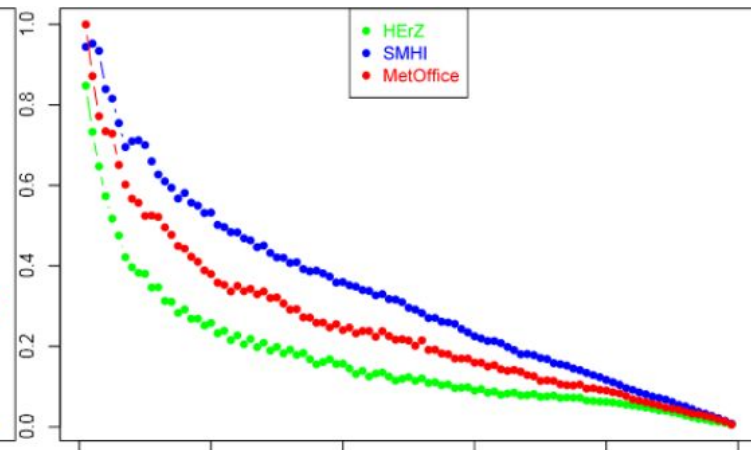


Contingency table based skill scores

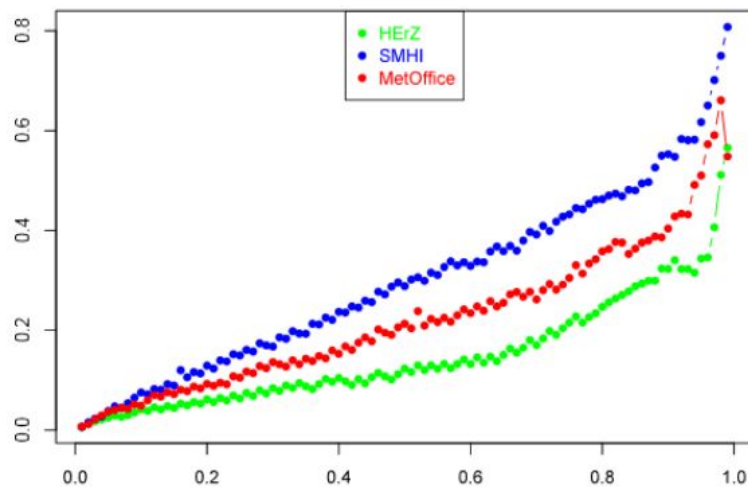
Hit rate of hourly means at Hannover



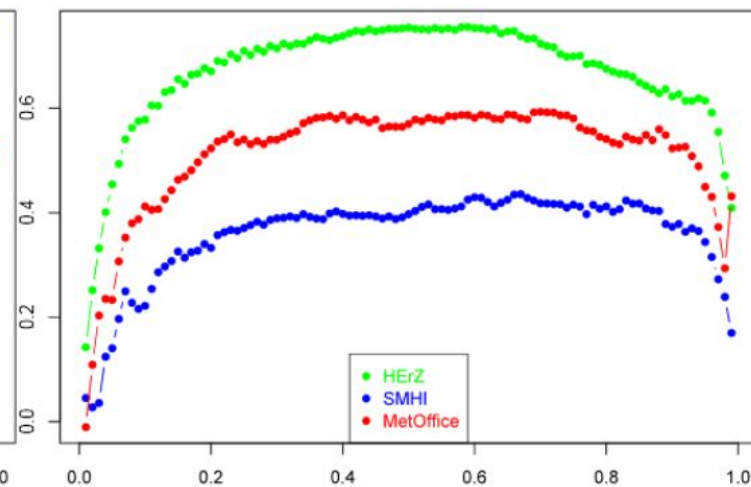
False alarm rate of hourly means at Hannover



False alarm ratio of hourly means at Hannover

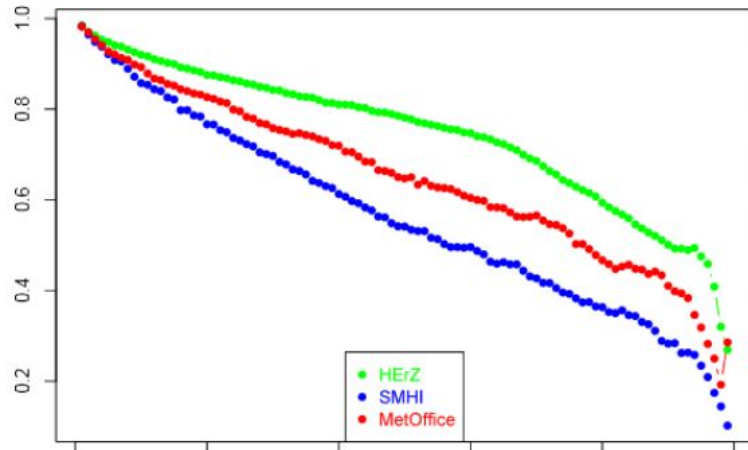


True skill of hourly means at Hannover

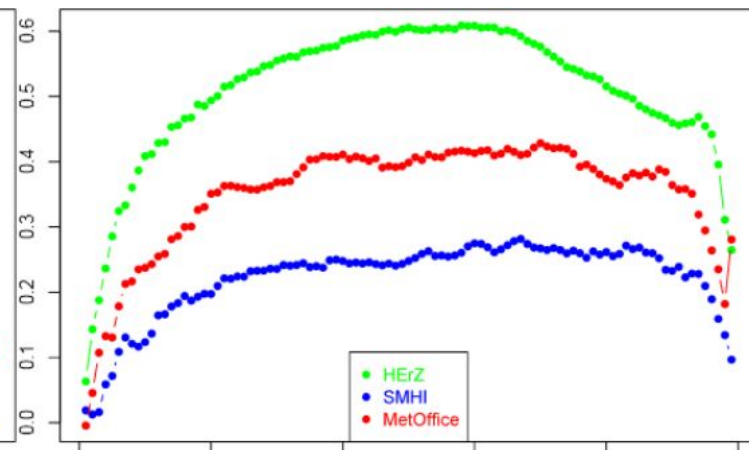


Contingency table based skill scores

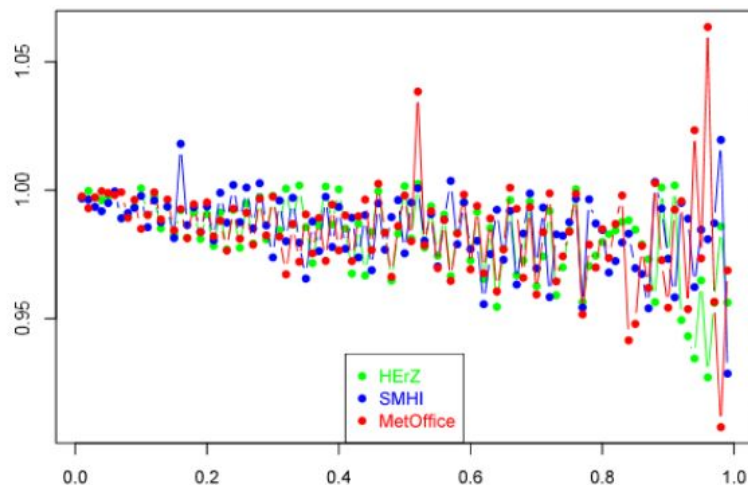
Threat score of hourly means at Hannover



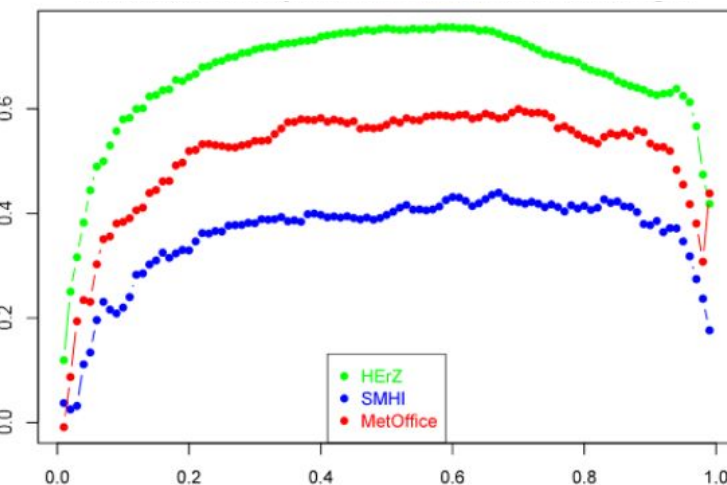
Equitable threat score of hourly means at Hannover



Frequency bias of hourly means at Hannover

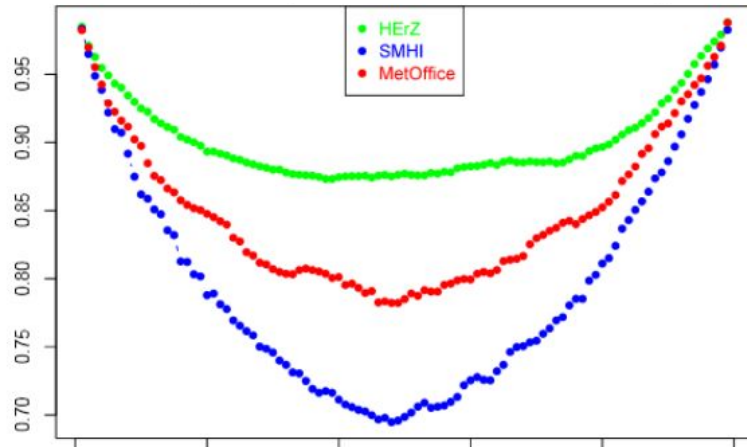


Heidke skill score of hourly means at Hannover

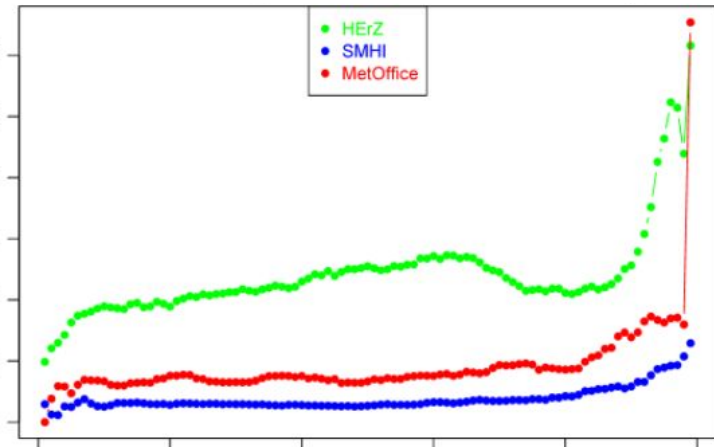


Contingency table based skill scores

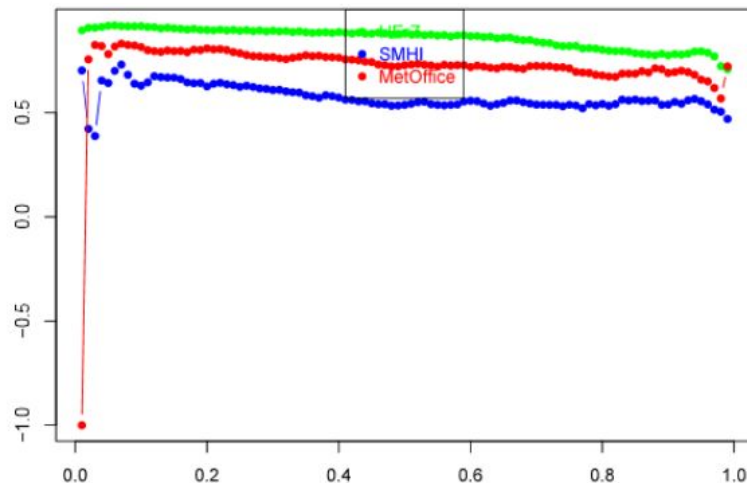
Accuracy of hourly means at Hannover



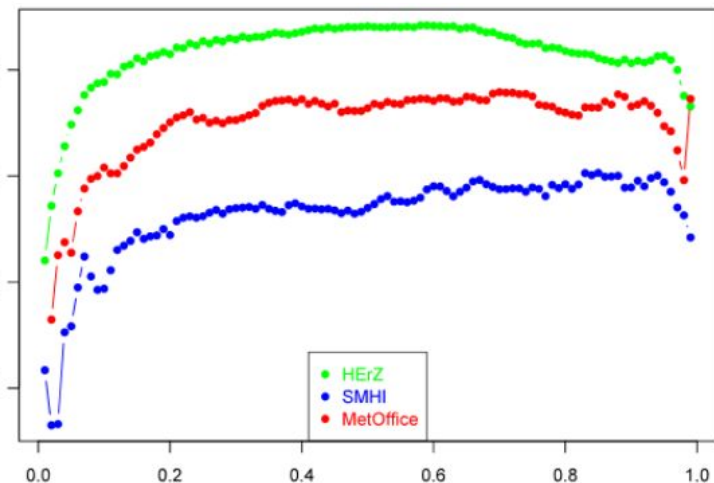
Odds ratio of hourly means at Hannover



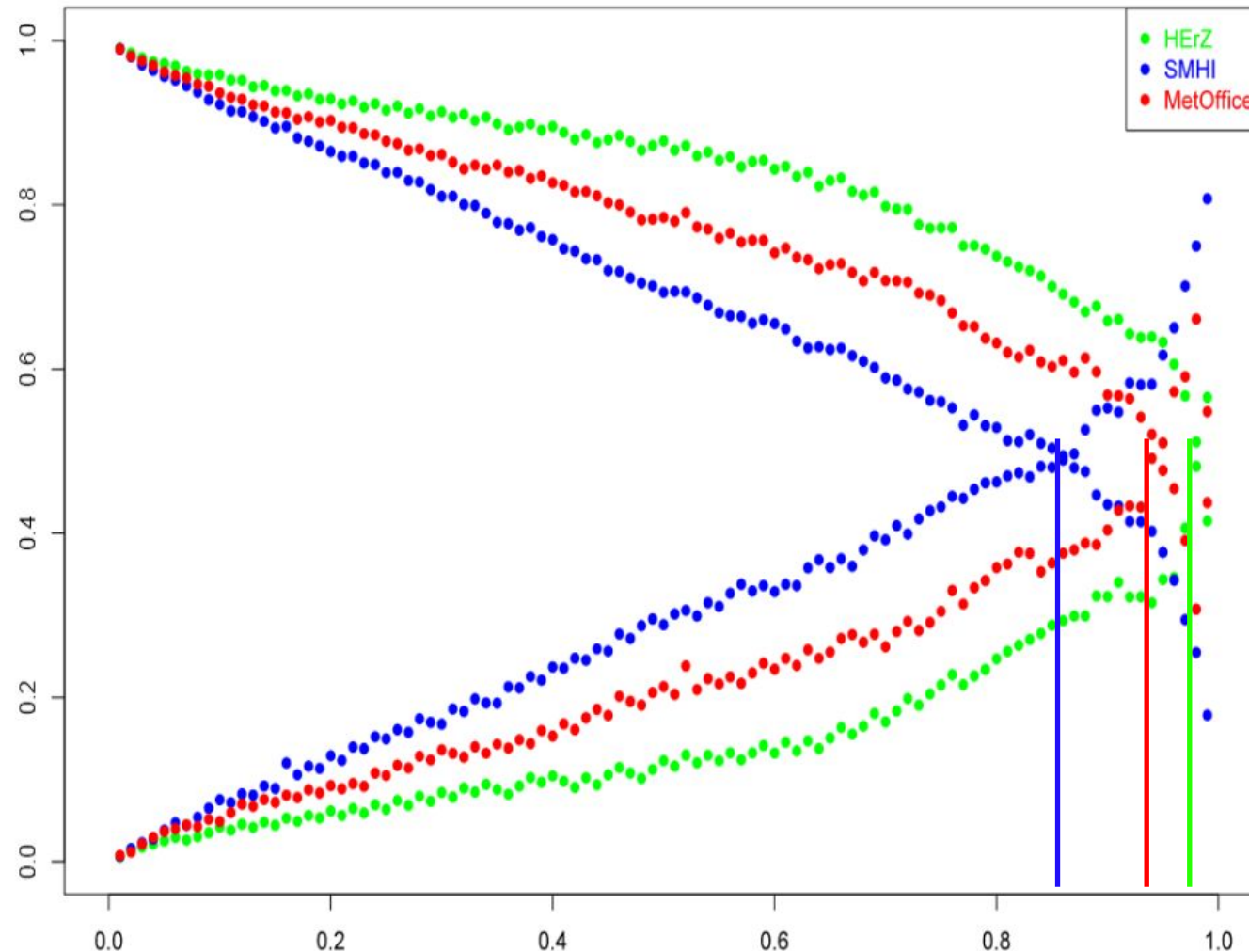
Edi of hourly means at Hannover



Sedi of hourly means at Hannover



Hit rate vs false alarm ratio of hourly means at Hannover



- When HR and FAR cross, the model does not have skill anymore
- COSMO-REA6 has skill up to the highest wind speeds

Summary and Conclusion

- Tools are available
 - in R and published on GitHub
- Evaluation performed for wind speed against mast and station measurements
- Comparison of different regional reanalyses
 - used EURO4M test archive
- Encouraging results for 10m wind speed between reanalyses and observations