Schweizerische Eidgenossenschaft
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Swiss Confederation

Federal Department of Home Affairs FDHA
Federal Office of Meteorology and Climatology MeteoSwiss

Comparative verification in complex topography

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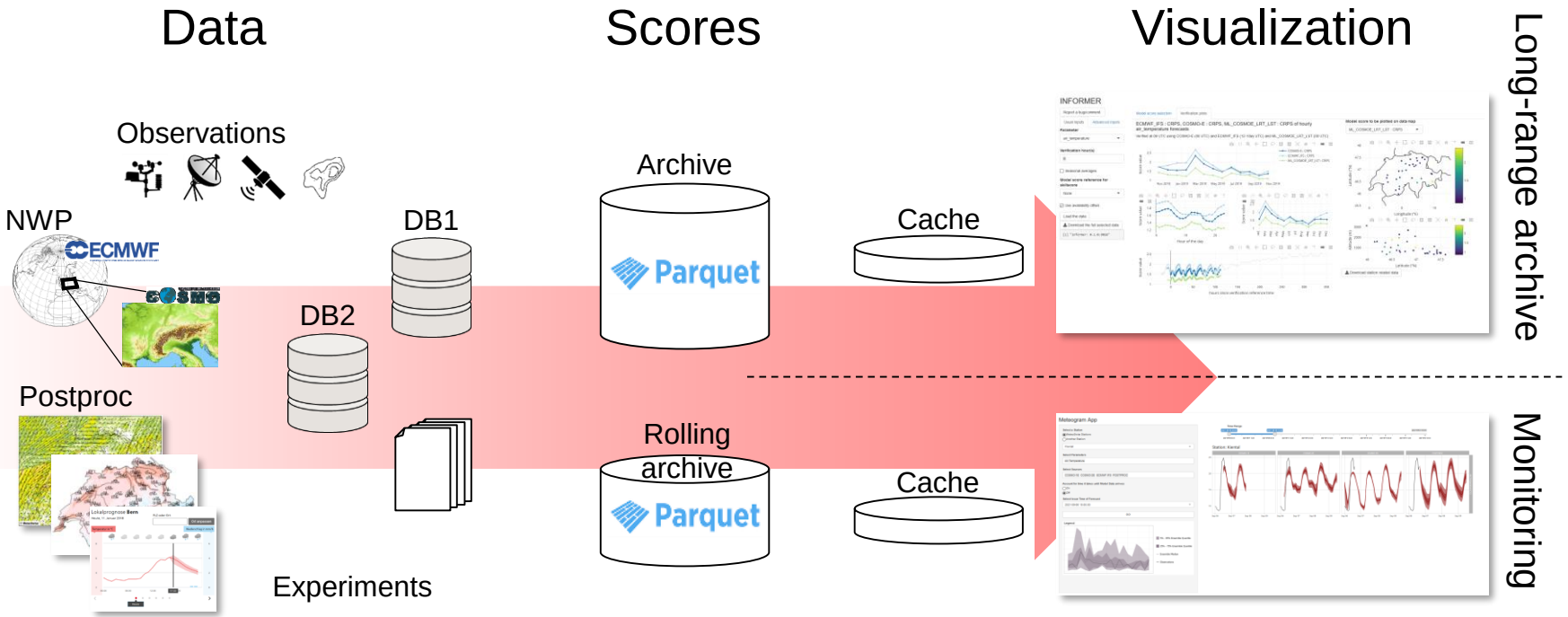
Objective

Provide data and tools to address a range of questions on performance of various automated forecast systems.

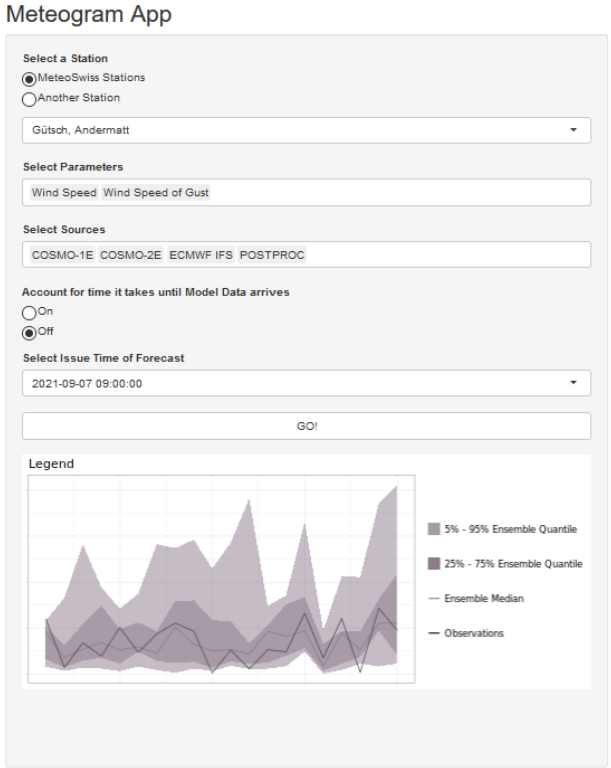
- Monitoring of forecast quality of most recent forecasts
- Case studies (meteograms of past forecasts with corresponding observations)
- In-depth analyses for development and usage of automated forecasts

Architecture



Monitoring of quality of most recent forecasts

Meteograms



MeteoSwiss

Scores for monitoring – time series

Monitoring App

Select Data from

MeteoSwiss Stations

Input for Score Plots and Busts Tables:

Select Parameters

Wind Speed | Wind Speed of Gust

Select Sources

COSMO-1E | COSMO-2E | ECMWF IFS | POSTPROC

GO!

Score Plots - Lead Time | Score Map | Forecast Busts

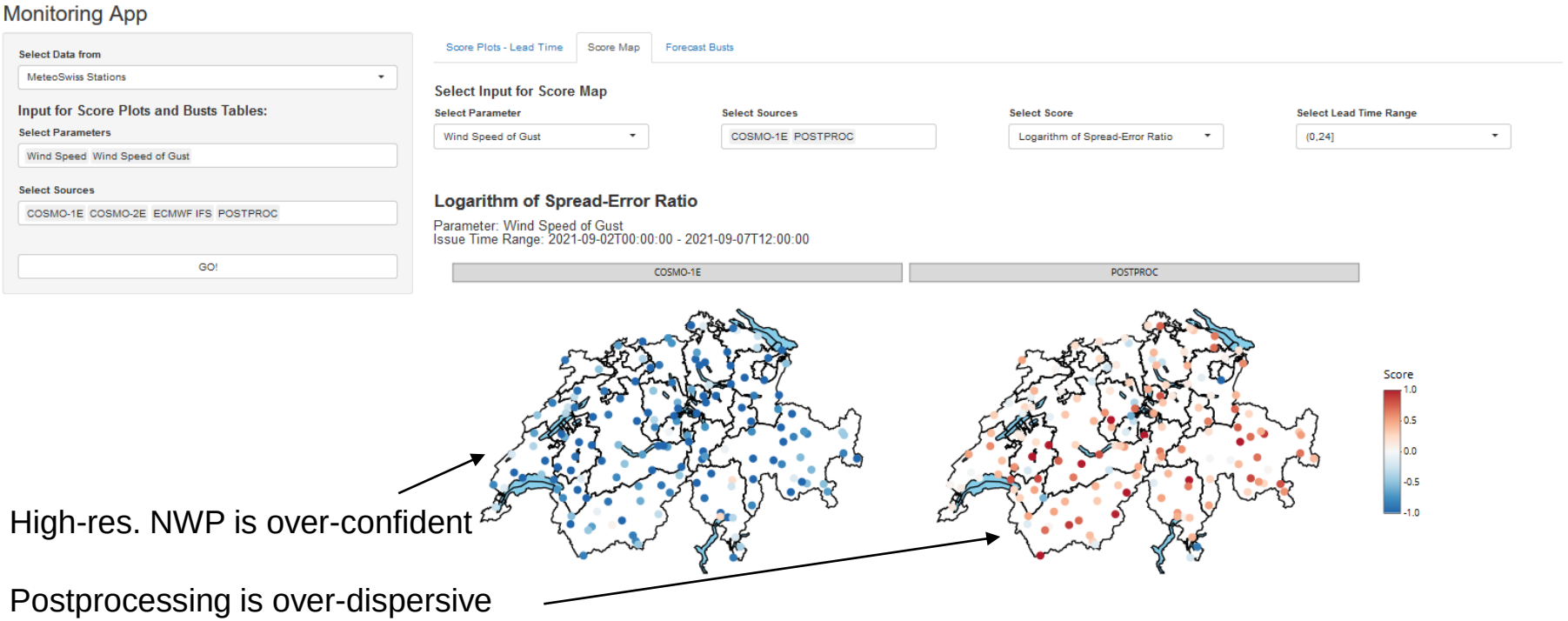
Scores of MeteoSwiss Stations

Scores vs. Lead Time

Diagnose issues with production of forecasts

(here the production of postprocessed forecasts was interrupted)

Scores for monitoring - maps



High-res. NWP is over-confident

Postprocessing is over-dispersive

Scores for monitoring – forecast busts*

Monitoring App

Select Data from

MeteoSwiss Stations

Input for Score Plots and Busts Tables:

Select Parameters

Wind Speed Wind Speed of Gust

Select Sources

COSMO-1E COSMO-2E ECMWF IFS POSTPROC

GO!

Score Plots - Lead Time | Score Map | Forecast Busts

Wind Speed

Issue Time Range: 2021-09-02T00:00:00 - 2021-09-07T12:00:00

Show 10 entries

Station		Parameter	Source	Issue Time	Time
11	Gütsch, Andermatt	Wind Speed	POSTPROC	2021-08-24T09:00:00	2021-09-03T03:00:00
12	Samedan	Wind Speed	POSTPROC	2021-08-28T15:00:00	2021-09-03T19:00:00
17	Sion	Wind Speed	POSTPROC	2021-08-29T03:00:00	2021-09-03T16:00:00
28	Säntis	Wind Speed	POSTPROC	2021-09-01T09:00:00	2021-09-05T22:00:00
35	Passo del Bernina	Wind Speed	POSTPROC	2021-08-29T09:00:00	2021-09-04T14:00:00
36	Col du Grand St-Bernard	Wind Speed	POSTPROC	2021-09-01T09:00:00	2021-09-06T13:00:00
38	Chur	Wind Speed	POSTPROC	2021-08-26T09:00:00	2021-09-02T15:00:00
44	Segl-Maria	Wind Speed	POSTPROC	2021-08-30T03:00:00	2021-09-05T15:00:00
48	Andermatt	Wind Speed	POSTPROC	2021-08-31T09:00:00	2021-09-05T13:00:00
55	Piz Martegnas	Wind Speed	POSTPROC	2021-09-02T09:00:00	2021-09-07T00:00:00

Showing 1 to 10 of 155 entries (filtered from 620 total entries)

Wind Speed of Gust

Issue Time Range: 2021-09-02T00:00:00 - 2021-09-07T12:00:00

Show 10 entries

Station		Parameter	Source	Issue Time	Time
3	Säntis	Wind Speed of Gust	POSTPROC	2021-09-01T09:00:00	2021-09-05T20:00:00
6	Monte Generoso	Wind Speed of Gust	POSTPROC	2021-09-04T09:00:00	2021-09-04T22:00:00
9	Pilatus	Wind Speed of Gust	POSTPROC	2021-09-01T15:00:00	2021-09-05T22:00:00
11	Gütsch, Andermatt	Wind Speed of Gust	POSTPROC	2021-08-27T15:00:00	2021-09-03T03:00:00

Station	
11	Gütsch, Andermatt
12	Samedan
17	Sion
28	Säntis
35	Passo del Bernina
36	Col du Grand St-Bernard
38	Chur
44	Segl-Maria
48	Andermatt
55	Piz Martegnas

Showing 1 to 10 of 155 entries (filtered fro

Various options to filter tables with ‘worst’ forecasts that allow to diagnose

- observation errors
- systematic issues with forecasts

MeteoSwiss

* Forecast with highest CRPS per parameter, source, and station

Long-range archive

Innovations – forecast issue time

- Forecasts are verified at specific (user-defined) times
- At issue time, the newest available forecast (from a given source) is used

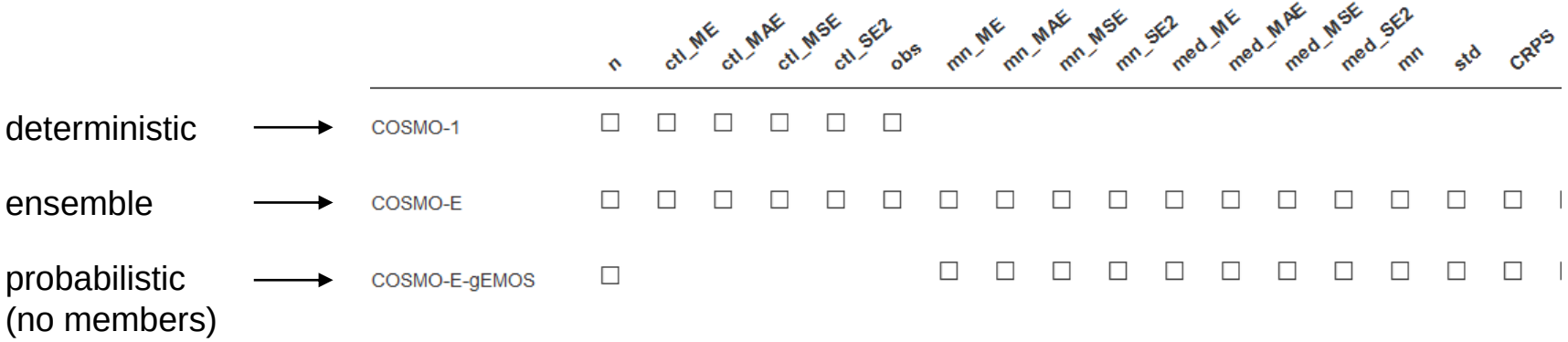
Example: forecast issued at 6 UTC uses

- COSMO-1E from 3 UTC
- COSMO-2E from 6 UTC
- ECMWF IFS from 12 UTC the day before (for the forecast out to +15d)
- Postprocessing (with above combination)

* e.g. availability of full NWP run

Innovations – matrix selection

- User is free to select which scores from which forecast sources to compare*



* and yes, there are a lot of meaningless comparisons that are technically possible

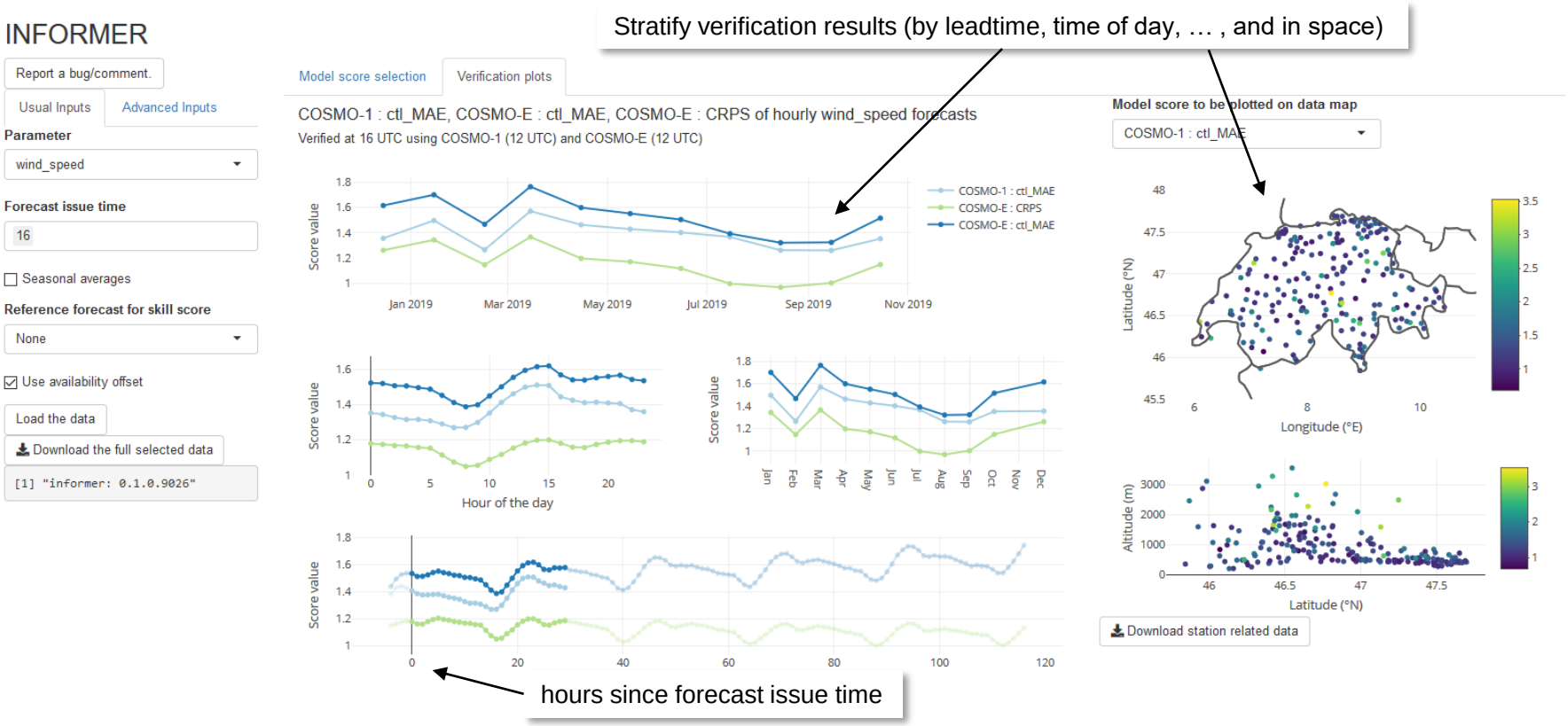
Innovations – matrix selection

Use case: several sources, one score

Use case: benefit of probabilistic forecasts

Use case: related scores, one source

CRPS of hourly wind speed forecasts



CRPSS of hourly wind speed forecasts

INFORMER

Report a bug/comment.

Usual Inputs | Advanced Inputs

Parameter

wind_speed

Forecast issue time

16

☐ Seasonal averages

Reference forecast for skill score

COSMO-E : ctl_MAE

☑ Use availability offset

Load the data

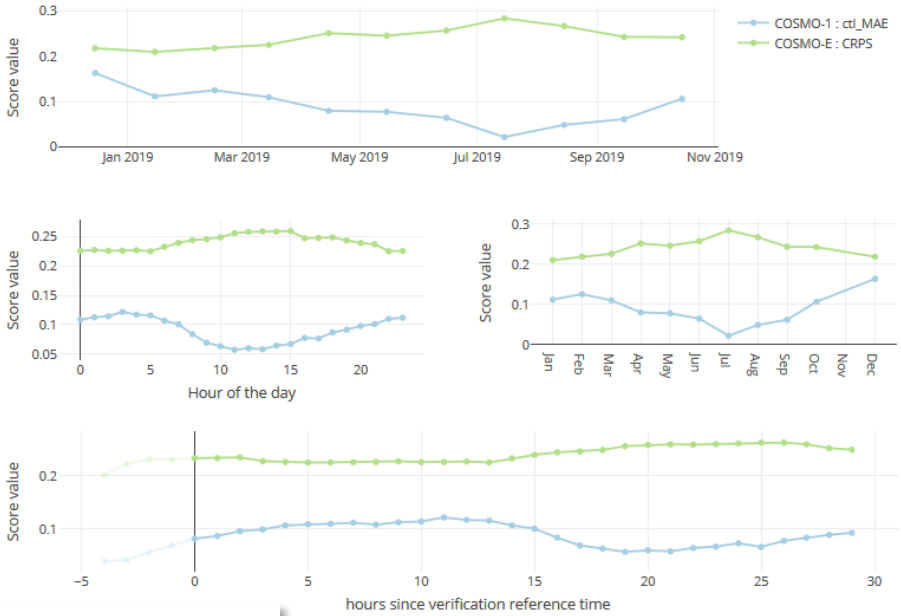
Download the full selected data

```
[1] "informer: 0.1.0.9026"
```

Model score selection | Verification plots

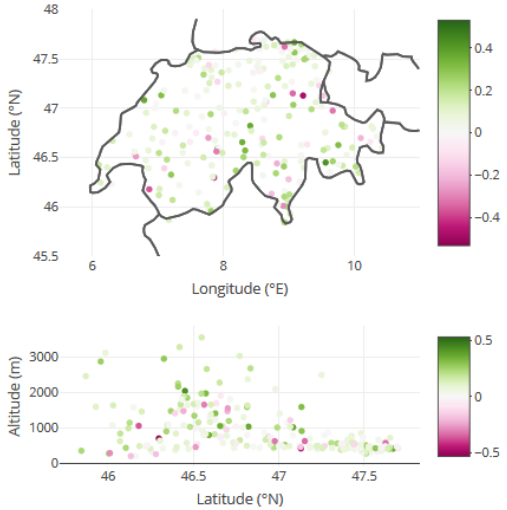
COSMO-1 : ctl_MAE, COSMO-E : CRPS skill of hourly wind_speed forecasts using COSMO-E : ctl_MAE as the reference forecast

Verified at 16 UTC using COSMO-1 (12 UTC) and COSMO-E (12 UTC)



Model score to be plotted on data map

COSMO-1 : ctl_MAE



Download station related data

Convert to skill scores by selecting the reference