

Package: ensemblepp (via r-universe)

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Title Ensemble Postprocessing Data Sets

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Depends R (>= 2.10.0)

Suggests ensembleBMA, crch, gamlss, ensembleMOS, SpecsVerification, scoringRules, glmx, ordinal, pROC, mvtnorm

Description Data sets for the chapter ``Ensemble Postprocessing with R'' of the book Stephane Vannitsem, Daniel S. Wilks, and Jakob W. Messner (2018) ``Statistical Postprocessing of Ensemble Forecasts'', Elsevier, 362pp. These data sets contain temperature and precipitation ensemble weather forecasts and corresponding observations at Innsbruck/Austria. Additionally, a demo with the full code of the book chapter is provided.

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NeedsCompilation no

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Repository <https://jakmes.r-universe.dev>

RemoteUrl <https://github.com/cran/ensemblepp>

RemoteRef HEAD

RemoteSha e265d94a793af331711d6fbedb9a587ebde9d419

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rain

Precipitation Observations and Forecasts for Innsbruck

Description

Accumulated 18-30 hour precipitation ensemble forecasts and corresponding observations at Innsbruck. The dataset includes GEFS reforecasts (Hamill et al. 2013) and observations from SYNOP station Innsbruck Airport (11120) from 2000-01-02 to 2016-01-01.

Usage

```
data("temp")
```

Format

A data frame with 2749 rows. The first column (rain) are 12-hour accumulated precipitation observations. Columns 2-12 (rainfc) are 18-30 hour accumulated precipitation forecasts from the individual ensemble members.

Source

Observations: <http://www.ogimet.com/synops.phtml.en>

Reforecasts: <http://www.esrl.noaa.gov/psd/forecasts/reforecast2/>

References

Hamill TM, Bates GT, Whitaker JS, Murray DR, Fiorino M, Galarneau Jr TJ, Zhu Y, Lapenta W (2013). NOAA's Second-Generation Global Medium-Range Ensemble Reforecast Data Set. *Bulletin of the American Meteorological Society*, 94(10), 1553-1565.

Vannitsem S, Wilks DS, Messner JW (2017). Statistical Postprocessing of Ensemble Forecasts, *Elsevier*, to appear.

Examples

```
## Diagnostic plots similar to Figure 8 in Vannitsem et al. ##

## load and prepare data
data("rain")

rain <- sqrt(rain)

rain$ensmean <- apply(rain[,2:12], 1, mean)
rain$enssd <- apply(rain[,2:12], 1, sd)

## Scatterplot of precipitation by ensemble mean
plot(rain~ensmean, rain, col = gray(0.2, alpha = 0.4),
     main = "Scatterplot")
abline(0, 1, lty = 2)
```

```
## Verification rank histogram
rank <- apply(rain[,1:12], 1, rank)[1,]
hist(rank, breaks = 0:12 + 0.5, main = "Verification Rank Histogram")

## Spread skill relationship
sdcat <- cut(rain$enssd, quantile(rain$enssd, seq(0, 1, 0.2)))
boxplot(abs(rain-ensmean)~sdcat, rain, ylab = "absolute error",
xlab = "ensemble standard deviation", main = "Spread-Skill")

## Histogram
hist(rain$rain, xlab = "square root of precipitation", main = "Histogram")
```

temp

Minimum Temperature Observations and Forecasts for Innsbruck

Description

18-30 hour minimum temperature ensemble forecasts and corresponding observations at Innsbruck. The dataset includes GEFS reforecasts (Hamill et al. 2013) and observations from the SYNOP station Innsbruck Airport (11120) from 2000-01-02 to 2016-01-01.

Usage

```
data("temp")
```

Format

A data frame with 2749 rows. The first column (`temp`) are 12-hour minimum temperature observations. Columns 2-12 (`tempfc`) are 18-30 hour minimum temperature forecasts from the individual ensemble members.

Source

Observations: <http://www.ogimet.com/synops.phtml.en>

Reforecasts: <http://www.esrl.noaa.gov/psd/forecasts/reforecast2/>

References

Hamill TM, Bates GT, Whitaker JS, Murray DR, Fiorino M, Galarneau Jr TJ, Zhu Y, Lapenta W (2013). NOAA's Second-Generation Global Medium-Range Ensemble Reforecast Data Set. *Bulletin of the American Meteorological Society*, 94(10), 1553-1565.

Vannitsem S, Wilks DS, Messner JW (2017). Statistical Postprocessing of Ensemble Forecasts, *Elsevier*, to appear.

Examples

```
## Diagnostic plots similar to Figure 1 and 3 in Vannitsem et al. ##

## load and prepare data
data("temp")

temp$ensmean <- apply(temp[,2:12], 1, mean)
temp$enssd <- apply(temp[,2:12], 1, sd)

## Scatterplot of minimum temperature observation by ensemble mean
plot(temp~ensmean, temp, main = "Scatterplot")
abline(0, 1, lty = 2)

## Verification rank histogram
rank <- apply(temp[,1:12], 1, rank)[1,]
hist(rank, breaks = 0:12 + 0.5, main = "Verification Rank Histogram")

## Spread skill relationship
sdcat <- cut(temp$enssd, breaks = quantile(temp$enssd, seq(0, 1, 0.2)))
boxplot(abs(temp-ensmean)~sdcat, temp, ylab = "absolute error",
xlab = "ensemble standard deviation", main = "Spread-Skill")

## Histogram
hist(temp$temp, xlab = "minimum temperature", main = "Histogram")
```

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