Package ‘nordklimdata1’

July 19, 2015

Type Package
Title Dataset for Climate Analysis with Data from the Nordic Region
Version 1.2
Encoding UTF-8
Description The Nordklim dataset 1.0 is a unique and useful achievement for climate analysis. It includes observations of twelve different climate elements from more than 100 stations in the Nordic region, in time span over 100 years. The project contractors were NORDKLIM/NORDMET on behalf of the National meteorological services in Denmark (DMI), Finland (FMI), Iceland (VI), Norway (DNMI) and Sweden (SMHI).
License GPL (>= 3)
Depends R (>= 2.10)
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nordklimdata1-package .................................................. 2
NordklimData .......................................................... 3
NordklimStationCatalogue .............................................. 5
Description

The NORDKLIM data set contains close to 70,000 years of monthly data from 114 stations. The station network covers all five Nordic countries, including data from the Faeroe Islands, Jan Mayen, Bjornoya and Svalbard. There are seven monthly climatic elements describing temperature, two on precipitation and one on air pressure, cloud cover and snow cover.

Project contractors: NORDKLIM/NORDMET on behalf of the National meteorological services in Denmark (DMI), Finland (FMI), Iceland (VI), Norway (DNMI) and Sweden (SMHI)

Details

<table>
<thead>
<tr>
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<th>nordklimdata1</th>
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Author(s)

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Source

http://www.smhi.se/hfa_coord/nordklim

References

Nordklim dataset 1.0 - description and illustrations Norwegian meteorological institute, 08/01 KLIMA, 2001
**Description**

The NORDKLIM data set - monthly data for 7 climatic elements from 114 stations in 5 Nordic countries.

**Usage**

```r
data(NordklimData)
```

**Format**

A data frame with 71329 observations on the following 16 variables.

- **NordklimNumber**: Nordklim number identifier
- **ClimateElement**: Climate element identifier
- **FirstYear**: First year of the dataset
- **January**: Readings for January
- **February**: Readings for February
- **March**: Readings for March
- **April**: Readings for April
- **May**: Readings for May
- **June**: Readings for June
- **July**: Readings for July
- **August**: Readings for August
- **September**: Readings for September
- **October**: Readings for October
- **November**: Readings for November
- **December**: Readings for December
- **CountryCode**: Country code

**Details**

The NORDKLIM data set has 16 columns, the first three columns are the Nordklim number, climate element number and first year of the dataset, the next 12 columns are twelve months of readings, from January to December and the last column is the country code. Monthly climatic elements in the NORDKLIM data set:

<table>
<thead>
<tr>
<th>Element number</th>
<th>Climatic element</th>
<th>Unit</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Mean temperature</td>
<td>0.1 C</td>
<td>T</td>
</tr>
<tr>
<td>111</td>
<td>Mean maximum temperature</td>
<td>0.1 C</td>
<td>Tx</td>
</tr>
<tr>
<td>Number</td>
<td>Description</td>
<td>Value</td>
<td>Unit</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------------</td>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>112</td>
<td>Highest maximum temperature</td>
<td>0.1</td>
<td>C</td>
</tr>
<tr>
<td>113</td>
<td>Day of maximum temperature</td>
<td></td>
<td>Th</td>
</tr>
<tr>
<td>121</td>
<td>Mean minimum temperature</td>
<td>0.1</td>
<td>C</td>
</tr>
<tr>
<td>122</td>
<td>Lowest minimum temperature</td>
<td>0.1</td>
<td>C</td>
</tr>
<tr>
<td>123</td>
<td>Day of minimum temperature</td>
<td></td>
<td>Td</td>
</tr>
<tr>
<td>401</td>
<td>Mean Pressure</td>
<td>0.1</td>
<td>hPa</td>
</tr>
<tr>
<td>601</td>
<td>Precipitation Sum</td>
<td>0.1</td>
<td>mm</td>
</tr>
<tr>
<td>602</td>
<td>Maximum 1-day precipitation</td>
<td>0.1</td>
<td>mm</td>
</tr>
<tr>
<td>701</td>
<td>Number of days with snow cover (&gt; 50% covered)</td>
<td></td>
<td>days</td>
</tr>
<tr>
<td>801</td>
<td>Mean cloud cover</td>
<td></td>
<td>%</td>
</tr>
</tbody>
</table>

Source

http://www.smhi.se/hfa_coord/nordklim

References

Nordklim dataset 1.0 - description and illustrations Norwegian meteorological institute, 08/01 KLIMA, 2001

Examples

## Not run:
data(NordklimData)
str(NordklimData)

# get all the country codes
countries <- unique(NordklimData$CountryCode)

# earliest and latest year of data collection
minFirstYear <- min(NordklimData$FirstYear)
maxFirstYear <- max(NordklimData$FirstYear)

# get the yearly average of all records
avgNordk <- cbind(NordklimData[,c('CountryCode', 'ClimateElement', 'FirstYear', 'NordklimNumber')],
                 YrAvg=apply(NordklimData[,c('January', 'February', 'March', 'April', 'May', 'June',
                                             'July', 'August', 'September', 'October', 'November', 'December')],1,function(x)
                              {x[x==9999]<-NA;mean(x,na.rm = TRUE)}))
str(avgNordk)

# plot the Danish mean temperatures for its 5 stations (for a quick visual inspection, no need for labels or legends)
DanavgNordk <- avgNordk[which(avgNordk$CountryCode=='DK' &
                           avgNordk$ClimateElement==101),c('FirstYear', 'YrAvg', 'NordklimNumber')]
p <- unique(DanavgNordk$NordklimNumber)
for (Op in p) { plot(DanavgNordk[which(DanavgNordk$NordklimNumber==Op),
                              c('FirstYear', 'YrAvg')],type='l',col=( which(Op==p)),
                     xlim=c(min(DanavgNordk$FirstYear), max(DanavgNordk$FirstYear)),
                     ylim=c(60,120)); if (Op != p[length(p)] par(new=T))

# average each country
avgNordkCountry=aggregate(YrAvg ~ CountryCode+ClimateElement+FirstYear ,
data = avgNordk, function(x) {x[x==9999]<-NA;mean(x,na.rm = TRUE)})
str(avgNordkCountry)
# plot the temperatures (mean of all stations) for each country
for (country in countries) { plot(avgNordkCountry[
which(avgNordkCountry$CountryCode==country & avgNordkCountry$ClimateElement==101),
c('FirstYear','YrAvg')],type='l',col=( which(country==countries)),
xlim=c(minFirstYear, maxFirstYear),ylim=c(0,120),
main='Mean of yearly means of all stations for each country',
  xlab='Years',ylab='Mean temperature');
if (country != countries[length(countries)]) par(new=T))
legend('topleft', legend = countries, col=1:5, pch=1, lty=1, merge=TRUE)
## End(Not run)

The Nordklim Station Catalogue

Description

Information about the Nordklim stations and climate element numbers.

Usage

data(NordklimStationCatalogue)

Format

A data frame with 114 observations on the following 31 variables.

Station  Station id
Catalogue  Catalogue id
Station.name  Station name
Height.ASL  Height at sea level
Country  Country
Nordklim.number  Nordklim id
Lat.Long  Lat./Long.
X101  Mean temperature
X101E  Mean temperature error
X111  Mean maximum temperature
X111E  Mean maximum temperature error
X112  Highest maximum temperature
X112E  Highest maximum temperature error
X113  Day of Th
X113E  Day of Th error
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X121</td>
<td>Mean minimum temperature</td>
</tr>
<tr>
<td>X121E</td>
<td>Mean minimum temperature error</td>
</tr>
<tr>
<td>X122</td>
<td>Lowest minimum temperature</td>
</tr>
<tr>
<td>X122E</td>
<td>Lowest minimum temperature error</td>
</tr>
<tr>
<td>X123</td>
<td>Day of T1</td>
</tr>
<tr>
<td>X123E</td>
<td>Day of T1 error</td>
</tr>
<tr>
<td>X401</td>
<td>Mean Pressure</td>
</tr>
<tr>
<td>X401E</td>
<td>Mean Pressure error</td>
</tr>
<tr>
<td>X601</td>
<td>Precipitation Sum</td>
</tr>
<tr>
<td>X601E</td>
<td>Precipitation Sum error</td>
</tr>
<tr>
<td>X602</td>
<td>Maximum 1-day precipitation</td>
</tr>
<tr>
<td>X602E</td>
<td>Maximum 1-day precipitation error</td>
</tr>
<tr>
<td>X701</td>
<td>Number of days with snow cover (&gt; 50% covered)</td>
</tr>
<tr>
<td>X701E</td>
<td>Number of days with snow cover (&gt; 50% covered) error</td>
</tr>
<tr>
<td>X801</td>
<td>Mean cloud cover</td>
</tr>
<tr>
<td>X801E</td>
<td>Mean cloud cover error</td>
</tr>
</tbody>
</table>

**Details**

The station catalogue has five columns with station information (station name, height at sea level, country code, NORDKLIM number and Lat./Long.) followed by 24 columns, two for each climate element number, the first is the first year of the dataset and the second is the last year.

**Source**

http://www.smhi.se/hfa_coord/nordklim

**References**

Nordklim dataset 1.0 - description and illustrations Norwegian meteorological institute, 08/01 KLIMA, 2001

**Examples**

```r
## Not run:
data(NordklimStationCatalogue)
str(NordklimStationCatalogue)
# 114 stations
length(NordklimStationCatalogue$Nordklim.number)
# in 5 Nordic countries
length(NordklimStationCatalogue$Country)
# how many stations per country?
table(NordklimStationCatalogue$Country,dnn = list("Number of stations per country"))
# how many climate elements recorded per station?
climElSta <- rowSums(sign(NordklimStationCatalogue[,c("X101","X111","X112"),])
```
NordklimStationCatalogue

```r

# how many stations per climate element?
staClimEl <- colSums(sign(NordklimStationCatalogue[, c('X101', 'X111', 'X112', 'X113', 'X121', 'X122', 'X123', 'X401', 'X601', 'X602', 'X701', 'X801')]), na.rm = TRUE)
barplot(staClimEl, xlab='Climate element', ylab='Stations', main='Stations per climate element')

# how many stations have 1, 2, 3, ..., 12 climate elements?
# (same as Fig. 2 from Nordklim dataset 1.0 - description and illustrations)
barplot(table(staClimEl), xlab='Climate element', ylab='Stations', main='Number of stations as a function of number of climatic elements')

## End(Not run)
```
Index

*Topic **datasets**
  NordklimData, 3
  NordklimStationCatalogue, 5

*Topic **package**
  nordklimdata1-package, 2

NordklimData, 3
nordklimdata1(nordklimdata1-package), 2
nordklimdata1-package, 2
NordklimStationCatalogue, 5