

Package ‘ssSCEC’

12 March 2010

Title SCEC Earthquake Catalogue

Version 1.0-16

Date 2010-03-12

Author David Harte (package software), Ray Brownrigg (ported to R and packaged), SCEC (earthquake data)

Maintainer David Harte <david@statsresearch.co.nz>

Description Contains the SCEC Catalogue compiled by the Southern California Earthquake Center (SCEC). This version of the package contains catalogue data from 1932 until 11 Mar 2010. The last year or two are incomplete. Events of type “qb” (quarry blast), “sn” (sonic boom), and “nt” (nuclear blast) are excluded.

Depends ssBase, utils

License GPL (>=2)

URL <http://www.statsresearch.co.nz/software.html>

R topics documented:

changes	1
joinSCEC	3
readSCEC	3
SCEC	4
Index	6

changes *Changes Made to the Package*

Description

This page contains a list of recent changes made to the package.

Details

1. Data available up to 25 November 2003 downloaded from SCEC and added to package. Note that there are no data available for 1977, 1978, 1979 and 1980. (25 Nov 2003)
2. Package names added to links on [SCEC](#) manual page. (Jan 2004)
3. All available data downloaded from SCEC and added to package. (30 Mar 2004)
4. ‘`ssSCEC/src/Makefile`’ modified to be compatible with MS Windows. (30 Mar 2004)
5. ‘`ssSCEC/src/Makefile`’ and ‘`ssSCEC/src/Makefile.win`’ modified to function for both R 1.8.1 and 1.9.0. (7 May 2004)
6. updated ‘`src/Makefile*`’ (handling of empty shared libraries) and ‘`R/SCEC.R`’ (`delay` deprecated) for R-2.1.0. (10 Jun 2005)
7. `joinfiles`: renamed to `joinSCEC`. (13 Dec 2005)
8. All current data downloaded from SCEDC. (13 Dec 2005)
9. Package vignettes added. (13 Dec 2005)
10. All current data downloaded from SCEDC. (15 Feb 2006)
11. Modified file ‘`R/SCEC.R`’: `warn.conflicts=FALSE` added to line starting with `delayedAssign`. (15 Feb 2006)
12. All current data downloaded from SCEDC. (18 Apr 2006)
13. ‘`ssSCEC/src/Makefile.win`’ modified to be compatible with R version 2.3.0. (9 June 2006)
14. `readSCEC`: argument `filename` given default value `"scec.csv"`. 28 July 2006
15. `joinSCEC`: originally only events of type `"le"`, `"re"`, and `"ts"` were included in the catalogue. Now all events are included except those of type `"qb"` (quarry blast), `"sn"` (sonic boom), and `"nt"` (nuclear blast). 28 July 2006
16. All current data downloaded from SCEDC. (28 July 2006)
17. “`utils`” added to “`Depends`” line in file ‘`ssSCEC/DESCRIPTION`’; needed in R version 2.4.0. (12 Oct 2006)
18. All current data downloaded from SCEDC. (12 Oct 2006)
19. All current data downloaded from SCEDC. (7 May 2007)
20. All occurrences of `subset.rect` in the Examples have been changed to `subsetrect`. See Changes in `ssBase`. (12 Jan 2008)
21. All current data downloaded from SCEDC. (12 Jan 2008)
22. All current data downloaded from SCEDC. (25 Sep 2008)
23. `joinSCEC`: the downloaded files have a header starting `"maka"`. Inserted: `x <- x[(substr(x, 1, 1) != "#") & (substr(x, 1, 4) != "maka")]`. (25 Sep 2008)
24. All current data downloaded from SCEDC. (12 Feb 2009)
25. Removal of LaTeX markups from `DESCRIPTION` file. (31 May 2009)
26. All current data downloaded from SCEDC. (24 Aug 2009)
27. All current data downloaded from SCEDC. (12 Mar 2010)

`joinSCEC`*Read Downloaded Data From SCEC*

Description

Reads the data files downloaded from SCEC. This function is only required if you intend to update the catalogue directly from SCEC.

Usage

```
joinSCEC(filenamees = system("ls *.catalog", intern=TRUE),  
          prtfile = "temp.csv")
```

Arguments

`filenamees` vector containing the names of the downloaded annual files.
`prtfile` name of output CSV file.

Details

The function reads the multiple number of downloaded annual data files, extracts the required fields, and writes one CSV file for inclusion into the package source code. Events of type "qb" (quarry blast), "sb" (sonic boom), and "nb" (nuclear blast) are excluded.

Value

One CSV file is written for inclusion into the package source code.

Author(s)

David Harte, 2003

See Also

[readSCEC](#)

`readSCEC`*Read Catalogue CSV File*

Description

Reads the basic CSV file output by [joinSCEC](#) and creates a catalogue object called [SCEC](#). This function is used when the package is installed into the R system files.

Usage

```
readSCEC(filename)
```

Arguments

`filename` name of CSV file.

Value

A catalogue object called [SCEC](#).

Author(s)

David Harte, 2003

See Also

[joinSCEC](#)

SCEC

Catalogue of SCEC Earthquake Events

Description

The SCEC Catalogue contains the catalogue compiled by the Southern California Earthquake Center (SCEC). See Details below.

Usage

SCEC

Format

The catalogue is stored as a list object and has classes "catalogue" and "data.frame". It contains the following variables.

time vector giving the number of days (and fractions thereof) from 00:00:00 hrs on 1 January 1970. It has class "datetimes" (see the function [datetimes](#)). The attribute "dp.second" records the number of decimal places to which seconds were recorded in the ASCII source file of events.

missing.time character vector the same length as `time` indicating the degree of missing values in `time`. The original ASCII catalogue listing contains separate variables for year, month, day, hour, minute and second. For some events one or more of these values are missing. In these cases, `missing.time` contains the first of "Y", "M", "D", "h", "m" or "s", respectively. Otherwise it will be ". In cases where there were missing values, the variable `time` will be calculated by using a one in the case of a missing month or day, and a zero for a missing hour, minute or second.

latitude vector giving the latitude of each event to 3 decimal places. These are positive in the northern hemisphere and negative in the southern hemisphere.

longitude vector giving the longitude of each event to 3 decimal places. They are the number of degrees east of Greenwich (i.e. between 0 and 360 degrees).

depth vector giving the depth (km) of each event.

magnitude vector giving the magnitude of each event.

Details

The catalogue compiled by the Southern California Earthquake Center contains various event types: local ("le"), regional ("re"), teleseism ("ts"), quarry blast ("qb"), sonic boom ("sn"), nuclear blast ("nt"), and unknown event ("uk"). This SLib version of the catalogue excludes events of type "qb" (quarry blast), "sn" (sonic boom), and "nt" (nuclear blast).

Updating the Catalogue

Data contained in the installed R package can be updated directly from the Southern California Earthquake Center (<http://www.data.scec.org>) as follows. The functions cited below are contained in this package.

1. Download the required data from the SCEC web site (http://www.data.scec.org/ftp/catalogs/SCEC_DC/), writing the files into a convenient temporary directory. Use the SCEDC Catalogue Format (there is also an alternative format).
2. Alternatively, open an XTERM window within the required directory, then


```
ftp scec.gps.caltech.edu
Login as anonymous with your email address as the password, then
cd pub/catalogs/SCEC_DC
binary
get SCEDC_catalogs.tar.gz
```
3. Start R in this directory, and attach this package, i.e. `library(ssSCEC)`.
4. Use the function `joinSCEC` to read the downloaded files, and write another CSV file containing only the minimal fields to make a legitimate SSLib catalogue, e.g.


```
joinSCEC()
```

 This will write the dataset containing only the required fields into a file called 'temp.csv'.
5. Unpack the tar archive containing the source code for this package, e.g.


```
tar -zxvf ssSCEC_*.tar.gz
```

 where "*" denotes the appropriate version numbers. Copy the CSV file 'temp.csv' created above into the 'src' directory. If the entire catalogue was downloaded, then 'temp.csv' replaces 'scec.csv'. If only some data have been downloaded, then include the new data from 'temp.csv' into 'scec.csv', and then remove 'temp.csv'.
6. Reinstall the ssSCEC package (see Harte, 2003).

Source

The SCEC Catalogue is compiled by the Southern California Earthquake Center (<http://www.scec.org>).

The data have been downloaded from http://www.data.scec.org/ftp/catalogs/SCEC_DC/.

See Also

[subsetcircle](#), [subsetpolygon](#), [subsetrect](#), [subsetsphere](#), [summary.catalogue](#)

Examples

```
# attach the package
library(ssSCEC)

# catalogue summary including events with missing date components
summary(SCEC)

# table of annual counts
table(years1(SCEC$time))

# table of monthly counts
table(years1(SCEC$time), months1(SCEC$time))
```

Index

*Topic **datasets**

SCEC, [4](#)

*Topic **documentation**

changes, [1](#)

*Topic **manip**

joinSCEC, [3](#)

readSCEC, [3](#)

changes, [1](#)

datetimes, [4](#)

joinSCEC, [2](#), [3](#), [3-5](#)

readSCEC, [2](#), [3](#), [3](#)

SCEC, [2](#), [3](#), [4](#), [4](#)

subsetcircle, [5](#)

subsetpolygon, [5](#)

subsetrect, [2](#), [5](#)

subsetsphere, [5](#)

summary.catalogue, [5](#)