Tutorial for spictapp: The Shiny app for the Stochastic Production model in Continuous Time (SPiCT)

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This toturial guides you through a SPiCT assessment using the click-based Shiny app "spictapp".

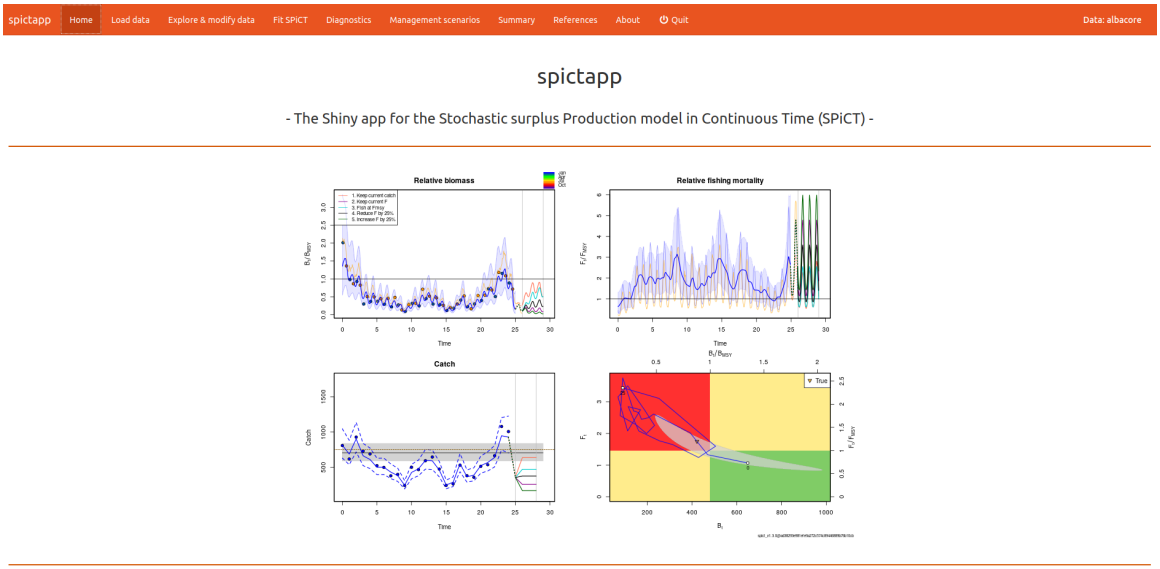

Figure 1: Home screen of spictapp.

Download

The spictapp is hosted on GitHub and can be downloaded as a zip archive. Unpack the archive to the destination of your choice.

Start the App

Before the start of the app, **spictapp** checks if all required R packages are required and installs any missing packages. To assure windows compatibility without requiring Rtools (large software package), the binary version of the spict R package is included in the zip archive and installed upon start of the app.

The app can be started by double-clicking the respective exectuable in the spictapp directory, i.e. 'spictapp' for linux and mac and 'spictapp_win' for windows operating systems (the file endings are '.sh' and '.bat', respectively).

Alternatively the script `runapp.R` in the spictapp directory can be executed from within R or with `Rscript runapp.R` from the terminal or command line.

Home

On start, the app shows the home screen of spictapp (Fig. 1), which shows four important plots of a simulated spict assessment (find more information to the plots below). At the top of the screen is the orange navigation bar of the app, which guides the user through the indivdual steps of a spict assessment (Fig. 2). The active tab is highlighted in darker tone (tab called 'Load data' in Fig. 2). The tab 'Quit' closes the app and browser window (in any browser other than firefox >= 46.0.1). This tutorial is structured following the steps of a common spict assessment and thus the tabs in the navigation bar.

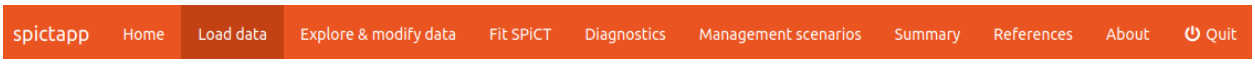

Figure 2: Tabs with assessment steps in the navigation bar.

At the far right of the navigation bar, the name of the uploaded data set is displayed (Fig. 3). In this example, the albcaore example data set was selected. The data name is shown independent on the active tab and helps avoid confusion when dealing with different data sets.

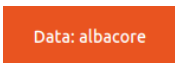

Figure 3: Data label in the navigation bar.

Load data

Any assessment requires input data. SPiCT requires information about the catches from the commercial fleet with corresponding time intervals and an abundance index or effort data, alternatively. While the catches and effort refer to an interval and the times of the start of these intervals have to be provided, the abdundance indices (multiple indices possible) correspond to a specific point in time, which can be specified as 2015.37 for mid May for example. Find more information about the data requirements of **SPiCT** in the two vignettes SPiCT Guidelines and SPiCT Handbook.

The button 'Browse...' in the 'Load Data' tab allows you to browse through your directories and upload any data set to **spictapp** (Fig. 4). The only requirement for the data file is that it has either the '.txt' or '.csv' file extension. Both file types can be created from Excel or R. The specific properties of the file can be changed within the app with the options given for seperators, quotes, and header. After uploading, the apps displays the data in its raw format and will try to automatically match the column names with the names

expected by **SPiCT**. If successful in matching expected column names, the data set will also be displayed under 'Data with assigned columns'.

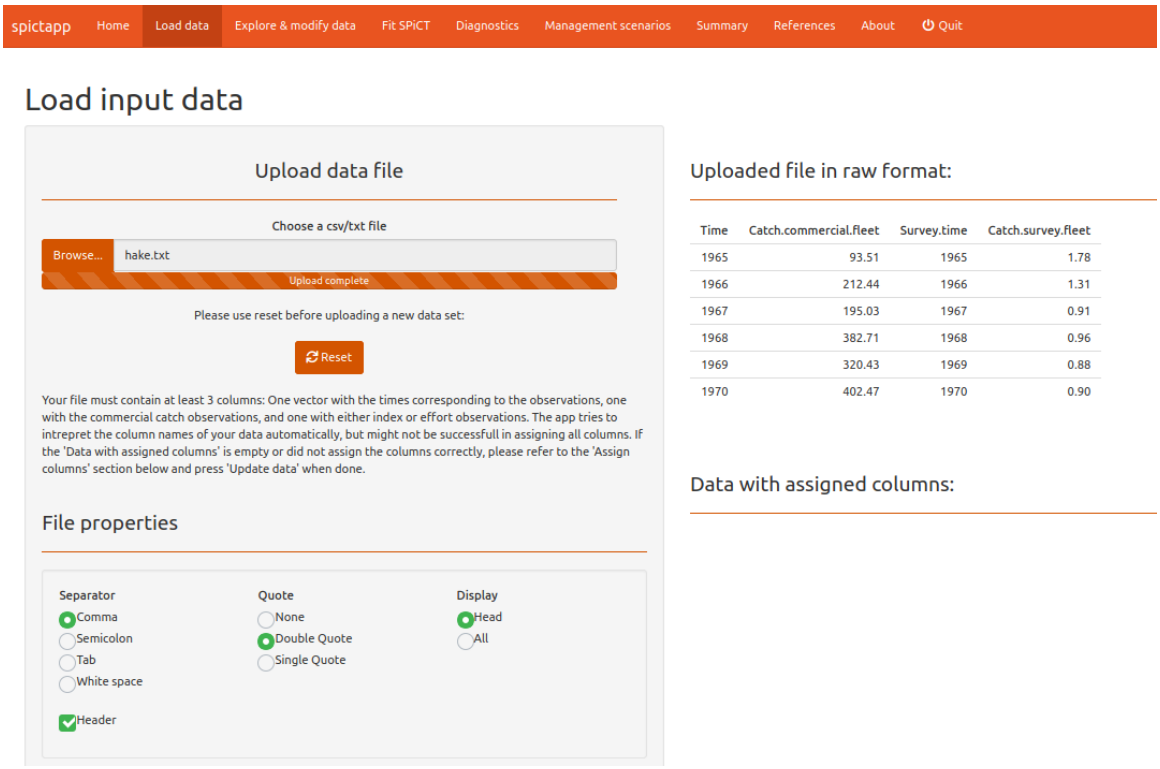

Figure 4: Upload data to spictapp.

If not all columns expected by **SPiCT** could be matched, the user can select the columns corresponding to the commercial catch observations ('obsC'), with corresponding times ('timeC') and index ('obsI') or effort ('obsE') observations with corresponding times ('timeI') or ('timeE'), respectively, where the names in brackets reflect the correspinding standard **SPiCT** variable names (Fig. 5). Note, that the app allows to input several columns for the index observations and times, but only one column for the catch and effort observations and times.

With pressing 'Update data', the columns are assigned to the corresponding **SPiCT** variables and the resulting data is displyed under 'Data with assigned columns' (Fig. 6).

SPiCT also allows you to specify the uncertainty around input data as a factor to multiply estimated observation noise with. For example, the uncertainty of the catch observations might have changed over time due to an improved data monitoring system. The three input fields below the 'Update data' button, let you assign corresponding columns in your data to these variables (called 'stdevfacC', 'stdevfacI', and 'stdevfacE' in **SPiCT**, respectively).

One of the three originalexample data sets included in the spict pacakge can be choosen by pressing 'Use example data set?' at the bottom of the page (Fig. 5). Note that many more example data sets are included in the data directory of the spictapp zip archive.

Explore & modify data

Blabla sPiCT timeline and data plot

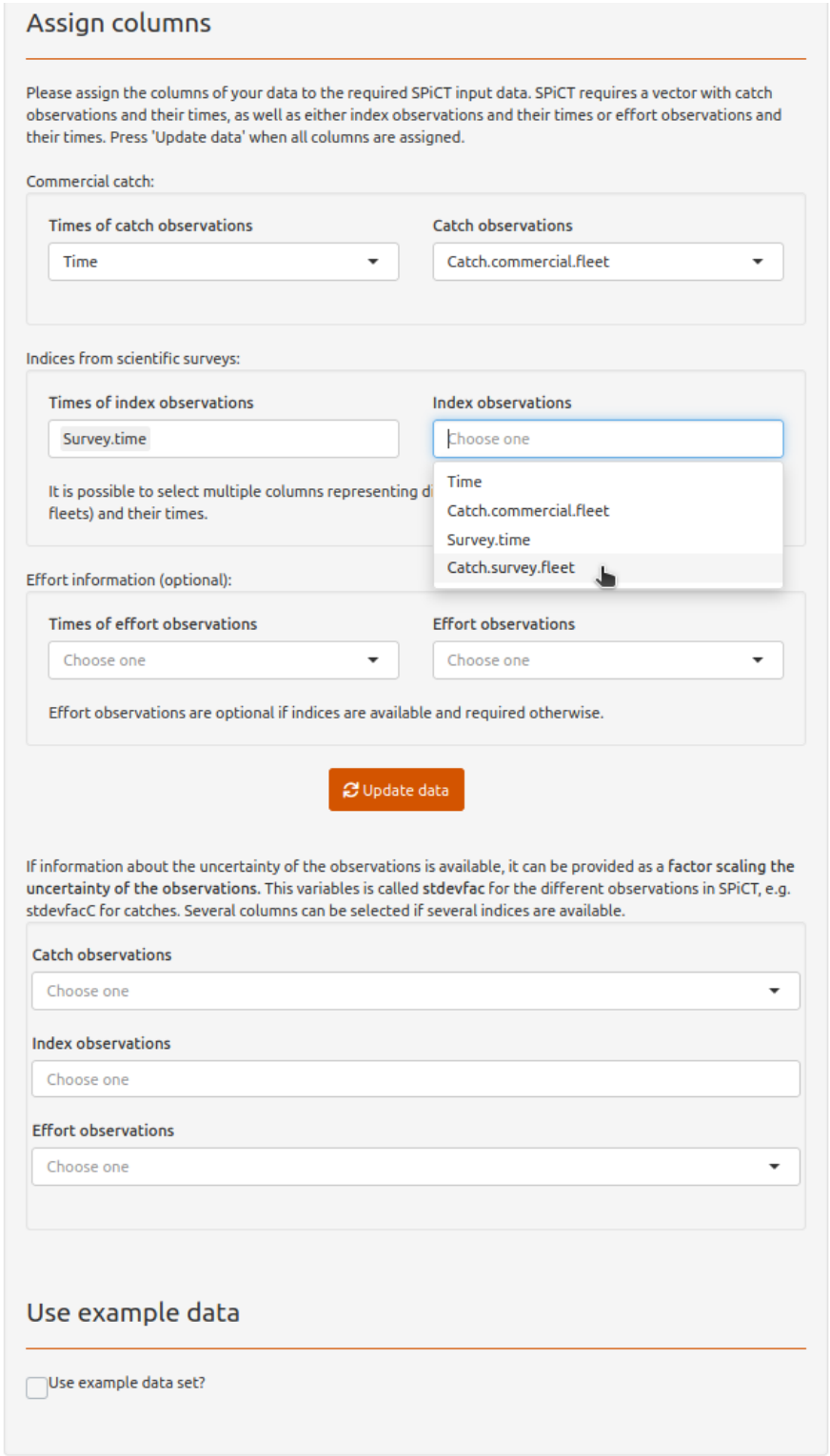

Figure 5: Assign columns.

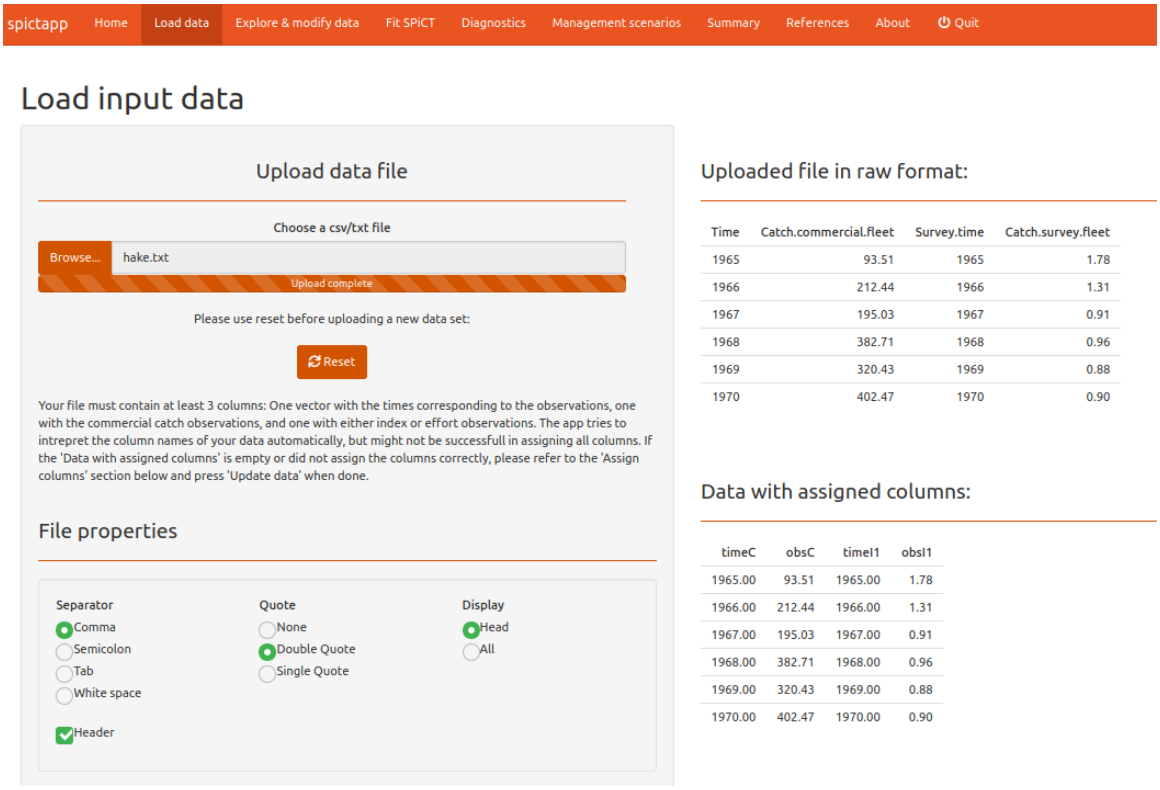

Figure 6: Assign columns.

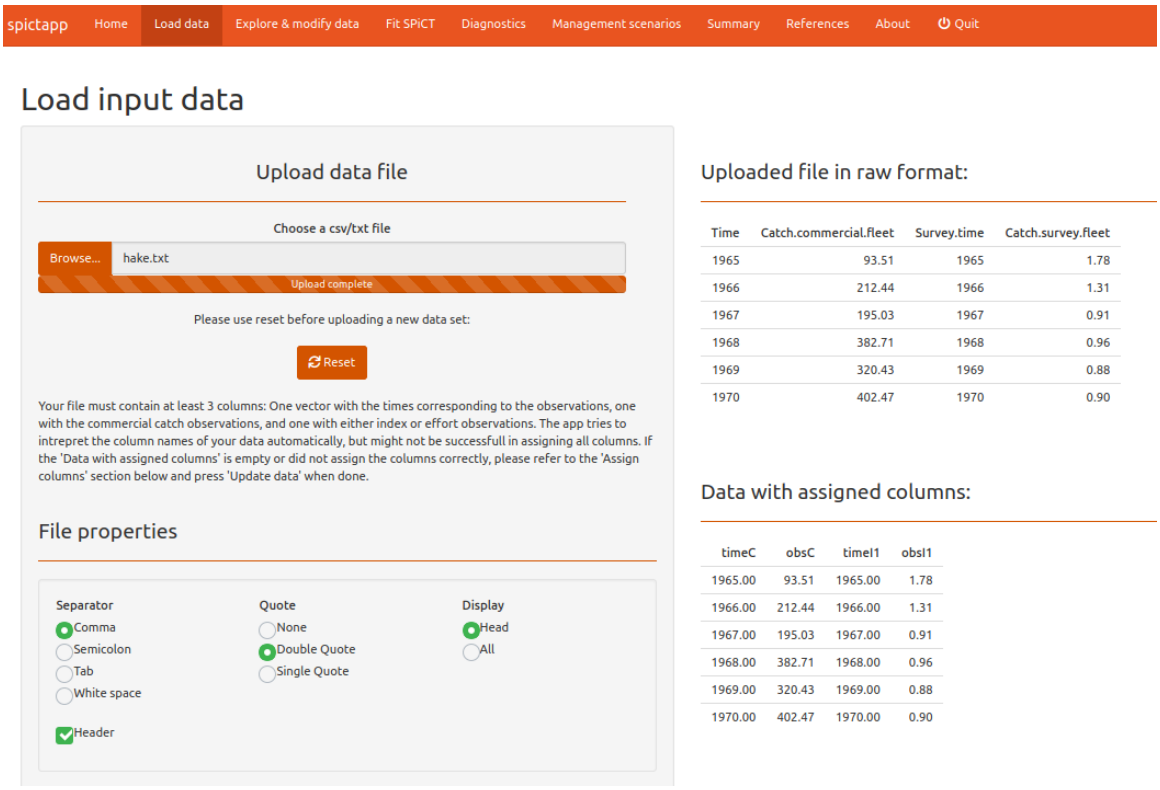

Figure 7: Assign columns.

changing dteuler, timing of index catch unit

change time range of all data, robust estimation for catches (several for indices possible / required if several indices)

seaosnal spict if seaosnal catches, number of seasons, by default dependent on input data 4 for quarterly catches and 1 for annual catches, season type and splieorder for season type 1 and 3

mangement interval, management evaluation time, ffac or fcon

default priors

additional priors

display options (advance data plot)

SPiCT assessment

fit spict by click on button,

convergence message

set seed value for reproducible results and assessments

optimiser (expert see handbook)

Diagnostics

run retrospecitve analysis

run sesnitivity analysis to intital values

Management with SPiCT

run different management scenarios, intermediate period, catch during intermediate period, fratile of catch dist

Summary

all results summarised and options to download (assessment report), all tables as zip archive, all figures as zip archive or all data as RData (includes a R list object called 'rv') which includes all used data and estimations allowing to reproduce the whole functionality of the app in R. The description of all individual elements of that list would exceed the scope of this vignette. see the names of all elements with `names(rv)`.

Other

References

references relevant for this app.

About

more information about the app, version, developers. question/issues links to user forum on RG

References