

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

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This totutrial guides you through a SPiCT assessment using the click-based Shiny app “spictapp”.

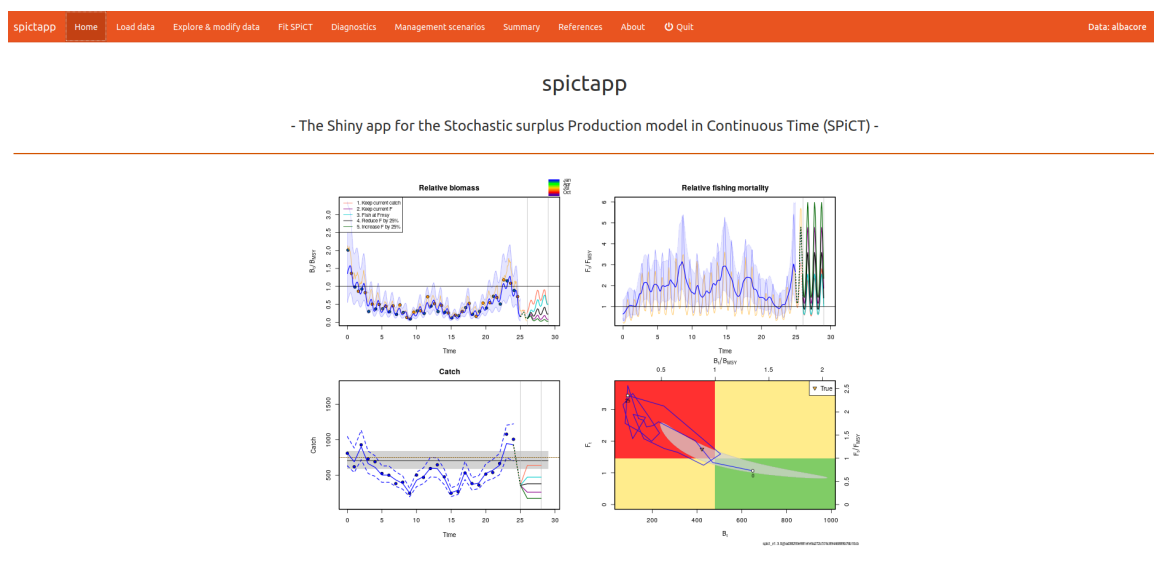


Figure 1: Home screen of spictapp.

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 executable 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 individual 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 $\geq 49.0.0$). This tutorial is structured following the steps of a common `spict` assessment and thus the tabs in the navigation bar.

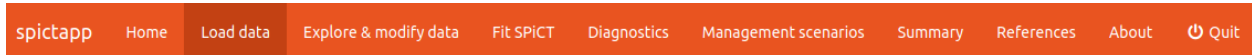


Figure 2: Tabs with assessment steps in the navigation bar.

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.

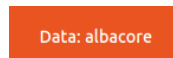


Figure 3: Data label in the navigation bar.

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 abundance 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 separators, quotes, and header. After uploading, the app 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’.

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 corresponding 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 displayed 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

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Upload data file

Choose a csv/txt file

Browse...

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Upload complete

Please use reset before uploading a new data set:

Reset

Your file must contain at least 3 columns: One vector with the times corresponding to the observations, one with the commercial catch observations, and one with either index or effort observations. The app tries to interpret the column names of your data automatically, but might not be successful in assigning all columns. If the 'Data with assigned columns' is empty or did not assign the columns correctly, please refer to the 'Assign columns' section below and press 'Update data' when done.

File properties

Separator

☒ Comma
☐ Semicolon
☐ Tab
☐ White space

Quote

☐ None
☒ Double Quote
☐ Single Quote

Display

☒ Head
☐ All

☒ Header

Uploaded file in raw format:

Time	Catch.commercial.fleet	Survey.time	Catch.survey.fleet
1965	93.51	1965	1.78
1966	212.44	1966	1.31
1967	195.03	1967	0.91
1968	382.71	1968	0.96
1969	320.43	1969	0.88
1970	402.47	1970	0.90

Data with assigned columns:

Figure 4: Upload data to spictapp.

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 original example data sets included in the spict package can be chosen 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.

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Assign columns

Please assign the columns of your data to the required SPiCT input data. SPiCT requires a vector with catch observations and their times, as well as either index observations and their times or effort observations and their times. Press 'Update data' when all columns are assigned.

Commercial catch:

Times of catch observations

Time

Catch observations

Catch.commercial.fleet

Indices from scientific surveys:

Times of index observations

Survey.time

It is possible to select multiple columns representing different fleets and their times.

Index observations

Choose one

Time
Catch.commercial.fleet
Survey.time
Catch.survey.fleet

Effort information (optional):

Times of effort observations

Choose one

Effort observations

Choose one

Effort observations are optional if indices are available and required otherwise.

Update data

If information about the uncertainty of the observations is available, it can be provided as a factor scaling the uncertainty of the observations. This variable is called `stdevfac` for the different observations in SPiCT, e.g. `stdevfacC` for catches. Several columns can be selected if several indices are available.

Catch observations

Choose one

Index observations

Choose one

Effort observations

Choose one

Use example data

☐ Use example data set?

Figure 5: Assign columns.

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1969	320.43	1969	0.88
1970	402.47	1970	0.90

Data with assigned columns:

timeC	obsC	timeI	obsI
1965.00	93.51	1965.00	1.78
1966.00	212.44	1966.00	1.31
1967.00	195.03	1967.00	0.91
1968.00	382.71	1968.00	0.96
1969.00	320.43	1969.00	0.88
1970.00	402.47	1970.00	0.90

Figure 6: Assign columns.

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1967.00	195.03	1967.00	0.91
1968.00	382.71	1968.00	0.96
1969.00	320.43	1969.00	0.88
1970.00	402.47	1970.00	0.90

Figure 7: Assign columns.

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