



HydrOffice StormFix Manual

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2021, CCOM/JHC, UNH

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IN BRIEF

HydrOffice is a research development environment for ocean mapping. It provides a collection of hydro-packages, each of them dealing with a specific issue of the field. The main goal is to speed up both algorithms testing and research-to-operation (R2O).

HydrOffice Stormfix is a collections of tools to reduce artifacts in acoustic backscatter data (see [List of references](#)).

USER MANUAL

The common workflow is to first detect the corrupted pings (*Detect artifacts* tab), then reduce them (*Reduce artifacts* tab).

2.1 Detect artifacts

You can access the tools in this tab after having loaded some data (*Inputs/Outputs* tab).

2.1.1 Inputs/Outputs

This tab is used to define the input binary data, by selecting files in Kongsberg formats (.all and .wcd), the control files, and to set the location for outputs (e.g., fix files).

To access these functionalities, you need to select the **Detect artifacts** tab on top of the application, then the **Inputs/Outputs** sub-tab at the lower-left corner.

Note: Currently supported Kongsberg sonars: **EM 122, EM 302, EM 710, ME70 BO, EM 2040, and EM 2040C.**

Data Inputs

In **Data inputs**:

- Drag-and-drop input binary files (.all or .wcd) in the *Input files* field. (The “+” browse button may also be used.)
- **Optionally** drag-and-drop control files (.ctrl) in the *Control files* field. (The “+” browse button may also be used.)

Note: For more information on how to setup a control file, *Control File Viewer/Editor*.

- The *References* field is currently unused.
- The directory and filename of loaded data will populate the respective field of **Data inputs**.
- With the addition of a input binary file, the *Track WCD MAD* sub-tab on the bottom of the interface will become available (Fig. 2.1).
- When both a binary file and a control file are loaded, the *Just check* sub-tab on the bottom of the interface will become available (Fig. 2.1).
- The **Clear data** button may be used to remove all data inputs.

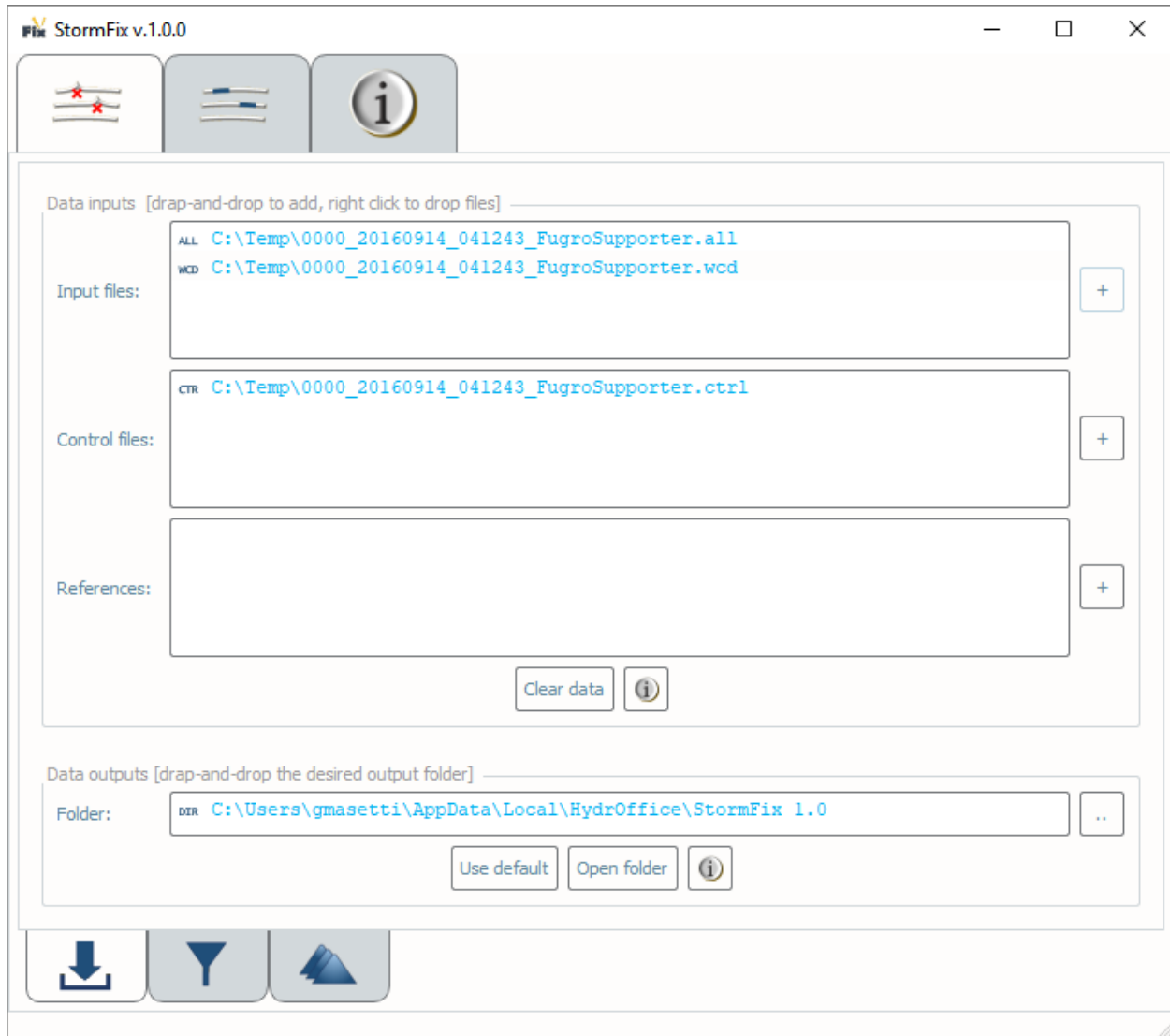


Fig. 2.1: The Inputs/Output sub-tab in the Detect Artifact tab.

- The **Info** button provides a link to the present section of the manual.
- Additional functionalities are available by right-clicking on the loaded binary files (Fig. 2.2) and control files (Fig. 2.3). See *Context Menu*.

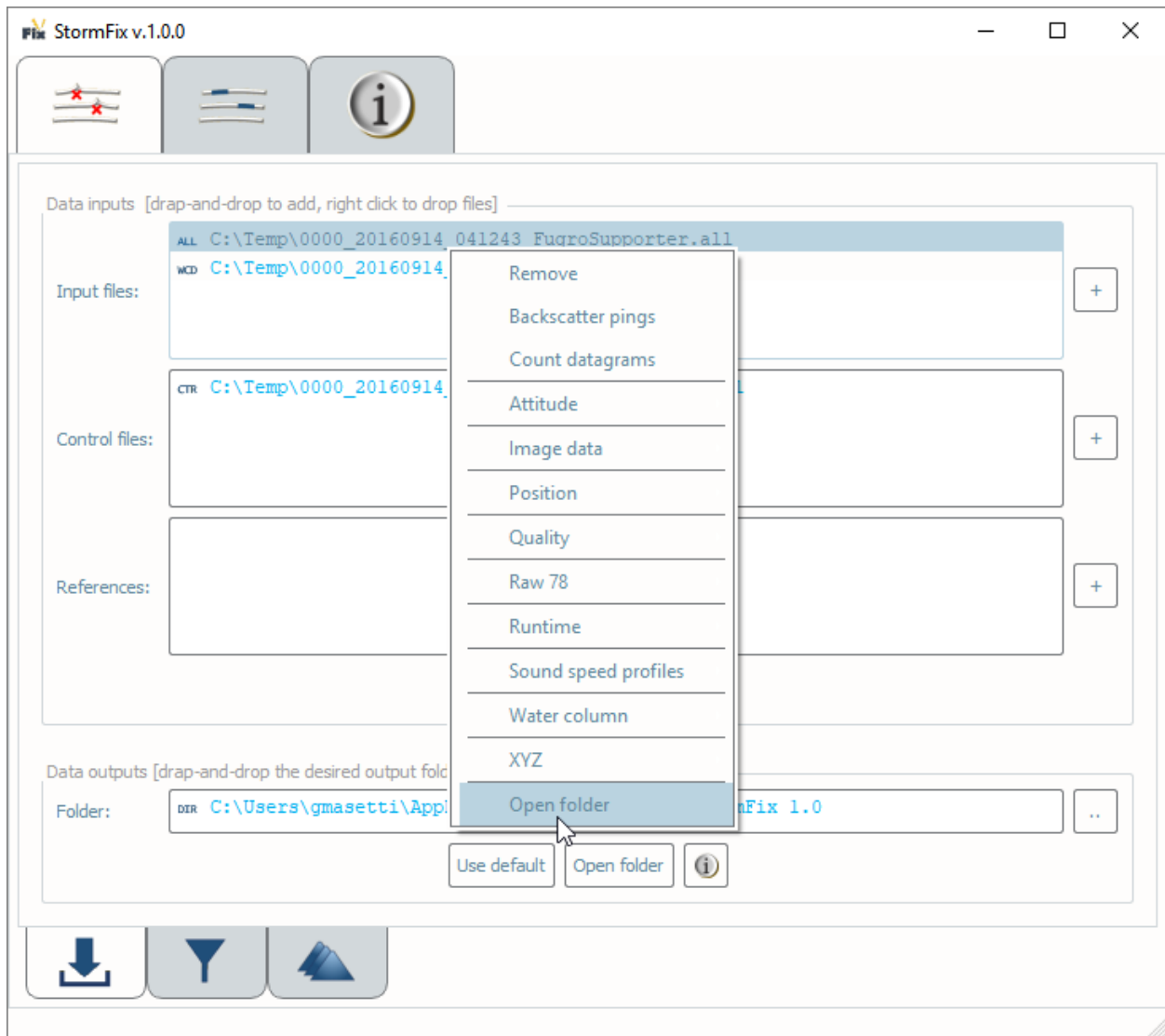


Fig. 2.2: Context menu accessible by right-clicking on a binary input file.

Context Menu

With binary files, the context menu provides access to actions to:

- Remove binary files.
- Create a new, empty Control File.
- Make exploratory plots of the raw data content (Fig. 2.9).

When selected control files, the context menu provides access to the *Control File Viewer/Editor*.

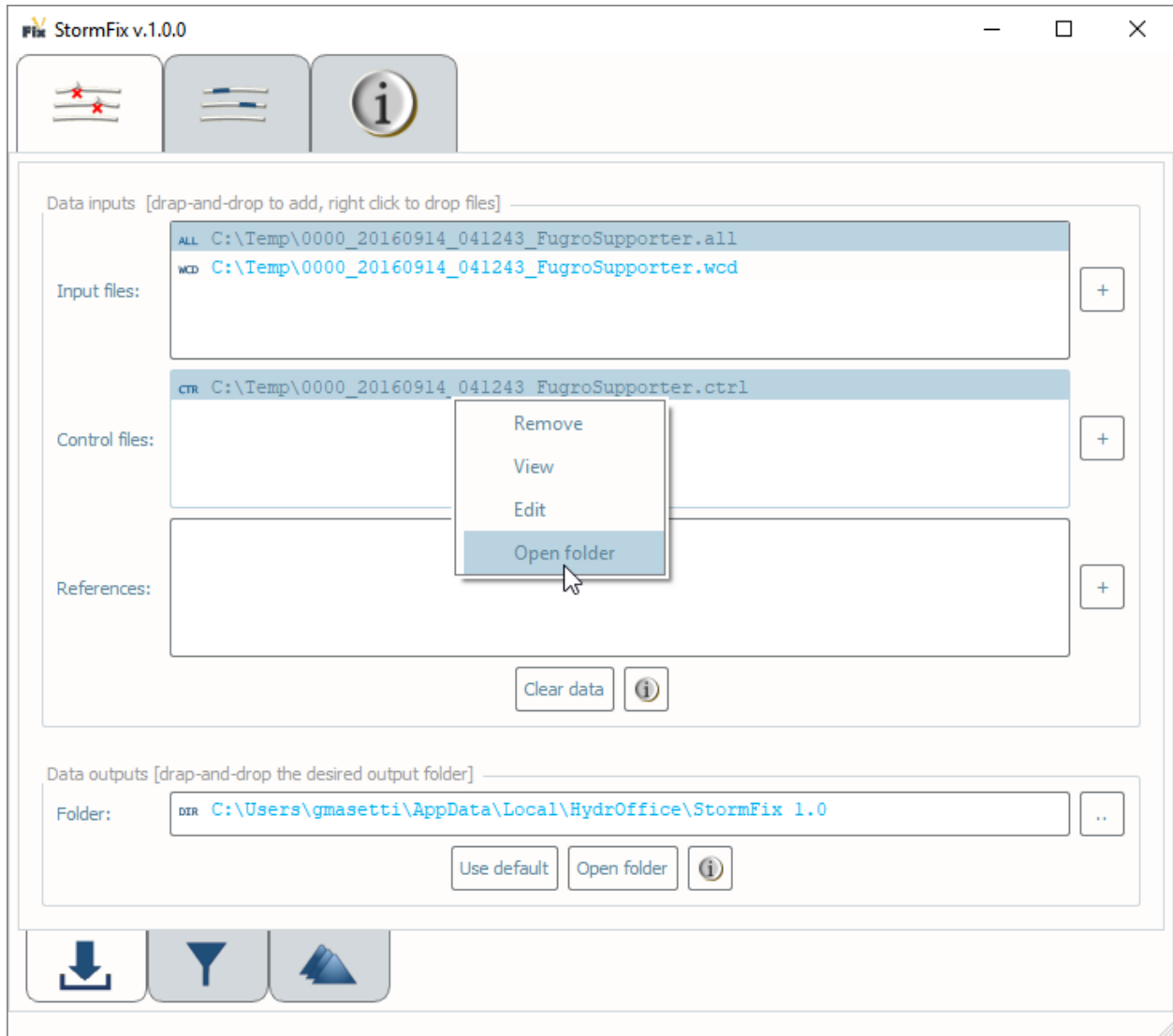


Fig. 2.3: Context menu accessible by right-clicking on a control input file.

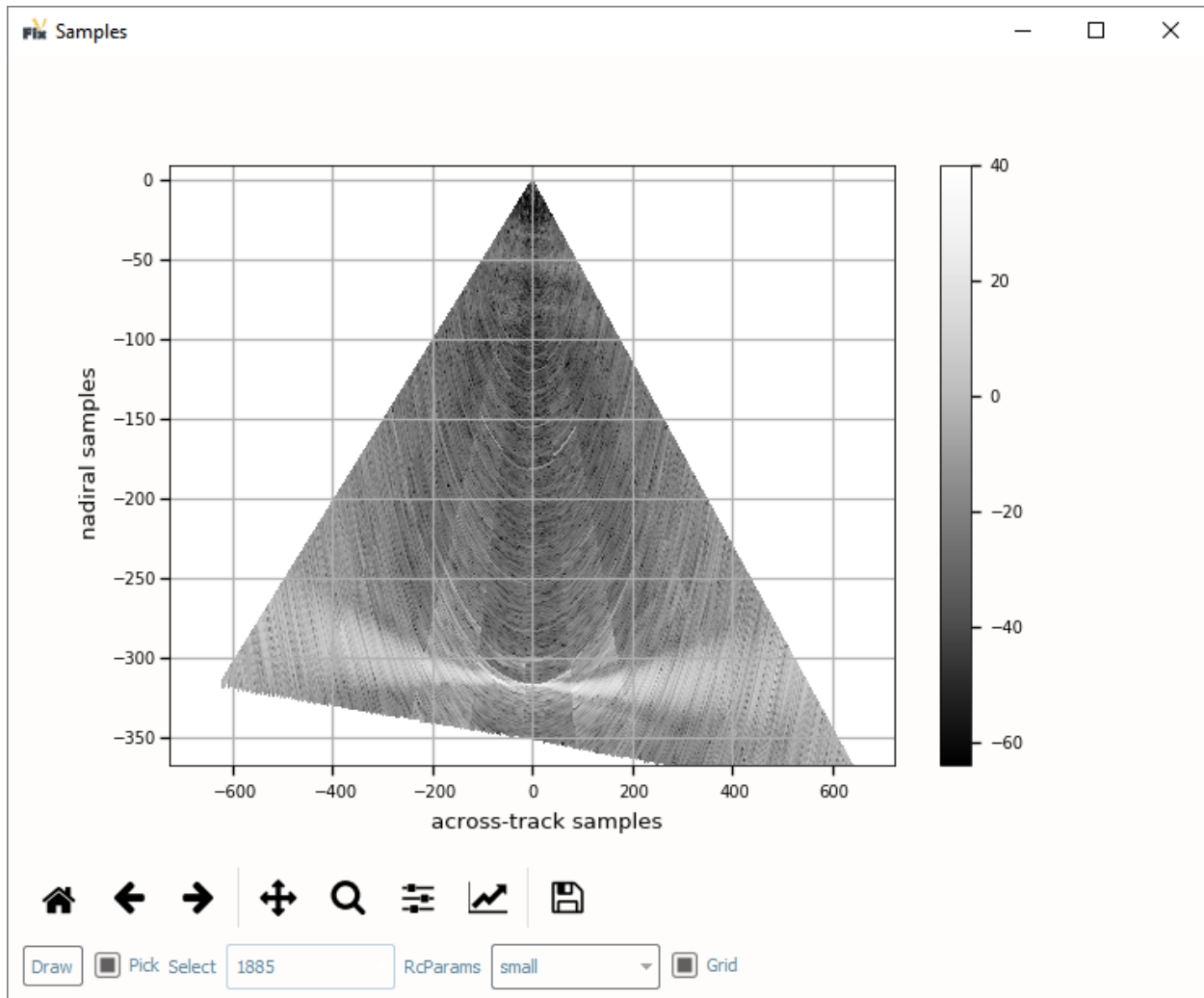


Fig. 2.4: Water Column Data values retrieved from the raw binary data.

Data Outputs

In **Data outputs**:

- The default output **Folder** location is listed; however, this may be modified via drag-and-drop (or browse to) a user-specified output folder. To return to the default output folder location, click **Use default**.
- The ensuing functions will open the output folder automatically upon execution; however, if needed, the specified output folder may be accessed by clicking the **Open folder** button.
- The **Info** button provides a link to the present section of the manual.

2.1.2 Just Check

This tool just checks the Control files against the binary files, then it creates the resulting Fix files.

2.1.3 WCD Track

This tool detects pings with artifacts.

How To Use?

In **Parameters** (Fig. 2.5):

- Switch the knobs to use median- or mean-based tracking, to visualize and/or to save plots intermediate steps of the monitoring algorithm.
- Select the number of horizontal bands to monitor along the water column.
- Set the number of initial samples (in pings) before starting to flag pings.
- Set the range factor that is multiplied by the moving MAD/standard deviation to decide if a section votes to flag a ping.
- Choice the number of sections in a band that have to positively vote in order to flag a ping.

How Does It Work?

See *List of references*.

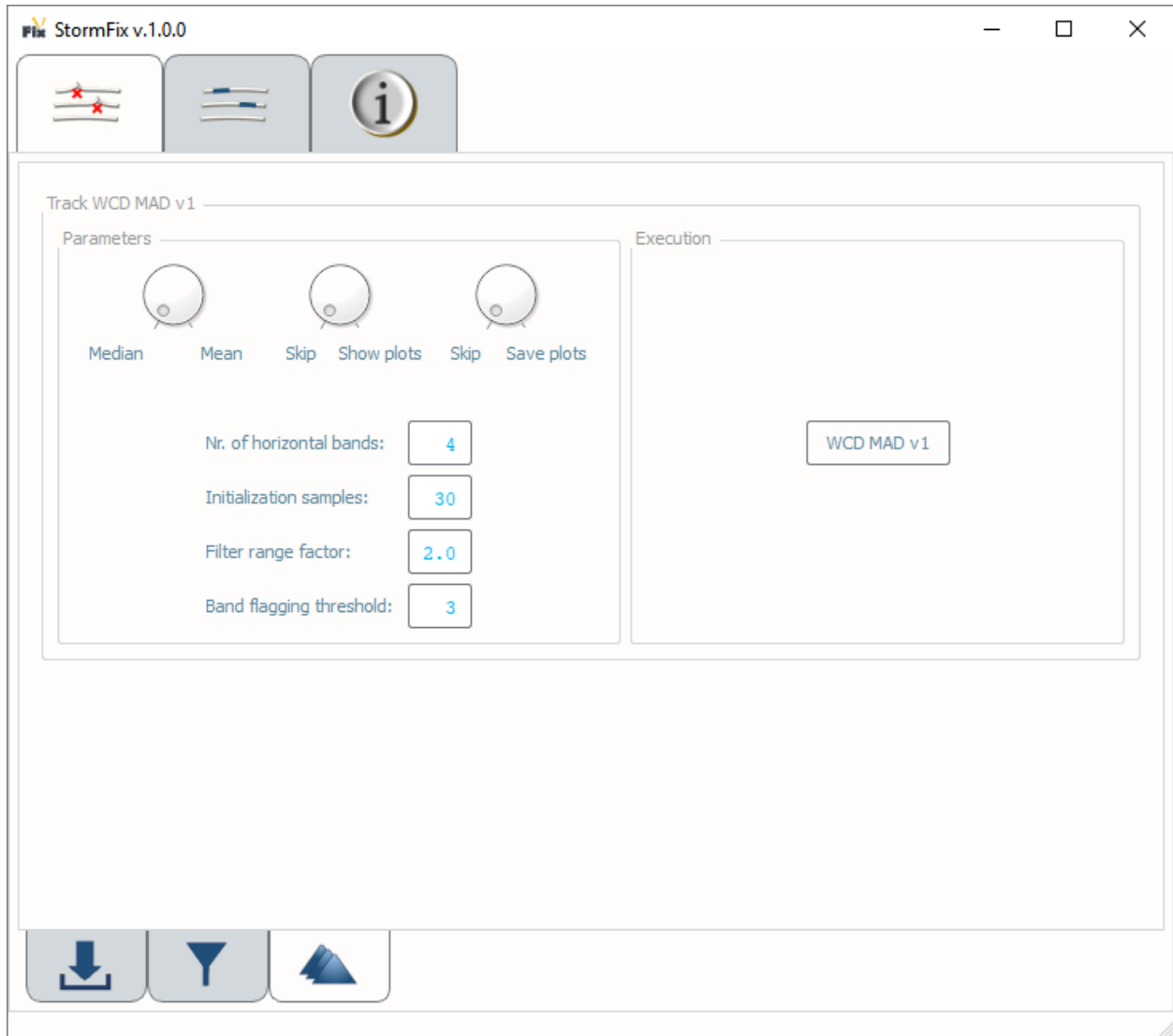


Fig. 2.5: The WCD Track sub-tab in the Detect Artifact tab.

2.2 Reduce artifacts

You can access the tools in this tab after having loaded some data (*Inputs/Outputs* tab).

2.2.1 Inputs/Outputs

This tab is used to define the input binary data, by selecting files in Kongsberg formats (.all and .wcd), the fix files, and to set the location for outputs.

To access these functionalities, you need to select the **Reduce artifacts** tab on top of the application, then the **Inputs/Outputs** sub-tab at the lower-left corner.

Note: Currently supported Kongsberg sonars: **EM 122, EM 302, EM 710, ME70 BO, EM 2040, and EM 2040C.**

Data Inputs

In **Data inputs**:

- Drag-and-drop input binary files (.all or .wcd) in the *Input files* field. (The “+” browse button may also be used.)
- Drag-and-drop fix files (.sfix) in the *Fix files* field. (The “+” browse button may also be used.)

Note: For more information on how to setup a fix file, *Fix File Viewer/Editor*.

- The *References* field is currently unused.
- The directory and filename of loaded data will populate in the respective field of **Data inputs**.
- When both a binary file and a fix file are loaded, the *Remove flagged pings* sub-tab and the *Randomize snippets in flagged pings* sub-tab on the bottom of the interface will become available (Fig. 2.6).
- The **Clear data** button may be used to remove all data inputs.
- The **Info** button provides a link to the present manual.
- Additional functionalities are available by right-clicking on the loaded binary files (Fig. 2.7) and fix files (Fig. 2.8). See *Context Menu*.

Context Menu

With binary files, the context menu provides exploratory plots of the raw data content (Fig. 2.9).

With control files, the context menu provides access to the *Fix File Viewer/Editor*.

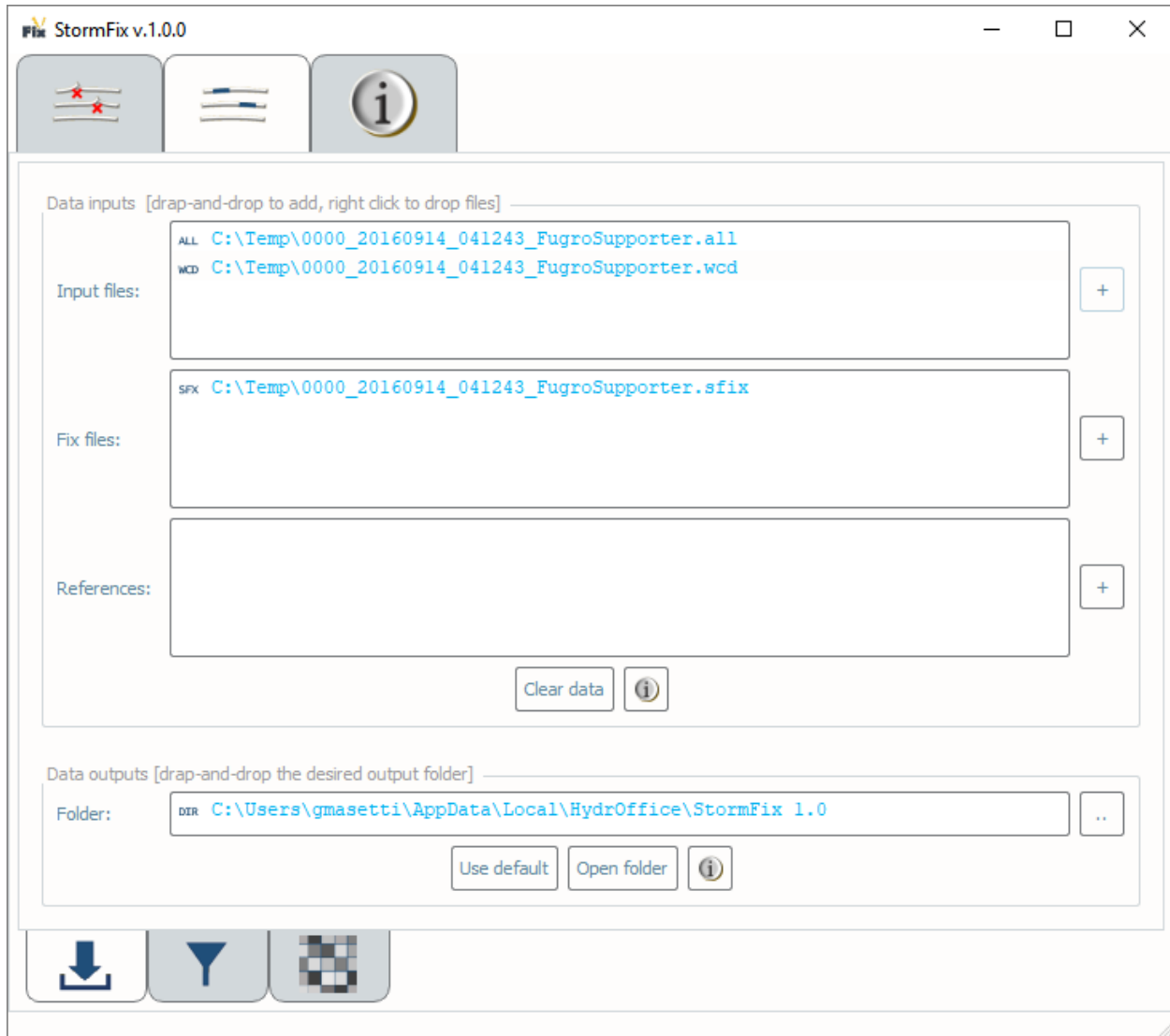


Fig. 2.6: The Inputs/Output sub-tab in the Reduce Artifact tab.

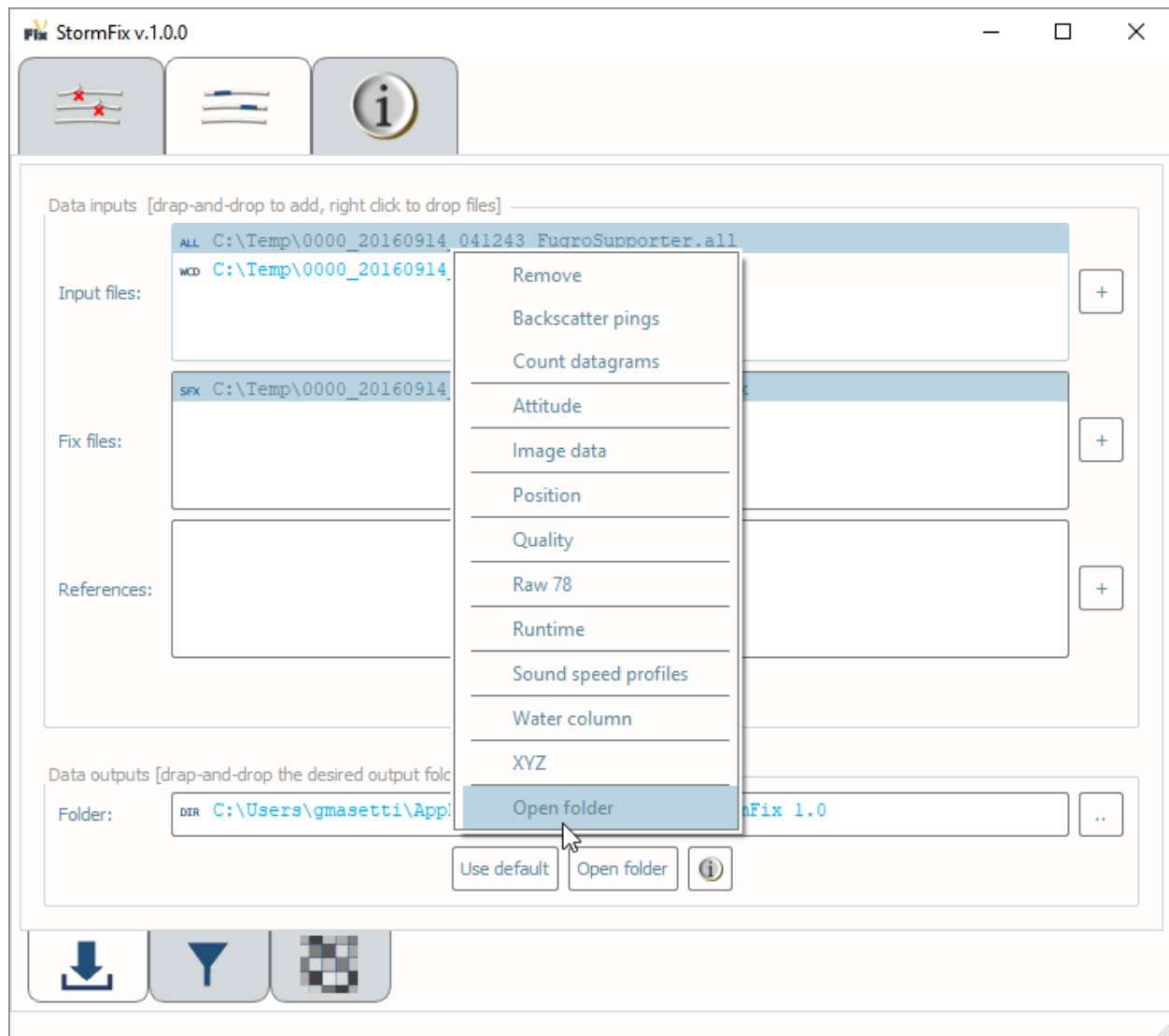


Fig. 2.7: Context menu accessible by right-clicking on a binary input file.

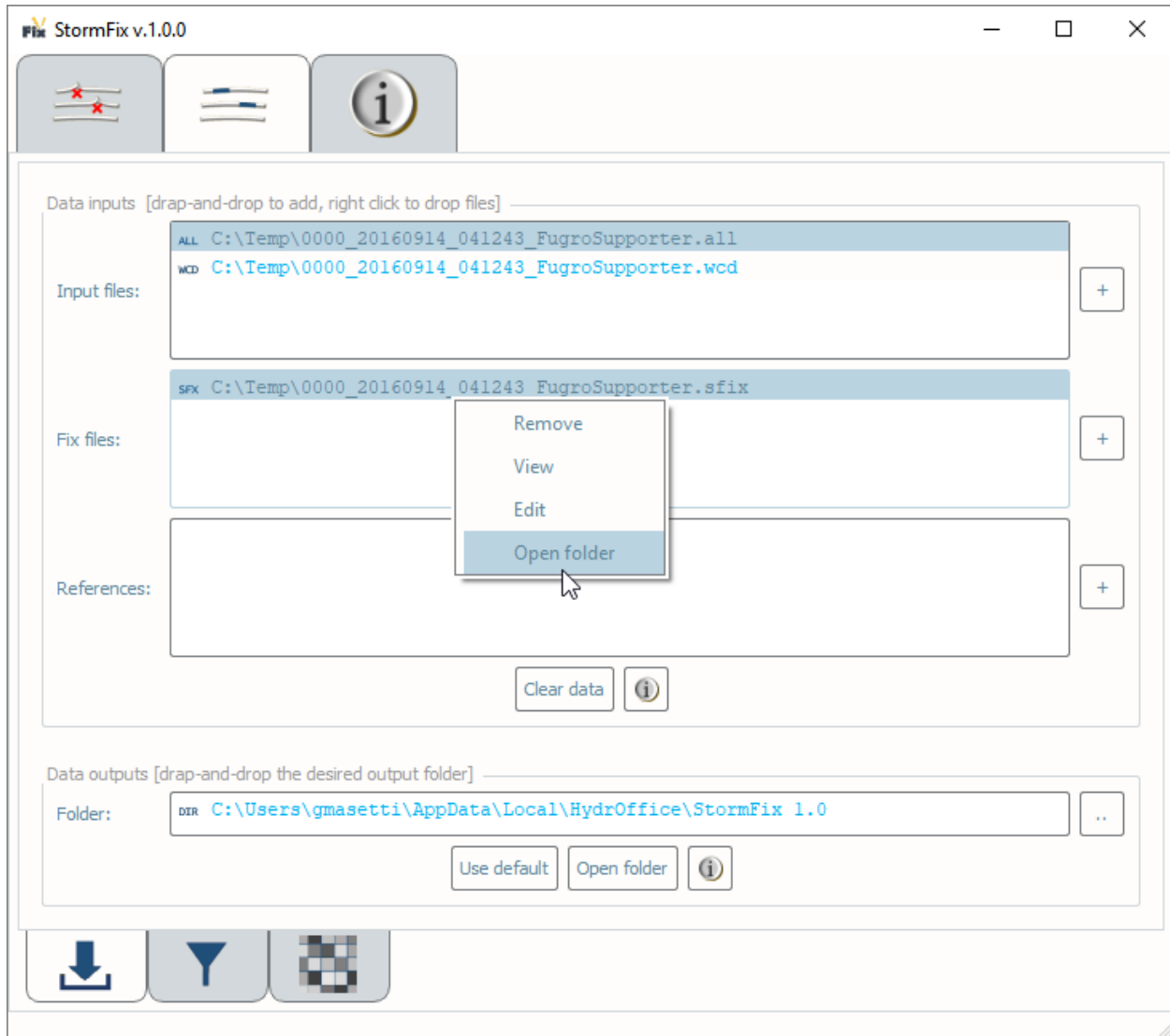


Fig. 2.8: Context menu accessible by right-clicking on a fix input file.

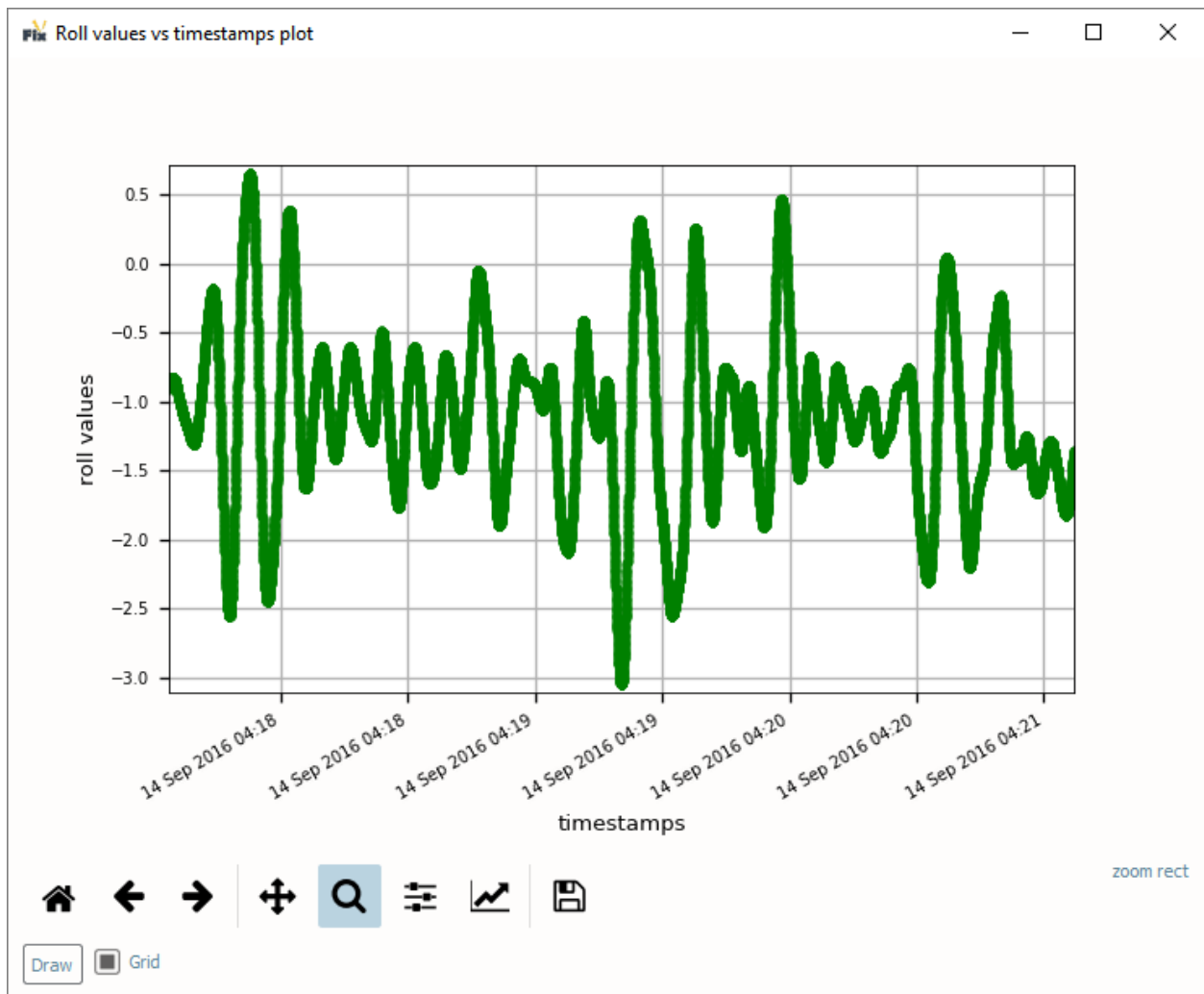


Fig. 2.9: Roll values retrieved from the raw binary data.

Data Outputs

In **Data outputs**:

- The default output **Folder** location is listed; however, this may be modified via drag-and-drop (or browse to) a user-specified output folder. To return to the default output folder location, click **Use default**.
- The ensuing functions will open the output folder automatically upon execution; however, if needed, the specified output folder may be accessed by clicking the **Open folder** button.
- The **Info** button provides a link to the present manual.

2.2.2 Remove Flagged Pings

This tool simply creates a copy of the binary files without the flagged pings.

2.2.3 Randomize Flagged Pings

This tool reduces the effect of artifacts in the flagged pings.

How To Use?

In **Parameters** (Fig. 2.10):

- Select the number of maximum gap in pings that you allow for randomize the flagged pings. If greater, the pings are removed.

How Does It Work?

See *List of references*.

2.3 Info tab

The Info Tab contains numerous helpful links and utilities:

- The HydrOffice's *Oceano website* (*StormFix* is part of the Oceano project).
- Online and Offline Documentation.
- License Information.
- Authors List.
- The HydrOffice Main Page.

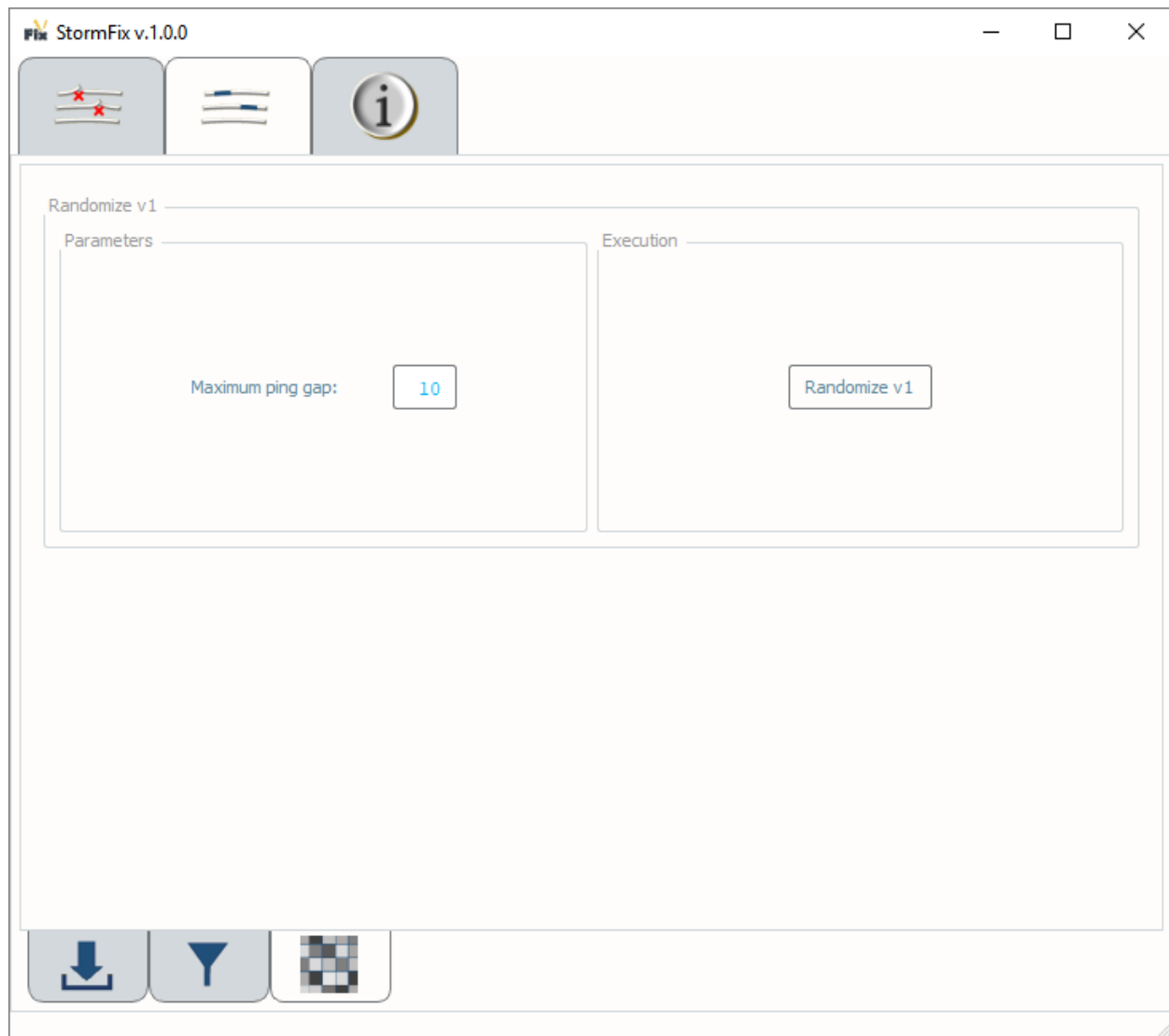


Fig. 2.10: The Randomize Flagged Pings sub-tab in the Reduce Artifact tab.

- The Center for Coastal and Ocean Mapping/Joint Hydrographic Center (CCOM/JHC) Main Page.
- The University of New Hampshire (UNH) Main Page.

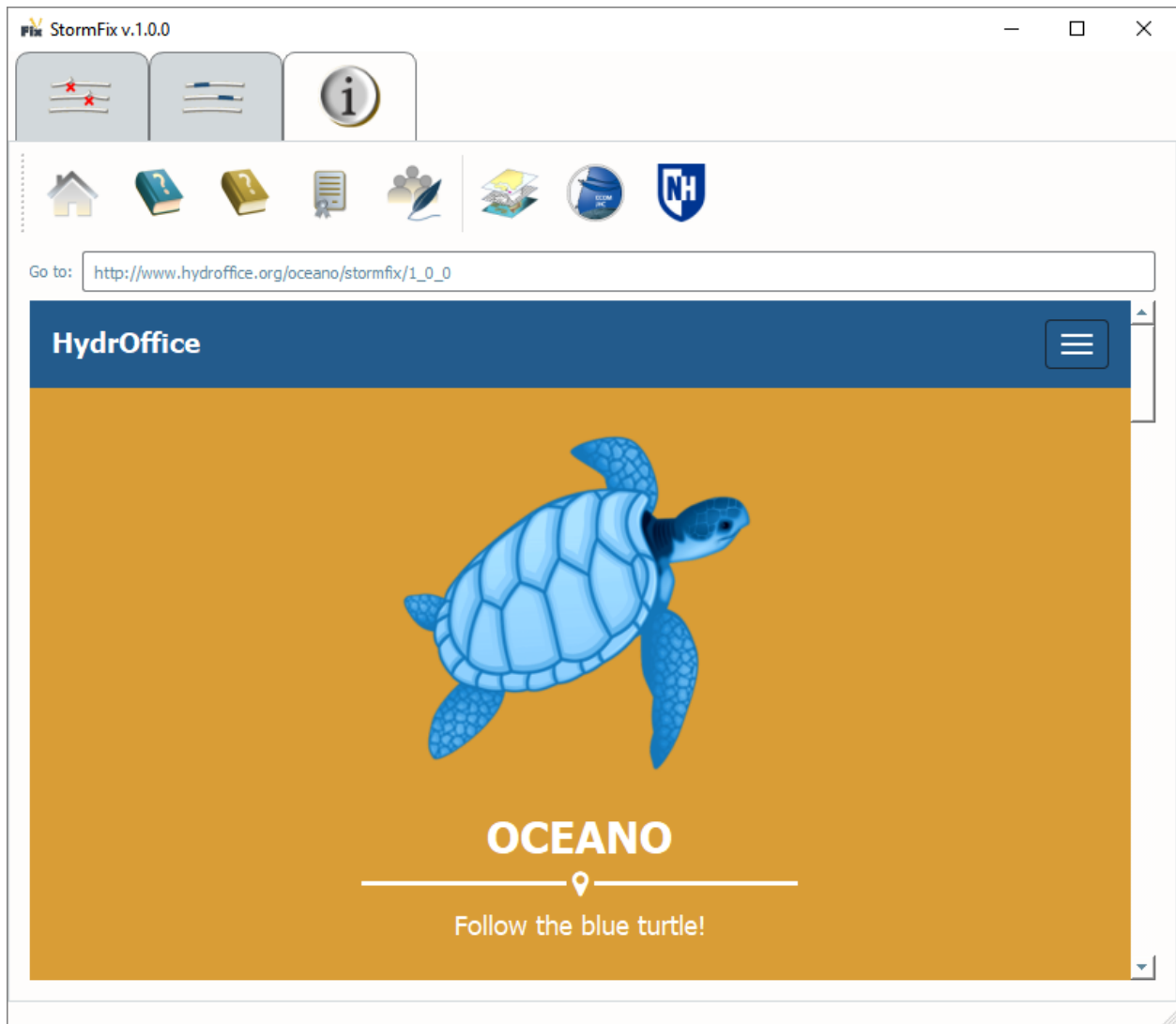


Fig. 2.11: The Info tab.

2.4 Editors

2.4.1 Control File Viewer/Editor

The Control File Viewer/Editor provides functionalities to visualize, edit and validate control files (.ctrl).

A **Control file** (Fig. 2.12) is used to customize the detection of corrupted pings.

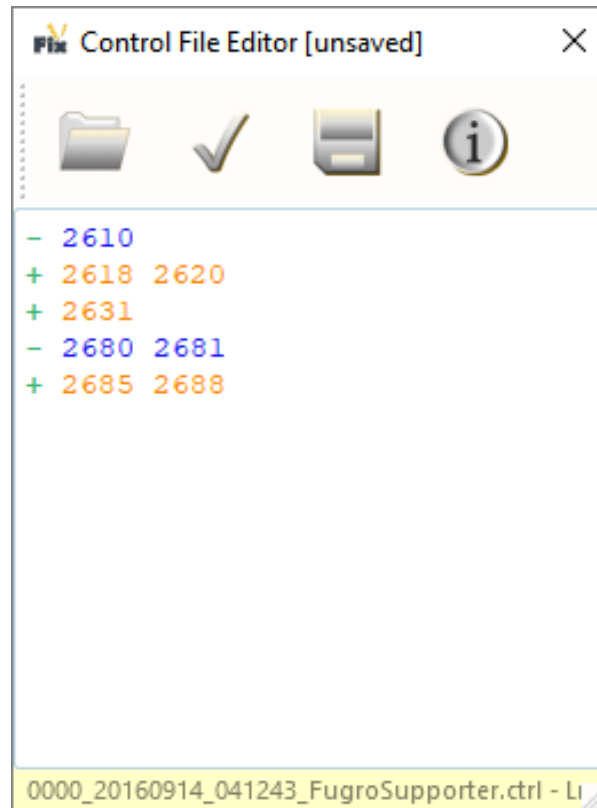


Fig. 2.12: An example of Control file.

Each row of a control file must start with:

- ‘#’ for a single-line comment.
- ‘+’ for adding pings to the list of the flagged ones.
- ‘-’ for removing pings from being analyzed for flagging.

It is possible to identify a single ping (e.g., ‘+ 1234’) or a range of pings (e.g., ‘+ 1234 1240’).

Warning: A control file **must** have the same name as the input file. For instance, the control file for ‘test.kng’ must be named ‘test.ctrl’.

2.4.2 Fix File Viewer/Editor

The Fix File Viewer/Editor provides functionalities to visualize, edit and validate fix files (.sfix).

A **fix file** (Fig. 2.13) is used to customize the reduction of corrupted pings.

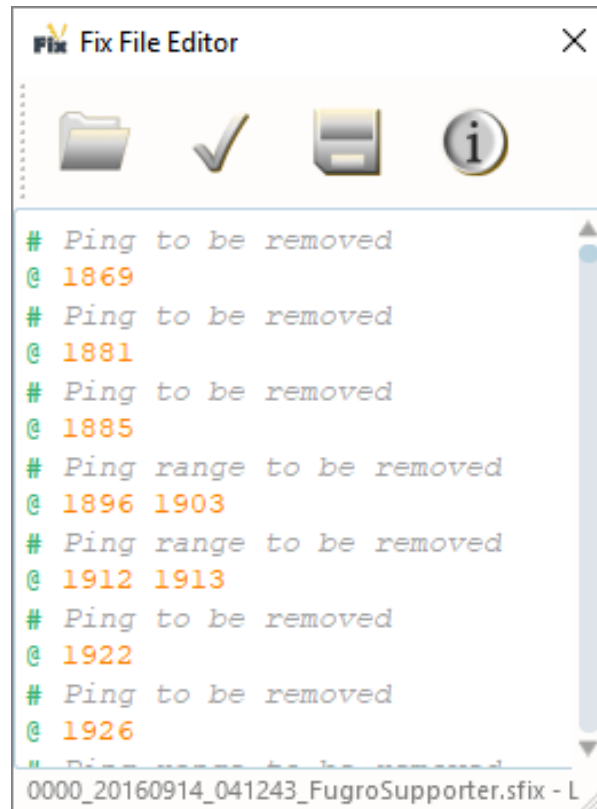


Fig. 2.13: An example of Fix file.

Each row of a fix file must start with:

- '#' for a single-line comment.
- '@' for flagged pings.

It is possible to identify a single ping (e.g., '@ 1234') or a range of pings (e.g., '@ 1234 1240').

Warning: A fix file **must** have the same name as the input file. For instance, the fix file for 'test.kng' will be named 'test.sfix'.

LIST OF REFERENCES

Masetti, G., Calder, B.R., and Hughes Clarke, J.E., [Methods for Artifact Identification and Reduction in Acoustic Backscatter Mosaicking](#), 2017 U.S. Hydro Conference. The Hydrographic Society of America, Galveston, TX, 2017.

DEVELOPMENT NOTES

N/A

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- Don't *ever* break backward compatibility.
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- Obey [PEP 8](#) and [PEP 257](#).
- Write [good commit messages](#).
- Ideally, [collapse](#) your commits, i.e. make your pull requests just one commit.

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Thank you for considering to contribute! If you have any question or concerns, feel free to reach out to us.

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Version 3, 29 June 2007

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CREDITS

Oceano is a project developed by the UNH's [Center for Coastal and Ocean Mapping](#).

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Feel free to contact us for comments and suggestions:

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The following wonderful people contributed directly or indirectly to this project:

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- [John Hughes Clarke](#)
- [genindex](#)
- [search](#)