Import a cruise plan created with Marine Facilities Planning into Perplex7
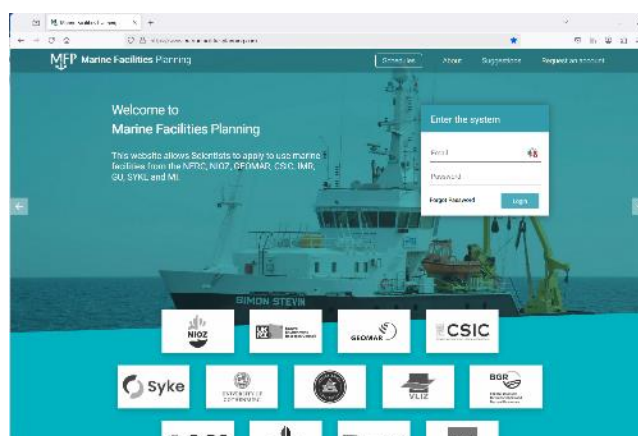
https://www.marinefacilitiesplanning.com/

Contents

Introduction

Perplex7 is a software that can be used to plan and efficiently carry out expeditions with research vessels. The software was developed at the Alfred Wegener Institute and used during countless voyages of the RV Polarstern.

PERPLEX allows scientists and expedition leaders as well as logisticians and nautical personnel to optimize routes and compare them with water depths, sovereignty zones and other important boundary conditions, e.g. sea ice concentration. In addition, individual equipment deployments can be planned and the requirements of passengers can be taken into account and balanced.

The planning, including all relevant information, is not only carried out before the expedition, but must also be updated regularly during the expedition, taking into account, for example, the actual speed of the ship or the duration of equipment deployments. The scientific chief scientist can easily use Perplex to create relatively precise work plans for the next few days. The remaining ship time is also continuously recalculated in order to meet the scheduled end of the voyage at the specified port

of entry. The software is based on a graphical user interface that displays all the required information such as the station list and map side by side.

The instructions explain how an expedition planned with *Marine Facilities Planning* (MFP) can be imported into Perplex7 so that the chief scientist can use the software at sea.

Requirements

- The stand-alone version of Perplex7 (Perplex7.exe) must be installed. Alternatively, the source code of the software (Perplex7.mlapp) can also be executed in the Matlab Command Window, e.g. if Perplex7 is to be used on a MAC.
- Check the "Ports.txt" file in the "Dataset" directory and add the port of departure and destination if necessary.
- Check the file "Default_InstrTable.csv" in the "Perplex7" directory and add devices if necessary. Alternatively, you can also edit the table with the device details in Perplex7, see Instrument tab, and also overwrite existing device names. Note that when creating a new cruise, the changes made are only retained if they were made directly in "Default_InstrTable.csv".
- The csv-file exported from MFP, e.g "CoordinatesExport-20250227T1121.csv" is needed.

```
WPT No.,LAT,,,LON,,,
1,54,27.19,N,007,45.28,E
2,54,33.97,N,008,07.52,E
3,54,45.77,N,008,12.64,E
4,54,50.66,N,007,21.69,E
5,55,20.89,N,007,36.78,E
```

A description of the software can be found in "Perplex7-Manua.pdf".

Convert MFP-Export

In Perplex7 there is a menu to import a text file with a list of waypoints; see Perplex7-Manua.pdf page 12-13. To be able to import the export of waypoint coordinates from MFP, the format must be converted, so that the above csv file becomes this text file:

```
54.453200   7.754700
54.566200   8.125300
54.762800   8.210700
54.844300   7.361500
55.348200   7.613000
```

The format was converted using a simple Matlab program *MFP_CoordinatesExportCSV.m*, which can be found in https://github.com/rohardt/Perplex7 and Mathworks File Exchange: https://de.mathworks.com/matlabcentral/fileexchange/132872-perplex7?s_tid=ta_fx_results

To execute *MFP_CoordinatesExportCSV.m* users can access "Matlab online" via their browser, they do not need a Matlab license!

Matlab online and Convert MFP-Export

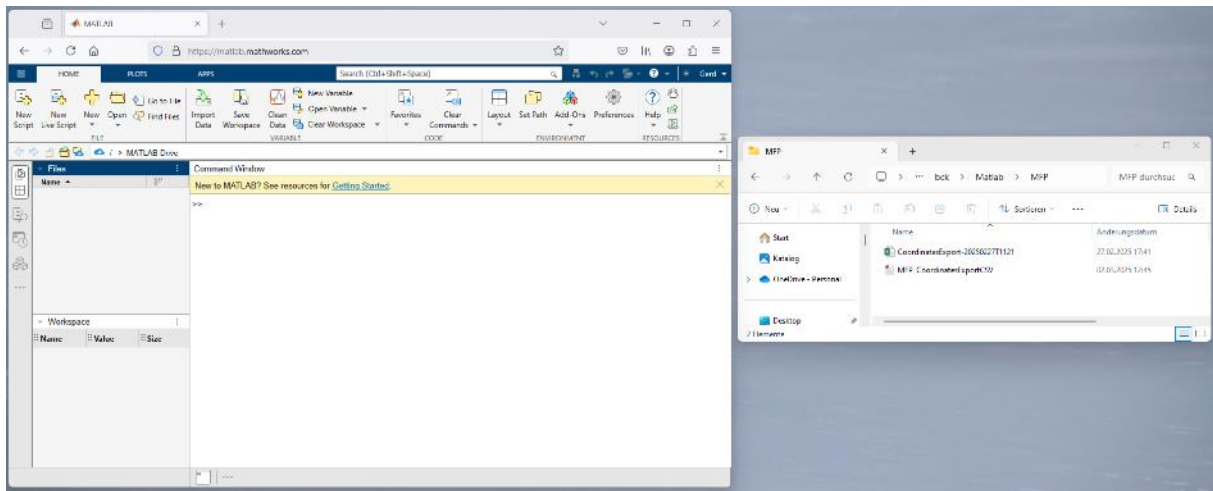Open and execute "Matlab online" in your browser.

Fig. 1: On the right is your local folder, e.g. "MFP". Click and select *CoordinatesExport-20250227T1121.csv* first and hold down the LMB (left mouse button). Then drag it into the Matlab window in "Files".
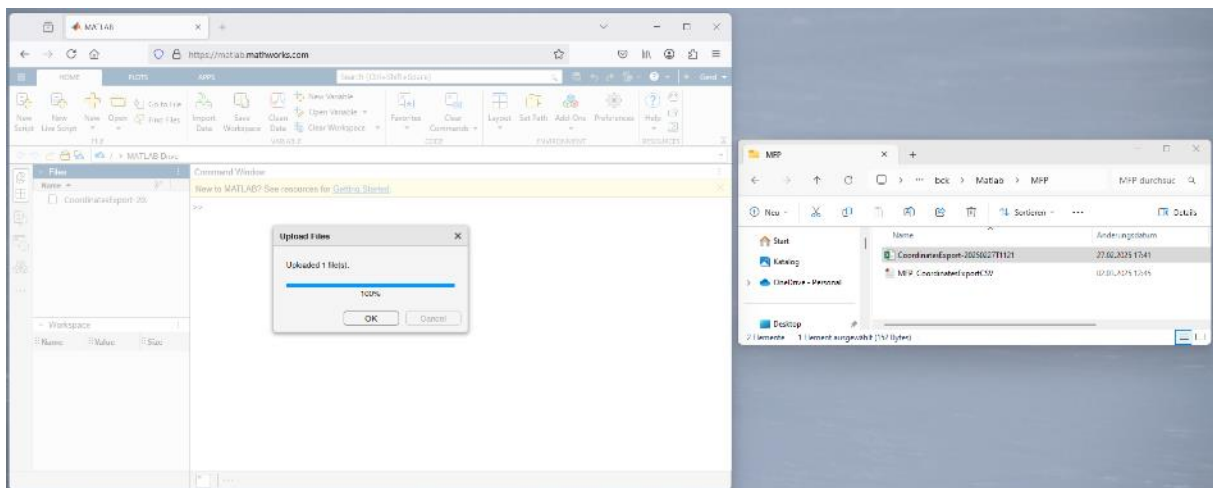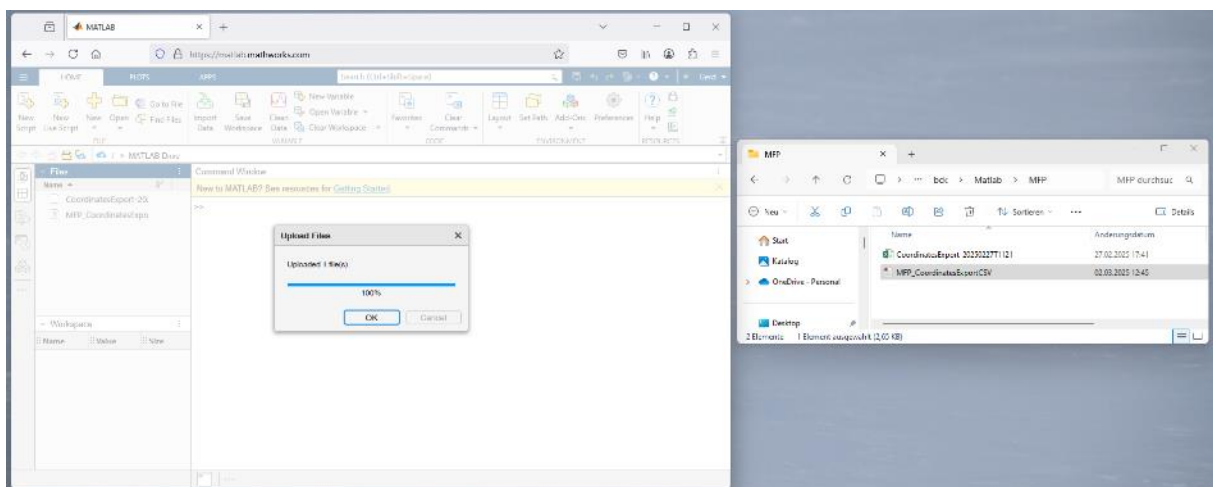

Fig. 2: Press [ok].

Fig. 3: Next click and select *MFP_CoordinatesExportCSV.m (the Matlab script)* and hold down the LMB. Then drag it into the Matlab window in "Files" too and press [ok].
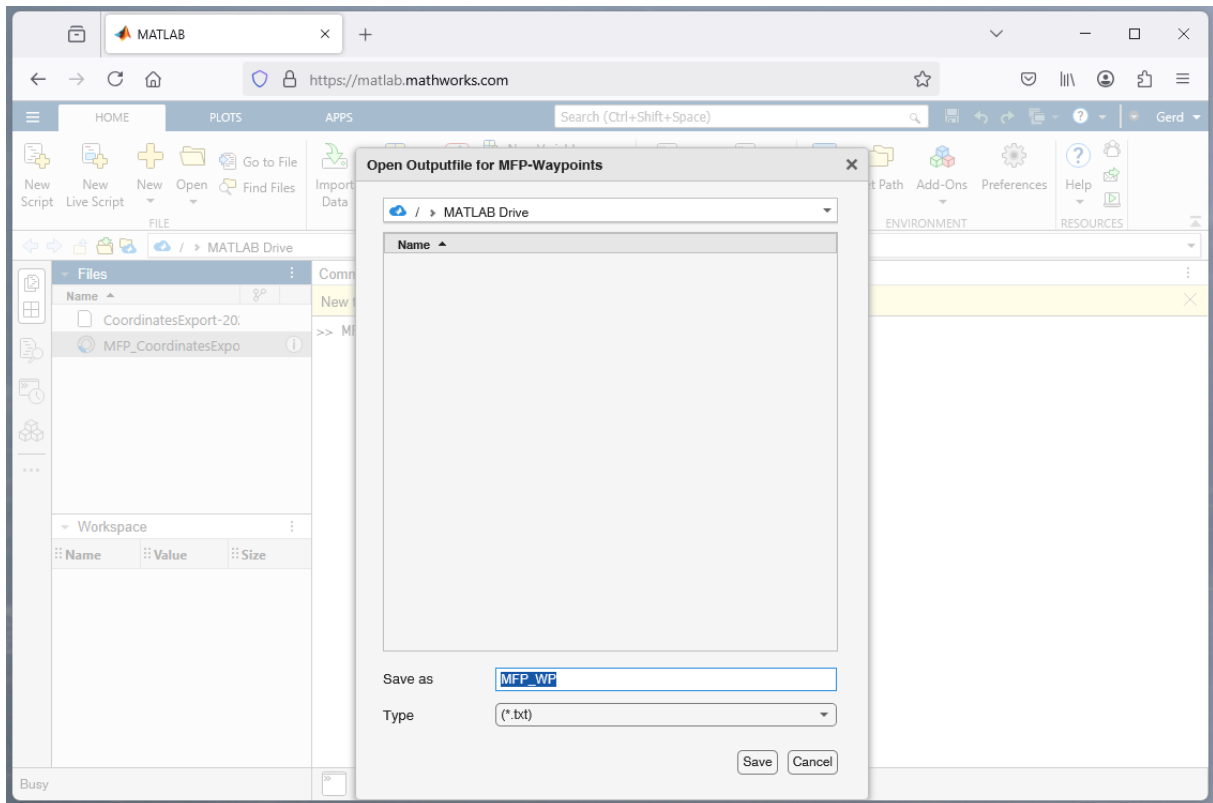
Fig. 4: Execute the script *MFP_CoordinatesExportCSV.m* (click on RMB and select "Run"). Then enter the name of the output file (without .txt) and press [save].
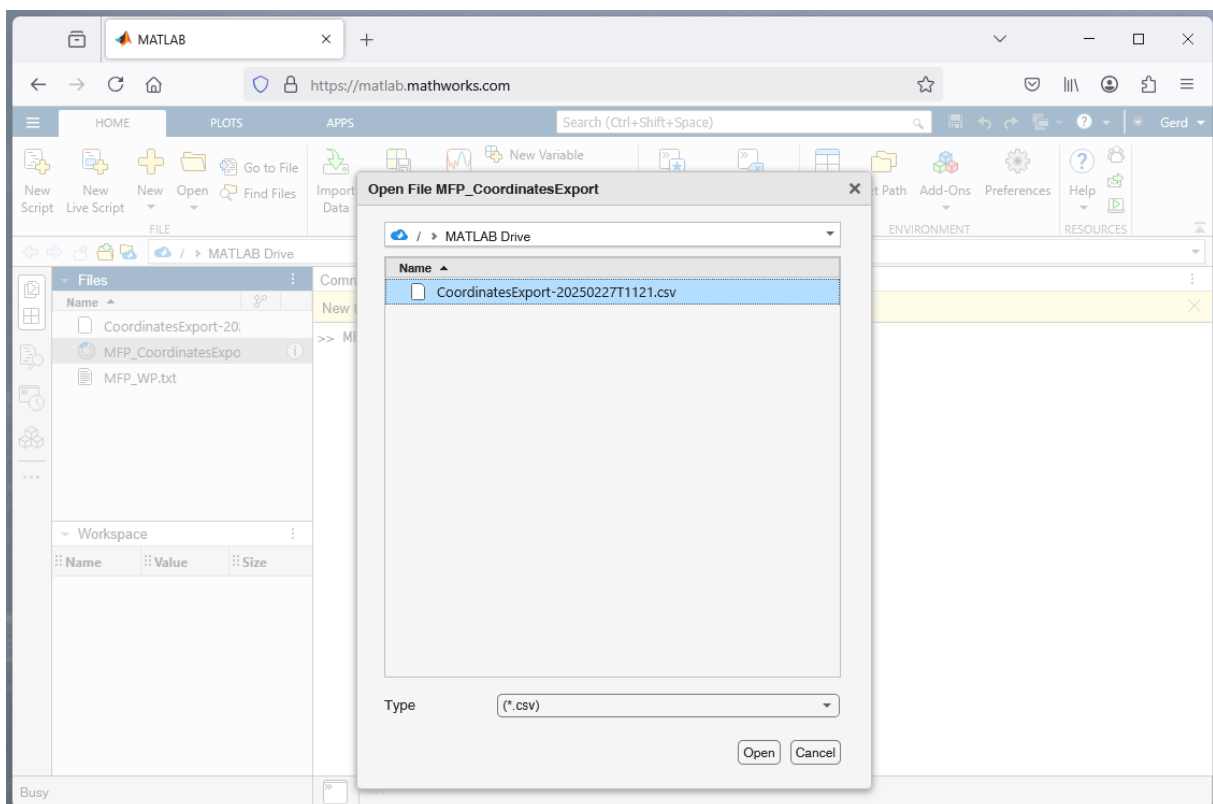
Fig. 5: All csv files are now displayed here. Select the required file and press [open].
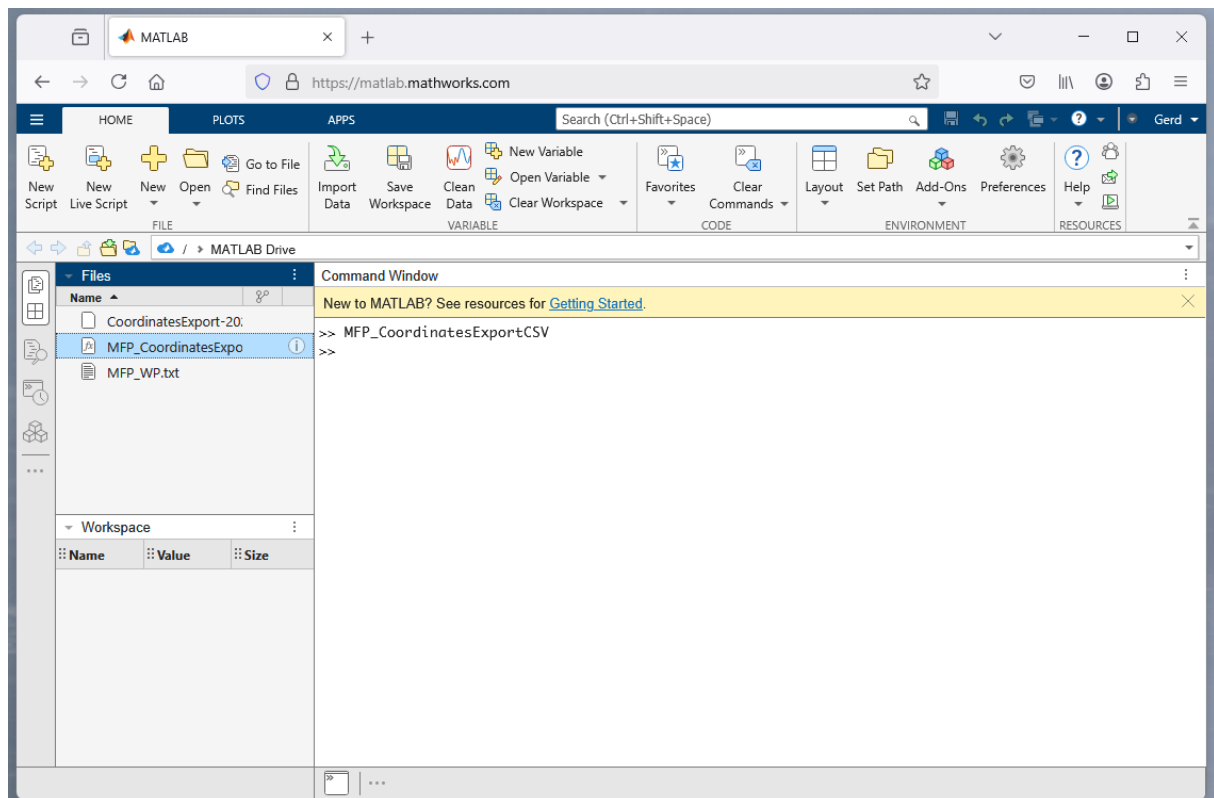
Fig. 6: MFP_WP.txt is the file with the latitude and longitude of the waypoints in the format that can be imported into Perplex7. Mark MFP_WP.txt with the RMB and select "download". This file can now be copied from the local "download" folder to the folder *C:\Perplex7\application\Import*.

Import MFP-Waypoints into Perplex7

The following shows how the waypoints from MFP are now imported into Perplex7 and completed with device inserts.
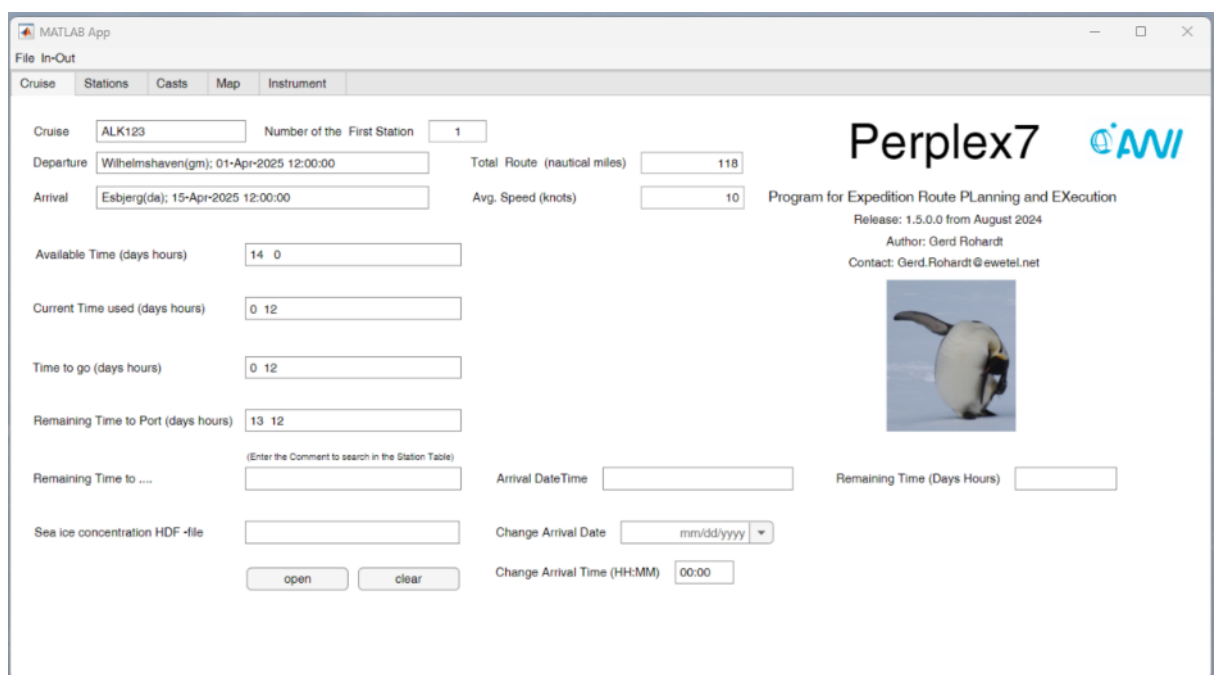
Fig. 7: Here is the cruise *ALK123* is just used as an example. Start with menu [File – New]. At the beginning, the Station Tab contains two waypoints (port of departure and arrival) only.

Fig. 8: Import with menu [In-Out – Import from txt-file]. Nr 2 – 6 are the waypoints from file "MFP_WP.txt".

Fig. 9: The map limits in the Map Tab were changed manually.

Fig. 10: As an example CTD, GRAB, PLA and SD were activated and the settings were made to calculate how long it takes to use a specific device. Pressing [Sort] moves all active devices on top of the table in alphabetical order. All active devices were displayed in the Cast Tab too.

Fig. 11: In the Cast Tab we select and inserted the devices. The order can be changed at any time; select Instrument and press [shift up] or [shift down]. For the PLA we also limited the profile depth to 10 m too.

Fig. 12: Nr 2. is the first station; see Cast Tab in Fig. 11. In the panel "Clone Cast Setup from…" we used the station setup from Nr 2 for Nr. 3 to 6; see Fig. 13.

Fig. 13: With "clone", it is very easy to enter the devices at the stations. If, for example, no GRAB is used at a particular station, this device can be deleted there afterward.
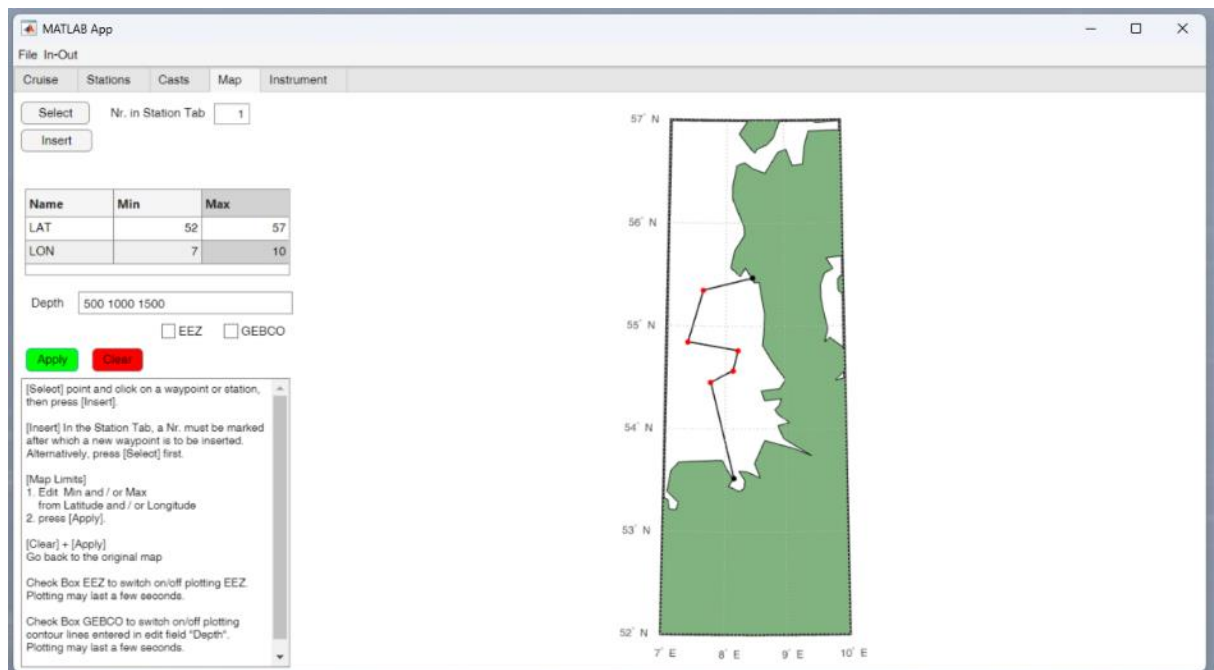
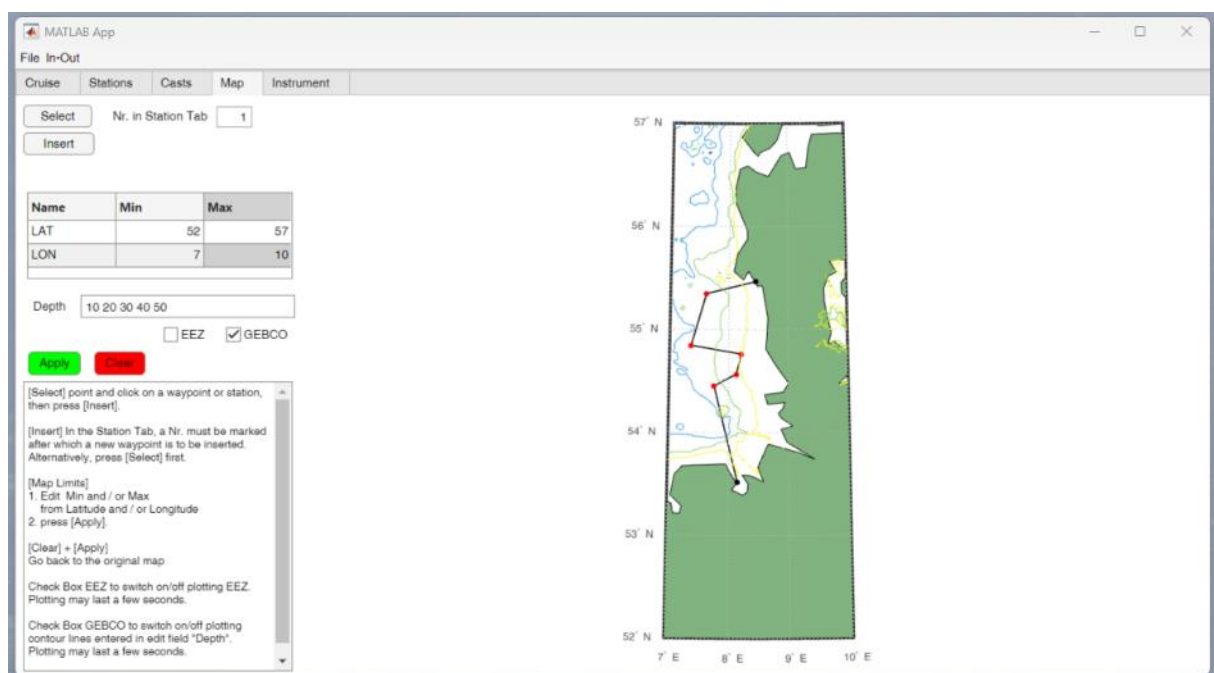**Fig. 14:** In the Map Tab, stations are displayed in red.
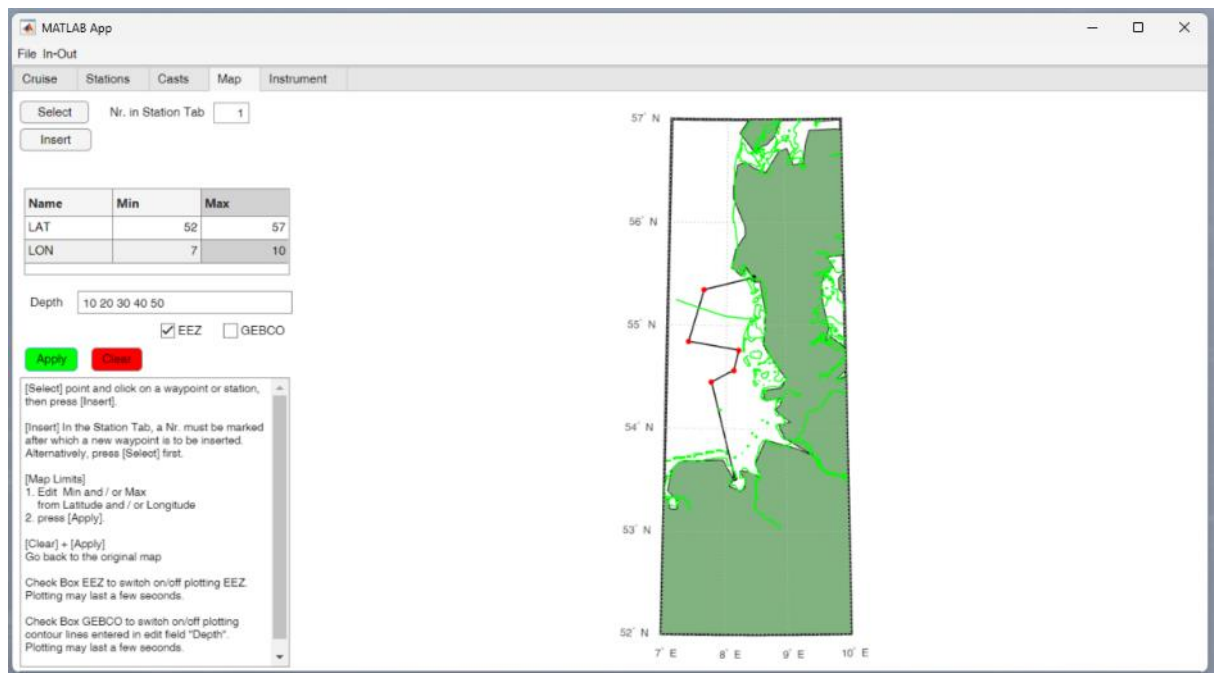

Fig. 15: Map Tab with depth contours.

Fig. 16: Map Tab with EEZ .

Links

- Source Code:

  https://github.com/rohardt/Perplex7

  https://de.mathworks.com/matlabcentral/fileexchange/

  Search for:

  "Perplex7" and/or "waypointsalongtransect"

- Stand-alone / compiled version:

  https://github.com/rohardt/Perplex7-Exe

Manual are the PDF-Files in the given links!