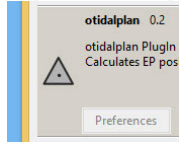


OpenCPN plugin - otidalplan_pi - guide for users



otidalplan is designed to calculate EP (estimated positions) along a route. The basic route is one that has already been added to OpenCPN. The plugin uses tidal current information from tidal harmonics and calculates the courses to steer and the speed made good along the EP route.

Links

Source code:

Still a pre-beta at present but the latest version can be found here:

https://github.com/Rasbats/otidalplan_pi/releases/

Forum:

http://www.cruisersforum.com/forums/f134/otidalplan_pi-planning-with-tidal-current-harmonics-223225.html

Summary

By using tidal currents at the optimal time routes can be made more quickly and often more safely. Fuel use is optimised. The plugin can provide routes for up to six different departure times, allowing comparisons between the routes.

Tidal current harmonics are readily available for the USA and some other parts of the world. This information can be used to calculate courses to steer and the speed made good along a route.

The methods that lie behind the calculations are shown below in italics. For basic use these can be ignored.

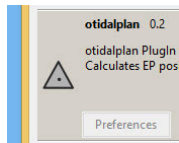
Installation

This version of the plugin requires at least version of OpenCPN 5.xx.yy. It is not compatible with any version before this.

Windows:

Download the installer from the releases page of GitHub. Run the '.exe'.

Use 'Options->Plugins' and find the otidalplan entry. Enable the plugin.



Interface Icon

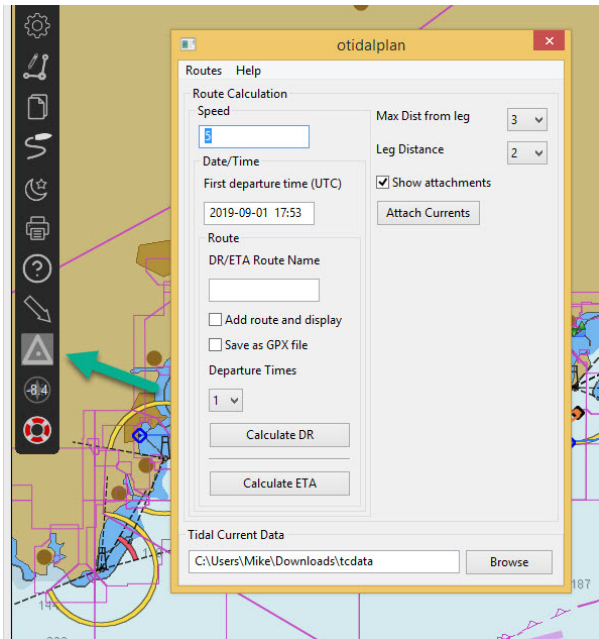


The plugin uses the EP (Estimated position) symbol as the icon.

Using otidalplan

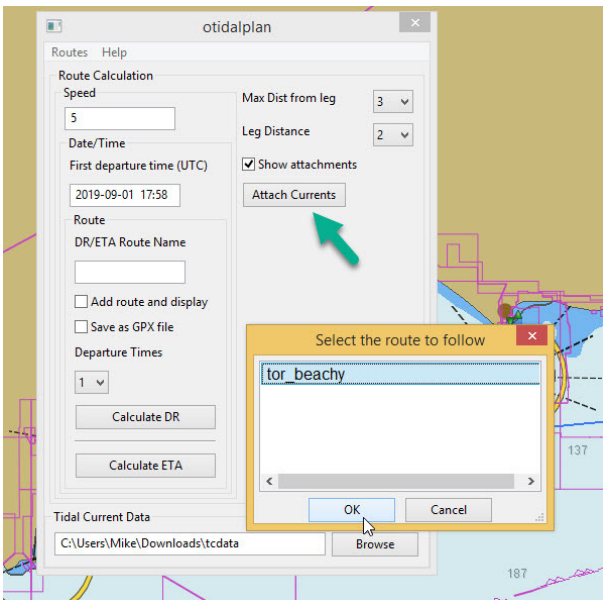
A pre-planned route must be available in OpenCPN. Otidalplan extracts this route from the 'navobj.xml' file. If you create a route it will not appear immediately in 'navobj.xml'. It appears when OpenCPN and the plugin are re-started. For later use the route will be available after starting OpenCPN.

Start the plugin.



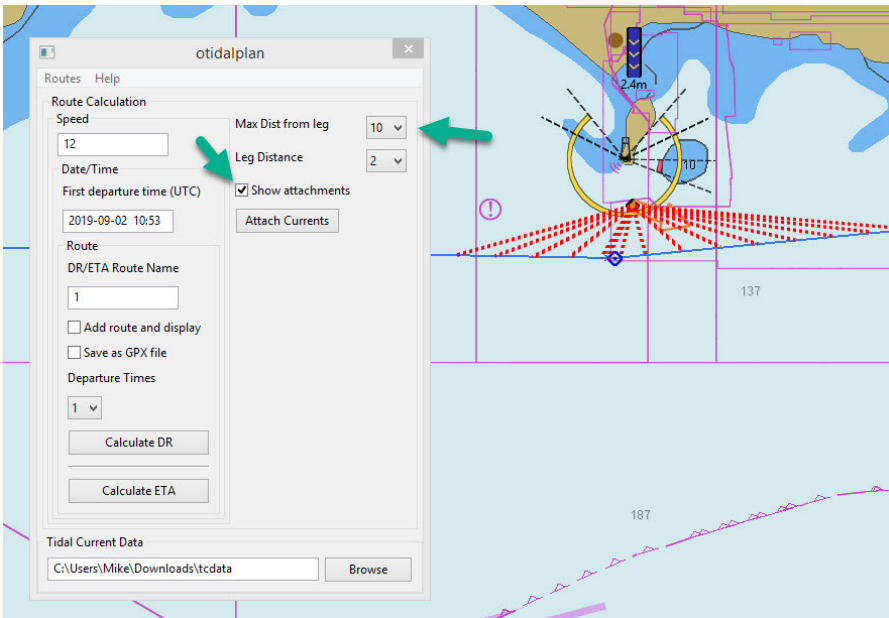
By default the 'Tidal Current Data' listed will be the one installed with OpenCPN. It is possible to select your own tidal harmonics folder. Use the browse button to find the folder containing 'HARMONIC.IDX'.

The first step in creating the EP route is to attach the tidal currents.

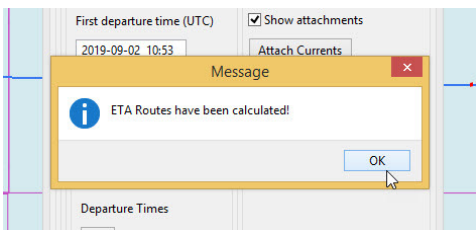
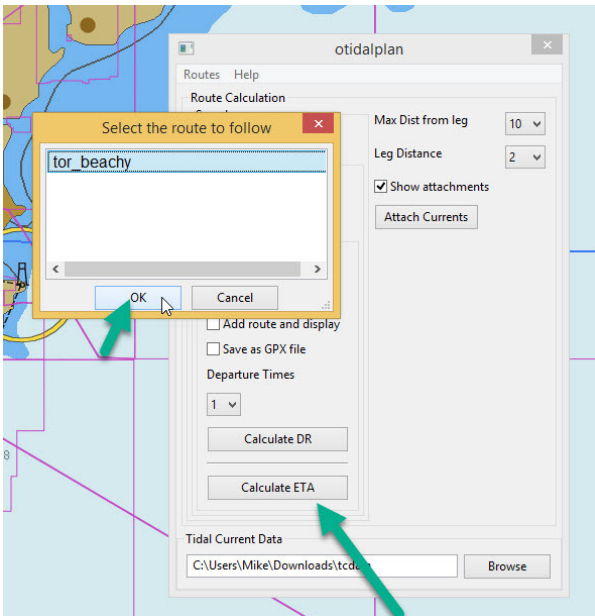


By default the points at which the current data will be used to calculate the EP are shown on the chart. The maximum distance from the leg was increased to 10 miles because the stations are a long distance apart. The spread of the 'attachment points' indicates the best maximum distance.

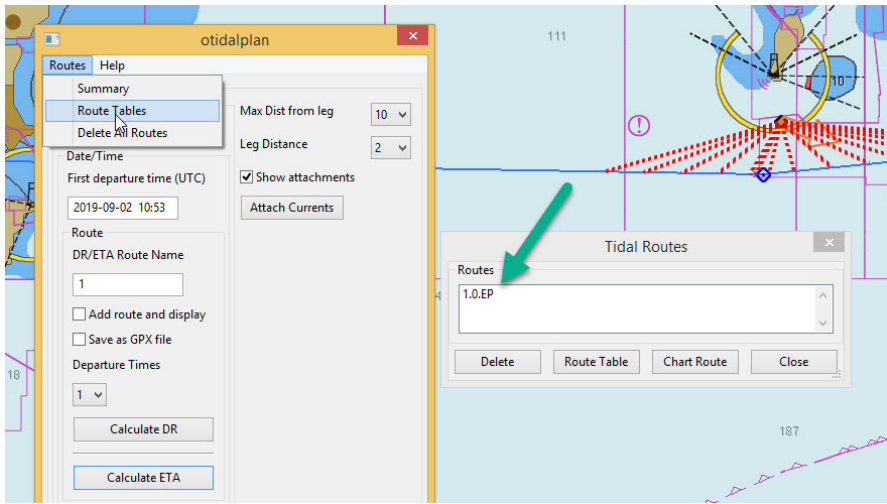
Calculation: 'Attach Currents' can be thought of as creating a set of DR positions along the route, with the vessel speed equal to 'Leg Distance'. From the mid-point between those positions a search is made for the closest tidal station. If one cannot be found the plugin uses the previous station.



Make sure you have entered a name for the route. Press 'Calculate ETA' and select the pre-planned route, which must be the same as the route used for 'Attach Currents'.

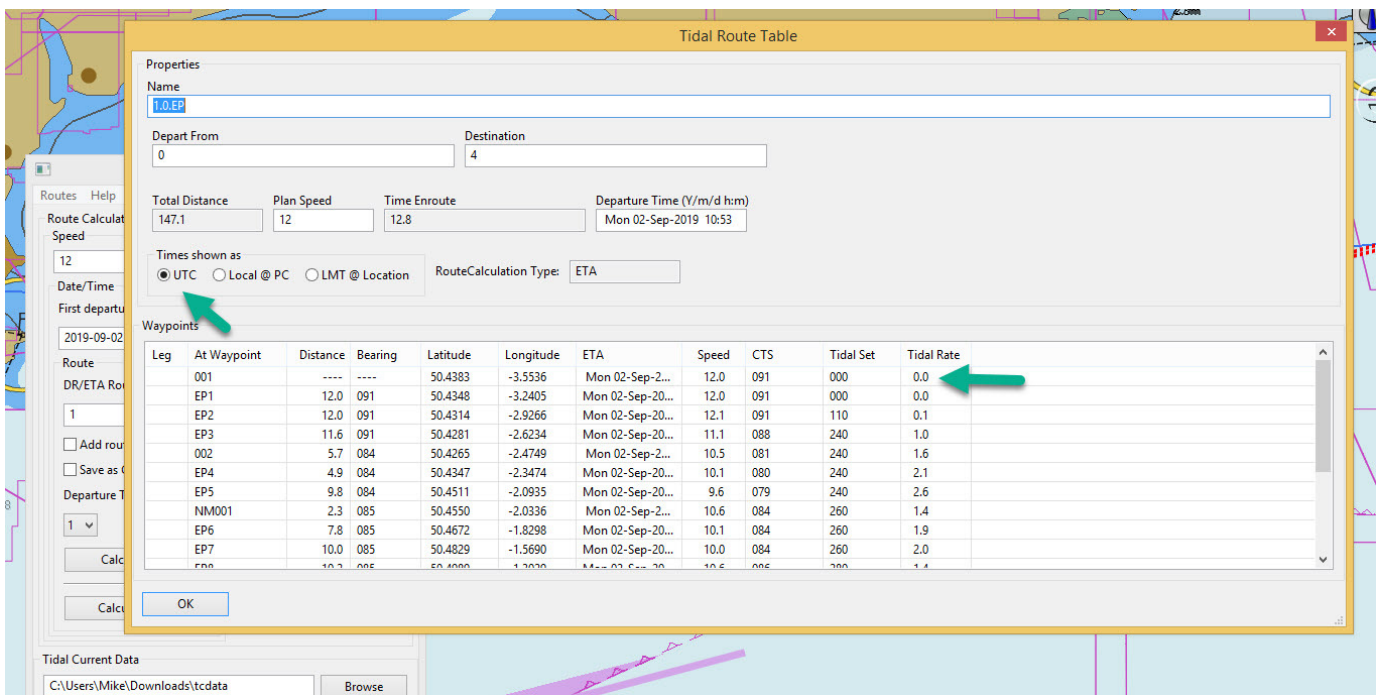


To view details of the calculated route use the menu option 'Route Tables'. Select the new route. You will see that '0.EP' has been added to the route name.

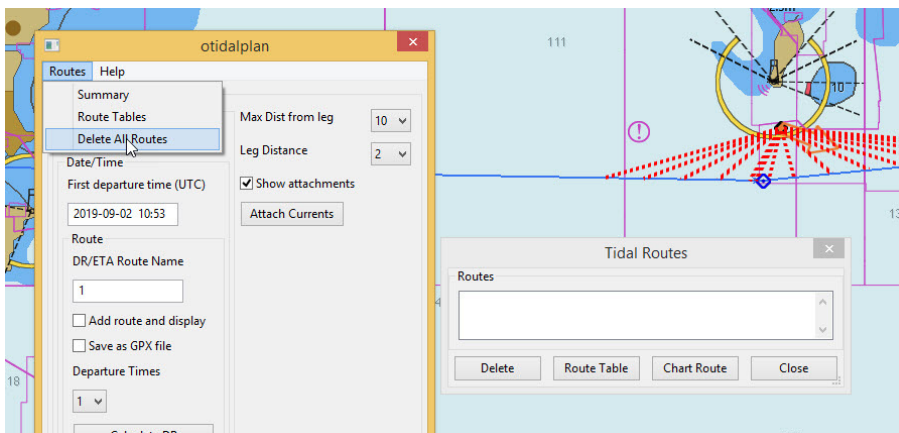


Pressing 'Route Table' the full details of the EP route are shown. Note that the plugin uses only UTC.

Calculation: this works on the basis of advancing along the route in 3 minute steps. For each step the direction and speed of the tidal current is found, based on the stations identified when 'Attach Currents' was used. A distance equal to the speed of the vessel is used to limit the search for currents. If the limit is reached the direction and speed of the current are set to zero.

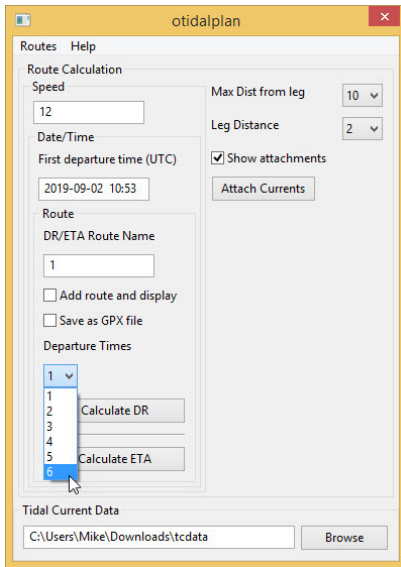


Any routes made by the plugin can be deleted using the menu, unless they have been added to OpenCPN.

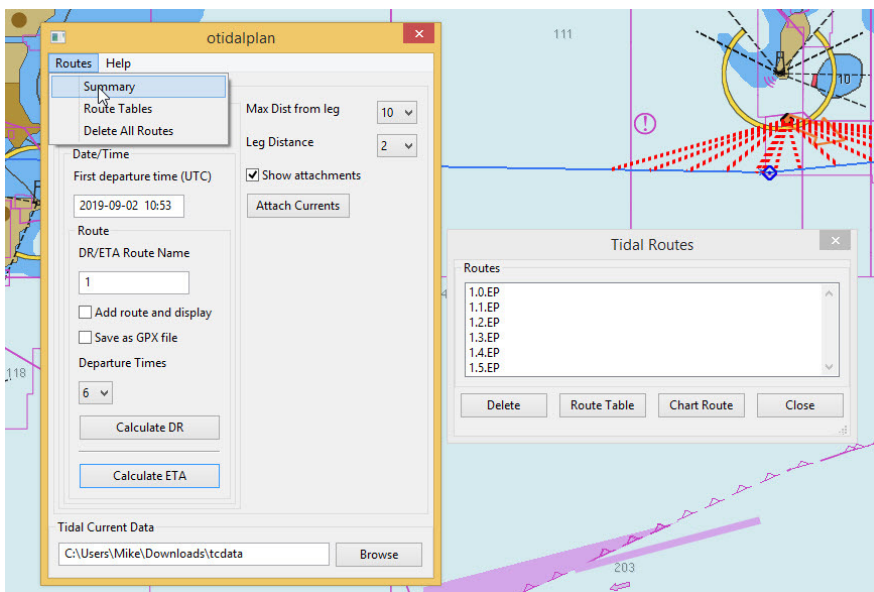


Up to six EP routes can be calculated.

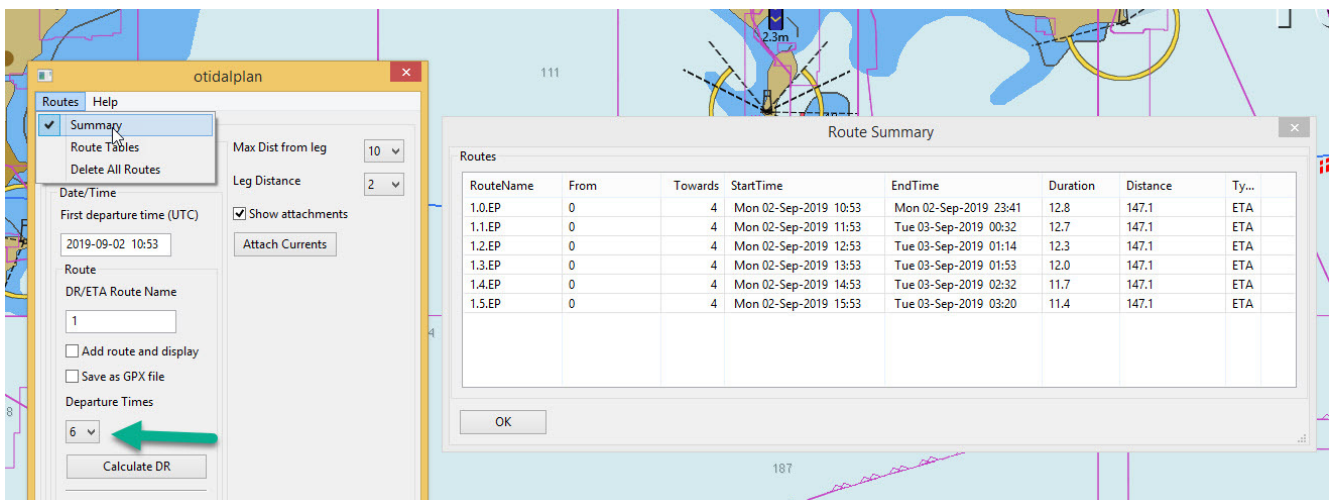
Calculation: The first route has a start time as entered in 'First departure time'. Each subsequent route is one hour later than the previous.



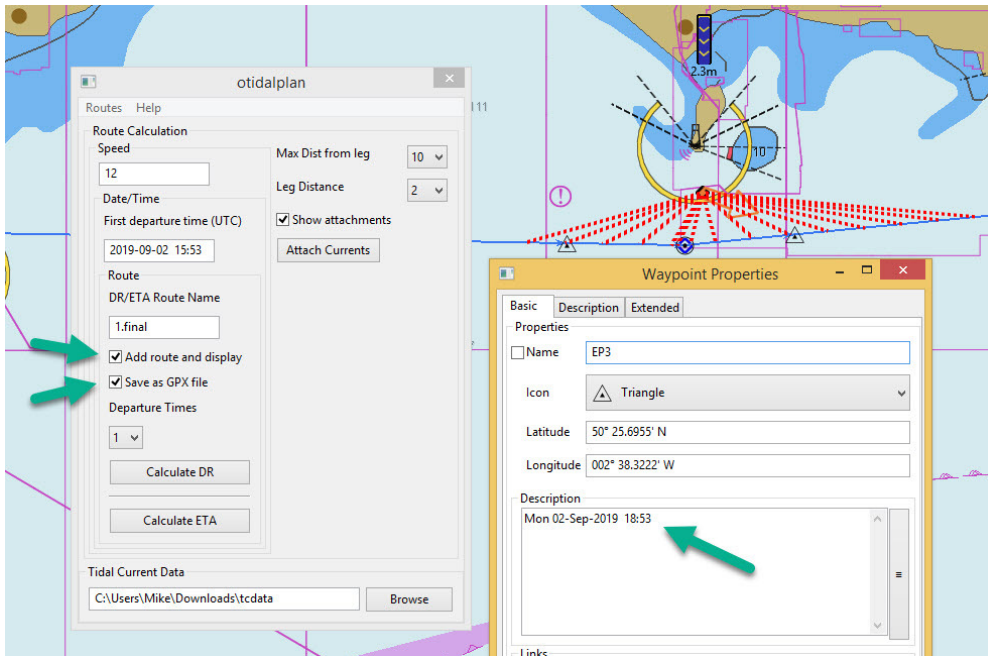
The EP routes have been made.



The 'Summary' option shows the routes with an estimate of the duration and both the start time and calculated end time.



Using the option to 'Add route and display', before pressing 'Calculate ETA' results in the EP route immediately appearing on the chart. Right-click on a waypoint shows its properties. The calculated time of arrival at that point is shown in the description.



Route table for the optimum route.

Properties

Name: 1.final.0.EP

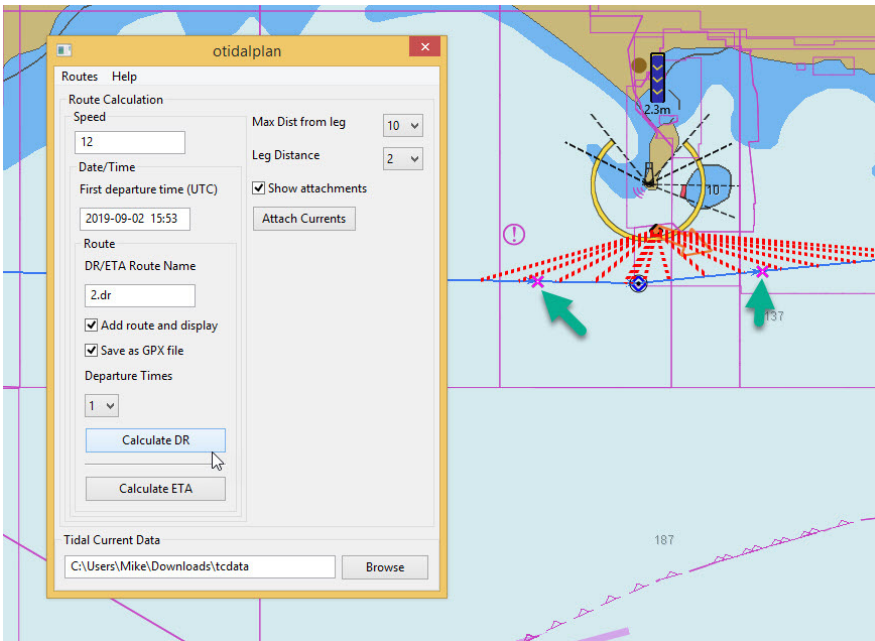
Depart From: 0 Destination: 3

Total Distance: 147.1 Plan Speed: 12 Time Enroute: 11.4 Departure Time (Y/m/d h:m): Mon 02-Sep-2019 15:53

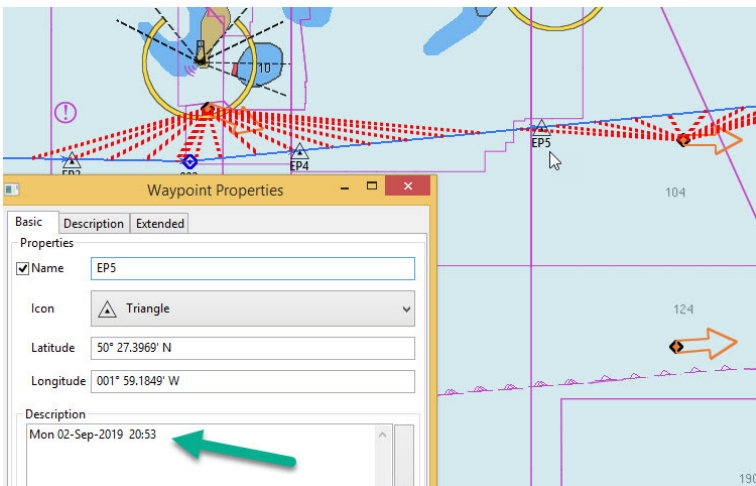
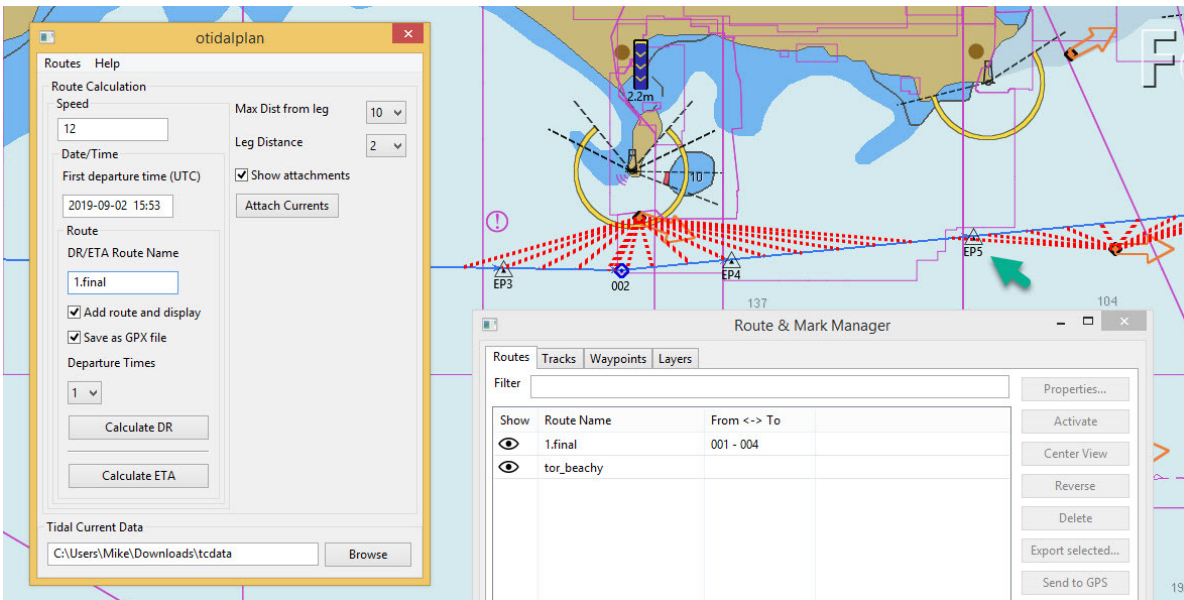
Times shown as: UTC Local @ PC LMT @ Location RouteCalculation Type: ETA

Leg	At Waypoint	Distance	Bearing	Latitude	Longitude	ETA	Speed	CTS	Tidal Set	Tidal Rate
002		6.3	084	50.4265	-2.4749	Mon 02-Sep-2019 19:23	12.2	084	110	0.2
EP4		5.9	084	50.4359	-2.3214	Mon 02-Sep-2019 19:53	12.6	083	110	0.7
EP5		12.9	084	50.4566	-1.9864	Mon 02-Sep-2019 20:53	12.7	084	090	0.7
EP6		13.2	084	50.4777	-1.6443	Mon 02-Sep-2019 21:53	13.5	084	090	1.5
EP7		14.1	084	50.5003	-1.2786	Mon 02-Sep-2019 22:53	14.4	081	100	2.6
003		2.5	080	50.5043	-1.2124	Mon 02-Sep-2019 23:02	14.4	075	100	2.6
EP8		11.8	080	50.5401	-0.9084	Mon 02-Sep-2019 23:53	14.2	076	100	2.4
EP9		13.8	080	50.5820	-0.5522	Tue 03-Sep-2019 00:53	13.5	081	070	1.6
EP10		13.2	080	50.6219	-0.2127	Tue 03-Sep-2019 01:53	12.8	080	070	0.8
EP11		12.5	080	50.6597	0.1095	Tue 03-Sep-2019 02:53	12.5	080	080	0.5
004		5.9	080	50.6775	0.2606	Tue 03-Sep-2019 03:20	12.2	----	080	0.2

If tidal currents are not available a DR route can be calculated.



With the option 'Save as GPX file' the EP route can be saved and then imported into OpenCPN. It will then show in the 'Route and Mark Manager'. The names of the EP positions are shown this time. Properties will show the ETA at the waypoint.



If there are comments on the method employed or the use of the program please post on the forum.

http://www.cruisersforum.com/forums/f134/otidalplan_pi-planning-with-tidal-current-harmonics-223225.html

Mike Rossiter

Edition 1, dated 02 Sep 2019, otidalplan_pi.html