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.

{ô}			
*•	otic	dalplan 🛛 💌	
4	Routes Help		
	Route Calculation Speed Date/Time First departure time (UTC) 2019-09-01 17:53 Route DR/ETA Route Name Add route and display Save as GPX file Departure Times 1 v Calculate DR	Max Dist from leg 3 V Leg Distance 2 V Show attachments Attach Currents	
	Calculate ETA		
TIA	Tidal Current Data		
	C:\Users\Mike\Downloads\tcdi	Browse	
			- 18 ⁻

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.

₽	/ otic	dalplan	×	111
	Joutes Help Summary Route Tables Delete All Routes Date/Time First departure time (UTC) 2019-09-02 10:53 Route DRVETA Route Name 1	Max Dist from leg Leg Distance Show attachments Attach Currents	10 ~	Tidal Routes I.O.EP Delete Route Table Chart Route Close

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.

a /												
	Name											
	T.O.EP											
<u> </u>	Depart From			Dest	ination							
	0			4								
ites Help	Total Distance	Plan Speed	Time	Enroute		Departure Time	(Y/m/d h:r	n)				
oute Calculat	147.1	12	12.8			Mon 02-Sep-2	019 10:53					
peed	Times also as											
12	Times snown as		@1	RouteCalo	ulation Type:	FTA						
Date/Time	Olic Olocal	PC OLMI	@ Location									
First departu												
2010 00 02	Waypoints											
2019-09-02				1.00	1.000	CTA.	e 1	CTS	Tidal Sat	Tidal Pata		
-	Leg At Waypoint	Distance	Bearing	Latitude	Londitude	EIA	Speed		I IUGI JEL			
Route	Leg At Waypoint	Distance	Bearing	Latitude 50.4383	-3 5536	ETA Mon 02-Sen-2	12.0	091	000	0.0		1
Route DR/ETA Ro	Leg At Waypoint 001 EP1	Distance 12.0	Bearing 091	50.4383	-3.5536 -3.2405	Mon 02-Sep-2 Mon 02-Sep-20	12.0 12.0	091 091	000	0.0	_	
Route DR/ETA Rou 1	Leg At Waypoint 001 EP1 EP2	Distance 12.0 12.0	Bearing 091 091	50.4383 50.4348 50.4314	-3.5536 -3.2405 -2.9266	Mon 02-Sep-2 Mon 02-Sep-20 Mon 02-Sep-20	12.0 12.0 12.1	091 091 091	000 000 110	0.0	-	
Route DR/ETA Rou 1	Leg At Waypoint 001 EP1 EP2 EP3	Distance 12.0 12.0 11.6	Bearing 091 091 091	50.4383 50.4348 50.4314 50.4281	-3.5536 -3.2405 -2.9266 -2.6234	Mon 02-Sep-2 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20	12.0 12.0 12.1 11.1	091 091 091 088	000 000 110 240	0.0 0.0 0.1 1.0	-	
Route DR/ETA Rou 1 Add rou	Leg At Waypoint 001 EP1 EP2 EP3 002	Distance 12.0 12.0 11.6 5.7	Bearing 091 091 091 084	Latitude 50.4383 50.4348 50.4314 50.4281 50.4265	-3.5536 -3.2405 -2.9266 -2.6234 -2.4749	Mon 02-Sep-2 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-2	12.0 12.0 12.1 11.1 10.5	091 091 091 088 081	000 000 110 240 240	0.0 0.0 0.1 1.0 1.6	-	
Route DR/ETA Rou 1 Add rou Save as (Leg At Waypoint 001 EP1 EP2 EP3 002 EP4	Distance 12.0 12.0 11.6 5.7 4.9	Bearing 091 091 091 084 084	Latitude 50.4383 50.4348 50.4314 50.4281 50.4265 50.4347	-3.5536 -3.2405 -2.9266 -2.6234 -2.4749 -2.3474	Mon 02-Sep-2 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20	12.0 12.0 12.1 11.1 10.5 10.1	091 091 091 088 081 080	000 000 110 240 240 240 240	0.0 0.0 0.1 1.0 1.6 2.1	-	
Route DR/ETA Rou 1 Add rou Save as (Departure T	Leg At Waypoint 001 EP1 EP2 EP3 002 EP4 EP5	Distance 12.0 12.0 11.6 5.7 4.9 9.8	Bearing 091 091 091 084 084 084	Latitude 50.4383 50.4348 50.4314 50.4281 50.4265 50.4347 50.4511	-3.5536 -3.2405 -2.9266 -2.6234 -2.4749 -2.3474 -2.0935	Mon 02-Sep-2 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20	Speed 12.0 12.1 11.1 10.5 10.1 9.6	091 091 091 088 081 080 079	000 000 110 240 240 240 240 240	0.0 0.0 0.1 1.0 1.6 2.1 2.6	-	
Route DR/ETA Roi 1 Add rou Save as (Departure T	Leg At Waypoint 001 EP1 EP2 EP3 002 EP4 EP5 NM001	Distance 12.0 12.0 11.6 5.7 4.9 9.8 2.3	Bearing 091 091 091 084 084 084 085	Latitude 50.4383 50.4348 50.4314 50.4281 50.4265 50.4347 50.4347 50.4511	-3.5536 -3.2405 -2.9266 -2.6234 -2.4749 -2.3474 -2.0935 -2.0336	Mon 02-Sep-2 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-2	Speed 12.0 12.1 11.1 10.5 10.1 9.6 10.6	091 091 091 088 081 080 079 084	000 000 110 240 240 240 240 240 260	0.0 0.0 0.1 1.0 1.6 2.1 2.6 1.4	-	
Route DR/ETA Roo 1 Add rou Save as (Departure T 1 v	Leg At Waypoint 001 EP1 EP2 EP3 002 EP4 EP5 NM001 EP6 P76	Distance 12.0 12.0 11.6 5.7 4.9 9.8 2.3 7.8	Bearing 091 091 091 084 084 084 084 085 085	Latitude 50.4383 50.4348 50.4314 50.4281 50.4265 50.4347 50.4551 50.4550 50.4672	-3.5536 -3.2405 -2.9266 -2.6234 -2.4749 -2.3474 -2.0935 -2.0336 -1.8298	ETA Mon 02-Sep-2 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20	Speed 12.0 12.1 11.1 10.5 10.1 9.6 10.6 10.1	091 091 091 088 081 080 079 084 084	000 000 110 240 240 240 240 240 260 260	1.00 Autor 0.0 0.0 0.1 1.0 1.6 2.1 2.6 1.4 1.9	-	
Route DR/ETA Roi 1 Add rou Save as (Departure T 1 v	Leg At Waypoint 001 EP1 EP2 EP3 002 EP4 EP5 NM001 EP6 EP7	Distance 12.0 12.0 11.6 5.7 4.9 9.8 2.3 7.8 10.0	Bearing 091 091 091 084 084 084 084 085 085 085	Latitude 50.4383 50.4348 50.4314 50.4281 50.4265 50.4347 50.4550 50.4550 50.4672 50.4829	-3.5536 -3.2405 -2.9266 -2.6234 -2.4749 -2.3474 -2.0935 -2.0336 -1.8298 -1.5690	ETA Mon 02-Sep-2 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20 Mon 02-Sep-20	Speed 12.0 12.1 11.1 10.5 10.1 9.6 10.6 10.1 10.0	091 091 091 088 081 080 079 084 084 084	1021 Sec 000 000 110 240 240 240 240 240 260 260 260 260	1.00 Automatical A	-	

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

-	D oti	dalplan	×		F
	Routes Help Summary Route Tables Delet Al Routes Date/Time First departure time (UTC) 2019-09-02 10:53 Route	Max Dist from leg Leg Distance Show attachments Attach Currents	10 v 2 v		}
8	DR/ETA Route Name Add route and display Add route and display Save as GPX file Departure Times			Routes	

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 it's properties. The calculated time of arrival at that point is shown in the description.

Routes Help	otidalplan	× 11	23m	
Route Calcula Speed 12 Date/Time First depart 2019-09-02 Route	Max Dist from leg Leg Distance ure time (UTC) 2 15:53	10 ~ 2 ~	U Waypoint Prope	rties - • ×
DR/ETA Ro 1.final Cald rou Save as Departure 1 ~ Cald	ute Name ste and display GPX file Times	Easic Prop N. Ic. La Lc	Description Extended erties EP3 im <u>A</u> Triangle ititude 50° 25.6955' N ngitude 002° 38.3222' W	
Calc Tidal Current D C:\Users\Mike	ulate ETA Data e\Downloads\tcdata B	rowse	n 02-Sep-2019 18:53	

Route table for the optimum route.

ivame											
1.fina	al.O.EP										
Depa	rt From			Dest	ination						
0				3							
			_	-							
Total	Distance P	lan Speed	Time	Enroute		Departure Time (Y/m/d h:	n)				
147.	•	12	11.4			Mon 02-Sep-2019 15:53					
Time	as shown as										
		с. Онит.		RouteCalc	ulation Type	FTΔ					
•••			@ Location	noutcourt	and the type						
Waypo	ints	Distance	Passian	1 ations in	Langeltude	ETA.	Canad	CTE	Tidal Cat	Tidel Date	
Ley	002	63	084	50.4265	-2 //7/0	Mon 02-Sen-2010 10-23	12.2	084	110	0.2	
	FP4	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	
	005	11.0	080	50.5401	-0.9084	Mon 02-Sep-2019 23:53	14.2	076	100	2.4	
	EP8	11.0				Tue 03-Sen-2019 00:53	13.5	081	070	1.6	
	EP8 EP9	13.8	080	50.5820	-0.5522	1 de 05 5ep 2015 00.55	-				
	EP8 EP9 EP10	13.8	080 080	50.5820 50.6219	-0.5522 -0.2127	Tue 03-Sep-2019 01:53	12.8	080	070	0.8	
	EP8 EP9 EP10 EP11	13.8 13.2 12.5	080 080 080	50.5820 50.6219 50.6597	-0.5522 -0.2127 0.1095	Tue 03-Sep-2019 01:53 Tue 03-Sep-2019 02:53	12.8	080 080	070 080	0.8	
	EP8 EP9 EP10 EP11 004	13.8 13.2 12.5 5.9	080 080 080 080	50.5820 50.6219 50.6597 50.6775	-0.5522 -0.2127 0.1095 0.2606	Tue 03-Sep-2019 01:53 Tue 03-Sep-2019 02:53 Tue 03-Sep-2019 03:20	12.8 12.5 12.2	080	070 080 080	0.8 0.5 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