

Starfix.MSS

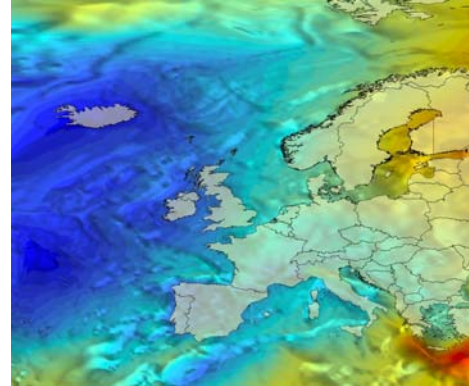
Background Theory

Starfix.MSS (Mean Sea Surface) computes real-time Observed Tides based on ellipsoidal height input from Starfix.HP and SkyFix-XP.

A geoid/MSS model is used as reference for the tides calculations.

A Mean Sea Surface corresponds to the permanent sea level relative to a reference ellipsoid, as measured by satellite altimetry. The MSS contains the marine geoid undulations (± 120 meters) plus the permanent sea level elevation (1-2 meters). This sea elevation is mainly caused by ocean circulation.

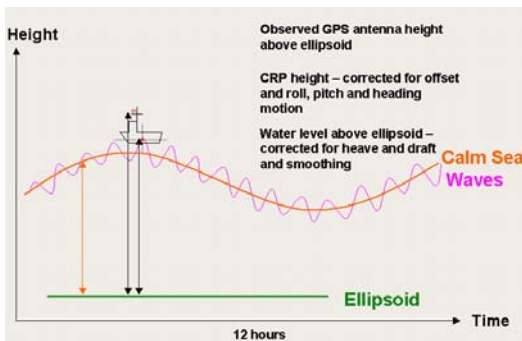
Starfix.HP and SkyFix-XP have proven to give very accurate height observations with 95% reliability percentage for the vertical accuracies of around 20 cm. Investigations have shown that Starfix.HP and SkyFix-XP systems are well suited for tides observation.



Starfix.MSS uses the GSFC.00 MSS model which has global coverage. Here shown for Europe

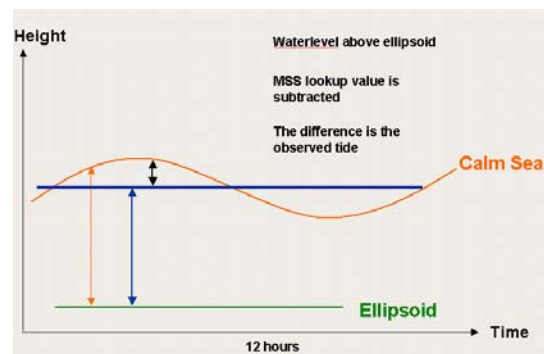
The basics of real-time observed tide calculation

The HP/XP antenna position is reduced to vessel reference point by correcting for offsets and for pitch, roll and heading. This position is then heave and draft corrected to give height of calm sea above the ellipsoid.



The difference between this height and the MSS lookup value is the observed tide and the advantages of MSS derived observed tides are:

- Observed tide is in general more accurate than predicted tide.
- The MSS gives a repeatable reference well suited for seabed subsidence studies.
- Depths related to MSS looks normal compared to using the ellipsoid as datum.



Observed tide

MSS Quality

Using a MSS model is a better approximation to local MSL than using a geoid. The accuracy of the MSS is very good in open, deeper waters (centimeter level), but it gets less accurate close to shore water depth less than 10 m.

Starfix.MssLogging

This is the online software of Starfix.MSS. This program computes and logs instantaneous values of the tide, as well as all sensor data and intermediate results.

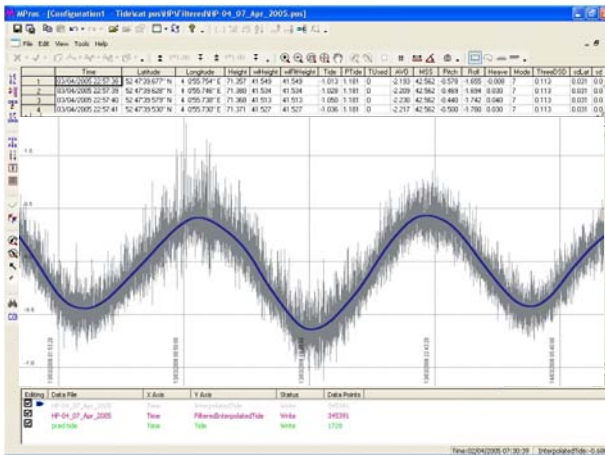
The values required to compute the tide are: antenna position and the **MSS lookup value**. Draft, antenna offsets and motion data can also be applied.



Starfix.Proc

Starfix.Proc is a post processing software that is used for final processing of the tide results. Starfix.Proc provides a fully graphical interface to the data. Gaps, spikes and other artifacts found in the real time data may be manually corrected before final filtering. Final filtering of the data is achieved by use of a frequency domain based FIR (Finite Impulse Response) filter.

This filter is tuned so that high frequency noise such as that caused by waves and swell is suppressed while the low frequency alterations caused by the tide are enhanced.



Frequency domain based filtering in Starfix.Proc