

The Applications Team can provide a wide range of parameters relating to sea-levels and currents, both tidal and non-tidal (surges). Here is a summary of data available from the POL hydrodynamic models. However, if there is something that is required that is not here, please contact us as we still may be able to help you.

All models can be provided for use in our POLPRED for Windows software and our Hydro-DLL (dynamic link library) for integration into your own Windows software.

All data is supplied under licence which we will ask you to sign before any data is provided.

### Definitions

- Tide:** The movement of water based purely on astronomical phenomena (i.e. no meteorological effects). Predictable for any period, future or hindcast
- Surge:** The movement of water based on meteorological effects such as atmospheric pressure, winds etc (only available as hindcast, not predictive).
- Total level:** The level of the water taking into account the tide and the surge (only available as hindcast, not predictive).
- Co-ordinates:** The latitude/longitude co-ordinates used in POL models are geographic co-ordinates and not geodetic (eg Not ED50, WGS84 etc).
- Datum:** The reference datum is either an 'undisturbed sea surface parallel to the geoid' which we approximate to Mean Sea Level or Lowest Astronomical Tide (LAT).
- Components:** Currents are sometimes given with the speed and direction resolved into east-going (u) and north-going (v) components.

### Data available from POL Models

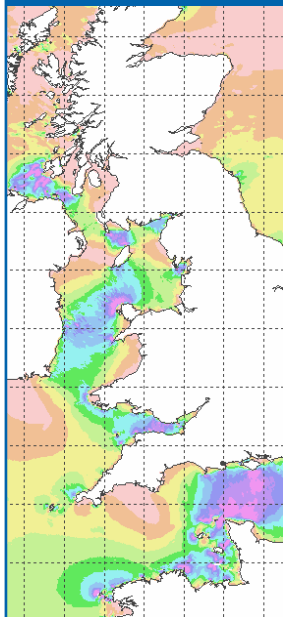
#### **One year of hourly tidal elevation, current speed and direction hindcast or forecast**

All models have depth-averaged currents except the CS3-3D models which have currents at different depth levels. The depth (sigma) levels available for the CS3-3D model are 0% (surface), 25%, 50% (mid-depth), 75%, 90% and 100% (bottom). The POL High Resolution Continental Shelf Model (CS20) has current data available at 32 different depth levels through the water column.

Although hourly data is our standard time interval, other intervals are available.

#### **Tidal Regime statistics**

Statistics available are Highest Astronomical Tide (HAT), Lowest Astronomical Tide (LAT), Tide Type, MHWS, MHWN, MLWN, MLWS, Maximum/Minimum Current Speed/Direction, Current Ellipse Eccentricity.



### **Elevation and current components**

Harmonic constants for the amplitude and phase for elevation and currents in component form.

### **High and Low Water Times & Heights**

### **Averaged spring/neap currents in 'tidal diamond' format**

A tidal diamond is a way of describing the average tidal current conditions for a location by referencing them to the time of high water (either at the same location or at a remote location). Each diamond gives the average current speed and direction over a complete tidal cycle from six hours before the time of high water to six hours after. Usually two sets of values are given – one for spring tides and another for neap tides.

### **Reference**

Bell, C. and L. Carlin (1998). "Generation of UK tidal stream atlases from regularly gridded hydrodynamic modelled data." *Journal of Navigation*, 51(1): 71-78.

### **Other data available from the CS3 model**

#### **Hindcast of hourly level and current simulations from the POL CS3 Model are available for total and surge residuals for the years 1992 onwards**

The model makes use of meteorological data from the UK Met. Office Operational Storm Surge Local Area Model (1992 to 1998) and the Mesoscale model (1999 onwards). The data being hindcast using a combination of measured and modelled meteorological data.

### **Other data available from the CSX and CSM models**

#### **Hourly level and current simulations hindcast for the years 1955 onwards are available for total, surge only and tide only**

The model makes use of meteorological data supplied by the Norwegian Meteorological Institute. Note that the model does not include baroclinic effects.

#### **Estimates of extreme surge levels OR total water levels with return period 2, 5, 10, 20, 50, 100, 200, 500 and 1000 years**

These estimates are derived from surge levels OR total (tide+surge) water levels hindcast by the POL CSX Continental Shelf Model for the 40 year period 1955-1994

#### **Estimates of extreme tide / surge and total still water levels and depth-mean currents . Report on 50 year return period of extreme surge currents**

This data set has estimates of extreme surge currents, albeit only the 50 year return period.