

# The NOC Hydro-DLL

## What is the Hydro-DLL?

The NOC Hydro-DLL, as it is often abbreviated, is a Microsoft Windows based Dynamic Link Library for computing tidal levels and currents for offshore locations. The product is aimed at software developers rather than end users – i.e. the functionality of the DLL can only be accessed through other software as it has no user-interface of its own. It effectively provides a black box where you can find out the tidal elevation as well as the current speed and direction for any specified latitude and longitude (within the domain of the model) and for any date and time (within the licensed period). To the software developer, it means that they can incorporate the ability to compute tidal levels and currents into their projects without having to understand any of the mathematics involved.

## How does it work?

The DLL is supplied with a large database of harmonic constants which can be used to compute tidal levels and currents at any point in time (future or past). The harmonic constants are derived from powerful ocean models which are run on the supercomputing facilities at the National Oceanography Centre.

For more information on tides, harmonics and ocean models, see the section later in this document entitled “Useful Additional Information”.

## How can I use this in my software?

The DLL is available in two ways:

- Royalty agreement
- One-off payment

### Royalty agreements

If you want to incorporate the Hydro-DLL into a product which you intend to sell commercially, then you should have a royalty agreement with us. This allows you to redistribute the Hydro-DLL and associated data sets along with your software.

In January each year, we require a statement from your company indicating the total number of unit sales made in the previous calendar year, and we will then invoice you for the amount set out in the royalty agreement pricing schedule. A draft copy of an agreement is available on request.

Many of the NOC tidal models cover very large areas, and therefore we have divided these models into smaller areas which you can offer individually to your customers.

### One-off payments

If you want to use the Hydro-DLL in software that will only be used within your organisation, then you can buy it for a single payment. The cost of this is dependent on the size of the area required and the time period for which you require the DLL to be able to compute. For example if you select January to December 2015 as the time period, you will be able to use the DLL at any time, however it will only return results when you ask for levels and currents within that date range.

We can provide a quote on request – just let us know your area and time period of interest.

You will also receive a copy of our POLPRED software – this is an interactive package so that you can choose to use either your own software with the Hydro-DLL, or our POLPRED software which provides you with a full graphical interface to the DLL. The POLPRED software is also available without the Hydro-DLL option.

### Using the DLL – a technical look

The DLL is provided with:

- one data file per hydrodynamic model
- royalty clients: one licence file for each region the model is split up into
- one-off payment clients: one licence file for your required location and time period

For example if you have a royalty agreement to provide our CS3 model with the nine standard areas, you will have, in addition to the DLL, one data files and 9 licence files.

The **Data Files** contain the harmonic constants for every grid cell in the model. The number of constants can vary from model to model, however there will be the same number for each cell within a model.

The **Licence Files** are used to restrict the area and period of time for which the DLL will allow the application to make predictions. Even though the constants may be in the data file, the DLL will not predict unless the licence file gives

permission to. To use the DLL you must first call the *SetHarmonicsFile* function to select the data file and the licence file you wish to use. You must be careful to pair the correct licence file to the model. If this returns successfully (check the return value), you will be able to call the other functions within the DLL to obtain the tidal streams and elevations within the area specified in the licence file. If you need to move into another area, you must call *SetHarmonicsFile* again with a different licence file.

Once you have successfully called the *SetHarmonicsFile* function, you can then access the other functions in the DLL – the main ones being:

**DoPrediction()** : Computes the level and current speed/direction

for one location for a single point in time.

**DoSeriesPrediction()** : Computes time series of levels and currents for one location for the specified time period.

### Implementing the DLL in your software

As mentioned above, the DLL supplied under a royalty agreement usually comes with standard areas, however you may wish to implement additional restrictions on areas within your software or make the switching between model areas appear transparent to the end-user (assuming they have purchased multiple areas). This is perfectly acceptable provided the end-user has purchased the appropriate

licenses and the NOC will receive the associated royalty.

Note that the data files are quite large (ranging from 6MB to 550MB depending on the model) however the licence files are very small (<100 bytes) and can be e-mailed to end-users if additional ones are purchased.

In January each year we require a statement from your company indicating the total number of unit sales made in the previous calendar year, and this will govern the amount we invoice you for. The more units that you sell, the more the unit cost is discounted (see draft agreement which is available on request).

## Standard DLL Regions

