CTC Data Generation Model (DGM)
Installation and Operating Procedures

Li Ding
Vitech Innovative Research and Consulting

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1. Installation

Follow the following steps to get started:

1. The program was developed using Visual Basic 2015. It requires MS .net framework 4.5.2 installed on the target machine. If the program does not start due to lack of the required framework, go to Microsoft's web site and search for download.
2. Unzip the release file (CTC_Release_x86.zip) to a separate folder.
3. This program also requires the 2013 Access Runtime, which may not available on all machines. Go to the subfolder 'Redistributable', and double-click on 'AccessRuntime_x86_en-us.exe', and installation will start. (The Access Runtime can be downloaded from http://www.microsoft.com/en-us/download/details.aspx?id=39358).
4. In most cases, the x86 version is good, and should be tried first However, if you happen to have a 64bit Microsoft Office installed on your machine, use the x64 file.
5. Go to the release folder and double-click CTCSimulatorApp.exe to start the program.
6. The database file is located in the folder 'AppData'. Do not modify these files.
7. There is another subfolder, 'DGMInputFiles', for DGM input files, which can be used as examples.

2. User Interface and Procedures

Figure 1 below is the main interface when the program starts up. The user simply clicks one of the buttons to start a module. For example, click DGM to start the DGM module (see Fig. 2), and click on SM to start the SM module (see Fig. 4). Click DB to create and edit the data in the database (see Fig. 5). The graph module is for preview of catch data, but is not officially released, and needs further development. Click 'Help' to bring up this document in PDF.

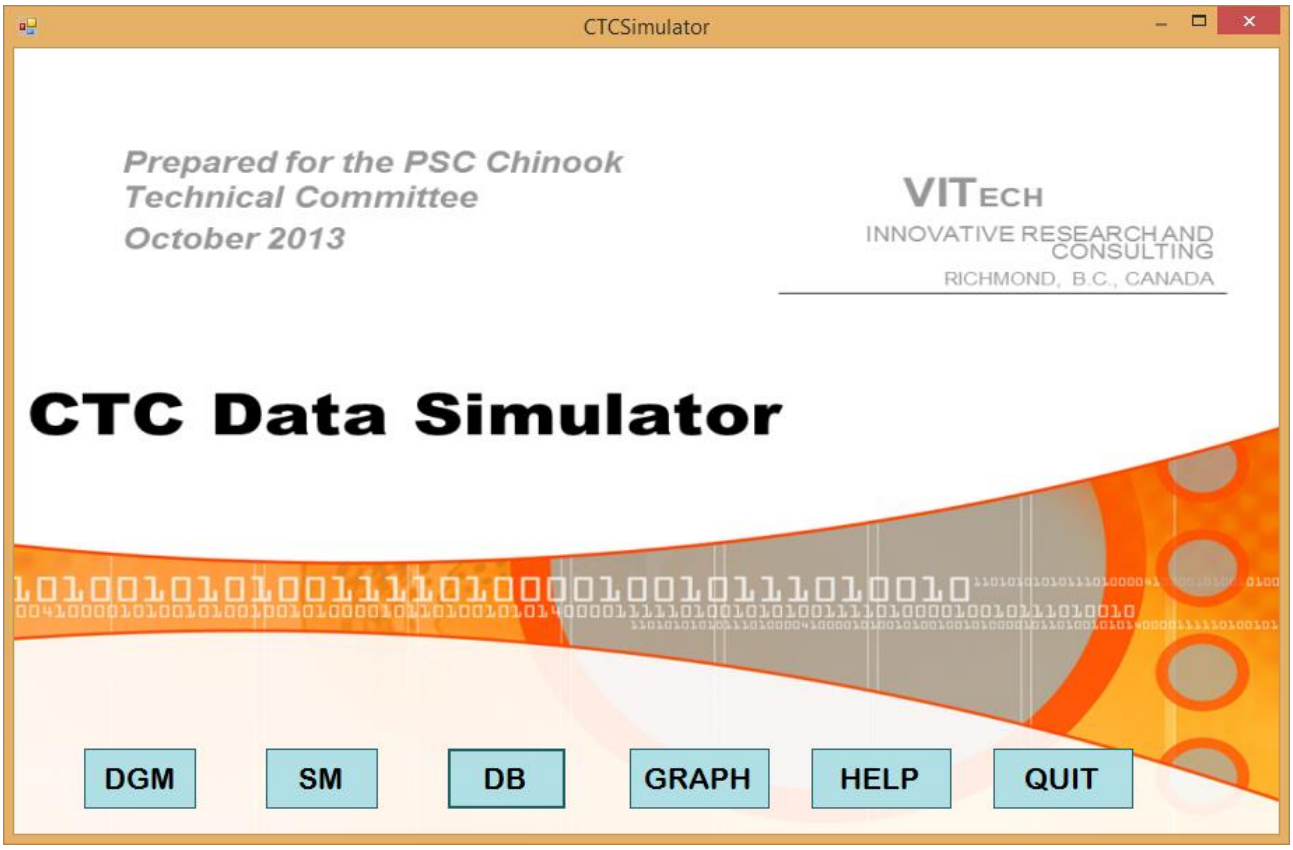

Figure 1: Main Interface

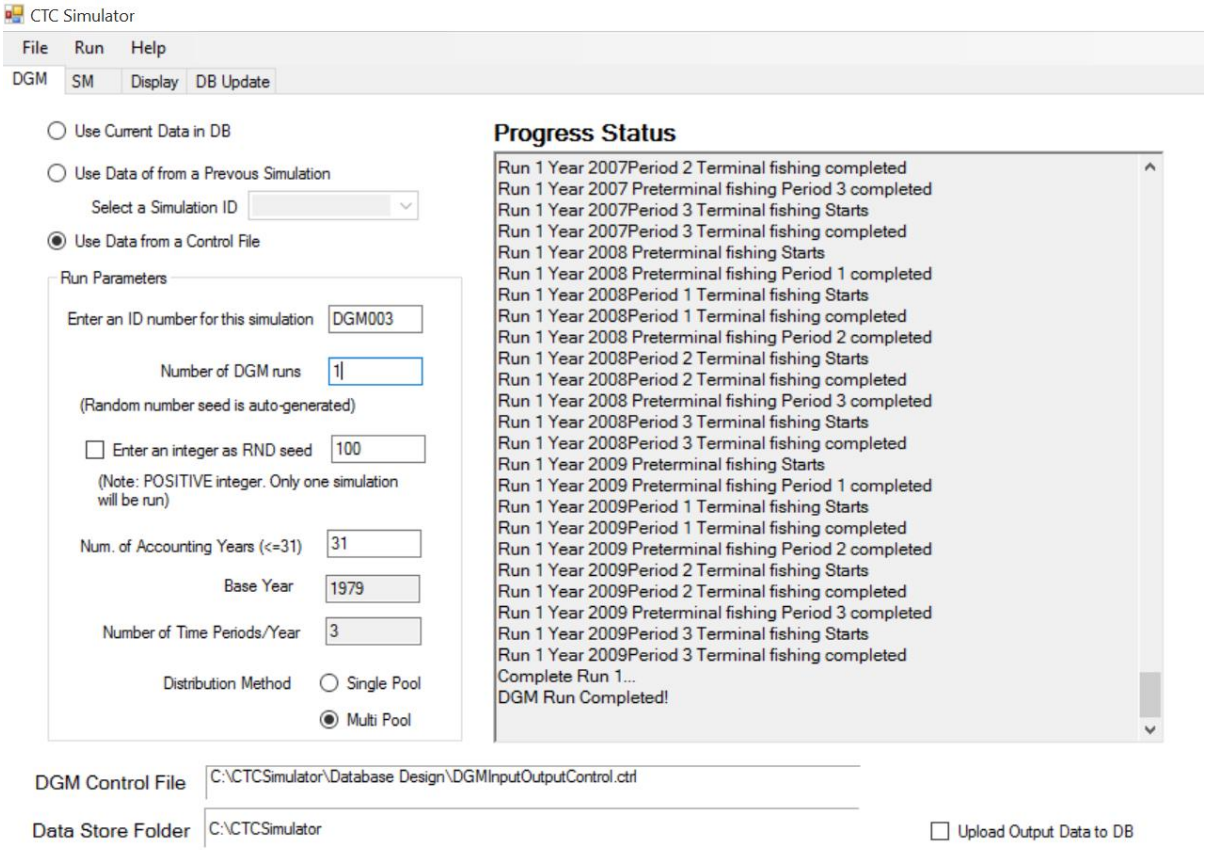

Figure 2: DGM Module Interface

3. Data Generation Model (DGM)

We start from this module for a simulation. As shown in Fig. 2, the user has three options to provide input data to DGM: 1) the input data currently in the database (DB); 2) data used in a previous simulation, or 3) data identified by a control file in a different location. Specific procedures are as follows:

- A default data store folder is provided in the textbox. However, the user can select a different folder from File Menu.
- The user selects an option of providing input data to DGM, and enters a simulation ID. The system will save the input data to a folder (under the selected data store) identified by the simulation ID. The folder path and other run parameters (shown on GUI) are saved to the database. The user may use the same simulation ID but with different run parameters. In this case, only the run parameters are updated.
    - If the user selects ‘Use current data in DB’, then the input data is pulled from the DB and saved to the target folder.

- If the user selects ‘Use data from a previous simulation run’, the input data is loaded from the folder associated with the simulation ID. The run parameters are pulled from the DB and shown on GUI. A control file is also generated for this simulation and saved as shown in the ‘DGM Control File’ textbox. Note that if the user starts a new DGM run, the output data will be saved to the currently selected data store folder, which may be different from the previous one. The new data store folder will be updated to the database, even though the simulation ID is still the same.

- If the user selects ‘Use Data from a Control File’, then the user needs to provide a control by using File→Load DGM control file. The system will load the data files specified in the control file.

- Enter the number of simulation to run. For each run, the random number seeds used to generate random numbers is automatically generated. If the user checks ‘Enter an integer as RND seed’, then this number will be used in the current run (only one simulation run will be generated.

- Select the number of accounting years. The base year is set at 1979 and the number time periods per year is set at 3.

- Select the distribution method.

- If the user wants to provide specific AI to TAC conversion as a lookup table (see technical report), go to File→Load AABM TAC Lookup Table.

- Go to Run→Start generating DGM data. When DMG starts, messages will be printed onto the Progress Status box. When DGM is completed, the output data are saved to the same folder where the input data are located. See Fig. 3 below. If the checkbox, ‘Upload output data to DB’, is checked, the system will upload the DGM output data from the current simulation run to the database, in the same structure as in the output files.

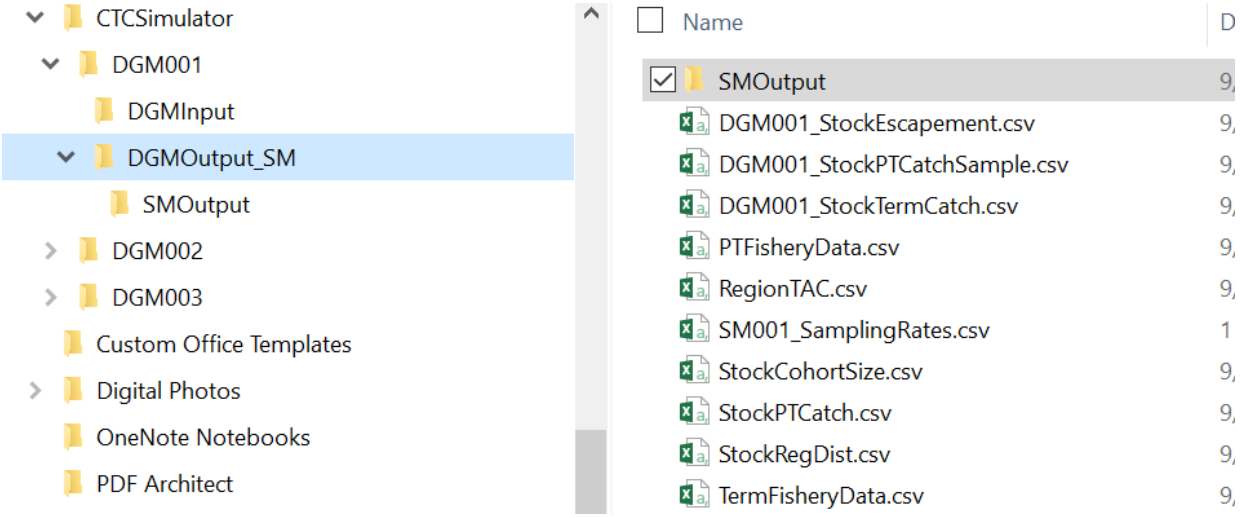

Figure 3: File organization structure of input/output data files for DGM/SM

4. Sampling Module (SM)

After DGM is completed, the user can proceed to run the SM module. Click on the 'SM' tab, the interface will be as shown in Fig. 4. The user has to select a DGM ID (i.e. use the DGM data associated with the ID), and enter an SM ID and the number of SM runs. Then the user loads a sampling rate data file from the File menu, and starts an SM run from the Run menu, on preterminal catches, terminal catch, or escapements. When the user starts an SM run, the system will retrieve the project folder path from the database using the DGM ID, and loads the DGM output files in the project folder *as the input data of SM*. So the DGM output folder is also the SM run folder, and the sampling rate data file is copied to this folder, with the SM Run ID as the prefix of the file name. The SM output data will also be stored in a subfolder **SMOutput**, as shown in Fig. 3.

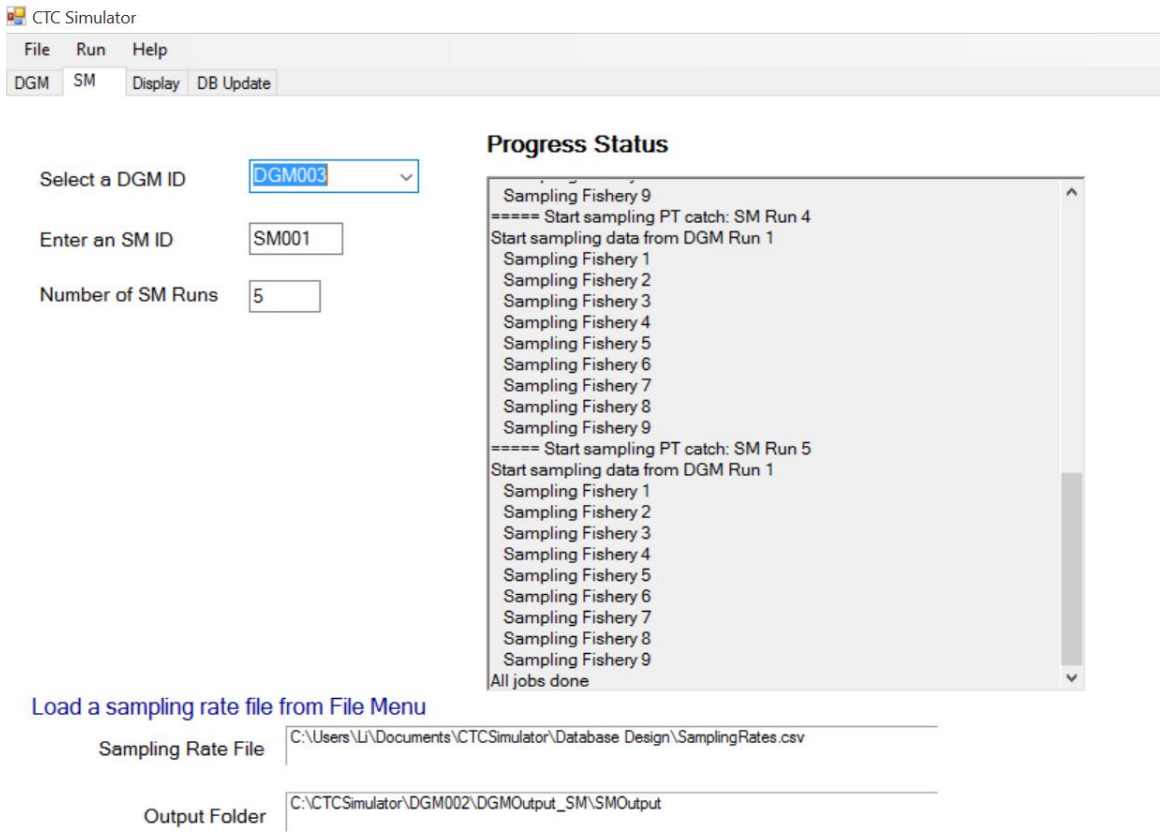

Figure 4: User input interface for Sampling Module

5. Database Update

The following figure (Fig. 5) shows the main interface for input data entry and update. Note that there are two options for data input: direct input from a control file (which points to individual data files), and manual entry by the user. As can be seen, the left side is for direct update and the right side for manual entry.

In the first option, there are two ways to provide a control file: 1). Go to File→Load DGM control file; 2) Click on 'Show Projects', and a list of previously run projects will show up in a window (Fig. 6). Select one Project ID, and click 'Select', and the control file path will be shown in the DB update interface (Fig. 5). Then click on 'Update DB', and the update will automatically start and progress messages will be shown in the box below. The user will be able to edit the control file to decide which file contains data that need to be added (or updated) to the database. This function allows the user to avoid having to enter data manually. This is particularly useful for loading a large amount of data such as single/multi pool distribution coefficients, which are too labor intensive for manual entry.

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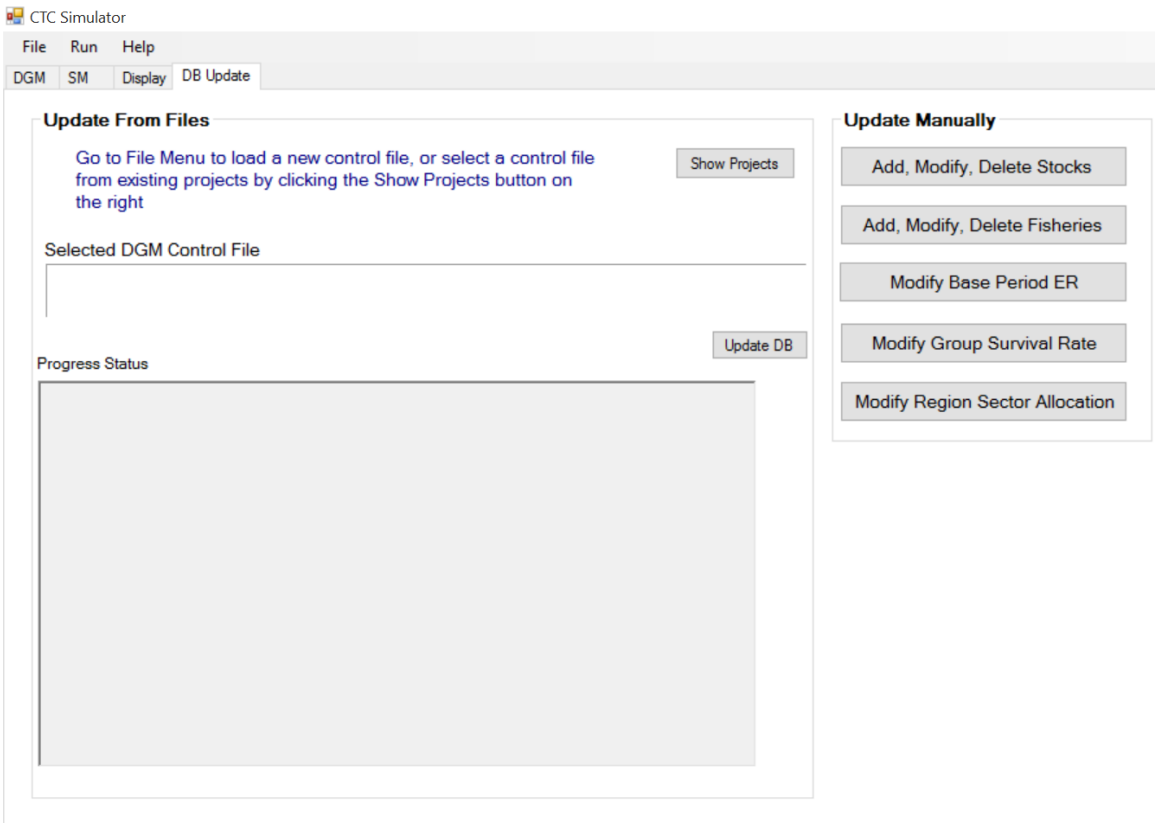

Figure 5: Database Update Module

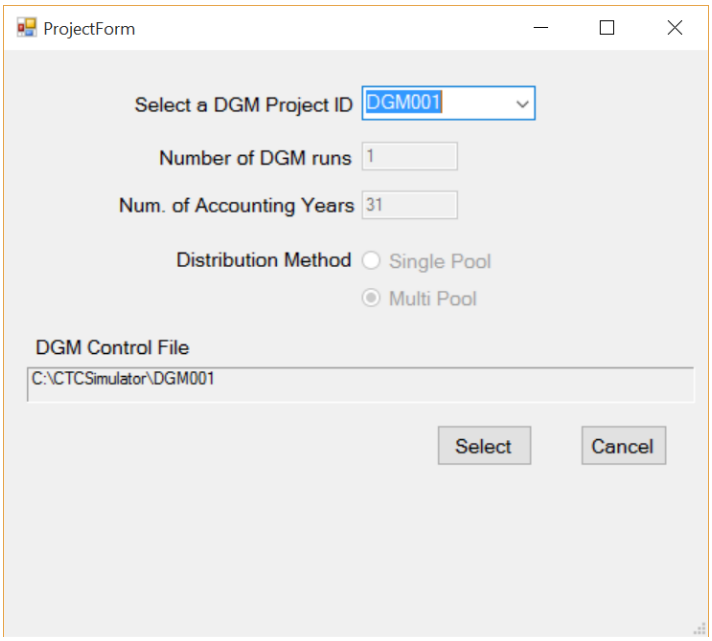

Figure 6: Project Selection

In the second option, the user can edit data via the interface. Specifically, the user can add, delete or modify a stock (or fishery) and its related data, without having to modify the data files listed in the control file. For example, if the user clicks ‘Add, Modify, Delete Stocks’, the following window shows up (Fig. 7). It shows the basic data associated with the currently selected stock ID. If another Stock ID is selected, its data will be shown accordingly. The user may modify the data fields in this interface, and click ‘Enter’ to save the changes.

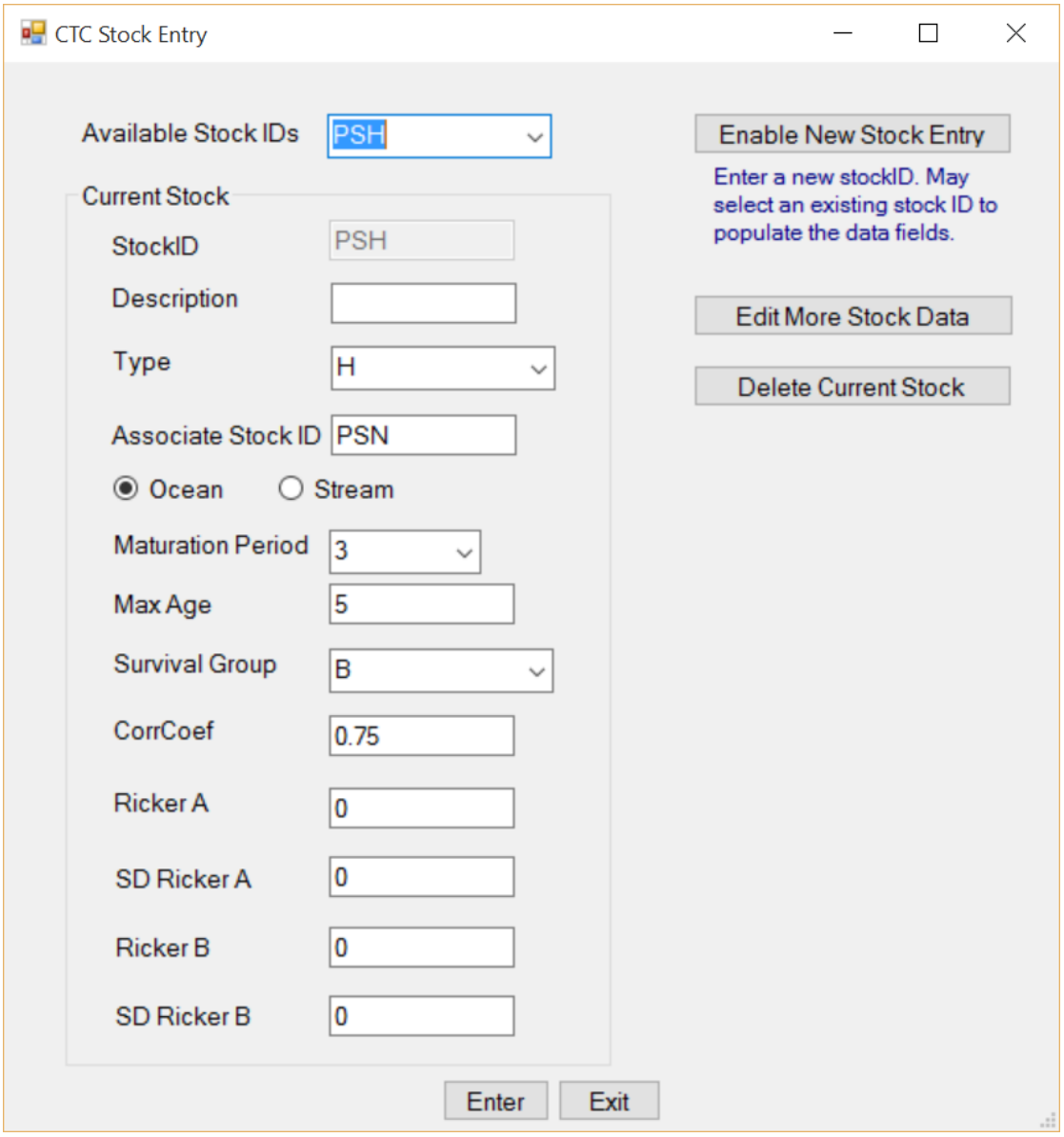

Figure 7: Stock Entry Interface

Click on 'Edit more stock properties' (Fig. 8) and you will see the following, where different properties of a stock can be edited separately.

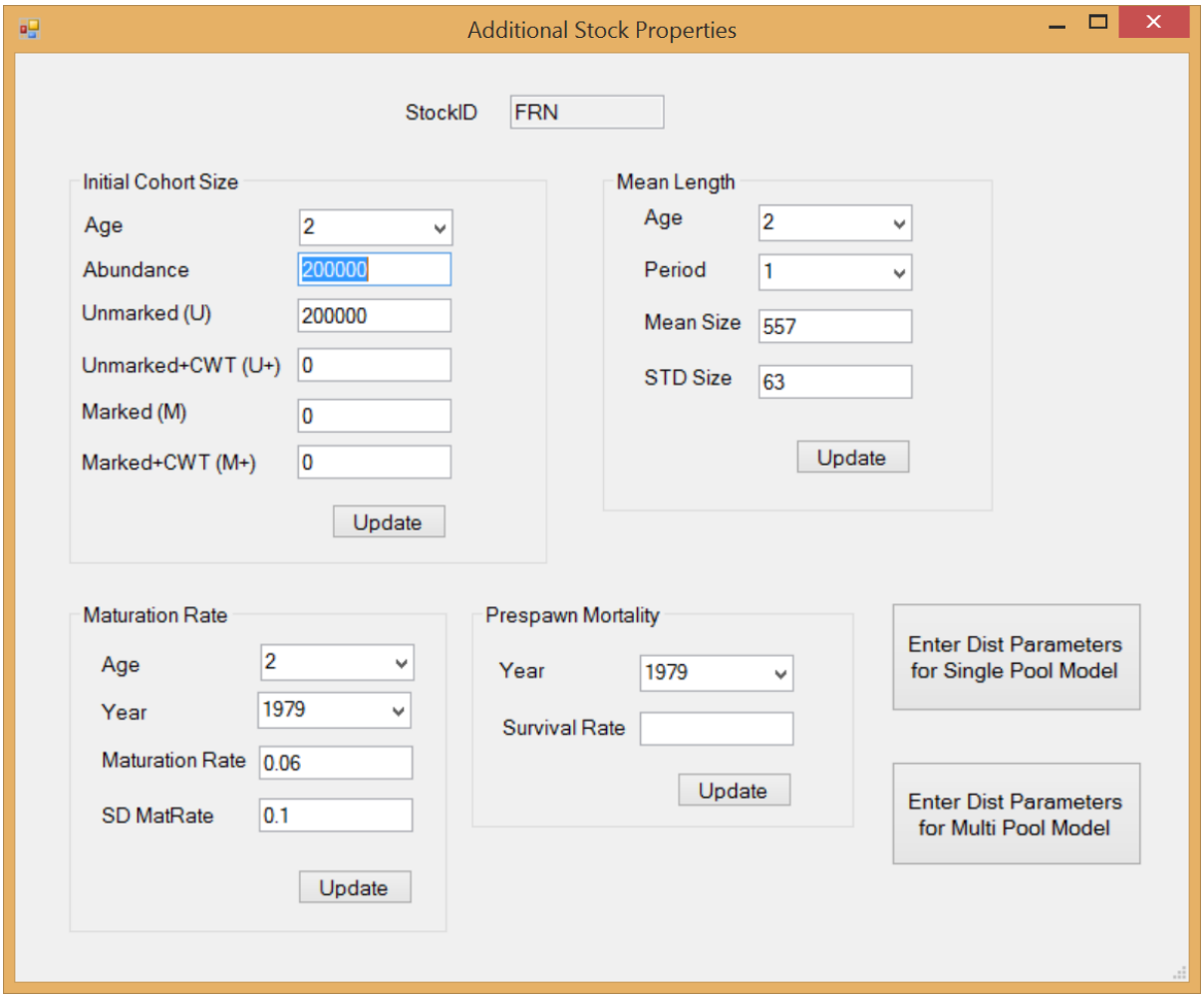

Figure 8: Additional stock properties

If the user clicks on ‘Enable New Stock Entry’, in Fig. 7, the interface will become Fig. 9. As shown in Fig. 9, the user is required to enter a new stock ID with other data fields. The user can select an existing stock ID, and its associated data will populate the fields below. After editing as needed, click ‘Enter’ and this creates a stock in the database. If it is created successfully, a message will pop up and then the interface will close. The user may enter more data for this stock later, by reopening the stock entry interface.

Click on ‘Delete Current Stock’ in Fig.7 will delete the selected stock from the database. This includes all data associated with this stock. The interface will close after successful operation.

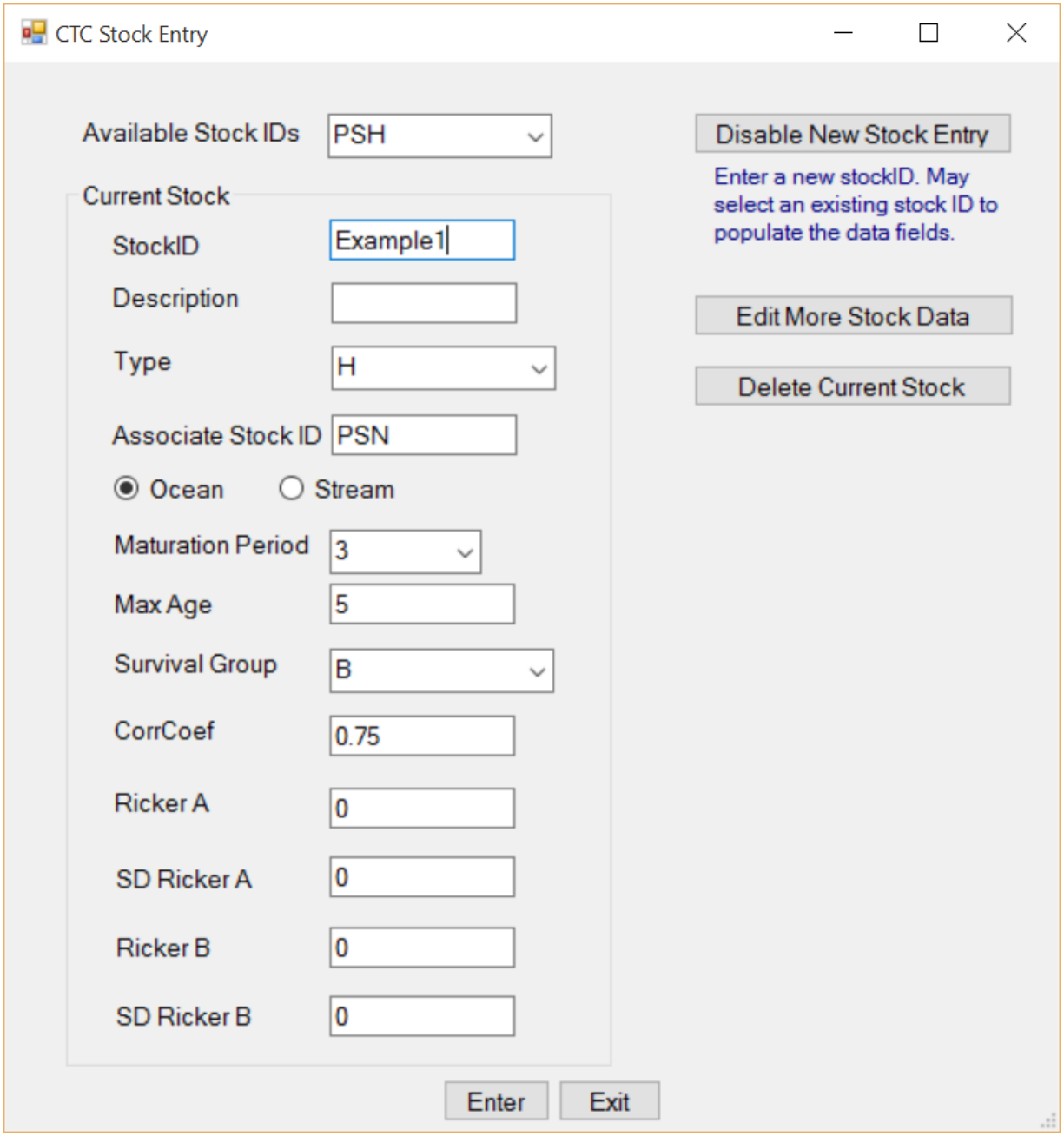

Figure 9: Fishery Entry Interface after the 'Enable New Stock Entry' is clicked.

Similarly, click on 'Add, Modify, Delete Fisheries', and the following interface (Fig. 10) will show up:

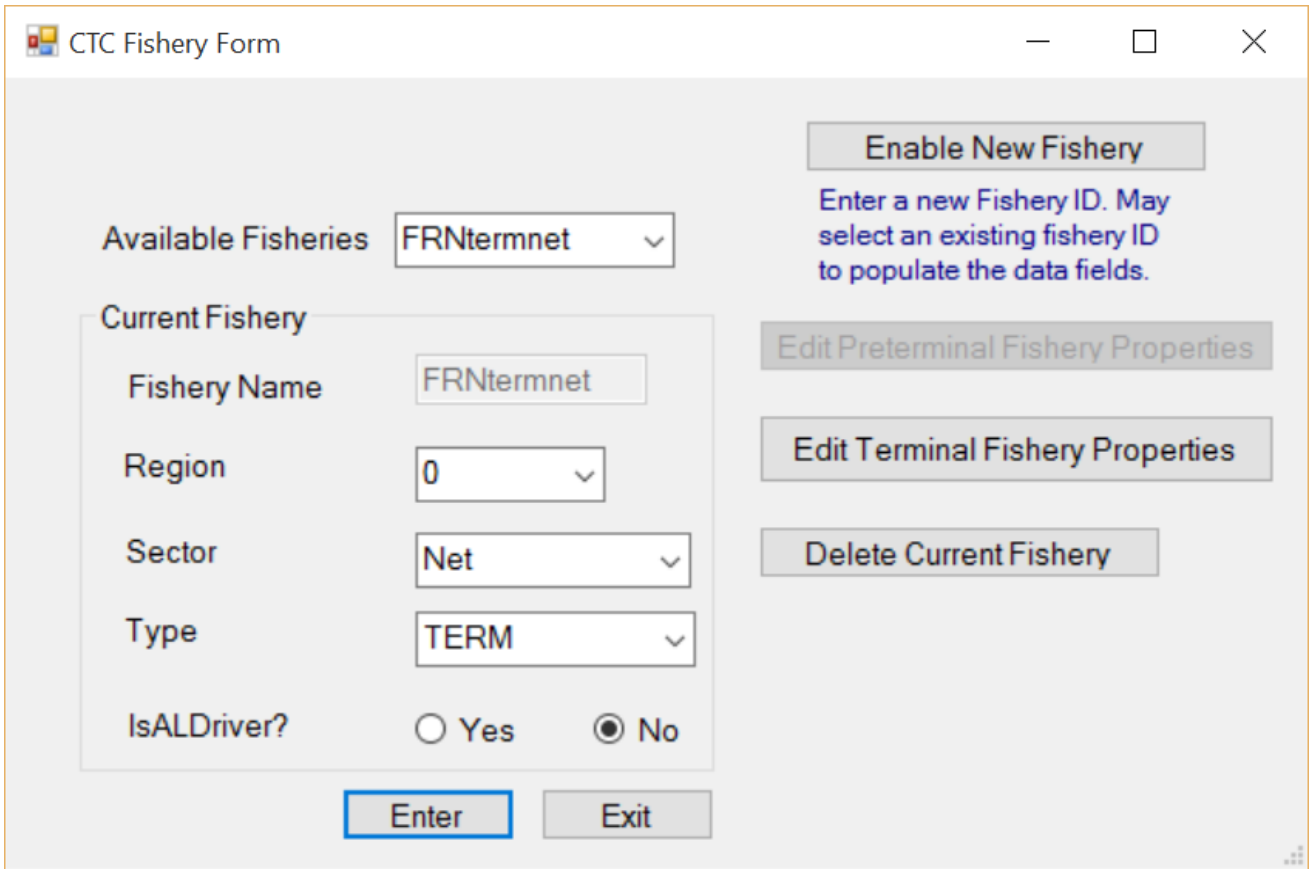

Figure 10: Fishery Entry Interface

If a terminal fishery is selected, the button, 'Edit Terminal Fishery Properties' (in Fig. 10), will be enabled. Otherwise, the button, 'Edit Preterminal Fishery Properties', will be enabled. The following two interfaces are for preterminal (Fig. 11a) and terminal fisheries (Fig. 11b), respectively. Addition and deletion of a fishery is the same as described in the procedures for Stock Addition and Deletion.

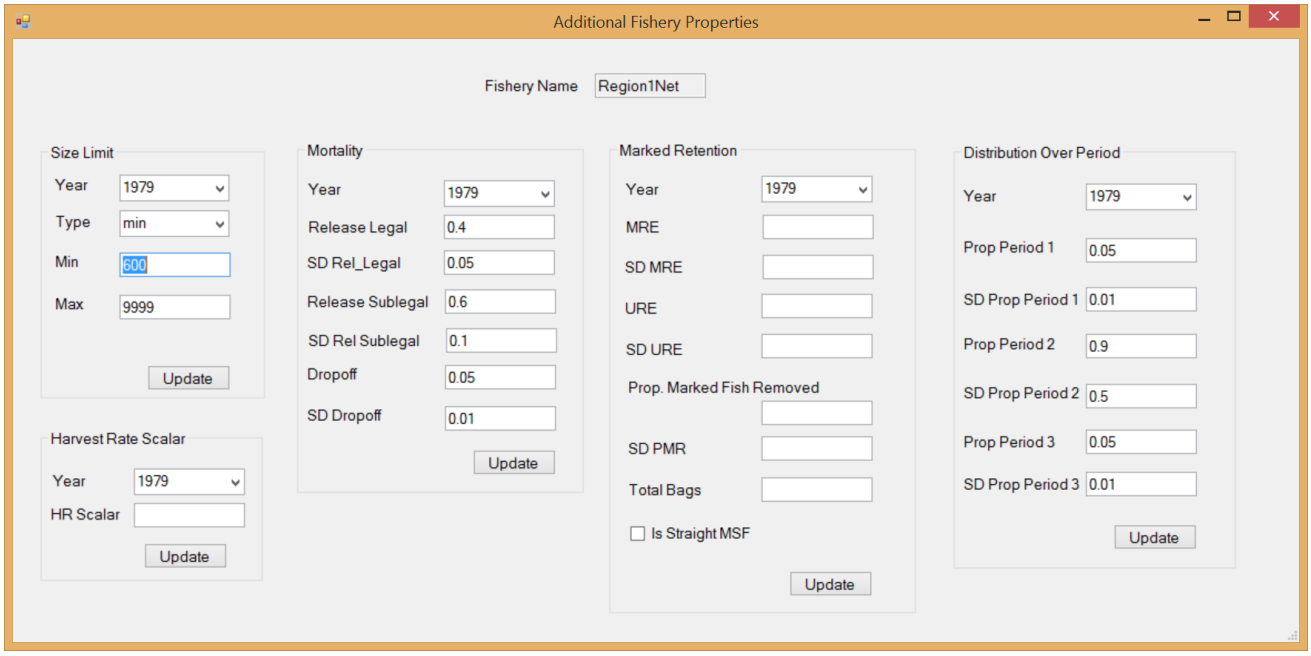

Figure 11a: Additional Preterminal fishery properties

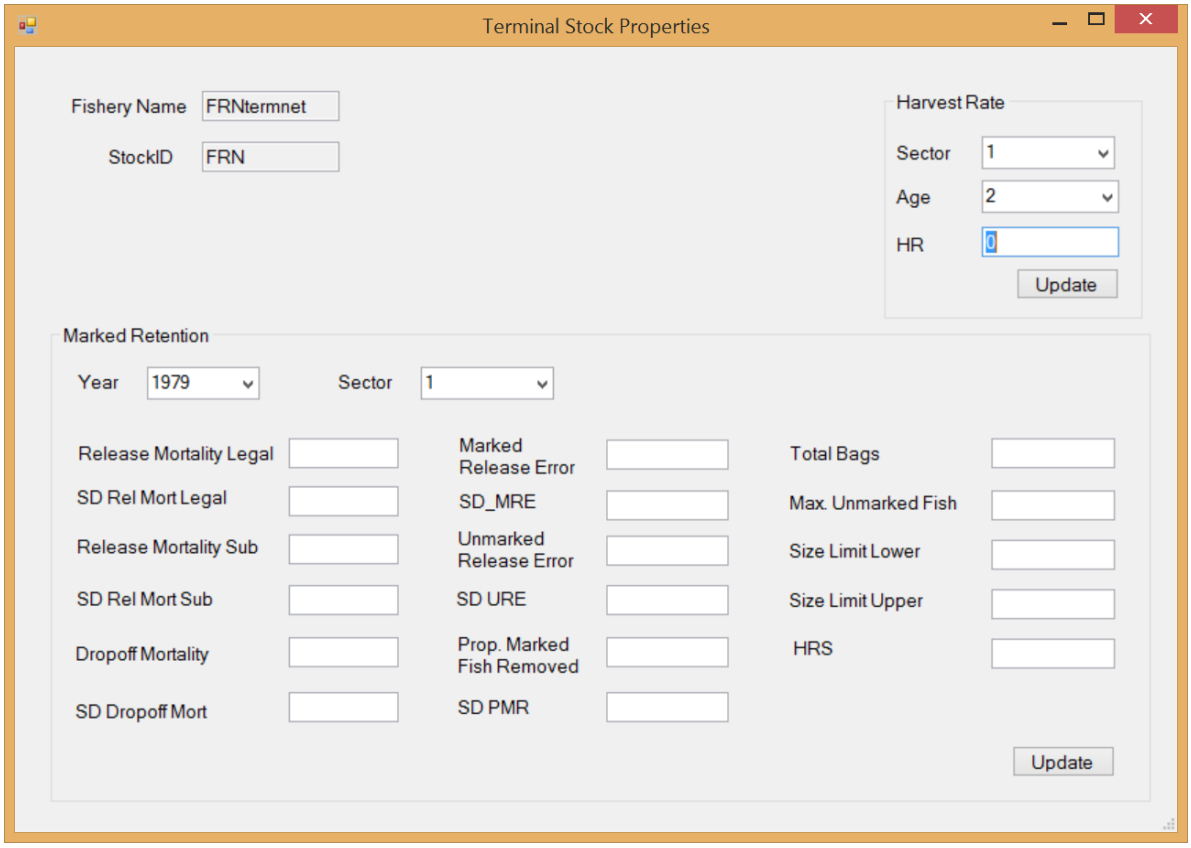

Figure 11b: Additional terminal fishery properties

If the user clicks on 'Enable New Fishery Entry', in Fig. 8, the interface will become Fig. 10 as shown below. The user is required to enter a new fishery name with other data fields. The user can select an existing fishery, and its associated data will populate the fields below. After editing as needed, click 'Enter' and this creates a new fishery in the database. If it is created successfully, a message will pop up and then the interface will close. The user may enter more data for this fishery later, by reopening the fishery entry interface.

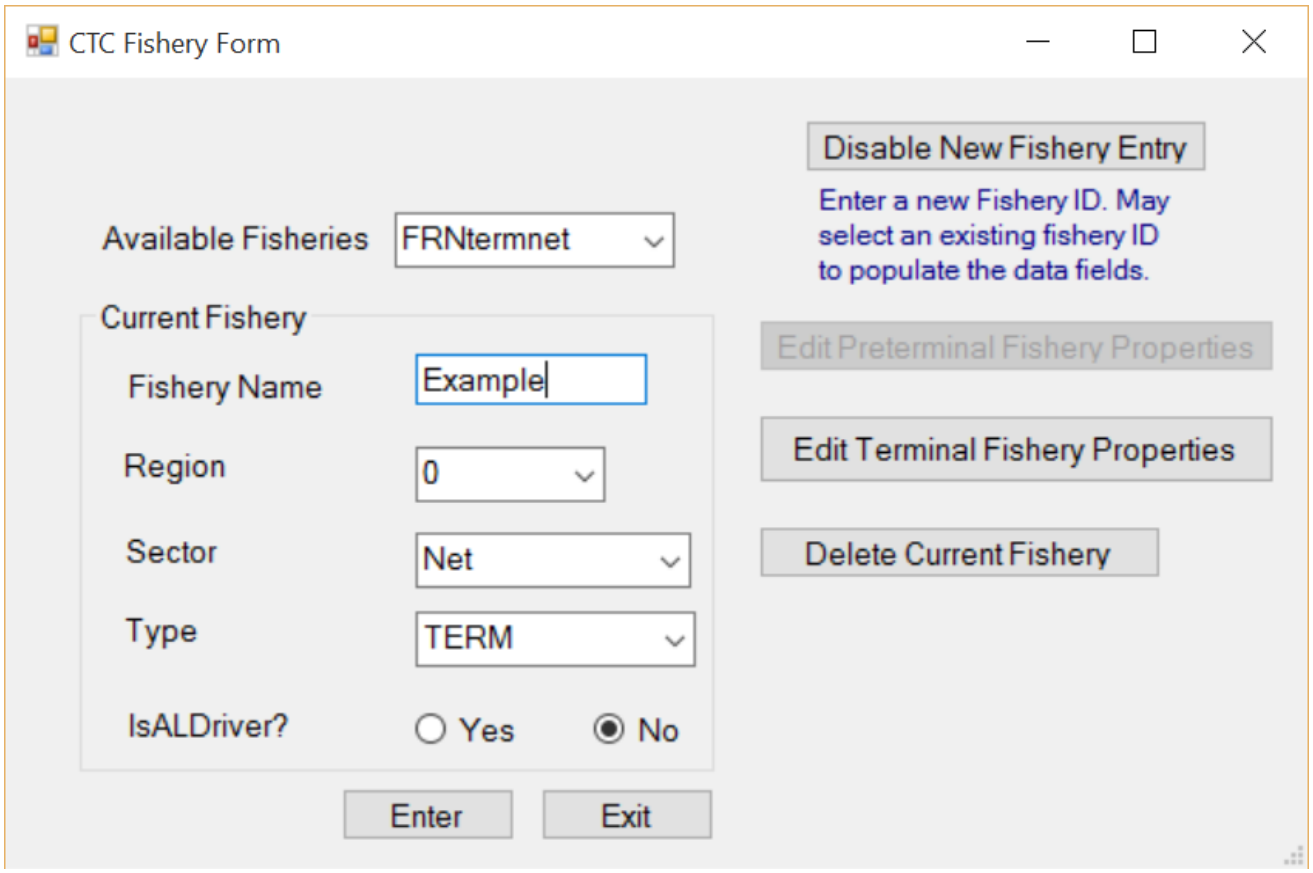

Figure 12: Fishery Entry Interface after the 'Enable New Fishert Entry' is clicked.

Click on ‘Modify Base Period ER’ in Fig. 6, and an interface for updating ER will pop up:

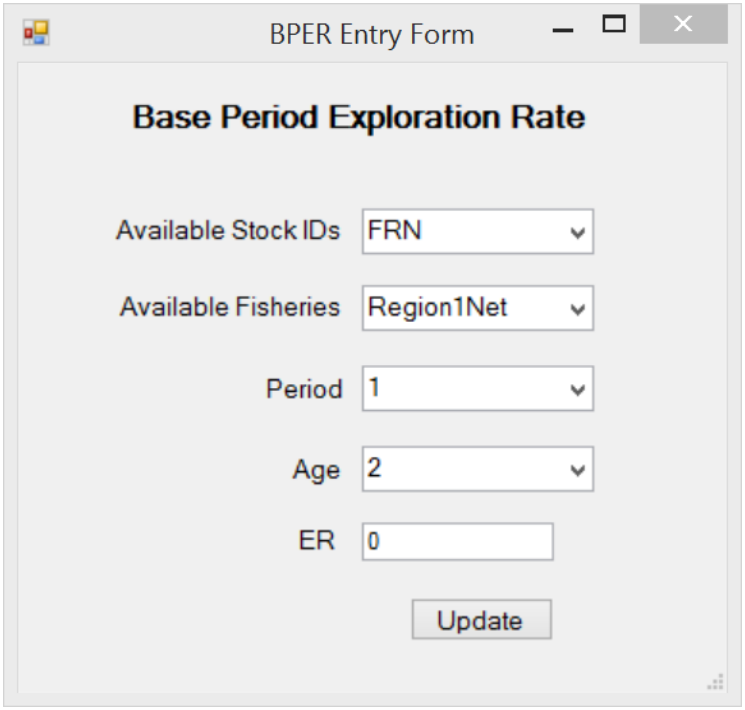

Figure 13: Base period ER interface

Finally, group survival rates and region sector allocation rates can be updated via the following interfaces (Fig. 14 and 15). Operation procedures are the same as described above.

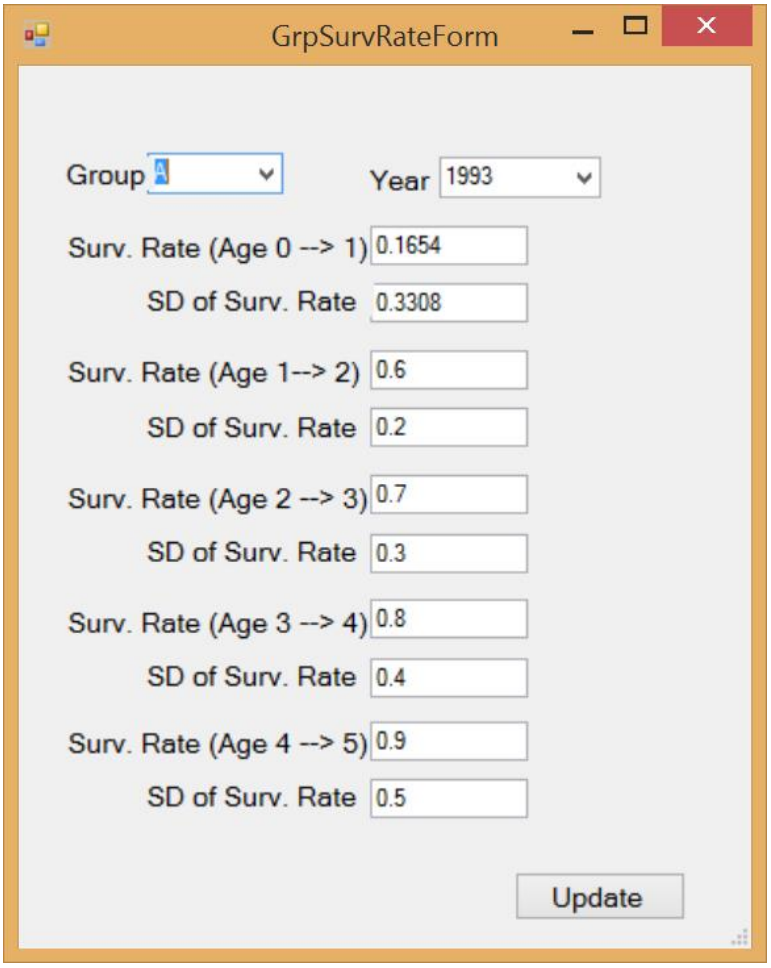

Figure 14: Group Survival Rate interface

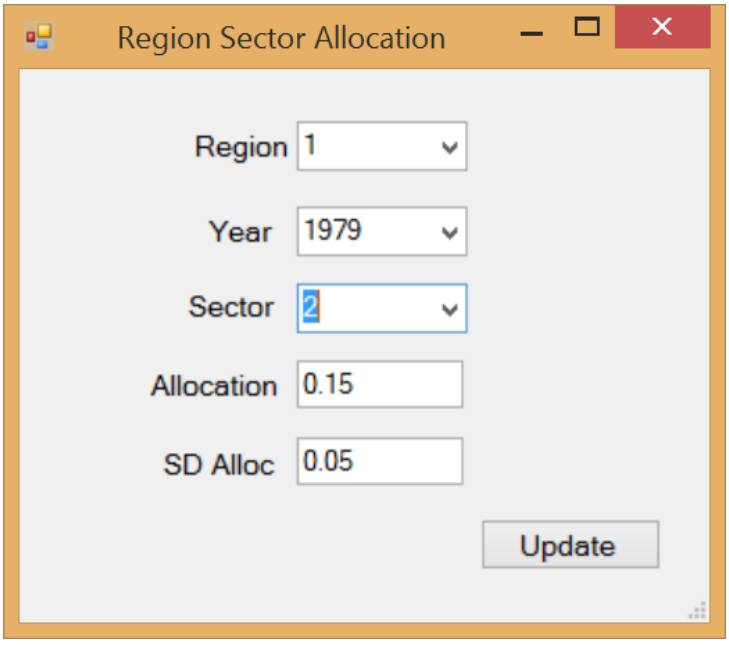

Figure 15: Region Sector Allocation interface