

FISHDA: Fishing Industries' Support in Handling Decision Applications

A User's Manual
Presented to
the Faculty of the College of Computer Studies
De La Salle University

In Partial Fulfillment
of the Requirements for the Degree of
Bachelor of Science in Computer Science

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August 29, 2007

Table of Contents

Table of Contents	i
List of Figures	iii
List of Tables	vi
1.0 Introduction	1-1
1.1 System Requirements	1-1
1.2 Installation	1-1
1.2.1 Prerequisites	1-1
1.2.2 System Installation	1-3
2.0 Getting Started	2-1
3.0 Input Values Module	3-1
3.1 Preferences Setup	3-1
3.2 New Model	3-1
3.3 Add Town	3-2
3.4 Input Parameters	3-2
3.5 Delete Town	3-5
3.6 Options Setup	3-5
3.6.1 Length of Simulation	3-5
3.6.2 Algorithm	3-6
3.6.3 Variable Catch Composition	3-6
3.7 Run Model	3-6
3.8 Window	3-7
3.9 Generate Report	3-10
3.10 Save File	3-12
3.11 Open Model	3-12
3.12 Sensitivity Analysis	3-13
4.0 Map	4-1
4.1 Adding Town	4-1
4.2 Deleting Town	4-1
4.3 Drawing Land	4-2
4.4 Draw Municipal Waters	4-2
4.5 Draw Non-Municipal Waters	4-3
4.6 Clear All	4-4
4.7 Open File	4-5
4.8 Save File	4-5
5.0 Help	4-6
6.0 Error Messages	6-1
6.1 Cannot Add More Towns to Model	6-1

6.2	Cannot Delete Town From Model	6-1
6.3	Invalid Town Name for Delete Town Model	6-1
6.4	Town Name in Model Must Be Unique	6-2
6.5	No Selected Output Parameter for Run	6-2
6.6	No Selected Parameter for Export	6-2
6.7	Cannot Select more than Two Parameters for Sensitivity Analysis	6-2
6.8	Invalid Filename Enter for Open Model/Map	6-3
6.9	Name of Town in Map Must be Unique	6-3
6.10	Cannot Add More Towns to Map	6-3
6.11	Invalid Town Name Entered in Map	6-4

List of Figures

Fig. 1-1. Welcome Screen	1-2
Fig. 1-2. End-User License Agreement	1-2
Fig. 1-3. Progress of .NET Framework Installation	1-3
Fig. 1-4. Finish Installation of .NET Framework	1-3
Fig. 1-5. Verifying Application Requirements	1-4
Fig. 1-6. Installer Welcome Screen	1-4
Fig. 1-7. Installation Progress Screen	1-5
Fig. 1-8. Waiting Screen	1-5
Fig. 1-9. Installation Complete	1-6
Fig. 2-1. FISHDA Main Screen	2-1
Fig. 3-1. Preferences Dialog Box	3-1
Fig. 3-2. Create New Model	3-1
Fig. 3-3. Adding Towns	3-2
Fig. 3-4. Biophysical Input First Part	3-4
Fig. 3-5. Biophysical Input Second Part	3-4
Fig. 3-6. Economic Input	3-5
Fig. 3-7. Annual Operating Cost	3-5
Fig. 3-8. Delete Town	3-5
Fig. 3-9. Options Dialog Box	3-6
Fig. 3-10. Output Dialog Box	3-7
Fig. 3-11. Results Window	3-7
Fig. 3-12. Tiled Horizontally	3-8
Fig. 3-13. Tiled Vertically	3-9
Fig. 3-14. Cascaded	3-10
Fig. 3-15. Export Dialog Box	3-11

Fig. 3-16. Sample Report	3-11
Fig. 3-17. Save Dialog Box	3-12
Fig. 3-18. Open Dialog Box	3-12
Fig. 3-19. Sensitivity Analysis	3-13
Fig. 4-1. Main Map Window	4-1
Fig. 4-2. Add Town Dialog Box	4-1
Fig. 4-3. Error Dialog Box	4-1
Fig. 4-4. Delete Town Confirmation	4-2
Fig. 4-5. Drawing a Land	4-2
Fig. 4-6. Draw Municipal Waters	4-3
Fig. 4-7. Town Before Drawing Non-Municipal Waters	4-3
Fig. 4-8. Town After Drawing Non-Municipal Waters	4-4
Fig. 4-9. Confirm Clear All Values	4-4
Fig. 4-10. Open Map Dialog Box	4-5
Fig. 4-11. Map Save Dialog Box	4-6
Fig. 6-1. Cannot Add Another Town	6-1
Fig. 6-2. Cannot Delete Town	6-1
Fig. 6-3. Town Name Does Not Exist	6-1
Fig. 6-4. Town Name Must be Unique	6-2
Fig. 6-5. No Output Parameter Selected	6-2
Fig. 6-6. No Parameter Selected	6-2
Fig. 6-7. Cannot Exceed Two Parameters	6-3
Fig. 6-8. Invalid Filename	6-3
Fig. 6-9. Town Name Already Exists	6-3
Fig. 6-10. Cannot Add More Than 4 Towns	6-4

List of Tables

Table 3-1. Input Parameter

3-2

1.0 Introduction

This manual will teach you how to use the different features of FISHDA (Fishing Industries' Support in Handling Decisions Application). It will guide you through the different functionalities and parts of the system.

1.1 System Requirements

The following are the minimum requirements of the FISHDA system. These are needed to be able to install and use the software.

Hardware:

- Intel Celeron 1.7 GHZ
- 256 MB RAM
- 52 MB free hard disk space
- 8x CD-ROM
- 64 MB Video Card
- 1024 x 768 resolution, 32-bit color mode
- Keyboard
- Mouse

Software:

- Microsoft Windows XP Home Edition or Professional installed as operating system
- Microsoft Excel
- Microsoft .NET Framework 2#

1.2 Installation

The installation of the FISHDA system is available for the convenience of the users of the system. The user must follow the step by step process to ensure that the system will run without errors. Installing the system must be done by installing the pre-requisites.

1.2.1 Pre-requisites

Pre-requisites applications are needed to be installed before installing the FISHDA system. The Microsoft .NET Framework 2.0 is the pre-requisite of the FISHDA system. The installer can be found on the *Prerequisites* folder included in the installation file of FISHDA system. After executing the installer, a welcome screen shown in Fig. 1-1 will appear. The user has to click *Next>* in order to continue with the installation.

An End-User License Agreement shown in Fig. 1-2 will ask the user to agree with the Terms and Conditions of the software. By clicking the checkbox saying he or she agrees, the user may click the *Install>* button to continue with the installation. After clicking the install button, users just have to wait for the installation to finish. Fig. 1-3 shows the progress of installation. Fig. 1-4 shows that the installation is complete and the user may now install the FISHDA System.

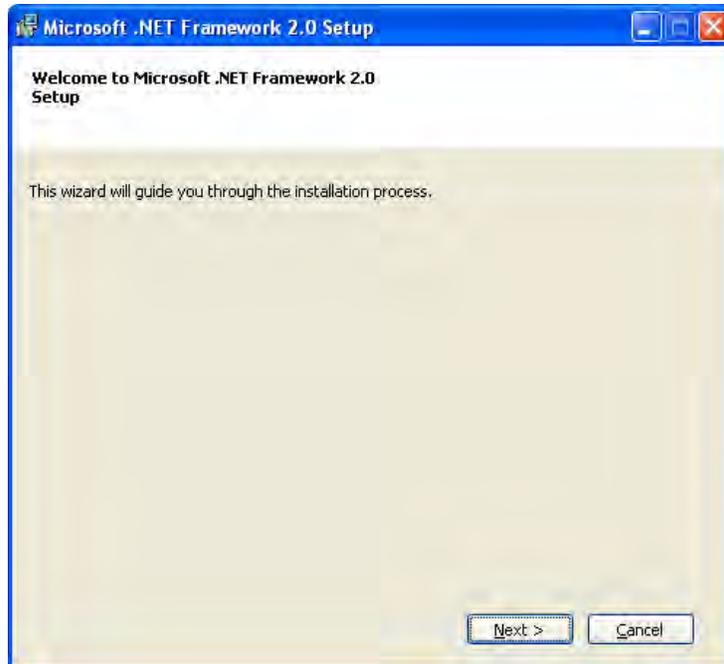


Fig. 1-1. Welcome Screen



Fig. 1-2. End-User License Agreement

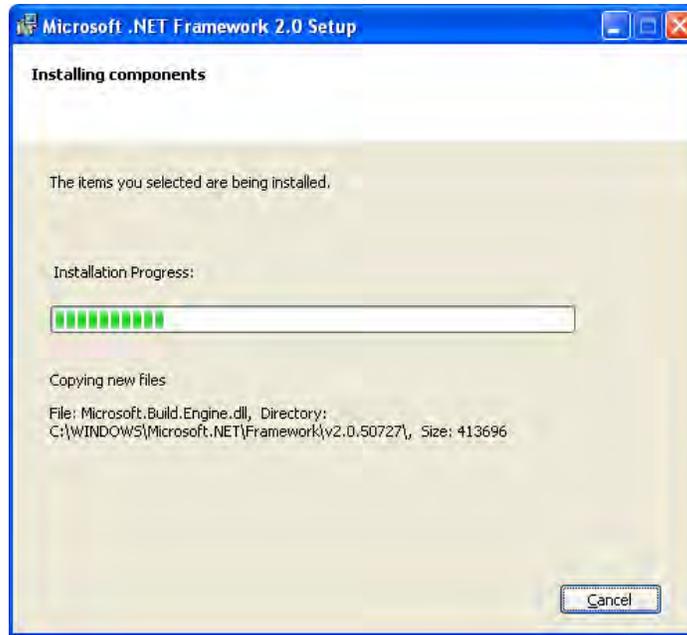


Fig. 1-3 Progress of .NET Framework Installation

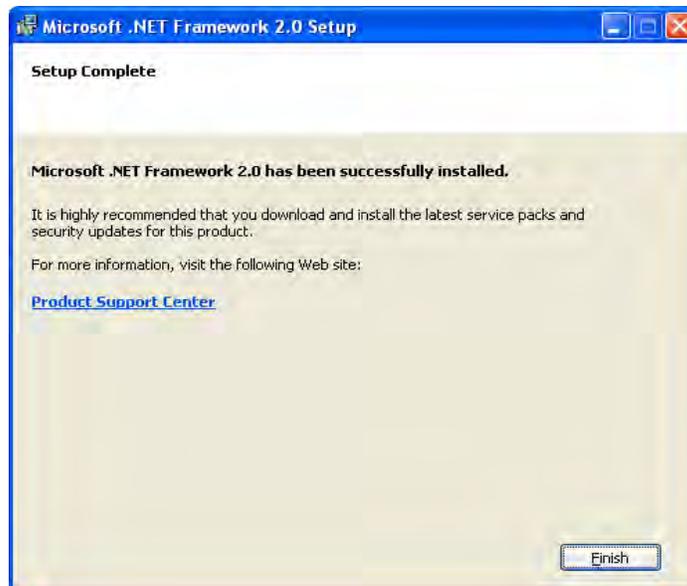


Fig. 1-4 Finish Installation of .NET Framework

1.2.2 System Installation

Clicking the *Setup.exe* will start the installation proper of FISHDA system. The setup will determine if the system meets the requirements in order to run the installation. Fig. 1-5 will appear as it inspects for the requirements for the installation.

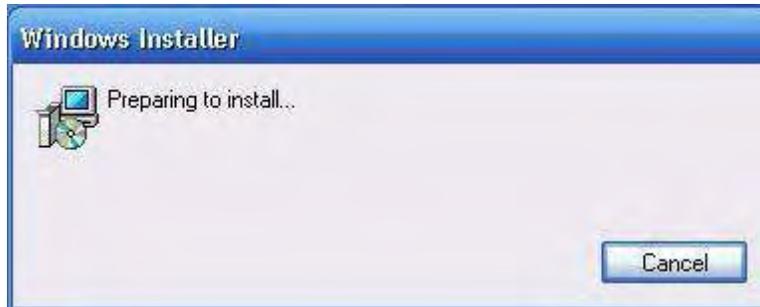


Fig. 1-5. Verifying Application Requirements

After verifying the system requirements, a welcome screen will appear to the user. Fig. 1-6 will appear to verify the installation of the system. By clicking the *Next* button, the installer will go to the next page of the installation process.

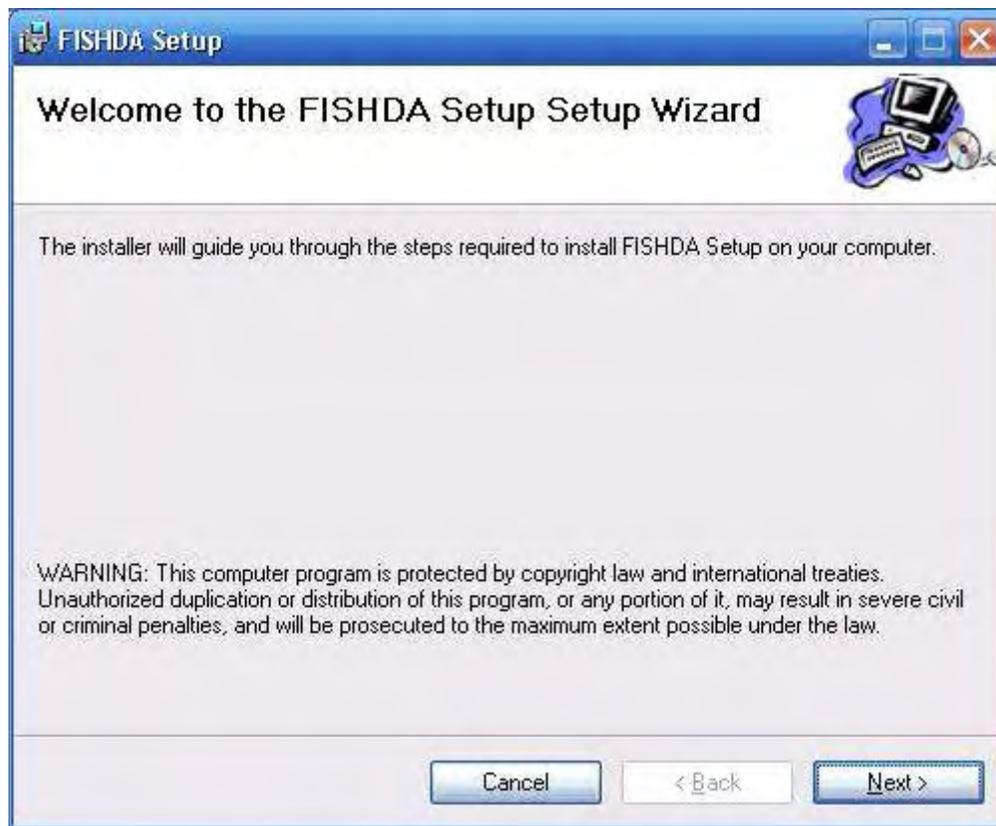


Fig. 1-6. Installer Welcome Screen

After clicking the *Next* button, the installer will allow the user to choose the target directory of the files as shown in Fig. 1-7. The default directory for the system is located in the Program Files folder. After choosing the directory and clicking the *Next* button, another page will ask the user if he or she wants to continue with the installation process. When chosen to continue, a progress bar shown in Fig. 1-8 will show the user the progress of the installation. After the installation has finished, Fig. 1-9. will appear and ask the user to click *Close* to finish the installation.



Fig. 1-7. Installation Progress Screen

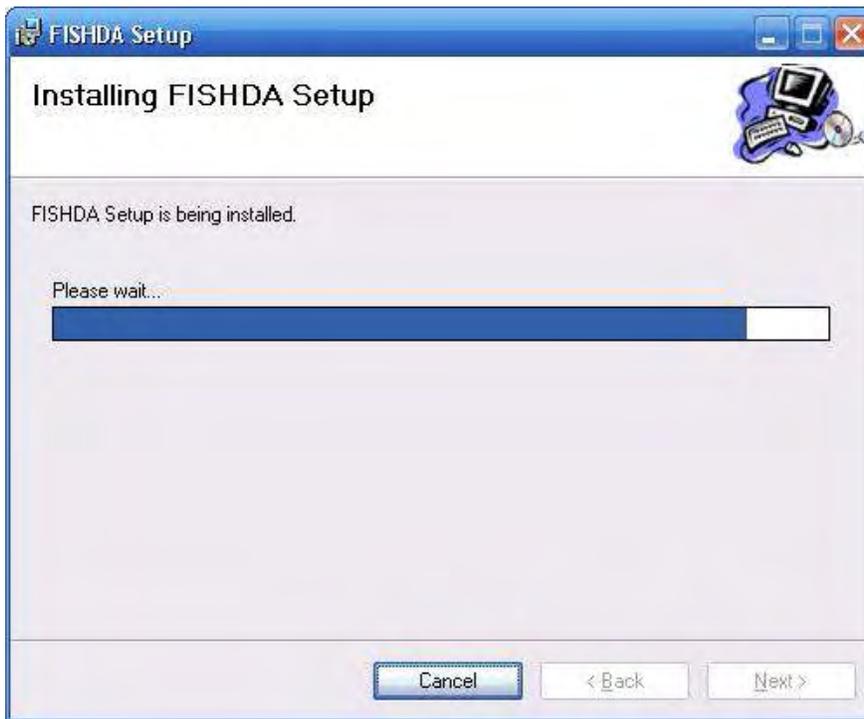


Fig. 1-8. Waiting Screen

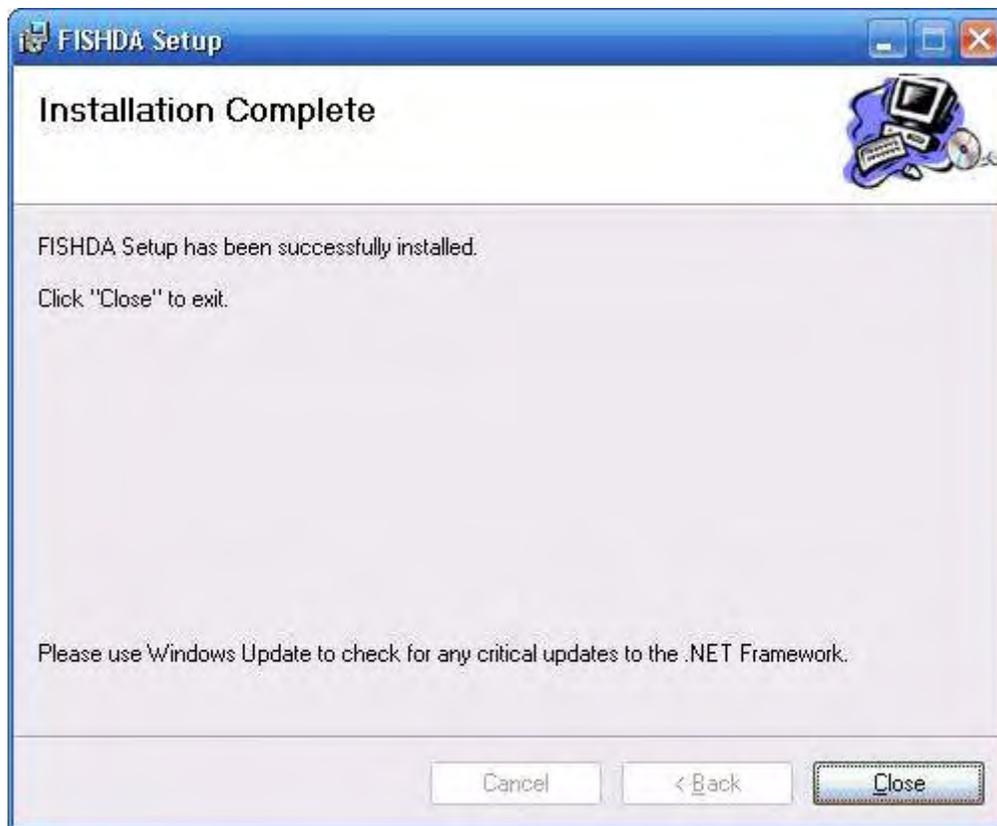


Fig. 1-9. Installation Complete

2.0 Getting Started

This section is a walkthrough the FISHDA software. It will show a sample run of the software. Moreover, it will guide you through creating a model, entering the data, running the model and generating reports. A sample run of the stand-alone map module will also be discussed.

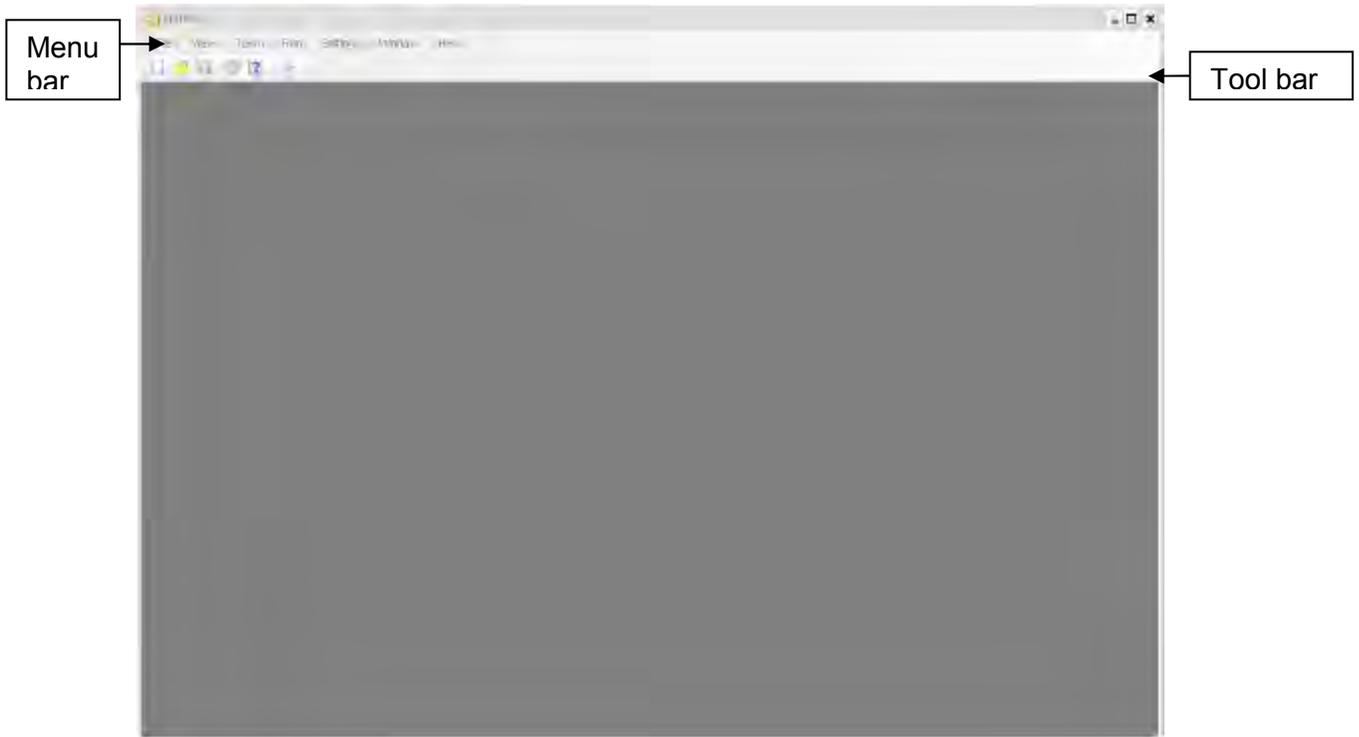


Fig. 2-1. FISHDA Main Screen

The main screen of FISHDA is shown in Fig. 2-1. Its parts are labeled:

Menu bar: Here you can find the *File*, *View*, *Town*, *Run*, *Settings*, *Window* and *Help* menu. These menus contain the processes that you will need to get around the system.

Tool Bar: This is where you can find shortcuts such as *New*, *Open*, *Save*, *Options*, *Help* and *Run*.

3.0 Input Values Module

This section will guide you in using the Input Values module. This is where you can create and edit your own model; and adjust the settings for simulation.

3.1 Preferences Setup

To begin creating a model, you must select the model type you want to create. You can do this by choosing *Settings -> Preferences* from the menu bar. The Preferences dialog box shown on Fig. 3-1 will then be displayed. Selecting *Single-Town Model* type will allow you to model a single town while the *Multi-Town Model* type will allow you to model up to a maximum of four (4) towns. In our example, we chose the *Multi-Town Model* type.

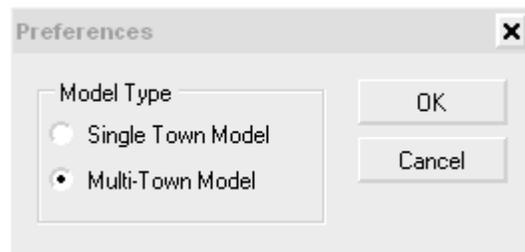


Fig. 3-1. Preferences Dialog Box

3.2 New Model

To create a new model, you can click on *File -> New* on the menu bar or click on the *New* button on the tool bar. The system will display an input window with one town as shown in Fig. 3-2.

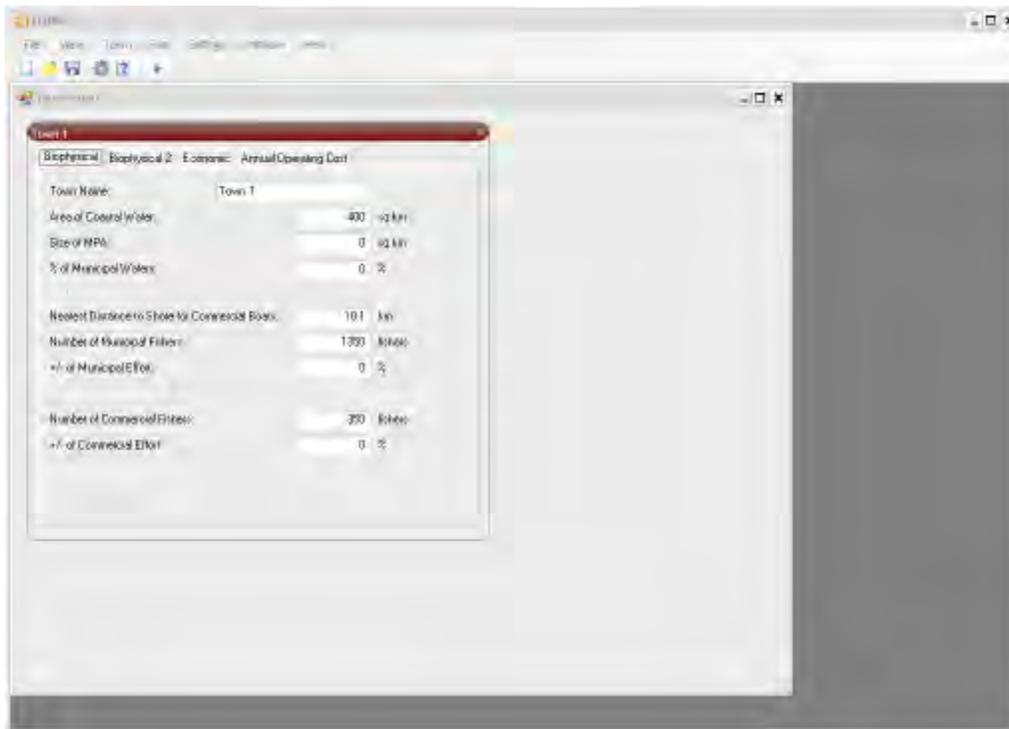


Fig. 3-2. Create New Model

3.3 Add Town

If you have selected the multi-town mode in the *Preferences Setup*, you can choose to add or remove towns from the model. In this example, we have already chosen the multi-town mode as shown in the previous section which means we can model more than one town. To add another town, you must choose *Town -> Add* from the menu bar. Fig. 3-3 shows a model with four towns present in the model.

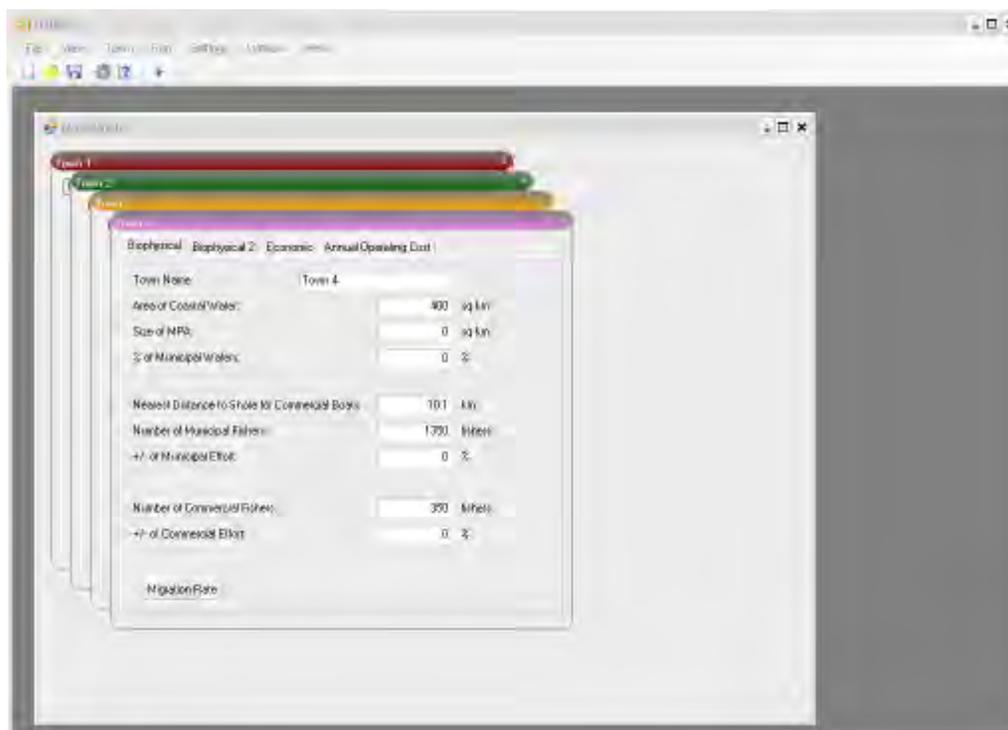


Fig. 3-3. Adding Towns

3.4 Input Parameters

After adding towns to the model, you can enter data for the parameters listed in Table 3-1.

Table 3-1. Input Parameters

Input Details for Each Town	
Town Name	This allows you to enter a name for the town.
Bio-physical Input (shown in Figs. 3-5 and 3-6)	
Area of Coastal Water	This is the size of a town's municipal water in square kilometers.
Size of MPA	This is the size of Marine Protected Area of the town in square kilometers.
Nearest Distance to shore for Commercial Boats	This is the nearest distance to shore that a commercial boat is allowed to be in kilometers.
Number of Municipal Fishers	This is the number of municipal fishers from the town.

Increase/Reduction in Municipal Effort:	This is the percent of increase or reduction of municipal effort.
Number of Commercial Fishers	This is the number of commercial fishers.
Increase/Reduction in Commercial Effort:	This is the percent of increase or reduction of commercial effort.
Percent Demersal in Municipal Catch	This is the percent of how much of the municipal catch is demersal fish.
Percent Pelagic in Commercial Catch	This is the percent of how much of the commercial catch is pelagic fish.
Municipal catch per fisher per day	This is the amount of fish in kilograms is caught by a municipal fisher in a day.
Municipal Catch Area	This is the size of the municipal catch area in square kilometers.
Municipal Fishing Days per Year	This is the number of municipal fishing days per year.
Commercial catch per fisher per day	This is the amount of fish in kilograms is caught by a commercial fisher in a day.
Commercial Catch Area	This is the size of the commercial catch area in square kilometers.
Commercial Fishing Days per Year	This is the number of commercial fishing days per year.
Demersal Fish Turnover Rate	This is the rate by which the demersal fish stock increases.
Demersal Fish Initial Stock	This is the initial amount of demersal fish in metric tons per square kilometer.
Demersal Fishing Carrying Capacity	This is the carrying capacity of demersal fishing in metric tons per square kilometer.
Demersal Fish MPA Spillover Rate	This is the demersal fish MPA spillover rate in percent.
Pelagic Fish Turnover Rate	This is the rate by which the pelagic fish stock increases.
Pelagic Fish Initial Stock	This is the initial amount of pelagic fish in metric tons per square kilometer.
Pelagic Fishing Carrying Capacity	This is the carrying capacity of pelagic fishing in metric tons per square kilometer.
Pelagic Fish MPA Spillover Rate	This is the pelagic fish MPA spillover rate in percent.
Economic Input (shown in Figs. 3-6 and 3-7)	
Municipal Fish Price	This is the market price of municipal fish.
Daily Expenditure Requirement Per Municipal Fisher	This is the approximate expenditure in PhP that a municipal fisher needs per day.
Marketing Fee	This is the government revenue from marketing fees in PhP.
Inspection Fee	This is the government revenue from inspection fees in PhP.
Public Market Entry Fee	This is the public market entry fee in PhP.
MPA Percent Cost Reduction	This is the amount of cost reduction in percent.
MPA Charges	This is the government revenue from MPA charges.

MPA Entrance Fees	This is the government revenue from MPA entrance fees.
MPA Fares	This is the government revenue from MPA fares.
MPA Registration Fees	This is the government revenue from MPA registration fees.
MPA Rentals	This is the government revenue from MPA rentals.
Multiple Fishery Cost Switch	This allows you to turn on or off the computation for government expenditure from multiple fishery operation.
Fishery Operating Expenses	This is the operating cost for multiple fisheries in PhP.
Recreation and Tourism Cost Switch	This allows you to turn on or off the computation for the government expenditure from recreation and tourism costs.
Recreation and Tourism Operating Costs	This is the government operating costs for recreation and tourism.
Settlement Cost Switch	This allows you to turn on or off the computation for government expenditure from settlement costs.
Settlement Operating Costs	This is the government operating costs for settlement.
Trade and Navigation Cost Switch	This allows you to turn on or off the computation for government expenditure from trade and navigation costs.
Trade and Navigation Operating Costs	This is the government operating costs for trade and navigation.

Town 1

Biophysical Biophysical 2 Economic Annual Operating Cost

Town Name: Town 1

Area of Coastal Water: 400 sqkm

Size of MPA: 0 sqkm

% of Municipal Waters: 0 %

Nearest Distance to Shore for Commercial Boats: 10.1 km

Number of Municipal Fishers: 1350 fisher

% of Municipal Effort: 0 %

Number of Commercial Fishers: 350 fisher

% of Commercial Effort: 0 %

Help/Save/Quit

Fig. 3-4. Biophysical Input First Part

Town 1

Biophysical Biophysical 2 Economic Annual Operating Cost

Percent Demersal in Municipal Catch: 27 %

Percent Pelagic in Commercial Catch: 90 %

	Municipal	Commercial
Catch Per Fisher Per Day:	5.8	18.9 kg
Catch Area:	240	338 sqkm
Fishing Days Per Year:	200	200 days

	Demersal	Pelagic
Fish Turnover Rate:	1.5	2 per year
Initial Stock:	1.3	2 nit/sq km
Fishing Carrying Capacity:	10	3 nit/sq km
MPA Spillover Rate:	10	10 %

Fig. 3-5. Biophysical Input Second Part

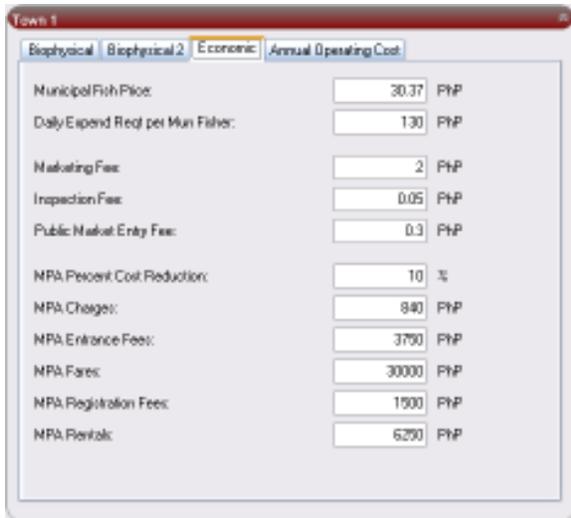


Fig. 3-6. Economic Input

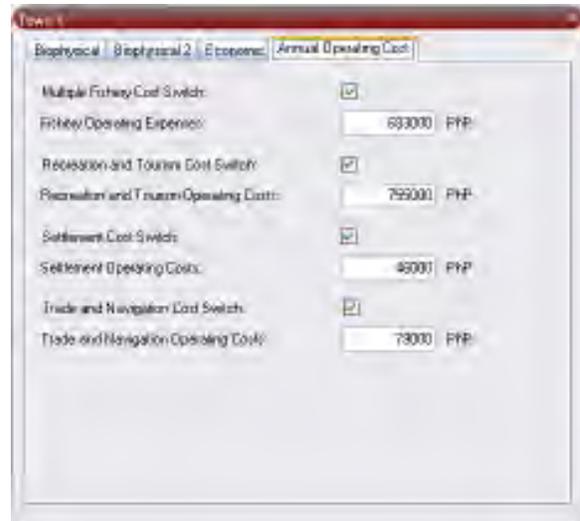


Fig. 3-7. Annual Operating Cost

3.5 Delete Town

If you wish to delete a town from the model you can follow these steps:

1. Click *Town -> Delete*.
2. Select the name of the town you wish to delete from the dropdown box as shown in Fig. 3-8.
3. Click on the *Ok* button.

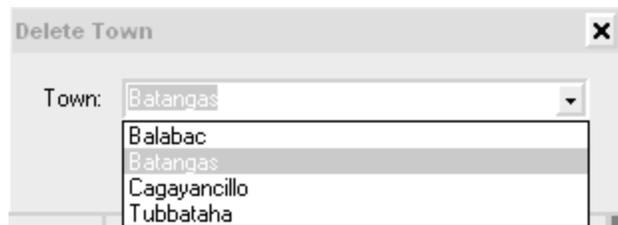


Fig. 3-8. Delete town

3.6 Options Setup

You can adjust the options for simulation by clicking on *Settings -> Options* from the menu bar or click on the *Options* button on the tool bar. The Options Dialog Box shown on Fig. 3-8 will be displayed. The parameters for the Options dialog box are described as follows:

3.6.1 Length of Simulation

This section allows you to select or adjust the start time, end time and time interval of simulation.

- From: This allows you to choose the start time of simulation.
- To: This allows you to choose the end time of simulation.
- Time Interval: This enables the user to specify the time step for the simulation. The possible values for the time interval are powers of 2; i.e. 0.25, 0.5, 1, 2, etc.

3.6.2 Algorithm

This is where you can decide which integration method or algorithm to use for the simulation. You can choose from the Euler Method and Runge Kutta 2nd Order Method.

Euler Method: This enables you to choose Euler Method as the integration method for the simulation.

Runge-Kutta 2nd Order: This enables you to choose Runge-Kutta 2nd Order Method as the integration method for the simulation.

3.6.3 Variable Catch Composition

This section on the other hand, gives you the choice to include formulas for percent demersal in municipal catch and percent pelagic in commercial catch.

Percent Demersal in Municipal Catch: Choosing this option will make the computation for municipal catch depend on the stock composition.

Percent Pelagic in Commercial Catch: Choosing this option will make the computation for municipal catch depend on the stock composition.

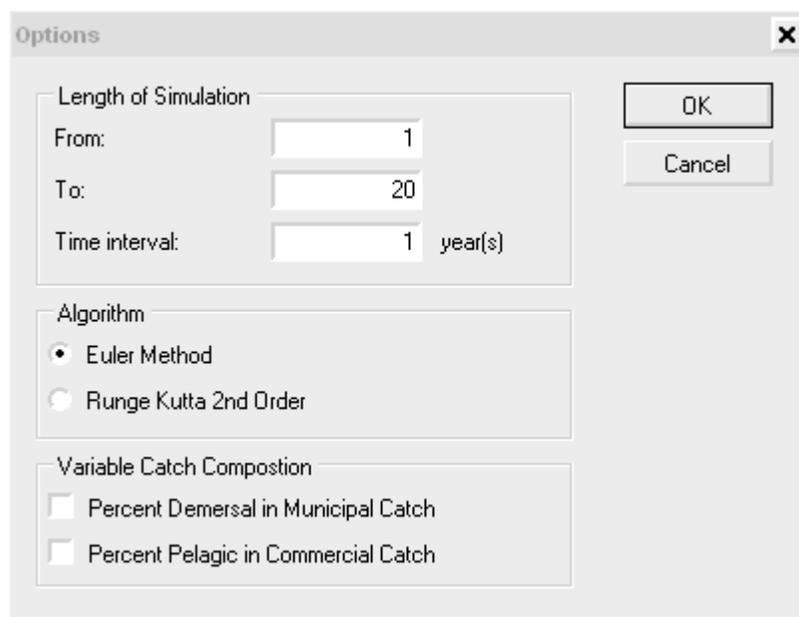


Fig. 3-9. Options Dialog box

3.7 Run Model

You can run the simulation of the model you have created by the following steps:

1. Select *Run* -> *Run* from the menu bar or by clicking on the *Run* button on the tool bar.
2. Choose which output parameter to graph. Clicking on the *Select All* button will check all output parameters checkboxes while *Clear All* button will clear all checkboxes. Refer to Fig. 3-10.
3. Click on the OK button, the *Results* window will appear with the generated graphs and a tabulation of values. The *Results* window is shown in Fig. 3-11.

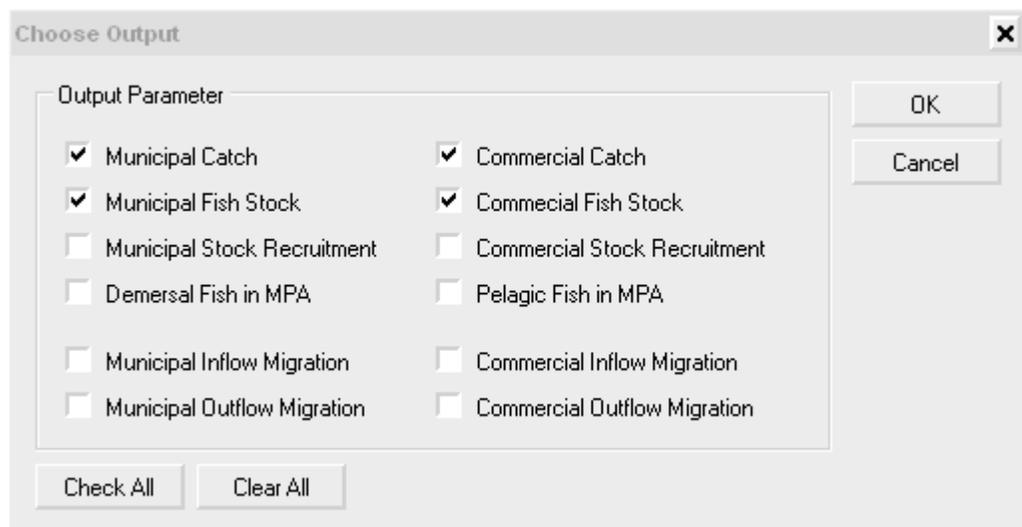


Fig. 3-10. Output Dialog Box

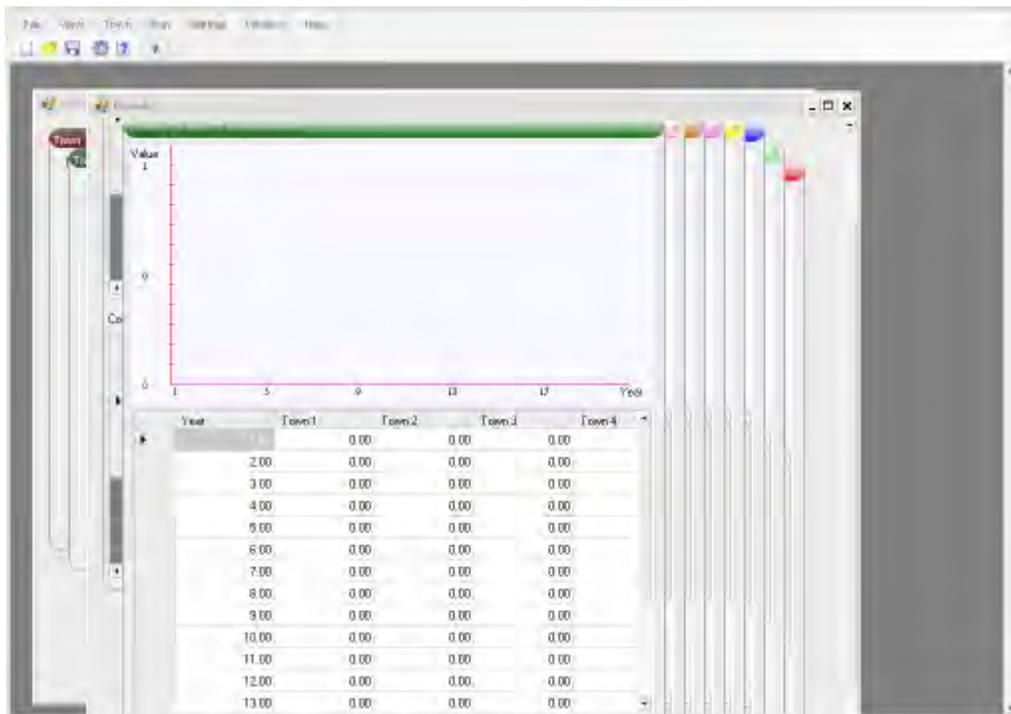


Fig. 3-11. Results Window

3.8 Window

You can organize the layout of the input window and results window on your screen by the Window feature. You can select *Window -> Tile Horizontal* to arrange the windows horizontally as shown in Fig. 3-12; you can also select *Window -> Tile Vertical* to arrange the windows horizontally as shown in Fig. 3-13; and you can choose *Window -> Cascade* to arrange the windows one upon the other as shown in Fig. 3-14.

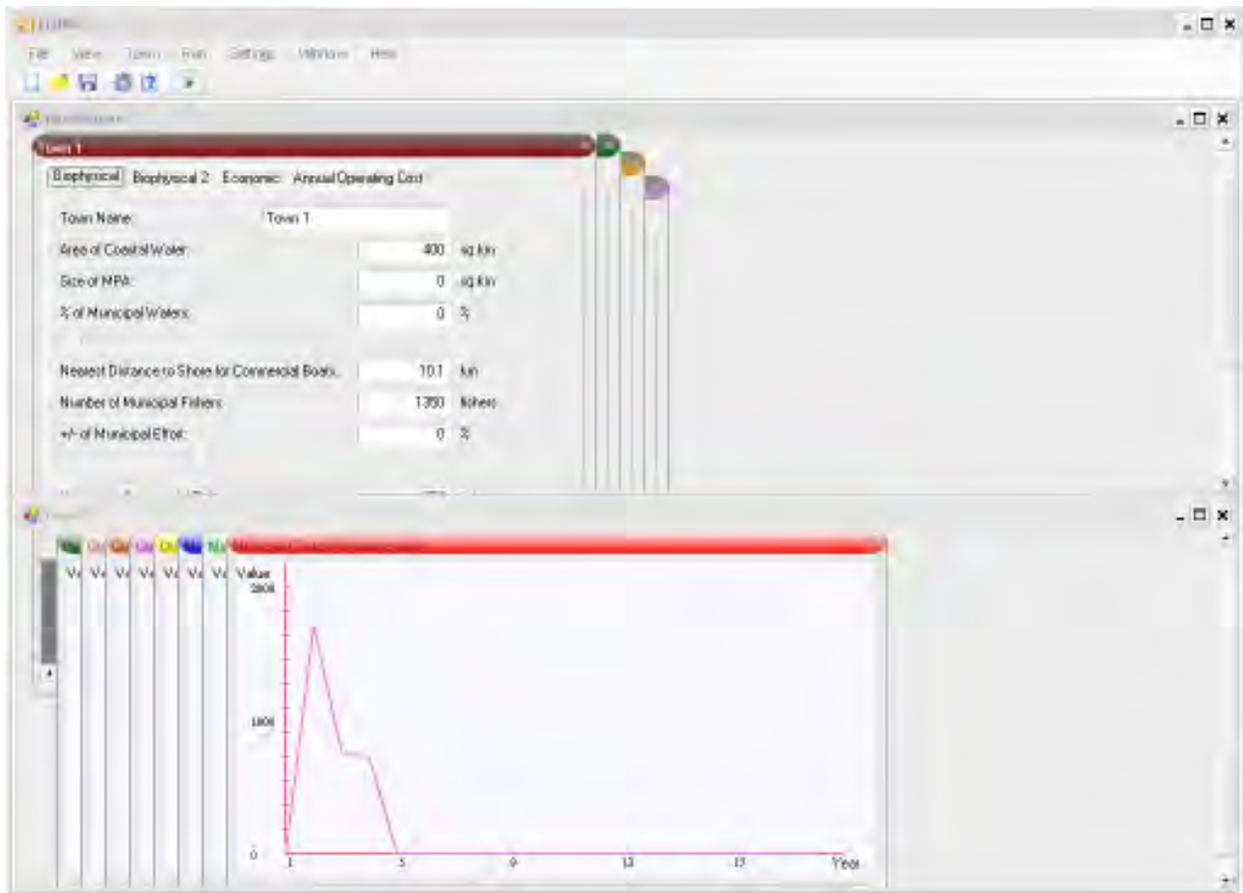


Fig. 3-12. Tiled Horizontally

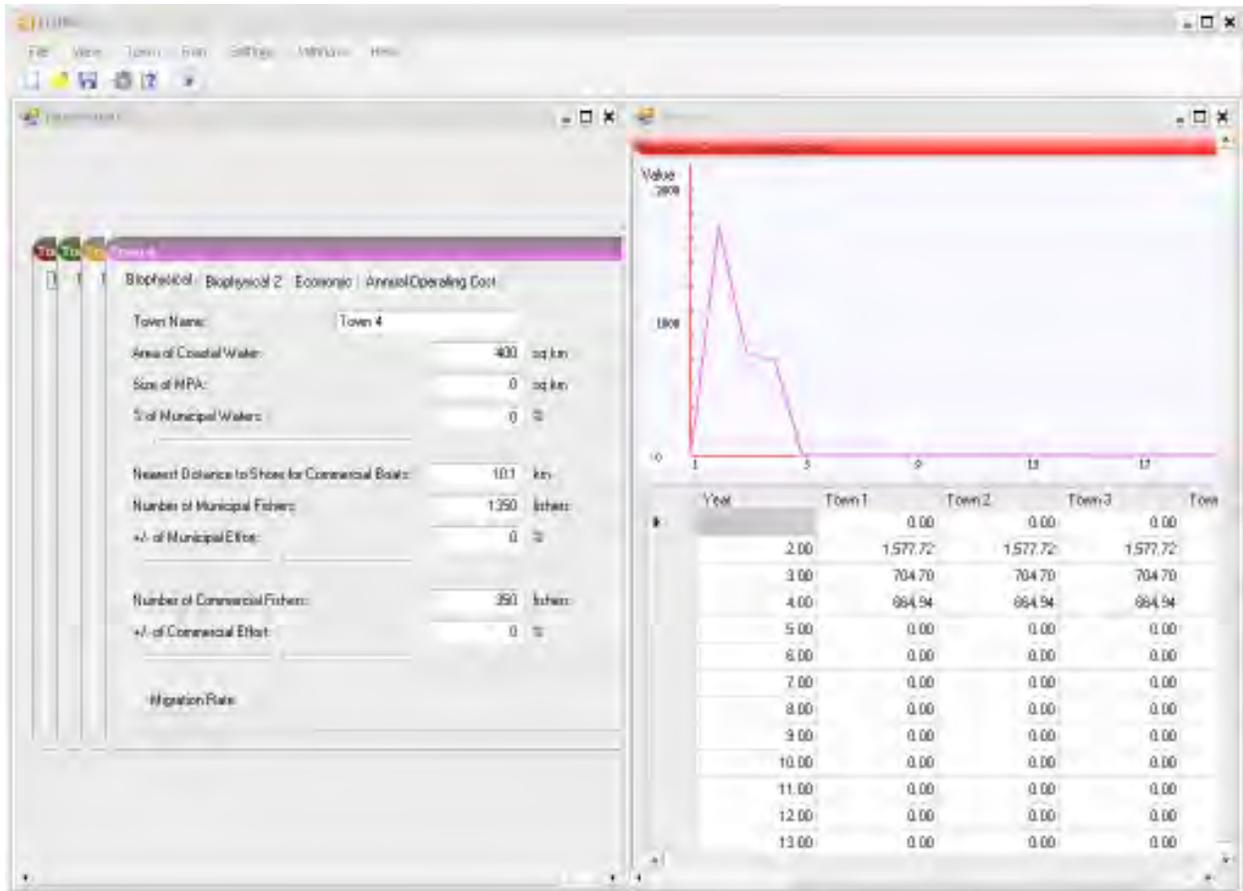


Fig. 3-13. Tiled Vertically

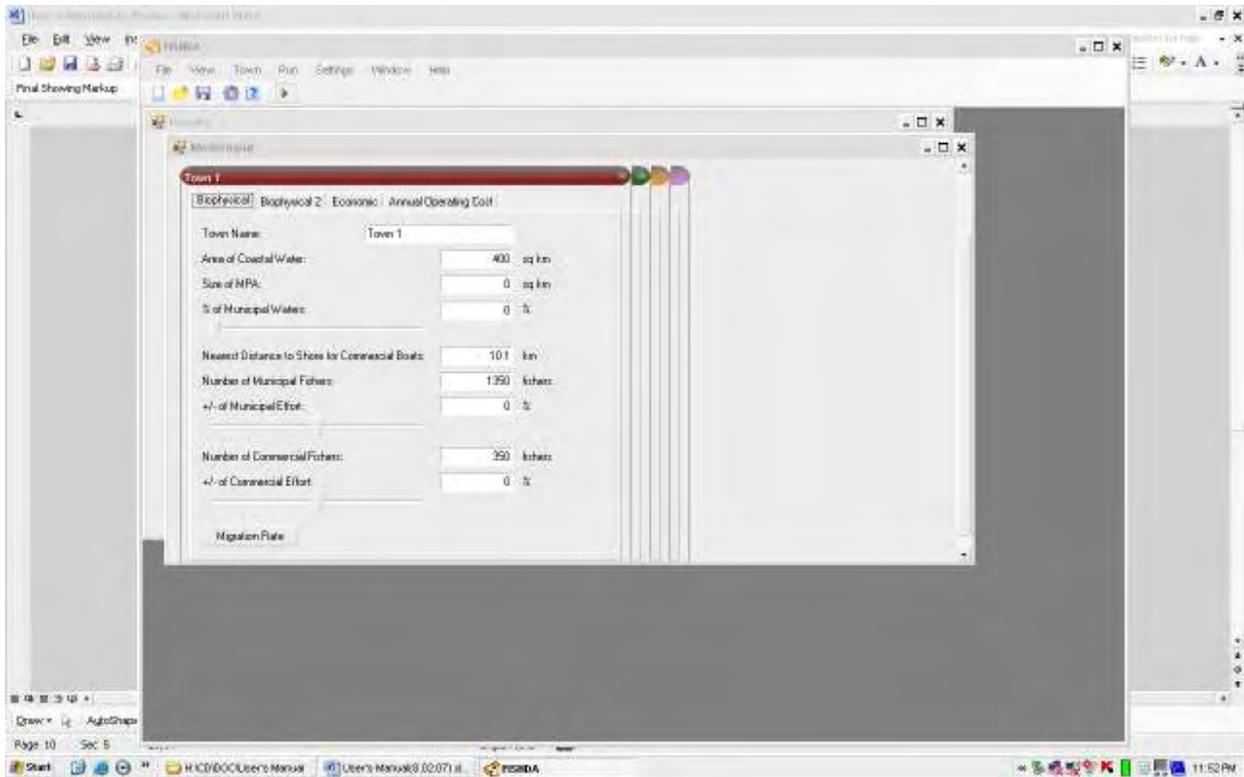


Fig. 3-14. Cascaded

3.9 Generate Report

You can generate reports by exporting data and results to an MS Excel file by the following steps:

1. After running the simulation, you can select *File -> Export* from the menu bar.
2. Select which parameters you want to be included in your report from the dialog box shown in Fig. 3-15
3. Click the *OK* button.

A sample report is shown in Fig. 3-16. Input parameters are exported to a single worksheet named "Input Parameters" with the town name as the column header and the parameter names as the row headers. Each output parameter is exported to a worksheet named after its self; i.e. Municipal Catch.



Fig. 3-15. Export Dialog Box

Year	Cagayan	Tubataha	Balabac	Balangas
1	800	800	800	1000
2	0	0	0	36.53
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				

Fig. 3-16. Sample report

3.10 Save File

You can save your model through the save feature. To save the current model in use whether it is new or existed previously, you can follow these steps:

1. Select *File -> Save As* or *File -> Save*.
2. Select a location you want to save in and enter a filename.
3. Click *Save*.

Selecting *File -> Save* when you already have an existing file will overwrite the changes on the said file. On the other hand, selecting *File -> Save As* will allow you to choose a new filename and location.



Fig. 3-17. Save Dialog Box

3.11 Open Model

To open an existing model, you must do the following:

1. Choose *File -> Open* from the menu bar or click on the *Open* button on the tool bar.
2. Browse and select the *.fda* file you want to load on the FISHDA Open dialog box as shown in Fig. 3-18.

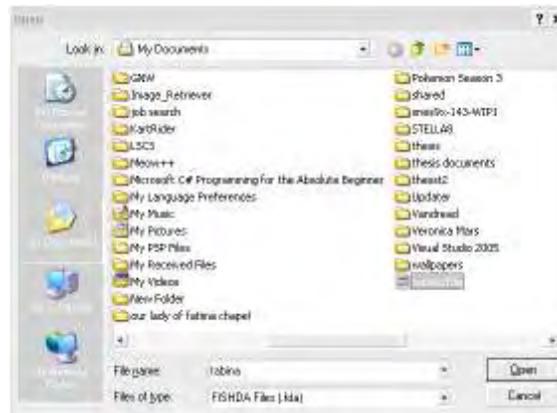


Fig. 3-18 Open dialog box

3.12 Sensitivity Analysis

You can perform sensitivity analysis by doing the following:

1. Select *Run -> Sensitivity Analysis*.
2. Choose from the different towns in your model and their parameters to perform multiple runs on. The system can accommodate a maximum of two parameters only. The parameters need not be from the same town. Please see Fig. 3-19.
3. After selecting the parameters, specify the start value, end value and the number of runs.
4. Click on the *Set* buttons to view the assigned values for the runs.
5. Click on the *OK* button.
6. Run the model. (Follow instructions for *Run Model* in Section 3.7)

Sensitivity Analysis

Town Name:

Input Parameters

% of Municipal Waters
 Number of Municipal Fishers
 +/- of Municipal Effort
 Number of Commercial Fishers
 +/- of Commercial Effort
 Nearest Distance to Shore for Commercial Boats
 Percent Demersal in Municipal Catch
 Percent Pelagic in Commercial Catch

Municipal Catch Per Fisher Per Day
 Municipal Catch Area
 Municipal Fishing Days Per Year
 Demersal Fish Turnover Rate
 Initial Demersal Stock
 Demersal Fishing Carrying Capacity
 Demersal MPA Spillover Rate

Commercial Catch Per Fisher Per Day
 Commercial Catch Area
 Commercial Fishing Days Per Year
 Pelagic Fish Turnover Rate
 Initial Pelagic Stock
 Pelagic Fishing Carrying Capacity
 Pelagic MPA Spillover Rate

Town 1 - Number of Municipal Fishers

Start value:
 End value:

Run #	Value
1	0
2	1
3	2
4	3
5	4
6	5

Town 1 - Number of Commercial Fishers

Start value:
 End value:

Run #	Value
1	0
2	2.01
3	4.02
4	6.03
5	8.04
6	10.05

Number of Runs:

Fig. 3-19. Sensitivity Analysis

4.0 Draw Map

The Draw Map module is a stand-alone tool to allow you to visualize and approximate the sizes of the areas of land and water for the modeling. The map module can be accessed by selecting on the menu bar *View -> Map*. The system will display a window as shown in Fig. 4-1 to allow you to draw a map.

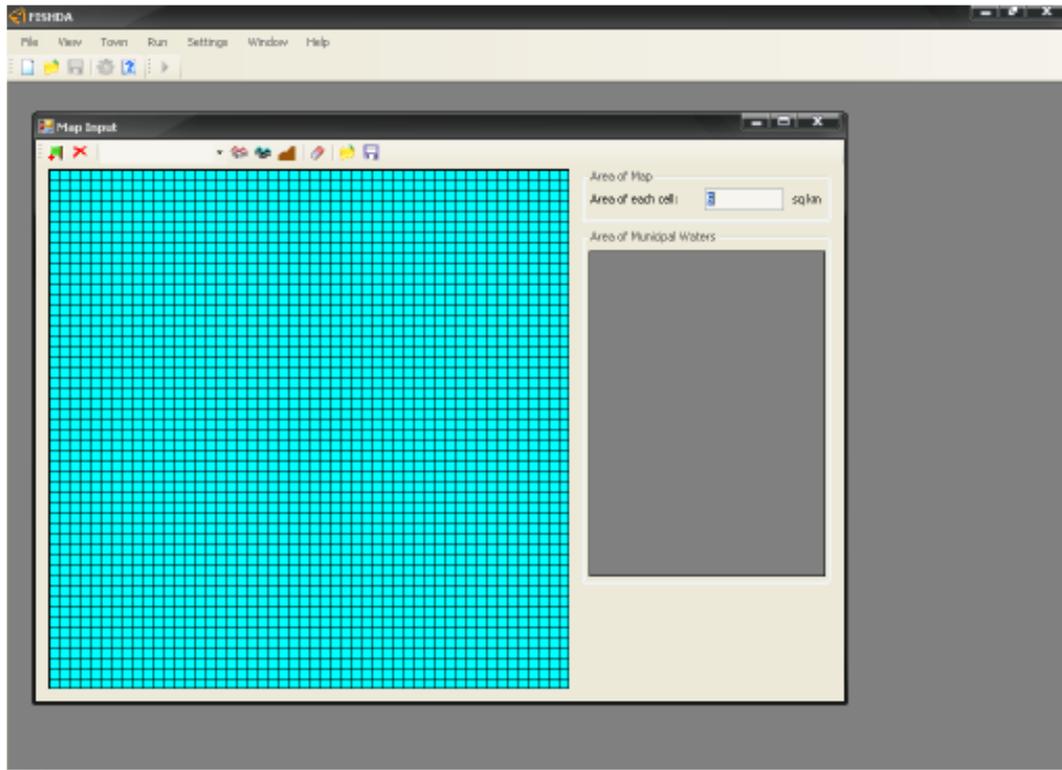


Fig. 4-1. Main Map Window

4.1 Adding Town

To add a town on the map, you can click the Add Town button as shown in Fig. 4-1. After clicking the button, a dialog box will appear in order to allow you to enter the name of the town. You must enter a town name or an error message shown in Fig. 4-3 will appear.



Fig. 4-2. Add Town Dialog Box



Fig. 4-3. Error Dialog Box

4.2 Deleting Town

To delete a town, you must first select the name of the town you wish to delete from the combo box. Then, click on the *Delete Town from Map* button. The system will confirm if you really wish

to delete the selected town as shown in Fig. 4-4. The system will then delete the town and all of the municipal waters of the deleted town will be converted back to non-municipal waters.



Fig. 4-4. Delete Town Confirmation

4.3 Drawing Land

To set land areas on the map, you must first click on the *Draw Land* button. Then, select the cells of the map you wish to designate as land. There are no restrictions in drawing land on the map as long it is not occupied by any town waters or by another land. A town waters can have lands attach in different parts of the town.

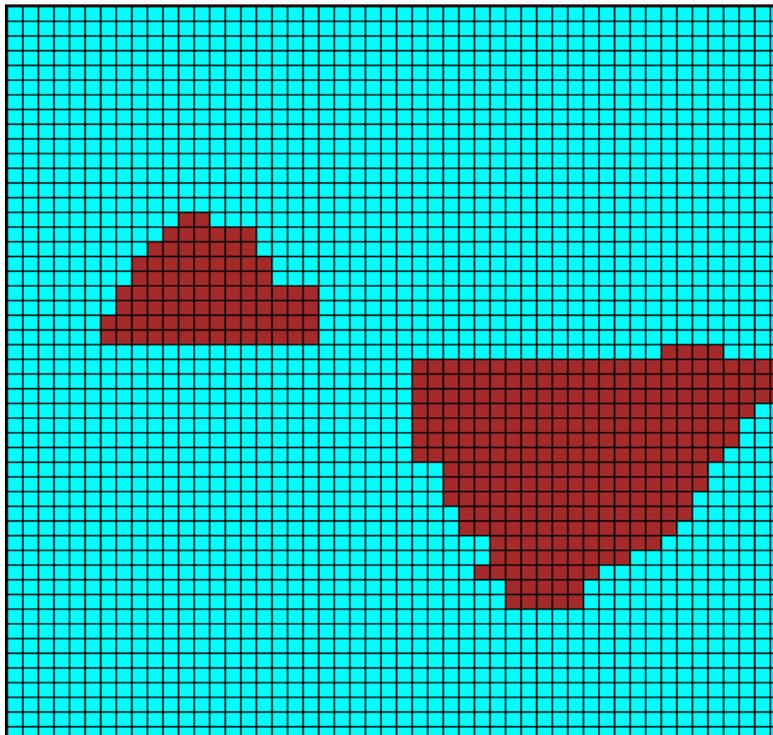


Fig. 4-5. Drawing a Land

4.4 Draw Municipal Waters

After adding different towns into the module, you can now set the municipal waters for the town(s). To set municipal waters for a town, you must first select a town name from the combo box. Click on the *Draw Municipal Waters* button. You can now set which cells to designate as municipal waters by clicking or dragging on the cells on the map. Fig. 4-2 shows two different towns drawn into the map. You may set town waters as long as it is connected to a land as shown below. After drawing the municipal waters of a town, the system will calculate the total areas of the waters and displaying it in the Area of Municipal Waters as shown in Fig. 4-6.

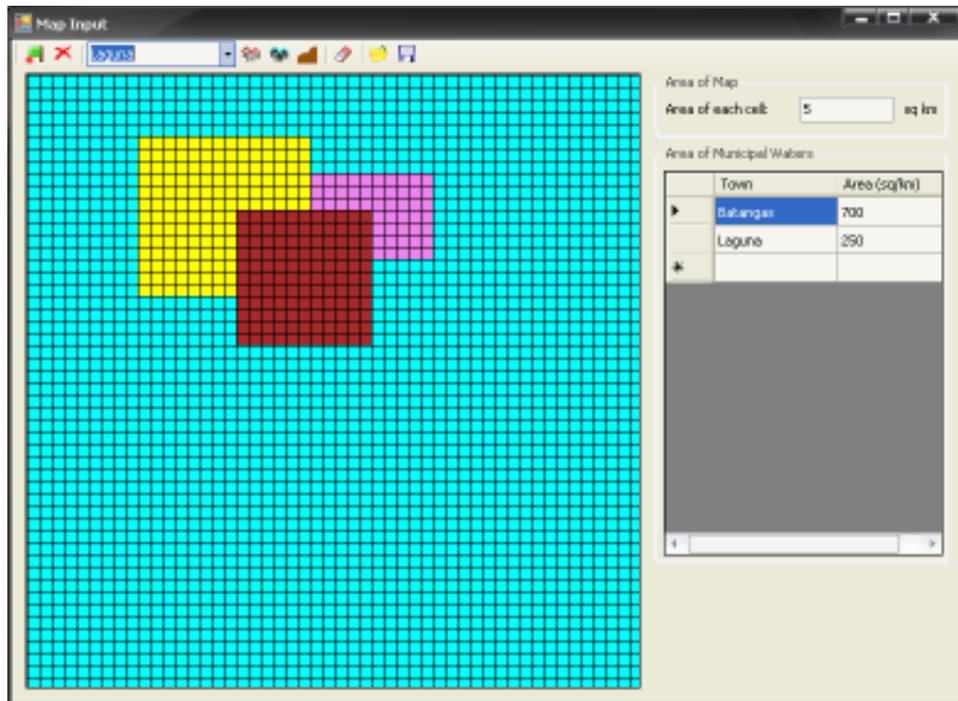


Fig. 4-6. Draw Municipal Waters

4.5 Draw Non-Municipal Waters

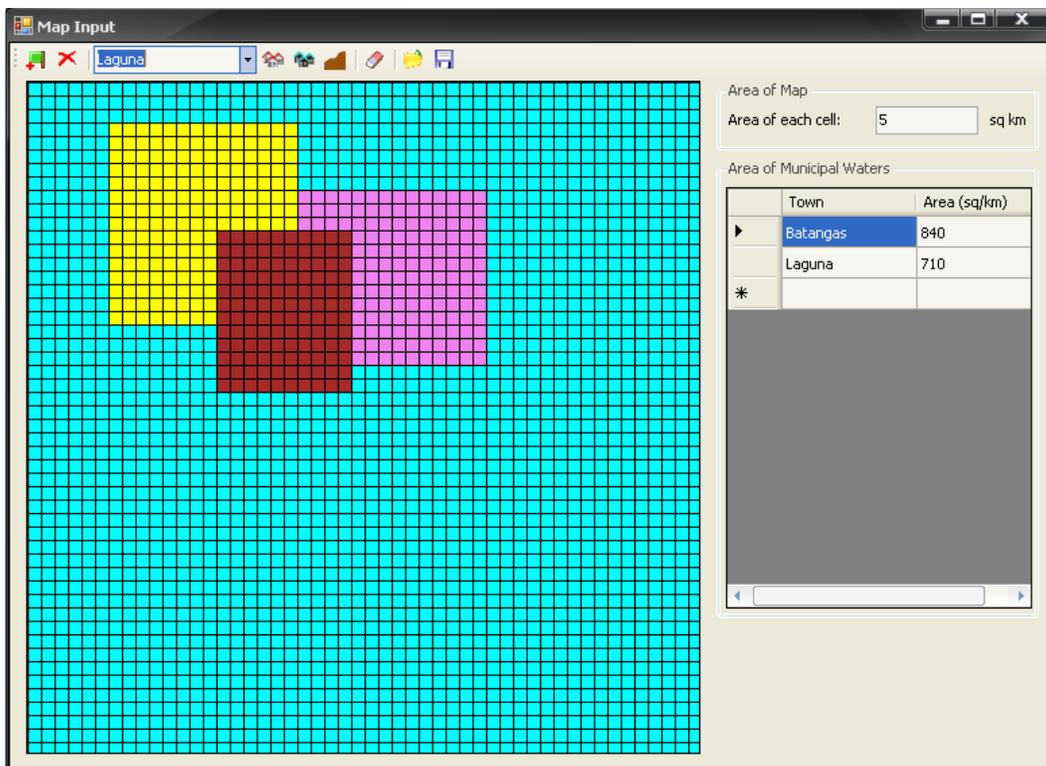


Fig. 4-7. Town Before Drawing Non-Municipal Waters

To set non-municipal waters, click the *Draw Non-Municipal Waters* button beside the *Draw Land* button. In Fig. 4-8, Batangas town was completely erased from the map and turned into non-municipal waters. The total area of Batangas was also recomputed and shown in the Area of Municipal Waters.

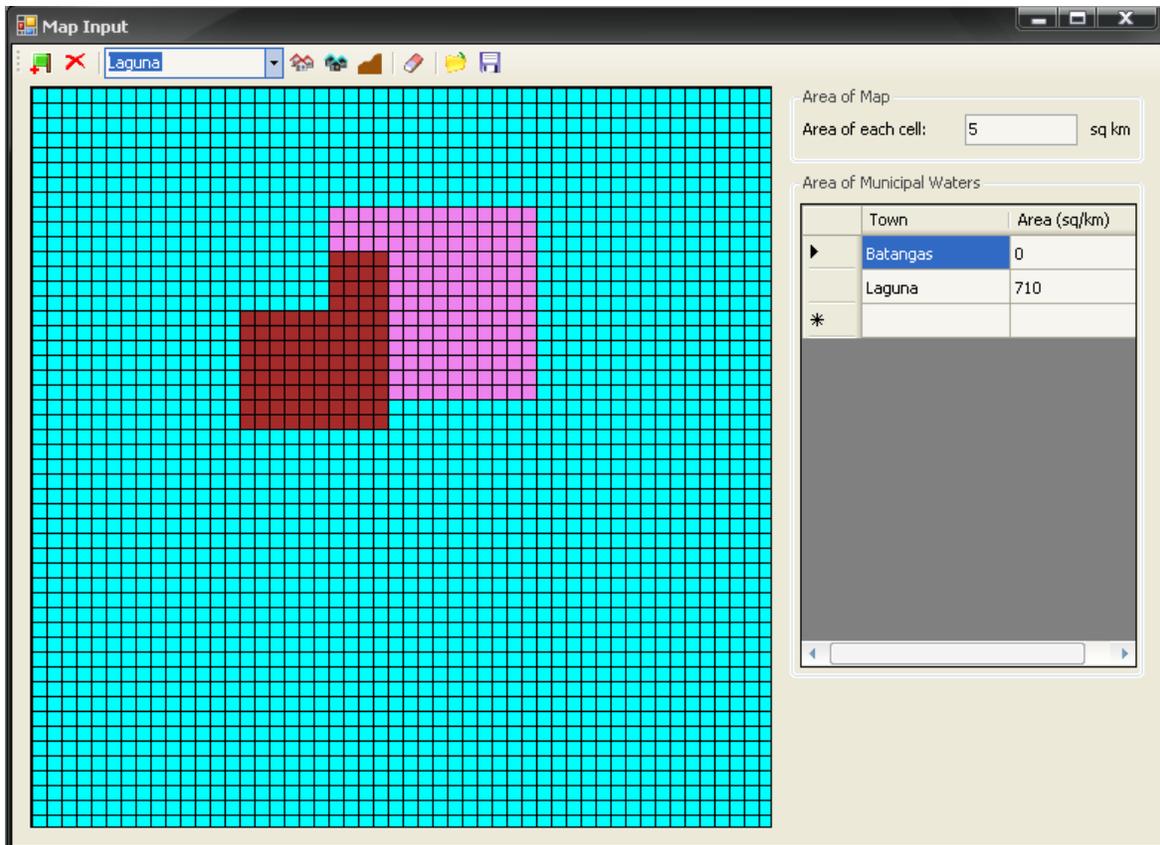


Fig. 4-8. Town After Drawing Non-Municipal Waters

4.6 Clear All

You have the option of clearing all of the land and town waters drawn into the map by clicking the *Clear All* button. After doing so, a dialog will appear as shown in Fig. 4-9 to confirm if you really wish to clear all values. Clearing the map will turn all of the town waters and land present in the map into non-municipal waters.



Fig. 4-9. Confirm Clear All Values

4.7 Open File

You can load a previously saved map by clicking on the *Open Map* button..An Open Map dialog box in Fig. 4-10 will appear to allow you to browse and select the file you wish to load. Only files with *.fmp* extension can be opened. After selecting, the saved map will be loaded and displayed on screen.

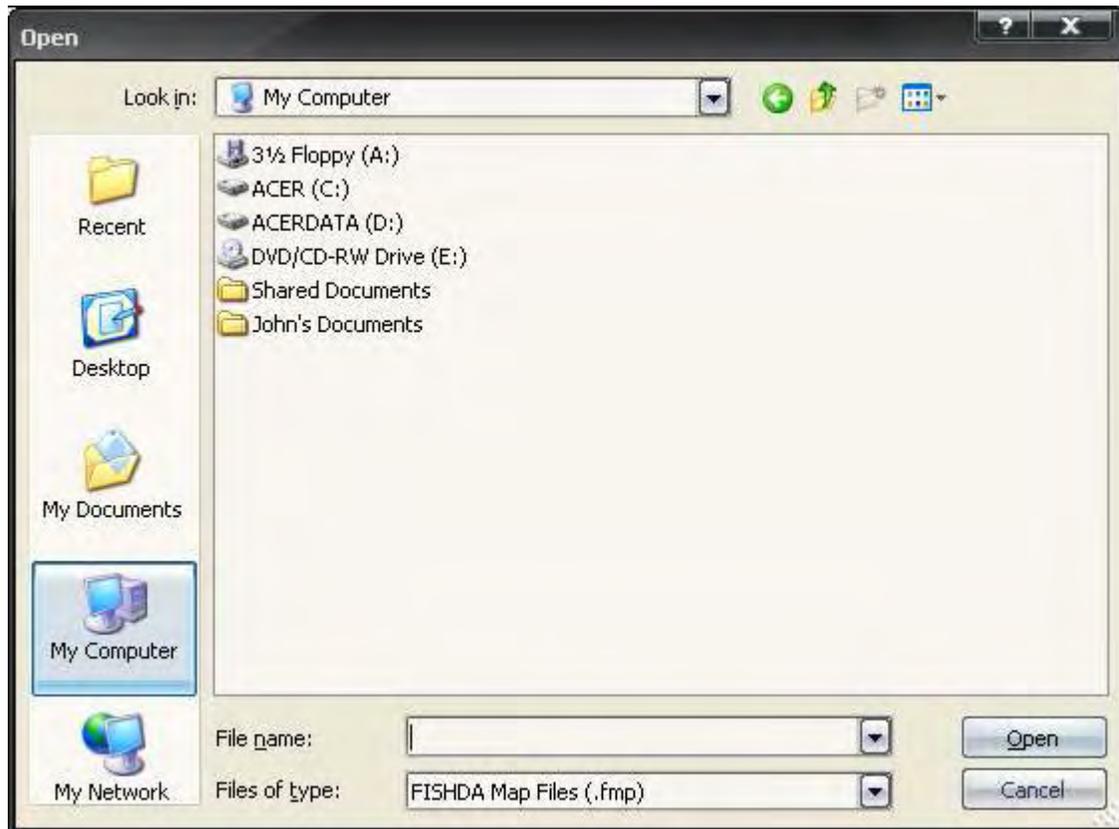


Fig. 4-10. Open Map Dialog Box

4.8 Save File

This feature allows you to save your map. To save the current model in use whether it is new or existed previously, select the Save button. A save dialog box shown in Fig. 4-11 will appear on screen to allow you to select a location you want to save in and enter a filename after which the save feature will save under a *.fmp* file extension.

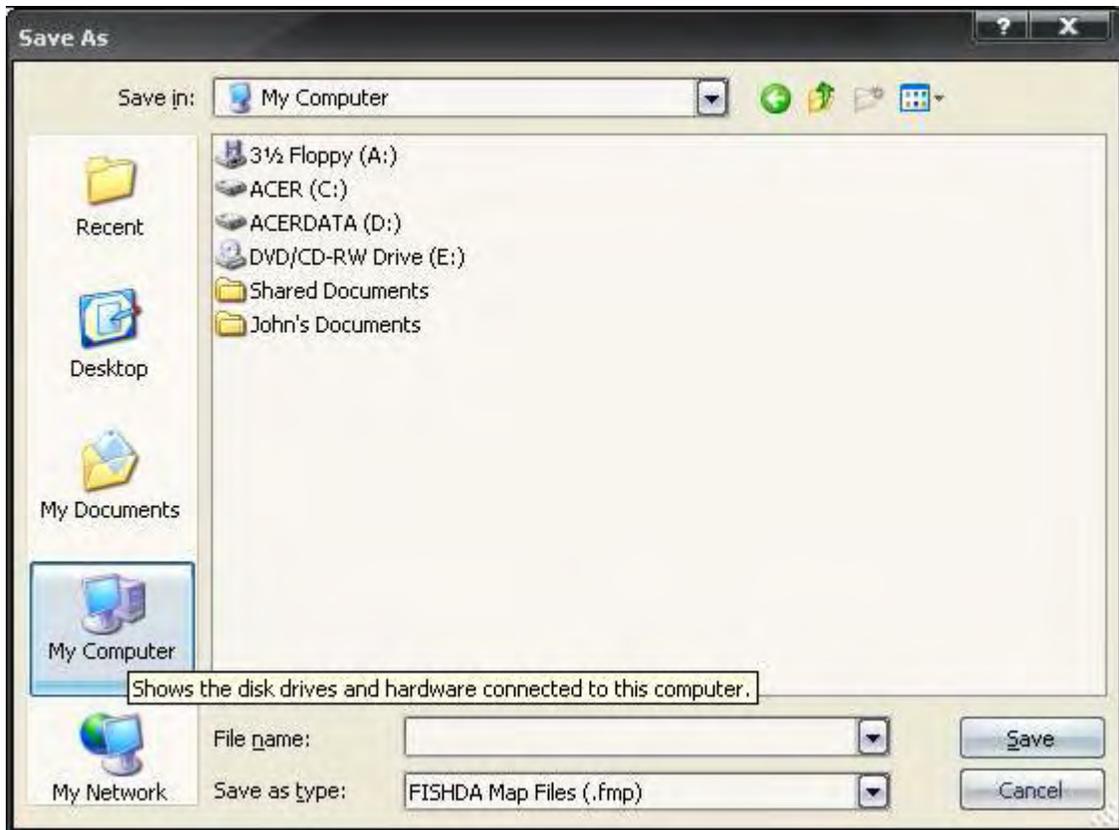


Fig. 4-11. Map Save Dialog Box

5.0 Help

To guide you in using the software, you can read the Help file by clicking on *Help* on the menu bar.

6.0 Error Messages

This section discusses the different error messages that you can possibly encounter in the FISHDA system.

6.1 Cannot Add More Towns to Model

The maximum number of towns that can be modeled in the system is four (4). If you choose to add another town to the model when there are already four towns, you will encounter an error message shown in Fig. 6-1.



Fig. 6-1. Cannot Add Another Town

6.2 Cannot Delete Town from Model

If you only have one town in your model, you cannot delete that town. A model must have at least one town in it. Selecting *Town -> Delete* from the menu bar when there is only one town in the model will produce *Cannot Delete Town* error as shown in Fig. 6-2.



Fig. 6-2. Cannot Delete Town

6.3 Invalid Town Name for Delete Town from Model

In deleting a town from the model, make sure that the name of the town you entered is valid, otherwise, you will get an error message as shown in Fig. 6-3.



Fig. 6-3. Town Name Does Not Exist

6.4 Town Name in Model Must Be Unique

The names of the towns in the model must be unique. If you have entered a town name that already exists in the model, you will get an error message as shown in Fig. 6-4.



Fig. 6-4. Town Name Must be Unique

6.5 No Selected Output Parameter for Run

When you have selected to run the simulation, you must select at least one output parameter to be displayed in the *Results* window. If you were not able to select at least one parameter for the output, you will get an error message as shown in Fig. 6-5.



Fig. 6-5. No Output Parameter Selected

6.6 No Selected Parameter for Export

When you have selected to generate a report to MS Excel, you must select at least one output parameter to be exported. If you were not able to select at least one parameter to be included in the report, you will get an error message as shown in Fig. 6-6.



Fig. 6-6. No Parameter Selected

6.7 Cannot Select More than Two Parameters for Sensitivity Analysis

You can select a maximum of two (2) parameters to perform sensitivity analysis on. Selecting more than two parameters will produce an error message shown in Fig. 6-7.



Fig. 6-7. Cannot Exceed Two Parameters

6.8 Invalid Filename Entered for Open Model/Map

When opening a saved file, make sure that the filename you entered is valid. Otherwise, you will get an error message as shown in Fig. 6-8.



Fig. 6-8. Invalid Filename

6.9 Name of Town in Map Must Be Unique

The names of the towns in the map must be unique. Towns with the same names will not be allowed. If you have entered a town name that is already in use, you will get the error message shown in Fig. 6-9.

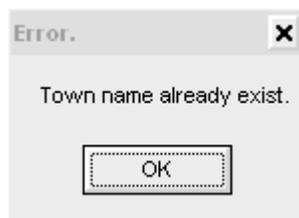


Fig. 6-9. Town Name Already Exists

6.10 Cannot Add More Towns to Map

The maximum number of towns that can be added in the map is four (4). If you choose to add another town to the map when there are already four towns, you will encounter an error message shown in Fig. 6-10.

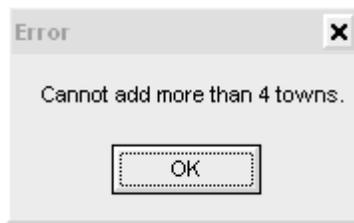


Fig. 6-10. Cannot Add More Than 4 Towns

6.11 Invalid Town Name Entered in Map

Entering an invalid town name on the combo box, then clicking on *Draw Municipal Water* or *Delete Town* button will give an error message shown in Fig. 6-11.



Fig. 6-11. Town Name Does Not Exist