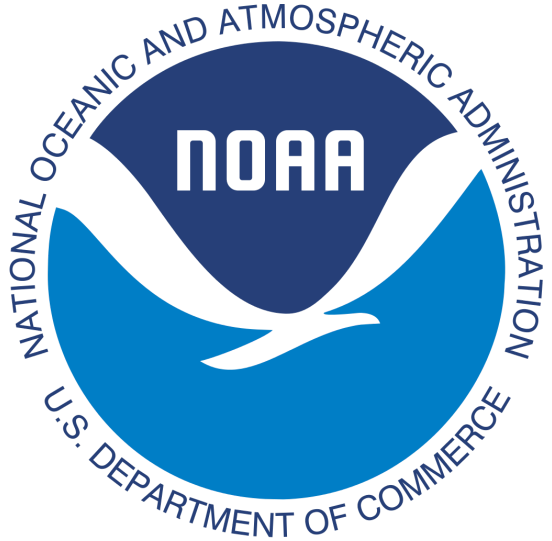
QuickStart Guide

MSVPA_X2

MultiSpecies Virtual Population Analysis

v0.9.0 (beta)

NOAA – National Marine Fisheries Service



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This application is an implementation of the MSVPA application written by Dr. Lance Garrison.

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1. Introduction

The Multi-Species Virtual Population Analysis tool is a Qt/C++ re-write of the Visual Basic tool written by Dr. Lance Garrison about 20 years ago. This tool is a series of single-species virtual population analysis (VPA) models linked by a simple feeding model to calculate natural mortality rates.[1]

A VPA is the process by which a population size is inferred to have been a certain size in the past in order to support the observed fish catches and natural mortality.

The functionality is the same as in the original tool, with the exception of being written in Qt/C++ and using a MySQL database for data storage.

2. Setup

In order to run MSVPA_X2, the following must be installed on your computer:

- MySQL

MSVPA_X2 uses MySQL to read and store all data used in the application.

3. Program Execution

Windows:

1. Create a directory for the release and copy the zip file into it.
2. Unzip the zip file containing the executable and required auxiliary files.
3. Double click the executable file and the application should start up.
   (N.B. You'll need to have MySQL installed prior to running the software.)

Linux:

1. Create a directory for the release and copy the tar file into it.
2. Untar the tar file containing the executable and required auxiliary files with:
   tar xvf *nameOfFile.tar*
3. Double click the **AppRun** file and the application should start up.
   (N.B. You'll need to have MySQL installed prior to running the software.)

Clicking **Help -> About** should raise a window with build information and is a good way to test that the application is functioning properly.

4. Importing the Test Database

The application is typically run by the user importing their data into the application's GUI forms (either manually or via copying/pasting from a spreadsheet). The user then saves their data into a MySQL database.

Alternatively, the user may import a MySQL database from an existing .sql file. A sample .sql file is provided as a test. It's named **Sept_10_*xx*.sql** (where *xx* is the version designation) and is provided with the release in the **sample_data** folder. To import this database, the user selects **File -> Import Database**.

N.B. After the import completes, it's important that the user clicks the **Save Project** and **Set Project as Current** buttons. After that, the user should click **File -> Regenerate CSV Files from Database** menu item.

5. Online Help

Online help is available in two formats:

1) Hover Help

Hover Help is available by holding the cursor over a GUI element. If Hover Help has been implemented for the element, a short textual tooltip will briefly appear.

2) WhatsThis? Help

WhatsThis? Help is typically more detailed information than what's available in Hover Help. It's available by first clicking on the arrow/question mark icon  in the application toolbar and then hovering over a GUI element. If WhatsThis? help has been implemented for a GUI element, the cursor will change from a circle with a diagonal line

to a question mark with an arrow at the bottom. Clicking on the element with the changed cursor will cause more detailed information to pop up on the screen, where it will remain until the user clicks the cursor.

6. GUI Layout

MSVPA_X2's user interface is set up as a collection of movable and resizable windows. From left to right they are: **Navigator**, **Data Input,** and **Output** windows. Below there is the **Progress Chart** window which shows the current state of the model run. An optional window is the **Log** window which shows the running log (by clicking Refresh) of the current application run. The Log window can be raised by right clicking on the top window border and checking the box next to Log.

7. Toolbar icons

The toolbar icons are shortcuts to often-used functionality. The currently implemented toolbar buttons are as follows:

1. MSVPA Create: 

   This button allows the user to create a new MSVPA configuration.

2. MSVPA Delete: 

   This button allows the user to delete the current MSVPA configuration.

3. Chart Capturing: 

   The  icon will allow the user to capture the currently displayed image in the Output window. If a data table is displayed in the Output window, clicking this button will allow the data to be saved as a CSV (comma separated value) file.

4. WhatsThis? Help: 

   This has been described in the Online Help section above. (You may do WhatsThis? Help on the WhatsThis? Icon itself!)

8. Project Setup

Prior to running a model in MSVPA_X2 the user must create a Project. In the Setup group in the Navigator, the user sets up first the Project, and then the Species. The user must be sure to click Save prior to moving to another tabbed window in the Setup group.

Please note, after the Project has been set up and a database created, the user should run **Utilities->Create Tables** to make sure all tables have been successfully created. This will have no effect on any tables that have already been created.

After the Setup has been completed, the user may then move to the **SSVPA** group.

9. SSVPA

These GUI forms contain the necessary age-based data to run a Single Species VPA. After the data are entered, the user runs the VPA by clicking Run on the Config tabbed window. After the VPA successfully runs, the user will see an Abundance surface in the Output window. The Surface chart is the 3-dimensional plot of Abundance data as a function of Age and Year. The user may then use the controls to the right of the chart to modify the chart as desired. As the user modifies select input data (i.e., Mortality Rates) the Abundance surface will update automatically (i.e., the SSVPA will re-run automatically).

10. MSVPA

An MSVPA is a user-named configuration consisting of Species assigned as Full MSVPA Species, Prey Only MSVPA Species, and Biomass Predators. After the user names and defines the MSVPA in the first MSVPA tabbed window, **Assign Species**, they then must populate the subsequent data input windows with the appropriate data.

The current MSVPA is run by clicking the Run button in the last MSVPA tabbed window, Execute. After a successful run, the user will have available to them a variety of output data charts in the Output window.

11. Output

MSVPA_X2 will produce output charts in the Output window. The appearance of these graphics may be modified by the GUI controls to the right of the drawing area in the Output window.

12. Saving your work

While all the data are saved in tables in the MySQL database that's selected in the user's Project file, the user may want to save their entire database as a backup, which is highly recommended. To do this, select **File->Export Database** and the current database will be saved as a .sql file.

13. Troubleshooting

1) **Can't connect to MySQL**

   This will happen if the MySQL server needs to be started or if the user enters the incorrect MySQL password to start the application.

2) **An application feature not working correctly**

   The application has a log system where status messages are periodically saved to an output file. The contents of these log files may be viewed by the user from within the application by enabling the Log window.

   To enable the Log window, right click anywhere on the toolbar and check the Log item. The Log window will appear in the application. You may click and drag it by its title to relocate it if desired. To view the most recent Log file, click the **Refresh** button in the Log window. The user may view a previous Log file by clicking the **Browse** button and selecting the desired Log file. After 50 Log files have been created, the user will be prompted to delete the current Log files.

   Log files are time-stamped and color-coded. Colors are defined as follows:
   - Black - Informational text
   - Blue - New section of messages

- Red - Warning
- **Red Bold** - Error

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[1] Lance P. Garrison, Jason S. Link, D. Patrick Kilduff, Matthew D. Cieri, Brandon Muffley, Douglas S. Vaughan, Alexei Sharov, Behzad Mahmoudi, Robert J. Latour, An expansion of the MSVPA approach for quantifying predator–prey interactions in exploited fish communities, *ICES Journal of Marine Science*, Volume 67, Issue 5, July 2010, Pages 856–870, https://doi.org/10.1093/icesjms/fsq005