Boston University

ESME Workbench 2011

User Guide

Monday, 28 March 2011

Contents

Introduction

This document describes the purpose, use, and appearance of ESME Workbench 2011. This software product integrates components of the Naval Underseas Warfare Center (NUWC), Biomimetica, and associated models into the One Navy Model (ONM) to model the Effects of Sound on the Marine Environment (ESME).

The One Navy Model

The ONM is a collection of discrete software products written by Biomimetica, BU, NUWC, and others. It does stuff.

Transmission Loss Calculators

Bellhop

RAM

CASS

REFMS (?)

Marine Mammal Movement Models

3MB

The Team

BU, NUWC, Biomimetica, … ?

The Purpose

Let's be nicer to whales. They never hurt nobody.

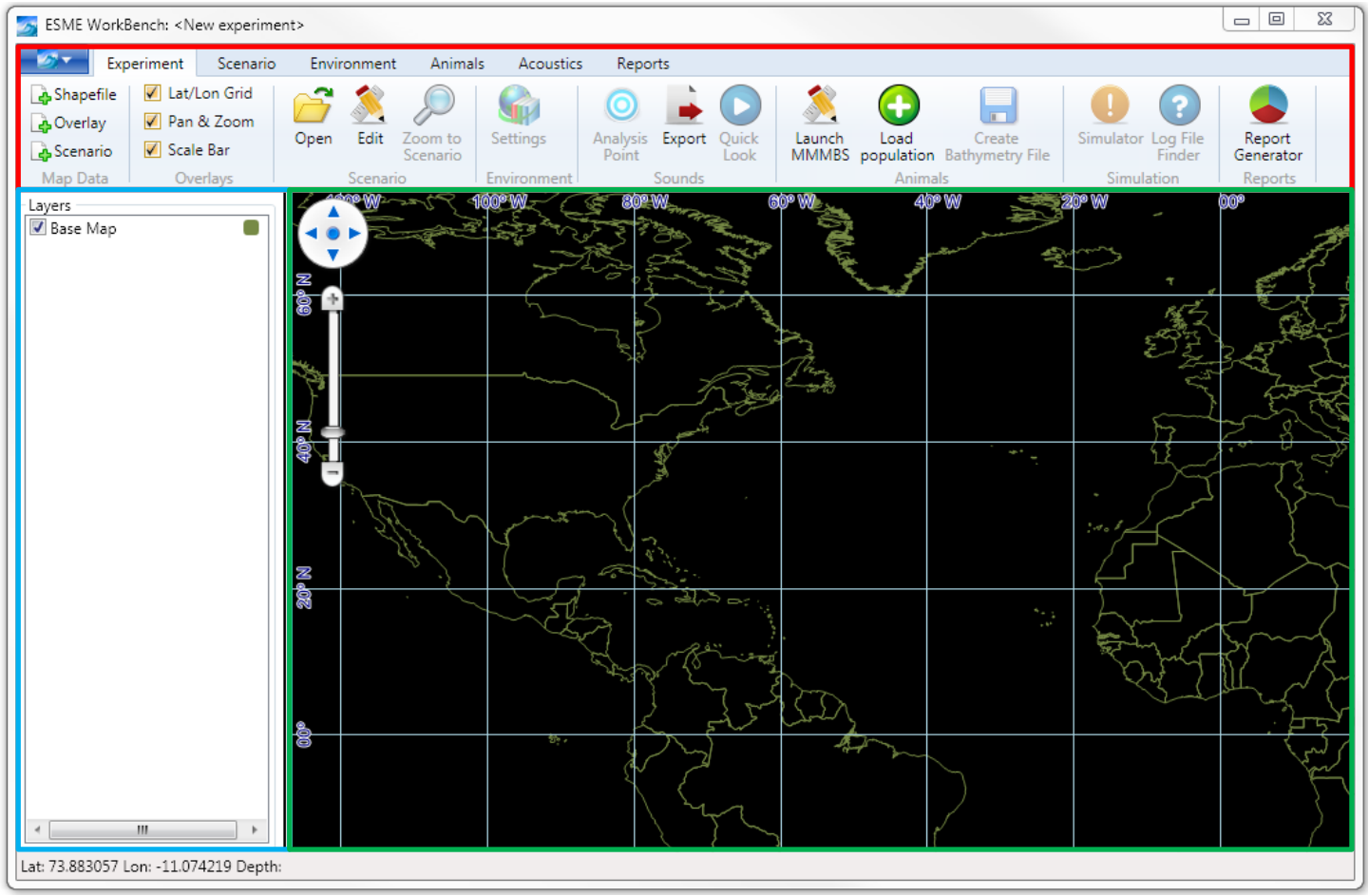
The Purpose of This Document

Everyone should know how to run a full simulation at some level. Let's instruct them.

ESME Workbench: User Interface Overview

ESME Workbench is intended to be an intuitive primary user interface to the ONM. From its main screen, users can complete all the steps necessary to run a full simulation, stopping and restarting at any point to modify parameters, view environmental information, or do any other task required before a simulation is fully run.

The Workbench Main Screen is pictured below:



The Workbench has three main areas:

1. The **Ribbon Control**, highlighted in red, contains buttons and other tools to load, save, and configure experiment data. For example, Scenario Files can be loaded here.
2. The **Layer List**, highlighted in blue, contains a list of experiment data that is already loaded, and allows its manipulation. For example, Analysis Points, once created, can be manipulated here.
3. The **Map**, highlighted in green, contains a graphical display of data for users to make sense of their experiments.

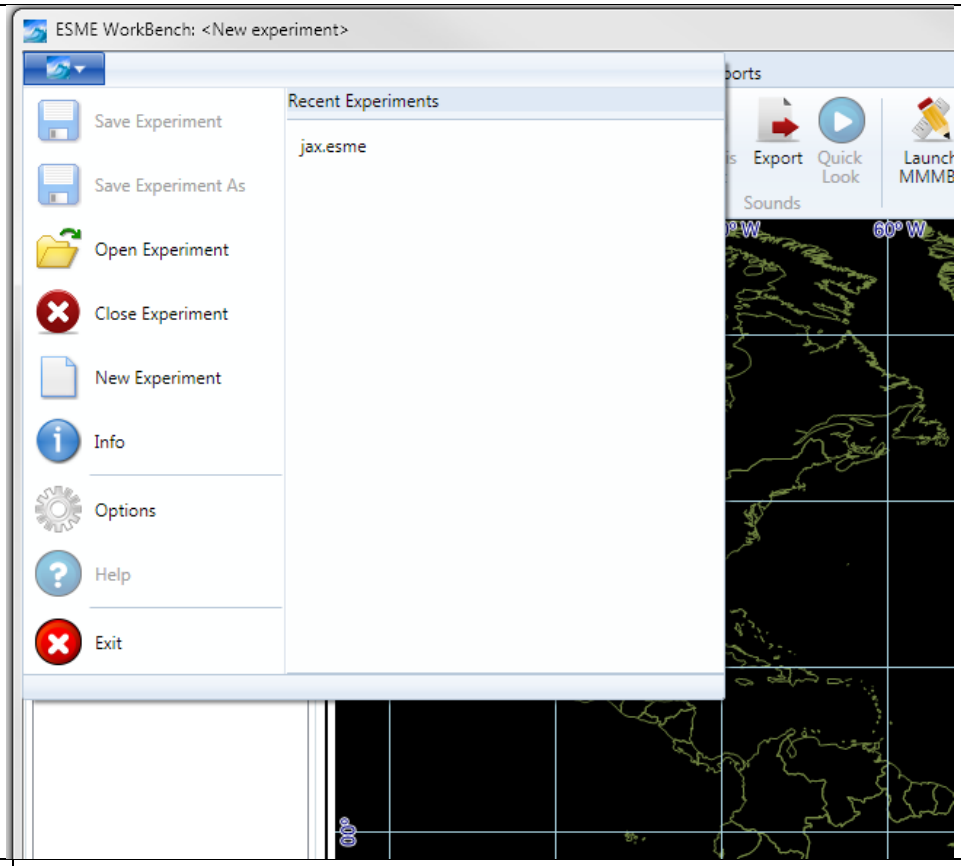
Each area is described more fully in the following sections.

The Ribbon Control

The ribbon control is the main way by which users add information to the experiment. There is a main application file menu, and several ribbon groups and tabs containing related buttons.

Configuration

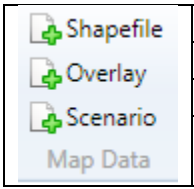
The large blue dropdown submenu is pictured below.



Name	Function
Recent Experiments	Lists recent experiments. Deleted or invalid experiments are not included.
Save Experiment	Opens a dialog box to save the experiment's state to a .esme file.
Save Experiment As	Opens a dialog box to save a previously saved .esme file to a different name.
Open Experiment	Loads a previously saved .esme file and all associated metadata
Close Experiment	Unloads and removes all current experiment information.
New Experiment	Unloads and removes all current experiment information.
Info	Displays the build information about ESME Workbench and its libraries for bug-reporting purposes.
Options	Opens the global options dialog box, described later.
Help	Displays help information
Exit	Quits ESME Workbench

Map Data

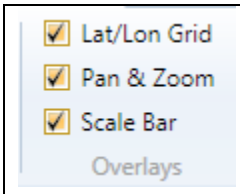
The Map Data ribbon group contains three buttons.



Name	Function
Shapefile	Opens a dialog box for the user to select a shapefile(*.shp) to load to the map display.
Overlay	Opens a dialog box for the user to select an overlay file (*.ovr) to load to the map display.
Scenario	Opens a dialog box for the user to select a scenario file (*.nemo) to load to the map display.

Overlays

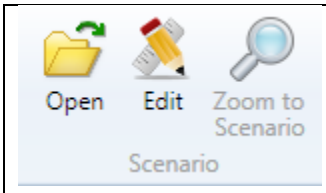
The Overlays ribbon group contains three check boxes.



Name	Function
Lat/Lon Grid	Toggles visibility of the grid display on the map.
Pan & Zoom	Toggles visibility of the on-map pan and zoom control widget. Mouse pan/zoom is not affected.
Scale Bar	Toggles visibility of the scale bar

Scenario

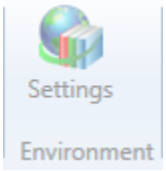
The Scenario ribbon group contains three buttons.



Name	Function
Open	Duplicates the functionality of the Map Data Scenario button.
Edit	Launches the NUWC Scenario Builder for users to create new *.nemo files.
Zoom to Scenario	This button is disabled until a valid Scenario File is loaded. When a valid scenario exists, clicking this button orients and zooms the map display to show the entire operational area.

Environment

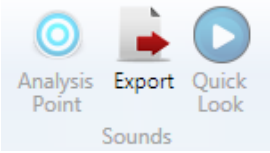
The Environment ribbon group contains one button.



Name	Function
Settings	Launches the Environmental Data Extraction Dialog, where users can select which time periods and which resolution OAML environmental data they wish to use for the experiment.

Sounds

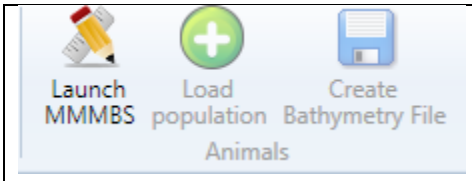
The Sounds ribbon group contains three buttons.



Name	Function
Analysis Point	Launches the Analysis Point dialog box, which begins the process of defining and placing an analysis point on the map. This button is disabled until a saved experiment exists that has valid environmental data extracted.
Export	Generates CASSOMatic batch files for all analysis points on the map.
Quick Look	Launches the Quick Look dialog box, which begins the process of running a quick look.

Animals

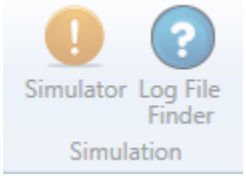
The Animals ribbon group contains three buttons.



Name	Function
Launch MMMBS	Launches MMMBS for users to interact directly with animat seeding operations.
Load Population	Loads a previously seeded population of animals (*.spe) and displays them on the map.
Create Bathymetry File	MMMBS requires direct access to bathymetric information about the operational area. Clicking this button extracts the current experiment bathymetry for use by MMMBS.

Simulation

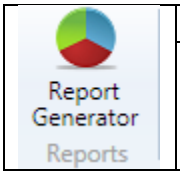
The Simulation ribbon group contains two buttons.



Name	Function
Simulator	Launches the NUWC Scenario Simulator. This button is disabled until all required steps for a simulation have been taken and all CASS transmission loss calculations have finished.
Log File Finder	Launches an explorer window to display the Scenario Simulator log file directory, for troubleshooting.

Reports

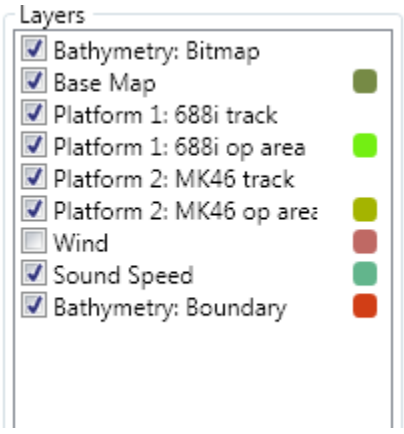
The Reports ribbon group contains one button.



Name	Function
Report Generator	Launches the NUWC Report Generator once the Scenario Simulator has completed a scenario simulation.

The Layer List

The layer list allows the user to control the display of information on the map.



The layer's visibility, display order, and where appropriate, symbol, color, size, and line weight may all be adjusted.

Visibility

Each layer in the layer list has a **checkbox** next to its name. Toggling the checked status of the box correspondingly toggles the visibility of that layer on the map. Note: unchecking a layer does not delete its associated data.

Display Order and Settings

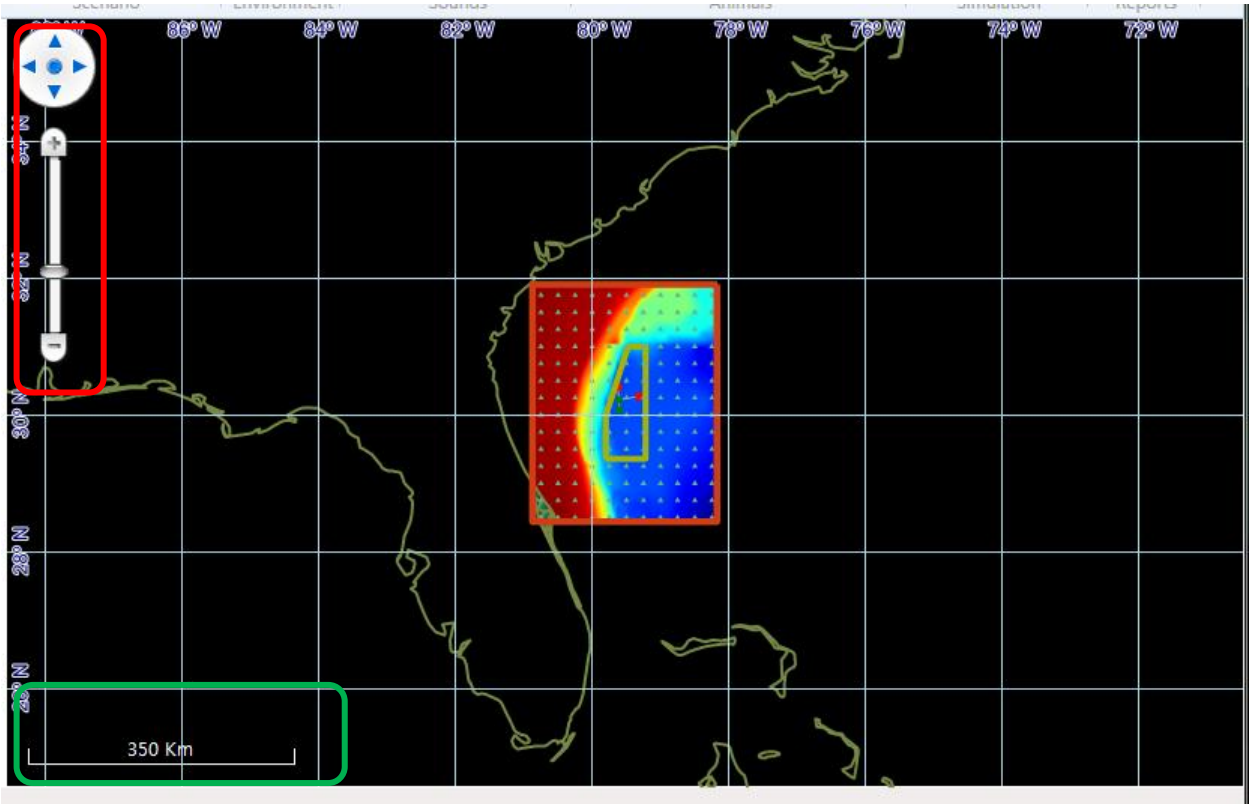
Right-clicking on the **layer name** displays a Layer Order context menu. This allows the user to move each layer up or down on the display. Layers "on top" of other layers obscure their predecessors. For some layers, such as Analysis Points, additional options to remove the layer or edit its settings are available.

Symbols, Size, and Color

Right-clicking on the **color box** associated with colorized layers allows the user to adjust:

- The displayed layer's Color, via a standard Color Picker interface.
- The displayed layer's Symbol, for those layers that have discrete data points.
- The displayed layer's Line Width, for boundary layers.

The Map



The Map is the primary interface by which data about the experiment is displayed to the user. Interactions with the map are primarily mouse-driven.

Pan/Zoom: The control highlighted in red, above, governs the zoom and position of the map data. Additionally, directly left-clicking and holding on the map with the mouse performs pan operations. For scroll wheel-equipped mice, the mouse wheel governs zoom level.

Scale: The scale bar, highlighted in green, displays the current scale in kilometers.

Cursor Location: The coordinates of the cursor are displayed on the bottom taskbar of the Workbench, below the Layer List. For map areas with available bathymetric data, the depth is also displayed.

Latitude/Longitude Grid: The latitude and longitude grid is overlaid on the map, and dynamically adjusts its scale as needed.

Workflow: Common Task Walkthroughs

Installation

Configuration

A Full Simulation: Flowchart

Building a Scenario

Loading a Scenario

Extracting Environmental Data

Determining Environmental Boundaries: Quick Looks

Calculating Transmission Losses: Analysis Points

Defining Animal Model Populations

Modeling Sound Exposure of Animals

Post-Processing Simulation Data

API