

Model Setup

Salinization Model

The instructions below explain how the mobilization model discussed in the paper can be executed on single or multiple computers. In addition to this document, readers should look at the general documentation for Repast Simphony (<http://repast.sourceforge.net/docs.html>) in order to learn how this simulation platform operates. The model was developed to operate within Repast Simphony 2.0.

Installing Repast Simphony

The first step in preparing to run the salinization model is to unzip the zip file downloaded from the web repository. Then, Repast Simphony should be installed (<http://repast.sourceforge.net/>) by downloading it from SourceForge. Instructions for properly setting up Repast Simphony should be followed as discussed on the SourceForge Repast page.

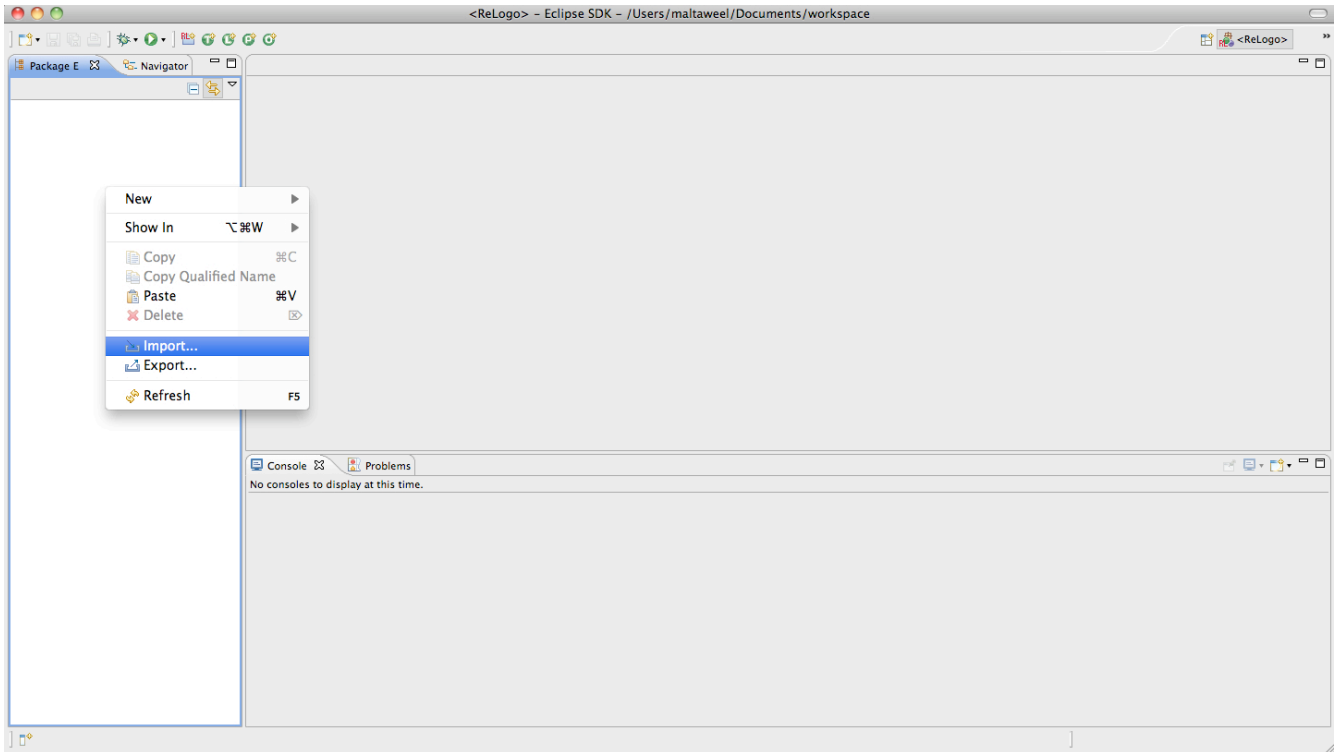


Figure 1.

Once Repast is setup and is opened, then the user should import the Salinization project into their workspace. To do this, right click in the package window and select the **Import...** option (see Figure 1). Then, select **General** → **Existing Projects into Workspace**, select **Next**, and in **Import Projects** select the **Browse** button and choose the Salinization folder.

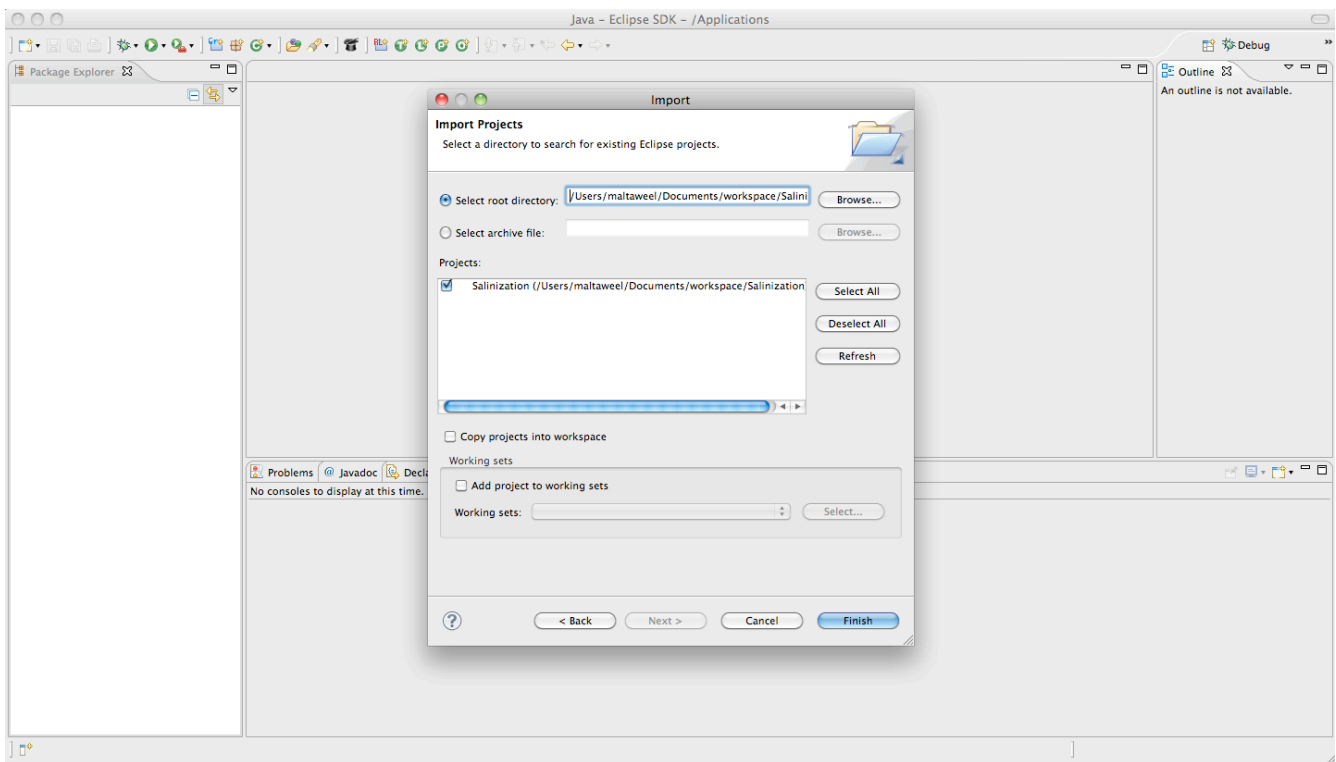


Figure 2.

At this stage, you should have the project selected in the Import Projects window, such as that shown in Figure 2. All that needs to be done now is to press the **Finish** button.

Running the Salinization Model

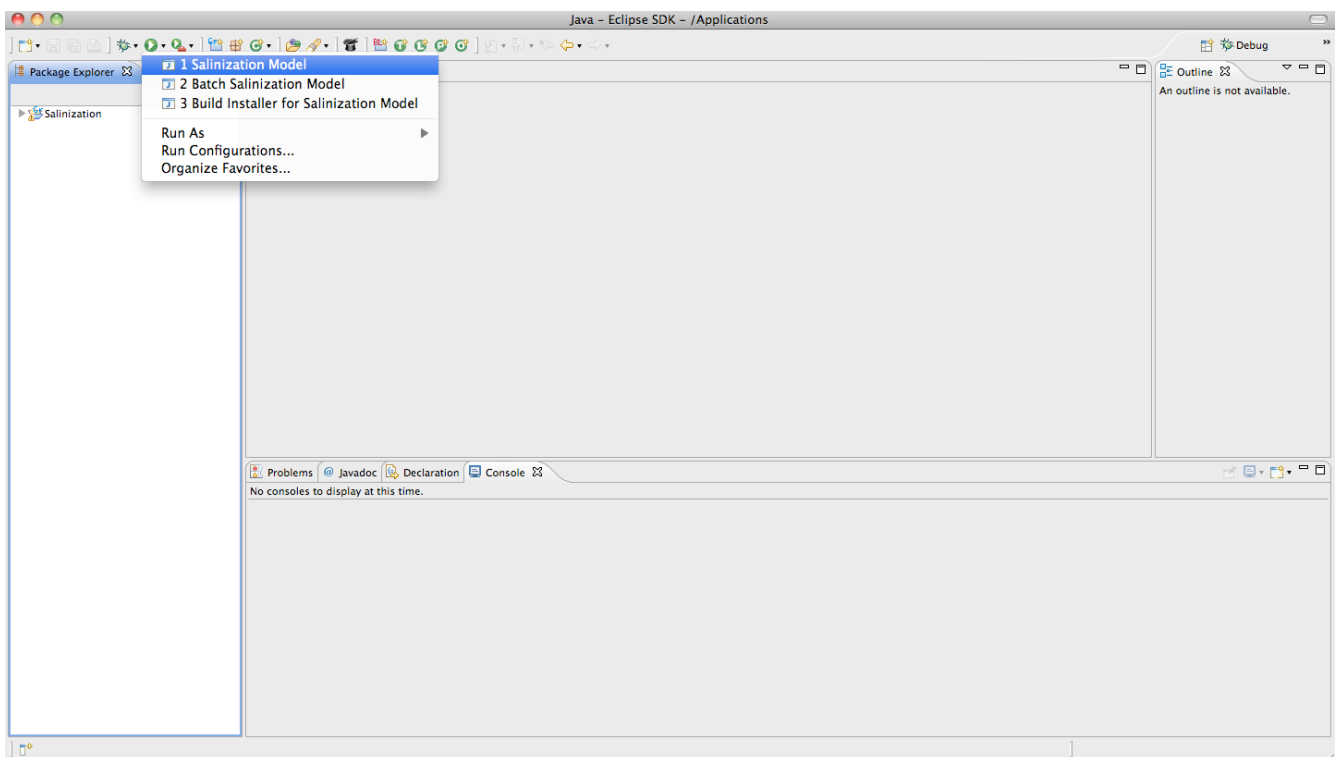


Figure 3.

Now, the salinization model can be run. To do this, select the downward arrow next to the green arrow (▶) and as shown in Figure 3. Select the Salinization Run option and click on the option.

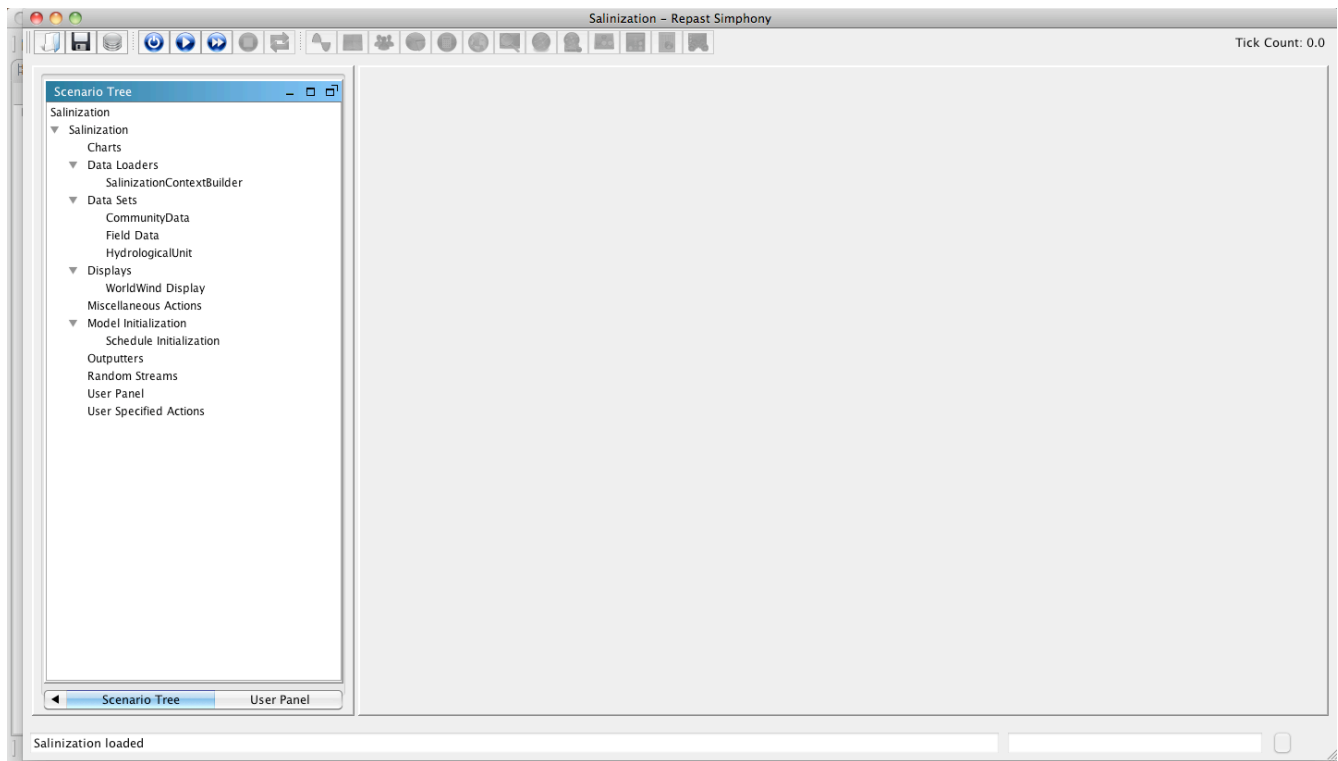


Figure 4.

At this point, the simulation GUI should be visible and the scenario should be loaded and ready to run. Now, simply press the initialization button (⏻) and then the run button (▶), or the run can be pressed directly (▶).

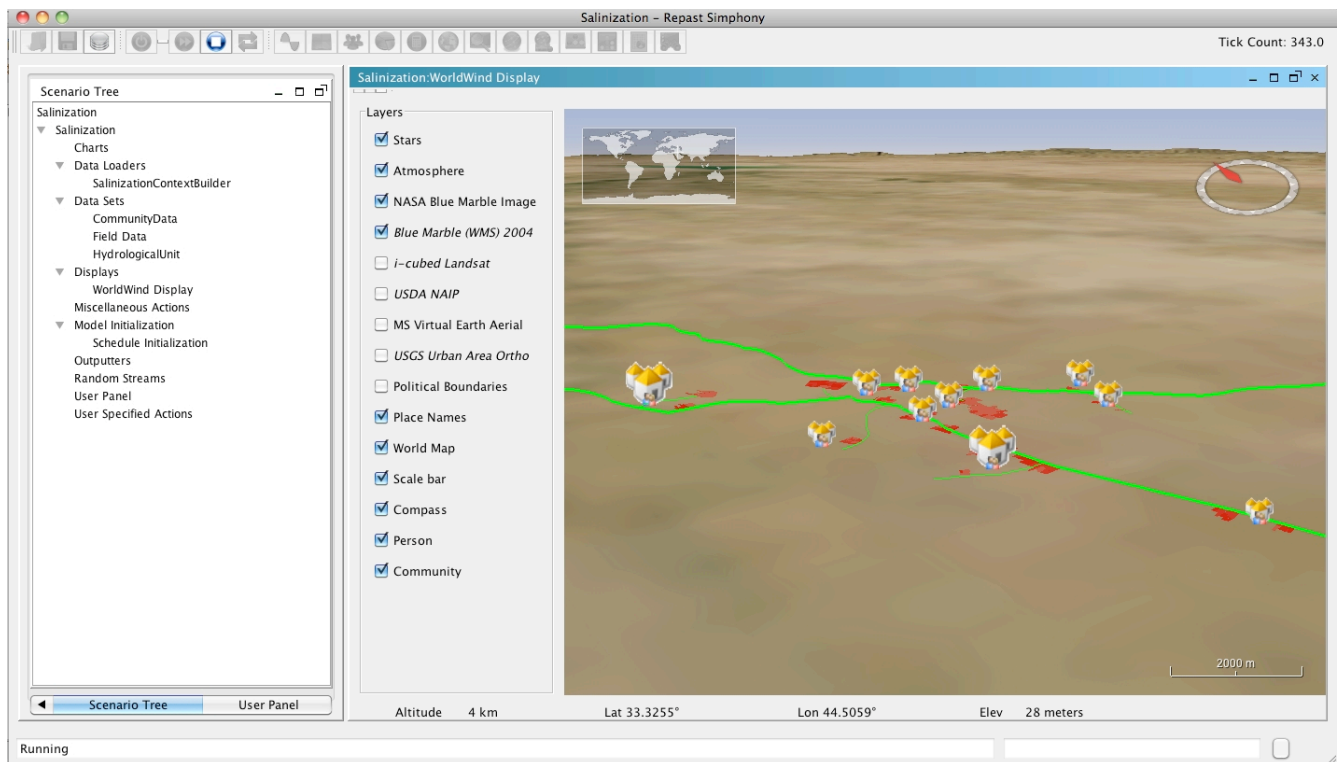



Figure 5.

The model should now display both graphical and WorldWind output that focuses on one of the scenarios modeled in the case studies (e.g., Figure 5). To adjust data for scenarios, users can go to the salinization.rs/parameters.xml file inside the Salinization folder and adjust variables as referenced in the article.

Running Batch Mode

To run the model in batch mode, simply go to the downward arrow next to the green arrow () in the Repast application. Select the Batch Salinization Model option, which will use the salinization.rs/batch_params.xml file in the Salinization folder. You can adjust the variables as referenced in the text for this file to change the scenario's settings.

Key Model Files

For the purposes of the article, all algorithms referenced in the paper can be found in `ucl.salinization.model.landuse.LandUse.java`, `ucl.salinization.model.physical.SalinizationModel.java`, and `ucl.salinization.model.physical.VolumeEstimatorModel.java`. The LandUse model is an agent-based model regulating agent decisions for fallowing and irrigation practice, the SalinizationModel file operates the main irrigation and salinity calculations, and VolumeEstimator determines rainfall based on a Markov chain model. See these files for specific code and notes on behaviors.

Key data files can be found in the data folder in Salinization. The data folder contains the shapefiles relevant for the landscape information, including the StreamFlowData folder (rainfall and irrigation discharge), SocialShapeFiles (settlement data), HydrologyShapeFiles (canal data), and FieldData (fields). The ScenarioData.xml in the data folder lists relevant data files used.

Output

Simulation output is produced in the output folder in Salinization. Output should be produced during the GUI-based run and batch mode.