



## Exercises: Running a potential rice production under ECHAM5 A1B climate scenario

### Introduction

The MWCropDSS (MapWindow Crop Production Decision Support System) , *a new version of CropDSS version 1.0*, understand how to make crop management data into FileX under the DSSAT Version 4.5 shell. It is important to understand the operation and performance of the crop models in the CSM before they can be applied to real world situations and problems such as precision farming and management.

### Aim

By completing this exercise, you will be able to:

- ✓ Run a rice simulation model to simulate rice production under A1B climate scenario in Chiang Mai and Lum phun provinces production zones.
- ✓ Use MapWindow GIS to visualize the spatial variability of rice yield under the 1980-89 period.

### Exercises and Self Test

#### 1. Setting up a new project

From the MWCropDSS v2.0 shell select *New Project*, the ‘**Project setting**’ interface will be presented (Figure 1). You will see five boxes in the interface, Project Data Location, Project Title, Project Details, Project boundary, and Project crop area. Type in the followings;

Project Data Location:	<b>MyProject</b>
Project Title:	<b>Rice production in Chiang Mai and Lumpun provinces.</b>
Project Details:	<b>Simulating rice production in Chiang Mai and Lumpun provinces under ECHAM5 A1B climate scenario during 1980-89.</b>
Project boundary:	<a href="#">\\MyProject\admin</a> will be added automatically
Project crop area:	<a href="#">\\MyProject\crop</a> will be added automatically

Click ‘**Save**’ button and two message boxes will appear to inform you about ‘**Save project completed**’ as well as ‘**Adding project boundary**’ data into your newly created ‘*MyProject*’.

### Self Test

Open the MyProject folder and check the content of the folder. You should see several sub-folders, i.e. Admin, Crop, Data, FileX, Output, SMU.

## 2. Setting up and copy *Admin* and *Crop* shapefiles into MyProject folders

Next step is to copy *Admin* and *Crop* shapefiles from “Project505” into appropriate sub-folders, under “MyProject” folder.

- ❑ On the main menu of MWCropDSS, click “**Edit Existing Project**” and select “**MyProject.cdss**” from the list of project.
- ❑ On the right-hand side of “**Project boundary**”, \MyProject\Admin, click on the button with three dots and the shell should take you to \MyProject\admin sub-folder. Select **atha505.shp** file and click ‘**Open**’, and select c505.shp for crop area and click ‘**save**’ button.

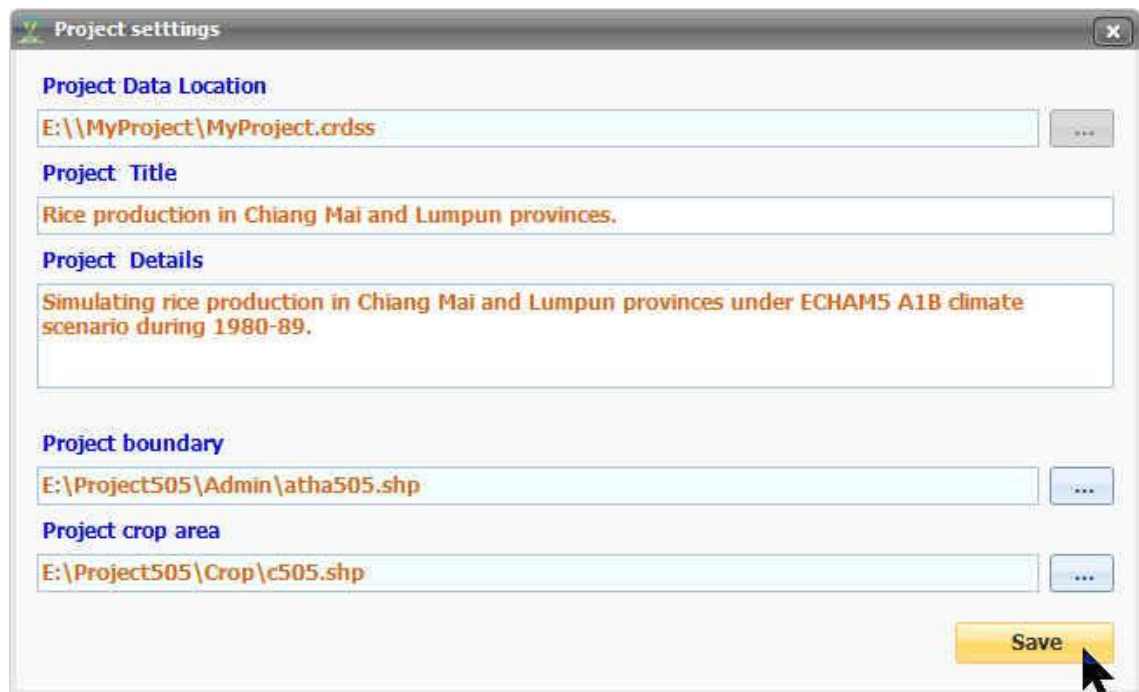


Figure 1: Project locations and data shapefiles.

- ❑ Now you are ready to copy the *Admin* and *Crop* shapefiles from “\Project505\Admin and \Project505\crop” into \MyProject\Admin and \MyProject\Crop sub-folders, respectively.

### Self Test

Open \MyProject\Admin and \MyProject\Crop sub-folders and check the content of the folder. You should see ATHA505.SHP and C505.SHP, respectively.

### 3. Running the rice model under MWCropDSS shell

Now you are ready to simulate the impact of climate change scenario on rice production in Chiang Mai and Lumpun provinces using ECHAM5 A1B climate scenario during 1980-1989.

- ❑ On the main menu of MWCropDSS, click “**Crop yield simulation**” on the top level menu, and click “**Run Model**” button on the second level menu on the far left. You may be prompted with a blank interface since you are using the MWCropDSS for the first time. To add your climate and production scenarios, click on ‘**Setting**’ button in the lower right of the interface (Figure 2).

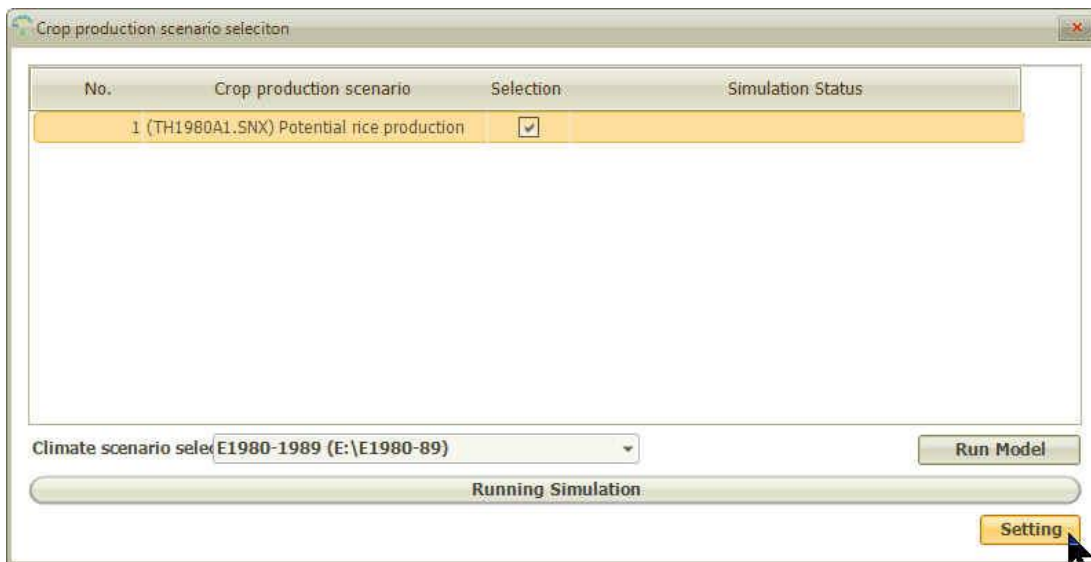


Figure 2: To define climate and production scenarios.

- ❑ Climate and production scenario interface will be presented, click “**Climate scenarios**” and “**Add**” button on the second level menu. Use the information in Figure 3 to complete the form.

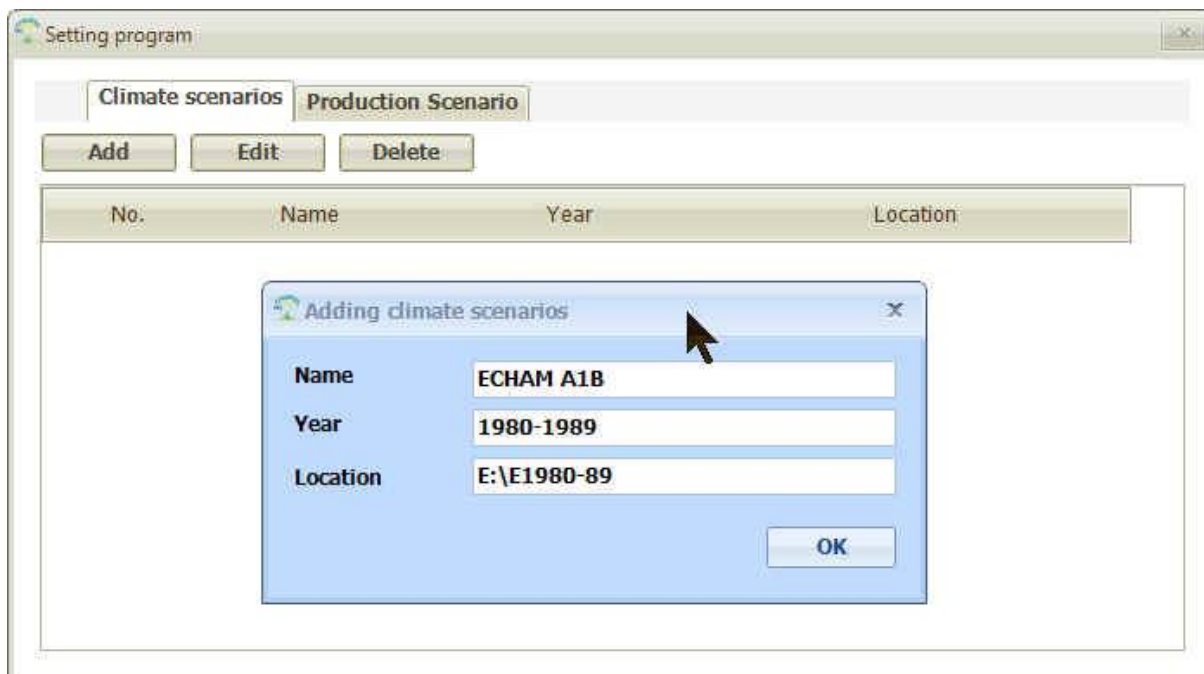


Figure 3: Information for climate scenario during 1980-1989 over Chiang Mai and Lumpun.

- ❑ Next, you need to add rice potential production scenario, click “**Production scenarios**” and “**Add**” button on the second level menu (Figure 4). TH1980A1.SNX is pre-defined Rice Management Data for use with the CERES-CSM-DSSAT rice model version 4.5 to simulated development and growth of rice crop in the area.

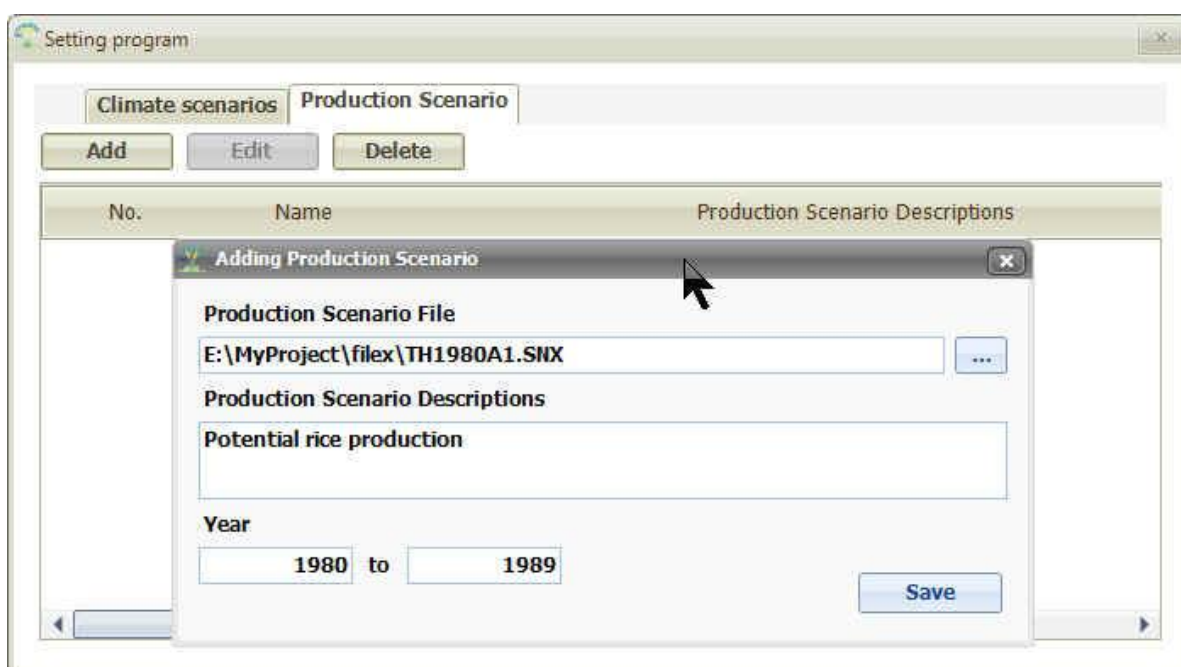


Figure 4: Information for rice potential production scenario during 1980-1989 over Chiang Mai and Lumpun.

- ❑ Finally, you are ready to run the simulation of potential rice production system for Chiang Mai and Lumpun province according to the climate and production scenarios as defined above.

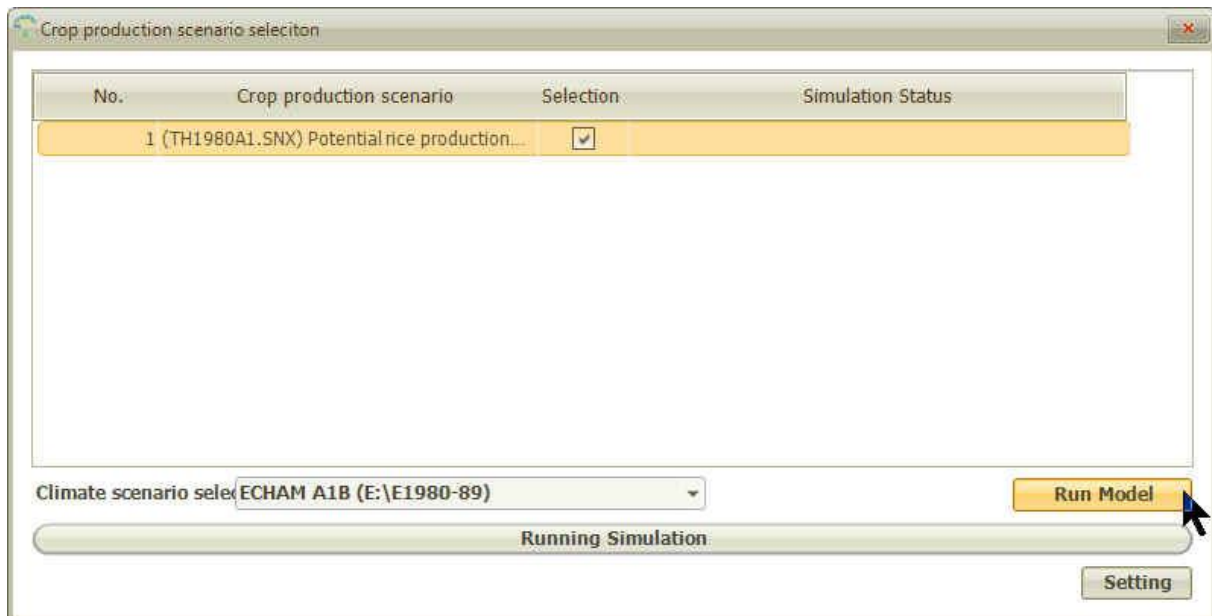


Figure 5: Running the CERES-CSM-DSSAT rice model under ECHAM A1B during 1980-89 and with potential rice production FileX.

#### 4. Joining output variables with the crop map

Now you are ready to join selected variables as a result of simulation runs with the crop area map.

- ❑ On the main menu of MWCropDSS, click “**Analysis**” on the top level menu, and click “**Creating map**” button on the second level menu on the far left. You should be presented with list of the completed run, i.e. *Potential rice production in CNX-LP ECHAM5 A1B* (Figure 6).

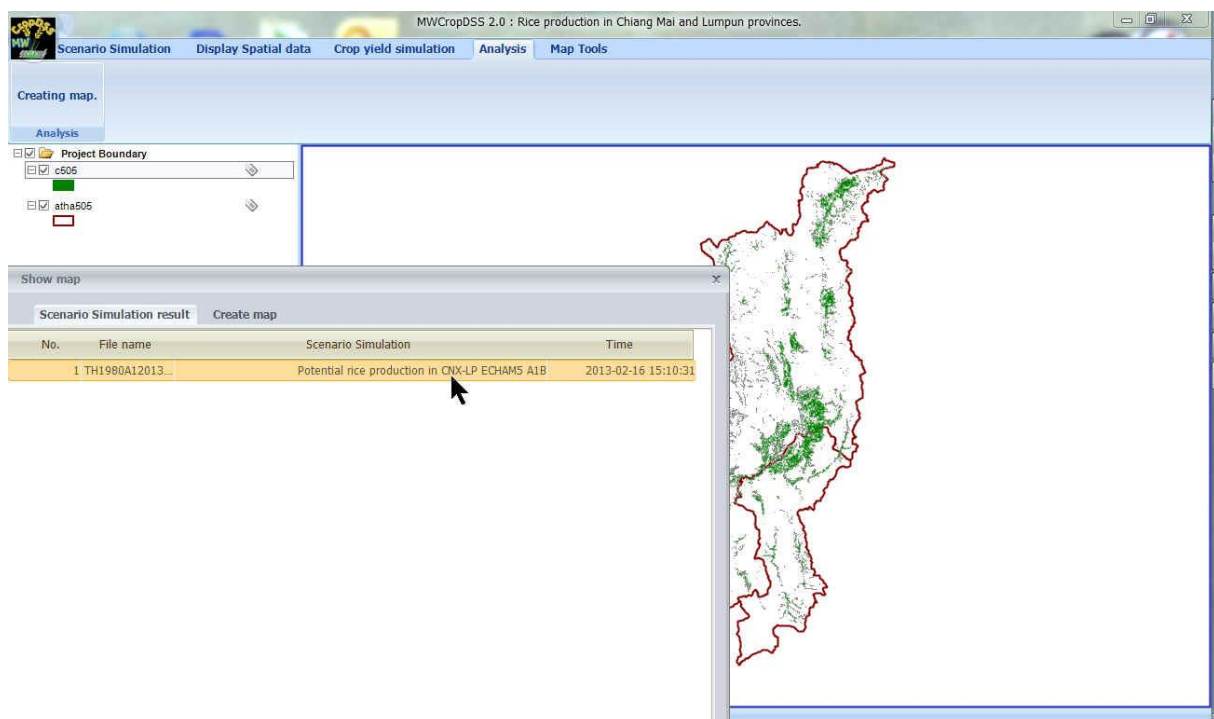


Figure 6: To define climate and production scenarios.

- ❑ To display your simulated variables on map, you need to select “**Create map**” tab and look for “**(HWAM) Harvested yield (kg [dm]/ha)**” and click “**Save**”. Save the new shapefile in **\MyProject\Output\** folder under the name **1980-89HWAM.SHP**.

### *Self Test*

Look for 1980-89HWAM.SHP file in \MyProject\Output\ folder.

## **5. Viewing crop map in MapWindow GIS**

This section introduces steps to view your simulated variables using MapWindow GIS version 4.8.6.

- ❑ Click on MapWindow GIS icon on your desktop and “Add” the shapefile **1980-89HWAM.SHP** saved in **\MyProject\Output\** folder (Figure 7).

Figure 7: Creating various categories with MapWindow GIS.