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User's Manual for Middle Ware Master WEAPhish

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1. What is Master_WEAPhish

In this collaborative project called WEAPhish linking a water resources model (WEAP) and a fish population model (Main Fish) scripted in python, we developed the middle ware called Master_WEAPhish scripted Visual Basic for Applications (VBA) in Excel. The advantage of using this middle ware is (1) easy repetitive process (2) convenient to store inputs and outputs at the same file (3) adjust more than one parameter per run.

2. How to set up WEAPhish

In the process, the middle ware is named "Master_WEAPhish" excel file is located in directory C:\WEAPhish. This excel file is saved as "Excel Macro-Enabled Workbook" and should be saved in this format all the time.

A. The Developer tab is not displayed by default. For those users who have not used VBA in excel before, please follow the extra steps:

Click on File menu and select "Options" at the end of the menu. In the new window that pops up, click on "Customize Ribbon" and check the option labeled "Developer" on the right hand pane. Click OK. Now, Developer tab will be on the ribbon interface.

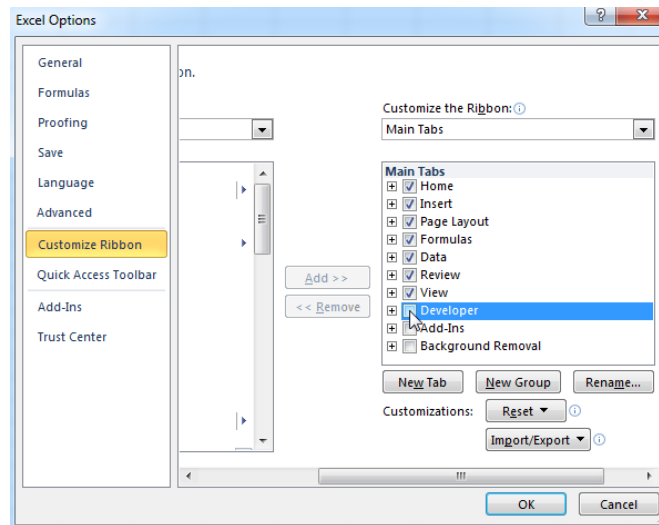


Figure 1. Excel Option window where user can select Developer. Developer tab allows user to view the VBA code and all built macros in Master_WEAPhish. If macro does not run, this step is crucial. Also user should double check it is saved as “Macro-enabled workbook”

B. Sometimes, the macro function not displayed by default. For those users who have not used VBA in excel before, please follow the extra steps:

Click the Microsoft Office Button, and then click Excel Options. Click Trust center, click Trust Center Setting, and then click Macro Settings. Then, Click the option “Enable all macros (not recommended; potentially dangerous code can run)”.

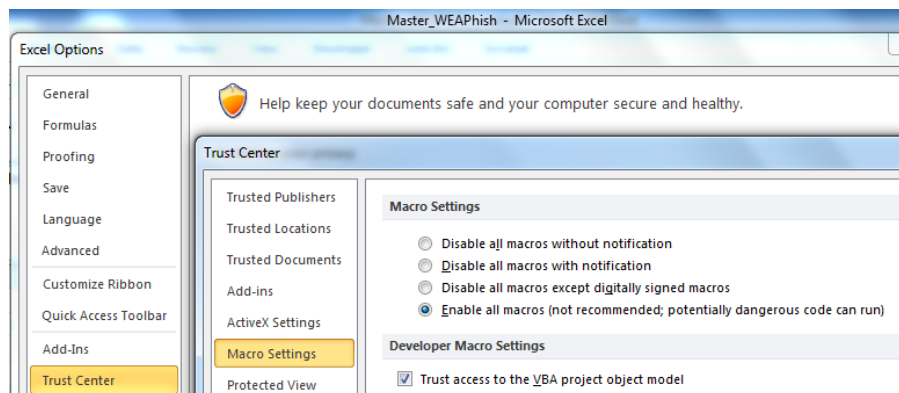


Figure 2. Another important set up before running the Master_WEAPhish. If user has never used macro in the machine, it is very likely for user to set this up as well.

3. How to set up sub-folders

Before, running the WEAP and main_fish.python file using the Master_WEAPhish, the sub folder need to be in right place for it to run. Download the WEAPhish.zip file and unzip it in directory “C:\”. Then the unzipped files in Local C should look like the following:

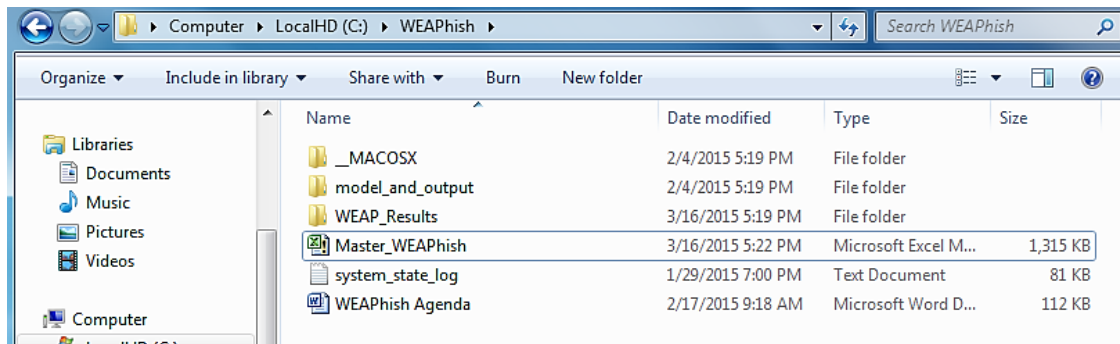


Figure 3. How unzipped WEAPhish.zip file would look like in Local Drive C. Do not change/remove these files to different directory. These need to stay in specific location. Instead of WEAPhish_Agenda, it will be updated as Master_WEAPhish_manual word document.

4. Download WEAP, Anaconda, Python 27

Follow the link, register as member (free), and download the most updated version of WEAP.

<http://www.weap21.org/>

After WEAP installation, it will automatically set up the WEAP area in directory "C:\Users\User's name\Documents\WEAP Areas". Remember to move the unzip file named "WEAP:2015_02_04_BUT_BAU". Open WEAP, in Schematic view, go to Area tab, go to Manage Areas, press the button Restore, and select the correct unzipped area file (User do not have to unzip the Area file).

For Anaconda, no registration is required, so follow the link and download it (check if your Windows 32-Bit or 64-Bit <http://continuum.io/downloads>

For Python 2.7, no registration is required, when you select the directory to run installation, use default. <https://www.python.org/download/releases/2.7/>



5. Explanation on each tabs

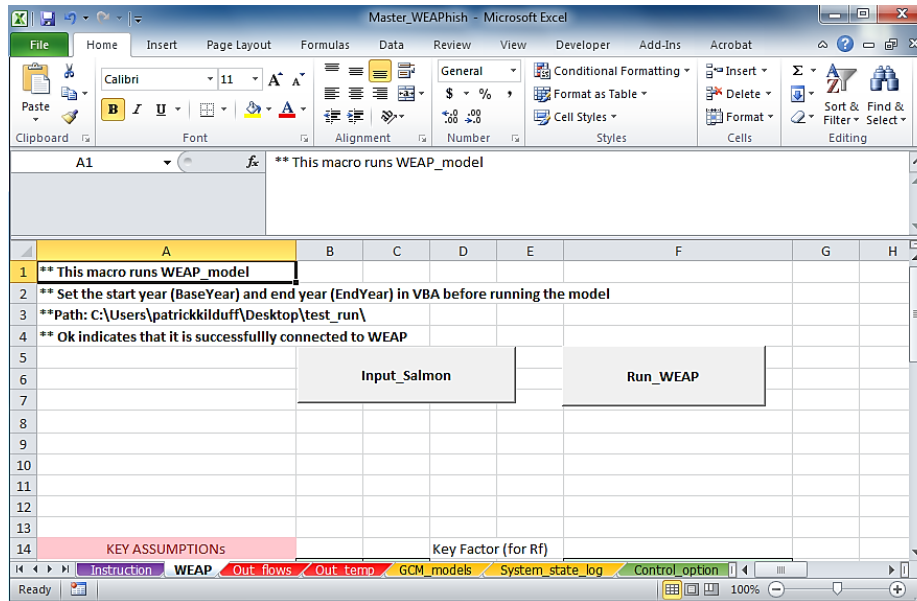


Figure 4. In Master_WEAPhish, “WEAP” tab where it has two main macros: Input_Salmon and Run_WEAP macro. Other tabs are displayed in different colors.

The detailed information about the content will be provided in Patrick’s manual. This description gives an idea of how to use the available Macro that are available in different tabs. Macro is

Instruction – Overview of Master_WEAPhish excel file. No macro in this tab. Read before using Master_WEAPhish

WEAP – this is main tab that controls the following: running WEAP, running scenarios, updating input data, changing start and end year, and adjusting key assumption.

Input Salmon macro this is located on the left top of the worksheet. Click this macro and it will take few seconds to run. No pop up window will be shown. This macro basically runs all the input value macro from the other tabs. Instead of individually updating the macro, user can simply click this macro to have all input data updated. However, if user needs to update individual input data set, user can go to individual input data tab and click individual macro for update. Then it will not update all input data.

Key Assumption are values directly connected to WEAP meaning any changes made in Key Assumption value will reflect on the WEAP calculation. Not recommended adjusting these values, unless user is confident about new Key Assumption values.



Start year and End year to adjust starting and ending year, user can control in this tab. This will automatically link to WEAP meaning there is no need for user to go on WEAP to adjust this feature.

K	L
Start Year	2000
End Year	2001

Figure 5. Start year and end year can be adjusted in column K and J.

Run WEAP macro is another macro located next to the Input_Salmon macro. This macro runs the WEAP. When you click it, the following tab will be shown:

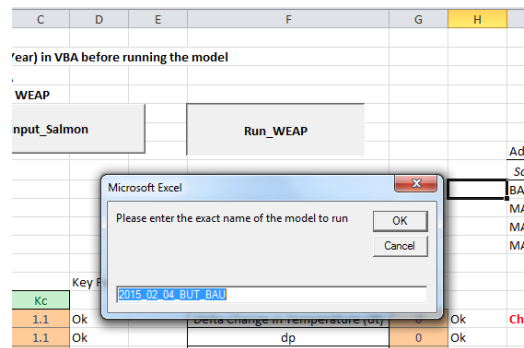


Figure 6. The pop up when user click on the Run_WEAP macro. It will ask user which model to run. The user is asked to input the name of the model to run. Please refer to name of the WEAP model.

After WEAP is done running, the result will be shown in the red tab (i.e. Out_flow, Out_temp). Also some results will be saved in the directory “C:\WEAPhish\WEAP_Results”

Running Scenarios user can easily adjust the scenario and GCM that they would like to run. As it is shown in Figure 7, the scenario is controlled in cell “L9” and General Circulation Models (GCMs) is controlled in cell “M9”. We have four scenarios available. Plugging in “1” in cell L9 will only run “Business As Usual (BAU)”, typing in “2” in cell L9 will run “Cold water Storage” and previous scenario, typing in “3” will run the scenario with “No Diversion/ No hydrologic pump from Centerville PWH” and previous two scenarios, and typing in “4” will run the combination of BAU and Cold Water Storage scenarios and previous three scenarios.



I	J	K	L	M
		Start Year	2000	ok
		End Year	2001	ok
Adjust years, ALL MAs, ALL climate scenarios and ALL GCMs				
Scenario labels	Scenario switches		Scenarios	GCM
BAU	1	BAU (Clim Chang)	1	1
MA01	2	Cold Water Storage		
MA02	3	No Diversion/No HP from Centerville PWH		
MA03	4	1+2		

Figure 7. In WEAP tab, user can choose which scenarios and GCM to run. User can type in from 1 to 4 for scenario in cell L9 and can type in from 1 to 12 for GCM in cell M9.

We have twelve GCM available. User can type in number 1 to 12 in cell M9. The GCM is shown in GCM_models tab. More scenarios and more GCM will take longer time to run.

Out_flows – After WEAP runs, the flow output data is saved in this work sheet.

Out_temp – After WEAP runs, the temperature output data is saved in this work sheet.

GCM_models – please do not adjust this work sheet unless user is confident about it. This may alter the name of the output files. Unless user has specific reason for adjusting these, this tab should remain the same.

System_state_log – please do not adjust this work sheet unless user is confident about it. This may alter the name of the output files. Unless user has specific reason for adjusting these, this tab should remain the same.

Control_option, Control_process, Relations, Spawn, Species_info, Stream, Supplement, Temps, Wua, Wua_stage_scalars

These tabs include one macro that exports the worksheet data into text file. As shown on the right side of the worksheet, the macro is called, for example, “Control_option.txt”. The text file will be saved in the directory “C:\WEAPhish\model_and_output\bc_2010”.

For further information about Master_WEAPhish or User’s Manual contact the following:

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