

SwanOneSed User Manual

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1. Introduction

SwanOneSed is an extension of SwanOne, which implies that the results of SwanOne are required. The model enables users to determine the net sediment transport on a yearly basis along a coastline due to the orbital motion of waves.

2. Installation

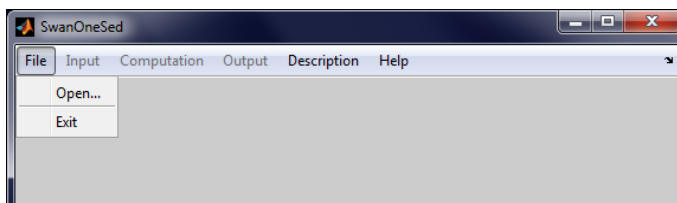
The model can be executed by either a standalone or a Matlab version. For the standalone (EXE-file), one should first install the MCR installer. After a double click on the executable, **wait for 60 seconds**. Matlab can also be applied by including the m-files. One should run SwanOneSed.m in Matlab R2015b.

3. Start-up

The start-up window appears by double-clicking on *SwanOneSed.m*. One can observe that three buttons are yet disabled. These will become active after selecting of the input data.



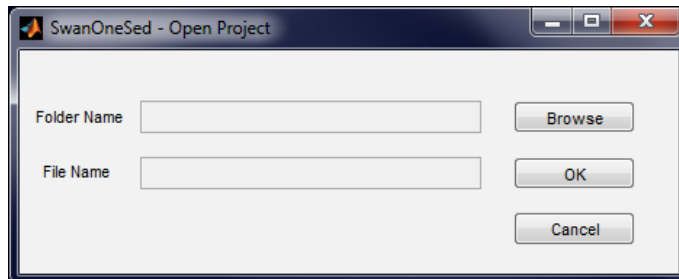
The input data originating from a SwanOne computation can be searched for by using the *File-* and *Open...-*button. In case one prefers to close the model, the *Exit-*button can be used.



Apart from this, the *Description-*button contains the background information, while the *Help-*button refers to this manual.

3.1. Open...

After clicking on *Open...* the following window appears. To find the correct SwanOne project folder, which contains the data, one should use the *Browse*-button. Once the file is selected, the folder name and file name will be shown.

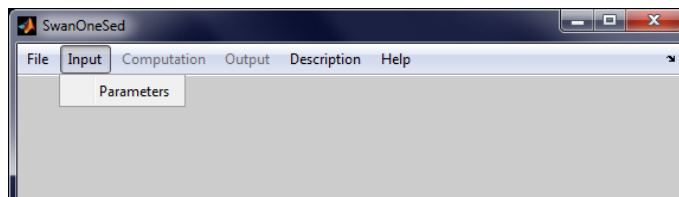


The *OK*-button will save the data. The data is then recognized and the *Input*-, *Computation*- and *Output*-button will become active.

Note: The file containing the input data does not have to be in the working directory.

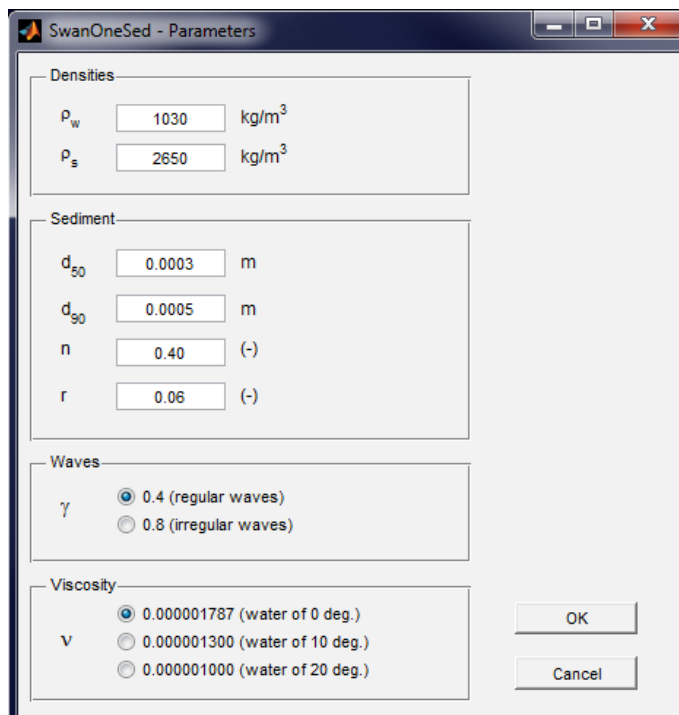
4. Input

Click on *Input/Parameters* to insert the required sediment, water and wave properties. When this is completed, the model enables the *Computation*-button.



4.1. Parameters

The characteristics of the sediment, the properties of water and the types of waves can be defined in the following window.

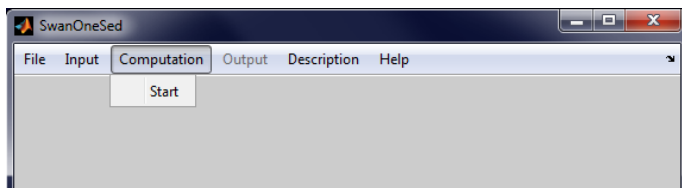


Variable and description:

ρ_w	density of water
ρ_s	density of sediment
d_{50}	median grain size
d_{90}	grain size exceeded by 10% of the total weight of sand
n	porosity of sand
r	bed roughness
γ	breakwater parameter (wave height/water depth ratio)
ν	viscosity

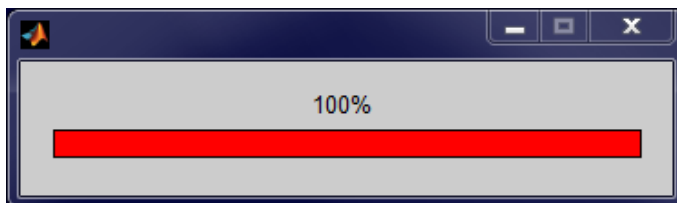
5. Computation

Subsequently, the longshore transport can be computed. Click on *Computation/Start*-button to start the computation, which also enables the *Output*-button.



5.1. Start

The following progress-bar appears and closes when all the results are computed.



6. Output

The output is several plots and a table. The plots are visualizing the characteristics and impact of waves as a function of the distance to the shoreline. In contrast, the tables provide raw data, which one can use for their own analysis.



6.1. Plots

Five plots are generated with increasing distance from to the point of measurement to the shoreline. One can find the following figures by clicking on the *Plots*-button.

Window on the left.

Top-left figure provides the bottom profile relative to the still water line.

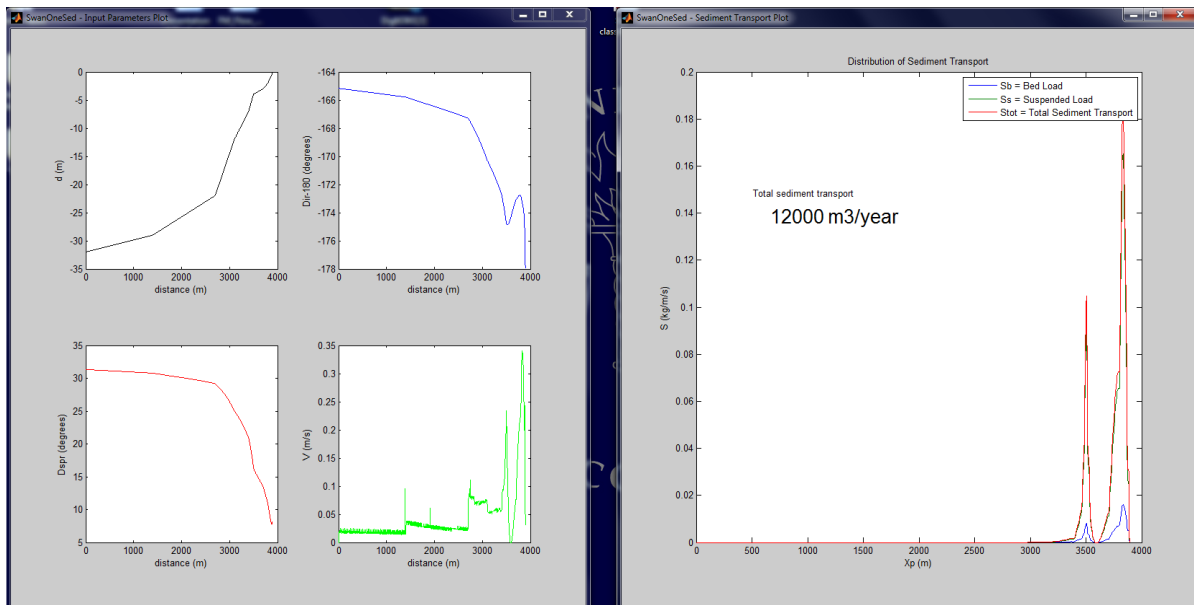
Top-right figure provides the main direction of the waves minus 180 degrees.

Bottom-left figure provides the directional spreading of waves.

Bottom-right figure provides the wave-generated flow velocities at the bed.

Window on the right.

The figure covering this window provides the most important information. It shows the location and the amount of sediment transport. What is more, one can observe three line corresponding with the bed load (blue line), suspended load (green line) and the total load (red line). In the middle of the figure the total sediment transport on a yearly based is presented.



6.2. Tables

Clicking on *Tables*-button will generate an Excel-file with eight columns. The relation between the column and the parameter are as follows:

- Column A: Xp is the distance to the shoreline.
- Column B: Depth_neg is the water depth relative to the still water line.
- Column C: Dir-180 is the main direction of the waves minus 180 degrees.
- Column D: Dspr is the directional spreading of the waves.
- Column E: V is the wave-generated flow velocities at the bed.
- Column F: Sb is the amount of bed load transported.
- Column G: Ss is the amount of suspended load transported.
- Column H: Stot is the amount of total sediment (suspended and bed load) transported.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	0	-32	-165.167	31.3316	0	0	0	0						
2	5	-31.9893	-165.169	31.3297	0.016833	0	0	0						
3	10	-31.9786	-165.171	31.3278	0.018686	0	0	0						
4	15	-31.9679	-165.173	31.3259	0.016802	0	0	0						
5	20	-31.9571	-165.175	31.324	0.01857	0	0	0						
6	25	-31.9464	-165.177	31.3222	0.016771	0	0	0						
7	30	-31.9357	-165.18	31.3203	0.02478	0	0	0						
8	35	-31.925	-165.182	31.3184	0.017485	0	0	0						
9	40	-31.9143	-165.184	31.3165	0.017846	0	0	0						
10	45	-31.9036	-165.186	31.3146	0.017455	0	0	0						
11	50	-31.8929	-165.188	31.3128	0.017814	0	0	0						
12	55	-31.8821	-165.19	31.3108	0.018458	0	0	0						
13	60	-31.8714	-165.193	31.309	0.02355	0	0	0						
14	65	-31.8607	-165.195	31.3071	0.018511	0	0	0						
15	70	-31.85	-165.197	31.3052	0.016634	0	0	0						
16	75	-31.8393	-165.199	31.3033	0.017735	0	0	0						
17	80	-31.8286	-165.201	31.3014	0.017348	0	0	0						
18	85	-31.8179	-165.203	31.2995	0.017703	0	0	0						

7. Script-Tree

The relation between the various Matlab scripts is found in the following table. It starts with *SwanOneSed.m*. By running this script and by using the interface, scripts of Level II and lower can be called for.

<i>Level I</i>	<i>Level II</i>	<i>Level III</i>
<i>SwanOneSed.m</i>	<i>open_clbk_str.m</i>	<i>browse_file_clbk.m</i>
		<i>ok_open_clbk.m</i>
		<i>cancel_open_clbk.m</i>
	<i>input_parameters_clbk.m</i>	<i>ok_input_clbk.m</i>
		<i>cancel_input_clbk.m</i>
		<i>changeALL.m</i>
	<i>computation_clbk.m</i>	<i>close_waitbar.m</i>
	<i>output_plots_clbk.m</i>	-
	<i>output_tables_clbk.m</i>	-
	<i>description_clbk.m</i>	-
<i>help_clbk.m</i>	-	