WDUNE HELP FILE

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1.0 SUMMARY OF HELP RESOURCES

YouTube tutorial videos: (recommended for new users)
1) Operate WDUNE in standalone mode: http://youtu.be/KWayGW4PNj4
2) Operate WDUNE with the ArcGIS launcher: http://youtu.be/mRIConK3CkE

Accompanying paper: Barchyn, TE, Hugenholtz, CH, 2011, A new tool for modeling dune field evolution based on an accessible, GUI version of the Werner dune model, Geomorphology.

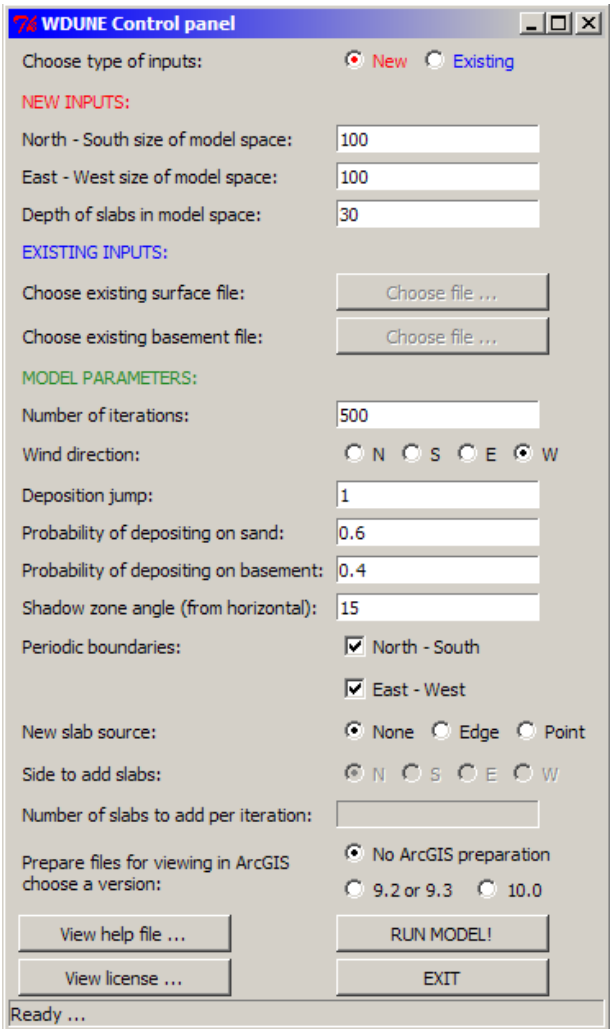
The website:
http://people.uleth.ca/~chris.hugenholtz/wdune/wdune.html

Email us:
Send an email to: tom.barchyn@uleth.ca if the problem cannot be solved with above resources.

2.0 QUICKSTART GUIDE: Installing and operating WDUNE model

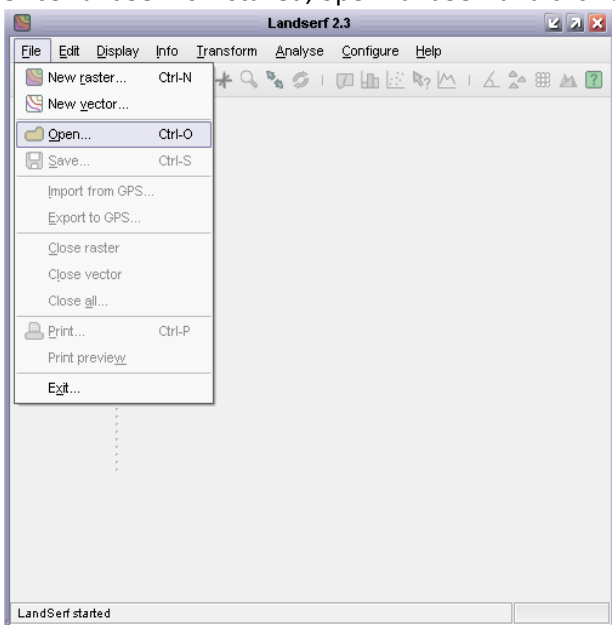
2.1 Standalone operation (Windows):

1) Double click on 'OPEN_CONTROL_PANEL.pyw'.
If nothing happens, see the troubleshooting guide. If all is successful, the window should look like this:

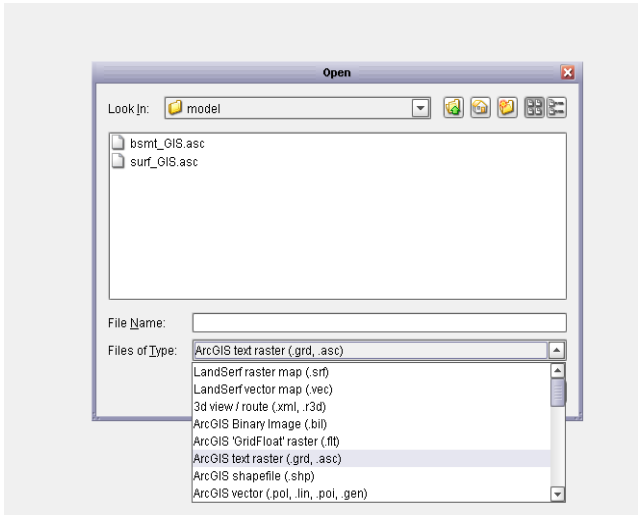


2) Press RUN MODEL! to run the model. For now, don't worry about the parameters, the defaults are fine to start out. It should take 10 seconds or so depending on the speed of your computer. The program will then ask you to save a surface file and a basement file. The surface is the topography; the basement is the non-erodible 'bedrock' underneath the topography. Both are Arc ASCII files and can be viewed with a variety of GIS programs. Save the files somewhere on your computer.

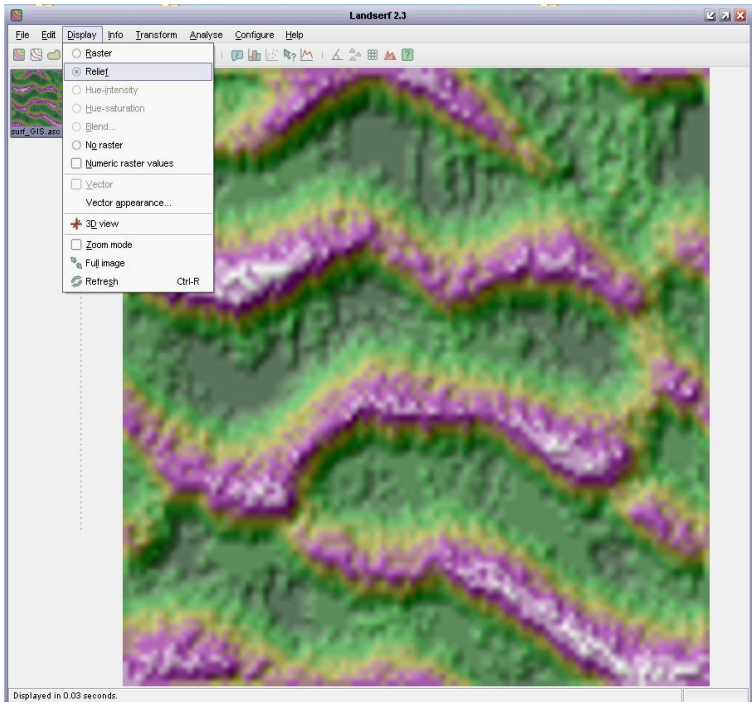
3) If you don't have a favourite GIS viewer, the easiest program to use is called LandSerf. This program is free from: http://www.soi.city.ac.uk/~jwo/landserf/download/
Once LandSerf is installed, open LandSerf and click open file:



Navigate to the folder where you saved the model outputs and change the file type to 'ArcGIS text raster':



Open 'surf_GIS.asc', or whatever you named your surface file. The surface file should show up in the window. To show the topography with shaded relief, click on Display -> Relief

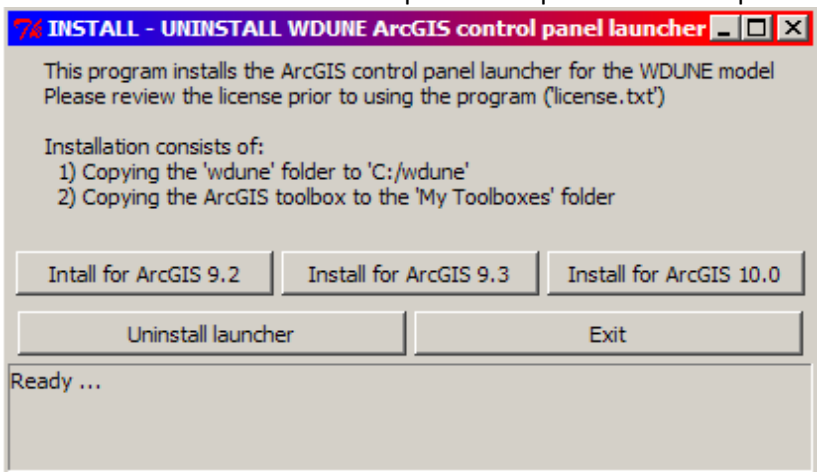


That's it! Now go back to the manual and modify the parameters or use the files you just created as inputs. See accompanying paper for details on the parameters.

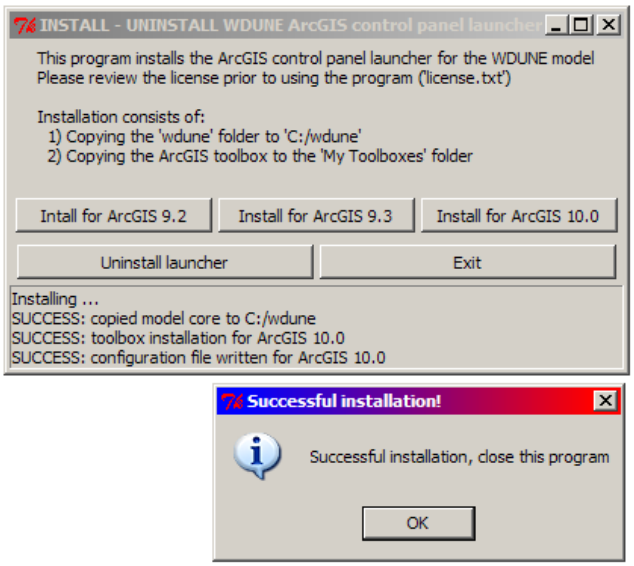
2.2 ArcGIS Launcher operation (Windows):

For users of ArcGIS, the same program can be launched from ArcGIS as a 'tool'. This requires slightly more complicated setup. We have created an installer to make this setup more convenient:

1) Click on 'ArcGIS_Launcher_INSTALL-UNINSTALL.pyw'. The window should look like this if you have a version of ArcGIS installed on your computer newer than version 9.1. If you are unsure what version of ArcGIS is installed on your computer, open ArcMap and click on menu: Help -> About ArcMAP . . .. If you have an older version of ArcGIS (before 9.2) it is much more convenient to operate the model in standalone mode because the output files require conversion prior to viewing.



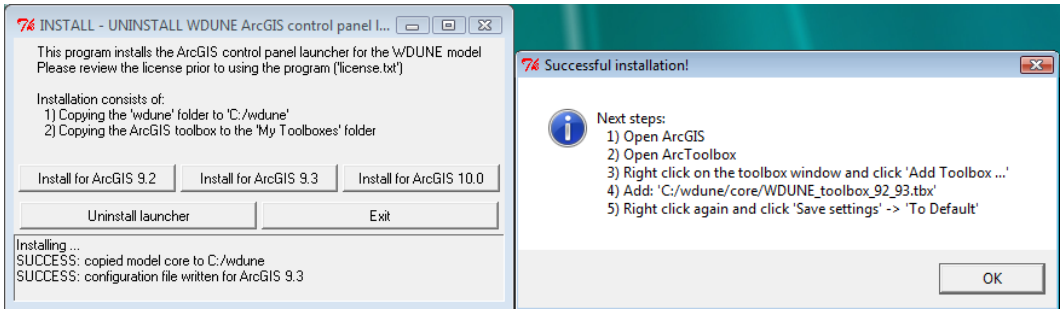
Click on the respective install button. If installation is successful, a message box will pop up.



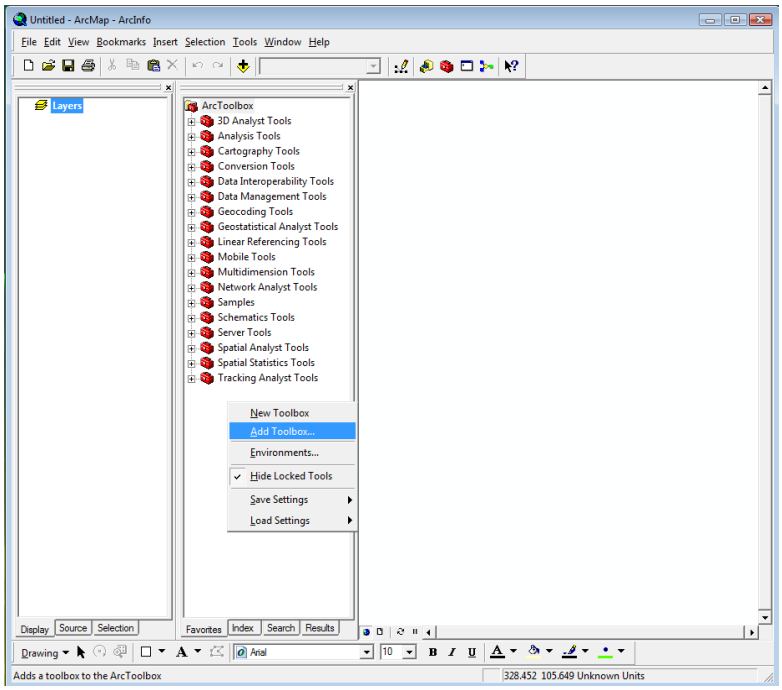
This program copies a version of the model to C:/wdune, and then copies a toolbox to the 'My Toolboxes' folder. Keep this program, by opening it up again and clicking 'Uninstall launcher' the launcher can be easily deleted from your computer when you are finished with the model.

2) Users with ArcGIS Version 10.0: Open up ArcMAP with no data in the window. The 'WDUNE_EDU_toolbox' should be in the 'My Toolboxes' folder. Skip forward to step 4).

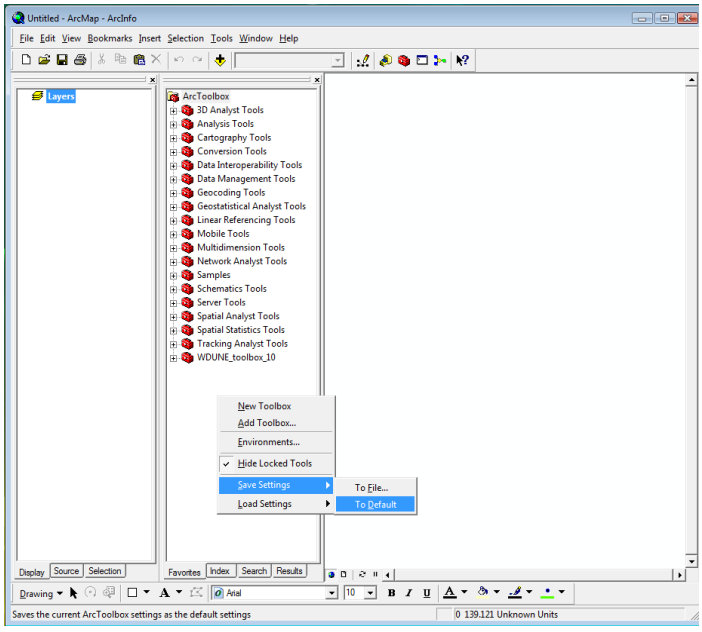
3) Users with ArcGIS 9.2 or 9.3 have to perform one additional step. After the installation is complete, you will need to add the toolbox manually to the default toolbox in ArcMAP.



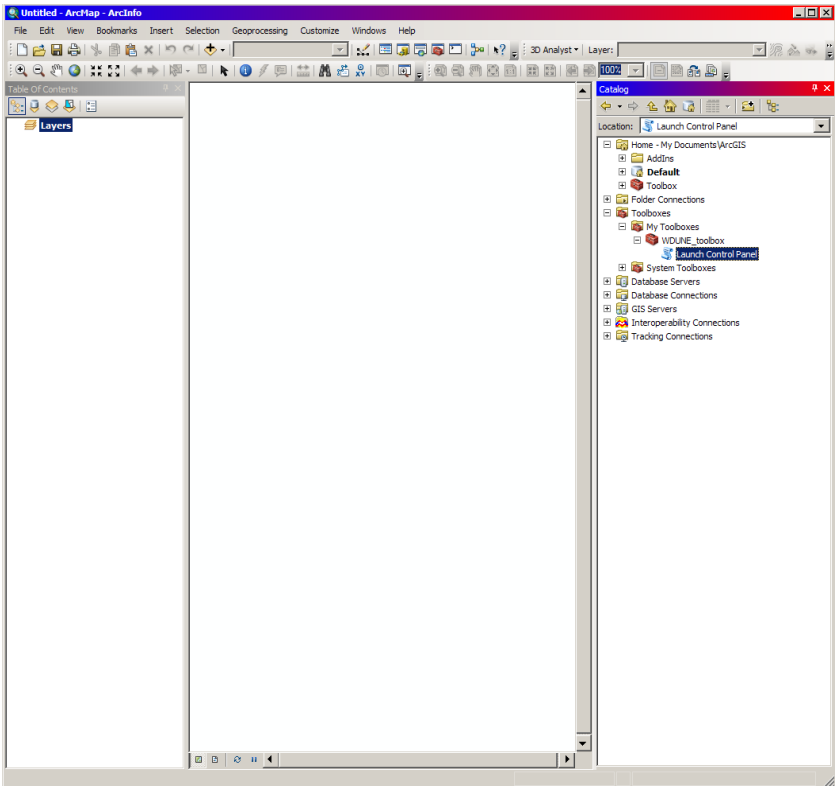
Next, open ArcMAP and click on the toolbox icon to open ArcToolbox. Right click in the white space in the bottom of the toolbox window and select 'Add Toolbox ...'.



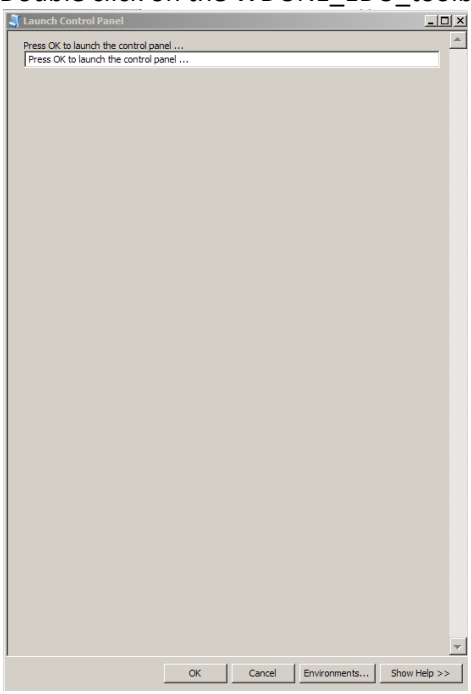
Choose the file 'WDUNE_toolbox_92_93.tbx', which will be located in 'C:/wdune/core'. Next, to avoid having to add the toolbox every time ArcMAP is loaded, right click again in the toolbox and select 'Save Settings' --> 'To Default'. ArcGIS will remember that you have added this toolbox to the ArcToolbox window.



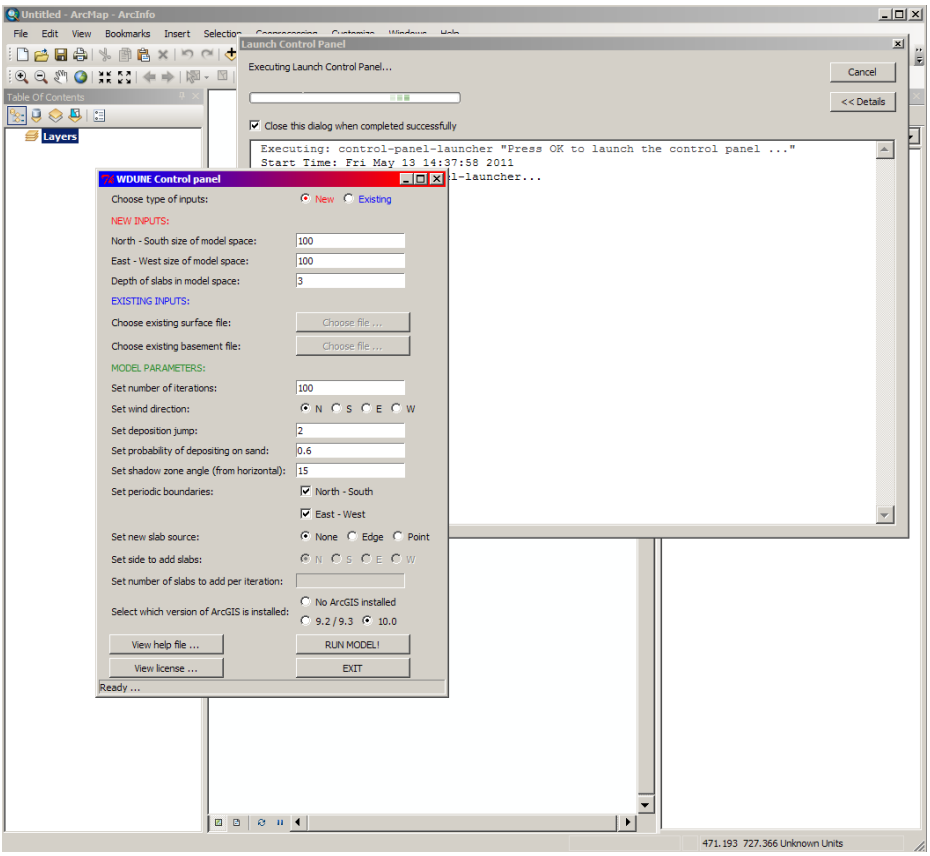
4) Operating the WDUNE program from the ArcGIS launcher:



Double click on the WDUNE_EDU_toolbox, and then on 'Launch Control Panel'. Wait, then click OK

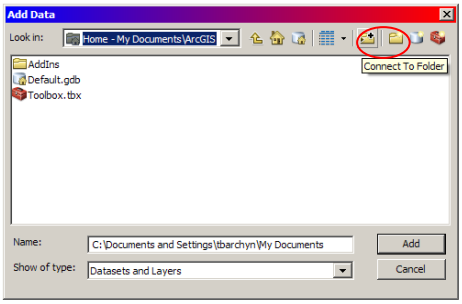


This will launch the same window that appears in the standalone mode.

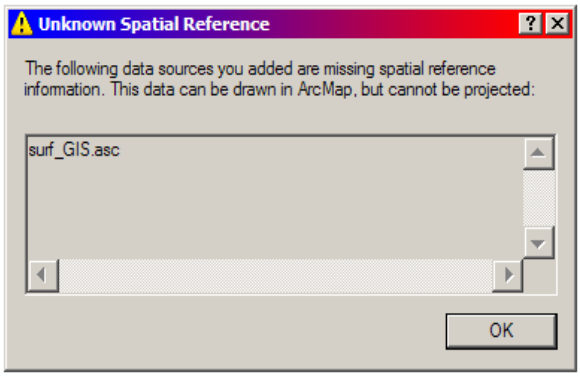


Click RUN MODEL to start the model, when the model is finished running, pick a location to save the model outputs. The outputs are Arc ASCII files. Following the model run, ArcGIS will attempt to calculate statistics for the files. This makes viewing of these files more convenient in ArcGIS.

Now click on the Add button on the top bar ( ). Navigate to the location where the files are saved and Click 'Add'. Sometimes it is necessary to create a folder connection to the folder where the files are saved. Do this by clicking on the 'Connect to Folder' button. This will allow you to make a new folder connection to the specific folder where the model outputs are stored.



Add 'surf_GIS.asc', or whatever you named the output surface file. ArcGIS will show an error:



Click 'OK'. This is not important, ArcGIS will still load the data. The surface should then appear in the map window. The colors represent elevation and will probably scale from black (low) to white (high). To run the model again, click on the launcher tool again.

Special warnings for ArcGIS users:
- Do not overwrite a file that is open in ArcGIS, always save with a new file name.

5) Uninstallation of the ArcGIS launcher. Open the 'ArcGIS_Launcher_INSTALL-UNINSTALL.pyw' file. Click 'Uninstall'. This should remove all components of the WDUNE Launcher from your computer.

2.3 Standalone operation (Linux):

This program will also run in Linux; however, we do not include a pre-compiled version of the model core due to the variety of Linux versions. Users will need to compile the program manually. We include instructions for compiling the program in Ubuntu 11.04 because this operating system is completely free and widely used in the scientific community. This aligns with our goals of improving modeling accessibility. Please let us know if you use the program in Linux, we may expand this section.

1) Ensure you have the necessary programs. A Python interpreter comes packaged with Ubuntu; however, the compiler GCC needs to be installed. To install GCC, go to the Ubuntu Software Center and search for 'g++'. Install the program named 'The GNU C++ compiler'.

2) Open the terminal window: Applications -> Accessories -> Terminal. Navigate to the location of the folder 'source_code' and type 'make'. On my computer, I placed the 'wdune_dist' folder on the desktop and used the following commands:

```
cd Desktop/wdune_dist/wdune_dist/source_code
make
```

Wait a moment or two for the program to compile and copy the executable to the core folder. Next, type 'ls' to see the files in the folder. Now, check to make sure the file is in the correct location by using the commands:

```
cd ..
cd core
ls
```

The file 'wdune_core_linux.exe' should be located in this folder.

3) Open the control panel. This can be accomplished several ways. The easiest method is to use the terminal. Navigate to the folder with the file 'OPEN_CONTROL_PANEL.pyw' and open the file with Python. On my computer, this required the following commands, starting from from the previous step:

```
cd ..
python OPEN_CONTROL_PANEL.pyw
```

The control panel should open, please refer to the instructions from Windows for operation instructions.

Alternately, you can open the file with the mouse. This can be accomplished by right clicking on the file 'OPEN_CONTROL_PANEL.pyw' and selecting 'Open with other application ...'. Select 'python' and click OK.

3.0 Model functioning

See accompanying manuscript for referenced details on model inputs, outputs, and parameters.

4.0 Troubleshooting guide

4.1 The 'OPEN_CONTROL_PANEL.pyw' file won't open (Windows)

This program requires a version of Python to operate successfully. Python is an computer programming language that is widely used, but requires an 'interpreter' program (also called Python) installed on the computer. This interpreter takes Python code and executes the commands. This program has been tested on Python versions 2.1 to 3.2. It may operate on newer versions of Python.

We recommend following the following troubleshooting steps:

A) Is Python installed on your computer? First, check the Start Menu (in Windows) and search for a version of Python, which is usually listed as a program. Alternatively, most versions of Python place the program in a folder directly on the C:/ drive, try to search for a folder named 'Python25' or similar. Go to step B) if there is a version of Python present. Go to step C) if there is not.

B) Is your version of Python older than 2.1? If so, install the latest version of Python from www.python.org. If your version is newer than 3.2 and the program doesn't work, please contact us, we will attempt to provide an update to allow compatibility with the latest version of Python. If the program still doesn't work, go to step E).

C) Do you have ArcGIS installed on your computer? If so, go to step D). If not, install the latest version of Python from www.python.org.

D) What version of ArcGIS do you have? Check the version by opening ArcMAP and checking the version of program by clicking on the 'Help' menu and on 'About ArcMAP ...'. If your version is older than 9.1, install a new version of python from www.python.org. Older versions of ArcMAP did not rely on Python. If your version is newer than 9.1, go to step E).

E) Change the file extension. If your version of Windows does not show file extensions, click on Tools -> Folder Options .... Go to the 'View' tab, and uncheck 'Hide extensions for known file types'. If this doesn't work, try to associate the '.pyw' with the program called 'python.exe'. This can be accomplished by right clicking on the file and choosing 'Open with ...'. Click 'Browse ...' and then navigate to the program called 'python.exe'. This program should be located in the folder 'C:/Python21/', the name of the folder will vary depending on the version of Python you have installed. If you have ArcGIS installed on your computer, the folder path may be 'C:/Python26/ArcGIS 10.0/' or similar. If it still doesn't work, go to step F).

F) Contact us (tom.barchyn@uleth.ca) with as much information as possible about your computer and error messages, and we will attempt to provide a solution. We cannot guarantee that we will be able to provide a solution for every computer system though.

Special note: If the program works and you have ArcGIS installed on your computer, do not install a newer version of Python. Each version of ArcGIS requires a specific version of Python. Installing a newer version may cause problems with the functioning of some tools in ArcGIS.

4.2 The 'OPEN_CONTROL_PANEL.pyw' file won't open (Linux)

Try to run the program from the Terminal by navigating to the directory where the file is and typing 'python OPEN_CONTROL_PANEL.pyw'.

4.3 The control panel was left open for a long time and I can't see the control panel (Windows)

This is a known problem that seems to intermittently occur. Open the Task Manager by pressing ALT, CNTRL, and DELETE simultaneously and pressing the button 'Task Manager'. Click on the 'Applications' tab. Right click on the application 'OPEN_CONTROL_PANEL.pyw' and select 'Bring To Front'. Close the Task Manager.

4.4 I need to manually install or uninstall the ArcGIS launcher

If an error occurs during installation or uninstallation of the ArcGIS launcher, you may need to install or uninstall the ArcGIS launcher manually. Before doing anything manually, we suggest first closing all programs that are open and clicking 'Install' for your respective version of ArcGIS, then 'Uninstall'. Frequent errors in the installation process will occur if any of the respective files are open, or if ArcGIS is open. Second, if there is an error in the toolbox uninstallation, check to see if the toolbox was successfully deleted.

Installation consists of the following steps, uninstallation is the reverse.

A) Copy the directory labeled 'core' to the location: 'C:/wdune/'. The new path will read: 'C:/wdune/core'.

B) Writing a configuration file. Don't worry about this if manually installing. When the Control panel opens, select your respective version of ArcGIS in the bottom of the control panel. The configuration file will be written the first time you successfully run the model. When manually uninstalling, this file will be deleted if you delete the folder 'C:/wdune/'.

C) Add the toolbox. This can be accomplished in any version of ArcGIS by right clicking in the ArcToolbox window and clicking 'Add Toolbox ..'. Navigate to the 'C:/wdune/core/' folder and select a toolbox. If your version is ArcGIS 10, select 'WDUNE_toolbox_10.tbx'. If your version is ArcGIS 9.2 or 9.3, select 'WDUNE_toolbox_92_93.tbx'. To remove the toolbox, right click on the toolbox and select 'Remove Toolbox'.