Q&A Webinar: Improving SWMM Modelling with GIS Tools

#	Question	Answer(s)	Comments after
1	Hi, thanks for this very interesting rpesentation. Is incorporating rating curves (depth-flow curves) applied on nodes like it's applied on pits on ESTRY something that could be incorporated in SWMM?	live answered	SWMM models supports both Diversion (Captured vs approach flow) and Rating (captured flow vs Water Depth) in addition to the HEC-22 physical parameter inlets. (MCA)
		Additionally, is it possible to have a hybrid system, i.e. ESTRY pits connected to TUFLOW links etc? Is there an interface between ESTRY and TUFLOW?	
		Here is a link to the SWMM inlet fields in TUFLOW's implementation of the solution. https://docs.tuflow.com/classic-hpc/release/2023-03-AD/SWMM-Input-Detailed-1.html#tab:tab-SWMM-Input-Inlets. Custom rating curves can be used (see field row 2 and 13 in the above table)	
		Hybrib SWMM and ESTRY linked models can be created. I have however only doen this by connecting ESTRY channels to SWMM Links. Rusty was the lead developer for TUFLOW-SWMM I'll ask him in the Q&A at the end if TUFLOW pits specifically can be connected directly to SWMM (as a replacement for the in-built SWMM inlet options)	
		That would be helpful, Chris. Thanks!	
2	Please I would like to know what software TUFLOW is and what is it for?	Here is a link to our "Applications" section of website (https://www.tuflow.com/applications/). It summarises all the most common TUFLOW use cases. If you have any questions, please email info@tuflow.com	
3	Hi, Currently I'm using ARC GIS Pro and TUFLOW conducting stormwater drainage study/modelling, my company adopt "glass roof method" for the roof water, we raise the residental propertie's dem (Lidar elevation) by 4m and discharge the roof water directly to the road curb or interlotment pits. My question is does "glass roof method" accurately represents the reality? if so how accurate is this method?	The method is quite commonly used in the flood modelling community and seems to be working well, provided you have accurate input data. There are other methods that can be used in such situations, please see the below link. https://wiki.tuflow.com/Direct_Rainfall_(Rain_on_Grid)_Modelling_Guidance#What_is_the_best_approach_for_modelling_buildings_in_rain_on_grid_model.3F	
4	Hi, does this tool work in ArcGIS Pro as well or it is just for QGIS?	This tool has only been built into the QGIS TUFLOW Plugin. It's not available in the ArcGIS Pro toolbox.	
		Thanks, do you have any plan to include it in ArcGIS Pro in future?	live answered
5	Thanks Chris! This option would require to determine a street section, though, right? I was thinking more of a pit with a rating curve that directrly interacts with the 2D domain, like in ERSTY, without having to determine a street section.	I'll ask Rusty this question during the Q+A	
		To flesh out that answer, you are correct. It would require Street section inputs. Here's a link to a free tutorial demonstrating it: https://wiki.tuflow.com/TUFLOW_SWMM_Tutorial_M02 I'll ask Rusty about the ESTRY / SWMM linkage to avoid the SWMM Street input dependency.	While it is true a street section has to be defined, it is only used in limited circumstances because we pull additional information from the 2D model. It is only used to compute the expected width of approach flow when using on-grade inlets. Any generic section is fine if you are using custom rating curves (h vs Q).

6	Do the results generated by the SWMM engine differ much from the ESTRY engine? Has SWMM been adopted in any flood assessment in Australia?	Various engines will never produce identical results; however, we would hope that results are generally similar. It will depend a little on the features in the model, for example manhole losses might be treated differently between SWMM and ESTRY / TUFLOW 1D. With regards to SWMM usage for flood assessments in Australia. Typically, these would require a 2D model component - it is rare to see purely 1D models used for flood assessments in Australia. Therefore, I'm not sure about purely 1D EPA-SWMM models, but SWMM linked to a 2D, for example XP-SWMM then yes there would be occurrences of this.	SWMM does not have an approach specifically for manhole losses and does not support dynamic losses for inlet and exit losses like ESTRY. These are functionalities we would like to add to TUFLOW-SWMM models. We had a model we converted from TUFLOW-ESTRY to TUFLOW-SWMM and was getting quite different results. However, the ESTRY input files (and therefore the converted SWMM files) used full inlet and outlet losses (0.5 and 1.0). However, because it adjusts these dynamically the applied losses were much lower. Once we used the average applied losses to SWMM, the results became very similar.
		Thanks Phillip. Would be interesting to see in a case study how the results from the different 1D engine, i.e. ESTRY, SWMM, 12d, Flood Modeller, compare.. just a thought	This would definitely be interesting. It could make an interesting paper.
7	Is there a way to see the output from an epa-swmm run? I see the some profiles are available in the integrity tools.	The SWMM results can be viewed in the QGIS TUFLOW Viewer in the same way as ESTRY results. Here's how you load the data: https://wiki.tuflow.com/TUFLOW_Viewer#TUFLOW-SWMM_Results Working with the results in the Viewer plot window is no different to ESTRY. SWMM does include some cool Map Window auto scaling display features that ESTRY doesn't.	
		Just saw the results part in rusty's slides. Awesome.	
8	Hi. I am Kola from South Korea. Can we have TUFLOW integration in ArcgisPro too?	Hi Kola, there is some TUFLOW integration with ArcGIS pro, see here: https://wiki.tuflow.com/ArcGIS_TUFLOW_Toolbar However, not all the functionality that is offered by QGIS is also supported by ArcGIS with Python, in particular the interacting in with the map window is not as functional as QGIS. However, QGIS is free and open source if you also want to use this it won't cost you anything.	Noted the request. If you want to look at the data in ArcGIS Pro, you could do the convert to/from GeoPackage using QGIS and then work with the data in ArcGIS Pro. This wouldn't be as seamless because you would probably need to close the GeoPackage in QGIS while working in ArcGIS Pro but a workaround until a direct connection is available.
9	Is TUFLOW-SWMM a separate software that requires a specific licence?	TUFLOW-SWMM doesn't need separate licence module. It is included in the standard TUFLOW engine licence.	
10	Does the plug-in also grab LID data from the .inp?	The plug in includes everything from the SWMM inp file except for pollutants and pollutant related information. We hope to add support for this in a future release.	
11	Does TUFLOW-SWMM support linear drainage (ie grated channels) modelling?	live answered	
12	is there similar integration between TUFLOW and 12d?	Yes there is. 12D sell a version of TUFLOW that is integrated with their own 1D engine (which was also orginally based on SWMM)	
13	Pipe colouring is very useful, based on flow values, or velocity. Is it possible to do something similar on an ESTRY-based model?	It should be possible. Will bring it up for a discussion with the developer	This is on our development list. Because of the number of requests and limited time, it is difficult to say when the feature will be available.
14	The 2D flow is calculated by TUFLOW, not SWMM?	Yes, SWMM is a 1D engine, TUFLOW is solving the 2D components. TUFLOW has a long history of 2D modelling, for more information on TUFLOW see https://www.tuflow.com/	
15	Can PCSWMM model be converted to TUFLOW?	live answered	Any SWMM model can be imported if it is spatial, and can be exported to the SWMM5 INP format directly. XPSWMM can export to INP if you maintain a license, however, XP models can be converted using XPVIEWER to XPX which can import to the TUFLOW-SWMM GPKG format.

16	EPASWMM Inlet Capture functionality is associated with links, but XPSWMM (and traditionally ESTRY) used inlet capture at nodes. So do inlets in Tuflow-SWMM use EPASWMM's inlet model or Tuflow's inlet modelling?	Inlets are calculated using the EPA SWMM inlet methods, the approach flows and velocities are calculated in the 2D and this information is passed to the EPA SWMM at each timestep.	
17	Thanks, Pavlina. It would also be nce to ascociate maximum capacity ratio in this colouring, very useful to network capacities for various ARIs	Noted. Thank you.	This is possible using the Aggregate method with the layer. Aggregate based on "objid" and select maximum for the channel capacity dataset. Another benefit of using GPKG files is that you can use built-in or custom tools to work the data.
18	If I only have SWMM with 1D results, can I still make 2D maps with Tuflow using a DEM ?	To produce 2D results with TUFLOW you will need to run the TUFLOW solver, TUFLOW is not able to take 1D results and produce detailed 2D mapping.	
19	Just wondering how the calibration of SWMM module and 2D TUFLOW module of the model are done, is it simultaneously or separetly?		A combined 1D/2D model is dynamic passing data between the two domains at many locations. This would make it difficult to calibrate them individually. I would turn off aggregations from all other fields you do not intend to use to speed up the calculation