	Q&A: Water quality model validation using mass balance analysis	
	Questions	**Answer**
1	How well can such a model represent WQ paramaters in a flowing environment, and what would you say is the maximum scale over which such a model could be useful?	Hi David, the WQ model uses the underlying hydrodyamic model to do the horizontal and vertical advection and mixing. So all good to use in a flowing environment. In terms of scale they can be used from the lab scale right up to coastal models over several hundred kilometers, or if driving by an ocean circulatoin model at the ocean scale.
2	Sometimes Bottom surface DO crossed surface DO in model. How is it happened?	While I can not say specifically in this case, this can occur during periods where a lake might 'turn over' and low DO waters upwell to the surface of the lake.
		Although rare, a few additional examples where the bottom DO can be > surface DO: Shallow lakes with high clarity benthic photosynthesis can be responsible for high DO (super saturated) that exceed surface (equilibrium). As DO concentrations are also temperature dependent during stratification there can be a miss match in surface and bottom. Plunging inflows of colder inflows settle on the bottom layers.
3	Yes, it's not happened in obserevd data?	Hi Md, sorry can you pls rephrase your question. Thank you :)
		sometimes bottom surface DO (Dissolved Oxygen) more than surface DO in model (in calibration slide). in observed data, i didn't see bottom DO is greter than surface DO. Why it's happened in the model?
		thanks Mitchel... i got ans
4	Where can someone get information that educates me what range of flux values is realistic? Can they be measured too and reported in a concentration or rate of change value?	live answered. Literature surveys
5	Sometimes Bottom surface DO (dissolved Oxygen) crossed surface DO in model. How is it happened?	Hi and thanks for your question. I've just answered a similar question, and while I can't say specifically in this model, one such reason could be lake turn over, bringing lower DO water from the bottom to the surface.
6	how the WWTPs produce oxygen? what happens to BOD they add?	I think it said WWTPs produce/increase DO not Oxygen!
		They introduce oxygen to the model, that is what Michael said. The BOD (which is also a load)
		Hi, thanks for your question. As Tony commented, the WWTP flows will come in fully oxygenated but the additional nutrient loads will then influence internal process which may lower DO in the model.
7	What would you consider is the minimum timespan you need to model for a baseline water quality assessment. Your example was 9 years. Is that common?	live answered. Depending on the questions being asked - but usually at least a year to encompass all seasons.
8	Do you know of any university degrees (Masters) in Australia that teach water quality modelling?	live answered. Not really.
		Matt Hipsey teaches Hydrology at UWA you could look into that - a colleague has had him
9	Like there are 'accepted bands' of Mannings 'n' values for flood studies, surely we could have something like 'accepted bands' of model process corefficients They just have to be reported,....	live answered. Agreed. Noting that these parameters whilst informing fluxes, do not solely determine them. The water quality model will use these parameters together with dynamically computed quantities such as dissolved oxygen, temperature, light, nitrate and sediment to determine actual rates
10	before you start your modelling? Particularly, if I want to use it as new data to suppliment past collected concentration data recordings.	live answered,. Depends on the questions being asked of the model.
11	I've struggled as a small consultant with some of the literature. I have to work to convince the boss for money to get over the paywalls, and then many of the studies are small sample sizes, dubious results, any hot tips for how to focus on the good stuff? - some of the meta reviews are also not kicking a lot of goals (but big points to many great researhcers in australia and elsewhere, it isn't really their fault)	live answered. Agreed - not much other than Google Scholar or academic access is suggested. Look at the TUFLOW FV Water Quality Manual for help - all parameters are described with rangesin the appendices.
12	I've struggled as a small consultant with some of the literature. I have to work to convince the boss for money to get over the paywalls, and then many of the studies are small sample sizes, dubious results, any hot tips for how to focus on the good stuff? - some of the meta reviews are also not kicking a lot of goals (but big points to many great researhcers in australia and elsewhere, it isn't really their fault)	You could check the Portland State University WQ manual as well
13	Are there any error checking systems built into TUFLOW Catch to highlight "0" values like you mentioned?	There are. The TUFLOW FV Water Quality Module checks all user inputs and writes warnings to the log file if parameters are out of range. Users are advised to carefully review these warnings.