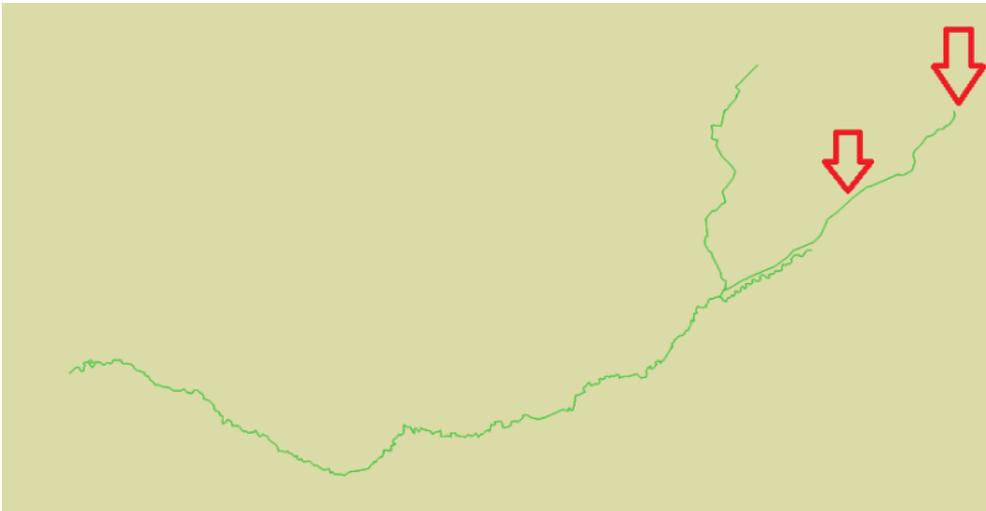


Current river network with two outlets to the river from nearby city. Measurements have been taken here during Weir overflow furthest to the right upstream. The rest of the river network will be given lateral run off with a base value of measured (DO, TEMP, AMMONIA, NITRATE, BOD).



Below is the WQ model I am using, the question is weather this is the correct place to define which parameters the model should use?

Water quality definitions

MIKE ECO Lab template
Initial state variables
Constants
Forcings
Output

Solution method: RK 4

Update frequency: 1

Disable calculation of processes. AD results only.

Model selection
 

Select model: MIKE 11 WQ Level 3

MIKE ECO Lab template file: C:\Program Files (x86)\DHI\2020\MIKE Zero\Templates\Ecolab\WQlevel3.ecolab

Update template

Summary
 

Description: <span style="border: 1px solid gray; padding: 2px 10px;">MIKE 11 WQ Level 3</span>			
State variables:	<span style="border: 1px solid gray; padding: 2px 10px;">5</span>	Auxiliary variables:	<span style="border: 1px solid gray; padding: 2px 10px;">0</span>
Constants:	<span style="border: 1px solid gray; padding: 2px 10px;">33</span>	Processes:	<span style="border: 1px solid gray; padding: 2px 10px;">11</span>
Forcings:	<span style="border: 1px solid gray; padding: 2px 10px;">4</span>	Derived output:	<span style="border: 1px solid gray; padding: 2px 10px;">0</span>

I am not sure if the “Global” initial state variables should be included or how they are connected with the WQ simulation, since I would like to define the background values for each branch. I.e. Background values (BOD concentrations etc.) for the river branches that were measured before the overflow. If not needed should the check box be unmarked?

Water quality definitions

MIKE ECO Lab template Initial state variables Constants Forcings Output

Global Local

Name	Description	Transport	Type	Unit	Fixed value	Factor
DO	Dissolved oxygen	<input checked="" type="checkbox"/>	eumConcentration_3	mg/l	10	1
TEMP	Temperature	<input checked="" type="checkbox"/>	eumItemUndefined	Degrees	15	1
AMMONIA	Ammonia	<input checked="" type="checkbox"/>	eumConcentration_3	mg/l	0	1
NITRATE	Nitrate	<input checked="" type="checkbox"/>	eumConcentration_3	mg/l	0	1
BOD	BOD	<input checked="" type="checkbox"/>	eumConcentration_3	mg/l	1	1

Template: MIKE 11 WQ Level 3

Map Tabular

The main question is can all this be done only by typing the values into the Boundary conditions under the branch AD/WQ boundary tab?

I need to have constant values for the river branches before the overflow event (lateral flows for each branch) and hydrographs/time varying boundaries with the dissolved wastewater values during the overflow all input here as marked below (in separate boundaries):

Standard boundaries (6)

Hydrodynamic AD/WQ boundary

AD / WQ boundary

Include boundary

Use mixing

Copy to selected boundaries

Create AD/WQ boundaries

View all AD/WQ boundaries

	Component	Unit	Boundary type	Input type	Scale	Constant
1	DO	mg/l	Concentration	Constant	1	0
2	TEMP	Degrees	Concentration	Constant	1	0
3	AMMONIA	mg/l	Concentration	Constant	1	0
4	NITRATE	mg/l	Concentration	Constant	1	0
5	BOD	mg/l	Concentration	Constant	1	0

ID	Type	Location type	Branch name	Upstream chainage	Downstream chainage	Storage ID	Catchment name	Ru typ
1	Elkær Bæk	Discharge	Open	0	0			Tot
2	Elkær Bæk	Discharge	Open	0	0			Tot

In addition as you mentioned earlier if I needed to calibrate the model it would need to be done under Water Quality definitions → constants. I.e. is it here I would need to change the reaeration rate and decay rate as show below?

Water quality definitions

MIKE ECO Lab template Initial state variables Constants Forcings Output

Global Local

Name	Description	Unit	Fixed value	Factor	Interpolate
latitu	Temperature: Latitude	Degrees	Build-in	1	<input checked="" type="checkbox"/>
Emax	Temperature: Maximum absorbed solar radiation	per day	4992	1	<input checked="" type="checkbox"/>
fi1	Temperature: Displacement of solar radiation max. from 12 pm	hours	1	1	<input checked="" type="checkbox"/>
Eaf	Temperature: Emitted heat radiation	per day	1608	1	<input checked="" type="checkbox"/>
RearNo	Oxygen Processes: No. of reaeration expression	dimensionless	3	1	<input checked="" type="checkbox"/>
teta_rear	Oxygen Processes: Reaeration temperature coefficient	dimensionless	1.02	1	<input checked="" type="checkbox"/>
resp	Oxygen Processes: Respiration of animals and plants	per day	3	1	<input checked="" type="checkbox"/>
teta2	Oxygen Processes: Respiration temperature coefficient	dimensionless	1.05	1	<input checked="" type="checkbox"/>
pmax	Oxygen Processes: Max. oxygen production by photosynthesis	per day	3.5	1	<input checked="" type="checkbox"/>
prodm2	Oxygen Processes: Production/respiration per m2 (=1) or per m3 (=2)	per day	1	1	<input checked="" type="checkbox"/>
kd3	Degradation: 1. order decay rate at 20 deg. C	per day	0.5	1	<input checked="" type="checkbox"/>
tetad3	Degradation: Temperature coefficient for decay rate	dimensionless	1.02	1	<input checked="" type="checkbox"/>
mdo	Degradation: Half-saturation oxygen concentration	mg/l	2	1	<input checked="" type="checkbox"/>
own1k2	Oxygen Processes: Own #1 Reaeration constant	per day	1	1	<input checked="" type="checkbox"/>
own1uexp	Oxygen Processes: Own #1 Exponent, flow velocity	dimensionless	0	1	<input checked="" type="checkbox"/>
own1dexp	Oxygen Processes: Own #1 Exponent, water depth	dimensionless	0	1	<input checked="" type="checkbox"/>
own1iexp	Oxygen Processes: Own #1 Exponent, river slope	dimensionless	0	1	<input checked="" type="checkbox"/>
own2k2	Oxygen Processes: Own #2 Reaeration constant	per day	1	1	<input checked="" type="checkbox"/>
own2uexp	Oxygen Processes: Own #2 Exponent, flow velocity	dimensionless	0	1	<input checked="" type="checkbox"/>
own2dexp	Oxygen Processes: Own #2 Exponent, flow velocity	dimensionless	0	1	<input checked="" type="checkbox"/>
own2exp	Oxygen Processes: Own #2 Exponent, river slope	dimensionless	0	1	<input checked="" type="checkbox"/>
own3k2	Oxygen Processes: Own #3 Reaeration constant	per day	1	1	<input checked="" type="checkbox"/>
own3uexp	Oxygen Processes: Own #3 Exponent, flow velocity	dimensionless	0	1	<input checked="" type="checkbox"/>
own3dexp	Oxygen Processes: Own #3 Exponent, flow velocity	dimensionless	0	1	<input checked="" type="checkbox"/>
own3exp	Oxygen Processes: Own #3 Exponent, river slope	dimensionless	0	1	<input checked="" type="checkbox"/>
ReleaseRatio	Nitrogen Content: Ratio of ammonia released at BOD decay	gNH4/gBOD	0.29	1	<input checked="" type="checkbox"/>
AmmoniaPlantUptake	Nitrogen Content: Uptake of ammonia in plants	Dimensionless	0.066	1	<input checked="" type="checkbox"/>

Template  
MIKE 11 WQ Level 3

And the desired output should be marked in the boxes under Output → Processes?

Water quality definitions

MIKE ECO Lab template Initial state variables Constants Forcings Output

Auxiliary variables Processes Derived output

Name	Description	Unit	Selected
bodd	BOD degradation	mg/l/d	<input checked="" type="checkbox"/>
reaera	Reaeration	mg/l/d	<input checked="" type="checkbox"/>
phtsyn	Photosynthesis in water column	mg/l/d	<input type="checkbox"/>
respT	Oxygen consumption from respiration of plants	mg/l/d	<input type="checkbox"/>
Rad_in	Radiation into water	degrees/d	<input checked="" type="checkbox"/>
Rad_out	Radiation out of water	degrees/d	<input checked="" type="checkbox"/>
AmmoniaReleaseFromBOD	Ammonification	mg N/d	<input checked="" type="checkbox"/>
Nitrification	Nitrification	mg N/d	<input checked="" type="checkbox"/>
Plantuptake	N uptake plants	mg N/d	<input type="checkbox"/>
bactenaUptake	N uptake bacteria	mg N/d	<input type="checkbox"/>
OxygenConsumptionFromNitrification	Oxygen consumption nitrification	mg/l/d	<input checked="" type="checkbox"/>

Template  
MIKE 11 WQ Level 3

Map Tabular

Many thanks!