1.5 Use the interface of SUPERFLEX to create the configuration files

With the help of SUPERFLEX interface, we can create different kinds of model structures and change their parameter values visually. In this exercise, we will use the interface to create the configuration files for M1, M2, and M3.

The main window of the interface (Figure 6) includes two parts. The right part is seveal checkboxes of reservoirs, lag functions, connections and multiplers. We can check or uncheck them, and the hydological model construction is also changed correspondingly. The check or uncheck behavior will also change the left image and open or close a pop-up window (Figure 7).

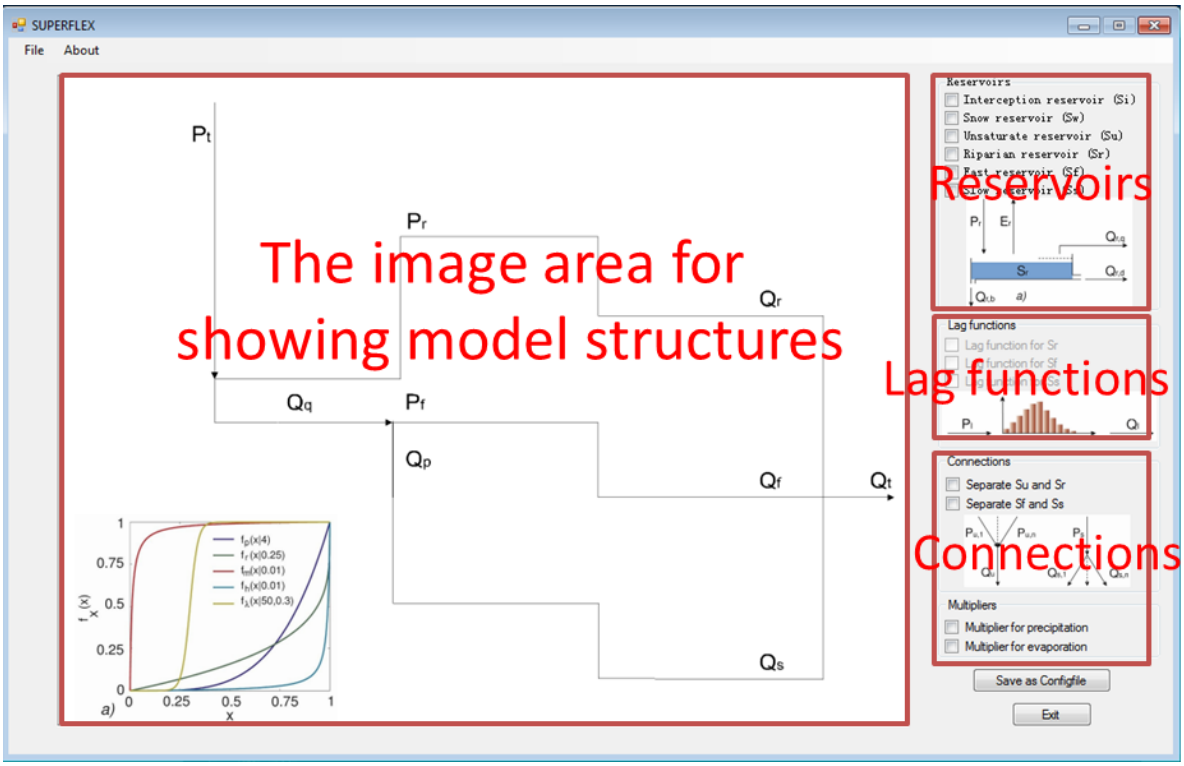

Figure 6. The main window of the interface for SUPERFLEX

Since the different hydrological processes of different reservoirs, we have different pop-up windows to represent them. Usually, we can change the constitutive functions, the parameters' values, the initial state, the lowest and highest limit states(Figure 7). Specifically, you can change the constitutive function by changing the radio-buttons; you can check or uncheck the checkboxes to turn on or off the parameters; the row of "value" is the parameter's value which will be shown in BATEA; the row of "ParLo" means the lowest limit of parameter; "ParHi" means highest limit; "ParTran" means using log(1) or not (0), "ParFit" indicates whether to show the scope bar in BATEA (T) or not(F). NOTE that, for the FAST reservoir(Figure 7b), the construction is more complicated, because we should choose different parameter sets by choosing different constitutive functions. In the end, we should save the constructures and parameters as configuration file.The following part, we will set our own model structures by this interface.

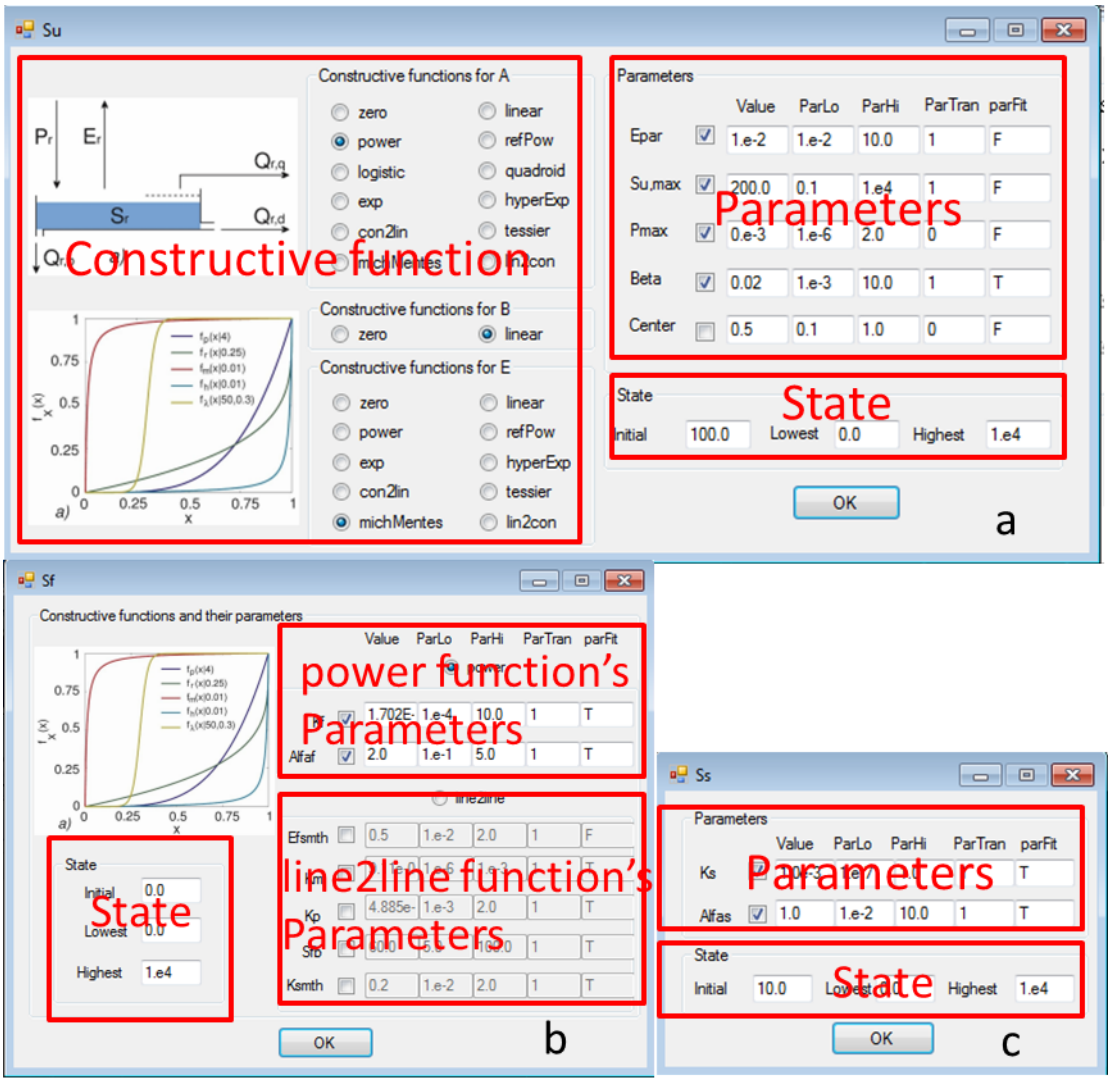

Figure 7. The pop-up windows of Su (unsaturated reservoir, a), Sf (fast reservoir, b), and Ss (slow reservoir, c).

The procedure of creating three models for M1, M2 and M3 is as follows:

Case 1:

Double click the SUPERFLEX interface, check the Su and you will see Figure 7a. On the left is the constitutive function of the Su reservoir, which is the relationship between S/Su,max and R/P. The default one is the power function (HBV model) for discharge A, linear for B, and michMentes for E. For the parameters, you can select it or close it, and change the shown value in BATEA, the lowest limit of value, the highest limit of value, the log (choose 1) or non-log (choose 0), whether to show the range bar in BATEA or not(T/F). And then, click “OK” to save your choices.

In Sf sub-window (Figure 7b), you can choose one from two functions to describe the relationship between discharge and soil moisture. If you choose the power function, the Kf and Alfaf is activated;

if you choose the line2line function, the other parameter set is used to describe the relationship. Do not forget to click “OK” to save your choices.

In the end, you can save your choices as flexConfig10.dat.

Case 2:

Here you select Su and Sf and change their values correspondingly (as Case1) and lag function (Table 1, 2), others are all the same to case1. In the end, you can save them as flexConfig11.dat

Case 3:

Here you select Su, Sf and Ss Sf and change their values correspondingly(as Case 1 and Figure 7c; Table 1, 2) and lag function (Table 1, 2), others are all the same to case1. In the end, you can save them as flexConfig20.dat

Lastly, we must be noted that theoretically we can create any models as we like by using this interface. However, modelling the hydrological processes is not as simple as just clicking buttons to add or demolish reservoirs and change constitutive functions. Any model is the creature of our knowledge on a basin, and it reflects our understanding of the catchment reality.