

Supporting Information for

**Quantitative assessment of climatic and reservoir-induced effects on  
river water temperature using Bayesian network-based approach**

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**Table S1(a)** Control parameters for support vector machine (SVM) for pre-TGR period and post-TGR period

Period	Month	Control parameters	
		cost <sup>a</sup>	gamma <sup>b</sup>
pre-TGR	Jan	100	0.01
	February	1000	0.001
	March	100	0.01
	April	100	0.01
	May	100	0.001
	June	100	0.001
	July	100	0.001
	August	1000	0.001
	September	1000	0.1
	October	1000	0.1
	November	100	0.001
	December	100	0.001
post-TGR	Jan	1000	0.01
	February	1000	0.01
	March	100	0.01
	April	1000	0.01
	May	100	0.001
	June	1000	0.001
	July	100	0.001
	August	1000	0.01
	September	1000	0.001
	October	100	0.01
	November	1000	0.0001
	December	1000	0.001

<sup>a</sup>cost: cost of constraints violation (default: 1)—it is the ‘C’-constant of the regularization term in the Lagrange formulation.

<sup>b</sup>gamma: parameter needed for all kernels.

**Table S1(b)** Control parameters for adaptive-network-based fuzzy inference system (ANFIS) for pre-TGR period and post-TGR period

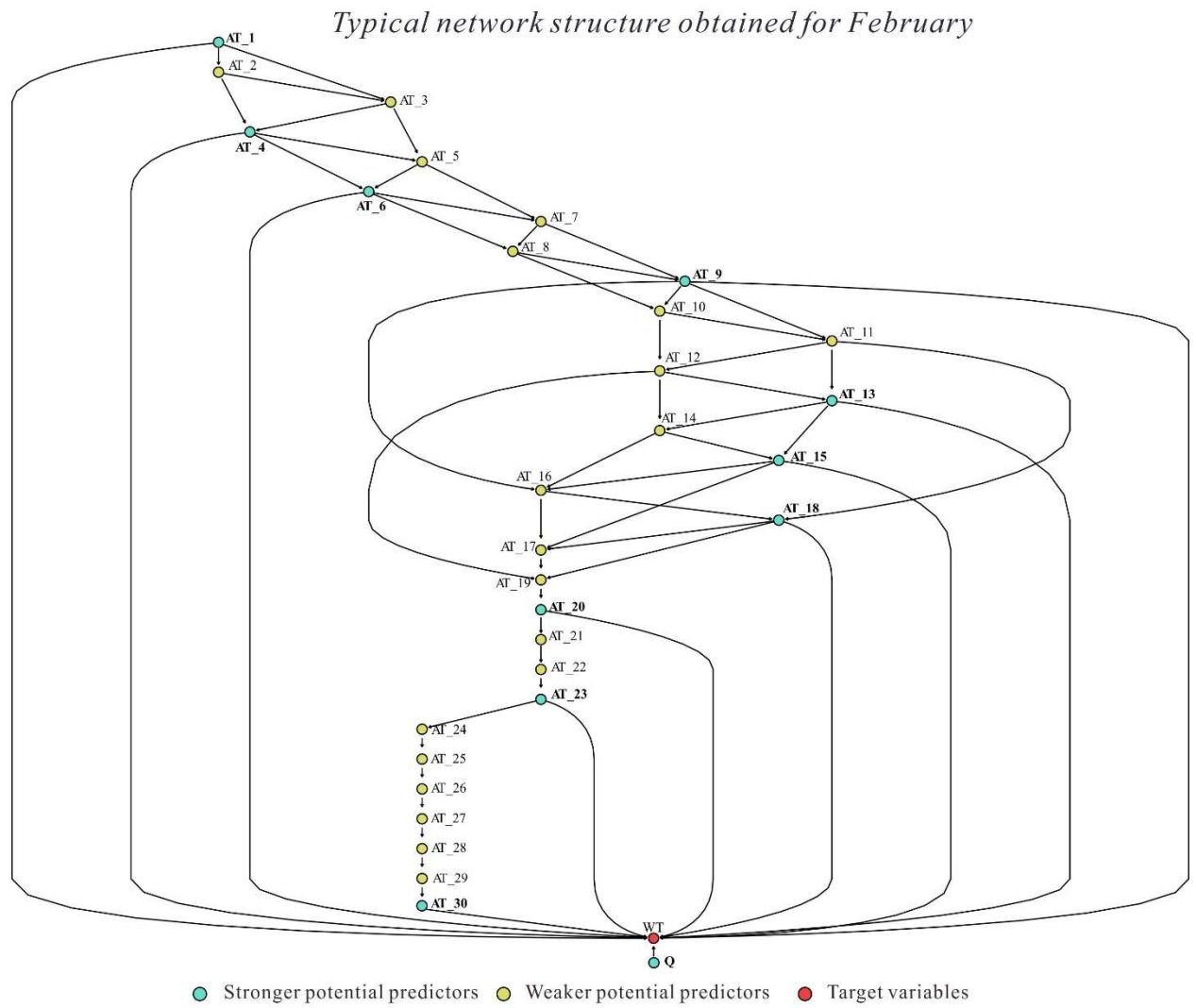
Period	Month	Control parameters			
		num.labels <sup>a</sup>	max.iter <sup>b</sup>	step.size <sup>a</sup>	type.mf <sup>b</sup>
pre-TGR	January	5	20	0.01	3
	February	7	20	0.01	3
	March	5	10	0.01	3
	April	5	20	0.01	3
	May	5	10	0.01	3
	June	5	10	0.01	3
	July	5	10	0.01	3
	August	5	10	0.01	3
	September	10	10	0.01	3
	October	5	10	0.01	3
	November	5	10	0.01	3
	December	5	10	0.01	3
post-TGR	January	5	10	0.01	3
	February	10	10	0.01	3
	March	10	10	0.01	3
	April	5	10	0.01	3
	May	5	10	0.01	3
	June	10	20	0.01	3
	July	5	10	0.01	3
	August	5	10	0.01	3
	September	5	10	0.01	3
	October	5	10	0.01	3
	November	5	10	0.01	3
	December	10	10	0.01	3

<sup>a</sup>num.labels: a positive integer to determine the number of labels (linguistic terms);

<sup>b</sup>max.iter: a positive integer to determine the maximal number of iterations;

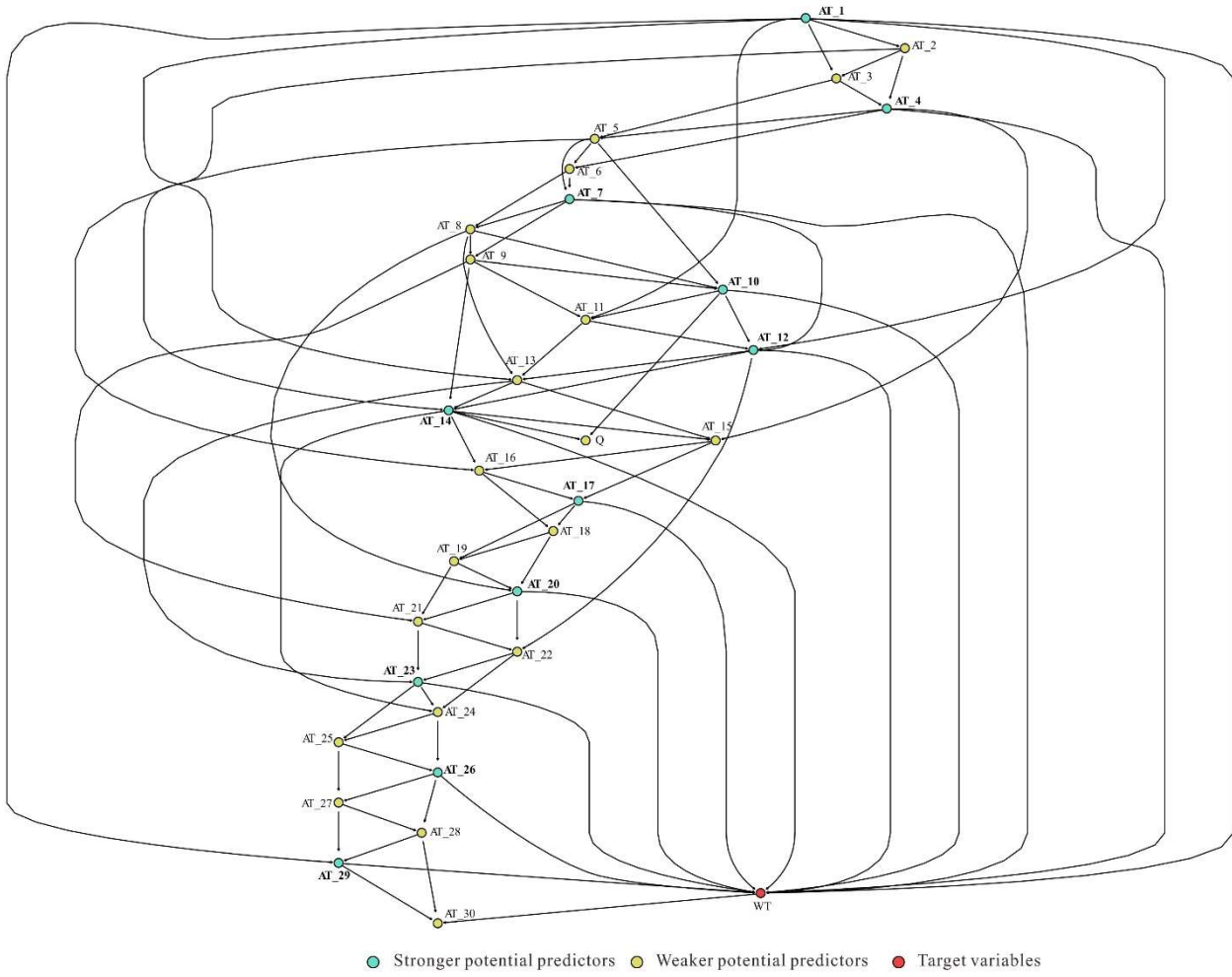
<sup>c</sup>step.size: the step size of the gradient descent;

<sup>c</sup>type.mf: type of the membership function.

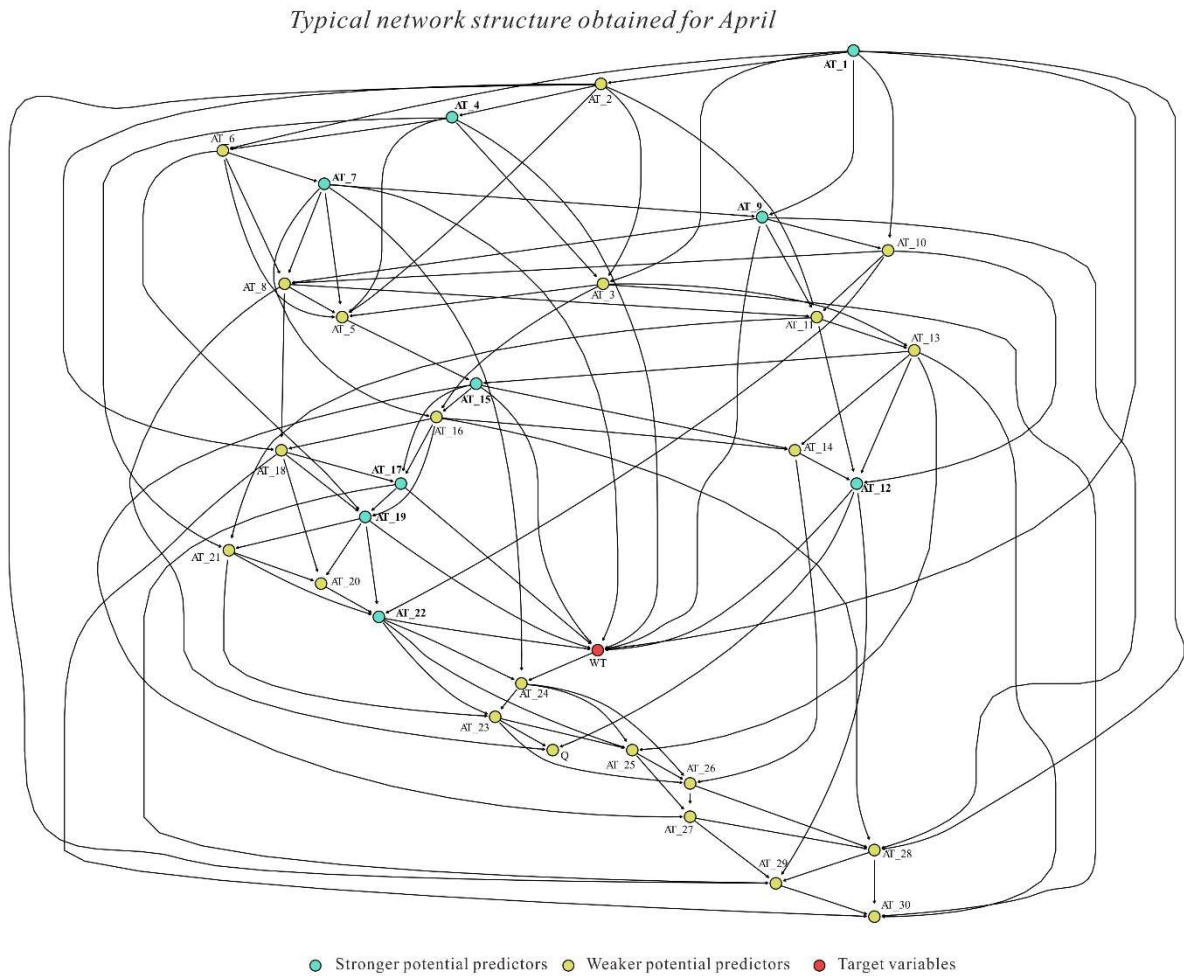


**Figure S1(a)** Typical network structure obtained for February. Notations for the variables are as follows: Water temperature (*WT*), discharge (*Q*). *AT\_1*, *AT\_2*, ..., *AT\_30* represent the lag-1, lag-2, ..., lag-30 for air temperature (*AT*) series. The nodes denoted with blue circle are selected as final potential predictors. *WT* is target variable while other variables are set as input variables.

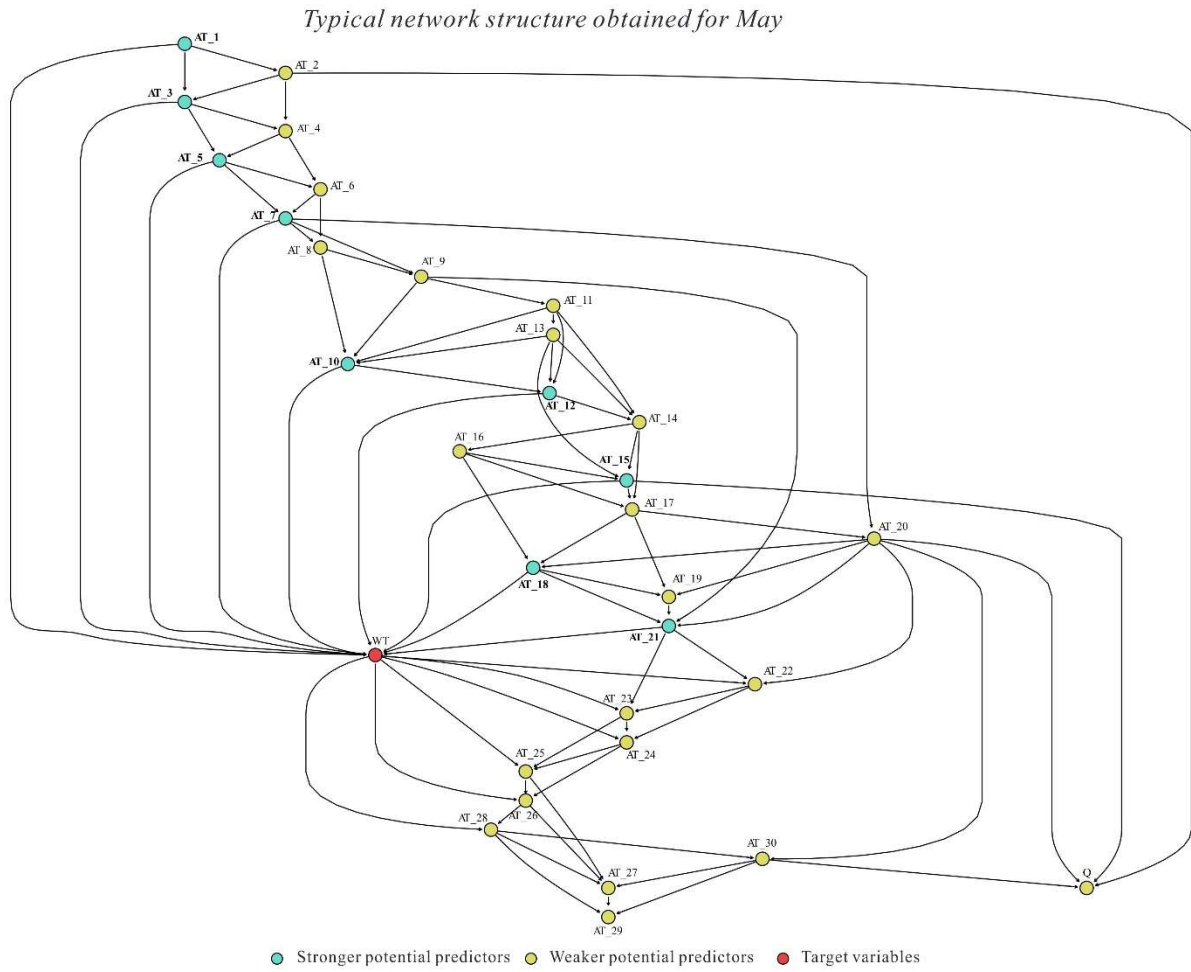
*Typical network structure obtained for March*



**Figure S1(b)** Typical network structure obtained for March. Notations for the variables are as follows: Water temperature (*WT*), discharge (*Q*). *AT\_1*, *AT\_2*, ..., *AT\_30* represent the lag-1, lag-2, ..., lag-30 for air temperature (*AT*) series. The nodes denoted with blue circle are selected as final potential predictors. *WT* is target variable while other variables are set as input variables.

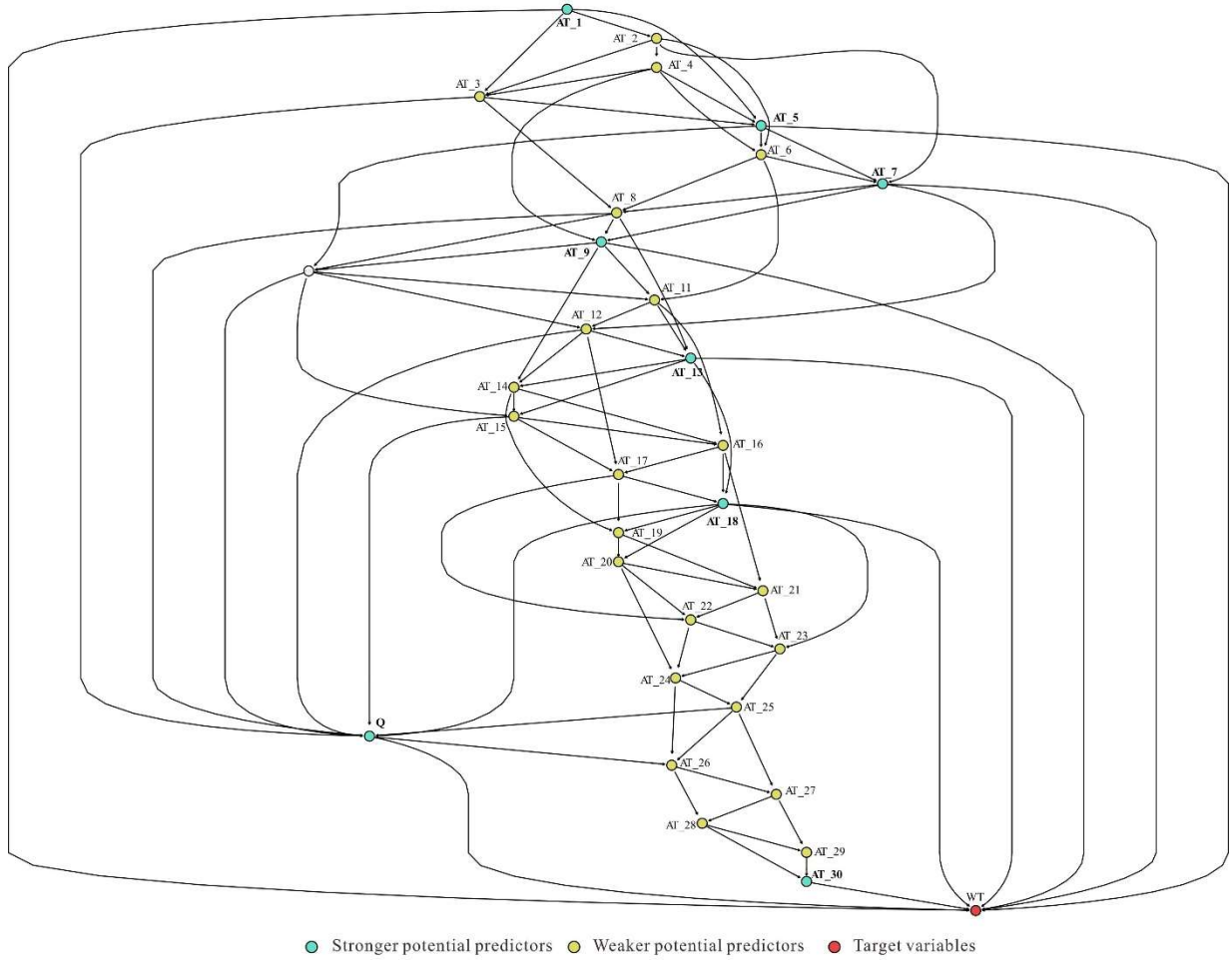


**Figure S1(c)** Typical network structure obtained for April. Notations for the variables are as follows: Water temperature (*WT*), discharge (*Q*). *AT\_1*, *AT\_2*, ..., *AT\_30* represent the lag-1, lag-2, ..., lag-30 for air temperature (*AT*) series. The nodes denoted with blue circle are selected as final potential predictors. *WT* is target variable while other variables are set as input variables.



**Figure S1(d)** Typical network structure obtained for May. Notations for the variables are as follows: Water temperature (*WT*), discharge (*Q*). *AT\_1*, *AT\_2*, ..., *AT\_30* represent the lag-1, lag-2, ..., lag-30 for air temperature (*AT*) series. The nodes denoted with blue circle are selected as final potential predictors. *WT* is target variable while other variables are set as input variables.

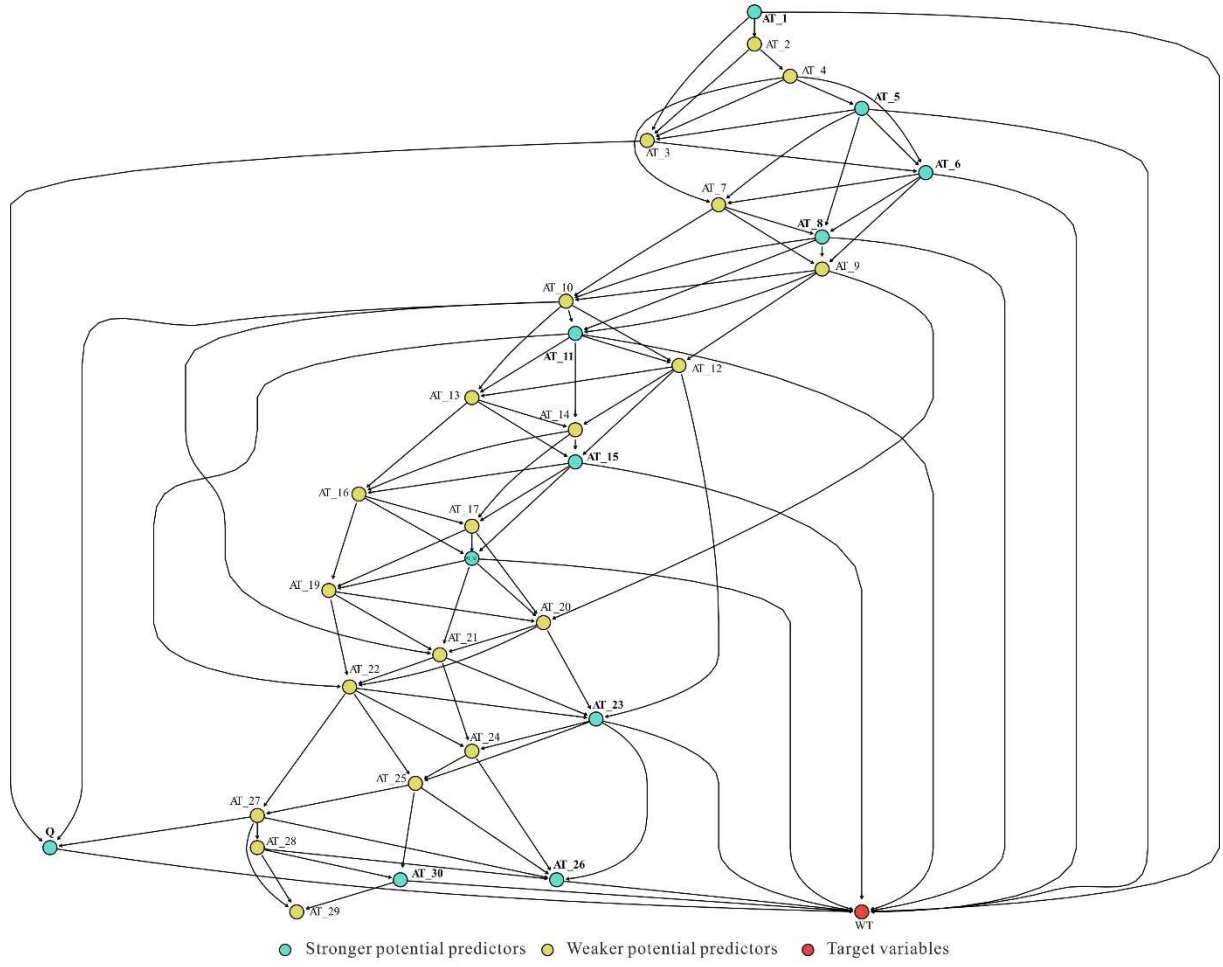
*Typical network structure obtained for June*



**Figure S1(e)** Typical network structure obtained for June. Notations for the variables are as follows: Water temperature (*WT*), discharge (*Q*). *AT\_1*, *AT\_2*, ..., *AT\_30* represent the lag-1, lag-2, ..., lag-30 for air temperature (*AT*) series. The nodes denoted with blue circle are selected as final potential predictors. *WT* is target variable while other variables are set as input variables.

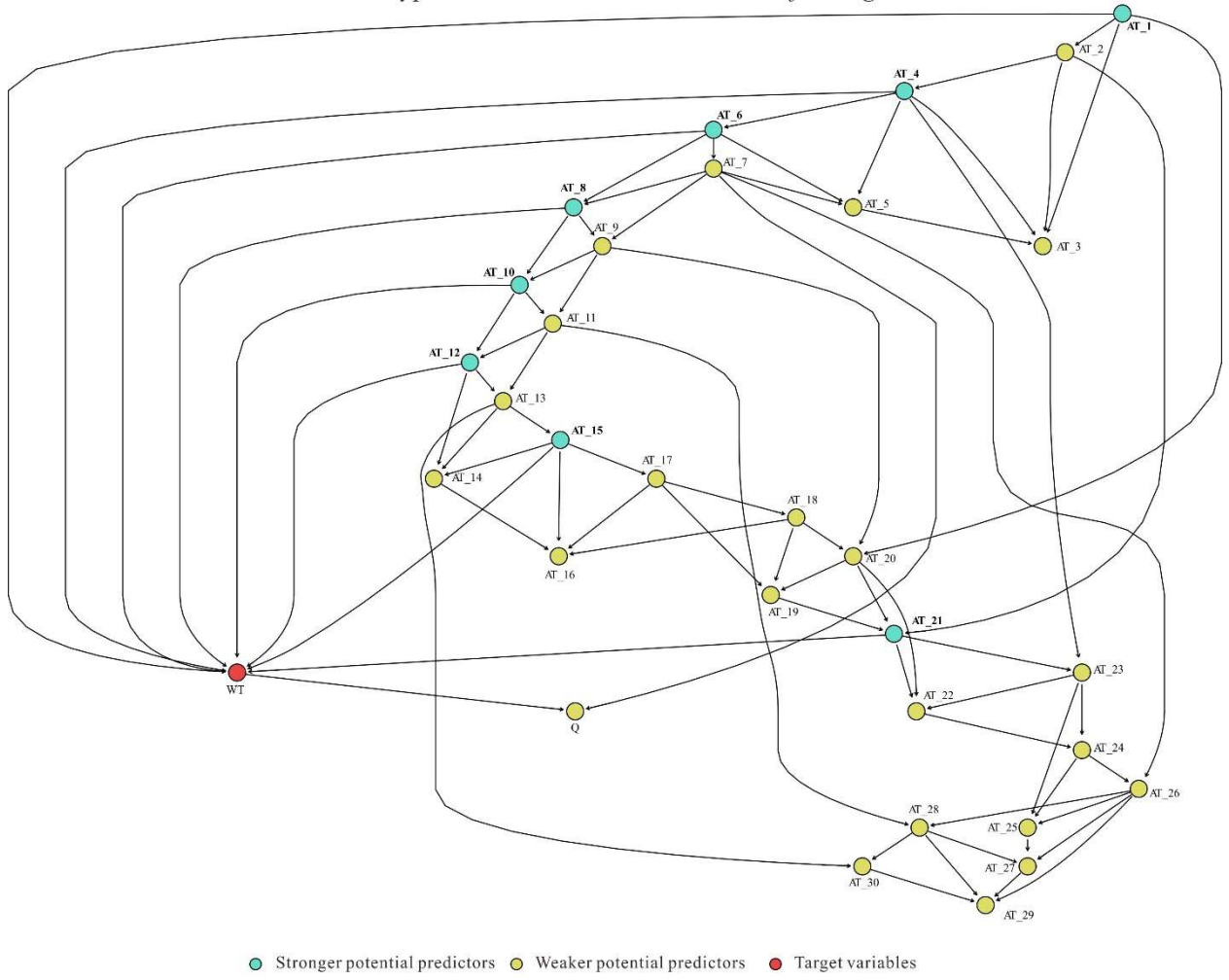


Typical network structure obtained for July



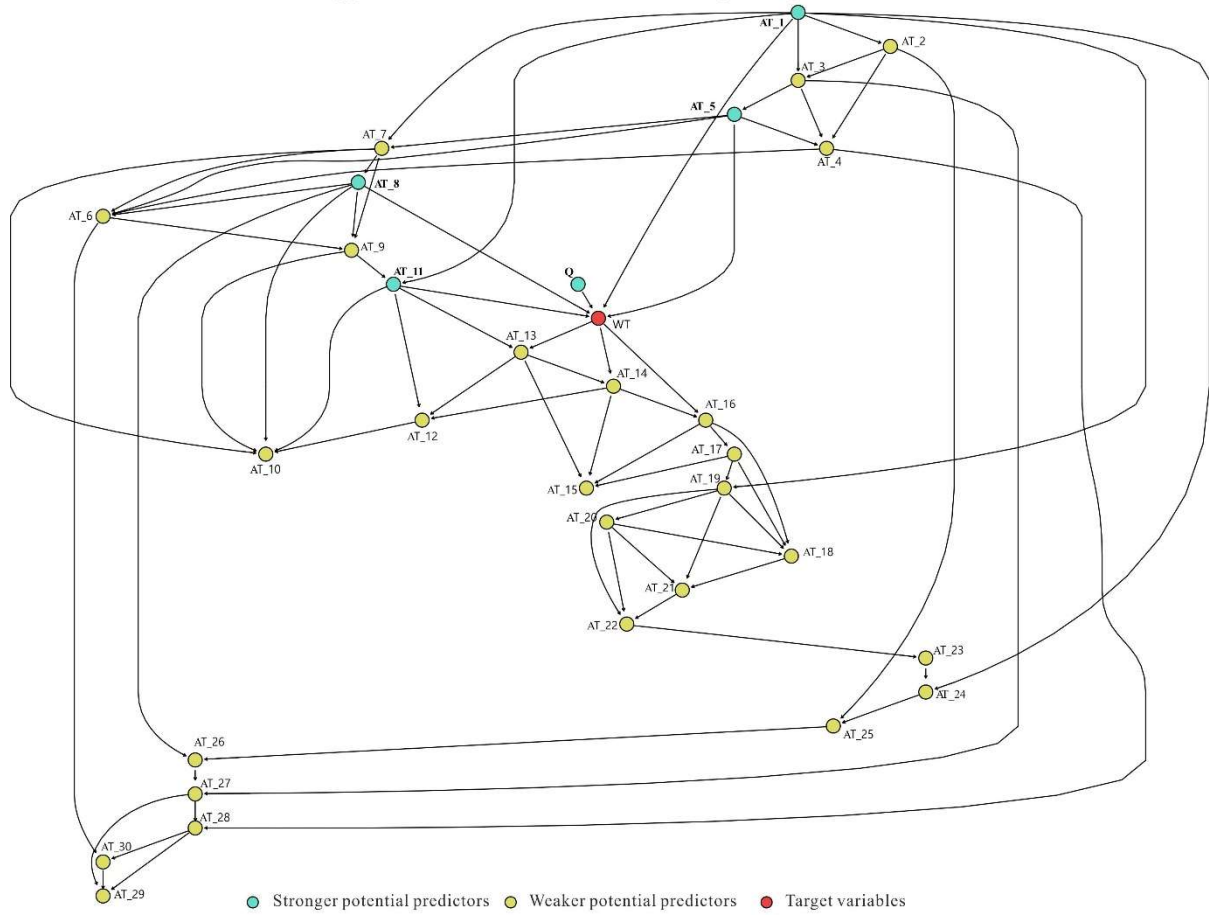
**Figure S1(f)** Typical network structure obtained for July. Notations for the variables are as follows: Water temperature ( $WT$ ), discharge ( $Q$ ).  $AT_1$ ,  $AT_2$ , ...,  $AT_{30}$  represent the lag-1, lag-2, ..., lag-30 for air temperature ( $AT$ ) series. The nodes denoted with blue circle are selected as final potential predictors.  $WT$  is target variable while other variables are set as input variables.

Typical network structure obtained for August



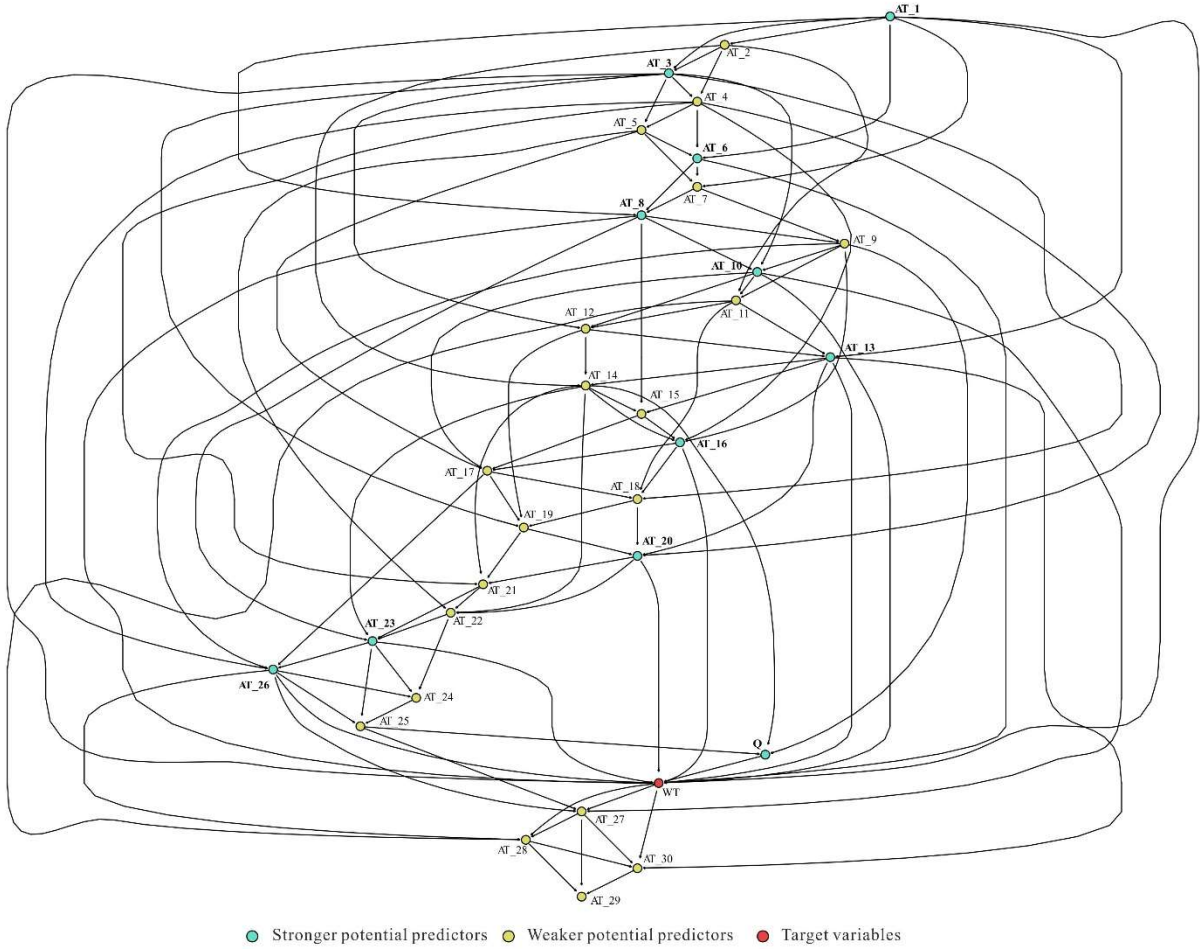
**Figure S1(g)** Typical network structure obtained for August. Notations for the variables are as follows: Water temperature ( $WT$ ), discharge ( $Q$ ).  $AT_1, AT_2, \dots, AT_{30}$  represent the lag-1, lag-2, ..., lag-30 for air temperature (AT) series. The nodes denoted with blue circle are selected as final potential predictors.  $WT$  is target variable while other variables are set as input variables.

*Typical network structure obtained for September*



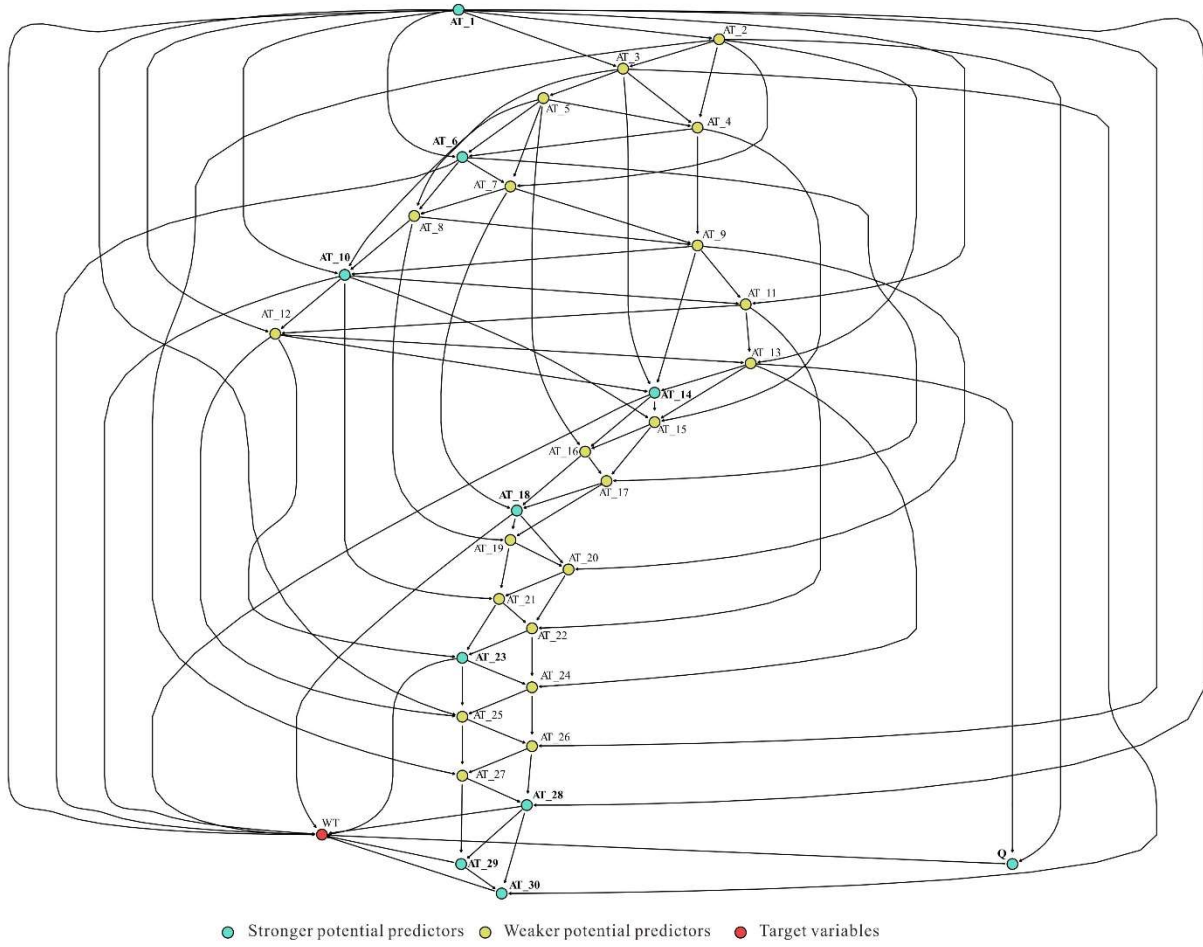
**Figure S1(h)** Typical network structure obtained for September. Notations for the variables are as follows: Water temperature (*WT*), discharge (*Q*). *AT\_1*, *AT\_2*, ..., *AT\_30* represent the lag-1, lag-2, ..., lag-30 for air temperature (*AT*) series. The nodes denoted with blue circle are selected as final potential predictors. *WT* is target variable while other variables are set as input variables.

*Typical network structure obtained for October*



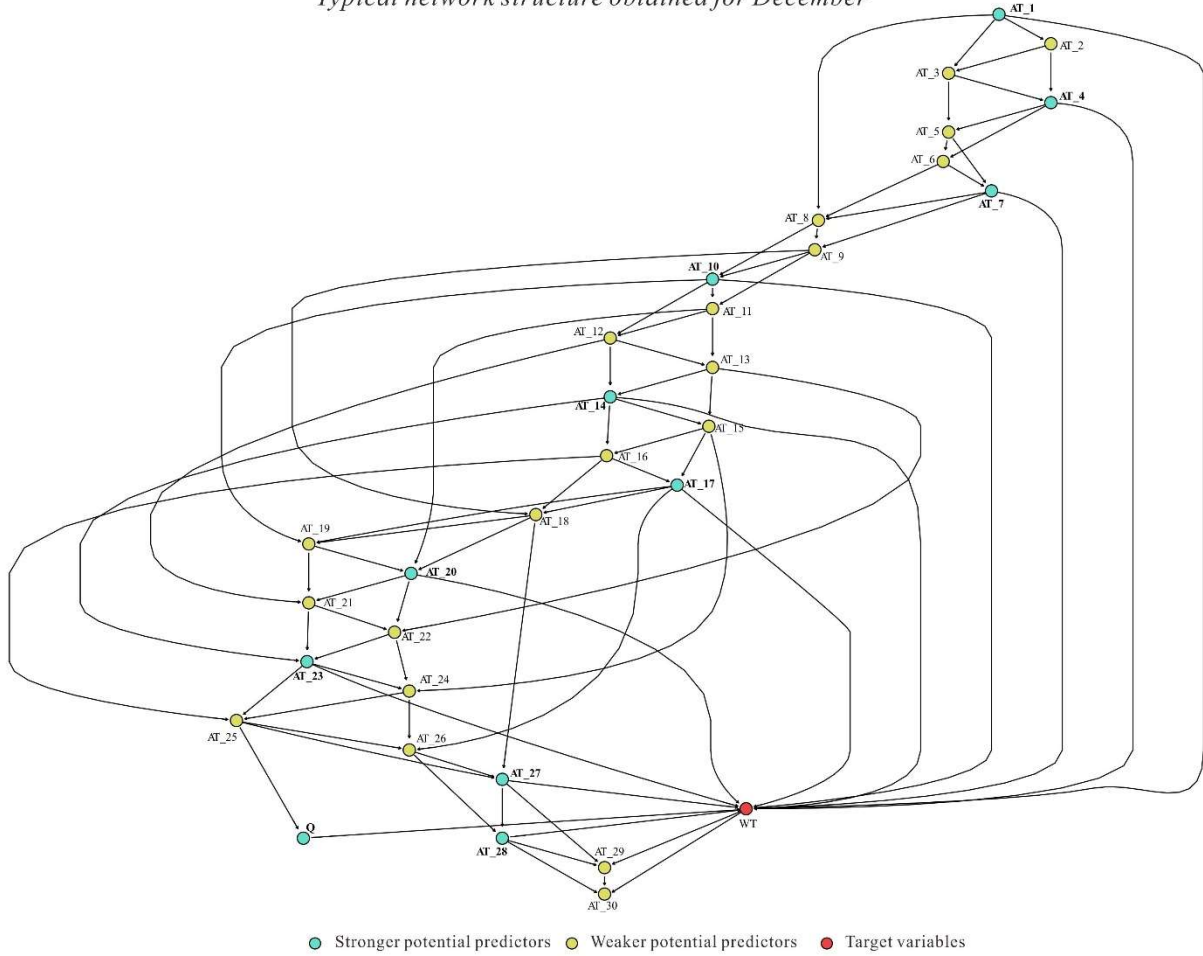
**Figure S1(i)** Typical network structure obtained for October. Notations for the variables are as follows: Water temperature ( $WT$ ), discharge ( $Q$ ).  $AT_1, AT_2, \dots, AT_{30}$  represent the lag-1, lag-2, ..., lag-30 for air temperature ( $AT$ ) series. The nodes denoted with blue circle are selected as final potential predictors.  $WT$  is target variable while other variables are set as input variables.

Typical network structure obtained for November



**Figure S1(j)** Typical network structure obtained for November. Notations for the variables are as follows: Water temperature ( $WT$ ), discharge ( $Q$ ).  $AT_1, AT_2, \dots, AT_{30}$  represent the lag-1, lag-2, ..., lag-30 for air temperature ( $AT$ ) series. The nodes denoted with blue circle are selected as final potential predictors.  $WT$  is target variable while other variables are set as input variables.

Typical network structure obtained for December



**Figure S1(k)** Typical network structure obtained for December. Notations for the variables are as follows: Water temperature ( $WT$ ), discharge ( $Q$ ).  $AT_1$ ,  $AT_2$ , ...,  $AT_{30}$  represent the lag-1, lag-2, ..., lag-30 for air temperature (AT) series. The nodes denoted with blue circle are selected as final potential predictors.  $WT$  is target variable while other variables are set as input variables.