



Table S1. Hyperparameter space for all the models assessed in this work. MLP – Multilayer Perceptron, RF – Random Forest, SVR – Support Vector Regression, ELM – Extreme Learning Machine, CNN – Convolutional Neural Network, LSTM – Long Short-Term Memory, TransformerCNN – Transformer using CNN in the feed-forward layer, Transformer LSTM – Transformer using LSTM in the feed-forward layer,

Model	Hyperparameter	Space
MLP	Number of hidden layers	Up to 5
	Number of neurons	Up to 20
	Activation function	ReLU, Sigmoid and Tanh
	Maximum number of epochs	150
RF	Number of trees in the forest	From 10 to 1000
	Number of features to consider when looking for the best split	Sqrt, Log2
SVR	Kernel	Linear, Poly, Rbf, Sigmoid
	c	From 0.01 to 10
	Epsilon	From 0.01 to 10
ELM	Maximum number of neurons	150
	Activation function	Linear, Sigmoid, Tanh, Rbf_l1, Rbf_l2, Rbf_Linf
CNN	Number of convolutional block layers	From 1 to 5
	Number of convolutional layers in the block	From 1 to 5
	Number of filters	From 16 to 64
	Length of the convolutional window	From 1 to 20
	Length of the pooling window	From 1 to 5
	Type of pooling function	Average and Maximum
	Number of hidden layers	From 1 to 3
	Number of neurons	From 1 to 20
	Activation function	ReLU
	Optimizer function	Adam
	Maximum number of epochs	150
LSTM	Number of layers	From 1 to 5
	Number units	From 16 to 64
	Number of hidden layers	From 1 to 3
	Number of neurons	From 1 to 20
	Activation function	ReLU
	Optimizer function	Adam
	Maximum number of epochs	150
TransformerCNN	Number of attention heads	From 1 to 5
	Size of the head	From 1 to 5
	Number of filters	From 16 to 64
	Number of transformers blocks	From 1 to 3

	Length of the convolutional window	From 1 to 20
	Number of hidden layers	Up 1 to 3
	Number of neurons	Up to 20
	Maximum number of epochs	150
TransformerLSTM	Number of attention heads	From 1 to 5
	Size of the head	From 1 to 5
	Number of units	Fro 16 to 64
	Number of transformers blocks	From 1 to 3
	Number of hidden layers	Up 1 to 3
	Number of neurons	Up to 20
	Maximum number of epochs	150

Table S2. Fittest hyperparameters for the best model and configuration at every location

Model	Station	Conf	Hyperparameters
CNN	ALM04	7	n_conv_layers = 1 n_conv_base = 5 n_filters = 38 n_kernels = 20 type_pool = Max, pool_size = 2 n_hidden_layers = 1 n_neurons = 20 epochs = 150 activation = relu optimizer = adam
CNN	CAD05	26	n_conv_layers = 1 n_conv_base = 5 n_filters = 64 n_kernels = 20 type_pool = Avg pool_size = 4 n_hidden_layers = 3 n_neurons = 20 epochs = 149 activation = relu optimizer = adam
CNN	COR06	4	n_conv_layers = 1 n_conv_base = 3 n_filters = 37 n_kernels = 18 type_pool = Avg

			pool_size = 2 n_hidden_layers = 2 n_neurons = 9 epochs = 145 activation = relu optimizer = adam
CNN	HUE06	4	n_conv_layers = 1 n_conv_base = 1 n_filters = 42 n_kernels = 20 type_pool = Avg pool_size = 2 n_hidden_layers = 1 n_neurons = 20 epochs = 150 activation = relu optimizer = adam
CNN	MAG01	22	n_conv_layers = 1 n_conv_base = 1 n_filters = 32 n_kernels = 10 type_pool = Avg pool_size = 5 n_hidden_layers = 1 n_neurons = 19 epochs = 149 activation = relu optimizer = adam
ELM	ALM04	1	activation = rbf_l2 neurons = 145
ELM	CAD05	2	activation = rbf_l2 neurons = 150
ELM	COR06	1	activation = rbf_l2 neurons = 150
ELM	HUE06	22	activation = rbf_l2 neurons = 150
ELM	MAG01	4	activation = rbf_l2 neurons = 150
LSTM	ALM04	6	n_layers = 1 units = 64 n_hidden_layers = 1 n_neurons = 20

			epochs = 150 activation = relu optimizer = adam
LSTM	CAD05	14	n_layers = 1 units = 59 n_hidden_layers = 1 n_neurons = 20 epochs = 150 activation = relu optimizer = adam
LSTM	COR06	16	n_layers = 1 units = 64 n_hidden_layers = 1 n_neurons = 20 epochs = 150 activation = relu optimizer = adam
LSTM	HUE06	8	n_layers = 1 units = 64 n_hidden_layers = 1 n_neurons = 15 epochs = 150 activation = relu optimizer = adam
LSTM	MAG01	22	n_layers = 1 units = 47 n_hidden_layers = 2 n_neurons = 15 epochs = 150 activation = relu optimizer = adam
MLP	ALM04	13	activation = relu optimizer = adam epochs = 59 neurons = [18, 16, 14, 9]
MLP	CAD05	14	activation = relu optimizer = adam epochs = 100 neurons = [20, 20]
MLP	COR06	7	activation = relu optimizer = adam epochs = 66

			neurons = [13, 15, 18, 9, 14]
MLP	HUE06	2	activation = relu optimizer = adam epochs = 100 neurons = [20, 18, 13]
MLP	MAG01	25	activation = relu optimizer = adam epochs = 23 neurons = [20, 12]
RF	ALM04	3	n_estimators = 70 max_features = log2
RF	CAD05	16	n_estimators = 69 max_features = log2
RF	COR06	13	n_estimators = 100 max_features = sqrt
RF	HUE06	18	n_estimators = 75 max_features = log2
RF	MAG01	5	n_estimators = 60 max_features = log2
SVM	ALM04	21	kernel = rbf c = 5.680 epsilon = 0.103
SVM	CAD05	26	kernel = poly c = 2.203 epsilon = 0.077
SVM	COR06	13	kernel = linear c = 10.0 epsilon = 0.111
SVM	HUE06	11	kernel = rbf c = 0.805 epsilon = 0.052
SVM	MAG01	2	kernel = rbf c = 1.388 epsilon = 0.287
Transformer CNN	ALM04	5	head_size = 4 num_heads = 4 ff_dim = 29 num_transformer_blocks = 2 n_hidden_layers = 2 n_hidden_neurons = 17 n_kernel = 4 n_strides = 2

Transformer CNN	CAD05	20	head_size = 3 num_heads = 3 ff_dim = 29 num_transformer_blocks = 2 n_hidden_layers = 2 n_hidden_neurons = 16 n_kernel = 2 n_strides = 3
Transformer CNN	COR06	2	head_size = 3 num_heads = 5 ff_dim = 22 num_transformer_blocks = 2 n_hidden_layers = 1 n_hidden_neurons = 19 n_kernel = 4 n_strides = 5
Transformer CNN	HUE06	13	head_size = 5 num_heads = 3 ff_dim = 29 num_transformer_blocks = 3 n_hidden_layers = 1 n_hidden_neurons = 14 n_kernel = 2 n_strides = 1
Transformer CNN	MAG01	4	head_size = 5 num_heads = 4 ff_dim = 14 num_transformer_blocks = 3 n_hidden_layers = 1 n_hidden_neurons = 5 n_kernel = 5 n_strides = 2
Transformer LSTM	ALM04	3	head_size = 1 num_heads = 5 lstm_units = 64 num_transformer_blocks = 3 n_hidden_layers = 1 n_hidden_neurons = 20
Transformer LSTM	CAD05	18	head_size = 2 num_heads = 3 lstm_units = 56 num_transformer_blocks = 2

			n_hidden_layers = 2
			n_hidden_neurons = 10
Transformer LSTM	COR06	8	head_size = 3
			num_heads = 2
			lstm_units = 52
			num_transformer_blocks = 3
			n_hidden_layers = 1
			n_hidden_neurons = 12
Transformer LSTM	HUE06	10	head_size = 5
			num_heads = 1
			lstm_units = 64
			num_transformer_blocks = 3
			n_hidden_layers = 1
			n_hidden_neurons = 20
Transformer LSTM	MAG01	4	head_size = 5
			num_heads = 4
			lstm_units = 49
			num_transformer_blocks = 2
			n_hidden_layers = 2
			n_hidden_neurons = 16