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Prediction of Algal Chlorophyll-a and Water Clarity in Monsoon-Region Reservoir Using Machine Learning Approaches

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Models: Multiple Linear Regression, SVM, ANN

Target: Chl-a and water clarity (Secchi depth)

Data:

Time-step: Monthly
Water Quality: DO, Water Temp., TN, BOD, COD, EC, TSS, TP
Weather: Precipitation

Matrices:

Table 2. Model accuracy metrics of Rz, Tz and Lz for chlorophyll-a prediction on the basis of MLR, SVM and ANN (Rz—riverine zone, Tz—transitional zone, Lz—lacustrine zone, MLR—multiple linear regression, SVM—support vector machine, ANN—artificial neural network).

Model Accuracy Metrics	Riverine Zone (Rz)						Transitional Zone (Tz)						Lacustrine Zone (Lz)					
	Before Validation			After Validation			Before Validation			After Validation			Before Validation			After Validation		
	MLR	SVM	ANN	MLR	SVM	ANN	MLR	SVM	ANN	MLR	SVM	ANN	MLR	SVM	ANN	MLR	SVM	ANN
RMSE	3.37	2.86	2.83	3.61	2.57	4.96	2.07	1.58	1.56	2.18	1.31	2.93	2.25	1.77	1.72	2.31	1.59	3.40
R^2	0.34	0.56	0.53	0.28	0.75	0.43	0.30	0.63	0.60	0.26	0.73	0.40	0.31	0.58	0.60	0.25	0.80	0.40
MAE	2.30	1.52	1.96	2.49	1.24	3.20	1.54	0.96	1.15	1.62	0.62	1.98	1.65	1.07	1.28	1.73	0.68	2.25

Table 3. Model accuracy metrics of premonsoon, monsoon and postmonsoon for chlorophyll-a prediction based on MLR, SVM and ANN (MLR—multiple linear regression, SVM—support vector machine, ANN—artificial neural network).

Model Accuracy Metrics	Premonsoon (January–June)						Monsoon (July–August)						Postmonsoon (September–December)					
	Before Validation			After Validation			Before Validation			After Validation			Before Validation			After Validation		
	MLR	SVM	ANN	MLR	SVM	ANN	MLR	SVM	ANN	MLR	SVM	ANN	MLR	SVM	ANN	MLR	SVM	ANN
RMSE	1.60	1.35	1.42	1.64	1.04	1.99	4.34	3.25	2.85	4.77	1.51	6.04	2.65	2.15	2.09	2.83	1.80	4.88
R^2	0.25	0.50	0.41	0.23	0.71	0.37	0.20	0.57	0.65	0.10	0.81	0.27	0.40	0.62	0.63	0.34	0.77	0.48
MAE	1.15	0.81	1.04	1.19	0.40	1.29	3.09	1.73	2.10	3.37	0.78	3.78	1.98	1.26	1.64	2.14	0.80	2.59

Major conclusions: