

Estimation of the Source Apportionment of Phosphorus and Its Responses to Future Climate Changes using Multi-model Applications

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1. Introduction

The Long Ashton Research Station Weather Generator (LARS-WG) model used in this study can be downloaded at <http://resources.rothamsted.ac.uk/mas-models/larswg>.

The Regional Nutrient Management (ReNuMa) model used in this study can be downloaded at <http://www.eeb.cornell.edu/biogeo/nanc/usda/renuma.htm>.

The land use map of the study area is provided in Figure S1.

This Supplementary Material summarizes the model parameters and outputs of ReNuMa and LARS-WG in this study for readers to test and replicate this work.

2. LARS-WG Model

The parameters of the LARS-WG model are summarized in the folder named “parameters of LARS-WG”. The model outputs of LARS-WG that represent the future climate statuses can be found in the folder named “results of LARS-WG”.

3. ReNuMa model

The results of scenario analyses based on the ReNuMa model to estimate the future watershed dissolved phosphorus are summarized in the folder named “results of ReNuMa”. The model parameters for the ReNuMa model are provided in Table S1 and Table S2 below.

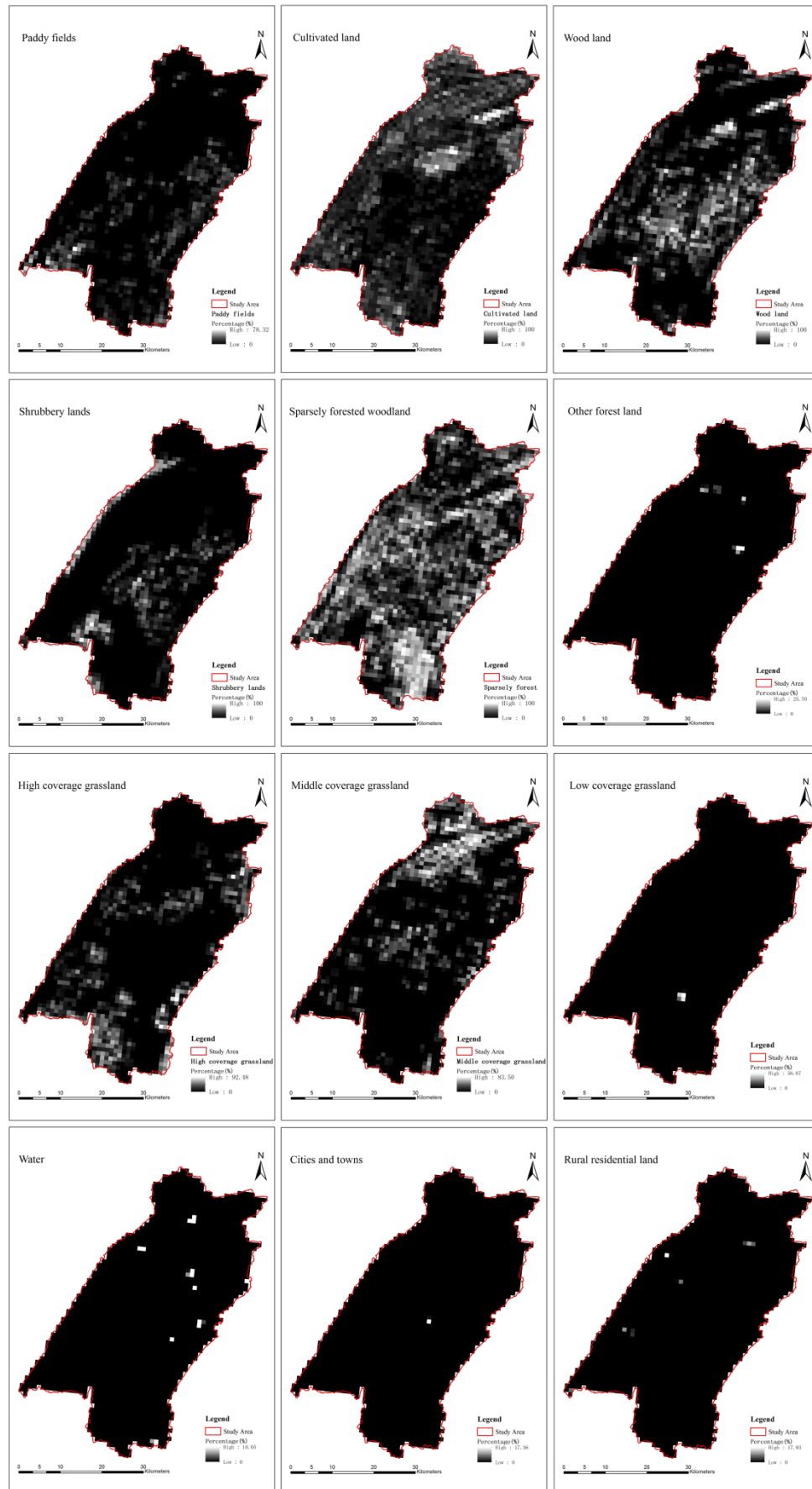


Figure S1. The land use map of the study area. A series of 1 km raster maps are provided with the values of percentages for each land use type in one raster.

Table S1. Hydrological Parameters of Regional Nutrient Management (ReNuMa) model.

Parameter Items	Subcategories	Parameter Values
runoff curve number	Paddy fields	76.77
	Cultivated land	84.03
	Wood land	47.26
	Shrubbery lands	56.59
	Sparsely forested woodland	50.17
	Other forest land including garden	68.98
	High coverage grassland	72.65
	Middle coverage grassland	81.04
	Low coverage grassland	87.84
	Water surface	100.00
	Cities and towns	93.83
	Rural residential land	92.92
runoff curve number	JAN	0.32
	FEB	0.32
	MAR	0.66
	APR	0.66
	MAY	0.66
	JUNE	0.66
	JULY	0.66
	AUG	0.66
	SEPT	0.66
	OCT	0.66
	NOV	0.32
	DEC	0.32
Groundwater flow	Quick recession coefficient	0.0670
	Quick seepage coefficient	0.0153
	Slow recession coefficient	0.0594
	Slow seepage coefficient	0
	Ground water limit for recession (cm)	0.2
	Ground water limit for seepage (cm)	0.2
	Unsaturated zone available water(cm)	8.3779
	Unsaturated zone leakage coefficient	0.4193

Table S2. Nutrient Parameters of Regional Nutrient Management (ReNuMa) model.

Parameter Items	Subcategories	Parameter Values
Manure	First manure month	5
	Last manure month	8
Rural runoff P concentration (mg/L)	Paddy fields	0.3456
	Cultivated land	0.3456
	Wood land	0.0772
	Shrubbery lands	0.0772
	Sparsely forested woodland	0.0772
	Other forest land including garden	0.0772
	High coverage grassland	0.1543
	Middle coverage grassland	0.1543
	Low coverage grassland	0.1543
Rural runoff P concentration during manure months (mg/L)	Paddy fields	0.4503
	Cultivated land	0.4503
Septic systems	Per capita tank P effluent (g/day)	3
	Per capita grow season P uptake (g/day)	1.6
Ground water	Ground water phosphorus concentration (mg/L)	0.0514



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