

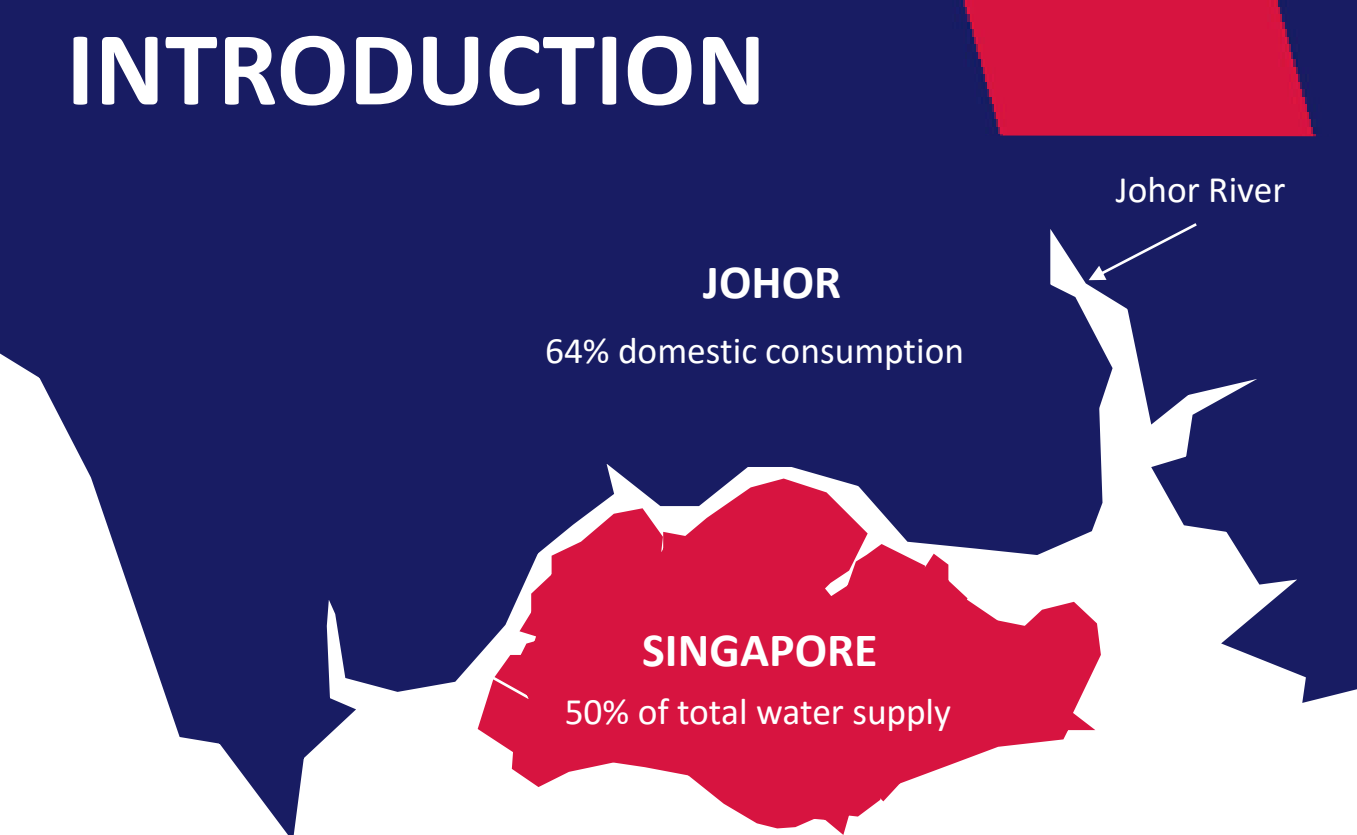
Modelling of ammonium pollution in the Johor River Basin using SWAT

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INTRODUCTION



Potential sources of high NH_4 content



SPH Websites

THE STRAITSTIMES

SINGAPORE POLITICS ASIA WORLD VIDEOS MULTIMEDIA LIFESTYLE FOOD FORUM OPINION BUSINESS SPORT MORE

SINGAPORE > Courts & Crime Education Housing Transport Health Manpower Environment

PUB's Johor waterworks plant shut in 7 pollution cases since 2017

SPH Websites

THE STRAITSTIMES

ASIA

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ASIA > East Asia SE Asia South Asia Australia/NZ

17,000 households in Kulai go dry after ammonia pollution in Johor river; PUB also stops treatment of water at Johor plant



ST VIDEOS

- Protest rally to take place on Monday, the first approved by police since Hong Kong's mask ban...
- Children injured after balloon blast at fitness event in Malaysia
- Vietnam pulls DreamWorks animation film Abominable over South China Sea map
- Syrian forces move in to help Kurds fight Turks

WATER QUALITY STUDIES IN THE JRB

Past studies

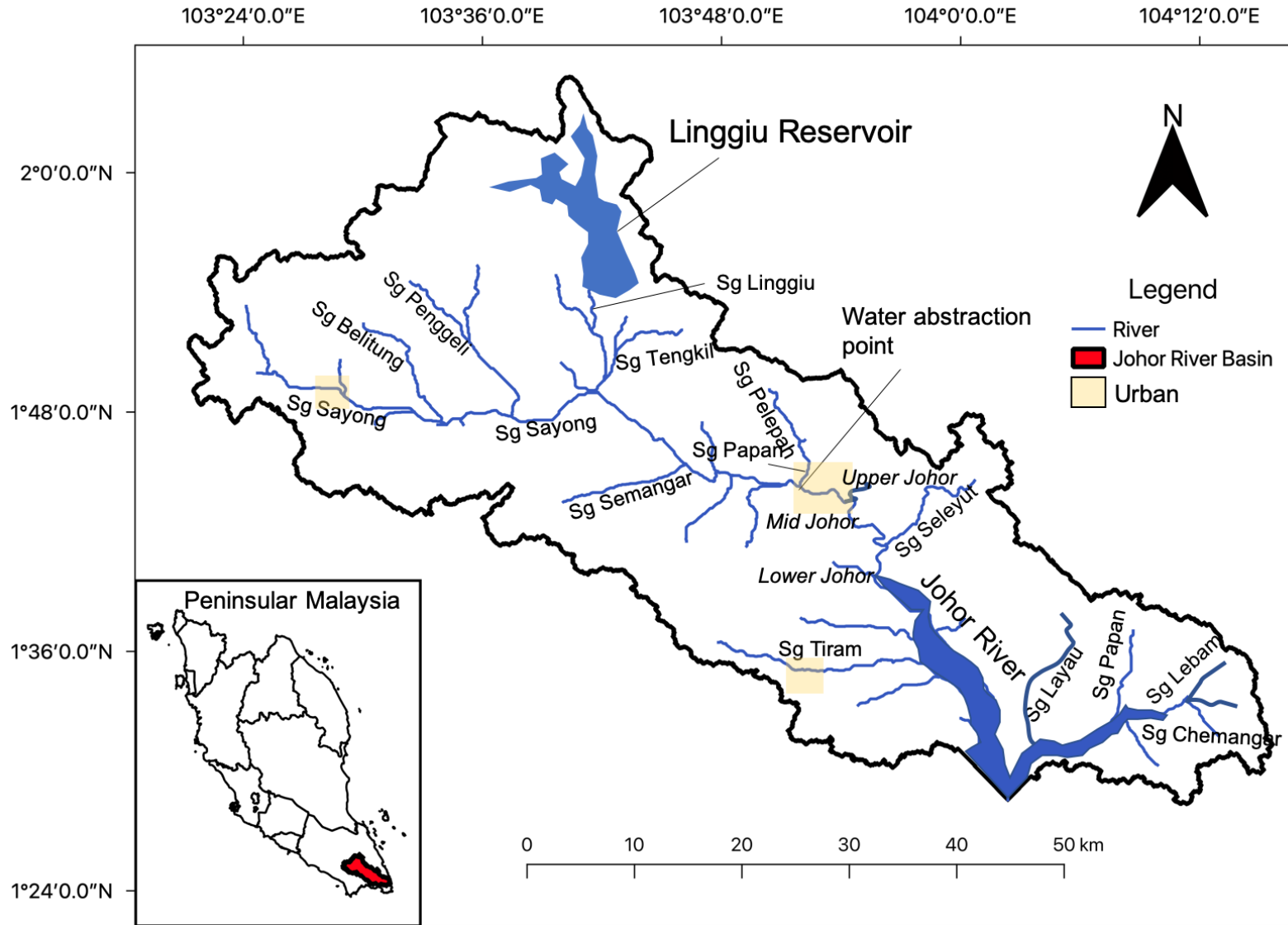
Water quality parameters

Types of model

AIMS AND OBJECTIVES

1. Model the spatial and temporal trends of NH_4 content within the JRB
2. Compare the differences in ammonium output based on simulation of different management scenarios
3. Determine the main contributors of NH_4 within the JRB

STUDY AREA



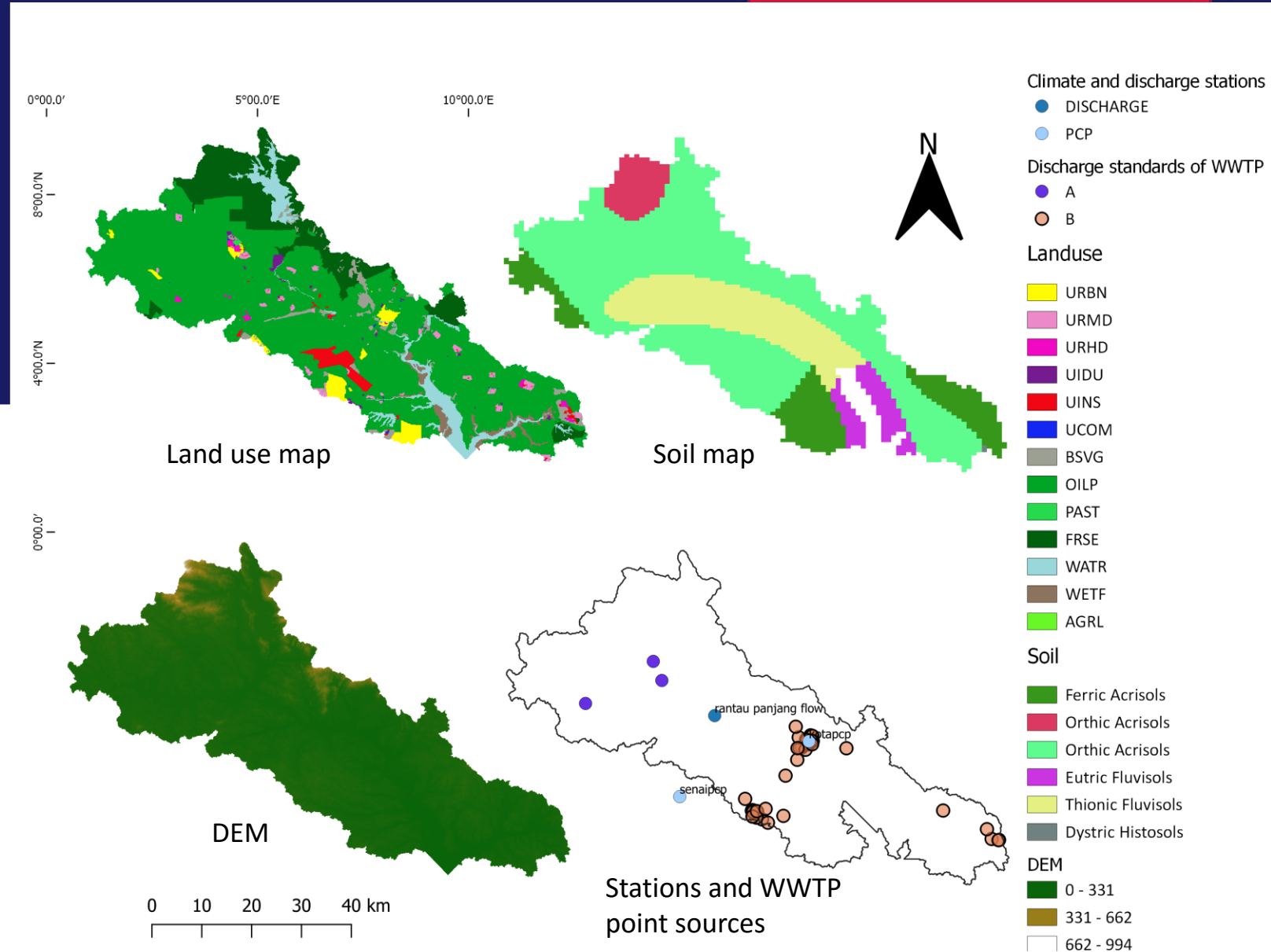
Area: 1652 km²

Climate: Northeast monsoon (November–February), Southwest monsoon (May–August)

METHODOLOGY

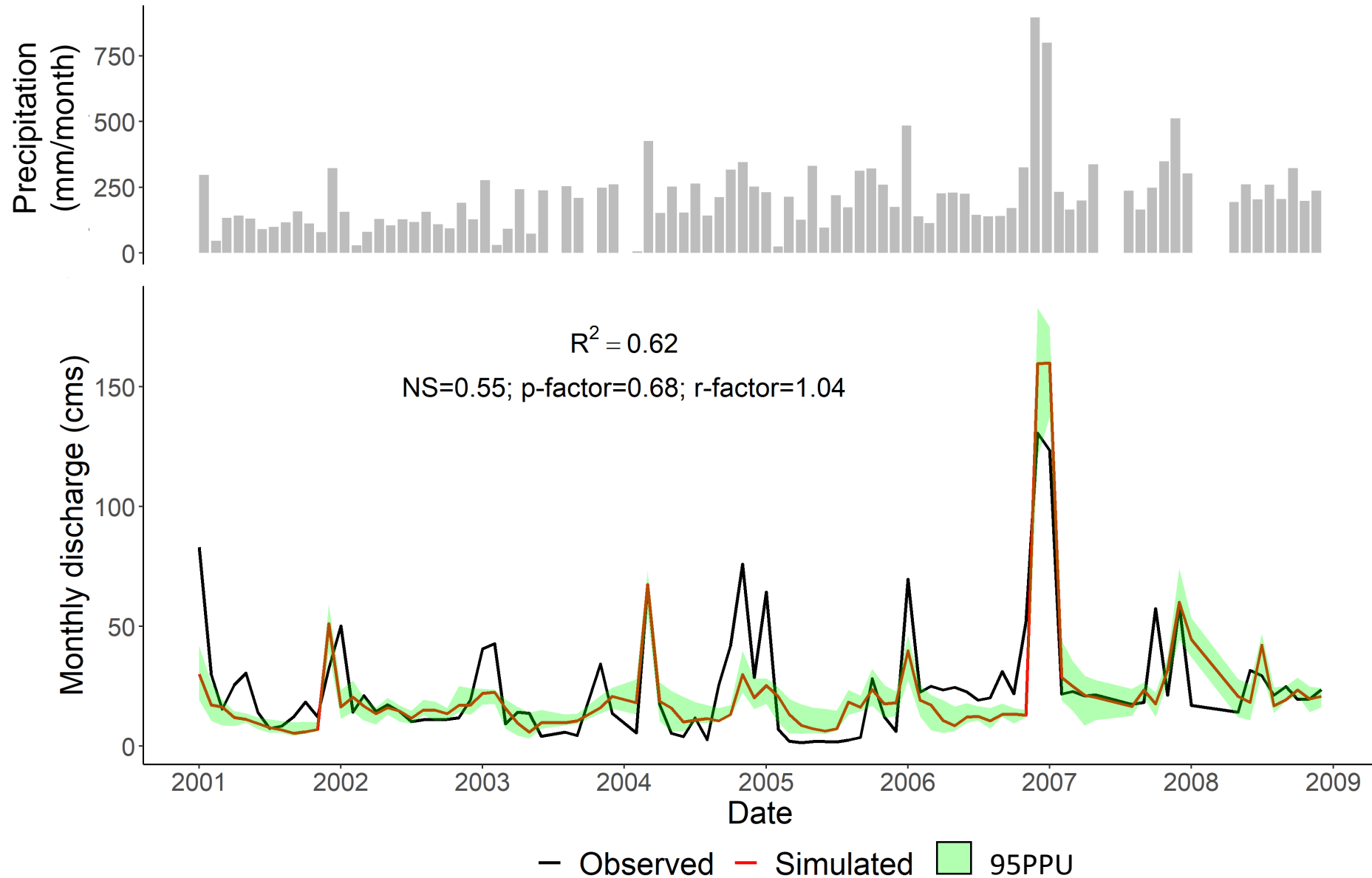
Conversion of PE to flow rate (m³/day) according to Malaysian Standards 1228 (MS1228)

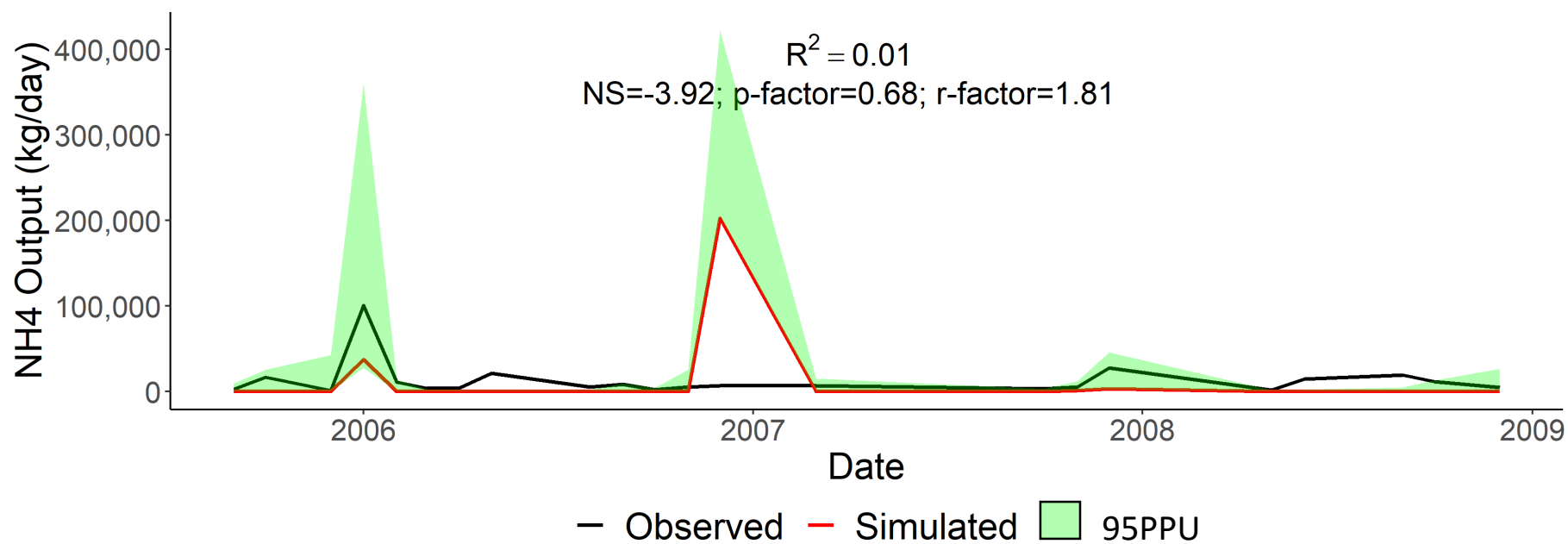
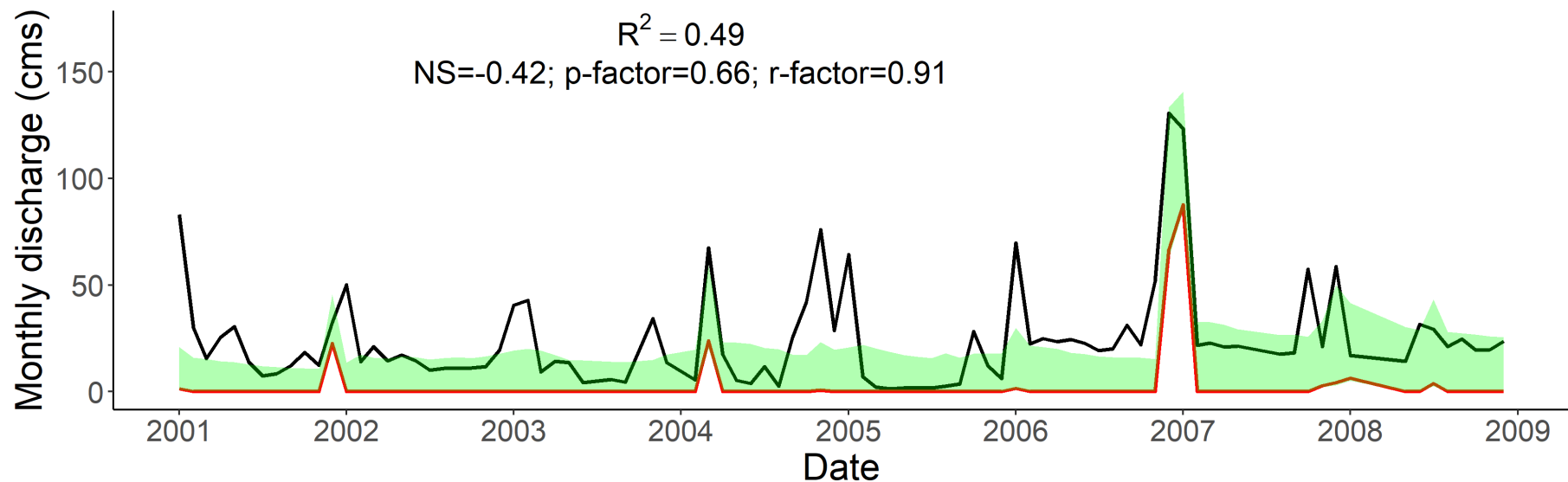
$$\text{Flow (m}^3\text{/day)} = \frac{(\text{PE} * 1000 * 0.077 \text{ [kg BOD/day/person]})}{\text{BOD [mg/l]}}$$



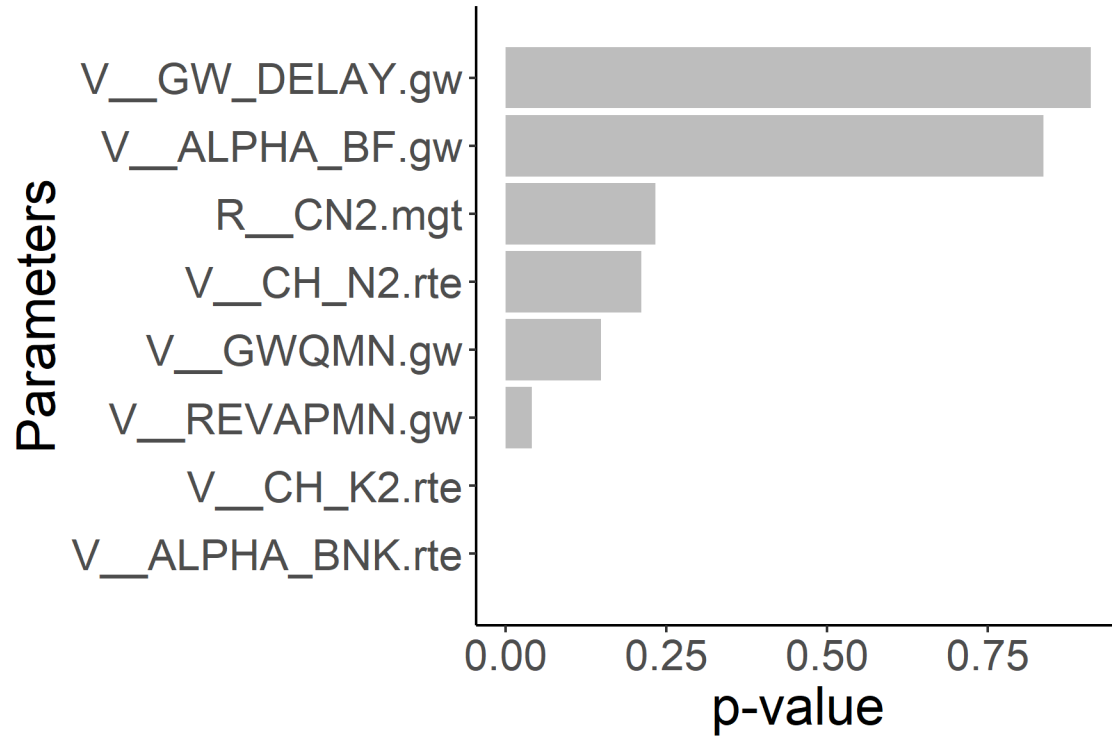
RESULTS

CALIBRATION

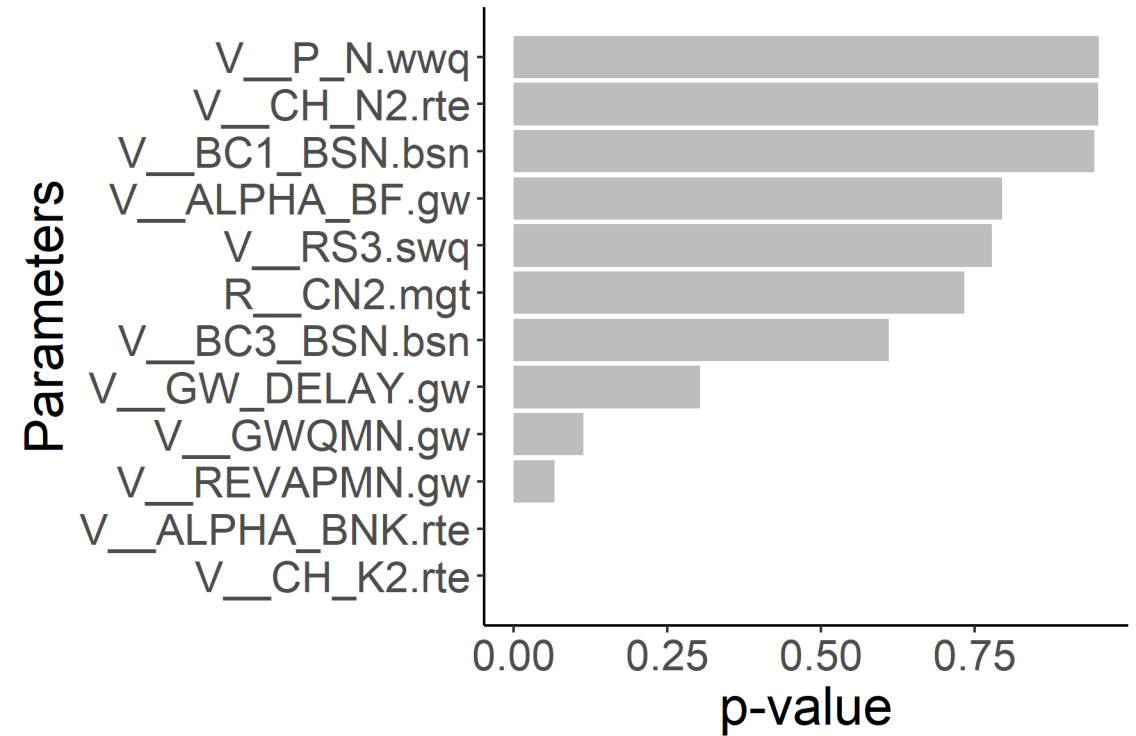


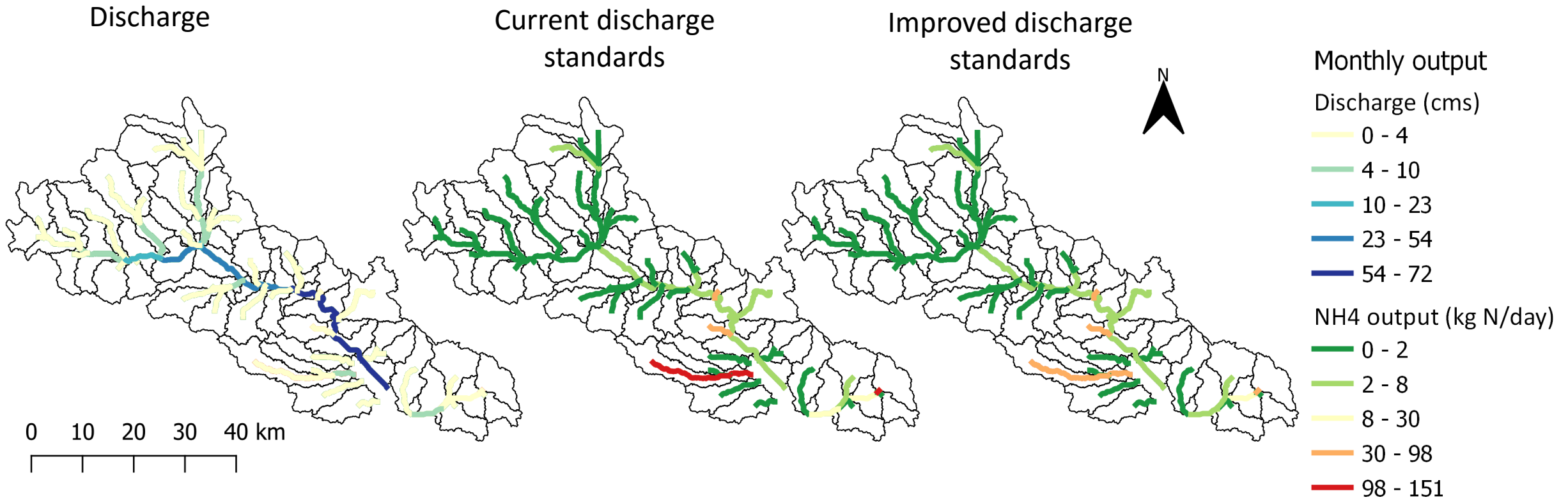


Discharge only



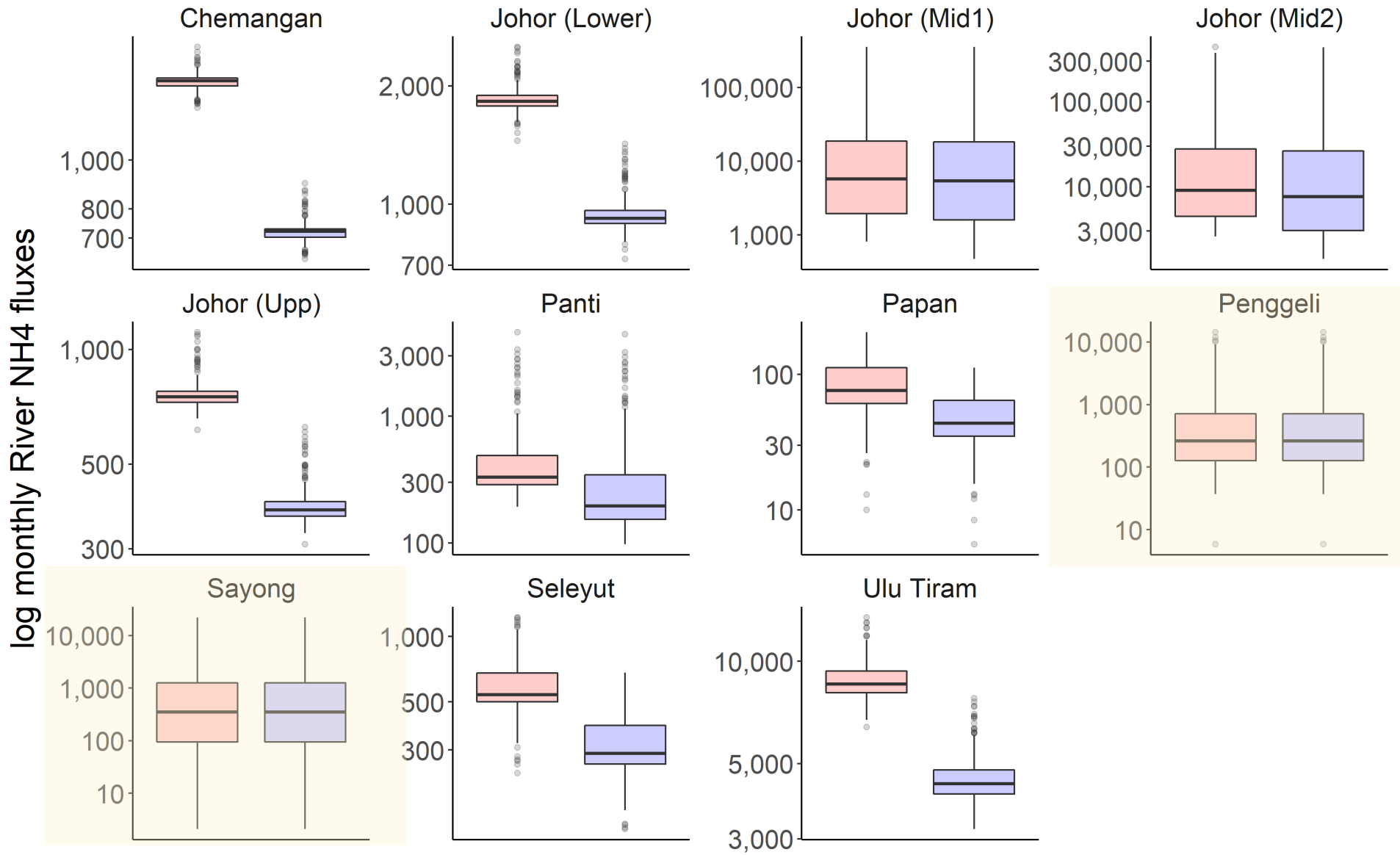
Discharge and water quality parameters







RESULTS

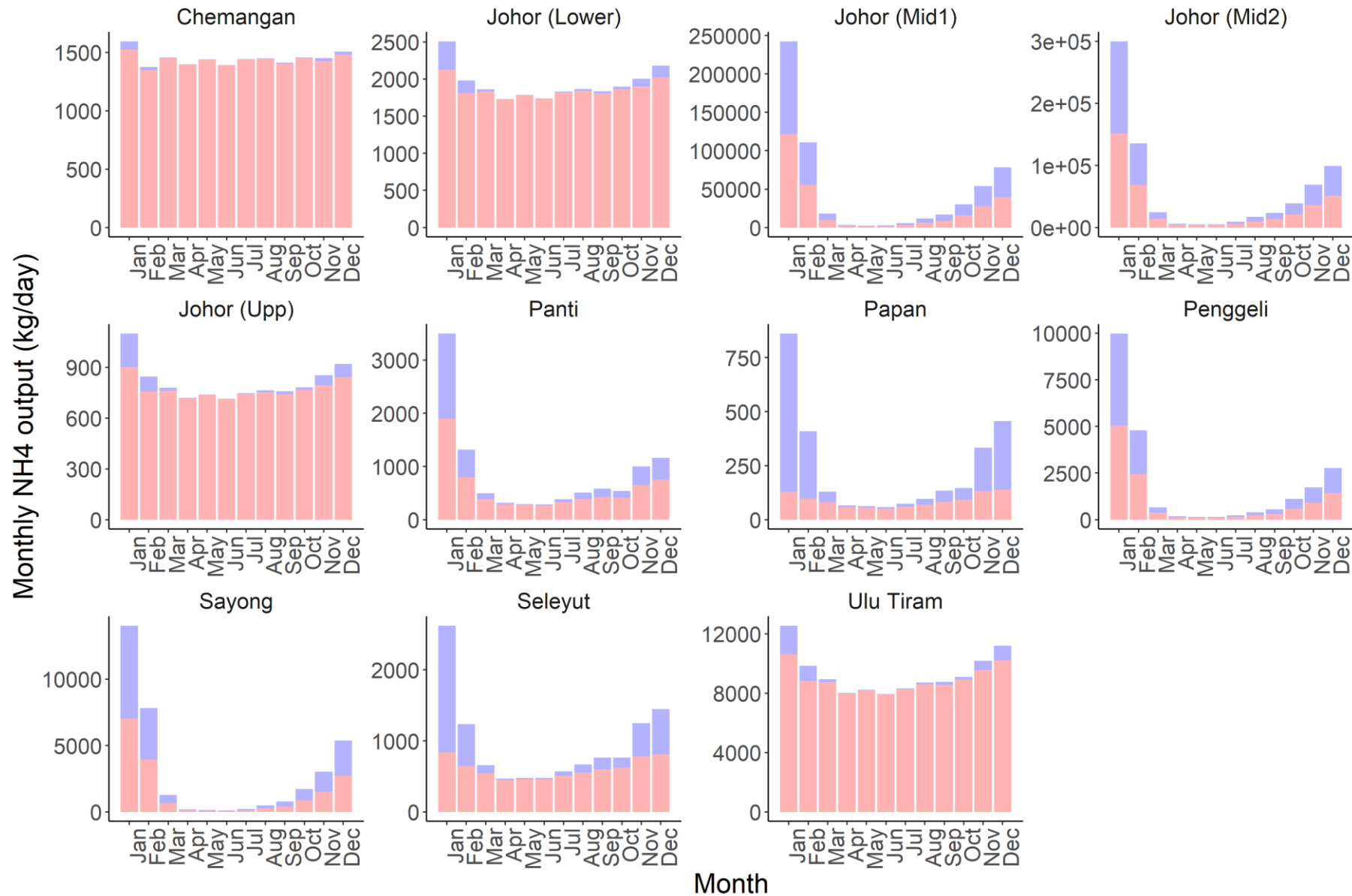
SWAT OUTPUT



Discharge standards  Current discharge standards  Standard A

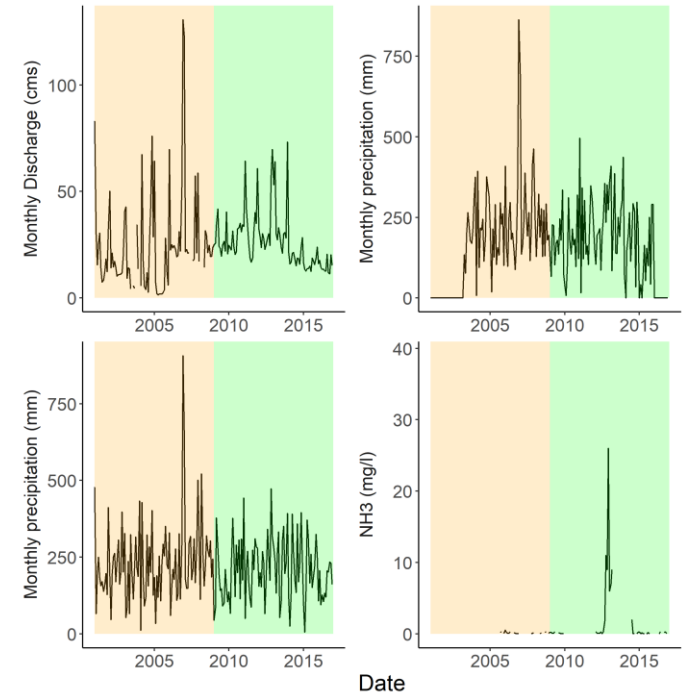
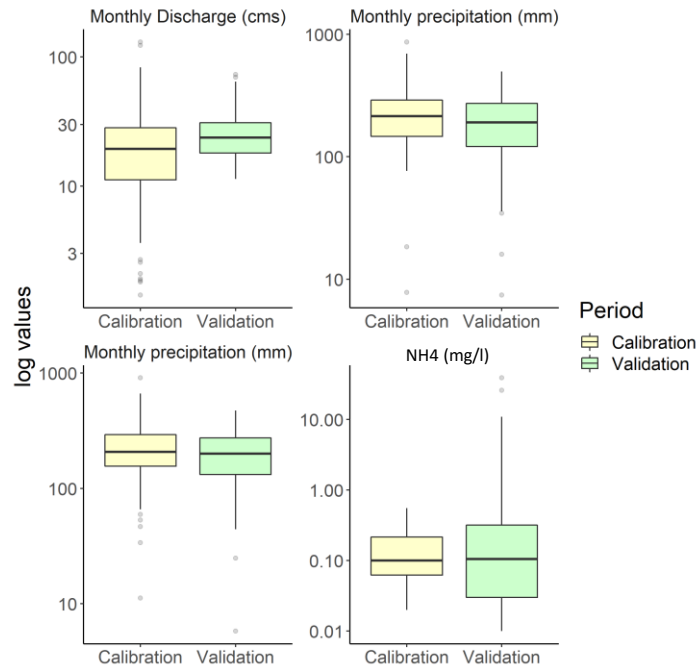
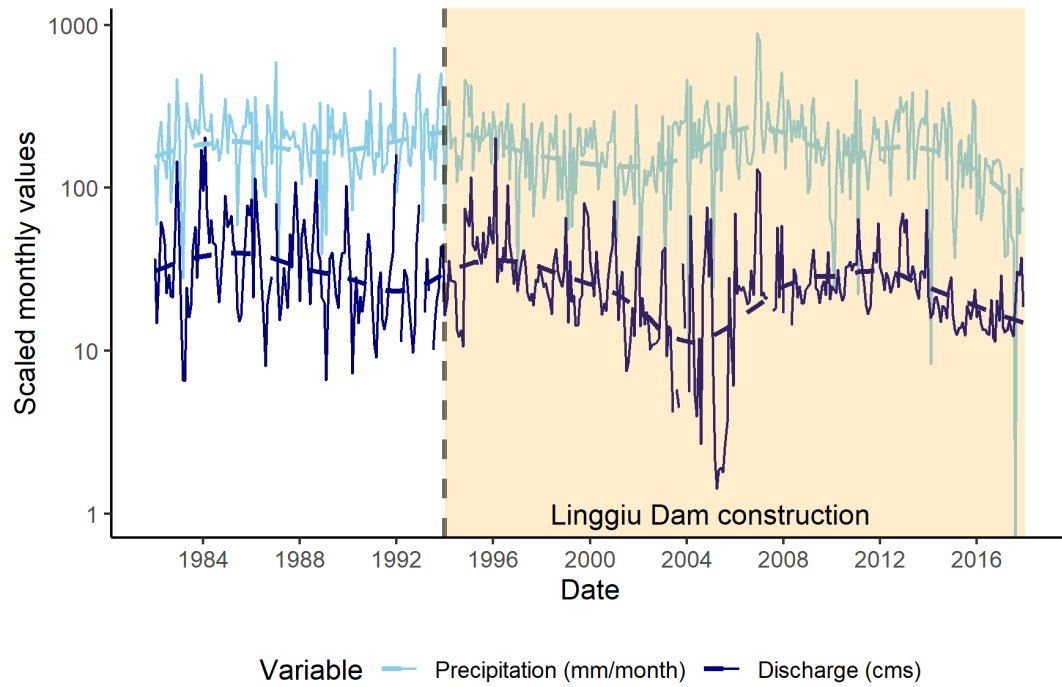
RESULTS

SWAT OUTPUT



Contribution of NH4 ■ Background levels ■ Current WWTP discharge standards

LIMITATIONS



FUTURE WORK

- Multi-site calibration: Use parameters of other gauging station (unaffected by dam) to calibrate for dam parameters
- Assess changes in water quality in response to future climate change scenarios

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