# Analysis of Temporal and Spatial Characteristics of Vegetation Net Primary Productivity and Its driving factors in Poyang Lake

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ABSTRACT

The complicated water regime of Poyang Lake has great impacts on the succession and growth of wetland vegetation. Based on the improved CASA model and the high spatial-temporal resolution remote sensing data, the temporal-spatial distribution pattern and its driving factors of net primary productivity of vegetation in Poyang Lake during 2000~2015 were estimated and analyzed.

INTRODUCTION
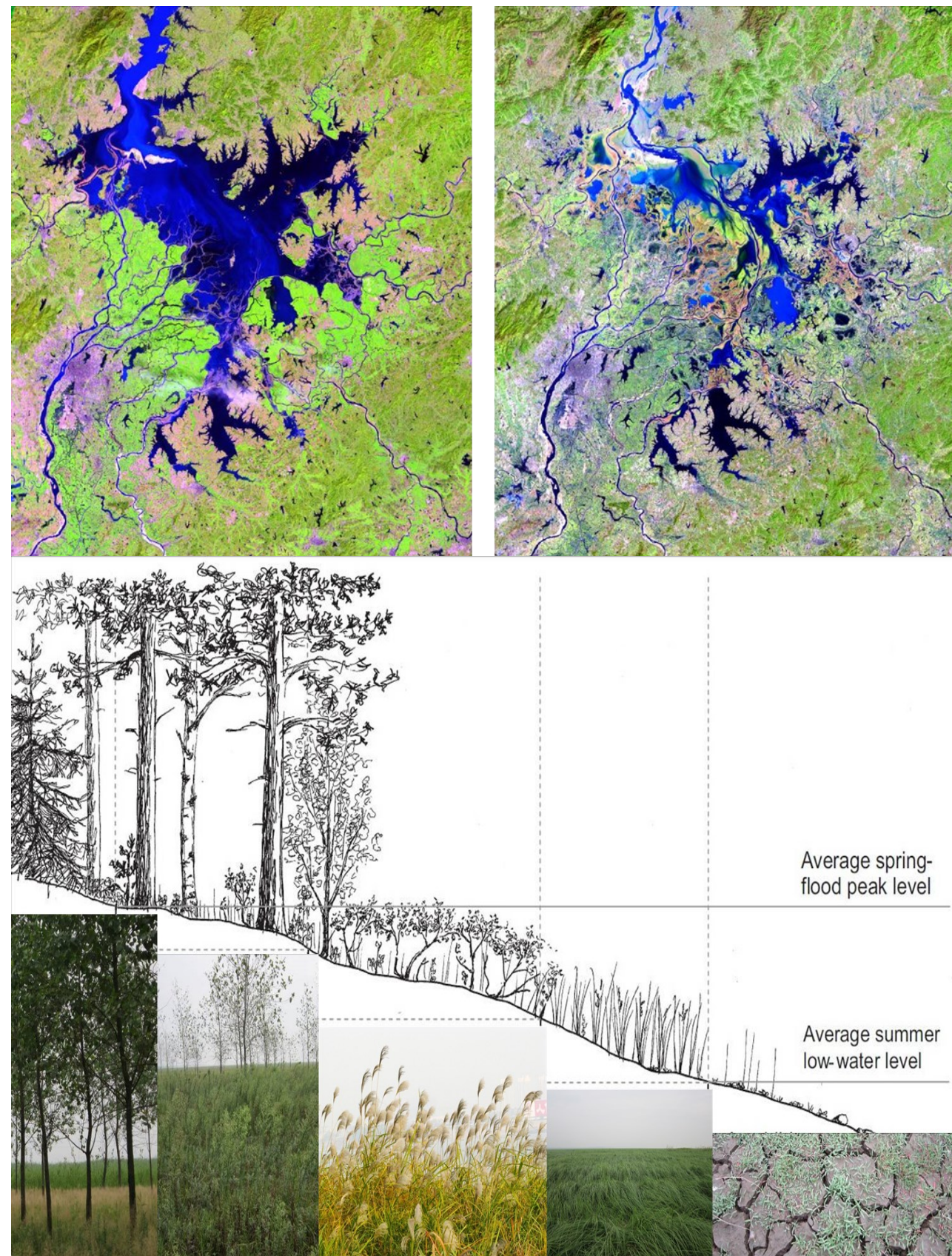
- The dramatic changes in hydrological process in Poyang Lake play an important role in shaping the vegetation ecosystem.

- Net primary productivity is a key component of the terrestrial carbon cycle.

- It's important to study the productivity of wetland vegetation in Poyang Lake and its response to the change of water regime.

OBJECTIVES
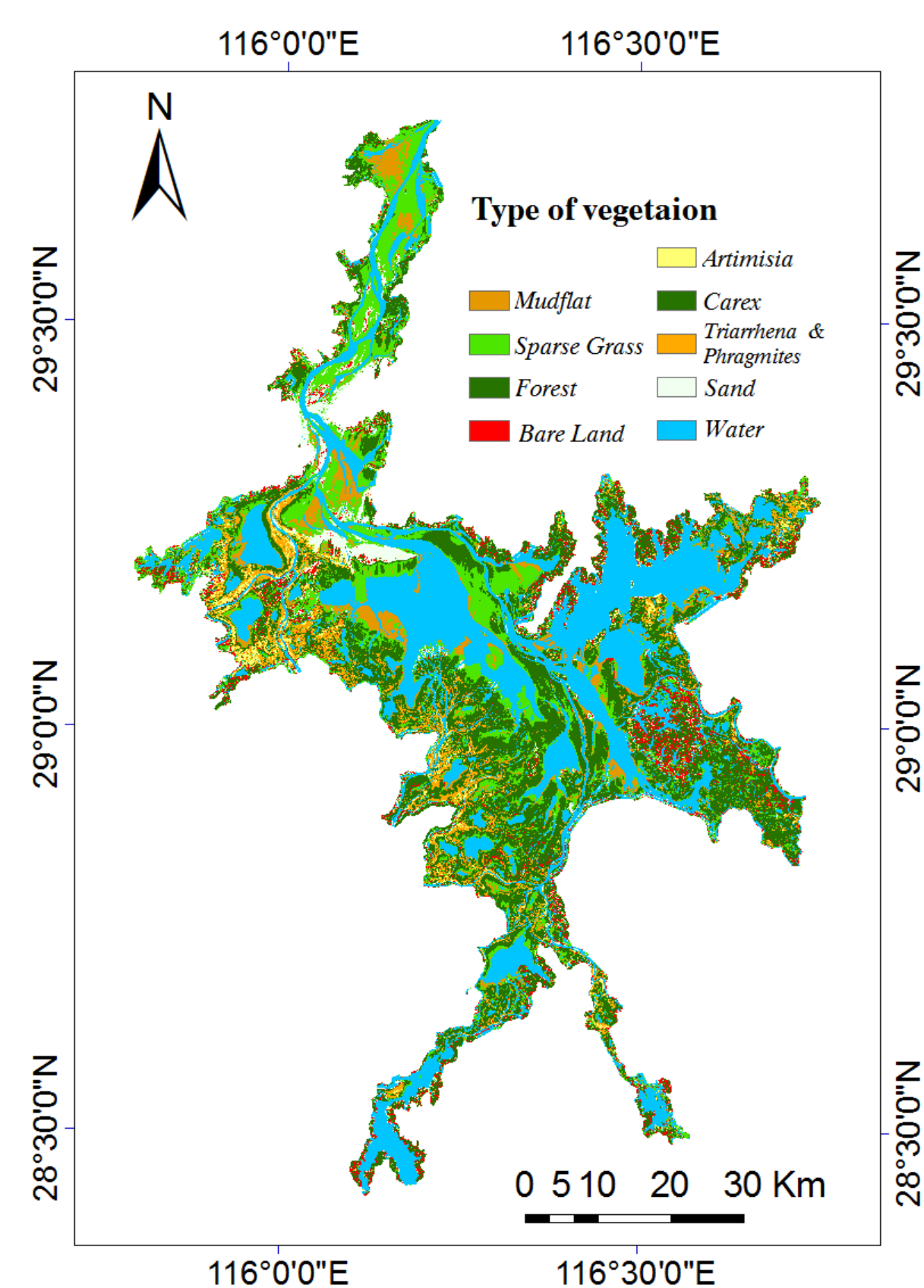
Poyang lake is the largest freshwater lake in China, with dramatic annual and seasonal hydrological fluctuation, shaping the unique landscape that described as flooding like the sea, drying like thread.

- To evaluate the net primary productivity in Poyang Lake at both annual and seasonal scales.

- To investigate the potential influencing factors of net primary

METHODS

- The NPP in Poyang Lake is estimated using CASA model based on long time series data of NDVI, temperature, precipitation and solar radiation.

- The NDVI data is derived using ESTAFM algorithm based on MODIS and Landsat products (30 m × 30 m, 8-day).
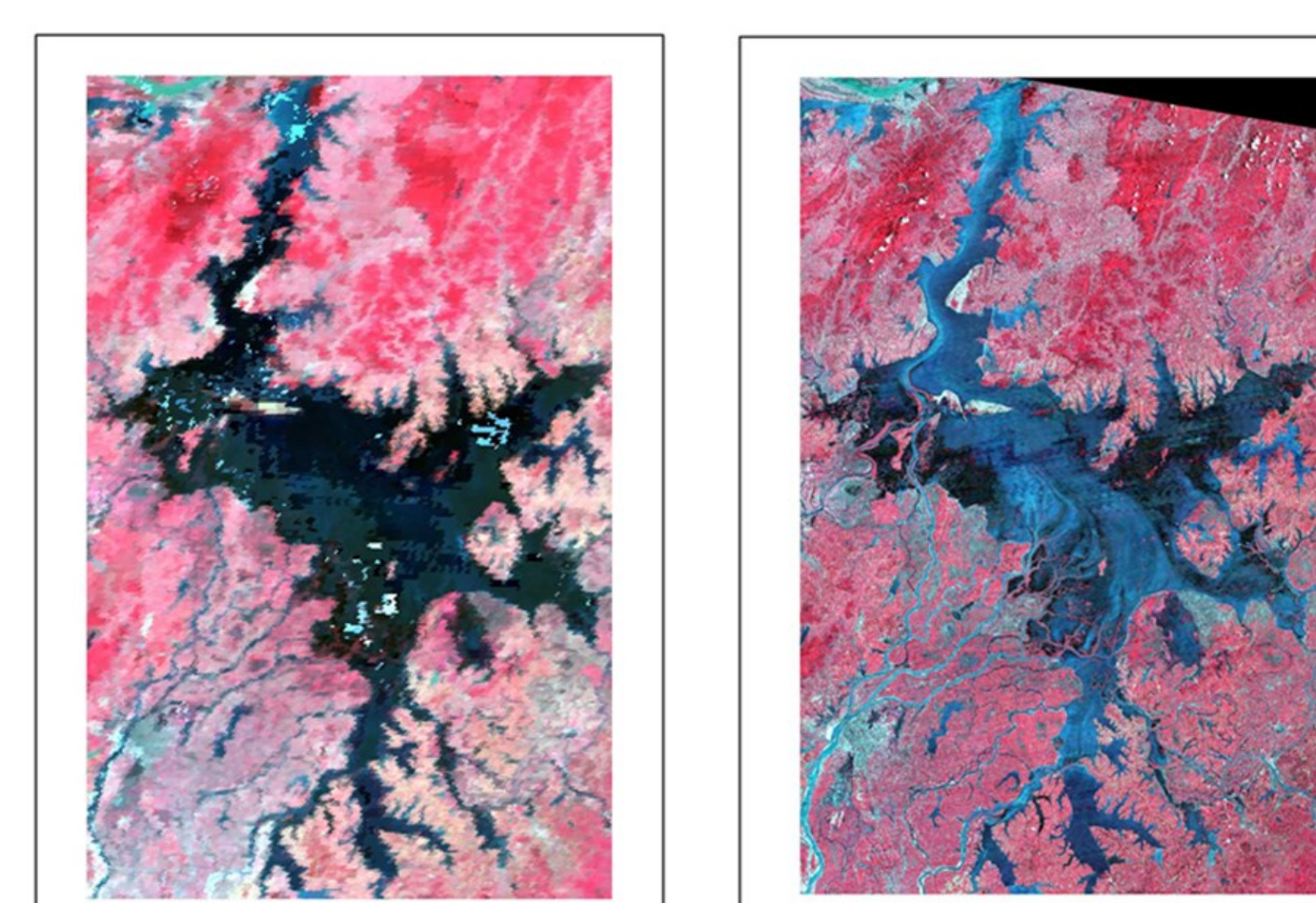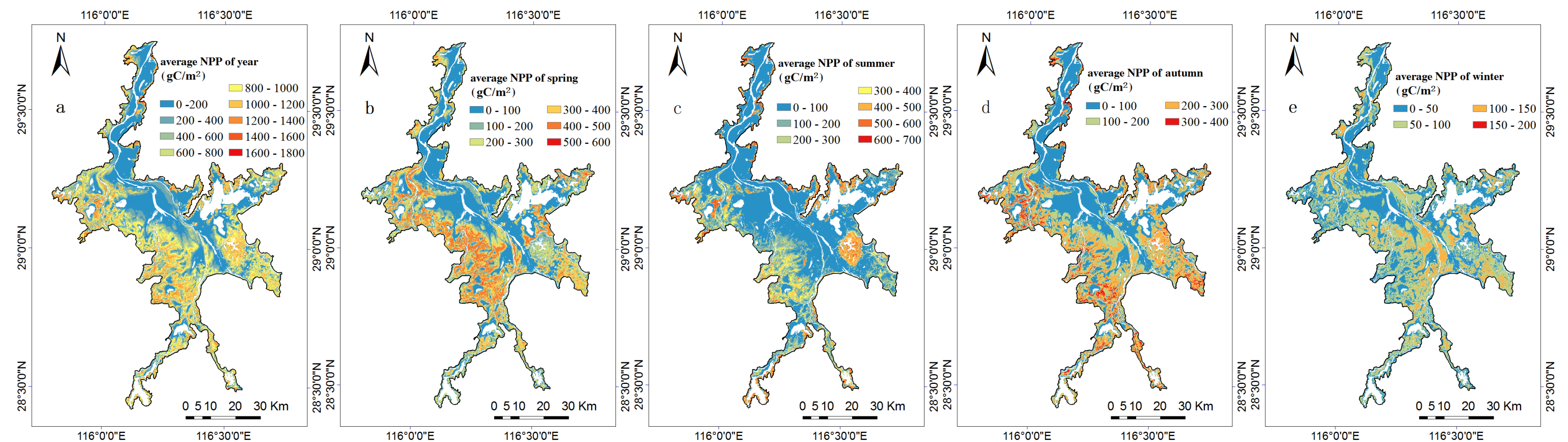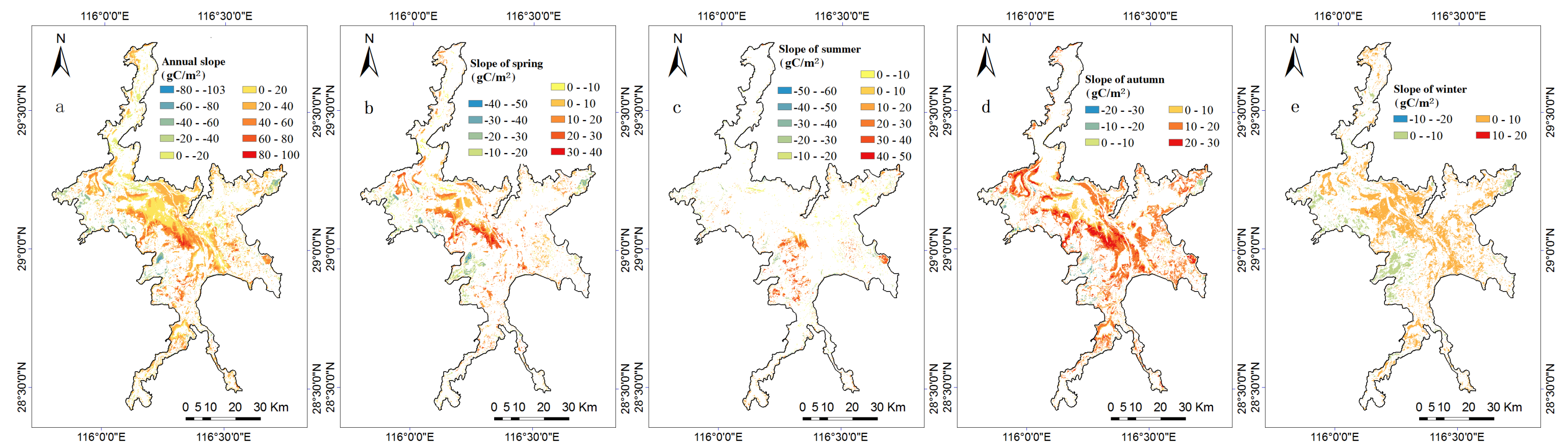

Fusion image using ESTARFM algorithm
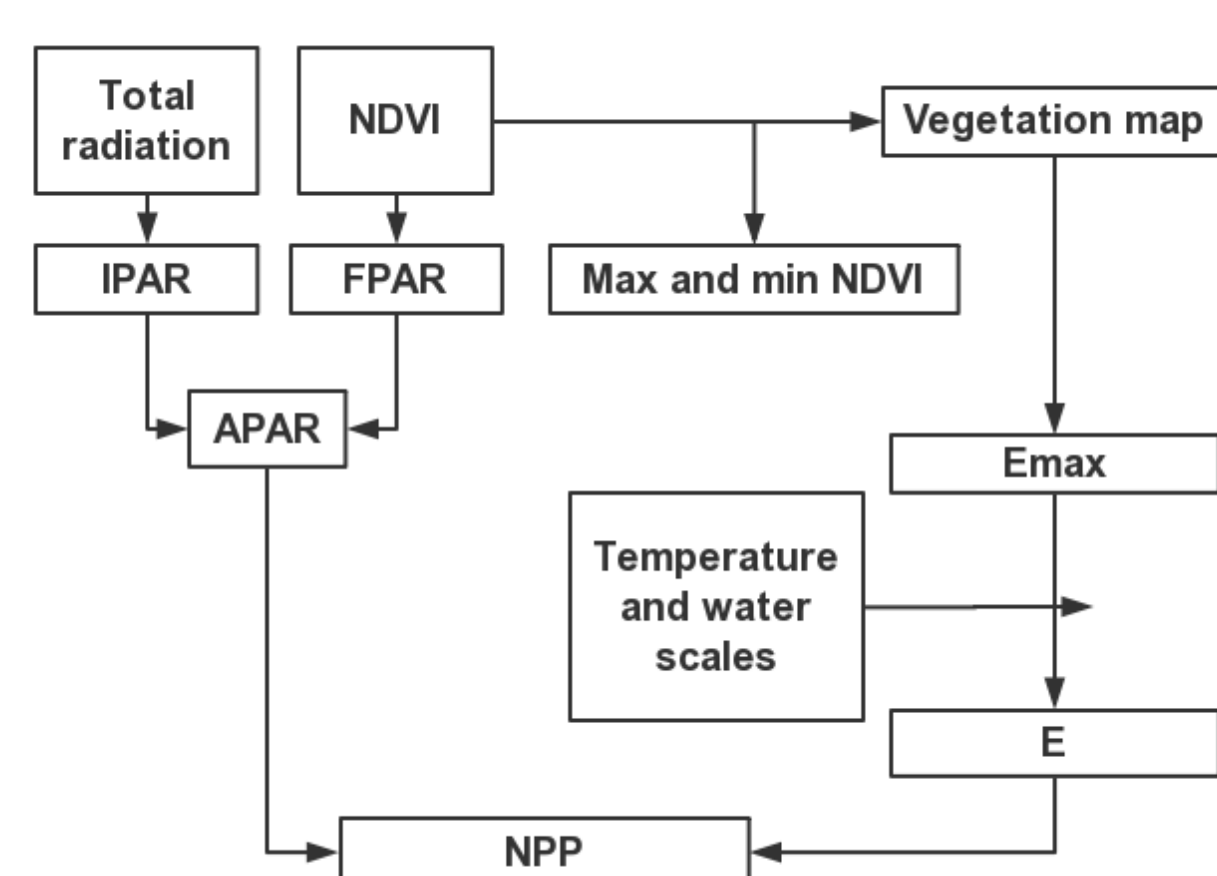
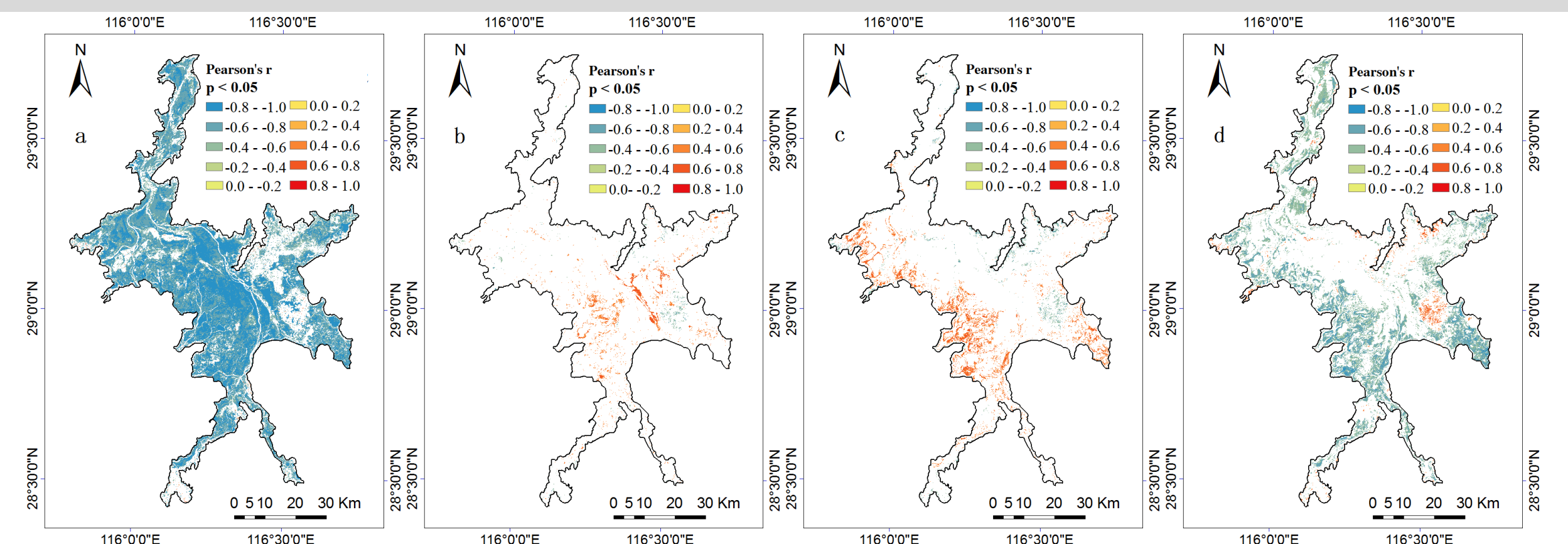Structure of CASA model

RESULTS

Annual and seasonal NPP in Poyang Lake. (a) annual; (b) spring; (c) summer; (d) winter

Annual and seasonal NPP change rate in Poyang Lake. (a) annual; (b) spring; (c) summer; (d) winter

Relationship between NPP and environmental factors. (a) inundation; (b) temperature; (c) radiation; (d) precipitation

CONCLUSIONS

- Average annual NPP of Poyang Lake increased during the study period.

- The annual variation of NPP of different vegetation performed a double-peak pattern with maximum value occurred in the first half year.

- Spatially, NPP is higher in the center area than that at the edge of the lake. Significant increasing trend (p<0.05) in NPP was observed for almost 1/3 areas of the lake, especially in autumn.

- The temporal-spatial pattern of NPP is dominated by water regime.

ACKNOWLEGEMENTS

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