Spatial prediction method of energy storage field in my country

Assessing biomass resource potential is essential for China"s ambitious goals of carbon neutrality, rural revitalization, and poverty eradication. To fill the data gap of high spatial resolution ...

Spatial information about the soil is needed increasingly for making informed management decisions about the environment, particularly with regard to developing different types of agriculture, however, such information is often unavailable especially in western Iran (Nabiollahi et al., 2019).Soil is the largest terrestrial ecosystems sink of organic carbon and ...

Land-use/land-cover change (LUCC) is an important factor affecting carbon storage. It is of great practical significance to quantify the relationship between LUCC and carbon storage for regional ecological protection and sustainable socio-economic development. In this study, we proposed an integrated framework based on multiobjective programming (MOP), the ...

In fact, because wind turbines (WTs) are installed in different positions on a wind farm, they can be influenced by complex terrain-driven flow, wind shear, and wake effects, 28 and so, the wind field always exhibits spatial heterogeneity and nonstationary features. 29 For example, the wake losses induced by interactions among multiple WTs cause wind speed ...

Pumped storage power stations in the power system have a significant energy saving and carbon reduction effect and are mainly reflected in wind, light, and other new energy grid consumption as well as in enhancing the proportion of clean energy in the power system [11, 12].The use of pumped storage and photovoltaic power, wind power, and other intermittent ...

To support formulating more targeted energy policies, this article systematically investigates the spatial-temporal evolution trend of China"s energy consumption at the provincial level by developing an integrated prediction model which involves ARIMA, buffer-operator GM (1,1), spatial autocorrelation analysis, Monte Carlo Stochastic Sampling, and Social Carbon ...

Recently, global climate change discussions have become more prominent, and forests are considered as the ecosystems most at risk by the consequences of climate change. Wildfires are among one of the main drivers leading to losses in forested areas. The increasing availability of free remotely sensed data has enabled the precise locations of wildfires to be ...

Situated in China"s arid and semi-arid zones, the Xinjiang region heavily relies on groundwater for its freshwater supply. This study utilizes data from the Gravity Recovery and Climate Experiment (GRACE) satellite mission, covering the years 2003 to 2021, to quantitatively evaluate the temporal and spatial changes in groundwater storage anomalies (GWSA) in the ...

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The climate system is closely related to the water, carbon and energy cycles (Fisher et al., 2017; Jung et al., 2010).As a core component of the system (Fisher et al., 2017; Ke et al., 2016; Lu et al., 2019; Trenberth et al., 2007), evapotranspiration (ET) affects the total quantity of water resources in a certain area.ET refers to the total water vapor flux conveyed by ...

The heterogeneity of soil matrix leads to a poor relationship between spectra and SOM content, the differences in the spatial distributions of SOM in large areas is obvious, so it is difficult to avoid errors caused by the spatial difference when using the global regression method for SOM prediction (Liu et al., 2019, Nocita et al., 2014).

spmodel is an R package used to fit, summarize, and predict for a variety spatial statistical models applied to point-referenced or areal (lattice) data. Parameters are estimated using various methods, including likelihood-based optimization and weighted least squares based on variograms. Additional modeling features include anisotropy, non-spatial random effects, ...

The results show that five pivotal factors significantly impact BCE in China, which are energy carbon emission intensity (ECEI), energy intensity (EI), economic density (ED), residential ...

The approaches used in this study provide a framework for integrating field and multispectral data, highlighting methods that greatly improve spatial prediction of basal area and volume estimation in Eucalyptus stands. This has potential to support fast growth plantation monitoring, offering options for a robust analysis of high-dimensional data. In fast-growing ...

Decision making for the energy transition. In consonance with Fürst and Scholles [], decision making in planning processes means connecting the factual and the value level, which is according to Scharpf [] influenced by power relations and actor constellations.Furthermore, decision making concerning the energy transition impacts all ...

With burgeoning economic development, a surging influx of greenhouse gases, notably carbon dioxide (CO_2), has precipitated global warming, thus accentuating the critical imperatives of monitoring and predicting carbon emissions. Conventional approaches employed in the examination of carbon emissions predominantly rely on energy statistics procured from the ...

Based on land use change data from 1990 to 2020, coupled with the PLUS-InVEST model, this study predicts and analyzes changes in carbon stocks in the GBA ...

Various studies have investigated the generalized spatial and temporal characteristics of renewable energy resources in regional areas and compiled standardized test datasets, including ...

For multi-energy storage vehicles, the performance of online predictive energy management strategies largely

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relies on the length and effective utilization of predictive information. In this context, this paper proposes a novel velocity prediction method for the full driving cycle of electric vehicles based on the spatial-temporal commuting data, then the ...

Abstract. Land use/land cover (LULC) structure optimization can effectively increase carbon storage/carbon sequestration (CS) and help realize carbon neutrality goals 1. Studying the ...

SOC - soil organic carbon content, SBD - soil bulk density, SOCD 1 - soil organic carbon density for each sample point obtained using

Traditional ultra-short-term wind power prediction methods usually only consider the local sequence information of the target wind turbine, without considering complex spatial relationships such as the spatial distance and correlation between wind turbines. Moreover, due to the volatility of wind power, general time series methods easily overlook the ...

Spatial prediction of soil ammonia (NH3) plays an important role in monitoring climate warming and soil ecological health. However, traditional machine learning (ML) models do not consider optimal parameter selection and spatial autocorrelation. Here, we present an integration method (tree-structured Parzen estimator-machine learning-ordinary kriging ...

Spatiotemporal modelling of RES is an emerging research field that aims at supporting and improving the planning process of energy systems with high shares of RES. ...

Because both carbon capture and atmospheric carbon reduction are important in balancing global carbon (Lin et al., 2011), the impact of urban forest vegetation on the global carbon balance is significant, as it facilitates carbon storage (CS), as well as lower energy consumption and reduced carbon emissions (Fang, 2001).To this end, urban forest planning ...

In this paper, we propose a new spatial prediction of renewable energy resources for reinforcing and expanding power grids. Potential capacity factors of renewable energy resources for long-term power grid planning are estimated by optimal spatial modelling based on Kriging techniques. The proposed method is verified by empirical data from ...

It should be noted that most of state-of-the-art methods are focused on the wind power prediction at a specific turbine site, without properly accounting for the spatial dependence structure in the wind power generation field. That is, traditional inputs to prediction models only consist of on-site observations (wind power measurements, wind speed and ...

The first part (IV-a) is a study of the subarctic and Siberia regions, where the impact of climate change on the cryosphere is reflected through the monitoring and analysis of soil moisture, soil ...

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1.2 Contributions and paper organization. In recent years, a large number of scholars have reviewed the WPP methods. Lei et al. (2009) introduced physical models, traditional statistical models, spatial correlation models, and AI models for WPP. Shi et al. (2012) reviewed ARIMA, ANN, SVM and the hybrid models that combines them, and compared the ...

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