2023年第17期总389期

农业与资源环境信息工程专题

本期导读

前沿资讯

1．卫星图像显示：美国路易斯安那州被洪水淹没的稻田

学术文献

1．2000-2020年中国祁连山自然保护区生产、生活和生态空间土地利用分类的演变及其驱动力研究

2．实现农业气候适应性的土地退化中和

3．索马里环境退化、农业作物和畜牧业生产之间的关系

科技报告

1．推进美国国家航空航天局的气候战略

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前沿资讯

1．Flooded Rice Fields in Louisiana（卫星图像显示：美国路易斯安那州被洪水淹没的稻田）

简介： As the Mississippi River meandered through several southern states over tens of thousands of years, it left a valuable layer of fertile soil in its wake. This low-lying floodplain and the flat coastal prairies of Louisiana and Texas are now home to most of the rice farms in the United States. Louisiana is the nation's third-largest producer of the crop, after Arkansas and California. The state's warm climate, abundant water, and water-retaining clay soils are well-suited for growing rice. Jefferson Davis and Acadia parishes in southwest Louisiana produce the most rice in the state, according to United States Department of Agriculture (USDA).

来源：NASA

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学术文献

1．Research on the evolution and the driving forces of land use classification for production, living, and ecological space in China's Qilian Mountains Nature Reserve from 2000 to 2020（2000-2020年中国祁连山自然保护区生产、生活和生态空间土地利用分类的演变及其驱动力研究）

简介：With the rapid development of the economy, problems such as resource depletion, environmental degradation, and increasingly strained human-land relations have become increasingly prominent. The rational layout of the production, living, and ecological spaces is the basis for solving the contradiction between economic development and environmental protection. This paper analyzed the spatial distribution pattern and evolution characteristics of the Qilian Mountains Nature Reserve based on the theory of production, living, and ecological space. The results show that the production and living function indexes are rising. The most advantaged areas are in the northern part of the research area, where the terrain is flat and transportation is convenient. The ecological function index rises, falls, then rises again. The high-value area is located in the south of the study area, and its ecological function is intact. The study area is dominated by ecological space. During the study period, the area of production space increased by 858.5 km2 and the living space area increased by 341.12 km2. The intensification of human activities has separated the continuity of ecological space. The area of ecological space has decreased by 233.68 km2. Among geographical factors, altitude has a significant impact on the evolution of living space. Population density is the main socioeconomic factor in changing the areas of production space and ecological space. This study is expected to provide a reference basis for land use

planning and sustainable development of resources and environment in nature reserves.
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2. Land Degradation Neutrality for Achieving Climate Resilience in Agriculture（实现农业气候适应性的土地退化中和）

简介：Land degradation is predicted to damage more than a quarter of the world's land surface, resulting in decreased or lost soil performance owing to physical and chemical degradation, as well as falling biological and economic productivity. Land loss and climate variation are two interrelated routes with biophysical and man-made drivers, consequences, and remedies. Land restoration has an influence on agro-ecological systems' socioeconomic constancy. Changes in the quantity and quality of ecosystem services as a result of climate resilience will have an impact on livelihoods in a variety of businesses. Agriculture adaptation planning should emphasize continuous land restoration, as well as the possibilities that come with restoring degraded land. While some national agricultural adaptation plans recognize the need of soil protection, many still fail to include land restoration as a component of such strategy. Management choices such as changing crop types and animal breeds, as well as adjusting the timing and location of management actions, have been a major emphasis for crop and livestock production systems. In order to achieve land degradation neutrality (LDN), efforts must be made to minimize additional net losses of land-based natural capital as compared to a reference condition, or baseline. Within individual land types, where land type is determined by land potential, planning for neutrality entails counterbalancing predicted losses with steps to obtain corresponding benefits. LDN adoption contributes to SDG 15 and other associated targets, providing possibilities for achieving these objectives in a cost-effective and environmentally sound manner at the same time.
来源：Towards Sustainable Use of Rangelands in North-West China
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3. The relationship between environmental degradation, agricultural crops, and livestock production in Somalia（索马里环境退化、农业作物和畜牧业生产之间的关系）

简介：Climate change is an imminent threat to both developing and developed countries. Various determinants of climate change have been discovered in the literature including, inter alia, the agriculture sector. To this end, this study models the role of agricultural crops — maize, sesame, sorghum, and wheat productions — and livestock production in environmental degradation in Somalia for the period of 1985 to 2017. The study applied the autoregressive distributed lag model (ARDL) for the long-run cointegration between the

variables, and vector error correction modeling (VECM) for short- and long-run causalities among the variables. The empirical result revealed the presence of a long-run cointegration between environmental degradation, agricultural crops, and livestock production. All the crops and livestock production increase environmental degradation except wheat production which has a constructive role in reducing environmental degradation in the long run. In contrast, the VECM results detected a short-run causality from sorghum to livestock production. Environmental degradation, sesame, sorghum, and wheat productions cause maize production significantly in the short run as well as in the long run. Moreover, sesame production causes sorghum production in the short run. Likewise, a long-run causality is established from environmental degradation, maize, sesame, livestock, and wheat production to sorghum production. However, Somalia policymakers should institute agricultural policies that are not only sustainable for agricultural production practices to meet the growing food demand but also sustainable to the environment.

来源：Environmental Science and Pollution Research

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科技报告

1．Advancing NASA’s Climate Strategy(推进美国国家航空航天局的气候战略)

简介：NASA uses the vantage point of space and its expertise in aeronautics to innovate, inform, and inspire for the benefit of all. NASA is a leader and trusted partner in providing climate and Earth system observations, modeling, research, applications, technology, and actionable information to scientists, decisionmakers, and the public. NASA’s free and open data powers research across the federal government, academia, and the private sector. The agency also works alongside international, federal, state, and local partners to advance understanding of and response to our changing planet. NASA’s climate portfolio is varied, extensive, and covers multiple missions and focus areas. To help assess and advance NASA’s climate strategy, a Climate Strategy Working Group (CSWG) was created and now falls under the guidance of the Office of the Chief Scientist. The CSWG found:• With more than two dozen satellites and instruments observing key climate indicators, NASA, in coordination with its domestic and international partners, remains the world’s leading agency for observing and understanding changes to the Earth system;• NASA has decades of experience developing technologies that contribute to reducing emissions and enhancing sustainability; and• NASA delivers climate-related information and resources to a wide range of government and university partners as well as the public.

来源：NASA

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