



2022年第45期总366期

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## ▶ 前沿资讯

### 1 .Satellites Help Scientists Track Dramatic Wetlands Loss in Louisiana (卫星帮助科学家追踪路易斯安那州严重的湿地损失)

简介: From Lake Pontchartrain to the Texas border, Louisiana has lost enough wetlands since the mid-1950s to cover the entire state of Rhode Island. Using a first-of-its-kind model, NASA-funded researchers quantified those wetlands losses at nearly 21 square miles (54 square kilometers) per year since the early 1980s. In the new study, scientists used the NASA-U.S. Geological Survey Landsat satellite record to track shoreline changes across Louisiana from 1984 to 2020. Some of those wetlands were submerged by rising seas; others were disrupted by oil and gas infrastructure and hurricanes. But the primary driver of losses was coastal and river engineering, which can have positive or negative effects depending on how it is implemented.

来源: NASA

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全文链接:<http://agri.ckcest.cn/file1/M00/03/43/Csgk0YfDQYyABFHIAATzUHPdy3g818.pdf>

### 2 . Project aims to boost ag tech through improved field connectivity (旨在通过改善农田网络连接来提升农业技术的项目)

简介: 许多农民和农业专家将数字农业视为未来之路。使用传感器、无人机和机器人、人工智能、先进的数据分析等管理农场将是有效应对世界日益增长的人口, 预计到2050年将达到100。但农业技术潜力的最大化取决于一个大多数领域都缺乏的工具: 高速互联网连接。由计算机工程师Mehmet Can Vuran领导的一个跨学科研究团队正试图改变这一现实。该项目在国家科学基金会三年100万美元资助下, 为农业领域设计下一代高速无线网络, 该网络将催化一系列数字农业技术的发展, 并支持无数农民的业务。目前, 至少三分之二的农民表示, 他们缺乏足够的互联网连接来运营他们的业务, 25%的美国农场根本没有互联网。

来源: SeedQuest

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## ▶ 学术文献

### 1 . A comprehensive review of remote sensing platforms, sensors, and applications in nut crops (遥感平台、传感器及其在坚果作物中的应用综述)

简介: BackgroundDue to their high protein content, nuts (almond, walnut, and pistachio) are among the main substitutes for meat, with a growing share of the food basket in the United States. However, the rapidly growing acreage of these crops, new legislations, the necessity of minimizing the environmental footprint, and a cost-effective production demand certain managerial practices based on precision agriculture and remote sensing, which have shown promising results in food production.Scope and approachThis paper presents a comprehensive review of remote sensing platforms, sensors, applications, and analytic pipelines with a focus on nut crops, even though the

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materials are applicable for other specialty crops. In this regard, the paper is divided into five main sections: First, the problems and potential solutions are elaborated in the introduction. Second, the available platforms: satellites, manned aircraft, and UASs are discussed. Then the sensors used for remote sensing, their working principle, and the pros and cons of each are presented. Next, practiced and suggested applications of remote sensing data are reviewed. Finally, data processing and analytics needed to produce and interpret reliable results are highlighted. Key findings and conclusions are listed as: 1) The acreage of the nut orchards and the purpose of the studies determine the fitting sensor and platform. 2) Although various sensors are available and reported to have promising results in other crops, they have not been used for nut crops. 3) Accurate sensor calibration is crucial for repeatable results as well as temporal and inter-field comparisons. 4) Except for water management, most remote sensing applications are limitedly studied in nut orchards, creating some research opportunities. 5) Finally, increasing data size requires new machine learning techniques and data fusion frameworks to handle all variables and fill the knowledge gap.

来源: Computers and Electronics in Agriculture

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## **2 . Workflow for building interoperable food and nutrition security (FNS) data platforms (构建可互操作的食品和营养安全 (FNS) 数据平台的工作流)**

**简介:** Background In response to growing needs for the integration of heterogeneous data on food and nutrition security (FNS), and the current fragmentation of interoperability resources, the 'FNS-Cloud project' aims to develop a cross-domain, interoperable data platform that integrates diverse FNS data. Currently, there is insufficient guidance on how to develop such an FNS data platform and integrate a variety of FNS data types that differ in both their syntax and semantics. Scope and approach In the present study, we propose a generalizable workflow to guide data managers in building interoperable, cross-domain FNS data platforms, which centres around the definition of interoperability criteria that capture standardized data structures, terminologies and reporting formats for key variables across FNS data types. Information technology tools for automating different workflow steps are discussed. Finally, we include an illustrative case study, where we harmonize and link branded food datasets based on pre-defined interoperability criteria to answer an example research question. Key findings and conclusions Our work highlights the unique harmonization requirements within the FNS field. We provide two examples of how generic and domain-specific interoperability criteria addressing these requirements can be defined. Incoming FNS data must comply with defined criteria in order to enable their (semi-)automated integration into any data platform. Our case study reinforces the importance of semantic annotation of FNS data, and the need for clear mapping rules to be included into platform-internal semantic data models. The proposed workflow can be applied to any setting in which data managers strive towards harmonized and linked FNS data, and, thus, promotes an open-data and open-science environment.

来源: Trends in Food Science & Technology

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### **3 . A platform for land use and land cover data integration and trajectory analysis (土地利用和土地覆盖数据集成和轨迹分析平台)**

**简介:** Information on land use and land cover (LULC) is essential to support governments in making decisions about the impact of human activities on the environment, planning the use of natural resources, conserving biodiversity, and monitoring climate change. Nowadays, different initiatives systematically produce information on LULC dynamics, on global, national, and regional scales. Examples of open and global LULC data products are Global Land-cover Classification with a Fine Classification System, Copernicus Global Land Service, and Global Land Cover by European Space Agency (ESA). At the national and regional level in Brazil, we can cite the data sets produced by PRODES, TerraClass, MapBiomas, and IBGE. Although these initiatives provide rich collections of open LULC maps, there is still a gap in tools that facilitate the integration of these data sets. The integrated analysis of these collections requires considerable effort by researchers who have to download, organize and harmonize them in their local computers, facing with different spatiotemporal resolutions and classification systems containing distinct class numbers, names and meanings. Besides that, these collections are distributed in different data formats through files or web services. To minimize these efforts, we propose a platform that allows users to access LULC collections from distinct sources, map their distinct classification systems, and retrieve LULC trajectories associated with spatial locations by integrating these collections. Besides the platform architecture description, this paper presents a case study that demonstrates its use in the integration and analysis.

**来源:** International Journal of Applied Earth Observation and Geoinformation

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