农业与资源环境信息工程专题

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➤ 前沿资讯

1．Gully erosion prediction tools can lead to better land management（沟蚀预测工具可以改善土地管理）

简介： Soil erosion is a significant problem for agricultural production, impacting soil quality and causing pollutants to enter waterways. Among all stages of soil erosion, gully erosion is the most severe phase, where large channels are carved through the field. Once gullies develop, they are challenging to manage through tiling; they require a more comprehensive approach along the impacted area. University of Illinois researchers developed a modeling framework that uses remote sensing environmental data to predict gully erosion susceptibility more accurately. This predictive model allows landowners and conservation agencies to direct management resources to the most vulnerable areas.

来源：EurekAlert

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全文链接：http://agri.ckcest.cn/file1/M00/10/17/Csgk0GORf2GAN4bSAAFo9gZYpyI671.pdf

2 Designing effective and sustainable strategies for assessing and addressing the challenges of EU agriculture to navigate within a safe and just operating space（设计有效和可持续的战略，以评估和应对欧盟农业在安全和公正的运营空间内运行的挑战）

简介：The European Green Deal, aims, among others, to increase the contribution of EU agriculture to climate change action, improve the management of natural resources, ensure a fair economic return for farmers, and reinforce the protection of biodiversity. EU agriculture and food practices are currently not on the right track to meet the Green Deal ambitions and objectives. These objectives are interdependent, and while often aligned, they may also compete. Synergies and trade-offs between socio-economic and environmental outcomes are brought together in the concept of a Safe and Just Operating Space, where the Safe component reflects the bio-physical boundaries of the ecosystem and the Just component the requirements for the well-being of the involved people.

来源：EurekAlert

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➤ 学术文献

1．Mapping the soil types combining multi-temporal remote sensing data with texture features（结合多时相遥感数据和纹理特征绘制土壤类型）

简介：With the rapid development of remote sensing (RS) technology, remote sensing images provide an important data basis for soil type mapping. In remote sensing images, temporal factor is difficult to obtain directly, and the rich geometric features are not used adequately. Multi-temporal

remote sensing data could effectively reflect the temporal variation of ground objects, while how to extract multi-temporal image features more effectively for soil type interpretation needs to be studied. Moreover, it is not clear whether multi-temporal features and texture features can be effectively integrated to improve mapping accuracies. Therefore, taking five soil types of Laoshan County, Shandong Peninsula, China as the subject investigated and six remote sensing images as data sources, this paper explored and compared two extraction methods of multi-temporal features from remote sensing images. The effects of the eight different texture features fused the multi-temporal features on digital soil mapping were also analyzed. The results showed that the principal component extraction result based on the tasseled cap transformation was better than based on the spectral band synthesis, increasing the overall accuracy by 3.83~11.41% and the kappa index by 0.03~0.13. The fusion of multi-temporal features and texture features can effectively improve accuracies of soil type mapping. After the addition of correlation texture feature parameter, the overall accuracy (86.81%) and Kappa index (0.81) were increased by 11.92% and 0.16, respectively. The research results showed that multi-temporal features in remote sensing images had great advantages in digital soil mapping, and the effective fusion with texture features provided a new idea for improving the accuracy of digital soil mapping.

来源：Computers and Electronics in Agriculture

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2 .Crop Yield Prediction Using Multi Sensors Remote Sensing（利用多传感器遥感预测作物产量）

简介：Pre-harvest prediction of a crop yield may prevent a disastrous situation and help decision-makers to apply more reliable and accurate strategies regarding food security. Remote sensing has numerous returns in the area of crop monitoring and yield prediction which are closely related to differences in soil, climate, and any biophysical and biochemical changes. Different remote techniques could be used for crop monitoring and yield prediction including multi and hyper spectral data, radar and lidar imagery.This study reviews the potentialities, advantages and disadvantages of each technique and the applicability of these techniques under different agricultural conditions. It also shows the different methods in which these techniques could be used efficiently. In addition, the study expects future scenarios of remote sensing applications in vegetation monitoring and the ways to overcome any obstacles that may face this work.It was found that using satellite data with high spthermaatial resolution are still the most powerful method to be used for crop monitoring and to monitor crop parameters. Assessment of crop spectroscopic parameters through field or laboratory devices could be used to identify and quantify many crop biochemical and biophysical parameters. They could be also used as early indicators of plant infections; however, these techniques are not efficient for crop monitoring over large areas.

来源：The Egyptian Journal of Remote Sensing and Space Science

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全文链接：http://agri.ckcest.cn/file1/M00/03/45/Csgk0YfoNrqAUNEwAAZua1x5FeU541.pdf

科技报告

1．Global status of black soils（全球黑色土壤状况报告）

简介：12月5日晚间，联合国粮农组织举行土壤日会议，发布了《全球黑土报告》。《报告》显示，黑土这一黑色宝藏正在受到威胁。大多数黑土失去了一半的有机碳储量，遭受中度到严重的侵蚀，同时出现了营养失衡、酸化、压实和土壤生物多样性丧失等问题。黑土地是世界上最肥沃的土壤，被称为"土壤中的大熊猫""世界的食物篮子"，全球黑土面积约有7.25亿公顷，覆盖了约7%的无冰陆地表面。资料显示，全球大片的黑土地共有四块，其中三块是黑土区，分别为乌克兰的乌克兰平原、美国的密西西比平原、中国的东北平原，另外一块为红化黑土，位于南美洲潘帕斯草原。尽管黑土只占世界土壤的一小部分，但黑土不仅养活定居在其上的人们，还通过大量的粮食出口，养活了世界其他地区的人口。相关专家介绍，黑土的特点是分解的植物物质含量高，富含碳以及氮、磷和钾等关键营养素。在黑土地上，过去几十年中，这些肥沃的土壤被广泛种植，生产了世界上约三分之二的向日葵种子，30%的小麦和26%的土豆，在全球谷物、块茎作物、油籽、牧场和饲料系统的农业生产中发挥了关键作用。此外，黑土对于减缓和适应气候变化至关重要。《报告》还绘制了全球黑土分布图，据介绍，这是全球土壤伙伴关系国家多年共同努力的成果。《报告》显示，黑土分布与当地草原生态系统密切相关，包括但不限于具有大陆性气候的其他草原生态系统。黑土在北美洲、欧亚大陆和南美洲的中纬度地区最为普遍，在热带地区也有少量分布。在全球范围内，约三分之一的黑土被农作物覆盖，三分之一被草原覆盖，剩下的三分之一是森林。

来源：FAO

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