

## 《农业水土资源监控研究》专题快报

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### 【动态资讯】

#### 1. 四川仁寿：让撂荒地变为“粮袋子”

【农民日报】日前，在四川省眉山市仁寿县钟祥镇龙桥社区3组，社区党总支书记范冬一边指导村民操作旋耕机为育秧田翻土，一边向记者介绍。为确保应播尽播、应种尽种，仁寿县创新举措，通过“党总支部+集体联合社+公司+农户”的土地经营模式等多种方法，精准施策，开展撂荒地整治工作，保障粮食安全，盘活闲置土地资源，为农民致富增收扩渠道，为乡村振兴添活力，让撂荒地变身为丰收的“粮袋子”。

链接:

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKQ5SAF7HTAEbcU-Hmzkk404.pdf>

#### 2. 我国农用地土壤污染状况总体稳定

【农民日报】记者日前从生态环境部举行的例行新闻发布会上获悉，全国土壤污染状况详查结果表明，我国农用地土壤污染状况总体稳定，但是一些地区土壤重金属污染仍比较突出，农用地土壤污染防治和安全利用的任务依然艰巨。全国土壤污染状况详查是根据《土壤污染防治行动计划》的要求，经国务院批准，由生态环境部、财政部、自然资源部、农业农村部等共同组织开展的。生态环境部土壤生态环境司司长苏克敬介绍，全国土壤污染状况详查包括农地土壤污染状况详查和重点行业企业用地土壤污染状况调查两个部分，重在摸清底数，推动解决问题。其中，农地土壤污染状况详查主要是为了支撑农用地分类管理及风险管控，降低农产品超标风险；重点行业企业用地土壤污染状况调查主要是为了支撑实施分类别、分阶段的治理。目前详查工作已经完成。

链接:

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKRGqAbwHzAClv0k2oGtk423.pdf>

### 3. 压紧压实粮食安全党政同责 确保粮食种足种满不撂荒

**【农民日报】**当前正值春耕生产最关键的时期，人误地一时，地误人一年。为深入贯彻党中央、国务院关于新冠肺炎疫情防控 and 春季农业生产决策部署，落实国务院第五次廉政工作会议精神，近日，农业农村部下发通知，要求各地严格落实粮食安全责任，全力抓好春季农业生产，不误农时春耕春播，及早安排夏收夏种，确保种足种满、种在适播期，保质保量完成全年粮食播种任务。落实粮食安全党政同责。将落实全年粮食播种面积作为粮食安全党政同责考核的重要内容，落实到市到县到地块。各级党委政府要提高政治站位，坚决扛起保障粮食安全责任，统筹抓好疫情防控和春耕、“三夏”生产，两手抓、两手都要硬，决不能以疫情防控为由减少粮食播种面积，要组建工作专班，强化政策协同配套和资金保障，坚决克服疫情影响，确保完成年初下达的粮食和大豆生产目标任务，力争面积有所增加。

**链接:**

<http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJzkzyAcLzxACq1U7UDlcE234.pdf>

### 4. 四级田长守护吃饭田——四川平昌探索耕地保护和粮食安全新机制

**【中国农网】**四川省平昌县，今年要确保完成粮食播种面积102万亩、产量40万吨的目标任务。春节过后，县委、县政府先后召开了多次粮食安全会议，自查出诸多须及时破解的问题。怎样守住耕地红线？怎样确保粮食安全？怎样调动干部群众积极性？怎样刺激农民种粮积极性？依靠传统思维和方法显然不够给力。平昌在思谋和探索一种新的机制和方法。从过去实施多年的河长制、林长制、路长制等网格化管理手段中受启发，平昌县推出了一套旨在守住耕地红线、确保粮食安全的田长制，通过短暂的推行和实践，效果明显。平昌推行的田长制为县、（乡）镇、村（居）、小组（田块）四级，每一级纵向、横向都有职责和分工，并配置相应的考核问责机制，推行“多长共治”的立体化网格监管。

**链接:**

[http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJzlCyAL2qFAAmlwfrVR\\_k485.pdf](http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJzlCyAL2qFAAmlwfrVR_k485.pdf)

### 5. 天津4.8万亩地将实现休耕与轮作

**【中国农网】**谷雨时节，在天津市武清区汉沽港镇汉沽港二街一眼望不到边的土地上，绿油油的油菜已经长到了六七公分高，满眼的绿色显示出盛春的无限生机。天津市海通谷物种植合作社理事长刘金成高兴地对记者说：“再有十来天，油菜花就开了，到了5月下旬，这些油菜就会全部被旋耕到地里！”据了解，这可不是普通的油菜种植，而是天津市出台政策补贴的绿肥休耕示范模式。

链接:

[http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKRXGAAwK1AAkEWQV\\_V0M751.pdf](http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKRXGAAwK1AAkEWQV_V0M751.pdf)

### 【文献速递】

#### 1. Effects of plastic residues and microplastics on soil ecosystems: A global meta-analysis

文献源: ScienceDirect,2022-05-05

摘要: Plastic pollution is one of the global pressing environmental problems, threatening the health of aquatic and terrestrial ecosystems. However, the influence of plastic residues and microplastics (MPs) in soil ecosystems remains unclear. We conducted a global meta-analysis to quantify the effect of plastic residues and MPs on indicators of global soil ecosystem functioning (i.e. soil physicochemical properties, plant and soil animal health, abundance and diversity of soil microorganisms). Concentrations of plastic residues and MPs were  $12,700 \text{ kg ha}^{-1}$  and  $0.01600,000 \text{ mg kg}^{-1}$ , respectively, based on 6,223 observations. Results show that plastic residues and MPs can decrease soil wetting front vertical and horizontal movement, dissolved organic carbon, and total nitrogen content of soil by 14%, 10%, 9%, and 7%, respectively. Plant height and root biomass were decreased by 13% and 14% in the presence of plastic residues and MPs, while the body mass and reproduction rate of soil animals decreased by 5% and 11%, respectively. However, soil enzyme activity increased by 7%–441% in the presence of plastic residues and MPs. For soil microorganisms, plastic residues and MPs can change the abundance of several bacteria phyla and families, but the effects vary between different bacteria.

链接:

<http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJznpj6AGcB-ADszrfH6x9M665.pdf>

#### 2. Rotation cropping and organic fertilizer jointly promote soil health and crop production

文献源: ScienceDirect,2022-05-05

摘要: Identifying field management practices to promote crop production, while conserving soil health is essential to maintain long-term food production in a changing world. Also, providing experimental evidence to support the use of traditional agricultural practices is necessary to secure sustainable agriculture. Here, we conducted a longterm 12-year experiment to investigate the impact of different combinations of fertilization type (control, inorganic fertilizer, organic fertilizer) and cropping regimes (continuous cropping and rotation cropping) on the crop (tobacco) production and multiple soil attributes associated

with soil health, including proportions of soilborne pathogens and decomposers, soil microbial diversity, microbial network stability and biomass, nutrient pools and microbial resource limitations. Our long-term experiment supports that the combination of organic fertilizer with rotation cropping increased crop production by at least 40% compared to the other management combinations and improved soil nutrient pools (e.g. the content of soil organic matter), improved the relative proportion of soil decomposers, and promoted bacterial and fungal network stability and biodiversity. Furthermore, this combination treatment relieved microbial resource limitation and reduced the abundance of potential fungal plant pathogens by at least 20% compared to other management combinations. In summary, we provide experimental evidence to support that the combined use of organic fertilization and rotation cropping management can help maintain long-term soil health, crop production, and economic outputs.

链接:

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKTmaAddAOAHvimX4jnGU755.pdf>

### **3. A bi-level multi-objective programming for water resources management under compound uncertainties in Dongjiang River, Greater Bay Area of China**

文献源: ScienceDirect,2022-05-05

摘要: To facilitate regional water resources allocation, an integrated bi-level multi-objective programming (IBMP) model with dual random fuzzy variables was developed in this research. The proposed model was derived through incorporating dual random fuzzy variables, multi-objective programming, and interval parameter programming within a bi-level optimization framework. This approach improved upon the previous bi-level programming methods and had two advantages. Firstly, it was capable of reflecting tradeoffs among multiple conflict preferences for water related bi-level hierarchical decision-making processes. Secondly, random fuzzy variables were used to tackle the dual uncertainties in both sides of the constraints, which were characterized as probability density functions and discrete intervals. Then, a real-world water resources planning problem was employed for illustrating feasibility of the application of IBMP model in Dongjiang river watershed of south China. Results reflected the alternative decisions for water allocation schemes under a set of probability levels and fuzzy  $\alpha$  - cut levels, which can support in-depth analysis of tradeoffs among multiple levels and objective values. Moreover, modeling comparison analysis was undertaken to illustrate the performances of the

proposed model.

链接:

<http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJznPaAZ10eACTmnVD8yOw913.pdf>

#### **4. Using the WEI+ index to evaluate water scarcity at highly regulated river basins with conjunctive uses of surface and groundwater resources**

文献源: ScienceDirect,2022-05-05

摘要: This paper discusses the role and limitations of using WEI+ as a water resource management tool for highly regulated river basins, with a conjunctive use of surface and groundwater resources. By considering flow regulation by reservoirs and aquifer systems, seasonality of water availability and demand, returns from water uses and environmental flow requirements, WEI+ constitutes an improvement to existing quantitative water scarcity indexes. However, the analysis the computation of WEI+ in complex river basins systems requires detailed data on water availability and water allocation to various uses, which are hard to obtain from monitoring records. The paper describes how the combined use of hydrological and water allocation models can help to overcome data gaps in water accounting and contribute to an improved analysis of water scarcity in heterogeneous and intricate river basins. It also examines the information provided by WEI+ and by other widely used water scarcity indexes, such as the Water Stress Index and the Criticality Ratio, as well as discusses the ability of WEI+ to measure the performance of hydraulic systems, usually evaluated by parameters such as reliability, vulnerability, and resilience. The Tagus River transboundary basin was selected as case study due to massive flow regulation by multi-purpose reservoirs and significant seasonality of water availability and demand. Results show the benefits of using WEI+ to define levels of water scarcity, over other indexes. Within the Tagus River systems, high values of WEI+ are reached during the summer months in regions with intensive agriculture, denoting severe water stress conditions in most sub-basins. The analysis also reveals the strong dependence of Portugal, the downstream country, on flows from Spain, the upstream country.

链接:

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKTSqAFqrPABnglGtYseo009.pdf>

#### **5. Effects of organic matter characteristics on soil aggregate turnover using rare earth oxides as tracers in a red clay soil**

文献源: ScienceDirect,2022-05-05

摘要: Organic materials input is remarkably essential for soil aggregates formation and breakdown processes. Which characteristics of organic materials control soil aggregate turnover is still largely unknown. Eleven organic materials were characterized in terms of nutrient stoichiometry, biochemical features and carbon (C) functional groups. The effects of organic matter characteristics on soil aggregate turnover were investigated by using rare earth oxides (REOs) as tracers. REOs concentrations in four aggregate fractions were measured on 0, 14, 28, and 56 d of incubation to calculate the aggregates transformation paths and turnover time. Our results exhibited that aggregate turnover time was reduced considerably with the addition of organic materials in order of easily decomposed residues (ED) < moderately decomposed residues (MD) < slowly decomposed manures (SD) but increased within aggregate fractions in sequence of silt and clay fractions < macroaggregates < microaggregates, such effects attenuated over time ( $P < 0.05$ ). Nutrient stoichiometry had no impacts on relative changes and turnover time of aggregates. Soluble sugars increased the formation of large macroaggregates at early stage of incubation, but laid no impacts on aggregate turnover time. Lignin reduced soil aggregates formation but increased aggregate turnover time in the first four weeks. C functional groups showed short-term effects on relative changes of aggregates while these characteristics did not explain aggregate turnover time except aromatic carbon. Under ED treatments, the relative formation of 0.0530.25 mm aggregates increased with the accelerating breakdown of macroaggregates, suggesting the formation of stable microaggregates in the mid-to-late incubation time. With MD and SD application, the relative formation was increased with the decrease of aggregate breakdown over time. We proposed the pathways of soil aggregates turnover, in which the stable microaggregates were released with the breakdown of stable macroaggregates in ED treatments, while such transformation was not observed in MD or SD treatments during the incubation time. Our results demonstrate that aggregate turnover depends on the initial characteristics of incorporated organic matters defined by biochemical features and C functional groups.

链接:

<http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJzm-CAFYpqAEGd5ZrZBHY055.pdf>

## 6. 生态退耕背景下黄河流域耕地变化与农业生产和生态环境关系研究

文献源: 中国农业资源与区划,2022-05-05

**摘要:** 分析生态退耕背景下黄河流域耕地的时空变化特征,探讨黄河流域不同区域耕地变化与农业生产和生态环境的相互关系,旨在为黄河流域农业绿色发展和耕地利用政策提供借鉴。基于2000—2020年黄河流域连续土地利用数据,利用面板格兰杰因果检验和双变量空间自相关量化耕地变化与农业生产、生态环境之间的动态因果及空间交互关系。(1)黄河流域2000—2020年年均减少耕地69.53万hm<sup>2</sup>,还林还草是耕地主要减少去向,2020年和2004年是退耕还林还草高峰年,中上游是退耕还林还草重点区;(2)从格兰杰因果检验来看,下游地区退耕还林还草对农业生产和生态环境没有显著影响,上游地区长期退耕还林还草对农业产值增加有利,中游粮食产量和生态系统服务供给低的地区退耕还林还草更多,中上游生态退耕对生态环境有显著促进作用;(3)从空间自相关结果来看,下游地区退耕与农业生产和生态环境的空间分布不具有—致性,黄土高原南部和太行山附近退耕还林还草与生态环境指标呈高—高集聚,鄂尔多斯高原地区退耕与农业产值呈小范围高—高集聚。[结论]退耕还林还草是黄河流域耕地变化的重要原因,退耕还林还草规模与农业生产和生态环境之间的空间关系异质性明显,且在部分区域存在因果关系,不同区域应当针对具体问题提出不同用地策略。

**链接:**

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKTBGAEwu7AAzrROvLdJg028.pdf>

## 7. 青海省互助县10年耕地土壤养分状况、变化趋势及肥力评价

文献源:水土保持研究,2022-04-20

**摘要:** 为了研究青海省互助县2007—2016年10年间耕地土壤理化性质以及土壤肥力状况的变化,将4 176个土壤样点的基本理化指标根据乡镇进行分析比较,采用模糊综合评价的方法对土壤肥力进行评价,以期为当地耕地的合理利用提供科学依据。结果表明:(1)互助县的耕地土壤养分状况整体较好,单个指标质量等级均在前三级。(2)由于长期使用酸性复合肥而不使用石灰,耕地酸碱度降低5.20%;长期耕种导致耕地肥力消耗,消耗的元素不及时补充,使得SOM含量降低9.69%;TK降低32.02%;土壤碳氮比降低27.28%。(3)互助县耕地土壤的肥力情况呈现西南低,东北高的趋势。土壤综合肥力指数上升了5.77%,主要是氮、磷元素升高引起,存在环境污染的风险。因此在后续的耕作过程中,应注重有机肥和钾肥的添加,秸秆还田,适当使用石灰,蚕豆与其他作物轮作,少施或不施磷肥,降低环境污染风险,确保耕作环境良好,作物可持续生长。

**链接:**

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKSxOAZysrAAsHFCPUNAc749.pdf>

## 8. 基于连续无有效降雨日数指标的江西省干旱时空分布特征



文献源：长江流域资源与环境,2022-04-15

摘要：全球气候变化的背景下，由于降雨不均发生的干旱问题已严重威胁作物生长和粮食安全，探究江西省干旱特征为防灾抗旱和农作物生长提供理论参考。利用江西省15个气象台站1957~2015年的逐日降水资料，以连续无有效降水日数为指标，分别计算了不同季节的干旱频率、干旱站次比和干旱持续天数，得到干旱频率的空间分布特征，并分析干旱站次比和干旱持续天数的年际变化趋势；同时引入逐日干旱频率，研究江西省不同站点的逐日干旱动态变化。结果表明：（1）江西省各地区夏旱和秋旱频发，以7~11月伏秋旱最为严重；（2）春旱主要发生在赣南，夏旱高发地区主要在鄱阳湖平原和赣州南部，全省只有较少地区秋旱轻微，其他大部分地区秋旱较为严重，冬旱呈现由北向南逐渐增大的趋势，一年中赣州都是干旱发生较为严重的区域，为江西省干旱重灾区；（3）江西省与各子区域的变化趋势基本一致。春旱和秋旱年际变化呈增加趋势，仅赣南地区干旱强度略有减小；夏旱呈降低趋势；冬季干旱范围虽有增加趋势，但干旱强度有减轻的趋势；赣南地区干旱情况总体呈减弱的趋势，仅冬季干旱强度有增强的趋势。

链接：

<http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJzmfWAecaMABey760MxlA968.pdf>

## 9. 连续小波变换的土壤有机质含量高光谱估测

文献源：光谱学与光谱分析,2022-04-07

摘要：土壤有机质含量的高光谱估测可快速、准确监测土壤肥力，对现代化农业生产进行精准施肥提供科学依据。以新疆渭干河-库车河三角洲绿洲耕层土壤为研究对象，对采集的98个土壤样品的原始光谱反射率 $R$ 分别进行传统倒数对数 $\lg(1/R)$ 、一阶微分 $R'$ 和倒数对数一阶微分 $[\lg(1/R)]'$ 数学变换，以及基于小波母函数Bior1.3不同尺度分解的连续小波变换（CWT），并与实测土壤有机质含量进行相关分析，从而筛选出各类变换下与土壤有机质含量密切相关的特征波段和小波系数（ $p < 0.01$ ）。分别以原始光谱反射率（ $R$ ）以及不同变换处理下的特征波段反射率和敏感小波系数作为自变量，土壤有机质含量作为因变量，采用偏最小二乘回归和支持向量机回归方法构建土壤有机质含量的估测模型。结果表明：（1）各类光谱变换方法有效提升光谱与土壤有机质含量之间的敏感性，其中经CWT变换后的土壤光谱反射率与有机质含量的相关性得到显著提高，相关系数由0.39提高到0.54（ $p < 0.01$ ）。（2）传统的 $[\lg(1/R)]'$ 变换构建的支持向量机回归模型，其决定系数（ $R^2$ ）高于 $\lg(1/R)$ 和 $R'$ 变换构建的模型，说明倒数对数一阶微分变换可有助于提高估测模型的精度，且支持向量机回归模型的精度和稳定性高于偏最小二乘回归模型。（3）经过CWT分解后，以原始光谱反射率在不同尺度上的敏感小波系数作为自变量建立的模型，估测精度和稳定性均有明显的提高，构建的



R-CWT-2~3-SVMR模型的决定系数 ( $R^2$ ) 为0.84,均方根误差 (RMSE) 为1.48,相对分析误差 (RPD) 等于2.11,模型精度达到最高并拥有极好的预测能力。高光谱数据经多种变换处理后可有效去除白噪声,而连续小波变换处理比传统的数学变换方法更适合于挖掘土壤有效信息,实现光谱信号的近似特征和细节特征的有效分离,建立的反演模型可更加精准估测土壤有机质含量。

链接:

[http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJzmsuAWhnTADI\\_RQIOU6I588.pdf](http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJzmsuAWhnTADI_RQIOU6I588.pdf)

### 【会议论文】

#### 1. Information System of Cartographic Images Analysis for Soil Condition Monitoring of Agricultural Parcels

发布源: IEEE

发布时间: 2022-05-02

摘要: The main purpose of environmental monitoring is to manage and minimize the impact of human's activities on the environment, to ensure compliance with laws and regulations, or to reduce the risk of adverse effects on the environment and human health. At the same time, we present the system for the automated processing of cartographic data. This system is used as a component of the information analytical system of organic farming and ensuring the environmental sustainability of soils. In this paper, we described the steps of design and development of the information system of cartographic images analysis based on the high-level Python language. The graphical method was used for calculating the area of interesting agricultural parcels from a satellite image. The developed image processing system allows us to perform a full range of subtasks required for fast and efficient processing. Comparative results of the speed of the individual stages of processing and analysis are presented as well.

链接:

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKSICAHuYrAB7oUb5iThw473.pdf>

#### 2. Machine learning-based global soil moisture estimation using GNSS-R

发布源: IEEE

发布时间: 2022-05-02

摘要: Retrieval of soil moisture (SM) content is essential for many agricultural and hydrological studies and applications. Remotely sensed SM estimations in high spatial and

temporal resolution are a vital requirement in many global studies. Global Navigation Satellite System (GNSS) Reflectometry (GNSS-R), one of the signals of opportunity (SoOp) techniques, has emerged in recent years as a new remote sensing method for SM retrieval in high spatio-temporal resolution. This paper summarizes our studies as a solution to high resolution SM retrieval on a global scale for agroecosystems. We have developed a machine learning (ML) framework to derive a quasi-global soil moisture (SM) product by using spaceborne GNSS-R observations provided by NASA's Cyclone GNSS (CYGNSS) constellation alongside remotely sensed ancillary geophysical data. The learning model is trained using in-situ SM data from the International Soil Moisture Network (ISMN) sites. The produced daily SM retrievals within the CYGNSS spatial coverage are independently compared with the Soil Moisture Active Passive (SMAP) mission's enhanced SM products at a resolution of 9 km × 9 km to evaluate the performance of the model.

链接:

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKRrSAG0iiADFh2iFKTwk621.pdf>

### **3. Land Use Classification of Kathgodam Region using Transfer learning-based approach**

发布源: IEEE

发布时间: 2022-04-25

摘要: Transfer learning is a new concept that has the potential to propel machine learning further in research and industry. One of the key reasons to use it is the absence of data on specific jobs, as gathering and classifying data can be costly and time-consuming. In machine learning, transfer learning is used to reprocess a formerly trained model on an original problem. In transfer learning, a machine uses knowledge from a previous assignment to improve the prediction about a new task. Transfer learning allows CNNs to learn with small amounts of data by transferring knowledge from models that have been pre-trained on big datasets. In this paper we have used various pretrained models like Inception v3, SqueezeNet, VGG-19 and VGG-16 to study the performance of pre-trained models to classify Agriculture land and non-Agriculture land in Kathgodam Region. The capabilities of the four pre-trained CNN models SqueezeNet, Inception V3, VGG16, and VGG19 for extracting features from images were explored by the authors. The accuracy of 98.5% is obtained using Inception V3.

链接:

<http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJzltYAZyYyAAVtFENztD4661.pdf>

#### **4. Smart Green House for Controlling & Monitoring Temperature, Soil & Humidity Using IOT**

发布源: IEEE

发布时间: 2022-04-25

摘要: Agricultural economics plays a vital role in the economics sector of development as because large portion of a country's population depends on agriculture sector. Higher agricultural productivity also increases the income of the rural population, raising demand for industrial output. Almost 70 percent of the India's population depends on the agriculture sector. Agricultural development makes a critical contribution to overall economic growth in many developing countries. As farmers' incomes rise, so does their demand both for farm inputs and services, and for non-farm goods. Increased agricultural production also leads to increased demand for processing facilities. There are many factors, which slow this development. So Smart farming is a management concept using modern technology to increase the quantity and quality of agricultural products. Today's agriculture routinely uses sophisticated technologies such as robots, temperature and moisture sensors, aerial images, and GPS technology. These advanced devices and precision agriculture and robotic systems allow businesses to be more profitable, efficient, safer, and more environmentally friendly. The main objective of this paper is to design a smartphone controlled green house with advanced monitoring system for controlling various parameters like temperature control, sob moisture & humidity control of any agricultural process. The prototype presented in this paper can monitor temperature, soil and humidity through sensors, IOT & ISP.

链接:

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKR0OAe29PAAUKWz5jl8c007.pdf>

#### **5. Big Data Application Technology Framework for Land Use Monitoring**

发布源: IEEE

发布时间: 2022-04-21

摘要: Land is a finite resource that cannot be replenished. China has traditionally followed a primary national policy of "treasure and rationally use land, and effectively protect cultivated land." In the effective and thorough oversight of land use, big data plays a significant role. This paper summarizes the types of land use monitoring big data, then analyzes the big data management and application architecture, the application of big data

analysis technology, and the system framework in the land use monitoring field, based on the Chinese most recent construction progress. Finally, the prospective development direction of big data for land use monitoring is examined. The "one map" of land use monitoring, the creation of a land use monitoring data warehouse, and the application of distributed database are examined in the context of big data management and application architecture; distributed parallel computing technology, remote sensing patch extraction based on deep learning technology, spatial analysis based on spatial database engine technology, and visual analysis based on BI technology are discussed in the section on the application of big data analysis technology; the system structure, overall structure, and system functions are discussed in terms of the system framework of land use monitoring. Deep mining of big data, analysis and mining of unstructured data, big data analysis and application in 3D visualization scenarios, and big data governance are the four future development paths for data analysis applications. This document provides as a guide for using big data to improve land use oversight.

链接:

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKSUeACQxCAC1xGHtm5Sw974.pdf>

## **6. Study on the impact of digital inclusive finance on rural land transfer and its mechanism : —Empirical evidence from CFPS and PKU-DFIIC**

发布源: IEEE

发布时间: 2022-04-20

摘要: Based on the panel data of CFPS 2014 and 2018, combined with the digital inclusive finance index (PKU-DFIIC) in the corresponding period, we deeply analyzed the degree of impact of digital inclusive finance on rural land transfer and the theoretical mechanism. It is found that, firstly, digital inclusive finance can lower the financial access threshold of farmers and improve their financial accessibility, thus providing beneficial conditions for farmers to adjust their economic decisions and realize the marketization of land transfer. Second, the positive effect of digital inclusive finance on land transfer varies significantly depending on the direction of transfer, subject, and digital inclusive finance dimensions. Third, digital inclusive finance can indirectly drive land transfer through three channels: alleviating information asymmetry, improving financial literacy, and increasing disembedding social capital. Through the posterior performance of the three intermediate channels, it is further concluded that digital inclusive finance can accelerate the land

transfer out of farmers through non-farm employment, risk preference, and job stability approaches. It facilitates the research conclusion that farmers' land transfer in with the help of transaction cost, the scale of operation, and long-term lending path. The paper expands the theoretical research scope of digital inclusive finance. It provides a new perspective and empirical evidence for integrating rural land resource allocation and solid marketization of agricultural land transfer under the general trend of rural revitalization and urban-rural integration.

链接:

<http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJzl2qAeIHAA8Do98AqH4025.pdf>

### 【相关专利】

#### 1. 一种耕地价格评估方法、系统及电子设备

发布源: 中国专利

发布时间: 2022-04-26

摘要: 本发明提供一种耕地价格评估方法、系统及电子设备,其中方法包括: 获取目标耕地的地理位置信息和属性指标的关注项; 由属性指标数据库按照关注项调取目标耕地的属性指标,并确定所属的耕地均质区域; 由基准地价数据库内得到目标耕地的基准地价; 基于目标耕地的属性指标,以及目标耕地所属的耕地均质区域的基准属性指标,确定目标耕地的修正参数; 基于基准地价和修正参数,得到目标耕地的评估价格。用以解决现有技术中多通过传统的人工估价方式进行耕地价值核算,所造成的价格确定主观性强,不同区域内耕地价格难以实现统一标准化的缺陷,通过预存耕地属性指标和基准地价,使不同区域耕地价格评估标准统一,实现快速、客观准确及规模化估价。

链接:

<http://agri.ckcest.cn/file1/M00/10/02/Csgk0GJzoAyAO01CAB4DSx5NpnM491.pdf>

#### 2. 一种基于时段累计蒸散发的实际灌溉面积识别方法

发布源: 中国专利

发布时间: 2022-04-22

摘要: 本发明提供一种基于时段累计蒸散发的实际灌溉面积识别方法,步骤1、计算农田范围内像元逐日灌溉蒸散发量; 步骤2、分析不同时长的累计灌溉蒸散发量概率分布直方图,确定灌溉识别的最短时长窗口 $T^*$ ; 步骤3、利用 $T^*$ 对应的时段累计灌溉蒸散发量概率分布直方图,分析确定灌溉与非灌溉像元的阈值 $ET^*$ ; 步骤4、用选定的阈值 $ET^*$ 对接 $T^*$ 时长累加的灌溉蒸散发数据进行划分,累计灌溉蒸散发量大于 $ET^*$ 的像元为灌溉像元,否

则为非灌溉像元；步骤5、当时长窗口 $T$ 大于 $T^*$ 时,重复步骤3、4,得到 $T$ 时长内的实际灌溉面积。本发明提供高植被覆盖和降水影响实际灌溉面积影响识别精度,给出确定基于蒸散发量识别灌溉面积的最短时长窗口的方法。

**链接:**

<http://agri.ckcest.cn/file1/M00/03/30/Csgk0YbKUCWAWVcvABJGfFUAZo977.pdf>

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