中国工程科技知识中心
China Knowledge Centre for Engineering Sciences and Technology

《农业水土资源监控研究》专题快报

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中国工程科技知识中心农业分中心

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【动态资讯】

1．科技创新推动下"智慧土地"发展的机遇与挑战

【中国网】中国网/中国发展门户网讯　　我国用全球7%的耕地承载着近20%的人口，保障了快速工业化和城市化发展进程，取得了举世瞩目的成绩，但也导致了我国极其稀缺的土地资源长期面临高强度、高风险利用、极度缺乏弹性空间等一系列可持续发展的问题。过去30多年的发展，支撑我国国土空间开发的土地资源、水资源、能矿资源和生态资源等基础条件发生了巨大变化。今后10-20年仍是我国工业化、城镇化快速推进的重要时期，也是空间结构调整的重要时期。我国既要满足人口增加、人民生活改善、经济发展对国土空间的巨大需求，又要为保障粮食安全而保护耕地，还要保障生态安全和人民健康。这就需要更加注重高效、协调、可持续的土地资源，需要更加注重处理集聚和分散、开发和保护的关系，需要更加注重国土安全，构建高效、协调和可持续的国土空间开发格局。因此，需要精准化、动态监管每一块土地资源开发利用与保护全过程，传统的土地资源管理模式面临着挑战。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bJXGAAqXeAB2dLhWDR6s418.pdf

2．Why the EU's Farm to Fork Strategy is a unique chance to radically change agriculture and food production

【AgroNews】With the Farm to Fork Strategy, the European Commission wants to move a step closer towards its vision of making Europe the first climate-neutral continent by 2050. The Farm to Fork Strategy is not a regulation or directive. It's rather a declaration of intent and, therefore, a unique opportunity for all stakeholders of the European food system to unite and define a roadmap towards a common goal a more sustainable food production.

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bJ56AJOB6AAynyP7gTJM886.pdf

3．今年全国粮食产量预计达6.7亿吨

【人民网－人民日报海外版】中国农业科学院和国际食物政策研究所（IFPRI）今天在京联合发布的《中国农业产业发展报告2020》和《2020全球粮食政策报告》显示，2020年全国粮食产量预计达到6.7亿吨，能够为打赢疫情防控阻击战、实现全年经济社会发展目标任务提供有力支撑。报告显示，在新冠肺炎疫情给国民经济造成冲击的特殊时期，农业－食物系统受到的影响较小，农业－食物系统的"战略后院""压舱石"和"蓄水池"作用更加凸显。报告运用2017年149个部门的中国社会核算矩阵乘数分析法，从产业链视角全面模拟评估疫情对农业及其相关产业和农民收入的潜在影响。研究结果表明，疫情对国民经济的冲击显著，带来国际出口市场不确定性风险，而农业－食物系统受国际市场影响较小，出口占总产出的比重和进口占总需求的比重均小于5%，且容纳了近1/3的劳动力，即使出口贸易不能完全恢复，就业也基本接近正常。作为基础产业，农业具有显著的产出乘数效应，农业增加值每增加1个单位，国内生产总值将增加3.4个单位。夯实农业发展基础，加快补齐农业短板，支持农业－食物系统中小企业，尤其是餐饮和住宿等受冲击较大的行业的创新发展，将有利于促进宏观经济增长和拉动就业，增加农民和农民工收入。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bI_6AZdTUABJyVFZoulg806.pdf

4．"数字开阳·智赢未来"——开阳县以大数据引领经济社会发展 谱写跨越新篇章

【环球网】大数据创造大价值，大数据书写新篇章。日前，贵州省发展和改革委员会下发文件，命名一批大健康产业示范基地，其中开阳县南江乡水东乡舍成功入选。这标志着开阳县水东乡舍大旅游+大数据+大健康+大振兴的服务综合体获得省级认可，并将走上提质增效的新道路。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bI3KAHJb3ABAes3YuMpg334.pdf

5．坚持"1+5+5"战略 北京市延庆区精准发力 促进农业发展提质增效

【中国食品安全网】北京市延庆区作为农业大区，积极承担粮、菜保供责任，2020年粮食种植面积达13.7万亩，蔬菜播种面达3.5万亩，目前三品认证基地总数保持在100家以上，农产品综合合格率常年保持在98%以上，为保供应做出突出贡献。延庆区坚持

"一个中心,五大产业，五大体系"的"1+5+5"战略，以"妫水农耕"农产品区域公用品牌为引领，带动延庆区一产提质增效，加快都市型现代农业发展。延庆区将"妫水农耕、健康之源"的理念融入现代农业品牌，加速推动优质农产品跨区域流通，促使优质农产品提升上市能力，推动以果品、蔬菜、畜牧、杂粮、园艺花卉等为核心的优质农产品走进千家万户。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bIuOAJUzWACM2EXPJB6w203.pdf

6．六项重点任务、四条推进措施！山东多措并举落实"保粮食安全"

【闪电新闻】山东如何落实"保粮食能源安全"？省粮食和储备局副局长李伟介绍，5月12日，省委经济运行应急保障指挥部制定印发了《"六保三促"工作方案》，其中将"保粮食安全"作为一项重要任务，从工作目标、重点任务、推进措施三个方面制定了详细的工作方案。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bKV-AJdohAAfab_WEv_E612.pdf

7．Ray of Hope for Agriculture in India

【AgroNews】Even in the times of advanced technology and modern innovations, India's heart lies in agriculture. The collapse of the supply chain system throughout the country induced by the lockdown has affected the sale of agri-products. As per a United Nations report published in 2019, 69% of India's population resides in rural areas.The impact of COVID-19 on the rural farming community and the severity of the effect depends on multiple factors in diversified segments. Though lockdown is now lifted in a phased manner, it will take many more months of dedicated effort and robust stimulus packages for the agriculture sector to get back to its feet.

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bKGWALumgAA7Yu17KQzg255.pdf

8．我国三大谷物自给率达到98.75%

【科技日报】中国农科院和国际食物政策研究所（IFPRI）3日在京联合发布《中国农业产业发展报告2020》和《2020全球粮食政策报告》。《中国农业产业发展报告2020》显示，2019年，中国稻谷、小麦和玉米三大谷物的自给率达到98.75%，为经济社会稳定发展和抵御突发事件冲击提供了坚实保障。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bJsKAGrFzAAV2K0aHTLY177.pdf

9．甘肃民勤：生态高地深耕绿色发展

【中国甘肃网】地处河西走廊东北部、石羊河流域最下游的甘肃省民勤县，西、北、东三面被腾格里沙漠和巴丹吉林沙漠包围。多年来，以防沙治沙、保护生态而闻名于世的民勤县，带给人们的第一印象往往是"沙海绿洲"。事实上，民勤所处的北纬38°线是寒暑交界的黄金地带，是世界公认最适宜农作物生长的纬度。这里隔离条件好、日照时间长、昼夜温差大、病虫危害轻，发展天然绿色农业的条件得天独厚。近年来，民勤县大力培育特色优势产业，积极引进培育龙头企业，持续拓宽致富增收渠道，全县农业结构不断优化、产业体系逐步健全，农民收入持续增加，脱贫攻坚工作取得显著成效。累计减贫38个村、11199户、43616人，所有贫困村、贫困户全部"脱贫退出"。全县10603户贫困户中产业达标的达到9252户。2018年10月省政府批准脱贫摘帽，退出插花型贫困县序列。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bJIqAN96yAL9n3nW9fL8373.pdf

10．江苏推进率先实现农业农村现代化和推进乡村治理现代化，提出30条举措

【现代快报讯】6月3日上午，江苏省政府新闻办公室召开新闻发布会，发布中共江苏省委《关于贯彻（中国共产党农村工作条例）实施办法》（简称"实施办法"）精神。现代快报记者注意到，实施办法分为7个部分共30条，提出推进率先实现农业农村现代化和推进乡村治理现代化两大目标任务和相关工作举措。实施办法也充满江苏特色，提及要总结推广"马庄经验""戴庄实践""邳州探索"。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bIhKASUAFAB3aEt_4hBA452.pdf

11．韩长赋在河南调研时强调切实抓好"三夏"生产确保小康之年粮食和农业丰收

【农业农村部新闻办公室】5月30-31日，农业农村部部长韩长赋在河南调研时强调，各级农业农村部门要深入学习贯彻全国两会精神，围绕做好"六稳"工作、落实"六保"任务，切实抓好粮食和农业生产，精心组织好夏收夏种，确保夏粮丰收到手，夯实秋粮和全年农业丰收基础，为打赢脱贫攻坚战、全面建成小康社会提供支撑。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bJQaAOsBRAAW8mTKwxcY927.pdf

12．农牧业如何打造数字企业？

【中国农网】从"互联网+"到"智能+"，我国数字革命正逐步渗入各行各业，影响着广大民众的点滴生活。从农业时代到工业时代，再到如今的数字时代，畜牧产业正逐渐拥抱数字科技，用数据改变传统，实现产业健康、持久、快速发展。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bJi6APOPjABLZzlw3RD0047.pdf

13．Game-changing technologies to transform food systems

【**International Institute for Applied Systems Analysis (IIASA)**】According to new research, a pipeline of disruptive technologies could transform our food systems, ecosystems, and human health, but attention to the enabling environment is needed to realize their potential. In the next three decades, the world will need a 3070% increase in food availability to meet the demand from an increasing population. In addition, the global food system will need to change profoundly if it is going to provide humanity with healthy food that is grown sustainably in ways that are not only resilient in the face of climate change but also do not surpass planetary boundaries.

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bKgOAFT7uAARtAiKMNfg492.pdf

【文献速递】

1．Knowledge generation using satellite earth observations to support sustainable development goals (SDG): A use case on Land degradation

文献源：International Journal of Applied Earth Observation and Geoinformation,2020-06-01

摘要：Land degradation is a critical issue globally requiring immediate actions for protecting biodiversity and associated services provided by ecosystems that are supporting human quality of life. The latest Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services Landmark Assessment Report highlighted that human activities are considerably degrading land and threating the well-being of approximately 3.2 billion people.In order to reduce and ideally reverse this prevailing situation, national capacities should be strengthened to enable effective assessments and mapping of their degraded lands as recommended by the United Nations Sustainable Development Goals (SDGs). The indicator 15.3.1 ("proportion of land that is degraded over total land area") requires regular

data production by countries to inform and assess it through space and time. Earth Observations (EO) can play an important role both for generating the indicator in countries where it is missing, as well complementing or enhancing national official data sources.In response to this issue, this paper presents an innovative, scalable and flexible approach to monitor land degradation at various scales (e.g., national, regional, global) using various components of the Global Earth Observation System of Systems (GEOSS) platform to leverage EO resources for informing SDG 15.3.1. The proposed approach follows the Data-Information-Knowledge pattern using the Trends.Earth model (http://trends.earth) and various data sources to generate the indicator. It also implements additional components for model execution and orchestration, knowledge management, and visualization.The proposed approach has been successfully applied at global, regional and national scales and advances the vision of (1) establishing data analytics platforms that can potentially support countries to discover, access and use the necessary datasets to assess land degradation; and (2) developing new capacities to effectively and efficiently use EO-based resources.

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bKuaATBmHADRT_I4diss172.pdf

2．1982—2015年中国气候变化和人类活动对植被NDVI变化的影响

文献源：地理学报,2020-05-25

摘要：基于中国603个气象站的地表气温和降水观测资料以及GIMMSNDVI3g数据,采用变化趋势分析和多元回归残差分析等方法研究了1982—2015年中国植被NDVI变化特征及其主要驱动因素（即气候变化和人类活动）的相应贡献。结果表明：①1982—2015年中国植被恢复明显,在选择的32个省级行政区中,山西、陕西和重庆的生长季NDVI增加最快,仅上海生长季NDVI呈减小趋势。②气候变化和人类活动的共同作用是中国植被NDVI呈现整体快速增加和巨大空间差异的主要原因,其中气候变化对各省生长季NDVI变化的影响在$-0.01×10^{-3}$~$1.05×10^{-3}a^{-1}$之间,而人类活动的影响在$-0.32×10^{-3}$~$1.77×10^{-3}a^{-1}$之间。③气候变化和人类活动分别对中国近34年来植被NDVI的增加贡献了40%和60%;人类活动贡献率超过80%的区域主要集中在黄土高原中部、华北平原以及中国东北和西南等地;人类活动贡献率大于50%的省份有22个,其中贡献率最大的3个地区为上海、黑龙江和云南。研究结果建议应更加重视人类活动在植被恢复中的作用。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bOP2AWP35AGGqZ-og7NA284.pdf

3．粮食损失研究进展和展望

文献源：自然资源学报,2020-05-25

摘要：我国人多地少,粮食安全事关国家安全。因此,在重视增产的同时,需要不断关注粮食损失问题。通过回顾现有粮食损失的研究,总结文献中提出的重要问题,展望未来可能的研究方向。分析表明,现有研究主要集中在：（1）减少粮食损失的目的和效果的研究。包括增加粮食供给、保障国家安全,减少不必要的资源浪费、减轻环境压力,保障粮食质量、保证食品安全,以及增加粮食价值链参与者的利润等。（2）粮食产后各环节损失水平估计及其影响因素研究。（3）减少粮食损失的方法研究,包括品种改良、教育培训、改进储存设施等。在对现有研究综述的基础上,提出了几点展望：未来的研究应向粮食价值链下游环节拓展,对粮食质量损失程度进行定量分析,并关注粮食的最优损失水平。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bOIqAHJrcABZhr9Eg77g778.pdf

4．土地利用/覆盖变化对生态系统服务的影响：空间尺度视角的研究综述

文献源：自然资源学报,2020-05-25

摘要：作为连接自然过程与社会过程的桥梁与纽带,生态系统服务与人类福祉和可持续发展息息相关。土地利用/覆盖变化（Land Use/Land Cover Change,LUCC）是生态系统服务变化的重要原因之一,对生态系统服务的影响随着空间尺度的变化而变化。尺度问题一直是LUCC和生态系统服务理论研究与实践管理的重点与难点。系统理解LUCC对生态系统服务影响的尺度特征、尺度差异及尺度关联,对深入LUCC和生态系统服务的尺度效应研究、协调多层次管理机构的制度决策、缓解生态系统服务稀缺对社会经济发展的限制等具有重要意义。本文从空间尺度切入,基于国内外不同尺度LUCC对生态系统服务影响的理论研究和实践进展,总结归纳尺度的概念与内涵,整理介绍考虑空间尺度的研究框架,系统梳理LUCC对生态系统服务影响研究中的空间尺度选择、空间尺度特征及空间尺度关联,评析单一尺度和多尺度研究方法的特点。并提出未来研究中应在构建人文因素与自然因素相结合的研究框架、阐释LUCC对生态系统服务影响的尺度效应、完善LUCC对生态系统服务影响的尺度分析方法等方面开展更深入的研究。

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bOBSACamcACngSJHgZCw664.pdf

5．Viewpoint: Water, agriculture & poverty in an era of climate change: Why do we know so little?

文献源：Food Policy,2020-05-05

摘要：Understanding the complex relationship between water, agriculture and poverty (WAP) is essential for informed policy-making in light of increasing demand for scarce water resources and greater climatic variability. Yet, our understanding of the WAP nexus remains surprisingly undeveloped and dispersed across multiple disciplines due to conceptual (biophysical and economic) and measurement issues. We argue that water for agriculture will need to be better managed for it to contribute to reductions in poverty and vulnerabilities. Moreover, this management will need to consider not just quantities of water, but the quality of the water and the multiple agricultural and non-agricultural uses. For this reason, expanding research in WAP needs to involve interdisciplinary efforts. We identify three key knowledge gaps in WAP that are particularly pressing in light of greater climatic variability. These are climate change adaptation, over-abstraction of groundwater, and water quality.

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bNBSAYSUCAAouRLTr5E8272.pdf

6．Understanding information about agricultural land. An evaluation of the extent of data modification in the Land Parcel Identification System for the needs of area-based payments – a case study

文献源：Land Use Policy,2020-05-05

摘要：The development the GIS technology and growing access to spatial data encourage greater use of information for various purposes. Users may not be aware that data pertaining to the same fragment of land (in aspect of geometry or description attributes), but acquired from different sources do not always adequately reflect reality. After Poland's accession to the European Union, the EU Member States have undertaken to develop a Land Parcel Identification System (LPIS) as part of the Integrated Administration and Control System in every country. The information aggregated by that system supports the payment of area-based subsidies, monitoring farmers' cross-compliance with selected environmental rules and the implementation of rural development programs. The LPIS was developed by compiling data from various sources, including the Cadastral Register (CR). The LPIS database is continuously modified to account for changes in the use of agricultural land. However, not all users are aware of these changes, and they regard LPIS data as identical to CR data. The above can breed conflict and legal complications. The aim of this study was to

evaluate the extent to which the reference data from the CR are modified in the LPIS. The CR was selected for this analysis because it is widely used for various purposes, including urban planning, calculation of taxes and public statistics. Geographic and descriptive data were analyzed, and the relationships between both data bases were determined (more than 12,000 elements were measured). The extent to which primary data were modified was expressed with the use of an indicator describing the percentage change in cadastral data. The study concerned geometry (Ig), described parameters (Id) and the cumulative index (Ic) of the examined objects. The results of the analysis indicate that the extent of changes in primary data varies across different locations. In more than 50 % of the analyzed objects, the relevant changes (cumulated index - IC) exceeded 50 %. These observations constitute valuable information for individuals, researchers or institutions who rely on LPIS resources. The proposed evaluation method can be used to assess the extent of data modification in other databases or locations.

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bLeCAOm9ZACA3QFC_rmg313.pdf

7．Conterminous United States land cover change patterns 2001–2016 from the 2016 National Land Cover Database

文献源：ISPRS Journal of Photogrammetry and Remote Sensing,2020-04-05

摘要：The 2016 National Land Cover Database (NLCD) product suite (available on www.mrlc.gov), includes Landsat-based, 30 m resolution products over the conterminous (CONUS) United States (U.S.) for land cover, urban imperviousness, and tree, shrub, herbaceous and bare ground fractional percentages. The release of NLCD 2016 provides important new information on land change patterns across CONUS from 2001 to 2016. For land cover, seven epochs were concurrently generated for years 2001, 2004, 2006, 2008, 2011, 2013, and 2016. Products reveal that land cover change is significant across most land cover classes and time periods. The land cover product was validated using existing reference data from the legacy NLCD 2011 accuracy assessment, applied to the 2011 epoch of the NLCD 2016 product line. The legacy and new NLCD 2011 overall accuracies were 82% and 83%, respectively, (standard error (SE) was 0.5%), demonstrating a small but significant increase in overall accuracy. Between 2001 and 2016, the CONUS landscape experienced significant change, with almost 8% of the landscape having experienced a land cover change at least once during this period. Nearly 50% of that change involves forest, driven by change

agents of harvest, fire, disease and pests that resulted in an overall forest decline, including increasing fragmentation and loss of interior forest. Agricultural change represented 15.9% of the change, with total agricultural spatial extent showing only a slight increase of 4778 km2, however there was a substantial decline (7.94%) in pasture/hay during this time, transitioning mostly to cultivated crop. Water and wetland change comprised 15.2% of change and represent highly dynamic land cover classes from epoch to epoch, heavily influenced by precipitation. Grass and shrub change comprise 14.5% of the total change, with most change resulting from fire. Developed change was the most persistent and permanent land change increase adding almost 29,000 km^2 over 15 years (5.6% of total CONUS change), with southern states exhibiting expansion much faster than most of the northern states. Temporal rates of developed change increased in 20012006 at twice the rate of 20112016, reflecting a slowdown in CONUS economic activity. Future NLCD plans include increasing monitoring frequency, reducing latency time between satellite imaging and product delivery, improving accuracy and expanding the variety of products available in an integrated database.

链接:

http://agri.ckcest.cn/file1/M00/00/F8/Csgk0V7bMDSAD4AfAIT2L5FrLQg474.pdf

8．Monitoring and mapping rural urbanization and land use changes using Landsat data in the northeast subtropical region of Vietnam

文献源：The Egyptian Journal of Remote Sensing and Space Science,2020-04-05

摘要：Rapid land use change has taken place in many neighboring provinces of the capital of Vietnam such as Thai Nguyen province over the past 2 decades due to urbanization and industrialization. Deriving accurate and updated land cover and land-use change information is essential for the environmental monitoring, evaluation and management. In this study, a robust classification algorithm, Random Forest (RF) was employed in R programming to map and monitor temporal and spatial characteristics of urban expansion and land-use change in Thai Nguyen province, Vietnam. The results showed that there has been a substantial and uneven urban growth and a significant loss of forest and cropland between 2000 and 2016. Most of the conversion of agriculture and forest into built-up and mining uses were largely detected in rural regions and suburbs of Thai Nguyen. Further GIS analysis revealed that rapid urban and industrial expansion was spatially occurred in the southern rural portions and central area of the province. This study also demonstrates the

potential of Landsat data and combination of R programming language and GIS to provide a timely, accurate and economical means to map and analyze temporal land cover and land use changes for future national and local land development planning.

链接:

9．结合Landsat 8和GF 1数据的冬小麦种植空间分布提取

文献源：中国农业资源与区划,2020-02-25

摘要：［目的］为探讨多源中等分辨率数据在冬小麦种植时空分布上的应用。［方法］利用2017年冬小麦关键生育期的Landsat8 OLI（抽穗期）和时间序列的GF 1 WFV（2016—2017生育期）数据，在分析各个行政分区的地表覆盖状况、作物结构和地块破碎度差别的基础上，将行政区划分为3种类型不同的提取单元并建立了适合于各自分区的提取模型：（1）利用关键生育期的OLI数据，采用监督分类—神经网络方法提取结构单一、地块齐整的怀远县种植区；（2）基于WFV数据构建五河县及城区种植区的冬小麦全生育期NDVI时间序列曲线，根据NDVI的时间特征构建冬小麦提取的决策树分类模型提取结构较复杂、混合像元明显的五河县及城区种植区；（3）在对关键生育期OLI NDVI数据合理分割的基础上，采用最大似然的面向对象分类法获取种植密集、地块破碎的固镇县种植区。［结果］提取结果采用混淆矩阵和当年度统计数据相结合的方法进行精度评价，结果表明：（1）怀远县提取出的冬小麦提取总体精度为97 91%，五河县及城区提取出的精度为97 62%，固镇县的精度为97 42%；（2）全区域冬小麦提取的总体精度为86 82%，Kappa系数为0 84。与当年度统计数据对比的结果表明：2017年蚌埠市的准确提取面积精度可达97 91%，提取面积数据小于蚌埠市统计年鉴提供的统计数据，与调查的实际种植地块基本一致。［结论］采用不同方法提取不同空间分布特征的冬小麦种植面积具有较好的精度，该方法可以为市域冬小麦面积提取提供技术参考。

链接: