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该信息参考面向院士专家开放订阅，每两周一期，欢迎订阅。

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【动态信息】

1. 标题：国务院办公厅关于印发“无废城市”建设试点工作方案的通知

【国务院办公厅】“无废城市”是以创新、协调、绿色、开放、共享的新发展理念为引领，通过推动形成绿色发展方式和生活方式，持续推进固体废物源头减量和资源化利用，最大限度减少填埋量，将固体废物环境影响降至最低的城市发展模式。“无废城市”并不是没有固体废物产生，也不意味着固体废物能完全资源化利用，而是一种先进的城市管理理念，旨在最终实现整个城市固体废物产生量最小、资源化利用充分、处置安全的目标，需要长期探索与实践。现阶段，要通过“无废城市”建设试点，统筹经济社会发展中的固体废物管理，大力推进源头减量、资源化利用和无害化处置，坚决遏制非法转移倾倒，探索建立量化指标体系，系统总结试点经验，形成可复制、可推广的建设模式。为指导地方开展“无废城市”建设试点工作，制定本方案。

链接：

http://www.gov.cn/zhengce/content/201901/21/content_5359620.htm?from=timeline&isappinstalled=0

2. 标题：回眸 2018，关于长江中心的那些瞬间

【国家长江保护修复联合研究中心微信公众号】回眸 2018，国家长江生态环境保护修复联合研究中心在襁褓中成长，筹建了联合研究领导小组、顾问专家组与总体专家组，组织编制了系列顶层设计与指导文件，落实工作经费，有序推进第一批 58 个长江沿线城市驻点跟踪研究工作。2019，中心将一如既往，深入一线，筚路蓝缕，为保护长江“谋良策、出奇兵、打硬仗”。

链接：

https://mp.weixin.qq.com/s?__biz=MzU2MzU3OTIzMQ==&mid=2247484574&idx=1&sn=bd2a86a346df5f5efa7aaf673ac2a663&chksm=fc5954aecb2eddb8f9d2695daff0574ad7168995348911ac1729d2bb70ad1595227382d14541&mpshare=1&scene=1&srcid=#rd

3. 标题：生态环境部印发指南，明确生态环境损害鉴定评估路径

【中国生态文明网】半个多月前,一桩时间跨度长达 3 年的土壤污染案件在江苏省高级人民法院二审落槌。这个案件就是备受关注的“常州毒地案”。之所以历经两年多时间才有了终审结果,其中一个重要原因就是土壤污染损害鉴定太过复杂。为了解决类似问题,生态环境部近日印发《生态环境损害鉴定评估技术指南土壤与地下水》(以下简称《指南》)。生态环境部法规与标准司、环境规划院负责人(以下简称有关负责人)指出,《指南》适用于我国境内因环境污染或生态破坏导致的涉及土壤与地下水的生态环境损害鉴定评估。生态环境管理和生态环境司法均需生态环境损害鉴定评估作为技术支撑。

链接：http://www.cecrpa.org.cn/sxyw/gnzx/201901/t20190125_690931.shtml

4. 标题：9 部门联合印发《建立市场化、多元化生态保护补偿机制行动计划》

【中国生态文明网】日前，国家发展改革委、财政部、自然资源部、生态环境部等 9 部门联合印发《建立市场化、多元化生态保护补偿机制行动计划》，旨在践行“绿水青山就是金山银山”的理念，积极推进市场化、多元化生态保护补偿机制建设。《行动计划》指出，市场化、多元化生态保护补偿机制建设要以习近平新时代中国特色社会主义思想为指导，全面贯彻党的十九大和十九届二中、三中全会精神，牢固树立和践行“绿水青山就是金山银山”的理念，紧扣我国社会主要矛盾的变化，按照高质量发展的要求，坚持谁受益谁补偿、稳中求进的原则，加强顶层设计，创新体制机制，实现生态保护者和受益者良性互动，让生态保护者得到实实在在的利益。

链接：http://www.cecrpa.org.cn/sxyw/gnzx/201901/t20190125_690930.shtml

5. 标题：习近平生态文明思想的主要内容

【百家号】习近平总书记在全国生态环境保护大会上提出了推进生态文明建设的六项重要原则，我把它概括为“六个观”。（一）尊重自然、顺应自然、保护自然的生态价值观；（二）以“两山”理念为代表的生态发展观；（三）将良好生态视为民生福祉的生态民生观；（四）全方位、全地域、全过程的生态整体观；（五）用最严密法治保护生态环境的生态法治观；（六）共谋全球生态文明建设的生态共治观。

链接：https://baijiahao.baidu.com/s?id=1623775113387176499&wfr=spider&for=pc

【文献速递】

1. **Spatiotemporal variations in macrofaunal assemblages linked to site-specific environmental factors in two contrasting nearshore habitats**

作者：Hanna Bae, Jung-Ho Lee, Sung Joon Song

文献源：Environmental pollution (Barking, Essex : 1987)，2018

摘要：A long-term study on a benthic community was conducted in two different localities, one in semi-enclosed bay of Jinhae (n = 10, south coast) and the other in open sea area of Samcheok (n = 10, east coast), Korea, respectively. We aimed to identify the spatiotemporal patterns of macrozoobenthos and the environmental variables influencing such patterns in the two contrasting habitats. The macrozoobenthos assemblages on the soft bottom of the subtidal zone were analyzed over the 3 years, encompassing 12 consecutive seasons, in 2013–2016. Among the 22 environmental variables measured, organic matter, dissolved oxygen, mean grain size, and water depth showed clear differences between two study areas. Accordingly, several ecological indices (such as the number of species, abundance, dominant species, and diversity index (H')) generally reflected site-specific benthic conditions. The macrofaunal community in the Jinhae showed typical seasonal fluctuations, whereas the Samcheok community showed no significant change over time and space. Region- or site-dependent temporal variabilities of macrofaunal assemblages are depicted through cluster analysis (CA), indicating distinct temporal changes in the composition of dominant species. In particular, the abundance of some dominant species noticeably declined in certain seasons when several opportunistic species peaked. Such faunal succession might be explained by significant changes to specific environmental factors, such as bottom dissolved oxygen, grain size, and water depth. Principle component analysis further identified major environmental factors, i.e., sediment properties in Jinhae and water quality parameters in Samcheok community, respectively. In addition, discriminant analysis confirmed the presence of several site-specific parameters for the faunal assemblage groups identified through CA. Finally, indicator value analysis identified species that were representative across stations and regions in accordance

with their habitat preference and/or species tolerance. Overall, the two contrasting nearshore habitats showed distinct community differences, in time and space, that were influenced by site-dependent environmental conditions.

2. Measuring high spatiotemporal variability in saltation intensity using a low-cost Saltation Detection System: Wind tunnel and field experiments

作者：W.de Winter, D.B.van Dam, N.Delbecque

文献源：Aeolian Research，2018

摘要：The commonly observed over prediction of aeolian saltation transport on sandy beaches is, at least in part, caused by saltation intermittency. To study small-scale saltation processes, high frequency saltation sensors are required on a high spatial resolution. Therefore, we developed a low-cost Saltation Detection System (SalDecS) with the aim to measure saltation intensity at a frequency of 10 Hz and with a spatial resolution of 0.10 m in wind-normal direction. Linearity and equal sensitivity of the saltation sensors were investigated during wind tunnel and field experiments. Wind tunnel experiments with a set of 7 SalDec sensors revealed that the variability of sensor sensitivity is at maximum 9% during relatively low saltation intensities. During more intense saltation the variability of sensor sensitivity decreases. A sigmoidal fit describes the relation between mass flux and sensor output measured during 5 different wind conditions. This indicates an increasing importance of sensor saturation with increasing mass flux. We developed a theoretical model to simulate and describe the effect of grain size, grain velocity and saltation intensity on sensor saturation. Time-averaged field measurements revealed sensitivity equality for 85 out of a set of 89 horizontally deployed SalDec sensors. On these larger timescales (hours) saltation variability imposed by morphological features, such as sand strips, can be recognized. We conclude that the SalDecS can be used to measure small-scale spatiotemporal variabilities of saltation intensity to investigate saltation characteristics related to wind turbulence.

3. Analysis and simulation of the spatiotemporal evolution pattern of tourism

lands at the Natural World Heritage Site Jiuzhaigou, China

作者：Jun Liu, Juan Wang, Shenghong Wang

文献源：Habitat International，2018

摘要：This study researched the Natural World Heritage Site of Jiuzhaigou, China, which has a vulnerable ecological environment and booming tourism industry. Using satellite imaging with field calibration, we established the site's land-use databases for 2005 and 2015, analysed tourism land-use transformations, determined the driving mechanism behind land-use, and simulated the spatial patterns of tourism lands for 2025 and 2035. The results revealed that, during 2005–2015, the heritage site underwent dramatic land-use/land-cover change from tourism development. The tourism functions have been becoming more similar. Moreover, the distribution of tourism lands was determined by elevation and slope, as well as distances to transportation lands, watersheds, and existing lands. Between 2025 and 2035, the evolution of tourism lands is projected to gradually slow down, while the tourism functions of each village would still be dominated by accommodation and catering.

4. Modeling spatiotemporal variations in leaf coloring date of three tree species across China

作者：Zexing Tao, Huanjiong Wang, Junhu Da

文献源：Agricultural and Forest Meteorology，2018

摘要：Autumn phenology can regulate climate-biosphere interactions and net primary production within the ecosystem. However, studies modeling spatiotemporal variations in leaf coloring date (LCD) remain limited, especially for species-specific phenology on a continental scale. Aiming to simulate spatiotemporal variations in LCD in three widespread tree species (Ulmus pumila, Fraxinus chinensis, and Robinia pseudoacacia) across China, we used phenological observation records acquired from the China Phenology Observation Network (CPON) during 1963–2010 to establish and compare three LCD models (multiple regression (MA), temperature-photoperiod (TP), spring-influenced autumn (SIA)). Subsequently, we simulated the mean LCD of the three species using the most effective model and examined the effect of geographical factors

(i.e., latitude, longitude, and altitude) on LCD through multiple regression analysis. Empirical Orthogonal Function (EOF) analysis was applied to identifying the most extensive and influential spatial modes of LCD variability and how they changed with time. The results showed that: (1) The LCD of F. chinensis was fitted better with the statistical model using monthly temperature as the independent variables (MR model). The LCD of F. chinensis was delayed by a temperature rise in August and September, but advanced by a temperature rise in May and June. The LCD of U. pumila and R. pseudoacacia was fitted better with the TP and SIA models, in which the photoperiod determined the date when the cold temperature started to accumulate. (2) The simulated mean LCD of U. pumila, F. chinensis, and R. pseudoacacia was October 6, October 16 and October 22, respectively. Latitude, longitude, and altitude had a significant influence on mean LCD of the three tree species. With increasing latitude and altitude, the LCD of all three species became earlier. However, the impact of longitude on the mean LCD varied among species. (3) For all the three species, the first EOF mode presented a consistent pattern of LCD variability across space, suggesting that an earlier or later LCD occurred simultaneously in the whole China. Meanwhile, the second EOF mode exhibited contrary signals of LCD variability in the north and south for F. chinensis and R. pseudoacacia. Over the past 50 years, the LCD of all the three species has delayed. The delaying trend revealed by the first EOF mode was 1.25 ($p < 0.01$), 0.21 ($p < 0.01$), and 0.53 days/decade (not significant) for U. pumila, F. chinensis and R. pseudoacacia, respectively. These results provide the basis for a better understanding of the phenology process in autumn and how it responds to climate change.

5. Spatiotemporal distribution and potential risk assessment of microcystins in the Yulin River, a tributary of the Three Gorges Reservoir, China

作者：Qiang He, Li Kang, Xingfu Sun

文献源：Journal of Hazardous Materials，2018

摘要：Microcystins (MCs) pose potential threat for both aquatic organisms and humans, whereas their occurrence in response to hydrodynamic alterations are not clearly understood. Here, spatiotemporal variations of dissolved MC-RR and MC-LR were

evaluated monthly in 2016 in the Yulin River, a tributary of the Three Gorges Reservoir (TGR). The environmental factors that linked to MCs concentration were discussed. The results revealed that MC-RR maximumly reached 3.55 μg/L, and the maximum MC-LR concentration exceeded the threshold value of 1.0 μg/L recommended by the WHO. MCs concentrations were higher during the flood season and decreased from the estuary to the upstream reach of the Yulin River. Ecological risk assessment confirmed that MC-LR had significant adverse effects on the benthonic invertebrates Potamopyrgus antipodarum. MCs content in the sediment was 1.70- to 20-fold higher than that in suspended particulate matter (SPM). The impacts of environmental factors on the MCs profile differed between flood and dry seasons and the longitudinal differences of MCs were determined by the longitudinal profile of water velocity and SPM content, which were affected by TGR operations. This study suggested that the occurrence of MCs in the Yulin River were influenced by hydrologic regime in TGR.

6. Quantifying biomass production for assessing ecosystem services of riverine landscapes

作者：K.R. Koopman, M.W. Straatsma, D.C.M. Augustijn

文献源：Science of The Total Environment，2018

摘要：Society is increasingly in need of renewable resources to replace fossil fuels and to prevent resource depletion. River-floodplain systems are known to provide important societal functions and ecosystem services to mankind, such as production of vegetative biomass. In order to determine the potential of harvesting vegetative riparian biomass, the capacity of river systems to produce such biomass needs to be determined. We developed a method for quantifying the spatiotemporal development of annual biomass production in river floodplains. Vegetation specific growth rates were linked to a landscape classification system (i.e., the Ecotope System for National Waterways). Biomass production was calculated for floodplains along the three Rhine River distributaries (i.e., the rivers Waal, Nederrijn-Lek and IJssel) over a 15 year period (1997–2012). During this period several large scale river management measures were undertaken to reduce flood risks and improve the spatial quality of the Rhine River as

part of the Room for the River program. Biomass production decreased by 12%–16% from 1997 to 2012 along the three distributaries, which may be a side effect of flood mitigation. Almost 90% of the biomass produced was non-woody (e.g., grass/hay, reed, crops), which decreased along all three river distributaries due to the abandonment of production grasslands and the physical reconstruction of floodplains (e.g., creation of side channels). Woody vegetation, however, showed a slight increase during the 15 year period likely owing to vegetation succession from shrubs to softwood forest.

7. A preliminary study about the spatiotemporal distribution of forensically important blow flies (Diptera: Calliphoridae) in the area of Bern, Switzerland

作者：Nina Feddern, Jens Amendt, Christian Schyma

文献源：Forensic Science International, 2018

摘要：To assess the species composition of necrophagous blow flies (Diptera: Calliphoridae) in the area around the federal city of Switzerland, Bern, sampling with baited bottle traps was performed over the course of 34 weeks in 2014. Six locations ranging from urban to forest habitats were sampled weekly or rather biweekly in the winter period. 5580 individuals belonging to 16 species were identified with Lucilia sericata as the most dominant and frequent species, followed by Calliphora vicina. While most individuals were found in the urban habitats, species richness was highest in the forest. Species richness and Chao–Shen entropy estimator peaked in most locations in the summer. In winter only two species were documented (C. vicina, Calliphora vomitoria). The species Lucilia illustris was found to be an indicator species for summer and autumn, while C. vomitoria was found to be an indicator species for the forest location. Entomological cases of the same time period conducted in the Institute of Forensic Medicine Bern were included to compare the species composition. Six blow fly species were found on human bodies which are in line with the monitoring. Of these, L. sericata, C. vicina and Protophormia terraenovae were the most frequent.

8. Spatiotemporal dynamics of marine bacterial and archaeal communities in surface waters off the northern Antarctic Peninsula

作者：Camila N. Signori, Vivian H. Pellizari, Alex Enrich-Prast

文献源：Deep Sea Research Part II: Topical Studies in Oceanography，2018

摘要：Seasonal changes in taxonomic and functional diversity of microbial communities in polar regions are commonly observed, requiring strategies of microbes to adapt to the corresponding changes in environmental conditions. These natural fluctuations form the backdrop for changes induced by anthropogenic impacts. The main goal of this study was to assess the seasonal and temporal changes in bacterial and archaeal diversity and community structure off the northern Antarctic Peninsula over several seasons (spring, summer, autumn) from 2013 to 2015. Ten monitoring stations were selected across the Gerlache and Bransfield Straits and nearby Elephant Island, and archaeal and bacterial communities examined by amplicon sequencing of 16S rRNA genes. Alpha-diversity indices were higher in spring and correlated significantly with temperature. Spring was characterized by the presence of SAR11, and microbial communities remaining from winter, including representatives of Thaumarchaeota (Nitrosopumilus), Euryarchaeota, members of Oceanospirillales, SAR324. Summer and autumn were characterized by a high prevalence of Flavobacteria (NS5 marine group and Polaribacter), Alphaproteobacteria (Rhodobacterales and SAR11 clade) and Gammaproteobacteria (Oceanospirillales/Balneatrix and Cellvibrionales), generally known to be associated with organic matter degradation. Relatively higher abundance of phytoplankton groups occurred in spring, mainly characterized by the presence of the haptophyte Phaeocystis and the diatom Corethron, influencing the succession of heterotrophic bacterial communities. Microbial diversity and community structure varied significantly over time, but not over space, i.e., were similar between monitoring stations for the same time. In addition, the observed interannual variability in microbial community structure might be related to an increase in sea surface temperature. Environmental conditions related to seasonal variation, including temperature and most likely phytoplankton derived organic matter, appear to have triggered the observed shifts in microbial communities in the waters off the northern Antarctic Peninsula.

9. Structural and functional shifts of bacterioplanktonic communities associated

with spatiotemporal gradients in river outlets of the subtropical Pearl River Estuary, South China

作者：Yong-zhan Mai, Zi-ni Lai, Xin-hui Li

文献源：Marine Pollution Bulletin，2018

摘要：In this study, we used high-throughput sequencing of 16S rRNA gene amplicons, to investigate the spatio-temporal variation in bacterial communities in surface-waters collected from eight major outlets of the Pearl River Estuary, South China. Betaproteobacteria were the most abundant class among the communities, followed by Gammaproteobacteria, Alphaproteobacteria, Actinobacteria, and Acidimicrobiia. Generally, alpha-diversity increased in winter communities and the taxonomic diversity of bacterial communities differed with seasonal and spatial differences. Temperature, conductivity, salinity, pH and nutrients were the crucial environmental factors associated with shifts in the bacterial community composition. Furthermore, inferred community functions that were associated with amino acid, carbohydrate and energy metabolisms were lower in winter, whereas the relative abundance of inferred functions associated with membrane transport, bacterial motility proteins, and xenobiotics biodegradation and metabolism, were enriched in winter. These results provide new insights into the dynamics of bacterial communities within estuarine ecosystems.

10. Late-Quaternary spatiotemporal dynamics of vegetation in Central Mexico

作者：Dayenari Caballero-Rodr ́guez, Alexander Correa-Metrio, Socorro Lozano-Garc ́a

文献源：Review of Palaeobotany and Palynology，2018

摘要：Central Mexico exhibits a complex environment with wide topographic, climatic, and biological gradients. Lacustrine basins distributed along the region have been the source for numerous paleoenvironmental reconstructions, representing an exceptional opportunity for studying vegetation turnover dynamics across time and space. A total of 1397 fossil and modern pollen samples were ordinated through a Detrended Correspondence Analysis (DCA) to characterize the regional ecological space. Resulting DCA Axis 1 scores were related to a forest cover gradient. Aiming to

generalize the interpretation of the analyzed records and given the clear altitudinal pattern shown by modern samples, paleoenvironmental interpretations were performed grouping fossil records according to their elevation. Euclidean distances among sites scores were used as estimators of ecological distance and summarized from two different approaches to observe turnover dynamics at different spatial scales: i) local turnover through time, and ii) ecological versus geographic distance. The regional late Quaternary vegetation dynamics were found mostly driven by global climatic events, whereas the Holocene was marked by more local factors such as precipitation regime and human occupation patterns. Strong local modulation in turnover dynamics was observed in the region. Additionally, we conclude that a palynological record produces results that are repeatable within 50 km, considering a maximum compositional turnover of 50%.

11. Four decades' dynamics of coastal blue carbon storage driven by land use/land cover transformation under natural and anthropogenic processes in the Yellow River Delta, China

作者：Tiantian Ma, Xiaowen Li, Junhong Bai

文献源：Science of The Total Environment，2019

摘要：Land reclamation can impact a variety of ecosystem services provided by coastal wetlands. The dynamics of coastal blue carbon storage (CBCS) altered by land use/land cover (LULC) transformation and its linkage with natural and anthropogenic driving processes was analyzed in the Yellow River Delta (YRD), China. Using LULC data in the YRD during 1970–2010, the LULC transformation in four periods (i.e., 1970–1980, 1980–1990, 1990–2000 and 2000–2010) and their cumulative conversions within coastal wetlands were tracked to investigate the flow of LULC transformation. The spatiotemporal dynamics of the CBCS were then modeled and investigated by InVEST based on the LULC transformation in relation to their driving processes. The results indicated that the CBCS in the YRD has been substantially altered by continuous LULC transformation driven by the natural and anthropogenic processes, totally decreased by 10.2% (1.63 × 106 Mg) during 1970–2010 followed the loss of 2028 km2 natural

wetlands converted to socioeconomic land use. The 78% of increased CBCS were contributed by single natural (e.g., succession) or anthropogenic (e.g., restoration) driving process at the seaward edge within tidal area, whereas 71% of decreased CBCS was linked with multiple driving processes in inland areas. In addition, the anthropogenic driving processes caused much greater loss (−5.97 × 105 Mg) than gain (6.81 × 104 Mg) in CBCS, compared with a net gain of CBCS (1.04 × 104 Mg) brought by the natural driving processes. The study can facilitate to develop coastal management strategy to balance and mitigate the conflicted LULC between socioeconomic development and maintenance of multiple ecosystem services incorporating CBCS.

12. Spatiotemporal patterns of phytoplankton composition and abundance in the Maryland Coastal Bays: The influence of freshwater discharge and anthropogenic activities

作者：Ozuem F. Oseji, Paulinus Chigbu, Efeturi Oghenekaro

文献源：Estuarine, Coastal and Shelf Science，2018

摘要：The spatial and temporal variations in phytoplankton abundance and community structure in the northern and southern parts of the Maryland Coastal Bays (MCBs) that differ in anthropogenic activities and hydrological characteristics were studied in 2012 and 2013 using photosynthetic pigments as biomarkers. Phytoplankton pigment biomass and diversity were generally higher in the northern bays that receive high nutrient input from St. Martin River, than in the southern bays where nutrient levels were comparatively low. Sites close to the mouths of tributaries in northern and southern bays had higher nutrient levels, which favored the development of dinoflagellates, and nano- and picophytoplankton, than sites closer to the inlets. The microplankton dominated the phytoplankton community in spring (>90%) and decreased in relative abundance into fall (<60%) whereas nanoplankton peaked in summer or fall. Picoplankton relative abundance increased from late spring (<10%, March 2012 & 2013) to summer (40%, July 2012 and August 2013) and was correlated positively with NH4+ and negatively with salinity. The observed spatial and seasonal

patterns of phytoplankton relative abundance and diversity are likely due to changes in nutrient concentrations and ratios, driven by variations in freshwater discharge, and selective grazing of phytoplankton. Water quality management in the MCBs should continue to focus on reducing nutrient inputs into the bays.

13. Spatial and seasonal bacterioplankton community dynamics in the main channel of the Middle Route of South-to-North Water Diversion Project

作者：Zhongxin Luo, Shengjie Li, Kun Hou

文献源：Research in Microbiology，2019

摘要：In this study, the spatial and seasonal bacterioplankton community dynamics were investigated in the main channel of the Middle Route of the South-to-North Water Diversion Project (MRP) using Illumina HiSeq sequencing. Water samples were collected in spring and summer from south to north at eight water quality monitoring stations, respectively. The results showed that seasonal changes had a more pronounced effect on the bacterioplankton community compositions (BCCs) than spatial variation. The diversity analysis results indicated that samples of summer have more operational taxonomic units (OTUs), higher richness and diversity than those in spring. The main phyla, Proteobacteria, Actinobacteria, Bacteroidetes, Cyanobacteria and Chloroflexi, displayed significant differences ($P < 0.05$) between spring and summer in the main channel. The Redundancy analysis (RDA) targeting all samples indicated that specific conductivity (SPC), dissolved oxygen (DO), pH and temperature (T) might be key factors in driving BCCs, while trophic status showed no significant correlation ($P > 0.05$). The present study provides important insights into the potential ecological roles of specific taxa in the new artificial ecosystem and it offers reference for studies on ecosystem succession of other giant interbasin water diversion project in the world.

14. 3D hydrodynamic investigation of thermal regime in a large river-lake-floodplain system (Poyang Lake, China)

作者：Yunliang Li, Qi Zhang, Rui Ye

文献源：Journal of Hydrology，2018

摘要：Thermal regime and its response to meteorological and hydrological forcings play an important role in controlling water quality and ecosystem of lakes. Many large floodplain lakes are subjected to significant river-lake interactions and could benefit greatly from hydrodynamic modeling. The current work presents a first attempt to use a 3D hydrodynamic model and statistical methods to explore spatiotemporal variations and primary causal factors of thermal stability within a large river-lake-floodplain system (Poyang Lake, China). The hydrodynamic model successfully reproduced the lake hydrodynamics and thermal dynamics through a comparative analysis of field measurements. Simulation results revealed that the thermal stability of Poyang Lake exhibits similar spatial patterns between seasons; however, the lake is generally stratified during summer and early autumn. It is classified as partial mixed and full mixed during winter and spring. The thermal stratification may develop in the center area and eastern bay area of the lake, while the full mixing is likely to occur in the floodplains and the main flow channels. Statistics and simulations indicate that the air temperature, solar radiation and evaporation trigger a positive effect on the thermal stability of Poyang Lake, whereas a negative relationship is recognized due to the catchment river temperature. The responses of thermal stability to the meteorological and hydrological changes are much stronger in summer than other seasons, producing a significant seasonal thermal regime in the floodplain lake. Additionally, the dynamics in the lake water depth and associated hydrological regime are a major factor in maintaining the seasonal thermal stability of Poyang Lake. The findings of this study can support management of Poyang Lake as well as other similar floodplain lakes, by providing information on both water quality and ecosystem succession.

15. Effects of soil macro- and mesofauna on litter decomposition and soil organic matter stabilization

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摘要：Soil fauna consumes substantial amounts of litter and can even consume the entire annual litterfall in some ecosystems. The assimilation efficiency of fauna may reach 50% but is usually much smaller. Soil fauna may affect soil organic matter (SOM) dynamics not only by assimilating litter but also by modifying the soil environment at many spatiotemporal scales. Litter processing by fauna usually results in a short-term increase in microbial activity in feces; this activity than decreases such that feces over the long term may decompose more slowly than the original litter. During passage through the guts of litter-feeding fauna, litter modifications include fragmentation, consumption of associated microorganisms, pH and redox changes, removal of easily decomposed polysaccharides, increase in the proportion of lignin, and decrease in soluble polyphenols and carbon:nitrogen (C:N) ratios. The coating of litter with clay during passage through earthworms reduces microbial access to the litter as well as conditions for microbial activity by reducing the diffusion of nutrients and oxygen. At a larger scale, soil fauna affects leaching and the release of particulate organic matter (POM), which in turn affect microbial activity in soil. Fauna also affects the distribution of organic matter in the soil profile and determine whether litter decomposes on the soil surface or as POM bound to soil particles, which substantially affects the microbial community and the rate of decomposition. Fauna affects the amount of organic matter entering different SOM pools, and this effect depends on litter quality and the degree of soil C saturation. At an even larger scale, fauna can change the soil profile, soil properties, and the plant community, which may in turn affect microbial activity and the decomposition rate. The effect of soil fauna on litter decomposition and soil C storage can be positive or negative. Faunal effects tend to be greatest in ecosystems under transition, e.g. ecosystem developing after some disturbance during primary or secondary succession.

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