



只有一个地球，  
请关心和维持这个小小的行星  
Only one earth, please care for  
and maintain the small planet

ISSN 1674-5906

CN 44-1661/X

# 生态环境学报

ECOLOGY AND ENVIRONMENTAL SCIENCES

2018年3月 第27卷 第3期 Vol.27 No.3

生态环境学报  
第二十七卷第三期

二〇一八年三月



情系红土  
根植南粤

生态环境学报编辑部

广东省土壤学会 主办  
广东省生态环境技术研究所

万方数据



# 生 态 环 境 学 报

第 27 卷 第 3 期 2018 年 3 月 18 日

## 目 次

### 研究论文

- 基于 MOD17A3 的中国陆地植被 NPP 变化特征分析……………李登科, 王钊 (397)
- 模拟放牧强度与施肥对青藏高原高寒草甸群落特征和物种多样性的影响……………张璐璐, 王孝安, 朱志红, 李英年 (406)
- 西南地区乔木林碳储量及木材生产潜力预测……………李奇, 朱建华, 范立红, 冯源, 肖文发 (416)
- 南亚热带森林群落演替过程中结构多样性与碳储量的变化……………夏艳莉, 张静, 邹顺, 唐旭利, 李凤 (424)
- 河北小五台山不同海拔白桦林土壤有机碳密度分布特征及影响因素……………尤海舟, 毕君, 王超, 任启文, 李联地 (432)
- 高寒沙地两种柳树不同径级细根分解动态特征  
……………何凌仙子, 贾志清, 刘涛, 李清雪, 张友焱, 冯莉莉, 杨凯悦, 赵雪彬, 杨德福 (438)
- 北部湾不同龄期无瓣海桑植株根系时空分布特征……………杜钦, 段文军, 李丽凤 (445)
- 美国红枫和元宝枫幼叶春季转色期生理特性研究……………刘平, 宋岩, 陆秀君, 曹宝慧, 刘思佳, 王玉涛 (452)
- 氮沉降对城市绿地植物及土壤养分的影响初探——以果岭草 (*Cynodon dactylon*) 为例  
……………莫凌梓, 彭彬, 王嘉珊, 黄伟斌, 陈小花, 徐国良 (459)
- 长期施肥对双季稻区水稻植株养分积累与转运的影响  
……………唐海明, 肖小平, 李超, 程凯凯, 汪柯, 孙耿, 张帆, 潘孝晨 (469)
- 不同钾效率基因型香蕉根际钾营养与根系特性研究……………吴宇佳, 张文, 符传良, 郑道君, 刘国彪, 谢良商 (478)
- 岩溶石灰土微生物丰度的影响因素及其指示意义……………朱美娜, 梁月明, 刘畅, 靳振江, 李强 (484)
- 老化生物炭对红壤铝形态影响的潜在机制……………林庆毅, 张梦阳, 张林, 夏浩, 姜存仓 (491)
- 2000—2014 年中国区域生态效率测度及其时空差异……………刘军, 马勇, 问鼎, 童昀, 任洁 (498)
- 城市扩张对热环境时空演变的影响——以哈尔滨为例……………刘丹, 于成龙 (509)
- 中国城市大气污染特征及社会经济影响分析……………肖悦, 田永中, 许文轩, 刘瑾, 万祖毅, 张雪倩, 刘旭东 (518)
- 太原市 PM<sub>2.5</sub> 周期性特征及其成因分析……………周静, 张岳军, 相栋, 韩照宇 (527)
- 乌鲁木齐市主要大气污染物浓度变化特征研究  
……………木尼拉·阿不都木太力甫, 玉米提·哈力克, 塔依尔江·艾山, 买尔当·克依木, 娜斯曼·那斯尔丁, 艾力亚·艾尼瓦尔 (533)
- 2015 年秋冬季节武汉城区黑碳气溶胶的分布及源区分析……………黄超, 赵锦慧, 何超, 刘玉青, 李小莉, 刘书凯 (542)
- 基于大型底栖动物完整性指数 (B-IBI) 的永定河水系生态健康评价……………孔凡青, 崔文彦, 周绪申 (550)
- 鄱阳湖北部湖区沉积物重金属分布及其潜在生态风险评价……………杨期勇, 曾明, 谢琪, 程鹏飞, 邱秀文, 黄亮, 赵军凯 (556)
- 大汶河-东平湖 CDOM 的荧光特征及与营养物质的耦合关系……………吕伟伟, 姚昕, 张保华 (565)
- 4 种植物对水体中苯的净化效果及其抗性响应……………裴淑兰, 王凯, 雷淑慧 (573)
- 蓬莱仙界园区土壤-蔬菜系统重金属形态解析及关联特征……………吴迪, 程志飞, 刘品祯, 杜启露, 张林 (581)

### 观 点

- 生态保护红线在环境法律制度中的融合与创新……………莫张勤 (588)



期刊基本参数: CN 44-1661/X \* 1992 \* m \* A4 \* 198 \* zh \* P \* ¥ 30.00 \* 1 000 \* 25 \* 2018-03

# ECOLOGY AND ENVIRONMENTAL SCIENCES

Vol.27 No.3 March 18, 2018

## Contents

### Research Articles

- The Characteristics of NPP of Terrestrial Vegetation in China Based on MOD17A3 Data..... LI Dengke, WANG Zhao ( 397 )
- The Effects of Simulated Grazing Intensity and Fertilizing on the Community Characteristics and Diversity in Alpine Meadow of Qinghai-Tibet Plateau  
..... ZHANG Lulu, WANG Xiaolan, ZHU Zhihong, LI Yingnian ( 406 )
- Prediction of Forest Carbon Storage and Timber Yield Potential in Southwestern China  
..... LI Qi, ZHU Jianhua, FAN Lihong, FENG Yuan, XIAO Wenfa ( 416 )
- Dynamics of Structural Diversity and Carbon Storage along A Successional Gradient in South Subtropical Forest  
..... XIA Yanju, ZHANG Jing, ZOU Shun, TANG Xuli, LI Feng ( 424 )
- Altitudinal Distribution Rule of *Betula platyphylla* Forest's Soil Organic Carbon Density And Its Influencing Factors in Xiaowutai Mountain in Hebei  
..... YOU Haizhou, BI Jun, WANG Chao, REN Qiwen, LI Liandi ( 432 )
- Dynamic Characteristics of Fine Root Decomposition of Two *Salicaceae* Species with Different Diameters in Alpine Sandy Land  
..... HE Lingxianzi, JIA Zhiqing, LIU Tao, LI Qingxue, ZHANG Youyan, FENG Lili, YANG Kaiyue, ZHAO Xuebin, YANG Defu ( 438 )
- The Temporal-spatial Distribution Traits of *Sonneratia apetala* Buch. Ham Root System under Varying Planting Ages in the Beibu Gulf, China  
..... DU Qin, DUAN Wenjun, LI Lifeng ( 445 )
- Research of Physiological Characteristics in Juvenile Leaves of *Acer×freemanii* ‘Autumn Blaze’ and *Acer truncatum* during Leaf Color Transformation  
in Spring ..... LIU Ping, SONG Yan, LU Xiujun, CAO Baohui, LIU Sijia, WANG Yutao ( 452 )
- Effects of Nitrogen Deposition on Plants and Soil in Urban Green Space——A Case Study on *Cynodon dactylon*  
..... MO Lingzi, PENG Bin, WANG Jiashan, HUANG Weibin, CHEN Xiaohua, XU Guoliang ( 459 )
- Effects of Different Long-term Fertilization Managements on Nutrition Accumulation and Translocation of Rice Plant in Double Cropping Paddy Field  
..... TANG Haiming, XIAO Xiaoping, LI Chao, CHENG Kaikai, WANG Ke, SUN Gen, ZHANG Fan, PAN Xiaochen ( 469 )
- Investigation of K Nutrition in Rhizosphere and Characteristics of Roots for Different K Efficiency Genotypes of Banana  
..... WU Yujia, ZHANG Wen, FU Chuanliang, ZHENG Daojun, LIU Guobiao, XIE Liangshang ( 478 )
- Influential Factors and Indicative Significance of Microbial Abundance in Karst Limestone Soil  
..... ZHU Meina, LIANG Yueming, LIU Chang, JIN Zhenjiang, LI Qiang ( 484 )
- The Potential Mechanism of the Effect of Aging Biochar on the Aluminum Morphology in Red Soil  
..... LIN Qingyi, ZHANG Mengyang, ZHANG Lin, XIA Hao, JIANG Cuncang ( 491 )
- Measuring of Regional Eco-efficiency in China and Its Spatial-temporal Differences from 2000 to 2014  
..... LIU Jun, MA Yong, WEN Ding, TONG Yun, REN Jie ( 498 )
- Urban Expansion and Its Influence on Spatio-temporal Variation of Thermal Environment: A Case Study of Harbin City..... LIU Dan, YU Chenglong ( 509 )
- Study on the Spatiotemporal Characteristics and Socioeconomic Driving Factors of Air Pollution in China  
.....XIAO Yue, TIAN Yongzhong, XU Wenxuan, LIU Jin, WAN Zuyi, ZHANG Xueqian, LI Xudong ( 518 )
- The Periodicity and Cause Analysis of PM<sub>2.5</sub> in Taiyuan .....ZHOU Jing, ZHANG Yuejun, XIANG Dong, HAN Zhaoyu ( 527 )
- Variation Characteristics of the Main Atmospheric Pollutant Concentration in Urumqi  
.....Munila ABUDUMUTAILIFU, Ümüt HALIK, Tayierjiang AISHAN, Maierdang KEYIMU, Nasima NASIRDIN, Ailiya AINIWAER ( 533 )
- The Analysis of Distribution and Source Area of Black Carbon Aerosol in Wuhan City in Autumn and Winter of 2015  
.....HUANG Chao, ZHAO Jinhui, HE Chao, LIU Yuqing, LI Xiaoli, LIU Shukai ( 542 )
- Health Assessment on Yongding River Watershed Using Benthic Index of Biotic Integrity (B-IBI).....KONG Fanqing, CUI Wenyan, ZHOU Xushen ( 550 )
- The Distribution of Heavy Metals and Potential Ecological Risk in the Northern Poyang Lake  
..... YANG Qiyong, ZENG Ming, XIE Qi, CHENG Pengfei, QIU Xiuwen, HUANG Liang, ZHAO Junkai ( 556 )
- Correlations between Fluorescence Characteristics of Chromophoric Dissolved Organic Matter and Nutrients in Dawen River and Dongping Lake  
..... LV Weiwei, YAO Xin, ZHANG Baohua ( 565 )
- Removal Effects and Responses of Four Ornamental plants Suffered to Benzene Stress in Water .....PEI Shulan, WANG kai, LEI Shuhui ( 573 )
- Speciation Analysis and Association Feature of Heavy Metals in Soil-vegetable System of Penglai Paradise  
..... WU Di, CHENG Zhifei, LIU Pinzhen, DU Qilu, ZHANG Lin ( 581 )

### Perspectives

- Integration and Innovation of Ecological Protection Red Line in Environmental Legal System .....MO Zhangqin ( 588 )