论文类成果

三峡库区重金属污染物水环境过程及效应研究系列文章

【创新性】

基于十年的长序列连续监测，获得了三峡库区重金属污染物监测数据 3 万余个，系统揭示了三峡库区重金属元素水环境演变过程及效应。建立了基于三峡库区实际地质背景条件下沉积物质量基准和地球化学基线，科学评价了三峡库区重金属的污染现状；结合泥沙年淤积量估算了三峡库区重金属污染物年均累积量及人为源重金属累积量；原位高分辨实现了重金属在库区沉积物－水界面释放过程的量化研究，阐明了三峡库区沉积物中有效态重金属的分布特征、影响因素及释放趋势。首次发现了库区沉积物剖面存在有效态重金属的“热点”释放现象和支流上游沉积物有效态重金属释放的特点，突破了传统认识。上述成果为科学认知三峡库区水环境中重金属污染的环境行为及风险提供了科学依据。

【影响力】

2015 年以来，有关三峡库区重金属污染物水环境过程及效应研究领域连续发表系列高水平 SCI 论文 14 篇。其中，在 Journal of Hydrology（2 篇 ）、Science of the Total Environment（2 篇 ）、Environmental Pollution（3 篇 ）等环境与生态及水文水资源领域高水平 Top 期刊发表 SCI 论文 7 篇。14 篇 SCI 论文累计影响因子达 54.34，篇均影响因子为 3.88。通过文献计量分析，该系列 SCI 论文数量占三峡库区重金属污染研究领域 SCI 论文总数的 30%，占三峡库区沉积物重金属污染研究 SCI 论文总数的 60%。所发表 Top 期刊论文数量占三峡库区重金属研究领域目前 Top 期刊论文发表总数的 50%。本系列 SCI 论文发表后被国内外同行广泛关注，自 2015 年发表以来，14 篇 SCI 论文累计引用次数为 108，单篇最高引用次数为 32，2015–2018 年均引用次数为 26。

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受奖单位：水环境所

RESEARCH ON THE WATER ENVIRONMENT PROCESS AND EFFECT OF HEAVY METAL POLLUTANTS IN THE THREE GORGES RESERVOIR REGION SERIES ARTICLES

【Innovation】

Based on the long-sequence continuous monitoring for a decade, we have obtained more than 30,000 pieces of monitoring data about heavy metal pollutants in the Three Gorges Reservoir Region, and systematically revealed the water environment evolution process of heavy metal elements in the Three Gorges Reservoir Region and its effect. We have established sediment quality criteria and geochemical baselines against the actual geological background of and scientifically assessed the current status of heavy metal pollution in the Three Gorges Reservoir Region; estimated the average annual accumulation of heavy metal pollutants and the accumulation of heavy metal from artificial sources according to annual sedimentation volume; realized the quantitative research of heavy metal in the sediment-water surface releasing process in the reservoir region in a in-situ and high-resolution way, and expounded the distribution characteristics, influence factors and releasing trends of effective heavy metals in the sediment of the Three Gorges Reservoir Region. We have discovered, for the first time, the "hotspot" releasing of effective heavy metals on the section of sediment in the reservoir region and the characteristics of the releasing of effective heavy metals in sediment in upper tributaries, breaking through the traditional cognition. Said achievements provide scientific basis for scientifically perceiving the heavy metal pollution in water environment of the Three Gorges Reservoir Region.

【Influence】

Since 2015, 14 high-level SCI theses on the research of the water environment process of heavy metal pollution in the Three Gorges Reservoir Region and its effect have been published continuously. In specific, 7 theses have been published in high-level top periodicals in environment and ecology, and hydrology and water resources fields such as Journal of Hydrology (2), Science of the Total Environment (2), and Environmental Pollution (3). Cumulative impact factor of these 14 theses amounts to 54.34, and their average impact factor is 3.88. According to bibliometric analysis, these theses take up 30% of the SCI theses about the research of heavy metal pollution in the Three Gorges Reservoir Region and 60% of the SCI theses about heavy metal pollution in sediment in the Three Gorges Reservoir Region. Number of Top journals take up 50% of theses about heavy metal pollution in the Three Gorges Reservoir Region published on Top journals. These series SCI theses register 108 citations cumulatively, the top-ranking thesis registers 32 citations, and average in 2015–2018 is 26 citations.

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Award-winning Unit : Department of Water Environment