

论文

太湖流域土壤重金属元素污染历史的重建:以Pb、Cd为例

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摘要:

太湖是位于长江下游的一个大型浅水湖泊,通过对4个代表太湖不同沉积环境的湖底沉积剖面的¹³⁷Cs和²¹⁰Pb沉积定年,重建太湖湖底沉积物和太湖来水流域土壤Cd、Pb的污染历史。结果显示:1980年以前,太湖底积物中Cd、Pb含量与流域内的自然背景含量相当,1980年以后,湖底沉积物中的Cd、Pb含量显著增高,这与我国大规模工业化进程的起始时间基本一致,推测工业化进程是湖底沉积物中Cd、Pb含量增加的主要原因。1900年以来太湖湖底沉积物中累积含有Cd和Pb分别为146 t和25 980 t,其中苕溪来水提供的Cd和Pb分别为40 t、6 777 t,宜溧河来水提供的Cd、Pb分别为36 t、6 023 t,其他来水(洮、漉、运河)提供的Cd、Pb分别为71 t、13 179 t,其他来水是太湖Cd、Pb累积的主要输入途径。Cd、Pb累积的高峰期为20世纪 80—90年代,1980年以来,运河来水Cd、Pb的输出通量为28 26 t、3 419 t;苕溪流域Cd、Pb的输出总量分别为13 70 t、1 585 t,其中人为源的Cd、Pb为8 90 t、610 t,人为源输出的Cd、Pb通量占总输出量的64 96%和38 47%;宜溧河流域Cd、Pb的输出总量分别为10 09 t、1 063 t,人为源的Cd、Pb分别6 96 t和500 t,人为源输出的Cd、Pb通量占总输出量的68 68%和47 08%,表明太湖流域人类活动所导致的Cd已超过自然剥蚀过程,因此削减工业化进程中的Cd、Pb排放总量,控制太湖运河来水的输出通量是改善太湖底积物Cd、Pb环境质量的关健措施。

关键词: [关键词: 重金属污染; 历史重建; 区域土壤; 太湖](#)

Reconstruction of the regional soil pollution history by heavy metals in Taihu lake drainage area: taking Pb and Cd as examples.

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Abstract:

The Taihu Lake located at the lower reaches of Yangtze River is a shallow large lake. The Cd and Pb pollution history of sediments of the Taihu Lake and the soils of its intake areas has been reconstructed based on ¹³⁷Cs and ²¹⁰Pb depositional dating at 4 sections representing different depositional environments. The results show that the Cd and Pb concentrations in the lake sediments were roughly equal to that of background level in the intake areas before 1980; while since then the concentrations have become considerably higher, which is just basically corresponding to the industrialization progress there. It is thus inferred that the industrialization has been the main reason for the increase in Cd and Pb concentrations in the lake sediments. The accumulated amounts of Cd and Pb in the lake sediments have been 146 t and 25980 t respectively since 1900, among them 40 t and 6777 t were due to the intake from Tiaoxi river, 36 t and 6023 t from Yili river, and 71 t and 13179 t from other rivers (say Tiao river, Ge river and the Grand Canal), respectively. It is seen that the above mentioned other rivers have been the main sources for the accumulated Cd and Pb in the Taihu Lake. The peak period of the accumulation was 80-90s of the last century. The outputs of Cd and Pb from the Grand Canal have been 28 26 t and 3419 t since 1980, respectively; while the total outputs of Cd and Pb from the basin of Tiao river have been 13 70 t and 1585 t, among them 8 90 t of Cd and 610 t of Pb have been due to human activities, corresponding to 64 96 % and 38 47 % of the total outputs of Cd and Pb respectively. The total outputs of Cd and Pb from the basin of Yili river have been 10 09 t and 1063 t since 1980, respectively, among them 6 96 t of Cd and 500 t of Pb have been due to human activities, corresponding to 68 68 % and 47 08 % of the total outputs of Cd and Pb respectively. It shows that the accumulation of Cd due to human activity has been over that of natural denudation in the Taihu Lake drainage area. The key measures for improving the environmental quality of the lake sediments should be to decrease the total discharge of Cd and Pb from industrialization progress and to control the outputs of Cd and Pb from the Grand Canal.

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