Water Pollution Impact Assessment of Beijing from 2011 to 2015: Implication for Degradation Reduction

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Abstract

Water resource is an essential element for all lives on this planet. However, with the rapid growth of economics, urban population, as well as the changes of land use, water degradation issues are becoming more severe. Beijing, as the capital and one of the megacities of China, is also facing the issues of water degradation. To investigate the water degradation variations and identify the most critical pollutants for water degradation reduction of Beijing, the present study determined the water degradation impacts of the major pollutants, regarding water eutrophication, acidification, and ecotoxicity. The results showed that (i) the water eutrophication decreased fluctuated at around 9,500 kt CODeq from 2011 to 2015, and phosphorus (P) is the most effective monitoring pollutant for eutrophication reduction. (ii) The water ecotoxicity decreased during this period, and reduced dramatically from 2013 to 2014 and slightly to 2015, with a reduction rate up to 91.23 % (2015). This sharp change is related to the reduction of coal consumption and steel production. Hg and Cd are identified as the two most critical pollutants for ecotoxicity reduction. (iii) The water acidification decreased gradually from 229.71 kt SO2eq to 167.51 kt SO2eq, with a decreasing rate of 27 %. SO2 is the most critical pollutant for acidification reduction. In conclusion, the overall water degradation decreased during this period, by 1.5 % for water eutrophication, 27 % acidification and 90 % for ecotoxicity. Phosphorus (P), SO2, Cr, and Hg are the most important pollutants for water degradation reduction.