

Impact of the land use changes on the concentration and chemical forms of dissolved iron in the Sanjiang plain China

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1. Introduction

In recent years the iron, has been shown to play a key role in limiting phytoplankton growth rates over much of the world ocean, particularly in the high nutrient, low chlorophyll (HNLC) regions. It is thought that a rich supply of iron brought from land region to river and sea. So that land region is important source for iron. The research site of Sanjiang plain, the largest wetland nearby Amur River, has been converted to upland field and paddy field. Therefore, it is thought that the dissolved iron output may be decreased significantly. The purpose of the research is to clarify what change took place in the dissolved iron concentration and chemical forms by chemical analysis of the soil interstitial water, the wetland, paddy field and upland field.

2. Materials and methods

The research sites are located at the Sanjiang plain in the Heilongjiang province of china. We collected soil interstitial water and surface water for two natural wetlands, paddy field and upland field, and measured pH, EC, water temperature and EH in the field and analyzed free ferrous iron, dissolved iron, acid soluble iron and dissolved organic carbon for the soil interstitial water.

3. Results and discussions

From 2005 to 2006 through analysis of the soil interstitial water, it has been found that the different in the concentration and chemical form of dissolved iron in the wetland paddy field, and in the upland field, dissolved iron concentration was remarkably low. As a whole, total dissolved iron concentration was relatively low in spring (May), but increased with season. And the concentration was largest in summer in the wetland and in the paddy field. As for the chemical form of dissolved iron, a large amount of iron was present as acid leachable form in the paddy field. On the other hand, the organic iron was major form in the wetland. It was also found that dissolved iron concentration is significantly decreased in surface water compared to deeper soil horizons. This finding is not only interesting in the behavior of Fe but of an important implication in considering the iron transport from land regions to river.