



Characterizing particle size distribution of nonpoint source pollutants in an agricultural area

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ABSTRACT

Nonpoint source (NPS) pollution is widely recognized as a major source affecting the water quality deterioration in rivers, lakes, and marine environments. Many studies about the relations between NPS pollutants and solid matters from drainage area have been carried out in the area of stormwater management. This study collected stormwater and soil samples from a drainage area in Korea; the particle size distributions (PSDs) were then analyzed during four storm events. The results indicate that the PSDs of fine and medium silt in the stormwater are related to the soil component of the drainage area. In addition, solid matter was strongly related to NPS pollutant discharges such as total nitrogen and total phosphorus during stormwater runoff. Therefore, to design an NPS management facility, the PSD from the drainage area should be considered. It is expected that this study can be applied to the designs of settling ponds used to remove particles from stormwater runoff.

Keywords: Stormwater runoff; Agricultural area; Particle size distribution; Nonpoint source pollution; Water quality management

1. Introduction

Nonpoint source (NPS) pollutants including nutrients and particulate matter are transported from the ground to water bodies during excessive rainfall or by human activities such as irrigation [1–3]. In agricultural areas, there are many nutrients and particulate in the soil that are affected by human activities and

weathering. For example, nutrients including phosphorus or nitrogen are well-known major sources of eutrophication in rivers, lakes, estuaries, and coastal oceans; the discharge characteristics of particulate matter can reflect the water quality during storm events and can be affected by land use and land cover [4]. Specifically, particulate matter has been recognized as a potential source of the deterioration of water quality [5], and the inflow of NPS pollutants into a

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