Levees grow: capturing a process of changing society with development of Levee Spatial Database in Kiso River basin, Japan

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In the era of the emergent Anthropocene, it is important to capture the feedbacks between physical and social processes [Savenije et al., 2014; Sivapalan, 2015]. Di Baldassarre et al. (2015) developed a framework to capture the feedback between floods and society based on a dichotomy of “green society” which cope with flooding by resettling out of flood-prone area or “technological society” which is deal with flooding by building levees.

Modern Japan can be categorized as a technological society that started from the Meiji era (1868-1912). Modern hydrological technologies were imported from Dutch engineers and modern flood prevention projects were also started. Before the Meiji era, discontinuous levee systems known as "*Kasumi*" or "*Wajyu* "(ring levee) were the major flood prevention structures, which protected communities from frequent floods. These traditional levees enabled the communities to live in harmony with floods. However, the traditional levee systems were gradually replaced by modern continuous levees starting from the Meiji era, with constant increase in length until the present era. It is important to capture the historical process of Japan’s evolution into a technological society through the process of levee growth.

This study aims to capture the processes of levee growth by developing a "Levee Spatial Database" in Kiso River basin: this system consist of position information of levees in several eras which are manually entered into GIS from a series of historical topographical maps from Meiji era to present. The result shows the processes of levee growth and shrinkage with changing land use and increasing population in the flood-prone area. We will discuss the phenomena and mechanisms of levee growth/shrinkage in the view of feedbacks between physical and social processes of changing society in Japan.

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