

## RELATIONSHIP BETWEEN ATMOSPHERIC-OCEANIC INDICES AND PRECIPITATION DURING HEAVY RAIN SEASON IN FUKUOKA, JAPAN

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The latest years have displayed a considerable interest in the relationships between global atmospheric-oceanic phenomena and local water resources. Qualitative and quantitative analyses of these phenomena and their influence on local hydro-meteorological events are important to predict future available water resources. Global atmospheric-oceanic phenomena can be represented using atmospheric-oceanic indices. Some of them are Southern Oscillation Index (SOI), Pacific Oscillation Index (PDOI), North Pacific Index (NPI), and Dipole Mode Index (DMI) (see e.g. Kawamura *et al.*, 2003 and 2004). Especially, the impacts of El Niño Southern Oscillation (ENSO) phenomenon on climate are widespread and beyond the tropical Pacific, a phenomenon known as teleconnection. ENSO has been considered by many literatures to cause anomalous weather conditions globally. There are many studies on the relationship between SOI and local hydro-meteorological phenomena. However, much less studies about the influence of other proposed indices on local events have been carried out, especially ones aiming at Japan region.

The rainfall data in Fukuoka city, which is located in the northern part of Kyushu Island in Japan, is used in this study. Fukuoka city is vulnerable to drought and the city has been affected by severe droughts in 1978 and 1996 (for details refer to Kawamura and Jinno). Therefore the analysis of rainfall in this city is vitally important.

The objective of this study is to detect the statistical relationship between four indices mentioned above and rainfall in the city of Fukuoka. Cross correlation analyses between those four indices and the rainfall during heavy rain season in Fukuoka city were conducted in this study. Correlation analyses revealed August rainfall has high correlation with June SOI and February NPI. Above and below normal amount of August rainfall appeared to have some relationship with the phase of SOI and NPI.

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