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メタデータ	言語: 出版者: 琉球大学21世紀COEプログラム 公開日: 2009-04-16 キーワード (Ja): キーワード (En): 作成者: Arakaki, Seiji, Mimura, Izumi, Myint, Ohnmar, Ulomi, Shadrack, Sekadende, Baraka, Takagi, Kimberly K., Higuchi, Tomihiko, Fujimura, Hiroyuki, Matoba, Kana, Kobayashi, Shusei, Tsurumi, Ryota, Cohen, Itay, Koren, Shachar, Oomori, Tamotsu, Tsuchiya, Makoto メールアドレス: 所属:
URL	http://hdl.handle.net/20.500.12000/9860

PE-2 Short-term temporal and spatial dynamics of nutrients and organic materials in the island river systems of Okinawa, Japan

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The movement of materials between ecosystems is a common process in nature. Rivers transport materials via water movement and connect terrestrial and marine ecosystems. In addition, abiotic transportation processes are modified by biotic process (i.e. photosynthesis, respiration, feeding, excretion and migration). Thus, the shorter, narrower features of Island river systems probably have unique functions and processes in regards to material transportation to the marine environment. Although knowledge of river ecosystems are necessary for a comprehensive understanding of island ecosystems, there is a paucity of basic information. The purpose of the present study is to clarify temporal and spatial dynamics of materials in island river systems. This study was conducted in two rivers on Okinawa Island. Genka River is surrounded by natural forest while Mukue River is under intensive human activity. We measured diurnal and spatial variations in water temperature, pH, DO, ORP, currents and nutrients (nitrate and ammonium) at four sites in each river (upper, middle, river mouth surface and bottom). Floating and deposited plant materials were observed in Genka River. Litter bags were used to assess leaf decomposition over a three week period. Nutrients in Mukue River were 10-100 times higher than those in Genka River. This is clearly due to anthropogenic influx from the basin. With respect to spatial variation within a river, both nitrate and ammonium showed higher concentrations in the middle sites, except ammonium in Genka River. Day-night variation of nutrient dynamics was obscure at both rivers, but fluctuation with the tide was detected in both the river mouth surface areas; high concentrations occurred at low tide. Leaves were decomposed by about 40% of the initial weight over three weeks, however there were no significant differences between sites. The C/N ratio gradually decreased at all the sites except for the upper stream.