

## The mechanism of suspended sediment load from a forested drainage basin

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The sediment load of a river is related to the transport, erosion and deposition of nutrient and organic matter. Thus, up to date, many researchers have been exploring the relationship between sediment load and ecosystem. In order to clarify the mechanism of suspended sediment load, this study focused on the hysteresis between the time series of the discharge and suspended sediment concentration in the Oikamanai River, Tokachi, Hokkaido. As a result, the "later type", where a peak suspended sediment concentration precedes a peak discharge, and the "simultaneous type", where both the peaks appear simultaneously, were observed during rainfall runoffs of the Oikamanai River. The later type was observed in 2009 and 2010 with three rainfall runoffs of 8-10 m<sup>3</sup>/s, while the simultaneous type was seen in 2011 with small rainfall runoffs of less than 5 m<sup>3</sup>/s except for two typhoon events. The later type is possibly due to the soil erosion on the basin slope by throughflow, while the simultaneous type is probably caused by the erosion of sediment accumulated in the river channel during non-rainfalls.

Keywords: forested drainage basin, suspended sediment load, hysteresis, throughflow, typhoon event

## Discharge and sediment load from a subarctic river basin: the Tanana River, Alaska

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The time series of discharge and sediment load from the subarctic Tanana River basin, Alaska, were simulated by a tank model. As a result, the simulations are reasonable, and hence, the contributions of glacier-melt runoff and glacier-melt sediment runoff to the Tanana discharge and sediment load were quantified at 26 - 57 % and 76 - 94 %, respectively.

Keywords: Glacier-melt runoff, sediment load, POC, PON, Permafrost, Snowmelt runoff

## Contribution of detrital materials from the Yukon River to the continental shelf sediments of the Bering Sea

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Bering Sea sediments contain detrital materials from the Yukon River. These materials may contain records of past climate changes in the Arctic area, such as the melting of glaciers around the drainage basin of the Yukon River, which help to understand hydrological cycle in this area. In the Bering Sea, however, the spatial extent and pattern of the detrital materials supplied from the Yukon River is not yet fully understood due to the lack of proxy. For better discrimination of the detrital materials from the Yukon Rivers, we focused on quartz, because it is the major component of both the silt- and sand-sized populations of detrital materials from the Yukon River (Eberl, 2004) and because it is resistant to chemical alteration and physical ablation by weathering, transport, and diagenesis. We adopted two parameters of quartz, the electron spin resonance signal intensity of its E1' center (Toyoda and Hattori, 2000) and its crystallinity index (Murata and Norman, 1976), and characterized the quartz in different sizes derived from the Yukon River. We then estimated the spatial pattern of quartz contributed by the Yukon River on the Bering Sea shelf by applying the method to core-top samples from the continental shelf and slope of the eastern Bering Sea.

The results showed a large contribution of sand-sized quartz from the Yukon River to wide areas of the continental shelf and slope, whereas contributions of clay- to silt-sized quartz from the Yukon River were small, except on the northeastern shelf. These spatial distribution patterns suggest that sand-sized quartz was repeatedly reworked and transported by processes such as storm surges to the outer continental shelf, whereas the clay- to silt-sized quartz on the northeastern shelf was supplied, as suspended materials, directly from the Yukon River. Therefore, the clay- to silt-sized quartz on the northeastern continental shelf probably records past climate changes related to the amount and intensity of the Yukon River discharge, whereas the sand-sized quartz in the eastern Bering Sea probably records variations of stormy weather.

Keywords: Yukon River, Bering Sea, Quartz, Electron Spin Resonance, Crystallinity

## Treatment Facilities for Hygienic Fish Market Wastewater

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Hygienic fish market in Indonesia is now being developed to have better products and healthy condition in the fishermen and vendors community. Inefficiency and inappropriate of wastewater treatment facilities can cause the water quality of the coastal nearby becomes deteriorated. In this research, we investigate the fish market activities condition in related to the wastewater generated. Samples were taken from wastewater generated by washing activities in Cituis Fish Market; thus the dominant parameters need to be treated can be determined. Data of wastewater quality was collected also from previous researches. The results show that BOD, COD, TSS, E.Coli, oil, and grease concentration have to be reduced to meet the government standard. Determination on treatment unit was conducted by considering the availability of land, user-friendly technology, treatment capacity, low-cost maintenance, and side-product potency. The recommended wastewater treatment unit is called up-flow modified septic tank. Trickling filter is installed to modify the conventional septic tank in order to increase the biological processes inside the tank. Sedimented waste in septic tank chamber can be used for other purposes such as manure and pellet.

Keywords: wastewater treatment facility, fish market wastewater, modified septic tank

## Estimating phosphate supply via submarine groundwater discharge in Osaka bay, Japan.

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Nutrient condition in water environment controls the ecosystem. Groundwater discharge to the oceans is significant as nutrient supply (Slomp et al, 2004 etc). Especially, phosphorus and silica concentration generally are relatively high in coastal area. However, it has not been enough to confirm the source of phosphorus in coastal groundwater in previous studies. This study aims to confirm hydrogeological properties in coastal groundwaters, and estimate the possible phosphorus sources of groundwater.

The study areas are Osaka, Marugame, Okayama, and Fukuyama alluvial plains and small island groundwaters in Hiroshima prefecture. We arranged hydrogeological and groundwater quality data sets in previous studies of Hiroshima University. The phosphorus concentrations were high in anoxic condition. In addition, shallow aquifers around alluvial clay had high concentrations. The phosphorus contents in alluvial sediments of Okayama plain were relatively high around alluvial clay. These results suggest the contribution of phosphorus from alluvial sediment to groundwater.

Keywords: submarine groundwater discharge, phosphate, semi-enclosed bay