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Total nitrogen concentration in suspended sediment yield for three Apennine torrents: relationships and comparison among basins

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Suspended sediment yield is known to imply several detrimental consequences: soil losses from agricultural land, clogging of water supply filters and reservoir siltation. Notwithstanding, suspended sediment yield represents an important factor in preventing maritime shore erosion and a resource for sea bottoms. Surface stream, along with groundwater, is also among the main vector for pollutants and nutrients: various studies have proved already how nitrogen content has been constantly rising in aquifers and surface waters [Böhlke and Denver, 1995] and how the natural cycle of nitrogen has been modified because of fertilizers and sewage [Vitousek et al., 1997]. Finer particles and their aggregates have been proved to be the preferential vehicle for particulate nitrogen [Droppo et al., 1997; Ongley et al., 1992]. An on-going suspended sediment monitoring programme on 3 Apennine Torrents has collected more than 1000 river-water samples in the last 7 years. The rising interest for nutrients migration and the availability of many suspended sediment samples have led to the analysis for total nitrogen on the specimens collected during year 2003. The monitored watersheds, although very close, present different lithological conditions and anthropization levels. Suspended sediment yield, grain size distribution and total nitrogen concentration have been analysed. First results confirm the presence of a direct relationship between nitrogen concentration and finer particle concentration ($<$ 20 mm), whereas an inverse proportionality seems to exist between total nitrogen concentration and the presence of coarser fraction (20-50 mm). Relationships of nitrogen concentration with soil use and agricultural and industrial activity are expected to exist, possibly with the presence of a seasonality component. The total nitrogen measured corresponds to the nitrogen present in the particulate and therefore almost insoluble: this form of nitrogen may be considered as agronomically useful and with minor impact on surface waters quality.

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