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Coupling river hydrochemical information with catchment properties for multi-scale-analysis of lateral matter fluxes in the Earth system

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Over the last decade the number of regional to global scale studies of river chemical fluxes and their steering factors increased rapidly, entailing a growing demand for appropriate databases to calculate mass budgets, to calibrate models, or to test hypotheses [1, 2]. Research applying compilations of hydrochemical data are related to questions targeting different time and spatial scales, as for example the annual to centennial scale. In focus are often the alteration of land-ocean matter fluxes due anthropogenic disturbance, the climate sensitivity of chemical weathering fluxes [3], or nutrient fluxes and their evolution [2, 4].
We present an overview of the GLObal RIver CHemistry database GLORICH, which combines an assemblage of hydrochemical data from varying sources with catchment characteristics of the sampling locations [1]. The information provided include e.g. catchment size, lithology, soil, climate, land cover, net primary production, population density and average slope gradient. The data base comprises 1.27 million samples distributed over 17,000 sampling locations [1].
It will be shown how large assemblages of data are useful to target some major questions about the alteration of land ocean element fluxes due to climate or land use change while coupling hydrochemical data with catchment properties in a homogenized database.
An extension by isotopic data will be in the focus of future work [c.f. 5]. Further, applications in climate change studies for understanding feedbacks in the Earth system will be discussed [6].

References:

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