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Presenting the GEMS-GLORI, a compendium of world river discharge to the oceans

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Abstract The GEMS-GLORI register, circulated by UNEP for review in 1996, lists 555 world major rivers discharging to oceans ($Q > 10$ km^3 year^{-1}, or $A > 10\,000$ km^2, or sediment discharge > 5Mt year^{-1}, or basin population > 5M people). Up to 48 river attributes are listed, including major ions and nutrients (C, N, P) in both dissolved, particulate, organic and inorganic forms. For many rivers, two or three sets of data are provided with relevant periods of records and references. Although half of the selected rivers are not yet documented for water quality, most of the first 40 rivers are well described (Irrawady, Zambezi, Ogooue, Magdalena, are noted exceptions). Altogether about 10 000 individual data from 500 references are listed. The global coverage in terms of river discharge and/or drainage area ranges from 40 to 67% for most major water quality attributes but drops to 25% for some organic and/or particulate forms of N and P. Planned development of the register includes collection of information on particulate chemistry and data on endorheic rivers and selected tributaries.

INTRODUCTION

Fluvial transport provides unique information on processes and rates of chemical weathering and mechanical erosion, (Walling & Webb, 1983; Meybeck, 1996). Water quality is also an integrated indicator of global environmental change and of local and regional environmental pollution impacts (Meybeck *et al.*, 1989). The Global Water Quality Monitoring Programme of UNEP/WHO/UNESCO/WMO, GEMS/WATER, was the first programme of its kind to address global issues of water quality through a network of monitoring stations in rivers and other water bodies on all continents (Fraser *et al.*, 1995). Recognizing the large quantity of pollutants carried from the land by rivers, the GEMS/WATER programme agreed to collect and to systematize published documentation on river fluxes to oceans. Early attempts were undertaken by Clarke (1924) and by IAHS (Durum *et al.*, 1960), Livingstone (1963) and UNESCO in the 1970s. The latter included a World Register of River Inputs (WORRI), and several contributions to the UNEP Regional Seas programme prepared for the Mediterranean, the Gulf of Guinea, the Caribbean and the Southeast Asian Seas. Considering the growing demand for riverine data (GESAMP, 1987), a new global register named GLORI (Global River Index), listing *c.* 1000 rivers with their basic river basin characteristics, total suspended solids and total dissolved solids, was issued by IGBP/LOICZ in April 1995 (Milliman *et al.*, 1995). In parallel, as agreed between IGBP/LOICZ and GEMS/WATER, another register was established on somewhat expanded grounds by the authors of the present paper (Meybeck & Ragu, 1996). This register, known as the GEMS/WATER Global Register of Rivers Inputs (GEMS-GLORI), is the first contribution made by this programme to the land-based sources issue.