

Annual fluxes of sediment-associated trace/major elements, carbon, nutrients and sulfur from US coastal rivers

ARTHUR J. HOROWITZ¹, VERLON C. STEPHENS², KENT A. ELRICK¹ & JAMES J. SMITH¹

*¹ US Geological Survey, Peachtree Business Center, 3039 Amwiler Road, Atlanta, Georgia 30360, USA
horowitz@usgs.gov*

² US Geological Survey, Denver Federal Center, Building 53, MS 415, Lakewood, Colorado 80225, USA

Abstract About 260–270 Mt of suspended sediment are discharged annually from the conterminous USA; approximately 69% derives from Gulf rivers (n = 36), 24% from Pacific rivers (n = 42), and 7% from Atlantic rivers (n = 54). Elevated sediment-associated chemical concentrations relative to baseline levels occur in the reverse order of sediment discharges: Atlantic rivers (49%) > Pacific rivers (40%) > Gulf rivers (23%). Elevated trace element concentrations (e.g. Cu, Zn) tend to occur in association with present/former industrial areas and/or urban centres, particularly along the northeast Atlantic coast. Elevated nutrient concentrations occur along both the Atlantic and Gulf coasts, but are dominated by rivers in the urban northeast and by southeastern and Gulf coast “blackwater” streams. Elevated Ca, Mg, K and Na levels appear to reflect local petrology whereas elevated Ti, S, Fe, and Al concentrations are ubiquitous, possibly because they have both natural and anthropogenic sources. Almost all the elevated sediment-associated chemical concentrations/fluxes are lower than worldwide averages.

Key words fluvial sediment-associated constituents; annual fluxes; conterminous USA