



References

- Agarwal A.K., Rizvi M.H., Singh I.B., Chandra, S. (1992) Carbonate deposits in Ganga Plain, In: Gangetic Plain: Terra Incognita (ed. I.B. Singh), Lucknow University, 35-43.
- Agarwal K.K., Singh I.B., Sharma M., Sharma S., Rajagopalan G. (2002) Extensional tectonic activity in the cratonward parts (peripheral bulge) of the Ganga Plain foreland basin, India, *Int J Earth Sci (Geol Rundsch)* 91, 897–905.
- Agarwal R.R. and Gupta R.R. (1968) Saline-alkali soils in India, Indian Council of Agricultural Research, New Delhi, pp.221.
- Ahmad T., Khanna P. P., Chakrapani G. J., Balakrishnan S. (1998) Geochemical characteristics of water and sediment of the Indus river, Trans-Himalaya, India: constraints on weathering and erosion, *J Asian Earth Sci.* 16 333-346
- Ahmad T., Harris N., Bickle M., Chapman H., Bunbury J. and Prince C. (2000) Isotopic constraints on the structural relationships between the Lesser Himalayan Series and the High Himalayan Crystalline Series, Garhwal Himalaya, *Geol. Soc. Am. Bull.* 112, 467-477.
- Albarède F. (1995) Introduction to the Geochemical modeling, Cambridge university press, pp-36.
- Alibert C., Michard A. and Albarede F. (1983) The transition from alkali basalts to kimberlites: Isotope and trace element evidence from melilitites, *Contrib. Mineral. Petrol.*, 82, 176–186.
- Allegre C.J. and Minster J.F. (1978) Quantitative models of trace element behavior in magmatic processes, *Earth Planet. Sci. Lett.* 38,1-25.
- Anderson S.P., Dietrich W.E. and Brimhall G.H. Jr. (2002) Weathering profiles, mass-balance analysis, and rates of solute loss: Linkages between weathering and erosion in a small, steep catchment, 114, 1143–1158.
- Assessment and development study of river basin Series ABSORBS/7/1982-83 (1982) Ganga basin Part-2, Central Board for the Prevention and Control of Water Pollution (CBPCWP), New Delhi.
- Bahadur J. (1997) Himalayan Ecohydrology - An Emerging Subject for Restoration of the Mountain System, Vigyan Prasar, New Delhi, India.
- Banner J.L. (1995) Application of the trace element and isotope geochemistry of strontium to studies of carbonate diagenesis, *Sedimentology*, 42, 805–824.
- Berner E.K. and Berner R.A. (1996) Global Environment: Water, Air and Geochemical Cycles: Prentice Hall, New Jersey, p. 376.
- Berner R.A. (1995) Chemical weathering and its effect on atmospheric CO₂ and climate, *Rev. Mineral.*, 31, 565–583.

- Berner R.A. and Berner E.K. (1997) Silicate weathering and climate. (in W.F. Ruddiman, Eds), *Tectonic Uplift and Climate Change*, Plenum, New York 354–365.
- Berner R.A. and Rao J.L. (1994) Phosphorus in sediments of the Amazon river and estuary: Implications for global flux of phosphorus to the sea, *Geochim. Cosmochim. Acta*, 58, 2333-2339.
- Berner R.A., Lasaga A.C., and Garrels R.M. (1983) The carbonate–silicate geochemical cycle and its effect on atmospheric carbondioxide over the past 100 million years, *Am. J. Sci.* 284, 641–683.
- Bhargava G.P. and Bhattacharjee J.C. (1982) Morphology, genesis and classification of salt affected soils, In: *Review of Soil Research in India, Part II*, Indian Society of Soil Science, New Delhi, pp. 508-528.
- Bhargava G.P., Paul D.K., Kapoor B.S. and Goswami S.C. (1981) Characterstics and genesis of some sodic soils in the Indo-Gangetic alluvial plain of Haryana and Uttar Pradesh , *Jour. Ind. Soc. Soil Sci.* 29, 60-71.
- Bhushan R., Dutta K., Somayajulu B.L.K. (2001) Concentrations and burial fluxes of organic and inorganic carbon on the eastern margins of the Arabian Sea, *Mar. Geol.* 178, 95-113.
- Bickle M. J., Harris N.B.W., Bunbury J.M., Chapman H.J., Fairchild I.J. and Ahmed T. (2001), Controls on the $^{87}\text{Sr}/^{86}\text{Sr}$ Ratio of Carbonates in the Garhwal Himalaya, Headwaters of the Ganges, *J. Geol.* 109, 737–753.
- Bickle M.J., Bunbury J., Chapman H.J., Harris N.B.W., Fairchild I.J., and Ahmad T. (2003) Fluxes of Sr into the headwaters of the Ganges, *Geochim. Cosmochim. Acta* 67, 2567–2584.
- Bickle M.J., Chapman H.J., Bunbury J., Harris N.B.W., Fairchild I.J., Ahmad T. and Pomiès C. (2005) Relative contributions of silicate and carbonate rocks to riverine Sr fluxes in the headwaters of the Ganges, *Geochim. Cosmochim. Acta* 69, 2221-2240
- Blum J.D., Gazis C.A., Jacobson A.D., Chamberlin C.P. (1998) Carbonate versus silicate weathering in the Raikhot watershed within the High Himalayan Crystalline Series, *Geology* 26, 411–414
- Bluth G.J.S. and Kump L.R. (1994) Lithologic and climatologic controls of river chemistry. *Geochim. Cosmochim. Acta*, 58, 2341-2359
- Bookhagen B. and Burbank D.W. (2006) Topography, relief, and TRMM-derived rainfall variations along the Himalaya, *Geophys. Res. Lett.*, 33, L08405.

- Bouquillon A., France-Lanord C., Michard A., and Tiercelin J.-J. (1990), Sedimentology and isotopic chemistry of the Bengal Fan sediments: The denudation of the Himalaya, in *Scientific Results, Proc. Ocean Drill. Program Ser.*, vol. 116, (eds. J. R. Cochran et al.), pp. 43–58, Ocean Drill. Program, College Station, Tex.
- Burbank D.W., Blythe A.E., Putkonen J., Pratt-Sitaula B., Gabet E., Oskin M., Barros A., and Ojha T.P. (2003) Decoupling of erosion and precipitation in the Himalayas, *Nature*, 426, 652 – 655.
- Burbank, D.W., Leland J., Fielding E., Anderson R.S., Brozovic N., Reid M.R., and Duncan C. (1996), Bedrock incision, rock uplift and threshold hillslopes in the northwestern Himalayas, *Nature*, 379, 505 – 510.
- Burg J.P., Nievergelt P., Oberli F., Seward D., Davy P., Maurin J.C., Diao Z., and Meier M. (1998) The Namche Barwa syntaxis: Evidence for exhumation related to compressional crustal folding, *J. Asian Earth Sci.*, 16, 239– 252.
- Campbell I.H., Reiners P.W., Allen C.M., Nicolescu S., and Upadhyay R. (2005), He-Pb double dating of detrital zircons from the Ganges and Indus Rivers: Implication for quantifying sediment recycling and provenance studies, *Earth Planet. Sci. Lett.*, 237, 402 – 432.
- Canfield D.E. (1997) The geochemistry of river particulates from the continental USA: Major elements. *Geochim. Cosmochim. Acta* 61, 3349–3365.
- Chabaux F., Granet M., Pelt E., France-Lanord C. and Galy V. (2006) ^{238}U – ^{234}U – ^{230}Th disequilibria and timescale of sedimentary transfers in rivers: Clues from the Gangetic plain rivers. *J. Geochem. Explor.* 88 , 373–375
- Chakrabarti R., Basu A.R. and Chakrabarti A. (2007), Trace element and Nd-isotopic evidence for sediment sources in the mid-Proterozoic Vindhyan Basin, central India, *Precambrian Res.*, 159, 260– 274.
- Chakrapani G.J., Gaillardet J., Dupre B. and Allegre C.J. (2002) Osmium isotopic composition in Ganga river sediments, *Curr. Sci.* 83, 1253-1255.
- Choudhuri B.K, Mukharjee P.K. and Bist K.S (1991) Structural and Geochemical studies across brittle-ductile Shear Zones: A case study of Bhagirathi Valley, Garhwal Himalaya, *J Him. Geol.*, 2, 179-184
- Clift P.D., Lee J.I., Hildebrand P., Shimizu N., Layne G.D., Blusztajn J., Blum J. D., Garzanti E., and Khan A.A. (2002), Nd and Pb isotope variability in the Indus River system: Implications for sediment provenance and crustal heterogeneity in the western Himalaya, *Earth Planet. Sci. Lett.*, 200, 91– 106.

- Colin C., Turpin L., Bertaux J., Desprairies A. and Kissel C., (1999) Erosional history of the Himalayan and Burman ranges during the last two glacial-interglacial cycles, *Earth Planet. Sci. Lett.* 171, 647-660,
- Colin C., Turpin L., Blamart D., Frank N., Kissel C. and Duchamp S. (2006) Evolution of weathering patterns in the Indo-Burman Ranges over the last 280 kyr: Effects of sediment provenance on $^{87}\text{Sr}/^{86}\text{Sr}$ ratios tracer, *Geochem. Geophys. Geosyst.*, 7, Q03007.
- Craddock W.H., Burbank D.W., Bookhagen B. and Gabet E.J. (2007) Bedrock channel geometry along an orographic gradient in upper Marsyandi River valley in central Nepal, *J. Geophys. Res.*, 112, F03007.
- Dadson S.J. et al., (2003) Links between erosion, runoff variability and seismicity in the Taiwan orogen *Nature*, 426, 648-651.
- Dadson, S. J. et al (2003) Links between erosion, runoff variability and seismicity in the Taiwan orogen *Nature* 426, 648-651.
- Dalai T.K. (2001) Major ions, Stable isotopes, $^{87}\text{Sr}/^{86}\text{Sr}$ and Re in the headwaters of the Yamuna: Implications to chemical weathering in the Himalaya, PhD Thesis, M.S.University, Baroda.
- Dalai T.K., Krishnaswami S. and Kumar A. (2003) Sr and $^{87}\text{Sr}/^{86}\text{Sr}$ in the Yamuna River System in the Himalaya: sources, fluxes, and controls on Sr isotope composition *Geochim. Cosmochim. Acta* 67, 2931-2948
- Dalai T.K., Krishnaswami S. and Sarin M.M. (2002) Major ion chemistry in the headwaters of the Yamuna river system: Chemical weathering, its temperature dependence and CO_2 consumption in the Himalaya *Geochim. Cosmochim. Acta*, 66, 3397-3416
- Das A (2005) Geochemical and Isotopic Studies of rivers draining Deccan basalts, Ph. D. thesis, Mohan Lal Sukhadia University, Udaipur, pp. 179.
- Das A. and Krishnaswami S. (2007) Elemental geochemistry of river sediments from the Deccan Traps, India: Implications to sources of elements and their mobility during basalt-water interaction, *Chem. Geol.* 242, 232-254
- Das A., Krishnaswami S., Sarin M.M. and Pande K. (2005). Chemical weathering in the Krishna basin and the western ghats of the Deccan Traps: rates of basalt weathering and their controls. *Geochim. Cosmochim. Acta* 69, 2067-2084.
- Das Gupta S.P., (1975) The upper Gangetic Flood Plain: A regional survey; Calcutta, National Atlas organisation, Monograph, 199p

- Datta S., Thibault Y., Fyfe W.S., Powell M.A., Har B.R., Martin R.R. and Tripathy S. (2002) Occurrence of trona in alkaline soils of the Indo-Gangetic Plains of Uttar Pradesh (U.P.), India: Episodes 25, 236-239
- Deniel C., Vidal P., Fernandez A., Lefort P., and Peucat J.J. (1987) Isotopic study of the manas lgranite (Himalaya, Nepal) :Inferences on the age and source of Himalayan leucogranites, Contrib. Mineral. Petrol. 96, 78–92.
- Derry L.A. and France-Lanord C. (1996) Neogene Himalayan weathering history and river $^{87}\text{Sr}/^{86}\text{Sr}$: Impact on the marine Sr record, Earth Planet. Sci. Lett., 142, 59–74.
- Derry L.A. and France-Lanord C. (1997) Himalayan weathering and erosion fluxes: Climate and tectonic controls, in Tectonic Uplift and Climate Change, (eds W. F. Ruddiman and W. Prell), pp. 90–312, Plenum, New York.
- Devi L. (1992) Climatic characteristics and water balance (A study of Uttar Pradesh) Concept Publishing Company, New Delhi, pp. 207.
- Donald A., (1992) Hydrological Aspects of the Himalayan Region, International Centre for Integrated Mountain Development, Kathmandu. (ICIMOD) Occasional paper no. 18, pp 68
- Dosseto A., Bourdon B., Gaillardet J., Allegre C.J. and N. Filizola (2006) Time scale and conditions of weathering under tropical climate: Study of the Amazon basin with U-series, Geochim. Cosmochim. Acta ,70, 71–89
- Drever J.I. (1997) The Geochemistry of natural waters: Surface and groundwater environments. Prentice Hall New Jersey, pp 436.
- Dupre B., Gaillardet J., Rousseau D., and Allegre C.J. (1996) Major and trace elements of river borne material: The Congo Basin. Geochim. Cosmochim. Acta 60, 1301–1321.
- Edmond J. M. (1992) Himalayan tectonics, weathering processes, and the strontium isotope record in marine limestone, Science 258, 1594-1597.
- Edmond J.M. and Huh Y. (1997) Chemical weathering yields in hot and cold climates, in Tectonic Uplift and Climate Change (eds. W.F. Ruddiman and Prell), Plenum Press, New York, 329-351.
- Edmond, J. M., Palmer M. R., Measures C. I., Grant B. and Stallard R. F. (1995) The fluvial geochemistry and denudation rate of the Guayana Shield in Venezuela, Colombia, and Brazil, Geochim. Cosmochim. Acta, 59, 3301-3325.
- English N. B., Quade J., Decelles P. G. and Garzione C. N. (2000) Geologic control of Sr and major element chemistry in Himalayan Rivers, Nepal, Geochim. Cosmochim. Acta ,64, 2549–2566,

- Evans M.J., Derry L.A., Anderson S.P., and France-Lanord C. (2001) Hydrothermal source of radiogenic Sr to Himalayan rivers, *Geology* 29, 803–806.
- Faure G. (1986) *Principles of Isotope Geology*. 2nd ed. John Wiley, New York, pp. 589
- Faure, G. (1986) *Principles of Isotope Geology*. 2nd ed. John Wiley, New York, 589 pp.
- Fedo C.M., Nesbitt H.W. and Young G.M. (1995) Unraveling the effects of potassium metasomatism in sedimentary rocks and paleosols, with implications for paleoweathering conditions and provenance. *Geology* 23, 921–924.
- Fekete B.M., Vorosmarty C.J. and Grabs W. (2004), *Composite Runoff Fields*, version1.0.
- Finlayson D.P., Montgomery D.R. and Hallet B. (2002) Spatial coincidence of rapid inferred erosion with young metamorphic massifs in the Himalayas, *Geology*, 30, 219 – 222.
- Finnegan N.J., Hallet B., Montgomery D.R., Zeitler P.K., Stone J.O., Anders A.M. and Yuping L. (2008) Coupling of rock uplift and river incision in the Namche Barwa–Gyala Peri massif, Tibet, *Geol. Soc. Am. Bull.*, 120, 142–145.
- Foster G.L. and Carter A. (2007) Insights into the patterns and locations of erosion in the Himalaya—A combined fission-track and in situ Sm-Nd isotopic study of detrital apatite, *Earth Planet. Sci. Lett.*, 257, 407–418.
- France Lanord C. and LeFort P.(1988) Crustal melting and granite genesis during the Himalayan collision orogenesis. *Trans. R. Soc. Edinburg, Earth Sci.* 79,183–195.
- France-Lanord C. and Derry L.A. (1997) Organic carbon burial forcing of the carbon cycle from Himalayan erosion , *Nature* 390, 65-67.
- France-Lanord C., Derry L.A. and Michard A. (1993) Evolution of the Himalaya since Miocene time: isotopic and sedimentological evidence from the Bengal fan, in *Himalayan tectonics*, (Eds. Treolar P.J., Searle M.P.) Special Publication, Geological Society, London, 603-621.
- France-Lanord C., Michard A., Bouquillon A., and Tiercelin J.-J. (1990) Isotopic chemistry and sedimentology of the Bengal fan sediments: The denudation of the Himalaya, *Chem. Geol.*, 84, 368– 370.
- France-Lanord, C., and Derry L. A. (1994), $\delta^{13}\text{C}$ of OC in the Bengal Fan: Source evolution and transport of C3 and C4 plant carbon to marine sediments, *Geochim. Cosmochim. Acta*, 58, 4809–4814.

- Gaillardet J., Dupre B. and Allegre C.J. (1995) A global geochemical mass budget applied to the Congo basin rivers: Erosion rates and continental crust composition, *Geochim. Cosmochim. Acta* 59, 3469–3485.
- Gaillardet J., Dupre B. and Allegre C.J. (1999b) Geochemistry of large river suspended sediments: Silicate weathering or recycling tracer, *Geochim. Cosmochim. Acta* 63, 4037–4051.
- Gaillardet J., Dupre B., Allegre C.J. and Negrel P. (1997) Chemical and physical denudations in the Amazon river basin, *Chem. Geol.* 142, 141–173.
- Gaillardet J., Dupre B., Louvat P. and Allegre C.J. (1999) Global silicate weathering and CO₂ consumption rates deduced from the chemistry of large rivers, *Chem. Geol.* 159, 3–30.
- Galy A. (1999) Etude Geochimique de l'Erosion Actuelle de la Chaîne Himalayenne, Ph.D. Thesis, Institut National Polytechnique de Lorraine.
- Galy A. and France-Lanord C. (1999) Weathering processes in the Ganges-Brahmaputra basin and the riverine alkalinity budget, *Chem. Geol.*, 159, 31–60.
- Galy A. and France-Lanord C. (2001), Higher erosion rates in the Himalaya: Geochemical constraints on riverine fluxes, *Geology*, 29, 23–26.
- Galy A., France-Lanord C. and Derry L.A. (1996) The Late Oligocene-Early Miocene Himalayan belt: Constraints deduced from isotopic compositions of Early Miocene turbidites in the Bengal Fan, *Tectonophysics*, 260, 109–118.
- Galy A., France-Lanord, C. and Derry L.A. (1999) The strontium isotopic budget of Himalayan rivers in Nepal and Bangladesh, *Geochim. Cosmochim. Acta*, 63, 1905–1925.
- Galy V., France-Lanord C., Beyssac O., Faure P., Kudrass H. and Palhol F. (2007a) Efficient organic carbon burial in the Bengal fan sustained by the Himalayan erosional system, *Nature* 450, 407–410.
- Gansser A. (1964) *Geology of the Himalayas*. Wiley Interscience publishers, London, pp284.
- Garrels R. M. and Mackenzie F. (1971) *Evolution of sedimentary rocks*: W. W. Norton, New York, pp 397.
- Garzanti E., Vezzoli G., Ando S., France-Lanord C., Singh S.K., and Foster G. (2004) Sand petrology and focused erosion in collision orogens: The Brahmaputra case, *Earth Planet. Sci. Lett.*, 220, 157–174.

- Garzanti E., Vezzoli G., Ando S., Lave J., Attal M., France-Lanord C., and DeCelles P. (2007) Quantifying sand provenance and erosion (Marsyandi River, Nepal Himalaya), *Earth Planet. Sci. Lett.*, 258, 500 – 515.
- Garzanti E., Vezzoli G., Ando S., Paparella P., and. Clift P.D (2005) Petrology of Indus River sands: A key to interpret erosion history of the Western Himalayan Syntaxis, *Earth Planet. Sci. Lett.*, 229, 287–302.
- Gislason S.R., Oelker E.H. and Snorrason A. (2006) Role of river suspended material in the global carbon cycle. *Geology* 34, 49–52.
- Goldsmith E. And Hildyard N. (1984) Salting the earth: the problem of salinisation, The social and environmental effects of large dams, Volume 1. Overview, Cornwall PL32 9TT, UK.
- Goodbred S.L. Jr. (2003) Response of the Ganges dispersal system to climate change: A source-to-sink view since the last interstade, *Sediment. Geol.*, 162, 83–104.
- Granet, M., Chabaux, F., Stille, P., France-Lanord, C., Pelt, E., 2007. Time-scales of sedimentary transfer and weathering processes from U-series nuclides: clues from the Himalayan rivers. *Earth Planet. Sci. Lett.* 261, 389–406.
- GRDC, www.grdc.sr.unh.edu.
- Gupta L.P. and Subramanian V. (1994) Environmental Geochemistry of the river Gomti: a tributary of the river Ganges. *Environ. Geol.* 24, 235–243.
- Gupta, L.N, Ghildial H. and Chawala H.S. (1994) Petrochemistry and tectonic environment of Granites and porphyries of Amritpur –Ramgarh area, Lesser Himalaya, Uttar Pradesh, *J Him. Geol.*, 5, 103-116
- Gupta, S. (1997), Himalayan drainage patterns and the origin of fluvial megafans in the Ganges foreland basin, *Geology*, 25, 11 – 14.
- Hameed A, Jawad M. Obaidy Al, and Joshi H. (2006) Chemical composition of rainwater in a tropical urban area of northern India, *Atmospheric Environment*, 40, 6886-6891
- Harris N., Bickle M., Chapman H., Fairchild I. and Bunbury J. (1998) The significance of Himalayan rivers for silicate weathering rates; evidence from the Bhote Kosi tributary. *Chem. Geol.* 144, 205– 220.
- Hay W.W. (1998) Detrital sediment fluxes from continents to oceans, *Chem. Geol.* 145, 287–323.
- Hodges K.V., Wobus C., Ruhl K., Schildgen T. and Whipple K. (2004), Quaternary deformation, river steepening, and heavy precipitation at the front of the higher Himalayan ranges, *Earth Planet. Sci. Lett.*, 220, 379– 389.

- Holeman J.N. (1968) Sediment yield of major rivers of the world, *Water Resour. Res.* 4, 737-747.
- Holland H. D. (1978) *The Chemistry of the Atmosphere and Oceans*. Wiley-Interscience, New York.
- Horwitz, E.P., Chiarizia, R., and Dietz, M.L. (1992) A novel strontium-selective extraction chromatographic resin. *Solv. Extract. Ion Exch.*, 10: 313-336.
- Hren M.T., Chamberlain P.C, Hilley G. E., Blisniuk P.M. Bookhagen B. (2007) Major ion chemistry of the Yarlung Tsangpo–Brahmaputra river: Chemical weathering, erosion, and CO₂ consumption in the southern Tibetan plateau and eastern syntaxis of the Himalaya, *Geochim. Cosmochim. Acta*, 71, 2907–2935
- http://disc2.nascom.nasa.gov/Giovanni/tovas/TRMM_V6.3B43.shtml
- http://rbis.sr.unh.edu/explorer/basin.cgi?basin=00000&bounds=75,90,19,34&point=0.00,0.00&type=eh_discharge_pristine&date=&town=1&pot=0&map_switch=1
- <http://www.grdc.sr.unh.edu>, (2004) Global Runoff Data Cent., Koblenz, Germany.
- <http://www.tropmet.res.in>
- Huh Y. (2003) Chemical weathering and climate - a global experiment: A review, *Geosciences Journal*, 7, 277-288.
- Huh Y. and Edmond J.M. (1998) On the interpretation of the oceanic variations in ⁸⁷Sr/⁸⁶Sr as recorded in marine limestones, *Proc. Ind. Acad. Sci., (Earth and Planetary Sciences)* 107, 293-305.
- Huntington K.W., Blythe A.E. and Hodges K.V. (2006), Climate change and Late Pliocene acceleration of erosion in the Himalaya, *Earth Planet. Sci. Lett.*, 252, 107–118.
- Hydroelectric Power Development Project (1982), Feasibility study report on Sapt Gandaki hydroelectric power development project, Nepal, report, His Majesty's Government of Nepal, Katmandu.
- Islam M.R., Begum S.F., Yamaguchi Y. and Ogawa K. (1999) The Ganges and Brahmaputra rivers in Bangladesh: Basin denudation and sedimentation, *Hydrol. Process.*, 13, 2907 – 2923.
- Ittekkot V. and Laane R.W.P.M. (1991) Fate of riverine particulate organic matter in Biogeochemistry of Major World Rivers, (eds. Degens E. T., Kempe S., and Richey J. E.) *SCOPE 42*, Wiley & Sons, Chichester, 233–243.
- Ittekkot V., Safiullah S., Mycke B. and Seifert R. (1985), Seasonal variability and geochemical significance of organic matter in the river Ganga, Bangladesh, *Nature*, 317, 800– 802.

- Ittekkot, V., and B. Haake. 1990. The terrestrial link in the removal of organic carbon in the sea. Pp. 318–325 in *Facets of modern biogeochemistry* (eds. V. Ittekkot, S. Kempe, W. Michaelis, and A. Spitzy. Heidelberg) Springer-Verlag.
- Jacobson A. D. and Blum J. D. (2000) Ca/Sr and $^{87}\text{Sr}/^{86}\text{Sr}$ geochemistry of disseminated calcite in Himalayan silicate rocks from Nanga Parbat: Influence on river-water chemistry. *Geology*, 28, 463–466.
- Jacobson A. D., Blum J. D., and Walter L. M. (2002) Reconciling the elemental and Sr isotope composition of Himalayan weathering fluxes: Insights from the carbonate geochemistry of stream waters. *Geochim. Cosmochim. Acta*, 66, 3417-3429.
- Jacobson A.D. and Blum J.D. (2003) Relationship between mechanical erosion and atmospheric CO_2 consumption in the New Zealand southern Alps, *Geology*, 31, 865-868.
- Jain V. and Sinha R. (2003) River systems in the Gangetic plains and their comparison with the Siwaliks: A review, *Curr. Sci.*, 84, 1025– 1033.
- Jha P.K. Subramanian V., Sitaswad R., and van Grieken R. (1990) Heavy metals in sediments of the Yamuna River (A tributary of the Ganges), India. *Sci. Tot. Environ.* 95, 7-27.
- Kansakar S.R. and Acharya R.C. (1990) Soil erosion and sedimentation in rivers of Nepal, paper presented at Workshop on Field Measurement of Sediment in Rivers and Reservoirs, Bangkok, 17 – 21 Dec .
- Kaur M. and Chamyal L. S. (1996) The granitoids of Pindar-Sarju- Ramganga and Goriganga valleys of higher Kumaun Himalaya, *J.Geol. Soc. India*, 47, 665–674.
- Kayal J.R. (2001) Microearthquake activity in some parts of the Himalaya and the tectonic model, *Tectonophysics*, 339, 331 – 351, doi:10.1016/ S0040-1951(01)00129-9.
- Keil R.G., Mayer L.M., Quay P.D., Richey J.E. and Hedges J.I. (1997), Loss of organic matter from riverine particles in deltas, *Geochim. Cosmochim. Acta*, 61, 1507–1511.
- Krishnan M.S. (1982) *Geology of India and Burma*, 6th addition, CBS Publishers & distributors, New Delhi, pp 536.
- Krishnaswami S. and Singh S. K. (1998) Silicate and carbonate weathering in the drainage basins of the Ganga-Ghaghara-Indus head waters: Contributions to major ion and Sr isotope geochemistry, *Proc. Indian Acad. Sci.* 107, 283–291.
- Krishnaswami S. and Singh S.K. (2005) Chemical weathering in the river basins of the Himalaya, India, *Curr.Sci.* 89, 841-849.

- Krishnaswami S., Singh S.K. and Dalai T. (1999) Silicate weathering in the Himalaya: Role in contributing to major ions and radiogenic Sr to the Bay of Bengal. In Ocean Science, Trends and Future Directions, (ed. B.L.K. Somayajulu) Indian National Science Academy and Akademia International, New Delhi, pp 23–51
- Krishnaswami S., Trivedi J. R., Sarin M.M., Ramesh R. and Sharma K.K. (1992) Strontium isotope and rubidium in the Ganga-Brahmaputra river system: Weathering in the Himalaya, Fluxes to Bay of Bengal and contribution to the evolution of oceanic $^{87}\text{Sr}/^{86}\text{Sr}$, Earth Planet. Sci. Lett. 109, 243–253.
- Krom M. D and Berner R.A. (1983) A Rapid Method for the Determination of Organic and Carbonate Carbon in Geological Samples, J. Sed. Petrol, 53, 660–663.
- Kumar G. (2005) Geology of Uttar Pradesh and Uttaranchal, Geological Society of India, Bangalore, pp 283.
- Kump L.R., Brantley S.L. and Arthur M.A., (2000) Chemical weathering, atmospheric CO_2 , and climate, Ann. Rev. Earth Planet. Sci., 28, 611–667.
- Kump LR. (2002). Reducing uncertainty about carbon dioxide as a climate driver. Nature, 419, 188–190.
- Lal D., Harris N.B.W., Sharma K.K., Gu Z., Ding L., Liu T., Dong W., Caffee M.W. and Jull A.J.T. (2004) Erosion history of the Tibetan Plateau since the last interglacial: Constraints from the first studies of cosmogenic ^{10}Be from Tibetan bedrock, Earth Planet. Sci. Lett. 217, 33–42,
- Lave J., and Avouac J. P. (2001) Fluvial incision and tectonic uplift across the Himalayas of central Nepal, J. Geophys. Res., 106, 26,561–591.
- Le Fort P. (1975) Himalayas: The collided range, present knowledge of the continental arc, Am. J. Sci., 275, 1 –44.
- Le Fort P. (1975) Recent Res. Geology, 2 pp-199
- Le Fort P., Debon F., Sonet J., and Shams F.A. (1983) The lower Paleozoic Lesser Himalayan granitic belt: Emphasis on the Simchar pluton of central Nepal. In Granites of the Himalayas Karakorum and Hindu Kush (ed. F.A. Shams), pp. 235–255. Institute of Geology, Punjab University, Lahore.
- Leland J., Reid M.R., Burbank D.W., Finkel R. and Caffee M. (1998), Incision and differential bedrock uplift along the Indus River near Nanga Parbat, Pakistan Himalaya, from ^{10}Be and ^{26}Al exposure age dating of bedrock straths, Earth Planet. Sci. Lett., 154, 93 – 107.

- Louvat P. and Allegre C.J. (1997) Present denudation rates on the island of Reunion determined by river geochemistry: Basalt weathering and mass budget between chemical and mechanical erosions. *Geochim.Cosmochim. Acta* 61, 3645–3669.
- Louvat P. and Allegre C.J. (1998) Riverine erosion rates on Sao Miguel volcanic island, Azores archipelago. *Chem. Geol.* 148, 177–200.
- Ludwig W. and Probst J.L (1998) River sediment discharges to the oceans: present-day controls and global budgets, *Am. J. Sci.* 298, 265–295.
- Ludwig W., and Probst, J.L, (1998) River sediment discharges to the oceans: present-day controls and global budgets, *Am. J. Sci.* 298, 265–295.
- Mahoney J. (1988) Deccan traps, petrology and structural geology, in *Continental Flood Basalts*, (ed J. D. Macdougall), Springer, New York, pp. 151– 194.
- Martin J. M. and Meybeck M. (1979) Elemental mass-balance of material carried by major world rivers. *Mar. Chem.*, 7, 173–206.
- McCauley S. E. and DePaolo D. J. (1997) The marine $^{87}\text{Sr}/^{86}\text{Sr}$ and $\delta^{18}\text{O}$ records, Himalayan Alkalinity Fluxes and Cenozoic climate models. In: *Tectonic Uplift and Climate change* (ed. W. F. Ruddiman), Plenum Press, New York, 428–467.
- McLennan S. M. (1993) Weathering and global denudation. *J. Geol.* 101, 295–303.
- Mehta, P.K. (1977) Rb-Sr geochronology of the Kulu-Mandi belt: Its implications for the Himalayan tectono genesis, *Geol. Rundschau.* 66,156–175.
- Meybeck M. (1979) Concentration des eaux fluviales en elements majeurs et apports en solution aux oceans. *Rev. Geol. Dyn. Geogr. Phys.* 21, 215–246.
- Meybeck M. (2005) Global occurrence of major elements in rivers, in *Surface and Groundwater, Weathering, and Soils* (ed. J.I. Drever), *Treatise on Geochemistry v 5*, 207–223.
- Milliman J.D. and Meade R.H. (1983) World-Wide Delivery of River Sediment to the Oceans, *J. Geol.* 91, 1–21.
- Milliman J.D. and Syvitski P.M. (1992) Geomorphic/tectonic control of sediment discharge to the ocean: the importance of small mountainous rivers. *J. Geol.* 100, 525–544.
- Milliman, J. D. & Syvitski, P. M. Geomorphic/tectonic control of sediment discharge ot the ocean: the importance of small mountainous rivers. *J. Geol.* 100, 525–544 (1992).
- Millot R., Gaillardet J., DupreB., and Allegre C. J. (2003) Northern latitude chemical weathering rates: Clues from the Mackenzie River Basin, Canada. *Geochim. Cosmochim. Acta* 67(7), 1305–1329.

- Millot, R., Gaillardet J., Dupre B., and Allegre C. J. (2002), The global control of silicate weathering rates and the coupling with physical erosion: New insights from rivers of the Canadian Shield, *Earth Planet. Sci. Lett.*, 196, 83–98.
- Mishra R.C., Sharma R.P. and Sinha A.K, (1973) Petrochemistry of the Almora crystallines, Kumaun Himalaya, *J Him. Geol.*, 3, 411-434.
- Molnar P. (2003) Nature, nurture and landscape, *Nature*, 426, 612– 614.
- Molnar P. and England P.C. (1990) Late Cenozoic uplift of mountain ranges and global climate change: Chicken or egg?, *Nature*, 346, 29–34.
- Montgomery D.R. (1994) Valley incision and the uplift of mountain peaks, *J. Geophys. Res.*, 99, 13,913– 13,921.
- Moon S., Huh Y., Qin J., and van Pho N. (2007) Chemical weathering in the Hong (Red) River basin: Rates of silicate weathering and their controlling factors, *Geochim. Cosmochim. Acta*, 71, 1411-1430.
- Nautiyal S.P. and Rawat R.S.(1990) nature and preliminary petrochemistry of the Amritpur granites, nainital district, Kumaun Himalaya, U.P., India, , *J Him. Geol.*, 1, 199-208.
- Negrel P., Allègre C.J., Dupre B. and Lewin E. (1993) Erosion sources determined by inversion of major and trace element ratios and strontium isotopic ratios in river: The Congo Basin case, *Earth Plane. Sci. Lett.*, 120, 59-76
- Nesbitt H.W. and Young G.M. (1982) Early Proterozoic climates and plate motions inferred from major element chemistry of lutites, *Nature*, 299, 715– 717.
- Nijampurkar V. N., Sarin M. M. and Rao D. K. (1993) Chemical composition of snow and ice from Chhota Shigri glacier, Central Himalaya. *Jour. Hydrol.* 151, 19-34.
- Oliver L., Harris N., Bickle M., Chapman H., Dise N. and Horstwood M. (2003) Silicate weathering rates decoupled from the $^{87}\text{Sr}/^{86}\text{Sr}$ ratio of the dissolved load during Himalayan erosion, *Chem. Geol.*, 201, 119– 139.
- Pal D.K., Srivastava P., Durge S.L. and Bhattacharyya T. (2003) Role of microtopography in the formation of sodic soils in the semi-arid part of the Indo-Gangetic Plains, India, *Catena* 51, 3– 31.
- Pal, D.K., Kalbande, A.R., Deshpande, S.B., and Sehgal, J.L., (1994) Evidence of Clay illuviation in sodic soils of the Indo-Gangetic plain since the Holocene. *Soil Sci.* 158, 465–473.
- Palmer M.R. and Edmond J.M. (1992) Controls over the strontium isotope composition of river water. *Geochim. Cosmochim. Acta* 56, 2099–2111.

- Pandey M.R., Tandukar R.P., Avouac J.P., Vergne J. and T. Heritier (1999), Seismotectonics of the Nepal Himalaya from a local seismic network, *J. Asian Earth Sci.*, 17, 703 – 712.
- Peng Z.X. and Mahoney J.J. (1995) Drillhole lavas in the Deccan Traps and the evolution of the Reunion plume; *Earth Planet. Sci. Lett.* 134 169–185
- Peng Z.X., J.J. Mahoney, P.R. Hooper, J.D. McDougal, and P. Krishnamurthy (1998), Basalts of the northeastern Deccan traps, India: Isotopic and elemental geochemistry and relation to southwestern Deccan stratigraphy, *J. Geophys. Res.*, 103, 29,843 –865.
- Picouet C., Dupre B., Orange D. and Valladon M. (2002) Major and trace element geochemistry in the upper Niger river (Mali): physical and chemical weathering rates and CO₂ consumption. *Chem. Geol.* 185, 93–124.
- Pierson-Wickmann A.-C., Reisberg L., France-Lanord C. and Kudrass H.R., (2001) Os-Sr-Nd results from sediments in the Bay of Bengal: implications for sediment transport and the marine Os record. *Paleoceanography* 16, 435-444.
- Pin C. and Bassin C. (1992) Evaluation of a strontium-specific extraction chromatographic method for isotopic analysis in geological materials *Anal. Chim. Acta*, 269, 249-255
- Pin C., Briot D., Bassin C., Poitrasson F. (1994) Concomitant separation of strontium and samarium-neodymium for isotopic analysis in silicate samples, based on specific extraction chromatography *Anal. Chim. Acta*, 298, 209-217
- Potts P. J., Tindle A. G. and Webb P. C. (1992) Geochemical reference material compositions, Whittles Publishing, U.K.
- Pratt-Sitaula B., Garde M., Burbank D.W., Oskin M., Heimsath A. and E. Gabet (2007) Bedload-to-suspended load ratio and rapid bedrock incision from Himalayan landslide-dam lake record, *Quaternary Res.*, 68, 111 – 120.
- Probst J. L., Mortatti J. and Tardy Y. (1994) Carbon river fluxes and weathering CO₂ consumption in the Congo and Amazon river basins. *Appl. Geochem.* 9, 1–13.
- Quade J., English N. and De Celles P.G. (2003) Silicate versus carbonate weathering in the Himalaya: a comparison of the Arun and Seti River watersheds, *Chem. Geol.* 202, 275– 296.
- Quade J., Roe L., DeCelles P.G. and Ojha T.P. (1997) The late neogene ⁸⁷Sr/⁸⁶Sr record of lowland Himalayan rivers, *Science* 276, 1828-1831.

- Rai S.K. and Singh S.K. (2007) Temporal variation in Sr and $^{87}\text{Sr}/^{86}\text{Sr}$ of the Brahmaputra: Implications for annual fluxes and tracking flash floods through chemical and isotope composition, *Geochem. Geophys. Geosy.* 8, Q08008.
- Rai S.K., Singh S.K. and Krishnaswami S. (2008) Chemical weathering in the Plain and Peninsular sub-basins of the Ganga drainage: Impact on the Major ion chemistry and Elemental Fluxes of the Ganga, *Geochim. Cosmochim. Acta* (under review).
- Rao D. V.(1983). Granites of the Himalaya, karakoram and and Hindukush (Ed. Shams F.A.), inst. Of Geology, Punjab university, Lahore Pakistan, pp 55.
- Rao D.R.,Sharma K.K.,and Gopalan K.(1995) Geochemistry and Rb-Sr chronology of upper Jurassic A-type granite,Tangmarg region, Kashmir Himalaya.*J. Geol. Soc. India* 46, 225–233.
- Rao K. L. (1975) *India's Water Wealth*. Orient Longman Ltd., New Delhi, pp 255.
- Rastogi N., (2005) Environmental radionuclides and chemical constituents in rain and aerosols: Biogeochemical sources and temporal variations. Ph. D. thesis, Mohan Lal Sukhadia University, Udaipur, pp. 149.
- Rawat R.S.(1990), Petrology of the Naini group (Chail nappe) metasedimentary rocks from inner lesser Garhwal Himalaya, U.P. India., , *J Him. Geol.*, 12, 236-160.
- Ray J.S., Veizer J. and Davis W.J. (2003) C, O, Sr and Pb isotope systematics of carbonate sequences of the Vindhyan Supergroup, India: age, diagenesis, correlation and implications for global events. *Precambrian Res.* 121, 103–140
- Raymo M.E. (1991) Geochemical evidence supporting T.C. Chamberlin's theory of glaciation, *Geology* 19, 344-347.
- Raymo M.E. and Ruddiman W.F. (1992) Tectonic forcing of late Cenozoic climate, *Nature*, 117–122.
- Raymo M.E., Oppo D.W. and Curry W. (1997) The mid-Pleistocene climate transition: A deep sea carbon isotopic perspective, *Paleoceanography*, 12, 546-559.
- Raymo M.E., Ruddiman W.F. and Froelich P.N. (1988) Influence of late Cenozoic mountain building on ocean geochemical cycles, *Geology* 16, 649-653.
- Raymo, M. E. (1994) The Himalayas, organic carbon burial, and climate in the Miocene. *Paleoceanography* 9, 399–404.
- Rengarajan R. (2004) Radium isotopes and rare earth elements in Indian rivers and the Bay of Bengal. Ph.D. Dissertation, Mohan Lal Sukhadia University, Udaipur, India.
- Rengarajan R., Singh S.K., Sarin M.M. and Krishnaswami S. (2008) Strontium isotope systematics and major ion chemistry of the Chambal River System, India, *Chem. Geol.*, (under review)

- Richard P., Shimizu N. and Allegre C. J. (1976) $^{143}\text{Nd}/^{144}\text{Nd}$, a natural tracer: An application to oceanic basalts, *Earth Planet. Sci. Lett.*, 31, 269–278.
- Richey, J. E., J. M. Melack, A. A. K. Aufdenkampe, V. M. Ballester, and L. Hess. 2002. outgassing from Amazonian rivers and wetlands as a large tropical source of atmospheric CO_2 . *Nature* 416:617–620.
- Richter F.M., Rowley D.B. and DePaolo D.J. (1992) Sr isotope evolution of seawaters the role of tectonics, *Earth Planet. Sci. Lett.* 170, 197–204.
- Rimstidt J.D., Balog A. and Webb J. (1998) Distribution of trace elements between carbonate minerals and aqueous solutions. *Geochim. Cosmochim. Acta*, 62, 1851–1863.
- Roy S., Gaillardet J. and Allègre C. J. (1999) Geochemistry of dissolved and suspended loads of the Seine River, France: anthropogenic impact, carbonate and silicate weathering *Geochim. Cosmochim. Acta*, 63, 1277–1292
- Ruddiman W.F. (1997) *Tectonic Uplift and Climate Change*, Plenum Publishing Corporation, New York, pp. 535.
- Ruddiman W.F., Raymo M.E., Prell W. and Kutzbach J.E. (1997) The uplift-climate connection: a synthesis., in *Global Tectonics and Climate Change* (eds. W.F. Ruddiman and W. Prell), Plenum Press, New York, pp 471–515.
- Saha A., Basu A. R., Garzione C. N., Bandyopadhyay P. K. and Chakrabarti A. (2004) Geochemical and petrological evidence for subduction-accretion processes in the Archean Eastern Indian Craton, *Earth Planet. Sci. Lett.*, 220, 91–106.
- Sarin M. M., Krishnaswami S., Dilli K., Somayajulu B. L. K., and Moore W. S. (1989) Major ion chemistry of the Ganga-Brahmaputra river system: Weathering processes and fluxes to the Bay of Bengal, *Geochim. Cosmochim. Acta*, 53, 997–1009.
- Sarin M.M. and Krishnaswami.S. (1984) Major ion chemistry of the Ganga-Brahmaputra river systems, India. *Nature*, 312 538–541.
- Sarin M.M., Bhushan R. and Dutta K. (1997) Determination of organic carbon and nitrogen in marine sediments using elemental analyzer, Abstract published in Proceedings of the conference on "Recent advances in elemental analysis" held at Homi Bhabha center for science education (TIFR), Mumbai India.
- Sarin M.M., Krishnaswami S., Trivedi J.R. and Sharma K.K. (1992), Major ion chemistry of the Ganga source waters Weathering in the high altitude Himalaya, *Proc. Indian Acad. Sci. (Earth Planet. Sci.)* 101, 89–98.

- Sarin, M. M., Rao, K. S., Bhattacharya, S. K., Ramesh, R. and Somayajulu, B. L. K., Geochemical studies of the river estuarine system of Krishna and Godavari. *Mahasagar* – Bull. Nat. Inst. Oceanogr., 1985, 18, 129–143.
- Sarkar A., Trivedi J. R., Gopalan K., Singh P. N., Singh B. K., Das A. K., and Paul D. K. (1984), Rb-Sr geochronology of the Bundelkhand granite complex in the Jhansi-Babina-Talbehat sector, UP, Indian J. Earth Sci., CEISM issue, 64– 72.
- Satsangi G. S., Lakhani A., Khare P., Singh S. P., Kumari K. M., and Srivastava S. S. (1998) Composition of rain water at a semi-arid rural site in India Atmospheric Environment, 32, 3783-3793
- Satsangi, G. S., Lakhani, A., Khare, P., Singh, S. P., Kumari, K. M. and Srivastava, S. S., Composition of rain water at a semi-arid rural site in India. *Atm. Env.*, 1998, 32, 3783–3793.
- Shukla U. K., Singh I. B., Sharma M., and Sharma S. (2001) A model of alluvial megafan sedimentation: Ganga Megafan, *Sediment. Geol.*, 144, 243– 262.
- Singh I.B. (1996) Geological evolution of Ganga plain – an overview. *J. Paleon. Soc. India* 41, 99- 137.
- Singh K.P., Mohan D., Singh V.K., Malik A. (2005a) Studies on distribution and fractionation of heavy metals in Gomti river sediments—a tributary of the Ganges, India, *J. Hydrol.* 312, 14-27.
- Singh M., Sharma M. and Tobschall H.J. (2005b) Weathering of the Ganga alluvial plain, northern India: implications from fluvial geochemistry of the Gomti River, *Appl. Geochem.* 20, 1-21.
- Singh S. K., and France-Lanord C. (2002) Tracing the distribution of erosion in the Brahmaputra watershed from isotopic compositions of stream sediments, *Earth Planet. Sci. Lett.*, 202, 645– 662.
- Singh S. K., Kumar A., and France-Lanord C. (2006) Sr and $^{87}\text{Sr}/^{86}\text{Sr}$ in waters and sediments of the Brahmaputra River System: Silicate weathering, CO_2 consumption and Sr flux, *Chem. Geol.* 234, 308–320.
- Singh S.K, Rai S.K. and Krishnaswami S. (2008) Sr and Nd isotopes in river sediments from the Ganga Basin: Sediment Provenance and Hotspots of Physical Erosion, *J. Geophys. Res.* 113, F03006.
- Singh S.K. (2006) Spatial variability in erosion in the Brahmaputra basin: Causes and impacts. *Curr. Sci.*, 90, 1271–1276.

- Singh S.K., Reisberg L. and France-Lanord C. (2003) Re-Os isotope systematics of sediments of the Brahmaputra River system. *Geochim. Cosmochim. Acta* 67, 4101–4111
- Singh S.K., Sarin M., and France-Lanord C. (2005) Chemical Erosion in the Eastern Himalaya: Major ion composition of the Brahmaputra and $\delta^{13}\text{C}$ of dissolved inorganic carbon. *Geochim. Cosmochim. Acta* 69, 3573-3588
- Singh S.K., Trivedi J.R., Pande K., Ramesh R. and Krishnaswami S. (1998) Chemical and Sr, O, C, isotopic compositions of carbonates from the Lesser Himalaya Implications to the Sr isotope composition of the source waters of the Ganga, Ghaghara and the Indus Rivers, *Geochim. Cosmochim. Acta* 62, 743–755.
- Singh S.P., Ram J, Walia C.S., Sachdev C.B., Dhankar R.P., Rana K.P.C., Sehgal J., Velayutham M. and Gajbhiye K.S. (2004) Soils of Uttar Pradesh: Their kinds, Distribution, Characterization and Interpretation for Optimising Land Use, National Bureau of Soil Survey and Land Use Planning, Nagpur India, pp. 91
- Sinha R. (2005), Why do Gangetic rivers aggrade or degrade?, *Curr. Sci.*, 89, 836–840.
- Sinha R. and P. F. Friend (1994), River systems and their sediment flux, Indo-Gangetic Plains, Northern Bihar, India, *Sedimentology*, 41, 825–845.
- Sinha R., Tandon S.K., Gibling M.R., Bhattacharjee P.S. and Dasgupta A.S., (2005) Late Quaternary geology and alluvial stratigraphy of Ganga basin, *Him. Geol.* 26, 223-240.
- Sinha R., Tandon S.K., Sanyal P., Gibling M.R., Stuben D., Berner Z., Ghazanfari P. (2006), Calcretes from a Late Quaternary interfluve in the Ganga Plains, India: Carbonate types and isotopic systems in a monsoonal setting, *Palaeogeogra. Palaeoclim., Palaeoeco.*, 242, 214-239.
- Spitzzy, A. and Ittekkot V. (1991). Dissolved and particulate organic matter in rivers. Ocean margin processes in global change. Report, Dahlem workshop, Berlin, 1990, 5-17.
- Srivastava P. (2001) Paleoclimatic implications of pedogenic carbonates in Holocene soils of the Gangetic plains, India. *Palaeogeogra. Palaeoclim., Palaeoeco.*, 172, 207–222.
- Stallard R.F. (1995) Tectonic, environmental and human aspects of weathering and erosion: A global review using a steady-state perspective, *Annu. Rev. Earth Planet. Sci.* 23, 11-39.

- Stallard R.F. and Edmond, J.M. (1983) Geochemistry of the Amazon 2. The influence of geology and weathering environment on the dissolved load. *J. Geophys. Res.* 88, 9671–9688
- Stern, C. R., Kligfield, R., Schelling, D., Virdi, N. S., Futa, K., Peterman, Z. E., and Amini, H. (1989) The Bhagirathi leucogranite of the High Himalaya (Garhwal India): Age, petrogenesis, and tectonic implications: *Geol. Soc. Am. Special Paper* 232, p. 33–45.
- Stewart R.J. and B. Hallet (2004) Extremely rapid and localized erosion in the Himalaya recorded in sediments of the Bengal Fan, *Eos Trans. AGU*, 84(47), Fall Meet. Suppl., Abstract T53A–0471.
- Stone P.B. (1992) The State of the Worlds' Mountains - A global report on behalf of Mountain Agenda for Earth summit at Rio, Zed Bosi, Ltd. London - pp 391.
- Strickland J.D.H. and Parsons T.R. (1972) A practical handbook of seawater analysis. *Bulletin* 167, Fisheries Research Board of Canada, pp. 310.
- Subramanian V., Richey J. E. and Abbas N. (1985) Geochemistry of river basins in the Indian subcontinent: Part II. Preliminary studies on the particulate C and N in the Ganga-Brahmaputra River system, *Mitt. Geol. Palaeontol. Inst. Univ. Hamburg*, 58, 513–518.
- Tamgade D.B., Gaikwad S.T., Nagbhushana S.R., Gajbhiye K.S., Deshmukh S.N. and Sehgal J. (1996) Soils of Madhya Pradesh: their kinds, distribution, characterization and interpretations for optimising land use, National Bureau of Soil Survey & Land Use Planning, Nagpur, pp. 182.
- Taylor, A., Blum, J.D. (1995) Relation between soil age and silicate weathering rates determined from the chemical evolution of a glacial chronosequence, *Geology* 23, 979–982.
- Thiede R.C., Bookhagen B., Arrowsmith J.R., Sobel E.R., and Strecker M.R. (2004) Climatic control on rapid exhumation along the Southern Himalayan Front, *Earth Planet. Sci. Lett.* 222, 791–806.
- Tipper E. T., Galy A, Bickle M.J. (2008) Calcium and magnesium isotope systematics in rivers draining the Himalaya-Tibetan-Plateau region: Lithological or fractionation control?, *Geochim. Cosmochim. Acta* ,72, 1057–1075.
- Tipper E.T., Bickle M.J., Galy A., West A.J., Pomies C. and Chapman H.J. (2006) The short term climatic sensitivity of carbonate and silicate weathering fluxes: Insight from seasonal variations in river chemistry, *Geochim Cosmochim Acta* 70, 2737–2754.

- Tiwari M., Pant C.C. and Tewari V.C. (2000) Neoproterozoic sponge spicules and organic-walled microfossils from the Gangolihat Dolomite, Lesser Himalaya, India, *Curr. Sci.*, 79, 651-54.
- Tripathi J.K., Bock B, Rajamani V. and Eisenhauer A. (2004) Ca and Sr dynamics in the Indo-Gangetic plains: Different sources and mobilization processes in northwestern India, *Curr. Sci.*, 87, 1453-58.
- Tripathy G.R., Goswami V., Singh S.K. and Chakrapani G.J. (2008) Temporal variations in major ions, Sr and $^{87}\text{Sr}/^{86}\text{Sr}$ of the Ganga headwaters: Estimates of silicate-carbonate erosion rates and their implications, *Geochim Cosmochim Acta* (under review).
- Trivedi J.R., Gopalan K., and Valdiya K.S. (1984) Rb-Sr Ages of granitic rocks within the Lesser Himalayan nappes, Kumaun, India. *J. Geol. Soc. India* 25, 641-654.
- UNESCO (1971) Discharge of selected rivers of the world, vol II, UNESCO, Paris, pp 194.
- UNESCO (1993) Discharge of selected rivers of the world, vol III, UNESCO, Paris, pp 600.
- Valdiya K.S. (1980) Geology of Kumaun Lesser Himalaya, Wadia Inst. Himalayan Geol., Dehradun, India, pp 291.
- Vance D., Bickle M.J., Ivy-Ochs S. and Kubik P.W. (2003), Erosion and exhumation in the Himalaya from cosmogenic isotope inventories of river sediments, *Earth Planet. Sci. Lett.*, 206, 273- 288.
- Verardo, D.J., Froelich, P.N. and McIntyre, A. (1990) Determination of organic carbon and nitrogen in marine sediments using the Carlo Erba NA 1500 Analyzer. *Deep Sea Res.*, 37, 157-165.
- Vigier N., Bourdon B., Lewin E., Dupre B., Turner S., Chakrapani G.J., van Calsteren P. and Allegre C.J. (2005) Mobility of U-series nuclides during basalt weathering: an example from the Deccan Traps (India). *Chem. Geol.* 219, 69-91.
- Vijan A. R. et al (2003) Imprint of Himalayan Orogeny on Pan African Granitoid Intrusives: Evidence from Dhaoladhar Granite NW Himalaya, India; *Journal of the Virtual Explorer, Electronic Edition, Volume 11, Paper 04, ISSN 1441-8142.*
- Wadia D.N. (1981) Geology of India. Tata-McGraw Hill, New Delhi, pp 508.
- Walker J.C.G., Hays P.B., and Kasting J.F. (1981) A negative feedback mechanism for the long-term stabilization of the Earth's temperature. *J. Geophys. Res.* 86, 9776-9782.

- Wasson R.J. (2003) A sediment budget for the Ganga-Brahmaputra catchment, *Curr. Sci.*, 84, 1041–1047.
- White A.F., Blum A.E., Bullen T.D., Vivit D.V., Schultz M. and Fitzpatrick J. (1999b) The role effect of temperature on experimental and natural chemical weathering rates of granitoid rocks. *Geochim. Cosmochim. Acta* 63, 3277–3291.
- White A.F., Bullen T.D., Vivit D.V., Schultz M.S. and Clow D.W. (1999a) The role of disseminated calcite in the chemical weathering of granitoid rocks. *Geochim. Cosmochim. Acta* 63, 1939–1953.
- White, A.F. and Blum, A.E. 1995. Effects of climate on chemical weathering in watersheds. *Geochim. Cosmochim. Acta* , 59, 1729–1747.
- Wobus C.W., A. Helmsath K. Whipple and K. Hodges (2005) Active out of-sequence thrust faulting in the central Nepalese Himalaya, *Nature*, 434, 1008– 1011.
- Wobus C.W., Hodges K.V. and Whipple K.X. (2003) Has focused denudation sustained active thrusting at the Himalayan topographic front?, *Geology*, 31.
- Wu L., Huh Y., Qin J., Du G., and van Der Lee S. (2005) Chemical weathering in the Upper Huang He (Yellow River) draining the eastern Qinghai-Tibet Plateau. *Geochim. Cosmochim. Acta* 69, 5279-5294.
- Yadav S, Rajamani V. (2004) Geochemistry of aerosols of northwestern part of India adjoining the Thar desert *Geochim. Cosmochim. Acta* , 68, 1975-1988
- Zeitler P.K. et al. (2001) Erosion, Himalayan geodynamics and the geomorphology of metamorphism, *GSA Today*, 11, 4–9.