

Contents

<i>Preface by Jochen Schmidt, Tom Cochrane, Chris Phillips, Sandy Elliott, Tim Davies & Les Basher</i>	v
--	---

1 Unlocking the archives – dating and source tracing technologies

Recent advances in dating and source tracing of fluvial deposits <i>A. Lang</i>	3
Assessing the remobilisation of recently deposited sediment from river flood plains during single overbank flood events, using caesium-134 and cobalt-60 as tracers <i>P. Greenwood, D. E. Walling & T. A. Quine</i>	13
Influence of particle size on geochemical suspended sediment tracing in Australia <i>Baihua Fu, Lachlan T.H. Newham & John B. Field</i>	23
Sediment source fingerprinting: testing hypotheses about contributions from potential sediment sources <i>Jean P. G. Minella, Robin T. Clarke, Gustavo H. Merten & Des E. Walling</i>	31
Mass balance models for use with $^{210}\text{Pb}_{\text{ex}}$ measurements to estimate soil loss from cultivated land <i>Xinbao Zhang, Des Walling, Xiubin He & Yunqi Zhang</i>	38
Use of Beryllium-7 to assess soil redistribution by erosion in two contrasting Mediterranean environments <i>A. Navas, D. E. Walling, L. Gaspar & J. Machin</i>	43
The sources and dispersal of sediment within a large flood plain complex <i>M. C. Thoms, S. Brennan & S. W. Franks</i>	52
Determination and interpretation of sediment provenance in a sedimentary sequence affected by post-depositional changes <i>R. Cossart, M. C. Thoms & M. A Reid</i>	60
Flood plain nutrient dynamics: patterns, controls and the influence of changing hydrology <i>A. G. Lowes, M. R. Southwell & M. C. Thoms</i>	68
Recent tidal-flat evolution and mangrove-habitat expansion: application of radioisotope dating to environmental reconstruction <i>A. Swales & S. J. Bentley</i>	76
Identifying relationships between flood history, flood frequency and the provenance of surface sediments in a semi-arid terminal wetland <i>S. C. Rayburg & M. C. Thoms</i>	85
Uncertainty assessment in suspended sediment fingerprinting based on tracer mixing models: a case study from Luxembourg <i>N. Martinez-Carreras, F. Gallart, J. F. Iffly, L. Pfister, D. E. Walling & A. Krein</i>	94

Response of a small arable catchment sediment budget to introduction of soil conservation measures <i>V. N. Golosov, V. R. Belyaev, J. S. Kuznetsova, M. V. Markelov & E. N. Shamshurina</i>	106
Combining direct observations, modelling, and ¹³⁷ Cs tracer for evaluating individual event contribution to long-term sediment budgets <i>V. R. Belyaev, V. N. Golosov, K. S. Kislenko, J. S. Kuznetsova & M. V. Markelov</i>	114
Connecting the disconnected: longitudinal correlation of river terrace remnants <i>M. D. Cheetham, A. F. Keene, W. D. Erskine, R. T. Bush & G. Jacobsen</i>	123
Intensity of soil erosion and sedimentation inferred from spatial distribution of radionuclide ¹³⁷ Cs in hillslope catchments, South Korea <i>A. Orkhonselenge, K. Kashiwaya & Y. K. Kim</i>	130
Redistribution of soil and soil organic carbon on agricultural landscapes <i>J. C. Ritchie & G. W. McCarty</i>	135
Post-European settlement impacts on erosion and land degradation: a case study using farm reservoir sedimentation in the Eastern Cape, South Africa <i>Kate Rowntree, Ian Foster, Tim Mighall, Leanne DuPreez & John Boardman</i>	139
Sediment fingerprinting in New Zealand: a pilot study into the feasibility of the application of the technique <i>B. P. Roddy, J. L. McWhirter, V. G. Moon, M. R. Balks & F. J. Dyer</i>	143
 2 Processes and scales in sedimentary systems – from point to continents	
Scaling sediment flux across landscapes <i>J. P. M. Syvitski & A. J. Kettner</i>	149
Sediment yield modelling at micro-basin and basin scales in semi-arid regions of Brazil <i>E. E. De Figueiredo</i>	157
Soil armouring and weathering: toward catchment scale computational modelling <i>S. Cohen, G. R. Willgoose & G. R. Hancock</i>	167
An evaluation of the role of physical models in exploring form–process feedbacks in alluvial fans <i>L. E. Clarke, T. A. Quine & A. P. Nicholas</i>	175
The signature of an extreme erosion event on suspended sediment loads: Motueka River Catchment, South Island, New Zealand <i>D. M. Hicks & L. R. Basher</i>	184
Changing suspended sediment dynamics due to extreme flood events in a small pluvial-nival system in northern Japan <i>A. C. Whitaker, H. Sato & H. Sugiyama</i>	192

The effect of local-scale valley constrictions on flood inundation and catchment-scale sediment delivery in the Fitzroy River Basin, Australia <i>J. C. Croke, D. Purvis-Smith, C. J. Thompson & Leo Lymburner</i>	200
Sediment yield from seismically-disturbed mountainous watersheds revealed by multi-temporal aerial LiDAR surveys <i>Akira Matsuoka, Takao Yamakoshi, Keiji Tamura, Jun Maruyama & Kiichiro Ogawa</i>	208
A study of spatial scaling in suspended sediment yield along a rural river system – the River Eden, Cumbria, UK <i>C. F. Mills, J. C. Bathurst & P. F. Quinn</i>	217
Using remote sensing to quantify sediment budget components in a large tropical river – Mitchell River, Gulf of Carpentaria <i>A. P. Brooks, J. Spencer, J. G. Shellberg, J. Knight & L. Lymburner</i>	225
Off-slope sediment delivery from landsliding during a storm, Muriwai Hills, North Island, New Zealand <i>N. J. Preston</i>	237
SPARROW regional regression for sediment yields in New Zealand rivers <i>A. H. Elliott, U. Shankar, D. M. Hicks, R. A. Woods & J. R. Dymond</i>	242
Morphometric analysis of interfluvial topography for scaling soil erosion rates from local to regional scales <i>Y. Kuznetsova & V. Golosov</i>	250
Sediment storage in Alpine sedimentary systems – quantification and scaling issues <i>J.-C. Otto, J. Goetz & L. Schrott</i>	258
Stochastic sediment–vegetation dynamics in an Alpine braided river <i>P. Perona, P. Molnar, M. Savina & P. Burlando</i>	266
Connectivity in steep-land environments: gully–fan coupling in the Tarndale system, Waipaoa catchment, New Zealand <i>Ian C. Fuller & Mike Marden</i>	275
Channel incision and sand compartmentalization in an Australian sandstone basin subject to high flood variability <i>W. D. Erskine</i>	283
Multi-scale sediment dynamics in an upland catchment, southeastern Australia: a synthesis <i>Hugh G. Smith & Deirdre Dragovich</i>	291
Holocene alluvial sediment deposition in contrasting environments in northwestern Europe <i>B. Notebaert & G. Verstraeten</i>	298
Flood-induced changes in the step-pool morphology of a steep mountain stream <i>P. Molnar, A. L. Densmore, B. W. McArdeall & P. Burlando</i>	302
Suspended sediment dynamics and transport into the Babitonga Bay, southern Brazil <i>F. A. Oliveira & J. L. S. Ross</i>	308
Recent sedimentation rates for the Rees-Dart braided river delta <i>Michelle Wild, Thomas Cochrane, Tim Davies, Murray Hicks, David Painter & Gavin Palmer</i>	312
Sediment movement from small catchments within the Moldavian Plateau of eastern Romania <i>I. Ionita</i>	316

3 Global change and erosion

The changing sediment loads of the world's rivers <i>D. E. Walling</i>	323
Gully erosion and sediment load: Waipaoa, Waipuu and Uawa rivers, eastern North Island, New Zealand <i>Michael Marden, Harley Betts, Gregory Arnold & Randolph Hambling</i>	339
Sediment sources in a dry-tropical catchment: central Queensland, Australia <i>A. O. Hughes, J. M. Olley, J. C. Croke & L. A. McKergow</i>	351
Chemical and physical weathering in a mountainous tributary of the Zhujiang (Pearl River), China <i>Shu-Rong Zhang & X. X. Lu</i>	359
Sensitivity of Alpine fluvial environments in the Swiss Alps to climate forcing during the Late Holocene <i>L. Schulte, R. Julià, M. Oliva, F. Burjachs, H. Veit & F. Carvalho</i>	367
An overlooked sediment trap in arid environments: ancient irrigation agriculture in the coastal desert of Peru <i>Jussi Baade & Ralf Hesse</i>	375
Glacial–interglacial cycles, soil erosion and natural desertification in the Middle East <i>Yoav Avni</i>	383
Changing sediment supply in Arctic rivers <i>Irina Overeem & James P. M. Syvitski</i>	391
Mapping potential soil erosion in East Africa using the Universal Soil Loss Equation and secondary data <i>Lieven Claessens, Paulo Van Breugel, An Notenbaert, Mario Herrero & Jeannette Van De Steeg</i>	398
The Waipaoa Sedimentary System: research review and future directions <i>N. Litchfield, K. Berryman, H. Brackley, L. Carter, M. Marden, M. Page & N. Trustrum</i>	408
Climatic and anthropogenic effects on soil transport rates and hillslope evolution <i>P. C. Almond, J. J. Roering, M. W. Hughes, F. S. Lutter & C. Leblond</i>	417
Will human catalysts or climate change have a greater impact on the sediment load of the Waipaoa River in the 21st century? <i>A. J. Kettner, B. Gomez & J. P. M. Syvitski</i>	425
The impact of climate change on glacial sediment delivery to rivers <i>Jim Bogen</i>	432
Reconstructing historical sediment yields from the infilling of farm reservoirs, Eastern Cape, South Africa <i>Ian D. L. Foster, John Boardman & John B. Gates</i>	440
National-scale sediment delivery to watercourses across England and Wales under recent (1970–2004) land-use change <i>A. L. Collins, D. Duethmann & P. Taylor</i>	448
Land-use impacts on catchment erosion for the Waitetuna catchment, New Zealand <i>J. Schmidt, S. Elliott & L. McKergow</i>	453

The effects of rapid and catastrophic sedimentation in tectonically active areas <i>James Goff</i>	458
Impacts of the 921 Ji-Ji earthquake, Taiwan, on channel morphology and channel evolution <i>Y. H. Hsu & Y. S. Hsu</i>	462

4 Linking erosion with environmental and societal impacts: sediment production, river regulation, depositional environments, hazards and risks, management and policy

Linking erosion with environmental and societal impacts in a rapidly changing environment <i>M. J. Crozier</i>	469
Erosion without sediment supply? The crux of a flood-plain restoration project downstream of dammed headwaters <i>Bernd Cyffka & Florian Haas</i>	477
Sediment dynamics and improvised control technologies in the Athi River drainage basin, Kenya <i>Shadrack Mulei Kithiia</i>	485
Recurrent displacement of a forested earthflow and implications for forest management, East Coast Region, New Zealand <i>Michael Marden, Chris J. Phillips & Donna Rowan</i>	491
Estimating the spatial distribution of sediment concentration in the Manawatu River, New Zealand, under different land-use scenarios <i>A.-G. E. Ausseil & J. R. Dymond</i>	502
Impacts of wildfire and post-fire salvage logging on sediment transfer in the Oldman watershed, Alberta, Canada <i>Uldis Silins, Micheal Stone, Monica Emelko & Kevin Bladon</i>	509
Managing coastal erosion: from long-term coastal evolution to seasonal shoreline changes <i>L. S. Esteves, P. Teixeira & J. J. Williams</i>	516
Hydrological and sedimentological connectivity of unsealed roads <i>C. J. Thompson, I. Takken & J. Croke</i>	524
Hydrological recovery of rangeland following cattle exclusion <i>A. A. Hawdon, R. J. Keen, D. A. Post & S. N. Wilkinson</i>	532
Improved sediment-management strategies for the sustainable development of German waterways <i>E. Goelz</i>	540
Predicting decadal-scale estuarine sedimentation for planning catchment development <i>M. O. Green</i>	550
Testing the capability of a sediment budget model for targeting remediation measures to reduce suspended-sediment yield <i>Scott N. Wilkinson</i>	559
Impacts of native forest harvesting on in-channel erosion and sediment yields in unmapped headwater catchments <i>Ashley A. Webb</i>	567
Reformation of pool-riffle sequences and induced bed armouring in a sand-bed stream following river rehabilitation <i>A. F. Keene, R. T. Bush, M. D. Cheetham & W. D. Erskine</i>	576

Evidence for catastrophic shifts in the trophic structure of flood-plain lakes associated with soil erosion <i>Michael Reid</i>	584
The effect of increasing urbanization and population density on the concentrations of sediment-associated constituents for the conterminous US <i>A. J. Horowitz & V. C. Stephens</i>	591
Towards improving the prediction of longshore sediment transport <i>J. J. Williams, L. S. Esteves & M. A. Lisniewski</i>	599
Changes in sediment discharge after the collapse of Mount Bawakaraeng in South Sulawesi, Indonesia <i>L. L. Dhanio, T. Mizuyama, K. Kosugi & D. A. Rampisela</i>	607
Influence of the changing environment on sediment loads of the Lower Mekong River <i>J. J. Wang & X. X. Lu</i>	612
Modelling hillslope soil erosion at ANZAC Cove, Turkey <i>S. Matthews & M. N. Neave</i>	616
Key word index	621