Biography

Kirstie’s research focuses on fluvial geomorphology, in particular river evolution, sediment budgets and landscape (dis)connectivity, and human disturbance to rivers. She has also developed frameworks for assessing the physical condition and recovery potential of river systems. She is co-developer of the River Styles Framework and a portfolio of professional development short courses (see www.riverstyles.com). Her research also focuses on how geomorphology provides a physical template for ecosystem function and how science can be better used in environmental management. She has also undertaken research on heavy metal contamination at Casey and Wilkes stations in Antarctica. She has co-written and/or edited three books titled “Geomorphology and River Management” (Blackwell, 2005), “River Futures” (Island Press, 2008) and “Geomorphic Analysis of River Systems: An Approach to Reading the landscape” (Wiley, 2013). Kirstie is on the Editorial Board of the journal Geomorphology and a winner of the Gordon Warwick medal for excellence in research.

Authored Books
1. Geomorphic analysis of river systems: an approach to reading the landscape
2. The River Styles® short course: workbook and field guide
4. Practical Applications of the River Styles Framework as a Tool for Catchment-wide River Management: A Case Study from Bega Catchment, NSW, Australia

Edited Books
1. River Futures: An Integrative Scientific Approach to River Repair

Journal articles
1. Mapping valley bottom confinement at the network scale
2. The impact of urbanisation on community structure, gene abundance and transcription rates of microbes in upland swamps of Eastern Australia
3. Single-grain OSL dating of fluvial terraces in the upper Hunter catchment, southeastern Australia
4. Water sources of upland swamps in Eastern Australia: implications for system integrity with aquifer interference and a changing climate
5. Connectivity as an emergent property of geomorphic systems
6. Understanding the spatial distribution and physical attributes of upland swamps in the Sydney Basin as a template for their conservation and management
7. Palaeohydrology of lowland rivers in the Murray-Darling Basin, Australia

8. Simulating the effect of environmental flow duration on seedling emergence from riparian seed banks of the Upper Hunter River, New South Wales

9. What's in a name? A naming convention for geomorphic river types using the River Styles Framework

10. Tracking geomorphic recovery in process-based river management

11. Dramatic reduction in size of the lowland Macquarie River in response to Late Quaternary climate-driven hydrologic change

12. The hydrological function of upland swamps in eastern Australia: the role of geomorphic condition in regulating water storage and discharge

13. A nested hierarchical perspective to enhance interpretations and communication in fluvial geomorphology for use in water resources management: lessons from the Okavango Delta, Botswana

14. Contextualising the trajectory of geomorphic river recovery with environmental history to support river management

15. Geomorphic controls on fluvial carbon exports and emissions from upland swamps in eastern Australia

16. Geomorphic effectiveness: a linear concept in a non-linear world

17. Practicing sociogeomorphology: relationships and dialog in river research and management

18. Different depths, different fauna: habitat influences on the distribution of groundwater invertebrates

19. 'Out with the Old'? Why coarse spatial datasets are still useful for catchment-scale investigations of sediment (dis)connectivity

20. Sedimentologically significant tributaries: catchment-scale controls on sediment (dis)connectivity in the Lockyer Valley, SEQ, Australia

21. Prioritising the placement of riparian vegetation to reduce flood risk and end-of-catchment sediment yields: important considerations in hydrologically-variable regions

22. Interactive effects of waterlogging and atmospheric CO2 concentration on gas exchange, growth and functional traits of Australian riparian tree seedlings

23. The Holocene evolution and geomorphology of a chain of ponds, southeast Australia: establishing a physical template for river management

24. River sensitivity: a lost foundation concept in fluvial geomorphology

25. A geomorphic assessment to inform strategic stream restoration planning in the Middle Fork John Day Watershed, Oregon, USA

26. Identifying key sedimentary indicators of geomorphic structure and function of upland swamps in the Blue Mountains for use in condition assessment and monitoring
47. Metal and petroleum hydrocarbon contamination at Wilkes Station, East Antarctica

48. Managing legacy waste in the presence of cultural heritage at Wilkes Station, East Antarctica


50. Developing and using geomorphological condition assessments for river rehabilitation planning, implementation and monitoring

51. Remediation of metal-contaminated soil in polar environments: Phosphate fixation at Casey Station, East Antarctica

52. Peatlands in eastern Australia? Sedimentology and age structure of Temperate Highland Peat Swamps on Sandstone (THPSS) in the Southern Highlands and Blue Mountains of NSW, Australia

53. Groundwater depth and topography correlate with vegetation structure of an upland peat swamp, Budderoo Plateau, NSW, Australia

54. Geochemical insights to the formation of "sedimentary buffers": Considering the role of tributary-trunk stream interactions on catchment-scale sediment flux and drainage network dynamics

55. The geomorphic character and hydrological function of an upland swamp, Budderoo Plateau, Southern Highlands, NSW, Australia

56. Digging deep for diversity: Riparian seed bank abundance and species richness in relation to burial depth

57. Reading the Landscape in Field-Based Fluvial Geomorphology

58. Highlighting the need and potential for use of interdisciplinary science in adaptive environmental management: The case of Endangered upland swamps in the Blue Mountains, NSW, Australia

59. Reading the landscape: Integrating the theory and practice of geomorphology to develop place-based understandings of river systems

60. The type and spatial distribution of past waste at the abandoned Wilkes Station, East Antarctica

61. Sediment tracing in the upper Hunter catchment using elemental and mineralogical compositions: Implications for catchment-scale suspended sediment (dis)connectivity and management
Fryirs, K. & Gore, D., 1 Jul 2013, In: Geomorphology. 193, p. 112-121

62. (Dis)Connectivity in catchment sediment cascades: A fresh look at the sediment delivery problem
Fryirs, K., Jan 2013, In: Earth Surface Processes and Landforms. 38, 1, p. 30-46

63. Channel-floodplain connectivity during an extreme flood event: Implications for sediment erosion, deposition, and delivery

64. Progress, problems and prospects in Australian river repair
Fryirs, K., Chessman, B. & Rutherfurd, I., 2013, In: Marine and Freshwater Research. 64, 7, p. 642-654

65. How Does Restoration of Native Canopy Affect Understorey Vegetation Composition? Evidence from Riparian Communities of the Hunter Valley Australia

66. Use of ergodic reasoning to reconstruct the historical range of variability and evolutionary trajectory of rivers

67. Geomorphology in action: Linking policy with on-the-ground actions through applications of the River Styles framework
68. The Geographic Basis of Geomorphic Enquiry  
Preston, N., Brierley, G. & Fryirs, K., Jan 2011, In : Geography Compass. 5, 1, p. 21-34 14 p.

69. Inside the "Black Box" of river restoration: Using catchment history to identify disturbance and response mechanisms to set targets for process-based restoration  

70. Climatic and vegetation control on sediment dynamics during the last glacial cycle  

71. Has river rehabilitation begun? Social perspectives from the Upper Hunter catchment, New South Wales, Australia  

72. Antecedent controls on river character and behaviour in partly confined valley settings: Upper Hunter catchment, NSW, Australia  

73. What are we monitoring and why? Using geomorphic principles to frame eco-hydrological assessments of river condition  

74. The relationship between geomorphic river adjustment and management actions over the last 50 years in the upper Hunter catchment, NSW, Australia  

75. Don't fight the site: Three geomorphic considerations in catchment-scale river rehabilitation planning  

76. Post-European settlement response gradients of river sensitivity and recovery across the upper Hunter catchment, Australia  

77. Naturalness and place in river rehabilitation  

78. Spatial variability in the timing, nature and extent of channel response to typical human disturbance along the Upper Hunter River, New South Wales, Australia  

79. Where do floodplains begin? The role of total stream power and longitudinal profile form on floodplain initiation processes  

80. Post-rehabilitation environmental hazard of Cu, Zn, As and Pb at the derelict Conrad Mine, eastern Australia  

81. Buffers, barriers and blankets: the (dis)connectivity of catchment-scale sediment cascades  

82. Catchment-scale (dis)connectivity in sediment flux in the upper Hunter catchment, New South Wales, Australia  

83. The relationship between geomorphic river structure and coarse particulate organic matter (CPOM) storage along the Kangaroo River, New South Wales, Australia  

84. Knowing your place: An Australasian perspective on catchment-framed approaches to river repair  

85. Landscape connectivity: The geographic basis of geomorphic applications  

86. Linking geomorphic character, behaviour and condition to fluvial biodiversity: Implications for river management  

87. Comparative assessment of three approaches for deriving stream power plots along long profiles in the upper Hunter River catchment, New South Wales, Australia  

88. Did humid-temperate rivers in the Old and New Worlds respond differently to clearance of riparian vegetation and removal of woody debris?  
89. Guiding principles for assessing geomorphic river condition: Application of a framework in the Bega catchment, South Coast, New South Wales, Australia

90. Die Auswirkungen antezedenter Landschaftsentwicklung auf Aussehen, Eigenschaften und Entwicklung von Fliegewässern am Fuße der Landstufe im Bega Einzugsgebiet, Südküste von New South Wales, Australien

91. Application of the River Styles framework as a basis for river management in New South Wales, Australia

92. Antecedent landscape controls on river character, behaviour and evolution at the base of the escarpment in Bega catchment, South Coast, New South Wales, Australia

93. Variability in sediment delivery and storage along river courses in Bega catchment, NSW, Australia: Implications for geomorphic river recovery

94. A geomorphic framework for river characterisation and habitat assessment

95. A geomorphological framework for river characterization and habitat assessment

96. River styles, a geomorphic approach to catchment characterization: Implications for river rehabilitation in Bega catchment, New South Wales, Australia

97. A geomorphic approach to the identification of river recovery potential

98. River Styles in Bega Catchment, NSW, Australia: Implications for river rehabilitation

99. Habitat assessment using the River Styles™ methodology

100. Habitat mapping using the River Styles Methodology

101. Tributary-trunk stream relations in a cut-and-fill landscape: A case study from Wolumla catchment, New South Wales, Australia

102. Slope-channel decoupling in Wolumla catchment, New South Wales, Australia: the changing nature of sediment sources following European settlement

103. Post-European changes to the fluvial geomorphology of Bega catchment, Australia: implications for river ecology

104. A fluvial sediment budget for upper Wolumla Creek, south coast, New South Wales, Australia

105. The character and age structure of valley fills in upper Wolumla Creek catchment, south coast, New South Wales, Australia

**Book Chapters**

1. Abordagens de Restauraçő do Sócioflúvio na Australásia

2. Impacts of land clearing

3. River types and contemporary sediment storage
4. Assessment of riparian seed bank resources for river rehabilitation: Wollombi Brook, Lower Hunter Valley, NSW

5. Underfit streams in the upper Hunter catchment NSW: Antecedent controls on partly-confined river behaviour

6. Suspended sediment connectivity of the Lower Macquarie River system, central west NSW, Australia.

7. Moves towards an era of river repair

8. River futures

9. Working with change: the importance of evolutionary perspectives in framing the trajectory of river adjustment

10. Principles of river condition assessment

11. The Australian river management experience

12. Social and biophysical connectivity of river systems

13. Sediment organisation along the upper Hunter River, Australia: A multivariate statistical approach

14. 16 sediment organisation along the upper Hunter River, Australia: a multivariate statistical approach

15. Sedimentary cascades in Australian river systems: Using examples from the Bega and Hunter catchments to demonstrate (di)connectivity of sediment movement and its implications for river recovery

16. The distribution of organic matter along the Kangaroo River, NSW

17. Bega River: Sediment Source, Transfer and Accumulation Zones

18. Bega River: Impacts of European settlement on sediment transfer relationships

**Peer-reviewed Conference Papers**

1. Ecosystem productivity of a wet-dry tropics wetland system: establishing a baseline understanding for conservation

2. A toolbox of sedimentary indicators for assessing the geomorphic structure, function and condition of endangered Temperate Highland Peat Swamps on Sandstone (THPSS), Blue Mountains, NSW
3. **The use and usefulness of geomorphology in river management**

4. **Sedimentologically significant tributaries: characterizing sediment connectivity in the Lockyer Valley, SEQ**

5. **Relating with rivers: geomorphic foundations for ethical cross-cultural dialogue in river management**

6. **Management and conservation of a unique and diverse Australian river type: chain-of-ponds**

7. **On-site teaching with XRF and XRD: training the next generation of analytical X-ray professionals**

8. **Adaptive management of Temperate Highland Peat Swamps on Sandstone in the Blue Mountains: is it occurring?**

9. **The Importance of ‘moving targets’ in assessing what is physically achievable and what we seek to achieve in river restoration practice**

10. **Is passive revegetation through utilisation of soil seed banks a viable rehabilitation option in riparian ecosystems?**

11. **The Formation and geomorphic condition of upland swamps in the Blue Mountains: rehabilitation potential of these endangered ecosystems**

12. **Tracing sediment supply to a colmation layer in the upper Hunter River using X-ray diffractometry: implications for catchment-scale sediment management**

13. **Depth, stratification and viability of seed banks in riparian systems: Watagan Creek, NSW**

14. **Using geomorphology in river management: linking policy with on-the-ground actions through applications of the River Styles framework in NSW**

15. **Space, place and a healthy dose of realism: Grounding the process of river repair**

16. **The importance of reach sensitivity and catchment connectivity in river rehabilitation planning**

17. **Challenges faced in the integration of science in river management in Australia**
19. **An interdisciplinary perspective of riverwork projects in the upper Hunter catchment: Has river rehabilitation begun?**

20. **Geomorphic controls on Coarse Particulate Organic Matter (CPOM) distribution: implications for river rehabilitation**

21. **Making Integrative, Cross-disciplinary Research Happen: Initial Lessons from the Upper Hunter River Rehabilitation Initiative**

22. **A catchment scale perspective on biophysical fluxes in the upper Hunter: Constraints and limiting factors on a large river rehabilitation experiment at Muswellbrook, NSW**

23. **Landscape perspectives on river rehabilitation practice**

24. **Linking landscape processes and river systems: Assessing implications of catchment-scale (dis)connectivity of sediment movement on river sensitivity, recovery and river management**

25. **Sedimentary Cascades in Australian River Systems: Using Examples from the Bega and Murrumbidgee Catchments to Demonstrate the Connectivity of Sediment Movement and Its Implications for Geomorphic River Recovery**

26. **Creating a catchment-framed biophysical vision for river rehabilitation programs**

27. **Application of the river styles framework to river management programs in New South Wales**

28. **The recovery potential of river styles in Bega catchment, NSW: a catchment based framework for prioritisation of river rehabilitation strategies**