

Kirstie Fryirs
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Biography

Kirstie's work focuses on fluvial geomorphology and river management. She researches the structure and function of rivers, how they adjust and evolve, how they have been impacted by anthropogenic disturbance and how to best use geomorphology in river conservation, recovery and rehabilitation. She also researches how catchment sediment budgets and (dis)connectivity operate and how rivers and catchments may respond to future disturbances, particularly floods and droughts.

She is probably best known as the co-developer of the River Styles Framework and portfolio of professional development short courses (see www.riverstyles.com). The River Styles Framework is a geomorphic approach for the analysis of rivers that includes assessment of river type and behaviour, physical condition and recovery potential. These analyses are used to develop prioritisation and decision support systems in river management practice. Uptake of the River Styles Framework has now occurred in many places on six continents.

Kirstie has strong domestic and international collaborations in both academia and industry. She has worked for many years on various river science and management projects as part of multi-disciplinary, collaborative teams that include ecologists, hydrologists, social scientists, practitioners and citizens.

Kirstie has also been lucky enough to work in Antarctica for two summer seasons, undertaking research on heavy metal contamination at Casey and Wilkes stations.

Kirstie has co-written and co-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). She holds several research, teaching and postgraduate supervision awards including the international Gordon Warwick medal for excellence in research.

Kirstie is also a Certified Environmental Practitioner in geomorphology, CEnvP(geomorphology), www.cenvp.org.

Authored Books

1. **Geomorphic analysis of river systems: an approach to reading the landscape**
Fryirs, K. A. & Brierley, G. J., 1 Jan 2013, Chichester, UK; Hoboken, NJ: John Wiley & Sons. 362 p.
2. **The River Styles® short course: workbook and field guide**
Fryirs, K. & Brierley, G., 2007, North Ryde, NSW: Macquarie University. 97 p.
3. **Geomorphology and River Management: Applications of the River Styles Framework**
Brierley, G. J. & Fryirs, K. A., 1 Feb 2005, Malden, MA: Blackwell Publishing. 398 p.
4. **Practical Applications of the River Styles Framework as a Tool for Catchment-wide River Management: A Case Study from Bega Catchment, NSW, Australia**
Fryirs, K. & Brierley, G., 2005, Sydney: Macquarie University.

Edited Books

1. **River Futures: An Integrative Scientific Approach to River Repair**
Brierley, G. (ed.) & Fryirs, K. (ed.), 2008, Washington DC: Island Press.

Journal articles

1. **Detection of decadal time-series changes in flow hydrology in eastern Australia: considerations for river recovery and flood management**
Arash, A. M., Fryirs, K. & Ralph, T. J., Dec 2023, In: Earth Surface Processes and Landforms. 48, 15, p. 3251-3272 22 p.
2. **Inherited age of floating charcoal fragments in a sand-bed stream, Macdonald River, NSW, Australia: Implications for radiocarbon dating of sediments**
Blong, R., Fryirs, K., Wood, R., King, F., Schneider, L., Dotte-Sarout, E., Fallon, S., Gillespie, R., Chen, Q. & Esmay, R., Sept 2023, In: Holocene. 33, 9, p. 1154-1159 6 p.
3. **A plural knowledges model to support sustainable management of dryland rivers in western India**
Brierley, G., Sahoo, S., Danino, M., Fryirs, K., Pandey, C. N., Sahoo, R., Khan, S., Mohapatra, P. & Jain, V., 1 Nov 2023, (E-pub ahead of print) In: River Research and Applications. 19 p.

4. **Natural flood management: lessons and opportunities from the catastrophic 2021–2022 floods in eastern Australia**
Fryirs, K., Zhang, N., Ralph, T. J. & Arash, A. M., 12 Jul 2023, In: *Earth Surface Processes and Landforms*. 48, 9, p. 1649-1664 16 p.
5. **Developing an equitable agenda for international capacity strengthening courses: environmental pedagogies and knowledge co-production in the Philippines**
Mitchell, D., Laurie, E. W., Williams, R. D., Fryirs, K. A., Brierley, G. J. & Tolentino, P. L. M., 25 Jul 2023, (E-pub ahead of print) In: *Journal of Geography in Higher Education*. 31 p.
6. **Evolution of a river management industry in Australia reveals meandering pathway to 2030 UN goals**
Russell, K., Fryirs, K., Reid, D., Miller, A., Vietz, G., Rutherford, I., Pearson, B., Wood, A., Gregor, S., Walker, J. & Slijkerman, J., 24 Mar 2023, In: *Communications Earth and Environment*. 4, 1, p. 1-13 13 p., 93.
7. **The size inherited age effect on radiocarbon dates of alluvial deposits: redating charcoal fragments in a sand-bed stream, Macdonald River, NSW, Australia**
Wood, R., King, F., Esmay, R., Chen, Q., Schneider, L., Dotte-Sarout, E., Fallon, S., Fryirs, K., Gillespie, R. & Blong, R., 8 Nov 2023, (E-pub ahead of print) In: *Radiocarbon*. 14 p.
8. **Trends in post-1950 riparian vegetation recovery in coastal catchments of NSW Australia: implications for remote sensing analysis, forecasting and river management**
Zhang, N. & Fryirs, K., 15 Sept 2023, In: *Earth Surface Processes and Landforms*. 48, 11, p. 2152-2170 19 p.
9. **A GIS workflow for the identification of corridors of geomorphic river recovery across landscapes**
Agnew, D., Graves, B. P. & Fryirs, K., 13 Dec 2022, In: *PLoS ONE*. 17, 12, p. 1-12 12 p., e0278831.
10. **Identifying corridors of river recovery in coastal NSW Australia, for use in river management decision support and prioritisation systems**
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11. **Degradation and recovery of alpine meadow catenas in the source zone of the Yellow River, Western China**
Brierley, G., Li, X., Fryirs, K., Gao, J., Shi, Y., Perry, G. L. W. & Cullum, C., Sept 2022, In: *Journal of Mountain Science*. 19, 9, p. 2487-2505 19 p.
12. **Development of place-based catenal models for grassland ecosystems of the Upper Yellow River, Western China**
Brierley, G., Li, X., Fryirs, K., Gao, J., Perry, G. L. W. & Cullum, C., Jun 2022, In: *Catena*. 213, p. 1-16 16 p., 106193.
13. **Truths of the Riverscape: moving beyond command-and-control to geomorphologically informed nature-based river management**
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14. **Bacterial communities in peat swamps reflect changes associated with catchment urbanisation**
Christiansen, N. A., Green, T. J., Fryirs, K. A. & Hose, G. C., Oct 2022, In: *Urban Ecosystems*. 25, 5, p. 1455-1468 14 p.
15. **The re-greening of east coast Australian rivers: an unprecedented riparian transformation**
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Fryirs, K., 15 Jun 2022, In: *Earth Surface Processes and Landforms*. 47, 7, p. 1671-1679 9 p.
17. **Assemblages of geomorphic units: a building block approach to analysis and interpretation of river character, behaviour, condition and recovery**
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20. **Using a fluvial archive to place extreme flood sediment (dis)connectivity dynamics in context of a longer-term record**
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21. **Spatial and temporal variation in macrophyte litter decomposition in a rare chain-of-ponds, an intermittent stream and wetland system**
Hardwick, L. J., Fryirs, K. A. & Hose, G. C., Apr 2022, In: *Wetlands*. 42, 4, p. 1-14 14 p., 33.
22. **Geomorphic and vegetative river recovery in a small coastal catchment of New South Wales, Australia: implications for flow hydrology and river management**
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Khan, S., Fryirs, K. A. & Shumack, S., Aug 2021, In: *Catena*. 203, p. 1-8 8 p., 105354.
34. **Relationships, social networks and the emergence of recovery-based river management: implications for practice and policy**
Mould, S., Fryirs, K. & Howitt, R., 2021, In: *Marine and Freshwater Research*. 72, 4, p. 481-492 12 p.
35. **Microbial communities of upland peat swamps were no different 1 year after a hazard reduction burn**
Christiansen, N., Fryirs, K. A., Green, T. J. & Hose, G., 2020, In: *International Journal of Wildland Fire*. 29, 11, p. 1021-1028 8 p.
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37. **Upland peatlands of eastern Australia as important water storage reservoirs**
Cowley, K. L., Fryirs, K. A., Cohen, T. J., Marx, S., Forbes, M. & Krogh, M., 2020, In: *Proceedings of the Linnean Society of New South Wales*. 142, p. 67-76 10 p.
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Khan, S. & Fryirs, K., 15 Jun 2020, In: *Geomorphology*. 359, p. 1-16 16 p., 107135.
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Khan, S. & Fryirs, K. A., 30 Sept 2020, In: *Earth Surface Processes and Landforms*. 45, 12, p. 2788-2803 16 p.
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Larkin, Z. T., Ralph, T. J., Tooth, S., Fryirs, K. A. & Carthey, J. . R., 20 Apr 2020, In: *Scientific Reports*. 10, 1, p. 1-15 15 p., 6653.
41. **River sensitivity and sediment connectivity as tools for assessing future geomorphic channel behavior**
Lisenby, P. E., Fryirs, K. A. & Thompson, C. J., 2 Jul 2020, In: *International Journal of River Basin Management*. 18, 3, p. 279-293 15 p.
42. **Supporting champions in river management**
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43. **The importance of relational values in river management: understanding enablers and barriers for effective participation**
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44. **Managing sediment (dis)connectivity in fluvial systems**
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45. **Simulating the effect of environmental flow duration on seedling emergence from riparian seed banks of the Upper Hunter River, New South Wales**
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48. **The use of the River Styles Framework as a tool to 'work with nature' in managing rivers in Brazil: examples from the Macaé Catchment**
Brierley, G., Fryirs, K., Marçal, M. & Lima, R., 2019, In: Revista Brasileira de Geomorfologia. 20, 4, p. 751-771 21 p.
49. **The impact of urbanisation on community structure, gene abundance and transcription rates of microbes in upland swamps of Eastern Australia**
Christiansen, N. A., Fryirs, K. A., Green, T. J. & Hose, G. C., 4 Mar 2019, In: PLoS ONE. 14, 3, p. 1-20 20 p., e0213275.
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Cowley, K. L., Fryirs, K. A., Chisari, R. & Hose, G. C., 9 Jan 2019, In: Water (Switzerland). 11, 1, p. 1-22 22 p., 102.
51. **Engaging with research impact assessment for an environmental science case study**
Fryirs, K. A., Brierley, G. J. & Dixon, T., 4 Oct 2019, In: Nature Communications. 10, p. 1-10 10 p., 4542.
52. **Learning, doing and professional development – the River Styles Framework as a tool to support the development of coherent and strategic approaches for land and water management in Brazil**
Fryirs, K., Brierley, G., Marçal, M., Naíse Peixoto, M. & Lima, R., 2019, In: Revista Brasileira de Geomorfologia. 20, 4, p. 773-794 22 p.
53. **To plug-in or not to plug-in? Geomorphic analysis of rivers using the River Styles Framework in an era of big data acquisition and automation**
Fryirs, K. A., Wheaton, J. M., Bizzi, S., Williams, R. & Brierley, G. J., 2019, In: Wiley Interdisciplinary Reviews. Water. 6, 5, p. 1-20 20 p., e1372.
54. **Understanding the spatial distribution and physical attributes of upland swamps in the Sydney Basin as a template for their conservation and management**
Fryirs, K. A., Farebrother, W. & Hose, G. C., 2019, In: Australian Geographer. 50, 1, p. 91-110 20 p.
55. **Single-grain OSL dating of fluvial terraces in the upper Hunter catchment, southeastern Australia**
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57. **Connectivity as an emergent property of geomorphic systems**
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63. **Dramatic reduction in size of the lowland Macquarie River in response to Late Quaternary climate-driven hydrologic change**
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70. **Different depths, different fauna: habitat influences on the distribution of groundwater invertebrates**
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