

# Tim Cohen BSc (Hons), PhD

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## Summary of Qualifications:

**Current position:** Lecturer, School of Earth and Environmental Sciences, University of Wollongong

**Tertiary Qualifications:** BSc (Hons) - 1997; PhD – 2003

## Employment history:

- Lecturer, Department of Environment and Geography, Graduate School of Environment, Macquarie University.
- Research Fellow – University of Wollongong 2006 - 2008
- Fluvial geomorphologist – Tasmanian Department of Primary Industries (DPIWE) 2005 - 2006
- GeoScience lecturer – University of Wollongong (part-time) 2001 – 2004
- Consultant geomorphologist 1996 – present

**Primary research interests:** Environmental degradation, post-European landscape dynamics, river rehabilitation, Quaternary climate change, Holocene floodplain dynamics.

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## **Professional history**

### **January 2010 – February 2011. Lecturer Level B**

#### **Department of Environment and Geography, Graduate School of the Environment, Macquarie University**

Lecturer in Masters program teaching science in environmental management, management of degraded environments and field techniques in environmental science.

### **January 2009 – December 2009. Lecturer Level B**

#### **Department of Environment and Geography, Macquarie University**

Lecturer in 100 – 300 level resource and environmental management, focusing on management of Australian ecosystems and natural resource base (including environmental rehabilitation).

### **July 2006 – 2008. Research Fellow**

#### **School of Earth and Environmental Sciences — University of Wollongong**

Research fellow working on ARC Discovery project “Palaeoclimatic and environmental significance of major Late Quaternary drainage contributions and disruptions in the Lake Eyre basin” (CI Nanson and CI Jones). Roles and responsibilities include the coordination of primary research in central Australia, the implementation of remote-area fieldwork, data processing (including geochronological research) and manuscript production.

### **January 2005 – July 2006. Fluvial geomorphologist**

#### **Department of Primary Industries, Water and Environment (DPIWE) - Tasmania**

Senior professional practitioner, providing scientific and technical advice and support associated with the physical and hydraulic aspects of river management, conservation and rehabilitation to a wide range of clients, including: Natural Resource Management Committees, community groups, individual landowners, local government and other State Government Agencies.

### **January 2001 – 2005. Part-time lecturer**

#### **School of Earth and Environmental Sciences — University of Wollongong**

Lecturer of 1st, 2nd and 3rd year geomorphology and earth science courses including introductory physical geography, soils, hydrology, landscape evolution and fluvial geomorphology and river management. Involved in the development of lecture, practical and examination material and the running of over-night field trips. Assisted in the design and supervision of Honours research projects.

### **1996 – Present. Consultant geomorphologist**

Consultancy work focusing on river rehabilitation and estuary process studies involving both site-specific assessments and catchment analysis. This work has involved catchment hydrological analyses, riparian zone assessments and the long-term monitoring of channel form/condition. Site assessment has also involved the development of management plans

and site strategies, including the design and construction of remedial works. Provided expertise to the then Department of Land and Water Conservation (NSW), the then East Gippsland River Management Board (Vic.), the then Bellinger Catchment Management Committee, the Upper North Coast Water Management Committee, Southern and Northern Rivers Catchment Management Authority.

**1995 – 1996. Research Officer**

**Macquarie University**

Research assistant on a LWRRDC project coordinated by Associate Professor Gary Brierley on fluvial geomorphology and freshwater ecology in south-eastern Australia. Work included the development of a geomorphic framework applied to the Bega catchment. Tasks included aerial photograph interpretation, data collection and community liaison. A major component of this work was developing links between stream ecologists, geomorphologists and land managers.

**1995. Part-time Interpretative Officer/Part-time Bushcare Officer**

**Ku-ring-gai Municipal Council**

Involved in designing environmental educational activities, running guided walks, and workshops at Ku-ring-gai Wildflower Garden for both children and adults. Involved in training community groups bush regeneration techniques, site assessment and site management practices.

**1994. Part-time Bush regenerator**

**Sydney Bush Regeneration Company**

Work included weed and native plant identification, site assessment and the development of appropriate bushland management strategies.

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## Publications:

### Book chapters:

Larsen, J., **Cohen, T.J.**, Nanson, G.C., Jones, B.G., Jansen, J., and May, J.-H. (2009) Climate change in the dead heart of Australia. Online vignette for the textbook *Key Concepts in Geomorphology*, Bierman, P and Montgomery, D (eds).

Nanson, G.C., **Cohen, T.J.**, Doyle, C.J. and Price, D.M. (2003). Alluvial evidence of major late-Quaternary climate and flow-regime changes on the coastal rivers of New South Wales, Australia. In: K. Gregory and G. Benito (Editors), *Palaeohydrology: Understanding Global Change*. Wiley, Chichester, pp. 233-258.

### Journal articles: (ERA Ranking, Impact Factor[5-Year]/Citations

**Cohen, T.J.**, Nanson, G.C., Jansen, J.D., Jones B.G., Jacobs, Z., Larsen, J.R., May, J.-H., Treble, P., Price, D.M., Smith, A.M., (2011). Late Quaternary mega-lakes fed by the northern and southern river systems of central Australia: varying moisture sources and increased continental aridity. *Palaeogeography, Palaeoclimatology, Palaeoecology* (in press, accepted April 2011).

**Cohen, T.J.**, Nanson, G.C., Jansen, J.D., Jones B.G., Jacobs, Z., Treble, P., Price, D.M., May, J.-M., Smith, A.M., Ayliffe, L.K., Hellstrom, J.C. (in press – accepted August 2010) Continental aridification and the vanishing of Australia's megalakes. *Geology*. (A – Geology, **4.84/NA**)

**Cohen, T.J.**, Nanson, G.C., Larsen, J.R., Jones, B.G., Price, D.M., Coleman, M., and Pietsch, T.J., (2010). Late Quaternary aeolian and fluvial interactions on the Cooper Creek Fan and the association between linear and source-bordering dunes, Strzelecki Desert, Australia. *Quaternary Science Reviews* 29, 455-471. (A\* - Geology, **5.39/NA**)

Nanson, GC, and Price, DM., Jones, BG, Maroulis, JC, Coleman, M., Bowman, H., **Cohen, TJ**, and Pietsch, T (2008). Alluvial evidence for major flow-regime changes during the Middle and Late Quaternary in eastern central Australia. *Geomorphology*, 101 (1-2), 109-129. (A – Physical Geography and Environmental Science, **2.68/6**)

**Cohen, T.J.**, and Nanson, G.C. (2008). Topographically associated but chronologically disjunct late Quaternary floodplains and terraces in a partly confined valley, southeastern Australia. *Earth Surface Processes and Landforms*, 33, 3, 424-443. (A – Physical Geography, **1.78/2**)

**Cohen, T.J.** and Nanson, G.C. (2007). Mind the gap: an absence of valley fill deposits identifying the Holocene hypsithermal period of enhanced flow regime in southeastern Australia. *The Holocene*, 17, 3, 411-418. (A – Geology, **2.48/5**)

Turney, C.S.M, Haberle, S, Fink, D, Kershaw, A.P, Barbetti, M, Barrows, T.T, Black, M, **Cohen, T.J**, Corrège, T, Hesse, P.P., Hua, Q., Johnston, R., Morgan, V., Moss, P., Nanson, G., Ommen, T.v, Rule, S., Williams, N.J., Zhao, J.X., D'Costa, D., Feng, Y.X., Gagan, M., Mooney, S. and Xia, Q., (2006). Integration of ice-core, marine and terrestrial records

for the Australian Last Glacial Maximum and Termination: a contribution from the OZ INTIMATE group. *Journal of Quaternary Science*, 21(7): 751-761. (A – Geology, Physical Geography and Environmental Science, **3.11/14**)

Reinfelds, I., **Cohen, T.J.**, Batten, P. and G.J. Brierley (2004). Assessment of downstream trends in channel gradient, total and specific stream power: a GIS approach. *Geomorphology*, 60, 3-4, 403-416. (A – Physical Geography and Environmental Science. **2.68/19**)

**Cohen, T.J.**, & G.J. Brierley (2000). Channel instability in a forested catchment: a case study from Jones Creek, East Gippsland, Australia. *Geomorphology*, 32, 109-128. (A – Physical Geography and Environmental Science, **2.68/7**)

Brierley, G.J., **Cohen, T.J.**, Fryirs, K., & A. Brooks (1999). Post-European changes to the fluvial geomorphology of Bega catchment: implications for river ecology. *Freshwater Biology*, 41, 839-848. A – Biological Sciences, **2.86/40**)

### **Published Conference Proceedings:**

**Cohen, T.J.**, Brooks, A. & B. Samosorn (2004) The potential of airborne laser scanner (ALS) data to produce detailed surveys of rivers: an example from the Hunter River, New South Wales, Australia. In Rutherford, I.D., Wiszniewski, I., Askey-Doran, M.J., and Glazik, R. (Eds) Proceedings of the 4<sup>th</sup> Australian Stream Management Conference: linking rivers to landscapes: Department of Primary Industries, Water and Environment, Hobart, Tasmania, 154-158.

Brooks, A. and **Cohen, T.J.** (2004) Wood introduction in a multi-objective river rehabilitation project: the Upper Hunter River Rehabilitation Initiative. In Rutherford, I.D., Wiszniewski, I., Askey-Doran, M.J., and Glazik, R. (Eds) Proceedings of the 4<sup>th</sup> Australian Stream Management Conference: linking rivers to landscapes: Department of Primary Industries, Water and Environment, Hobart, Tasmania, 134-140.

**Cohen, T.J.** (1999) Channel recovery mechanisms in a forested catchment, Jones Creek, East Gippsland, lessons for river management in southeastern Australia. In Rutherford, I. & Bartley, R. (Eds) Proceedings of the Second Australian Stream Management Conference, Vol.1., Adelaide, 181-187.

### **Reports and other documents:**

Telfer, D., and **Cohen, T.J.**, (2010) Bellinger and Kalang River estuaries erosion study. Report prepared for Bellingen Shire Council

**Cohen, T.J.** (2008) An assessment of remedial works on Brogers Creek, Kangaroo Valley NSW. Report prepared for Southern Rivers CMA.

**Cohen, T.J.**, and Nanson, G.C., (2008) A geochronological assessment of the Warkworth Sands in the Hunter Valley, NSW. Report prepared for Scarp Archaeology.

**Cohen, T.J.**, and Telfer, D. (2006) Channel instability and rehabilitation options for the Wilson River, NSW. Report prepared for Northern Rivers Catchment Management Authority, 1 – 66.

- Cohen, T.J.** (2005) The geomorphology of the Macleay River estuary. Report prepared for Kempsey Shire Council, 1 – 39.
- Cohen, T.J.** (2004) A geomorphic analysis of the Orara River – Cochrane’s Pool to Coramba. Report prepared for Orara valley Rivercare Management Committee and Coffs Harbour City Council, 1 – 59.
- Cohen, T.J.,** & G.J. Brierley (1999) River styles in the Hastings Basin, mid north coast, NSW. Report completed for NSW Department of Land and Water Conservation, 1-115.
- Cohen, T.J.,** Reinfelds, I., & G. Brierley (1998) River styles in Bellinger-Kalang catchment. Report completed for NSW Department of Land and Water Conservation, 1-118.
- Cohen, T.J.,** Brierley, G., & K. Fryirs (1996) Fluvial geomorphology and river ecology of coastal river in southeastern Australia. Graduate School of the Environment, Working Paper 9603, Part 2, 55-82.
- Brierley, G., Fryirs, K., & **T.J. Cohen** (1996) A geomorphic approach to catchment characterisation. Graduate School of the Environment, Working Paper 9603, Part 1, 1-54.
- Fryirs, K., Brierley, G., & **T.J. Cohen** (1996) Application of the catchment characterisation procedure to Wolumla Creek catchment, south coast, New South Wales. Graduate School of the Environment, Working Paper 9603, Part 3, 83-140.

### **Conference presentations:**

- May, J-H., Larsen, J., **Cohen, T.J.,** Meyer, M., Nanson, G.C. (2010) European Geophysical Union. Mt. Chambers Creek alluvial fan - a recorder of late Quaternary flow regime changes along the eastern Flinders Ranges, South Australia. *Poster presentation.*
- Handley, H.K., Dosseto, A., Suresh, P.O., **Cohen, T.J.,** Turner, S.P. (2009) American Geophysical Union Fall Meeting. Sediment residence time and landscape evolution in arid Australia. *Poster presentation.*
- Cohen, T.J.** (2009) 7th International Association of Geomorphologists (IAG). Mega lakes and big rivers: evidence for late Quaternary climate change in central Australia. **Keynote oral address.**
- Nanson, G.C and **Cohen, T.J.** (2009) Fluvial and lacustrine response to Pleistocene climate change in Australia. Global Continental Palaeohydrology Conference, Haifa, Israel, November 2009.
- Cohen, T.J.** (2009) Past Climates Symposium. Lake levels on mega-Frome in central Australia: evidence of late Quaternary climate change. *Poster presentation.*
- Kermode, S., **Cohen, T.J.,** Reinfelds, I., Nanson, G.C, Pietsch, T.J., (2009) Alluvium of antiquity: polycyclic terraces of the lower Shoalhaven River gorge, NSW, Australia. International Association of Geomorphologists, Melbourne, July 2009.
- Nanson, G.C and **Cohen, T.J.** (2009) Late Quaternary climate change in central Australia: mega-lake phases, river activity and the exceptional climatic conditions that drove them. Brazilian-Argentinean Congress on the Quaternary and International Geological. Correlation Program 582, Santa Fe. Argentina, September 2009.
- Nanson, G.C and Cohen, T.J. (2009) Late Quaternary climate change in central Australia: mega-lake phases and the climate that drove them. Past Climates, Wellington, NZ, 2009.

- Nanson, G.C and **Cohen, T.J.** (2008) Late Quaternary climate change in central Australia: mega-lake phases and the climate that drove them. Australian Quaternary Association Conference, Victor Harbour, December, 2008.
- Cohen, T.J.** (2007) XVII INQUA Congress. Late Quaternary development of linear and source-bordering dunes in the Strzelecki desert, Australia. Oral Presentation.
- Cohen, T.J.** (2006) 12<sup>th</sup> Biennial Australia New Zealand Geomorphology Group Conference. The relationship between hydrology and channel geometry in Tasmanian rivers. Oral Presentation.
- Cohen, T.J., Brooks, A.,** (2004) 4<sup>th</sup> Australian Stream Management Conference. The potential of airborne laser scanner (ALS) data to produce detailed surveys of rivers: an example from the Hunter River, New South Wales, Australia. *Poster presentation.*
- Cohen, T.J.** (2004) 11<sup>th</sup> Biennial Australia New Zealand Geomorphology Group Conference. Late Quaternary floodplain processes in a partly confined valley of New South Wales, Australia. Oral presentation. Awarded best post-graduate oral paper.
- Cohen, T.J.** (2002) International Association of Hydrological Sciences Conference - The structure, function and management implications of fluvial sedimentary systems. Late Quaternary floodplain processes in a confined valley of New South Wales, Australia. *Poster presentation.*
- Cohen, T.J.** (2000) 96<sup>th</sup> Association of American Geographers Conference. Post-European channel dynamics in coastal NSW, Australia: A review of channel and floodplain evolution models. Oral Presentation.
- Cohen, T.J.** (1999) 2<sup>nd</sup> Australian Stream Management Conference. Channel recovery mechanisms in a forested catchment, Jones Creek, East Gippsland; lessons for river management in south-eastern Australia. Oral Presentation.
- Cohen, T.J.** (1998) 8<sup>th</sup> Biennial Australia New Zealand Geomorphology Group Conference (1998) Channel instability in a forested catchment: A case study from Jones Creek East Gippsland, Australia. Oral Presentation.

## Higher Degree Research supervision

- Peterson, D. (2003) Rehabilitation of Cabbage Tree Creek. Honours - Bachelor of Environmental Science – University of Wollongong.
- Mickey, S. (2006) Bankfull discharge of Tasmanian rivers. Honours - Bachelor of Science – University of Tasmania.
- Kermode, S.J. (2007) An assessment of the geomorphic high flow processes, lower Shoalhaven gorge, New South Wales. Honours - Bachelor of Environmental Science – University of Wollongong.
- Garrett, O. (2009) The predicted impacts of sea-level rise on floodplain inundation on the lower Shoalhaven River: insights from the past and present Bachelor of Science Honours – University of Wollongong.

## Major Competitive Grants:

- Nanson, G.C., Jones, B.G., Chivas, A.R., Woodroffe, C.D., Fryirs, K.A., Murray-Wallace, C.V., Dodson, J.R., **Cohen, T.J.**, Harrison, S.P., Nanson, R.A., Williams, M.A., Collins, A.S., Amos, K.J., Hesse, P., Cendón, D.I., Pietsch, T.J., Brooks, A.P., Goodwin, I.D., Olley, J.M. (2011) *ARC LIEF* LE110100220 Sonic drilling to provide contamination-free core sampling of rock and unconsolidated sediment. **A - \$150,000**
- Shulmeister, J., **Cohen, T.J.**, Kiernan, K., Woodward, C., Barrows, T., Kemp, J., Fitsimmons, K., Clark, D. (2010) The last glaciation maximum climate conundrum and environmental responses of the Australian continent to altered climate states. *ARC Discovery* (DP110103081) **A –\$360,000.**
- Cohen, T.J.**, Treble, P., Hellstrom, J., Drysdale, R. (2010) Identifying moisture sources for the Australian continent over the last glacial cycle. Macquarie University New Staff Grant – **A - \$16,500.**
- Westaway, K., Goodwin, I., Fryirs, K., Hesse, P., Fanning, P., George, S., **Cohen, T.J.** Luminescence dating facility – dosimetry and luminescence detection. RIBG – Macquarie University. **A - \$65,437.**
- Nanson, G.C., Jones, B.J., Murray-Wallace, C.V., **Cohen, T.J.** (2009) *ARC Discovery* **DP1096911** “How green were our deserts? Evidence for Late Quaternary climate change and the source of water in the Lake Eyre basin.” **A - \$350,000.**
- Cohen, T.J.**, Jones, B.J. (2009) AINSE Award (09074) A fluvial record of late Holocene climate change on south coast rivers of New South Wales: implications for predicted sea-level rise. **A - \$8430.**
- Nanson, G.C., Chivas, A.R., Roberts, R.G., Murray-Wallace, C.V., Head, L., **Cohen, T.J.** Arnold, L. (2007) Reader for Optically Stimulated Luminescence dating. RIBG – University of Wollongong. **A - \$60,000.**
- Cohen, T.J.**, Lawson, A., Miller, S., Blackall, D., Ely, D. (2007) Sea level changes: linking art and science. Partnership Development Grant – University of Wollongong. **A - \$4030.**
- Nanson, G.C., and **Cohen, T.J.** (2001) AINSE Award 01/108. Cross-catchment comparison of Holocene floodplain activity on the mid-north coast of NSW. **A - \$5000.**



Nanson, G.C., and **Cohen, T.J.** (2000) AINSE Award 00/115. A chronological investigation into the downstream pattern of floodplain formation on the Bellinger River, NSW: A comparative analysis with radiocarbon, OSL and TL dating techniques. **A - \$8000.**

### **Public presentations and scientific committees**

2010 – Bellingen Shire Council – Estuary Management Presentation

2009 – NSW Environmental Trust – Restoration and Rehabilitation Program Steering Committee Review Panel.

2009 – ABC Radio National – Sea-level change on the south coast of NSW

2009 – ABC Stateline – Science-arts project television documentary on sea-level change on the Shoalhaven River

2008 – Port Macquarie Council/Northern Rivers CMA – Wilson River Presentation

2007 – Kempsey Shire Council – Macleay River Data Compilation Study

2003 – Bellingen Shire Council – Post-European landscape dynamics on the Bellinger River

### **Professional organisations:**

- AUS-INTIMATE (INQUA sub-group) – Australian co-leader
- Australian & New Zealand Geomorphology Group (ANZGG) – Honorary secretary
- Australian Quaternary Association (AQUA)

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## **CONSULTANCY PROJECT DETAILS**

### **Past Clients – State Government**

- 2008 NSW Southern Rivers CMA – An assessment of remedial works on Brogers Creek, Kangaroo Valley
- 2007 Tasmanian Department of Primary Industries Water and Environment - Design and construction of remedial works on Palmers Rivulet, Western Tiers.
- 2006 NSW Northern Rivers CMA – A geomorphic assessment of the Wilson River (in conjunction with GECO catchment consulting)
- 1998 NSW Department of Land and Water Conservation – River Styles Assessment for Bellinger and Hastings catchments

### **Past Clients – Local Government**

- 2009 Bellinger Shire Council – The geomorphology of the Bellinger/Kalang estuaries
- 2004 Coffs Harbour City Council/Orara Valley Rivercare Management Committee
- 2005 Kempsey Shire Council – Data compilation for Macleay River Estuary (in conjunction with GECO catchment consulting)

### **Past Clients – Tertiary Sector**

- 2004 Griffith University - Upper Hunter River Rehabilitation Initiative – Design and construction of engineered log jams

### **Past Clients – Private Sector**

- 2008 Scarp Archaeology – A geochronological assessment of the Warkworth Sands in the Hunter Valley, NSW.
- 2008 Tharwa Sands Pty Ltd – A geomorphic assessment of aggregate extraction on the Murrumbidgee River

### **Past Clients – Community**

- 2003 Never Never Catchment Group
- 1996 Lower Portland Rivercare Group