

## Profile Summary

I am the Dean of the Faculty of Social and Applied Sciences which includes:-

- CCCU Business School
- School of Human & Life Sciences
- School of Law, Criminal Justice & Computing
- School of Psychology, Politics & Sociology

I am also the institutional lead for the Broadstairs campus.

I am Professor of Physical Geography with my main research interests being associated with coastal geomorphology, sea level change, environmental change and environmental hazards. This has included funded research on coastal evolution, environmental change and sea level changes.

I am also a Senior Fellow of the Higher Education Academy with teaching expertise in physical geography, environmental change and environmental hazards. I have also developed a number of courses in Geography and Environmental Sciences.

## Research and Knowledge Exchange

Research Interests: Coastal geomorphology, sea level change, Quaternary geomorphology, Neotectonics, environmental hazards, environmental hazards and Human Evolution.

Research Techniques: Geomorphological mapping, field survey, physical and chemical analysis of sediments.

Regional Interests: Scotland, Mediterranean, Scandinavia.

## Recent Publications

Smith D.E., Cullingford R.A. & Firth C.R. 2000: Patterns of isostatic land uplift during the Holocene: evidence from mainland Scotland. *Holocene*, **10**, 489-501.

Firth C.R. & Stewart I.S. 2000: Postglacial tectonics of the Scottish glacio-isostatic uplift centre. *Quaternary Science Reviews*, **19**, 1469-1493.

Andrade C., Dawson A., Firth C., Freitas C., Shi S. & Smith D.E. 2000: Extreme coastal flooding. In Smith D.E., Raper S.B., Zerbini S. & Sanchez-Arcilla A. (eds.). *Sea level change and coastal processes: Implications for Europe*, European Commission, Luxembourg, 134-172.

Wickham-Jones C. & Firth C.R. 2000: The Mesolithic settlement of Northern Scotland: First results of fieldwork in Caithness and Orkney. In Young R. (ed) *Mesolithic Lifeways: Current research from Britain and Ireland*, Leicester Archaeological Monographs, Vol 7, p119-132.

- Stewart I.S., Firth C.R., Rust D., Collins P.E.F. & Firth J.A. 2001: Postglacial fault movement and palaeoseismicity in western Scotland: A reappraisal of the Kinloch Hourn fault, Kintail. *Journal of Siesmology*, **5**, 307-328.
- Smith D.E., Firth C.R. & Cullingford R.A. 2002: Relative sea level trends during the early-middle Holocene along the eastern coast of mainland Scotland, U.K. *Boreas*, **31**, 185-202.
- Smith D.E., Shi S., Cullingford R.A., Dawson A.G., Dawson S., Firth C.R., Foster I.D.L., Fretwell P.T., Haggart B.A., Holloway A.K. & Long D. 2004: The Holocene Storegga Slide tsunami in the United Kingdom. *Quaternary Science Reviews*, **23**, 2291-2321.
- Smith D.E., Fretwell P.T., Cullingford R.A. & Firth C.R. 2006: Towards improved isobase models of Holocene land uplift for Mainland Scotland. *Transactions of the Royal Society*, **364**, 949-972.
- Smith, D.E., Stewart, I.S., Harrison, S. and Firth, C.R. 2009: Late Quaternary neotectonics and mass movemnet in South East Raasay, Inner Hebrides, Scotland. *Proceedings of the Geologists' Association*, **120** (2-3). pp. 145-154.
- Teasdale, P., Collins, P.E.F., Firth, C.R. and Cundy, A.B. 2011: Recent estuarine sedimentation rates from shallow inter-tidal environments in Western Scotland: implications for future sea-level trends and coastal wetland development *Quaternary Science Reviews*, **30** (1-2),109-129.
- Smith D.E., Harrison S., Firth C.R. and Jordan J.T. 2011: The early Holocene sea level rise. *Quaternary Science Reviews*, **30(15-16)**, 1846-1860.
- Smith D.E., Hunt N., Firth C.R., Jordan J.T., Fretwell P.T., Harman M., Murdy J., Orford J.D., & Burnside, N.D. 2012: Patterns of Holocene relative sea level change in the North of Britain and Ireland. *Quaternary Science Reviews*, **54(26)**, 58-76.
- Hopkinson L., Rutt K., Kristova P., Blows J. & Firth C.R. 2015: Sourcing limestone masonry for restoration of historic buildings: A spectroscopic study. *Science of the total environment*

### Recent Funded Research

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|------|---------|---|
| 2004 | £15,500 | Topic: Sea-level changes near Dounreay Nuclear Power Station<br>Source: British Geological Survey (NERC)<br>Role: Principal Investigator<br>Starting Date: August 2004<br>Duration: 1 year1 |
| 2004 | £1,000  | Topic: Newfoundland Tsunami Sediments<br>Source: GeoMarine Ltd<br>Role: Principal Investigator<br>Starting Date: December 2004<br>Duration: 1 year  |
| 2005 | £54,000 | Topic: Ozone levels and air quality in Southern England<br>Source: European Commission<br>Role: Investigator  |

- Starting Date: March 2005  
Duration: 2 years
- 2007 £125,000 Topic: RCUK Research Fellowship in Hydrogeology  
Source: EPSRC  
Role: Lead Academic  
Starting Date: October 2007  
Duration: 5 years
- 2010 £247,000 Topic: Setarms (Characterisation and use of dredged sediments from the English Channel)  
Source: European Commission  
Role: Collaborator  
Starting Date: December 2010  
Duration: 3 years
- 2011 £1,500 Topic: Future Coastal Evolution of Cuckmere Valley  
Source: East Sussex Council  
Role: Collaborator  
Starting Date: February 2011  
Duration: 3 months
- 2014 £100,000 Topic: Monitoring the Evolution of Medmerry Setback  
Source: Environment Agency  
Role: Collaborator  
Starting Date: February 2014  
Duration: 5 years

#### Recent Conference Papers

- Firth C.R., McGuire B. & Stewart I.S. 2005: Late Quaternary climatic change as a trigger for explosive volcanism. *Royal Geographical Society/ Institute of British Geographers Annual Conference, September*, London
- Firth C.R., Collins P.E.F., & Teesdale P. 2005: Recent estuarine sedimentation rates in Scotland: Implications for future coastal development. *Royal Geographical Society/ Institute of British Geographers Annual Conference, September*, London
- Smith D.E., Fretwell P.T., Hunt N., Firth C.R. & Orford J.D. 2007: Shoreline based models of land uplift compared with ice sheet loading in a glacio-isostatic area: the UK and Republic of Ireland. *British Society for Geomorphology, Geomorphology – a 2020 Vision*, Birmingham, July.
- Smith D.E., Hunt N., Firth C.R., Fretwell P.T., Harman M., Murdy J., Orford J.D. and Jordan J. 2007: Glacio-isostatic uplift and sea surface changes during the mid and late Holocene in the northern United Kingdom and Republic of Ireland. *UK Sea Level IGCP Conference*, St Andrews, July.
- Teesdale P., Cundy A.B., Collins P.E.F. & Firth C.R. 2007: Recent sea level changes and sedimentation in the Western Highlands of Scotland. *UK Sea Level IGCP Conference*, St Andrews, July.

- Firth C.R., Teasdale P & Smith D.E. 2007 Patterns of Holocene Coastal Development in Eastern Scotland: INQUA XVII Congress: Cairns, July-August.
- Firth C.R., Teasdale P., Cundy A.B. & Collins P.E.F 2007: Is recent sea level rise accelerating? Testing the theory in Scotland. INQUA XVII Congress: Cairns, July-August.
- Smith D.E., Fretwell P.T., Hunt N., Harrison S. and Firth C.R. 2007: Determining the anatomy of Quaternary ice sheets using Digital Terrain Mapping: the British-Irish Ice Sheet at the Last Glacial Maximum. INQUA XVII Congress: Cairns, July-August.
- Smith D.E., Hunt N., Firth C.R., Fretwell P.T., Harman M., Murdy J. and Orford J.D. 2007: Glacio-isostatic uplift and sea surface changes during the last 8000 years in the United Kingdom and the Republic of Ireland. INQUA XVII Congress: Cairns, July-August.
- Teasdale P.A., Firth C.R. & Henderson I.E. 2009: Recent sedimentation rates from inter-tidal marshes in the Adur Estuary, south-east UK: determined from  $^{210}\text{Pb}$  and  $^{137}\text{Cs}$  radiometric dating methods. INQUA Coastal and Marine Processes Commission, Holland, July.
- Firth C.R., Smith D.E. & Rose J. 2010: Locating the centre of Holocene glacio-isostatic uplift in Scotland. In Woodroffe S.A., Long, A.J., Shennan I. and Roberts D.H. (eds.) *Sea-level changes: Science of a Changing World*. Quaternary Research Association Annual Discussion Meeting. Durham. P69.
- Teasdale P., Firth C.R. & Cundy A.B. 2010: Recent sea level changes across the Scottish glacio-isostatic uplift centre. *Coastal evolution and sea level change, Arundel, West Sussex*.
- Firth C.R., Smith D.E., Fretwell P.T and Burnside N. 2011: Patterns of glacio-isostatic uplift in northern Britain and Ireland derived from raised marine shorelines: the application of krigging. INQUA XVIII Congress: Bern, July
- Smith D.E., Firth C.R., Harrison S., Jordan J.T., Macleod A., Mighall T.M., Stewart I., Teasdale P.A. and Tooley M.J. 2011: A remarkable late Quaternary neotectonic feature on the Isle of Raasay, Scotland, UK. INQUA XVIII Congress: Bern, July
- Teasdale P.A., Cundy A.B., Collins P.E.F. and Firth C.R. 2011: Radiometric dating techniques and recent sea level change: A review. INQUA XVIII Congress: Bern, July
- Firth C.R. 2011: Fieldwork Authorisation – The Buck stops with me. *Safety in fieldwork*. USHA Conference, London, Sept.
- Cundy A.B., Teasdale P.A., Firth C.R. & Hopkinson L. 2013. Characterisation of estuarine sediments from the English Channel. SetArms Conference, April.
- Teasdale P.A., Kilkie P & Firth C.R. 2015: Recent estuarine sedimentation rates from shallow inter-tidal environments in Chichester Harbour, southern UK: implications for future coastal wetland development. Society of Wetland Scientists, Rhode Island, USA, May.
- Firth C.R. and Smith D.E. 2015: Field evidence to constrain models of glacio-isostatic uplift in Scotland. INQUA XIX Congress: Japan, July.
- Firth C.R. and Cole J. 2015: A review of super-volcano eruptions and their impact on hominin evolution. INQUA XIX Congress: Japan, July.

### **Research Students**

S. Turner	PhD 2000	Wetland evolution in southern Sicily. (Full-time)
J.Reade	MPhil. 2003	Evaluation of coastal management strategies in South-east England. (Part-time)
P.Teasdale	PhD 2005	Evolution of coastal wetlands in western Scotland. (Full-time/part-time)
S. Makajee	MPhil 2006	Nutrient cycles in costal wetlands (Part-time)
L. McGrady	PhD 2008	Pollution levels in automotive shredder residue (Full-time/part-time)
Xiaowei Yu	PhD 2010	Sediment transport and wave breaking ( Industrial Funded Studentship, second supervisor,)
E. Matthewson	PhD	Tectonic evolution in northern Spain (EPSRC Full-time studentship, second supervisor, currently completing revisions)
P. Kilkie	PhD	The mobility of estuarine sediments (Full-time expected completion Jan 2016)
S. Bromfield	MPhil/PhD	Characterisation of periglacial sediments (Full-time expected completion Sept 2016)
J Dale	MPhil/PhD	Initial evolution of the Medmerry setback site (Full-time Environment Agency funded PhD, expected completion Sept 2017)

### **Teaching and Subject Expertise**

#### **1. Teaching Duties**

Level 4: Geomorphology, Environmental Hazards, Environmental Change, Fieldwork, Statistics, Tutorials.

Level 5: Geomorphology (coastal and Quaternary), Environmental Hazards, Climate Change, Advanced Statistics

Level 6: Coastal Geomorphology, Dissertation supervision

Whilst I have developed and delivered modules associated with my research specialisms (coastal geomorphology, environmental change, environmental hazards) I have also used my broad knowledge of environmental systems to contribute to other areas of geography and geology.

#### **2. Course Development and Design**

I have developed 7 courses in the areas of Geography, Environmental Sciences and Geology (listed below).

1994	MSc Environmental Change	Brunel University College
1996	BSc (Hons) Geography	Brunel University
1996	BA (Hons) Geography	Brunel University

1996	BSc (Hons) Earth Sciences	Brunel University
1998	BSc (Hons) Environmental Hazards	Brunel University
2003	BSc (Hons) Environmental Hazards	University of Brighton
2013	BSc (Hons) Geography with Archaeology	University of Brighton

### 3. Innovation in Teaching and Assessment

Examples of innovation include:-

- Use of laboratory hardware models to develop students skills in experimental design (Firth 1988)
- Use of oral presentations to improve students communication skills
- Use of data response exam questions to assess students observational skills
- Integration of computer based learning into modules
- Using photos to enhance students observational skills in the field
- Design of challenging and stimulating coursework assessments based on research data
- Introduction of Web Design into undergraduate courses
- Making statistics courses stimulating and relevant
- Integrating research into student learning (both research informed and research based learning)