DOCTORADO EN ARQUEOLOGÍA

Facultad de Ciencias Sociales - UNICEN

Curso de Doctorado

Geocronología del Cuaternario para arqueólogos

Dictado por:

Lewis Andrew OWEN, PhD

Department of Geology, University of Cincinnati

Fecha:

13 al 17 de marzo de 2017

El lunes 13 inicia a las 16 hs.

Lugar:

Facultad de Ciencias Sociales, Campus Universitario de Olavarría.

Doctorado en Arqueología

Curso

1. Título: Geocronología del Cuaternario para arqueólogos

2. Docente a cargo: Lewis Andrew OWEN, PhD

3. Objetivos:
Recientes avances en tecnologías geocronológicas del Cuaternario están ayudando a revolucionar nuestra comprensión del cambio paleoambiental y la evolución del paisaje mediante la definición de la planificación de eventos y la cuantificación de las tasas de cambio. Este curso tiene como objetivo examinar los principales principios, técnicas y aplicabilidad de los métodos siderales de datación, isotópica, radiogénica, química y biológica para contribuir a la formación de los arqueólogos que se ocupan de definir la temporalidad de los eventos y las tasas de cambio ambiental. Los estudios de casos iluminan el papel clave de la geocronología en la geomorfología y la arqueología. El curso consistirá en clases teóricas y prácticas donde se ayudará a los arqueólogos a evaluar la validez de los diferentes métodos de datación, así como el análisis y presentación de datos.

4. Contenidos:

Unidades:

1. Introducción a la geocronología, estratigrafía y a la datación relativa
2. Datación por radiocarbono
3. La datación por luminiscencia
4. La datación cosmogénica
5. Tefrocronología y Datación por series de Uranio

5. Bibliografía

Unidad 1: Introducción a la geocronología, la estratigrafía y la datación relativa
Clase teórica.
Trabajo práctico: Desarrollo de cronologías relativas y estratigrafía.

Bibliografía obligatoria:
Hughes, P.D., 2010. The role of geomorphology in Quaternary stratigraphy: morphostratigraphy, lithostratigraphy and allostratigraphy. Geomorphology 123, 189-199.

Unidad 2: Datación por radiocarbono
Clase teórica.
Trabajo práctico: Calibración de las edades de radiocarbono
Bibliografía obligatoria:
Reimer, P.J and 29 others, 2013. IntCal13 and Marine13 Radiocarbon Age Calibration Curves 0-50,000 Years cal BP. Radiocarbon, 55, 1869-1887.

Unidad 3: La datación por luminiscencia
Clase teórica.
Trabajo Práctico: El cálculo de las edades OSL y evaluación de su significado.
Bibliografía obligatoria:
Rhodes, E.J., 2011. Optically stimulated luminescence dating of sediments over the past 200,000 years. Annual Review of Earth and Planetary Sciences, 39, 461-88.

Unidad 4: La datación cosmogénica
Clase teórica.
Trabajo Práctico: El cálculo de las edades de TCN, la evaluación de modelos a escala y problemas geomorfológicos.

Bibliografía obligatoria:
Marrero, S.M., Phillips, F.M., Borchers, B., Lifton, N., Aumer, R., Balco. G., 2016. Cosmogenic nuclide systematics and the CRONUScalc program. Quaternary geochronology, 31, 160.

Unidad 5. Tefrocronología y Datación por series de Uranio?
Clase teórica.
Trabajo práctico: Elegir y aplicar los métodos geocronológicos cuaternarios a los problemas arqueológicos.
Bibliografía obligatoria:

Fontijn, K., Lachowycz, S.M., Rawson, H., Pyle, D.M., Mather, T.A., Naranjo, J.A., Moreno-Roa, H., 2014. Late Quaternary tephrostratigraphy of southern Chile and Argentina. Quaternary Science Reviews, 89, 70-84.

Si bien se consigna solo una referencia como bibliografía obligatoria, se agregará una lista de referencias completas como bibliografía adicional. Se entregará a los alumnos la bibliografía así como material adicional para las clases teóricas y los ejercicios prácticos por vía electrónica.

6. Modalidad de dictado:
Intensivo.

7. Duración:
30 horas reloj.

8. Modalidad de evaluación:

Además de completar el ejercicio diario, se efectuará una evaluación final escrita de carácter individual.

Curriculum Vitae

Lewis Andrew Owen

Department of Geology, University of Cincinnati
Cincinnati, Ohio 45221
Lewis.Owen@uc.edu

Citizenship and Date of Birth

USA and British, June 29, 1964

High School Education

1975-1982: St Teilo's Church in Wales High School, Cardiff, United Kingdom

Undergraduate Education

October 1982 - June 1985: B.Sc. honors in Geology, Imperial College of Science and Technology, University of London, London, UK

Graduate Education

August 1985 – June 1988: Ph.D. in Quaternary Geology and Geomorphology, Departments of Geology & Geography, University of Leicester, Leicester, UK
Title: "Terraces, uplift and climate, Karakoram Mountains, Northern Pakistan"
Advisors: Professors Edward Derbyshire and Brian F. Windley

Present & Past Employment

9/09 – present: **Professor and Head, Department of Geology, P.O. Box 210013, University of Cincinnati, Cincinnati, OH 45221-0013, USA**

9/08 – 9/09: Professor and Acting Head, Department of Geology, University of Cincinnati

9/07 – 9/08: Professor, Department of Geology, University of Cincinnati

9/04 – 9/07: Associate Professor, Department of Geology, University of Cincinnati

7/01 – 7/04: Associate Professor, Department of Earth Sciences, University of California, Riverside, CA92521, USA

8/97 – 7/01: Assistant Professor, Department of Earth Sciences, University of California, Riverside

8/95 – 8/97: Lecturer in Geomorphology, Department of Geography, Royal Holloway, University of London, Egham, Surrey, TW20 OEX, UK

2/91 – 8/95: Lecturer in Earth Science, Departments of Geology and Geography, Royal Holloway, University of London

9/89 – 2/91: Lecturer in Earth Science, Hong Kong Baptist University, Hong Kong

3/89 – 9/89: Engineering Geologist/Geomorphologist for Geomorphological Services Ltd., UK

9/88 – 3/89: Post-Doctoral Researcher, Department of Geography, University of Leicester, UK. **Subject**: *Landslides and debris flows in the thick loess of China*

Affiliations

Geological Society of America (GSA); American Geophysical Union; Geological Society of London; American Quaternary Association; Quaternary Geology and Geomorphology Division of GSA

Awards

- **Clair P. Holdredge Award** (2012) - presented to authors of a publication that in the past five years has been judged to be an outstanding contribution to the advancement of the profession of engineering geology; awarded for Rockwell et al. (2010)

- **Busk Medal of the Royal Geographic Society** (2011) – senior medal for conservation research or for fieldwork abroad in geography or in a geographical aspect of an allied science; awarded for field research in paleoenvironmental history and geomorphology in tectonically active areas

- Elected **Fellow of the Geological Society of America** (2011)

- Elected **Fellow of Graduate School**, University of Cincinnati (2009)

- **Guest Professorship at the Qinghai Institute for Saline Lakes, Chinese Academy of Sciences**, Xining, for achievements in Quaternary research (2002)

- **Guest Professorship at the Quaternary Glacier and Environmental Research Center of China**, Lanzhou University, for achievements in Quaternary glacial geology (2000)

- Elected **Fellow of the Royal Geographic Society** (1995)

- **President's Award of the Geological Society of London** (1992) – for significant contributions before the age of 30 – awarded for research in environmental geology

- Elected **Fellow of the Geological Society of London** (1988)

Hobbies

Kayaking, cycling, scuba diving (PADI Divemaster and BSAC Club Instructor) and geology

Overall Summary of Research, Teaching and Professional Activities

My research and teaching focuses on understanding the nature and dynamics of Quaternary paleoenvironmental change and landscape evolution of active plate margins. I have concentrated my efforts on two major geologic-geographic regions: 1) the Himalayan-Tibetan orogen; and 2) the western Cordilleras of North and South America. This is because these regions provide the best natural laboratories for understanding the dynamics of geomorphic, tectonic and climatic processes along active plate margins, and ultimately they provide analogs for understanding the evolution of many ancient plate boundaries.

Throughout my career, I have been particularly concerned with examining the relationship between tectonics, geomorphic processes and Quaternary climatic change in controlling the evolution of landscapes in these regions. Consequently my efforts have concentrated on numerically dating landforms and sediments to help quantify the timing of geomorphic events, and rates of geomorphic and tectonic processes. To undertake the numerical dating, I established laboratories at the University of Cincinnati (UC), and previously at the University of California, Riverside (UCR), to enable my students and I to utilize the newly evolving methods of terrestrial cosmogenic nuclide surface exposure and optically stimulated luminescence dating. The laboratories that I have established at UC have provided the Department of Geology with new facilities both for research and teaching. They are also attracting numerous graduate students, researchers and professional geoscientists from other institutes to work in my laboratories.

Before joining the University of Cincinnati, I was on the faculty at UCR (1997-2004) and was promoted to an Associate Professor of Geology (with tenure) in 2001. Prior to working at UCR, I was a permanent faculty member in the Center for Quaternary Research (CQR) in the Department of Geography at Royal Holloway, University of London (1991 to 1997). The CQR is the leading research center for terrestrial Quaternary science in the United Kingdom. Between 1989 and 1991, I was a lecturer in the Department of Geography at the Hong Kong Baptist University (1989 to 1991), where I taught geomorphology and physical geography. These positions have provided me with extensive experience in academia on three continents. During the past four years, I have taken on the responsibility of head of department, which has been a very rewarding experience. My external service has focused on working on editorial boards for some of the leading journals in geosciences and I am presently an Editor-in-Chief for CATENA.

RESEARCH

Summary of Research

My research focuses on the Quaternary geology and geomorphology of active plate margins, specifically mountain belts and their forelands. I am particularly concerned with quantifying the timing, and rates and magnitudes of landscape evolution in these regions to understand the dynamics and interactions between tectonics, Earth surfaces processes and climate. This involves remote sensing, field mapping, geomorphic and sedimentological analysis of landforms, and geochronology. I have concentrated my efforts in two major geographic-tectonic regions: 1) the Himalayan-Tibetan orogen; and 2) the Cordilleras of North and South America. These regions provide some of the best natural laboratories for understanding the dynamics of and the interaction between geomorphic, tectonic and climatic processes along active plate margins. I have also undertaken research in other geomorphically and tectonically active regions, including the Red Sea margin in Yemen, the Atlas Mountains of Morocco, the Venezuelan Andes, Trinidad and the Highlands of Scotland. Ultimately, these studies provide analogs for understanding and modeling ancient orogens and for predicting future environmental change. My main research interests are listed below. **Please see the grant section of my curriculum vitae for specific projects**.

- **Quaternary paleoenvironmental change and landscape evolution along active plate margins, focusing on mountains and deserts:**

- Paleoenvironmental change and landscape evolution of the Himalayan-Tibetan orogen and the Cordilleras of North and South America.

- Tectonics and landscape evolution along active faults systems, specifically within the San Andreas-Gulf of California transform plate margin and the Himalayan-Tibetan orogen.

- Defining rates of denudation and crustal displacement using geomorphic and geochronologic techniques in high mountains and their forelands.

- Tectonic, climatic and autocyclic controls on alluvial fan development.

- Defining the timing and extent of glaciation in high mountain regions, specifically the Himalaya, Tibet, western USA and Alaska.

- Testing the role of paraglaciation on landscape development.

- Paleohydrological changes within desert basins and mountain forelands, including the Atlas Mountains, Precordillera of Argentina, Southern California and Nevada, Himalaya and Tibet, and Mongolia.

● **Quaternary Geochronology**

- Testing the applicability of terrestrial cosmogenic radionuclide methods for dating Quaternary landforms and surfaces.

- Applying and developing optically stimulated luminescence methods for dating Quaternary sediments and landforms.

- Intercalibrating luminescence, terrestrial cosmogenic radionuclide surface exposure and radiocarbon dating methods.

● **Environmental Geology**

- Geomorphic hazard mitigation, specifically landsliding, erosion and flooding

- Paleoseismic studies for earthquake hazard mitigation.

- Environmental sensitivity mapping.

My most notable contributions have included developing a modern framework for defining the extent and time of Quaternary glaciation throughout the Himalaya and Tibet, specifically for Mt. Everest, the Karakoram and the Himalaya of Northern India. I have provided some of the first quantitative studies of the timing, magnitude and rates of erosion, landsliding and sediment transfer for the Himalayan-Tibetan orogen. In addition, my work using terrestrial cosmogenic nuclide surface exposure and optically stimulated luminescence methods to determine geomorphic rates of vertical and horizontal displacement along active faults has helped drive the development of tectonic geomorphology. Notable studies of mine include research on major

faults such as the Death Valley-Fish Lake Valley, Owens Valley, San Jacinto and San Andreas faults along the San Andreas-Gulf of California transform plate margin. My research on mountain and desert geomorphology has also made a major contribution to our understanding of landscape development and the nature of environmental change in some of the world's most environmentally sensitive regions.

Detailed outline of research

My research focuses on the Quaternary geology and geomorphology of tectonically active mountains and their forelands. I am particularly concerned with quantifying the timing, and rates and magnitudes of Quaternary landscape evolution in these regions to understand the dynamics and interactions between tectonics, Earth surface processes and climate. This involves remote sensing, field mapping, geomorphic and sedimentological analysis of landforms and sediments, and geochronology. Throughout my career, I have concentrated my efforts in two major geologic-geographic regions: 1) the Himalayan-Tibetan orogen; and 2) the Cordilleras of North and South America. These regions provide two of the best natural laboratories for understanding the dynamics and the interaction between geomorphic, tectonic and climatic processes along active plate margins. I have also undertaken research in other regions including the Yemen, Mongolia, United Kingdom, Canadian High Arctic, Alaska, Venezuela, Morocco, Trinidad and Iceland. My research program to date has resulted in 15 graduates successfully completing doctorates and masters degrees under my supervision, > 120 papers in internationally peer-reviewed journals, > 20 articles in books or magazines, > 12 edited volumes, and since 1998 approximately 100 abstracts.

In numerous high mountain environments and drylands, my research has: established new Quaternary stratigraphic frameworks; produced some of the first lithofacies models that show the relationships between sediments, landforms and environmental settings; helped reconstruct the nature of Quaternary paleoenvironmental change; and has quantified rates of geomorphic and tectonic processes. In particular, this work has enabled me to become one of the leading researchers and authorities on the Late Quaternary glacial geology, geomorphology and paleoenvironmental history of the Himalayan-Tibetan orogen. In a broad sense my research is providing frameworks and analogs to help reconstruct and understand the recent geologic history and paleoenvironmental evolution of young plate boundaries and orogenic systems. In particular, it has helped establish a modern foundation for reconstructing the nature of Quaternary paleoenvironmental change and landscape evolution in the high mountains and dryland regions of central Asia, with implications for understanding the nature of Quaternary climatic change and the dynamics of continental-continental collision. Furthermore, my work on the dynamics of geomorphic systems and

environmental change is important for hazard mitigation, environmental management and sustainable development in high mountains and dryland regions.

In 1992, the Geological Society of London acknowledged my early career research contributions by presenting me with the President's Award for my contributions to environmental geology. The Geological Society of London is the oldest and one of the most prestigious geological societies, and this award is given each year to a geoscientist who has made an outstanding contribution to their discipline before the age of 30. In June 2000, the Quaternary Glacier and Environment Research Center of China in Lanzhou University honored my research achievements by awarding me with a Guest Professorship. This was followed in 2002 by another Guest Professorship bestowed on me by the Qinghai Institute for Saline Lakes (Chinese Academy of Sciences) for my contribution to the Quaternary geology of high Asia. In 2011, I was awarded the prestigious Busk Medal from the Royal Geographical Society for my field research in palaeoenvironmental history and geomorphology in tectonically active areas.

My research in the Himalayan-Tibetan orogen has concentrated on understanding the dynamics of glacial systems. This is because glaciation dominates the geomorphic and sedimentary systems in high mountain regions and their study provides a starting point for defining and quantifying the nature of Earth surface processes and their relationship to the climate and tectonics, and their controls on landscape evolution. Three major problems exist: i) the dynamics of high mountain glacial sedimentary systems have not been adequately quantified; ii) the former extent of glaciers throughout the Quaternary is poorly defined and reconstructions of past glaciers are problematic in many regions; and iii) the timing of glaciation throughout the late Quaternary is not well known.

Giving the first problem, I have been developing lithofacies and landsystems models to characterize Himalayan-Tibetan and other high-altitude glacial systems (B3, B4, B40, B41, C1, C2, C4, C5 and C11)[1]*. Steep slopes that supply abundant debris to the surface of glaciers dominate these glacial systems. The abundance of debris on glacier surfaces poses problems in using them as proxies for reconstructing past climate, for example, using the standard techniques of reconstructing equilibrium-line altitudes depressions. I addressed this problem for the Himalayan-Tibetan region as part of PMIP (Palaeoclimate Modeling Intercomparison Project endorsed by PAGES and IGBP), by producing and compiling data from remote sensing and field studies throughout the Himalaya and Tibet to reconstruct the paleoclimatic conditions during the global Last Glacial Maximum (LGM) (B56, B57).*

The second problem, defining the former extent of past glaciations throughout these regions, has emerged because of the difficulties in distinguishing former glacial deposits from mass movement deposits, and vice

[1] Numbers refer to the publications listed in the section below.

versa. I have, therefore, been systematically field checking previous studies and undertaking new field mapping based on our modern understanding of the glacial geology derived from my lithofacies and landsystem models. This is producing new and modern chronologies throughout the region (B11, B13, B15, B17, B19, B21, B22, B26, B28, B30, B31, B35, B36, B38, B43, B44, B49, B54, B60, B63, B72, B76, B85, B88, B90, B99, B101, B104 and B121).

The third problem, defining the timing of glaciation, has arisen because the standard method of radiocarbon dating cannot be used in the Himalayan-Tibetan region due to the scarcity of organic matter necessary for the technique. I have therefore been addressing this problem by defining the timing of glaciation using the newly developing techniques of terrestrial cosmogenic nuclides (TCN) and optically stimulated luminescence (OSL) dating. By selecting distant study areas through the Himalaya and Tibet, I have been dating the glacial successions and testing if glaciation was synchronous throughout the region during the Late Quaternary. This work is also allowing me to resolve the relative importance of the south Asian summer monsoon and mid-latitude westerlies that control the climatic system and glaciation in the region (B30, B31, B35, B36, B37, B38, B43, B44, B48, B49, B54, B60, B63, B72, B76, B85, B88, B90, B99, B101, B104, B113, B121). My graduate students and I have undertaken more than a twenty detailed regional studies and have determined »1500 TCN ages on the glacial successions. This research shows that glaciation was very restricted during the global Last Glacial Maximum (LGM) but was more extensive in the early part of the last glacial cycle and that monsoon precipitation and cloud cover is the primary control on glaciation in this region (B35, B36, B37, B38, B43, B44, B46, B48, B49, B54, B60, B63, B72, B76, B85, B88, B90, B99, B101, B104). Of particular note is our work in the Hunza valley and around Mt. Everest that provides the most detailed geochronological studies for the timing of multiple glaciations in central Asia (B37 and B90). I will continue to develop this extensive program over the next few years by extending my field studies and geochronological work. My interest in glaciation has also included examining recent glacier fluctuation. In particular our work in the Karakoram is showing that some glaciers are advancing, contrary to the popular view that they might retreat due to human-induced global warming (B116).

My work on Himalayan-Tibetan glaciation was internationally recognized when I was asked to contribute to: EPILOP (Environmental Processes of the Ice Age: Land, Oceans, Glaciers) of IGBP/PAGES, which aims to reconstruct the nature of glaciation during the LGM; PMIP that aims to model the climatic conditions during the LGM; and INQUA's (International Union for Quaternary Research) global glacial mapping project (B36). Clearly, the above research has important implications for climatic modelers who are emphasizing the need to understand variations in tropical and subtropical climatic systems for accurate modeling of past and future climate change.

The influence of glaciation on hydrologic and climatic systems is another one of my major interests; and was the subject of IGCP415 (International Geological Correlation Program 415: Glaciation and reorganization of Asia's network of drainage). As part of this program, I led a working group on the glaciation of Tibet and the bordering mountains and co-edited four volumes of papers that examined the regional and global implications of Himalayan-Tibetan glaciation (F6 to F9). I also helped lead an INQUA and NSF funded workshop on mountain glaciation, which resulted in two edited volumes of papers on mountain glaciation and geomorphology (F11 and F12).

With regard to glaciation and hydrology, I have been testing the paraglacial concept, that is, most landscape changes in glaciated regions take place during deglaciation in relative short periods of time as the glacial, fluvial and mass movement systems readjust themselves to the changing conditions. This work is showing the importance of climate change and hence oscillations in the extent of mountain glaciers, and on the rates and magnitudes of erosion and sediment transfer in the Himalaya and Tibet (B6, B10, B24, B39, B51, B52, B59, B61, B63, B89, B108 and B112). I have been continuing this work by examining moraines and alluvial fans in the Garhwal Himalaya, and in the valleys around Mount Everest and Nanda Devi, and in the Kunlun Mountains (B51, B52, B59, B61 and B63).

Over the last few years, we have been using TCNs to help define rates of fluvial incision, basin-wide erosion, and headwall erosion throughout several glacial basins in the Himalayan-Tibetan orogen. This is

helping us to quantify the importance of glacial and associate processes in landscape evolution and has resulted in several papers (B83, B87, B88, B104, B114 and B115). The data we are obtaining is showing strong temporal controls on rates of erosion, that is, Holocene rates are much higher than Late Quaternary rates of erosion. The reasons for this are many fold including episodic erosion, climate controls and autocyclic processes; and this will be a focus of research in the coming years. Some of this work was featured on the History Channel's series How the Earth was made.

I have also worked in desert regions of central Asia and that have included studies in the Qaidam Basin of Tibet, southern Mongolia and northern China. In these regions alluvial fan, lacustrine and glacial sediments provide information on the role of the climate, tectonics and autocyclic processes in the evolution of deserts and their fluctuating margins. In particular, this work has concentrated on the alluvial fans in the Gobi desert and Qaidam Basin to show that although they are associated with the tectonically active Gobi Altai and Kunlun Mountains, their formation was largely controlled by changes in the hydrological system when the region became more arid during the Late Pleistocene (B18, B39 and B63). I was also able to show that much of the Gobi desert had experienced permafrost conditions during the Last Glacial and that permafrost degradation had occurred by ~10,000 years ago (B25). Furthermore, this research delimited the southernmost extent of permafrost in northern Asia during the Late Quaternary, which has also helped in determining paleotemperatures for the region. Ultimately, these studies will link the paleoclimatic records for the Himalaya, the Tibetan Plateau, the Loess Plateau of central China and the Gobi Desert to provide detailed regional reconstructions of Late Quaternary climatic change in central Asia.

My interest in the role of tectonics on the landscape evolution of the Himalaya and Tibet has involved research along the Gobi Altai-Tien Shan (GATS) fault system and the associated transpressional mountain ranges in Asia. The GATS fault system is important because it represents the northern most extension of the Indian-Asia collision zone. My research aimed to quantify the amount of deformation that was

accommodated along this fault system and to provide one of the first examinations of the evolution of young transpressional mountain ranges along a major strike-slip fault system within a continental interior (B16, B27 and C10). As part of this research we also completed a study of the western termination of this fault system in the easternmost Tien Shan, which is highlighting the importance of structural controls on the geomorphic evolution of transpressional mountain ranges (B45). From these studies we were able to assess rates of mountain uplift and calculate earthquake recurrence intervals by applying OSL methods to date deformed sediments and landforms within the foreland regions (B27). These studies are important because they may be used as analogs in similar tectonic settings, such as in transpressional zones along the San Andreas Fault. This research also has important implications for predicting the geometry and nature of active faulting for seismic hazard mitigation. Currently, we are working on the Karakoram Fault in the Pamir Mountains to determine its evolution and role in orogensis. This is involving mapping landforms and structures, and glacial and terrace chronologies using TCN and OSL methods. This work will continue over the next few years. Further extending my interest in active faulting in orogens, Shams ul-Hadi, Shuhab Khan (University of Houston) and I have recently dated several offsets along the Chaman Fault that runs along the western margin of the Indian-Asian (Afghanistan block) collision zone in Pakistan and Afghanistan (Bip1 and Bs4).

I have also undertaken studies of the geomorphic effects of large earthquakes in the Himalaya and Tibet. The first set of studies involved work throughout the Garhwal Himalaya that was shook by two large earthquakes during the 1990s and then a series of studies on the recent Kashmir earthquake in 2005. These earthquakes produced extensive landsliding and we were able to examine their contribution in terms of overall effect on denudation and landscape modification. The maps and databases that we produced in these research projects are being used for hazard mitigation in the study areas (B14, B33, B73, B77, B95, B102, B120, B122, Bs7). This work is helping to highlight these highly hazardous phenomena and I am planning to extend this work by undertaking a systematic study of geomorphic hazards throughout northwestern Himalaya in the coming years. In addition, I led and completed a study of earthquake-induced giant ice avalanches in the Kunlun Mountains of Tibet that were produced by the 2001 Magnitude 7.9 Kokoxili earthquake (B50).

My research in the Cordilleras of North and South America has focused on San Andreas-Gulf of California Transform System (SAGCTS), the Alaskan Range, the Venezuelan Andes, Atacama Desert and Precordillera of Argentina. These include studies on both tectonic geomorphology and Quaternary paleoenvironmental change (Bs11). With regard to the tectonic geomorphology, I am particularly concerned with quantifying, on geomorphic timescales (10's to 100,000's years), the partitioning of deformation along the southern stretch of the SAGCTS margin (B34, B42, B53, B58, B65, B68, B71, B80, B84, B94, B100, B103, B118, B119 and B122). I am addressing this by a combination of remote sensing, field mapping, fault trenching and dating of sediments and landforms. This research has including studies of offset rates and paleoseismic events on the southern stretch of the San Andreas Fault and on the San Jacinto, Raymond, Malibu, Banning, Brawley and Mission Creek faults. I am also examining the evidence for crustal deformation, particularly the early stages of mountain uplift, in the Mecca Hills along the eastern margin of the Salton Trough. Our initial studies are defining uplift rates and are providing the oldest (» 400 ka) ages on pediment and alluvial fan surfaces in the western USA. These surfaces are deformed by numerous faults and in the coming years I plan to use these dated faulted surfaces to test diffusion models of fault scarp degradation.

My paleoenvironmental research on the SAGCTS has concentrated on the study of the glacial geology of the San Gorgonio Mountain and the paleohydrological history of the adjacent foreland regions. My research on the San Gorgonio Mountain is providing the first data on the timing of glaciation in the southwestern most glaciated area of North America (B47). This is allowing us to quantify the nature of climate change during the Late Pleistocene in the region and it fills an important gap in our knowledge of timing and extent of mountain glaciation in the American Cordilleras. This work was featured on the CNN and Discovery Channel web pages, and highlighted in Geotimes and several regional newspapers. I am presently extending this work by examining the Late Quaternary glacial successions in the southern Sierra Nevada of California.

My research on paleoenvironmental change along the SAGCTS has also included paleohydrological studies. This has involved collaboration with the USGS (B.F. Cox and J.W. Hillhouse) on the evolution of the Mojave River drainage system (B42, B97 and B109). Our work combines field mapping, coring, sedimentology, geomorphology, paleomagnetism, OSL dating and vertebrate paleontology to reconstruct the evolution of the drainage system as the Transverse Ranges grew and the lacustrine basins developed in response to tectonics and climate change throughout the Quaternary. In addition, I have also recently developed several projects on alluvial fans in southern California and Baja California to examine the mode and timing of formation. Our recent results show a strong correlation between times of climatic instability and alluvial fan development (B65 and B97). This is somewhat analogous to our work on paraglacial fans in the Himalaya and Tibet. In the coming years, I plan to continue this work by studying fans along the southern end of the San Andreas Fault and in Owens Valley. I have also been working on lake level changes using a combination of geomorphic mapping, sedimentological analysis and numerical dating. Of particular importance is our finding that many of the shorelines that were previously thought to have formed towards the end of the Last Glacial (13-10 ka) have a more complex history extending back to ~30 ka. These shorelines are also important because they are associated with archaeological sites that provide evidence for human occupation during the early Holocene.

In the Alaska Range, we have been working on the glacial successions around Mt. Denali (Mt. McKinley – the highest mountain in North America) in Alaska. This research involves developing a glacial chronology, and examining the spatial and temporal variability in erosion using TCN methods. So far this work has resulted in the first comprehensive numerically dated glacial chronology for the region (B96 and B105). We plan to develop this work into a long-term research program to help understand of the links between tectonic, glaciation and climate change across the Alaskan Range. We presently have a project to examine temporal and spatial variations in rates of glacial erosion across the Kenai and Chugach Mountains in southern Alaska using TCNs, OSL thermochronology and apatite (U-Th)/He dating.

In the Atacama Desert in Chile, I have been working with Richard Allmendinger (Cornell University) and Jason Rech (Miami University) to date fan and pediment surfaces that have giant earthquake-generated cracks in them using TCN methods. These surfaces date to > 8 Ma and provide a record of numerous great earthquake events and help provide us with a history of landscape development in one of the driest places on our planet. We have submitted this research to *Nature Geoscience*, which is in revision (Bs6).

Extending my interest in the forelands of mountain belts, I have been working in the Precordillera of the Argentina Andes with Andrew Meigs (Oregon State University) and Thomas Rockwell (California State University, San Diego). In the Precordillera we are improving the chronology of deformation and earthquakes at La Rinconada near San Juan, an area that has experience some of the greatest earthquakes in Argentina. We have developed a terrace chronology across the La Rinconada fault zone using TCN and OSL dates to define at least the last four rupture events and to determine rates of vertical uplift and erosion. We currently have two papers in revision on the tectonics of the region (Bs2 and Bs3), and are currently writing a manuscript on the alluvial fan development around the active faults, which will be submitted to *Quaternary Science Reviews*.

In addition, I have been working in the Venezuelan Andes with Steve Wesnousky (University of Nevada) and Marc Caffee (Purdue University). This involves developing glacial chronologies and using deformed glacial landforms to determine rates of horizontal and vertical crustal displacement in this transpressional mountain range (B117).

The lack of numerical dating is one of the biggest hurdles in determining rates of landscape evolution and paleoenvironmental change in my study areas. Therefore, when I moved to UCR in 1997, I established an OSL dating laboratory. I also developed strong links with the Lawrence Livermore National Laboratory to develop a program of TCN dating. This is enabling us to date landforms and sediments from a wide variety of environments (as discussed above). Since moving to UC, I have established new laboratories for geochronology, which are enabling us to date large numbers of rock and sediment samples. Our laboratories have attracted many faculty and students from outside UC, including visitors from the Scotland, Spain, University of Oregon, Central Washington University, University of Kentucky, California State University San Diego, Purdue University, Yale, Virginia Tech, University of Houston and University of St. Louis. These scientists are working with us on tectonic and glacial projects. This is helping us to foster links with other universities and broaden our research activities.

Although OSL and TCN dating methods are now providing a whole range of new possibilities for quantifying rates of geologic change, these techniques are still in the early stages of development. I have, therefore, been developing projects to help develop methodologies for these techniques in different geologic setting. In particular, the project that I initiated to date Late Quaternary shorelines in the Mojave Desert is allowing us to compare radiocarbon, OSL and TCN dating techniques (e.g. B67). In addition, I have been working in Death Valley and at the Calico Archaeological Site in the Mojave Desert to test the applicability of TCN and OSL methods for dating and erosion studies (B107 and B109).

I am also working with Marc Caffee on the Isle of Skye in Scotland. This aims to test the production rates for ^{10}Be, ^{26}Al and ^{36}Cl TCNs by dating moraines that formed during the Younger Dryas Stade. We also hope to explore the use of in situ ^{14}C and noble gas techniques in our study areas on Skye. We will continue this work over the next few years to help refine TCN dating methods as part of a multi-campus research as part of a multimillion-dollar NSF program (CRONUS) to help improve our knowledge and understanding of terrestrial TCNs.

My research funding for all these projects has come from many sources. These include the Royal Society, NERC (UK National Environmental Research Council), US National Science Foundation, National Geographic Society, the Department of the Energy funded LLNL/IGPP program, Earthwatch and consultancy work. My external funding has totaled >US$1 million over the last decade.

Publications

*** Current or former students**

[#] Current or former post-doctoral researchers

A. Books

A3. Pickering, K.T. and Owen, L.A. (1997) *Instructor's manual for an Introduction to Global Environmental Issues*. Routledge, London, 106 pp.

A2. Pickering, K.T. and Owen, L.A. (1997) *An Introduction to Global Environmental Issues*. Routledge, London, 2nd edition, 512 pp.

A1. Pickering, K.T. and Owen, L.A. (1994) *An Introduction to Global Environmental Issues*. Routledge, London, 1st edition, 390 pp.

B. Publications in International Peer-Reviewed Journals

Summary of peer-reviewed publications in journals (published and in press): Annals of Geography - 1; Annals of Glaciology - 1; Arctic, Alpine and Antarctic Research – 1; Boreas - 5; Bulletin of the Seismological Society of America - 2; Catena - 2; Current Science - 1; Earth and Planetary Science Letters – 1; Earth Surface Processes and Landforms – 1; Erdkunde - 1; Geology - 4; Geomorphology - 21; Geophysical Research Letters - 1; Geological Society of American, Bulletin - 9; Geological Society of America Special Paper - 1; Geological Society of London Special Paper – 3; Journal of the Geological Society, London - 6; Journal of Korean Geographical Society - 1; Journal of Geophysical Research - 3; Journal of Himalayan Geology - 1; Journal of Quaternary Science - 11; Lithosphere – 3; Nature – 1; Natural Hazards – 1; Quaternary International - 13; Quaternary Proceedings - 2; Quaternary Research - 2; Quaternary Science Reviews - 12; Sedimentary Geology - 3; Tectonics - 1; Tectonophysics – 2; Zeitschrift für Geomorphology – 6.

B136. Longbottom, T.L.*, Townsend-Small, A., Owen, L.A., Murari, M.K.[#] (2014) Climatic and topographic controls on soil organic matter storage and dynamics in the Indian Himalaya: Potential carbon cycle - climate change feedbacks. *CATENA*. 119, 125-135.

B135. Murari, M.K.[#], Owen, L.A., Dortch, J.M., Caffee, M.W., Dietsch, C., Fuchs, M., Haneberg, W.C., Sharma, M.C., Townsend-Small, A. (2014) Timing and climatic drivers for glaciation across monsoon-influenced regions of the Himalayan-Tibetan orogen. *Quaternary Science Reviews*, 88C, 159-182.

B134. Owen, L.A., Clemmens, S.J., Finkel, R.C., Gray, H.* (2014) Late Quaternary alluvial fans at the eastern end of the San Bernardino Mountains, Southern California. *Quaternary Science Reviews*, 87, 114-134.

B133. Rockwell, T.K., Ragona, D.E., Meigs, A.J., Owen, L.A., Costa, C., Ahumada, E. (2014) Inferring a thrust-related earthquake history from secondary faulting: A Long rupture record of La Laja Fault,

San Juan, Argentina. *Bulletin of the Seismological Society of America*, 104, 269-284.

B132. Owen, L.A. and Dortch, J.M. (2014) Quaternary glaciation of the Himalayan-Tibetan orogen. *Quaternary Science Reviews*, 88, 14-54.

B131. Gurrola, L.D., Keller, E.A., Chen, J., Owen, L.A. and Spencer, J.Q.[#] (2014) Tectonic geomorphology of marine terraces: Santa Barbara fold belt, California. *Geological Society of America, Bulletin*, 126, 219-233.

B130. Lee, S.Y.*, Seong, Y.B., Owen, L.A., Murari, M.K., Lim, H.S., Yoon, H.I. and Yoo, K.-C. (2014) Late Quaternary glaciation in the Nun-Kun massif, northwestern India. *Boreas*, 43, 67-89.

B129. Ul-Hadi, S.*, Khan, S.D., Owen, L.A., Khan, A.S., Hedrick, K.A.* and Caffee, M.W. (2013) Slip-rates along the Chaman fault: implication for transient strain along the western Indian plate margin. Geology. *Tectonophysics*. 608, 389-400.

B128. Hedrick, K., Owen, L.A., Rockwell, T.K., Meigs, A., Costa, C., Caffee, M.W. Masana, E. and Emilio Ahumada (2013) Timing and nature of alluvial fan and strath terrace formation in the Eastern Precordillera of Argentina. *Quaternary Science Reviews,* 80, 143-168.

B127. Dortch, J.M., Owen, L.A., Caffee, M.W. (2013) Timing and climatic drivers for glaciation across semi-arid western Himalayan-Tibetan orogen. *Quaternary Science Reviews*, 78, 188-208.

B126. Khan, S.F., Kamp, U. and Owen, L.A. (2013) Documenting five years of landsliding after the 2005 Kashmir earthquake, using repeat photography. *Geomorphology*, 197, 45-55

B125. Baker, A.M., Allmendinger, R.W., Owen, L.A., Rech, J.A. (2013) How much of "elastic rebound is permanent. *Nature Geoscience*. 6, 492-496.

B124. Ul-Hadi, S.*, Khan, S.D., Owen, L.A., and Khan, A.S. (2013) Geomorphic response to an active transpressive regime: a case study along the Chaman strike-slip fault, Western Pakistan. Geomorphology. *Earth Surface Processes and Landform*, 38, 250-264.

B123. Yuan, Z., Chen, J., Owen, L.A., Hedrick, K.A.*, Caffee, M.W., Li, W., Schoenbohm, L.M., Robinson, A.C. (2013) Nature and timing of large landslides within an active orogen, eastern Pamir, China. *Geomorphology*, 182, 49-65, doi.org/10.1016/j.geomorph.2012.10.028.

B122. McGill, S.F., Owen, L.A., Weldon, R.J., Kendrick, K.J. (2013) Latest Pleistocene and Holocene slip rate for the San Bernardino strand of the San Andreas Fault, Plunge Creek, Southern California: implications for strain partitioning within the southern San Andreas Fault Zone for the last 32 ka. *Geological Society of America, Bulletin*, 125, 48-72, doi:10.1130/B30647.1

B121. Owen, L.A., Chen, J., Hedrick, K.A.*, Caffee, M.W., Robinson, A., Schoenbohm, L.M., Zhaode, Y., Li, W., Imrecke, D., and Liu, J. (2012) Quaternary glaciation of the Tashkurgan Valley, Southeast Pamir. *Quaternary Science Reviews*, 47, 56-72. doi: 10.1016/j.quascirev.2012.04.027

B120. Yuan, Z., Chen, J., Li, W., Owen, L.A., Schoenbohm, L.M. (2012) ^{10}Be dating of Taheman large scale landslide in Eastern Pamir and paleoseimic implications. *Quaternary Sciences*, 32, 409-416. doi:10.3969/j.issn. 1001-7410. 2012.03.06 (In Chinese)

B119. DeVecchio, D.E., Heermance, R.V., Fuchs, M., Owen, L.A. (2012) Climate-controlled landscape evolution in the Western Transverse Ranges, California: Insights from Quaternary geochronology of the Saugus Formation and strath terrace flights. *Lithosphere*, 4, 110-130.

B118. DeVecchio, D.E., Keller, E.A., Fuchs, M., Owen, L.A. (2012) Late Pleistocene structural evolution of the Camarillo fold belt: Implications for fold growth and seismic hazard in Southern California. *Lithosphere*, 4, 91-109.

B117. Wesnousky, S.G., Aranguren, R., Rengifo, M., Owen, L.A., Caffee, M.W., Murari, M.K.[#], and Perez, O.J., (2012). Towards quantifying geomorphic rates of crustal displacement, landscape development, and the age of glaciation in the Venezuelan Andes. *Geomorphology*, 141-142, 99-113.

B116. Copland, L., Sylvestre, T., Bishop, M.P., Shroder, J.F., Seong, Y.B., Owen, L.A., Bush, A. and Kamp, U. (2011) Expanded and recently increased glacier surging the Karakoram. *Arctic, Alpine and Antarctic Research,* 43, 503-516.

B115. Dortch, J.M.*, Owen, L.A., Schoenbohm, L.M. and Caffee, M.W. (2011). Asymmetrical erosion and morphological development of the Ladakh Range, northern India. *Geomorphology*, 135, 167-180.

B114. Dortch, J.M.*, Dietsch, C., Owen, L.A., Caffee, M.W. and Ruppert, K.* (2011) Episodic fluvial incision of rivers and rock uplift in the Himalaya and Transhimalaya. *Journal of the Geological Society, London*, 168, 783-804.

B113. Hedrick, K.A., Seong, Y.B.*, Owen, L.A., Caffee, M.C. and Dietsch, C. (2011) Towards defining the transition in style and timing of Quaternary glaciation between the monsoon-influenced Greater Himalaya and the semi-arid Transhimalaya of Northern India. *Quaternary International*, 236, 21-33.

B112. Shroder, J., Owen, L.A., Seong, Y.B.*, Bishop, M.P., Bush, B., Caffee, M.W., Finkel, R.C., and Kamp, U. (2011) The role of mass movement on landscape evolution in the Central Karakoram: Discussion and speculation. *Quaternary International*, 236, 34-47.

B111. Frankel, K.L., Dolan, J.F., Owen, L.A., Ganev, P. and Finkel, R.C. (2011) Spatial and temporal constancy of seismic strain release along an evolving segment of the Pacific-North America plate boundary. *Earth and Planetary Science Letters*, 304, 565-576.

B110. Smith, C.A.*, Lowell, T.V., Owen, L.A. and Caffee, M.C. (2011) Late Quaternary glacial chronology of Nevado Illimani, Bolivia, and implications for paleoclimatic reconstructions across the Andes. *Quaternary Research*, 75, 1-10.

B109. Owen, L.A., Frankel, K.L., Knott, J.R., Reynhout, S.*, Finkel, R.C., Dolan, J.F. and Lee, J. (2011) Beryllium-10 terrestrial cosmogenic nuclide surface exposure dating of Quaternary landforms in Death Valley. *Geomorphology*, 125, 541-557.

B108. Dortch, J.M.*, Owen, L.A., Caffee, M.W. and Kamp, U. (2011) Catastrophic partial drainage of Pangong Tso, northern India and Tibet. *Geomorphology*, 125, 109-121.

B107. Owen, L.A., Davis, T.*, Caffee, M.W., Budinger, F. and Nash, D., (2011) Surface ages and rates of erosion at the Calico Archaeological Site in the Mojave Desert, Southern California. *Geomorphology*, 125, 40-50.

B106. Rockwell, T., Gath, E., Gonzalez, T., Madden, C., Verdugo, D., Lippincott, C., Dawson, T., Owen, L.A., Fuchs, M., Cadena, A., Williams, P., Weldon, E. and Franceschi P. (2010) Neotectonics and paleoseismology of the Pedro Miguel fault zone in Panama: Earthquake hazard to the Panama Canal. *Bulletin of the Seismological Society of America*, 100, 3097-3129.

B105. Dortch, J.M.*, Owen, L.A., Caffee, M.C., Dewen, L. and Lowell, T. (2010) Beryllium-10 surface exposure dating of glacial successions in the Central Alaska Range. *Journal of Quaternary Science*, 25, 1259-1269.

B104. Bishop, M.P., Bush, A., Copland, L., Kamp. U, Owen, L.A., Seong, Y.B. and Shroder, J.F. (2010) Climate Change and Mountain Topographic Evolution in the Central Karakoram, Pakistan. *Annals of Geography*, 100, 1-22.

B103. Blisniuk, K.*, Rockwell, T., Owen, L.A., Oskin, M., Lipponett, C.*, Caffee, M.C. and Dortch, J.* (2010) Late Quaternary slip rates gradient defined using high-resolution topography and ^{10}Be dating of offset landforms on the southern San Jacinto Fault zone, California. *Journal of Geophysical Research*, 115, B08401, doi:10.1029/2009JB006346.

B102. Kamp, U., Owen, L.A., Growley, B.J.* and Khattak, G.* (2010) Back analysis of landslide susceptibility zonation mapping for the 2005 Kashmir earthquake: an assessment of the reliability of susceptibility zoning maps. *Natural Hazards*, 54, 1-25.

B101. Dortch, J.M.*, Owen, L.A. and Caffee, M.W., (2010) Quaternary glaciation in the Nubra and Shyok valley confluence, northernmost Ladakh, India. *Quaternary Research*, 74, 132-144.

B100. Ganev, P.N., Dolan, J.F., Blisniuk, K., Oskin, M. and Owen, L.A., (2010) Paleoseismologic evidence for multiple Holocene earthquakes on the Calico fault: Implications for earthquake clustering in the Eastern California Shear Zone. *Lithosphere*, 4, 287-298.

B99. Owen, L.A., Yi, C., Finkel, R.C. and Davis, N.* (2010) Quaternary glaciation of Gurla Mandata (Naimon'anyi). *Quaternary Science Reviews*, 29, 1817-1830.

B98. Owen, L.A. (2010) Landscape development of the Himalayan-Tibetan orogen: a review. *Special Publication of the Geological Society of London*, 338, 389-407.

B97. Miller, D., Schmidt, K.M., Mahan, S.A., McGeehin, J.P., Owen, L.A., Barron, J.A., Lehmkuhl, F. and Löhrer, R. (2010) Holocene landscape response to seasonality of storms in the Mojave Desert. *Quaternary International*, 215, 45-61.

B96. Dortch, J.*, Owen, L.A., Caffee, M.W. and Brease, P. (2010) Late Quaternary glaciation and equilibrium line altitude variations of the McKinley River region, central Alaska Range. *Boreas*, 39, 233-246.

B95. Khattak, G.A.*, Owen, L.A., Kamp, U. and Harp, E.L. (2010) Evolution of earthquake-triggered landslides in the Kashmir Himalaya, northern Pakistan. *Geomorphology*, 115, 102-108.

B94. Armstrong, P., Perez, R., Owen, L.A. and Finkel, R.C. (2010) Timing and controls on late Quaternary landscape development along the eastern Sierra el Mayor, northern Baja California, Mexico. *Geomorphology*, 114, 415-430.

B93. Owen, L.A. (2009) Latest Pleistocene and Holocene glacier fluctuations in the Himalaya and Tibet. *Quaternary Science Reviews*, 28, 2150-2164.

B92. Copland, L., Pope, S.*, Bishop, M.P., Shroder, J.F., Clendon, P., Bush, A., Kamp, U., Seong, Y.B.* and Owen, L.A. (2009) Glacier velocities across the central Karakoram. *Annals of Glaciology*, 50(52), 41-49.

B91. Rockwell, T., Fonseca, J., Madden, C., Dawson, T. Owen, L.A., Vilanova, S. and Figueiredo, P. (2009) Paleoseismology of the Vilariça Segment of the Manteigas-Bragança Fault in Northeastern Portugal. *Special Publication of the Geological Society of London*, 316, 237-258.

B90. Owen, L.A., Robinson, R., Benn, D.I., Finkel, R.C., Davis, N.K.*, Yi, C., Putkonen, J., Li, D. and Murray, A.S. (2009) Quaternary glaciation of Mount Everest. *Quaternary Science Reviews*, 28, 1412-1433.

B89. Dortch, J.*, Owen, L.A., Haneberg, W.C., Caffee, M.W., Dietsch, C. and Kamp, U. (2009) Nature and timing of mega-landslides in northern India. *Quaternary Science Reviews*, 28, 1037-1056.

B88. Seong, Y.B.*, Owen, L.A., Caffee, M.W., Kamp, U., Bishop, M.P., Bush, A., Copland, L. and Shroder, J.F. (2009) Rates of basin-wide rockwall retreat in the K2 region of the Central Karakoram defined by terrestrial cosmogenic nuclide ^{10}Be. *Geomorphology*, 107, 254-262.

B87. Adams, B.*, Dietsch, C., Owen, L.A., Caffee, M., Spotila, J. and Haneberg, B. (2009) Exhumation and incision history of the Lahul Himalaya, northern India, based on (U-Th)/He thermochronometry and terrestrial cosmogenic nuclide dating techniques. *Geomorphology*, 107, 285-299.

B86. Seong, Y.B.*, Owen, L.A., Lim, H.S., Yoon, H.I., Kim, Y., Lee, Y.I. and Caffee, M.W. (2009) Rate of late Quaternary ice-cap thinning on King George Island, South Shetland Islands, West Antarctica defined by cosmogenic ^{36}Cl surface exposure dating. *Boreas*, 38, 207-213.

B85. Seong Y.B.*, Owen, L.A., Yi, C. and Finkel, R.C. (2009) Quaternary glaciation of Muztag Ata and Kongur Shan: evidence for glacier response to rapid climate changes throughout the Late Glacial and Holocene in westernmost Tibet. *Geological Society of America, Bulletin*, 121, 348-365.

B84. Lee, J., Stockli, D.F., Owen, L.A., Finkel, R.C. and Kislitsyn, R. (2009) Exhumation of the Inyo Mountains, California: Implications for the timing of extension along the western boundary of the Basin Range Province and distribution of dextral fault slip rates across the Eastern California Shear Zone. *Tectonics*, 28, TC1001, doi:10.1029/2008TC002295.

B83. Seong Y.B.*, Owen, L.A., Yi, C., Finkel. R.C. and Schoenbohm, L. (2009) Geomorphology of anomalously high glaciated mountains at the northwestern end of Tibet: Muztag Ata and Kongur Shan. *Geomorphology*, 103, 227-250.

B82. Seong Y.B.*, Bishop, M.P., Bush, A., Clendon, P.*, Copland, P., Finkel,. R., Kamp, U., Owen, L.A. and Shroder, J.F. (2009) Landforms and landscape evolution in the Skardu, Shigar and Braldu Valleys, Central Karakoram. *Geomorphology*, 103, 251-267.

B81. Owen, L.A., Thackray, G., Anderson, R.S., Briner, J., Kaufman, D., Roe, G., Pfeffer, W. and Yi, C. (2009) Integrated research on mountain glaciers: current status, priorities and future prospects. *Geomorphology*, 103, 158-171.

B80. Spelz, R.M., Fletcher, J.M., Owen, L.A. and Caffee, M.W. (2008) Quaternary alluvial-fan development, climate and morphologic dating of faults scarps in Laguna Salada, Baja California, Mexico. *Geomorphology*, 102, 578-594.

B79. Fuchs, M. and Owen, L.A. (2008) Luminescence dating of glacial and associated sediments: review, recommendations and future directions. *Boreas*, 37, 636-659.

B78. Arboleya, M.-L., Babault, J., Owen, L.A., Teixell, A. and Finkel, R.C. (2008). Timing and nature of fluvial incision in the Ouarzazate foreland basin, Morocco. *Journal of the Geological Society, London*, 165, 1059-1073.

B77. Kamp, U., Growley, B.J., Khattak, G.A.* and Owen, L.A. (2008) GIS-based landslide susceptibility mapping for the 2005 Kashmir Earthquake Region. *Geomorphology*, 101, 631-642.

B76. Owen, L.A., Caffee, M.W., Finkel, R.C. and Seong, B.Y.* (2008) Quaternary glaciations of the Himalayan-Tibetan orogen. *Journal of Quaternary Science*. 23, 513-532.

B75. Thackray, G.D., Owen, L.A. and Yi, C. (2008) Timing and nature of late Quaternary mountain glaciation. *Journal of Quaternary Science*, 23, 503-508.

B74. Seong Y.B.*, Owen, L.A., Bishop, M.P., Bush, A., Clendon, P.*, Copland, P., Finkel,. R., Kamp, U. and Shroder, J.F. (2008) Rates of fluvial bedrock incision within an actively uplifting orogen: Central Karakoram Mountains, northern Pakistan. *Geomorphology*, 97, 274-286.

B73. Owen, L.A., Kamp, U., Khattak, G.A.*, Harp, E.L., Keefer, D.K. and Bauer, M.A. (2008) Landslides triggered by the October 8, 2005, Kashmir Earthquake. *Geomorphology*, 94, 1-9.

B72. Seong Y.B.*, Owen, L.A., Bishop, M.P., Bush, A., Clendon, P.*, Copland, P., Finkel,. R., Kamp, U. and Shroder, J.F. (2007) Quaternary Glacial History of the Central Karakoram. *Quaternary Science Reviews*, 26, 3384-3405.

B71. Frankel, K.L.*, Dolan, J.F., Finkel, R.C., Owen, L.A. and Hoeft, J.S.* (2007) Spatial variations in slip rate along the Death Valley-Fish Lake Valley fault system determined from LiDAR topographic data and cosmogenic ^{10}Be geochronology. *Geophysical Research Letters, 34, LI8303*, doi:10.1029/2007GL030549.

B70. Gupta, A., Kale, V.S., Owen, L.A. and Singhvi, A.K. (2007) Late Quaternary bedrock incision in the Narmada river at Dardi Falls. *Current Science*, 93, 564-567.

B69. Seong, Y.B.*, Lim, H.S., Yoon, H.I., Lee, Y.I., Kim, Y. and Owen, L.A. (2007) A preliminary geomorphic overview of Late Quaternary glacier fluctuations in the South Shetland Islands, West Antartica. *Journal of the Korean Geographical Society*, 41, 513-526.

B68. Frankel, K.L., Brantley, K.S., Dolan, J.F., Finkel, R.C., Klinger, R.E., Knott, J.R., Machette, M.N., Owen, L.A., Phillips, F.M., Slate, J.L. and Wenicke, B.P. (2007) Cosmogenic ^{10}Be and ^{36}Cl geochronology of offset alluvial fans along the northern Death Valley fault zone: Implications for transient strain in the eastern California shear zone. *Journal of Geophysical Research – Solid Earth*, 112, B06407, doi:10.1029/2006JB004350.

B67. Owen, L.A., Bright, J., Finkel, R.C., Jaiswal, M.K., Kaufman, D., Mahan, S., Schneider, J.S., Sharp, W., Singhvi, A.K. and Warren, C.N. (2007) Numerical dating of a Late Quaternary spit-shoreline complex at the northern end of Silver Lake, Mojave Desert, California. *Quaternary International*, 166, 87-100.

B66. Le, K.*, Lee, J., Owen, L.A. and Finkel, R.C. (2007) Late Quaternary slip rates along the Sierra Nevada frontal fault zone, California: slip partitioning across the western margin of the Eastern California Shear Zone/Basin and Range Province. *Geological Society of America, Bulletin*, 119, 240-256.

B65. Benn, D.I., Owen, L.A., Finkel, R.C. and Clemmens, S.* (2006) Pleistocene Lake Outburst Floods and Fan Formation along the Eastern Sierra Nevada: Implications for the Interpretation of Intermontane Lacustrine Records. *Quaternary Science Reviews*, 25, 2729-2748.

B64. Meltzner, A.J., Rockwell, T.K. and Owen, L.A. (2006) Recent and long-term behavior of the Brawley fault Zone, Imperial Valley, California: An escalation in slip rate. *Bulletin of the Seismological Society of America*, 96, 2304-2328.

B63. Owen, L.A.. Finkel, R. C., Ma H. and Barnard, P.L.* (2006) Late Quaternary landscape evolution in the Kunlun Mountains and Qaidam Basin, Northern Tibet: a framework for examining the links between glaciation, lake level changes and alluvial fan formation. *Quaternary International*, 154-155, 73-86.

B62. Yi, C., Zhu, L., Seong, Y.B.*, Owen, L.A. and Finkel, R.C. (2006) A lateglacial rock avalanche event in the Tianchi Lake, Tien Shan, Xinjiang. *Quaternary International*, 154-155, 26-31.

B61. Barnard, P.L.*, Owen, L.A., Finkel, R.C. and Asahi, K. (2006) Landscape response to deglaciation in a high relief, monsoon-influenced alpine environment, Langtang Himal, Nepal *Quaternary Science Reviews*, 25, 2162-2176.

B60. Owen, L.A., Caffee, M., Bovard, K.*, Finkel, R.C. and Sharma, M. (2006) Terrestrial cosmogenic surface exposure dating of the oldest glacial successions in the Himalayan orogen. *Geological Society of America, Bulletin*, 118, 383-392.

B59. Barnard, P.L.*, Owen, L.A. and Finkel, R.C. (2006) Quaternary fans and terraces in the Khumbu Himalaya, south of Mt. Everest: their characteristics, age and formation. *Journal of the Geological Society, London*, 163, 383-400.

B58. Wesnousky S. G., Barron, A. D., Briggs, R. W., Caskey, S. J., Kumar, S. and Owen, L. (2005) Paleoseismic transect across the northern Great Basin. *Journal of Geophysical Research*, 110, B05408, doi:10.1029/2004JB003283.

B57. Benn, D.I., Owen, L.A., Osmaston, H.A., Seltzer, G.O., Porter, S.C. and Mark, B. (2005) Reconstruction of equilibrium-line altitudes for tropical and sub-tropical glaciers. *Quaternary International*, 138/139, 8-21.

B56. Owen, L.A. and Benn, D.I. (2005) Equilibrium-line altitudes of the Last Glacial Maximum for the Himalaya and Tibet: an assessment and evaluation of results. *Quaternary International*, 138/139, 55-78.

B55. Lehmkuhl, F. and Owen, L.A. (2005) Late Quaternary glaciation of Tibet and the bordering mountains: a review. *Boreas*, 34, 87-100.

B54. Owen, L.A., Finkel, R.C., Barnard, P.L.*, Ma, H., Asahi, K., Caffee, M.W. and Derbyshire, E. (2005) Climatic and topographic controls on the style and timing of Late Quaternary glaciation throughout Tibet and the Himalaya defined by ^{10}Be cosmogenic radionuclide surface exposure dating. *Quaternary Science Reviews*, 24, 1391-1411.

B53. Kent, G.M., Babcock, J.M., Driscoll, N.W., Harding, A.J., Dingler, J.A., Seitz, G.G., Gardner, J.V., Mayer, L.A., Goldman, C.R., Heyvaert, A.C., Richards, R.C., Karlin, R., Morgan, C.W., Gayes, P.T. and Owen, L.A. (2005) 60 k.y. record of extension across the western boundary of the Basin and Range province: Estimate of slip rates from offset shoreline terraces and a catastrophic slide beneath Lake Tahoe. *Geology*, 33, 365–368.

B52. Barnard, P.L., Owen, L.A., Sharma, M.C. and Finkel, R.C. (2004) Late Quaternary (Holocene) landscape evolution of a monsoon-influenced high Himalayan valley, Gori Ganga, Nanda Devi, NE Garhwal.* Geomorphology*, 61, 91-110.*

B51. Barnard, P.L.*, Owen, L.A. and Finkel, R.C. (2004) Style and timing of glacial and paraglacial sedimentation in a monsoonal influenced high Himalayan environment, the upper Bhagirathi Valley, Garhwal Himalaya. *Sedimentary Geology*, 165, 199-221.

B50. Van der Woerd, J., Owen, L.A., Tapponnier, P., Xiwei X., Kervyn, F., Finkel, R.C. and Barnard, P.L.* (2004) Giant, M~8 earthquake-triggered, ice avalanches in the eastern Kunlun Shan (Northern Tibet): characteristics, nature and dynamics. *Geological Society of America*, *Bulletin*, 116, 394-406.

B49 Spencer, J.Q.[#] and Owen, L.A. (2004) Optically stimulated luminescence dating of Late Quaternary glaciogenic sediments in the upper Hunza valley: validating the timing of glaciation and assessing dating methods. *Quaternary Sciences Reviews*, 23, 175-191.

B48. Owen, L.A., Finkel, R.C., Ma, H., Spencer, J.Q.[#], Derbyshire, E., Barnard, P.L.* and Caffee, M.W. (2003) Timing and style of Late Quaternary glaciations in NE Tibet. *Geological Society of America*, *Bulletin*, 115, 1356-1364.

B47. Owen, L.A., Finkel, R.C., Minnich, R. and Perez, A.* (2003) Extreme southern margin of Late Quaternary glaciation in North America: timing and controls. *Geology*, 31, 729-732.

B46. Owen, L.A., Spencer, J.Q.[#], Ma Haizhou, Barnard, P.L.*, Derbyshire, E., Finkel, R.C., Caffee, M.W. and Zeng Yong Nian, (2003) Timing of Late Quaternary glaciation along the southwestern slopes of the Qilian Shan. *Boreas*, 32, 281-291.

B45. Cunningham, D., Owen, L.A., Snee, L.W. and Li Jiliang (2003) Structural framework of a major intracontinental orogenic termination zone: the extreme easternmost Tien Shan, China. *Journal of the Geological Society*, *London*, 160, 575-590.

B44. Finkel, R.C., Owen, L.A., Barnard, P.L. and Caffee, M.W. (2003) Beryllium-10 dating of Mount Everest moraines indicates a strong monsoonal influence and glacial synchroneity throughout the Himalaya.* Geology*, 31, 561-564.*

B43. Owen, L.A., Ma Haizhou, Derbyshire, E., Spencer, J.Q.[#], Barnard, P.L., Zeng Yong Nian, Finkel, R.C. and Caffee, M.W. (2003) The timing and style of Late Quaternary glaciation in the La Ji Mountains, NE Tibet: evidence for restricted glaciation during the latter part of the Last Glacial.* Zeitschrift für Geomorphologie*, 130, 263-276.*

B42. Cox, B.F., Hillhouse, J.W. and Owen, L.A. (2003) Pliocene and Pleistocene evolution of the Mojave River, and associated tectonic development of the Transverse Ranges and Mojave Desert, based on borehole stratigraphy studies and mapping of landforms and sediments near Victorville, California. In: Enzel, Y., Wells, S. and Lancaster, N., (eds.), Paleoenvironment and paleohydrology of the Mojave and southern Great Basin deserts. *Geological Society of America Special Paper*. 368, 1-42.

B41. Owen, L.A., Derbyshire, E. and Scott, C.H.* (2002) Contemporary sediment production and transfer in high-altitude glaciers. *Sedimentary Geology*, 155, 13-36.

B40. Benn, D.I. and Owen, L.A. (2002) Himalayan glacial sedimentary environments: a framework for reconstructing and dating former glacial extents in high mountain regions. *Quaternary International*, 97-98, 3-26.

B39. Yang, X., Zhu, Z., Jaekel, D., Owen, L.A. and Han, J. (2002) Late Quaternary palaeoenvironmental change and landscape evolution along the Keriya River, Xingjiang, China: the relationship between high mountain glaciation and landscape evolution in foreland desert regions. *Quaternary International*, 97-98, 155-166.

B38. Owen, L.A., Kamp, U.*, Spencer, J.Q.[#] and Haserodt, K. (2002) Timing and style of Late Quaternary glaciation in the eastern Hindu Kush, Chitral, northern Pakistan: a review and revision of the glacial chronology based on new optically stimulated luminescence dating. *Quaternary International*, 97-98, 41-56.

B37. Owen, L.A., Finkel, R.C., Caffee, M.W. and Gualtieri, L.[#] (2002) Timing of multiple glaciations during the Late Quaternary in the Hunza Valley, Karakoram Mountains, Northern Pakistan: defined by cosmogenic radionuclide dating of moraines. Geological Society of America, Bulletin*, 114, 5, 593-604.*

B36. Owen, L.A., Finkel, R.C. and Caffee, M.W. (2002) A note on the extent of glaciation throughout the Himalaya during the global Last Glacial Maximum. *Quaternary Science Reviews*, 21, 147-157.

B35. Owen, L.A. Gualtieri, L.[#], Finkel, R.C., Caffee, M.W., Benn, D.I. and Sharma, M.C.* (2001) Cosmogenic radionuclide dating of glacial landforms in the Lahul Himalaya, Northern India: defining the timing of Late Quaternary glaciation. *Journal of Quaternary Science*, 16, 555-563.

B34. Lee, J., Spencer, J.Q. [#] and Owen, L.A. (2001) Holocene slip rates along the Owens Valley fault, California: implications for the recent evolution of the Eastern California Shear Zone. *Geology*, 29, 9, 819–822.

B33. Barnard, P.L.*, Owen, L.A., Sharma, M.C.* and Finkel, R.C. (2001) Natural and human-induced landsliding in the Garhwal Himalaya of Northern India. *Geomorphology*, 40, 21-35.

B32. Derbyshire, E., Fort, M. and Owen, L.A. (2001) Geomorphological hazards along the Karakoram Highway: Khunjerab Pass to the Gilgit River, Northern Pakistan. *Erdkunde*. 55, 1, 49-71 and Appendix.

B31. Richards. B.W.M.*, Benn, D. I., Owen, L.A., Rhodes, E.J. and Spencer, J.Q.[#] (2000) Timing of Late Quaternary glaciations south of Mount Everest in the Khumbu Himal, Nepal. *Geological Society of American, Bulletin*, 112, 1621-1632.

B30. Richards, B.W.M.*, Owen, L.A. and Rhodes, E.J., (2000) Timing of Late Quaternary glaciations in the Himalayas of northern Pakistan. *Journal of Quaternary Science*, 15 (3), 283-297.

B29. Owen, L.A., Scott, C.H.* and Derbyshire, E., (2000) The Quaternary glacial history of Nanga Parbat. *Quaternary International*, 65/66, 63-79.

B28. Owen, L.A., Cunningham, D., Windley, B.F., Badamgarov, J. and Dorjnamjaa, D. (1999) The landscape evolution of Nemegt Uul: a late Cenozoic transpressional uplift in the Gobi Altai, southern Mongolia. In: Smith, B. J., Whalley, W.B. and Warke, P.A. (eds.) *Uplift, Erosion and Stability: Perspectives on Long-term Landscape Development, Geological Society, London, Special Publications*, 162, pp. 1-18.

B27. Owen, L.A., Cunningham, W.D., Richards, B.*, Rhodes, E.J., Windley, B.F., Dornjamjaa, D. and Badamgarav, J., (1999) Timing of formation of forebergs in the northeastern Gobi Altai, Mongolia: implications for estimating mountain uplift rates and earthquake recurrence intervals. *Journal of the Geological Society*, 156, 3, 457-464. Erratum: *Journal of the Geological Society*, 156, Contents xii.

B26. Owen, L.A. (1998) Timing and style of glaciation in the Himalaya. *Journal of Himalayan Geology*, 18, 2, 37-45.

B25. Owen, L.A., Richards, B.*, Rhodes, E.J., Cunningham, W.D., Windley, B.F., Badamgarav, J. and Dorjnamjaa, D. (1998) Relic permafrost structures in the Gobi of Mongolia: age and significance. *Journal of Quaternary Science*, 13, 6, 539-548.

B24. Owen, L.A. and Sharma, M.C.* (1998) Rates and magnitudes of paraglacial fan formation in the Garhwal Himalaya: implications for landscape evolution. *Geomorphology*, 26, 171-184.

B23. Owen, L.A. and England, J. (1998) Observations on rock glaciers in the Himalayas and Karakoram Mountains of northern Pakistan and India. *Geomorphology*, 26, 199-213.

B22. Owen, L.A., Derbyshire, E. and Fort, M. (1998) The Quaternary glacial history of the Himalaya. *Quaternary Proceedings*, 6, pp. 91-120.

B21. Lehmkuhl, F., Owen, L.A. and Derbyshire, E. (1998) Late Quaternary glacial history of northeastern Tibet. *Quaternary Proceedings*, 6, pp. 121-142.

B20. Benn, D.I. and Owen, L.A. (1998) The role of the Indian summer monsoon and the mid-latitude westerlies in Himalayan glaciation: review and speculative discussion. *Journal of the Geological Society, London*, 155, 353-363.

B19. Owen, L.A., Mitchell, W., Bailey, R.M.*, Coxon, P. and Rhodes, E. (1997) Style and timing of Glaciation in the Lahul Himalaya, northern India: a framework for reconstructing late Quaternary palaeoclimatic change in the western Himalayas. *Journal of Quaternary Science*, 12, 2, 83-109.

B18. Owen, L.A., Windley, B.F., Cunningham, W.D., Badamgarov, G. and Dorjnamjaa, D. (1997) Quaternary alluvial fans in the Gobi Desert, southern Mongolia: evidence for neotectonics and climate change. *Journal of Quaternary Science*, 12, 3, 239-252.

B17. Derbyshire, E. and Owen, L.A. (1997) Quaternary glacial history of the Karakoram Mountains and Northwest Himalayas: a review. *Quaternary International*, 38/39, 85-102.

B16. Cunningham, W.D., Windley, B.F., Owen, L.A., Barry, T., Dorjnamjaa, D. and Badamgarav, G. (1997) Geometry and style of partitioned deformation within a Late Cenozoic transpressional zone in the eastern Gobi Altai Mountains, Mongolia. *Tectonophysics*, 277, 285-306.

B15. Sharma, M.C.* and Owen, L.A. (1996) Quaternary glacial history of NW Garhwal Himalayas. *Quaternary Science Reviews*, 15, 335-365.

B14. Owen, L.A., Sharma, M.* and Bigwood, R.* (1996) Landscape modification and geomorphological consequences of the 20 October 1991 earthquake and the July – August 1992 monsoon in the Garhwal Himalaya. *Zeitschrift für Geomorphologie*, 103, 359-372.

B13. Owen, L.A., Derbyshire, E., Richardson, S.*, Benn, D.I., Evans, D.J.A. and Mitchell, W.A. (1996) The Quaternary glacial history of the Lahul Himalaya, Northern India. *Journal of Quaternary Science*, 11, 1, 25-42.

B12. Owen, L.A. (1996) Quaternary lacustrine deposits in a high-energy semi-arid mountain environment, Karakoram Mountains, northern Pakistan. *Journal of Quaternary Science*, 11, 6, 461-483.

B11. Coxon, P., Owen, L.A. and Mitchell, W.A. (1996) A late Quaternary catastrophic flood in the Lahul Himalayas. *Journal of Quaternary Science*, 11, 6, 495-510.

B10. Owen, L.A., Benn, D.I., Derbyshire, E., Evans, D.J.A., Mitchell, W.A., Thompson, D. and Richardson, S.*, Lloyd, M.* and Holden, C.* (1995) The geomorphology and landscape evolution of the Lahul Himalaya, Northern India. *Zeitschrift für Geomorphologie*, 39, 2, 145-174.

B9. Evans, D.J.A., Owen, L.A. and Roberts, D.* (1995) Stratigraphy and sedimentology of Devansian (Dimlington Stadial) glacial deposits, east Yorkshire, England. *Journal of Quaternary Science*, 10, 3, 241-265.

B8. Davison, I, Al-Kadasi, M., Al-Khirbash, S., Al-Subbary, A.K., Baker, J., Blakey, S., Bosence, D., Dart, C., Owen, L.A., Menzie, M., McClay, K., Nichols, G. and Yelland, A. (1994) Geological evolution of the southern Red Sea rift-margin: Republic of Yemen. *Geological Society of America, Bulletin*, 106, 1474-1493.

B7. Owen, L.A., White, B.*, Rendell, H. and Derbyshire, E. (1992) Loessic silts in the western Himalayas: their sedimentology, genesis and age. *CATENA*, 19, 493-509.

B6. Owen, L.A. (1991) Mass movement deposits in the Karakoram Mountains: their sedimentary characteristics, recognition and role in Karakoram landform evolution. *Zeitschrift für Geomorphologie*, 35, 4, 401-424.

B5. Derbyshire, E., Wang, J., Jin Z., Billard, A., Egels, Y., Kasser, M., Jones, D.K.C., Muxart, T and Owen, L.A. (1991) Landslides in the Gansu Loess of China. *CATENA*, 20, 119-145.

B4. Owen, L. A. and Derbyshire, E. (1989) The Karakoram glacial depositional system. *Zeitschrift für Geomorphologie*, 76, 33-74.

B3. Owen, L.A. (1989) Terraces, uplift and climate in the Karakoram Mountains, Northern Pakistan: Karakoram intermontane basin evolution. *Zeitschrift für Geomorphologie*, 76, 117-146.

B2. Owen, L.A. (1988) Neotectonics and glacial deformation in the Karakoram Mountains and Nanga Parbat Himalaya. *Tectonophysics*, 163, 227-265.

B1. Owen, L.A. (1988) The palaeontology and geochemistry of the *Gastrioceras cancellatum* Marine Band, on the Glyn Neath Bank, North Crop of the South Wales Coal Field. *Mercian Geologist*, 11, 3, 161-170.

Bip. Publications in Peer-Reviewed Journals (*in press*)

Bs. Publications in Peer-Reviewed Journals (*in review*)

Bs5. Gray, H.J., Owen, L.A., Dietsch, C., Beck, R.A., Caffee, M.A., Finkel. R.C. and Mahan, S.A. 2014. Quaternary landscape development, alluvial fan chronology and erosion of the Mecca Hills at the southern end of the San Andreas fault zone. Quaternary Science Reviews, in revision.

Bs4. Tankersley, K.B., Murari, M., Crowley, B.E.,Owen, L.A., Mortensen, L., Storrs, G. 2014. Quaternary Chronostratigraphy and Paleoecology of Big Bone Lick, Kentucky. Quaternary Research. In review

Bs3. Robinson, A.C., Owen, L.A., Chen, J., Schoenbohm, L.M., Hedrick, K.A., Blisniuk, K., Sharp, W.D., Imrecke, D.B., Li. W., Yuan, Z., Caffee, M.W., Mertz-Kraus, R., (2014). No late Quaternary strike-slip motion on the northern Karakoram fault. Geology, in revision.

Bs2. Reynhout, S.A.*, Dietsch, C., Dortch, J.M.*, Owen, L.A., Caffee, M.W. (in review) Slow erosion rates within an active orogen, southern Ladakh Range, India. *Earth Surface Processes and Landforms*. in revision.

Bs1. Meigs, A.J., Schultz-Fellenz, E.S., Ragona, D., Rockwell, T.K., Costa, C., Ahumada, E., Owen, L.A. and Schiffman, C. (in review) Limits to paleoseismic event detection from fold growth strata. *Bulletin of the Seismological Society of America*. In revision.

BB. Comments and Replies

BB3. Seong Y.B.*, Owen, L.A., Bishop, M.P., Bush, A., Clendon, P., Copland, P., Finkel, R., Kamp, U. and Shroder, J.F. (2008) Reply to comments by Matthias Kuhle on "Quaternary glacial history of the central Karakoram". *Quaternary Science Reviews*. 27, *1656-1658*.

BB2. Owen, L.A. Gualtieri, L.[#], Finkel, R.C., Caffee, M.W., Benn, D.I. and Sharma, M.C.* (2002) Reply - Cosmogenic radionuclide dating of glacial landforms in the Lahul Himalaya, Northern India: defining the timing of Late Quaternary glaciation. *Journal of Quaternary Science*, 17, 279-281.

BB1. Richards, B.W.M.*, Owen, L.A. and Rhodes, E.J. (2001) Comment - Asynchronous glaciation at Nanga Parbat, northwestern Himalaya Mountains, Pakistan. *Geology*, 29, 3, 287-287.

BBB. News and Views/Perspectives

BBB3. Palin, M., Earle, S., Livingstone, D., Elden, S., Lowe, J. and Owen, L.A. (2011) Honouring geographers and contemporary exploration: from the archive to the ocean at the RGS-IBG Medals and Awards Ceremony 2011. The Geographical Journal, 177, 279-287.

BBB2. Frankel, K.L., Finkel, R.C. and Owen, L.A. (2010) Terrestrial cosmogenic nuclide geochronology data reporting standards needed. *EOS*, 91, 4, 31-32.

BBB1. Owen, L.A. (2008) How Tibet might keep its edge. *Nature*, 455, 748-749.

C. Book Chapters

C23. Owen, L.A. (2013) Tectonic geomorphology: a perspective. In: Owen, L.A. (Ed. 2013) Tectonic Geomorphology. Treatise in Geomorphology, vol. 5, Academic Press, San Diego, p 3-12.

C22. Frankel, K.L. and Owen, L.A. (2013) Transform plate margins and strike-slip fault systems. In: Owen, L.A. (Ed. 2013) Tectonic Geomorphology. Treatise in Geomorphology, vol. 5, Academic Press, San Diego, p. 37-70.

C21. Kamp, U. and Owen, L.A. (2013) Polygenetic landscapes. In: Owen, L.A. (Ed. 2013) Tectonic Geomorphology. Treatise in Geomorphology, vol. 5, Academic Press, San Diego, p. 370-393.

C20. Huff, W. and Owen, L.A. (2013) Volcanic landforms and hazards. In: Owen, L.A. (Ed. 2013) Tectonic Geomorphology. Treatise in Geomorphology, vol. 5, Academic Press, San Diego, p. 148-192.

C19. Kondo, H. and Owen, L.A. (2013). Paleoseismology. In: Owen, L.A. (Ed. 2013) Tectonic Geomorphology. Treatise in Geomorphology, vol. 5, Academic Press, San Diego, p. 267-299.

C18. Kamp, U. and Owen, L.A. (2011) Late Quaternary Glaciation of Northern Pakistan. . In: Elhers, J., Gibbard, P. and Hughes, P.D. (eds), *Quaternary Glaciations - Extent and Chronology: a closer look*. Developments in Quaternary Science, volume 15, Elsevier, Amsterdam, 909-927.

C17. Owen, L.A. (2011) Quaternary glaciation of Northern India. In: Elhers, J., Gibbard, P. and Hughes, P.D. (eds), *Quaternary Glaciations - Extent and Chronology: a closer look*. Developments in Quaternary Science, volume 15, Elsevier, Amsterdam, 2nd Edition, 929-942.

C16. Owen, L.A. (2006) Quaternary Glaciation. In Kreutzmann, H. (editor) *Karakoram in Transition – Culture, Development, and Ecology in the Hunza Valley.* Oxford University Press, 12-23.

C15. Owen, L.A. and Derbyshire, E. (2004) Glacial Environments. In: Fookes, P.G., Lee, E. M. and Milligan, G. (eds) Handbook of Engineering Geomorphology, Whittles Publishing, Caithness, 345-375.

C14. Owen, L.A. (2004) Cenozoic evolution of global mountain systems. In: Owens, P.N. and Slaymaker, O. (eds), Mountain Geomorphology. Edward Arnold (Publishers) Ltd., London, 33-58.

C13. Owen, L.A. (2004) The Late Quaternary glaciation of Northern India. In: Elhers, J. and Gibbard, P. (eds). *Extent and Chronology of Glaciations*. Volume 3, Elsevier, Amsterdam, pp. 201-210.

C12. Benn, D.I., Kirkbride, M.P., Owen, L.A. and Brazier, V. (2003) Glaciated valley landsystems. In: Evans, D.J. (ed.), *Glacial Landsystems*. Edward Arnold, London, pp. 372-406.

C11. Searle, M.P. and Owen, L.A. (1999) The evolution of the Indus River in relation to topographic uplift, erosion, climate and geology of western Tibet, the Transhimalayan and High Himalayan Ranges. In: Meadows, A. and Meadows, P. (eds) *The Indus River*, Oxford University Press, Oxford, pp. 210-230.

C10. Davison, I., Tatnell, M.*, Owen, L.A., Jenkins, G.* and Baker, J.A. (1998) Tectonic geomorphology and rates of crustal processes along the Red Sea margin, NW Yemen. In: Purser, B.H. and Bosence, D.W.J. (eds.) *Sedimentation and Tectonics in Rift Basins: Red Sea and Gulf of Aden*, Chapman Hall, London, pp. 595-612.

C9. Derbyshire, E. and Owen, L.A. (1996) Glacioaeolian processes, sediments and landforms. In: Menzies, J. (ed.) *Past Glacial Environments: sediments, forms and techniques*, Wiley, Chichester, pp. 213-237.

C8. Owen, L.A., Sharma, M.C.* and Bigwood, R.* (1995) Mass movement hazard in the Garhwal Himalaya: the effects of the 20 October 1991 Garhwal earthquake and the July-August 1992 monsoon season. In: McGregor, D.F.M. and Thompson, D.A. (eds.) *Geomorphology and Land Management in a Changing Environment*, Wiley, Chichester, pp. 69-88.

C7. Owen, L.A. (1994) Global geology and world development. In: Unwin, T. (ed.) *Atlas of World Development.* John Wiley, Chichester, pp. 40-41.

C6. Shroder, J.F., Owen, L.A. and Derbyshire, E. (1993) Quaternary Glacial history of the Karakoram and Nanga Parbat Himalaya. In: Shroder, J.F. (ed.) *Himalaya to the Sea: Geology, Geomorphology and the Quaternary*. Routledge, London, pp. 132-158.

C5. Owen L.A. and Derbyshire, E. (1993) Quaternary and Holocene intermontane basin sedimentation in the Karakoram Mountains. In: Shroder, J.F. (ed.) *Himalaya to the Sea: Geology, Geomorphology and the Quaternary*. Routledge, London, pp. 108-131.

C4. Owen, L.A. (1994) Glacial and non-glacial diamictons in the Karakoram Mountains. In: Croots, D. and Warren, W. (eds.) *The formation and deformation of glacial deposits*. A.A. Balkema, Rotterdam, pp. 9-29.

C3. Derbyshire, E. and Owen, L.A. (1990) Quaternary Alluvial Fans in the Karakoram Mountains. In: *Alluvial Fans: A field approach*, A.H. Rachocki and Church, M. (eds.). John Wiley & Sons Ltd., pp. 27-53.

C2. Owen, L.A. and Derbyshire, E. (1988) Glacially deformed diamictons in the Karakoram Mountains, Northern Pakistan. In: Croots, D. (ed.) *Glaciotectonics*, A. A. Balkema, Rotterdam, pp. 149-176.

C1. Owen, L.A. (1988) Wet-sediment deformation of Quaternary and Recent sediments in the Skardu Basin, Karakoram Mountains, Pakistan. In: Croots, D. (ed.) *Glaciotectonics*, A. A. Balkema, Rotterdam, pp. 123-147.

Cip. Book Chapters (*in press*)

D. Encyclopedia Articles

D7. Owen, L.A. (2013) Late Quaternary glaciations in Highland Asia. In: Scott E.A (ed.) *Encyclopedia of Quaternary Science*, Vol. 2, pp. 236-244. Elsevier, Amsterdam.

D6. Owen, L.A. (2013) Tectonic uplift and continental configurations. In: Scott E.A (ed.) *Encyclopedia of Quaternary Science*, Vol. 2, pp.127-135. Elsevier, Amsterdam.

D5. Owen, L.A. (2006) Late Quaternary glaciation in Highland Asia. In: Scott E. (ed.) *Encyclopedia of Quaternary Science*, Elsevier, Oxford volume 2, 1109-1115.

D4. Owen, L.A. (2006) Tectonic uplift and continental configurations. In: Scott E. (ed.) *Encyclopedia of Quaternary Science*, Elsevier, Oxford, volume 2, 1011-1016.

D3. Owen, L.A. (2001) Mountain Geomorphology. In: Hancock, P.L. and Skinner, B.J. (eds) *The Oxford Companion to the Earth.* Oxford University Press, Oxford, 708-713.

D2. Owen, L.A. (2001) Loess deposition and palaeoclimate. In: Hancock, P.L. and Skinner, B.J. (eds) *The Oxford Companion to the Earth*. Oxford University Press, Oxford, 618-622.

D1. Owen, L.A. (2001) Himalayan-Tibetan uplift and global climate change. In: Hancock, P.L. and Skinner, B.J. (eds) The *Oxford Companion to the Earth.* Oxford University Press, Oxford, 507-510.

Dip. Encyclopedia Articles (in press)

E. Articles in Popular Journals/Magazines

E6. Dortch, J.M., Owen, L.A., Caffee, M.W. and Brease, P. (2011) Understanding moraine formation around the Muldrow Glacier, Denali National Park and Perserve. *Alaska Park Science*, 10, 1, 7-11.

E5. Owen, L.A. (1996) Earth Shattering News. *Geographical Magazine*, 118, 11, 12-14.

E4. Owen, L.A. (1996) High roads high risks. *Geographical Magazine*, 118, 1, 12-15.

E3. Owen, L.A. (1995) Shaping the Himalayas. *Geographical Magazine*, 112, 2, 23-25.

E2. Owen, L.A. (1993) Radon: a new environmental health hazard. *Journal of Geography*. 339, 78, 2, 194-198.

E1. Butler, R.W.H., Owen, L.A. and Prior, D.J. (1988) Flashfloods, earthquakes and uplift in the Pakistan Himalayas. *Geology Today*, 4, 6, 197-202

F. Edited Volumes

F15. Marković, S.B and Owen, L.A. (2014, eds.) Loess and dust dynamics, environments, landforms, and pedogenesis: a tribute to Edward Derbyshire. CATENA, 117, 1-156.

F14. Owen, L.A. (2013, ed.) Tectonic Geomorphology. Treatise in Geomorphology, vol. 5, Academic Press, San Diego, 393p.

F13. Yi, C., Dortch, J.M., Zhou, L. and Owen, L.A. (2011, eds.) Quaternary Paleoenvironmental Change and Landscape Development in Tibet and the Bordering Mountains. Quaternary International, 236, 1-2, 1-166.

F12. Owen, L.A., Thackray, G.D. and Yi, C. (2009, eds.) Mountain glaciation and landscape evolution. Geomorphology, *103, 155-284.*

F11. Thackray, G.D., Owen, L.A. and Yi, C. (2008, eds.) Timing and nature of Late Quaternary mountain glaciation. Journal of Quaternary Science, *23, 503-702.*

F10. Knott, J. and Owen, L.A. (2007, eds.) Dryland dating. Quaternary International, *166, 101 pp.*

F9. Yi, C. and Owen, L.A. (2006, eds.) Quaternary palaeoenvironmental change in Tibet and the bordering mountains. Quaternary International, *154-155, 157 pages.*

F8. *Owen, L.A. and Zhou S. (2002, eds.) Glaciation in Monsoon Asia.* Quaternary International, *97-98, 179 pages.*

F7. *Owen, L.A., Teller, J.T. and Rutter, N.W. (2002, eds.) Glaciation and reorganization of Asia's network of drainage.* Global and Planetary Change, *32 (4), pp. 289-374.*

F6. *Owen, L.A. and Lehmkuhl, F., (2000, eds.) Late Quaternary Glaciation and Paleoclimate of the Tibetan Plateau and Bordering Mountains*. Quaternary International, *65/66, 212 pages*.

F5. Owen, L.A. (1998, ed.) Mountain Glaciation. *Quaternary Proceedings*, 6, 169 pages.

F4. Owen, L.A. and Unwin, T., (1997, eds.) *Environmental Management: Readings and Case Studies.* Blackwell, Oxford, 492 pages.

F3. Stewart, I., Owen, L.A. and Vita-Finzi, C. (1993, eds.) Neotectonics and Active Faulting. *Zeitschrift für Geomorphologie*, Suppl. Bd. 94, 328 pages.

F2. Owen, L.A., Stewart, I. and Vita-Finzi, C. (1993, eds.) Neotectonics - recent advances. *Quaternary Proceedings*, No.3, 112 pages.

F1. Derbyshire, E. and Owen, L.A. (1989, eds.) Quaternary of the Karakoram and Himalaya. *Zeitschrift für Geomorphologie*, Suppl. Bd., 76, 255 pages.

Fip Edited volumes in press

G. Book Reviews

G7. *Owen, L.A. (1999) Tectonic uplift and climate change, by W.F. Ruddeman (Ed.) Plenum Press, New York 1997.* Quaternary Science Reviews, *18, 881-882.*

G6. Owen, L.A. (1998) Dangerous Earth, by Murck, B.W., Skinner, B.J. and Porter, S.C., John Wiley and Sons, Chichester, 1997. *Journal of Quaternary Science*, 13, 358.

G5. Owen, L.A. (1997) Seismology, by Dole, H., John Wiley and Sons, Chichester, 1995. *Area*, 29 (N1), 86-87.

G4. Owen, L.A. (1996) Geological and Landscape Conservation, by O'Halloran, D., Green, C., Harley, M., Stanley, M. and Knill, J., Geological Society Special Publication, Bath, 1994. *Journal of Quaternary Science*, 11, 2, 169-171.

G3. Owen, L.A. (1995) The seismicity of Egypt, Arabia and the Red Sea, by Ambraseys, N.N., Melville, C.P. and Adams, R.D. Cambridge University Press, Cambridge, 1994. *Quaternary Science Reviews*, 14,5, 541.

G2. Owen, L.A. (1995) New views on an old planet: a history of global change, by Van Andel, T.H., Cambridge University Press, Cambridge, 2nd Edition, 1994. *Journal of Quaternary Science*, 14, 5, 542-543.

G1. Owen, L.A. (1993) Geomorphological record of the Quaternary orogeny in the Himalaya and the Karakoram, by J. Kalvoda. Developments in earth Surface Processes, Vol. 3, Elsevier, London, 1992. *Quaternary Science Reviews*, 12, 10, 914-915.

H. Conference and Field Meeting Reports

H3. Owen, L.A. (1994) Report on the 1994 QRA Annual Field Meeting, Cumbria. *Quaternary Newsletter*, 73, 19-23.

H2. Owen, L.A. (1994) Report on conference at Geological Society on climate modelling. *Quaternary Newsletter*, 74, 41-48.

H1. Owen, L.A. (1993) Report on the Neotectonics meeting. *Quaternary Newsletter*, 69, 34-37.

I. Abstracts since 1998

I106. Bergen, K.J., Shaw, J.H., Leon, L.A., Dolan, J.F., Pratt, T.L., Ponti, D.J., Barrera, W., Rhodes, E.J., Murari, M.K. and Owen, L.A., 2014. Continuity of slip rates over various time scales on the Puente Hills Blind-thrust Fault, Los Angeles, California. Geophysical Research Abstracts, Vol. 16, EGU2014-13126, EGU General Assembly.

I105. Fame, M., Spotila, J. and Owen, L.A. 2014. The effect of late Cenozoic glaciation on denudation in the White Mountains of New Hampshire. Northeastern Section - 49th Annual Meeting (23–25 March), Geological Society of America Abstracts with Programs, Vol. 46, No. 2, Paper No. 58-5

I104. Dortch, J., Owen, L.A. and Caffee, M.W. 2013. Timing and climatic drivers for glaciation across semi-arid western Himalayan-Tibetan orogen. EGU Annual Meeting, Vienna, Austria, April 7-12; 2013-11762, GM9.3/CR1.6

I104. Haritashya, U.K., Bishop, M.P., Bolch, T., Copland, L., Owen, L.A., Mani, S. 2013. Past fluctuations and current status of the Gangotri Glacier. CONTROL ID: 1813212. American Geophysical Union Annual Meeting, San Francisco, December 2013.

I103. Dortch, J., Hughes, P., Owen, L.A., Murari, M.K., Caffee, M.W. 2013. Patterns of glaciation and topographic hypsometry across semi-arid western Himalayan-Tibetan orogen *(Invited).* CONTROL ID: 1801652. American Geophysical Union Annual Meeting, San Francisco, December 2013.

I102. Valentino, J., Spotila, J.A., Owen, L.A., Buscher, J. 2013. Transience and Glacial Erosion in South Central Alaska. CONTROL ID: 1803956. American Geophysical Union Annual Meeting, San Francisco, December 2013.

I101. Babault, J., Capó, A., Van Den Driessche, J., Owen, L.A., Caffee, M.W. 2013. Switch from longitudinal to transverse drainage during mountain building: as case study from the Himalaya. CONTROL ID: 1799552. American Geophysical Union Annual Meeting, San Francisco, December 2013.

I100. Owen, L.A. (2012) Nature and Timing of Quaternary glaciation in the Himalaya: Review and Speculation. (Invited presentation). Abstract C32A-05 presented at 2012 Fall Meeting, AGU, San Francisco, California, 3-7 December.

I99. Counts, R.C.*, Murari, M.#, and Owen, L.A. (2012) Optically stimulated luminescence chronology of terraces of the lower Ohio River valley: implications for quaternary climate change and neotectonic deformation. Geological Society of America *Abstracts with Programs.* Vol. 44, No. 7, p.186.

I98. Gray, H.*, Owen, L.A., Dietsch, C., Beck, R., Mahan, S., (2012) Geomorphic response to tectonic activity within the Mecca Hills, California. Geological Society of America *Abstracts with Programs.* Vol. 44, No. 7, p. 93.

I97. Owen, L.A. (2012) Climate change, glaciation, sediment transfer, landscape development and loess in and around the Tibetan-Himalayan orogen: A tribute to Professor Edward Derbyshire. *International Conference on Loess Research: A tribute to Edward Derbyshire (ED@80)*. University of Novi Sad, Novi Sad, Serbia, 27-30 September, 2012, p 15-16.

I96. Chen, J., Schoenbohm, L.M., Yuan, Z., Li, W., Li, T., Owen, L.A., Sobel, E.R., Kirby, B.T., Huang, M., Hedrick, K.* (2011) Holocene slip rate along the Northern Kongur Extensional System, Chinese Pamir. Abstract T43F-2447 presented at 2011 Fall Meeting, AGU, San Francisco, California, 5-9 December.

I95. Imrecke, D.B., Robinson, A.C., Chen, J., Li, W., Hedrick, K., Owen, L.A., Yuan, Z., Schoenbohm, L.M., Xiaodong, Y., (2011) The Margin of a Gneiss Dome: Development of the Waqia Half-Graben, Southeast Pamir. Abstract T43F-2449 presented at 2011 Fall Meeting, AGU, San Francisco, California, 5-9 December.

I94. Wesnousky, S.G., Arenguren, R., Rengifo, M., Owen, L.A., Caffee, M.W., (2011) Some additional observations for understanding the glacial history and neotectonics of the Venezuelan Andes and Bocono fault. Abstract T11B-2321 presented at 2011 Fall Meeting, AGU, San Francisco, California, 5-9 December.

I93. Blisniuk, K., Oskin, M.E., Sharp, W.D., Meraux, A.B., Rockwell, T.K., Fletcher, K., Owen, L.A. (2011). Spatial variability of time-constant slip rates on the San Jacinto fault zone, southern California (Invited). Abstract T431-02, presented at 2011 Fall Meeting, AGU, San Francisco, California, 5-9 December.

I92. Stewart, A.K., Owen, L., Szabo, J.P., and Lowell, T., (2011) Timing and formation of late Quaternary kames in Northeastern Ohio: implications for understanding the spatial and temporal variability in glacier erosion and the preservation of glacial landforms. Geological Society of America Abstracts with Programs, Vol. 43, No. 5, p. 452.

I91. Hedrick, K.A., Owen, L. A., Dietsch, C., And Caffee, M.W., (2012) Rates of landscape erosion in Zanskar, Northern India. Geological Society of America Abstracts with Programs, Vol. 43, No. 5, p. 272.

I90. Longbottom, T.L., Owen, L., Caffee, M.W., and Murari, M.K., (2011) Quaternary history of glacier morphology and landform development in the Garhwal and Lahul Himalaya. Geological Society of

America Abstracts with Programs, Vol. 43, No. 5, p. 475.

I89. Reynhout, S., Owen, L.A., Dietsch, C., Dortch, J.M., and Caffee, M.W., (2011) Quantifying the glacial buzzsaw within an arid mountain range: Ladakh, northwestern Himalaya. Geological Society of America Abstracts with Programs, Vol. 43, No. 5, p. 385.

I88. Owen, L.A. (2011). Developing Quaternary glacial chronologies for the himalayan-tibetan orogen to help define the nature of paleoclimate change for high-latitudes in subtropical regions. Geological Society of America Abstracts with Programs, Vol. 43, No. 5, p. 64. (invited presentation)

I87. Yuan, Z., Chen, J., Owen, L.A., Li, W., Hedrick, K.A., Caffee, M.W., and Schoenbohm, L.M. (2011) Cosmogenic nuclide dating of landslides/rock avalanches in NE Pamir, China. Geological Society of America Abstracts with Programs, Vol. 43, No. 5, p. 444.

I86. McGill, S.F., L.A. Owen, E.O. Kent, T.K. Rockwell, and N.W. Onderdonk, (2011) Slip rate of the northern San Jacinto fault from offset landslides in the San Timoteo Badlands, Abstract A-151, Southern California Earthquake Center, 2011 Annual Meeting, Proceedings and Abstracts, v. 21, p. 200.

I85. Domack, E.W., Hess, D.P., Owen, L.A., Murari, M.K., (2011) Landforms and surface geology of eastern Oneida lake and Oneida county, New York: new insights from matching bathymetry with lidar topography. Geological Society of America Abstracts with Programs, Vol. 43, No. 1, p. 58.

I84. Murari, M.K., Domack, E.W., Hess, D.P., Owen, L.A., (2011) Timing of esker and dune formation at the eastern end of Oneida lake, New York state, defined by optically stimulated luminescence dating. Geological Society of America Abstracts with Programs, Vol. 43, No. 1, p. 58.

I83. Ul-Hadi, S., Khan, S., Owen, L.A. and Khan, A.S. (2010) Geomorphic response to an active transpressive regime: a case study along the Chaman strike-slip fault, western Pakistan. Geological Society of America *Abstracts with Programs*, 42, 5, 620.

I82. McGill, S.F., Owen, L.A., Kent, E.O., Onderdonk, N.W., and Rockwell, T.K., (2010) Slip rate of the northern San Jacinto fault from offset landslides in the San Timoteo badlands. Southern California Earthquake Center (SCEC) Annual Meeting Proceedings and Abstracts, v. 20, p. 249-250.

I81. Owen, L.A, Caffee, M.W., Davis, N., Dortch, J., Finkel, R.C., Hedrick, K., Robinson, A.C., Schoenbohm, L., and Seong, Y.B. (2010) Style and Timing of Glaciation along the Karakoram Fault. In Leech, M.L. et al. (Eds.), Proceedings for the 25th Himalaya-Karakoram-Tibet Workshop: U.S. Geological Survey, Open-File Report 2010-1099, A146 [http://pubs.usgs.gov/of/2010/1099/owen/].

I80. McGill, S., Weldon, R.J. and Owen, L.A. (2010) Latest Pleistocene slip rates along the San Bernardino strand of the San Andreas fault. Joint GSA Cordilleran Section/Pacific Section AAPG with the Western Regional SPE meeting. Geological Society of America *Abstracts with Programs*, Vol. 42, No. 4, p. 69**.**

I77. Reynhout, S.*, Owen, L., Frankel, K. L., Finkel, R., Dolan, J. and Knott, J.R. (2009) New rates of Pleistocene slip on the Death Valley fault. Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 228.

I76. Dortch, J.M.*, Owen, L.A. and Caffee, M.W. (2009) Landscape evolution and morphology of the Tangtse river valley controlled by catastrophic partial drainage of Pangong Tso. Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 624.

I75. Rech, J.A., Owen, L.A., Allmendinger, R.W. and Baker, A. (2009) Assessing the role of seismic pumping in the formation of co-seismic soil cracks, Atacama Desert, Chile. Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 172.

I74. Gurrola, L.D., Keller, E.A., Cjen, J., Owen, L. and Spencer, J.Q.[#] (2009) Tectonic geomorphology of marine terraces: Santa Barbara fold belt, California. Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 350.

I73. Baker, A., Owen, L., Rech, J. A. and Allmendinger, R.W. (2009) Coeseismic crack production and reactivation in the northern Chile forearc. Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 128.

I72. Rockwell, T., Fonseca, J., Madden, C., Dawson, T., Owen, L., Vilanova, S., and Figueiredo, P., (2008) Paleoseismic Assessment of the Vilariça Segment of the Manteigas-Bragança Fault in Northeastern Portugal for the Proposed Sabor River Dam. *Association of Engineering Geologists Annual Meeting, Program with Abstracts, NEWS* v. 51, TS 20.

I71. Teixell, A., Arboleya, M., Babault, J., Teson, E., Ayarza, P., Alvarez-Lobato, F. and Owen, L.A., (2008) Tectonics, Uplift and Surface Processes in the Moroccan Atlas Mountains. *Eos Trans. AGU, 89*(53), Fall Meeting, T43D-05.

I70. Le, K., Oskin, M., Rockwell, T. and Owen, L., (2008) Temporal and spatial late Quaternary slip rate variability on the southern San Jacinto fault, California. *Eos Trans. AGU, 89*(53), Fall Meeting, T44B-08.

I69. Owen, L. A., (2008) Quaternary glaciation of the Himalaya and Tibet. *Eos Trans. AGU, 89*(53), Fall Meeting, GC11B-01. (invited presentation)

I68. Owen, L.A. (2008) Climatic controls on landscape evolution throughout the Himalaya and Tibet: Review of the current knowledge and future directions. *Himalayan Geology*, 29, 1-142.

I67. Miller, D.M., Owen, L. and Mahan, S.A., (2008) Medieval climate in the Mojave Desert suggests regional *lake rise between extended droughts. Geological Society of America Abstracts with Programs.*

I66. Miller, D.M., Mahan, S. A., McGeehin, J. P. and Owen, L. (2008) Geomorphic response to seasonality of storms during the Holocene in the Mojave Desert, California. GSA Abstracts with Programs Vol. 40, No. 1.

I65. Kamp, U., Growley, B.J., Khattak, G.A.* and Owen, L.A. (2008) GIS-based Landslide Susceptibility Mapping for the 2005 Kashmir Earthquake Region . Annual Meeting, Boston, Massachusetts.

I64. McGill, S., Kendrick, K., Weldon, R. and Owen, L. (2007) Pleistocene and Holocene slip rate of the San Andreas fault at Badger Canyon, San Bernardino, California. SCEC Annual Meeting, Palm Springs, September 2007.

I63. Yi, C., Zhu, Z., Owen, L.A., Seong, Y.B.* and Lu, X. (2007) How long did the glaciers stand in the Last Glaciation Maximum in Mustag Ata, northwestern Tibet. *Quaternary International*, 167-168, 463.

I62. Yi, C., Yang, J. and Owen, L.A. (2007) Holocene glacier fluctuation in Tibet and surrounding mountains – based on radiocarbon dating. *Quaternary International*, 167-168, 462-463.

I61. Seong, Y.B.*, Owen, L., Bishop, M., Bush, A., Copland, L., Finkel, R., Kamp, U. and Shroder, J. (2007) Quaternary glacial history of the Central Karakoram. *Quaternary International*, 167-168, 375.

I60. Arboleya, M.L., Babault, J., Owen, L.A., Teixell, A. and Finkel. R.C. (2007) Rates of Quaternary evolution of an intracontinental mountain belt foreland basin, Atlas Mountains, Morocco: defined by terrestrial cosmogenic nuclides. *Quaternary International*, 167-168, 14-15.

I59. Owen, L.A., Seong, Y.B., Laxton, S.*, Dortch, J.*, Finkel, R., Caffee, M. and Yi, C. (2007) Holocene and latest Pleistocene alpine glacier fluctuations in the high mountains of East Asia. *Quaternary International*, 167-168, 213.

I58. Owen, L.A., Caffee, M., Finkel, R., Seong, Y.B.*, Yi, C., Dortsch, J.* and Laxton, S.* (2007) Defining the timing and extent of Late Quaternary glaciation in the Himalaya. *Quaternary International*, 167-168, 213.

I57. Owen, L.A. and Benn, D.I. (2007) Himalayan glacial sedimentary environments: a framework for reconstructing and dating the former extent of glaciers in high mountains. *Quaternary International*, 167-168, 312-213.

I56. Stewart, A.K., Lowell, T.V., Owen, L.A. and Szabo, J.P. (2007) Palaeotopography and glacier erosion: terminal region, Ohio USA. Geological Society of America Abstracts with Programs, Vol. 39, No. 6, p. 503.

I54. Fletcher, J., Spelz-Madero, R. and Owen, L. (2007) Origin of megamullion corrugations and evolution of a rolling hinge: insights from a morphometric and structural analysis of an active low-angle normal fault, Sierra El Mayor, Baja California. Geological Society of America Abstracts with Programs, Vol. 39, No. 6, p. 184.

I53. Frankel, K.L., Dolan, J. F., Finkel, R. C., Owen, L. A. and Hoeft, J. S. (2007) spatial variations in fault slip rate along the Death Valley-Fish Lake Valley Fault Zone. Geological Society of America Abstracts with Programs, Vol. 39, No. 6, p. 260.

I52. Rockwell, T., Madden, C., Dawson, T., Vilanova, S., Figueiredo, P., Owen, L. and Fonseca. J. (2006) Paleoseismology of the Vilariça Fault in NE Portugal (2006) A case for large, infrequent earthquakes. Submitted January 2006 to the BSSA Meeting in Geneva, April 2006.

I51. Kamp, U., Owen, L.A., Khattak, G.A.*, Harp, E.L., Keefer, D.K. and Bauer, M. (2006) The human and geomorphic consequences of the October 8, 2005 Kashmir earthquake. Submitted January 2006 to the America Geographical Union Annual Meeting in Chicago April, 2006.

I50. Kamp, U., Owen, L.A., Khattak, G.A.*, Harp, E.L., Keefer, D.K. and Bauer, M. (2006) The geomorphic consequences of the October 8, 2005 Kashmir earthquake. Submitted January 2006 to the British Geomorphological Society Meeting in Loughborough, April 2006.

I49. Budinger, F.E.* and Owen, L.A. (2006) Be-10 cosmogenic radionuclide surface exposure dating of alluvial fan deposits at the Calico site, Mojave Desert, California. Desert Symposium, Zzyxx, April 2006.

I48. Khan, M., Khattak, G.*, Shafique, M. and Owen, L. (2006) Geology of the Kashmir Earthquake and its geomorphic consequences. SSA Meeting in San Francisco, April 2006.

I47. McGill, S. F., Weldon, R. J. II, Kendrick, K. and Owen, L.A. (2006) Latest Pleistocene Slip Rate of the San Bernardino Segment of the San Andreas fault in Highland: Possible Confirmation of the Low Rate Suggested by Geodetic Data. SSA Meeting in San Francisco, April 2006.

I46. Owen, L.A., Finkel, R.C., Kuffman, D., Mahan, S., Sharp, W. and Singhvi, A. (2006) The Work of the Dryland Dating Group of INQUA: A calibration site in Mojave Desert, California. Dryland Dating Workshop and IGCP500 Meeting in Lazaretto in March 2006, p.30.

I45. Owen, L.A., Kamp, U., Khattak, G.A.*, Harp, E.L., Keefer, D.K. and Bauer, M. (2006) Landslides triggered by the October 8, 2005, Kashmir Earthquake: European Geosciences Union General Assembley, 3rd April, Vienna, Austria, April 2-7, 2006, Geophysical Research Abstracts, vol. 8, 02811. Vienna in April 2006.

I44. Yi, C. and Owen, L.A. (2005) Glacier advances since the MIS3b(?) in Tibet and neighboring mountains based on radiocarbon dating. Geological Society of America Geological Society of America *Abstracts with Programs*, 37, 40.

I43. Seong, Y.B.*, Owen, L.A., Yi., C. and Finkel, R. (2005) Late Quaternary glaciations of Mushtagata and Mt. Kongur in semi-arid region of northwestern Tibet from cosmogenic 10Be exposure dating. Geological Society of America *Abstracts with Programs*, 37, 479.

I42. Owen, L.A. and Finkel, R.C. (2005) A Quaternary chronostratigraphy for alluvial fans, pediments and terraces in the Mecca Hills (Salton Trough) at the southern end of the San Andreas Fault: a framework for defining rates of crustal displacement and landscape evolution within a zone of transpression. Tectonics of Strike-Slip Restraining & Releasing Bends in Continental & Oceanic Settings to be helded at Burlington House, London sponsored by the Geological Society of London Tectonic Studies Group and Marine Studies Group.

I41. Owen, L.A. et al. (2005) A comparison of numerical dating techniques at a Late Quaternary spit-shoreline complex, northern end of silver lake, Mojave Desert, California. Geological Society of America *Abstracts with Programs*, 37, 478.

I40. Frankel, K., Dolan, J., Finkel, R.C., Owen, L.A., Knott, J.R., Belmont, P.W. and Lee. J. (2005) Fault slip rates on the northern Death Valley fault zone and eastern California shear zone kinematics, 37, 69.

I39. Davis, N.*, Owen, L.A., Yi, C. and Finkel, R.C. (2005) Timing and style of glaciation on the Gurla Mandhata massif: a test for synchroneity of semi-arid Tibetan glaciers with global climate change. Geological Society of America *Abstracts with Programs*, 37, 40.

I38. Davis, N.P.*, Owen, L.A., Yi, C. and Finkel, R.C. (2005) The importance of terrestrial cosmogenic nuclides in testing for synchroneity of semi-arid Tibetan glaciers with global climate change. 10th International Conference on Accelerator Mass Spectrometry, Berkley (September 5-10, 2005).

I37. Clemmens, S.*, Owen, L.A., Matti, J. and Finkel, R.C. (2005) Defining the timing and spatial distribution of Late Quaternary deformational along the Banning and Mission Creek faults of the southern San Andreas fault system**.** Tectonics of Strike-Slip Restraining & Releasing Bends in Continental & Oceanic Settings to be held at Burlington House, London sponsored by the Geological Society of London Tectonic Studies Group and Marine Studies Group.

I36. Frankel, K.L., Dolan, J.F., Owen, L.A., Finkel, R.C., Lee, J., Knott, J.R., Pigati, J.S., Lifton, N.A. and Hoeft, J.S. (2005) Determining fault slip rates and patterns of landscape evolution in the Death Valley region from cosmogenic nuclides and high-resolution digital topography. Abstract volume of the Penrose Conference: Kinematics and Geodynamics of Intraplate Dextral Shear in Eastern California and Western Nevada, April 21-26, 2005: Mammoth Mountain, California, p. 91.

I35. Owen, L.A., Finkel, R.C., Lee, J., Schroeder, J. and Knott, J.R. (2005) Climatically controlled landscape development in the Eastern California Shear Zone and adjacent regions: a framework for defining geologic rates of crustal displacement. Abstract volume of the Penrose Conference: Kinematics and Geodynamics of Intraplate Dextral Shear in Eastern California and Western Nevada, April 21-26, 2005: Mammoth Mountain, California, p. 106

I34. Schroeder, J.M, Lee, J., Owen, L.A. and Finkel, R.C. (2005) Pleistocene dextral fault slip along the White Mountain Fault Zone, California: implications for kinematics of fault slip in the Eastern California Shear Zone. Abstract volume of the Penrose Conference: Kinematics and Geodynamics of Intraplate Dextral Shear in Eastern California and Western Nevada, April 21-26, 2005: Mammoth Mountain, California, p. 111.

I33. Le, K. Lee, J., Owen, L. and Finkel, R. (2005) Late Pleistocene to Holocene extension along the eastern Sierra Nevada, California. Abstract volume of the Penrose Conference: Kinematics and Geodynamics of Intraplate Dextral Shear in Eastern California and Western Nevada, April 21-26, 2005: Mammoth Mountain, California, p. 100.

I32. Owen, L.A., Finkel, R.C., Barnard, P.L.*, Ma Haizhou, Ashai, K., Caffee, M.W. and Derbyshire, E. (2005) Dating the timing of Late Quaternary glaciation in the semi-arid regions of the Himalaya and Tibet. Abstract volume of INQUA Dryland Dating Workshop, Zzyxx, Mojave Desert, March 23-26, p. 11.

I31. Owen, L.A. (2004) The timing and style of Late Quaternary glaciation throughout the high mountains of Central Asia defined by geomorphic, sedimentological, geochronologic and ice core studies. Eos, Transactions, American Geophysical Union, vol. 85, no. 47, F483.

I30. Le, K., Lee, J., Owen, L. and Finkel, R. (2004) Late Pleistocene to Holocene extension along the southern Sierra Nevada frontal fault zone, California. Eos, Transactions, American Geophysical Union, vol. 85, no. 47, F1719.

I29. Blair, M.O., Meigs, A.J. and Owen, L.A. (2004) Climatic control of sediment production, storage and routing in the Chugach Mountains, Southeast Alaska. Geological Society of America Abstract with Programs, vol. 36, no. 5, p. 307.

I28. Cadena, A.M., Rubin, C.M., Rockwell, T.K., Walls, C., Lindvall, S., Madden, C., Khatib, F. and Owen, L. (2004) Late Quaternary Activity of the Pinto Mountain Fault at the Oasis of Mara: implications for the Eastern California Shear Zone. Geological Society of America Abstract with Programs, vol. 36, no. 5, p. 137.

I27. Cadena, A.M., Rubin, C.M., Rockwell, T.K., Walls, C., Lindvall, S., Madden, C., Khatib, F. and Owen, L. (2004) Late Quaternary Activity of the Pinto Mountain Fault at the Oasis of Mara: implications for the Eastern California Shear Zone. Abstract volume of Southern California Earthquake Center (SCEC) Annual Meeting, Palm Springs, September 19-23, p. 81.

I26. Le, K., Lee, J., Owen, L. and Finkel, R. (2004) Late Pleistocene to Holocene extension along the southern Sierra Nevada Frontal Fault Zone, California. Abstract volume of Southern California Earthquake Center (SCEC) Annual Meeting, Palm Springs, September 19-23, p. 121.

I25. Owen, L.A., Finkel, R.C. and Caffee, M.C. (2003) Timing and style of glaciation throughout the Himalaya and Tibet during the last glacial-interglacial transition. *Geological Society of America Annual Meeting, Seattle 2003, Abstract with Programs*.

I24. Schroder, J.M., Lee, J., Owen, L.A. and Finkel, R.C. (2003) Pleistocene dextral fault slip along the White Mountains Fault Zone, California. *Geological Society of America Annual Meeting, Seattle 2003, Abstract with Programs*.

I23. Clemmens, S.*, Owen, L.A., Matti, J., Finkel, R., Landis, G. and Singhvi, A. (2003) Alluvial fans, a much neglected dryland environmental proxy: evidence for landscape evolution, palaeoenvironmental change and neotectonics along a transform plate boundary, south-central California. *Programs with Abstracts, XVI INQUA Congress, Reno*, p. 255.

I22. Yang, X. and Owen, L.A. (2003) The relationship between high mountain glaciation and desert evolution on the northern slope of Kunlun mountains. *Programs with Abstracts, XVI INQUA Congress, Reno*, p. 156.

I21. Minnich, R. Owen, L.A. Finkel, R.C. and Perez, A.* (2003) Timing of Late Quaternary glaciation at the extreme southern margin of glaciation in North America, San Gorgonio mountain, southern California. *Programs with Abstracts, XVI INQUA Congress, Reno*, p. 72

I20. Owen, L.A., Finkel, R.C., Caffee, M.W., Ma H., Derbyshire, Sharma, M., Gualtieri, L.[#] and Benn, D.I. (2003) Late Quaternary glaciation in the Himalaya and Tibet. *Programs with Abstracts, XVI INQUA Congress, Reno*, p. 155.

I19. Finkel, R.C., Owen, L.A., Barnard, P.L.* and Ma Haizhou (2003) Nature and rates of landscape evolution in a hyper-arid intermontane basin, Qaidam, northern Tibet. *Programs with Abstracts, XVI INQUA Congress, Reno*, p. 176.

I18. Barnard, P.L.*, Owen, L.A. and Finkel, R.C. (2003) The role of paraglacial processes in the evolution of high mountain landscapes, the high Himalaya of India and Nepal. *Programs with Abstracts, XVI INQUA Congress, Reno*, p. 65.

I18. Armstrong, P.A., Owen, L., A., Shinnefield, A.*, Finkel, R.C. and Perez, R.A.*, (2003) Terrace age and development on the eastern Sierra El Mayor, northern Baja: Combined influence of tectonics, sea level change, and river incision. *Abstract volume for Geological Society of America Cordilleran Section Meeting, Puerta Vallarta, Mexico*.

I17. Schroder, J.M., Lee, J., Owen, L. A. and Finkel, R.C. (2002) Quaternary dextral fault slip history along the White Mountains fault zone, California. Abstract volume for the Cordilleran Section Meeting of GSA, *GSA Abstracts with Programs*, 34, 5.

I16. Owen, L.A. (2001) Late Quaternary glaciation of Tibet and the bordering mountains: the progress of Working Group 2 of IGCP415. *Abstract volume for the Annual IGCP415 meeting, Aachen*, September, 2001.

I15. Lee, J., Spencer, J.Q.[#], Owen, L.A. and Dixon, T. (2001) Paleoseismology along the Owens Valley Fault: accounting for the San Andreas discrepancy. Abstract volume for the Cordilleran Section Meeting of GSA, *GSA Abstracts with Programs.*

I14. Marin, M. Dolan, J.F., Hartleb, R.D., Christofferson, Z. and Owen, L.A. (2000) A latest Pleistocene-Holocene slip rate on the Raymond fault from 3D trenching, east Pasadena, California. EOS, 81, F855.

I13. Barnard, P.L.*, Owen, L.A., Finkel, R.C. and Caffee, M. (2000) Rates and magnitudes of glaciofluvial erosion and resedimentation in the Khumbu (Everest Himal: the role of glacial and paraglacial processes in the evolution of high mountain landscapes. *Geological Society of America Annual Meeting, Reno 2000, Abstract with Programs*, A-330.

I12. Lee, J., Rubin, C., Miller, M., Spencer, J.Q.[#], Owen, L.A, and Dixon, T. (2000) Kinematics of the Eastern California Shear Zone north of the Garlock Fault. *Geological Society of America Annual Meeting, Reno 2000, Abstract with Programs*, A-105.

I11. Spencer, J.Q.[#] and Owen, L.A. (2000) OSL dating of partially bleached sediments using single aliquot techniques. *Geological Society of American Annual Meeting, Reno 2000, Abstract with Programs*, A-324.

I10. Owen, L.A., Finkel, R.C., Caffee, M., Spencer, J.Q.[#], Barnard, P.L.* and Bovard, K.* (2000) Cosmogenic radionuclide and optically stimulated luminescence dating of glacial successions throughout Tibet and the bordering mountains. Geological Society of American Annual Meeting, Reno 2000, Abstract with Programs, A-511.

I9. Owen, L. A., Finkel, R. C., and Caffee, M. W., Barnard, P.L.*, Spencer, J. Q.[#] And Bovard, K.*, Richards, B.W.M., Rhodes, E.J., Benn, D. Gualtieri, L., Ma H. and Sharma, M., C. (2000) Defining the timing and extent of glaciation throughout the Himalayas and Tibet during the global Last Glacial Maximum (18-24 ka). *Abstract volume of EPILOG meeting, Oregon, October*.

I8. ***Teller, J.T., Vaikmae, R., Rutter, N., Astakhov, V., Baker, V., Bush, A., Lehmkuhl, F., Owen, L.A., Polyak, L. and Romanovsky, N. (2000) Glaciation and reorganization of Asian network of drainage: the GRAND Project.*** **Abstract volume of the joint meeting of INQUA and IGCP415, Chengdu*, June 2000, p. 29-30.***

I7. ***Finkel, R.C., Owen, L. A., Caffee, M. and Spencer, J.Q.[#] (2000) Timing of Late Quaternary glaciation in the Hunza Valley, Karakoram.*** **Abstract volume of the joint meeting of INQUA and IGCP415, Chengdu*, June 2000, p. 8.***

I6. ***Owen, L.A., Finkel, R., Caffee, M., Gualtieri, L.[#], Benn, D.I, and Sharma, M.C.* (2000) Timing of deglaciation in the Lahul Himalya, Northern India.*** **Abstract volume of the joint meeting of INQUA and IGCP415, Chengdu, June 2000*, p. 24.***

I5. ***Derbyshire, E., Owen, L.A., Haizhou, M., Spencer, J.Q.[#], Zeng, Y., Finkel, R., and Caffee, M. (2000) The Late Quaternary glacial history of the Anyemagen Mountains, N.E. Tibet.*** **Abstract volume of the joint meeting of INQUA and IGCP415, Chengdu, June 2000*, p. 4.***

I4. Spencer, J.Q.[#], Owen, L.A., Finkel, R.C. and Caffee, M.W. (1999) Luminescence dating of glacial deposits in the Karakoram Mountains of northern Pakistan: comparison with cosmogenic dates and former thermoluminescence and radiocarbon ages. *Book of Abstracts, 9th International Conference on Luminescence and Electron Spin Resonance Dating, Rome 6-10 September 1999*, p. 274.

I3. Owen, L.A., Caffee, M., Finkel, R., Gualtieri, L.[#] and Spencer, J.Q.[#] (1999). Timing of Late Quaternary Glaciations throughout the Himalayas. *GSA Abstracts with Programs*, 31, A141.

I2. Owen, L.A., Cunningham, D.W., Windley, B.F., Richards, B.*, Dorjnamjaa, D. and Badamgarav, J. (1999) Landscape evolution and paleoenvironmental change in the Gobi of Mongolia. GSA* Abstracts with Programs.

I1. Owen, L.A., Richards, B.*, Cunningham, D.W., Windley, B.F., Dorjnamjaa, D. and Badamgarav, J. (1998) Style and timing of foreland propagating thrust faults along the Gobi Altai Mountains of Southern Mongolia. *GSA Abstracts with Programs*, 30, 5, March.

J. Field Guides

J3. Frankel, K.L., Lee, J., Bishop, K., Dawers, N., Ganev, P., Unruh, J. and Owen, L.A (2010) "Miocene - Quaternary tectonic evolution of the northern eastern California shear zone.", (2010). Field Guide, Accepted Collection: GSA Field Guide. Published by the SEPM.

J2. Frankel, K.L., Glazner, A.F., Kirby, E., Monastero, F.C., Strane, M.D., Oskin, M.E., Unruh, J.R., Walker, J.D., Anandakrishnan, S., Bartley, J.M., Coleman, D.S., Dolan, J.F., Finkel, R.C., Greene, D., Kylander-Clark, A., Morrero, S., Owen, L.A. and Phillips, F., (2008) Active tectonics of the eastern California shear zone, *in* Duebendorfer, E.M., and Smith, E.I., eds., Field Guide to Plutons, Volcanoes, Faults, Reefs, Dinosaurs, and Possible Glaciation in Selected Areas of Arizona, California, and Nevada: Geological Society of America Field Guide 11, p. 43–81, doi: 10.1130/2008.fl d011(03).

J1. Lee, J., Stockli, D., Schroeder, J., Tincher, C., Bradley, D., Owen, L., Gosse, J., Finkel, R. and Garwood, J. (2006) Fault slip transfer in the Eastern California Shear Zone-Walker Lane Belt: *Geological Society of America Penrose Conference Field Trip Guide* (Kinematics and Geodynamics of Intraplate Dextral Shear in Eastern California and Western Nevada, Mammoth Lakes, California, 21-26 April 2005), 26 p., doi: 101130/2006.FSTITE.PFG.

K. Bibliographies

K1. Barnard, P.L.* and Owen, L.A. (2000) A Selected bibliography for Late Quaternary glaciation in Tibet and the bordering mountains. *Quaternary International*, 65/66, 193-212.

L. Reports

L1. Owen, L.A. (January 20, 2010). ASIA: Glaciers defy predicting but will bring change. Global Strategic Analysis. Oxford Analytica.

M. Electronic publications

M2. Owen, L. (2012) Quaternary glaciation of the Himalaya and Tibet. Vignettes, Key Concepts in Geomorphology. URL: http://serc.carleton.edu/60233

M1. Owen, L. (2012) Defining rates of erosion using terrestrial cosmogenic nuclides in the Himalaya. Vignettes, Key Concepts in Geomorphology. URL: http://serc.carleton.edu/60234

Research grants

National Science Foundation

NSF; Collaborative Research: Transient landscapes, temporally variable erosion rates, and the impact of glaciation and climate change on landscape morphodynamics; January 2012-December 2015; $111,110; PI; EAR-1123643

NSF; Collaborative Research: Continuation and Termination of Karakorum and Karakax Faults in Western Tibet: Implications for the Role of Regional Strike-Slip Faults in Orogenic Belts; August 2009-July 2012; $228,354: PI; EAR-0910759

NSF; Collaborative Research: Improving the Chronology of Deformation and Earthquakes at La Rinconada, Argentina: Testing Segmentation and Recurrence Patterns of Blind Thrust Regimes; August 2009-July 2012; $39,112; PI; EAR-0838344

NSF; Tibetan Workshop; September 2006-August 2007; $10,000; PI; with NSF; US-China Workshop on Mountain Glacier Fluctuations, October 2005-September 2007; $54,303; co-Pi with Glenn Thackray

NSF; Collaborative Research: Deglaciation chronology of the Des Moines Lobe – implications for ice sheet dynamics and climate change; July 2006 – June 2008; $30,000; co-PI

NSF; Collaborative Research: Determination of slip rates on the Death Valley-Furnace Creek-Fish Lake Valley fault system; January 2005-December 2008; $52,500; PI

NSF; Human and geomorphic consequences of the October 8 Pakistan earthquake; March 2006 – March 2007; $29,000; PI

NSF; (subcontract from University of Nebraska); Alpine glaciation and mass-movement relief production in the Western Himalaya; 7/15/03-7/01/06; $43,680; PI

NSF; Recent kinematic evolution of the northern Eastern California; 7/02-6/05; $125,000; PI

NSF; Geomorphic consequences of the 28 March 1999, Garhwal Earthquake; 6/99 – 1/00; $7,100; PI

Southern California Earthquake Center (USGS-NSF funded)

Southern California Earthquake Center; Optically stimulated dating of sediments in the Eastern California Shear Zone; January 2012-February 2013; $18,000; PI

Southern California Earthquake Center; Optically stimulated dating of sediments in the Eastern California Shear Zone; January 2010-February 2011; $10,000; PI

Southern California Earthquake Center; Optically stimulated dating of sediments in the Eastern California Shear Zone; January 2008-February 2010; $20,000; PI

Southern California Earthquake Center; Optically stimulated dating of sediments in the Southern California; January 2007-February 2008; $20,000; PI

Southern California Earthquake Center; Optically stimulated dating of sediments in the Southern California; January 2006-February 2007; $11,232; PI

Southern California Earthquake Center; Optically stimulated dating of sediments in Southern California; January 2005-February 2006; $20,000; PI

National Earthquake Hazard Reduction Program (USGS funded)

NEHRP; Determining the deformation and earthquake hazard for a newly discovered Holocene fault in the Wabash Valley Seismic Zone, Western Kentucky; Dec 1, 2010-Nov 30, 2011; $90,669; PIs- Ronald Counts and Lewis Owen

NEHRP; Slip rate for the central and southern San Jacinto Fault Zone, southern California: Towards understanding variations in rate over time (Collaborative Proposal between San Diego State University and University of Cincinnati); December 2006-November 2007; ~$32,000; PI

National Geographic Society

NGS: Past, present and future glaciations of Nanda Devi, in the monsoon-dominated

Garhwal Himalaya, northern India; 1/1/10-12/20/10; $19,000; PI

NGS; Past and present glaciation around Mount Everest; 6/03-10/04; $20,250; PI

NGS; Paleoclimate change in northern Tibet; 8/98 – 8/00; $14,900; PI

International Union for Quaternary Research (INQUA)

INQUA; Dryland dating workshop in India; July 2006-June 2007; $3000; PI

INQUA; Dryland dating workshop in Canary Islands; July 2005-June 2006; $3000; PI

INQUA; Dryland dating workshop in Mojave Desert; March 2005; $2000; PI

Foundations

Max Kade Foundation, Postdoctoral Research Grant, March 2007-Febuary 2008; $33,500; PI

Calico Early Man Site Archaeological Project; Luminescence and cosmogenic dating of Calico Early Man site; March 1, 2005 – May 30, 2007; $49,123; PI

Calico Early Man Site Archaeological Project; Luminescence and cosmogenic dating of Calico Early Man site; March 1, 2005 – February 28, 2006; $19,135; PI

Western Center Community Foundation; Geochronology of Pleistocene Lake Mojave; 8/00 – 12/01; $41,967; PI

Lawrence Livermore National Laboratory Grant Programs (Department of Energy)
IGPP/LLNL; Defining the timing of glaciation in western Tibet; October 2004-September 2005; $7000; PI

IGPP/LLNL; Defining the timing of Late Quaternary Glaciation in Tibet using cosmogenic

radionuclide surface exposure dating; 8/03-7/03; $29,142; PI

IGPP/LLNL (Dept. of Energy); Quaternary glaciation of the Mushitage Massif, NW Tibet:

testing the nature and synchroneity of climate change throughout Northern Tibet; 8/03-7/03;

$39,117; PI

IGPP/LLNL (Dept. of Energy); A Quaternary chrono-stratigraphy for alluvial fans, pediments and terraces in the Mecca Hills (Salton Trough): a framework for defining rates of crustal displacement and landscape evolution; 8/02-7/03; $30,500; PI

IGPP/LLNL (Dept. of Energy); Rates of Landscape Evolution in an Active Himalayan Valley: Gongotri, Garhwal Himalaya, Northern India; 10/00 – 9/01; $29,936; PI

CAMS/LLNL (Dept. of Energy); Rates of paraglacial fan formation in the Upper Indus Valley, Ladakh: the use of cosmogenic and optically stimulated luminescence dating in quantifying rates of paraglacial processes; 10/99 –9/00; $15,380; PI

IGPP/LLNL (Dept. of Energy) Timing of Late Quaternary glaciation in the mountains bordering the northeastern and southeastern margins of Tibet; 10/99 – 9/00; $32,116; PI

IGPP/LLNL (Dept. of Energy); Timing of Late Quaternary glaciation in the Hunza valley, Northern Pakistan; 10/98 – 10/99; $29,180; PI

Royal Society (UK)
Royal Society; Cenozoic tectonics in the Gobi Altai-En Tien Shan, Central Asia; 10/95 – 10/97; $28,000; co-PI

National Environment Research Council (UK)
NERC; Cenozoic tectonics in the Gobi Altai- En Tien Shan, Central Asia: rates, magnitudes and styles of deformation; 7/95 – 10/97; $26,500; co-PI

University of Cincinnati Research Council

University Research Council (URC) Interdisciplinary Grant Program; Living and Researching at the Top of the World: The Science and Design of Extreme Environments Research Habitats; August 2010-July 2011; $24,725; PIs - Brian Davies, Jainagesh Sekhar, Lewis Owen

University of California Research Expedition Program

University of California Research Expedition Program; Rates and Magnitude of Landscape

Evolution on a Scottish Isle: The Isle of Skye, Inner Hebrides; $3,850; PI

University of California Research Expedition Program; Paleoenvironmental changes & landscape evolution in the Zanskar Himalaya; 8/00-12/01; $9,780; PI

University of California Research Expedition Program; Landscape Evolution in the Himalayas; 8/00 – 12/00; $9,300; PI

University of California Regents

UC Regents; Advancing & retreating glaciers at the source of the Ganges River, Garwhal

Himalaya, Northern India; 7/02-6/03; $1900; PI

Pacific Rim Grant; Long-term Glaciological and Hydrological Responses to Variations in the Southeast Asian Monsoon in Eastern Tibet; 10/00 – 6/02; $37,197; PI

UC Regents; Quaternary Glacial History of Gonga Shan, S.E. Tibet; 7/00 – 6/01; $2,700; PI

UCR Academic Senate; Rates of Denudation Across the Himalayas; 6/00 – 5/01; $3,500; PI

UCR Academic Senate; Landscape evolution of the upper Indus valley. Ladakh, Northern India; 7/99 – 6/00; $2,350; PI

UCR Academic Senate; Late Quaternary paleoenvironmental change in the Kullu and Spiti Valleys, Indian Himalaya; 7/98 - 6/99; $2,700; PI

UCR Regents; A test of the applicability of luminescence dating of Quaternary sediments in the Coachella Valley; 8/98 – 8/00; $3,000; PI

National Academies

Neotectonic and Earthquake-Hazard Study of the Chaman Fault, Western Pakistan; 10/1/13-09/30/15; $80,242

Contracts

University of Oregon; OSL dating of Alaskan sediment; October 2005; $7000; PI

Instituto Superior Tecnico; Preparation of Sediment Samples for Optically Stimulated Luminescence Dating of Sediment in the Quaternary Geochronology Laboratories; 4/30/2007-4/1/2008; $10,000; PI

Scientific Superior Education and Research Center of Ensenda; Cosmogenic Dating of Rock and Sediments from Baja California; 10/1/2007-12/30/2007; $13,500; PI

Universitat Potsdam; Cosmogenic Nuclide Dating of Sediment from Mustag Ata and Kongur; 12/1/2007-11/30/2008; $7,500; PI

University of California, Santa Barbara; Luminescence Dating of Sediments from Southern California; 10/1/2007-12/31/2007; $9,282; PI

Jawaharlal Nehru University; Preparation of Sediment Samples for Optically Stimulated Luminescence Dating of Sediment in the Quaternary Geochronology Laboratories; 4/1/2007-4/1/2008; $3,000; PI (with Dr. Shuhab Khan at University of Houstan and Dr. Abdul Salam Khan at Univeristy of Balochistan)

State University of New York at Buffalo; Luminescence Dating of Sediment from Buffalo, New York; 5/30/2008-8/30/2008; $1,600; PI

National Academies

Neotectonic and Earthquake-Hazard Study of the Chaman Fault, Western Pakistan; 10/1/13-09/30/15; $80242

Research collaborators

USA

Richard Allmendinger, Cornell University
Phillip Armstrong, Jeffery Knott, California State University, Fullerton
Michael Bishop, **Jack Shroder**, University of Nebraska, Omaha
Marc Caffee, Purdue University
Brett Cox, **David Keefer,** USGS Menlo Park
James Dolan, University of Southern California
Robert Finkel, Lawrence Livermore National Laboratory
Ulrich Kamp, University of Montana
Darrell Kaufman, Northern Arizona University
Edward Keller, University of California, Santa Barbara
Graham Kent, **Gordon Seitz,** University of California, San Deigo
Katherine Kendrix, USGS Pasadena
Jeff Lee, Central Washington University
Jon Matti, **Shannon Mahon**, **Ed Harp, Larry Snee**, USGS, Denver
Douglas Morton, USGS Riverside
Jason Rech, Miami University

Edward Rhodes, UCLA
Alex Robinson and **Shuhab Khan**, University of Houston
Tom Rockwell, California State University San Diego
Steve Wesnousky, University of Nevada, Reno

Canada
Andrew Bush, **John England**, University of Alberta
Luke Copland, University of Ottawa

Mexico
Alejandro Carrillo Chavez, Universidad Nacional Antónoma de México
John Fletcher, **Ronald Spelz**, CICESE, Ensenada

Europe
Maria-Luisa Arboleya, Julien Babault, Antonio Teixell, Universitat Autonoma de Barcelona, Spain
Douglas Benn, **Ruth Robinson**, University of St, Andrews, UK
Dickson Cunningham, **Brian Windley**, University of Leicester, UK
Edward Derbyshire, Royal Holloway, University of London
Frank Lehmkuhl, University of Aachen, Germany
Michael Searle, Oxford University, UK
Jerome Van der Woerd, IPGS-EOST Strasbourg, France

Asia
Dorj Dorjnamjaa, Mongolian Geological Survey/Mongolian Academy of Sciences
Li Jiliang, Chinese Academy of Sciences, Beijing, China
Milap Sharma, JNU, Delhi, India
Ashok Singhvi, Physical Research Laboratory, Ahmedabad, India
Ma Haizhou, Salt Lake Institute, Chinese Academy of Sciences, Xining, China
Chaolu Yi, Institute of Tibetan Plateau Research, China
Chen Jie, Zhaode Yuan, Wenqiao Li, Jinfeng Liu, China Seismological Bureau, Beijing, China
Seong Bae Seong, Korea University, Seoul, Korea

South America
Carlos Costa, Universidad Nacional de San Luis, Argentina
Roberto Donato Martino, Universidad Nacional de Córdoba, Argentina

Reina Arangoren, Martin Rengifo, ***Universidad de Los Andes, Mérida, Venezuela***

TEACHING

Summary

I have taught and developed undergraduate and graduate courses at the Hong Kong Baptist University, Royal Holloway University of London, University College London, University of California, Riverside (UCR) and the University of Cincinnati (UC). This has provided me with the opportunity to teach students from a large range of different cultural and socio-economic backgrounds in contrasting urban settings. It also allowed me to develop a broad range of very different types of courses, which are listed in detail below.

While teaching at the Hong Kong Baptist University, I developed and taught geomorphology and general Earth science courses for students whose first language was Chinese. These courses focused on teaching students about the dynamics of Earth surface processes in tropical coastal environments and included aspects of environmental geomorphology and management. While at the University of London, I taught students in the Departments of Geography and Geology. This involved specialist courses on alpine and polar geomorphology, neotectonics, Quaternary sedimentology and environmental geology. I was particularly involved in running field camps in the Himalaya, Scotland and Southern Spain. These included training students in surficial geologic mapping, Quaternary geology and geomorphic methods.

I taught upper-division classes on geomorphology and Quaternary paleoenvironmental change, and a graduate course on Quaternary field methods while at UCR. These courses had a strong fieldwork component that included excursions in the local area, the Salton Trough, the Basin and Range and Baja California. I also taught an introductory course on Earth's dynamic surface, which was supported by an instructor's manual and textbook that I co-authored. This textbook, which has sold > 20,000, and my book on environmental management have been used in a large number of courses at other universities throughout the US and UK. We are currently completing the third edition of our environmental issues textbook. While at UCR, as part of my commitment to involving students in fieldwork, I took students and volunteers to the Himalaya and Scotland as part of a University Research Expedition Program.

Since joining UC in September 2004, I have developed several new courses: Quaternary Geochronology; Freshman Seminar on Natural Hazards; Trinidad and the Geology of the Himalaya. The latter course involves a three week-long field trip traversing the Himalaya of northern India. As far as we are aware, no

other university teaches such as course. This course has been featured in the College's promotional video and magazine, making it a flagship course for our Department and College. My Quaternary geochronology course has a significant laboratory component, which includes laboratory training in methods of preparation for terrestrial cosmogenic nuclide surface exposure and luminescence dating. This course is probably unique to UC and provides our students with highly competitive skills for both research and/or careers in applied geology. I have also taught three existing courses and co-taught four graduate seminar courses at UC. These courses include a significant laboratory and fieldwork component. My main introductory course, Environmental Geology, utilizes our environmental issues textbook and is enabling me to help educate students in the application of geology. I also teach a Freshman geology class, which is very field based and is part of a three-course sequence that has been very successful in attracting students into our major.

Presently, I am the main advisor for five graduate students. I am on the committees for three other graduate students. While at UCR, I advised approximately two graduate students per year. Since moving to UC, I have been able to increase the number of graduates that I advise. This is because we have a critical mass of faculty at UC who teach and undertake research in Quaternary geology and geomorphology that helps us to attract a large and well-qualified pool of students into our Quaternary geology and geomorphology program.

I believe that much of what we teach should directly filter down to our students from our research activities. My philosophy has been to expose and involve students in research and applied projects very early on in their career. I also believe that students learn best while in the field and should be involved in hands-on projects. So I actively encouraged students to take part in my field research and applied projects. I also believe it is extremely important to expose students to international travel to broaden their outlook, but also to give them confidence and experience to help prepare them for a professional career that would likely involve international travel. Therefore, many of my fieldtrips have taken students to distant locations such as the Himalaya, Mexico and Scotland.

The courses that I have taught are briefly described below:

GEOL6011 (2012-present) Quaternary Geology
This course examined the geologic evidence for the nature of Quaternary environmental change. Attention was paid to the various forms of evidence, including sedimentological, geomorphic, geochemical and paleontological, that can be used to establish the history and scale of environmental changes. Emphasis was placed on understanding the possible forcing mechanisms that have driven environmental change throughout the Quaternary, and defining and quantifying the rates and magnitudes of these changes using geologic tools. Students were trained in laboratory and field methods and explored the links between the lithosphere, hydrosphere, cryosphere, atmosphere and biosphere on Quaternary timescales. Attention was also given to how this geologic knowledge may be applied to help predict future environmental change. The course was taught as a series of formal lectures and guest lectures from members of the Quaternary and Anthropocene Research Group.(~30 students)

GEOL6021 and GEOL6041 (2013-present) Changing Landscapes, Dynamic Environments and Geohazards in the Himalaya
The goal of this course was to better understand the nature and dynamics of natural processes, past present and future human impacts, and how one might protect, plan, and design for a sustainable future in the Himalaya. Student considered landscape change (e.g., mountain building, glaciation, erosion), geohazards, ecology, and complex socio-economic and cultural issues, including those surrounding the growing eco-tourism industry. The course is open to all students from any discipline. The course built on our experiences of teaching GEOL590 and

including a component of design analysis taught by a professor from the College of Design, Architecture, Art and Planning. (~15 students)

GEOL380/GEOL3080 (2012-present) Landscape evolution and environmental change on the edge of the Caribbean, Trinidad
This honors course examined how the landscapes in Trinidad have developed from their geologic origins to its occupation by humans some 10,000 years ago, to post-Columbian settlement and into the present day. Aspects of how humans have influenced Trinidad's landscapes and how they will continue to in the coming years were considered from geologic and anthropologic perspectives. In addition, the course examined how natural processes such as earthquake, landslides, floods and extreme weather threaten the inhabitants of Trinidad. A key component of this course was the develop scientific hypotheses to test during a 10 day field trip to Trinidad to help faculty and future students develop a long-term commitment to examining environmental change and landscape evolution in Trinidad and adjacent regions. I lead this course in collaboration with colleagues from the Department of Anthropology, Biology and Geography. (~15 students)

GEOL174 Freshman Seminar on Natural Hazards (2008-2012), Department of Geology, University of Cincinnati
This course was developed as Freshman seminar for geology and other majors. The course focused on examining natural hazards as the interface between humanity and its needs for space and resources and the ongoing geologic processes of Earth. The basic principle of geology, including tectonics, Earth surfaces processes and climate change were explored to understand the nature of geologic hazards. Students learned how to interpret geologic data, recognize the risk from geologic hazards and be trained in some basic field methods. (~ 20 students)

GEOL590 Geology of the Himalaya (2004 – 2011), Department of Geology, University of Cincinnati
I developed this field course with my colleague, Craig Dietsch, to allow students to examine the geology of the Himalayan-Tibetan orogen by undertaking a 500 km-long N-S traverse in northern India from the Indo-Gangetic Plain through the Himalaya to the edge of the Tibetan Plateau. The course exposed students to the nature of the geologic processes that are currently shaping this active mountain belt to provide them with an understanding of modern processes and a foundation for studying ancient orogens. Attention was given to investigating the structural geology, petrology, and geomorphology at key locations along traverse. Students were trained in the geologic techniques that are used to study active mountain belts, including field mapping, sampling of rocks and sediments for geochronology, metamorphic petrology, structural analysis, and monitoring geomorphic processes. The students were assessed on the presentation of a field report at the end of the course. (~ 10 students, and 5 external participants)

GEOL699 Geology Colloquium (2004 – 2008), Department of Geology, University of Cincinnati
This course comprised weekly seminars given by external speakers. All graduate students were required to attend this course. (~ 30 students).

GEOL527 Quaternary Geochronology (2004 – 2011), Department of Geology, University of Cincinnati
I designed and teach this course to provide students with an introduction to newly developing Quaternary dating methods. This course examined the main principles, techniques and applicability of the sidereal, isotopic, radiogenic, chemical and biological dating methods to provide training for Quaternary geologists, neotectonists, paleosesimologists, biogeographers, pedologists, and archaeologists concerned with defining the timing of events and rates of environmental change. Case studies illuminated the key role of geochronology in Quaternary geology, geomorphology, tectonics and archaeology. A series of assignments were provided to help train students in assessing and evaluating the validity of different dating methods, and the analysis and presentation of data. Students also received field and laboratory instruction in the newly developing techniques of cosmogenic radionuclide surface exposure and luminescence dating. The course comprises 10 lecture topics, 5 labs, a poster-presentation, a field trip and a final examination. (~ 12 students)

GEOL104 Environmental Geology (2004 – present), Department of Geology, University of Cincinnati
Students were introduced to the study of Environmental geology highlighting the interaction of humans with the geologic environment including the atmosphere, the biosphere, the lithosphere, and the hydrosphere. The course focused on: 1. Management of geological resources such as fossil fuels, minerals, water and land space; 2. Mitigation of effects of natural hazards on humans; 3. Geological engineering, including the construction in and use of the geological environment; and 4. Waste disposal and minimization of the effects of pollution. The course examined the nature of these processes from an environmental geology perspective to learn how an understanding of their dynamics is relevance to the well being of humankind. The course comprised 20 lectures, 10 labs, a poster-presentation, tests and a final examination. (~ 100 students)

GEOL108 Geological Environments of Cincinnati (2004), Department of Geology, University of Cincinnati
The geology of Cincinnati was examined through lectures, labs and fieldtrips. Topics includes: 1. Introduction to Geology; 2. Bedrock of Cincinnati; 3. Fossils of Cincinnati; 4. Building Stone of Cincinnati; 5. Glaciation of Ohio; 6. Karst in Ohio and surrounding regions; 7. Landsliding; and 8. Flooding. The course comprises 10 lecture topics, 5 field trips, tests and a final examination. (~20 students)

Quaternary Geochronology (MS and PhD) (1997 – 2004) Department of Earth Sciences, University of California, Riverside
This course was jointly taught with Robert Finkel from the Lawrence Livermore National Laboratory. The course provided training in Quaternary dating methods for graduate students. Attention was given to the application of methods to different geologic problems, and the nature of the different analytical methods, for example, the dating ranges and uncertainties. Students were provided with hands-on experience in sampling and sample preparation and measurement for radiocarbon, cosmogenic radionuclide and luminescence dating. The assessment was in the form of a research paper. (~ 5 students and 5 external participants)

Quaternary Field Methods (MS and PhD) (1997 – 2004) Department of Earth Sciences, University of California, Riverside
This course provided training in Quaternary field techniques for graduate students. Attention was given to field mapping, the analysis and interpretation of Quaternary landforms and sediments, and the collection of samples for geochronological work. Students spent about two weeks in the field examining parts of the landscapes in Southern California. The students were asked to write a research paper on their studies as part of their assessment. (~ 5 students)

Quaternary Paleoenvironmental Change (Upper-Level) (1998 – 2004) Department of Earth Sciences, University of California, Riverside
This upper-level course examined the possible forcing mechanisms that have driven climate change throughout the Quaternary and the nature of Quaternary environmental change. Attention was paid to the various forms of evidence that can be used to establish the history and scale of the environmental changes and how this knowledge may be applied to help predict future environmental change. Students were trained in the Quaternary laboratory and field methods and they explored the links between the lithosphere, hydrosphere, biosphere and atmosphere on Quaternary timescales. The course comprised 20 lecture, 10 labs, a poster-presentation, two weekend-long fieldtrip, and a final examination. (~ 12 students)

Geomorphology (Upper-Level BS) (1997 – 2004) Department of Earth Sciences, University of California, Riverside
This upper-level course examined the relationships between processes and landforms within a modern conceptual framework. Geomorphic systems were considered in terms of their geologic, climatic, biotic and anthropogenic settings. Emphasis was placed on tectonic, desert, fluvial, glacial, periglacial, mass-movement and coastal processes. Examples were used from a large variety of geological and geographical settings to help provide a theoretical and practical

perspective for the subject. Landforms and sediments were considered in terms of their recognition, genesis, and environmental and economic importance. Attention was given to methods of measuring, monitoring and interpretation of collected data from various spheres. Several weekend-long field trips provided the students with examples of tectonic and desert landforms, and provided training in geomorphic field techniques. The course was examined through a laboratory book, tests and a final examination. (~ 12 students)

Earth's Dynamic Surface (Lower-Level BA and BS) (1998 – 2004) Department of Earth Sciences, University of California, Riverside

This was a lower-level course for Arts and Science students. The course examined tectonic, climatic, geomorphic, hydrologic and biological processes to show how they continuously operate to produce Earth's landscapes and environments. The course comprised 20 lectures, 10 labs, a poster presentation, tests and a final examination. (~ 100 students)

Advanced Sedimentology (BSc) (1996), University College London

This course covered aspects of sedimentological research for final year BSc geology students. I taught the terrestrial sedimentology research topics while one of the instructors was on sabbatical leave. Lectures included: glacial processes and deposits; fluvial systems; aeolian sediments; lacustrine deposits; mass movements deposits; alluvial fans; and deltas; shallow coastal deposits. A lab followed each lecture topic and the course was assessed using the labs and a final 3-hour long examination. (~15 students)

Geographical Environments (BA and BSc) (1993 - 1997) Department of Geography, Royal Holloway, University of London

This was the main first year core course for Geography students. The course comprised ~ 80 lectures that examined the breath and nature of geography. I was responsible for planning and coordinating the course that involved ten separate modules, each comprising eight lectures. Attention was given to methods of measurement, monitoring and the interpretation of collected data from various spheres. I taught modules on environmental geomorphology and climatology. The course was examined using a 3 hour-long final examination. (~ 100 students)

Geology of the Continents (BSc) (1992 - 1994), Department of Geology, Royal Holloway, University of London

This course introduced freshmen geology students to continental dynamics and geological methodologies. My responsibilities included teaching Earth surface processes (5 lectures plus lab sessions). This course comprised 20 lectures, with each lecture followed by two labs. The course was assessed with a final examination and the submission of a lab book. (~ 80 students)

Engineering Geology (BSc) (1992-1994), Department of Geology, Royal Holloway, University of London
This course introduced final year BSc geology students to a detailed working knowledge of engineering geology. I was course coordinator for this course and was responsible for overseeing its contents and teaching two engineering geology topics. I also supervised students in the field and oversaw the examination process. The course comprised 20 lectures, 10 labs, a field excursion and a final examination. (~ 40 students)

Quaternary Sedimentology (MSc) (1992 - 1997) Departments of Geology and Geography, Royal Holloway, University of London
I designed and taught this course as part of a MSc degree in Quaternary science. The main aim was to develop the student's expertise in Quaternary sedimentological research. Practical work, including field and laboratory training, was an important component of this course, introducing the students to conventional and newly developed techniques for the analysis of sediment. Emphasis was placed on the study of glacial, mass-movement, fluvial, aeolian and lacustrine sedimentation. Processes of transportation, deposition, deformation and diagenesis were studied using examples from both contemporary and ancient environments. The course comprised 10 lectures, 20 hours of lab work, a three-day field trip, a research project and a final examination. (~ 10 students)

Environmental Geology (BSc) (1991 - 1995), Department of Geology, Royal Holloway, University of London
I co-designed and jointly taught this course for environmental geologists and biologists. Students were introduced to the principles of environmental geology including Earth systems, endogenetic and exogenetic processes, material properties of rocks and sediments, environmental hazards, climatic change, hydrogeology, waste disposal and environmental management. The course comprised 20 lectures, 10 labs, two field trips, two assessed assignments and a final written examination. (~ 50 students)

Polar and Alpine Geomorphology (BSc) (1991 - 1997) Departments of Geology and Geography, Royal Holloway, University of London
I designed and taught this course for second year Geography and Geology students. The relationships between processes and landforms were examined within a modern conceptual framework for high-altitude and high-latitude environments. Mountain and polar systems were introduced in terms of their geologic, climatic, biotic and anthropogenic settings. Emphasis was placed on studying glacial, periglacial, mass-movement, aeolian and fluvial processes. Attention was given to methods of measuring, monitoring and interpretation of collected data from various spheres. Landforms and sediments were considered in terms of their recognition, genesis, and environmental and economic importance. A three-day field course was held in South Wales. The course comprised 20 lectures, 10 labs, two assessed assignments and a final written examination. (~ 40 students)

Neotectonics (BSc) (1991 - 1997) Departments of Geology and Geography, Royal Holloway, University of London
I designed and taught this course for final year BSc Geography and Geology students. This course examined the methods of neotectonic study that included geologic, geomorphological, historical and geodetic

information. Attention was given to tectonic processes such as earthquakes, volcanic activity, and isostasy, and their role as landscape forming processes. A field course was held in western Scotland to examine recent faulting, paleoseismicity and uplift. The course comprised 20 lectures, 10 labs, two independent assignments and a final written examination. (~25 students)

Graduate students advised

Christine H. Scott, 1989-1992. Ph.D. thesis: *Contemporary sediment transfer in Himalayan glacial systems: implications for the interpretation of the Quaternary record*.

Milap C. Sharma, 1992-1996. Ph.D. thesis: *Quaternary history and landscape evolution of NW Garhwal, central Himalaya*.

Shaun Richardson, 1993-1997. Ph.D. thesis: *Deglaciation and shoreline displacement adjacent to a spreading ridge, N.E. Iceland*.

Patrick A. Fothergill, 1994-1998. Ph.D. thesis: *Late Tertiary and Quaternary intermontane basin evolution in North-East Tibet: the Guide Basin*.

Ben Richards, 1995-1999. Ph.D. thesis: *Palaeoclimate of South Asia over the last 80 ka: luminescence ages of sediments from former glaciations in Nepal and Pakistan*.

Gary Patt, 1998-2000. Master's thesis: *Tectonic geomorphology of the Mecca Hills, Southern California*.

Kelly Ruppert (Bovard), 1999-2001. Master's thesis: *Landscape evolution and paleoenvironmental change in the upper Indus valley*.

Patrick Barnard, 1998-2003. Ph.D. thesis: *The timing and nature of glaciofluvial erosion and resedimentation in the Himalaya: the role of glacial and paraglacial processes in the evolution of high mountain landscapes.*

Anne Perez, 2000-2003. Master's thesis: *The Late Quaternary glaciation of San Gorgonio Mountain, Transverse Ranges, Southern California*.

Jason Dortch, 2004-2006. Master's thesis: *Glacial history of the Navana Valley, Alaska***.**

Yeong Bae Seong, 2003-2008. Ph.D thesis: *Quaternary glaciation and its role on landscape evolution of the Muztag Ata-Kongur Shan and K2 regions in the Westernmost Himalayan-Tibetan orogen*.

Patrick Smith, 2002-2009. Ph.D thesis: *Landscape evolution of the San Caparistro River Terrace in Southern California*.

Katheryn Hedrick, 2007-2009 Master's thesis: *Towards defining the transition in style and timing of Quaternary glaciation between the monsoon-influenced Greater Himalaya and the semi-arid*

Transhimalaya of Northern India.

Jason Dortch, 2006-2010. Ph.D. thesis: *Rates of landscape development in the Transhimalaya: a framework for testing the links between climate, erosion and tectonics*.

Ronald Counts, 2006-2012. Ph.D. thesis: *River terraces and paleoenvironmental evolution of the Ohio River*.

Jerermy Hatfield, 2007-present. Master's student: *Active normal faulting in Death Valley*.

Fred Budinger, 2006-present. Ph.D. Candidate. *Landscape evolution and paleonvironmental change at Calico Archaeological Site, Mojave Desert.*

Katheryn Hedrick, 2009-present. Ph.D. student. *Alluvial fan formation in the Pamir and Precordillera of Argentina.*

Harrison Gray, 2011-present. Doctoral student. *Tectonic geomorphology within a transpressional zone along the southern San Andreas fault.*

Jeanette Arkle, 2012-present. Doctoral students. *Rates of transpression along the southern margin of the Caribbean Plate Boundary, Trinidad and Venezuela*.

Post-doctoral researchers supported

Dr. Lyn Gualtieri*, 1998-1999.* Cosmogenic radionuclide dating of moraines in the Himalaya*.*

Dr. Joel Spencer*, 1998-2001*. Luminescence dating of Quaternary sediments.

Dr. Markus Fuchs*, 2007-2008*. Luminescence dating, active tectonics and paleoenvironmental change

Dr. Madhav Murari, *2010-2014.* Luminescence and cosmogenic nuclide dating, active tectonics and paleoenvironmental change

PROFESSIONAL ACTIVITIES

Summary

My service to the scientific community and academia has included reviewing manuscripts and editorial duties for international journals, running symposium and workshops, helping to lead international scientific research programs, and playing an active role in administration at departmental, college and university levels.

My role reviewing journals has included reviewing > 20 manuscripts per year, plus serving as an Associate Editor for the main journal of the Geological Society of America (*Bulletin of the Geological Society of America*), the top geologic journal (*Geology*) and one of the top journals for Quaternary science (*Quaternary Research*). Furthermore, I have been on the editorial board of *Quaternary International* since 1997, which is the journal of the International Union for Quaternary Research (INQUA). Presently, I am Editor-in-Chief for *CATENA*, which is one of the leading journals for geoecology and landscape evolution.

My service to the profession has included presenting my work at national and international meetings and workshops. Over the last decade, I presented > 50 external research lectures, including keynote addresses at the annual meetings of the American Geophysical Union and Geological Society of America. I have also been invited to give numerous talks at universities throughout the US, India and China. In addition, to presenting my own work, I have organized and/or helped organize numerous symposium and workshops.

I was fortunate in 1997 to have been invited to lead a working group on the glaciation of Tibet and the bordering mountains for International Geological Correlation Program (IGCP) 415. Since then, I have organized three international meetings and a field excursion in northern India for IGCP 415. These are helping to collate and extend our knowledge, and stimulate new research on the nature of Late Quaternary paleoenvironmental change in central Asia. I have also been actively involved in the Himalayan Interdisciplinary Paleoclimate Project of PAGES and the global glaciation mapping program of INQUA. During the 2003 INQUA Congress in Reno and 2008 INQUA Congress in Cairns, I convened several oral and poster sessions on deserts and late Quaternary glaciation in central Asia, and was asked to present three keynote lectures on my research. I will also be convening a symposium on the glaciation of Tibet and adjacent mountains at the next INQUA Congress in Bern in August 2011. In 2006, I co-organized a two-week long workshop in Tibet, which included examining the glacial geology and geomorphology along a 500-km long traverse across Tibet. Over 50 scientists from China, USA and Europe attended our workshop and it resulted in two edited volumes of papers on mountain glaciation and landscape evolution.

My contribution to geochronology involved co-organized a workshop on Quaternary geochronology in the Spring of 2004. This workshop was offered to any interested students and professional geologists within the USA. The workshop provided training in sample collection and preparation, with emphasis on cosmogenic nuclide, optically stimulated luminescence and radiocarbon dating methods. Since then, my expertise in

geochronology has involved me in the activities of INQUA's Commission on Stratigraphy and Chronology. As a consequence, I was funded by INQUA to hold the first workshop of the Drylands Dating Subcommission in the Mojave Desert in March 2005 and to co-organize a second workshop in the Canary Islands in March 2006.

*My professional activities have also included applied/environmental geology. This interest developed when I undertook post-doctoral research on landslides and debris flows in the thick loess of China and when I was employed by a consultancy firm (*Geomorphological Services Ltd.*) to undertake work on landslides and environmental risk assessment in the UK. Since moving to the US, I have been involved in a variety of different environmental projects. This has included work with the* Environmental Systems Research Institute *(ESRI) on an environmental sensitivity-mapping project in Nigeria, which involved developing protocols, techniques and training for Nigerian scientists to undertake environmental work on oil spills on the Niger Delta. In addition, I have also completed studies on geomorphic hazards along the Karakoram Highway, one of the world's greatest highways, in Northern Pakistan to aid in hazard mitigation. During the last few years, I have also been involved on several development and site investigation projects for* Environmental Consultants International *(ESI). This has involved luminescence dating of Quaternary sediments to test for active faulting across the several stretches of the San Andreas and Malibu faults in Southern California, and for seismic hazard assessments in Portugal and Panama. In 2009, I was asked to be a consultant on a seismic hazard assessment for the renewal of a license for a nuclear reactor in Argentina for* D'Appolonia Engineering. *In 2011, I worked for* AECOM *on a consultancy project to examine sand drifts around Owens Lake in California. These applied research projects provide me with useful resources for teaching and they also allow me to develop my research interests and publish on aspects of applied geology, as well as keeping me in touch with industry. Furthermore, these projects help open up employment opportunities for my students.*

My professional service in the universities where I have worked has included serving on a variety of student, departmental, college and university committees. At UC, for example, I have been a member of the University Research Committee, the University's Grievance Committee, Dean's Faculty Advisory Committee, College Budget Committee and the University of Cincinnati Field Station Steering Committee. I have also been regularly involved in other College activities such as judging graduate posters during our annual graduate research forum and helping in the production of the college promotional videos. Outside the college, I am involved in K-12 activities including judging at the Ohio Science Fair and visiting local schools to talk about Earth science.

Since taking over of head of department in 2008 my administrative duties at UC have clearly increased and involve all the regular Head duties including such matters as budget management, allocation of faculty and staff duties, conducting annual staff reviews, advocating for the department, recruitment and retention of students, and working with the Dean's Office. Being Head has allowed me to develop and implement quite a few new initiatives to help expand our research and teaching excellence. These are listed and described below in the section entitled "Major initiatives since becoming Department Head". Summaries of my other professional activities are also provided below.

Editorial Duties

• Editor-in-Chief for *CATENA* (2010-present)
• Associate Editor for *Quaternary Research* (January 2006-present)
• Associate Editor for *Geology* (January 2006-2009)
• Associate Editor for *Geological Society of America Bulletin* (January 2005-2008)
• Editorial board member for *Quaternary International* (1997-present)

Course Directorships

• Director of the Environmental Earth Science B.Sc. degree for Departments of Geography and Geology at Royal Holloway, University of London (1991-1997)
• Director of the Geography-Geology B.Sc. for Departments of Geography and Geology at Royal Holloway, University of London (1991-1997)

Laboratory Directorships

• Director of the Luminescence Dating Laboratory at the University of Cincinnati (2004-present)
• Director of the Terrestrial Cosmogenic Nuclide Laboratory at the University of Cincinnati (2004-present)

Research Cluster Directorships

• Director of the Quaternary and Anthropocene Research Group (QARG) at UC (2011-present)

Workshops and Conference Organization

• Symposium convener for the GSA Annual Meeting (October 2011)
• Symposium convener for the GSA Annual Meeting (October 2010)

• Co-organizer of International Workshop and field excursion on Mountain Glaciation in Tibet (September 2007)
• Symposium convener for the 2007 INQUA Congress in Cairns (August 2007)
• Co-organizer for Drylands Dating Subcommission workshop in the Canary Islands (April 2006)
• Co-organizer for Drylands Dating Subcommission workshop in the Mojave Desert (March 2005)
• Organizer for Quaternary Geochronology Workshop in Riverside (May 2004)
• Member of the INQUA Commission on Stratigraphy and Chronology (2003-present)
• Symposium convener for the 2003 INQUA Congress in Reno in August 2003
• Working Group Leader, International Geological Correlation Program 415 (1997-2002)

Consultancy

• Consultancy work for AECOM on dating sand drift deposits around Owens Lake, California (October – November 2011)
• Consultancy work for D'Appolonia Engineering for renewal of nuclear power station license in Argentina (June 2009 – April 2010)
• Consultancy work for Environmental Consultants International for seismic hazard assessment for engineering projects in Southern California, Portugal and Panama (2001-present)
• Consultant for Geomorphologist for Murday Consulting Corporation and Environmental Systems Research Institute for environmental sensitivity index mapping of the Niger Delta (November, 1998 – October 1999)
• Contract work for USGS including OSL and ^{10}Be cosmogenic nuclide dating of sediments from Mongolia and the Mojave Desert for paleoenvironment studies (September, 1998 – present)

External Examining

• Ph.D. Examination Committee for Jakob Heyman, Stockholm University, Sweden (2010)
• Ph.D. Examination Committee for Ronald Spelz, CICESE, Ensenada, Mexico (2008)
• External Examiner for Environmental Geosciences Degree at University College London (1995-1998)

University of Cincinnati Committees

• University Grievance Committee (2009-present)
• University Research Committee (2006-2009)

College Committees

• College Executive Committee (2012-present)
• Dean's Finance Committee (2010-2011)
• Dean's Faculty Advisory Committee (2008-2009)
• University of Cincinnati Center for Field Studies Steering Committee (2008-present)

Major initiatives since becoming head of department

• **Re-organization and promotion of our Department staff**. This involved the abolishment of an inefficient staff position and its replacement with a new position, which I called an Academic Director. The Academic Director,

who has a background in geology, has advanced many administrative aspects of our graduate program, including streamlining and better organizing our entire graduate student application process, maintenance of graduate student files, keeping all of our graduate students in accord with College and University paperwork and their deadlines, and all departmental scheduling. In addition, the Academic Director has been extremely helpful in facilitating communicating among students and faculty, and she has been instrumental in updating older departmental documents so that they are compatible with various documents of the College, Graduate School and the University. This new hire has revolutionized how our Departmental Office works and has considerably reduced the administrative workload for many of our faculty members and students. This innovative position has become a model that several other science departments within Arts and Sciences have now adopted.

I also worked with all our department staff to ensure that they received promotions or bonuses for their contributions to our department and college. These promotions were long overdue. I also made sure that two of our staff also received recognition awards from our college for their long service and outstanding contributions.

- **Development of a new Departmental plan**. This involved creating a plan to identified areas of research and teaching that we could grow into program/centers of excellence. The plan highlighted our research strengths and needs, hiring priorities, teaching needs and funding opportunities. The plan showed that we could develop three areas of research and teaching excellence building on our current strengths and resources. The first of these areas is *paleontology/paleobiology/paleoecology* for which this year the *US News and World Report* ranked us 6th best graduate program in paleontology in the country. The second area is *Quaternary geology and geomorphology/environmental geology/surface processes*. This builds on our recent success in obtaining numerous research grants from the NSF and our strong publication record in this research area. The third area is in *sedimentology/stratigraphy/sedimentary and low-temperature geochemistry*. This has been a traditional area of expertise in our department, but has not been adequately supported in recent years, however, we were able to strengthen this area by hiring three new faculty members in Quaternary geology who work on aspects of geochemistry (see below). Our teaching priorities build on these areas of strength, but we also recognized the need to provide a holistic education for our students and we are supporting teaching in areas outside of our research foci by attracting adjunct professors to our department. As such I was able to attract Dr. William Haneberg (one of the leading engineering geologists in the US) to become and Adjunct Professor and teach structural geology to our students. We will cover such topics as basin dynamics and petroleum geology by bringing alumni into our department to teach short courses.

- **Recruitment of new faculty**. Over the last three years we successfully recruited six new tenure-track faculty members and two research assistant professors. These new faculty members helped us address the chronic problems we had with age structure and diversity in our department. The new faculty members also help support each of our three areas of research strength, particularly our sedimentology/stratigraphy/sedimentary, low-temperature geochemistry research area and Quaternary science. I was the last hire that the department made prior to these hire, which was in 2004, and the previous hire was in 1998. Recruiting new faculty members is clearly very exciting for our department.

- **Production of a new website for our Department**. Our departmental website was very out dated when I took over as Head. Fortunately, over the last year or so, I been able to work with staff in the Dean's Office to update and redesign our website in our college's corporate style.

- **Establishment and editing a weekly newsletter.** After taking over as Head, I developed a weekly newsletter called *Rolling Rocks*. This built on the tradition of sending a weekly e-mail to faculty and students that was initiated by the former head of department. I circulate *Rolling Rocks* to students, staff, faculty, the Dean Office and alumni to inform them of our weekly activities and achievements. *Rolling Rocks* includes photographs to make it attractive and a little bit of humor (at least things that I consider funny). *Rolling Rocks* is also posted on our new website to make it available to a wider audience. Please check it out at

http://www.artsci.uc.edu/collegedepts/geology/pubs/

- **Re-design of our teaching curriculum**. This year UC changed from the quarter to the semester system. This provided us we an opportunity to totally re-organize our teaching curriculum. During the last two years, particularly with the help of our new Academic Director, we have totally re-designed our teaching curriculum, which includes all new lecture, laboratory and field courses.

- **Writing an Undergraduate Assessment Document and a Graduate Assessment Document**. I oversaw the writing of assessment documents for undergraduate and graduate programs for external review in 2010. These comprehensive documents summarized, for example, the details of our teaching and research programs, students and faculty profiles, our successes and failures, and future plans. The documents were so well received by our external and internal reviewers that the university provided us with a budget to hire two research professors for a five-year period, with a half position becoming permanent after five years.

- **Updating of our graduate handbook**. With the help of our new Academic Director, I have overseen the rewriting of our graduate handbook, which we now continuously update. The graduate handbook provides all the information our students need about graduate life with us including information on course requirements, available scholarships, places to obtain advice, rules and regulations, and information on stipends and tuition.

- **Development of an international field program for our students**. I believe field research and international travel is an essential part of a geoscientist's education. I initiated a program to provide a series of three international fieldtrips on a regular, rotating, annual basis to enhance our students' global outlook and geologic experience. The fieldtrips span our three areas of research strength and are multi-week excursions to: the coastal marine settings of the Florida Keys and the Bahamas to examine coastal and shallow water marine processes, sedimentary environments, coastal ecology, and marine ecosystems; the high-latitude regions of either Alaska or Iceland to examine modern glaciers, glacial processes, and glacial landforms, glacial sediments and depositional settings, and their record of modern high-latitude climate; and the Himalaya in northern India to examine archetype collisional bedrock geology, high-altitude glaciers, glacial processes, and glacial landforms, river systems, landslides, and other aspects of one of Earth's most dynamic mountain landscapes. We are subsidizing these fieldtrips from our endowments. Participants from outside of our department including alumni and students and scientists from other universities join these fieldtrips and help subsidize the costs. Students at any level of their education can take these courses. The idea is that an undergraduate, masters or doctoral student could take all three courses during their time with us. The courses are taught in a way that junior students can learn from more senior students, and in turn the senior students get teaching experience from mentoring the junior students. An essential aspect of all three fieldtrips is therefore to have students participate in small field-based, self-contained research projects; thus, the fieldtrips are clearly important venues for student education. As with all our others fieldtrips, I believe that one of their essential goals is to "bring Geology is to life" for the participants and to help create a bonding experience for our students and faculty.

  At the beginning of every academic year we run a four-day fieldtrip for all our faculty and graduate students. Over the last few years these have included field trips to the Cascades, Kentucky and Lake Erie.

- **Initiation and development of a graduate-undergraduate mentoring program. I initiated and developed a graduate-undergraduate mentoring program** with **the help our graduate students. In this program, our graduate students partner with one or more undergraduates to hold informal meetings, such as a visit to the coffee shop, to help encourage them to participate in departmental activities and to also see if they would like to be involved in research projects. This provides an opportunity for graduate students to begin developing their mentoring skills.**

- **Holding regular meetings with students**. I have held regular meetings (at least once a quarter) with our graduate

students since taking over as head of department. This provides them with the opportunity to raise issues and present ideas to help improve and develop of our program. I have also held meetings with our students to obtain their views on faculty candidates we have invited for interviews during the past year. We also hold open forums once a quarter where undergraduate and graduate students, and faculty meet to discuss issues. In addition, as head of department, I have an open door policy so that any student can visit me to express any concerns or let me have new ideas about how we can help improve their educational experience.

- **Enhancement of the teaching experience for our graduate students.** I have initiated a program on geoscience education for our graduate students to provide them with training and so that they can appreciate the importance of propagating their science through outreach. The students will keep a portfolio of their activities, which would include details of such things as cooperative ventures with various local agencies and groups to conduct environmental assessments; presentations for classes at local elementary and secondary schools, both public and private; participation in the Cincinnati Gem and Mineral Show and the Southwest Ohio Science Fair, and other programs open to the general public; and lectures to the Dry Dredgers (a local organization of amateur paleontologists). In addition, our best doctoral students now have the opportunity to teach a whole laboratory in physical geology during the regular academic year and/or an introductory geology course as part of our summer school. Having our students teach a summer course provides them with experience to help them with academic and applied job, but also it is also saving us a lot on summer salaries that in the past went to tenured faculty.

- **Creation of a sense of place for our undergraduate students**. To help increase recruitment and retention of undergraduate students we have been very proactive in encouraging students who take our courses to be thoroughly involved in the academic and social life of our department. For example, all the students are invited to join our departmental fieldtrips, picnics, parties, banquet, and even our soccer matches. Our new Academic Director makes sure our students are aware of these activities and I also highlight our events in *Rolling Rocks*. The creation of an undergraduate lounge and a graduate-undergraduate mentoring program has also helped to make them feel part of the department. In the last five years we have tripled the number of majors in our program. In essence, we are trying to create a sense of place for our students within our department to both help attract students to and retain them into our program.

- **Establishment of an Alumni Advisory Committee**. In 2009, I established an Alumni Advisory Committee that comprises seven alumni from industry, government, and academia to help advise us on issues such as curriculum and research development, employment and fund raising. The committee meets at UC once a year (coinciding this past year with our spring departmental banquet), and it holds a semi-annual conference call with faculty, and exchanges e-mails on issues that arise throughout the year. I encouraged the Committee to write a report on the state of the department and the future needs of the profession to help us with strategic planning. I asked the Committee to be proactive in helping to raise our level of our endowments. As a consequence our endowments are continuing to increase despite the poor economy. With help from our Committee we plan to develop formal recruiting visits, short courses, and workshops given by alumni with the goal of helping both our MS and PhD graduates find job placements.

- **Expansion of cross-departmental research and teaching**. During the last two years, I have worked closely with faculty in the Departments of Anthropology, Biological Sciences, Chemistry and Geography to help develop two new research clusters: 1) Geographical Information Network Systems; and 2) Molecular Markers. We are recruiting new faculty as part of these clusters and establishing new research and teaching programs. These clusters are also helping to strengthen research and teaching links between our departments. In addition, I have been working with faculty within the College to help establish an environmental quality initiative to help address environmental problems within the Tri-State region, and to help attract students into the STEM disciplines. In addition, I have also been part of a committee examining how we can rationalize our computer teaching laboratories and pool our resources in terms of teaching statistics.

- **Development of interdisciplinary research and teaching project between Colleges**. During the last year, I have worked with faculty in the College of Design, Architecture, Art and Planning, and the College of Engineering to develop a research project that links some of our interests in research and living in extreme environments. We were recently successful in receiving support from the University to fund a research and teaching project to design habitats for high altitude research. This involved our students designing and making a habitat, which they tested on a Himalayan glacier in Northern India last summer. We have funding for three more years to run a new course to take our students to the Himalaya as part of this research.

- **Initiation and development of a research cluster in the study of the Quaternary and Anthropocene: QARG.** Building on the existing expertise in Quaternary science within the Departments of Anthropology, Biological Sciences, Geography and Geology, I initiated and now direct a new research and teaching cluster know as the *Quaternary and Anthropocene Research Group* (QARG). We hold meetings and weekly colloquium on Quaternary science and are developing new research projects in places such as Trinidad, Alaska and Kentucky. As a consequence of this and our new research collaborations we were granted approval from the Dean to search for a new faculty member in Quaternary science who is a joint hire in the Departments of Anthropology and Geology. The new faculty member is based in our Department. We check out the website we developed for QARG at: http://www.uc.edu/orgs/qarg.html

- **Enhancement of our available space**. With the recruitment of our eight new hires, I have worked to make sure that we utilize our available space as best as possible to provide them with offices and new laboratories. This is including renovating of seven old laboratories to build biogeochemistry, geochemistry, Quaternary paleoecology, numerical modeling, microscope, fission track dating, and invertebrate paleontology laboratories. I was also able to revamp of an old faculty lounge into an undergraduate lounge to help foster a sense of place for our students. In addition, we were able to make enough space to provide the Department of Geography with five of our rooms to accommodate two new hires that they have made during the past 24 months. I have also had to make creative use of space to help accommodate our growing graduate students program.

- **Development of collaborative links with institutes in Asia**. Over the last few of years, I have had been trying to establish collaborative links with colleagues at institutes in Asia to developing exchange programs between students and faculty. This has included field and laboratory training for Chinese and Indian scientists, and field experiences for our students. These links have been particularly useful in helping to increase the number of graduate applications we receive from Asia. In the summer of 2011 we had students and faculty from Korea and China join work in our laboratories.

- **Development of internships for students in our Professional Writing and Editing MA program.** I have been developing internships within our Department for students from our Professional Writing and Editing MA program. The students help faculty with grant proposal writing, editing of research papers and books, and the development of websites, while at the same time it provide the students with an opportunity to develop their skills in academic editing and writing.

- **Fundraising and increasing our endowments.** During the past few years, I have been working with our Development Office on plans to help increase donations from alumni to enhance our endowments. This has included identifying and planning meetings with our top prospects, and in the coming months will include visits to Denver and Houston to talk with potential donors. In particular, we are planning a campaign to ask our alumni if they could contribute to an equipment fund, particularly to help us raise funds to match a promise from the Dean to acquire a stable isotope mass spectrometer.

- **Enhancing diversity.** Increasing diversity is one of the most challenging areas for us to address in our department. We have done well in terms of gender, with approximately 50% of our students being female. Prior to 2012, however, we had no women on our faculty. But of the eight hires we have made in the last four years four

have been women. We struggle with enhancing diversity of other minorities in our science. This is a problem for our science overall. However, recently we have been awarded a grant from the Graduate School to enhance diversity. This will cover the costs of having faculty recruit diverse graduate students, and stipends and tuition costs for two students from a diverse background for the next three years.