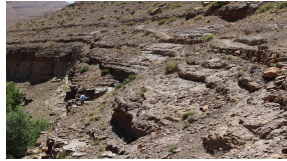


Newsletter

**SEDIMENTARY
GEOLOGY AND
GEOMORPHOLOGY
DISCIPLINE**



**SUMMER FIELD
WORK**
ROWAN MARTINDALE



**FLUCTUATING
TECTONICS**
BRIAN HORTON

STRATA



Trip to High Atlas Mountains

Professor Rowan Martindale and her student, Nick Ettinger, were studying Early Jurassic reefs of Morocco.

Martindale went to
summer field work
in the High Atlas
Mountains



*Faculty and
Student Awards in
SGG discipline*

David Mohrig

AGU Fellow, American
Geophysical Union



David Mohrig

DGS Faculty Performance
Award, Department of
Geological Sciences.

Wonsuck Kim

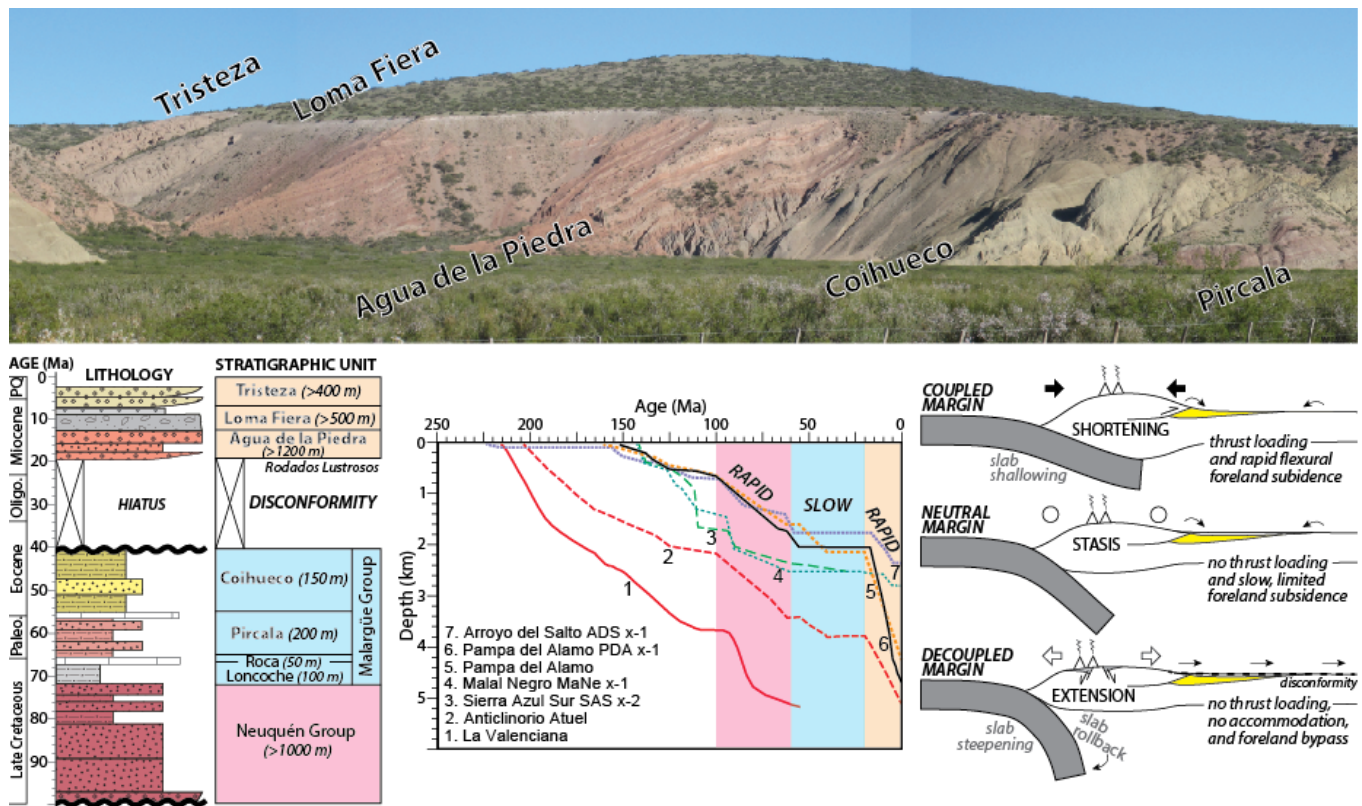
2016 Best paper Award,
Geoscience Information
Society

Ron Steel

William F. Twenhofel Medal,
SEPM

John Snedden

A.I. Levorsen Memorial
Award, GCAGS



Fluctuating late Cretaceous-Cenozoic tectonic conditions

Field photograph, stratigraphic charts, sediment accumulation histories, and proposed modes of basin genesis during fluctuating Late Cretaceous-Cenozoic tectonic conditions for the northern Neuquén Basin of Argentina. New chronostratigraphic and provenance constraints reveal a major depositional hiatus and highly variable rates of retroarc foreland basin subsidence during contrasting stress regimes along the Andean plate margin. More information can be found in Horton, B.K., and Fuentes, F. (2016)

Jacob A. Covault
Research Scientist
and Leader of the
Quantitative Clastic
Laboratory

PhD 2008, Stanford University

Dr. Covault and his colleagues at the Quantitative Clastics Laboratory (QCL) carry out integrated sedimentary studies at multiple scales with subsurface, outcrop, Earth surface, and marine geology datasets to answer science questions related to source-to-sink sediment dispersal and the morphodynamic evolution of depositional systems. Dr. Covault and the QCL team are working to address key challenges in the exploration and development of natural resources, namely reservoir presence and quality prediction in frontier basins, and reservoir connectivity and heterogeneity. Dr. Covault is looking for graduate students and post-docs with whom to collaborate on source-to-sink

Covault

sediment routing and signal propagation, deciphering the stratigraphic record of continental margins, and the impact of facies models on reservoir performance.

2015-16 Two selected publications:

Romans, B. W., Castelltort, S., Covault, J. A., Fildani, A., & Walsh, J. P. (2016). Environmental signal propagation in sedimentary systems across timescales. *Earth-Science Reviews.*, 153, 7-29, doi:10.1016/j.earscirev.2015.07.012.

Talling, P. J., Allin J., Ermitage D. A., Arnott, R. W., & Cartigny, M.J., et al. (2015). Key future directions for research on turbidity currents and their deposits. *Journal of Sedimentary Research.*, 85(2), 153-169, DOI: 10.2110/jsr.2015.03.

Google Scholar: H-index = 22; Total Citations = 1188

<https://scholar.google.com/citations?user=un1p5KcAAAAJ&hl=en&oi=sra>

Joel Johnson Assistant Professor

PhD 2007, MIT, Cambridge

Within the field of geomorphology, key research interests of Dr. Johnson's are (1) to understand how climate affects landscape evolution over geological timescales, (2) to understand internal feedbacks between water flow, sediment transport and channel morphology in mountain rivers, and (3) to better predict sediment transport, sorting, and deposition by rapidly changing hydrographs.

Research conducted by Dr. Johnson and his research group incorporates both field work and laboratory flume experimentation. Dr. Johnson research also emphasizes novel applications of new technologies for making unique measurements.

2015-16 Two selected publications:

Olinde, L., Johnson, J. P. (2015). Using RFID and accelerometer-embedded tracers to measure probabilities of bed load transport, step lengths, and rest times in a mountain stream. *Water Resources Research.*, 51(9), 7572-7589, DOI:10.1002/2014WR016120.

Johnson

Murphy, B. P., Johnson, J. P., Gasparini, N. M., & Sklar, L. S. (2016). Chemical weathering as a mechanism for the climatic control of bedrock river incision. *Nature*, 532(7598), 223-227, DOI:10.1038/nature17449

Google Scholar: H-index = 11; Total Citations = 919

https://scholar.google.com/citations?hl=en&user=NOpHYRMAAAAJ&view_op=list_works&sort

Wonsuck Kim Associate Professor

PhD 2007, University of
Minnesota, Minneapolis

Dr. Kim's research seeks to advance our understanding of stratigraphic responses to sediment transport processes and imposed boundary conditions in depositional basins. The research interest lies in improving tools for predicting subsurface spatial architecture across a range of scales using an understanding of sediment transport and surface flow dynamics and their time-integrated preservation in depositional systems.

Dr. Kim's research group conducts laboratory experiments to study sedimentation over space and time scales that are inaccessible in the field, and use the experimental data to motivate and constrain theoretical models of morphodynamics and depositional patterns. Dr. Kim's group also applies insight gained from physical and mathematical models to field data in order to improve interpretation of paleoenvironments using the stratigraphic record.

2015-16 Two selected publication:

Kopp, J.* and **Kim, W.**, 2015, The effect of lateral tectonic tilting on fluviodeltaic planform and stratal asymmetries: Experiment and theory: *Basin Research*, v. 27, no. 4, p. 517-530, DOI: 10.1111/bre.12086

Hsu, L., Martin, R.†, McElroy, B., Miller, K.†, and **Kim, W.**, 2015, Data management, sharing, and reuse in experimental geomorphology: challenges, strategies, and scientific opportunities: *Geomorphology*, v. 244, p. 180-189, DOI: 10.1016/j.geomorph.2015.03.039

Google Scholar: H-index = 14; Total Citations = 807

<https://scholar.google.com/citations?user=5MYIjHEAAAAJ>

*Kim***2015-16 Two selected grants:**

NSF - Sea-level rise and vegetation controls on delta landform evolution: A coupled experimental and numerical modeling study (\$534,126), 9/1/13-8/31/16

NSF - Building a sediment experimentalist network (\$440,559), 8/1/13-7/30/16

2015-16 Selected awards:

2016 Geoscience Information Society Best Paper Award
 “Hsu, L., Martin, R., McElroy, B., Miller, K., and Kim, W., 2015, Data management, sharing, and reuse in experimental geomorphology: challenges, strategies, and scientific opportunities: *Geomorphology*, v. 244, p. 180-189, DOI: 10.1016/j.geomorph.2015.03.039”
 GSIS (Geoscience Information Society)

Peter T. Flawn Centennial Fellow in Geology
 Department of Geological Sciences, University of Texas

Students graduated in 2015-16:

Anastasia Piliouras (PhD, Now Postdoctoral Researcher at Los Alamos National Lab)

Emily Chatmas (MS: Now at Peregrine Petroleum)

Yejin Lim (MS: Now PhD student at University of Texas)

Eunsil Jung (MS: Now PhD student at University of Texas)

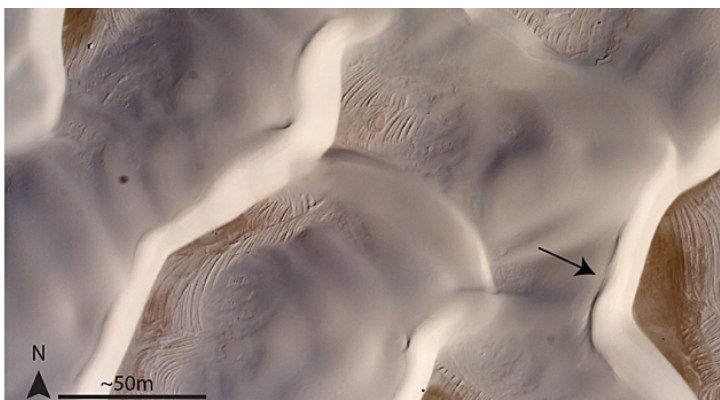


Figure (Left) Aerial image of crescentic dunes with local crestal reversed slipfaces (arrows), referred to as ‘Chinese walls’. These features form with winds from the SSE mode. [Pedersen et al., 2015]

**Rowan C.
Martindale**
Assistant Professor

PhD 2012, University of
Southern California

I am interested in marine paleoecology and the geobiology of carbon cycle perturbation events (e.g. mass extinctions, oceanic anoxic events, and ocean acidification events) in deep time. My research includes carbonate sedimentology and the paleontology/paleobiology of reef builders and exceptional fossil deposits. I am currently working on the Pliensbachian-Toarcian (Early Jurassic, ~183 Ma) crisis and Toarcian Oceanic Anoxic Event, but previous work focused on the reef demise and extinction at the Triassic-Jurassic boundary. The Late Triassic and Early Jurassic events will help us understand what environmental conditions cause massive ecosystem collapse, and what conditions marine biota can survive. A large part of my research involves the study of Upper Triassic and Lower Jurassic reef ecosystems, the newly evolved scleractinian corals, and reef variations geographically and temporally. I have also been researching an Early Jurassic Lagerstätte from Canada, which preserves both pelagic and benthic communities across the Toarcian OAE

2015-16 Two selected publications:

Martindale R.C., Strauss, J.V., Sperling, E.A., Johnson, J.E., & Van Kranendonk, M.J., et al. 2015. Sedimentology, chemostratigraphy, and stromatolites of lower Paleoproterozoic carbonates, Turee Creek Group, Western Australia. *Precambrian Research*, 266, 194–211. DOI: 10.1016/j.precamres.2015.05.021

Martindale R.C., Corsetti, F.A., James, N.P., & Bottjer, D.J., 2015. Paleogeographic trends in Late Triassic reef ecology from northeastern Panthalassa. *Earth Science Reviews*, 142, 18–37. DOI:10.1016/j.earscirev.2014.12.004

Google Scholar: H-index = 7; Total Citations = 509

<https://scholar.google.com/citations?user=1r9sFjgAAAAJ&hl=en>

2015-16 Two selected grants:

NSF DBI program, CSBR: Natural History: Critical infrastructure upgrades and expanded digital access to Non-vertebrate Paleontology Collections at the University of Texas at Austin (Molineux and Martindale), \$495,880 (2015-2018).

Martindale

NSF Digitization TCN: Collaborative Research: The Cretaceous World: Digitizing Fossils to Reconstruct Evolving Ecosystems in the Western Interior Seaway. (Ann Molineux, Rowan Martindale, Matthew Brown). UT Portion of Award: \$240,528 (07/2016 to 06/2019)

2015-16 Selected awards:

2013 Outstanding Paper in Palaios award from SEPM: Martindale et al. 2013 doi: 10.2110/paleo.2013.016

Students graduated in 2015-16:

Selva M. Marroquín (MSc, completed Spring 2016, now a PhD student at Virginia Tech)

Chiara Tornabene (MSc, completed Spring 2016)

Web Links:

Field Blog: <http://findingfossils.blogspot.com/>

Cornel Olariu *Research Associate*

PhD 2005, University of Texas,
Dallas

Dr. Olariu studies the architecture and stratigraphy of clastic sedimentary deposits with emphasis on shallow water depositional systems. He also studies the transfer of sediment along depositional profile from shallow to deeper parts of the basins, controls on stratigraphy that operate at different time scales, short (climatic) vs. long (tectonic), as well as autocyclic and allocyclic processes

2015-16 Two selected publications:

Gong, C., Wang, Y., Steel, R. J., Olariu, C., & Xu, Q., et al. (2015). Growth styles of shelf-margin clinoforms: prediction of sand-and sediment-budget partitioning into and across the shelf. *Journal of Sedimentary Research*, 85(3), 209-229, DOI: 10.2110/jsr.2015.10

Gong, C., Steel, R. J., Wang, Y., Lin, C., & Olariu, C. (2016). Shelf-margin architecture variability and its role in sediment-budget partitioning into deep-water areas. *Earth-Science Reviews*, 154, 72-101, DOI: 10.1016/j.earscirev.2015.12.003

Google Scholar: H-index = 12; Total Citations = 687

<http://scholar.google.com/citations?user=RKcNbFMAAAAJ&hl=en>

Peter B. Flemings ***Professor***

PhD 1990, Cornell, Ithaca

Dr. Flemming's studies fluid flow in sedimentary basins through experiments, field study and theory. At the kilometer scale, he addresses fundamental questions: What controls submarine landslides and submarine mud volcanoes? How are methane hydrates formed? At the grain scale and smaller, he explores what controls permeability, and the thermodynamics of hydrate solidification. More practically, he addresses how pressures are distributed in the subsurface, how to safely drill wells, and how to predict where hydrocarbons are trapped.

2015-16 Two selected publications:

Bhandari, A. R., Flemings, P. B., Polito, P. J., Cronin, M. B., & Bryant, S. L., (2015), Anisotropy and stress dependence of permeability in the Barnett shale. *Transport in Porous Media*, 108(2), 393-411, DOI: 10.1007/s11242-015-0482-0.

Casey, B., Germaine, J. T., Flemings, P. B., & Fahy, B. P. (2015). Estimating horizontal stresses for mudrocks under one-dimensional compression. *Marine and Petroleum Geology*, 65, 178-186, DOI: 10.1016/j.marpetgeo.2015.02.001

Google Scholar: H-index = 31; Total Citations = 4703

<http://scholar.google.com/citations?user=HlNabBsAAAAJ&hl=en>

Ron Steel ***Professor***

PhD 1971, University of
Glasgow, Scotland

Ron Steel is Professor and Davis Centennial Chair at UT Austin and Sixth-Century Chair of Sedimentary Geology at University of Aberdeen, Scotland. He was a Chair of the Department of Geological Sciences in the Jackson School at UT Austin. He has some 170 published papers, edited 9 books, received 6 best paper or poster awards, and graduated 100+ MS and PhD students from the universities of Bergen, Wyoming and UT Austin. He has received > \$10m in external grants since 1985, while in Universities of Bergen, Wyoming and Texas. He has held Distinguished and Endowed Lectureships for AAPG, Japan Society for Promotion of Science, and University of Texas at Austin. His current research interests focus on the processes, sediment transport and construction of shelf margins, the bridge between terrestrial and deepwater sediment accumulation.

Steel

2015-16 Two selected publications:

Rossi, V. M., Kim, W., López, J. L., Edmonds, D., and Geleynse, N., et al. (2016), Impact of tidal currents on delta-channel deepening, stratigraphic architecture, and sediment bypass beyond the shoreline. *Geology*, G38334. 1.

Koo, W. M., Olariu, C., Steel, R. J., Olariu, M. I., and Carvajal, C. R. et al. (2016), Coupling Between Shelf-Edge Architecture and Submarine-Fan Growth Style In a Supply Dominated Margin. *Journal of Sedimentary Research*,. 86(6),613-628, DOI : 10.2110/jsr.2016.42

Google Scholar: H-index = 57; Total Citations = 10312

<http://scholar.google.com/citations?user=mGF3gIQAAAAJ&hl=en&oi=sra>

Timothy Shanahan *Associate Professor*

PhD 2006, University of
Arizona, Tucson

Dr. Shanahan is interested in understanding the nature and cause of past climate changes, and their impact on the environment, particularly as they pertain to future climate change. To do so, he focuses primarily on sedimentological, geochemical and isotopic changes in the sediment record. He is especially interested in the use of annual sediment records in the development of high resolution climate reconstructions. He utilizes a variety of geochemical and isotopic approaches including scanning m-x- ray fluorescence (for in-situ elemental variations in sediment cores) and compound specific organic molecular and isotopic (dD, d¹³C) approaches (e.g., "biomarkers")

2015-16 Two selected publications:

Shanahan, T. M., McKay, N. P., Hughen, K. A., Overpeck, J. T., Otto-Bliesner, B., et al. (2015). The time-transgressive termination of the African Humid Period. *Nature Geoscience*,. 8(2), 140-144, DOI: 10.1038/ngeo2329

Anderson, V. J., Saylor, J. E., Shanahan, T. M., & Horton, B. K. (2015). Paleoelevation records from lipid biomarkers: Application to the tropical Andes. *Geological Society of America Bulletin*,. 127(11-12), 1604-1616, DOI:

Google Scholar: H-index = 19; Total Citations = 2081

<http://scholar.google.com/citations?user=UEOzEgEAAAAJ&hl=en>

Brian K. Horton *Professor*

PhD 1998, University of
Arizona, Tucson

Brian's research interests focus on the processes of mountain building and sedimentary basin development along convergent plate margins, particularly for the Andes of South America. He utilizes sediment provenance, stratigraphy, geochronology, geochemistry, and structural geology to understand modern and ancient orogenesis, plateau construction, sediment routing, and the evolution of major river systems.

2015-16 Two selected publication:

Horton, B.K., Anderson, V.J., Caballero, V., Saylor, J.E., and Nie, J., et al. 2015, Application of detrital zircon U-Pb geochronology to surface and subsurface correlations of provenance, paleodrainage, and tectonics of the Middle Magdalena Valley Basin of Colombia: *Geosphere*, v. 11, p. 1790-1811, DOI:10.1130/GES01251.1.

Horton, B.K., and Fuentes, F., 2016, Sedimentary record of plate coupling and decoupling during growth of the Andes: *Geology*, v. 44, p. 647-650, DOI:10.1130/G37918.1.

Google Scholar: H-index = 34; Total Citations = 4390

<https://scholar.google.com/citations?user=FcXBSz4AAAAJ&hl=en>

2015-16 Two selected grants:

NSF Frontiers in Earth System Dynamics (FESD), The dynamics of mountains, landscapes, and climate in the distribution and generation of biodiversity of the Amazon/Andean forest, \$231,710, (8/1/2015-7/31/2017)

NSF Tectonics, Thrust belt response to rapid surface uplift of the Altiplano: A field test of Cordilleran cyclicity in southern Bolivia, \$130,499, (7/1/2013-6/30/2016)

Web Links :

http://www.jsg.utexas.edu/researcher/brian_horton/

<https://twitter.com/AndesTectonics>

David Mohrig

Professor

PhD 1994, University of
Washington, Seattle

Dr. Mohrig's research group focuses on the application of sedimentary deposits and transport processes to unraveling the evolutions of terrestrial and submarine landscapes. They study the behavior of topography generated at the interface between a granular material and a moving fluid from very short to very long time and space scales, with particular emphasis on processes controlling channel formation, both on land and in the deep ocean. Research methods include carefully designed laboratory and natural experiments on sediment-transporting flows, field studies of modern and ancient sediment-dispersal systems, theoretical modeling of evolving granular-bed topography, and the remote sensing of subsurface sedimentary deposits using seismic data.

2015-16 Two selected publication:

Shaw, J., You, Y., Mohrig, D., and Kocurek, G. (2015), Tracking hurricane-generated storm surge with washover fan stratigraphy, *Geology*, 43(2), 127-130, DOI:10.1130/G36460.1.

Pedersen, A., Kocurek, G., Mohrig, D., and Smith, V. (2015), Dune deformation in a multi-directional wind regime: White Sands Dune Field, New Mexico. *Earth Surface Processes and Landforms*, 40(7), 925-941, DOI:110.1002/esp.3700.

Google Scholar: H-index = 39; Total Citations = 47480

https://scholar.google.com/citations?hl=en&user=lbfs94AAAAJ&view_op=list_works&sortby=pubdate

William L. Fisher

Professor

PhD 1961, University of
Kansas, Lawrence

Fisher's research has focused in the areas of stratigraphy, sedimentology, and oil and gas assessment. In 1967 he introduced the concept of depositional systems-now a fundamental part of modern stratigraphy and sedimentology. In 1977 he and Frank Brown introduced the concept of systems tracts, now a basic part of sequence stratigraphy.

Google Scholar: H-index = 23; Total Citations = 3380

<http://scholar.google.com/citations?user=jR5sK3wAAAAJ&hl=en>

Gary Kocurek ***Professor***

PhD 1980, University of
Wisconsin

Dr. Kocurek's research interests are in the sedimentology, geomorphology and stratigraphy of aeolian systems; fluid flow and grain transport; bedform dynamics and pattern evolution of dune fields; the stratigraphic record of aeolian and related systems on Earth and Mars.

2015-16 Two selected publication:

Day M., Anderson W., Kocurek G. & Mohrig D. 2016. Carving intra-crater layered deposits with wind on Mars. *Geophysical Research Letters* 43:6 2473-2479, doi:10.1002/2016GL068011

Brothers S.C., Kocurek G., Brothers T.C. & Buynevich. Stratigraphic architecture resulting from dune interactions: White Sands Dune Field, New Mexico. *Sedimentology* (in press).

Google Scholar: H-index = 51; Total Citations = 7369

<https://scholar.google.com/citations?user=8b4kpvgAAAAJ&hl=en>

2015-16 Two selected grants:

Aeolian Systems Source-to-Sink Analysis for MSL Landing Site and Basin. 2012 -2016. NASA (\$294,679).

Development of the next generation of aeolian dune stratigraphic model with application to the Jurassic Norphlet Sandstone. 2011 – 2016. Shell (\$1,248,511) (David Mohrig, Wonsuck Kim, Co-PIs)..

Students graduated in 2015:

Sagar Parajuli PhD (co-supervised with Liang Yang) Post-doc UC Irvine

John Snedden ***Senior Research*** ***Scientist***

PhD 1986, Louisiana State
University

John leads the Gulf Basin Depositional Synthesis Project (GBDS), an industry-supported research project that assembles and synthesizes well, seismic, and other data to establish a basin-scale depositional history of the Gulf of Mexico. His work focuses on Mesozoic & Cenozoic depositional systems, source-to-sink sand transport processes, and supersequence architecture. Seismic, well log, and biostratigraphic analyses allow us to address important scientific questions for this basin.

Snedden

2015-16 Two selected publication:

Snedden, J.W., J. Virdell, T. L. Whiteaker, and P. Ganey-Curry, 2016, A Basin-scale perspective on Cenomanian-Turonian (Cretaceous) Depositional Systems, Greater Gulf of Mexico (USA): Interpretation, vol. 4, no. 1, p. 1-22.
doi: 10.1190/INT-2015-0082.1

Sanford, J. C., J. W. Snedden, and S. P. S. Gulick, 2016, The Cretaceous-Paleogene boundary deposit in the Gulf of Mexico: Large-scale oceanic basin response to the Chicxulub impact, J. Geophys. Res. Solid Earth, 121, doi:10.1002/2015JB012615.

Google Scholar: H-index = 15; Total Citations = 968

<https://scholar.google.com/citations?user=cnid-X8AAAAJ&hl=en>

2015-16 Two selected grants:

Multiple Sponsors, Gulf Basin Depositional Synthesis.
\$2,124,000, 2013-2015

ION Geoventures, UTIG-GBDS Royalty and Contract Income.
\$4,197,209, 2014-2015

2015-16 Selected awards:

A.I. Levorsen Memorial Award, GCAGS

Students graduated in 2015:

Sanford, J. (MS, Chevron geologist)

Bovay, A.C. (MS, Chevron Geologist)

Web Links:

<http://ig.utexas.edu/2015/10/07/john-snedden-in-new-york-times/>

<http://www.aapg.org/publications/blogs/learn/article/articleid/32893>

<http://www.aapg.org/publications/news/explorer/emphasis/articleid/28466/how-to-turn-a-dry-hole-into-a-success-story>

Charles Kerans

Professor

PhD 1982, Carleton University,
Ottawa, Canada

Dr. Charlie Kerans' interest in carbonate geology cover aspects of carbonate sedimentology and sequence stratigraphy. Applied aspects of carbonate reservoir characterization, outcrop analog studies, and new approaches to 3D modeling are of particular interest. Current projects include field work in Australia, West Texas, and New Mexico. Subsurface datasets include reservoirs from the Cretaceous and Jurassic of the Middle East and the Permian of West Texas. New research directions are in quantitative modeling of outcrop and subsurface data.

2015-16 Two selected publication:

Payton, T.E. and Kerans, C. (2015), Late Devonian Carbonate Margins and Foreslopes of the Lennard Shelf, Canning Basin, Western Australia, Part A: Development During Backstepping and the Aggradation-To-Progradation Transition, *Journal of Sedimentary Research*, 85(11), 1334-1361, DOI:10.2110/jsr.2015.84

R.M. Phelps, C. Kerans, R.O.B.P. Da-Gama, J. Jeremiah, D. Hull, R.G. Loucks (2015), Response and recovery of the Comanche carbonate platform surrounding multiple Cretaceous oceanic anoxic events, northern Gulf of Mexico: *Cretaceous Research*, 54 (2015), pp. 117–144, DOI: 10.1016/j.cretres.2014.09.002

Google Scholar: H-index = 25; Total Citations = 2878

<https://scholar.google.com/citations?user=mNoGfzcAAAAJ&hl=en>