

# Report of Baylor University Geology Department, Faculty and Student Research Accomplishments, 2006 calendar year

## Faculty Publications (underline = Baylor Geology Faculty) (\* = peer-reviewed)

- (1) \*\*Alvarez, J., Skipwith, W. and Allen, P.M., 2006. River effects at highway crossings due to watershed changes: *Paper and Abstract*: Texas Section ASCE.
- (2) \*An, C.B., Feng, Z.-D., and Barton, L., 2006, Dry or humid? Mid-Holocene humidity changes in arid and semi-arid China: *Quaternary Research* 25, 351-361.
- (3) \*\*Atchley, S.C., 2006, Jurassic Rock Creek and Lower Cretaceous “Ellerslie” gas development potential across the Carrot Creek region of southern Alberta: (Sponsored by Auriga Energy, Inc.)
- (4) \*\*Atchley, S.C., and Cleveland, D.M., 2006, Reservoir characterization and development potential of a retrograde gas reservoir: the Devonian Swan Hills Formation at the Kaybob South BHL Gas Unit #1: (Sponsored by Auriga Energy, Inc.)
- (5) \*Atchley, S.C., West, L.W., and Sluggett, J.R., 2006, Reserves growth in a mature oil field: the Devonian Leduc Formation at Innisfail field, south-central Alberta, Canada: *Bulletin of the American Association of Petroleum Geologists*, v. 90, p. 1153-1170.
- (6) \*\*Bumgardner, F., Bjelland, A., Haskell, E., Moes, P., Muldrow, J., Wareham, N., White-Swift, E.G. and Yelderman, J.C., 2006, *Checklist of the Birds in McLennan County, Texas* (Sixth Revision): Central Texas Audubon Society, Waco, Texas, Publication No. 4, 13 p.
- (7) \*Chen, P.-Y., Arnold, J.G., Srinivasan, R., Volk, M., and Allen, P.M., 2006, Surveying ground water level using remote sensing: An example over seco and Hondo Creek watershed in Texas: *Ground Water Monitoring and Remediation*, v. 26, no. 2, p. 1-8.
- (8) \*Cronin, V.S., 2006, Book review – Computational Geosciences with *Mathematica* by William C. Haneberg: *Environmental & Engineering Geoscience*, v. XII, no. 4, p. 385-386.
- (9) \*Duke, J.R., White, J.D., Allen, P.M., Muttiah, R.S., 2006: Riparian influences on hyporheic-zone formation downstream of a small dam in the Blackland Prairie Region of Texas: *Hydrological Processes*, v. 20. (online).
- (10) \*Feng, Z.-D., Tang, L.Y., Wang, H.B., Ma, Y.Z., and Liu, K.-b., 2006, Holocene vegetation variations and the associated environmental changes in the western part of the Chinese Loess Plateau: *Paleogeography Paleoclimatology Paleoecology*, v. 241, p. 440-456.
- (11) \*Feng, Z.-D., Wang, H.B., and Zhai, X.W., 2006, Holocene climatic and environmental changes in the arid and semiarid regions of China: A review: *The Holocene*, v. 16, p. 19-30.
- (12) \*Goforth, T.T., Hetzer, C.H., and Stump, B.W., 2006, Characteristics of regional seismograms produced by delay-fired explosions at the Minntac Iron Mine, Minnesota: *Bulletin of the Seismological Society of America*, v. 96, no. 1, pp. 272-287.

- (13) \***Goforth, T.T.**, and Zhou, R., 2006, Characteristics of seismic waves produced by surface mining operations: *Proceedings of the 32<sup>nd</sup> Annual Conference on Explosives and Blasting Techniques, International Society of Explosive Engineers*, v. 1, p. 1-16.
- (14) \*Harmel, R.D., Richardson, C.W., King, K.W., and **Allen, P.M.**, 2006, Runoff and soil loss relationships for the Texas Blackland Prairies ecosystem: *Journal of Hydrology*, v. 331, p. 471-483.
- (15) \*Lenczewski, M., McKay, L., Pitner, A., **Driese, S.**, and Vulava, V., 2006, Pure-phase transport and dissolution of TCE in sedimentary rock saprolite: *Ground Water*, v. 44, p. 406-414.
- (16) \*\***Nordt, L.**, 2006, Soils and paleopedology, in *Glossary of Geologic Terms*, J. Mehl and J. Jackson (eds.): American Geophysical Union, Washington, D.C. <http://previews.georef.org/dbtw-wpd/glossary/search.htm>
- (17) \***Nordt, L.**, Orosz, M., **Driese, S.**, and Tubbs, J., 2006, Vertisol carbonate properties in relation to mean annual precipitation: Implications for paleoprecipitation estimates: *Journal of Geology*, v. 114, p. 501-510.
- (18) \*Prochnow, S., **Atchley, S.**, Boucher, T., **Nordt, L.**, and Hudec, M., 2006, The influence of salt withdrawal subsidence on paleosol maturity and cyclic fluvial deposition in the upper Triassic Chinle Formation: Castle Valley, Utah: *Sedimentology*, v. 53, p. 1319-1345.
- (19) \*Prochnow, S., **Nordt, L.**, **Atchley, S.**, and Hudec, M., 2006, Multi-proxy paleosol evidence for middle and late Triassic climate trends in eastern Utah: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 232, p. 53-72.
- (20) \*Shunk, A.J., **Driese, S.G.**, and Clark, G.M., 2006, Latest Miocene to earliest Pliocene sedimentation and climate record derived from paleosinkhole fill deposits, Gray Fossil Site, northeastern Tennessee, USA: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 231, p. 265-278.
- (21) \*\*Skipwith, W., Alvarez, J., and **Allen, P.M.**, 2006, Bentle Branch storm water and stream bank stability study: *Paper and Abstract*, Texas Section ASCE.
- (22) \*Sumrall, C.D., Sprinkle, J., and **Bonem, R.M.**, 2006, An edrioasteroid-dominated echinoderm assemblage from a Lower Pennsylvanian marine conglomerate in Oklahoma: *Journal of Paleontology*, v. 80, p. 229-244.

\* = peer-reviewed journal, \*\* = proprietary reports or proceedings (not peer-reviewed), \*\*\* = text or lab book

## **Faculty and Student Presentations (underline = Baylor Geology Faculty)**

- (1) **Allen, P.M.**, 2006, Urban geology: Quantifying geological descriptions into guidelines and ordinances: American Association of Petroleum Geologists Annual Meeting, Houston, Texas. Abstract.
- (2) **Allen, P.M.**, 2006, Working Paper on Channel Erosion for SWAT Modelers Workshop in POTSDAM, GERMANY, October 2006. (Allen is in charge of International Working Group for SWAT Model on Channel Erosion Subroutine, and gave two presentations to modelers during week-long conference). <http://www.brc.tamus.edu/swat/wmdworkshop06/>
- (3) **Allen, P.M.**, **Dunbar, J.**, Narasimhan, B., Srinivasan, R., Prochnow, S., and Zygo, L., 2006, Assessment of erosion volumes for model calibration in large watersheds: What is reality for reservoir sedimentation rates? Abstract . TRRMS, Austin, Texas.

- (4) Alvarez, J., Skipwith, W., and **Allen, P.M.**, 2006, River effects at highway crossings due to watershed changes: Paper and Abstract, Texas Section ASCE.
- (5) Appold, M.S., Enright, R., Galicki, S., Isiorho, S., Lasage, D., Lepper, K., Reichard, J., Sims, W.J., Wang, H., and **Yelderman, J.C., Jr.**, 2006, Teaching Hydrogeology in the 21<sup>st</sup> Century; Resources demonstrating the interface between hydrogeology and other scientific and social disciplines: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (6) Ashley, G.M., Hover, V.C., **Driese, S.G.**, Roure, C.A., McBrearty, S.B., Owen, R.B., and Renaut, R.W., 2006, A changing landscape in the semi-arid tropics: Insights from paleosols, East African Rift, Kenya: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (7) Ashley, G.M., Owen, R.B., **Driese, S.G.**, Park, L.A., and Goman, M., 2006, The importance of groundwater-fed wetlands as a reliable water source for humans in arid environments: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (8) **Atchley, S.C.**, 2006, Short-course for Husky Energy titled "Introduction to Carbonate Reservoirs" co-taught with Dr. John Weissenberger, Calgary, Alberta.
- (9) Bongino, J., **Nordt, L.**, and Forman, S., 2006, Late Quaternary history of the Waco Mammoth Site: Environmental reconstruction and interpreting the cause of death: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (10) Cleveland, D., **Atchley, S.**, and **Nordt, L.**, 2006, Allo- and autocyclic signatures in paleosol-bearing alluvial successions: the triassic (Norian-Rhaetian) Chinle Group, northern New Mexico: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (11) Davila, P.A., **Yelderman, J.C., Jr.**, Doyle, R., Lesikar, B., O'Neill, C., and Rodriguez, S., 2006, Evaluation of a subsurface-flow Constructed Wetland for On-site wastewater Treatment using Standard 40 Protocol (abstract): National Onsite Wastewater Recycling Association, Annual Conference, Denver, CO.
- (12) **Driese, S.G.**, "Pedogenic signatures of early terrestrial ecosystems based on micromorphological and geochemical study of Precambrian-Cambrian paleo-weathering surfaces formed on granite": (talk presented at 43<sup>rd</sup> Annual Soil Survey and Land Resource Workshop in College Station, TX, February 2, 2006).
- (13) **Driese, S.G.**, "Paleosol evidence for Quaternary uplift and for climate and ecosystem change in the Cordillera de Talamanca, Costa Rica": talk presented at the Waco Gem and Mineral Society, October 2, 2006.
- (14) **Driese, S.G.**, "Multi-proxy approaches to interpreting climate and time in the geologic record using soils": talk presented at the University of California-Davis, Department of Land, Air and Water Resources, November 29, 2006.
- (15) **Driese, S.G.**, Ashley, G.M., Li, Z.-H., Hover, V.C., and Owen, B., 2006, Late Holocene equatorial paleoclimate record based upon soils spanning the Medieval Warm Period and Little Ice Age, Lobo Plain, Kenya: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (16) **Driese, S.G.**, Mora, C.I., and Elick, J.M., 2006, Landscape and climate records derived from Devonian vertic floodplain soils, Catskill Formation, central PA: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (17) **Dunbar, J.A.** and **Allen, P.M.**, 2006, Long-term sediment yield and the trap efficiency of SCS flood control reservoirs in the Texas Blackland Prairie: (abstract) USDA-CREES conference in San Antonio, Texas, Feb., 2006.

- (18) **Dunbar, J.A.** and **Allen, P.M.**, 2006, Sediment yield from the Blackland Prairie from sedimentation and large water supply reservoirs and SCS flood control structures: (abstract) Texas Blackland Prairie, (abstract) Texas River and Reservoir Management Society Annual Meeting, Austin, Texas April, 2006.
- (19) **Dworkin, S.I.**, **Nordt, L.C.**, and **Atchley, S.C.**, 2006, Sr isotope ratios and trace element concentrations of pedogenic calcite record environmental conditions in west Texas paleosols spanning the K-T boundary: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (20) **Feng, Z.-D.**, 2006, Holocene Climatic variations in the Mongolian Plateau: (an international RACHAD Conference held in Lanzhou of China, July 26-29, 2006)
- (21) **Feng, Z.-D.**, 2006, Potential Ecology in the severely disturbed Chinese Loess Plateau: (2<sup>nd</sup> International Conference on Earth Systems and Environments held in Beijing, October 22-26, 2006).
- (22) **Feng, Z.-D.**, 2006, Natural rhythms of Holocene desertification in the Chinese Loess Plateaus: (2<sup>nd</sup> International Conference on Earth Systems and Environments held in Beijing, October 22-26, 2006).
- (23) **Greene, D.M.**, 2006, “Climate and Its Effects on Man: The Influence of Ozone Depletion and Global Warming”: talk presented before the City Federation of Women, Temple, Texas, January 24, 2006.
- (24) **Greene, D.M.**, 2006, “Diverging Points of View on the Global Warming Controversy”: talk presented before the Senior Kiwanis Club, Waco, Texas, December 13, 2006.
- (25) Jossou, E.M., **Atchley, S.C.**, and Kahmann, J.A., 2006, Reservoir quality and continuity, and secondary recovery potential of the Mississippian Pekisko Formation at Twining Field, south-central Alberta, Canada: American Association of Petroleum Geologists Annual meeting in Houston, TX.
- (26) Kahmann, J.A., and **Driese, S.G.**, 2006, Characterization of trace elements in Mississippian Pennington Formation paleosols at Pound Gap, KY: A new paleoclimate indicator?: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (27) Li, Z.-H., **Driese, S.G.**, and Mora, C.I., 2006, Paleoclimate variability revealed by speleothem  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  records from the Raccoon Mountain Cave, east Tennessee, USA: Southeastern section Geological Society of America meeting in Knoxville, TN.
- (28) Li, Z.-H., **Driese, S.G.**, and Mora, C.I., 2006, Stable isotope analysis reveals two different carbon sources for speleothem formation in Raccoon Mountain Cave, East Tennessee: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (29) Ludvigson, G.A., González, L.A., and **Driese, S.G.**, 2006, Meteoric sphaerosiderite lines from the Atokan (Langsettian) Crooked Fork Group, eastern Tennessee: A first-cut comparison between paleoequatorial precipitation rates from the Carboniferous icehouse and Cretaceous greenhouse world: North-central section Geological Society of America meeting in Akron, OH.
- (30) Maher, M.A., and **Bonem, R.M.**, 2006, Construction of a Comprehensive Modern Lagoonal Reef Model for Interpretation of Ancient Bioherms: Annual Meeting, Geological Society of America, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (31) Merino, E., Banerjee, A., and **Dworkin, S.**, 2006, Origin of associated Terra Rossa and Karst by Mineral Replacement Driven by Dissolved Dust: A Striking Case of Chemical Geodynamics: World Congress of Soil Science, Philadelphia, PA, Abstract with Programs.

- (32) Merino, E., Banerjee, A., and **Dworkin, S.**, 2006, Dust, terra rossa, replacement, and karst: Serendipitous geodynamics in the critical zone (abstract): *Geochimica et Cosmochimica Acta*, Volume 70, Issue 18, Supplement 1, August-September 2006, Page 36
- (33) Narasimhan, B., **Allen, P.M.**, Srinivasan, R., Arnold, J., and **Dunbar, J.**, 2006, Channel erosion and best management practice simulation using SWAT: *Abstract*, ASABE.
- (34) **Nordt, L.C.**, 2006, "Late Quaternary vegetation and temperature change in the central Great Plains based on the isotopic composition of buried soils": University of Kansas, Kansas Geological Lecture Series (March).
- (35) **Nordt, L.C.**, von Fischer, J., and Tieszen, L., 2006, Late Quaternary evolution of North American grasslands inferred from stable carbon isotopes of buried soil organic matter: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (36) Rodriguez, S.L., Davila, P.A., Suchecki, R., and **Yelderman, J.C., Jr.**, 2006, Toxicity and Water Quality of Effluent from Three Different On-site Wastewater Treatment Systems (abstract): National Onsite Wastewater Recycling Association, Annual Conference, Denver, CO.
- (37) Seidman, L., and **Cronin, V.S.**, 2006, Analysis of seismo-lineaments, DEMs and fieldwork leads to different ideas about active deformation in the Santa Monica Mountains, southern California: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (38) Shunk, A.J., **Driese, S.G.**, Farlow, J.F., Hulbert, R., and Whitelaw, M., 2006, High-resolution stratigraphy and sedimentology of Late Miocene-Pliocene paleolacustrine strata deposited in paleosinkhole settings, eastern US: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.
- (39) Skipwith, W., Alvarez, J., and **Allen, P.M.**, 2006, Bentle Branch storm water and stream bank stability study: *Paper and Abstract*, Texas Section ASCE.
- (40) Suchecki, R.J., Jr., Pertuit, R.K., **Yelderman, J.C., Jr.**, Scheffe, B.L., 2006, Enhancing Biological Nutrient Reduction in Secondary Individual Onsite Wastewater Treatment Systems: WEFTEC Conference in Dallas, Texas.
- (41) Suchecki, R.J., Jr., **Yelderman, J.C., Jr.**, Scheffe, B.L., and Pertuit, R.K., 2006, Enhancing biological nutrient reduction in advanced individual onsite wastewater treatment systems (abstract): Colorado Professionals in Onsite Wastewater, CPOW Annual Educational Conference, Western Slope, March 10, Grand Junction, CO.
- (42) Suchecki, R.J., Jr., **Yelderman, J.C., Jr.**, Scheffe, B.L., and Pertuit, R.K., 2006, Enhancing biological nutrient reduction in advanced individual onsite wastewater treatment systems (abstract): Colorado Professionals in Onsite Wastewater, CPOW Annual Educational Conference, Eastern Slope, March 24, Golden, CO.
- (43) Suchecki, R.J., Jr., **Yelderman, J.C., Jr.**, Scheffe, B.L., and Pertuit, R.K., 2006, Enhancing biological nutrient reduction in advanced individual onsite wastewater treatment systems (abstract): National Onsite Wastewater Recycling Association, Annual Conference, Denver, CO.
- (44) Weckbacker, J., and **Yelderman, J.C. Jr.**, 2006, Effects of recharge on groundwater below on-site wastewater drain fields as related to soil type: Geological Society of America, Annual Meeting, Philadelphia, PA Abstracts with Programs, Vol. 38, No. 7.
- (45) White, J.C., Ren, M., **Parker, D.F.**, and Anthony, E.Y., 2006, Aenigmatite-ilmenite-clinopyroxene equilibria and applications to geothermometry and oxygen barometry in pantelleritic melts: examples

from Pantelleria (Italy) and Eburru (Kenya): Geological Society of America, presented at Southeastern Section Meeting of Geological Society of America in Knoxville, TN, Abstracts with Programs, v. 38, no. 3.

(46) **Yelderman, J.C. Jr.**, 2006, A Word Picture is Worth a Thousand Graphs or the Use and Abuse of Analogies (abstract): Abstracts volume for the 2006 Ground Water Summit, April 23-27, 2006, San Antonio, Texas, p.171.

(47) **Yelderman, J.C. Jr.**, Lesikar, B., Doyle, R., O'Neill, C., and Davila, P., 2006, Testing a Wetland to NSF Standard 40: Texas On-Site Wastewater Treatment Research Council Conference, Waco, Texas.

(48) **Yelderman, J.C. Jr.**, Wallestad, C., and White, J.D., 2006, Recalibrated Recharge: Solving complex problems with models: Geological Society of America, Annual Meeting, Philadelphia, PA, Abstracts with Programs, v. 38, no. 7.

### **Grants and Contracts AWARDED and in force (underline = Baylor Geology Faculty)**

(1) **Allen, P.M.**, and **Dunbar, J.A.**, 2006, Contract with Federal Government on Lake Whitney Salinity Assessment (\$400,000-1.2 million) Year One.

(2) **Allen, P.M.**, and **Dunbar, J.A.**, 2006, US EPA Grant (in progress) on West Texas Reservoir Sedimentation/chemistry with John Dunbar. (28,000?)

(3) **Atchley, S.M.**, 2006, Funding for construction of the Beaver-Brown Applied Petroleum Studies Workroom: \$10,000, Anadarko Petroleum Corporation; \$5,000 Nadel-Gussman and Associates; \$1000 American Association of Petroleum Geologists SW Section

(4) **Atchley, S.M.**, 2006, Student and Faculty support on Kaybob South APS project, Summer 2006, \$6,500, Auriga Energy Inc.

(5) **Atchley, S.M.**, 2006, General support towards sequence stratigraphic research (committed for 1Q 2007) \$8750 DayLight Energy Inc.

(6) **Atchley, S.M.**, and **Nordt, L.C.**, 2006, The interrelationship of sequence stratigraphy, paleoclimatology, and terrestrial ichnology in Triassic paleosol-bearing alluvial successions, Moenkopi and Chinle Formations, southwestern United States: American Chemical Society, Petroleum Research Fund, May 2006, \$79,707, two years.

(7) **Dunbar, J. A.**, 2006, Electrical Resistivity Investigation of Gas Hydrate Distribution in Mississippi Canyon Block 118, Gulf of Mexico: US Department of Energy, \$278,166, October, 2006 to September 2009.

(8) **Dunbar, J.A.**, and **Allen, P.M.**, 2006, Sediment prevention through the repair of floodwater-retarding structures in McCulloch County, Texas: Texas State Soil and Water Conservation Board, \$28,573, June 2006 to May 2008.

(9) **Feng, Z.-D.**, 2006, (Lead PI): Collaborative research (with Dr. K.-B Liu at LSU): Bioclimatic reconstruction of the past 50,000 years from eolian sequences in the westerlies-dominated Central Asia: Award No: NSF-BCS-0623478; (07/01/2006-06/30/09) Award Amount: total \$290,000 (Feng's portion = \$150,000).

(10) **Yelderman, J.C., Jr.**, 2006, Awarded extension of the nutrient reduction study for OSSF aerobic systems,

Murphy Cormier, Inc., awarded March 2006 through August 2006, \$6,000

(11) **Yelderman, J.C., Jr.**, 2006, Awarded extension of Phase II of the nutrient reduction study for OSSF aerobic systems, Murphy Cormier, Inc., awarded July 2006 through June 2007, \$45,000

(12) **Yelderman, J.C., Jr.**, 2006, Awarded an extension of the wetland study grant for \$10,000.

## **Grants, Contracts and Software Patents SUBMITTED (underline = Baylor Geology Faculty)**

(1) **Driese, S.G.**, 2006, Evaluating evidence for high-frequency climate forcing of sedimentation and pedogenesis based upon Upper Mississippian paleosols in the U.S. Appalachian Basin and modern analog soils in Timor, Indonesia (\$80,000 requested for two years, commencing January 1, 2007). NOT FUNDED

(2) **Driese, S.G.**, Ming, D.W., Runkel, A., and Ren, M., 2006, Pedogenic signatures of early Earth terrestrial weathering systems as partial analogs for past Martian weathering conditions: submitted to NASA, Mars Fundamental Research Program (\$244,413 requested for three years, commencing January 1, 2007). PENDING

(3) **Driese, S.G.** and **Parker, D.F.**, 2006, Acquisition of a wavelength-dispersive XRF instrument for Department of Geology, Baylor University: submitted to NSF Instrumentation and Facilities program (\$123,619 requested for one year, commencing January 1, 2007). NOT FUNDED

(4) **Driese, S.G.**, 2006, with 4 University of Kansas (KU) Geology faculty members (Ludvigsen, G., Fowle, D.A., González, L.A., and Roberts, J.A., KU as lead institution), Collaborative Research: Actualistic calibration of the sphaerosiderite paleoclimate proxy: submitted to NSF Geobiology and Low-temperature Geochemistry program (\$148,352 requested Baylor University for three years, commencing June 1, 2007). AWARDED

(5) **Dunbar, J.A.**, 2006, Evaluation of sediment survey accuracy, Lake LBJ, Texas: Texas Water Development Board, \$30,000, Jan. 2006. PENDING?

(6) **Nordt, L.C.**, 2006, Late Pleistocene adaptations and behavioral transformations in the South African Highveld Grassland. Collaborator with Co-Principal Investigators Dr. Britt Bousman and Dr. David Brink (submitted). (details?)