**GLY 510 SEDIMENTARY ENVIRONMENTS**
**Part II: PALEOECOLOGY**
**SPRING 2010**

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Welcome to Part II of Sedimentary Environments! Part II of this course will concentrate on the organic components of sedimentary environments, particularly their paleoecology. The field of paleoecology focuses on the relationship of ancient (fossil) organisms to their environment, including the physical and the biological environment. Fossils represent key elements in reconstructing the environment of a sedimentary deposit; we will learn about a variety of paleoecological methods that can be used to understand ancient environments.

Part II of the course will also provide opportunities to apply what we have learned to the local sedimentary record. We will make use of the rich fossil record of southeastern North Carolina as a resource for a team research project, including a field trip and paleoecological analysis of a Plio-Pleistocene fauna.

TEXTBOOK (for background reading):

Brenchley, P.J., and D.A.T. Harper. 1998. Palaeoecology: Ecosystems, environments and evolution. Chapman & Hall, London.

COURSE REQUIREMENTS AND GRADING POLICY:

Regular class attendance and participation in class discussion is expected in this course. Students should read the assigned materials prior to the class session in which they will be discussed. The research project will be conducted as a team and will include a written report and discussion of results on the last day of class. Note: The UNCW Academic Honesty Policy will be adhered to in this course (see Student Handbook).

Grading: participation: 10%
research project: 20%
final exam: 20%

FACULTY OFFICE HOURS:

On campus (DeLoach Hall 117) TR 8:00 - 9:30, 11:00 - 2:00, 3:30- 4:30; MWF (during Part II of course) from 10:00 – 1:00.

SCHEDULE OF CLASS SESSIONS:

Mar. 1, 3 Environmental controls (Ch. 2)
5 Introduction to research project

8-12 SPRING BREAK

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| | 15 | SEGSA/research project |
| | 17, 19 | Work on research project |
| | 22-26 | Taphonomy (Ch. 3) |
| | 29, 31 | Trace fossils (Ch. 5) |
| Apr. | 1 | EASTER BREAK |
| | 5-9 | Environmental indicators (Ch. 6) |
| | 12-16 | Populations and communities (Ch. 7) |
| | 19, 21 | Adaptive morphology (Ch. 4) |
| | 23 | Wrap up research project |
| | 26 | Class presentation/discussion of research results |
| | 30 | Final examination |

READING LIST:

*I. Environmental controls*

Tomasovych, A. 2006. Brachiopod and bivalve ecology in the Late Triassic (Alps, Austria): onshore-offshore replacements caused by variations in sediment and nutrient supply. Palaios 21:344–368.

Zuschin, M. and M. Stachowitsch. 2009. Epifauna-dominated benthic shelf assemblages: lessons from the modern Adriatic Sea. Palaios 24: 211-22.1

*II. Introduction to research project*

Allmon, W.D., G. Rosenberg, R.W. Portell, and K.S. Schindler. 1996. Diversity of Pliocene-Recent mollusks in the western Atlantic: extinction, origination and environmental change, p. 271-302. In J.B.C. Jackson, A.G. Coates, and A.F. Budd (eds). Evolution and environment in tropical America. Chicago, Univ. Chicago Press.

*III. Taphonomy*

Csiki, Z., D. Grigorescu, V. Codrea, and F. Therrien. In press. Taphonomic modes in the Maastrichtian continental deposits of the Haţeg Basin, Romania—Palaeoecological and palaeobiological inferences. Palaeogeography, Palaeoclimatology, Palaeoecology. *Available online 10/19/09*

Hauser, I., W. Oschmann, and E. Gischler. 2008. Taphonomic signatures on modern Caribbean bivalve shells as indicators of environmental conditions (Belize, Central America). Palaios 23: 586-600.

Zhao, F., J.-B. Caron, S. Hu, and M. Zhu. 2009. Quantitative analysis of taphofacies and paleocommunities in the Early Cambrian Chengjiang *Lagerstätte*. Palaios 24: 826-839.

*IV. Trace fossils*

Hauck, T.E., S.E. Dashtgard, S.G. Pemberton, and M.K. Gingras. 2009. Brackish-water ichnological trends in a microtidal barrier island–embayment system, Kouchibouguac National Park, New Brunswick, Canada. Palaios 24: 478-496.

Krapovickas, V., P.L. Ciccioli, M.G. Mángano, C.A. Marsicano, C.O. Limarino. 2009. Paleobiology and paleoecology of an arid–semiarid Miocene South American ichnofauna in anastomosed fluvial deposits. Palaeogeography, Palaeoclimatology, Palaeoecology 284(3-4):129-152.

*V. Environmental indicators*

Dutton, A., B.T. Huber, K.C. Lohmann, and W.J. Zinsmeister. 2007. High-resolution stable isotope profiles of a dimitobelid belemnite: implications for paleodepth habitat and late Maastrichtian climate seasonality. Palaios 22: 642-650.

Keller, G., and S. Abramovich. 2009. Lilliput effect in late Maastrichtian planktic Foraminifera: Response to environmental stress. Palaeogeography, Palaeoclimatology, Palaeoecology 284(1-2): 47-62

Marques da Silva, C., B. Landau, R. Domènech, and J. Martinell. 2010. Pliocene Atlantic molluscan assemblages from the Mondego Basin (Portugal): Age and palaeoceanographic implications. Palaeogeography, Palaeoclimatology, Palaeoecology 285(3-4):248-254.

McElwain, J.C. 2004. Climate-independent paleoaltimetry using stomatal density in fossil leaves as a proxy for $CO_2$ partial pressure. Geology 32(12):1017-1020.

*VI. Populations and communities*

Boyer, D.L., and M.L. Droser. 2009. Palaeoecological patterns within the dysaerobic biofacies: Examples from Devonian black shales of New York state. Palaeogeography, Palaeoclimatology, Palaeoecology 276(1-4):206-216.

Kidwell, S.M. 2007. Discordance between living and death assemblages as evidence for anthropogenic ecological change. Proc. National Academy of Sci. 104(45):17701-17706.

Poirier, C., P.-G. Sauriau, E. Chaumillon, and J. Allard. 2009. Can molluscan assemblages give insights into Holocene environmental changes other than sea level rise? A case study from a macrotidal bay (Marennes–Oléron, France). Palaeogeography, Palaeoclimatology, Palaeoecology 280(1-2):105-118

Todd, J.A., J.B.C. Jackson, K.G. Johnson, H.M. Fortunato, A. Heitz, M. Alvarez, and P. Jung. 2001. The ecology of extinction: molluscan feeding and faunal turnover in the Caribbean Neogene. Proc. R. Soc. Lond. B 269:571-577.

*VII. Adaptive morphology*

Corliss, B.H., and C. Chen. 1988. Morphotype patterns of Norwegian Sea deep-sea benthic foraminifera and ecological implications. Geology 16(8):716-720.

Jacobs, D.K., N.H. Landman, and J.A. Chamberlain, Jr. 1994. Ammonite shell shape covaries with facies and hydrodynamics: iterative evolution as a response to changes in basinal environment. Geology 22(10):905-908.

Leighton, L.R. 2000. Environmental distribution of spinose brachiopods from the Devonian of New York: test of the soft-substrate hypothesis. Palaios 15(3):184-193.