



## **Experiential Ecology: Hands-on Subterranean Ecology in the Mammoth Cave Region**

July 10-16, 2015

GEOG 475 and GEOS 510

Summer 2016

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**Course Instructor:** Dr. Julian J. Lewis.

**WKU Co-Instructor:** Dr. Leslie A. North

**Instructor Email:** lewisbioconsult@aol.com

**Co-Instructor Email:** leslie.north@wku.edu

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**Course Description:** This course will be a completely hands-on experience in field ecology with zero papers, readings, or classroom lectures. For persons seeking academic credit for participation in the course, final grades will be determined by attendance and participation.

Unlike in the past when obligate cave communities were considered to be largely separate assemblages from animals occurring on the surface, participants in the course will be looking at the ecological niches of terrestrial and aquatic animals inhabiting a variety of subterranean habitats. The emphasis will be on examining cave habitats and communities, but the roles of sinkholes, deep soil compartments, springs, seeps, stream gravel interstices, and the epikarst will also be explored since each of these habitats have subterranean communities that are uniquely adapted to live there. The ecological classification of the animals inhabiting caves and the spectrum of other subterranean habitats will be discovered and some biological myths debunked—white, eyeless animals that are found only in forests, but black, eyed animals that are troglobites, i.e., animals restricted to caves!

In what ways have modern molecular genetics and DNA analysis re-framed the ways in which we see cave animals? How have these animals evolved? How broad are their ranges? We will examine the evolutionary paths that lead animals into subterranean niches. Are there really “troglobites in training”? In the “real world”, how does the ecological classification of a species, its range restriction (endemism), and the size of its population affect actual decision-making in the construction of highways and other large-scale engineering projects? How has man changed this environment? We will

investigate the “paradox of enrichment”. Is more really better? When is enough enough? The central Kentucky karst is a renowned example of pollution ecology and the roles of Mammoth Cave National Park and the surrounding towns and industries will be our classroom.

The day-to-day ecological methods for conducting ecological evaluations will be performed, with hands-on population censusing in different cave habitats. Identification of cave animals will be learned, and different methods of estimating population sizes conducted in streams and terrestrial habitats in Mammoth Cave. The practical roles of RT&E...rare, threatened and endangered species...will be explored and the actual methods used for determining global rarity and listing learned.

The concepts and techniques that students will learn are applicable from Franklin County, Kentucky to France, and everywhere in between...subterranean biology is a global concern and concepts and techniques from around the world will be employed. The largest cave system in the world will be our playground and we will investigate all of the rides!

**Required Text:**

- Manual of course material, reports, and articles covered in class to be provided by WKU at the start of the course.

**Grading:** This course may be taken as a non-credit workshop, or for graduate or undergraduate academic credit. Continuing Education Credits may also be awarded for this course. Participants taking the course for academic credit will be required to complete and submit a fieldbook to the instructor at the end of the course for review. A standard 10-point grading scale (100-90 = A; 89-80 = B, etc.) will be used in the course.

The assignment weight breakdown will be: Attendance (40%), Participation (30%), Fieldbook (30%). Due to the short time period of the course students are expected to participate in every field stop, rain or shine. Students should make accommodations to be as comfortable as possible in any type of weather.

Regular and prompt attendance is absolutely necessary in this class! You should keep in mind the following. Activities missed because of an unexcused absence cannot be made up and it will not be accepted. If a student is unable to participate in any field activities, he/she must notify the instructor as much in advance as possible. The instructors will determine if the student can successfully complete the course.

All students are required to sign a waiver for liability purposes related to any and all work involving multiple trips to the field for study and projects. The Karst Field Studies Program provides this form on the KFS website under the Forms tab. A blanket waiver form covering all trips even if they are short in distance or duration will be provided.

**Other Requirements/Information:** Each student will be required to take notes and observations in a field notebook. A camera is also recommended. Students are required to have basic field equipment, including sturdy boots, a field notebook, rain gear, gloves, kneepads, and water. Students are encouraged to bring their own personal cave gear; however, proper White Nose Syndrome decontamination procedures are required of all gear - do not bring dirty gear.

\*\* Cell phones should be turned off during class! \*\* Please treat your colleagues and their desire to learn with appropriate respect.

**ADA Statement:** Students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for this course must contact the Director of the Karst Field Studies Program, Dr. Leslie North at [leslie.north@wku.edu](mailto:leslie.north@wku.edu) or (270) 745-5982 so proper accommodations can be considered and made as necessary.

**Schedule Change Policy:** The Department of Geography and Geology strictly adheres to University policies regarding schedule changes. It is the responsibility of the student to meet all admissions deadlines. Only in exceptional cases will a deadline be waived (you will be required to fill out an appeal form). The form requires a written description of the extenuating circumstances involved and the attachment of appropriate documentation. Poor academic performance, general malaise, or undocumented general stress factors are not considered as legitimate circumstances.

