Exploring Evidence of the Anthropocene: Archaeological and Ecological Research Experiences in the Upper Mississippi River System - 2019

National Science Foundation – Research Experience for Undergraduates (REU)

Southern Illinois University Edwardsville – Stem Center and Department of Anthropology
University of Illinois Urbana-Champaign – Illinois Natural History Survey
Western Illinois University, Kibbe Life Science Research Station

Program Goals: The primary objective of this REU site is to promote scientific literacy and communication, critical thinking and STEM skills, and interdisciplinarity. We hope that this immersive research experience investigating the longevity of human-environmental interactions with the Upper Mississippi River System will help you develop the means to be successful as a future research scientist.

Program Description: You will achieve the above goal through interdisciplinary research in archaeology and ecology. Over the 8 weeks of this program, you will work in interdisciplinary teams, develop a research question that addresses a relevant topic regarding deep-time, human-environmental dynamics in the Upper Mississippi River System. You will conduct archaeological and ecological field work, laboratory work, and finish the program having developed a team-based research poster that will be presented on the last day of the REU and again in spring 2019 at the Mississippi River Research Consortium.

By the end of the program, students should:
• Have a greater understanding of the means by which scientists conduct research;
• Have a greater understanding of inferences that can be derived from observational and experimental study designs, limiting factors of these research approaches;
• Have gained hands-on experience in archaeological and ecological field and laboratory methods, and gained topical knowledge about archaeology, ecology, great rivers, human interactions with great rivers, and the Anthropocene;
• Feel more comfortable generating, processing, synthesizing, communicating, and presenting scientific research; and
• Have experienced a fun, although challenging, summer of learning the intricacies of scientific research.
Daily schedule: Monday - Friday

Preparation: You should prepare a lunch, pack plenty of water and appropriate clothing for the field or laboratory.

Breakfast: You need to eat breakfast prior to the start of the day’s activities. Field work is physically intensive and you will need the energy.

Daily field activities: 8:00 am – 4:30 pm conducted at various research locations. Students will be given time for lunch, but students should come to the field/lab with their lunches prepared.

Dinner: 5:00 - 6:30 pm

Evening Session: 7:00 – 8:30 pm (except Friday evening)

This is an initial schedule. Adjustments will be made depending on the interest of students, flow of discussion, and weather. Please check with program staff for updates to the schedule and the course readings.

Teams to be determined after week 2. Each ecology student will be paired with an archaeology student to form interdisciplinary teams.

Team 1:  Team 2:  Team 3:  Team 4:

REU Schedule at a Glance*  Tentative Schedule

<table>
<thead>
<tr>
<th>Week 1</th>
<th>June 3-7</th>
<th>Introduction Week. All students together: Introduction, one day SIUE, one day GRFS, discipline-specific introductions, safety day</th>
<th>Each day varies. See detailed schedule below.</th>
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</thead>
<tbody>
<tr>
<td>Field and lab research: Weeks 2-5</td>
<td>ARCHAEOLOGY TRACK</td>
<td>ECOLOGY TRACK</td>
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<tr>
<td>Week 2: Discipline week</td>
<td>June 10-14</td>
<td>Archaeology students learn field-based research methods</td>
<td>Ecology students learn field-based research methods.</td>
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<td>Week 3: Interdis. week</td>
<td>June 17-June 21</td>
<td>Archaeology field work: Interdisciplinary teams will work together in a daily rotation</td>
<td>Ecological field sampling: Interdisciplinary teams will work together in a daily rotation</td>
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<td>Week 4: Discipline week</td>
<td>June 24-28</td>
<td>SIUE Archaeology Lab: Archaeology students will learn zooarchaeological methods and begin analyzing collections</td>
<td>Ecology students learn field-based research methods</td>
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<td>Week 5: Interdis. week</td>
<td>July 1-5</td>
<td>SIUE Archaeology Lab: Interdisciplinary teams will work together in a daily rotation</td>
<td>Ecological field sampling: Interdisciplinary teams will work together in a daily rotation</td>
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<td>Analysis Weeks 6-7</td>
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<tr>
<td>Week 6</td>
<td>July 8-12</td>
<td>All Students: Data quantification</td>
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<tr>
<td>Week 7</td>
<td>July 15-19</td>
<td>All Students: Data analysis</td>
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<td>Week 8</td>
<td>July 22-26</td>
<td>All Students: Writing&lt;br&gt;Thurs: Public presentation&lt;br&gt;Fri: Wrap up and pack up</td>
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* Each week, one team per day will work at Great Rivers Field Station (GRFS) to conduct age and growth analysis on selected fish elements and process samples for isotope analysis.
June 2, Sunday
4:00 pm Student, TA, PI/Co-PI introductions, pizza dinner, short campus walk, and room assignments.

WEEK 1: INTRODUCTION WEEK—ALL STUDENTS WILL BE TOGETHER FOR MOST ACTIVITIES.

June 3, Monday: All Students
Introduction to SIUE: Monday morning 8:30 am – 12:00 pm (8:30-9:00 Introductions, 9:00-10:00 am Police welcome with Dustin Brueggemann, 10:00 – 11:00 Pre-assessment with Tom, 11:00 – 12:00 pm ITS help and campus tour, 12:00-12:30 Lunch, 12:30-1:30 What is archaeology (Carol), 1:30-2:30, Illinois Archaeology (Carol), 2:30-3:00 Zooarchaeology work (Carol and Shana) 3:00-4:30 tour of Gerhing
Evening Welcome Discussion with Tarsha, Carol, and John

June 4, Tuesday: All Students at GRFS
Leave at 8:00 am. First aid Training 8:30 am – 12:00 pm at GRFS; 12:00-12:30 lunch, 12:30-3:00 Tour GRFS, Safety, chemical, and animal care training 1:00-3:00, 3:00-4:00 What is Ecology (John), Living in a River Town (Christine Favilla)
Evening Lecture—Dinner at Old Bakery

June 5, Wednesday: All students
Leave at 8:00 am. 8:30-12:00 pm Cahokia trip, 12:00-12:30 lunch at Cahokia, 1:00-2:00 Intro to River Ecology, 2:00 – 4:30 Tour up the River
Evening Lecture at SIUE—Intro to the Anthropocene

June 6, Thursday: All students
Leave at 8:00 am. Tour of Illinois State Museum in Springfield, IL
Evening Session: What is Ecology?

June 7, Friday: All students
8:00-9:00 River Ecology (John), 9:00-10:00 Zooarchaeological database (Carol and Shana), 10:00-11:00 Ecological database (John), 11:00 – 12:00 pm Multivariate Analyses (John), 12:00-12:30 Lunch, 12:30 leave for fishing.

WEEK 2: DISCIPLINE WEEK—ARCHAEOLOGY STUDENTS AT GERHING SITE, ECOLOGY STUDENTS ON RIVER

June 10, Monday: Disciplinary Day
Archaeology students (4) at Gerhing site  Ecology students (4) on River
Team 1 at GRFS for age and growth
Evening: Building professional relationships with your professors. Faculty Panel Discussion with Cheryl Eames (Math), Jessica Harris (History), Steve Hupp (Psychology), Nicole Klein (Applied Health) Thad Meeks (Psychology), Dan Segrist (Psychology),

**June 11, Tuesday: Disciplinary Day**

Archaeology students (4) at Gerhing site  
Ecology students (4) on River  
Team 2 at GRFS for age and growth/isotopic work  
Evening: Ecology discussion night—readings Forbes 1925 and Lindeman 1942

**June 12, Wednesday: Disciplinary Day**

Archaeology students (4) at Gerhing site  
Ecology students (4) on River  
Team 3 at GRFS for age and growth/isotopic work  
Evening: Stable Isotopes in Archaeology—readings DeNiro et al. 1985 and Schoeninger and Moore 1992

**June 13, Thursday: Discipline Day**

Archaeology students (4) at Gerhing site  
Ecology students (4) on River  
Team 4 at GRFS for age and growth/isotopic work  
Evening: Weekly discussion night—Experiment Design

**June 14, Friday: Disciplinary Day**

Archaeology students (4) at Gerhing site  
Ecology students (4) on River  
Team 5 at GRFS for age and growth/isotopic work  

Enjoy the weekend!

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**WEEK 3: INTERDISCIPLINARY WEEK—TEAM ROTATION**

**June 17, Monday: Interdisciplinary Day**

Morning: Job Search Strategies—Career Development  
Teams 1 and 2 at Gerhing site  
Teams 3 and 4 on River  
Team 5 at GRFS for age and growth/isotopic work  
Evening: Panel on discipline specific job search strategies with Katie Leslie, and ...

**June 18, Tuesday: Interdisciplinary Day**

Teams 2 and 3 at Gerhing site  
Teams 5 and 1 on River  
Team 4 at GRFS for age and growth/isotopic work
2019 Tentative Syllabus

Evening: Ecology Lecture/discussion

June 19, Wednesday: Interdisciplinary Day
Teams 4 and 5 at Gerhing site  Teams 1 and 2 on River
Team 3 at GRFS for age and growth/isotopic work

Evening: Archaeology Lecture by Grace Ward, Washington University STL, Paleoethnobotany

June 20, Thursday: Interdisciplinary Day
Teams 1 and 3 at Gerhing site  Teams 4 and 5 on River
Team 2 at GRFS for age and growth/isotopic work

Evening: Observations of the first two weeks

June 21, Friday: Interdisciplinary Day
Teams 4 and 5 at Gerhing site  Teams 2 and 3 on River
Team 1 at GRFS for age and growth/isotopic work

Enjoy the weekend!

WEEK 4: DISCIPLINE WEEK—ARCHAEOLOGY STUDENTS AT SIUE, ECOLOGY STUDENTS ON THE RIVER

June 24, Monday: Disciplinary Day
Archaeology students at SIUE lab  Ecology students on River
Team 2 at GRFS for age and growth/isotopic work

Evening: Student Involvement Seminar

June 25, Tuesday: Disciplinary Day
Archaeology students at SIUE lab  Ecology students on River
Team 3 at GRFS for age and growth/isotopic work

Evening: Ecology Lecture/discussion – John Chick

June 26, Wednesday: Disciplinary Day
Archaeology students at SIUE lab  Ecology students on River
Team 4 at GRFS for age and growth/isotopic work

Archaeology Lecture/discussion: Dr. Corey Ragsdale Experimental Archaeology and Bioarchaeology

June 27, Thursday: Disciplinary Day
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Archaeology students at SIUE lab
Team 5 at GRFS for age and growth/isotopic work
Evening: Weekly Discussion

June 28, Friday: Disciplinary Day
Archaeology students at SIUE lab
Team 1 at GRFS for age and growth/isotopic work
Enjoy the weekend!

WEEK 5: INTERDISCIPLINARY WEEK—TEAM ROTATION

July 1, Monday: Interdisciplinary Day

Morning: Job Interview Preparation—Career Development
Teams 1 and 2 at SIUE lab
Team 5 at GRFS for age and growth/isotopic work

July 2, Tuesday: Interdisciplinary Day

Teams 2 and 3 at Gerhing site
Team 4 at GRFS for age and growth/isotopic work
Evening: Ecology Lecture/Discussion - Dick Brugam

July 3, Wednesday: Interdisciplinary Day

Teams 1 and 3 at SIUE lab
Team 2 at GRFS for age and growth/isotopic work
Evening: Observations of the weeks

July 4, Thursday: Independence Day

National Holiday, Enjoy the Day!

July 5, Friday: Interdisciplinary Day

Teams 4 and 5 at SIUE lab
Teams 2 and 3 on River
Team 1 at GRFS for age and growth/isotopic work

**Enjoy the weekend!**

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**WEEK 6: ANALYSIS WEEK**

**Students scheduled for analysis at SIUE or GRFS unless we have schedule adjustments.**

**July 8, Monday: Analysis Day**

Teams 2 and 3 at SIUE lab  
Team 4 at GRFS for age and growth/isotopic work  

Evening: Student Development

**July 9, Tuesday: Analysis Day**

All Teams working on analysis at SIUE  

Evening: Ecology Lecture/discussion (AH 0201) – Sergisuz Czesny

**July 10, Wednesday: Analysis Day**

All Team working on analysis at SIUE  

Evening: Archaeology Lecture/Discussion

**July 11, Thursday: Analysis Day**

All Teams working on analysis at SIUE  

Evening Session: Experiences working with data

**July 12, Friday: Analysis Day and Field Trip Day**

All Teams working on analysis at SIUE until noon  
Leave for Kibbe at noon.

**July 13, Saturday: Field Trip**

Electrofishing Pools 19 and 20 with Jim Lamer at Kibbe

**July 14, Sunday: Field Trip**

Return to Alton and SIUE

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**WEEK 7: ANALYSIS AND WRITING WEEK**

**Students scheduled for analysis at SIUE or GRFS unless we have schedule adjustments.**
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July 15, Monday: Writing Day

Morning: Resume/vita development—Career Development (8:00 – 9:00 am)
Construct abstract, methods, and results
Evening: Build/redesign your resume/vita

July 16, Tuesday: Writing Day
Construct abstract, methods, and results day 2
Evening: Ecology Lecture/discussion – Andy Casper

July 17, Wednesday: Writing Day
Construct intro and discussion
Evening: Archaeology Lecture/discussion

July 18, Thursday: Writing
Construct conclusion
Evening: Experiences interpreting data

July 19, Friday: Writing
Construct references and cross-check sources
Enjoy the weekend!

WEEK 8: WRITING WEEK 2

No formal evening sessions.

July 22, Monday: Talk to Others
Edits and reviews

July 23, Tuesday: Writing
11:00 am – 2:00 pm for presentation to senior personnel and other researchers (SIUE).
Pulling together a poster

July 24, Wednesday: Finishing Poster Day
Pulling together the final poster

July 25, Thursday: Poster Presentation
Students present posters at SIUE 1:00 pm – 3:00 pm (MUC at SIUE, Thanks Anthro Club!)

July 26, Friday: Evaluation Day
2019 Tentative Syllabus

8:30 am – 10:30 am post-assessment evaluations (SIUE)

10:30 am – 12:00 pm Wrap up and pack up.

Selected readings that will be provided to participants:

Archaeology Readings:

Brugam, R. B., K. Little, L. Kohn, P. Brunkow, G. Vogel, and T. Martin


DeNiro, M. J., M. J. Schoeninger, and C. A. Hastorf

Fortier, Andrew C., Thomas E. Emerson, and Dale L. McElrath

Redman, C. L., J. M. Grove, and L. H. Kuby

Schoeninger, Margaret J., and Katherine Moore

Ecology Readings:


Junk, Wolfgang J., Peter B. Bayley, and Richard E. Sparks

Lindeman, Raymond L.

10

Odum, E.  

Polis, Gary A., and Donald R. Strong. 

Sparks, Richard E. 

Sparks, R. E.  

Sparks, Richard E., John C. Nelson, and Yao Tin  

**Anthropocene Readings**

Bauer, A. M., and E. C. Ellis  

Corlett, R. T.  

Crutzen, P. J., and E. F. Stoermer  

Erlandson, J. M., and T. J. Braje  


Smith, B. D., and M. A. Zeder  

Steffen, W., P. J. Crutzen, and J. R. McNeill  
2007 The Anthropocene: are humans now overwhelming the great forces of nature. AMBIO: A Journal of the Human Environment, 36(8), 614-621.