



MOSAICS IN SCIENCE DIVERSITY Internship Program

2020 PROJECT DESCRIPTION

NPS UNIT: MAMMOTH CAVE NATIONAL PARK	PD #: 2020516
<p>Position Title: Air Quality Assistant Position Type: MIS Intern Primary natural resource discipline: Multidisciplinary Project keywords: Caves, Geohazards, Radon, Air Quality, Physical Science, Visitor and Employee Health and Safety, Meteorology Park or Program Website: https://www.nps.gov/macaindex.htm Location: Mammoth Cave, Kentucky</p>	
MOSAICS IN SCIENCE INTERN OVERVIEW	
<p>The Mosaics in Science Diversity Internship Program is focused on persons who are under-represented in STEM fields. Students and recent graduates who are African American, Latino/Hispanic, Asian, Pacific Islander, and Native American are encouraged to apply for these internships. In order to be eligible for a MIS intern position, applicants must be a U.S. citizen or U.S. permanent legal resident (“green-card-holder”) between the ages of 18 and 30 years old, inclusive, or veterans up to age 35.</p> <p>A Mosaics Intern within the Mosaics in Science Diversity Internship Program is an entry level natural resource science internship that focuses on career exploration and building fundamental natural resource science skills. Each Mosaics Intern will receive a weekly stipend of \$400, park-provided housing or a housing allowance and paid travel expenses. Interns who successfully complete 640 hours of work in one or more eligible internships and are under the age of 30 will be eligible for the Public Lands Corps Non-Competitive Hiring Authority for two years following the completion of the internship. Successful completion of a Mosaics in Science internship does not guarantee that the participant will be hired in to a federal position.</p>	
PROJECT DESCRIPTION AND WORK PRODUCTS	
<p>Position Description: The internship is located at Mammoth Cave National Park (MACA) in the Division of Science and Resources Management and serves as an Air Quality Assistant in support of the park air quality and meteorological monitoring program. The primary responsibilities include assisting in operating and maintaining the Mammoth Cave National Park air quality and climate monitoring stations, cave meteorology stations, and conducting air radon monitoring in cave air and tracking employee exposure.</p> <p>Major Duties:</p> <p>Radon Monitoring</p> <ul style="list-style-type: none"> • Implements established natural resource management protocols by following standardized procedures to collect, analyze, and organize field data. • Perform calibration of all equipment utilized for sample collection and analysis. • Performs routine and recurring testing of collected samples. Records all data collected, inputs data on the park’s network database, provides preliminary assessment and classification of the information, and generates reports. • Enters employee radon exposure data into network database and generates employee exposure reports to ensure exposure falls under regulated limitations. 	

- Ensure proper scientific integrity for quality control of data collected.

Cave Air Quality Monitoring

- The intern will be responsible for downloading and analyzing meteorological data collected via data loggers located inside the cave. Seek assistance for situations not covered by instructions or guidelines. Make field observations of natural resource conditions.
- Evaluate observed conditions and problems, and make preliminary determinations on the cause of problems noted. Provide results to higher-level specialist for analysis.

Air Quality Station Operation

- Perform station site maintenance tasks: mowing and trimming lawn with push mower and weed trimmer.
- Assist in the preparation of reports, plans, and guidelines. Draft project reports may include literature research, descriptions of methods, preparation of graphs and charts, and summary of findings.
- Provide logistical support and area orientation for contract or cooperating scientists; provide technical information, ensure quality control, and solve logistical or operational problems within the scope of the incumbent's knowledge and authority.
- Install, operate, and maintain resource management equipment and scientific instruments (e.g., tools, sampling, monitoring, photographic, and laboratory equipment). Inventory equipment, evaluate quality assurance compliance, and calibrate equipment as necessary.
- Provide information to other employee and visitors about the natural resource management program; refer unusual questions to the supervisor.
- May develop and present related interpretive programs to the public.

Objectives of the Internship

- Provide needed support for air quality, climate monitoring, and cave meteorology stations, cave air radon monitoring, and employee and visitor safety.
- Support for the overall meteorology mission of the park.
- Provide interpretive information for the public relating to air quality and meteorological operations of the park.

This position is offered through the National Park Service's Mosaics in Science Diversity Internship Program in partnership with Environment for the Americas.

Work Products: Primary products will be data sets that are obtained through monitoring all toured cave trails for radon progeny concentrations on a weekly basis by collecting and analyzing grab samples of cave air. Additionally, the intern will service meteorological instruments located in the cave where data will be downloaded. Finally, the intern will assist with ongoing operation of the park's surface air quality station.

QUALIFICATIONS

Some college/university coursework in STEM field science or weather focused field of study that may include: agriculture air quality instrumentation, atmospheric chemistry, biology, environmental engineering, environmental science, geology, GIS, industrial hygiene, meteorology, or physical science.

Familiar with basic GPS, Word Processing and Spreadsheets, basic use of scientific instruments and laboratory equipment.

Intern must be able to perform their duties with safety as their top priority, follow standard operating procedures, and ensure proper scientific integrity and quality control of data collection.

The applicant must be a U.S. citizen or U.S. permanent legal resident (“green-card-holder”) between the ages of 18 and 30 years old, inclusive, or veteran up to age 35. Prior to starting this position a government security background clearance will be required.

VEHICLE AND DRIVER LICENSE REQUIREMENTS

Applicant must have a valid driver license and a good driving record. The intern will be required to drive to various locations in and around the park on a daily basis (2-10 miles) to perform their normal duties. A park owned vehicle will be available for the intern to drive.

Types of vehicles available to the intern may include: Electric GEM car/truck, 4-Door Sedan, Mini-Van, Light to Medium Weight Pick-Up truck, and 4-Wheel Drive Pick-Up truck.

Driving Environment: The intern will routinely drive a park owned vehicle along paved roadways in and outside of the park. The park roads are two lane highways that wind in and out of hills and valleys. The park and surrounding areas are rich with wildlife which at times may cause traffic situations. The intern must be aware of their driving environment at all times to ensure their own safety and that of the wildlife, other park staff, and visitors to the park. Outside of the park, the intern may drive on 4 lane highways and interstate roadways and in medium to heavy traffic. There may be instances where the intern may need to utilize 4-wheel drive in back-country trails areas where the roadway is not paved. The intern will be properly trained on driving in these conditions beforehand.

A personal vehicle is RECOMMENDED but not required for this position. The housing units are within walking distance to the office of Science and Resources Management where the intern will report for duty each day.

Additionally, other buildings in the park (Superintendent, Law Enforcement, Environmental Education, Administration, External Programs, Facilities Maintenance, Cumberland Piedmont Network, and Science and Resources Management) are also within walking distance. The Visitors Center is located less than a mile away from the housing units.

If the intern does not have a personal vehicle, a park owned vehicle may be checked out on a limited basis to travel to the local communities to get groceries or household items or recreational activities.

The park has a small stock of bicycles and helmets that the intern may check out during their internship to commute back to the office or for health and wellness activities and/or recreation.

HOUSING

Park housing is available and will be provided at no cost to the participant. There are two single occupancy bedrooms with a full sized bed, dresser, and closet. The third bedroom is a large double-occupancy bedroom with two twin sized beds.

The rest of the house is shared space: kitchen/utility room, dining area, living room, and entry porch/”mud” room and restroom with shower.

The house is fully furnished with washer and dryer, all major kitchen appliances, and television. There is a telephone on which local calls and credit card calls may be made. WiFi is available, but has limited bandwidth. There are local public libraries (15-25 minutes away) in surrounding counties with high speed internet and computer labs that the intern can use.

The house has a back patio with a picnic table and charcoal grill (charcoal provided by resident).

The house has an attached carport for parking a single vehicle with an additional paved parking space adjacent to the driveway. Additional parking for daytime guests is a short distance from the house. There is a central HVAC system for cooling and heating the house. There is one thermostat that controls the temperature for the entire hours. Heat is powered by propane.

INTERNSHIP START/END DATES

Start Date: 5/18/2020

End Date: 7/31/2020

Eleven weeks of the internship will be in the park. A mandatory Career Workshop will be held in Washington, D.C. from August 2 – 6, 2020.

Are these dates flexible? Yes

STIPEND PAYMENT

\$4,800, all travel and housing costs will be covered

NATURAL & PHYSICAL WORK ENVIRONMENT

Natural Environment: Under a swath of Kentucky hills and hollows is a limestone labyrinth that became the heartland of a national park. Mammoth Cave National Park was established in 1941 to preserve the natural & cultural resources above and below the park’s surface. Mammoth Cave National Park encompasses over 80 miles of multi-use surface trails intertwined among 52,830 acres of forest. Mammoth Cave is the world’s longest know cave system with over 412 miles of explored cave lying beneath the surface.

In addition to the extensive natural resource, the park offers a rich cultural history. Archaeologists believe prehistoric people enter the cave approximately 5,000 years ago. The mission of the Mammoth Cave National Park is to preserve these natural and cultural resources above and below ground for present and future enjoyment by the world’s visitors. After rediscovery by European settlers, the cave saw several uses, but quickly became a magnet for tourists from the United States and abroad, beginning its first commercial tour in 1816. Some of the earliest enslaved cave guides, Stephen Bishop, Mat Bransford, and Nick Bransford, were responsible for discovering many of Mammoth Cave’s famous passages.

These cultural and natural resources that are protected within this national park are considered national treasures and have been designated as a UNESCO World Heritage site and serve as the core area of in an international biosphere.

The importance of continuing to explore and discover the secrets of Mammoth Cave National Park and thereby continuing to draw visitors to its diversity, beauty, and mystery, as they have since prehistory is reflected in the mission and purpose of the park: to preserve, protect, interpret, and study the internationally recognized biological and geologic features and processes associated with the longest know cave system in the world, the park’s diverse forested karst landscape, the Green and Nolin Rivers and extensive evidence of human history; and to provide and promote public enjoyment, recreation, and understanding.

The park itself is a relatively isolated environment. Although there is a small store on the park, general merchandise and groceries can be obtained at local communities near the Visitors Center:

Distance from Headquarters Area: Park City (8 miles), Cave City (12 miles), Horse Cave (17 miles), Glasgow (20 miles), Munfordville (21 miles), Brownsville (23 miles), or Bowling Green (30 miles).

Cultural, recreational, educational activities:

There are boundless opportunities for the MIS intern in the park and surrounding areas. Within the park, there are numerous front-country and backcountry hiking trails, a multi-use trail for biking, walking, or jogging, a

mountain bike trail, campgrounds, and canoeing and kayaking on the Green and Nolin Rivers. The intern will be able to participate in guided cave tours and other interpretive programs in the park that cover a variety of cultural and natural resource topics. There is a gym facility adjacent to housing for the use of park employees and interns. The intern will be encouraged to join biologists, archaeologists, physical scientists, and others during work activities throughout the park that will include water quality sampling, air quality monitoring, cave historic and archaeological evaluation, bat mist netting, rare plant monitoring, and more. Over several decades, the park's interpretive rangers have assembled an impressive reference library covering all aspects of the park that will be available to the intern for self-guided learning and research. Outside the park, south-central Kentucky offers a rich heritage of food, drink, music and more.

Each summer the housing is occupied by a variety of seasonal employees working in interpretation and maintenance, as well as interns from all park teams. This is a dynamic community that often socializes in the evening. The intern will be a member of a broader community of interns in the park. These will include interns monitoring bat populations in the park, interns in the interpretation program, and an intern in the park's volunteer program.

Physical Work Environment: The intern will be required to work inside the main Mammoth Cave system where the cave air holds steady at 55°F temperature and the environment varies from wet to dry in locations. There are temperature fluctuations at the entrance as the surface air changes causing directional air flow changes. The temperature in these locations can vary from 55°F to below 32°F. The cave environment is dark, although the majority of the work will be along publicly toured routes and have a lighting system in place. The intern will be issued a park owned caving helmet and light during their internship. Most of the cave trail is paved, but there are some meteorological stations located off-trail. The cave is mainly wide open passages, but there are some passages where the corridor narrows and ceiling height is very low. The intern must be comfortable traversing small sections of the cave through very low or close passages. Candidates with claustrophobia may have difficulty reaching work sites. Additionally, to reach cave work sites, the intern must ascend and descend hundreds of stairs and several steep inclines, which can be moderately difficult.

The intern may spend several hours in the cave standing or bending over to service instruments and download data at cave meteorological stations. The intern must be able to walk quickly while collecting air samples for radon monitoring.

The intern will receive training on safe caving and back-country fieldwork. The intern will spend 75% of their time working in the field (on the surface operating the air quality station and in the cave at meteorological stations and conducting Radon Monitoring) and 25% of their time in the office (entering data, compiling reports, and intern administrative tasks).

HAZARDS:

Ticks, poison ivy, stinging insects, snakes, mosquitoes, various wildlife: coyotes and bobcats (rare sightings).