

Opportunity Title: USFS Plant Physiology Research Internship

Opportunity Reference Code: USDA-USFS-2021-0218

Organization U.S. Department of Agriculture (USDA)

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How to Apply *Connect with ORISE...on the GO!* Download the new ORISE GO mobile app in the [Apple App Store](#) or [Google Play Store](#) to help you stay engaged, connected, and informed during your ORISE experience and beyond!

A complete application package consists of:

- An application
- Transcript(s) – For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. Selected candidate must provide proof of completion of the degree before the appointment can start. All transcripts must be in English or include an official English translation. Click [Here](#) for detailed information about acceptable transcripts.
- A current resume/CV
- Two educational or professional recommendations. Applications need at least one recommendation submitted in order to be viewed by the mentor.

All documents must be in English or include an official English translation.

Application Deadline 9/10/2021 3:00:00 PM Eastern Time Zone

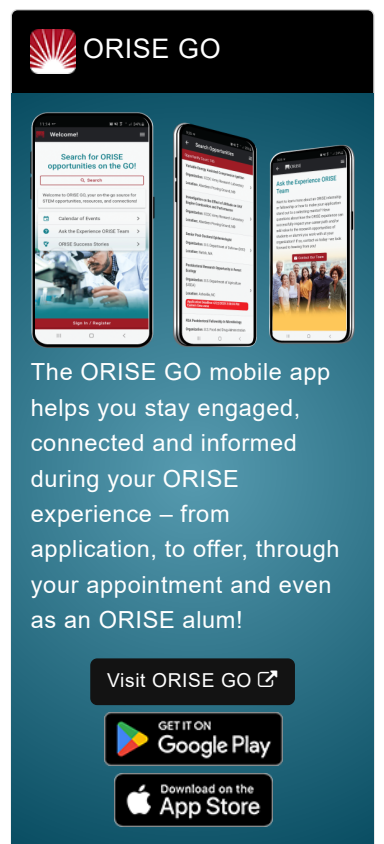
Description *Applications will be reviewed on a rolling-basis.

USFS Office/Lab and Location: A research opportunity is currently available with the U.S. Department of Agriculture (USDA), U.S. Forest Service (USFS), Center for Bottomland Hardwoods Research located in Stoneville, Mississippi.

The Center for Bottomland Hardwoods Research provides science-based information for managing southern bottomland hardwood and wetland forests, including their stream ecosystems, for a sustained yield of forest products and other ecological values. Bottomlands include a diverse set of forest types, found mostly in the floodplains of rivers and their streams on the broad coastal plain stretching from Virginia to Texas. Comprehensive knowledge of species biology and system ecology is needed to develop better tools to restore and manage bottomland hardwood forests, and their associated wetlands, if this valuable resource is to persist.

Research Project: Under the guidance of a mentor, research activities will include:

- **Oak seedling physiology** - The student will learn fundamentals of oak seedling physiology, mechanisms of flood tolerance in bottomland oaks, and how plant physiology experimentation can advance our knowledge to inform sustainable management of bottomland hardwood forests.
- **Experimental Design and Conduct** - The student will have the opportunity to learn: a) basic concepts and terminology in experimental design, such as randomization, replication, experimental unit, plot, block, and control; b) how to implement an experimental design to conduct an experiment in a greenhouse setting; c) how to sample for treatment responses; and, d) how to document observations.
- **Plant culture and maintenance** - The student will have the opportunity to learn: a) standard cultural practices for growing bottomland oak seedlings; b) techniques to identify the various stages of oak seedling ontogeny and seasonal phenology; c) methods to monitor plant health and vigor; d) practices to minimize plant pests in a greenhouse; and, d) how to develop and



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implement irrigation and fertilization schedules.

- **Plant physiology and growth sampling** - The student will have the opportunity to learn: a) how to sample oak seedling biomass; b) how to prepare plant biomass samples for various laboratory analyses; c) how to image and measure root system growth and development.
- **Data handling** - The student will have the opportunity to learn: a) principles of data quality; b) how to organize and build electronic data sets; c) data-proofing practices; and, d) how to summarize large data sets, properly annotate with meta-data, and properly archive.
- **Greenhouse and laboratory safety** - The student will receive training and will have the opportunity to learn: a) potential safety hazards associated with conduct of research in a greenhouse and laboratory; b) proper use of Personal Protective Equipment appropriate for use in greenhouse and laboratory settings; and, c) practices that foster safety in the workplace.

Learning Objectives: Throughout the course of this internship, the participant will have the opportunity to learn and develop skills and experience in plant physiology research. This research will help inform forest management and conservation decisions. The participant will receive training, gain knowledge, and acquire experience in various aspects of research focused on understanding how soil flooding influences growth and physiology of bottomland oak seedlings. This opportunity will also allow the participant to learn about and participate in various aspects of research including experimental design, treatment application, sampling methods, plant measurement, and data handling, as well as plant culture practices, greenhouse operation and control, and environmental/meteorological monitoring.

Mentor: The mentor for this opportunity is Emile Gardiner (emile.gardiner@usda.gov). If you have questions about the nature of the research please contact the mentor.

Anticipated Appointment Start Date: Fall 2021. Start date is flexible and negotiable, and will depend on a variety of factors.

Appointment Length: The appointment will initially be for one year, but may be extended upon recommendation of USFS and is contingent on the availability of funds.

Level of Participation: The appointment is part-time (20 hours per week).

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience.

Citizenship Requirements: This opportunity is available to U.S. citizens only.

ORISE Information: This program, administered by ORAU through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and USFS. Participants do not become employees of USDA, USFS, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.

Questions: Please visit our [Program Website](#). After reading, if you have additional questions about the application process please

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email USForestService@orise.orau.gov and include the reference code for this opportunity.

Qualifications The qualified candidate should be currently pursuing a bachelor's degree in one of the relevant fields.

Preferred skills:

- A keen sense of observation
- Ability to maintain comprehensive notes
- A willingness to learn and gain experience in a physically demanding greenhouse environment

- Eligibility Requirements**
- **Citizenship:** U.S. Citizen Only
 - **Degree:** Currently pursuing a Bachelor's Degree.
 - **Discipline(s):**
 - **Environmental and Marine Sciences** ([5](#) )
 - **Life Health and Medical Sciences** ([7](#) )