**DENIN Environmental Scholars Internships**

Dates of internship: Spring 2020 through Summer 2020

Location: University of Delaware, Newark, DE 19711

Number of positions available: 1

Faculty Mentor: Jennie Saxe, Assistant Professor, Department of Civil and Environmental Engineering, University of Delaware

Graduate Student Mentor: N/A

Professional Staff Mentor: Nicole Hill, Division of Waste and Hazardous Substances, DNREC

**Project Title: Alternative Uses for Scrap or Recycled Tires**

**Research Description:**

Scrap tires in Delaware are regulated by the Delaware Department of Natural Resources and Environmental Control (DNREC). Tires are considered “scrap” when they are no longer prudent or practical for vehicular use, not used on a vehicle for 6 months and/or are 6 years or older from manufacture date. Delaware produces over 750,000 scrap tires every year as defined by these criteria. Scrap tires present a number of environmental, health and safety hazards to our communities, and preventing them from fouling the environment is a goal. Scrap tire piles are an ideal breeding ground for mosquitos, which often carry diseases. Fires in piles of scrap tires, whether started by arson or lightning strike could take days or weeks to extinguish due to the chemical composition and often stacked nature of scrap tires. Therefore, DNREC is seeking information on alternate uses for scrap or recycled tires. Ideally, these alternate uses could also offer economic opportunity or attract new businesses to the State of Delaware.

**Research Questions:**The student should research DNREC’s scrap tire regulations, and those of progressive US states, especially focusing on the management of tires throughout a tire’s life cycle. The student should also research specific alternate uses for scrap or recycled tires internationally, and assemble a comparative analysis of positive and negative aspects of each alternate use.

In addition, the student should research business opportunities in the use or recycling of scrap tires. What types of businesses would be attracted by the alternate use? What markets exist for scrap tires both domestically and internationally?

**Student Learning Objectives: Professional and Research Skills**

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| Broad Professional Skills | Specific Skills |
| Express ideas in writing | Write descriptions of research procedures, prepare a written report of findings. |
| Express ideas verbally | Present findings to DNREC Scrap Tire Program |
| Work independently | Conduct research on the specific alternate uses for scrap or recycled tires |
| Maintain professional attitude and work principles (i.e. integrity, responsibility, diligence, following ethical standards) | Be on time, learn procedures, ask questions if unsure, respect everyone you work with |

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| Broad Scientific Research Skills | Specific Skills |
| Understand scientific terms  |  |
| Locate scientific articles and resources | Conduct searches for literature about uses for scrap and recycled tires. |
| Use scientific tools |  |
| Recognize simple patterns in research data |  |
| Understand research questions |  |
| Read and understand research articles |  |
| Apply research tools and techniques in research experiments  | Use UD Library resources |
| Analyze research data  | Organize documentation of research findings and maintain a database of references/resources |
| Understand, apply, and explain scientific concepts and theories |  |
| Identify appropriate research methods |  |

**Prerequisites:**

The student should have completed coursework which provides familiarity with environmental issues and terminology related to solid waste, water and air pollution, and sustainability.

The student should have excellent written and oral communication skills, and a demonstrated ability to use library resources and organize, write and present findings.

**Work Environment and Expectations:**

The student will work part time during spring 2020, and may be invited to continue full time during summer 2020. The student will participate in routine meetings with the faculty mentor and interim updates to the sponsoring agency. The final products will be a written report and a presentation to the sponsoring agency.

Students will also participate in a summer retreat, communications workshop and end-of-internship symposium at UD in August 2020. The student will be part of a community of undergraduates carrying out research, organized by the Delaware Environmental Institute (DENIN). The student will be mentored by a UD faculty member, Dr. Jennie Saxe, and by a DNREC environmental professional, Nicole Hill.

**Stipend:**

$1,000 for spring 2020; $4,000 for summer 2020. Direct deposit is required.

**Funding Source:**

DNREC scrap tire program fees.

**How to apply:**

<https://ugresearch.udel.edu/PUB_Program.aspx>