# 2020 Cooperative Summer Field Training Program

<table>
<thead>
<tr>
<th>USGS Project Scientist</th>
<th>Greg Noe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project start date</td>
<td>6/1/2020</td>
</tr>
<tr>
<td>Duration</td>
<td>3 months</td>
</tr>
<tr>
<td>Location</td>
<td>Reston, VA</td>
</tr>
<tr>
<td>Type of Intern</td>
<td>Any</td>
</tr>
<tr>
<td>Title of Project</td>
<td>The effect of floodplain geomorphology on nutrient biogeochemistry and water quality</td>
</tr>
<tr>
<td>Background</td>
<td>The USGS Wetland Ecosystem Ecology and Biogeochemistry Laboratory investigates the role of wetlands in influencing water quality. We have ongoing and upcoming studies to measure and model the transport, cycling, and retention of nitrogen, phosphorus, carbon, and sediment in floodplain wetlands and associated streams and rivers. Our approach is to: 1) quantify the hydrogeomorphic and ecological controls of nutrient and contaminant fluxes in wetland ecosystems, 2) scale wetland fluxes from site to watershed scale, and 3) identify the principles and modeling tools needed to manage wetland and river ecosystems for water quality effectively in the context of climate and land use change. Most study locations are in the Chesapeake Bay watershed as well as tidal wetlands throughout the Southeastern U.S.</td>
</tr>
<tr>
<td>Objectives</td>
<td>1. Become an integrated member of a research team investigating the role of wetlands as traps for contaminants. 2. Master common field and laboratory techniques in geomorphology, biogeochemistry, and ecology. 3. Enter and summarize scientific data for interpretation and publication.</td>
</tr>
<tr>
<td>Intern Tasks</td>
<td>The intern will be trained in proper protocols and become responsible for making measurements and collecting samples in the field, processing and analyzing samples in the laboratory for biogeochemical and physical attributes, performing QA/QC, and entering data into databases. Field methods will include measuring hydroperiod using pressure transducers, surveying elevation, measuring rates of geomorphic change in stream floodplains and banks using artificial marker horizons, erosion pins, and dendrogeomorphology, collecting sediment and water samples, placing ion exchange resin bags on floodplains, and measuring soil carbon, nitrogen, and phosphorus biogeochemical cycling. The intern will carefully weigh, dry, and sieve sediment samples and weigh and extract soils and ion exchange resin for inorganic nutrients. Laboratory analyses will include pH, total carbon and nitrogen using an elemental analyzer, organic matter content using loss on ignition, and particle size using laser diffraction. Computer analyses could include GIS and statistics.</td>
</tr>
<tr>
<td>Expected Results and Benefits to the Intern</td>
<td>The intern will gain valuable experience as part of an energized team of scientists with diverse expertise in geomorphology, biogeochemistry, ecology, and landscape/GIS analysis. The intern will be exposed to interdisciplinary research techniques in these</td>
</tr>
</tbody>
</table>
fields and will gain balanced experience in field measurements and laboratory analyses that will enable his or her future career.

**Skills and Interests of Candidates**

Excellent verbal and written communication skills, ability to work in a research team, experience in fieldwork, and proficiency in data manipulation and graphing are essential. In addition, demonstrated experience and ability to perform detailed laboratory chemical analyses on environmental samples independently and demonstrated proficiency in the collection of ecologic, geomorphic, and hydrologic data are highly desirable. The intern must have a willingness to travel overnight and be comfortable spending long days in wetland environments of the Southeast and mid-Atlantic. Above all, the intern should have interest in and enthusiasm for researching the role of riparian wetlands in regulating water quality through their removal of sediment and nutrient pollutants from our waterways.

Specific desirable laboratory skills include: Process samples in preparation for performing chemical and physical analyses of water, plant, and sediment samples in the laboratory. Create solutions of calibrants and reagents. Conduct QA/QC of data. Enter data into electronic spreadsheets and permanent project databases.

**Project Type**

Field Work; Lab Work; Office Work;

**Project Discipline**

Geomorphology; Ecology; Surface Water; Paleontology;