Resource Assessment Branch
Resource Inventory and Assessment Division
Soil Science & Resource Assessment
Natural Resources Conservation Service
U.S. Department of Agriculture

Position:	**Modeling Climate Fellow** **Natural Resource Specialist/Physical Scientist/Soil Scientist** **(GS-0401/1301/0407-12/13)**
Duty location:	**Location negotiable after selection (Temple, Texas; Beltsville, Maryland)**
Term limit:	**Initial 2-year appointment with the potential for additional 1-year extensions up to a total of 4-years.**
Eligibility:	**with U.S. citizenship or work permit** **Advanced degree required (MS or PhD)**

INTRODUCTION

This position serves within United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Soil Science and Resource Assessment (SSRA), Resource Inventory and Assessment Division (RIAD), Resource Assessment Branch. Within NRCS, RIAD conducts the National Resources Inventory (NRI) program and assessments of natural resource conditions and trends in the United States. The Resource Assessment Branch (RAB) at RIAD assesses the condition and trends of land, soil, water, and related resources on the Nation's non-federal lands in support of efforts to protect, restore, and enhance the lands and waters of the United States. It leads the agency's Conservation Effects Assessment Project (CEAP) to model and analyze national, regional, and State conservation efforts and supports USDA in policy making for resource conservation.

This fellow is assigned to RAB as part of the Climate Change Fellows Program (CCPF) that USDA has established to gain the expertise needed to implement USDA's climate strategy under the Inflation Reduction Act (IRA) for better understanding and measuring the climate impacts of conservation and management practices and for improving greenhouse gas (GHG) estimates. The fellow will support RAB's climate work activities for the implementation of the IRA statute on data collection, compilation, analysis, modeling, and assessment using natural resource and physical scientific expertise. The fellow is expected to support a new interagency Conservation Practices Data Team (CPDT) as well as other associated key climate action area activities in RAB for quantifying and assessing soil and biomass C and GHG emissions.

MAJOR DUTIES AND RESPONSIBILITIES

The fellow will work with the Resource Assessment Branch Modeling Team, Conservation Data Team, other key action area members, and collaborators to:

- Review conservation and management practice data (e.g., tillage, cover crop, irrigation, fertilization, and others) for agricultural ecosystem models (e.g., EPIC, DayCent, DNDC, APEX, SWAT).
- Determine the strengths and weaknesses of those conservation and management data for modeling and climate assessment from the field scale to national scale.
- Identify the gaps, research more recent and accurate data sources, and develop methods and procedures to obtain and compile new data sets for updating conservation and management data sets for model improvement and assessment.
- Assist in compiling soil and biomass C and GHG flux monitoring data sets for field-scale model evaluation and improvement.
- Assist in developing modeling testbeds or pilot platforms and required input data sets for model evaluation and intercomparison.
- Assess model C-N budgeting and GHG emissions and their sensitivities to changes in conservation and management practices.
- Assist in improving model parametrization on C-N cycling and comparing model output with remotely sensed data (e.g., satellite LAI, NH_3, CH_4, and N_2O retrievals) for spatial and temporal evaluation.
- Assist with integrated modeling of atmosphere for weather and nitrogen (N) deposition input and assessment of the impacts of future atmospheric scenarios on C sequestration and GHG emissions.
- Help identify and evaluate conservation and climate co-benefit assessment metrics in relation to NRCS resource concerns (e.g., soil, water, air, plants, animals, humans). Consult with internal and external experts and stakeholders to ensure that proposed assessment metrics address the agency and end user needs.
- Accomplish diverse duties through the utilization of programming packages and advanced data management, analysis and visualization tools including Fortran, Java, C/C++, R, Python, Access, SQL, SAS, ERDAS Imagine, ArcGIS Pro.
- Document and maintain data, tools, and models including updates and changes in the climate-related modeling and assessment.
- Support data and tool exchange and sharing with existing program activities (e.g., CEAP) for complementary efforts.

Other duties

Coordinate with internal and outside team members to complete assigned tasks. Develop and deliver presentations for internal and external audiences (e.g., conferences or workshops) and publications.

KNOWLEDGE REQUIRED BY THE POSITION

Professional knowledge of physical or natural resource science including biogeochemical cycles and processes, soil science, statistical techniques, quantitative methods, and geospatial science. Working knowledge of soil, plant, water, and atmosphere interactions in relation to carbon (C) and nitrogen (N) such as soil organic carbon (SOC), biomass C, or CO_2-N_2O-CH_4 fluxes.

Skills and knowledge in assembly of conservation, management, and soil data for agricultural ecosystem modeling. Ability to conduct agricultural biogeochemical modeling and analysis using one or more ecosystem models (e.g., EPIC, DayCent, DNDC, APEX, SWAT). Have strong programming skills (e.g., Fortran, C/C++, and/or Java) to understand and update models and tools. Ability to conduct statistical analysis and perform tabular and geospatial data processes to derive temporal and spatial data sets required in agricultural ecosystem modeling.

Skill to maintain and document data, tools, and models following existing metadata procedures or by developing new procedures if needed. Ability to writing clearly and objectively for reports and/or articles. Skill in planning and scheduling work and developing processes to ensure completion of activities within timelines. Ability to communicate with all levels of personnel. Interpersonal skills to work successfully with interdisciplinary team members and other agencies, non-Federal organizations, and contactors.