

Resources Assessment Division - Modeling Team

United States Department of Agriculture – Natural Resources Conservation Service

Who We Are:

The Natural Resources Conservation Service (NRCS) Resources Assessment Division (RAD) Modeling Team informs USDA leadership and Congress on the impacts of current and alternative conservation programs and natural resources legislation. Working with Texas A&M and USDA Agricultural Research Service scientists, RAD applies the Agricultural Policy/Environmental eXtender model (APEX) and the Soil Water Assessment Tool (SWAT) to answer cutting edge questions about the impacts of conservation practices on natural resource sustainability, especially in terms of water quality and agricultural field edge losses, watershed losses, and deliveries of nutrients and sediment to the Gulf of Mexico. The Temple-based RAD modeling team provides modeling support to the National Resource Inventory, Soil and Water Conservation Act, and the Conservation Effects Assessment Project.

National Resources Inventory

•The National Resources Inventory (NRI) is the nation's most extensive statistical survey of land cover, land use, and natural resource conditions and trends on non-federal lands. This data is used to determine resource conditions and conservation practice impacts on agricultural land across the country.

Soil and Water Resources Conservation Act

•The Resources Conservation Act (RCA) of 1977 gave USDA the authority to appraise the status and trends of soil, water, and related resources on non-federal land and to assess sustainability of those resources; evaluate current and needed programs, policies, and authorities; and develop a national soil and water conservation program to guide USDA soil and water conservation activities. The NRCS-RAD team models conservation practice costs and benefits and simulates alternative management strategies and scenarios.

Conservation Effects Assessment Project

•The Conservation Effects Assessment Project (CEAP) is a multi-agency effort to quantify the environmental benefits of implemented conservation practices and programs. CEAP uses literature reviews, modeling, farmer surveys, watershed assessments, and regional studies in collaboration with partners in universities, federal/state agencies, and conservation organizations to conduct national assessments for cropland, grazing lands, wetlands, and wildlife.

Conservation Effects Assessment Project Modeling Strategy:



National Survey Data

- NRCS uses NASS and NRI data to determine current (baseline) conditions on farmland



APEX

- APEX is used to simulate edge of field losses for nitrogen, phosphorus, water eroded sediment, and wind-eroded soil
- Carbon dynamics are also simulated



SWAT

- SWAT is used to assess conservation practice impacts on the watershed, which ultimately includes deliveries to large bodies of water, such as the Great Lakes, Chesapeake Bay, and the Gulf of Mexico



Evaluate

- Compare costs and benefits of current practices
- Simulate alternative conservation approaches to determine best management options
- Analyze trends in conservation adoption

CEAP Impacts and Visions for the Future:

- Prioritizes natural resource conservation needs with careful consideration of economic and social realities facing American farmers.
- Develops standardized databases, methods, and models that can be used to assess costs and benefits of our conservation practices instead of merely reporting results.
- Provides an unparalleled foundation for improving conservation policy decision-making, program implementation, conservation program performance estimates, and the development and transfer of conservation technology.
- Allows the farming community, landowners, legislators, program managers, and other environmental policy issue stakeholders to design and implement new opportunities more effectively based on tracked successes.
- Provides robust scientific basis for evaluating program options to address forthcoming natural resource challenges such as water availability, climate change, invasive species, and biofuel feedstock production.