Science and Technology Solutions for Streamlining Conservation Delivery

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ABSTRACT

The USDA Natural Resources Conservation Service (NRCS) delivers technical assistance to operators of many thousand farms and ranches through the network county level field service centers within the Mississippi River Basin. Technical assistance includes conducting resource inventories and developing alternatives for optimizing the productivity and sustainability of the producer's operation, as well as the watershed in which it is located. The models and tools to inventory, develop, and analyze solutions currently are not integrated into business processes in an efficient manner. Each tool is used separately with its own data and processing requirements, which limits their use. Furthermore, the additional workload to deliver financial assistance constrains time spent on technical assistance. To re-establish its emphasis on science-based technical assistance, NRCS has established the Conservation Delivery Streamlining Initiative (CDSI). In support of CDSI, a robust and flexible infrastructure must be built to provide the best science and tools available in developing estimates of system response as conservation planners provide technical assistance to producers. This infrastructure begins with a common user experience that field personnel will be trained once to use while the underlying toolset may vary with time and utility. This user interface is envisioned to operate in the field office or in the field on a portable handheld device while being equally functional to answer the resource inventory and assessment needs while working with the producer. The next layer of this infrastructure is the computational components that do the heavy lifting to generate the estimates of system response and formulate the conservation alternatives for the producer to choose from. This computational layer will be based on a service oriented architecture that uses the USDA Object Modeling System (OMS) to facilitate the creation and utility of regionally derived modeling toolsets. It contains a library of science, control, and database components (modules), and methods to assemble selected components into a modeling package customized to the problem, data constraints, and scale of application. To help drive this computational system a flexible data provisioning system must be provided which pulls site specific data from a vast collection of geospatial oriented data sources across the enterprise and Internet cloud. The data system will be exposed as web services that can be used internally by a specific computational tool or provide data streams for offline use while working with the producer on site. Streamlined business workflows developed by CDSI and efforts such as the Mississippi River Basin Initiative will drive the science that will be incorporated into the system and how it will be used.

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