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## Lifecycle Management for Models and Data Deployed as Integrated Services Supporting Farm Sustainability and Conservation Assessments

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## Lifecycle Management for Models and Data Deployed as Integrated Services Supporting Farm Sustainability and Conservation Assessments

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**Abstract:** The Water Erosion Prediction Project (WEPP) and Wind Erosion Prediction System (WEPS) models simulate the effects of cropping systems and practices on water and wind soil erosion, sediment delivery, soil organic matter trend, tillage intensity, air particulate matter, and farm operation energy consumption. The two models, developed by the USDA Agricultural Research Service (ARS) and deployed as model web services by the Colorado State University (CSU) Object Modeling System Laboratory (OMSL), support multiple user communities operating from common soil, climate, and cropping system domain databases through supporting data services. User communities include Field-to-Market (FtM) - The Alliance for Sustainable Agriculture, their qualified data management partners (QMDPs), USDA Natural Resource Conservation Service (NRCS) county and state offices, as well as collaborating research and development project teams at CSU, ARS, and other organizations. CSU OMSL maintains and hosts the model and data services on the Cloud Services Integration Platform (CSIP) working with participating teams to maintain daily operational efficiency. CSIP currently supports several million WEPP/WEPS-related service requests annually, including those for FtM crop year sustainability assessments on 1.2 million acres annually. User segments increasingly reliant on these services requires a commitment to effective lifecycle management. In this presentation we summarize steps taken to ensure effective long-term support to the combined efforts of all invested: distributed development, DevOps, container-based deployments, data standards and stewardship, publish/subscribe, system activity monitoring, archiving, knowledge transfer, and continuity of operations planning.

**Keywords:** Lifecycle management; integrated models; farm sustainability; resource conservation