

# Automated Testing of WEPP Web Services

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The Water Erosion Prediction Project (WEPP) model is a process-based FORTRAN computer simulation program for prediction of runoff and soil erosion by water at hillslope profile, field, and small watershed scales (Flanagan et al., 2007). To effectively run WEPP and interpret results additional software has been developed. Software external to WEPP includes user interfaces, databases of model parameters and software to provide translation to WEPP input formats along with spatial mapping and graphical software to present modeling results.

To support the USDA-Natural Resources Conservation Service (NRCS) in the evaluation of WEPP, web based interfaces have been developed (Frankenberger et al., 2015). These interfaces make use of large databases for land-use management, soils and climates hosted on web servers. The NRCS Land Management Operations Database (LMOD) has over 25,000 management scenarios based on Revised Universal Soil Loss Equation version 2 (RUSLE2) data that forms the basis for WEPP inputs (Figure 1). In addition, soil parameters based on the NRCS Soil Survey Geographic Database (SSURGO, Figure 2) and climate based on 2600+ CLIGEN (CLimate GENERator) stations are included.

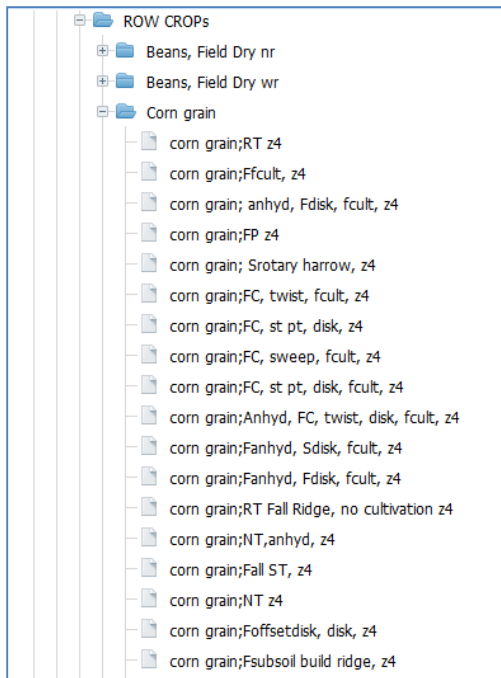


Figure 1. LMOD management choices.

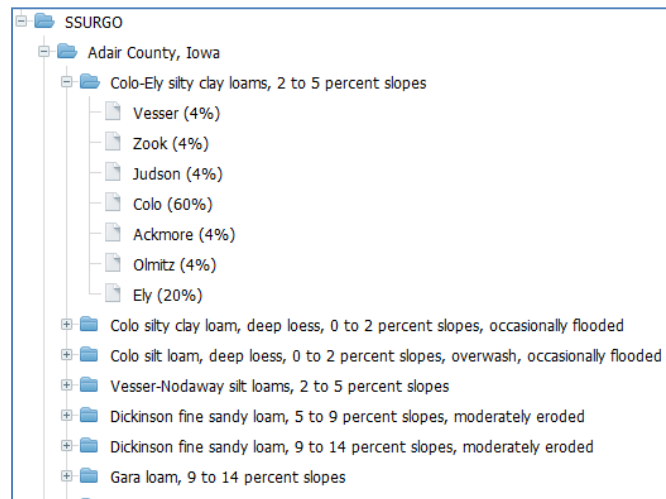


Figure 2. SSURGO soil choices.

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To effectively test the WEPP model web based interfaces additional testing software was developed to build different combinations of inputs to the model and report results. The summaries help identify model or data problems that need further investigation. Selected automated testing of the user interface is also done by using JavaScript testing frameworks. The testing results are available continuously so that developers can gauge the maturity of the WEPP model implementation and interface.

#### References

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- Frankenberger, J.R., D.C. Flanagan, W. Elliot, E. Theller. 2015. Demonstration of the Water Erosion Prediction Project (WEPP) internet interfaces and services. Proceedings of the 3<sup>rd</sup> Joint Federal Interagency Conference (10<sup>th</sup> Federal Interagency Sedimentation Conference and 5<sup>th</sup> Federal Interagency Hydrologic Modeling Conference), April 19-23, 2015, Reno, Nevada. p. 1797-1807.