Carlson, Jack

From: Rojas, Ken - Fort Collins, CO [Ken.Rojas@ftc.usda.gov]
Sent: Wednesday, April 08, 2009 3:01 PM
To: Norfleet, Lee; Price, Lane - Raleigh, NC; Harlow, Jerry - Fort Worth, TX; Widman, Norm - Washington, DC; McKinney, Shaun - Portland, OR; Peacock, George - Fort Worth, TX; Meyer, Daniel - Fort Collins, CO; Geter, Frank - Fort Collins, CO; Oaks, Wendall - Washington, DC; Butler, David - Fort Collins, CO; Brenner, John - Fort Collins, CO; David, Olaf; Carlson, Jack; Ahuja, Laj
Cc: Restad, Jason - Fort Collins, CO

These are the notes from the OMS/NRCS meeting (April 1&2, 2009). Please post any additions or omissions…

Integrating Science Components into Conservation Technical Assistance, Program Delivery and Conservation Effects Assessment

April 1-2, 2009
Fort Collins, Colorado

Participants

NRCS: Lee Norfleet (Temple, TX), Lane Price (Raleigh, NC), Jerry Harlow (Fort Worth, TX), Norm Widman (WDC), Shaun McKinney (Portland, OR), George Peacock (Fort Worth, TX), Dan Meyer (FTC), Frank Geter (FTC), Wendall Oaks (WDC), Dave Butler (FTC), John Brenner (FTC), and Ken Rojas (FTC)

ARS/CSU: Olaf David, Jack Carlson, Laj Ahuja

Major Topics Covered

OMS Framework Update
Modeling Support to the Conservation Effects Assessment Project (CEAP)
Modeling Support to the NRCS Conservation Delivery Streamlining Initiative (CDSI)

Meeting Summary and Follow-Up

1. Discussion of key terms and concepts.
    a. Component – software unit (e.g. infiltration, interception, etc)
    b. Compound component – two or more components (e.g. erosion, nitrogen fate/transport)
    c. Model – assembly of components organized around a priority business requirement
    d. Model Base – assembly of model instances that cover the intended regions of use
    e. Model Service – the models in a model base are deployed as services on a production platform; business applications call and run the services as part of a workflow; model services do not contain a user interface, which the business application provides
    f. Modeling Framework – a tool to build, test, validate, provision, deploy, and support the models in a model base
    g. SOA – service oriented architecture: made up of many pieces; but go to here to access web services for computations and data access.
    h. OMS – Object Modeling System: modeling framework to help facilitate the building, testing, and utility of computational models. Many of the computational services on the SOA will originate here.

2. There are two major modeling efforts currently supported by the OMS framework. One is the new CEAP model which will be used to help quantify the regional variations and conservation effects assessment, and the other is the PRMS model for water supply forecasting. OMS will be used to support the delivery of science to CDSI business applications. The group agreed that it is important to demonstrate business applications that incorporate OMS model services, so we will rely on CDSI to help derive and prioritize a working list of business needs. The first operational instances in 2009 will be computational services utilized by the NRCS Engineering Field Tools (EFT) application. A working draft of the OMS Strategic plan was delivered to this group to help lay out the long term vision for the OMS system.

3. The new CEAP model is being developed as a model base to support watershed assessments to (1) focus and prioritize workload, and (2) perform CEAP national and regional assessments. Another model base will be developed to support the science requirements for CDSI. The need for at least a handful of model bases was proposed, which can include regional resource assessment, farm/field resource planning and assessment, eco-services and enviro-credit, practice and engineering design, and others as needed.

4. Lee Norfleet reviewed the phase one process for the CEAP assessment involving the upper Mississippi River Basin. More than 3,700 SWAT model runs supported the analysis. The process included farm level surveys on selected NRI sample points conducted by NASS. Surveys required OMB approval and therefore they will be used sparingly. Changes to the CEAP process will hinge on this issue.

5. The new CEAP model contains improvements that will benefit future assessments. There is general agreement that OMS provides a framework and repository for effectively managing CEAP model components through time.

6. The group agreed that data provisioning and model calibration support is a critical success factor for widespread CEAP analyses. There is a need to develop policy for coordinated data collection and stewardship to support approved model bases. Currently the process is fragmented across disciplines. The discussion provided a general sense of the scope of the need, and from this Ken Rojas and Jack Carlson will draft a white paper laying out options for organizing data provisioning and calibration support and distribute for an iterative review and comment process. The paper will include an initial workload analysis.

7. The data management layer is the most important data gap for both CEAP and CDSI. Formalizing data definitions also is a priority.

8. Developing models and components with the OMS framework is being simplified. The new OMS model and component development handbook is crucial to incorporating work at Blacklands, Tucson, and West Lafayette into the model bases that will support CEAP and CDSI.

9. Lane Price reviewed the CDSI Vision, which emphasizes optimizing workflows to reduce the administrative burden on field employees. Science should be delivered as services to be integrated into the more efficient conservation planning workflows, and delivered in a manner that does not hinder adjustments to workflows through time. There is general agreement that OMS model services deployed in the service oriented architecture supports this approach.

10. The group agreed that a NRCS S&T matrix should be developed at the component and compound component level to identify the best science to include in the OMS model and component library. This will help define the model bases for CEAP and CDSI. Frank Geter and Dan Meyer will initiate this effort.

11. There is a need to organize research and science development to support CDSI. Currently a couple of ARS CRIS projects support new science for CEAP. It follows then that appropriate CRIS projects should support the CDSI effort. Item for follow-up.

12. George Peacock updated status on GSAT and other grazing land related projects. GSAT-related science components will be incorporated into the model base supporting CDSI.

13. George Peacock and Jack Carlson will initiate an effort to develop an ontology and knowledge base for ecological site state/transition models (STMs). This study will help determine the extent to which ontology and knowledge bases are a useful tool for model development and deployment.

14. Norm Widman updated status on erosion technology development. Erosion science components are being incorporated into the CEAP model base and will be for CDSI. Follow up needed on the development and design of the Land Management Operations Database (LMOD).

15. Shaun McKinney updated status on ecosystem services tools, including the Nitrogen Trading Tool. Whether a separate model base is needed to support market-based conservation is unresolved. The model base supporting CDSI conceivably could support ecosystem services. Probably a three-way discussion between the TSC, CDSI, and ITC to lay out and evaluation options.

16. Jerry Harlow provided a brief status of the GeoEDC effort at the Department level, which is focused on the geospatial data center at Salt Lake City. The NRCS NCGC and GeoEDC are expected to be key parts of data provisioning to the CEAP and CDSI model bases.

17. There is considerable interest in the technology contained in the APEX model. The model is available as an executable. Understanding the source code requires consultation from the developers. The desired state is to have annotated APEX or APEX-like science components in a source code repository, available incorporating into model bases. In the short run, it may be useful to black-box the APEX executable for business applications. In the longer term, build a library of APEX or APEX-like components, annotated to facilitate their use in various modeling projects. The matrix referred to in 11 above would be key to the longer-term effort. Potential follow-up includes meeting with the ARS and NRCS Blacklands group and Texas A&M to discuss options.

Ken

Ken Rojas
USDA-NRCS-ITC
2150 Centre Ave., Bldg D, Suite 200; Fort Collins; CO; 80526-8121; (970)492-7326; ken.rojas@ftc.usda.gov