**05. Usability Features**

**Budget Summary**

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| --- | --- | --- | --- | --- | --- | --- |
| TASK | Contract | FY 11 Funding | Prev Yr funds Carried forward to FY11 | FY11 Expenditures | Carry Forward to FY12 | Total Projected FY12 Budget |
| SCT Enhancement (default aggregation statistics) (and **start of unit scheme work**) | BOR LC FY11 | $5,000  |   | $5,000  |   |   |
| Display comma separators on any slot | USACE - SWD Task Order 2 |   | $5,000  | $5,000  |   |   |
| Adjust flexible date range of many slots | USACE - ABQ Task Order 2 | $5,000  |   | $5,000  |  |  |
| Set link properties by clicking on link | USACE - ABQ FY12 | $2,000  |   |   |   | $2,000  |
| Edit/Construct slot list for SCT | USACE - ABQ FY12 | $8,000  |   |   |   | $8,000  |
| Export/Import slot notes and allow rules to write notes | USACE - ABQ FY12 | $9,000  |   |   |   | $9,000  |
| Design a Scenario manager for stakeholders | USACE - ABQ FY12 |   |   |   |   | $15,000  |
| BOR - LC FY11 | $10,000  |   |   | $10,000  | $10,000  |
| Usability Features FY12, 13 SCOPE TBD | BOR - ABQ  |   |   |   |   | $40,000  |
| Performance Improvements | BOR - ABQ | $10,000  |   |   | $10,000  | $10,000  |
| Performance Improvements | USACE - SWD Task Order 3 | $10,000  |   |   | $10,000  | $10,000  |
| Provide automated data aggregation tools | BOR - ABQ FY13 |   |   |   |   | $15,000  |
| GIS Enhancements | USACE - ABQ Task Order 2 |   | $12,500  | $12,500  |   |   |
| USACE - ABQ FY12 |   |   |   |   | $20,000  |
| BOR - LC FY11 | $10,000  |   |   | $10,000  | $10,000  |
| Explore improved DSS library for direct DSS DMI; design new CWMS integration; design RW adaptor to NWS CHPS | USACE - SWD Task Order 3 | $20,000  |   |   |   | $20,000  |
| **TOTALS** |  | **$89,000** | **$17,500** | **$27,500** | **$40,000** | **$169,000** |

**FY 2011 Accomplishment Highlights**

**SCT Aggregation**

Previously, the default aggregation functions (e.g., “sum” or “average” in the SCT were set and were difficult to change. This enhancement makes them easily user-configurable. For details see SCT\_AggregationFunction.pdf.

**Unit Schemes**

Another request was for a simple switch to change the units viewed in the SCT. It turned out not to be possible to do this easily. Rather, we took this opportunity to begin to implement a long-anticipated enhancement of unit schemes that are defined by the user and which control all slots. Alternate unit schemes can be defined and selected with a simple switch. This change will also do away with the DB File, an antiquated approach to defining default units. Please read more about this important enhancement in UnitSchemes.Aug2011Vision.pdf.

**Display Comma separators on any slot**

Numeric comma separators can now be optionally shown in numeric Slot data through the use of a new “Show Commas in Numbers” checkbox in the Workspace menu. This is limited to display of data within RiverWare, and does not affect the formatting of output (files and such) generated from RiverWare. “Locale”-based formatting provided by Qt classes is used internally to effect the formatting, but is hard-coded to the English/US locale. We had considered making use of the users' actual “locale” setting, but decided that insuring that all numeric display and editing was correctly locale-based was beyond the scope of this project. A particular concern is that the typical European locales actually REVERSE the meaning of periods and commas (with respect to English/US), so we would need to be sure that locale support is absolutely comprehensive throughout RiverWare before supporting non-English/US locales. This feature and the implementation is described in CommaSeparatorsVersOneNotes-2010nov11.pdf.

Also When a RPL editor displays a numeric values as part of an expression or statement, that display now respects the Workspace's “Show Commas in Numbers” setting. For example, when the user has enabled this setting, a number which previously would have been displayed as 1234567.89 “cfs” would now be displayed as 1,234,567.89 “cfs”.

**Adjust flexible date range of many slots**

The **Edit** ➥ **Adjust Values** operation can be applied to any arbitrary slot / timestep cell selection in the SCT. Both absolute and relative (percentage) adjustments of values in series slots can be made. Absolute adjustments are available only when all cells in the selection have the same scale and unit. Neither NaN values nor Read-Only (cross-hatched) values are affected. Since slots can appear in an SCT more than once, the adjust value operation is careful to adjust each selected slot/Timestep value only once. Click the Report Results toggle to see a summary of the slots changed. See SCT\_AdjustValues.pdf.

**Set link properties by clicking on link**

From the RiverWare Workspace, in all supported “Views”, the user can now add a Simulation Object, Account, or Link to an existing Display Group of the corresponding type. This is done through the use of context menu operations. To present consistent operation titles, the similar existing operations to show and edit the Display Groups to which these objects are already members were re-titled to specify the type of Display Group relevant to the operation. In the case of Simulation Objects and Accounts, this new “Add to [Object/Account] Group” operation is available only for those objects not yet in any group.

This new feature is described in this user interface document: AddToDisplayGroupsContextMenus-2010dec21.pdf

**Edit/Construct slot list for SCT**

A new tab was added to the SCT to better support the definition and modification of the list of series slots and slot dividers shown in the SCT's series slot data table (the SCT's first tab). Slot items can be defined and manipulated individually or in groups of slot items -- defined as the slot items between slot dividers. A special “Create Similar Groups” feature is supported which allows an item group made up of slots of one simulation object or account to be replicated for multiple different simulation objects or accounts of the same type. For details see SCT\_EditSeriesSlotListHelp.pdf.

**Export/Import slot notes and allow rules to write notes**

In a series slots with expressions, a RPL expression is sometimes used to calculate the values for the timesteps in the slot. The RPL expression can reference values in other slots to be used in the calculation. Reclamation in Albuquerque uses this type of slot to sum outflows for groups of accounts on reservoirs. They typically they annotate a release from an account with a note on the outflow slot for that account. They would like for the release notes on the outflows of the accounts to show up in the series slot with expression that sums the account outflows. In this sense, the notes should be “collected” from the source slots referenced in the RPL expression and shown in the expression slot. This was developed and tested by Reclamation. For details of the design and use of this functionality, please see CollectedExprSlotNotesDesign.pdf and CollectedNotesHelp.pdf.

**Integrating GIS Technology with RiverWare: Support for World Files and Upcoming Goals**

Graphical information systems (GISs) support storage, analysis, and display of spatial data. In Spring of 2010, CADSWES developed a long-term strategy for the phased integration of GIS technology within RiverWare. The first phase of this integration was introduced with RiverWare 6.0 and the main feature of this new development was the creation of a new workspace view, the Geospatial View. This view includes support for georeferenced objects and a background image registered to the view's coordinate system.

In FY11, we extended this work by improving the process whereby images are georeferenced for display in the Geospatial View. In particular, RiverWare now supports both reading and writing of files in the world file format for raster map images. The world file format is a plain text standard used by many GIS applications (originally introduced by ESRI) for georeferencing map images. RiverWare users with access to the world file description of a background image can now skip the interactive registration process for that image. In addition, once an image has been registered they can export the corresponding world file, which can then be read by RiverWare when using the same image with other models or used with any GIS application that supports the world file format. The instructions for using this can be found in OnlineHelp.GeospatialView.pdf.

While the limited time and resources available for this development constrained the scope of this work to the World File format, we also analyzed the ways in which RiverWare could make use of numerous other data formats employed by GIS applications. The results of this analysis, including recommendations and time estimates for FY12 work (funded jointly by BOR-LC and USACE-ABQ), were included in the functional requirements and design document for this work. See GISIntegration.Phase2.pdf.

**FY 2012 Goals**

**Scenario manager for Stakeholders**

This task, shared by BOR LC and USACE Albuquerque District, is to design a scenario manager that greatly extends the current one in RiverWare. We will work with sponsors and stakeholder to determine how stakeholders would like to use the tool, then design something to meet the needs.

**Performance Improvements**

Both BOR Albuquerque and USACE SWD have funded performance improvements. It is likely that these two efforts will be independent and based on the computational peculularities of the URGWOM model (accounting, groundwater objects and hypothetical simulatioin) and the SWD models based on the flood control algorithm.

**Update DSS version for direct DSS database connection**

RiverWare accesses an old version of DSS. We would like to obtain a newer version from HEC to access for the direct DSS data connection.

**CWMS Integration**

The new version of CWMS RT has a new CAVI. RiverWare must be adapted to run with the tools in this new environment. This task is to meet with HEC and other USACE personnel and contractors to determine how to achieve this.

**RiverWare Adaptor for NWS CHPS**

The National Weather Service has deployed a new “Community Hydrologic Prediction System”; it is being adopted throughout the U.S. A number of models have been adapted to running in sync with CHPS. NWS and USACE has asked that a RiverWare adaptor be developed. This task is to determine what it would take to accomplish this.

**Automated Data Aggregation Tools**

This task, for BOR Albuquerque, would allow data to be automatically aggregated. This will faciliatate the adoption of a monthly timestep model, given the currently accepted daily model. This work is scheduled to be done in FY13.

**Usability Features**

Reclamation has two additional tasks of $20K each for discretionary usability features. These are to be done in FY12 and FY13.