#### **CADSWES Maintenance Accomplishment Report Compilation -- November 2015** Phil, edit 12-14-2015.

## November 2015 Maintenance Highlights:

- 1. RiverWare 6.7.3 Release
- 2. Four (4) bug fixes.
- 3. Plotting and Output Architectural Proposal
- 4. RiverWare Qt4 to Qt5 Port
- 5. TCL Upgrade to solve Model Loading Problem
- 6. Reprise Library / RiverWare Linking Method Change
- 7. Ongoing: Monitoring and maintaining daily RiverWare regression tests.
- 8. Ongoing: Installation Process and Licensing development and administration.

Report contributors:

- Substantive content from: Neil, Phil, Jessica, David.
- Bug fix items from: Neil (2), David (1), Phil (1).
- Indicated that they had no *maintenance* accomplishments to report this month: Bill, Mitch, Tim, Patrick.

(II) RiverWare Software Maintenance

- A. Releases, Patches and Snapshots
- B. Software Updates, Bug fixes (not associated with new development)
- C. Development tool improvements; issue tracking software; modelcomp
- D. Enhancements or changes to regression tests (not part of development tasks)
- E. Download, Install and Release Processes
- F. Updates to license software/procedures
- G. Updates to download/install/configure user documentation
- H. Modification to Web pages for downloads and installs

## (II.A) Releases, Patches and Snapshots

The following releases were generated this month:

- Two RiverWare 6.8 development snapshots:
  - 11-11-2015 (for BPA),
  - o 11-30-2015 (for USACE-Tulsa)
- RiverWare 6.7.3 patch release on 11-13-2015. Release notes are as follows:

The following bugs were addressed:

- 5686: In certain situations, the Groundwater Storage object incorrectly computed negative storage due to Head Based Percolation. Now, the Head Based Percolation is limited to be less than the previous Storage, converted to a flow. In addition, the Groundwater Available for Pumping is constrained to be greater than or equal to zero.
- 5688: A crash could occur when performing an import (resize) to an accounting slot.
- For the Reach Pan Evaporation method, the Reach Pan Coefficient can now be greater than 1.0. Previously the Reach issued an error if this value was greater than 1.0.

# (II.B) Software Updates, Bug fixes (not associated with new development)

### The following bugs were fixed:

- Bug 5686: Negative Storage on Groundwater object. In certain situations, the Groundwater Storage object incorrectly computed negative storage due to Head Based Percolation. Now, the Head Based Percolation is limited to be less than the previous Storage, converted to a flow. In addition, the Groundwater Available for Pumping is constrained to be greater than or equal to zero. This bug was fixed for patch release 6.7.3.
- Bug 5687: Model saved in 32 bit RiverWare does not open in 64 bit RiverWare
- Bug 5688: RiverWare shuts down when trying to import resize a file.
- Bug 5689: Output Canvas: Multiple Teacup Groups not honoring Maximum Bar Height.

### **Plotting and Output Architectural Proposal**

Users have expressed the desire to have more user-friendly and better looking plotting in RiverWare. Sponsors have allocated funds for improvements, but before these are implemented, it seemed prudent to revisit the way that users create, save, and edit plots and other output devices. For example, there are multiple dialogs where the user can select slots to plot and configure the layout (E.g. 2X1 curves) of the plot. In both places, the user can edit the plot and the interaction between them is not very intuitive. In addition, the plots use a "Save" paradigm which has never been easy to explain or use. In November a document was started that will list deficiencies, requirements, and a proposal to improve the plots. This document in located in /projects/riverware/doc/plotting/PlottingOutputPlan.fm

### **RiverWare Qt4 to Qt5 Port**

RiverWare 6.7 and recent prior RiverWare versions use Qt 4.8.5. In October we devised changes to the RiverWare code base to compile RiverWare source code with a version of Qt5 provisionally built last spring. That work did not result in a RiverWare executable. In November, the most current version of Qt5 (Qt 5.5.1) was obtained and built from source code, dependent ancillary libraries used by RiverWare were built with that new version -- see below - and RiverWare itself was built, resulting in a basically working RiverWare executable. This was accomplished in the 64-bit environment, both debug and release builds. Some work was done for the 32-bit builds, but was not complete. More testing of this RiverWare build will be needed. The RiverWare Qt5 port will *not* be part of the upcoming RiverWare 6.8 release.

The ancillary libraries built with Qt 5.5.1 include the following. Our "win-config.pl" perl script tool for installing the required libraries onto a CADSWES Windows development machine was enhanced to support these library builds:

- 1. Qwt 6.1.2
- 2. RdfToExcel
- 3. Quazip 0.7.1
- 4. QsLog 2.0b3

The following document describes in detail this RiverWare porting and building work:

 CADSWES Qt5 Port Status / November 2015 R:\doc\Qt\2015\RiverWareQt5PortStatus-Nov2015.pdf R:\doc\Qt\2015\RiverWareQt5PortStatus-Nov2015.html

## TCL Upgrade to solve Model Loading Problem

TCL is a third-party software utilized in loading and interpreting RiverWare model files. In investigating bug 5687 where a crash was occurring on model load, it was found that the problem was occurring within TCL after a call to interpret a particular model file line. Trying to debug within TCL was not successful, so the version of the software was updated from 8.5.1 to 8.5.18 (the current 8.5 release). This update fixed the crash and allowed the model to load successfully.

Updating the TCL version required building the new source code with Visual Studio 2010 on both 32 and 64 bit platforms. Include paths and library paths in RiverWare were updated to point to the new version, and a new compilation symbol had to be introduced to allow RiverWare source code to compile successfully with TCL 8.5.18. Packages for 32 and 64 bit were created and incorporated into the win-config process so that development machines could be updated with the new TCL libraries and dlls.

With the new version of TCL, a slowdown was noticed in some of the regression tests that are run nightly for RiverWare. This slowdown is being investigated.

## (II.C) Development tool improvements; issue tracking software; modelcomp

## DevPartner

A trial copy of DevPartner was installed on a development machine to see if it would be useful in testing for memory problems during a crash on model load (Bug 5687). This was run with several configurations, but either did not detect any problem or else crashed before the problem line involved in this bug was reached. The one-week trial period was allowed to expire without purchasing a permanent copy of the software.

(II.D) Enhancements or changes to regression tests (not part of development tasks)

The regression tests continue to be maintained on a daily basis. This involves updating the regression tests to exercise new developments in the code. Also, as new code is added to the

development area, the model comparisons performed in the nightly regression tests usually show differences (for example, because a new method category may have been added). When this occurs, the regression tests need to be updated to reflect the current state of the development area so model comparisons do not fail. In addition, every week, the daily history of each regression test is analyzed to determine if the run time or model size has significantly changed because of new development.

In November, a slowdown of certain tests was noticed. After tracing through the logs, it was found that the updated version of TCL was the cause of this slow down. This will be investigated in December.

(II.E) Download, Install and Release Processes

- InstallShield project files:
  - Provisionally fixed a problem with the Print button in the License Agreement window during installation process. The button is for printing a paper copy of the legal license agreement (or to PDF if a PDF print driver is available on the user's system). Applied the fix to all six snapshot (6.8), prerel (6.7), and release (6.7.X) InstallShield project files. However further testing revealed an error of not able to print when doing an actual installing from a generated setup file. Printing from inside of the IS program while running the "Test User Interface" step does work. This only happens on my development computer, not on other two computers tested. Continue investigating.

## (II.F) Updates to license software/procedures

- Maintaining RiverWare licenses for internal development systems. This is an ongoing task.
- Reprise:
  - Completed the procedure testing for the instruction webpage (pdf file) for obtaining a Viewer license.
  - Working with Neil on solving the issue of the hacked RLM DLL file which is included in each release. Testing the RiverWare executable that has the change of statically linking in RLM library file from Neil. Created a testing InstallShield project file for generating the install file that does not include the RLM DLL file in the release.

### **Reprise Library / RiverWare Linking Method Change**

Reprise is the licensing software that is used by RiverWare. To avoid using the Reprise dynamically linked library file, which is susceptible to hacking to bypass the licensing, RiverWare was configured to link with *static* Reprise libraries. This means that the licensing code is compiled directly into the RiverWare binary executable file and does not rely on the separate Reprise dll file. This statically linked executable is being tested. If all aspects of license functionality work successfully, the static linking will be incorporated into the RiverWare build process.

## (II.G) Updates to download/install/configure user documentation

- Completed the instruction webpage (pdf file) for obtaining a Viewer license. It is different than the complete Viewer License User Guide. The complete user guide is a link on this Viewer license page for users who need more detailed instructions. This webpage contains the simplified quick instructions and downloading links for users who are already familiar with the Viewer license request process.
- Implementing a new online document which describes the differences between all the license types we currently offer so user can make decision about which type of license best meets their needs.

(II.H) Modification to Web pages for downloads and installs

None reported for November 2015.

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