



Center for Advanced Decision Support for
Water and Environmental Systems (CADSWES)

UNIVERSITY OF COLORADO **BOULDER**

Training, Licensing, Releases, Software Maintenance

**2025 RiverWare User Group Meeting
Edie Zagona and RiverWare Team**

Major RiverWare Activities at CADSWES

- Software development (R&D)
- Basin Specific modeling and sponsor support
- Software Maintenance and Releases
- Help Desk – User Support Hours
- Training/ Tech Transfer - formal classes, online materials
- Support of licensing for Venture Partners

Training

Currently all RiverWare training classes are remote/virtual via zoom

- 5-day Advanced Simulation and Rulebased Simulation
 - 2.5-day Simulation only and 3-day Rulebased Simulation Only are embedded
- Accounting – 3-day offered once each year (with special classes as needed)
- Optimization – 3-day class – Plan to offer in 2025 or early 2026
- Additional training plans:
 - 1 or 2-week RiverWare and River System Management for foreigners– suspended for now
 - Dedicated Training classes: standard + specific models – on demand
 - Online materials ; informational tutorials – are enhanced when possible
- Needs? Special topics?

Deskhelp Support

Provided to licensees through purchased support hours

Sponsors have User Support funding in their contracts

All user support questions should be sent to:

riverware-support@colorado.edu

Multiple support staff receive email and most appropriate or available person can respond

Provides assistance for

- “How to” use the software to accomplish your modeling objectives
- Analyzing problems
- Interpreting results



Software Development (R&D)

Goal: deliver professional quality software applications that meet users' needs

R&D Team:, water resources engineers, operations research analyst, professional software developers

Support Team: software configuration management, hardware and software maintenance, licensing, releases

Process

- Requirements analysis and documentation
- High level design document/ Estimates
- Detailed designs for sponsor review
- Implementation and testing
- Pre-release or snapshots for testing
- Feedback from sponsors, further testing
- Final release, user documentation, regression tests



Funded typically by Sponsors, sometimes by others under contract agreements
(all users have access to all development)

Basin Specific Modeling/Reviews

CADSWES focuses on R&D and Tech Transfer but assists with applications when necessary (funded by users or sponsors under contracts or user support funds). Examples:

- Models that use new RiverWare software features/functionality
- Applications or special studies that benefit from expertise not yet developed in agencies or with consultants
- Model reviews, performance analysis

We encourage in-house expertise and use of consultants; this benefits all users and CADSWES

Software Maintenance and Releases

This work includes

- **Keeping the software upgraded** for new versions of compilers, operating systems, platforms and third-party software libraries
(Qt (with WebKit), Qwt, CPLEX, Concert, GDAL/OGR, FlexLM, Reprise, Oracle, Tcl, netCDF, Google Protocol Buffers, QuaZIP, Java Runtime Environment)
- **Issue tracking and fixing**
 - Maintain issue tracking application (Jira online)
 - Critical issues fixed immediately for next patch release
 - Non-critical issues deferred to next major release or later
- **Minor enhancements, refactoring, modernizing GUI**
- **Maintaining Development and Builds Environments:**
Microsoft Visual Studio, Source control (Git and Git Extensions) GitHub Actions, Purify and Quantify, DevPartner BoundsChecker, Regression tests, modelcomp

Software Maintenance and Releases

- **Releases**

Major releases: RiverWare 9.4 – usually 2 per year

Patch releases: RiverWare 9.4.1 – as needed

Generated from last full release with fixes and minor enhancements, possible doc updates; Tested and verified (usually without a prerelease)

- **Installation and Licensing**

Installshield updates, license software updates, issue licenses, maintain online payment web pages, maintain user databases, send quotes, invoices, renewal notices

- **Maintain download Web sites, upload ftp site, user support tracking tools**

- **Ongoing improvements for cyber security compliance**

includes compliance with new Secure Software Development Framework under Exec Order 14028-4e; established by NIST and mandated by OMB; Static code analysis

Funded by sponsors and license fees (by MOU agreement with CU, BOR, TVA, USACE)

Licensing of RiverWare by University Venture Partners

- RiverWare is University of Colorado Intellectual Property and is licensed by agreement with Sponsoring Agencies
- CADSWES assists with licensee communications and payments on behalf of VP
- Upcoming enhancements: Activation Pro licensing that does not require machine information to generate license files