



**CADSWES** University of Colorado

Center for Advanced Decision Support for Water and Environmental Systems

# Water Accounting: New and Upcoming Features and Training

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RiverWare User Group Meeting  
February 10-11<sup>th</sup>, 2010

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# Presentation Outline

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- Accounting Class Status and Outline
- Diversion Account Enhancements
  - Variable Efficiency Return Flows
  - Split Return Flows
  - Route Return Flows
- Upcoming Enhancement – Controller Work

# Accounting Class

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Offered twice last fall to a total of ~30 students  
Next class later this spring/summer

## Day 1

- Overview of accounting system
- Run and view an accounting model
- How accounting works
- Building an accounting model

# Accounting Class Outline

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## Day 2

- Accounting Utilities
- Rules and Accounting – Strategies and features
- Exchanges

## Day 3

- Water Rights Allocation
- Exercise: Designing a Water Rights Allocation Model

# Diversion Account Enhancements

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- Variable Efficiency Return Flow calculation  
New Method in the Return Flow Calculation category:  
Variable Efficiency Return Flow

$$Efficiency[t] = \min\left(\frac{DepletionRequested[t]}{Diversion[t]}, MaximumEfficiency\right)$$

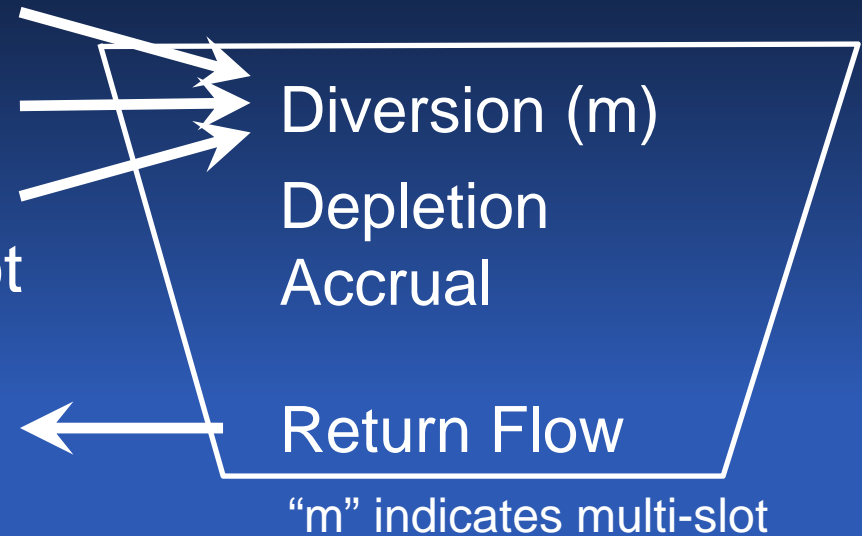
$$Depletion[t] = Diversion[t] \times Efficiency[t]$$

$$tempReturnFlow[t] = (Diversion[t] - Depletion[t])$$

# Diversion Account Enhancements

## Requirements:

- Split Return Flows
  - Return Flow is a Series Slot
  - Need to return to multiple accounts
- Route Return Flows
  - “Return Flow Lag” is integer timesteps
  - Need to route using response coefficients



# New: Return Flow Route or Split category

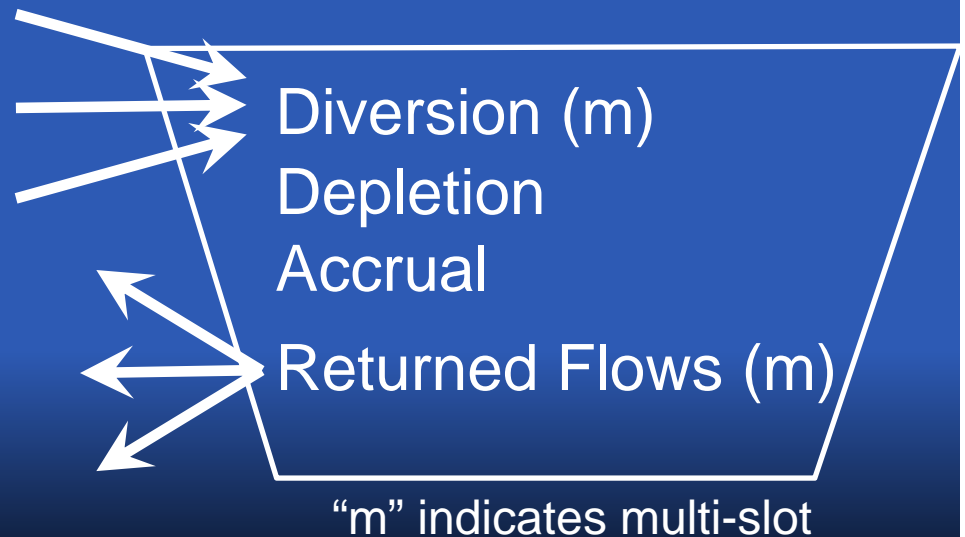
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- **Simple Lag**: default; existing behavior and slots
  - No splitting allowed
  - Integer timestep lag
  - Solves as before: Sets Return Flow at  $t+\text{lag}$
  - Use with `SolveWaterRights()`

# Return Flow Route or Split category

## ➤ Split and Route:

- Split tempReturnFlow using proportion
  - Multi Return Lag Coefficients
  - Solves for Returned Flows[t] using previous values for routing
  - Cannot use SolveWaterRights()
- Use caution when switching methods as supply links may be broken





# Upcoming/Current Work - Controller

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## ➤ Background:

- Object Level Accounting Methods (OLAM) connect the physical and accounting systems.

E.g. a method specifies how physical Local Inflows are divided to the accounts' Slot Inflow slot.

- Accounting controller executes the OLAM after simulation on a timestep
- This limits the method's usefulness as rules can't reference current accounting values

## ➤ Enhancement:

- Let the user specify when each method will execute

# Execution Time Options for OLAMs

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- Beginning of Run
- Beginning of Timestep
- Beginning of Timestep and as Dependencies Change
- Beginning of Accounting Timestep and as Dependencies Change (previous default)

# Setting of OLAM Execution Time

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- For a single Object:

Via combo box in the Open Object dialog where the method is selected.

- For Multiple Objects at Once:

Via combo box in the Multiple Object Method Selector where a method selection can be applied to many objects

# New Compiled Accounting Methods

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## ➤ Zero Slot Inflows

- Sets Slot Inflow slot on all accounts to zero
- Default execution time is Beginning of Run

## ➤ Copy Slot to Slot Inflow

- Copies the physical Local Inflow value to a specified account's Slot Inflow slot and zeros the other accounts
- Default execution time is Begin Timestep
- Account is specified in a List Slot on the object
- Account can be specified by name or water type for many objects using the Multiple Object Method Selector

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Questions?  
Comments?  
Suggestions?