

## HEC-ResSim 3.1 Release Notes (May 2013)

Version 3.1 (May 2013) of the Reservoir System Simulation program (HEC-ResSim) is now available. This version supersedes Version 3.0 which was released to the general public in April 2007. Several new features, as well as enhancements to existing features, have been added to the program since that time. The new features to look for are listed below along with the [\[reference Section in the User's Manual\]](#):


- **New Features:**
  - Variable **Lag & K** Routing Method [\[9.2.1.8\]](#)
  - **Variable** Power Plant **Capacity** [\[10.17.2\]](#)
  - **Flexible Zone** Definition [\[11.3.3\]](#)
  - **Flow Contingency** for Downstream Operation [\[11.5.4\]](#)
  - **Advanced Options** for Downstream Operation [\[11.5.4\]](#)
  - Induced Surcharge **ESRD Curves** [\[11.5.6.2\]](#)
  - Induced Surcharge Falling Pool Release Option to **Maintain Peak Gate Openings** [\[11.5.6.3\]](#)
  - **Projected Elevation** Operation [\[11.12\]](#)
  - Alternative **Run Controls** (Time Step & Flow Computation Method) [\[13.4\]](#)
  - Alternative Time Series (**Plot & Tabulate** DSS data; **Inflow Multipliers**) [\[13.8\]](#)
  - Alternative **Hotstart** Capability [\[13.10\]](#)
  - Simulation **Run Manager** [\[14.1.1\]](#)
  - **Storage** (or Elevation) **Overrides** [\[14.6.3\]](#)
- Other **Enhancements** and **Improvements** include:
  - Capability to turn on/off the **Grid Lines** in the Map Display region [\[2.2.1\]](#)
  - Network **Connectivity Tool** [\[8.1.3\]](#)
  - **Import Network** [\[8.2.3\]](#)
  - **Simulation List** (summary of Alternatives last computed in each Simulation) [\[14.1.1\]](#)
  - In a Simulation, select multiple Alternatives to “**Replace from Base...**” [\[14.1.1\]](#)
  - New **Compute Options** to “Save GC Releases to DSS” and “Consider ROC rules during Downstream operation logic” [\[14.4.2\]](#)



We strongly recommend that **before** you start using **HEC-ResSim 3.1**:  
➤ [make backup copies](#) of your existing watersheds (and consider having separate modeling locations for v3.0 and v3.1 H2Osheds)

As you **use HEC-ResSim 3.1**:

- 1) check the data in all elements of your model, being especially vigilant in reviewing your operations rules
- 2) *verify the operation of your current models with ResSim 3.1, and*
- 3) *once satisfied with the results produced by the new version for each of your current models, make another set of backup copies. This second backup copy is suggested because when you open a watershed in ResSim 3.1, the format of key model files is changed, thus making the watershed unable to be opened with older versions of ResSim.*

Please refer to the HEC-ResSim User's Manual [\[Section\]](#) for details regarding the new features, enhancements and improvements. The Table of Contents includes  markers to help you quickly identify and find descriptions for the new features.

A brief overview for each of the **new features** is provided below:

1. **Variable Lag & K Routing Method** [\[9.2.1.8\]](#)

The Lag & K method is a hydrologic storage routing method for use between flow points that is based on a graphical routing technique and is extensively used by the National Weather Service (NWS) in their hydrologic forecasting models.

2. **Variable Power Plant Capacity** [\[10.17.2\]](#)

The installed power capacity at a power plant can be entered as a *constant* MW value (along with an Overload Factor), or as a variable power capacity that is a *function of*: Reservoir Elevation, Reservoir Storage, Release, or Operating Head.

3. **Flexible Zone Definition** [\[11.3.3\]](#)

Use this feature when the zone definition is a *function of*: Date, Date and Time, Model Variable, External Variable, or State Variable.

4. **Flow Contingency for Downstream Operation** [\[11.5.4\]](#)

For downstream operations, a flow contingency percentage can be applied to the cumulative local flows at the downstream location. This contingency value can be entered as either a *constant* or as a *function of* the downstream location's cumulative local flows.

5. **Advanced Options for Downstream Operation** [\[11.5.4\]](#)

For downstream operations, two adjustments can be made that impact the reservoir release decision process: (1) how routing attenuation is considered; and (2) how rate-of-change rule constraints are handled. These adjustments can be made *globally* (all downstream rules at all reservoirs) or can be applied to *individual rules*.

6. **Induced Surcharge ESRD Curves** [\[11.5.6.2\]](#)

Emergency Spillway Release Diagram (ESRD) curves can be entered as an "Elevation vs. Minimum Release per Inflow" relationship or as an "Elevation vs. Min Release per Rate of Rise" relationship.

7. **Induced Surcharge Falling Pool Release Option to Maintain Peak Gate Openings** [\[11.5.6.3\]](#)

This option indicates that the maximum release will be held until surcharge operation is no longer applicable and normal operations are resumed.

8. **Projected Elevation Operation** [\[11.12\]](#)

During the rising limb of an inflow event hydrograph, to better manage an expected reservoir inflow without violating the downstream channel capacity, release decisions are based on projected future reservoir elevations, rather than current lake elevations.

9. **Alternative Run Controls** (Time Step & Flow Computation Method) [13.4]

From the *Run Control* tab in the Alternative Editor, you will need to select a Compute Time Step (ranging from 5 Minutes to 1 Day) and choose a Flow Computation Method (Program Determined, Period Average, or Instantaneous) to indicate the appropriate technique to be used in the computations.

10. **Alternative Time Series (Plot & Tabulate DSS data; Inflow Multipliers)** [13.8]

From the *Time-Series* tab in the Alternative Editor, you can review the data values in a DSS record in a graphical or tabular form. You can also use Inflow Multipliers to increase and/or decrease the incremental local flows. These multipliers can be used globally or by location.

11. **Alternative Hotstart Capability** [13.10]

From the *Hotstart* tab in the Alternative Editor, you can Create and Load Hotstart Files. Basically, this feature can be used instead of using the Lookback period data for determining the system state (i.e., assign a previously simulated watershed state to another alternative or simulation).

12. **Simulation Run Manager** [14.1.1]

This option provides you with the capability to select and compute multiple alternatives in a simulation. You can also select and view the compute logs for each alternative.

13. **Storage (or Elevation) Overrides** [14.6.3]

Force the reservoir storage (or elevation) to be values specified by the user. Specifying these override values *can disrupt mass balance* computations; therefore, you *must use caution* when using this override option.