

Modifications and Required Changes from Previous AdH Input Formats and Expected Simulation Differences (Version 4.01)

- The Eddy Viscosity computations have changed. The estimated eddy viscosity computation now has three options: 1) isotropic, 2) anisotropic, and 3) Smagorinsky. The EEV card now requires a method indicator after the coefficient. All coefficients, regardless of the option, should lie between 0.1 and 1, with 0.5 as a good starting point for options 1 and 2 and 0.2 for option 3. The method will default to isotropic if one is not specified.
- An MP FRC card has been provided to allow users to remove elements from the computation matrix when the wet area of the element falls below the fraction value provided on the card. The default value for this card is 0.5 or 50%. Previous versions of AdH removed elements from the computation when the average nodal depth was less than zero. This change in the element inclusion criteria will likely modify your results in the area of the wet/dry boundary as well as your run performance.
- An additional output file is provided to give the user the non-normalized error value for hydro and transport (when running transport). These files remove the need to determine the SRT and TRT values with separate simulations since the values are stored in separate files labeled *project_name_err_HYDRO.dat* and *project_name_err_TRANS.dat*. Again, the values in these files are not normalized by the tolerance values. The values in the *project_name_err.dat* file are normalized and represent the maximum of the hydro and transport at each node.
- The error computation for transport has been modified. A new equation is being used to compute the value that will trigger element refinement for transport so previous values on the TRT (transport refinement tolerance) card will provide different results with version 4.01 and should be re-evaluated.
- A breach option is available to define the elevation of the bed at a breached location so that the erosion on the breach can be included in the simulation. This is done with the DB BCH card and a bed elevation (*project_name_belev.dat*) output file is provided to track the bed change at the breach.
- The screen output format now has 3 levels. PC LVL can be set to 0 or 1 with 0 being a short format option and 1 being a long format option. The default is PC LVL 0. PC OLD can be used to get the non-tabular output format that early users of AdH may be accustomed to. The short and long formats are given below.
 - Short - from left to right is time, time step size, percent completion progress, nonlinear iteration number, linear iteration count, node number

giving the maximum residual, node number giving the maximum increment norm, node count after adaption, failure flag

- Long - from left to right is time, time step size, percent completion progress, nonlinear iteration number, linear iteration count, maximum residual norm, node number giving the maximum residual, x, y, and z-coordinates of this worst node, maximum increment norm, node number giving this maximum increment, x, y, and z-coordinates of this worst node, node count after adaption, failure flag

- A new interactive user site has been developed for AdH (and is continuously being updated) called the Knowledge Hub (<https://knowledge.usace.army.mil/Login.aspx>) . This site is currently only available to USACE employees. The site houses the user manual and quick reference as well as video instructions and other documentation. This site allows users to share knowledge and ask questions. This site will eventually replace the current AdH website for 2D shallow water and will become the primary means of communication with our development team. We encourage you to take a look at the Knowledge Hub user guides and join the Adaptive Hydraulics community. The documents below are provided in the KnowledgeHub folder of the AdH ftp site.
 - **KH_joiningtheHub.pdf**. This document outlines the steps to join the Hub, including making sure the plug-ins and certificates are installed.
 - **KH_getting_started.pdf**. This document outlines how new users can make connections to individuals and communities.
 - **KH-creating_communities.pdf**. This document outlines how to create communities and managing communities.
 - **KH_troubleshooting.pdf**. This document outlines some of the issues with getting on the Knowledge Hub. I would recommend sending this one whenever you send KH_joiningtheHub.pdf.
 - **KH_welcome_condensed.pdf** and **KH_welcome_expanded.pdf**. This is a one-page and a four-page overview of the Knowledge Hub. Choose whichever one is appropriate for those seeking more information about the Hub.

For more information on these cards and up-to-date information, see the ADH 2-Dimensional Shallow Water Manual and the ADH Quick Reference at <https://adh.usace.army.mil>. (until the new site gets up and running)