

Q&A Report: HEC-RAS Past, Present & Road Ahead

#	Question	Answer	Answer Name
1	Why is it "H-E-C" and "RAS"? i.e. the first three syllables and the second one syllable?	Correctly, it should be "H-E-C" R-A-S", where the R-A-S stands for River Analysis System.	Evan O'Brien
		But you hear all kinds of combos.	Evan O'Brien
		So hence Krey misspoke?	Attendee
		Yes, but the meaning is still commonly understood.	Evan O'Brien
		I often run into HEC-RAS v5 where depth grids are pulled into ras mapper but you have to an old version of ArcGIS which often is not available. It seems ESRI is not always in sync and often you cannot pull older depth grids into current version of GIS. Any suggestions?	
		PS I don't model anymore just run BCAs	Attendee
2	floodplain hatch	Correct	Evan O'Brien
3	can i link my HEC-RAS to HEC-WAT and kind of do a Monte Carlo analysis?	I believe so., although I don't have any experience in this.	Evan O'Brien
4	can i use HEC-RAS for modelling a river catchment for water allocation purposes ?	Not really. HEC-RAS is mostly designed for event-scale flooding (hours, days), whereas water allocations are typically modelled on a daily timestep and consider long term flow series spanning many years.	Evan O'Brien
5	I'm confused as to how do I validate a 2D model when the roughness are all spatially distributed. Do I just focus on a "zone" in the waterway or in the floodplain? Given my validation data is only an anecdotal flood level.	Yes, a common issue. The model calculates water surface elevations everywhere in the 2D domain, but calibration and validation can typically only be carried out on a point by point basis. It is unusual to have more than 1 or 2 high quality stream height gauges within a model domain. Absent gauged data, one has to rely upon flood markers and other anecdotal evidence. In such a scenario if your model is within +/- 0.3m you are probably doing well.	Evan O'Brien
		I see, thanks. It was really hard to get stage data in the waterway and most of the time we only rely on residents records. The rainfall data could also be very coarse.	Attendee
6	thank you for the feedback	You are welcome.	Evan O'Brien
7	Currently the HEC-RAS 2025 is in Alpha version, would you know the official release date? And why is that the HEC team do not recommend using it for projects?	As to the release date, Mark will probably have more to say on this later in the webinar. The reason not to use it for projects is that it almost certainly still contains bugs/errors in the code. And also that key features are not yet implemented. Ultimately if you used it for a paying project you might open yourself to liability in the event that your model results were later shown to be wrong. In the meantime, you can generate a RAS2025 mesh and import it to HEC-RAS 6.7.	Evan O'Brien
8	I'm new to RAS/HMS and looking to model urban catchments. Are coupled 1D-2D models with pit and pipe networks and WSUD infrastructure possible?	Yes, but not yet fully featured. I ran a course on this recently, and I will have a few words to say on this topic in a moment.	Evan O'Brien
9	are the validation tests run with flumes or real river systems?	IIRC, it's a comparison of HEC-RAS results against physical models.	Evan O'Brien
9	are the validation tests run with flumes or real river systems?	And there are some specific solutions that have an analytical solution. These are also compared to modelled results.	Evan O'Brien
10	Does HEC-RAS have tools to do hydraulic assessment for pressurised pipeline network?	Yes, but it is still in beta, and has some limitations. I will have a few words to say about this in a moment.	Evan O'Brien
11	Regarding the meshing capabilities of HEC-RAS 2025 (then imported in HECRAS 6.6) is it better to use the triangles rather than grids on the floodplain?	live answered	Evan O'Brien
		Probably depends on if you know the primary direction of flow. Triangles are better for unknown paths on the floodplain. Squares for use in the channel where flow is primarily 1D.	Attendee
12	Given meteorological data such as rainfall, can this parameter be modelled to simulate the effects of flooding in a catchment and its impact on the hydraulic infrastructure within the cathment?	Yes. Precipitation can be applied as a boundary condition to the 2D domain.	Evan O'Brien
13	Can i use a 5x5m DTM when I want to simulate pipes within HEC-RAS?	5m resolution is probably too coarse for most applications. A piped network typical of a kerb and channel system requires a DEM that can capture the road crest and kerb heights. Even 1m DEM is sometimes too coarse, and may require augmentation with additional data (eg. external survey implemented as vector modifications)	Evan O'Brien
14	What is the difference between the precipitation added directly at the perimeter than in the meteorological model?	Assigning precipitation via the meteorological model opens up additional flexibility to apply spatially varying data, among other things. Precip applied to the entire grid has temporal variation only.	Evan O'Brien
15	Can the mesh be created in different cell size near creeks similar to Quadtree model in TUFLOW?	Yes. This is possible in both v6.7 and v2025. And is something that should be considered in any good model.	Evan O'Brien
16	why is RAS 2025 moving away from structured mesh?	Flexibility. An unstructured mesh can still be defined to produce a series of fairly regular rectangles if required.	Evan O'Brien
17	What are the minimum system requirements for the RAS 2025, What about parrallelization?	Not dissimilar to the current v6.x. Once the gpu solver is implemented there will be additional requirements (eg. recent nVidia GPU)	Evan O'Brien
18	can HEC model underground pipes?	Yes	Evan O'Brien
19	pipe network	live answered	Evan O'Brien
20	I am grateful that HECRAS 2025 is now only 1 window 🙏. Will HECRAS 2025 bring all the features that are present in the current HECRAS 6.7?	That's the general idea. Functionality is being incrementally added with each update. The HEC website has the feature roadmap.	Evan O'Brien
21	Given that RAS2025 can take advantage of recent GPU technology, does it make sense to increase the mesh size to better capture terrain/flow gradients? Pros/Cons?	It's a matter of preference. My observation is that as soon as TUFLOW implemented the GPU solver, a lot of engineers simply turned off their brains and started building ugly brute force models.	Evan O'Brien
		I think that additional detail should only be added if it materially improves the quality of the answer. Keeping in mind that accuracy and precision are not the same. Most models will be limited by the accuracy of the hydrograph inputs, and then by the accuracy of the underlying terrain model.	Evan O'Brien
		Thanks for the thoughts. I'm currently modelling a terrain that is complex and saw countless small flow paths. Being able to reduce cell size was great for figuring out the main flow paths, so that I can now refine my mesh.	Attendee
22	Is the HEC-RAS pipe modelling at the level of detail compared to SWMM?	Not yet.	Evan O'Brien
23	Does HEC-RAS 2025 can take in account the emergence of groundwater?	I'm not sure. But if so, I think it would probably be pretty far off. Check the website to see if it's listed on the future features.	Evan O'Brien

24	With increasing availability of LiDAR data, we've basically switched to 2D modelling only. However, regular LiDAR only captures the water surface but not the bathymetry. Any thoughts on using terrain with water surface only, not using bathymetry?	Don't do that! Your velocities are much different since you don't have the full depth of the channel.	Attendee
		Ryan makes the salient point. If the water surface obscures a significant portion of the channel, then you will need to obtain bathymetry or otherwise make some approximation of it. This is typically a problem in large rivers, especially in the tidal zone. For smaller and/or inland rivers where the majority of flow is carried on the floodplain it's not such a big issue.	Evan O'Brien
		What if getting bathymetry is not an option, e.g. remote location? I've read that reducing the roughness at the watersurface could make sense. Also, if LiDAR was collected at low flows, and we're interested in high flows, effects of missing bathymetry can become negligible.	Attendee
25	Thank you. At what horizontal resolution can be modeled the floodings in a city?	At the resolution of your underlying digital elevation model. Practically, that means a lower limit of 1m	Evan O'Brien
26	Can HEC-RAS do all the work can be done by TUFLOW? If yes, why do people pay for TUFLOW license instead of using free HEC-RAS?	live answered	Evan O'Brien
27	Does HEC-RAS take into account the management of sediments as you model hydraulic structures such as dams, etc on run-river systems ?	I'm not sure. There are all kinds of sediment transport features, but I've not yet investigated if it can be used to calculate sedimentation of a dam	Evan O'Brien
28	What are your thought about modelling wind generated waves with HEC-RAS 2D and RAS 2025 ?	A niche case, but quite easily done.	Evan O'Brien
29	can the inlet be modelled as per Hec 22?	No, it allows the user to use either a weir or orifice	Mark Forest
30	How do you model a sediment simulation when you dont have a sediment load timeseries / data on a section of the waterway?	You acknowledge that you don't have sufficient data for an accurate answer, and advise your client accordingly.	Evan O'Brien
31	is development happening during the shutdown?	live answered	Evan O'Brien
32	Does the AWS consider giving waivers to students when undertaking the courses or trainings being offered ?	We can provide a discount for group registrations. We also periodically offer special discounts for training courses.	Anushree Mistry
33	Is there a plan to implement "direct rainfall" into the model? Also, how about being able to read external hydrograph files (e.g. DRAINS or RORB) as a time series for multiple different temporal patterns, AEPs, durations (i.e. batch mode)	Direct rainfall already exists in v6.x External hydrographs cannot be read directly from other programs, but you could investigate using HEC-DSS as the middleman	Evan O'Brien
		ARR recommends finding the median flood surface from an ensemble of temporal patterns per duration. At the moment, it is very cumbersome to do this as you need to create many individual files in HECRAS	Attendee
34	Hi i'm quite new to HEC RAS. Just wanted a quick clarification from you if thats possible. My 1D steady model under mixed conditions eports 'energy equation not balanced' and defaults to critical around 50 m upstream from my weir. Ive cut closer cross sections and tried fixes but it didnt help. Should treat it as a must-fix before using results.	Sounds like your model is not quite stable. Perhaps you have inappropriate boudnary conditions. There will be lots of info online that will help you solve the problem.	Evan O'Brien
35	Are ARR 2019 ensembles doable in HEC-RAS?	Yes. It just requires the correct number of boundary condition scenarios to be set up.	Evan O'Brien
36	can we model transitioning from open channel to pressurized flow	Yes, but the functionality is still in beta, so use with caution.	Evan O'Brien
37	can HEC import ARR 19 rainfall data?	There is no automated import function, but you can get ARR design rainfall and apply it as a boundary condition.	Evan O'Brien