Questions and Answers from the Oct. 29, 2020 CTP Webinar: Using a Depth x Velocity Product in Conjunction with Floodways

Wouldn't the increase in the flood fringe of the 1-foot surcharge be less than 1 foot, because it's spread out over a larger area than the floodway?

Yes, that is correct. Floods are a volume issue so as flooding spreads out into the flood fringe the increase in flooding may be less than one foot. However, most engineering analyzes do not account for the loss of storage as the flood fringe is filled. Ataul Hannan highlighted in his presentation that when loss of storage is taken into account the increase in flooding can be 2 to 3 feet instead of one foot. See slide 63 of the slide deck for details.

Does FEMA have a preference which Floodway method to use: DxV or Equal Discharge Reduction?

SID 73 of FEMA's Standards and Guidelines is in the process of being revised. It presently states: An equal conveyance reduction method must be used to establish the minimal regulatory floodway, except where an initial equal conveyance floodway is adjusted in coordination with FEMA and the impacted communities.

The proposed revision which is scheduled to be published with a publication date of November 2020 will state:

A methodology based on equitable consideration of both overbanks must be used to establish the minimal regulatory floodway. Variations to this approach must be made in coordination with FEMA and the impacted communities.

This will enable the use of DxV data when defining floodway boundaries.

Don't most communities require new construction to be 1' above BFE already?

Many communities do require new construction to be 1' above the BFE, however many do not. In addition, while freeboard does help address the impacts of surcharge on new construction, it does not address the impacts on existing development or the impacts on development outside the SFHA as the floodway fringe is filled causes flood inundation to extend beyond the SFHA.

If a constriction downstream causes a 1-ft rise, the upstream area will see 1-ft, regardless of the spread. I'm from Arizona and all new development adjacent to a watercourse must be built at least 1-ft above the BFE. Are there really communities that allow development adjacent to a watercourse with no freeboard? That seems to defeat the purpose.

Many communities do require freeboard for construction within the SFHA, however, many do not. We are not aware of communities other than what you state about Arizona that require new development outside the SFHA to be built above the BFE.

The concept that SFHA mapping is created that allows development to encroach into the natural floodway and cause increased flooding on existing development and new development legally built to the height of the BFE does indeed seem to conflict with the basic intent of floodplain management regulations.

ASFPM recommends that communities be provided information and the impacts of selecting and adopting a floodway with a surcharge. The poll we ran after the presentation on floodway impacts indicated that in the opinion of those attending the webinar over 60% that responded felt that over half of communities if made aware would adopt higher standards floodways.

Since insurance rate are moving to more frequency based rates instead of historic "zone" based rates, are Floodways even necessary? Communities can set their own floodways through zoning.

When higher standards floodways are adopted those regulations are very effective in limiting the impacts of encroachments into the Special Flood Hazard Area. It is unclear whether the new rating structure will have a component that would limit encroachment impacts and how the associated mapping will be developed to support floodplain management. Zoning is a tool available for communities to ensure that development in communities can be properly planned and can occur in a manner that is consistent community values. How zoning will be used to address issues that are currently being addressed by the floodway regulations associated with the NFIP is unclear. Without federal minimum standards there is a concern that zoning regulations will vary across the country and in some cases will be politically motivated and not based upon science.

How do you handle isolated areas that fall below your floodway standard but are surrounded by floodway?

We recognize there will be isolated areas or islands of higher ground or slower moving water and these are not regulated as a floodway but might still be below the BFE and are regulated as a flood fringe. New or substantially damage/improved structures are not permitted in the floodway but might be possible on an "island" of flood fringe if mitigated property (e.g. elevated). It is quite common in our agricultural areas the old timers built their homes on these slightly higher areas and we work to preserve farming where it is safer.

FEMA uses 5 (fps) * ft. What is the basis for that desirable limit?

I am not aware of FEMA's rational for their standard.

What happens when DFF Floodway is outside SFHA?

The county regulates to best available data as well as the SFHA. The DFF Floodway was based on LiDAR data that was not available for the countywide remapping project, so there are many locations where a better representation of the flood hazard is in the DFF Floodway study. We also regulate erosion risks (aka channel migration zones) and to the surveyed base flood elevation that might not match the FEMA FIRM.

Is 1d steady state model and 2d unsteady? Are same inflow used for 1d and 2d?

The 1-D model was steady state and the 2-D model was unsteady but was calibrated to match as close as feasible to the published base flood elevation. Initial peak flows were the same.

Did you consider using depth x velocity instead of depth of 3 ft and velocity of 3ft/s?

I'm not sure that in the late 1980's when the county first adopted the deep and or fast flowing water floodway regulation the depth/velocity product method was well documented. The county did use the ACER Technical Memorandum Number 11 published in 1988 by the Bureau of Reclamation which was an authoritative source.

WA case study: Did anyone challenge your DFF floodway and claim a "taking"? If so, what was your response?

The county has been challenged in court over vesting and denial of a variance. The county's rulings were upheld at every level of state court. In Washington State the Attorney General publishes guidance to help communities avoid a "takings" decision, see https://www.atg.wa.gov/avoiding-unconstitutional-takings-private-property

Was filling considered in mobile home area with low velocities?

In a floodway no fill is allowed. This standard is not to protect from erosion but the DFF Floodway threshold is set to protect children's lives.

What happened to the families? Where did they go and was equity discussed in the community as a learning moment?

The previous mobile home families moved to other mobile home parks outside the floodway or found other housing options. Equity is a subject we continue to learn about and try to fairly implement. We know that when we are buying out a flood prone neighborhood, we are radically changing the community in the process. We also know that if our flood risk messaging were to take hold in society floodplains would not be considered as valuable. Then would only low-income people live in the floodplain, and would government respond the same way in a flood without wealthy and politically connected parties affected by the flood?

Is DFF in your floodplain management ordinance?

The DFF floodway is defined in Pierce County Code – PCC Title 18E.70.020.B.2

https://www.codepublishing.com/WA/PierceCounty/#!/PierceCounty18E/PierceCounty18E70.html#18E.70

What do you do with properties that are already built in a new defined floodway? Would they have to pay new insurance rate or relocate? Was there a public push back on the remapping?

Structures that are in the floodway are subject to substantial damage/improvement limits. If more than fifty percent of the structure is damaged over a five year rolling time period the structure looses its "non-conforming rights" and any building permit would be treated as a new project. Flood insurance rates are based on the FEMA mapping of the SFHA and not effected by the other risks that the county regulates. There has be little public pushback on the DFF Floodway as people understand that children should be able to live in a safe home.

Where does the regulatory authority lie for DFF?

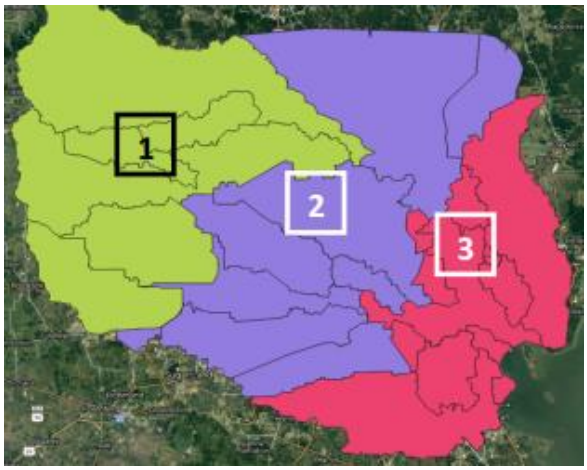
It comes from County ordinance listed above.

Do you share the 2D model (the non-FEMA model) with engineers when they're wanting to show a no-rise? How do they request it?

We do not allow development in the floodway, so the developer needs to avoid rather than show a no-rise. We do share all of our modeling data and program files on request so that if someone what to challenge the modeling they can.

How was the rainfall depth adjusted for such a large 2D area?

We have three hydrologic regions in Harris County. Rainfall are assigned to watershed based on the hydrologic region it is in (see below).



Region	24-Hr Totals (Inches)			24-Hr Totals (Inches - AMS)		
	100-Year			500-Year		
	Current	Atlas 14	% change	Current	Atlas 14	% change
1	12.4	16.3	31.5%	17.7	24.2	36.7%
2	13.2	16.9	28.0%	18.9	25.0	32.3%
3	13.5	18.0	33.3%	19.3	27.2	40.9%

Was the Colorado State University, July 1988, physical study for the Product Number Flood Hazard Concept - Verification Study that supports the David Love analysis included in the recent analyses? It reflects hydraulic flume testing of the hazard to people.

Yes.
Car Floatation Analysis, Simons, Li & Associates, Inc., prepared for City of Boulder, 1984
Analysis of High Hazard Flood Zone, David J. Love & Associated, Inc., prepared for the City of Boulder, 1987
Downstream Hazard Classification Guidelines (ACER Technical Memo No. 11), US Bureau of Reclamation, 1988

We are using that information for Step 1 to start with a D*V number. The final product number will be finalized by Step 2 and 3. During Harvey event I walked along flooded roads with various depths and velocities. I think as a start the information is good enough.

Did you look at EGL changes in the supercritical flow regime?

In Harris county we do not experience supercritical flow regime. The terrain is very flat.

If you are treating the entire floodplain as floodway (no rise, CLOMR/LOMR required, etc.) then why bother going to so much trouble to define a different floodway?

Yes, we do treat our floodplain as floodway. FEMA floodway have been already identified for the 1,200 miles of detailed study areas in Harris County. In the MAAPnext effort the communities prefer to have FEMA floodway.

I don't understand this table, for volume? No and Yes, what does that mean?

In a steady state RAS floodway modeling routing is not included. If changes are made in the geometry file it needs to be recycled in HMS to have new flows. If not done volume is **not** checked. In unsteady model it will show the effect of any geometry change and **includes** volume changes.

What was n=1 supposed to be representing, an encroachment in 2D because you can't do it like you do in 1D?

Yes. We are using n=1 in all areas excluding the floodway area to find the surcharge like we do in 1D steady state modeling.

Does this approach (n=1.0) work where you allow floodplain encroachments that surcharge? That is, where you allow fill and a rise in the floodplain encroachments?

By using n=1 in all areas excluding the floodway area identified by D*V in 1D/2D modeling, we are calculating the surcharge within the floodway zone. This is what we have been doing in a steady state FW modeling for years. As I explained if you take your floodway run model with encroachment and replace it by using n=1 in the floodway fringe area and do the routing in HMS. After that with the new flow if you run the FW RAS model modified with n=1, the surcharge will be identical to encroachment run.