I’m usually pretty good at knowing my limits, but in this column I’m going to stretch just a bit outside my comfort zone on two topics.

Coastal Communities with Zone V. While I’ve got the concepts of watershed hydrology and riverine hydraulics down pat, my understanding of wave mechanics isn’t on par (despite struggling through and ultimately passing a very math-heavy course on the subject as an undergrad).

So let’s talk about waves, wave height and special flood hazard areas identified on Flood Insurance Rate Maps as Zone VE (or V1-V30 on older FIRMs). FEMA has a number of excellent resources that describe how coastal flooding is determined and how those zones are delineated. The really technical stuff is in the guidelines for the experts who conduct the studies that are the basis for FIRMs. The best resource for everyone else is the Coastal Construction Manual (FEMA P-55, 4th ed.). I know several factors come into play when determining wave height at any given location. But for the purpose of this column, I’m going to simplify things a bit.

Floodplain managers should already know that, generally speaking, FEMA draws the landward boundary of Zone V where, during base flood conditions, wave heights will drop below three feet. But that’s not the whole story. Maybe there will be three-foot waves right at the Zone V boundary, but as you move from the Zone V boundary toward the shore, the wave heights will likely increase.

Here’s why you can’t assume that every location within Zone V will have wave heights of just three feet. The CCM tells us, “The maximum wave crest elevation (used to establish the BFE) is determined by maximum wave height, which depends largely on the 100-year stillwater depth (d100).” The graphic shows the relationship and indicates that wave height (distance from wave trough to wave crest) is equal to 0.78 times the 100-year stillwater depth. Thus, at any given location, knowing the 100-year stillwater depth is key to understanding base flood wave conditions.

The closer a location is to the shore, the more likely it is to have lower ground elevation (I’m speaking generally, not accounting for dunes and other “high spots”). And the lower the ground elevation, the greater the stillwater depth – and, consequently, the higher the waves. (Oh, and we’ve not even taking into consideration that erosion can lower the ground, causing even greater stillwater depths, with commensurately higher wave heights!).

So, why should we understand that relationship? Because buildings are required to be designed to resist flood loads, including loads associated with moving water and waves. Higher waves result in more signifi-
cant wave loads that must be taken into consideration when designing foundations. Assuming that all Zone V waves are only three feet will result in underestimating wave loads. And the unfortunate consequence would very likely be more damage the next time coastal flooding occurs.

Several times during training classes I’ve mentioned that floodplain managers and designers working in coastal communities need to look in the Flood Insurance Study and use the transect data to determine stillwater depth and wave height at specification locations where buildings will be built. I can’t say students had a good understanding that wave heights vary through the Zone V area and how one would go about determine them. The answer? Turn again to the Coastal Construction Manual, Section 8.5. As a reminder, building codes based on the International Code Series refer to ASCE 7 for all loads, including flood loads. Flood loads are covered in Chapter 5 and the commentary for this chapter has good guidance.

Flood Insurance Manual is NOT the Same as Construction and Design Requirements. I consider myself well-versed in NFIP land management and construction rules (although every day I consult the copy of 44 CFR Part 60, which I keep close at hand). But I approach the NFIP Flood Insurance Manual with great care.

I’m writing about this now because recently I was contacted by a building official who pointed to the fact that flood insurance policies can be written for buildings with basements and concluded that, therefore, basements are permitted. Obviously, that’s not the case for new construction, nor for buildings proposed to be substantially improved or repaired after substantial damage.

We should all be aware that just because the NFIP will write a flood policy does not mean that the rules for rating those policies are the same as the rules for construction of buildings in flood hazard areas. Indeed, owners can get insurance for any building,* regardless of whether the building is or isn’t “compliant” with the construction rules set forth in 44 CFR 60.3. [*The caveat is that buildings specifically identified under the federal statute provision called Section 1316 are declared by FEMA to be ineligible for federal flood insurance. Without getting into all the details, if a community cites a violation and is unable to get the owner to correct the violation, there is a procedure that allows a community to ask FEMA to issue a Section 1316 declaration].

FEMA, NFIP state coordinators and lots of other folks encourage local floodplain managers, building officials, architects and engineers to have some understanding that decisions made when buildings are designed and constructed can affect how those buildings are rated when owners obtain NFIP flood insurance policies. There are several differences between NFIP rules for the construction of buildings and NFIP insurance rating rules that we should know about, but I can’t get into too much detail today.

Perhaps the most common difference has to do with enclosures. We all know NFIP rules (and building codes) allow areas below elevated buildings to be enclosed with walls, provided the enclosed areas meet certain rules. A notable limitation is that enclosures are permitted only for parking of vehicles, storage and building access. Beyond that, the rules vary somewhat depending on flood zone, but for this discussion, those differences aren’t important.

What’s important is that for elevated buildings, the best insurance rating is used if there is no enclosed area: no garage, no storage room, and no enclosed building access (stairwell, foyer). Whether in Zone A or Zone V, enclosures with solid walls, regardless of the size of the enclosure, will increase the premium
compared to the premium for buildings that do not have any enclosures. Said another way, elevated buildings that have enclosures, even enclosures that comply with every detail of the rules, will still have higher insurance premiums than buildings without any enclosed area. The most significant premium increase is due to the simple presence of enclosures below elevated buildings in Zone V, where there’s also an additional surcharge if enclosures are larger than 300 square feet. I’ve heard homeowners can be quite surprised to realize that they pay considerably more if their homes have enclosures, even enclosures that fully comply with the minimum requirements.

Some coastal communities adopt rules that exceed NFIP minimums and either prohibit enclosures or limit the size of enclosures, usually to discourage owners from modifying the enclosed areas. Community Rating System credits are available for both options: up to 240 points for prohibiting enclosures; up to 100 points for limiting the size of enclosures; and additional 30-90 points for requiring nonconversion agreements to be recorded on deeds. As always, actual points for individual communities will be determined by FEMA/Insurance Services Office.

CORRECTION! In my last column about buildings over water, I had a typo that was caught by a couple of folks who know the insurance side of the NFIP inside and out. Please note the following correction. Luckily, while I erred in the text shown, the text I copied out of the Flood Insurance Manual correctly cited 1982.

- The NFIP will not insure new buildings over water or buildings over water that are substantially improved after October 1, 1982.

Submit your own items or suggestions for future topics to column editor Rebecca Quinn, CFM, at rcquinn@earthlink.net. Comments welcomed!

States Turn to Courts on Flood Insurance Rates

Louisiana officials confirmed this month that the state plans to piggyback on a lawsuit its Gulf Coast neighbor Mississippi filed against the Federal Emergency Management Agency in late September, the National Emergency Management Association reported in its Oct. 28-Nov. 1 “State Director Update.”

The states hope to stall the onset of premium increases that legislators agreed to last year to stabilize the chronically indebted National Flood Insurance Program. Florida has given an official nod of support to the suit, which South Carolina and Massachusetts are also expected to back.

The legal action comes after a growing contingent of lawmakers has tried for months to add provisions to various bills on the move in the House and Senate to delay the premium increases and pleaded to no avail with FEMA officials to skirt the requirements of a law the lawmakers say has had unintended consequences.