

# Flood Risk Management: Disparate State and Federal Standards

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## I. Introduction

On August 15, 2017, President Trump issued Executive Order 13807,<sup>1</sup> which—among other provisions—revoked the previous administration’s Federal Flood Risk Management Standard (hereinafter “FFRMS”).<sup>2</sup> This standard had only been in effect for two years, but had garnered widespread support in the emergency management and mitigation sectors.<sup>3</sup> Federal guidelines have since reverted to those active prior to the enactment of FFRMS.<sup>4</sup> That notwithstanding, several states and counties have taken the initiative to enshrine the higher flood risk standards of FFRMS in their statutes and ordinances.<sup>5</sup> This paper seeks to examine the justification behind and the feasibility of implementing the higher flood standards adopted under FFRMS and other regional authorities, with the goal of reducing floodplain risk exposure.<sup>6</sup>

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<sup>1</sup> Exec. Order No. 13,807 § 6, 82 Fed. Reg. 40,463 (Aug. 15, 2017) (repealing the Executive Order creating FFRMS).

<sup>2</sup> 44 C.F.R. 9 (2015).

<sup>3</sup> See *infra* note 24.

<sup>4</sup> See *infra* notes 10-11, 25.

<sup>5</sup> See, e.g., Durham County, N.C., Code of Ordinances, Ch.16.5-71 § 10 (2015), *infra* note 44.

<sup>6</sup> A brief note on terminology: “Flood hazard areas are divided into two parts, called the ‘regulatory floodway’ and the ‘flood fringe,’ which are referred to collectively as the ‘floodplain.’ In conducting its flood studies, FEMA identifies the area adjacent to a river or stream that is subject to dangerously high flood levels and rushing water during a flood and within which the presence of development would increase the danger posed by flood conditions. This area, which poses the greatest flood risk, is known as the regulatory floodway. 44 C.F.R. § 59.1. The remainder of the floodplain area is the flood fringe, which is expected to be under water during a 100-year flood; see *infra* note 12, but within which floodwaters are expected to be comparatively more shallow and slow-moving.” *Columbia Ventures v. Richland Cty., S.C.*, 413 S.C. 423, 430-31, 776 S.E.2d 900, 904 (2015).

## II. Legislative History

FFRMS relies upon the authority granted by 42 U.S.C. § 4101 et seq.,<sup>7</sup> Identification of Flood-Prone Areas, which requires that

The Administrator . . . may— (1) identify and publish information with respect to all flood plain areas . . . which has special flood hazards . . . and (2) establish or update flood-risk data in all such areas, and make estimates with respect to the rates of probably flood caused loss for the various flood risk zones for each of these areas<sup>8</sup>

This act furthermore ensures that “[o]nce during each five-year period . . . the Administrator shall assess the need to revise and update all floodplain areas and flood risk zones identified, delineated, or established under this section.”<sup>9</sup> These flood maps are used nationwide in concert with the National Flood Insurance Program (hereinafter “NFIP”), which directs the federal, state, and local governments to “make appropriate land use adjustments to constrict the development of land which is exposed to flood damage and minimize damage caused by flood losses,”<sup>10</sup> as well as to “guide the development of proposed future construction, where practicable, away from locations which are threatened by flood hazards.”<sup>11</sup>

The FFRMS was created in 2015, under the Obama Administration, through a modification of the Carter Administration Executive Order 11988. Executive Order 11988 modified the existing National Flood Insurance Act of 1968, 42 U.S.C. § 4001 et seq., to require that “[e]ach agency . . . take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial

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<sup>7</sup> 42 U.S.C. § 4101(a) (2017).

<sup>8</sup> Id.

<sup>9</sup> Id. § 4101(e).

<sup>10</sup> 42 U.S.C. § 4001(e) (2017).

<sup>11</sup> Id.

values served by floodplains.”<sup>12</sup> The order furthermore instructs that “each agency has a responsibility to evaluate the potential effects of any action it may take in a floodplain [and] to ensure that its planning programs and budget request reflect consideration of flood hazards and floodplain management.”<sup>13</sup>

To ensure that these changes be effected, Executive Order 11988 established the floodplain building standards that—except for when Executive Order 13690 was in effect, and for regions in which the local government has a heightened standard—are the default standards for floodplain construction for the whole nation.<sup>14</sup> The most significant of these standards, is the requirement that “this Order shall, at a minimum, require [that] . . . accepted floodproofing [sic] and other flood protection measures shall be applied to new construction . . . [and that] agencies shall, wherever practicable, elevate structures above the base flood level rather than filling in land”.<sup>15</sup>

Through Executive Order 13690, the Obama administration modified the standards of Executive Order 11988 in creating FFRMS, which it describes as

[A] flexible framework to increase resilience against flooding and help preserve the natural values of floodplains. Incorporating this Standard will ensure that agencies expand management from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended.<sup>16</sup>

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<sup>12</sup> Exec. Order No. 11,988 § 1, 3 C.F.R., 1977 Comp. p.117 (May 24, 1977).

<sup>13</sup> Id. § 2.

<sup>14</sup> Id. § 3(a-b).

<sup>15</sup> Id.

<sup>16</sup> Exec. Order No. 13,690 § 1 ¶3, 3 C.F.R. 268, 268 (Jan. 30, 2015).

The most significant change that this executive order implemented was that it shifted federal construction off of the 100-year flood standard.<sup>17</sup> Practically speaking,

[T]he 100-year storm [or flood] is not based on an actual storm. Instead, a theoretical storm is constructed by using mathematical models. A hydraulic computer model is applied to generate width and location of the floodway at each cross-section at which the stream is measured. The water surface elevation for the design flood is plotted onto a corresponding topographical map showing relative ground elevations. Areas in which the plotting reveals the flood elevation of the theoretical design flood to be higher than the ground elevation are then included within the flood hazard area.<sup>18</sup>

In opposition to this relatively low standard, FFRMS proffers four delineations of floodplains, determined through

- (1) using a climate-informed science approach that uses the best-available, actionable hydrologic and hydraulic data that integrate current and future changes in flooding[;]
- (2) the elevation and flood hazard area that result from using the freeboard value, reached by adding an additional [two] feet . . . for non-critical actions and by adding an additional [three] feet to the base flood elevation for critical actions[;]
- (3) the area subject to flooding by the 0.2 percent annual chance flood[, or 500-year floodplain; or]
- (4) the elevation and flood hazard area that result from using any other method identified in an update to the FFRMS.<sup>19</sup>

This standard therefore worked to strengthen floodplain standards so as to “improve the resiliency of communities and federal assets against the impact of flooding.”<sup>20</sup>

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<sup>17</sup> Columbia Ventures, 413 S.C. 423, 430 (2015), 776 S.E.2d 900, 903 (S.C. 2015) (quoting 44 C.F.R. § 59.1) (“The basis for most of FEMA’s mapping and regulation is the ‘base flood’ or ‘100-year flood,’ which has a one percent chance of occurring in any particular year.”).

<sup>18</sup> Am. Cyanamid Co. v. State, Dep’t of Env’tl. Prot., 231 N.J. Super. 292, 300, 555 A.2d 684, 688 (App. Div. 1989) (internal citations omitted).

<sup>19</sup> Exec. Order No. 13,690 § 2(i), 3 C.F.R. 268, 269 (Jan. 30, 2015).

<sup>20</sup> Id. § 1 ¶1, 268.

It is noteworthy that “[t]he scope of E.O. 11988 applie[d] to federal agencies and actions”,<sup>21</sup> and that “[t]he minimum standard for non-critical federal actions that are not federally funded projects [was] the 1-percent-annual-chance flood elevation and corresponding horizontal floodplain,” but “[a]gencies should [have] continue[d] to use the 0.2-percent-annual-chance flood elevation and corresponding horizontal floodplain” under FFRMS.<sup>22</sup> The primary purpose of FFRMS was “not meant to be an ‘elevation’ standard”,<sup>23</sup> but rather “a resilience standard.”<sup>24</sup> Despite the strong policy and environmental arguments made in favor of these higher standards by both private and public sectors, the Trump administration has firmly opposed FFRMS.<sup>25</sup> The Trump Administration enacted Executive Order 13807 on August 15, 2017. This order, among other actions, ensured that “Executive Order 13690 of January 30, 2015 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input), [be] revoked.”<sup>26</sup>

### **III. Flood Standards in North Carolina**

North Carolina benefits from one of the most extensively developed flood mapping systems in the nation, but its laws require only the lowered federal flood standard; certain counties, such as Durham County, have required certain aspects of FFRMS in their building

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<sup>21</sup> Memorandum from Roy Wright, Deputy Assoc. Adm’r for Ins. and Mitigation (FEMA), to Sally Jewell, Sec’y, Dep’t of Interior, Oct. 2, 2015, [https://www.fema.gov/media-library-data/1444837593343-d831e9fdd5e29cf352b2116f8c0b756b/Secretary\\_Jewel\\_Memo.pdf](https://www.fema.gov/media-library-data/1444837593343-d831e9fdd5e29cf352b2116f8c0b756b/Secretary_Jewel_Memo.pdf).

<sup>22</sup> Id.

<sup>23</sup> Id.

<sup>24</sup> Id.

<sup>25</sup> Lisa Friedman, Trump Signs Order Rolling Back Environmental Rules on Infrastructure, N.Y. TIMES, Aug. 15, 2017, at A17 (“Environmental activists, flood plain managers and some conservatives had urged the trump administration to preserve [FFRMS], arguing that it protected critical infrastructure and taxpayer dollars.”), <https://www.nytimes.com/2017/08/15/climate/flooding-infrastructure-climate-change-trump-obama.html>.

<sup>26</sup> Exec. Order No. 13,807 § 6, 82 Fed. Reg. 40,469 (Aug. 15, 2017).

code.<sup>27</sup> On a state level, North Carolina statutes appear to require that building codes rely on the 100-year floodplain, though certain counties demand a higher standard.<sup>28</sup> This is consistent with the NFIP, which states that “[c]ommunities are required to adopt the [Flood Insurance Rate Maps (“FIRMS”)]<sup>29</sup> and to restrict development in those flood hazard areas.”<sup>30</sup> NFIP regulations demand that communities

[P]rohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway<sup>[31]</sup> unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge.<sup>32</sup>

Beyond these limitations, while “[a] local community’s floodplain land-use controls must meet FEMA’s minimum requirements . . . FEMA encourages communities to impose more restrictive regulations.”<sup>33</sup>

In North Carolina, certain aspects of floodplain management are left to the state government’s discretion. These regulatory areas are among the broader requirements of

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<sup>27</sup> The North Carolina flood mapping program is administered under specific revenue appropriated by the General Assembly, and provides extensive state-wide coverage. N.C. GEN. STAT. § 143-215.56A (2015) (“The Floodplain Mapping Fund is established as a special revenue fund . . . [and r]evenue in the fund may be used only to offset the Department's cost in preparing floodplain maps and performing its other duties under this Part.”).

<sup>28</sup> See, e.g., Durham County, N.C., Code of Ordinances, Ch.16.5-71 § 10 (2015), *infra* note 44.

<sup>29</sup> See 42 U.S.C. § 4101(e), *supra* note 9 (NFIP relies on FEMA’s creation, every five years of the Flood Insurance Rate Maps (hereinafter “FIRMS”) for the entire United States. These maps re-draw floodplains based on erosion, storm damage, and other factors taken into account in the modeling process); see generally *supra* note 18 (in North Carolina, there is also a state agency that assist in and, in some instances, directs the development of statewide FIRMS); see *supra* note 26.

<sup>30</sup> *Columbia Ventures*, 413 S.C. at 430, 776 S.E.2d at 903 (quoting 42 U.S.C. § 4102(c); 44 C.F.R. § 60.3). *Id.* at n.3 (quoting 44 C.F.R. § 59.1) (“In addition to local land use restrictions, federal law requires flood insurance in special hazard areas.”).

<sup>31</sup> See *supra* note 6.

<sup>32</sup> 44 C.F.R. § 60.3(d)(3); see *Columbia Ventures*, 413 S.C. at 431, 776 S.E.2d at 904 (“This is commonly known as the ‘no-rise’ standard.”).

<sup>33</sup> *Columbia Ventures*, 413 S.C. at 430, 776 S.E.2d at 903; see also 44 C.F.R. § 60.1(d).

floodplain zoning, and the majority of the statutes are minimum-based means of complying with the NFIP requirements imposed on state and local governments under 42 U.S.C. § 4001 et seq., with the option of stricter local and county government standards. The North Carolina General Statutes broadly define NFIP guidelines in reference to the “base flood,” “100-year flood,” and “flood hazard area” designations, which it defines as:

(1a) ‘Base flood’ or ‘100-year flood’ means a flood that has a one percent (1%) chance of being equaled or exceeded in any given year. The term “base flood” is used in the National Flood Insurance Program to indicate the minimum level of flooding to be addressed by a community in its floodplain management regulations.

(1b) ‘Base floodplain’ or ‘100-year floodplain’ means that area subject to a one percent (1%) or greater chance of flooding in any given year, as shown on the current floodplain maps prepared pursuant to the National Flood Insurance Program[.]

[ . . . ]

(1d) ‘Flood hazard area’ means the area designated by a local government, pursuant to this Part, as an area where development must be regulated to prevent damage from flooding. The flood hazard area must include and may exceed the base floodplain.<sup>34</sup>

Within the scope of these definitions, the state government establishes that generally, local government can grant easements or variances to zoning designations within these floodplains.<sup>35</sup>

Nevertheless, there are several instances in which the North Carolina does not allow for exception to the ban on construction within the 100-year floodplain. Among several other specific mandatory state-wide guidelines, North Carolina requires that “waste disposal unit[s] of a sanitary landfill shall not be constructed within: (1) A 100-year floodplain or land removed from a 100-year floodplain pursuant to [44 C.F.R. Part 72] . . . as a result of man-made

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<sup>34</sup> N.C. GEN. STAT. § 143-215.52(a)(1a-1b) (2015).

<sup>35</sup> See infra note 36.

alterations within the floodplain such as the placement of fill.”<sup>36</sup> Examples such as this ban on the granting of variances from state and NFIP baseline requirements are clearly designed with the purpose of protecting public infrastructure from flood damage, the same motivation behind the Obama Administration’s formulation of FFRMS. Beyond these few provisions, the General Assembly leaves broad latitude to county and local governments to decide, based on the specific circumstances of their region, what flood and zoning standards to enact.

The North Carolina General Statutes grant a broad discretion to local governments as to what flood standards to impose; the statutes go as far as to state that beyond the key exceptions highlighted above, the state laws “shall not preclude the imposition by responsible local governments of land use controls and other regulations in the interest of floodplain management for the 100-year floodplain.”<sup>37</sup> Nevertheless, there is a strict procedure for the granting of variances: any such variances may be granted if and only if

[A]ll of the following apply:

- (1) The use serves a critical need in the community.
- (2) No feasible location exists for the location of the use outside the 100-year floodplain.
- (3) The lowest floor of any structure is elevated above the base flood elevation or is designed to be watertight with walls substantially impermeable to the passage of water and with structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy.
- (4) The use complies with all other applicable laws and regulations.<sup>38</sup>

The policy justification behind this sweeping power is to allow for regional governments to take into account not only the human factors influenced by the designation of

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<sup>36</sup> N.C. GEN. STAT. § 130A-295.6(c) (2015).

<sup>37</sup> N.C. GEN. STAT. § 143-215.61 (2015).

<sup>38</sup> N.C. GEN. STAT. § 143-215.54A(b) (2015).



floodplains, but also to recognize the advantages in the long-term to protecting their regional infrastructure.<sup>39</sup>

The General Statutes furthermore allow that “[a] local government may adopt ordinances to regulate uses in flood hazard areas and grant permits for the use of flood hazard areas that are consistent with the requirements of this” statute.<sup>40</sup> Among the non-exhaustive list of possibilities for land use not requiring special permitting that are enumerated in this statute are all open, non-building structures such as “lawns, gardens, play areas, and other similar uses” and “ground level area uses” such as roads and parking lots.<sup>41</sup> This sweeping power extends beyond the ability to determine what sorts of structures may or may not be permitted within a floodplain; they also allow for local governments to issue variances and easements to flood hazard areas, under certain circumstances governed by the NFIP,<sup>42</sup> and to

[D]elineate any flood hazard area subject to its regulation by showing it on a map or drawing, by a written description, or any combination thereof, to be designated appropriately and filed permanently with the clerk of superior court and with the register of deeds in the county where the land lies . . . [a] local government may also delineate a flood hazard area by reference to a map prepared pursuant to the National Flood Insurance Program.<sup>43</sup>

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<sup>39</sup> Columbia Ventures, 413 S.C. at 430, 776 S.E.2d at 904 (2015) (“FEMA identifies the area adjacent to a river or stream that is subject to dangerously high flood levels and rushing water during a flood and within which the presence of development would increase the danger posed by flood conditions”).

<sup>40</sup> N.C. GEN. STAT. § 143-215.54(a) (2015).

<sup>41</sup> Id. § 143-215.54(b)(2-3); see id. § 143-215.54(b) (listing zoning options for floodplain development).

<sup>42</sup> There are a variety of possible ways in which a state or local government may challenge the FIRMs in order to have the floodplain designation revised. See 44 C.F.R. 65.6(b)-(g) (2017); see also Columbia Ventures, 413 S.C. at 433, 776 S.E.2d at 905 (“a floodplain designation may be removed if a landowner constructs a certified levee, thereby allowing the area protected by a certified levee to no longer be considered part of the floodway or floodplain.” (internal citations omitted)). See generally, e.g., Paterno v. State, 74 Cal.App.4th 68, 87 Cal.Rptr.2d 754 (1999) (examining municipal liability for flooding within flood hazard areas).

<sup>43</sup> Under the guidelines in 44 C.F.R. 65.6(b-g) (2017); see N.C. GEN. STAT. § 143-215.56(c) (2015); see also supra note 41.

Within the state, up to hundreds of variances can be issued over the course of the five-year period between the issuance of new FIRMS. However, not every local or county government is as permissive of zoning variances, generally out of concern for liability for flood damages caused through undue risk created by unmitigated permitting.<sup>44</sup>

A clear example of the sort of raised standards a local government can institute is the case of the Durham County Code of Ordinances' floodplain zoning regulations. This code applies one of the three types of zoning changes advocated in FFRMS: the heightened two-foot minimum freeboard requirement. In order to obtain a building permit where the floodplain status of the land is unclear, the permit application "must show construction of the lowest floor at least two feet above the highest adjacent grade."<sup>45</sup> The county similarly imposes a strict requirement for building above the base flood level, even outside of the flood hazard area. The requirement, drafted broadly to apply to all construction in Durham County, is that

Fill material shall be used for all new construction and substantial improvements to create an elevation that is two feet above base flood elevation. The fill material shall be required to extend for a distance of 40 feet from the exterior walls of a building. Where the distance to the property line is less than 40 feet, the fill shall extend to the property line. The required fill material distance shall include a sloped edge with a maximum 3:1 slope (for example, for a fill three feet deep: 31

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<sup>44</sup> See, e.g., Complaint at 3-4, Aldred v. Harris Cty., No. 2017-57831 (Tex. Dist. Ct., Harris Cty. Sept. 3, 2017) (alleging class action against Harris County and City of Houston after flooding caused by Hurricane Harvey for negligent permitting in flood hazard areas) ("Harris County Flood Control District and City of Houston have failed to adequately prepare each reservoir for the possibility of flooding and have permitted unmitigated development around the reservoir such that they knew homes and businesses would flood in a heavy water event." "A Corp of Engineers report rated both Houston reservoirs' dams and spillways as extremely high risk. Defendants' actions were done with intent and they knew of the substantial risk of flooding damage to homes and businesses around the Reservoirs and downstream."). See also Complaint, Ross v. San Jacinto River Auth., No. 2017-58385 (Tex. Dist. Ct., Harris Cty. Sept. 4, 2017) (alleging class action against waterbody observation authorities following Hurricane Harvey flooding for unmitigated and negligent permitting in flood hazard areas).

<sup>45</sup> Durham County, N.C., Code of Ordinances, Ch.16.5-52 § 4 (2015).

feet of flat fill + nine feet of sloped fill) or a retaining wall in lieu of the slope (for example, a side yard of flat fill and a retaining wall).<sup>46</sup>

Finally, the code requires—just as FFRMS advocated—that all houses, non-residential buildings, and commercial structures within the county be “elevated no lower than two feet above the base flood elevation.”<sup>47</sup> In imposing these stricter floodplain zoning regulations, Durham County provides a clear demonstration of the sort of stricter flood regulation that FFRMS sought to apply nationwide, as well as the ease with which local and even state governments can apply limitations on floodplain construction in the spirit of FFRMS, without creating unduly restrictive zoning requirements.

#### **IV. Conclusion**

With the enactment of Executive Order 13807, the current administration relegated federal floodplain regulations to the very permissive requirements enacted in the Carter Administration through Executive Order 11988. By pushing aside the adaptable resiliency standard created in Executive Order 13690, the president exposed future and present construction nationwide to increased risk of future flooding; nevertheless, some state and local governments have adopted more stringent limitations on flood hazard area management, in line with the spirit of FFRMS. Through the example of Durham County, the ease with which these building permit and zoning regulations can be enacted was shown to be relatively low and the ordinances themselves uncomplicated. While insufficient time has passed to examine the repercussions of revoking FFRMS, these local examples demonstrate the ease with which, by having the foresight

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<sup>46</sup> Id., Ch.16.5-71 § 10 (2015).

<sup>47</sup> Id., Ch.16.5-72 § 1-3(b) passim (2015).

to protect the construction of today from present and future flood conditions, the policy guidelines offered in FFRMS can be preserved despite administration disapproval.