

Federal Flood Risk Management Standard

FEDERAL FLOOD RISK MANAGEMENT STANDARD

Contents

Contents.....	1
Use of Executive Order 11988, Floodplain Management and Relationship to the FFRMS	Error!
Bookmark not defined.	
Development and Update of the Federal Flood Risk Management Standard.....	2
Application to all Federal Actions	2
Exceptions, Class Reviews, and Simplified Evaluation and Review Processes.....	4
Critical Actions	4
Improvements in Implementation of EO 11988	5
Consideration of Natural Features and Nature-Based Solutions.....	5
Higher Vertical Elevation.....	6
Approaches for Establishing the FFRMS Elevation and Flood Hazard Area.....	7
Climate-Informed Science Approach	7
Freeboard Value.....	8
500-Year Elevation	8
Further Guidance on Application of 500-year and Freeboard Options	9
Updates to the FFRMS	9
Implementation Experience.....	10
Consensus Standard Revised	10
Changes in the Underlying Flood Hazard Information.....	10
Changes in Current Climate Science	10
References	11

Use of Executive Order 11988, Floodplain Management and Relationship to the FFRMS

This Federal Flood Risk Management Standard (FFRMS) builds upon Executive Order (EO) 11988 and is to be incorporated into existing Federal department and agency processes used to implement EO 11988.¹

Development and Update of the Federal Flood Risk Management Standard

The Mitigation Framework Leadership Group (MitFLG), established through the National Mitigation Framework (NMF) through Presidential Policy Directive 8 (PPD-8), developed this Standard and will continue to reassess the Standard in order to provide recommendations for updating the Standard to the Water Resources Council in consultation with the Federal Interagency Floodplain Management Task Force (FIFMTF). The FIFMTF works to promote the health, safety, and welfare of the public by encouraging programs and policies that reduce flood losses and protect the natural environment through improved coordination, collaboration, and transparency in floodplain management efforts within the federal government. As a senior level group that promotes coordination of mitigation efforts across the Federal Government, MitFLG is responsible for assessing the effectiveness of Mitigation core capabilities as they are developed and deployed across the Nation. To that end, the MitFLG facilitates information exchange, coordinates policy implementation recommendations on national-level issues and oversees the successful implementation of the NMF.

Application to all Federal Actions

The FFRMS applies to all Federal Actions, as described in section 1 of EO 11988. EO 11988 and the Floodplain Management Guidelines For Implementing EO 11988 (Implementing Guidelines) apply to Federal Actions in or affecting floodplains² and define a Federal Action as

¹ <http://www.archives.gov/federal-register/codification/executive-order/11988.html>

² EO 11988 defines floodplains as “lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.”

FEDERAL FLOOD RISK MANAGEMENT STANDARD

any Federal activity including: “(1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to, water and related land use resource planning, regulating, and licensing activities.”

Applying the FFRMS to all Federal Actions: ensures that Federal departments and agencies make sound flood risk and floodplain management decisions; provides consistency with the current, understood process for implementing EO 11988 as well as the National Environmental Policy Act (NEPA), where applicable; and eases implementation by establishing a consistent overall approach for all Federal activities in or affecting floodplains, while also allowing Federal departments and agencies flexibility to implement the FFRMS by selecting the approach that best aligns with their missions, authorities, and programs.

The elevation component of the FFRMS applies to all new construction and substantially improved structures (e.g., reconstruction, rehabilitation, addition, and any other improvement) the cost of which equals or exceeds 50 percent of the value of the structure.³

The elevation component of the FFRMS also applies to substantial damage projects for structures (e.g., when damage sustained from any source or event equals or exceeds 50 percent of the value of the structure) if the project will rely on Federal funding.

If desired, Federal departments and agencies may extend the determination of substantial improvement, or the repair of substantial damage, or both, to include a cumulative determination in which Federal investments are tracked over time. One approach that Federal departments and agencies can adopt to monitor activity is to track improvements and repairs until they meet or exceed 50 percent of the value of the structure. Federal departments and agencies interested in implementing a cumulative approach will need to develop a process to track their respective cumulative Federal investments.

³ The definition of ‘structure’ is a walled and roofed building, mobile home, gas or liquid storage tank that is primarily above ground.

Exceptions, Class Reviews, and Simplified Evaluation and Review Processes

The head of a Federal department or agency, or an appropriate designee as set forth in the agency implementing plan, may except particular department or agency activities and facilities from the provisions of the FFRMS where it is in the interest of national security, where the agency action is an emergency action, where application to a Federal facility or structure is demonstrably inappropriate, or where the agency action is a mission-critical requirement related to a national security interest or emergency action. Agencies will provide more specific descriptions of what may constitute a national security interest or an emergency action by that agency in its policies and rules. When an agency action is excepted because it is in the interest of national security, it is an emergency action, or it is a mission-critical requirement related to a national security interest or an emergency action, the agency head shall rely on the land subject to the base flood.

In addition, Federal departments and agencies may use an altered or shortened decision-making process for actions with insignificant impacts or actions of a short duration, as the current EO 11988 process specifies. Federal departments and agencies may also choose to conduct general review of activities in lieu of site-specific reviews and class reviews of certain repetitive actions. The Implementing Guidelines for EO 11988 will be amended to provide detailed guidance to Federal departments and agencies regarding applicability, exceptions, and processes for documenting compliance with the FFRMS.

Critical Actions

Critical Action is defined in the Implementing Guidelines to EO 11988 to include any activity for which even a slight chance of flooding is too great. The concept of Critical Action reflects a concern that the impacts of flooding on human safety, health, and welfare for many activities could not be minimized unless a higher degree of protection or resilience than that delivered by the base flood elevation was provided.

Federal departments and agencies will be responsible for determining whether a Federal Action constitutes a Critical Action, which includes questions such as:

FEDERAL FLOOD RISK MANAGEMENT STANDARD

- If flooded, would the proposed action create an added dimension to the disaster, as could be the case for liquefied natural gas terminals and facilities producing and storing highly volatile, toxic, or water-reactive materials?
- Given the flood warning lead-time available, would the occupants of buildings such as hospitals, nursing homes, prisons, and schools be sufficiently mobile to avoid loss of life and injury?
- Would essential and irreplaceable records, scientific and cultural museum collections, utilities, emergency services, national laboratories, and structures that may house critical equipment, systems, networks, and functions be lost?

Improvements in Implementation of EO 11988

The FFRMS has been developed to create a national minimum flood risk management standard to ensure that Federal Actions that are located in or near the floodplain when there are no other practical alternatives last as long as intended by considering risks, changes in climate, and vulnerability.

The FFRMS seeks to improve the implementation of EO 11988 through the following enhancements:

- The FFRMS encourages the use of natural features and nature-based approaches in the development of alternatives for Federal Actions.
- The FFRMS provides a higher vertical elevation and corresponding floodplain, where appropriate, to address current and future flood risks.
- The elevation and corresponding floodplain of the FFRMS can be determined using three approaches, outlined in later sections of this document.

Consideration of Natural Features and Nature-Based Solutions

The FFRMS encourages the use of natural systems, ecosystem processes, and nature-based approaches in the development of alternatives for Federal Actions in implementing Step 3 of the Implementing Guidelines. This approach, combined with restoration of natural systems and ecosystem processes where appropriate, recognizes the growing role of natural and restored

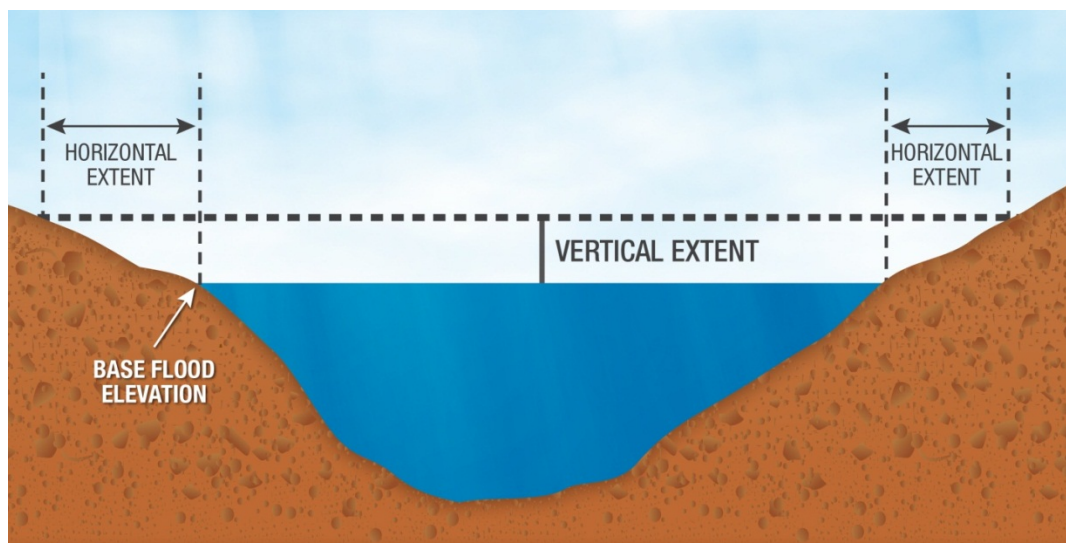
FEDERAL FLOOD RISK MANAGEMENT STANDARD

systems and of features engineered to mimic natural processes (generally known as “green infrastructure”) in mitigating flood risk and building the resilience of Federal investments both within and that will affect floodplains. Using natural and nature-based approaches is consistent with Section 1 of EO 11988 which directs Federal departments and agencies to take action to restore and preserve the natural and beneficial values served by floodplains.

Encouraging the use of natural systems and nature-based approaches earlier in the planning and design of Federal Actions is consistent with the Federal Government policy priorities and best practices, which promote the integration of green infrastructure for coastal flood risk management following Hurricane Sandy (e.g., Hurricane Sandy Rebuilding Strategy recommendations 19-22), and with the Climate Action Plan (e.g., references to “natural defenses”). This policy is also broadly consistent with and supports other policy and guidance documents, such as the *Principles and Guidelines for Water and Land Related Resources Implementation Studies* (now updated and referenced as *Principles, Requirements and Guidelines or PR&G*), *Guidance on Effective Use of Programmatic NEPA Reviews* and other agency implementing guidance.

Higher Vertical Elevation

The FFRMS provides a higher vertical elevation to ensure that uncertainties associated with climate change and other future changes are more adequately accounted for in the department or agency decision processes for future Federal Actions.



EO 11988 currently uses the base floodplain to determine the vertical elevation and floodplain boundary. The FFRMS increases both the vertical elevation and the corresponding area of the floodplain to which the FFRMS applies.

As in EO 11988, the FFRMS flood hazard elevation establishes the level to which a structure or facility must be resilient – this may include elevating the structure or, where appropriate, designing it to withstand or otherwise quickly recover from a flood event. In selecting the appropriate resilience approach, Federal departments and agencies should consider several factors such as flood depth, velocity, rate of rise of floodwater, duration of floodwater, erosion, subsidence, the function or use and type of structure or facility, and other factors. Additional guidance on these concepts will be provided in an update to the Implementing Guidelines.

Approaches for Establishing the FFRMS Elevation and Flood Hazard Area

Three approaches are available for establishing the FFRMS elevation and flood hazard area. These approaches include:

- Utilizing the best-available, actionable hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science (heretofore referred to as the “climate-informed science approach”);
- Freeboard (Base Flood Elevation (BFE) + X); and
- 500-year flood elevation.

The climate-informed science approach is preferred. Federal departments and agencies should use this approach when data to support such an analysis are available.

Climate-Informed Science Approach

For areas vulnerable to coastal flood hazards, the climate-informed science approach includes the regional sea-level rise variability and lifecycle of the Federal Action. The climate-informed science approach for Federal Actions affected by coastal flood hazards includes:

FEDERAL FLOOD RISK MANAGEMENT STANDARD

- Use of the U.S. Department of Commerce’s - National Oceanic and Atmospheric Administration’s (NOAA’s) or similar global mean sea-level-rise (GMSLR) scenarios, adjusted to local relative sea-level (LRSL) conditions.
- A combination of the LRSL conditions with surge, tide, and wave data using state-of-the-art science in a manner appropriate to policies, practices, criticality, and consequences (risk).

For areas vulnerable to riverine flood hazards, the climate-informed science approach for Federal Actions is as follows:

- Account for changes in riverine conditions due to current and future changes in climate and other factors (e.g., land use) by applying state-of-the-art science in a manner appropriate to policies, practices, criticality, and consequences (risk).

The climate-informed science approach for Critical Actions will utilize the same methodology as used for other non-critical actions that are subject to EO 11988, but with an emphasis on criticality as one of the factors for departments and agencies to consider when conducting the analysis. Note that the climate-informed science approach for Critical Actions will differ between coastal and riverine systems.

Freeboard Value

The FFRMS defines the following freeboard values:

- An additional two (2) feet shall be added to the BFE.
- For Critical Actions, an additional three (3) feet shall be added to the BFE.
- These increases will apply to both the vertical elevation and the corresponding horizontal extent of the floodplain.

500-Year Elevation

Federal departments and agencies may elect to use available “500-year” flood data as the basis of the FFRMS elevation and corresponding floodplain extent. Note that the “500-year” flood hazard data produced by the U.S Department of Homeland Security’s - Federal Emergency

Management Agency (FEMA) in coastal areas only considers storm-surge hazards. These data do not include local wave action or storm-induced erosion that are considered in the computation of BFEs. Federal departments and agencies are encouraged to obtain or develop the necessary data, including wave heights, to ensure that any “500-year” data applied will achieve an appropriate level of flood resilience for the proposed investment.

Further Guidance on Application of 500-year and Freeboard Options

When a Federal department or agency does not use a climate-informed science approach in a coastal flood hazard area, the department or agency must use, at a minimum, the applicable freeboard elevation (i.e., BFE + 3 feet for Critical Actions, or BFE + 2 feet for other actions). In some cases where the FEMA 500-year flood elevation does not include a wave height, or a wave height has not been determined, the result will likely either be lower than the current BFE or the BFE plus applicable freeboard. The “500-year” elevation should not be used in these cases.

When actionable science is not available and a Federal department or agency opts not to follow the climate-informed science approach for riverine flood hazard areas, the Federal department or agency may also select either the freeboard approach, or “500-year” flood elevation approach, or a combination of approaches, as appropriate. A Federal department or agency is not required to use the higher of the elevations but may opt to do so.

Updates to the FFRMS

The FFRMS shall be reviewed after adoption and implementation, as Federal departments and agencies are able to identify scientific, technological, and economic information that may affect the implementation of the FFRMS. Periodic updates will allow the FFRMS to include requirements based on timely and relevant advances in science that takes into account changes to climate and other changes in flood risk. The MitFLG, established by the NMF, in consultation with the FIFMTF and after seeking stakeholder input, will reassess the FFRMS annually to determine if updates are warranted and will provide any recommendations to the Water Resources Council. The Water Resources Council shall issue an update to the Standard at least every 5 years. A full update will be conducted at least every five years.

Four areas have been identified that could trigger review and potential revision of the FFRMS: implementation experience; changes in national consensus standards used to inform the policy; changes in the underlying flood hazard information; and changes in current climate science that address critical data and information gaps.

Implementation Experience

As Federal departments and agencies implement the FFRMS, implementation challenges as well as opportunities to enhance or modify the FFRMS may be identified. In order to ensure that the FFRMS continues to meet its stated objectives, implementation of the policy will be monitored. Federal departments and agencies should collect feedback on implementation from relevant programs and offices, identify potential gaps in the process, and outline areas for improvement with the Standard. Such information should be provided to the MitFLG as part of the annual reassessment of the FFRMS.

Consensus Standard Revised

As the International Code Series, published by the International Code Council, and reference standards such as the American Society of Civil Engineers (ASCE)-24 are updated, the Federal Government should consider whether such updates require reconsideration of the FFRMS.

Changes in the Underlying Flood Hazard Information

The Technical Mapping Advisory Council established by FEMA, as mandated by the Biggert-Waters Reform Act of 2012 (BW-12), will make recommendations on how to incorporate projected sea-level rise and other future climate change impacts into the existing flood study process. These recommendations may include mapping areas of future flood risk and developing methods to inform the potential revision of flood hazard elevations in both riverine and coastal areas. The MitFLG will review these recommendations should be reviewed in detail for potential implications to the FFRMS and coordinated with activities undertaken to address the critical data and information gaps noted above.

Changes in Current Climate Science

FEDERAL FLOOD RISK MANAGEMENT STANDARD

In developing the guidance contained in the FFRMS, the MitFLG working group identified a number of critical data and information gaps. These gaps reflect challenges that Federal departments and agencies will likely face in implementing the current FFRMS, as well as other scientific issues that, if addressed in the near term (i.e., within two-to-three years), could be used to review and potentially revise the FFRMS. One important gap identified to improve the riverine climate-informed science option is to convene a working group that produces a new method to estimate projected future flood-flow frequencies.

References

1. Executive Order 11988, Floodplain Management, 1977, 42 CFR 26951, 3CFR 1977.
2. The Floodplain Management Guidelines for Implementing E.O. 11988, Water Resources Council, 1978.
3. Further Advice on Executive Order 11988, Federal Interagency Floodplain Management Task Force, 1987.
4. The Principles and Requirements for Federal Investments in Water Resources, March 2013.
5. The National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.).
6. The National Flood Insurance Act of 1968, as amended (42 U.S.C. 4001 et seq.).
7. The Flood Disaster Protection Act of 1973 (Public Law 93-234, 87 Stat. 975).
8. The Coastal Barrier Resources Act of 1982 as amended (16 U.S.C. 3501 et seq.).
9. The Coastal Zone Management Act (16 U.S.C. 1451 et seq.).
10. The Coastal Barrier Improvement Act of 1990 (Public Law 101-591; 104 Stat. 2931).
11. The Endangered Species Act of 1973, as amended (15 U.S.C. 1531 et seq.).