




## Floodplain Management Workshop

Rappahannock-Rapidan Regional Commission

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October 11, 2017  
Culpeper, VA

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## Introduction

- DCR Staff Introductions
- Community Introductions
  - Name
  - Community name
  - Title
  - What you hope to gain from the workshop

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## Workshop Goals

- Remind communities of the basics of the National Flood Insurance Program, addressing community-specific questions and comments.
- Ensure that communities understand their roles and responsibilities in floodplain management.
- Provide communities with NFIP and DCR program updates.
- Establish a closer relationship between DCR and PDCs, to facilitate future collaboration.

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## Agenda

- Overview of the NFIP
- Floodplain Ordinances and Permitting
  - Floodplain Management Regulations
  - Accessory Structures
  - Floodplain Ordinances and Administrative Procedures
  - Permitting Development
  - Elevation Certificates
- Flood Hazard Maps and Data
  - Flood Insurance Rate Maps and Flood Insurance Studies
  - Accessing and Using Flood Hazard Data
  - Changing FIRMs and FIS Reports
  - Non-regulatory Products and Other Resources
- Pre- & Post-Disaster Considerations
- Community Rating System
- DCR Division of Dam Safety and Floodplain Management Update
  - Floodplain Management Program Overview
  - Dam Safety Database

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## Overview of the National Flood Insurance Program

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## National Flood Insurance Program (NFIP) Milestones

- 1968 – National Flood Insurance Act
- 1969, 1972 – Tropical Storms Camille and Agnes
- 1973 – Flood Disaster Protection Act of 1973 – mandatory purchase
- 1979 – FEMA created – NFIP moved
- 1988 – Stafford Act
- 1994 – National Flood Insurance Reform Act – creates Flood Mitigation Assistance grants, codifies mandatory purchase, lender penalties established
- 2003 – DHS created, FloodSmart program, Hurricane Isabel
- 2004 – FIRA 2004 (BBB Act) – Reformed claims process, plain language mailings, appeals process, Florida hurricanes
- 2005 – Katrina, Rita, Wilma – \$14 billion in the hole
- 2012 – Biggert-Waters Flood Insurance Reform Act, Hurricane Sandy - \$20 billion in the hole
- 2014 – Homeowner Flood Insurance Affordability Act of 2014

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## NFIP Background

- Created by National Flood Insurance Act of 1968
- Participation is **voluntary**
  - Adopt and enforce regulations
  - Eligible for flood insurance
- **Benefits** of participation
  - Flood insurance
  - Grants and loans
  - Disaster assistance
  - Federally-backed mortgages
- **Goals** of the NFIP include
  - Save lives and protect property
  - Encourage a comprehensive approach to floodplain management

**The Base Flood:**  
The flood having a 1% chance of being equaled or exceeded in a given year. Used by the NFIP as the basis for mapping, insurance rating, and regulating development.



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## NFIP Background

- The NFIP is a **voluntary program**
  - Voluntary agreement between FEMA and the local government.
  - Elements and requirements of the program are in 44 CFR 59 – 75.
  - A locality complies with **44 CFR 60.3** by adopting a floodplain ordinance that meets or exceeds the minimum requirements and by implementing proper floodplain management. FEMA then provides the flood insurance rate maps (FIRMs) and authorizes the sale of flood insurance in the community.



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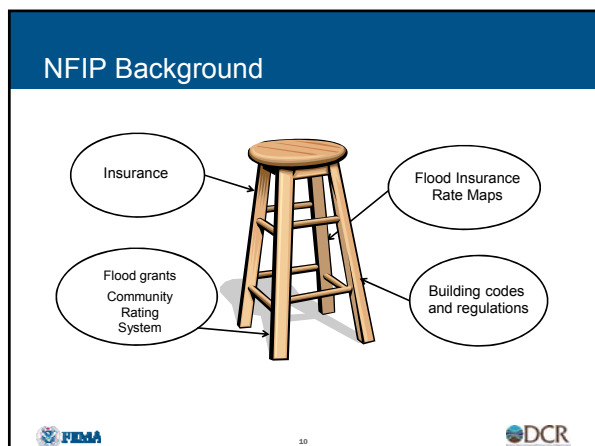
## Joining the NFIP

- Without mapped SFHA (NSFHA)
  - Resolution to join the NFIP Process
  - Submit application to DCR → FEMA
- With mapped SFHA
  - Resolution to join the NFIP Process
  - Adopt floodplain ordinance in compliance with 44 CFR
  - Submit application to DCR → FEMA
    - Communities have one year after their first FIRM to join the NFIP
    - If a community applies after that year, a Community Assistance Visit is required to ensure that all post-FIRM development in the SFHA complies with 44 CFR



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### NFIP Flood Insurance Basics

- Sold by licensed insurance agents through
  - "Write Your Own" insurance companies
  - FEMA's Direct Servicing Agent
- Essential elements of rating include
  - Flood Zone
  - Elevation Difference (BFE, LFE)
  - Building/Occupancy Type
  - Construction Date (pre-FIRM vs. post-FIRM)
  - Coverage Limits & Deductible

	Emergency Program	Regular Program
<b>Residential (1-4 family)</b>		
Building	\$35,000	\$250,000
Contents	\$10,000	\$100,000
<b>Other Residential</b>		
Building	\$100,000	\$500,000
Contents	\$ 10,000	\$100,000
<b>Non-Residential</b>		
Building	\$100,000	\$500,000
Contents	\$100,000	\$500,000

Logos for FEMA and DCR are visible at the bottom.

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### NFIP Flood Insurance Basics

- Increased Cost of Compliance**
  - Included in policy to help property owners in SFHA to pay for mitigation measures to bring NFIP insured structures into compliance
  - Provides up to \$30,000\* for mitigation
    - Floodproofing (non-residential)
    - Relocation
    - Elevation
    - Demolition

*\*ICC coverage applies solely to buildings and only covers the cost of the compliance measures undertaken.*

Logos for FEMA and DCR are visible at the bottom.

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## NFIP Roles: Federal and State

### ▪ Federal

- National program oversight
- Risk identification (mapping)
- Establish development/building standards
- Provide technical assistance to state/communities/agencies
- Provide insurance coverage

### ▪ State

- State program oversight
- Establish development/building standards
- Provide technical assistance to local communities/agencies
- Evaluate and document floodplain management activities



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## NFIP Roles: Local

### ▪ Local Officials and Floodplain Administrators

- Adopt and enforce floodplain management ordinance compliant with Federal/State laws
- Permit or deny development
- Inspect development and maintain records
- Make substantial damage/substantial improvement determinations

- Development oversight is a **local responsibility**



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## NFIP in Virginia

- There is no state-level floodplain regulation. The VA USBC contains standards for buildings in flood-prone areas and a statement that the local floodplain ordinance is not superseded by the VA USBC.
- VA Flood Damage Reduction Act, Section 10.1-600 to 10.1-603 of the Code of Virginia directs all state agencies to comply with floodplain regulations.
- Executive Memo 2-97 requires state projects in the SFHA to comply with the local floodplain ordinance.



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## NFIP in Virginia

- Currently, 290 Virginia communities participate in the NFIP.
- DCR is charged by the General Assembly in the VA Flood Damage Reduction Act, Section 10.1-600 to 10.1-603 of the Code of Virginia, to be the liaison between FEMA and communities.
- DCR assists communities with their floodplain ordinances and maps, and provides floodplain workshops and guidance.



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## NFIP Program Updates

- Impacts of recent reform legislation
  - Annual premium increase caps of 15-18%
  - Certain pre-FIRM subsidize-rated buildings in Zone A's, and V's increase 25% until reach full-risk rate\*:
    - Non-primary residences
    - Commercial buildings
    - Repetitive loss structures
    - Substantially damaged buildings



\*Rate using information from Elevation Certificate



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## NFIP Program Updates

- Impacts of recent reform legislation (cont.)
  - Properties newly mapped into SFHA can get lower-cost Preferred Risk Policy (PRP) rates first year if purchased within 12 months of map change
    - Will then increase no more than 15-18% until reach standard Zone X rate or rated using current map, whatever is cheaper
  - Lapsed policies more than 90 days will be rewritten using full-risk rates
    - This affects pre-FIRM subsidize-rated and Newly Mapped policies



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## NFIP Program Updates

### ■ Premium Increases and Surcharges

- Overall, premiums will increase from an estimated \$827 per policy to \$878, for an average increase of 6.3%
- When the HFIAA surcharge and the Federal Policy Fee are included, the total amount billed to the policyholder will increase from \$953 to \$1,005, an average of 5.4%
- Annual premium increases continue to comply with all the requirements of BW-12 and HFIAA 2014
  - No less than 5%-no more than 15% per rating class
  - Individual PH premiums no more than 18%-some exceptions
  - Specific 25% mandatory increase for certain categories



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## NFIP Program Updates

### ■ Premium Increases and Surcharges-Pre-FIRM Subsidized Policies

- Primary Residences: The combined premium increase for all primary residence policies in SFHA is 5%, with a total increase of 5%
- Non-Primary Residences: The combined premium increase for non-primary residence policies in SFHA is 24%, with a total increase of 21%
- Pre-FIRM subsidized policies subject to 25% annual increases as required by BW-12 (non-primary residential, business, SRL, and SD/SI) will increase slightly less than 25%



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## Overview of the National Flood Insurance Program

**Questions?**



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## Floodplain Ordinances and Permitting

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Floodplain Ordinances and Permitting

## FLOODPLAIN MANAGEMENT REGULATIONS


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## Floodplain Management Regulations

- Minimum NFIP requirements are found in the Code of Federal Regulations, Title 44, Chapter 1, Subchapter B
  - Definitions: 44 CFR 59.1
  - Development Standards for flooding: 44 CFR 60.3
  - Variances: 44 CFR 60.6
- Land use authority granted to localities by the state (VA Code §15.2-2280 and §10.1-600 et seq.)
- Designed to address public health, safety, and welfare of citizens


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### Regulation “Staircase”

- Regulations build cumulatively in increments according to mapping and flood zone designations.
- Each step adds more stringent requirements as risk increases.

FEMA DCR

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### 44 CFR §60.3(a): No Flood Map

- Applies to communities for which FEMA:
  - Identified no Special Flood Hazard Areas.
  - Prepared no flood map.

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### 60.3(a) Floodplain Management Criteria

- The community shall:
  - Require permits for all proposed development.
  - Ensure all necessary permits are received.
  - Review permit applications for building sites to be reasonably safe from flooding.

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### 60.3(a) New Construction Criteria

- All new construction/substantial developments:
  - Are designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement.
  - Are constructed with flood-resistant materials.
  - Use methods and practices to minimize flood damage.
  - Protect utilities and other service facilities from intrusion of floodwaters.



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### Protecting Utilities

- Raise HVAC components.
- Install backflow valve.
- Elevate electrical components.
- Anchor fuel tanks.
- Waterproof veneer.



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### New Development: 60.3(a)(4) and (5)

- (4) Review subdivision and other new development proposals for:
  - i. Need to minimize flood damage.
  - ii. Location/construction of public utilities/facilities.
  - iii. Adequate drainage.
- (5) Require new and replacement water supply systems be designed to minimize or prevent infiltration of flood waters.



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### Sewage/Waste Disposal Systems: 60.3(a)(6)

- Within floodprone areas, require:
  - i. New/replacement sewage systems that minimize or eliminate infiltration of floodwaters.
  - ii. Location of onsite waste disposal systems to avoid impairment to them or contamination from them.



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### 60.3(b): Approximate Zone A

- FIRMs identify edges of Special Flood Hazard Areas (approximate Zone A).
- No maps/studies to determine:
  - Base Flood Elevations.
  - Regulatory floodways.
  - Coastal high hazard areas.



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### 60.3(b) Requirements (1)–(4)

1. Require permits for ALL development in mapped SFHAs.
2. Apply 60.3(a) (2)–(6) standards to development.
3. Require that subdivision and other development proposals include BFE data.
  - Subdivisions: 50 lots or 5 acres
4. Use available BFE and floodway data.



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### Review Subdivision Proposals: 60.3(b)(3)

Zone A

(can the project be designed differently?)

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### 60.3(b) Requirements (5) - (8)

5. Document lowest floor or floodproofing elevation.
6. Provide notification of watercourse alterations.
7. Ensure the flood-carrying capacity within an altered watercourse is maintained. (proper permits and adjacent jurisdiction/owner notification required)
8. Require that manufactured homes be elevated and anchored.

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### 60.3(b) Requirements: Review

- Meet 60.3(a) requirements.
- Obtain BFE and floodway data.
- Elevate lowest floor to or above BFE.
- Install openings in enclosed spaces below lowest floor.
- Include BFE in subdivision proposals over 50 lots or 5 acres.

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### 60.3(c): A Zones With BFEs

- FIRMs identify:
  - Special Flood Hazard Areas
  - Base Flood Elevations
- Not determined by maps or studies:
  - Regulatory floodways
  - Coastal High Hazard Areas



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### A Zones With BFEs

- 1-percent flood:
  - AO: Shallow sheet flow, depths 1–3 feet, average **depths** shown on FIRM
  - AH: Shallow ponding, depths 1–3 feet, **BFE** shown on FIRM
  - A1–A30, AE: BFEs determined
  - A99: Protected by flood protection system under construction



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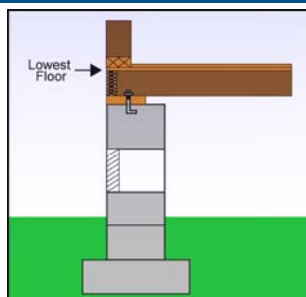
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### Lowest Floor, Zone AE: 60.3(c)(2) and(3)



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## Manufactured Homes

- Difference between 60.3(c)(6) and (12)
  - (6) Anywhere; manufactured home has been substantially damaged; replacement is required to be at or above the BFE.
  - (12) Only in a manufactured home park with no substantial damage from flooding; new or replacement can be on 3' reinforced piers regardless of the BFE.



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## Recreational Vehicles, 60.3(c)(14)

- Must be on site for less than 180 consecutive days,
- Be fully licensed and ready for highway use(wheels & tires, quick disconnects, no attached decks), or
- Meet the elevation and anchoring requirements for manufactured homes [60.3(c)(6)].



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## 60.3(c) Requirements: Review

- Apply 60.3(b) requirements, including:
  - Elevate lowest floor to or above BFE.
  - Install openings in enclosed spaces below lowest floor.
- Development cannot cumulatively raise the BFE by more than 1 foot
  - 1 foot of rise includes existing and anticipated development
  - Community-wide
  - If development will increase the BFE by more than a foot, apply for a CLOMR (and subsequent LOMR).



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### 60.3(d): A Zones With BFE and Floodway

- FIRMs/FIS identify:
  - Special Flood Hazard Areas.
  - Base Flood Elevations.
  - Floodways.



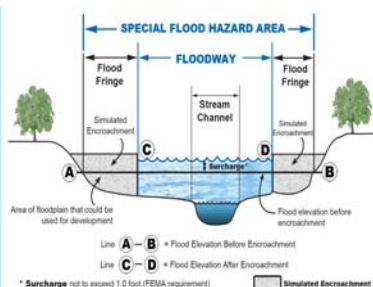
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### Floodways

**Floodway** is the channel designated to convey the fastest deepest moving waters during the base flood.

Also designed to help floodplain management — no federal minimum requirement for development outside the floodway to submit studies about BFE impacts.



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### 60.3(d) Requirements: Review

- Meet 60.3(c)(1)-(14) requirements
- Prohibit encroachments in the floodway, unless shown to cause no increase in BFE.
  - If development will increase the BFE, apply for a CLOMR (and subsequent LOMR).

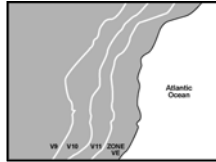


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### 60.3(e): Zones VE and V1-30

- FIRMs/studies identify:
  - Special Flood Hazard Areas.
  - Base Flood Elevations.
  - Coastal High Hazard Areas.



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### Zones VE and V1-30

- SFHA
- Areas of 1-percent chance coastal flood with velocity hazards (wave action >3 feet or seaward of landward toe of primary frontal dune)
- Base Flood Elevations and flood hazard factors determined



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### Transect Schematic

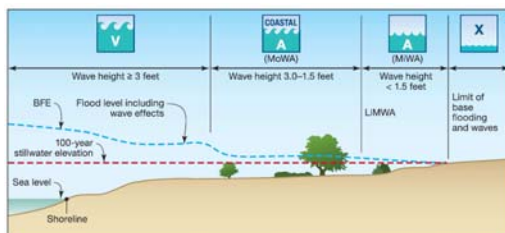


Figure 3-53.  
Typical shoreline-perpendicular transect showing stillwater and wave crest elevations and associated flood zones

COASTAL CONSTRUCTION MANUAL

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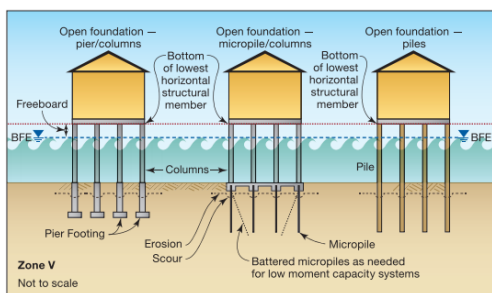
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## Lowest Horizontal Structural Member: 60.3(e)(2)



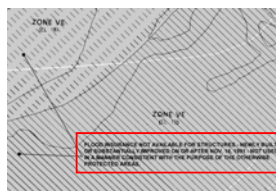
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## Coastal Barrier Resources Act (CBRA)



Federal law discourages development in these coastal areas by severely restricting federal assistance (flood insurance, disaster assistance).



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## 60.3(e) Requirements: Review

- Meet 60.3(c)(1)-(14) requirements
- Elevate the bottom of the lowest structural member to or above BFE
- Certify that structures are anchored to resist flotation, collapse, and lateral movement resulting from both high velocity wind and water loads
- Require that the space below the lowest floor be free of obstruction (except for break away walls, lattice, etc.)
- Prohibit the use of structural fill
- Prohibit man-made alterations to sand dunes



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## NFIP Sanctions of program deficiencies and violations

- Probation
  - \$50 surcharge per policy
  - Help offset future claims
  - Apply pressure to comply
- Suspension
  - No new policies or renewals
  - No Federally related financing
  - No Federal financial assistance or aid



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Floodplain Ordinances and Permitting

## ACCESSORY STRUCTURES



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## Types of Development

- Residential Development
  - Non-Residential Development
  - Other Development
- *APPURTENANT STRUCTURE: A structure which is on the same parcel of property as the principal structure to be insured and the use of which is incidental to the use of the principal structure. (44CFR 59.1)*



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### Accessory or Appurtenant Structures

- Considered non-residential structures
- 44 CFR 60.3(c)(3) & (e)(1) requires:
  - Must be at or above the BFE, or
  - Dry flood-proofed



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### Wet-Floodproofing Exception

- FEMA guidance has been that small, low cost accessory structures can be wet-floodproofed
  - TB 7-93
  - TB 5-08
  - FEMA 480
- PROBLEM: What is small and low cost?



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### What is Small & Low Cost?

- FEMA Region 3 has recently defined accessory structures as **600 ft<sup>2</sup> or less**.
- Wet-floodproofing Exception:
  - Certain conditions must be met.
  - Variances may be required.
  - Variances may not be issued for an accessory structure exceeding 600 ft<sup>2</sup>.



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### Accessory Structure Requirements

1. Not for human habitation
1. Be limited to no more than 600 ft<sup>2</sup> in total floor area
2. Be useable only for parking of vehicles or limited storage
3. Be constructed with flood damage-resistant materials below the base flood elevation
4. Be constructed and placed to offer the minimum resistance to the flow of floodwaters



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### Accessory Structure Requirements (cont.)

6. Be anchored to prevent flotation
7. Have electrical service and mechanical equipment elevated to or above the base flood elevation
8. Shall be provided with flood openings (specific standards defined)
9. *A signed Declaration of Land Restriction (Non-Conversion Agreement) shall be recorded on the property deed*



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### Accessory Structure Requirements (cont.)

- Variances
  - Not allowed for accessory structures exceeding 600 ft<sup>2</sup>
- Higher Standards
  - A community could choose a higher standard and limit accessory structures to a size less than 600 ft<sup>2</sup>, such as 200 ft<sup>2</sup>
  - In that case, a variance could be issued for larger accessory structures, not to exceed 600 ft (i.e. between 200 ft<sup>2</sup> -600 ft<sup>2</sup>)



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## Ordinance Compliance

- Local ordinances must be in compliance with this accessory structure definition.
- Three options for compliance
  - Prohibit accessory structures in the SFHA
  - Allow accessory structures in the SFHA and identify minimum requirements in your ordinance
  - Don't address accessory structures and require a variance for all accessory structures

NOTE: This is only for wet-floodproofing. You can still permit these structures in the SFHA if they meet the requirements of a non-residential structure (elevated or dry-floodproofed).



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## Model Ordinance Update

- New Definition
  - **Appurtenant or accessory structure** - A non-residential structure which is on the same parcel of property as the principal structure and the use of which is incidental to the use of the principal structure. Accessory structures are not to exceed *600 square feet*
- Two options for compliance
  - Prohibit accessory structures
  - Address accessory structures and limit to 600 square feet



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Floodplain Ordinances and Permitting

## FLOODPLAIN ORDINANCES AND ADMINISTRATIVE PROCEDURES


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Floodplain Management Ordinance

**The Ordinance**

- NFIP participating municipalities in VA agreed to **adopt and enforce** an ordinance meeting the minimum requirements of the NFIP
- Ordinance must
  - Be legally enforceable
  - Applied uniformly throughout the community
- Floodplain regulations are usually found in one of, or a combination of, five types of regulations: "stand alone", zoning ordinances, building codes, subdivision regulations, and sanitary regulations


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Stand Alone Ordinances

- One ordinance contains all NFIP requirements for development standards
- Developers and officials can easily see the requirements in **one place**
- Ensure that all offices/agencies are aware of floodplain standards when inconsistent
- May not be coordinated with other regulations or codes – regulations **could be in conflict**


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## Contents of an Ordinance

- **Purpose:** Why was the ordinance adopted? What are its objectives?
- **Definitions:** What technical terms are needed?
- **Adoption of effective flood data**
- **Requirement for a floodplain development permit**
- **Development standards:** Must include provisions for
  - Building protection standards (elevation, floodproofing, anchoring) commensurate to the flood zones in your community
  - Standards for manufactured homes and manufactured home parks
  - Standards for subdivisions
  - Substantial damage/improvements
  - Construction in the floodway and standards for encroachments where floodways are not mapped



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## Contents of an Ordinance

- **Designation of an administrator**
- **Variance and Appeals process**
- **Enforcement:** Clear penalties for violations must be specified
- **Abrogation and greater restriction:** Higher standard takes precedence
- **Severability:** One provision ruled invalid does not invalidate the rest



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## VA Model Floodplain Management Ordinance

- Includes the provisions to comply with the NFIP
- Also includes recommended higher standards
- Refers to the VA Uniform Statewide Building code and other sources

Update: Revisions of the Virginia Uniform Statewide Building Code (VSBC) 2012

### XX. Example Floodplain Management Ordinance

This is an example of an ordinance that could be used by a jurisdiction to comply with the requirements of the National Flood Insurance Program (NFIP) and the Virginia Uniform Statewide Building Code (VSBC). The ordinance is intended to be used as a model and is not intended to be a legal document.

Any jurisdiction adopting this ordinance should consult with legal counsel to ensure that the ordinance is properly adopted and enforced.

1. The purpose of this ordinance is to establish minimum standards for floodplain management in order to protect public health, safety, and property.

2. These provisions shall be enforced to the extent that they are not inconsistent with the VSBC and the NFIP.

3. These provisions shall be enforced to the extent that they are not inconsistent with the VSBC and the NFIP.

4. The Department of Planning and Development (DPM) is authorized to enforce these provisions.

5. The Department of Planning and Development (DPM) is authorized to enforce these provisions.

6. The Department of Planning and Development (DPM) is authorized to enforce these provisions.

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10. The Department of Planning and Development (DPM) is authorized to enforce these provisions.

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12. The Department of Planning and Development (DPM) is authorized to enforce these provisions.

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### Common Higher Regulatory Standards

- Freeboard
- Community Identified Flood Hazard Areas
- Restrictions to Subdivision of Land
- Non Conversion Agreement
- Location Restrictions
- Prohibition
  - Development in SFHA or Floodway
  - Manufactured Homes
  - Fill
- Flood Protected Setback
- Certificate of Compliance
- Historic Structures


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### Higher Standards

- Recommended higher standards in the model ordinance
  - 1.5 feet (18") of freeboard for residential and nonresidential construction
  - Manufactured homes required to meet new construction standards
  - Prohibition of manufactured homes outside of existing manufactured home parks
  - Size limit for enclosed space below lowest floor in VE Zone
  - Cumulative substantial damage
  - Different elevation requirements in Coastal A and VE Zones
  - Prohibition of critical facilities in Shaded X Zone
  - Non-conversion agreement requirement for accessory structures


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### Higher Standards Reduce...

...**work** and administrative burden

...**risk** and response/recovery efforts

...**costs** for insurance and rebuilding


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## Elevating Above the BFE Saves Money

- NFIP premiums based on April 2016 rates
- One-floor residential structure with no basement built Post-FIRM in SFHA
- \$200,000 coverage for the building and \$80,000 for contents
- At BFE Insurance Premium: \$2,136

Zone AE	Annual NFIP Insurance Savings	Savings Over 30 Year Mortgage*
1 ft. below BFE	-\$2,650	-\$79,500
At BFE	0	0
1 ft. freeboard	\$1,063 (50%)	\$31,890
2 ft. freeboard	\$1,426 (67%)	\$42,780
3 ft. freeboard	\$1,545 (72%)	\$46,350

\*Estimate based on April 2016 rates only



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## Ordinance Enforcement

### Discovering and Investigating Potential Violations

- Violations can be found through
  - Periodic inspections
  - Reports by other government agencies
  - Citizen's complaint
- Violations not remedied can result in
  - Increased risk to life and property
  - Increased insurance premiums
  - Probation – increased insurance rates for everyone
  - Suspension – NFIP insurance and many grants/loans unavailable

**Investigate potential violations and take appropriate action!**



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## Ordinance Enforcement Options

- **Check your ordinance for the enforcement procedures that have already been outlined**
- May include
  - Voluntary compliance by property owner
  - Written Notice of Violation or stop work order and/or revoke permit
  - Per day fine
  - Withhold certificate of occupancy
  - Record on Deed
  - Injunction – court order to stop non-compliant activity
  - Municipal housing court or building court
  - **Coordinate with your solicitor**



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## Community Liability

- Flood problem awareness with no action
- Failure to warn citizens of known flood hazard
- Improper development that increases flood risk
- Inconsistent administration of floodplain provisions



(PEMA)



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## Legal Backing

State and local governments are more likely to be successfully sued for permitting development that causes increased flooding than they are for prohibiting such development.

**Ordinances that meet the NFIP minimum requirements have not been found to be a "taking."**

### State laws

- Provide communities with the authorities necessary to adopt and enforce floodplain management ordinances
- Establish procedural and other requirements that communities must follow in adopting and implementing land use ordinances
- State floodplain management laws and regulations establish additional requirements that communities must include in their floodplain management ordinances



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## When You've Exhausted All Legal Recourse...

**Your community can consider the use of Section 1316**

*No new flood insurance coverage shall be provided for any property that has been declared to be in violation of State or local laws, regulations, or ordinances which are intended to discourage or otherwise restrict land development or occupancy in flood-prone areas*

### Denying flood insurance means:

- Risk of flood losses with no insurance coverage
- Property may be difficult to sell
- Market value of the property may fall
- Lending institutions holding a mortgage could foreclose
- Some disaster assistance will be denied

**Work with your State NFIP Coordinator and FEMA contact**



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## Floodplain Ordinance Resources

- VA DCR website
  - [Floodplain Management](#)
- FEMA 480, NFIP Floodplain Management Requirements
  - [http://www.floods.org/ace-files/documentlibrary/CFM-Exam/FEMA\\_480\\_Complete.pdf](http://www.floods.org/ace-files/documentlibrary/CFM-Exam/FEMA_480_Complete.pdf)
- Virginia Uniform Statewide Building Code:
  - <http://www.dhcd.virginia.gov/index.php/va-building-codes/building-and-fire-codes/regulations/uniform-statewide-building-code-usbc.html>
- FEMA Building Code Resource page
  - <http://www.fema.gov/building-code-resources>



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## Administrative Requirements

- Generally, the NFIP requires an administrative process but does not detail what these administrative processes must look like
- Communities must establish administrative procedures that work and are compatible with other regulations and ordinances
- Other requirements not detailed in the regulations
  - Duties of the Floodplain Administrator
  - Appeals process
  - Issuance of variances
  - Permitting systems
  - Recordkeeping systems



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## Duties of the Floodplain Administrator

- |   |  |
|---|--|
| ▪ Review applications                                 | ▪ Notification of watercourse alterations      |
| ▪ Make floodplain determinations                      | ▪ Maintain and help update flood data and maps |
| ▪ Make Substantial Improvement / Damage determination | ▪ Inspect development                          |
| ▪ Issue or deny permits                               | ▪ Recordkeeping                                |
| ▪ Review plans and specifications                     | ▪ Remedy violations                            |
| ▪ Ensure all other permits are obtained               |  |



Keep good records! A project file should be kept for each development permit application to demonstrate that the project was built in compliance with your regulations.



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## Duties of the Floodplain Administrator

- **Training and education:** Understand the NFIP regulations, State regulations, and local ordinances
- **Community Outreach:** Educate residents on the need for permits, the benefits of floodplains, the economic sustainability of good floodplain management, and the benefits of flood insurance
- **Coordinate with other agencies:** State agencies, adjacent communities, public works, zoning, code enforcement, or building dept.
- **Apply ordinances consistently:** Get specific guidance from your community's legal counsel as necessary

Common legal questions and answers about floodplain regulations in the courts can be found in **Appendix C of ASFPM's No Adverse Impact: A Toolkit for Common Sense Floodplain Management.**



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## Appealing a Floodplain Admin's Decision

- Appeals are typically **administrative** in nature (could be to a floodplain determination, substantial improvement/damage determination, etc.)
- Appeals apply to the application of an administrative decision of a floodplain administrator ordinance
- Communities must establish a **process** and an **entity** for applicants to appeal an administrative decision when they disagree
- Basic appeals process



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## Issuance of Variances

- Granting relief from ordinance requirements
- Establish a process and an entity for applicants to request variances
- Conditions of the property NOT the person
- Notice of increase to risk and insurance premiums
- Patterns of variances may result in sanctions



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## Evaluate the Merits of a Variance

- General rule – **Do not grant variances**
- Very specific conditions must be satisfied to justify a variance
  - Good and sufficient cause
  - Unique site conditions (personal considerations do not apply)
  - Hardship – must be exceptional
  - No threat to public safety
  - Minimum necessary to afford relief



Think carefully before granting a variance to build below the BFE. The property will be more likely to suffer damage and insurance will be costly. Communities with patterns of issuing variances may face sanctions – costing all property owners more!



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## Appealing an Appeal/Variance

If you **disagree** with the decision of the board to grant the appeal or variance...

...**appeal** the appeal/variance

- Why appeal? Granted for reasons inconsistent with criteria in ordinance
- Become familiar with the timeframe to file the appeal (30 days?)
- FEMA expects communities to exhaust all legal avenues



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## Record Keeping Requirements

- Requirement to maintain compliance documentation **indefinitely**
- What records?
  - Permit application
  - Inspections
  - As-built documentation
  - Other compliance documentation (for instance, certifications)
  - Flood map changes and updates
- Best practices
  - Store permits by address (rather than property owner name)
  - Use colored file folders to identify floodplain properties



For a structure located in the SFHA, FEMA and the State will require data to prove a potential violation is compliant.



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Floodplain Ordinances and Permitting

## PERMITTING DEVELOPMENT

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### Permits are Required for ALL Development

**ALL development in the SFHA requires a permit**

- Definition of development (as per 44 CFR 59)
 

**Any manmade change to improved or unimproved real estate**, including, but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.
- Before any kind of development in the SFHA is allowed, the project must be permitted by the local floodplain administrator.
- Ensure you have a process for capturing all floodplain development**

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### Permits are Required for ALL Development

- Federal, state, and local government agencies must also adhere to floodplain management requirements.
- Executive Memorandum 2-97 requires:
  - State projects in the SFHA must comply with the local floodplain ordinance, if working in a participating community. This means obtaining permits from the community's floodplain administrator.
  - When doing a project in a community that does not participate in the NFIP, state agencies are still required to meet the minimum NFIP criteria as outlined in 44 CFR 60.3.

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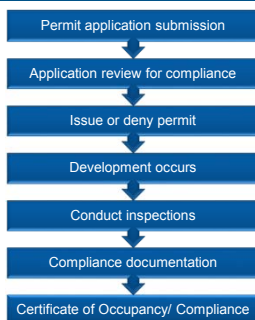
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## The Life of a Permit



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## Application Should Include...

- A good permit application should **capture all information** needed to evaluate the proposed work for compliance with required building/development standards of proposed work
- Application **MUST** include a **floodplain determination** and a **substantial improvement determination** (for modifications to an existing building)

### For Official Use Only:

Floodplain Determination: \_\_\_\_\_

Base Flood Elevation: \_\_\_\_\_

Cost of Improvement: \$ \_\_\_\_\_

Market Value of Structure: \$ \_\_\_\_\_

Improvement Percentage: \_\_\_\_\_ %



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## Application Review

### Who are the people typically responsible for reviewing permits?

- Floodplain Administrator
- Building Code Officer
- Zoning Officer
- Community Engineer
- Third-party permitting/inspection company

### Coordination with other reviewers:

- Is one person responsible for all aspects of floodplain development?
- If not, are all parties aware of the floodplain requirements?
- How is the permit application routed and either approved or denied?



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## Building Codes and the NFIP

- VA Uniform Statewide Building Code establishes building standards for new and substantially-improved buildings
- VA USBC incorporates parts of the ICC Codes
- **Not all** NFIP requirements appear in the VA USBC
  - Does not establish site or location requirements
  - Other types of development (non-structures)
- **Challenges of Administration**
  - Regulating development beyond buildings
  - Designate responsible party for meeting **all** NFIP requirements
  - Establish administrative procedures to assure coordination
  - **Do not assume** that the flood provisions of the VA USBC will be carried out by the community building official or third party



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## Building Codes and the NFIP



### ▪ REMEMBER!

- You must adhere the most restrictive code, provision, or requirement
- The absence of certain floodplain management requirements from existing building codes does not absolve the community from applying the requirements of its floodplain management ordinance and vice versa



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## VA Uniform Statewide Building Code

- The 2012 USBC (adopted in 2015) is currently in place.
- The 2015 USBC will likely be adopted in the spring of 2018.
  - The new USBC is expected to include some additional higher standards for building construction in floodplains, based on the 2015 International Codes.
- While the USBC excludes certain types of smaller development from requiring a building permit (section 108.6), this does not exclude them from needing a floodplain permit of some kind.
  - Currently, because these 15 activities are exempt from building permit requirements, a building permit may not be used for these types of development. Communities must use a different kind of permit to capture this development (such as a zoning or floodplain permit).



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## Application Review

### Review for completeness

- Forms filled out
- Site plan
  - Floodplain delineation
  - Elevations
- Building plans
- Certifications
- All other permits obtained

### Review for compliance

- Proposed building elevations
- Proposed design standards
- Building/fill/material placement
- Mechanical elevations
- Compliant openings
- Flood resistant materials



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## Review Permits For...

- **Location/Siting**
  - Floodplain determination
  - Zone and BFE identification
- **Use**
  - Residential
  - Non-residential
- **Type of work**
  - New construction/addition
  - Non-structural development
  - Placement of fill, etc.
- **Cost of improvement**
  - Substantial improvement?
- **Design standards**
  - Compliance with minimum and higher standards?
  - Is a variance necessary?



Elevated utilities (PEMA)



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## Considerations for Zone A



### Benefits of Requiring Detailed studies:

- Properly elevating structures to or above the BFE will reduce future flood losses, and will provide savings to the individual, community, and NFIP.
- Having a BFE determined will likely lower insurance premiums.
  - Simplified methods of BFE estimation are not suitable for insurance rating.
- Determining the BFE may allow the property to be removed from the requirement to obtain flood insurance, if it is elevated about the BFE.
- This is less work and less liability for floodplain administrators.
- Communities can get CRS credit for requiring detailed studies.



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## Considerations for Zone A

### Other possible sources of elevation data:

- Check other sources: federal, state, and local
- H&H study may be available – FEMA Engineering library
- Simplified methods of estimation:
  - Contour interpolation: point on boundary
  - Data extrapolation: estimating from the FIS
- In some cases, FEMA may be able to provide a BFE for a property when a LOMA is submitted.
  - Property must be less than 50 lots or 5 acres
  - The property owner may be asked to have their property surveyed.



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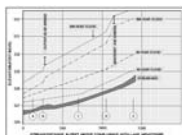
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## Considerations for Zone AE, AH, and AO

### Zone AE

- Provide the necessary elevation data for effective permitting
- Use the flood profile to determine site-specific water surface elevations



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### Zone AH and AO

- Represent areas subject to shallow flooding and sheet flow where average depths range from 1-3 feet
- Average whole-foot elevation/depth derived from the FIRM
- Lowest floor  $\geq$  flood depth  
or  
Lowest floor  $\geq$  2' when no depth is specified

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## Considerations for Zone AE

### AE Zones without Floodways

- Where FEMA has provided BFEs but no floodway, the community must review all development to **track cumulative rise**
- Ensure development does not increase the BFE more than 1.0 foot
- Once allowable rise is reached, **no further rise** is permitted
- Administrative procedure to track and collect cumulative impact



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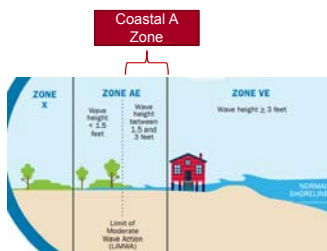
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## Considerations for Zone AE

### Zone AE in Coastal Areas

- Use LiMWA to identify Coastal A Zone
- NFIP regulations do not have provisions for Coastal A Zones
- The 2015 VA USBC will include standards for Coastal A Zone construction



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## Considerations for Zone VE

### Zone VE

- Fill for structural support of buildings is prohibited
- Man-made alteration of sand dunes and mangrove stands that would increase potential flood damage is prohibited
- Buildings must be elevated on pilings with space below lowest floor free from obstructions
- Bottom of lowest structural member of lowest flood must be at or above BFE
- For construction and/or floodplain management purposes use elevations in the FIS Coastal Transect Parameters table when they are higher than the whole-foot elevation on the FIRM, otherwise use whole-foot BFE on FIRM



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## Considerations for Floodways

### Development must prove "no rise"

- No rise = zero foot (0.00')
- Rise is tracked both upstream and downstream of development location

### Documentation requirement

- H&H study
- If existing structure, site plan showing footprint will not expand

Ensure "no rise" certificate is prepared and certified by a qualified and licensed engineer. Read the certification; ensure it shows no rise.



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## Issue/Deny Permit

### ▪ Issue the permit

- Include any conditions (i.e. required inspections)
- Start of work must commence within 180 days from the issuance of the permit

### ▪ Deny the permit

- Provide written explanation citing the specific provisions of the ordinance not met in the application
- Citation of specific provisions point out how to resubmit application in compliance with regulations
- Provide instructions regarding appeal or a variance



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## Conduct Inspections

### ▪ Importance of coordination: Check for compliance with the NFIP minimum standards

- Inspect frequently during construction
- Check openings and mechanicals

### ▪ Recommend a **minimum** of three inspections

1. After site is staked but before permanent foundation work
2. After foundation is complete
3. Before issuing certificate of occupancy



Schoharie, NY (FEMA photo library)

Identifying compliance issues prior to construction will be much easier – and cheaper – to correct than correcting compliance issues post-construction.



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## Considerations During Inspections

### Address Non-Compliance Early

- If inspections reveal violations, take steps to bring into compliance
  - Voluntary option
  - Provide written notice
  - Issue fines or penalties
  - Withhold final approvals
- Refer to ordinance for specific enforcement procedures
- Insurance for non-compliant structures is available, **but it's very expensive!**



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## Exercise: Inspections Review

### Most significant issues nationwide:

- Insufficient venting
  - Insurance rating heavily impacted
- Equipment not elevated
  - Expensive to replace
- Propane tanks not secured
  - Become explosive projectiles



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## Collecting Compliance Documentation

- Permit file **must contain as-built** or finished construction data for all new structures or substantial improvements in SFHA
- Required to prove compliance with the floodplain ordinance
- Must be **signed and sealed** by the design or certifying professional
- Examples of compliance documentation
  - Site plans and surveys
  - Building/architectural plans
  - FEMA Elevation Certificate (EC)
  - Floodproofing certificate
  - Engineered openings
  - Non-conversion agreement



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## Non-Conversion Agreement

- For enclosed spaces below BFE, uses are limited to parking, access, some storage
- Gives community official authority to revisit potential violations
- Consider requiring in ordinance
- Collect in advance of C.O.
- Attach to deed
- [Example non-conversion agreements on FEMA's website](#)



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## Other Types of Development



- Other types of development require inspections
  - Placement of fill
  - Installation of fences
  - Storage of equipment and materials
  - Placement of recreational vehicles
  - Etc.
- Develop **administrative procedures** to permit for and inspect non-building development

(FEMA Region III)  
Floodplain tour revealed unpermitted trailer storage in floodway, about 10 feet from top of bank.


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## Other Types of Development

- Develop a permitting and inspection process for manufactured homes and recreational vehicles
- Manufactured homes must be elevated on a permanent foundation and securely anchored
- Recreational vehicles are required to
  - Be licensed and road-ready
  - Be on site less than 180 days **or**
  - Meet the requirements of a manufactured home



(FEMA Region III)  
A recreational vehicle washed into a manufactured home unit


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## Certificate of Occupancy/Compliance

- Final step in the permit process
- After final inspection, construction/development is completed, and all as built compliance documentation is received
- Certificate of Occupancy is key to
  - Utility connection
  - Property sale
  - Occupancy
- Compliance checks do not end with occupancy
  - Periodic "windshield" inspections are encouraged
  - Enclosure/full foundation wall issues


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## FEMA Draft Permitting Policy

- FEMA draft policy is available online.
- Public comment period has ended. FEMA received comments from 37 entities.
  - Comments are currently being reviewed and adjudicated.



<https://www.fema.gov/media-library/assets/documents/131010>

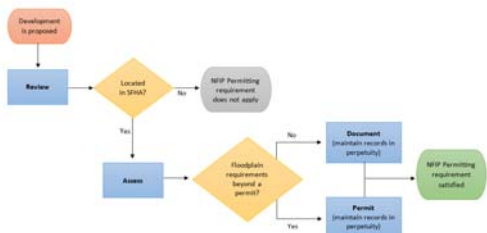


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## FEMA Draft Permitting Policy

- FEMA draft policy requires that development be reviewed, assessed, and documented.



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## FEMA Draft Permitting Policy

- Classes of activities may be reviewed upfront and considered to be permitted, without requiring an individual permit for each case.





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Floodplain Ordinances and Permitting

## ELEVATION CERTIFICATES

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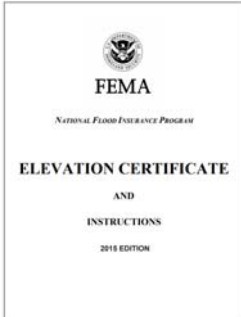
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### The Elevation Certificate (EC)

- Administrative tool used to provide elevation information necessary to
  - **Ensure compliance with community floodplain management ordinances**
  - Determine the proper insurance premium rate
  - Support requests for certain Letters of Map Change



FEMA  
NATIONAL FLOOD INSURANCE PROGRAM  
**ELEVATION CERTIFICATE**  
AND  
INSTRUCTIONS  
2018 EDITION

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### Reviewing an Elevation Certificate

- Floodplain Administrators should review for accuracy
- Incomplete form received? Send it back for revision
- **Considerations for EC Review**
  - Lowest floor in comparison to BFE
  - Lowest floor in comparison to LAG and HAG
  - Bottom of lowest horizontal structural member (Zone VE)
  - Building diagram
  - Mechanicals elevations
  - Openings requirement (engineered require certification)

A surveyor's mistake can lead to a very expensive insurance rate, and a less safe and non-compliant structure.

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## Section B: FIRM Information

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION								
B1. NFIP Community Name & Community Number				B2. County Name			B3. State	
B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use base flood depth)			
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in item B9: <input type="checkbox"/> FIS Profile <input type="checkbox"/> FIRM <input type="checkbox"/> Community Determined <input type="checkbox"/> Other/Source: _____								
B11. Indicate elevation datum used for BFE in item B9: <input type="checkbox"/> NGVD 1929 <input type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other/Source: _____								
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input type="checkbox"/> No Designation Date: _____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA								

Who can fill out  
Section B?



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## Section C: Building Elevation Information

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)			
C1. Building elevations are based on: <input type="checkbox"/> Construction Drawings* <input type="checkbox"/> Building Under Construction* <input type="checkbox"/> Finished Construction			
C2. Elevations - Zones A1 - A30, AE, AH, A (with BFE), VE, V1 - V30, V (with BFE), AR, ARA, ARAL, ARAL1 - A30, ARALH, ARALD. Complete items C2 a-i below according to the building diagram specified in item A7. In Puerto Rico only, enter meters.			
* A New Elevation Certificate will be required when construction of the building is complete.			
Benchmark Utilized: _____		Vertical Datum: _____	
Indicate elevation datum used for the elevations in items a) through f) below: <input type="checkbox"/> NGVD 1929 <input type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other/Source: _____			
Datum used for building elevations must be the same as that used for the BFE. Check the measurement used.			
a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	_____ - _____	<input type="checkbox"/> feet	<input type="checkbox"/> meters
b) Top of the next higher floor	_____ - _____	<input type="checkbox"/> feet	<input type="checkbox"/> meters
c) Bottom of the lowest horizontal structural member (V Zones only)	_____ - _____	<input type="checkbox"/> feet	<input type="checkbox"/> meters
d) Attached garage (top of slab)	_____ - _____	<input type="checkbox"/> feet	<input type="checkbox"/> meters
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	_____ - _____	<input type="checkbox"/> feet	<input type="checkbox"/> meters
f) Lowest adjacent (finished) grade next to building (LAG)	_____ - _____	<input type="checkbox"/> feet	<input type="checkbox"/> meters
g) Highest adjacent (finished) grade next to building (HAG)	_____ - _____	<input type="checkbox"/> feet	<input type="checkbox"/> meters
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	_____ - _____	<input type="checkbox"/> feet	<input type="checkbox"/> meters

Who can fill out  
Section C?



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## Section D: Certification

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION			
This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.			
<input type="checkbox"/> Check here if attachments.   Were latitude and longitude in Section A provided by a licensed land surveyor? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Certifier's Name	License Number		
Title	Company Name		
Address	City	State	Zip Code
Signature	Date	Telephone	
Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner. Comments (including type of equipment and location, per C2(e), if applicable): <div style="border: 1px solid black; height: 100px; width: 100%;"></div>			
Signature _____ Date _____			

Who can fill out  
Section D?



129



## Section E: Elevations Without Survey

**SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)**  
 For Zones AO and A (without BFE), complete items E1-E5. If the Certificate is intended to support a LOMA or LOMR if request, complete Sections A, B, and C. For items E1-E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).

a) Top of bottom floor (including basement, crawlspace, or enclosure) is  -  ☐ feet ☐ meters ☐ above or ☐ below the HAG.

b) Top of bottom floor (including basement, crawlspace, or enclosure) is  -  ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6-9 with permanent flood openings provided in Section A items 8 and/or 9 (see pages 8-9 of Instructions), the next higher floor (elevation C2 b in the diagrams) of the building is  -  ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E3. Attached garage (top of slab) is  -  ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and for equipment servicing the building is  -  ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E5. Zone AO only. If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

Who can fill out  
Section E?



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## Section F: Owner's Certification

**SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION**  
 The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.

Property Owner or Owner's Authorized Representative's Name:

Address  City  State  ZIP Code

Signature  Date  Telephone

Comments

☐ Check here if attachments

Who can fill out  
Section F?



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## Section G: Community Information

**SECTION G - COMMUNITY INFORMATION (OPTIONAL)**  
 The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in items G8-G10. In Puerto Rico only, enter meters.

G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G10) is provided for community floodplain management purposes.

G4. Permit Number  G5. Date Permit Issued  G6. Date Certificate of Compliance/Occupancy Issued

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building  -  ☐ feet ☐ meters Datum

G9. BFE or (in Zone AO) depth of flooding at the building site  -  ☐ feet ☐ meters Datum

G10. Community's design flood elevation:  -  ☐ feet ☐ meters Datum

Local Official's Name  Title

Community Name  Telephone

Signature  Date

Comments

Who can fill out  
Section G?



132



Exercise: What Building Diagram is this?



133




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Exercise: What Building Diagram is this?



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Exercise: What Building Diagram is this?



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Exercise: What Building Diagram is this?

Building Diagram 3



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Exercise: What Building Diagram is this?

Building Diagram 4



137




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Exercise: What Building Diagram is this?

Building Diagram 5



138




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Exercise: What Building Diagram is this?



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Exercise: What Building Diagram is this?



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Floodplain Ordinances and Permitting

**Questions?**



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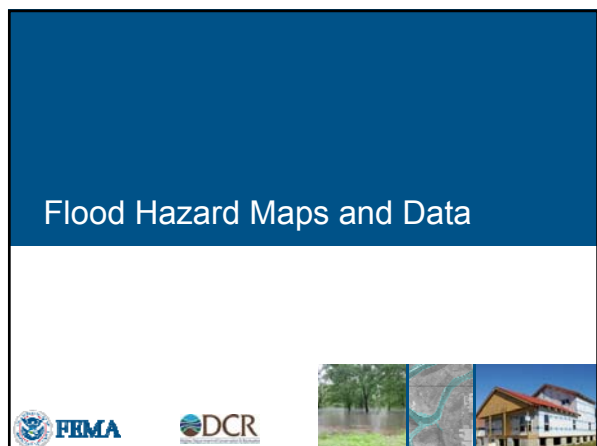
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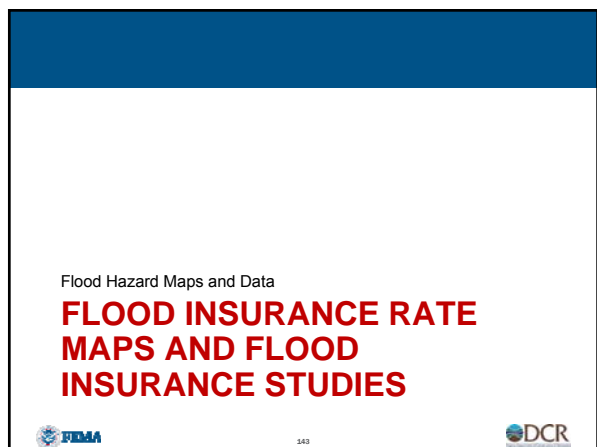
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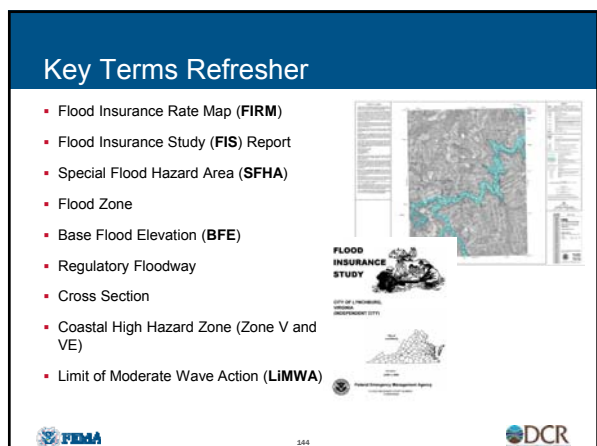
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## Flood Insurance Rate Maps

- FEMA identifies flood hazards from rivers, coasts, ponding, lakes, etc., through scientific and engineering methods. Computer models consider the size of the watershed, roughness coefficient, etc.
- FEMA maps those hazards on a Flood Insurance Rate Map (FIRM).
- The FIRM is used for floodplain management, flood insurance, and to help communicate flood risk to communities and the public.



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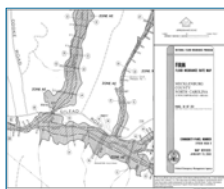
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## Special Flood Hazard Area

- The special flood hazard area (SFHA) is the land in the floodplain subject to a 1% percent or greater chance of being flooded in any given year.
  - Also referred to as 100-year floodplain.
- The elevation of 1% chance flood is the base flood elevation (BFE).
- Zoning and building code requirements are tied to the special flood hazard area.
- During the average 30-year mortgage, there is a 26% chance of a base flood occurring.



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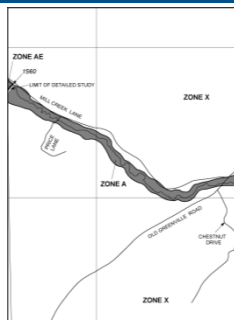
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## FIRM – Zone A



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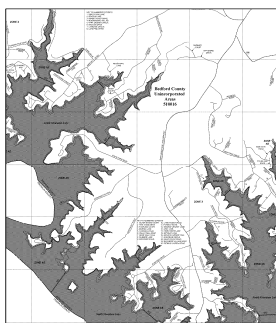
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### FIRM With Elevations – Zone AE



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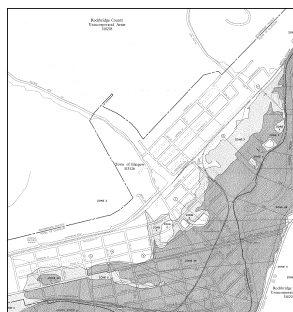
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### FIRM With Floodway



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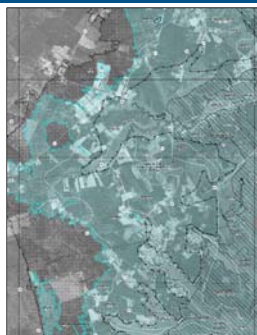
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### FIRM - V Zones



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Flood Hazard Maps and Data

## ACCESSING AND USING FLOOD HAZARD DATA


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### The National Flood Hazard Layer (NFHL)

- FEMA's nationwide geospatial database of all digital **effective** FIRM data
  - [National Flood Hazard Layer](#)
  - Integrates FIRM data including LOMCs
  - Available in GIS format
  - FIRM and FIS are still the official source of data


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### Virginia Flood Risk Information System (VFRIS)

#### BACKGROUND

- In March 2015, the General Assembly amended §10.1-602 of the Code of Virginia, tasking DCR to develop a web-based flood protection plan for the Commonwealth that includes (among other things):
  - An inventory of flood-prone areas
  - The collection and distribution of information relating to flooding and floodplain management
  - Assist localities in their management of floodplain activities


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### What is VFRIS?

- Interactive map tool that brings together information from FEMA, FWS, ESRI, VGIN, and others to provide an understanding of flood risk.
- Developed by the Virginia Institute of Marine Science and DCR.
- No longer managed by the State of North Carolina.



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### VFRIS Goals

- Provide local officials, home owners, realtors, and developers with an understanding of a property's flood risk.
- Create a mapping tool that is more flexible and current than what was afforded on the old VFRIS, maintained by the State of North Carolina.
- Develop a mapping tool that is specific to Virginia and can be customized to the needs of the commonwealth.



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### VFRIS Timeline

- Phase I of VFRIS was rolled out in February, 2017.
- Phase II was completed in October, 2017.
- An additional phase or two expected, in addition to continued maintenance over the lifetime of VFRIS.



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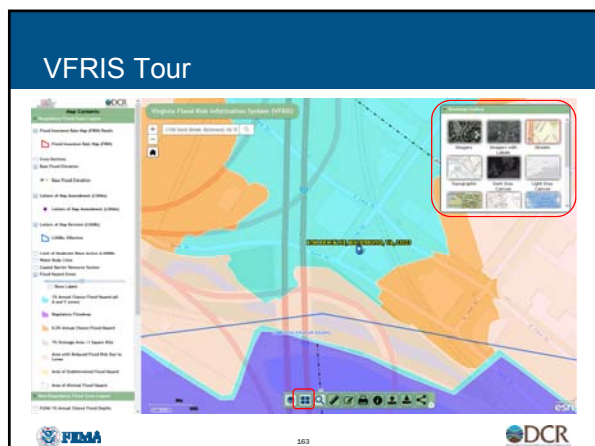
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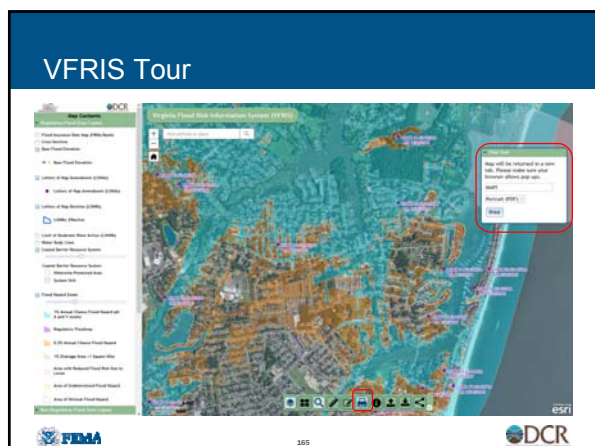
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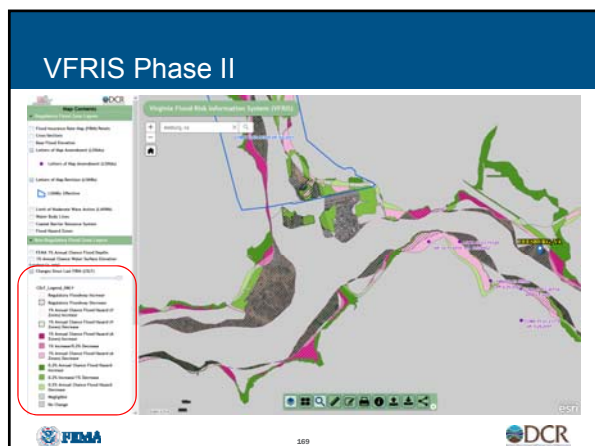
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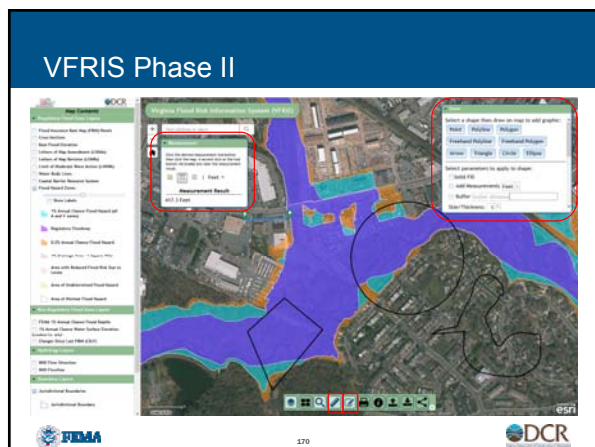
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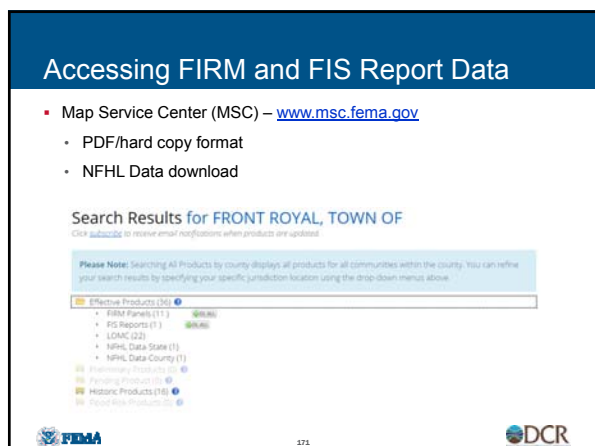
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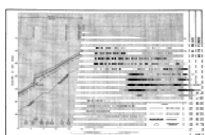
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## Using the Flood Insurance Study

- Use the FIS report for
  - Flood determinations for specific sites
  - Finding the **most accurate BFE** data
  - DO NOT** use the FIRM for riverine elevation determinations. **DO** use the FIRM for coastal flooding elevation determinations.
  - Red flag when reviewing riverine elevation data from surveyors – whole number BFEs




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## Making a FIRMette

- Map Service Center (MSC) FIRMette – [www.msc.fema.gov](http://www.msc.fema.gov)

Search Results—Products for PULASKI COUNTY UNINCORPORATED AREAS

The flood map for the selected area is number 51153C0005, effective 09/26/2005



Show all products for this area

Layers of Map Change

- Revisions (2)
- Amendments (2)
- Revalidations (2)

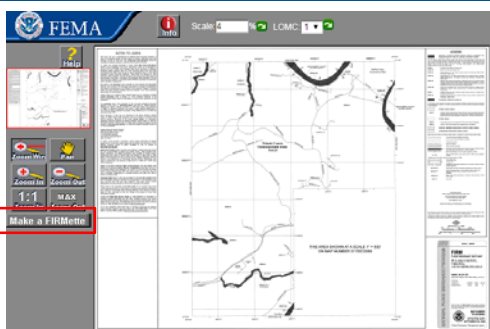
Locator Map



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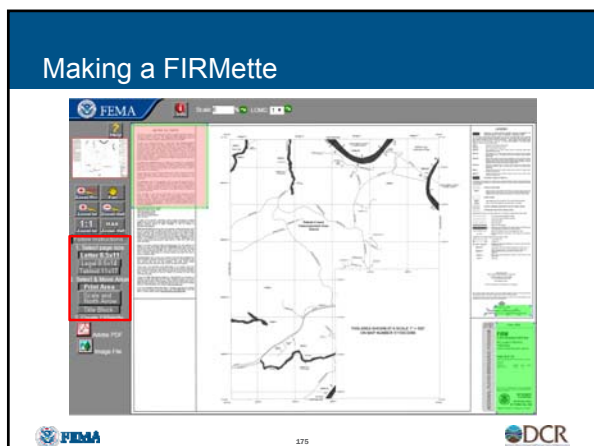
## Making a FIRMette



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## Making a FIRMette




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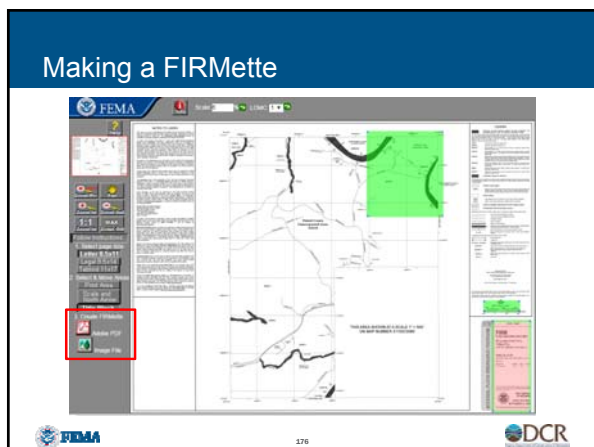
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## Making a FIRMette




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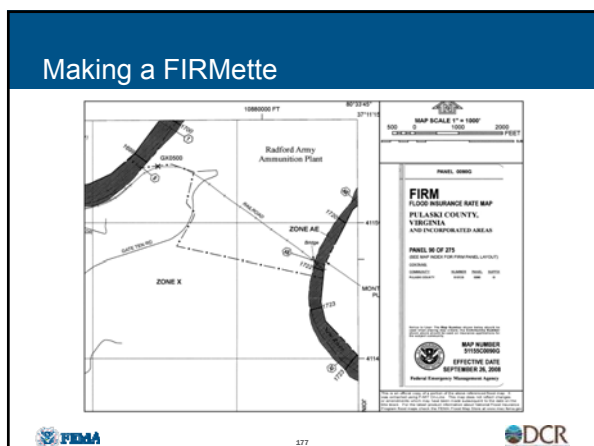
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## Making a FIRMette




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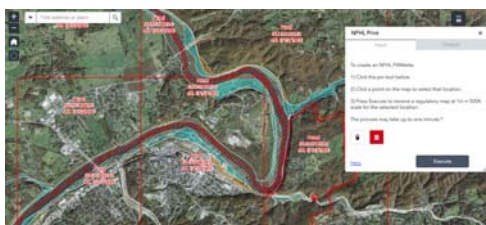
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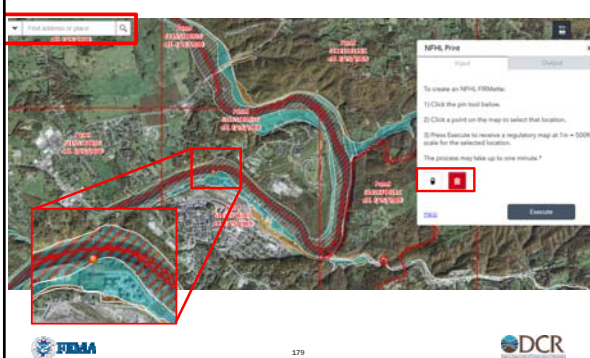
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## Making a FIRMette

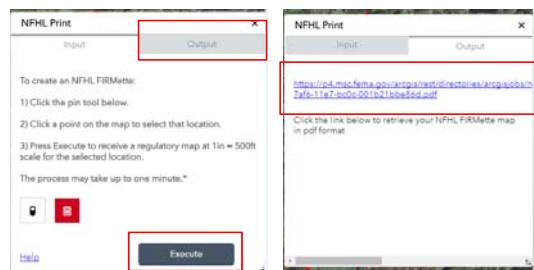
- NFHL FIRMette builder – <http://fema.maps.arcgis.com/apps/webappviewer/index.html?id=49069b91c14a411fa8defccf5c1f6266>



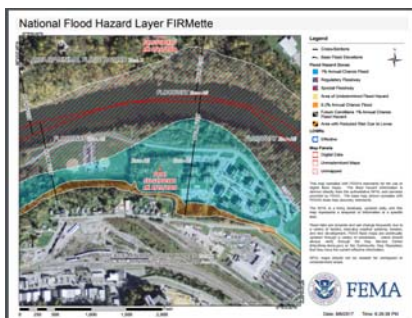
## Making a FIRMette



## Making a FIRMette



## Making a FIRMette



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## Approximate A Zone Elevations

- Detailed studies are not available.
- Simplified methods can provide estimated BFEs.
- If you lack confidence in simplified estimation methods, require property owners to provide BFEs based on detailed studies.
- Simplified methods:
  - Contour interpolation
  - Data extrapolation (rarely applicable)



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## Contour Interpolation & Data Extrapolation

- Both are simplified methods, and cannot be used to support LOMA and LOMR-F applications.
- Contour interpolation overlays topographic maps on the FIRM.
- Data extrapolation extends flood profiles beyond the detailed study area.
- At least one other method plus previous flooding history should be used.
- See FEMA 265.



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## Contour Interpolation Steps

- Identify the contour interval.
  - Note that a smaller contour interval will yield a more accurate BFE estimate.
- Draw a line through the SFHA at the site of the structure, perpendicular to the river.
- Identify the elevation where this line crosses each side of the SFHA.
- Determine if this method is appropriate.
  - The floodplain boundary must generally conform with the contour lines along the flooding source.
  - The difference between the elevation on both sides of the SFHA must be equal to or less than  $\frac{1}{2}$  of the contour interval.
- If acceptable, estimate the BFE by adding half of the contour interval to the elevation of the lower side of the SFHA.



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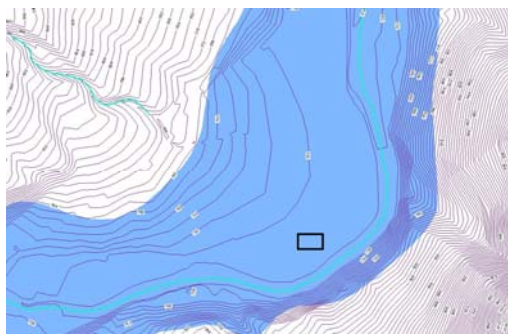
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## Contour Interpolation Example 1



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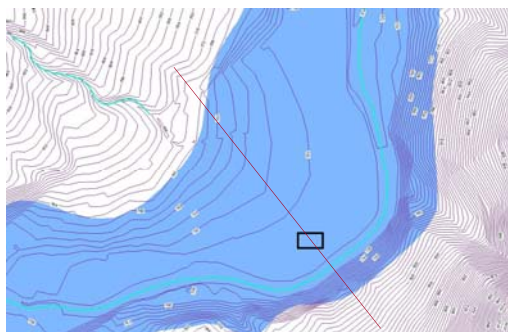
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## Contour Interpolation Example 1



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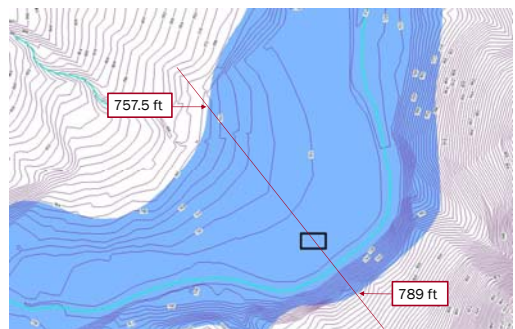
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### Contour Interpolation Example 1




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### Contour Interpolation Example 1 Answers

- Contour interval: 4 ft
  - $\frac{1}{2}$  contour interval:  $5 \text{ ft} / 2 = 2 \text{ ft}$
- Elevation of the northwest SFHA boundary: 757.5 ft
- Elevation of the southeast SFHA boundary : 789 ft
- Difference between elevations:  $789 - 757.5 = 31.5 \text{ ft}$
- Method acceptable?:  $31.5 > 2 \text{ ft}$ , so method is not acceptable

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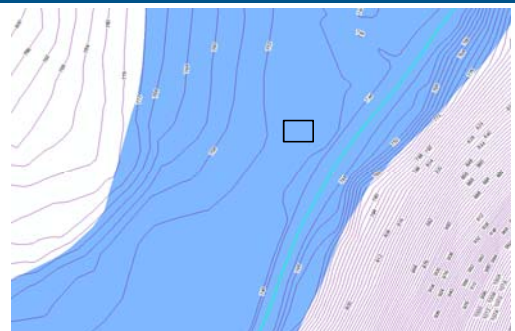
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### Contour Interpolation Example 2




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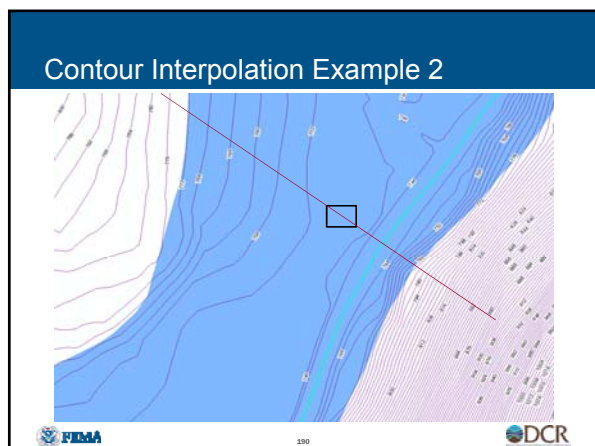
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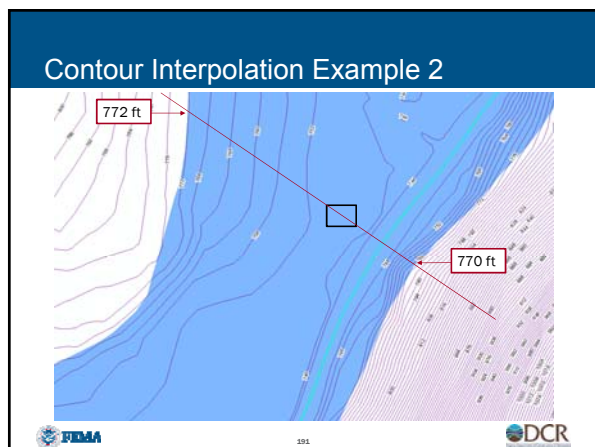
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### Contour Interpolation Example 2 Answers

- Contour interval: 4 ft
  - $\frac{1}{2}$  contour interval:  $5 \text{ ft} / 2 = 2 \text{ ft}$
- Elevation of the northwest SFHA boundary: 772 ft
- Elevation of the southeast SFHA boundary : 770 ft
- Difference between elevations:  $772 - 770 = 2 \text{ ft}$
- Method acceptable?:  $2 \text{ ft} = 2 \text{ ft}$ , so method is acceptable
- Estimated BFE:  $770 \text{ ft} + 2 \text{ ft} = 772 \text{ ft}$

FEMA DCR

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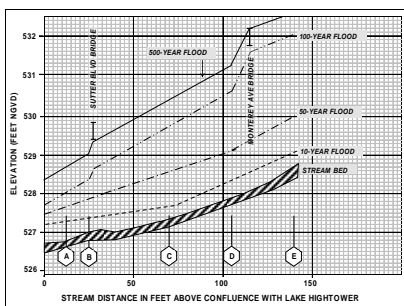
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## Data Extrapolation: Extend Profile



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## Data Extrapolation Criteria

- Site must:
  - Be within 500 feet of the detailed study area.
  - Have floodplain characteristics similar to the detailed study area—for example:
    - The valley does not narrow rapidly upstream.
    - There is no waterfall.
  - Have no hydraulic structures such as dams and bridges.



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## Data Extrapolation Steps

- Determine the location of the site on the flood profile for the detailed study area.
- Extrapolate the last segment of the flood profile that has a constant slope to the location of the site.
- Determine the BFE from the extrapolated profile.



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## Data Extrapolation – Figures 11 and 12



Figure 12 - Data Extrapolation Method - Plan View

\*Property Y is approximately 175' upstream of the limit of detailed study (as measured along the streamline). Using the profile below, we can extrapolate the 100-year flood profile to determine that the BFE for property Y is equal to 33'.

\*Property Z is approximately 100' upstream of the limit of detailed study (as measured along the streamline), and is therefore beyond the limit of data extrapolation.



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## Data Extrapolation – Figures 11 and 12

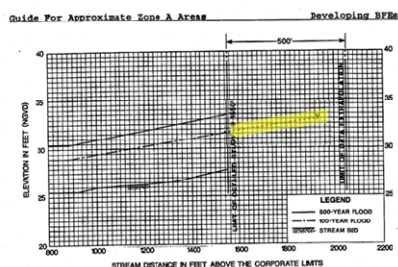


Figure 11 - Data Extrapolation Method - Profile



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## Data Extrapolation – Figures 13 and 14

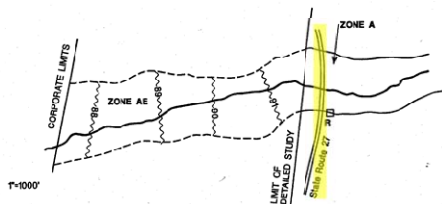


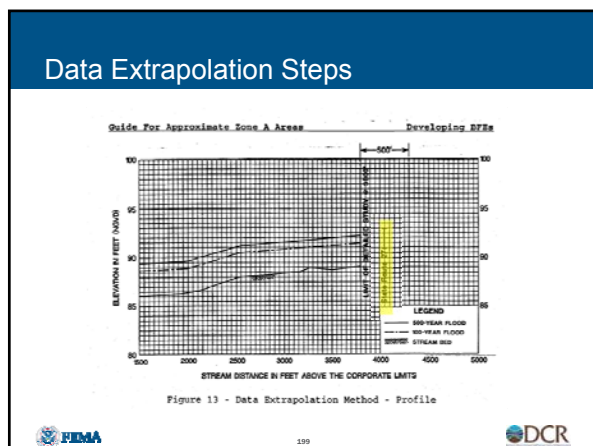
Figure 14 - Data Extrapolation Method - Plan View

\*State Route 27 may have an effect on the 100-year water-surface elevations. Therefore, data extrapolation should not be used to obtain a BFE for property A.



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### New Model-Backed A Zones

- FEMA is starting to provide communities with model-backed A Zones
- To generate these, automated H&H studies are run for A Zones
  - Not detailed enough to be included on the FIRMs but can be used to approximate a 1% flood elevation
  - Another method to compare estimated methods
- Caveats:
  - Bridges and culverts not taken into consideration
  - Requires special skills to interpret data

*Zone A cross sections will be available in the future*

FEMA DCR

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### Flood Hazard Maps and Data

## CHANGING FIRMS AND FIS REPORTS

FEMA DCR

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## When to Use the LOMC Process



- To update the map due to better topographic data, a physical change in the floodplain, or better modeling (LOMR)
- To remove the mandatory federal flood insurance requirement
  - Inadvertent inclusions – structures built on natural high ground (LOMA)
  - Structures elevated on fill\* (LOMR-F)

\* **Caution:** Placement of fill around an existing foundation to increase the LAG could result in a low floor violation.

*Note: LOMAs are not issued in Zone VE based on Primary Frontal Dune*



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## Requirement to Submit New Data

### When is a community **required** to initiate a revision?

- Development occurring in Zones A1-30 and AE without a designated floodway for proposed increases of more than 1.0 foot
- Floodway encroachment (no rise requirement)
- Alteration or relocation of a stream (including but not limited to installing culverts and bridges)
- Submission of new technical or scientific data within 6 months of receipt/completion
  - Proposals greater than 50 lots or 5 acres
  - Better topographic information

*The Coordinated Needs Management Strategy (CNMS) (<https://msc.fema.gov/cnms/>) tracking tool is used by FEMA to track map update needs. Communities can share needs with FEMA using this tool.*



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## Requirement to Submit New Data

### Role of the Floodplain Administrator

- Review CLOMR and LOMR applications
  - Appropriate revision and in line with ordinance?
  - Make use of local resources, such as an engineer or legal counsel
  - Pass the cost along to the applicant
- Make use of conditional process to ensure compliance
- Clearly communicate to developers their responsibility in the revision process
- Follow-up: ensure a LOMR is completed for final projects before issuance of certificate of occupancy/compliance



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## LOMCs and Community Responsibility

- Community Acknowledgement Form
  - FEMA requires the community acknowledgement for approval of a LOMR-F and may request it for other LOMCs.
  - But...you do not have to sign!
  - Consider signing for projects that the community supports.
- Assist applicant (review required for C/LOMR-F and C/LOMR)
- Requirement to submit new technical data within 6 months
- Tracking and storing information
  - LOMC determinations
  - Elevation Data
  - Permit and Inspection Data



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## LOMC Exercise: Timing is Critical

### Example

- A permit application is received for a proposed structure currently located on a site currently shown in the SFHA
- The building site is on naturally high ground and the lowest adjacent grade is above the current BFE
- The applicant is proposing a single-story residential structure with a basement

**Question:** Since the ground elevations are above the corresponding BFE can the floodplain management requirements be waived?



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## LOMC Exercise: Importance of Timing

### Answer: No

- For both regulatory and insurance purposes the site is considered to be in the SFHA
- The structure must be constructed in compliance with the floodplain ordinance – no basements (if the lowest floor of the basement will be below BFE)

### Recommended Action:

Recommend that the applicant obtain a LOMA

- A LOMA for the land will remove the structure from the SFHA and the requirements of the floodplain ordinance will not apply
- A LOMA for the land will remove the requirement to purchase flood insurance, and insurance will be available at reduced rates
- Single and multiple lot or structure LOMA applications are no cost



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## Exercise LOMC: Importance of Timing

### Example 2

- A permit application is received for a proposed structure on a site currently located within the SFHA. Structural fill will be placed, elevating the structure above the corresponding BFE.
- A CLOMR-F has been received by the applicant stating the property, including the building pad, will be above the BFE if built as proposed. There is no floodway and no other fill restrictions.

**Question:** Since the applicant has a conditional letter from FEMA stating the property will be outside of the SFHA when filled as proposed, they want to waive the lowest floor requirement for structures built within the SFHA and propose adding a basement. Is this allowable?



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## Exercise LOMC: Importance of Timing

### Answer: No

- For both regulatory and insurance purposes the site is considered to be in the SFHA until the effective map is officially revised through a LOMR-F. Even then, having a lowest floor below the adjacent BFE is strongly discouraged.
- The structure must be constructed in compliance with the floodplain ordinance – no basements

**Recommended Action:** If the LOMR-F is received removing the land from the SFHA, use FEMA Technical Bulletin 10-01 to ensure the structure is reasonably safe from flooding.

### Potential issues:

- Flood insurance covers limited damages in basements from overland flow
- Foundation damage/collapse from subsurface flow



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## LOMC and Permit Resources

- Application Instructions: <https://www.fema.gov/letter-map-changes>
- Elevation Certificate: <http://www.fema.gov/media-library/assets/documents/160?id=1383>
- LOMC Tutorials: <https://www.fema.gov/online-lomc-training>
- FEMA Map Service Center (MSC): <http://msc.fema.gov>
- FIRMeTte Resources: <https://www.fema.gov/media-library/assets/documents/34930>
- Orthometric Height Conversion (VERTCON): [http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert\\_con.pr1](http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.pr1)



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Flood Hazard Maps and Data

## NON-REGULATORY PRODUCTS AND OTHER RESOURCES

211

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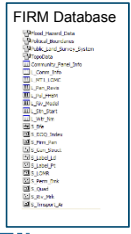
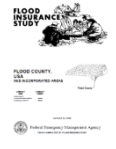

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## Non-Regulatory Products and Other Resources

- Through the Risk Mapping Assessment and Planning (Risk MAP) Program, FEMA provides communities with both regulatory and non-regulatory products.
- Traditional regulatory products:

212

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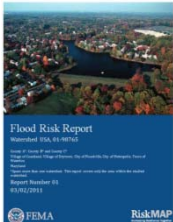
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## Non-Regulatory Products and Other Resources

- New non-regulatory products:

213

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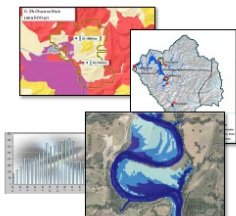
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## Non-Regulatory Products and Other Resources

- The Flood Risk Database includes 4 datasets:

- Changes Since Last FIRM
- Flood Depth & Analysis Grids
- Flood Risk Assessments
- Areas of Mitigation Interest



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## Flood Risk Database

- **Changes Since Last FIRM**

- Horizontal Changes and Results
- **Structure/Population counts impacted by change**
- **Depth & Analysis Grids**
  - Depth (10, 04, 02, 01, 0.2 percent chance)
  - Percent Annual Chance
  - Percent 30-Year Grid
  - **Delivery of Water Surface Elevation (multi-freq)**
  - **Water Surface Elevation Change Grid (1%)**

- **Velocity Grids**
- **Multi Freq Grids for Coastal Areas, etc.**

- **Flood Risk Assessment**

- Average Annualized Loss – 2010
- Refined Flood Risk Assessment
- **HAZUS or Non-HAZUS with improved data/assumptions**

- **Areas of Mitigation Interest**

- Areas of Mitigation Opportunity or Awareness

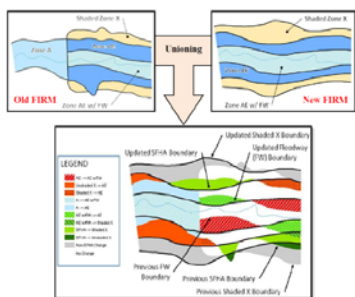
\*Red = Enhanced Flood Risk Database



215



## Changes Since Last FIRM



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## Flood Depth and Analysis Grids

- Flood Depth and Analysis Grids include:
  - Flood Depths for multiple flood frequencies
  - Water Surface Elevation for multiple flood frequencies
  - Water Surface Elevation Change Since Last FIRM (1%)
  - Percent Annual and 30-yr Percent Chance of Flooding
  - Velocity
  - Hillshade



217




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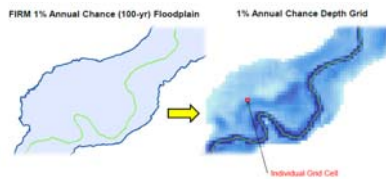
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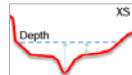
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## Flood Depth and Analysis Grids

- Each square of the Flood Depth and Analysis Grid has a value:



- Calculated by subtracting the elevation of the ground from the elevation of the water surface during a given flood event.



218




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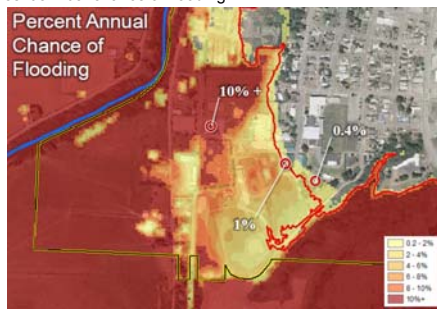
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## Percent Chance of Flooding Grids

- Percent annual chance of flooding



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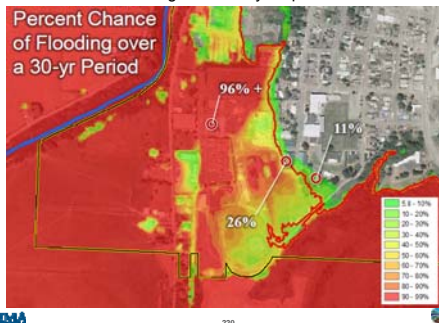
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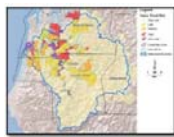
## Percent Chance of Flooding Grids

- Percent chance of flooding over a 30-year period



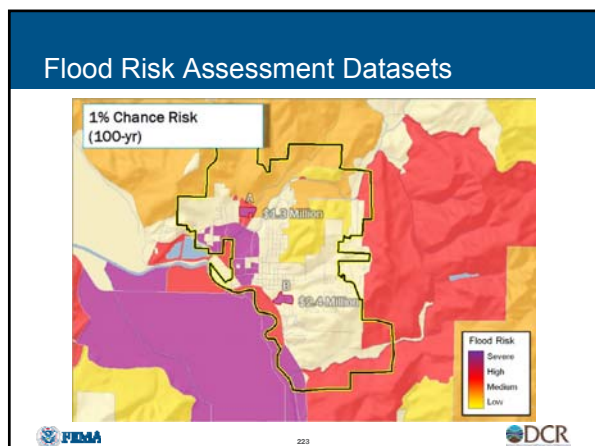
## Flood Risk Assessment Datasets

- 2010 HAZUS Average Annualized Loss (AAL) Study Data
- Refined HAZUS and Other Risk Analyses Data
- Composite Data



## Flood Risk Assessment Datasets

- Identify Areas and Communicate Relative Flood Risk:
  - Flood prone areas
  - Vulnerable people and property
- Provide Flood Risk \$:
  - Potential damage severity for different flood frequencies
  - Identify locations with possible cost effective mitigation options
- Improve Estimates for Flood Risk \$:
  - Losses from Average Annualized Loss (AAL) Study
  - Refined losses from new flood study depth grids
  - Refined general building stock data from local sources




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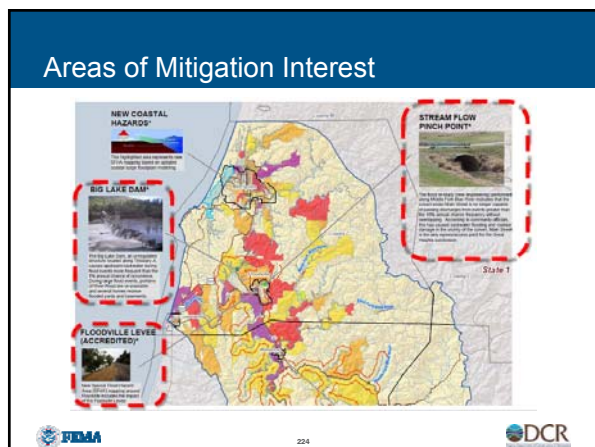
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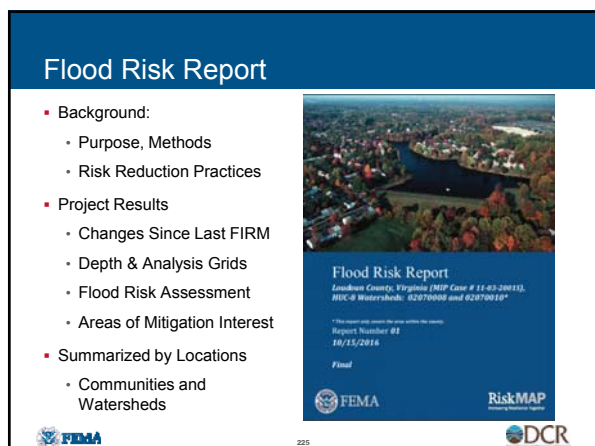
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## Where to Find Non-Regulatory Products

- FEMA Map Service Center: Search All Products - <https://msc.fema.gov/portal/advanceSearch>

FEMA Flood Map Service Center: Welcome!

Looking for a Flood Map? 

Enter an address, a place, or longitude/latitude coordinates:

Enter an address, a place, or longitude/latitude coordinates

Search



Looking for more than just a current flood map?

Visit [Search All Products](#) to access the full range of flood risk products for your community.



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## Where to Find Non-Regulatory Products

FEMA Flood Map Service Center: Search All Products

Choose one of the three search options below and optionally enter a posting date range.

Jurisdiction	Jurisdiction Name	Product ID
State	Jurisdiction Name or FEMA ID	Product ID
VIRGINIA	(Ex: Fairfax Countywide or S1059Q)	(Ex: Panel Number, LOMC Case Number)
County		
LOUDOUN COUNTY		
Community		
LOUDOUN COUNTY ALL JURISD		

> Filter By Posting Date Range (Optional)

Search

Clear All Fields



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## Where to Find Non-Regulatory Products

Search Results for LOUDOUN COUNTY ALL JURISDICTIONS

Click [here](#) to receive email notifications when products are updated.

Please Note: Searching All Products by county displays all products for all communities within the county. You can refine your search results by specifying your specific jurisdiction location using the drop-down menus above.

- Effective Products (85)
- Historical Products (1)
- Historical Products (1)
- Road Risk Products (1)**

Please Note: Road Risk Products have purposes that are different from regulatory flood hazard products (i.e., FEMA FIS Report, and Flood Database). Regulatory flood hazard products are mandated by law and used by the National Flood Insurance Program (NFIP) for rating flood insurance policies and enforcing the federal mandatory insurance purchase requirements. Road Risk Products are supplementary resources for communicating flood risk to communities and may not entirely align with the regulatory flood maps. The information in these products reflect what was produced by the Road Risk Map Study in that state. Depending on the requirements of the study, the Road Risk Products available for your community may consist of a Flood Risk Map, Road Risk Report or Road Risk Database.

- Road Risk Maps (1)
- Road Risk Reports (1)
- Road Risk Database (1)

Product ID	File Format	MSC Posting Date	Size	Download
FDL_S1107C_GeoDatabase	GeoDatabase	10/15/2016	390KB	<a href="#">Download</a>
FDL_S1107C_GeoTIFFs	GeoTIFFs	10/15/2016	344KB	<a href="#">Download</a>
FDL_S1107C_Shapefiles	Shapefiles	10/15/2016	35KB	<a href="#">Download</a>





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## Flood Hazard Maps and Data

# Questions?


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## Pre- and Post-Disaster Considerations



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## Increase Your Capacity Pre-Disaster

- Know your areas of risk
- Obtain training (Floodplain management training, SD Estimator)
- Educate residents on the ordinance and substantial damage requirements
- Ensure ordinance is compliant
- Enter into a Mutual Aid Agreement
- Pre-load data onto SDE Tool
- Pre-identify an alternative site for permit office
- Contractor vetting
- Develop a Mitigation Plan



Substantial Improvement/  
Substantial Damage  
Desk Reference  
2015.0-210 / May 2015  
FEMA


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## Hazard Mitigation Plans

- Hazard mitigation plans help to prepare communities for disasters and guide post-disaster response and recovery efforts.
- The Federal Disaster Mitigation Act of 2000 requires localities to adopt a local or regional hazard mitigation plan in order to be eligible for funding through FEMA's Hazard Mitigation Grant Program and Pre-Disaster Mitigation Grant Program.
  - VDEM provides PDCs with funding to assist their member localities in developing regional hazard mitigation plans.
  - Most communities in Virginia choose to participate in regional hazard mitigation plans.
- Hazard mitigation plans are required to be updated every five years, but should be reviewed annually and after each disaster.
  - Floodplain managers should be included in annual reviews, to advocate for mitigation projects and help identify what mitigation has occurred.



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## Hazard Mitigation Plans

- Almost universally, flooding is the number one disaster facing communities. Floodplain managers are the local experts on flooding and should be involved in gathering and vetting the data that will be included in the hazard mitigation plan.
- Hazard mitigation plans are required to include the number of NFIP policies and repetitive loss/severe repetitive loss claims. Floodplain managers should play a key role in increasing NFIP participation and reducing the number of vulnerable structures in the community.
- In CRS communities, the floodplain managers and CRS coordinator should work together closely to make sure that the hazard mitigation plans gets as much CRS credit as possible.
  - Communities wishing to get CRS credit for their hazard mitigation plans need to meet additional requirements.



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## Post-Flood Disaster Checklist

- Review floodplain management ordinance
- Tour floodplain to ensure development/rebuilding is compliant
- Require permits for all development, not just for substantial damage
- Notify property owners of permit and building requirements
- Perform substantial damage determination
- Notify property owners of determination results and subsequent building requirements in writing



(PEMA)



(PEMA)



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## Permits Are Required

- A permit is required **regardless** of whether or not the repairs rise to the level of substantial damage.
  - Permits are required for repairs
  - The permit fee can be waived
  - The permit requirement **cannot be waived**
- Non-compliance post-disaster will have negative insurance implications and could result in sanctions.



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## Substantial Improvement/Damage

### Definition:

- Cost to restore the structure to its **pre-damaged** condition equals or exceeds **50%** of its **pre-damage market value**



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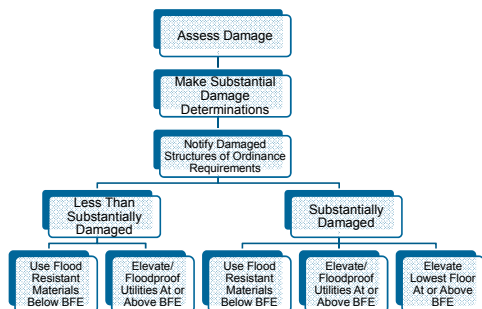
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## Substantial Damage Determination Process



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## Making Substantial Damage Determinations

- Substantial damage determinations are a **local responsibility**
- Ways to determine market value:
  - Tax assessed value
  - Appraisal (licensed professional)
  - Actual cash value, including depreciation
  - Qualified estimates based on professional judgment of local official
- Look at the Substantial Improvement/Substantial Damage Desk Reference (FEMA P-758) for guidance on what costs to include



Foundation failure (FEMA Region III)



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## Substantial Damage Estimator

- Pre-populate property information pre-disaster in preparation for post-disaster substantial damage determinations
  - Basic structure characteristics, market value, etc.
- Downloadable for free at
  - [Substantial Damage Estimator Tool \(2.0\)](http://www.fema.gov/media-library/assets/documents/18692?id=4166)  
(<http://www.fema.gov/media-library/assets/documents/18692?id=4166>)
  - [Substantial Damage Estimator Best Practices](http://www.fema.gov/media-library/assets/documents/26753)  
(<http://www.fema.gov/media-library/assets/documents/26753>)



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## Substantial Damage Implications

### Benefits of bringing structures into compliance with current codes:

- Reduces exposure to flood risk
- Reduces the cost of flood insurance and future damages
- Fulfills one prerequisite for ICC eligibility
- Cost beneficial for HMGP grants

### Challenges to achieving compliance:

- Cost of addressing compliance issues
- Typically requires significant changes to design of structure




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## Post-Flood Opportunities

- Increase awareness of flood risk
- Encourage residents to build back safer and stronger
- Share low cost mitigation actions with property owners
- Distribute information on grant opportunities
- Capture high water marks



Homeowner's Guide to Retrofitting  
Six Ways to Protect Your Home From Flooding  
FEMA P-323, 1st Edition / June 2014

FEMA DCR

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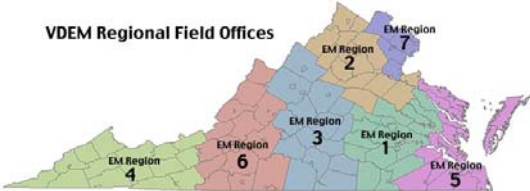
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## VDEM Regional Contacts

VDEM Regional Field Offices



EM Region 1  
EM Region 2  
EM Region 3  
EM Region 4  
EM Region 5  
EM Region 6  
EM Region 7

Regional Planner (Region 2):  
Catherine Hughes  
[catherine.hughes@vdem.virginia.gov](mailto:catherine.hughes@vdem.virginia.gov)

FEMA DCR

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## Pre- and Post-Disaster Considerations

# Questions?

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## The Community Rating System (CRS)




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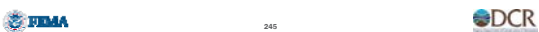
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## The Community Rating System (CRS)

- Voluntary program for communities participating in the NFIP
- Recognizes activities beyond the minimum NFIP requirements by **reducing the cost of flood insurance from 5 to 45 %**
- Goals
  - Reduce flood damage to insurable property
  - Encourage a comprehensive approach to floodplain management
  - Strengthen/support the insurance aspects of the NFIP


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## Benefits of CRS

- Money stays in the community
- Insurance savings offset costs
- Improved flood protection
- Better organized programs
- Technical assistance
- Public information builds constituency
- Incentive to keep implementing




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## CRS Premium Savings

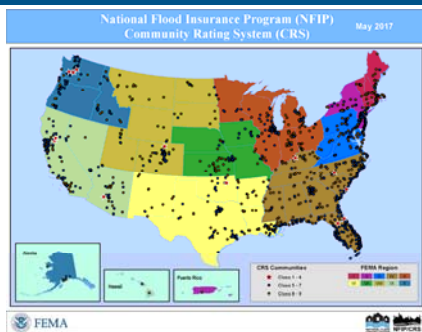
CRS Classes, Credit Points, and Premium Discounts			
CRS Class	Credit Points	Premium Reductions	
		In SFHA	Outside SFHA
1	4,500 +	45%	10%
2	4,000 – 4,499	40%	10%
3	3,500 – 3,999	35%	10%
4	3,000 – 3,499	30%	10%
5	2,500 – 2,999	25%	10%
6	2,000 – 2,499	20%	10%
7	1,500 – 1,999	15%	5%
8	1,000 – 1,499	10%	5%
9	500 – 999	5%	5%
10	0 – 499	0	0



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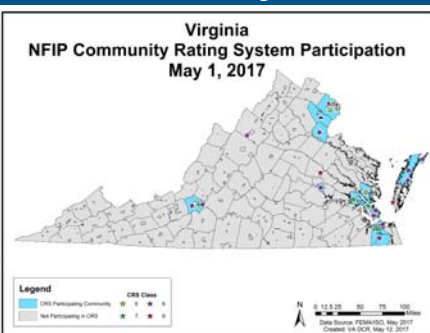
## CRS Communities in the US



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## CRS Communities in Virginia



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## CRS Communities in Virginia

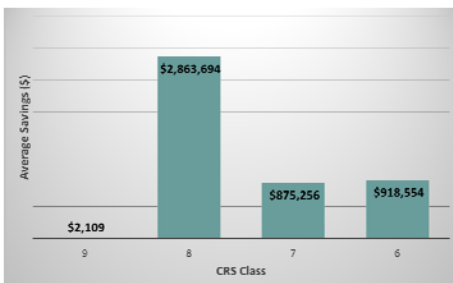
- ACCOMACK COUNTY
- CITY OF ALEXANDRIA
- ARLINGTON COUNTY
- TOWN OF ASHLAND
- TOWN OF BRIDGEWATER
- TOWN OF CAPE CHARLES
- CITY OF CHESAPEAKE
- TOWN OF CHINCOTEAGUE
- FAIRFAX COUNTY
- CITY OF FALLS CHURCH
- GLOUCESTER COUNTY
- CITY OF HAMPTON
- JAMES CITY COUNTY
- CITY OF NORFOLK
- CITY OF POQUOSON
- CITY OF PORTSMOUTH
- PRINCE WILLIAM COUNTY
- CITY OF RICHMOND
- CITY OF ROANOKE
- ROANOKE COUNTY
- STAFFORD COUNTY
- TOWN OF VIENNA
- TOWN OF VINTON
- TOWN OF WACHAPREAGUE
- YORK COUNTY



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## CRS Classes & Savings in Virginia



Number of Communities per Class

4	15	4	4
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## What If – Example

		TOTAL	SFHA **	X-STD/ARIA99 **	PRP ***
	RIF	11,505	6,924	1,390	3,621
	PREMIUM	\$9,361,000	\$7,066,212	\$662,600	\$1,432,196
	AVERAGE PREMIUM	\$784	\$1,021	\$621	\$366
CRS Class	09	Per Policy	\$35	\$54	\$33
		Per Community	\$417,306	\$371,909	\$45,400
08	Per Policy	\$60	\$107	\$33	\$0
	Per Community	\$789,211	\$743,811	\$45,400	\$0
07	Per Policy	\$97	\$161	\$33	\$0
	Per Community	\$1,161,120	\$1,116,720	\$44,400	\$0
06	Per Policy	\$132	\$215	\$65	\$0
	Per Community	\$1,578,429	\$1,487,620	\$90,800	\$0
05	Per Policy	\$163	\$269	\$65	\$0
	Per Community	\$1,950,331	\$1,859,530	\$90,800	\$0
04	Per Policy	\$195	\$322	\$65	\$0
	Per Community	\$2,322,236	\$2,231,439	\$90,800	\$0
03	Per Policy	\$226	\$376	\$65	\$0
	Per Community	\$2,654,141	\$2,603,341	\$50,800	\$0
02	Per Policy	\$257	\$430	\$65	\$0
	Per Community	\$3,006,042	\$2,976,240	\$30,000	\$0
01	Per Policy	\$288	\$483	\$65	\$0
	Per Community	\$3,437,959	\$3,347,159	\$90,800	\$0



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## Costs to Community

- Pass a Community Assistance Visit
  - Letter of Good Standing
- Designate a CRS Coordinator
- Implement activities
- Maintain records
- Recertify each year
- Participate in verification visits



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## Prerequisites to Participate

1. Be in Regular Phase of the NFIP at least 1 year
2. In full compliance with the NFIP
3. Agree to maintain Elevation Certificates
4. Assess and address repetitive loss properties
5. Maintain all flood insurance policies required for community-owned buildings
6. Coastal communities agree to show LiMWA on FIRM



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## Higher Class Prerequisites

- Class 6
  - Receive and maintain a classification of 5/5 or better Building Code Effectiveness Grading Scale (BCEGS)
- Class 4
  - Receive and maintain a classification of 4/4 or better BCEGS
  - Demonstrate programs that minimize flood losses, minimize increases in future flooding, protect natural floodplain functions, and protect people from the dangers of flooding.
- Class 1
  - Successful CAV within the previous 12 months
  - Demonstrate that it has a "no adverse impact" program

NOTE: Each class must meet the prerequisites required for the class(es) below it



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## Application Process

- Program Prerequisites
  - Activity Credit Points
- CRS Quick Check
- Letter of Interest
- ISO Verification Visit & Report
- FEMA approval
- Effective May 1 or October 1



*NOTE: This process may take several months or even a year.*

FEMA DCR

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## Maintaining CRS

- Recertify annually
- Cycle verification visits every 3-5 years
  - By ISO/CRS Specialist
- Modifications
  - Follow cycle verification process

FEMA DCR

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## Four Categories of Activities

- 300 Series – Public Information
- 400 Series – Mapping and Regulations
- 500 Series – Flood Damage Reduction
- 600 Series – Warning and Response

19 Activities  
94 Elements

FEMA DCR

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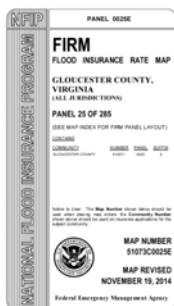
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## Public Information Activities

- 310 – Elevation Certificates
- 320 – Map Information Service
- 330 – Outreach Projects
- 340 – Hazard Disclosure
- 350 – Flood Protection Information
- 360 – Flood Protection Assistance
- 370 – Flood Insurance Promotion



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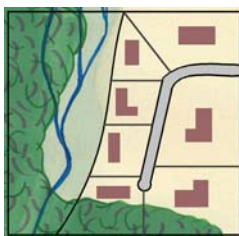
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## Mapping and Regulations Activities

- 410 – Additional Flood Data
- 420 – Open Space Preservation
- 430 – Higher Regulatory Standards
- 440 – Flood Data Maintenance
- 450 – Stormwater Management



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## Flood Damage Reduction Activities

- 510 – Floodplain Management Planning
- 520 – Acquisition and Relocation
- 530 – Flood Protection
- 540 – Drainage System Maintenance



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## Warning and Response Activities

- 610 – Flood Warning & Response
- 620 – Levee Safety
- 630 – Dam Safety



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## CRS Activity Examples

- Preserving open land in the floodplain
- Having/enforcing statewide building codes
- Adding freeboard provision to ordinance
- Low density zoning
- Letters to property owners in floodprone areas
- Retrofitting floodprone buildings
- Removing floodprone buildings from floodplain
- Having/enforcing stormwater management regulations
- Maintaining drainage systems



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## Helpful Hints

- Most communities apply for credit for activities that they're already implementing
- Most communities can join as a Class 8 based on existing activities
- "New" community CRS initiatives for additional credit are often less expensive, public information activities
- To be successful, all the offices and departments that are responsible for flood-related activities should be involved



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The Community Rating System

**Questions?**

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DCR Division of Dam Safety and Floodplain Management Update

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DCR Division of Dam Safety and Floodplain Management Update

**FLOODPLAIN MANAGEMENT  
PROGRAM OVERVIEW**

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## Floodplain Management Program Overview

- DCR is charged by the General Assembly in the VA Flood Damage Reduction Act, Section 10.1-600 to 10.1-603 of the Code of Virginia, to serve as the coordinator of all flood protection programs and activities in the Commonwealth.
- DCR acts as a liaison between FEMA and communities for the National Flood Insurance Program.
- DCR assists communities with their floodplain ordinances and maps, provides floodplain workshops and trainings, and provides technical assistance and guidance.
- DCR works closely with FEMA Region III, VA state agencies, other state NFIP offices in the Region, and the VA Silver Jackets team.



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## Silver Jackets Program Goals

- Facilitate strategic life-cycle flood risk reduction.
- Create or supplement a continuous mechanism to collaboratively solve state-prioritized issues and implement or recommend those solutions.
- Improve processes, identifying and resolving gaps and counteractive programs.
- Leverage and optimize resources.
- Improve and increase flood risk communication and present a unified interagency message.
- Establish close relationships to facilitate integrated post-disaster recovery solutions.



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## The Floodplain Management Plan for the Commonwealth of Virginia

- The plan will be a web-based resource that serves as a one-stop-shop for flood information in Virginia.
  - This is a departure from the 2005 plan, which was a 226 page document.
- The new Virginia Flood Risk Information System (VFRIS) is one major element of the website. Phase 1 of VFRIS was rolled out in February 2017.
- The draft website layout is complete and two pages are in the initial draft phase.
- Legal information and analysis has been provided by the Virginia Coastal Policy Center.



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## State Model Floodplain Ordinance

- DCR updated the state model floodplain ordinance to incorporate new FEMA guidance on accessory structures.
  - DCR has been working with communities to understand this accessory structure guidance and incorporate it into their ordinances.
  - No statewide deadline for community adoption. DCR works with communities on a rolling basis.
- DCR is currently working to ensure the ordinance aligns with the current and future VA Uniform Statewide Building Code.



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DCR Division of Dam Safety and Floodplain Management Update

## DAM SAFETY UPDATE



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## Dam Safety Inventory System (DSIS)




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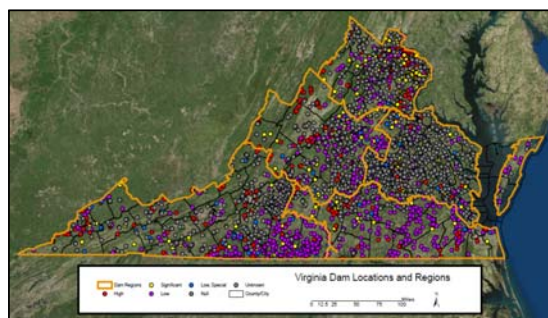
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## Virginia Dam Locations and Regions



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## Dam Safety Inventory System Goals

- Digital Files and Attachments
- Centralized Database
- Simplified Tracking
- Quickly Find Data
- Export Reports and Files for Sharing
- Public Facing
- Quickly Respond to Emergency Requests
- Effective Response During Emergencies



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## Dam Safety Inventory System Information

- Contact information
- Technical Specifications
- Inspections
- Permits
- Certificates
- Emergency Action Plans
- Map location and additional map layers (including dam break inundation zones and SFHA)



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### Dam Safety Inventory System

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### Dam Safety Inventory System

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### Dam Safety Inventory System

**Leatherwood Creek Dam #5 – Watershed**

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### Dam Safety Inventory System

Leatherwood Creek Dam #5 – Watershed



FEMA DCR

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### Dam Safety Inventory System Contacts

David Wilmoth, Dam Safety Engineer  
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 804-625-3977

James Martin, Conservation Data Specialist  
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 804-887-8916



FEMA DCR

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### Dam Safety Contacts

**Dam Safety Regions and Contacts**



FEMA DCR

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DCR Division of Dam Safety and Floodplain Management Update

Questions?

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Floodplain Management Contacts

DCR Floodplain Management

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  - Floodplain Program Manager
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Floodplain Management Contacts

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