

# **ANALYSIS OF THE NATIONAL FLOOD INSURANCE PROGRAM**

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# Outline

- **Introduction**

- Flood
- National Flood Insurance Program (NFIP)
- NFIP Reforms
- Subsidized Rates and Actuarial (Full-risk) rates

- **Analysis**

- Premiums Collected vs. Losses Paid
- Difference between Premiums Collected and Losses Paid
- Loss Ratio per year

# Outline

- **Flood Insurance Rate Maps (FIRMs)**
  - Risk Areas
  - Preferred Risk Policy
  - “Grandfathering”
- **Coverage**
  - Emergency Program and Regular Program
  - Community Rating Service (CRS) Program
  - Moderate-to-low Risk Areas PRP
  - High Risk Areas

# Outline

- **Biggert-Waters Flood Insurance Reform Act of 2012**
  - Goals
  - Homeowner Flood Insurance Affordability Act of 2014
- **Actuarial Rate Formula**
- **Premium Calculation**
  - Rate Tables
  - Premium Calculation Examples
- **Conclusion**

# Introduction

- A flood is a condition where two or more acres of normally dry land or two or more properties are inundated by water or mudflow [11].
- Causes of Flood
  - Heavy Rainfall, Wildfire, Tropical Storms and Hurricanes, Spring Thaw, Clogged drainage systems
- Primary Effects
  - Loss of life, Damage to motor vehicles and structures, Power Outage
- Long-term Effects
  - Economic Hardship, Shortages, Psychological Damage

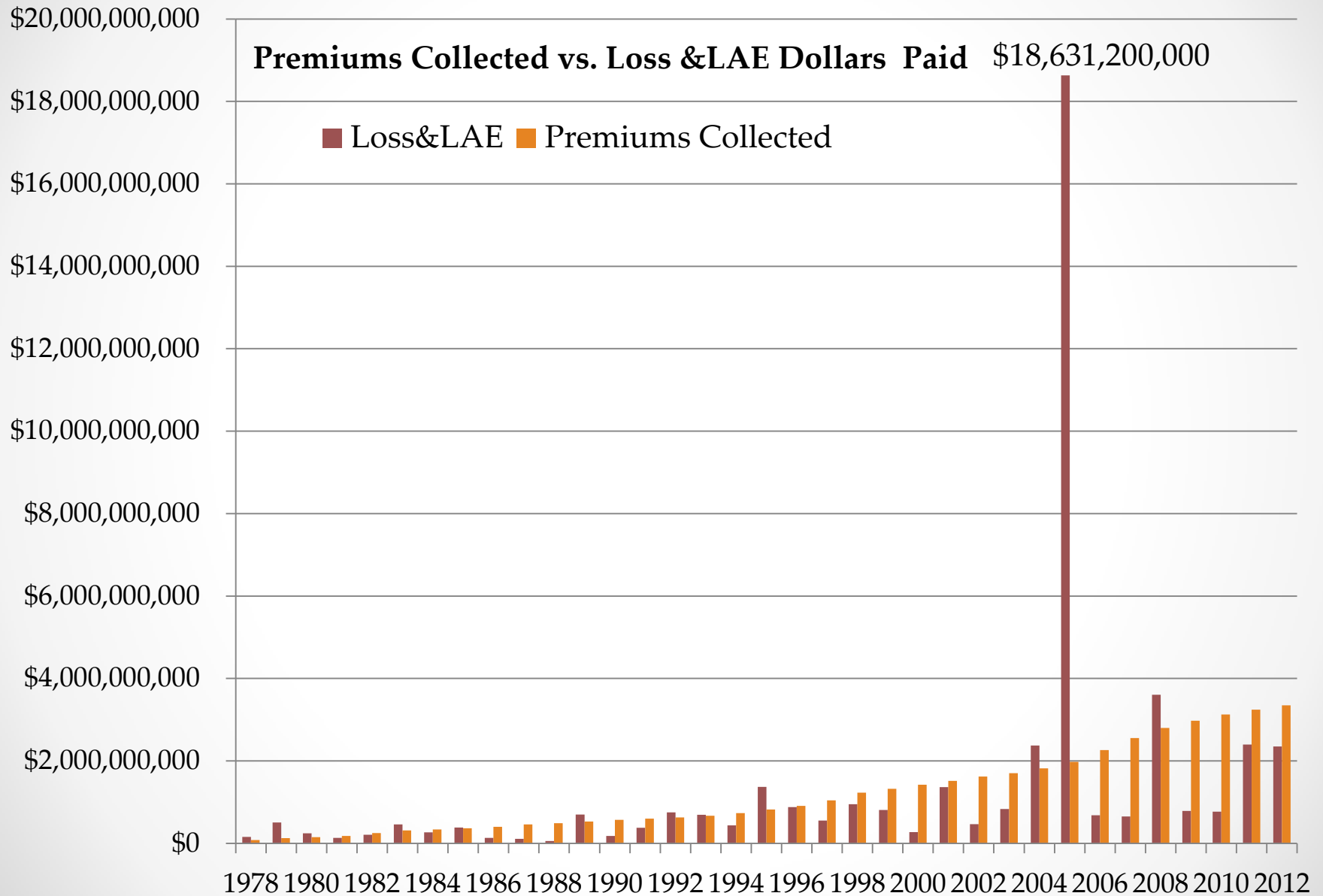
# Introduction

- National Flood Insurance Act of 1968
  - Provide Financial Protection
  - Reduce the impact of flooding
- Federal Emergency Management Agency (FEMA)
  - Write Your Own (WYO) program in 1983
  - Direct Business
- Deductibles

# Introduction

- National Flood Insurance Program (NFIP) Reforms
  - Flood Disaster Protection Act of 1973
  - National Flood Insurance Reform Act of 1994
  - National Flood Insurance Reform Act of 2004
  - Biggert-Waters Flood Insurance Reform Act of 2012 (BW12)
  - Homeowner Flood Insurance Affordability Act of 2014 (HFIAA)
- Subsidized rates are rates that do not reflect full risk of flooding.
- Actuarial rates reflect full-risk of flooding and are based on the elevation relative to Base Flood Elevation (BFE).

# Analysis





# Analysis

Expenses	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Interest on Borrowing						\$523,221.7	\$523,535,548	\$730,185,164	\$811,515,698	\$214,368,255
Other Expenses	\$322,587,415	\$320,981,003	\$339,883,060	\$363,734,043	\$366,330,151	\$395,019,539	\$450,216,093	\$489,269,088	\$495,063,569	\$533,363,749
Total	\$322,587,415	\$320,981,003	\$339,883,060	\$363,734,043	\$366,330,151	\$400,251,756	\$973,751,641	\$1,219,454,252	\$1,306,579,267	\$747,732,004

- Other Expenses
  - Direct and Bureau General Expense
  - WYO Operating Allowance
  - Direct Agent Commission

# Analysis

\$5,000,000,000

## Annual Difference between Premiums Collected and (Losses&LAE) Paid

\$0

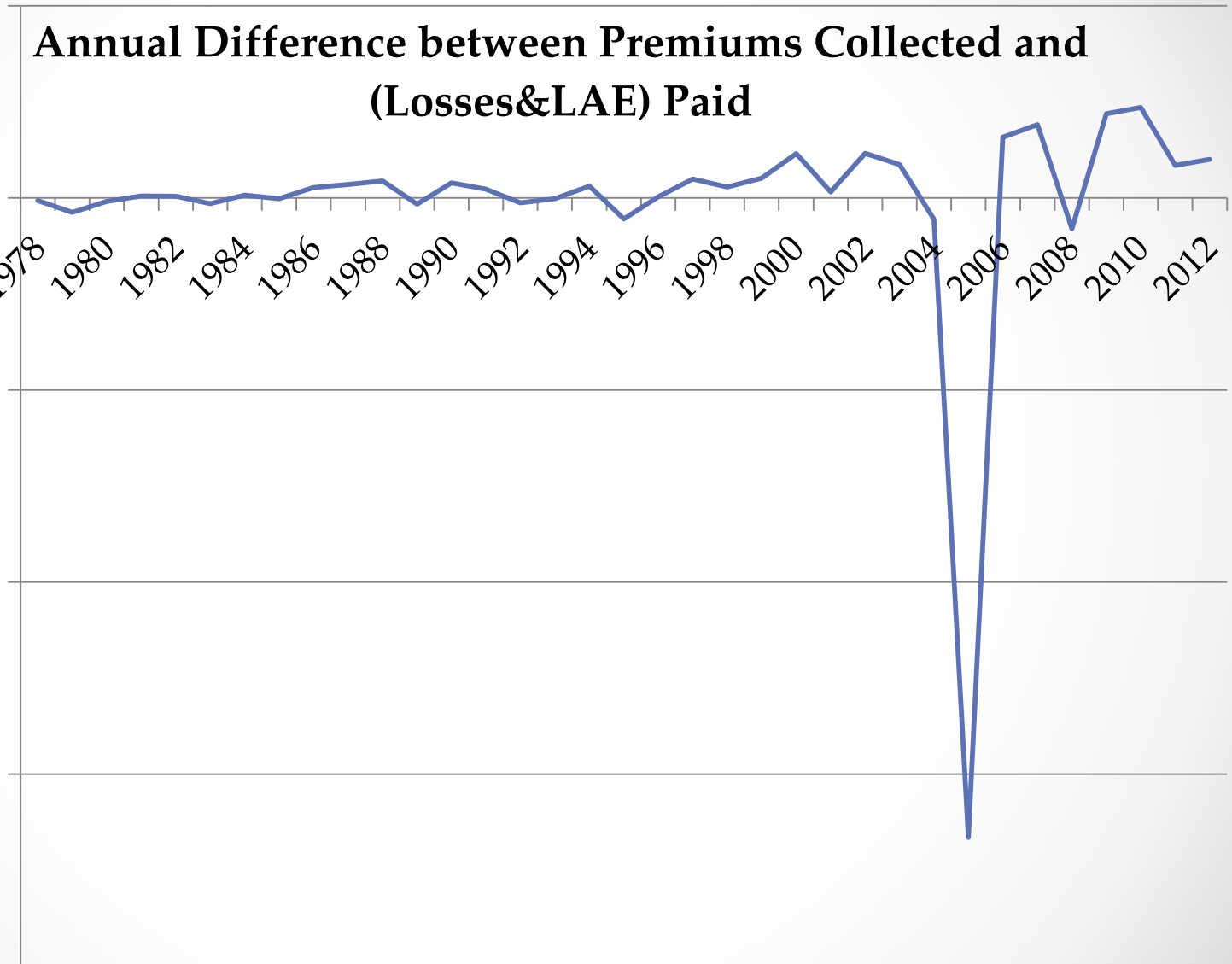
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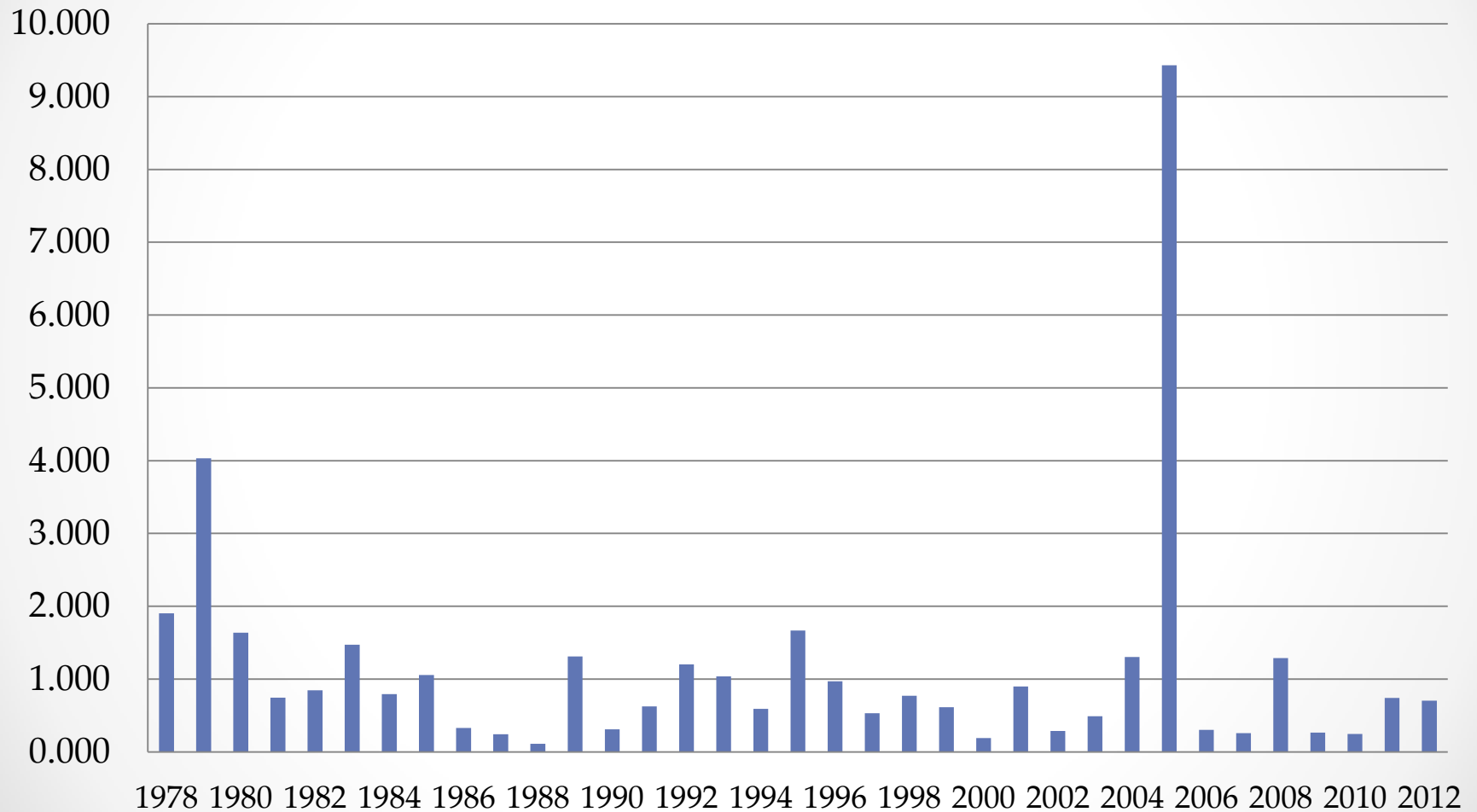
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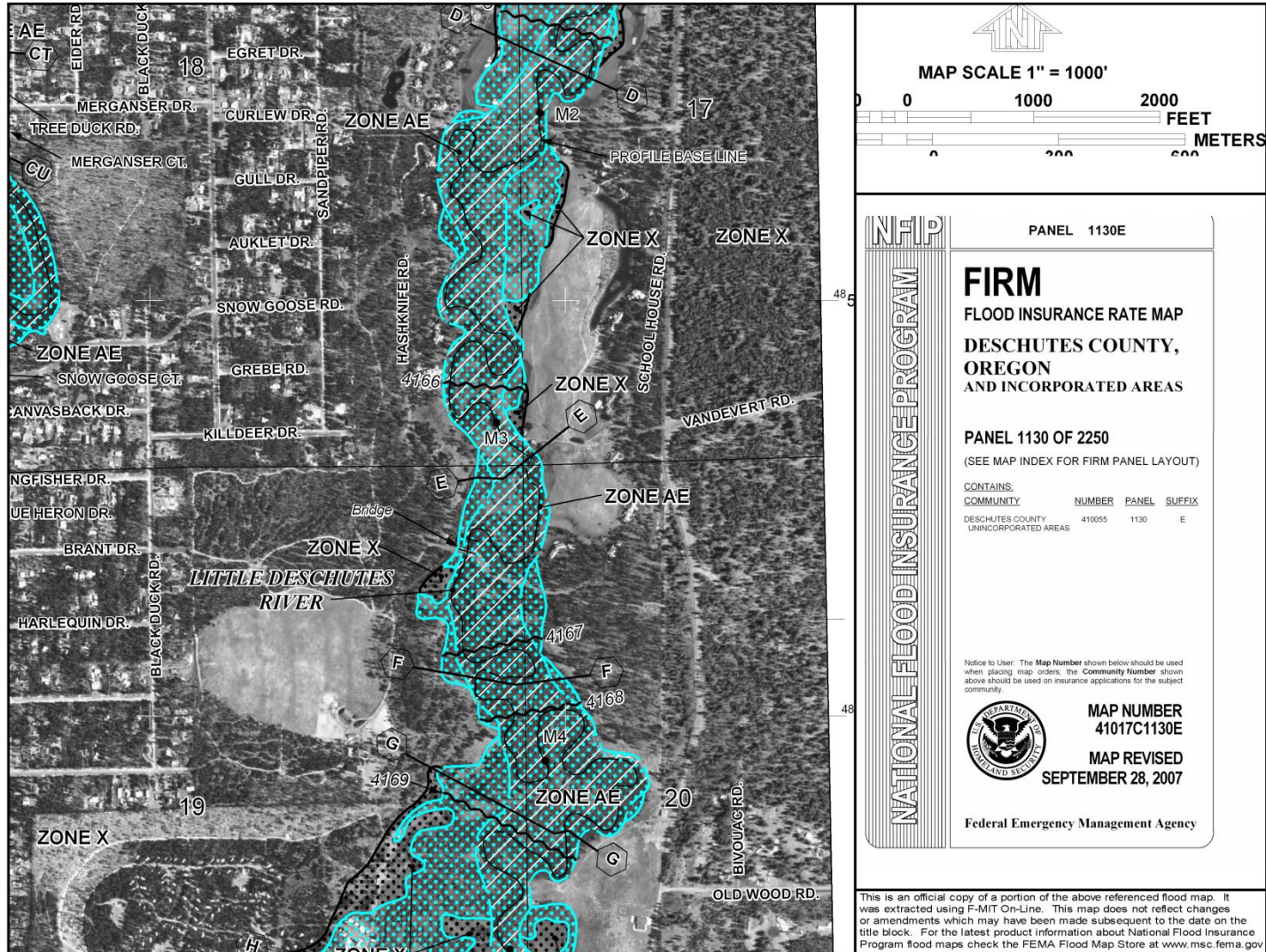


# Analysis

Loss Ratio per year



# Flood Insurance Rate Maps (FIRMs)



# Flood Insurance Rate Maps (FIRMs)

- **Preferred Risk Policy**

- Cost-saving option for properties that have been newly mapped in high-risk areas
- Loss history requirement - 2 loss claims of \$1000 or more

- **Grandfathering**

- Extension of PRP after 2 years
- Lock in moderate-to-low risk rates instead of high risk rates

# Coverage

- **Emergency Program** - initial phase of a community's participation in the NFIP if no FIRM is available.
- **Regular Program**
  - Final phase of a community's participation in the NFIP.
  - Flood Insurance Rate Maps (FIRMs) are in effect and full limits of coverage are available.
- **Community Rating Service (CRS) Program**
  - voluntary incentive program that recognizes and encourages community floodplain management activities

# Moderate-to-low risk Areas (Zones B, C, X)

## Residential Preferred Risk Policy

BUILDING & CONTENTS <sup>1</sup>			CONTENTS ONLY <sup>1,4,7</sup>		
Coverage	Annual Premium <sup>2,3</sup>		Coverage	Annual Premium <sup>2</sup>	
	Without Basement or Enclosure <sup>6</sup>	With Basement or Enclosure <sup>5</sup>		Contents Above Ground <sup>7</sup>	All Other Locations <sup>8</sup>
\$20,000/ \$8,000	\$129	\$176	\$8,000	\$57	\$79
\$30,000/ \$12,000	\$183	\$211	\$12,000	\$75	\$106
\$50,000/ \$20,000	\$240	\$269	\$20,000	\$110	\$147
\$75,000/ \$30,000	\$281	\$315	\$30,000	\$126	\$168
\$100,000/ \$40,000	\$312	\$346	\$40,000	\$140	\$187
\$125,000/ \$50,000	\$334	\$368	\$50,000	\$153	\$207
\$150,000/ \$60,000	\$356	\$390	\$60,000	\$167	\$226
\$200,000/ \$80,000	\$390	\$429	\$80,000	\$194	\$248
\$250,000/ \$100,000	\$414	\$460	\$100,000	\$221	\$271



# Moderate-to-low risk Areas (Zones B, C, X)

## Non-Residential Preferred Risk Policy

Building & Contents <sup>1</sup>			Contents Only <sup>1,4,6</sup>		
Coverage	Annual Premium <sup>2,3</sup>		Coverage	Annual Premium <sup>2</sup>	
	Without Basement or Enclosure <sup>5</sup>	With Basement or Enclosure <sup>4</sup>		Contents Above Ground (more than one floor)	All Other Locations (basement only not eligible)
\$50,000/\$50,000	\$643	\$1,016	\$50,000	\$185	\$394
\$100,000/\$100,000	\$1,016	\$1,731	\$100,000	\$270	\$586
\$150,000/\$150,000	\$1,326	\$2,321	\$150,000	\$355	\$778
\$200,000/\$200,000	\$1,637	\$2,756	\$200,000	\$439	\$970
\$250,000/\$250,000	\$1,886	\$3,129	\$250,000	\$524	\$1,163
\$300,000/\$300,000	\$2,134	\$3,502	\$300,000	\$609	\$1,355
\$350,000/\$350,000	\$2,321	\$3,875	\$350,000	\$694	\$1,547
\$400,000/\$400,000	\$2,507	\$4,185	\$400,000	\$778	\$1,739
\$450,000/\$450,000	\$2,694	\$4,497	\$450,000	\$863	\$1,931
\$500,000/\$500,000	\$2,880	\$4,807	\$500,000	\$948	\$2,123



# High risk Areas (Zones A, V)

## Standard Rated Policy

- Dwelling Policy
- General Property Policy
- Residential Condominium Building Association Policy (RCBAP)

BUILDING COVERAGE	EMERGENCY PROGRAM	REGULAR PROGRAM		
		Basic Insurance Limits	Additional Insurance Limits	Total Insurance Limits
Single-Family Dwelling	\$ 35,000 *	\$ 60,000	\$190,000	\$250,000
2-4 Family Dwelling	\$ 35,000 *	\$ 60,000	\$190,000	\$250,000
Other Residential	\$100,000 **	\$175,000	\$ 75,000	\$250,000
Non-Residential	\$100,000 **	\$175,000	\$325,000	\$500,000
CONTENTS COVERAGE				
Residential	\$ 10,000	\$ 25,000	\$ 75,000	\$100,000
Non-Residential	\$100,000	\$150,000	\$350,000	\$500,000

\* In Alaska, Guam, Hawaii, and U.S. Virgin Islands, the amount available is \$50,000.

\*\* In Alaska, Guam, Hawaii, and U.S. Virgin Islands, the amount available is \$150,000.

# Biggert-Waters Flood Insurance Reform Act of 2012 (BW12)

- **Goals**

- Extend NFIP for five years
- Make NFIP more financially stable
  - Phase out subsidized rates
  - Reserve Fund Assessment
  - Installment Payments
  - Increase minimum deductible for pre-FIRM properties

- **20% pay subsidized rates**

- 5% - 25% annual increase in premium immediately
- 15% - Remain subsidized until
  - Property is sold
  - Lapse in policy
  - Purchase a new policy

# Homeowner Flood Insurance Affordability Act of 2014 (HFIAA)

## ■ Goal

- Relieve non-subsidized policyholders who were required to see a 20 percent increase in late 2014 due to map changes under BW12.
- Issue Refunds
  - New policyholders (post-BW12) in high-risk areas
  - Policyholders who renewed their policies post-HFIAA
- Requires gradual rate increase by no less than 5% annually
- Introduce new surcharge to offset subsidized policies
  - \$25 – primary residence policy
  - \$250 – all other policies

# Actuarial Rate Formula

$$RATE = \left[ \sum_{i=Min}^{Max} (PELV_i \times DELV_i) \right] \times \frac{LADJ \times DED \times UINS}{EXLOSS}$$

*Rate* – per \$100 of insurance coverage of property

*Min* - minimum lowest floor elevation at which flood damage occurs

*Max* = lowest floor elevation at which flood damage approaches a maximum

*Lowest Floor Elevation* are measured to the nearest foot

*PELV* - probability that the flood water elevations reach a given depth relative to BFE

*DELV* - ratio of the flood damage to the value of the insurable property

*LADJ* is the ratio of allocated loss adjustment expense to loss dollars paid

*DED* - estimate of the percentage of the damage that will not be covered by insurance

*UINS* - under-insurance factor; ratio of property value to insurance amount

*EXLOSS* - expected loss ratio; offset premium discounts

# Premium Calculation

**TABLE 1. EMERGENCY PROGRAM RATES**

ANNUAL RATES PER \$100 OF COVERAGE  
(Basic/Additional)

	BUILDING	CONTENTS
Residential	.91	1.15
Non-Residential	.99	1.93

**TABLE 8B. DEDUCTIBLE FACTORS<sup>1, 2, 3</sup>**

Single-Family and 2-4 Family Building and Contents Policies<sup>4</sup>

DEDUCTIBLE OPTIONS: Building/Contents	PRE-/POST-FIRM Full-Risk	PRE-FIRM Subsidized	DEDUCTIBLE OPTIONS: Building/Contents	PRE-/POST-FIRM Full-Risk	PRE-FIRM Subsidized
\$1,000/\$1,000	1.000 <sup>5</sup>	N/A	\$3,000/\$3,000	.850	.925
\$1,250/\$1,000	.995 <sup>5</sup>	N/A	\$4,000/\$1,000	.925 <sup>5</sup>	N/A
\$1,250/\$1,250	.980	N/A	\$4,000/\$1,250	.915	N/A
\$1,500/\$1,000	.990 <sup>5</sup>	N/A	\$4,000/\$1,500	.900	.975 <sup>5</sup>
\$1,500/\$1,250	.975	N/A	\$4,000/\$2,000	.875	.950
\$1,500/\$1,500	.965	1.050 <sup>5</sup>	\$4,000/\$3,000	.825	.900
\$2,000/\$1,000	.975 <sup>5</sup>	N/A	\$4,000/\$4,000	.775	.850
\$2,000/\$1,250	.965	N/A	\$5,000/\$1,000	.900 <sup>5</sup>	N/A
\$2,000/\$1,500	.950	1.025 <sup>5</sup>	\$5,000/\$1,250	.890	N/A
\$2,000/\$2,000	.925	1.000	\$5,000/\$1,500	.875	.955 <sup>5</sup>
\$3,000/\$1,000	.950 <sup>5</sup>	N/A	\$5,000/\$2,000	.850	.930
\$3,000/\$1,250	.940	N/A	\$5,000/\$3,000	.800	.880
\$3,000/\$1,500	.925	1.000 <sup>5</sup>	\$5,000/\$4,000	.760	.830
\$3,000/\$2,000	.900	.975	\$5,000/\$5,000	.750	.810

# Premium Calculation

## ■ Emergency Program Example

- Occupancy – Residential
- Rate – 0.91/1.15 (per \$100 of coverage)
- Building Coverage – \$35000
- Contents Coverage – \$10,000
- Deductible: \$2000/\$2000
- Deductible factor – 1
- Reserve Fund Assessment - (5% of Premium Subtotal)
- Federal Policy Fee - \$44

## ■ Premium Calculation

Building:  $(0.91 * 350) = \$319$

Contents:  $(1.15 * 100) = \$115$

Premium Subtotal = \$434

RFA = \$22

Premium =  $\$434 + \$22 + \$44 = \mathbf{\$500}$

●

ANNUAL RATES PER \$100 OF COVERAGE (Basic/Additional)



### FIRM ZONES AE. A1-A30 – CONTENTS RATES

[illegible]

# Premium Calculation

## ■ Regular Program Example

- Flood Zone: AE
- Occupancy: Non-Residential
- # of Floors: 2
- Basement/Enclosure: None
- Elevation Difference: +4
- Building Rate: 0.20/0.08 and Contents Rate: 0.22/0.12
- Building Coverage: \$500,0000
- Contents Coverage: \$500,000
- Deductible: \$5000/\$5000
- Deductible factor: 0.890
- ICC Premium: \$4
- CRS Discount: 25%
- Reserve Fund Assessment: (5% of Premium Subtotal)
- Probation Surcharge: \$0
- Federal Policy Fee: \$44



# Premium Calculation

- Building: Basic Limit - \$175,000 Additional Limit - \$325,000
- Contents: Basic Limit - \$150,000 Additional Limit - \$350,000
- Premium Calculation

Building:  $(0.2 * 1750) + (0.08 * 3250) = \$350 + \$260 = \$610$

Contents:  $(0.22 * 1500) + (0.12 * 3500) = \$330 + \$420 = \$750$

Apply Deductible Factor:  $(0.89 * 610) = \$543$ ,  $(0.89 * 750) = \$668$

Premium Subtotal =  $\$1,211 + \$4 = \$1,215$

Apply CRS Discount (25%) =  $\$911$

RFA(5%) =  $\$46$

Premium =  $\$911 + \$46 + \$44 = \mathbf{\$1,001}$

# Conclusion

- Decrease in Total Policies in Force since 2009
- Eliminate PRP, Grandfathering and Emergency Program
- Policyholders adjusting to price increases
- Reserve fund and debt forgiveness

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- FEMA (Homeowners Flood Insurance Affordability Act) - <http://www.fema.gov/media-library/assets/documents/93074>
- FEMA (Flood Insurance Manual) - <http://www.fema.gov/flood-insurance-manual>
- FEMA (Standard Flood Insurance Policy) - <http://www.fema.gov/national-flood-insurance-program/standard-flood-insurance-policy-forms>
- FEMA (NFIP Summary of Coverage) - <http://www.fema.gov/media-library/assets/documents/12179?id=3011>
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QUESTIONS???