



FEMA

Benefit-Cost Calculator

V.6.0 (Build 20241018.1218 | Release Notes)

Benefit-Cost Analysis

Project Name: Bow Creek Section II



Map Marker	Mitigation Title	Property Type	Hazard	Discount Rate (%)	Benefits (B)	Costs (C)	BCR (B/C)
▲							
1	Bioretention @ Virginia Beach, Virginia		DFA - Riverine Flood	3.1	\$ 121,637,347	\$ 81,733,931	1.49
TOTAL (SELECTED)					\$ 121,637,347	\$ 81,733,931	1.49
TOTAL					\$ 121,637,347	\$ 81,733,931	1.49

Property Configuration

Property Title:

Bioretention @ Virginia Beach, Virginia

Property Location:

23451, Virginia Beach, Virginia

Property Coordinates:

36.8451268, -75.9754369

Hazard Type:

Riverine Flood

Mitigation Action Type:

Bioretention

Property Type:

Green Infrastructure

Analysis Method Type:

Historical Damages

Cost Estimation

Bioretention @ Virginia Beach, Virginia

Discount Rate (%):

3.1%

Use Default:Yes

Project Useful Life (years):

50

Project Cost:

\$43,861,520

Number of Maintenance Years:

50

Use Default:Yes

Annual Maintenance Cost:

\$1,500,000

Damage Analysis Parameters - Damage Frequency Assessment

Bioretention @ Virginia Beach, Virginia

Year of Analysis was Conducted:

2024

Year Property was Built:

1970

Analysis Duration:

55

Use Default:Yes

Historical Damages Before Mitigation

Bioretention @ Virginia Beach, Virginia

Damage Year	Recurrence Interval (years)	OTHER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL		
		Damages (\$)	Category 1 (\$)	Category 2 (\$)	Category 3 (\$)	Number of Volunteers	Number of Days	Damages (\$)	Current Dollars?	Inflated Damages (\$)
2016	7	30,000,000	0	0	0	0	0	30,000,000	No	38,723,570

Comments

Damages Before Mitigation:

There have been 7 hurricanes that have impacted the Virginia Beach area since 1970, Agnes (1972), Daniel (1992), Isabel (2003), Jeanne (2004), Matthew (2016), Jose (2017), Florence (2018). On average a major storm hits the area every 7 years.

Annualized Damages Before Mitigation
Bioretention @ Virginia Beach, Virginia

Annualized Recurrence Interval (years)	Damages and Losses (\$)	Annualized Damages and Losses (\$)
7	38,723,570	5,531,935
Sum Damages and Losses (\$)		Sum Annualized Damages and Losses (\$)
	38,723,570	5,531,935

Expected Damages After Mitigation
Bioretention @ Virginia Beach, Virginia

	OTHER	OPTIONAL DAMAGES			VOLUNTEER COSTS		TOTAL
Recurrence Interval (years)	Damages (\$)	Category 1 (\$)	Category 2 (\$)	Category 3 (\$)	Number of Volunteers	Number of Days	Damages (\$)
7	5,000,000	0	0	0	0	0	5,000,000

Annualized Damages After Mitigation
Bioretention @ Virginia Beach, Virginia

Annualized Recurrence Interval (years)	Damages and Losses (\$)	Annualized Damages and Losses (\$)
7	5,000,000	714,285
Sum Damages and Losses (\$)		Sum Annualized Damages and Losses (\$)
	5,000,000	714,285

Benefits-Costs Summary
Bioretention @ Virginia Beach, Virginia

Discount Rate (%):	3.1% Use Default:Yes
Total Standard Mitigation Benefits:	\$121,637,347
Total Social Benefits:	\$0
Total Mitigation Project Benefits:	\$121,637,347
Total Mitigation Project Cost:	\$81,733,931
Benefit Cost Ratio - Standard:	1.49
Benefit Cost Ratio - Standard + Social:	1.49