

Project Description	Elevate 5 feet
Project Useful Life (years)	20

**Project
Description**

PINK Block (Information Only). This space is provided to enter a brief summary of the proposed mitigation project, for example, "buyout," "relocate," or "elevate ten feet."

**Project Useful
Life**

GREEN Block (Data Input). The project's useful life is the estimated number of years during which the mitigation project will maintain its effectiveness. Useful life is the time period over which the estimated economic benefits of the proposed mitigation project are counted. The useful life which the user enters **MUST** be commensurate with the actual project being considered.

Useful lives of 5 to 10 years for equipment purchases, and 30 (residential) to 50 (non-residential) years for building projects are typical. For major infrastructure projects, or for historically important buildings, useful lives of 50 to 100 years may be appropriate. For buyouts/relocations an entered lifetime of 100 years will capture fully the benefits of the mitigation measure.

**Mitigation
Effectiveness
Estimates**

Enter Effectiveness Estimates for the Mitigation Measure		
Mitigation Measure	100% Effective to Depth	0% Effective at Depth
Elevation	4	N/A
Relocation/Buyout	N/A	N/A
Flood Barriers		
Other		

GREEN Block (Data Input). The effectiveness of most flood mitigation projects varies with the depth of flood water. For the flood mitigation type selected, enter estimates of the depth at which the mitigation is 100% and 0% effective:

Elevation

Elevating buildings by N feet is generally 100% effective to N-1 feet. For example, elevating 8 feet is 100% effective to 7 feet, elevating 12 feet is 100% effective to 11 feet. This result arises from the fact that, for example, an "8-foot flood" is considered in the program to be all floods between 7.5 and 8.5 feet. Therefore, elevating a structure 8 feet will convert an 8-foot flood into a 0-foot flood (from -0.5 to 0.5 feet), and there is still damage from a 0-foot flood. Thus, an 8-foot elevation is 100% effective to only 7 feet.

For buildings with basements, the situation can be more complicated depending on the degree of flood proofing of the basement. Unless there is detailed information available about an individual structure, assuming that elevating N feet is 100% effective to N-1 feet is a reasonable assumption for structures with and without basements. This assumes that flood proofing of the basement occurs along with elevation.

The flood depth at which elevations are 0% effective is calculated automatically by the program and need not be entered by the user

Relocation/Buyout

Relocation/Buyout projects are assumed to be 100% effective at all flood depths and thus effectiveness depths need not be entered by the user.

Flood Barriers

The flood depth at which flood barriers are 100% and 0% effective depends on how the barrier is constructed and on assumptions about freeboard. Freeboard is defined as the height of a flood barrier above a flood height which is necessary to insure satisfactory flood performance. For example, to provide 100-year flood protection for flood insurance purposes levees must be constructed 3 feet above the 100-year flood elevation (i.e., with 3 feet of freeboard).

In the absence of detailed engineering analysis, a simple assumption about flood barriers is that a flood barrier of height N feet is 100% effective to N-1 feet and 0% effective at N feet.

Other

Other flood hazard mitigation projects include wet flood proofing and any other measures not covered by the three mitigation types discussed above.

The depths at which "Other" flood hazard mitigation projects are 100% and 0% effective must be estimated on a case-by-case basis.

The program calculates effectiveness only for the selected mitigation project type. Other entries should be deleted (see **Delete** button, page 3-13) to avoid confusion; however, the program ignores any other values in the table.

The effectiveness of flood hazard mitigation projects at every flood depth is calculated by the program from the depths of 100% and 0% effectiveness. To view the default **Mitigation Effectiveness** estimates at each flood depth select **Level Two Data | Mitigation Project Effectiveness** from the Benefit-Cost program menu; for more information see page 8-17.

**MITIGATION
PROJECT
COSTS**

Mitigation Project Cost (excluding relocation costs)	\$40,000
Base Year of Costs	1994
Annual Maintenance Costs (\$/year)	\$500
Present Value of Annual Maintenance Costs (\$)	\$5,297
Relocation Costs for Mitigation Project	
Relocation Time Due to Project (months)	2.0
Rental Cost during Occupant Relocation (\$/sf/month)	\$2.00
Rental Cost during Occupant Relocation (\$/month)	\$2,000
Other Relocation Costs (\$/month)	\$500
Total Relocation Costs	\$5,000
Total Mitigation Project Costs	\$50,297

Project Cost

GREEN Block (Data Input). The **Mitigation Project Cost** includes all direct construction costs plus other costs such as architectural and engineering fees, testing, permits, and project management, but excludes relocation costs.

**Base Year of
Costs**

PINK Block (Information Only). The **Base Year of Costs** is the year in which the mitigation project's costs were estimated. If cost estimates are several years old, they may need to be adjusted by the user to account for inflation in costs between the base year and the present.

**Annual
Maintenance
Costs**

GREEN Block (Data Input). **Annual Maintenance Costs (\$/year)** may be required to maintain the effectiveness of some mitigation projects, particularly levees where annual inspection and vegetation removal may be required. For most other mitigation projects, **Annual Maintenance Costs** will be negligible or zero.

**Present Value of
Annual
Maintenance
Costs**

YELLOW Block (Result). Based on the discount rate, the **Annual Maintenance Cost** for each year of the project's useful life is reduced to its present value and summed.

**Relocation Costs
for Mitigation
Project**

For some mitigation projects, occupants may have to be relocated for construction of the project. In such cases, the **Relocation Costs** are an integral part of the mitigation project and must be counted in the total mitigation project costs.

**Relocation Time
Due to Project**

GREEN Block (Data Input). **Relocation Time Due to Project (months)** is the number of months for which the building must be vacated in order for the mitigation project to be completed. Note that this relocation time is completely distinct from the displacement time needed to repair flood-related damages.

Rental Cost During Occupant Relocation	<p>GREEN Block (Data Input). Rental Cost During Occupant Relocation (\$/sf/month) is an estimate of the rental rate paid for temporary quarters. Major floods may cause extensive damage to many structures, thus reducing the available supply of temporary space and leading to higher rental costs throughout the area.</p> <p>YELLOW Block (Result). Rental Cost During Occupant Relocation (\$/month) is calculated from the Rental Cost (\$/sf/month) and the Total Floor Area (sf).</p>
Other Relocation Costs	<p>GREEN Block (Data Input). Other Relocation Costs (\$/month) include moving and extra operating costs incurred because of the temporary relocation.</p>
Total Relocation Costs	<p>YELLOW Block (Result). The Total Relocation Costs are calculated from the entered Relocation Time Due to Project (months), Rental Cost During Occupant Relocation (\$/month), and Other Relocation Costs (\$/month).</p>
Total Mitigation Project Costs	<p>YELLOW Block (Result). Total Mitigation Project Costs are calculated by summing the Mitigation Project Cost, the Present Value of the Annual Maintenance Costs, and the Total Relocation Costs.</p>
To Continue...	<p>This completes the LEVEL ONE (Minimum Data) Benefit-Cost Analysis data entry process except for the Flood Hazard data. To enter Flood Hazard data, click on the Next Screen button at the bottom of the second LEVEL ONE Data page, or select Flood Hazard from the Benefit-Cost Program menu.</p>