
Unit 8

BCAs for Drought Mitigation, Generators,
and Other Types of Projects

Unit 8 Overview

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- This unit will cover:
 - Project basics, data and documentation requirements, and BCA Toolkit exercises for:
 - Drought mitigation projects
 - Generators
 - Other types of mitigation projects

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Visual 1: Unit 8 Overview

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- Project basics, data and documentation requirements, and BCA Toolkit exercises for:
 - Drought mitigation projects
 - Generators
 - Other types of mitigation projects

Unit 8 Objectives

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- At the end of this unit, participants will be able to:
 - Explain BCA data and documentation requirements and complete a BCA for:
 - Drought mitigation projects
 - Generators
 - Other types of mitigation projects

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Visual 2: Unit 8 Objectives

Unit 8 has several objectives. At the end of this unit, students should be able to:

- Explain BCA data and documentation requirements for drought mitigation and generator projects
- Complete a drought mitigation BCA
- Complete a generator BCA

Drought mitigation projects

Drought Mitigation Projects

Drought mitigation

Drought mitigation

- Aquifer storage and recovery (ASR) project type
 - Serves primarily as a drought management tool, but can also be used to reduce flood risk, mitigate salt water intrusion, and restore aquifers that have been subject to overdraft.
 - Concept is to capture water when there is an abundant supply, store the water in subsurface aquifers, and recover water from the storage aquifer if and when there is a need.



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Visual 3: Drought mitigation

Aquifer storage and recovery (ASR) project type:

- Serves primarily as a drought management tool, but can also be used to reduce flood risk, mitigate salt water intrusion, and restore aquifers that have been subject to overdraft.
- Concept is to capture water when there is an abundant supply, store the water in subsurface aquifers, and recover water from the storage aquifer if and when there is a need.

Drought recurrence intervals (RIs)

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- The recurrence of drought is very complex and there are many variables to be understood in predicting drought.
- It is necessary to determine the recurrence interval associated with the severity of scenario drought events.
- Establishing a traditional recurrence interval for drought may be difficult; however, the subapplicant should use the best available data and methodology deemed appropriate by a licensed professional engineer or similarly qualified professional.

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Visual 4: Drought RIs

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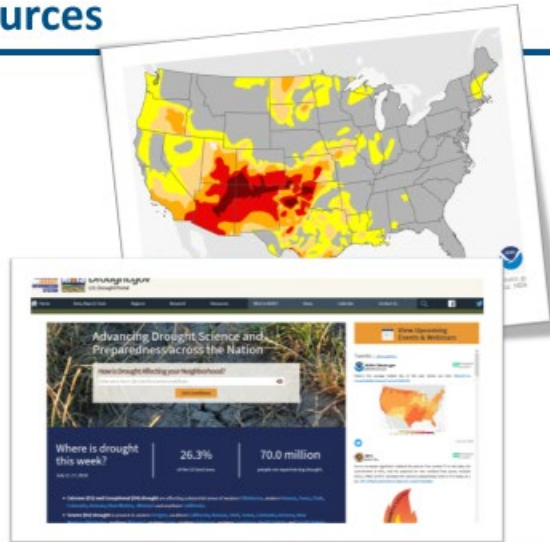
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Establishing a traditional recurrence interval for drought may be difficult; however, the subapplicant should use the best available data and methodology deemed appropriate by a licensed professional engineer or similarly qualified professional.

Drought data sources

Drought data sources

- USDA
- NOAA
- drought.gov
- [National Drought Mitigation Center](http://NationalDroughtMitigationCenter.gov)
- Universities and other academic sources



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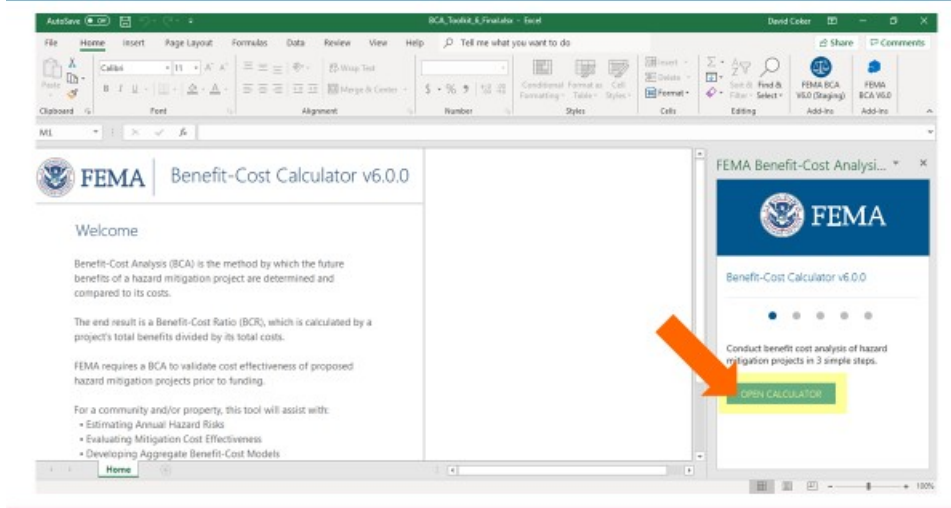
Visual 5: Drought data sources

Data sources for drought information and recurrence intervals may include:

- USDA
- NOAA
- drought.gov
- [National Drought Mitigation Center](http://NationalDroughtMitigationCenter.gov)
- Universities and other academic sources

BCA Toolkit Exercise

BCA Toolkit Exercise, Part 1



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We will now show how to complete a drought mitigation project in the BCA Toolkit. The following slides describe the data inputs, sources, and documentation requirements.

 Recurrence interval



Recurrence interval

- **What it is:**

- The recurrence interval for drought at that location.
- You may run the BCA with one RI, but at least 3 are preferred for drought projects.

Input required?	Potential sources	Recommended documentation with application
Yes	<ul style="list-style-type: none"> • USDA • NOAA • drought.gov • National Drought Mitigation Center • Universities and other academic sources 	<ul style="list-style-type: none"> • Screenshot(s) of data and source used • Relevant page(s) from study from credible source

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Visual 6: Recurrence interval

What it is:

- The recurrence interval for drought at that location.

Source(s):

- USDA
- NOAA
- drought.gov
- [National Drought Mitigation Center](http://NationalDroughtMitigationCenter.gov)
- Universities and other academic sources

Recommended BCA documentation with application:

- Screenshot(s) of data and source used
- Relevant page(s) from study from credible source

Water demand



Water demand

- **What it is:**

- The daily water demand in million gallons per day (mgd) of the system/area being mitigated under normal, non-drought conditions.
- This is calculated by dividing the total annual production (in millions of gallons) by 365.
- **Note:** The Help Content in the BCA Toolkit states that the annual production should first be divided by the population; this is an error.

Input required?	Potential sources	Recommended documentation with application
Yes	<ul style="list-style-type: none"> • Utility company 	<ul style="list-style-type: none"> • Letter from utility company

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Visual 7: Water demand

What it is:

- The daily water demand of the system/area being mitigated under normal, non-drought conditions.
- This is calculated by dividing the total annual production (in millions of gallons) by 365.
- **Note:** The Help Content in the BCA Toolkit states that the annual production should first be divided by the population; this is an error.

Source(s):

- Utility company

Recommended BCA documentation with application:

- Letter from utility company

 Before and after mitigation conditions



Before & after mitigation conditions

- **What it is:**

- The (1) supply yield and (2) duration of impact, before and after the mitigation project, associated with the RI(s) entered.
- Supply yield: The estimated average supply. This is calculated within the tool
- Duration of impact: The number of days the water system is affected (i.e. experiencing abnormal conditions).

Input required?	Potential sources	Recommended documentation with application
Yes	<ul style="list-style-type: none"> • Utility company • Project engineer 	<ul style="list-style-type: none"> • Letter from utility company • Note from project engineer describing how values were derived

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Visual 8: Before and after mitigation conditions

What it is:

- The (1) supply yield and (2) duration of impact, before and after the mitigation project, associated with the RI(s) entered.
 - Supply yield: The estimated average supply. This is calculated within the tool
 - Duration of impact: The number of days the water system is affected (i.e. experiencing abnormal conditions).

Why it's important:

- The BCA Toolkit compares the before and after mitigation conditions to calculate the project benefits.

Source(s):

- Utility company
- Project engineer

Recommended BCA documentation with application:

- Letter from utility company
- Note from project engineer describing how values were derived

Population served



Population served

- **What it is:**
 - The number of people who would be both impacted by drought and who would benefit from the proposed ASR project.

Input required?	Potential sources	Recommended documentation with application
Yes	<ul style="list-style-type: none"> • Utility company • Project SOW • GIS data • U.S. Census Bureau 	<ul style="list-style-type: none"> • Letter from utility company • Note from project engineer or BCA analyst describing how values were derived

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Visual 9: Population served

What it is:

- The number of people who would be both impacted by drought and who would benefit from the proposed ASR project.

Why it's important:

- The economic value of loss of water (i.e., damages) is dependent upon the number of people impacted by a drought.

Source(s):

- Utility company
- Project SOW
- GIS data
- U.S. Census Bureau

Recommended BCA documentation with application:

- Letter from utility company
- Note from project engineer or BCA analyst describing how values were derived

Generator projects

Generator Projects

Generator BCAs

Generator BCAs

- HMA will only fund generators for critical public facilities, such as police/fire stations, utilities, hospitals, and EOCs.
 - HMA requirements for generator projects may be found in the [HMA Guidance](#) and in this [Job Aid](#).
 - Generator BCAs are run using historical damages or professional estimated (future) damages.
 - Generators mitigate infrastructure failure due to loss of power, not a specific hazard (e.g. wind or flood). As such, the main benefits of generators are avoided loss of service/function.
 - You will need to have a clear idea of what function the generator ensures during a power outage and the level of protection (i.e., at what point will the generator fail).
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Visual 10: Generator BCAs

This unit discusses how to perform a BCA for generator projects. It does not cover overall project requirements for generators. Refer to the HMA Guidance and the generator Job Aid for eligibility questions.

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Generator BCAs are run using historical damages or professional estimated (future) damages.

Generators mitigate infrastructure failure due to loss of power, not a specific hazard (e.g. wind or flood). As such, the main benefits of generators are avoided loss of service/function.

You will need to have a clear idea of what function the generator ensures during a power outage and the level of protection (i.e., at what point will the generator fail). Generator projects are often straightforward, but can get tricky when they are put on facilities that serve multiple functions. For example, you want to put a generator on a school that serves as an emergency shelter. The generator is not for the school, it is for the emergency shelter function.

Data sources for generator BCAs

Data sources for generator BCAs

- Recurrence intervals
 - ATC wind speed website
 - NOAA/National Weather Service
- Before-mitigation damages
 - Utility outage information
- After-mitigation damages
 - Utility company
 - Project engineer

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Visual 11: Data sources for generator BCAs

Recurrence intervals

- ATC wind speed website
- NOAA/National Weather Service

Before-mitigation damages

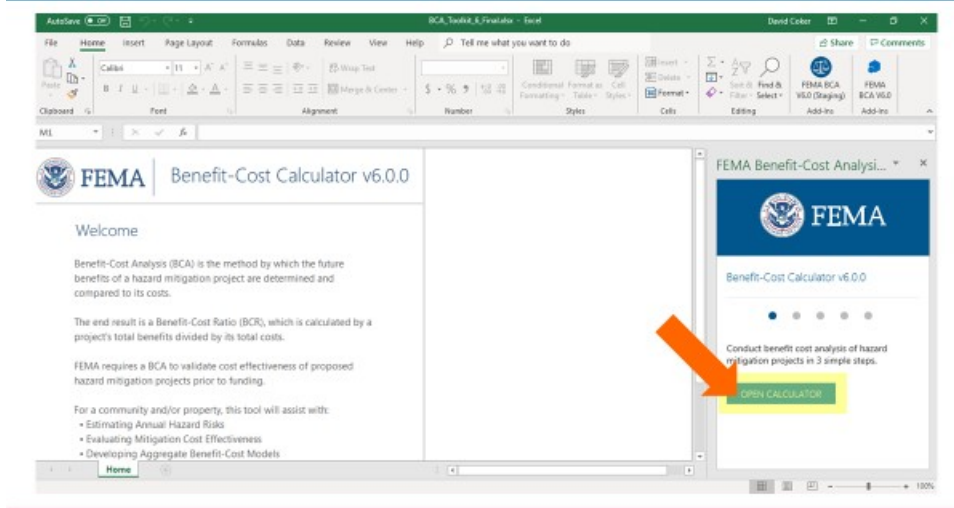
- Utility outage information

After-mitigation damages

- Utility company
- Project engineer

BCA Toolkit Exercise

BCA Toolkit Exercise, Part 2



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We will now show how to complete a generator BCA in the BCA Toolkit.

Other hazards and project types

Other hazards and project types

- As long as you have certain data, the BCA Toolkit can analyze any mitigation project type, including (but not limited to):
 - Electrical/power line mitigation
 - Infrastructure protection
 - Tsunami protection

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Visual 12: Other hazards and project types

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- Electrical/power line mitigation
- Infrastructure protection
- Tsunami protection

Data needs

Data needs

- For most “other” project types, you will use the Historical Damages or Professional Expected Damages methodologies.
- As such, the main pieces of data you’ll need are the damages before and after mitigation.

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Visual 13: Data needs for other project types

For most “other” project types, you will use the Historical Damages or Professional Expected Damages methodologies.

As such, the main pieces of data you’ll need are the damages before and after mitigation.

Unit 8 Review

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- In this unit we covered:
 - Project basics, data and documentation requirements, and BCA Toolkit exercises for:
 - Drought mitigation projects
 - Generator projects

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Visual 14: Unit 8 Review

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