

Animal Disease Spread Model

Getting Started: Installing ADSM, starting a scenario and
uploading a population

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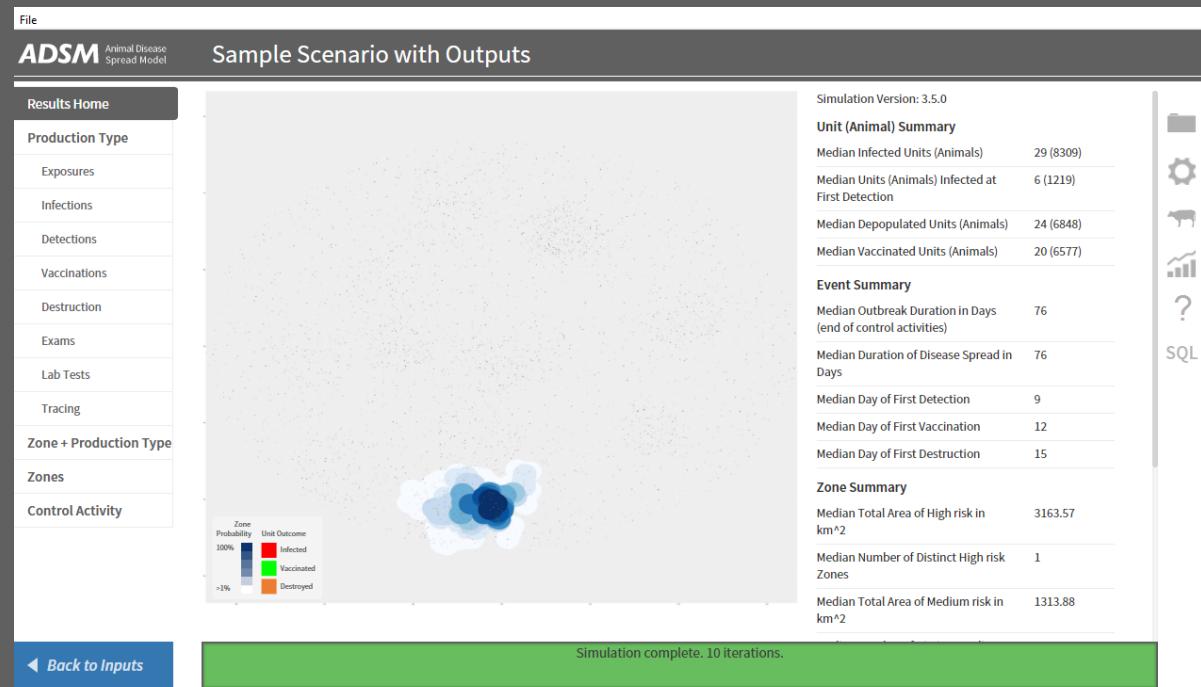
Installing ADSM

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Installing ADSM



Downloading ADSM

ADSM is currently available at

<https://github.com/NAVADMC/ADSM/releases/latest>

The Install process will create a menu item and a new folder in your file structure called the ADSM Workspace. The default location for the ADSM Workspace is in the “My Documents” folder.

Users may select to put the ADSM Workspace into a different folder or run on a portable storage device (e.g., flash drive).



Using Portable Storage

The purpose of having a portable application is to allow you to put the application wherever you want.

Be aware that an application installation on a USB flash drive and having your ADSM workspace on the USB flash drive could slow down the application when it is executing a scenario. In fact, it can slow down so much that a “Database Locked” error can happen.



To work around this, you can put your output (ADSM Workspace) on the portable drive and the ADSM application on another (Desktop), or vice versa.



Sample Scenario with Outputs

Scenario Description

Population

Disease

Disease Progression

Assign Progression

Disease Spread

Review Disease Spread

Controls

on

Control Protocol

Vaccination Triggers

Vaccination Rings

Vaccination Global

Destruction Global

Assign Protocols

Zones

Zone Effects

Assign Effects

Output Settings

view the population

The name of the current scenario

Edit the different disease settings

Close this overlay

The overlay, shown here in blue, will be visible the first time you open ADSM. Use the stacked files in the upper right to toggle off this feature.

Check and make sure everything is entered correctly and run the simulation

Open different scenarios, change the scenario settings, review the results, create and edit functions, and find helpful sources

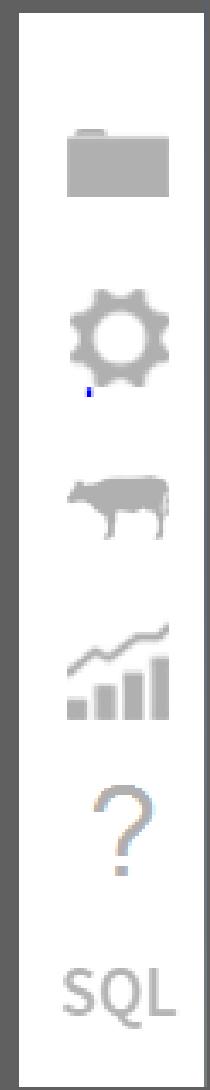
Administrative Panel



The Administrative Panel contains:

- ✿ Project Panel
- ✿ Settings Panel
- ✿ Production Type Panel
- ✿ Functions Panel
- ✿ Documentation Panel
- ✿ SQL Panel

The Administrative Panel will be covered in detail in the training called ADSM Administration.



Navigation Tabs





Scenario Description

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Output Settings

Edit the Scenario

Navigation tabs, located in the left panel of the application, are used to enter scenario specific parameters about disease transmission and control activities.

Tabs are presented in logical order, but no specific order is required for parameter entry.

The navigation tab provide a visual cue to know which parameter blocks you have completed. The tab will be yellow if the parameter entry is incomplete and green if the parameter entry is complete for that tab.

Not all parameters are required to run the simulation, so the application may be able to run with yellow tabs. Validating the scenario will present a message to help you understand what is missing and if you can proceed with running the simulation.

[Cancel](#)[Apply](#)

Scenario Description

Population

Disease

Disease Progression

Assign Progression

Disease Spread

Review Disease Spread

Controls

on

Control Protocol

Vaccination Triggers

Vaccination Rings

Vaccination Global

Destruction Global

Assign Protocols

Zones

Zone Effects

Assign Effects

Output Settings

Edit the Scenario

Description

This file contains a sample scenario for an outbreak of a highly contagious disease. This file may serve as an example that can be modified for other uses, but parameters in this file should not be considered definitive or accurate for any particular disease or situation.

The description of the scenario.

The Scenario Description box allows you to provide documentation on the simulation you are running.

A scenario breaks down into 3 main components for input into the simulation:

- Population Parameters
- Disease Parameters
- Control Parameters

Cancel

Apply



Scenario Description

Population

Disease

Disease Progression

Assign Progression

Disease Spread

Review Disease Spread

Controls

on

Control Protocol

Vaccination Triggers

Vaccination Rings

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Destruction Global

Assign Protocols

Zones

Zone Effects

Assign Effects

Output Settings

Validate Scenario ▶

Depending on the type of question that you are trying to answer, you can modify these main components and do comparisons:

For example, changing the Population and keeping all the other parameters the same would let you find if the disease and control strategies behave differently in different geographical areas that might have different animal densities.

Another example could be keeping the Population and Disease parameters the same, and changing Control parameters to evaluate the effect of different control strategies on an outbreak.

Working through the parameters that feed into a model provides a useful exercise in understanding all the complexities that should be considered when using simulation to evaluate disease spread and control options.



Starting a New Scenario



A wide-angle photograph of a vast, open landscape. In the foreground and middle ground, a massive herd of cattle, mostly brown and white, is grazing in a field dotted with low, scrubby bushes and patches of snow. The terrain is hilly and extends to a range of mountains in the background under a sky filled with soft, grey clouds.

Let's get started on this journey.

Starting a Scenario

Initially, the scenario will open to a blank scenario.

A description field is provided to enter details about the simulation.

This description lets you document the scenario, such as the question you are trying to answer, where the population came from, or other important information that would be useful when you refer back to this scenario.

Selecting **Apply before** you leave the page is necessary to save changes on each page.

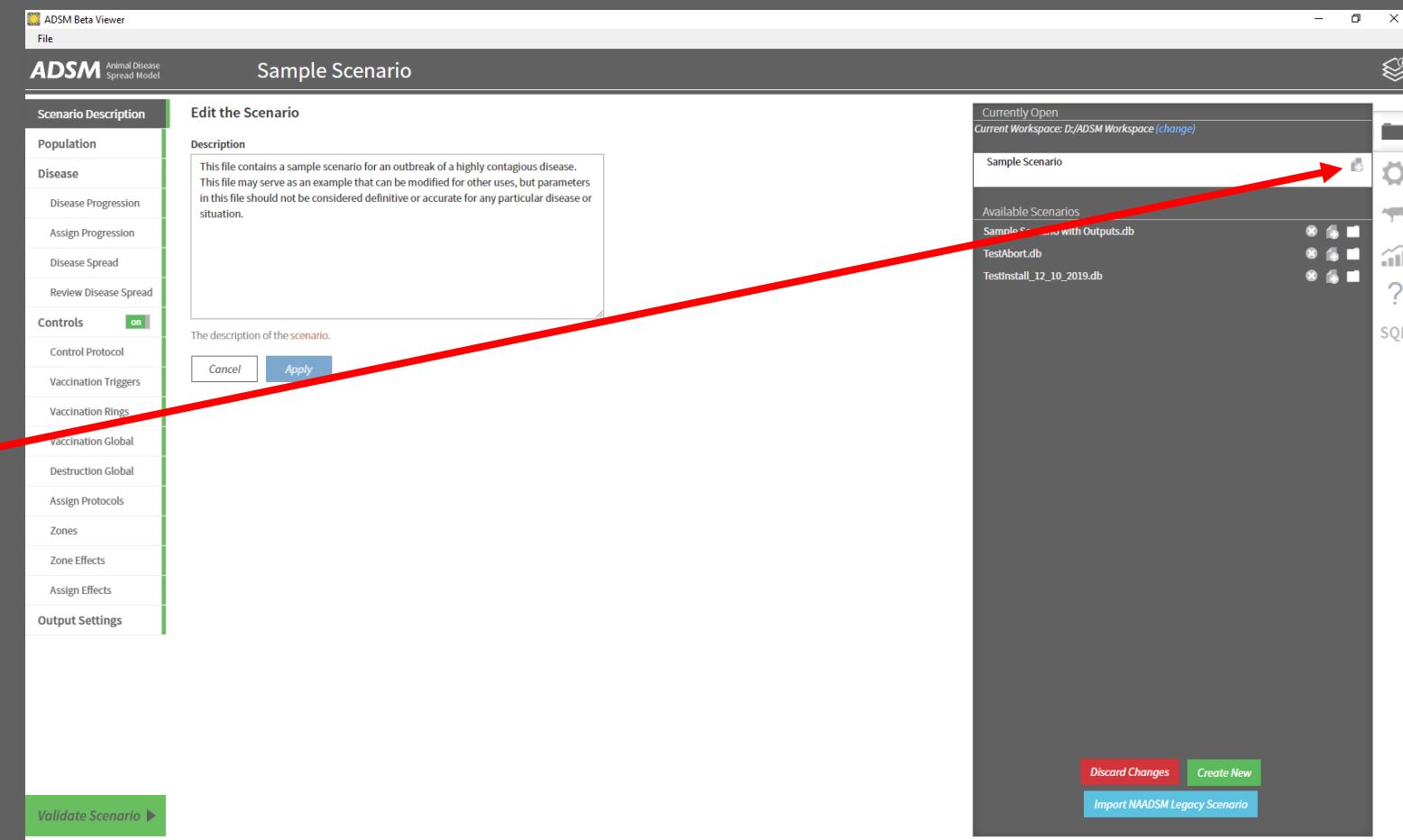
The screenshot shows the ADSM (Animal Disease Spread Model) software interface. At the top, there is a header bar with the title "ADSM - Animal Disease Spread Model" and a "File" menu. Below the header, the word "Blank" is displayed. On the left side, there is a vertical navigation menu with the following items: "Scenario Description" (which is highlighted with a green bar), "Population", "Disease", "Disease Progression", "Assign Progression", "Disease Spread", "Review Disease Spread", "Controls" (with a "on" button), "Control Protocol", "Vaccination Triggers", "Vaccination Rings", "Vaccination Global", "Destruction Global", "Assign Protocols", and "Zones". At the bottom of this menu is a yellow button labeled "Validate Scenario ▶". To the right of the menu, there is a section titled "Edit the Scenario" containing a "Description" field with the placeholder text "The description of the scenario." Below the description field are two buttons: "Cancel" and "Apply".

Saving and Duplicating Scenarios

The very first time you open ADSM, the scenario file will be automatically named “Blank.db”.

Use the Project Panel and select the *Save As* icon to rename the scenario file to a name of your choosing and save.

You can use this same process to duplicate a scenario and select *Save As* to name that is meaningful to you.
Note that selecting *Save* will overwrite an existing file if the same name is used.



Note that selecting Save will overwrite an existing file if the same name is used.

This scenario has been saved as “TrainingScenario”.

A description has been added and saved, using the *Apply* button.

Let’s move on and add a *Population* by selecting the tab.

The screenshot shows the ADSM software interface with the following details:

- Title Bar:** ADSM - Animal Disease Spread Model
- File Menu:** File
- Toolbar:** TrainingScenario
- Status Bar:** changes not saved to file... Save
- Main Area:** A sidebar on the left lists scenario components: Scenario Description, Population, Disease, Disease Progression, Assign Progression, Disease Spread, Review Disease Spread, Controls (with an "on" button), Control Protocol, Vaccination Triggers, Vaccination Rings, Vaccination Global, Destruction Global, Assign Protocols, and Zones. The "Validate Scenario ▶" button is at the bottom of this list.
- Content Area:** The "Edit the Scenario" tab is selected. It contains a "Description" section with the following text:

This Scenario will be used for training materials. It was created 8/12/2019 by the ADSM Development Team. It will include a synthetic population of cattle and swine, as found in the Sample Scenario. This population maps to somewhere in the Atlantic Ocean. Note that no parameters in the Sample Scenario or training materials should be taken as an example of a real disease.
- Buttons:** At the bottom right are "Cancel" and "Apply" buttons.

Population Tab

If you need to add a population, the window looks like this.

ADSM - Animal Disease Spread Model

File

ADSM

Training Scenario

changes not saved to file... Save changes?

Population

Load a Population

Choose File No file chosen Import a Population (XML or CSV)

You can import a file from anywhere on your computer and it will be added to the ADSM workspace.

Available Population Files:

- pop_circle_6_extrafield.csv
- Population_Grid.xml
- Sample_population.xml

SQL

Validate Scenario ►

If a population is already loaded, as in the Sample Scenario, the window displays the population.

ADSM Animal Disease Spread Model

Sample Scenario

Population File: Sample_Pop_Big.xml (3,957 units) Replace Population

Scenario Description

Population

Disease

Disease Progression

Assign Progression

Disease Spread

Review Disease Spread

Controls on

Control Protocol

Vaccination Triggers

Vaccination Rings

Vaccination Global

Destruction Global

Assign Protocols

Zones

Zone Effects

Assign Effects

Output Settings

The map displays a representative sampling of population data Refresh Map

FILTERS

Production Type:

Initial State:

Initial Size Min: Max:

Longitude Min: Max:

Latitude Min: Max:

Clear Filters

Validate Scenario ►

Production type	Latitude	Longitude	Initial state	Initial size	Unit id
Cattle	32.99984	-35.12144	Latent	107	19
Swine	33.41808	-35.2526	Susceptible	89	2
Cattle	36.78172	-36.36554	Susceptible	141	3
Cattle	32.93898	-35.34563	Susceptible	341	4
Cattle	36.31128	-35.21025	Susceptible	114	5
Cattle	33.27371	-35.20067	Susceptible	155	6
Cattle	36.59603	-36.28207	Susceptible	161	7
Cattle	34.54935	-32.81917	Susceptible	827	8
Cattle	35.55098	-31.74311	Susceptible	355	9
Cattle	32.79245	-34.2104	Susceptible	46	10
Cattle	35.76083	-37.81564	Susceptible	518	11
Cattle	34.47019	-36.0473	Susceptible	356	12
Cattle	36.11096	-35.13854	Susceptible	100	13
Cattle	34.92398	-33.8703	Susceptible	904	14
Swine	36.0872	-34.33728	Susceptible	142	15
Cattle	34.83321	-32.90607	Susceptible	191	16
Cattle	37.38944	-35.13237	Susceptible	156	17
Cattle	36.50795	-36.37611	Susceptible	228	18
Cattle	33.89553	-34.55941	Susceptible	327	20
Cattle	33.95002	-35.69487	Susceptible	55	21
Cattle	34.00686	-35.59949	Susceptible	169	22
Swine	34.5475	-35.05291	Susceptible	841	23
Cattle	36.01563	-34.36979	Susceptible	31	24
Cattle	37.40086	-35.21244	Susceptible	115	25
Cattle	35.26371	-36.31808	Susceptible	56	26
Cattle	33.10394	-32.70794	Susceptible	55	27
Cattle	36.89481	-34.46319	Susceptible	81	28
Cattle	33.92407	-33.14195	Susceptible	20	29

Showing the first 100 Units. Use sort and filters to find specific Units.

Edit Population

Adding a Population

A prompt will ask you to choose the population file. There are 2 different actions that can happen when loading a population.

- 1) If your population source file is outside the ADSM Workspace, select [Choose File](#) and a navigation window will open. Navigate to the location of the file that is to be imported. Select the file, and the filename will replace the text “No file chosen”. Use [Import a Population \(XML or CSV\)](#) and the file import will begin.

Depending on the size of the population and the speed of your PC, this import could take a while. The Development Team’s test file with 363,000 units takes about 10 minutes.

- 2) If the population source file has already been moved into the ADSM Workspace, the import will begin as soon as you select it from the list of available files.

In this example there are several population files already copied into the ADSM Workspace.

The screenshot shows the ADSM software interface with the following details:

- Top Bar:** ADSM - Animal Disease Spread Model, File.
- Left Sidebar:** A vertical list of scenario components: Scenario Description, Population (selected), Disease, Disease Progression, Assign Progression, Disease Spread, Review Disease Spread, Controls (with an "on" button), Control Protocol, Vaccination Triggers, Vaccination Rings, Vaccination Global, Destruction Global, Assign Protocols, Zones, and Validate Scenario ►.
- Right Panel:**
 - Training Scenario:** Load a Population section. It includes a "Choose File" button (disabled, showing "No file chosen") and a "Import a Population (XML or CSV)" button.
 - Message:** You can import a file from anywhere on your computer and it will be added to the AD.
 - Available Population Files:** pop_circle_6_extrafield.csv, Population_Grid.xml, Sample_population.xml.
- Bottom Right:** changes not saved to...



Scenario Description

Population

Disease

Disease Progression

Assign Progression

Disease Spread

Review Disease Spread

Controls on

Control Protocol

Vaccination Triggers

Vaccination Rings

Vaccination Global

Destruction Global

Assign Protocols

Zones

Zone Effects

Assign Effects

Output Settings

Population File: Sample_Pop_Big.xml (3,957 units) [Replace Population](#)

The map

FILTERS

Production type

Initial State

Initial Size

Longitude

Latitude

Clear Filters

Showing the first 100 Units. Use sort and filters to find specific Units.

Edit Population

Sample Population

If a population has already been added, as in the Sample Scenario, the population screen will display a visualization and details.

The Edit population link in the bottom right corner allows changes to be made to the population file within the application.

Production type	Latitude	Longitude	Initial state	Initial size	Unit id
Cattle	32.99984	-35.12144	Latent	107	19
Swine	33.41808	-35.2526	Susceptible	89	2
Cattle	36.78172	-36.36554	Susceptible	141	3
Cattle	32.93898	-35.34563	Susceptible	341	4
Cattle	36.31128	-35.21025	Susceptible	114	5
Cattle	33.27371	-35.20067	Susceptible	155	6
Cattle	32.99984	-35.12144	Susceptible	101	7
Cattle	33.10394	-32.70794	Susceptible	55	27
Cattle	36.89481	-34.46319	Susceptible	81	28
Cattle	33.92407	-33.14195	Susceptible	20	29



Population File: Sample_Pop_Big.xml (3,957 units) [Replace Population](#)

Production type	Latitude	Longitude	Initial state	Initial size	Unit id
Cattle	32.99984	-35.12144	Latent	107	19

Replace Population

The population can also be replaced using the “Replace Population” link at the top.

If parameter blocks have already been created, they will be retained. However, assignments to specific production types, Vaccination Triggers and Vaccination Rings parameters will be deleted.

The deletion happens to the parameters that are associated to a specific production type. This functionality provides maximum flexibility in changing a population and retaining most parameters. The parameters can be re-assigned to the new production types when the new population is imported.

Cattle	36.89481	-34.46319	Susceptible	81	28
Cattle	33.92407	-33.14195	Susceptible	20	29

Showing the first 100 Units. Use sort and filters to find specific Units.

[Edit Population](#)



Population File: Sample_population.xml (3,957 units) [Replace Population](#)

Population

Disease
Disease Progression
Assign Progression
Disease Spread
Review Disease Spread

Controls [on](#)

Control Protocol
Vaccination Triggers
Vaccination Rings
Vaccination Global
Destruction Global
Assign Protocols
Zones
Zone Effects
Assign Effects
Output Settings

Population Description

The map displays a representative sampling of population data. Refresh Map

FILTERS

Production Type:

Initial Size: Min: Max:

Longitude: Min: Max:

Latitude: Min: Max:

Days in initial state: Min: Max:

Days left in initial state: Min: Max:

[Clear Filters](#)

Production type	Latitude	Longitude	Initial state	Days in initial state	Days left in initial state	Initial size	Unit id
Cattle	32.99984	-35.12144	Latent	0	0	107	19
Swine	33.41808	-35.2526	Susceptible	0	0	89	2
Cattle	36.78172	-36.36554	Susceptible	0	0	141	3
Cattle	32.93898	-35.34563	Susceptible	0	0	341	4
Cattle	36.1111	-36.001	Susceptible	0	0	114	5
Cattle	33.2731	-35.20067	Susceptible	0	0	155	6
Cattle	38.56	-32.81917	Susceptible	0	0	161	7
Cattle	34.54935	-32.81917	Susceptible	0	0	827	8
Cattle	35.55098	-31.74311	Susceptible	0	0	355	9
Cattle	32.79245	-34.2104	Susceptible	0	0	46	10
Cattle	34.47019	-36.0473	Susceptible	0	0	356	12
Cattle	36.11096	-35.13894	Susceptible	0	0	100	13
Cattle	36.0072	-34.33728	Susceptible	0	0	90	14
Cattle	34.83321	-32.90607	Susceptible	0	0	142	15
Cattle	37.38944	-35.13237	Susceptible	0	0	191	16
Cattle	36.50795	-36.37611	Susceptible	0	0	156	17
Cattle	33.89553	-34.15941	Susceptible	0	0	228	18
Cattle	33.93662	-33.89401	Susceptible	0	0	327	20
Cattle	34.00686	-35.59949	Susceptible	0	0	55	21
Swine	34.5475	-35.05291	Susceptible	0	0	169	22
Cattle	36.01563	-34.36979	Susceptible	0	0	841	23
Cattle	37.40086	-35.21244	Susceptible	0	0	31	24
Cattle	35.26371	-36.31808	Susceptible	0	0	115	25
Cattle	33.10394	-32.70794	Susceptible	0	0	56	26
Cattle	36.89481	-34.46319	Susceptible	0	0	55	27
Cattle	33.2731	-35.20067	Susceptible	0	0	81	28

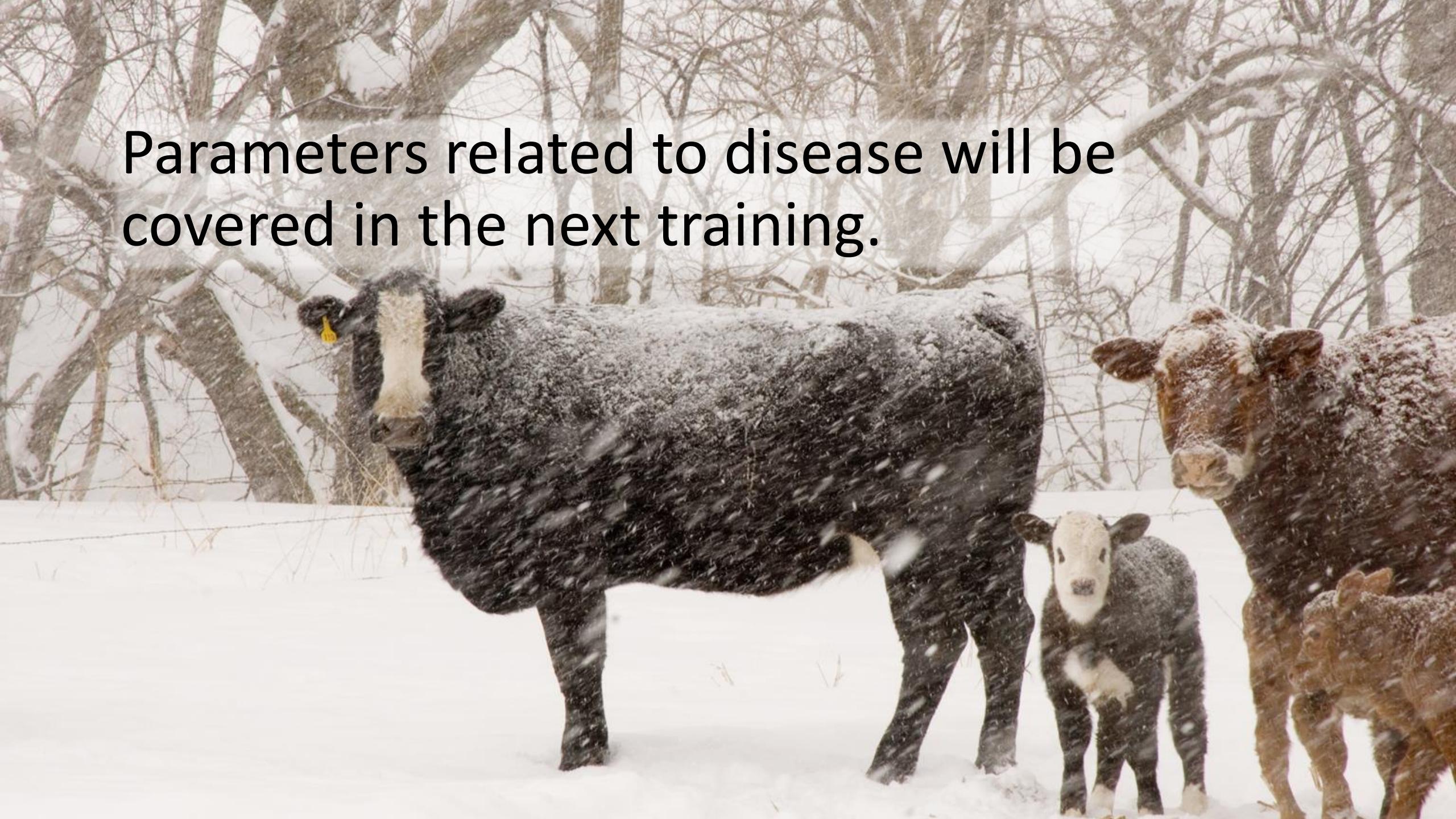
Summary

This training module has covered **describing your scenario and managing your population.**



What's Next





Parameters related to disease will be covered in the next training.



Join the flock!

Learn more about ADSM or try an example

ADSM is currently available at <https://github.com/NAVADMC/ADSM/releases/latest>

Try the sample scenario

<https://github.com/NAVADMC/ADSM/wiki/A-Quick-Start-Guide:-Running-the-sample-scenario>

Read the wiki pages link

<https://github.com/NAVADMC/ADSM/wiki>

Addition training materials will be posted at
<http://navadmc.github.io/ADSM/>

Training will include:

Overview

Populations and Production Types

Getting Started

Disease Parameters

Control Parameters

Output settings and Run

Results

Verification and Validation

Vaccination Strategy

Administration



The outcome of an ADSM simulation (as with any computer simulation model) depends heavily on the quality of the scenario input parameters; the assumptions of the modeler who created the scenario; and the capabilities and limitations of the model framework itself. The utility of disease models like those created with ADSM critically depends on input and interpretation of experts familiar with the behavior of disease within populations, and with the limitations, assumptions, and output of the model. While ADSM is available as a service to animal health communities, the ADSM team does not necessarily endorse results obtained with the ADSM application or any conclusions drawn from such results. Note that the parameters provided in the Sample Scenario are simple examples to clarify concepts in the application. These parameters do not represent any real population or disease event.



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Photo credits

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