

Ecological Site Reviewer

Help Document

The Ecological Site Reviewer (ESR) ArcGIS Online web-application was designed to provide access to viewing maps and attributes for basic environmental properties, ecological characteristics, and background reference information for sites throughout Montana.

Using the ESR the viewer can:

- Identify and review environmental characteristics of sites prior to conducting field work
- Locate representative sites for field data collection
- Identify optimum navigation to selected sites
- Save and print maps, charts, and tables of selected sites and associated attributes.
- Provide input on data layers with the edit tool

The Ecological Site Reviewer was developed by the Montana NRCS and GIS programmers at the Montana State Library



<https://nris.msl.mt.gov>



<https://msl.mt.gov>



Natural Resources
Conservation Service

<https://www.nrcs.usda.gov/wps/portal/nrcs/mt/home>

Introduction to the Ecological Site Reviewer

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This application was built using Esri's ArcGIS Online platform. ArcGIS Online is a cloud-based environment for storing and managing geographic content. It enables users to create and share maps and explore data through a web browser. The Ecological Site Reviewer was built from a web map within the web-based ArcGIS Online application.

Click here to start using the [Ecological Site Reviewer](#). Your web browser will open using ArcGIS Online to a map of Montana with a topographic map background and a display of the Montana Landcover in the foreground. Major highways and County boundaries will also be displayed for reference at the statewide scale. As you navigate to specific locations and zoom in, additional layers with greater detail will be displayed.

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<https://msl.mt.gov/NRCS/SiteReviewer>

Step 1 – Selecting a Basemap

Click on this icon to open the Basemap Gallery

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The screenshot displays the 'Ecological Site Reviewer' application interface. The main map area shows a geographic region of Montana with various colored overlays and site codes such as 43BN, 43BC, 43BW, 43BSW, 43BSV, 43SE, 46N, 46C, 46S, 52C, 58AC, 58AE, 58BE, 58DE, 60BE, and 60AE. The map is overlaid with a grid and various geographical features like rivers and roads. The top of the application has a search bar and navigation controls. On the right side, a 'Basemap Gallery' window is open, displaying a grid of nine basemap options: Imagery with Labels, Light Gray Canvas, Streets, Topographic, USA Topo Maps, 1990-2003 Montana Air, Montana Topo Maps, Map of Montana, and USGS National Map. A red arrow points to the gallery icon in the top right corner of the application. Below the gallery window, there is a text box with instructions.

The background map or Basemap is a reference image to help provide geographic context.

The default Basemap is set to Montana Topo Maps. If you want to change the Basemap click the Basemap Gallery button to open the window.

To change the Background Map choose from one of the options available in the Basemap Gallery

Click the x or the Basemap Gallery button to hide the window

Step 2 – Viewing the Data Layers and Legend

Ecological Site Reviewer Montana State Library & USDA-NRCS NRCS - Soils Relative Effective Annual Precipitation NRCS - Bozeman MT

Find address or place

Legend

Indian Reservations

Countries

Roads

Road Labels

Primary Road Labels (state-scale)

1

2

3

Road Transportation System

Primary Roads (state-scale)

1

2

3

NRCS Layers

Major Land Resource Area

- 32C:Desertic Basins, Central
- 43BC:Central Rocky Mountains, Central
- 44BC:Central Rocky Mountain Valleys, Central
- 46C:Northern Rocky Mountain Foothills, Central
- 46SW:Northern Rocky Mountain Foothills, South West
- 52C:Glaciated Plains, Central
- 58AC:Sedimentary Plains, Central
- 46SE:Northern Rocky Mountain Foothills, South East
- 53AE:Glaciated Plains, East
- 54E:Soft Shale Plains, East
- 58AE:Sedimentary Plains, East
- 58BE:Northern Rolling High Plains, Southern Part
- 58CE:Northern Rolling High Plains, Northeastern Part
- 58DE:Northern Rolling High Plains, Eastern Part
- 60AE:Pierre Shale Plains and Badlands

Layer List

Operational layers

- Indian Reservations
- Counties
- Incorporated Cities & Towns
- PLSS Township
- PLSS First Division
- Major Waterbodies (state-scale)
- Major Rivers (state-scale)
- Named Waterbodies (county-scale)
- Named Rivers and Streams (county-scale)
- Cadastral Parcels
- Conservation Easements
- Public Lands
- Watersheds
- Wetlands and Riparian Areas
- Roads
- Hydrography (local-scale)
- Managed Areas
- DOR Final Land Unit Classification
- NRCS Layers
- Landcover Level 3
- Landcover Classes

Turn on the **Legend** to see how each visible layer is symbolized to represent the features on the map.

Turn on or off the data layers within the **Layer List** by checking the box to the left of the layer name.

Some layers are only visible when you zoom in, and are grayed out in the Layer List if they are not visible at the current extent/scale of your map.

Layers will display in the order shown in the Layer List and may need to be turned off or on to be shown.

Step 3 – Changing the map extent – Zooming in or out

Ecological Site Reviewer Montana State Library & USDA-NRCS NRCS - Soils Relative Effective Annual Precipitation NRCS- Bozeman MT

Find address or place

Operational layers

- Indian Reservations
- Counties
- Incorporated Cities & Towns
- PLS Township
- PLS First Division
- Major Waterbodies (state-scale)
- Major Rivers (state-scale)
- Named Waterbodies (county-scale)
- Named Rivers and Streams (county-scale)
- Cadastral Parcels
- Conservation Easements
- Public Lands
- Watersheds
- Wetlands and Riparian Areas
- Roads
- Hydrography (local-scale)
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- NRCS Layers
- Landcover Level 3
- Landcover Classes

You can use the roller function on your mouse or the + and - buttons to zoom in or out on the map.

As you zoom in additional background layers will be visible.

60mi Boise
+ -100.030 50.255 Degrees

HERE, Garmin, FAO, NOAA, USGS, EPA, NPS | U.S. Department of Agriculture

Step 4 – Navigating to an area of interest, searching, and bookmarks

The screenshot shows the 'Ecological Site Reviewer' application interface. At the top, there is a search bar with the text 'Find address or place' and a search icon. Below the search bar, a dropdown menu is open, showing a list of search options: 'All', 'OwnerParcel (geocode)', 'Soil Surveys', 'PLSS Township', 'City or Town', and 'Address Search (101 Main St Helena)'. A red arrow points to the search bar, and another red arrow points to the dropdown menu. A text box explains: 'Type in the Search Box, Then Select from the list of possible matches. Do not press the Enter Key or the Search Icon, as this will return the first match.' Another text box says: 'Click the Down Arrow To choose a Search Option'. A third text box says: 'Add and Navigate to Bookmarks'. Below this, a 'Bookmark' dialog box is shown with an 'Add' button and a 'Bookmark 1' label. A large central text box states: 'You can navigate to an area of interest by zooming in or using the search tool.' In the bottom left corner, a text box says: 'Lat/Long coordinates – Click crosshair icon to set coordinates in one position'. In the bottom right corner, a text box says: 'After Reloading the Map you can go back to your last Map Extent'. A red arrow points to a button labeled 'App State' with the text: 'Click to restore the map extent and Layers visibility where you left off.' The main map area shows a detailed view of a region with various colored overlays and labels like '43AW', '43BN', '43BC', '43BSW', '44AW', '44BC', '44BSW', '46SW', '58AC', '58BE', '60BE', '60DE', '60AE', '60CE', '60AE', '60CE', '60AE'. The map also shows geographical features like 'COLUMBIA MOUNTAINS', 'COTEAU DU MISSOURI', 'BADLANDS', and 'GREAT SANDY DESERT'. The bottom of the map shows a scale bar and coordinates: '-110.521 50.391 Degrees'. The bottom right corner of the map area contains a small text box: 'App State Click to restore the map extent and Layers visibility where you left off.' The bottom of the application window shows a footer with text: 'Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS | U.S. Department of Agriculture Farm Services Agency Aerial Photo'.

Step 5 – Tools: Measuring

The screenshot shows the 'Ecological Site Reviewer' software interface. At the top, there is a navigation bar with the title 'Ecological Site Reviewer' and several menu items: 'Montana State Library & USDA-NRCS', 'NRCS - Soils', 'Relative Effective Annual Precipitation', 'NRCS - Bozeman MT', and 'Help'. Below the navigation bar is a search bar with the text 'Find address or place' and a magnifying glass icon. To the right of the search bar are icons for home, measurement, print, and mobile view. A red circle highlights the measurement tool icon, with a red arrow pointing to a text box on the left. The text box contains instructions: 'To make Area, Distance, and Location Measurements click on the Measurement Tool To open the Tool Window. Click on the button to choose which type of measurement, area, distance or location. Use the Dropdown Arrow to Change the Unit of Measure Then left click in the map to start the measurement, and double click on the map to finish.' The main map area shows a satellite view of a landscape with a large, dark grey, irregularly shaped area highlighted in blue. The map includes labels for 'LANNON RD', 'Wet spot', and several 'Rock outcrop' and 'Saline spot' locations. A scale bar at the bottom left indicates a distance of 1000ft. At the bottom right, there is a copyright notice: 'Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA | U.S. Department of Agriculture Farm Servic...' and the 'esri' logo.

Measurement

Area

Acres

To make Area, Distance, and Location Measurements click on the Measurement Tool To open the Tool Window.

Click on the button to choose which type of measurement, area, distance or location.

Use the Dropdown Arrow to Change the Unit of Measure

Then left click in the map to start the measurement, and double click on the map to finish.

Step 6 – Tools: Swipe

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The screenshot displays the 'Ecological Site Reviewer' application. The interface includes a search bar at the top left, a toolbar with various icons, and a 'Layer List' panel on the right. A red circle highlights the 'Swipe' icon in the toolbar. A tooltip above it reads 'Select the layer you want to swipe' and shows a dropdown menu with 'NAIP_2005' selected. Another red circle highlights the dropdown arrow. A 'Swipe Slider Bar' is visible on the map. The map shows a landscape with fields and a stream, with several 'Rock outcrop' features marked. The 'Layer List' panel on the right shows various layers, with 'NAIP_2005' checked. The software title bar includes 'Montana State Library & USDA-NRCS', 'NRCS - Soils', 'Relative Effective Annual Precipitation', 'NRCS - Bozeman MT', and 'Help'.

Ecological Site Reviewer Montana State Library & USDA-NRCS NRCS - Soils Relative Effective Annual Precipitation NRCS - Bozeman MT Help

Find address or place

Select the layer you want to swipe

NAIP_2005

Click on the Swipe Button to open the Swipe Tool

Choose from the Visible Layers (checked on in the Layer List) available in the Drop-down List by clicking on the down arrow in the tool window.

Use the Swipe Slider Bar to reveal/hide the selected layer

Swipe Slider Bar

Layer List

- Soil Surveys
- Soil Line Features
- Soil Point Features
- Soils MU
- Major Land Resource Area
- Rangeland Resource Unit
- Landcover Level 3
- Landcover Classes
- USDA/NASS Cropland 2017
- Frost Free Days
- REAP
- Aspect
- Slope
- NAIP_2005
- NAIP_2009
- NAIP_2011
- NAIP_2013
- NAIP 2015 CIR
- NAIP_2015
- Elevation
- ESD2018

Wet spot

LANNON RD

68

69

71

76

76

Rock outcrop

Rock outcrop

Rock outcrop

Rock outcrop

Rock outcrop

Rock outcrop

Rock outcrop

Rock outcrop

Saline spot

1000ft

-105.568 48.589 Degrees

Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDI

Step 7 – Tools: Printing

Ecological Site Reviewer Montana State Library & USDA-NRCS NRCS - Soils Relative Effective Annual Precipitation NRCS - Bozeman MT Help

Find address or place

Print

Map title: ArcGIS Web Map
Layout: A3 Landscape
Format: PDF

Advanced Print

- ArcGIS Web Map
- ArcGIS Web Map

Clear prints

Map scale/extent:
Preserve: map scale map extent
Force scale: current
Labels:
Show labels:
Layout metadata:
Author: MSL - NRCS Web Applic
Copyright:
Include legend:
MAP_ONLY size:
Width (px): 670
Height (px): 500
Print quality:
DPI: 96

0mi
-111.387 49.124 Degrees

Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS | U.S. Department of Agriculture Farm Services Agency Aerial Photography Field Office | US... esri

Click on the Print tool button to open the tool window.

Enter a Title, Choose your layout, and pick a file format from the Dropdown Arrows.

Click on the Advanced button for additional options:
Scale, Size, Print Quality, etc.

Then click the Print button to export your map.

You can save multiple map files. Click on the Map Name text to open file in a new browser window and save it.

Click the Clear prints button to remove the maps from the list.

Step 8 – Identifying Features

Ecological Site Reviewer Montana State Library & USDA-NRCS NRCS - Soils Relative Effective Annual Precipitation NRCS - Bozeman MT Help

Find address or place

Once you have navigated to an area at the level of detail you are interested in, click within the map to reveal the **Popup Window** that displays selected attributes of the Data Layers.

Only layers that are checked on in the Layer List and visible in the Legend will have a popup window open when you click in the map. Turn on all the layers you wish to view attributes for in the Popup Window.

The top left of the popup window will show how many layers have been opened (3 in this example). If there are several layers visible then click through the left and right arrows on the popup window to view the popup windows for other visible layers.

(2 of 3)
FLU 2017
Classification: Irrigated Pivot
Zoom to

Layer List

- DOR Final Land Unit Classification
 - FLU 2009
 - FLU 2011
 - FLU 2013
 - FLU 2015
 - FLU 2017
 - Crop
 - Fallow
 - Grazing Land
 - Hay
 - Irrigated Flood
 - Irrigated Pivot
 - Irrigated Sprinkler
 - Non-commercial Forest
 - Timber
- NRCS Layers
 - Soil Surveys
 - Soil Line Features
 - Soil Point Features
 - Soils MU
 - Major Land Resource Area
 - Rangeland Resource Unit

Legend

DOR Final Land Unit Classification

- FLU 2017
 - Crop
 - Fallow
 - Grazing Land
 - Hay
 - Irrigated Flood
 - Irrigated Pivot
 - Irrigated Sprinkler
 - Non-commercial Forest
 - Timber

NRCS Layers

Soil Line Features

- Escarpment, Bedrock
- Escarpment
- Gully
- Levee
- Slope

Soil Point Features

- Rock Outcrop
- Prominent Knoll
- Lake Sediment Outcrop
- Shallow
- Bouldery
- Boulders
- Rubble

Show/Hide Map Overview

WELLIVER RD

ZaE, ZaD, ZaC

-104.714 48.723 Degrees

Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA | U.S. Department of Agriculture Farm Services Agency

Step 9 – Add a Marker, View Lat/Long, and get URL to share marker location

The screenshot displays the 'Ecological Site Reviewer' web application interface. The top navigation bar includes the application name, 'Montana State Library & USDA-NRCS', and various menu items like 'NRCS - Soils' and 'Relative Effective Annual Precipitation'. A search bar is located at the top left. The main map area shows a landscape with various colored regions and labels. A popup window is open over a specific area, displaying soil and land use information. A red circle highlights a blue marker on the map, with a red arrow pointing to it. A second popup window is open over this marker, showing its coordinates and a shareable URL. A third popup window is open over the 'Add a marker' button in the map's context menu.

Soils MU: Dooley fine sandy loam, 0 to 6 percent slopes

MU Name	Dooley fine sandy loam, 0 to 6 percent slopes
MU Symbol	DoB
Farm Land Class	Farmland of statewide importance
Acres	775.30
Average Slope	3
Drainage Class	Well drained

Related tables:
ESD2018

[Zoom to](#)

First, click on the map to open the popup window

Click on ... and Choose: **+** Add a marker

- Pan to
- +** Add a marker
- View in Attribute Table

Then click on the newly created Blue Marker to View the Lat/Long and URL to the Map Location in the Popup. The URL can then be sent to a colleague to show them the exact location you are looking at.

Longitude	-104.3375
Latitude	48.4817
URL	http://montana.maps.ar

[Zoom to](#)

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Step 10 – Viewing Layer Attribute Tables

To open the Attribute Table(s) for existing Layers click on the drop down arrow at the bottom of the map screen.

Scroll through available attribute tables or Click Dropdown arrow to choose from the list

Attribute Table Options:
 Export to CSV and turn on/off Column Headings

Click on Filter by map extent to only show items in table that are visible in the map

Sort ascending
Sort descending

Click on the Column Name to Sort the table

Turn on and off Column Headings by checking on/off the boxes

Left Click on the empty gray box next to a record to Select it. Selected records will be highlighted in the table and on the map in cyan. You can use the 'Zoom to' option to focus on the selected polygon.

Shape	ACRES	OBJECTID	MA_ID	MANAME	MANAGER	MA_TYPE	INSTTYPE	INST	UNITTYPE	DataSource	SourceDate	URL	EditDate	Editor
	11332.99530415417	1015417	1081	Freezout Lake Wildlife Management Area	Montana Fish, Wildlife & Parks, Region 4	SFPWM	State	Montana Fish, Wildlife & Parks	Wildlife Management Area					
	6627.85182		53			SFPWM	State	Montana Fish, Wildlife & Parks	Wildlife Management Area					
	1055.51565681764	61	97			SFPWM	State	Montana Fish, Wildlife & Parks	Wildlife Management Area					

Step 11 – Viewing Related Tables from Popup

Related Tables:
In the Ecological Site Reviewer the soils map units have been related to a table containing additional ecological site attributes. The ESD table has a one-to-many relationship with the Soils MU data layer that can be explored through the popups and the attribute table.

The screenshot shows the Ecological Site Reviewer interface with a map of soil map units. Three popups are open:

- Soils MU: Dooley fine sandy loam, 0 to 6 percent slopes** (2 of 2):
 - MU Name: Dooley fine sandy loam, 0 to 6 percent slopes
 - MU Symbol: DoB
 - Farm Land Class: Farmland of statewide importance
 - Acres: 775.30
 - Average Slope: 3
 - Drainage Class: Well drained
 - Related tables: Soils – ESD Component (with a circled '...')
- ESD** (2 of 2):
 - Related records:
 - Loamy (Lo); Farnuf 2%
 - Loamy (Lo); Williams 3%
 - Sandy (Sy); Parshall 1%
 - Sandy (Sy); Tally 4%
 - Sandy Argillic (SyA); Dooley 90% (with a circled '...')
 - Statistics...
 - View in Attribute Table
- Soils MU** (2 of 2):
 - Related records:
 - Soils MU: Dooley fine sandy loam, 0 to ... (with a circled '...')
 - Soils MU: Dooley fine sandy loam, 0 to ...
 - Soils MU: Dooley fine sandy loam, 0 to ...
 - Soils MU: Dooley fine sandy loam, 0 to ...
 - Soils MU: Dooley fine sandy loam, 0 to ...
 - Soils MU: Dooley fine sandy loam, 0 to ...
 - Soils MU: Dooley fine sandy loam, 0 to ...
 - Soils MU: Dooley fine sandy loam, 0 to ...
 - Soils MU: Dooley fine sandy loam, 0 to ...
 - Soils MU: Dooley fine sandy loam, 0 to ...
 - Soils MU: Dooley fine sandy loam, 0 to ... (with a circled '...')
 - Zoom to
 - Pan to
 - Add a marker
 - View in Attribute Table

Three callout boxes with the text "Click on ... To Reveal More Options" point to the circled '...' icons in the 'Related tables' section of the Soils MU popup, the 'ESD' popup, and the 'Related records' list in the Soils MU popup.

Step 12 – Related Table Charts

1) Select the Related Table Charts Tool from the upper right-hand corner.

2) Click on the map. An orange marker will be placed where you clicked on the map, and the pie chart showing the composition of ecological sites within the soil map unit will update in the Related Table Charts Window.


Note: If the Related Table Charts Tool is Open then clicking on the map will only update the Pie Chart.

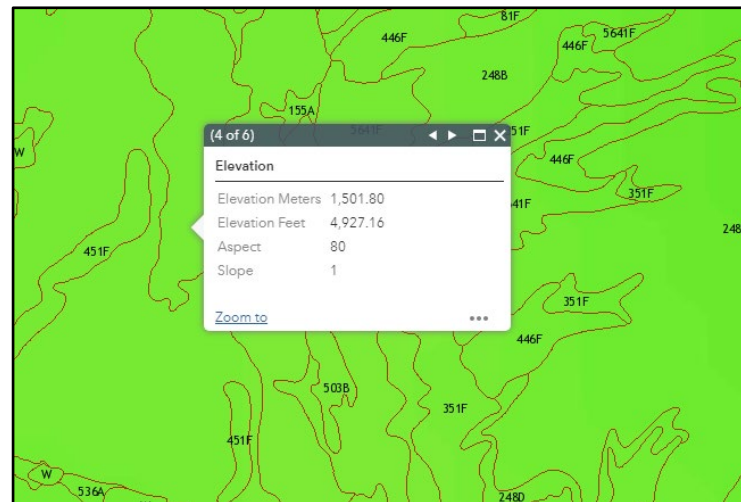
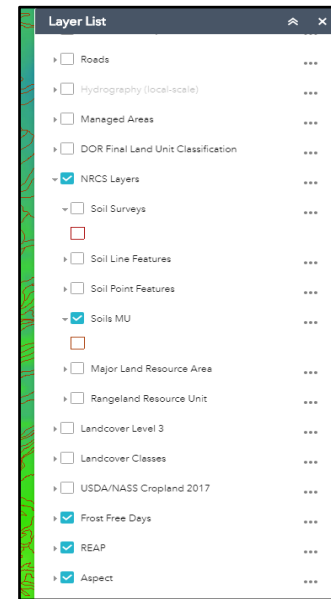
To view the Popup Windows when you click on the map, first close the Related Table Charts tool window by clicking on the "X" in the upper righthand corner.

ESD Component	Percentage
Sandy Argillic (SyA): Dooley	90%
Sandy (Sy): Tally	4%
Sandy (Sy): Parshall	1%
Loamy (Lo): Williams	3%
Loamy (Lo): Farnuf	2%

Ecological Site Reviewer – Example Use

Scenario - I am headed to the field tomorrow in Township 2N Range 9E and need to know the characteristics of my study area, including slope, aspect, elevation, relative effective annual precipitation, soil type, and number of frost free days.

- Step 1 – Open the Ecological Site Reviewer (ESR)
- Step 2 – Click the Layer List button  and turn on the layers of interest and turn off the layers not needed
- Step 3 – Zoom and pan or search to find the study area. Type “2N 9E” in the Search Box and wait for the list of possible matches. Under PLSS Township, choose “2N 9E” and the map will zoom to that township.
- Step 4 - Click on the map where you are interested in doing field work. The popup will return the values of the layers turned on in Step 2.



Provide Input with the Edit Tool

The Edit Tool allows users to markup where a revision to a layer may be needed. For example, a user may be doing field work in an area and determine that a soil map unit should be modified or that the ecological site or MLRA assignment should be changed. The user can draw a polygon and add a comment describing the modification needed. Others using the application will see the suggestion and agency partners can begin collaborating to make the change happen.

The screenshot shows the 'Ecological Site Reviewer - Interagency Version' application. The interface includes a map, a toolbar, a search bar, and a 'Layer List' on the right. Five numbered callouts provide instructions on how to use the 'Edit' tool:

- 1. Click the Edit Tool**: Points to the 'Edit' icon in the top toolbar.
- 2. Click New Feature**: Points to the 'New Feature' button in the 'Edit' dialog box.
- 3. Choose the shape you'd like to draw, such as arrow, polygon, freehand, or circle**: Points to the shape selection options in the 'Edit' dialog box.
- 4. Follow the onscreen directions displayed next to the cursor to draw your edit suggestion**: Points to the 'Click to start drawing (Press CTRL to enable snapping)' instruction in the 'Edit' dialog box.
- 5. Fill out the form that pops up. Optionally, include an attachment. Save is at the bottom of the form (scroll down)**: Points to the 'Edit Suggestions' form, which contains fields for Name, Email, Layer to be Revised, Description, Source, and Attachments.

View Layers Over Time

There are several layers in the Site Reviewer that are time-enabled. These Layers have a date range in their name, for example, USDA/NASS Cropland (2007 – 2020). Turn on the layer you are interested in looking at. Then, click on the Time Tool. A Time Slider will appear at the bottom of the map. You can move the Time Slider or advance it with the left and right arrows. You can see which year you viewing in the Time Slider. You can click on the map to bring up the popup for the layer for additional information.

1) Select Layers that are Time-enabled (identified by the time range in layer title)

2) Select Time Tool from the upper right-hand corner

3) Move the Time Slider to view the Time-enabled layers over the various years

The screenshot shows the 'Ecological Site Reviewer' interface. The top navigation bar includes 'Montana State Library & USDA-NRCS' and 'Help'. A search bar is located at the top left. The main map area displays a complex landscape with various colored overlays representing different data layers. On the right side, a 'Layer List' panel is visible, listing several layers with checkboxes. A red arrow points to the 'Time Tool' icon (a clock) in the top right corner of the map area. At the bottom of the map, a 'Time Slider' is visible, showing the year '2016' and navigation controls. The bottom status bar includes coordinates and a list of data sources: 'Bureau of Land Management, Esri, Caneda, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS | DOR, MSL, N'.