



University
of Victoria

Surreal Lab Project FVS User Guide

CRD Data Visualization Guide

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Summary

This guide outlines data visualization for the CRD for the SURREAL Lab FVS Project. This will cover the process for data visualization including database structure, importing of data into FVS, graphing and export of data, and FVS' stand visualization tool. For Further information on running the FVS tool, please refer to the Surreal Lab Project FVS User Guide.

Database Structure

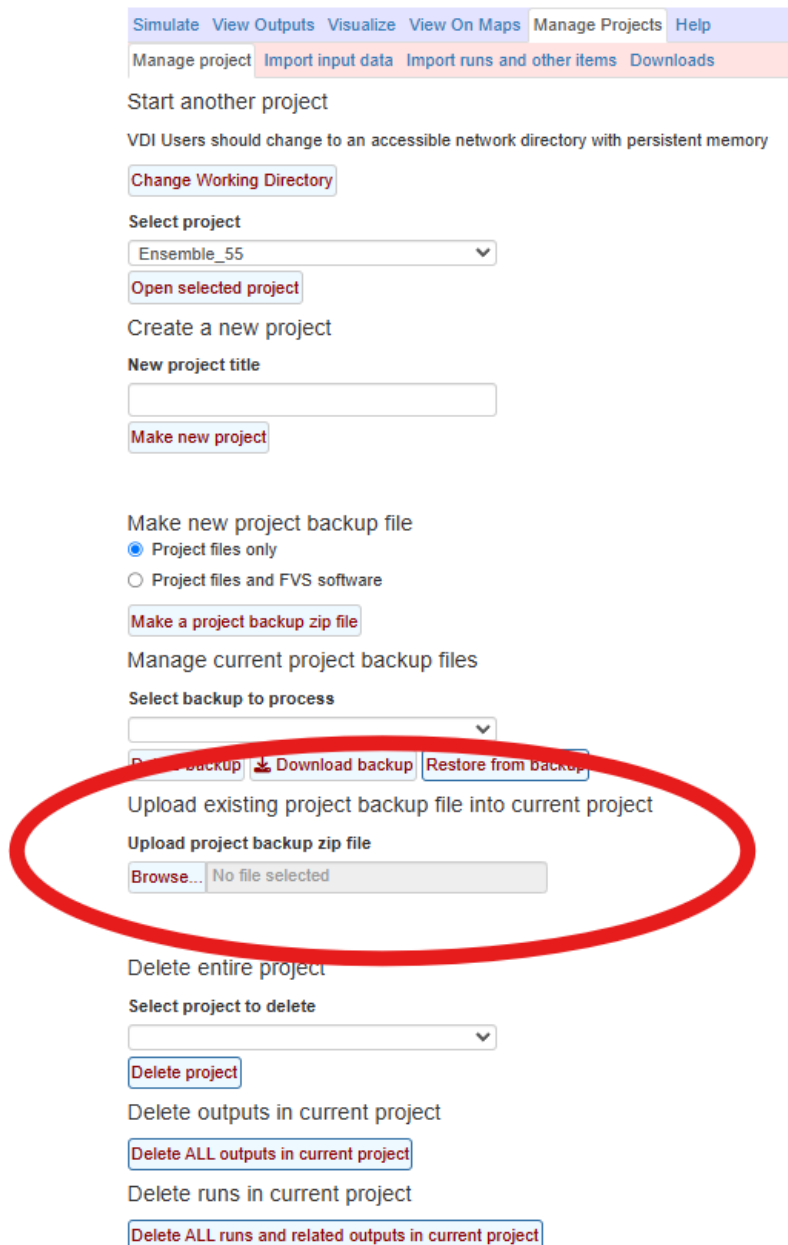
For the CRD FVS Project all data is broken up into a series of simulations, called ensembles. The specifics of what each ensemble examines can be found in the Simulation Master Sheet.

Inside each ensemble folder there is: a copy of the exact input data used for the simulation, a copy of the climate data used for the simulation, the Summary2, SnagDet, and Treelist csv output files, a project backup .zip folder, a simulation master sheet, and an outputs folder. The outputs folder contains all reports, organized by stand, and all figures and tables for the ensemble. If further data or stand visualization is required, the project backup file can be imported back into FVS.

Importing Project Backups into FVS

When uploading a project backup into FVS, the data in the current project will be deleted. Before beginning this process, create a new FVS Project to ensure important data isn't deleted.

To load an FVS backup file back into FVS, you must use the upload existing project backup file option. This adds the backup file to your project folder, allowing FVS to read it. It should also be noted that FVS can be very specific about how files are uploaded and read by the system, so always use FVS tools to move, upload, or save data to avoid any errors.



The screenshot displays the FVS web interface with the following sections and elements:

- Navigation Bar:** Simulate, View Outputs, Visualize, View On Maps, Manage Projects, Help.
- Sub-navigation Bar:** Manage project, Import input data, Import runs and other items, Downloads.
- Start another project:** VDI Users should change to an accessible network directory with persistent memory. Includes a "Change Working Directory" button.
- Select project:** A dropdown menu showing "Ensemble_55" and an "Open selected project" button.
- Create a new project:** A "New project title" input field and a "Make new project" button.
- Make new project backup file:** Radio buttons for "Project files only" (selected) and "Project files and FVS software". Includes a "Make a project backup zip file" button.
- Manage current project backup files:** A dropdown menu for "Select backup to process". Below it are buttons for "Delete backup", "Download backup", and "Restore from backup".
- Upload existing project backup file into current project:** This section is circled in red. It contains the text "Upload project backup zip file" and a "Browse..." button next to a "No file selected" message.
- Delete entire project:** A dropdown menu for "Select project to delete" and a "Delete project" button.
- Delete outputs in current project:** A "Delete ALL outputs in current project" button.
- Delete runs in current project:** A "Delete ALL runs and related outputs in current project" button.

After the file has been uploaded it will appear in the Manage current backup files sections. Select the desired backup folder from the dropdown menu and select the restore from backup button.

[Simulate](#) [View Outputs](#) [Visualize](#) [View On Maps](#) [Manage Projects](#) [Help](#)

[Manage project](#) [Import input data](#) [Import runs and other items](#) [Downloads](#)

Start another project

VDI Users should change to an accessible network directory with persistent memory

[Change Working Directory](#)

Select project

Ensemble_55

[Open selected project](#)

Create a new project

New project title

[Make new project](#)

Make new project backup file

☒ Project files only

☐ Project files and FVS software

[Make a project backup file](#)

Manage current project backup files

Select backup to process

[Delete backup](#) [Download backup](#) [Restore from backup](#)

Upload existing project backup file into current project

Upload project backup zip file

[Browse...](#)

Delete entire project

Select project to delete

[Delete project](#)

Delete outputs in current project

[Delete ALL outputs in current project](#)

Delete runs in current project

[Delete ALL runs and related outputs in current project](#)

This will delete any data in the current project at this stage and overwrite it with the project backup data so ensure there is nothing needed in the project.

After confirming the data overwrite warning message, the selected project will import into FVS.

Graphing Data in FVS

Navigate to the view outputs tab to view and visualize the data for the simulation.

FVS Forest Vegetation Simulator

USDA U.S. FOREST SERVICE
Caring for the land and serving people

Project title: Example
Current Location: C:/FVS/Example
Last accessed: Mon Apr 14 14:44:52 2025
Run contents: 7 stand(s), 2 group(s)

Release date: 20240701
Local configuration

Simulate **View Outputs** Visualize View On Maps Manage Projects Help

Load Explore Recent Query

Species codes ☐ FVS ☐ FIA ☒ Plants

Runs to consider

Run 3
Run 2
Run 1

DBH class size Large DBH



4 48

Rebuild StdStk

Database tables to consider

Database variables to consider

When getting data out of FVS, first select all needed runs. Generally, this will be all of them. Then choose your database tables.


Forest Vegetation Simulator

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Project title: **Example**
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 Run contents: 7 stand(s), 2 group(s)

Release date: 20240701
 Local configuration

Simulate | View Outputs | Visualize | View On Maps | Manage Projects | Help

Load | **Explore** | Custom Query

Species codes ☐ FVS ☐ FIA ☒ Plants

Describe tables

Runs to consider

DBH class size Large DBH

Rebuild Stands

Database tables to consider

Database variables to consider

These are either stand, plot, or tree level lists. The different types cannot be mixed and matched, but several in the same category can be selected together. The describe tables option will outline what data is stored in each table.

Forest Vegetation Simulator

U.S. FOREST SERVICE
Caring for the land and serving people

Project title: Example

Current Location: C:\FVS\Example

Last accessed: Tue Apr 22 11:01:29 2025

Run contents: 7 stand(s), 2 group(s)

Release date: 20240701

Local configuration

Simulate View Outputs Visualize View On Maps Manage Projects

Load Explore Custom Query

Species codes OFVS CFIA Plants

Runs to consider

Run 1
Run 3
Run 2

DBH class size Large DBH

4 48

Rebuild StdStk

Database tables to consider

FVS_Cases
----Composite tables-----
CmpStdStk
CmpSummary2
----Stand-level tables-----
FVS_Carbon
FVS_Down_Wood_Cov
FVS_Down_Wood_Vol

Database variables to consider

FVS_Cases.CaseID
FVS_Cases.Stand_CN
FVS_Cases.StandID
FVS_Cases.MgmtID
FVS_Cases.RunTitle
FVS_Cases.KeywordFile
FVS_Cases.SamplingWt
FVS_Cases.Variant
FVS_Cases.Version
FVS_Cases.RV
FVS_Cases.Groups
FVS_Cases.RunDateTime

Describe tables




FVS_Potfire

FVS_Potfire is a table in the FVS database. The table contains predicted potential flame lengths, torching indices, crowing indices, probability of torching, tree mortality, smoke production and fuel models for moderate and severe fire conditions. There is one row for each stand and cycle year. For the eastern FVS variants, the table is called FVS_Potfire_East and the content differs in some ways. NOTE: this table corresponds to the Potential Fire Report described in Section 2.6.7 of the Fire and Fuels Extension Guide. FVS_Potfire

Variable	Description
CaseID	Unique FVS case identifier that corresponds to the FVS_Cases table
StandID	Stand identification
Year	The year of the fire
Surf_Flame_Sev	The potential surface fire flame length under severe conditions. This flame length does not take any crown fire activity into account
Surf_Flame_Mod	The potential surface fire flame length under moderate conditions. This flame length does not take any crown fire activity into account
Tot_Flame_Sev	The potential total flame length under severe conditions. This flame length takes crown fire activity into account
Tot_Flame_Mod	The potential total flame length under moderate conditions. This flame length takes crown fire activity into account
Fire_Type_Sev	Surface (S), passive (P), active crown (A), or conditional (C) crown fire under severe conditions
Fire_Type_Mod	Surface (S), passive (P), active crown (A), or conditional (C) crown fire under moderate conditions
PTorch_Sev	Probability of torching under severe fire conditions
PTorch_Mod	Probability of torching under moderate fire conditions
Torch_Index	The 20-ft wind speed required to cause a torching of trees
Crown_Index	The 20-ft wind speed required to cause an active crown fire
Canopy_Ht	Height of the base of canopy
Canopy_Density	Bulk density of canopy
Mortality_BA_Sev	Percent of the basal area that would be killed in severe fire conditions
Mortality_BA_Mod	Percent of the basal area that would be killed in moderate fire conditions
Mortality_VOL_Sev	Total volume that would be killed under severe fire conditions
Mortality_VOL_Mod	Total volume that would be killed under moderate fire conditions
Pot_Smoke_Sev	Potential amount of smoke emissions less than 2.5 microns in severe fire conditions
Pot_Smoke_Mod	Potential amount of smoke emissions less than 2.5 microns in moderate fire conditions
Fuel_Mod1	Current fuel model 1 used in the weighting scheme. Up to four fuel models may be shown, but normally only one or two are present. If the static option is in effect, only one fuel model will be shown
Fuel_Mod2	Current fuel model 2 used in the weighting scheme. Up to four fuel models may be shown, but normally only one or two are present. If the static option is in effect, only one fuel model will be shown
Fuel_Mod3	Current fuel model 3 used in the weighting scheme. Up to four fuel models may be shown, but normally only one or two are present. If the static option is in effect, only one fuel model will be shown
Fuel_Mod4	Current fuel model 4 used in the weighting scheme. Up to four fuel models may be shown, but normally only one or two are present. If the static option is in effect, only one fuel model will be shown
Fuel_Wt1	Weighting for fuel model 1. These should sum up to 100, but may not due to rounding
Fuel_Wt2	Weighting for fuel model 2. These should sum up to 100, but may not due to rounding
Fuel_Wt3	Weighting for fuel model 3. These should sum up to 100, but may not due to rounding
Fuel_Wt4	Weighting for fuel model 4. These should sum up to 100, but may not due to rounding

[Link to reference document for table FVS_Potfire](#)

This will also give a description of each field. If additional information about a field is required, access the [Keyword Reference Guide for the Forest Vegetation Simulator](#) linked at the end of this guide. Once the appropriate table has been selected, move to the explore subtab.


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Simulate Outputs Visualize View On Maps Manage Projects Help

Local Explorer Custom Query

Select

Run 1
 Run 2
 Run 3

Groups

None loaded

Stands

2100120_2014
 2200011_2014
 2200014_2014
 2200021_1992
 2200022_1992
 2200023_1992

MgmtIDs

A001
 A002
 A003

Years

1992
 2002
 2012
 2014
 2022
 2024

Species

None loaded

DBHClasses

None loaded

Database table(s) selected: FVS_Summary2
 Select variables

☐ Select all
 ☒ MgmtID
 ☒ StandID
 ☒ Year
 ☒ RmvCode
 ☒ Age
 ☒ Tpa
 ☒ TPrdTpa
 ☒ BA
 ☒ SDI
 ☒ CCF
 ☒ TopHt
 ☒ QMD
 ☒ TCuFt
 ☒ TPrdTcuFt
 ☒ MCuFt
 ☒ TPrdMCuFt
 ☒ BdFt
 ☒ TPrdBdFt
 ☒ RTpa
 ☒ RTCuFt
 ☒ RMCuFt
 ☒ RBdFt
 ☒ PrdLen
 ☒ Acc
 ☒ Mort
 ☒ MAI
 ☒ ForTyp
 ☒ SizeCls
 ☒ StkCls
 ☒ RunTitle
 ☒ CaseID

Tables Graphs

Convert to columns

None

Variable to display

None

Download table

Type
 ☒ .xlsx
 ☐ .csv

	MgmtID	StandID	Year	RmvCode	Age	Tpa	TPrdTpa	BA	SDI	CCF	TopHt	QMD
1	A001	2200021_1992	1992	0	32	1460.79	1460.79	61.828	188	165	58	2.786
2	A001	2200022_1992	1992	0	32	512.271	512.271	99.544	224	152	57	5.969
3	A001	2200023_1992	1992	0	32	1229.452	1229.452	98.491	264	188	74	3.832
4	A002	2200021_1992	1992	0	32	1460.79	1460.79	61.828	188	165	58	2.786
5	A002	2200022_1992	1992	0	32	512.271	512.271	99.544	224	152	57	5.969
6	A002	2200023_1992	1992	0	32	1229.452	1229.452	98.491	264	188	74	3.832
7	A003	2200021_1992	1992	0	32	1460.79	1460.79	61.828	188	165	58	2.786
8	A003	2200022_1992	1992	0	32	512.271	512.271	99.544	224	152	57	5.969
9	A003	2200023_1992	1992	0	32	1229.452	1229.452	98.491	264	188	74	3.832

This will allow you to view data tables to around 5000 lines, and the second graph option allows for simple graphs of the data. Ensure you highlight all years before examining any data or you will only get the results from the initial year. If more then 5000 lines of data is required, or additional data processing is needed, you can export the data table.

Forest Vegetation Simulator

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Release date: 20240701
 Local configuration

Simulate View Outputs Visualize View On Maps Manage Projects Help

Load Explore Custom Query

Select run titles

Run 1
 Run 2
 Run 3

Groups

None loaded

Stands

2100120_2014
 2200011_2014
 2200014_2014
 2200021_1992
 2200022_1992
 2200023_1992

MgmtIDs

A001
 A002
 A003

Years

2075
 2085
 2095
 2105
 2115
 2125

Species

None loaded

DBHClasses

None loaded

Database table(s) selected: FVS_Summary2
 Select variables

☐ Select all
 ☒ MgmtID ☒ StandID ☒ Year
☒ RmvCode ☒ Age ☒ Tpa ☒ TPrdTpa ☒ BA
☒ SDI ☒ CCF ☒ TopHt ☒ QMD ☒ TCuFt
☒ TPrdTcuFt ☒ MCuFt ☒ TPrdMCuFt ☒ BdFt
☒ TPrdBdFt ☒ RTpa ☒ RTCuFt ☒ RMCuFt
☒ RBdFt ☒ PrdLen ☒ Acc ☒ Mort ☒ MAI
☒ ForTyp ☒ SizeCls ☒ StkCls ☒ RunTitle
☒ CaseID

Tables Graphs

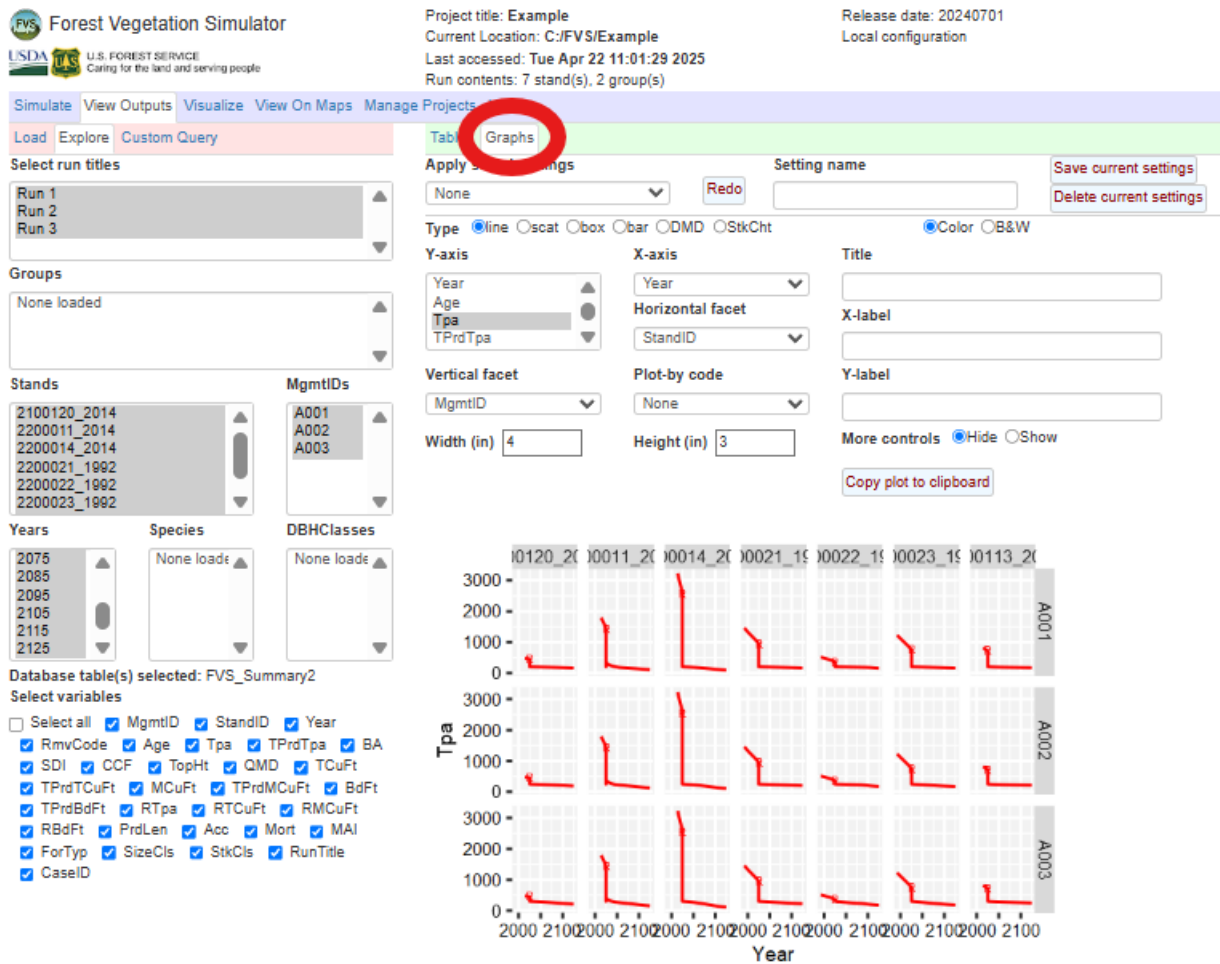
Convert to columns Variable to display

None

Download table
 Type ☒ .xlsx ☐ .csv

	MgmtID	StandID	Year	RmvCode	Age	TPa	TPrdTpa	BA	SDI	CCF	TopHt	QMD
1	A001	2100120_2014	2014	0	65	478.682	478.682	196.39	381	292	91	8.67
2	A001	2100120_2014	2024	0	75	460.222	460.222	240.829	445	339	95	9.79
3	A001	2100120_2014	2025	1	76	458.146	458.146	245.1	451	344	95	9.90
4	A001	2100120_2014	2025	2	76	199.997	458.146	163.508	277	213	95	12.2
5	A001	2100120_2014	2026	0	77	199.993	458.139	166.746	281	216	95	12.3
6	A001	2100120_2014	2035	0	86	197.575	455.721	195.947	319	246	98	13.4
7	A001	2100120_2014	2045	0	96	195.012	453.157	228.453	360	279	101	14.6
8	A001	2100120_2014	2055	0	106	192.266	450.412	259.544	398	309	103	15.7
9	A001	2100120_2014	2065	0	116	189.26	447.405	289.081	432	338	106	16.7
10	A001	2100120_2014	2075	0	126	185.942	444.087	315.358	462	364	107	17.6
11	A001	2100120_2014	2085	0	136	182.307	440.453	340.011	489	387	109	18.4
12	A001	2100120_2014	2095	0	146	178.335	436.48	362.036	512	407	111	19.2
13	A001	2100120_2014	2105	0	156	174.051	432.196	381.584	532	425	112	20.0
14	A001	2100120_2014	2115	0	166	169.499	427.644	399.251	548	441	114	20.7
15	A001	2100120_2014	2125	0	176	164.72	422.866	415.483	563	455	115	21.5
16	A001	2200011_2014	2014	0	27	1792.951	1792.951	185.24	472	380	51	4.35
17	A001	2200011_2014	2024	0	37	1484.77	1484.77	294.108	659	483	59	6.02
18	A001	2200011_2014	2025	1	38	1442.833	1442.833	302.411	670	487	60	6.19
19	A001	2200011_2014	2025	2	38	200	1442.833	148.019	256	171	60	11.6
20	A001	2200011_2014	2026	0	39	313.319	1556.151	152.947	287	177	61	9.46
21	A001	2200011_2014	2035	0	48	248.186	1491.018	201.548	342	217	66	12.2
22	A001	2200011_2014	2045	0	58	204.116	1446.949	254.069	396	258	72	15.1
23	A001	2200011_2014	2055	0	68	182.809	1425.642	295.227	437	289	77	17.2
24	A001	2200011_2014	2065	0	78	172.516	1415.348	334.015	477	316	83	18.8
25	A001	2200011_2014	2075	0	88	163.698	1406.53	372.345	515	342	88	20.4
26	A001	2200011_2014	2085	0	98	153.934	1396.766	395.241	534	354	93	21.6
27	A001	2200011_2014	2095	0	108	143.447	1386.28	416.731	549	363	98	23.0
28	A001	2200011_2014	2105	0	118	132.273	1375.106	431.586	556	368	102	24.4

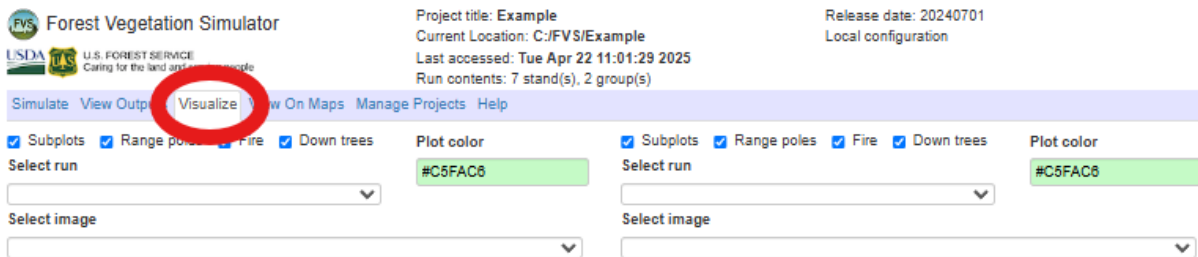
Additionally, data can be viewed in FVS using the Graphs subtab.



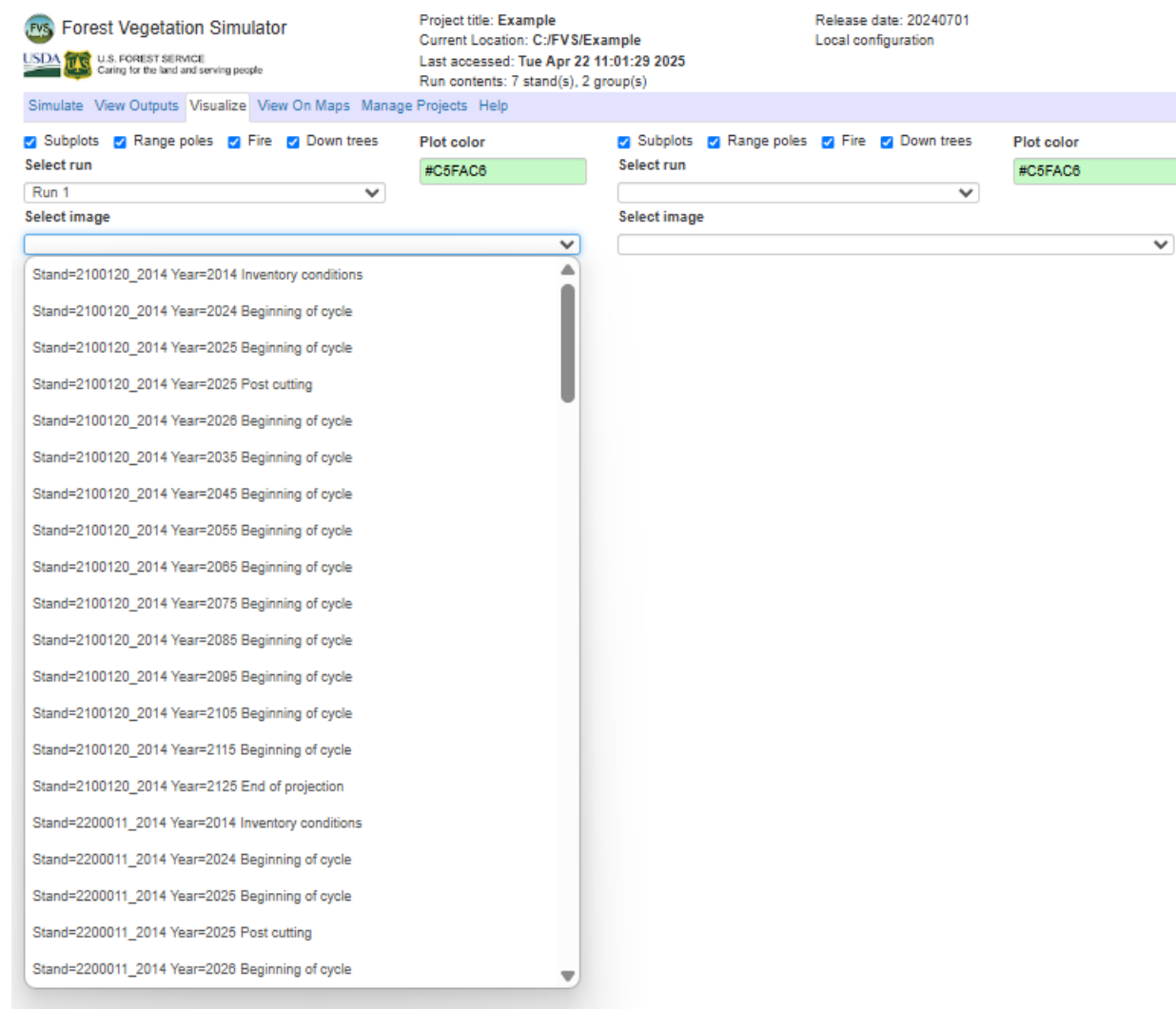
Using the controls on the left of the window, the required runs, stands, and years can be selected, and in the right window variables for graphing can be selected. There is a limit to the number of graphs possible, so a subset of stands or runs may be needed depending on the simulation in question.

Stand Visualization in FVS

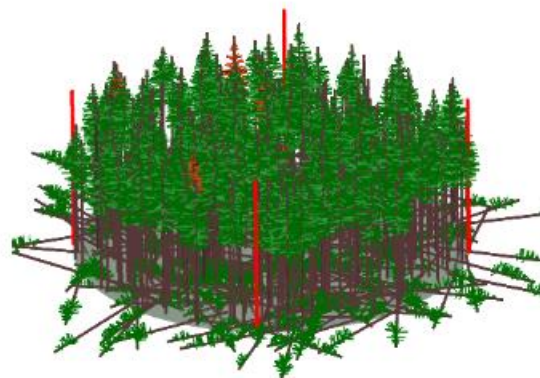
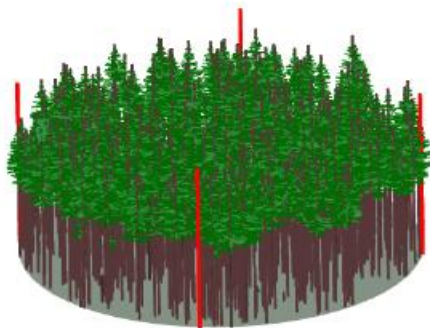
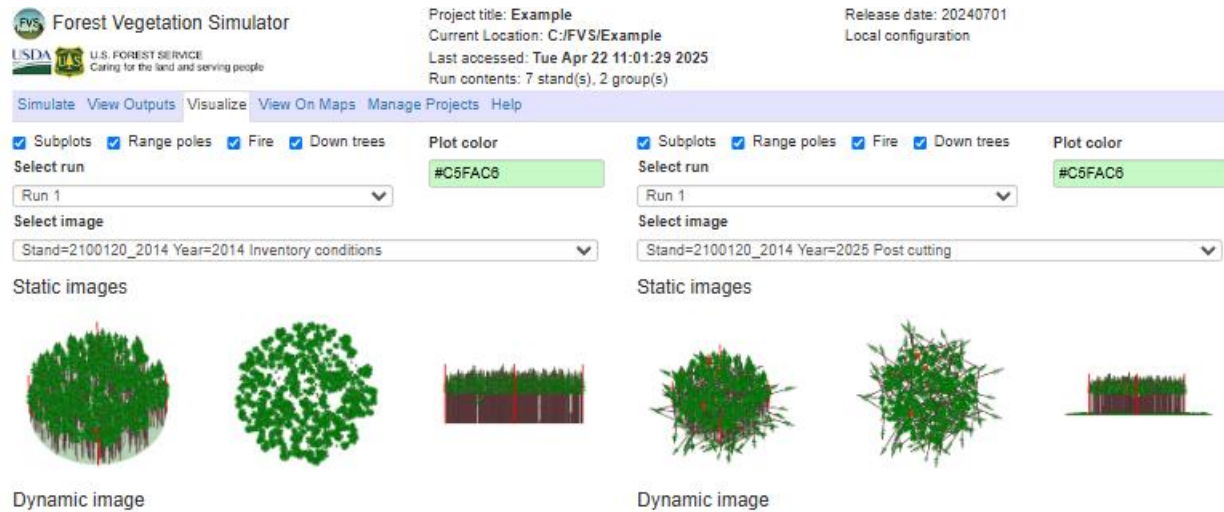
To visualize the stand, navigate to the visualize tab at the top of the screen.

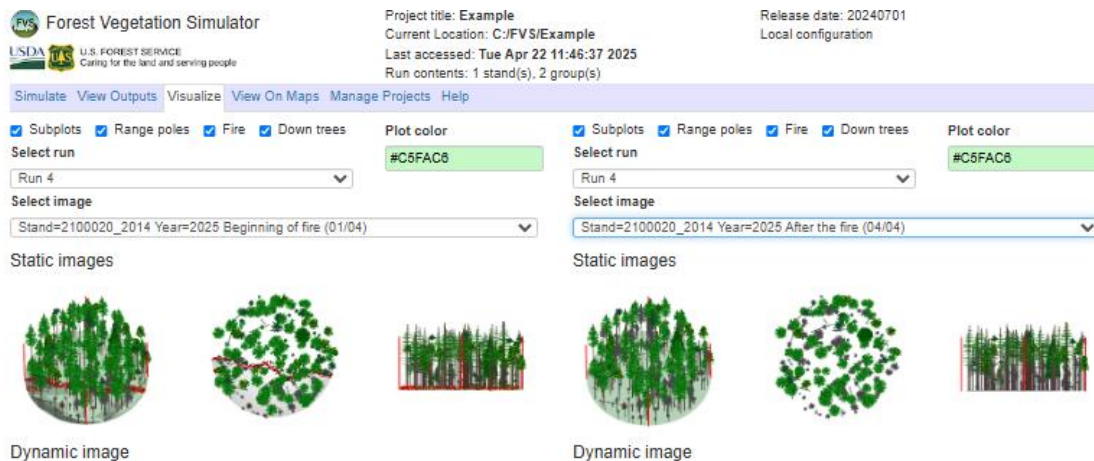


From here the run of interest can be selected from the dropdown menu, and a list of images from that run will be available.



Images will be available for each stand, and for the inventory year and every 5 years (if that is the selected reporting interval) afterwards until the end date of the simulation. If cutting, planting, fires, or other activities are present in the run, there will also be additional images available after or during those events. Two images can be loaded for comparisons if needed.





Resources

All FVS resources can be found [here](https://www.fs.usda.gov/managing-land/forest-management/fvs/documents/guides), at <https://www.fs.usda.gov/managing-land/forest-management/fvs/documents/guides>

Resources of Interest:

Essential FVS: A User's Guide to the Forest Vegetation Simulator outlines the general aspects of the model.

Users Guide to the Database Extension of the Forest Vegetation Simulator Version 3.0 (FVS with SQLite) covers more data specific

Keyword Reference Guide for the Forest Vegetation Simulator shows the use of specific keywords in greater detail

The Fire and Fuels Extension to the Forest Vegetation Simulator: Updated Model Documentation covers the specifics of fire modeling in FVS

Climate-FVS Version 2: Content, Users Guide, Applications, and Behavior (in additional documents) outlines the use of the climate modeling system in FVS

Pacific Northwest Coast (PN) Variant Overview of the Forest Vegetation Simulator (in Variant Overviews) details how FVS deals with stands in the Pacific Northwest, some systems work differently than documented in the more general user guides depending on the regional variant used.