Analyst-Assisted Short-Term Fire Behavior (STFB)

Estimated time to complete: 40 minutes or more depending on how elaborate the user choses to make the simulation.

WFDSS Short-Term Fire Behavior (STFB) is a two-dimensional fire growth model and is similar to the FlamMap's Minimum Travel Time (MTT), which is a desktop application. STFB is a web-based application that calculates spread rates and maximum spread direction at each cell. STFB uses one set of wind and fuel moisture conditions; STFB provides potential fire spread (arrival times and major paths) for a user-defined length of time. The model then holds all environmental conditions (wind and fuel moistures) constant for the duration of the simulation, STFB calculates fire growth and behavior by searching for the set of pathways with minimum fire spread times from an ignition (point, line, or polygon) source.

In this exercise Fire Behavior Specialists and Super Analysts will become familiar with how to prepare, run and interpret a Short-Term Fire Behavior (STFB) model. This exercise is not intended to be a comprehensive guide to STFB, but teaches the user basic skills to run the model. This includes:

- Creating an incident on their home unit, an area of equal familiarity, or recreate a past fire.
- Preparing to run the model by setting basic weather, wind and landscape parameters.
- Running the model and interpreting the results.

Before you begin:

- Ensure you have a WFDSS User Name and Password. For information on requesting an account see http://wfdss.usgs.gov/wfdss_help/WFDSSHelp_request_acct.html
- Have access to WFDSS Training site
- Have either Fire Behavior Specialist or Super Analyst user roles. You will also need the Author user role to create an incident.
- This document contains electronic hyperlinks to WFDSS Help and related documents. The hyperlinks are underlined; clicking on this text will take you to the help content or the related document. **Bold** text refers to specific text, buttons, tabs, pages, etc. in the WFDSS program.
- The **WFDSS 101** series found on the **Training** page of WFDSS is an excellent source for gaining basic skills in using WFDSS.

Creating a New Incident

You will need to create an incident on the **Training** site of WFDSS for this exercise. This may be a fictitious fire or you may choose to recreate a past fire. See **WFDSS 101** Lesson 2 Creating an Incident or see Creating an Incident WFDSS Help.

1. Create your incident.

Running Analyst–Assisted Short-Term Fire Behavior (STFB)

Now that you have an incident created see Running an Analyst–Assisted Short-Term Fire Behavior Analysis. You are ready to begin entering information for Short-Term Fire Behavior.

To run an Analyst-Assisted STFB:

1. From the **Incident Analyses** tab for your incident select the **STFB** radio button under the **New Analysis** and click on **Create Analysis for Incident.**

2. Follow the Help instruction to enter General Parameters.

    Note: If you are running this simulation in the winter or other off fire season times, use an *__Analysis Date__ from a past fire season so the weather data the model selects is conducive to fire growth. Short-Term Fire Behavior uses historical weather data if a past date is used.

3. The **Ignition File** will not exist at this point unless other analyses have created one. You can **Create** your analyses without one to save your general parameters. You will create one in the following steps. You may also create a barrier file later.

4. After creating your analyses, your wind and weather information appears below your General Information. Verify that your wind, weather, and initial fuel moisture information is what you want to use by using the ▼ down arrow to expand each section. You can also modify the data if needed, and click **Save**. See Modifying Fuel Moisture for Fire Behavior Analysts, Modifying Weather Stream Data (Analyst-Assisted BFB & STFB, NTFB), Modifying Wind Stream Data (Analyst-Assisted BFB & STFB, NTFB).
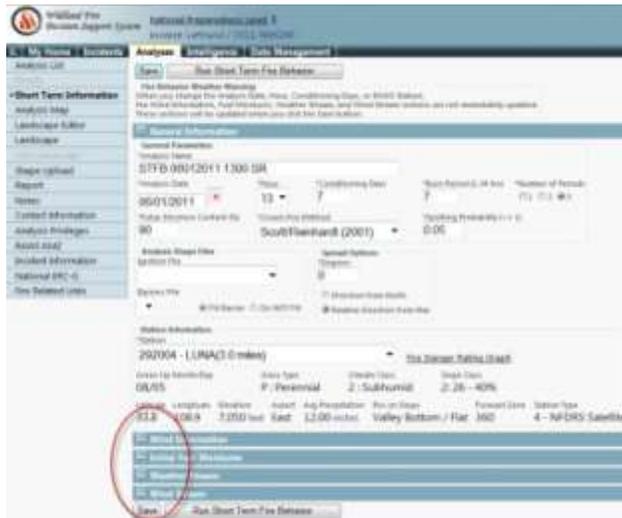
5. Use the menu options at the left to navigate to the **Analysis Map.** This is where you define the landscape extent, ignitions, barriers, and landscape masks if used. The Landscape Extent tool ▦ is used to draw the extent of analyses landscape on the map. Draw a landscape extent that is just a little larger than you feel the fire will reasonably spread to within the specified burn periods (days). You can also use the default landscape extent (green box). See Drawing Landscape Extent.

6. Create your **Ignition File** by clicking the **+** to the left of **Analysis** to expand analysis options. Click the green ○ to the right of **Ignitions** select the ⬨ Draw a polygon tool and draw a small box around the point of origin. You are approximating the fires current perimeter. Other tools can be used for this purpose as well, such as the Draw a rectangle or the Draw a point tools, although point ignitions can be problematic. It is best to begin with an ignition of two acres or more. Ignition files can also be uploaded and existing shapes on the map can be selected and made into an ignition file. Once your ignition has been drawn or selected,

name it, and click **Save.** See Creating an Analysis Ignition File. See also About Analysis Shape Files (Analyst-Assisted STFB, NTFB, FSPro).

7. **Barriers** can be created in the same manner as ignition files. The Draw a line tool may be appropriate for drawing a barrier along a highway or river.

> **Note:** STFB only accepts one **Barriers File**, so separate barriers need to be combined into one file. See Creating a Barrier

8. **Landscape Masks** are used to change landscape characteristics within a specific area such as fuel models within a burn area. Landscape Masks are created in a similar fashion to the ignition and barrier files. See Creating a Landscape Mask. The **Historical Fires** layer can be used to create landscape masks, see Copying Feature Information. GIS shape files can also be uploaded, see Uploading Shapes.

9. Use the **Menu** tab to navigate to the **Landscape Editor** if you want to make changes to the landscape. See Creating a Landscape Editor Rule.

10. Use the **Menu** tab to navigate to **Landscape** to create your landscape file from the extent you defined in Step 5. See Creating the Landscape File.

11. Generating the landscape will take little while. You may refresh the window by clicking on **Landscape** in the menu options**.** Once the landscape has been generated WFDSS will give you a message at the top of the page indicating the landscape file has been successfully generated and the **Generate LCP Critique** button and **View Landscape** becomes available. These are good tools for assessing the landscape and any changes you may have made in Step 9. See Viewing the Landscape for Analysis, Generating a Landscape Critique.

> **Note:** You need to refresh the **Landscape** page after generating a Landscape Critique for the **Download LCP Critique** button to appear.

12. Once all the necessary inputs to the model have been added navigate back to **Short Term Information.** Use the drop down box to select the **Ignition File** you created in Step 6 and the **Barriers File** if you created one in Step 7, and click **Save.**

13. To run the analysis, click *the **Run Short Term Fire Behavior*** button at the top or bottom of the page. A **Warning** message displays if you are missing inputs. You must complete the missing information before you can run the analysis.

14. When you click the **Run Short Term Fire Behavior** button you are returned to the **Analyses** page and be able to see your run with a status of **queued** or **in process**. Processing may take several minutes. You will need to refresh the Analyses page by clicking on the **Analyses** tab.

> Once your run status changes to **Review,** you may view the results by clicking the **View Results** button.

15. By clicking each of the check boxes you can view the outputs on the map. Clicking on the Legend icon to the right of **Arrival Time** output brings up a Legend window for that output option. For interpreting your results see Analyst - Assisted STFB – What it means (interpretation)**.**

16. Clicking the **+** next to **Basic Output** opens outputs such as flame lengths, rates of spread, fire line intensities, etc., for you entire landscape similar to Basic Fire Behavior (BFB) outputs.

17. You decide when the run is valid and want to make it available to the decision, or the run is not valid and want reject it. From the **Results** tab you can **Accept** or **Reject** your simulation. Remember to add notes to the dialog box. This is your opportunity to explain to viewers:

    ▪ Why the model run was made.
    ▪ How it should be interpreted.
    ▪ Assumptions and limitations of the run.
    ▪ Potential shelf life of the run
    ▪ Triggers for a new analysis

    By selecting **Analysis Privileges** from the menu options you can grant specific people viewer privileges to view your analysis without having to accept the run at this point. Your STFB analysis will not be available to anyone else except Super Analysts to view until you either grant them viewer or editor privileges or accept the analysis. See Granting Analysis Privileges.

18. If you want to make modifications to your analysis, you may use the **Copy** feature on the **Analyses** page to create a new FSPro analysis with all the same parameters used in the copied run. This feature allows you to make any changes you wish to the parameters of the copy run. See Copying an existing STFB Analysis

Notes

A good Analyst keeps good notes. These notes help you as well as those who follow you to understand what you did and why. Each page in STFB has **Notes** in the left-hand menu options. You may add Notes to each page to help remind you and to tell others that follow you, what you changed and why, on that page. These Notes appear at the top of each page and can be edited at any time.

Values Inventory

You can obtain values inventory information associated with a Short-Term Fire Behavior (STFB) analysis. WFDSS uses the STFB Arrival Time footprint to query the values inventory database. Click the ▼ down arrow to the right of your **Short Term Results** to expand the analysis information and click on the **Values Inventory.** This opens a new window with the values information. See To access the STFB Values Inventory Information.
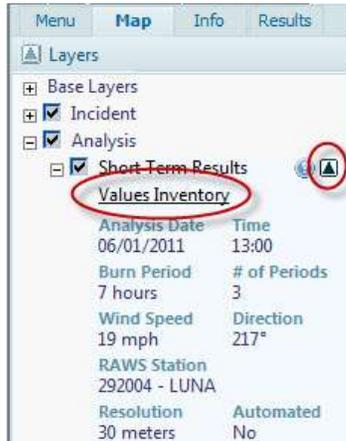
Now that you have successfully completed a Short Term Fire Behavior analysis and have acquired basic skills, we encourage you to practice and try more elaborate analyses. The links below provide further information that may be helpful as you develop your skills.

Reports & Downloads

- Viewing the Analysis Report

- Downloading an Analysis KMZ File

- Downloading a LCP File

- Uploading an LCP File

- Downloading a Landscape Critique

Further information on Analyst-Assisted Short-Term Fire Behavior

- Analyst-Assisted – STFB –What it is

- Analyst-Assisted STFB – What it needs (inputs)

- Analyst-Assisted STFB - What it does (outputs)
- Analyst–Assisted STFB – Why use it (potential uses)

- Analyst–Assisted STFB – Assumptions and Limitations