

A BRIEF INTRODUCTION TO THE INTERAGENCY FUELS TREATMENT DECISION SUPPORT SYSTEM (IFTDSS)

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INTRODUCTION

The last decade saw a dramatic proliferation of software systems intended to help fire and fuels managers in the United States. Funding for these software systems came from a variety of sources without any central control or vision. A governance process with stated requirements on how to transition a research-grade software application to an operationally ready one was never created. This resulted in a fuels management environment with numerous, fragmented, stand-alone tools; system and data access issues; decentralized planning and support; minimal security; and ad-hoc training.

To help mitigate this problem situation, the Joint Fire Science Program (JFSP), working in conjunction with the National Wildfire Coordinating Group (NWCG) Fuels Management Committee (formerly the National Interagency Fuels Coordinating Group), initiated the Software Tools and Systems (STS) study in 2007. Between 2010 and 2012, the JFSP released a series of pilot versions of IFTDSS that demonstrated growing functionality and conformance with field user needs. These pilot versions were made available to a large body of test users in an active program to gather user feedback. The most current version of IFTDSS (Beta version 2.0) was released in October 2012. The IFTDSS software integration framework is available at iftdss.sonomatech.com. All project documentation, including a detailed final report, is available at www.frames.gov/iftdss.

WHAT IS IFTDSS?

The Interagency Fuels Treatment Decision Support System (IFTDSS) is an existing service integration platform, currently with over 100,000 lines of software code, that provides command and control for software modules and datasets executing from within a common user interface. It provides capabilities for use and integration of standardized and custom datasets, supports

treatment unit- and landscape-scale analyses, data visualization functionality, estimates of fire behavior and first-order fire effects, and quantitative hazard and risk assessments. It allows users to choose pre-designed solution pathways for the most commonly performed fuels treatment tasks. These pre-designed solution pathways, called workflows, were designed and reviewed by members of the user stakeholder community to ensure that offered functionality matched real needs. It is important to understand that IFTDSS is not another new fuels treatment system. It is a service integration framework that organizes and makes available a large number of pre-existing software modules through a single, Web-based graphical user interface.

HOW CAN IFTDSS HELP FIRE AND FUELS MANAGERS AND SOFTWARE DEVELOPERS?

IFTDSS transforms a chaotic, ungovernable set of stand-alone, stove-piped software applications into a consolidated, manageable single software application focused on helping users solve their mission critical business needs. The primary orientation is to support local, project-scale analyses but as part of a landscape area of interest that could be up to 2 million acres in size. IFTDSS takes the model processing power of many different systems and brings them together into one place. The IFTDSS process is easy to understand and use. Users no longer need to learn and to use multiple tools with different interfaces, thus reducing training and re-familiarization time. Users no longer need to spend most of their time on data transformation issues from one software system to another. Users can use the collaboration features of IFTDSS to share data and project analyses with other professionals. Finally, for the first time, users of IFTDSS have access to a credible, yet easy to learn and apply risk assessment process that they can perform themselves at their local office.

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HAS IFTDSS BEEN TESTED AND EVALUATED?

IFTDSS has been developed with the intimate involvement of numerous members of the fire and fuels community since its inception in 2007. Users were involved at the design state and the early testing stages. Their suggestions and critical comments were a dominant guiding force throughout the development process. In 2013, IFTDSS had over 400 users all across the United States. IFTDSS has also been subjected to an independent evaluation by members of the Software Engineering Institute of Carnegie Mellon University located in Pittsburgh, PA. The report of that evaluation concluded that IFTDSS represented a significant improvement in the software support available to fire and fuels managers (Bennett and others 2013). In general, IFTDSS is well aligned with the interagency Wildland Fire Information and Technology strategic vision as described by Douglas and Phipps (2012). IFTDSS provides a significantly improved platform for the integration of data and models in fire and fuels when compared to the current situation. Eleven workshops, eight in person and three virtual, on-line sessions, were held across the United States. Ninety-eight workshop attendees completed the same post-workshop survey, which was a response rate of 98%. Given the notional size of the fuels management community of approximately 1,000, the survey responses represent approximately 10% of the target community. The users were overwhelmingly positive about IFTDSS (Bennett and others 2013).

WHAT FUNCTIONALITY DOES IFTDSS MAKE AVAILABLE?

Five workflows have been identified and implemented in IFTDSS Version 2.0. Each workflow provides a logical, step-by-step process of using the various tools needed

to perform the tasks of that workflow. IFTDSS field-user designed workflows are a set of business-oriented modeling pathways intended to capture the problem-solving needs of the fuels treatment analysis and planning community. They provide access to scientific models in a stepwise, intuitive pattern, reducing the emphasis of individual models. These workflows were developed based on direct user input from JFSP-sponsored fuels treatment working group and other test user groups.

The Data Acquisition and Editing Workflow is used to identify the appropriate vegetation, geophysical, and weather data for IFTDSS that will be needed for a project. The Hazard Analysis Workflow is used to identify potentially hazardous areas across a landscape. The Risk Assessment Workflow provides a first-approximation probabilistic risk assessment for fuels treatment planning. The Fuels Treatment Workflow (a) simulates fuels treatment placement in areas of high fire hazard within an area of interest, and (b) simulates post-treatment influences on fire behavior and fire effects potentials. The Prescribed Burn Planning Workflow provides the information needed to plan and document a proposed prescribed fire.

REFERENCES

- Bennett, C.M.; Brown, N.; Doney, D. [and others]. 2013. Final Report of the Interagency Fuels Treatment Decision Support System (IFTDSS) Evaluation Study. Special Report CMU/SEI-2013-SR-017. [Place of publication unknown]: Software Engineering Institute, Carnegie Mellon University. 142 p. Available at: http://www.frames.gov/documents/iftdss/IFTDSS_SEI_FINAL_07-01-2013.pdf.
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