Joint Fire Science Program and National Interagency Fuels Working Group

Summary of Fire and Fuels Specialists Software Tools Survey

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As part of a comprehensive study of the issues related to software systems in the fire and fuels subject area, it was desirable to understand what software tools were actually in use nationwide for fuels treatment analysis and planning. The survey asked each respondent the following questions:

> What software program(s) are you using to perform fuels treatment planning work? Feel free to elaborate on how you are using these tools and if they are helpful.
>
> If you are not using any software to plan fuels treatments please still answer the question by responding "none" and feel free to elaborate.

It is estimated that the various federal agencies employ approximately 700 – 800 fuels treatment specialists. The 44 responses to this survey translates approximately into a 5% sample of the population of fuels treatment specialists. The sample was random in the sense that everyone had the same opportunity to respond. It was biased in the sense that the respondents were self selected and thus constitute a particular subset of the entire population with unknown characteristics. However, the point of the survey was not to produce a statistically valid result but rather to obtain an impression of what software tools fuels specialists used most frequently and conversely, which ones they did not use. Many respondents choose to provide additional comments concerning the issues and situations which provide the context in which they use these software tools.

Results

The results of the enumeration of software tools used by the respondents are given in Table 1, below. A couple of interesting points emerge from a study of this table:

- Behave, with all its variants, is one software tool that is almost universally used (89% of respondents) on a routine basis. It is by far the single most widely used software tool.
- Eight other software tools (programs and published data sets) make up the second round in terms of use, from 20% - 50% of respondents: FOFEM, FIREFAMILY+, all versions of ArcGis, FARSITE, FLAMMAP, LANDFIRE DATA, FMA+, and FVS/FFE.
- Finally, another eight software tools make up the third group of software that is used less widely but still used by at least 10% to 19% of the respondents: FFI/Firemon, RERAP, NEXUS, GOOGLE EARTH, WIMS DATA, CONSUME, FRCC, SIS.

- It is clear that very few of the respondents use any of the four available comprehensive fuels treatment analysis and planning systems, ie. ArcFuels, IFP-LANDFIRE, INFORMS, SFRAS. It was often difficult to differentiate between those respondents who said they used LANDFIRE DATA versus those that used the suite of LANDFIRE Interagency Fuels Planning tools. Only two of the respondents specifically mentioned the IFP-LANDFIRE tools. Given this fuzziness, it reasonable to conclude that of the four comprehensive systems, the IFP-LANDFIRE fuels treatment process has the most field use in 2008. SFRAS is a special case because it is system funded and sponsored by the Southern Group of State Foresters and aimed and marketed to state fuels specialists. For some inexplicable reason, state fuels specialists were left out of the target audience of this survey. However, a significant number of the respondents were fuels specialists in federal agencies stationed in the southern United States and none of them reported using SFRAS. Information obtained from the SFRAS development team indicates that it is being used primarily by state fuels specialists in Florida and Texas. INFORMS had one respondent using it and ArcFuels had none. ArcFuels was mentioned several times in the free form comments as being a tool that people want to learn how to use at some point in the future.

- Most fuels treatment specialists create their own, what may be call ad-hoc processes, chaining together available fuels planning tools to satisfy their project needs. They are thus custom designing a flow control process that converts their locally available data of various kinds into the type of output they need to support their work. This means that they prepare their own data for initial input to a software tool and then reformat that data, if necessary, for input to the next program in the process chain until they get the results that they are looking for. This is a very labor intensive, expertise intensive, and time intensive process. It is not yet clear whether the creation of these custom flow controls are the result of preferences to have the freedom to do this, or that the comprehensive systems present obstacles of one type or another and thus are not used.

An examination of the free form responses is also extremely revealing in describing the context of the working world in which federal fuels treatment specialists must function. These free form responses are summarized below:

- The proliferation of fuels and vegetation models available: each requires time to learn and maintain familiarity with. New software and updates of old software is happening faster than anyone in the field can possibly keep up with. Even sorting through the choices available to figure out the data input requirements and outputs available is a daunting task in the face of all the other operational demands that necessarily are given higher priority. There are certainly many fuels specialists that can use a variety of available software tools to produce great fuels treatment analyses and plans. These are a distinct minority. Most field fuels specialists don't have the time, training, or familiarity with these software tools to make them an efficient use of their time. The typical response is to simply stick to a few easy to use programs and essentially ignore the rest.

- Developing information and guidance on the correct resolution requirements and capability is an urgent need. Field fuels specialists need clear and easy ways to understand which software tools and which data sets are applicable to which scale: project level, mid-level, and high-level. There currently exists a very confused situation in which even the scale level definitions are not uniform and mean different things to different people.

- FFI needs to link to FSVeg seamlessly because it is the database of record for the Forest Service much like FFI is the database of record for the Interior Department agencies. Having to enter data twice is unrealistic. There are a lot of great features in FFI that could support Forest Service monitoring activities as well as USDI activities.

- Several respondents complain that ArcGis is updated frequently and each update requires you first to remove not only the old version, but also much of the associated software, before you can install the new version. This process takes on the order of hours up to a full day to perform and is hugely irritating to fuels specialists. The inability to upload software tools on their desktop due to security and administrative restrictions is also a major hurdle to using some potentially useful software tools.

- Fuels treatment analysis and planning tools for rangeland conditions are no where near as well developed as tools that apply to forest land conditions. This situation needs to be remedied urgently.

The questions asked of fuels treatment specialists in this survey focused on what was being used today and what the issues and problems are today. A second survey is currently being planned to ask: what functionality would you want to have if you were not software limited?

Finally, it came to our attention in late January 2009, that Vita Wright, Research Scientist with the USDA Forest Service in Missoula, MT, was finishing up a similar user survey asking what software tools fire and fuels specialists actually used to perform their job. Preliminary data analysis shows a strikingly similar results profile as the one we found in our survey. For more information, please contact Vita Wright directly at vwrite@fs.fed.us .

Table 1 : Final compiliation of the software tools and data sets reported most frequently used by 44 fuels specialists from the Fish and Wildlife Service, Bureau of Indian Affairs, National Park Service, Bureau of Land Management, and Forest Service.

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Software System	Times Mentioned in the Survey Number
Sample Size =	44
Behave (all variants)	39
FOFEM	19
FIREFAMILY+	16
ArcMap ArcGis	16
FARSITE	15
FLAMMAP	13
LANDFIRE DATA	10
FMA +	10
FVS-FFE	10
FFI/Firemon	7
RERAP	6
Nexus	6
Google Earth	6
WIMS DATA	5
CONSUME	5
FRCC	5
SIS	4
SASEM	2
PROBACRE	2
Vsmoke GIS	2
LANDFIRE TOOLS	2
BLUESKY	1
INFORMS	1
FCCS	1
FSPRO	1
KCFAST	1
Map Tech Terrain Navigator Pro	1
Microsoft Digital Image Suite	1
NFPORS	1
Parcel Quest	1
Rainbow Series	1
RAMS	1
Simple Graphical Smoke Screening System	1

Compare 4 Fuel Model Spreadsheet	1
Starfire	1
NFDS Calculator	1
NRIS Reporting System	1
FACTS Reporting System	1
SVS	1
VDDT	1
MTT/TOM	1
Wind Ninja/Wind Wizard	1
Topo 4.0	1