



FHTET
Forest Health Technology Enterprise Team

FVS-EVENT MONITOR ARCVIEW PROJECT

PROVIDING TECHNOLOGY FOR FOREST HEALTH PROTECTION

FVS-EMAP is a simple tool for moving simulation results from the USDA Forest Service's Forest Vegetation Simulator (FVS) into the ArcView® Geographic Information System. FVS projections of a group of stands can provide many output variables projected into several points in the future. There has been no convenient way to perform this function up until now. Using FVS-EMAP, maps can be created using stand output variables for future time periods, and for one or more simulation scenarios.

Input to FVS-EMAP is generated by the FVS Event Monitor (EM) using COMPUTE keywords. All variables calculated via the COMPUTE keyword can be mapped using this process. A *shapefile* representing the stand boundaries is required as a "template" onto which FVS-EMAP will map EM output variables.

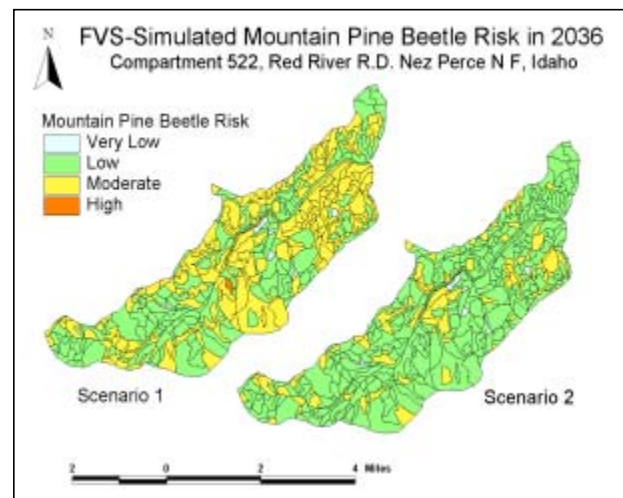
What can be mapped with FVS-EMAP?

- **Pre-defined EM variables**

Many variables, representing a wide variety of site, tree, and stand attributes, are available within the EM (BA, TPA, QMD, etc.). FVS users have access to all of these pre-defined EM variables and can write them to an output file. We provide users an EM file that produces basic stand summary information so that it can be mapped.

- **User-defined variables**

Users may create new variables based upon mathematical manipulation of user-defined or pre-defined EM variables. Using this approach, stand conditions such as wildlife habitat indices and pest hazard ratings can be calculated.



Example ArcView image depicting FVS-projected hazard ratings from two different simulation scenarios. Hazard values were calculated via the Event Monitor's COMPUTE keyword, and loaded into ArcView via FVS-EMAP. Input data based on both inventoried and estimated stand conditions.

FHTET has produced EM *addfiles* that calculate insect hazard ratings. Output from these *addfiles* may be used as input into FVS-EMAP:

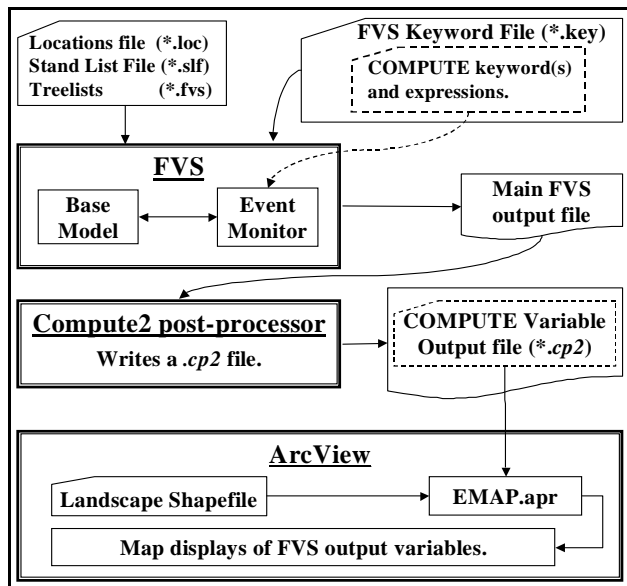
- **Mountain Pine Beetle in Lodgepole Pine Hazard Rating System (I)**
Based on *Amman et al. 1977*
- **Mountain Pine Beetle in Lodgepole Pine Hazard Rating System (II)**
Based on *Randall and Tensmeyer 2000*
- **Spruce Beetle Hazard Rating System**
Based on *Schmid and Frye 1976*

FHTET has also produced a stand summary statistics *addfile* reporting basic FVS and Fire and Fuels Extension (FFE) output variables. All of these *addfiles* and their documentation are available from the FHTET website (see reverse).

Using FVS-EMAP requires...

- Standard **FVS** software and input data
- An appropriate FVS keyword file containing the **COMPUTE** keyword and expressions defining variables of interest
- The '**Compute2**' post-processor (available with FVS software)
- An ArcView® **shapefile** representing the simulated stands, providing the information needed to map stand boundaries
- **ArcView**® GIS software, ver. 3.2 (available on Forest Service IBM computers)

The custom ArcView® project **EMAP.apr** (available from FHTET, see source below)



This diagram shows the process to create maps from FVS output with the custom ArcView® project EMAP.apr.

Online Sources for Software and Documentation

FVS-EMAP software (*EMAP.apr*), documentation, and FHTET EM addfiles can be downloaded from:

<http://www.fs.fed.us/foresthealth/technology/products.shtml>

Additional **FVS software** and **documentation** can be downloaded from the Forest Management Service Center

FVS Web site:

<http://www.fs.fed.us/fmsc/fvs/index.php>

Using FVS-EMAP is a 3-step process

1. Include the EM keyword COMPUTE, mathematical expressions that define your desired variables, and an END keyword into an FVS simulation. This generates the output to be mapped.
2. Invoke the FVS Compute2 post-processor after executing the FVS run. This will convert the FVS output into a .cp2 file usable by FVS-EMAP.
3. Launch our custom ArcView® project, **EMAP.apr**. Program prompts will guide the user through the map-creation process.

An additional FVS-EMAP feature automates the preparation of the stand boundary file inputs for the FVS Parallel Processor and the Westwide Pine Beetle Model FVS Extension. See the FVS-EMAP documentation for details.

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