

# ASSESSING VALUES AT RISK IN THE UNITED STATES FROM WILDLAND FIRE

## FINAL REPORT

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# VAR-DSS

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## ABSTRACT

This project was proposed to consist of three phases. Phases I and II were to develop and build a working prototype of a value at risk (VAR) decision support system (DSS), known as VAR-DSS. These two phases were completed as of April 1, 2002. The completed project was presented by Doug Rideout at the San Antonio JFS conference. Phase III was to construct a final DSS model, based upon the prototype that would operate on an extensive database of valuation information from a nation wide survey as well as an extensive and systematic literature database. Upon completion of the three phases, available literature on fire effects as they relate to VARs, would be catalogued into a relational database that could be easily accessed from various user perspectives. Fire managers and planners would have ready access to a synthesis of scientific findings combined with results of a national survey of the general public, agency customers and fires managers. Upon query of the system, the DSS would provide the user with information of VAR effects by eco-region, customer, VAR type and management practice. The professionally programmed user interface will provide virtually seamless access to fire effects on VAR. It is crucial to recognize that the VAR-DSS is a "web-enabled" computer program to organize and display synthesized information based on analysis of the literature and survey results. It is not a library-related catalogue. It is not just a web-page; it is a web-enabled program. It therefore requires some training. The strength of the prototype is in the web-enabled program that has resided on the internet at <http://www.vardss.info/> since mid April. Because the project (phases I and II) is complete, we can no longer promise that the site will continue. Further, it is infeasible to replicate the program in this report. Nevertheless, this report is intended to show key features of the program.

## SUMMARY UPDATE

Phases I and II were funded to build a prototype VAR-DSS. The prototype has been completed beyond the original project specifications.

A database of literature results and focus group responses was constructed with the purpose of providing a working data base to demonstrate the prototype. Originally we had contacted several software vendors to facilitate the programming of the prototype. We decided to do our own programming through Jenna Stone. This was a crucial decision and facilitated the success of the prototype. This is a new type of software that is not common to the fire profession and required special considerations.

In sum, we have completed the project (phases I and II only) beyond original specification as a web-enabled dynamic data program was constructed. The program is user friendly and able to provide easy and remote access to data on values at risk by eco-region. Phase III has not been funded and we have received no indication of interest (one way or the other) by the JFS program.

# VAR-DSS

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## INTRODUCTION

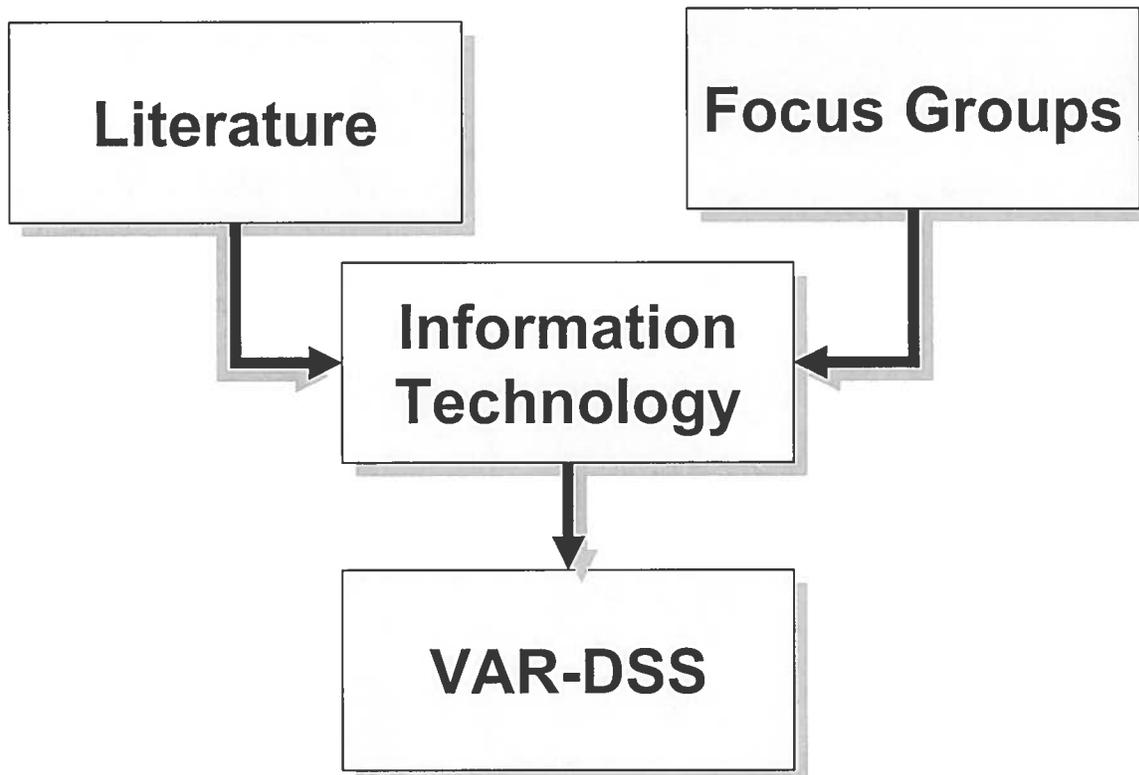
This is the final report for phases I and II of the Values at Risk (VAR) Decision Support (DSS) project, known as VAR-DSS. Phases I and II consist of constructing a fully functional prototype VAR-DSS that could be made whole through completion of phase III. Phase III is to support the DSS with a full literature and survey information. The purpose of the VAR-DSS is to provide a decision support system for fire managers and planners. Fire managers and planners would have ready access to a synthesis and analysis of scientific findings combined with results of a national survey of the general public, agency customers and fire managers. Upon query of the system, the DSS would provide the user with information on VAR effects by eco-region, customer classification, VAR type, and management practice. A professionally programmed user interface will provide virtually seamless access to fire effects on VAR. This is the final report on the completion of the fully functional prototype computer model. The computer model represents two new and important trends in software design.

- First, it is web-enabled; meaning that the program resides on the World Wide Web and can be readily access from virtually any site.
- Second, while supported by a traditional database, the data is accessed through an innovative interface that allows an intuitive approach to the data analysis.

Our prototype VAR-DSS provides a simple summary of analytic results from the database. This will be demonstrated in following sections of this report.

## CONSTRUCTION OF THE PROTOTYPE VAR-DSS

Construction of the prototype is reflected in the figure immediately below:



While the final product would include a full sampling of the literature on VAR to be included in the model and results of a national survey, the prototype includes small databases on each to demonstrate the process of the working model. This provided a means of testing the viability of the VAR-DSS concept without incurring the expense of full data acquisition and analysis. Therefore, the prototype contains a fully functioning web-based VAR-DSS computer program accessing a limited data set. The web-based program can no longer be support as the project has ended and the Joint Fire Science program has indicated no interest, one way or the other, in the product.

Next are descriptions of the literature data base, the focus groups (that would be used for constructing a national survey) results used in the prototype.

### LITERATURE BASE

Data were collected through a variety of outlets:

1. Several graduate students, at Colorado State University collected fire articles used for other fire projects.
2. Several large data studies were found through the USFS, Rocky Mountain Research Station.

3. Several articles were located through the Internet using Yahoo and Infoseek searches.
4. A few articles were located through forestry professors' private collections at Colorado State University.
5. Most of the remaining articles were located through the Colorado State University library and through using the libraries' Cambridge Scientific Abstracts program to search through several databases including:
  - a. Agricola
  - b. Agricultural and Environmental Biotechnology Abstracts
  - c. Aquatic Sciences and Fisheries Abstracts
  - d. Biological Sciences
  - e. Conference Papers Index
  - f. Ecology Abstracts
  - g. Environmental Sciences and Pollution Management
  - h. Health and Safety Sciences
  - i. Oceanic Abstracts
  - j. Plant Science
  - k. Sociological Abstracts
  - l. Water Resources Abstracts

# VAR-DSS

These data were compiled and analyzed as to their affect on VARs and programmed into the Literature Analysis web page as per the following screen print.

The screenshot shows a Microsoft Internet Explorer browser window displaying the VAR-DSS Literature Analysis web page. The browser's address bar shows the URL <http://www.varss.info/literature.asp>. The page title is "VAR-DSS".

The main content area is titled "Literature Analysis" and includes a "Design the Table Layout" section with several dropdown menus for filtering results:

- Values At Risk
- Fire Intensity
- Ecoregion
- Fire Type
- Literature Source
- Publication (by Author/Yr)

Below the filters, the page displays the message: "No records exist matching the selected criteria." and "Filtered by: 17th Tall Timbers Fire Ecol. Conf., 17th Tall Timbers Fire Ecol. Conf." A note at the bottom of the results section states: "\*Impact is scaled [ +1 Positive, 0 Neutral, -1 Negative ]".

The browser's taskbar at the bottom shows several open applications, including "VAR\_DSS\_Final Repo...", "VARSS Literature A...", "C:\Documents and Se...", and "Microsoft Power Point...". The system clock indicates the time is 4:11 PM.

# VAR-DSS

Literature sources available in the prototype are as per the following two screen prints:

VAR-DSS Literature Analysis - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://www.varsss.info/literature.asp

## VAR-DSS

Reset Search Download Help

Search

- Literature
- Surveys
- About VAR-DSS

### Literature Analysis

Design the Table Layout:

Values At Risk Fire Intensity Ecoregion

Fire Type Literature Source Publication (by Author/Yr)

No records exist matching

Filtered by: 17th Tall Timbers

\*Impact is scaled [+1 Posi

Filter by

- 17th Tall Timbers Fire Ecol. Conf.
- American Journal of Botany
- American Midland Naturalist
- Annales de Limnologie
- Archiv für Hydrobiologie
- Biogeochemistry
- Biological Conservation
- Canadian Entomologist
- Canadian J. Fisheries and Aquatic Sci.
- Canadian Journal of Earth Sciences
- Canadian Journal of Forest Research
- Canadian Journal of Zoology
- Conservation Biology
- Ecological Modelling
- Ecological Restoration
- Environmental Entomology
- Environmental Management
- Forest Ecology and Management
- Forest Products Journal
- Forest Science
- Freshwater Biology
- Geophysical Research Letters
- Great Basin Naturalist
- International Journal of Wildland Fire
- Journal of Ecology

17th Tall Timbers Fire Ecol. Conf.

Discussions \* Subscribe... Discussions not available on http://www.varsss.info/

Internet

VAR\_DSS\_Final Repo... C:\Documents and Se... Microsoft PowerPoint ... 4:13 PM

and

# VAR-DSS

VAR-DSS Literature Analysis - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites Media

Address http://www.var-dss.info/literature.asp

## VAR-DSS

Reset | Search | Download | Help

Search

- Literature
- Surveys
- About VAR-DSS

### Literature Analysis

Design the Table Layout

Values At Risk Fire Intensity Ecoregion

Fire Type Literature Source Publication (by Author/Yr)

No records exist matching

Filtered by: 17th Tall Timber

\*Impact is scaled [+1 Post]

- Environmental Management
- Forest Ecology and Management
- Forest Products Journal
- Forest Science
- Freshwater Biology
- Geophysical Research Letters
- Great Basin Naturalist
- International Journal of Wildland Fire
- Journal of Ecology
- Journal of Forestry
- Journal of Range Management
- Journal of Sedimentary Research
- Journal of Sustainable Forestry
- Journal of the Alabama Academy of Science
- Journal of Vegetation Science
- Journal of Wildlife Management
- Michigan Botanist
- Natural Areas Journal
- Northern Journal of Applied Forestry
- Northwest Science
- Plant and Soil Science
- Science of the Total Environment
- Soil Science Society of America Journal
- Southern Journal of Applied Forestry
- Southwestern Naturalist
- The Forestry Chronicle
- USDA Forest Service Gen. Tech. Rep.
- USDA Forest Service Research Note
- Wildlife Society Bulletin

Discussions Discussions not available on http://www.var-dss.info/

Internet

4:14 PM

# VAR-DSS

Literature data could also be sorted by author and year as per the following example:

The screenshot shows a Microsoft Internet Explorer browser window displaying the VAR-DSS Literature Analysis application. The browser's address bar shows the URL <http://www.var-dss.info/literature.asp>. The application title is "VAR-DSS Literature Analysis".

The interface includes a search sidebar on the left with links for "Literature", "SURVEYS", and "About VAR-DSS". The main content area is titled "Literature Analysis" and features a "Design the Table Layout" section with several dropdown menus: "Values At Risk", "Fire Intensity", "Ecoregion", "Fire Type", "Literature Source", and "Publication (by Author/Yr)".

Below the filters, a message states: "No records exist matching the selected criteria." Below this, it says "Filtered by 17th Tall Timbers Fire Ecol. Conf., 17th Tall Timbers Fire 1989" and "\*Impact is scaled [ +1 Positive, 0 Neutral, -1 Negative ]".

A dropdown menu for "Publication (by Author/Yr)" is open, showing a list of authors and years: Amaranthus et al 1988, Amaranthus et al 1993, Anderson et al 1982, Anderson et al 1987, Anderson et al 1989, Apfelbaum et al 1984, Aquilani et al 2000, Bachelet et al 2000, Bailey et al 1978, Baker 1988, Barnett 1999, Bartos et al 1994, Bayley 1992, Blackwell et al 1991, Bock 1988, Borchert 1989, Borning et al 1990, Boyce et al 1989, Bozek et al 1994, Bradley et al 2001, Bregg 1990, Breis et al 2000, Burn 1998, Cain 1993, and Cain et al 1998.

The browser's status bar at the bottom shows the time as 4:16 PM and the system tray includes icons for Internet, a taskbar with several open applications, and a system clock.

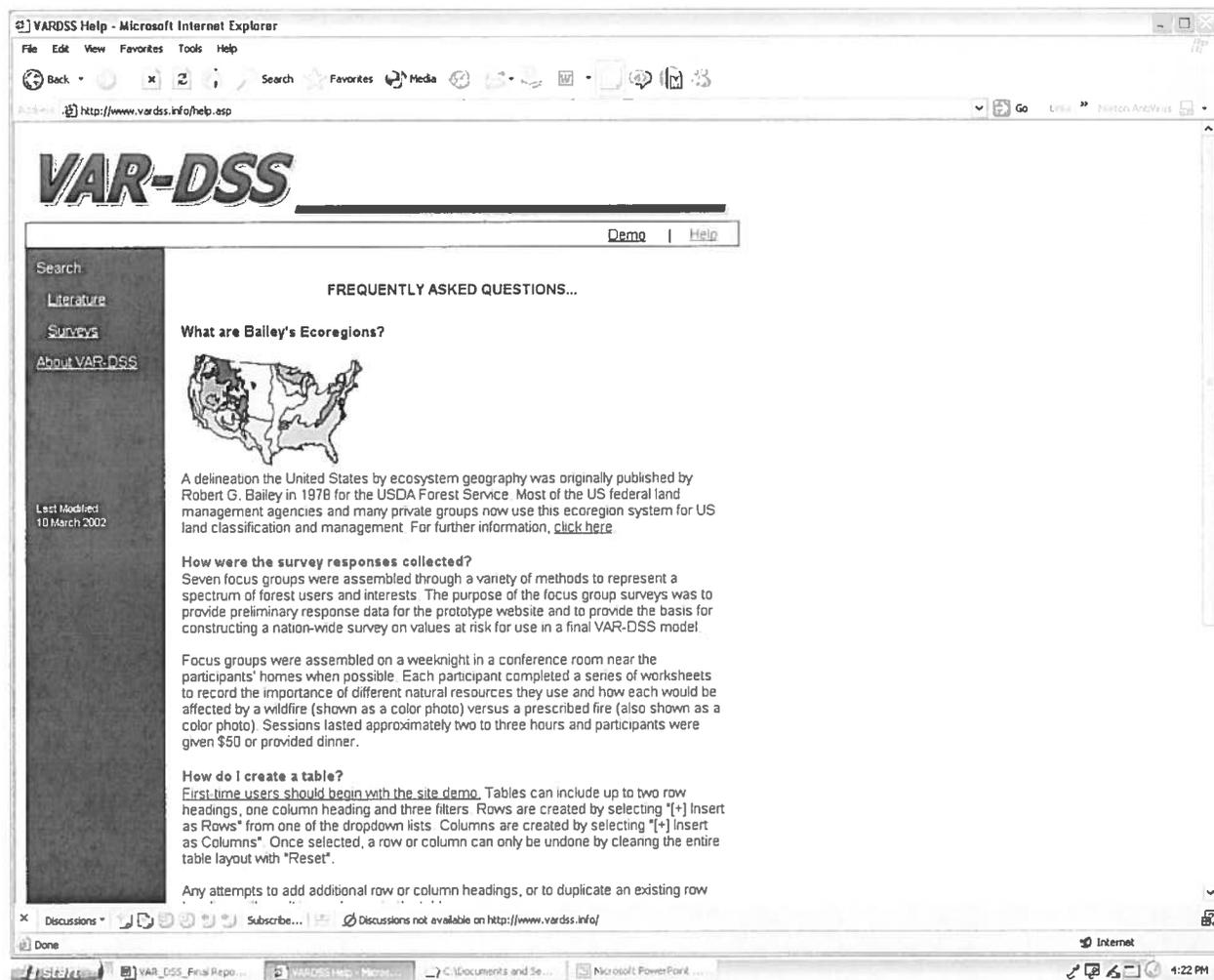
# VAR-DSS

Literature is also sorted and analyzed by VAR as per the classifications in the VAR-DSS table:

The screenshot displays the VAR-DSS Literature Analysis interface. The browser window title is "VAR-DSS Literature Analysis - Microsoft Internet Explorer". The address bar shows the URL "http://www.var-dss.info/literature.asp". The page features a search bar and a "Design the Table Layout" section with several dropdown menus: "Values At Risk", "Fire Intensity", "Ecoregion", "Literature Source", and "Publication (by Author/Yr)". The "Values At Risk" dropdown is open, showing a list of categories including "Air Quality", "Community Impacts", "Endangered Species", "Forests", "Grazing", "Health/Safety", "Historic/Cultural", "Property", "Recreation", "Scenery", "Soil", "Timber/Lumber", "Vegetation", "Water Quality", "Wilderness", and "Wildlife". The page also includes a "Search" section with "Literature" and "Surveys" options, and a "Filter by" section. The footer contains a "Discussions" link and a note: "Discussions not available on http://www.var-dss.info/".

# VAR-DSS

The literature data were also managed by Bailey's Ecoregion as explained on the web page. This page from the help section provided an interactive link to <http://www.fs.fed.us/earthcare/ecolink.htm> where the user could find much additional information on ecoregion definition.



# VAR-DSS

Literature data were also available for analysis by fire type: prescribed and burned as per the following screen:

VAR-DSS Literature Analysis - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites Media

Address http://www.var-dss.info/literature.asp

## VAR-DSS

Reset | Logout | Download | Help

Search

LITERATURE

SURVEYS

About VAR-DSS

### Literature Analysis

Design the Table Layout:

Values At Risk Fire Intensity Ecoregion

Fire Type Literature Source Publication (by Author/Yr)

Fire Type

- (+) insert as Rows
- (+) insert as Columns

Filter by

Prescribed

Wildfire

to create your rows and columns  
s' to create the table rows  
mns' to create the table columns  
ed to narrow your search to a subset of the data.

Prescribed  
Wildfire  
(Positive, 0 Neutral, -1 Negative)

Last Modified:  
10 March 2002

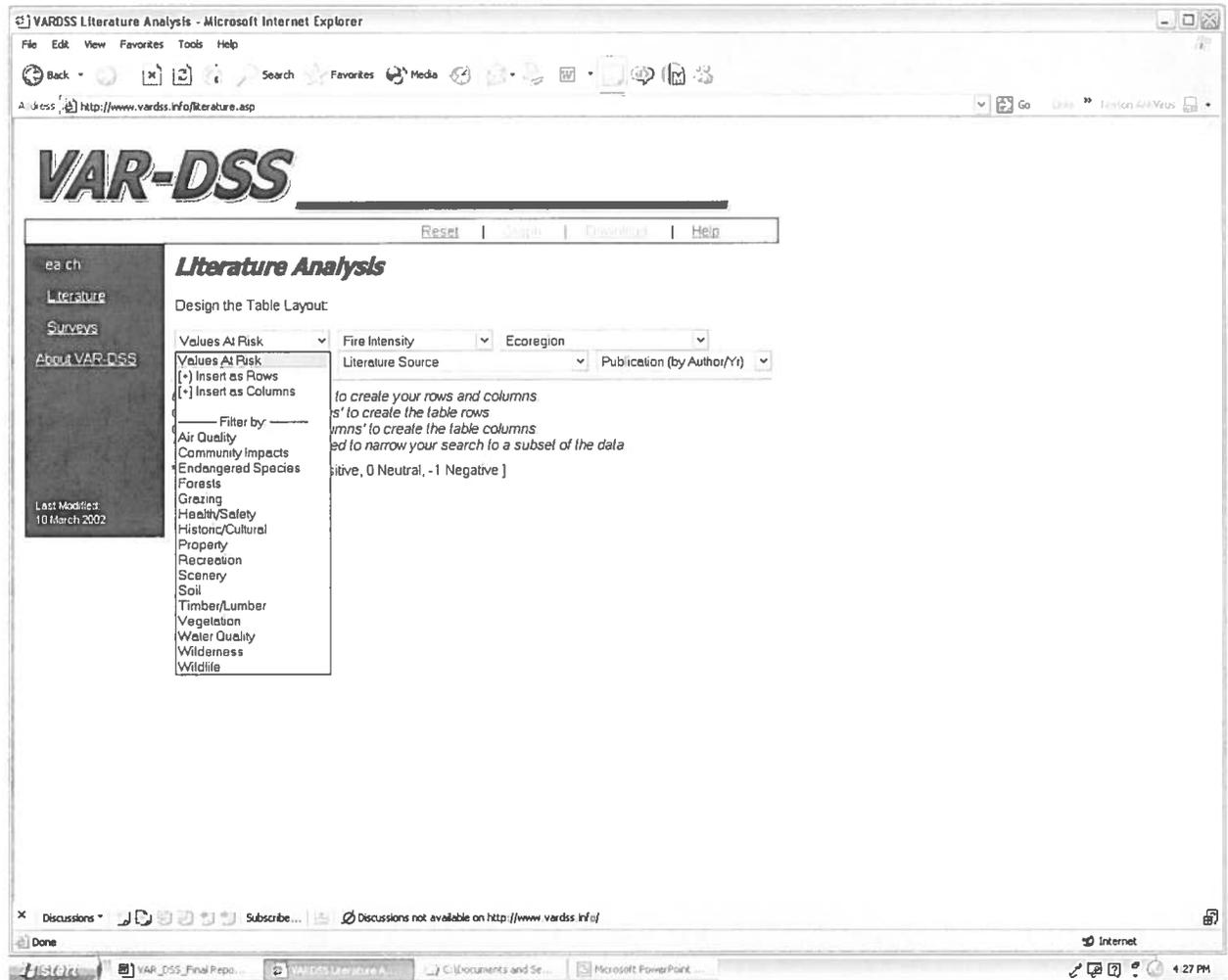
Discussions Discussions not available on http://www.var-dss.info/

Done Internet

VAR-DSS Final Repo... VAR-DSS Literature A... C:\Documents and Se... Microsoft PowerPoint...

4:26 PM

Literature were also available for analysis by VAR as per the following print screen:



and by a similar menu structure by high and low fire intensity (not shown to save space).



## FOCUS GROUP DATABASE

We conducted seven focus groups in various locations in the country representing a variety of interest groups. These were:

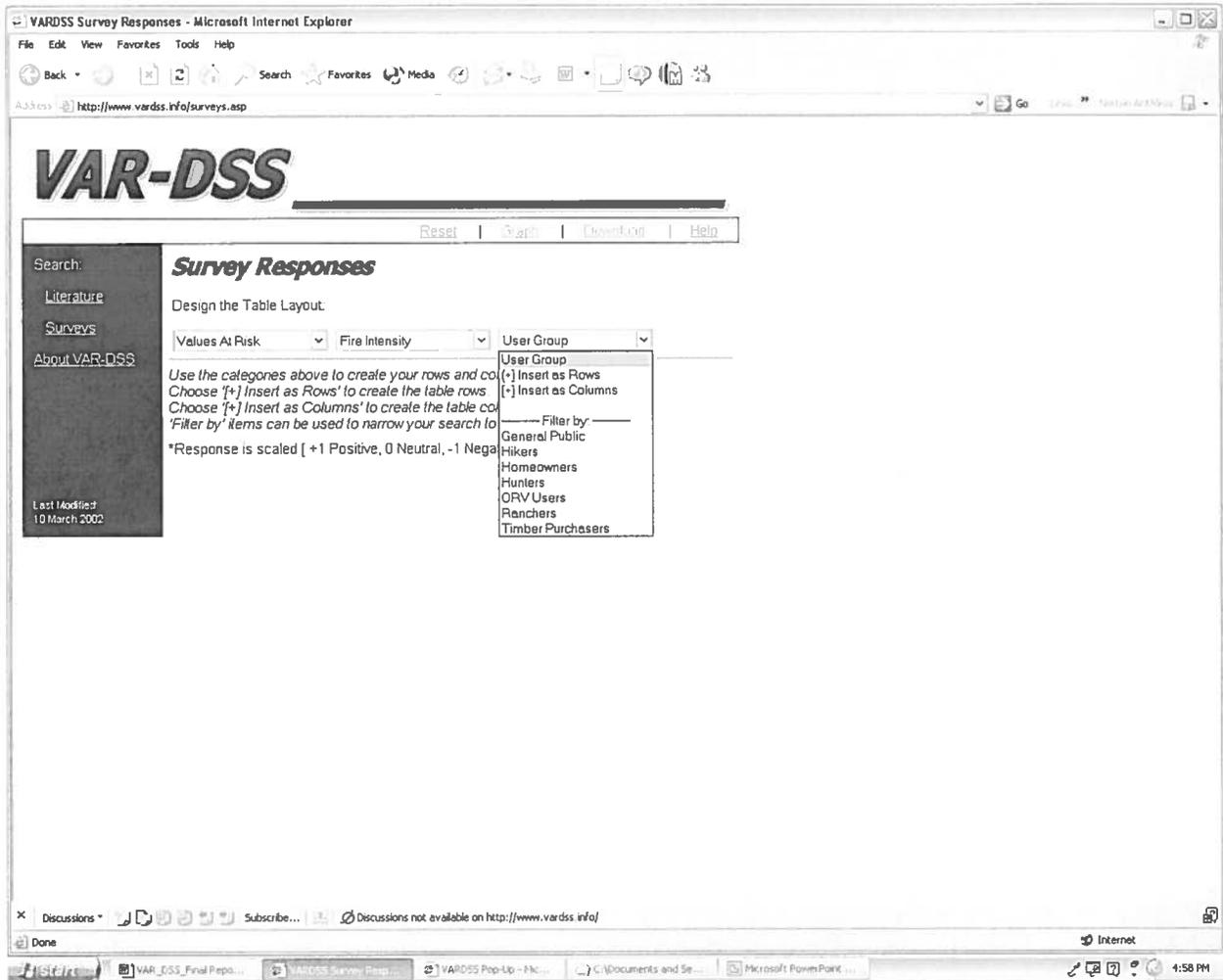
- Colorado Mountain Club –Fort Collins, Co (9 participants)
- General Public—Denver, Colorado (11 participants)
- Elk hunters – Loveland, Colorado (11 participants)
- Homeowners – Lake Tahoe (11 participants)
- Timber purchasers represented by the federal timber purchasers association – Charleston South Carolina (8 participants)
- Cattleman Association – Grass Valley, California (7 participants)
- Colorado Off Highway Vehicle Association – Longmont, Colorado (7 participants)

These groups were held on a weeknight in a conference room near the participants' homes except for the timber purchasers, who were attending a national meeting. Most of the groups were given \$50 upon entering the conference room. The sessions were not video or audio taped. Each participant filled out a series of worksheets to record the importance of different natural resources they used how those would be affected by a wildfire (shown as a color photo) and a prescribed fire (also shown as a photo). The information from the worksheets was typed up after the focus group. This information was then summarized into the excel spreadsheets. In addition, discussion about the wildfire and prescribed fire were recorded on flip charts. The information on the worksheets and flip charts was used to make revisions to the worksheets for subsequent focus groups.

Various approaches were used with the focus groups. The homeowners in Lake Tahoe were contacted randomly through numbers in the phone book. Elk hunters' numbers were attained from Colorado Hunting and Fishing License information. The general public was contacted through a firm in Denver, Colorado. Numbers for all other groups were attained through their participating organizations.

# VAR-DSS

Focus groups as made available in the prototype software are shown in the screen below.



# VAR-DSS

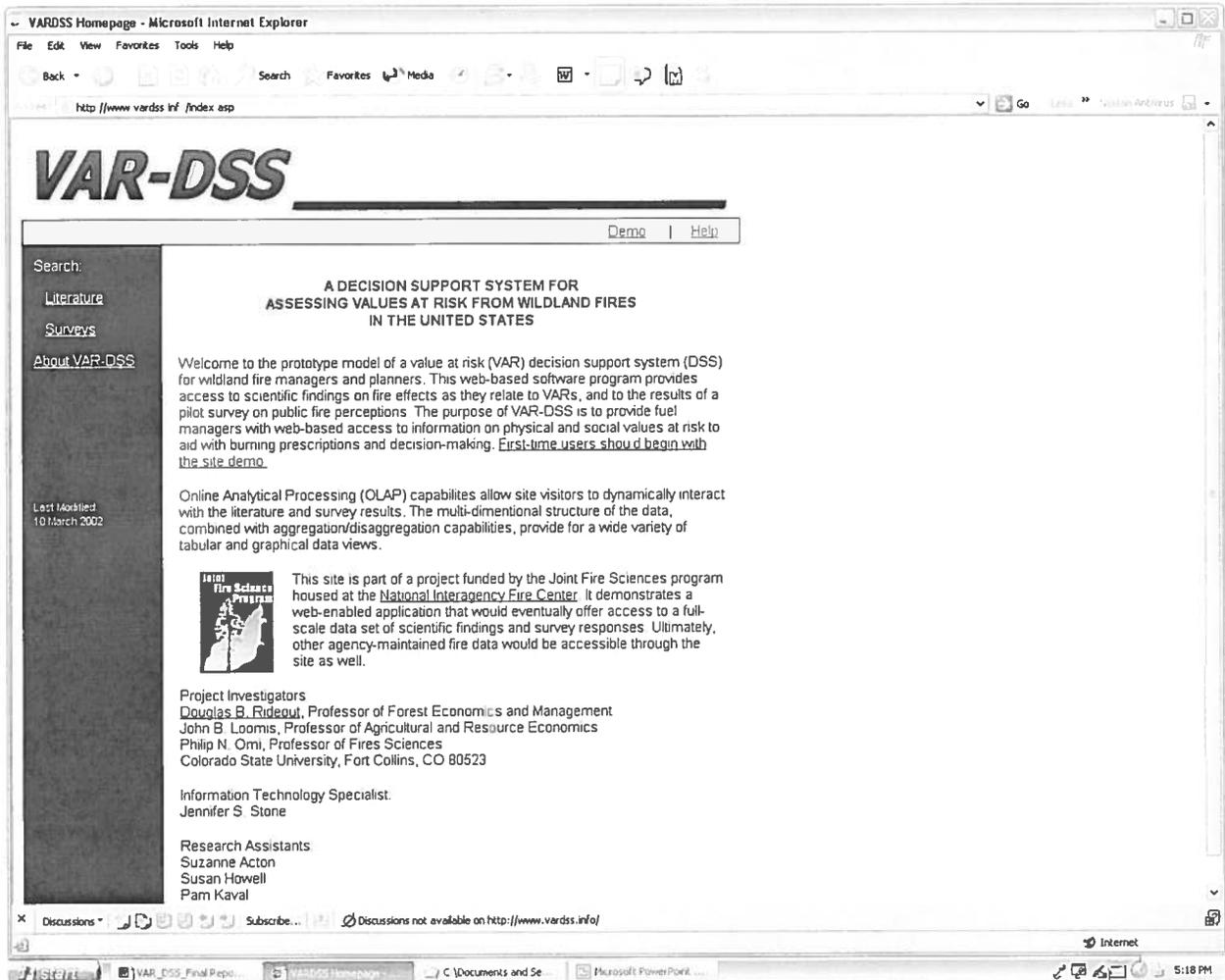
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## **Prototype VAR-DSS**

The fully functioning web-enabled prototype computer program is best explained by example. Here we will walk through the two demonstration examples accessed through the help menu provided with the program. The program is operated by four screens and each screen was designed to be compact and easily accessed. These consisted of the Opening Screen, the Literature Analysis screen, the Survey Response screen and the Help screen. The Opening Screen is shown below and the others are shown by through documentation of the tutorial. Each screen has been previously been displayed in this report.

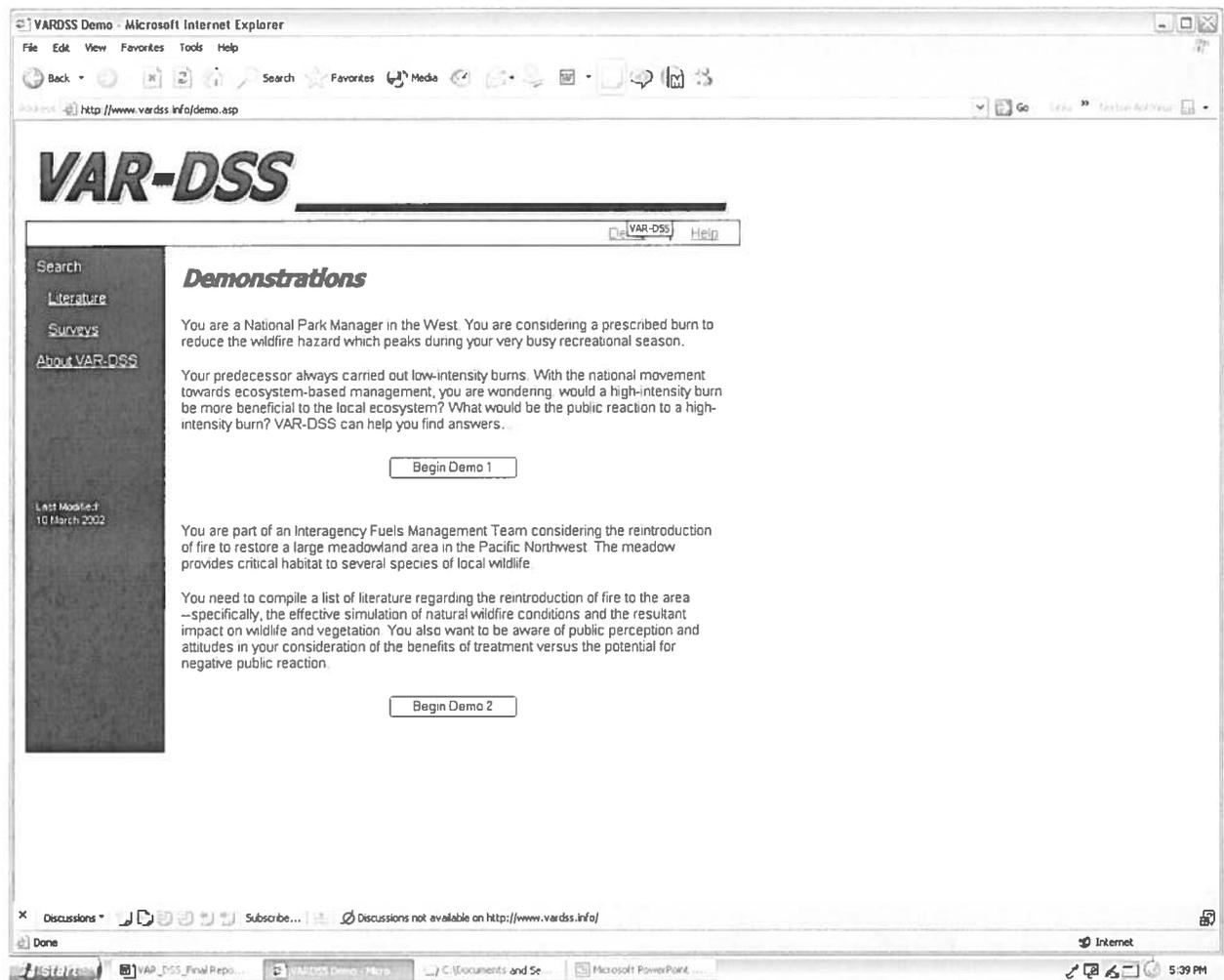
# VAR-DSS

The opening screen explains the program, provides access to the other screens, references the JFS program and shows the investigators and key project assistants. Additional assistants were also used.



Users were guided to the site demo. This was a key point in the opening screen because we found that most users of web sites expected to be able to just point and click through the program as if it were a series of pages to read. Instead, VAR-DSS is a complex computer program that required education of the user. The straight forward demonstrations provided a means of getting the user through the "learning curve." The following screen shows the opening menu for the two demonstrations. The short introduction to each provides a contextual example of the kind of question that could make use of the VAR-DSS.

# VAR-DSS



The following will demonstrate the program by using the two demonstration examples provided in the VAR-DSS prototype.

## **DEMO #1**

The first demonstration makes use of the literature analysis.

"You are a National Park Manager in the West. You are considering a prescribed burn to reduce the wildfire hazard which peaks during your very busy recreational season.

Your predecessor always carried out low-intensity burns. With increased emphasis on ecosystem-based management, you are wondering: would a high-intensity burn be more beneficial to the local ecosystem? What would be the public reaction to a high-intensity burn? VAR-DSS can help you find answers..."

Let's look at how fire intensity has been shown to impact the various values at risk.

# VAR-DSS

1. Choose "[+] Insert as Rows" from the Values at Risk dropdown to make row headings.
2. Choose "[+] Insert As Columns" from the Fire Intensity dropdown to make column headings.
- \*\*At any time, you can start over by pressing "Reset" on the top menu bar.
3. Choose "Average Impact" from the dropdown that appears inside the table.

The results of these three steps are shown in the following screen:

The screenshot shows the VAR-DSS web application interface. The main content area displays a table titled "Literature Analysis" with the following data:

Values at Risk	HIGH	LOW	TOTAL
Average Impact			
AIR QUALITY	-1.0	-1.0	-1.0
COMMUNITY IMPACTS	-0.5	--	-0.5
FORESTS	0.1	0.4	0.3
GRAZING	--	1.0	1.0
HEALTH/SAFETY	-1.0	--	-1.0
HISTORIC/CULTURAL	-1.0	-1.0	-1.0
PROPERTY	-1.0	1.0	0.0
RECREATION	-1.0	-1.0	-1.0
SCENERY	-1.0	0.3	0.0
SOIL	-0.6	0.2	-0.2
TIMBER/LUMBER	0.1	0.4	0.3
VEGETATION	0.4	0.4	0.4
WATER QUALITY	-0.6	-0.4	-0.5
WILDERNESS	-1.0	--	-1.0
WILDLIFE	0.4	0.3	0.4
TOTAL	-0.1	0.3	0.1

A pop-up window titled "VAR-DSS Demo Literature Pop-Up - Microsoft Int..." is overlaid on the table, containing the following text:

**Demo 1 Literature Analysis:**  
Let's look at how fire intensity has been shown to impact the various values at risk

- 1 Choose "[+] Insert as Rows" from the Values at Risk dropdown to make row headings
- 2 Choose "[+] Insert As Columns" from the Fire Intensity dropdown to make column headings
- \*\*At any time, you can start over by pressing "Reset" on the top menubar
- 3 Choose "Average Impact" from the dropdown that appears inside the table

Below the table, a note states: "\*Impact is scaled [ +1 Positive, 0 Neutral, -1 Negative ]".

We can see that only wildlife had a positive response, on average, to a high intensity fire, while recreation-related values responded more positively to fires of lower intensity. Note that you can get a description of a particular value at risk by pressing its hyperlinked name in the table.

Let's narrow the data set to impacts found in our same western ecoregion.

4. Choose "M330 Temperate Steppe Mt." from the Ecoregion dropdown to look at this subset of the data. The result is shown in the following screen:

**VAR-DSS**

Reset | Graph | Download | Help

Search

- Literature
- Surveys
- About VAR-DSS

Last Modified: 10 March 2002

**Literature Analysis**

Design the Table Layout:

Values At Risk: [Dropdown] Fire Intensity: [Dropdown] Ecoregion: [Dropdown]  
 Fire Type: [Dropdown] Literature Source: [Dropdown] Publication (by Author/Yr): [Dropdown]

Values at Risk	HIGH	LOW	TOTAL
	Average Impact		
FORESTS	--	-1.0	-1.0
GRAZING	--	1.0	1.0
VEGETATION	--	1.0	1.0
WILDLIFE	0.0	--	0.0
TOTAL	0.0	0.3	0.3

Filtered by: 330 Temperate Steppe  
 \*Impact is scaled [+1 Positive, 0 Neutral, -1 Negative]

VAR-DSS Demo Literature Pop Up - Microsoft Internet Explorer

Let's narrow the data set to impacts found in our same western ecoregion

4 Choose "M330 Temperate Steppe Mtn" from the Ecoregion dropdown to look at this subset of the data

The impact on recreation was unrelated to fire intensity for this type of landscape. As for the ecosystem structure, only timber production responded positively, on average, to the higher intensity.

What about people's reactions?

The impact on recreation was unrelated to fire intensity for this type of landscape. As for the ecosystem structure, only timber production responded positively, on average, to the higher intensity...

Note that many of the results in this demonstration summarized data on how the literature was evaluated for its effect on value. In the table above negative, neutral and positive impacts have been averaged. This is one characteristic that distinguishes VAR-DSS from a catalogue.

What about people's reactions?

[Next Page](#)

Following the demo's directions, we produced the following screen on public responses:

# VAR-DSS

VAR-DSS Demo Survey Responses - Microsoft Internet Explorer

Address: http://www.varsss.info/demo1srv.asp

## VAR-DSS

Reset | Graph | Download | Help

Search: **Survey Responses**

Design the Table Layout.

Values At Risk | Fire Intensity | User Group

User Group	HIGH	LOW	TOTAL
Average Response			
GENERAL PUBLIC	-0.3	0.3	0.0
HIKERS	-0.1	0.5	0.2
HOMEOWNERS	-0.4	0.2	-0.1
HUNTERS	-0.1	0.8	0.3
ORV USERS	0.1	0.9	0.5
RANCHERS	0.2	0.8	0.5
TIMBER PURCHASERS	-0.5	0.7	-0.0
TOTAL	-0.2	0.6	0.1

\*Response is scaled [ +1 Positive, 0 Neutral, -1 Negative]

**Demo 1 Survey Responses:**  
Let's look at how people have reacted to the different fire intensities

- 1 Choose "[+] Insert as Rows" from the User Group dropdown to make row headings
- 2 Choose "[+] Insert as Columns" from the Fire Intensity dropdown to make column headings
- 3 Choose "Average Response" from the dropdown that appears inside the table

Perhaps due to positive media coverage and other

Done

8:47 AM

# VAR-DSS

VAR-DSS Demo Survey Responses - Microsoft Internet Explorer

Address: http://www.var-dss.info/demo/srv.asp

## VAR-DSS

Reset | Graph | Download | Help

Search: Literature, Surveys, About VAR-DSS

Last Modified: 10 March 2002

### Survey Responses

Design the Table Layout:

Values At Risk | Fire Intensity | User Group

User Group	HIGH	LOW	TOTAL
	53%	47%	100%
GENERAL PUBLIC	53%	47%	100%
HIKERS	60%	40%	100%
HOMEOWNERS	56%	44%	100%
HUNTERS	53%	47%	100%
RV USERS	44%	56%	100%
RANCHERS	60%	40%	100%
TIMBER PURCHASERS	55%	45%	100%
TOTAL			

\*Response is scaled [ +1 Positive, 0 Neutral, -1 Negative]

VAR-DSS Demo Surveys Pop-Up - Microsoft Internet Explorer

Perhaps due to positive media coverage and other publicity, people responded favorably to low intensity fires, but negatively to fires of higher intensity. Lets take a closer look at the survey responses

4. Choose "% of Row Total" from the dropdown that appears inside the table

Except for ranchers, people were more likely to respond to the survey in regards to high-intensity fires -- showing people felt very strongly in their dislike for fires of higher intensities

Let's download this table to Microsoft Excel for further analysis by pressing "download" on the top menubar

Screen continued on next page:

# VAR-DSS

The screenshot shows a Microsoft Internet Explorer browser window displaying the VAR-DSS website. The address bar shows the URL: http://www.var-dss.info/demo/srv.asp. The page title is "VAR-DSS" and the main heading is "Survey Responses".

On the left side, there is a search bar with the text "Literature" and "Surveys" entered. Below the search bar, there is a list of "About VAR-DSS" links. The main content area features a table titled "Survey Responses" with columns for "User Group", "HIGH", "LOW", and "TOTAL". The table data is as follows:

User Group	HIGH	LOW	TOTAL
GENERAL PUBLIC	53%	47%	100%
HIKERS	53%	47%	100%
HOMEOWNERS	60%	40%	100%
HUNTERS	56%	44%	100%
ORV USERS	53%	47%	100%
RANCHERS	44%	56%	100%
TIMBER PURCHASERS	60%	40%	100%
TOTAL	55%	45%	100%

Below the table, there is a note: "\*Response is scaled [ +1 Positive, 0 Neutral, -1 Negative]".

A pop-up window titled "VAR-DSS Demo Surveys Pop-Up" is open, displaying instructions for using the table. The instructions are:

- 3 Choose "Average Response" from the dropdown that appears inside the table
- Perhaps due to positive media coverage and other publicity, people responded favorably to low intensity fires, but negatively to fires of higher intensity. Lets take a closer look at the survey responses
- 4 Choose "% of Row Total" from the dropdown that appears inside the table
- Except for ranchers, people were more likely to respond to the survey in regards to high-intensity fires -- showing people felt very strongly in their dislike for fires of higher intensities

The demo then shows that the data from the created table can be downloaded into MS Excel for further analysis by the user. By combining literature results with survey results, the user has an opportunity to broaden their view and expand their understanding of how values at risk might be related to their project or effort.

The measure of impact under “**count**” is a count of the number of articles/responses that were positive, negative or neutral with respect to fire effect. For example, a positive impact would be an indication of positive or beneficial fire effects. Some articles might have made both positive and negative impacts. In this case we would have listed a count for both the positive and negative.

## DEMO #2

Demo two illustrates additional features of the VAR-DSS. Here we will build a list of literature and then expand it to include vegetation and wildlife impacts. We will also show how a particular literature citation can be obtained.

The demo begins...

"You are part of an Interagency Fuels Management Team considering the reintroduction of fire to restore a large meadowland area in the Pacific Northwest. The meadow provides critical habitat to several species of local wildlife."

"You need to compile a list of literature regarding the reintroduction of fire to the area --specifically, the effective simulation of natural wildfire conditions and the resultant impact on wildlife and vegetation. You also want to be aware of public perception and attitudes in your consideration of the benefits of treatment versus the potential for negative public reaction."

# VAR-DSS

Executing the first three steps result in the following intermediate table:

The screenshot shows the VAR-DSS web application interface. The main content area displays a table titled "Literature Analysis" with columns for "Publication", "NEGATIVE", "NEUTRAL", "POSITIVE", and "TOTAL". The table lists 20 publications with their respective counts. A pop-up window titled "VAR-DSS Demo Literature Pop-Up - Microsoft Int..." is overlaid on the right side, containing instructions for a demo analysis.

**Literature Analysis**

Design the Table Layout

Values At Risk: [Dropdown] Fire Intensity: [Dropdown] Ecoregion: [Dropdown]  
 Fire Type: [Dropdown] Literature Source: [Dropdown] Publication (by Author/Yr): [Dropdown]

Publication	NEGATIVE	NEUTRAL	POSITIVE	TOTAL
	Count			
AMARANTHUS ET AL 1988	1	0	0	1
ANDERSON ET AL 1989	0	1	0	1
APFELBAUM ET AL 1984	0	0	1	1
AQUILANI ET AL 2000	1	0	0	1
RACHELET ET AL 2000	0	0	1	1
BAILEY ET AL 1978	0	1	0	1
BAKER 1988	1	1	0	2
BARNETT 1999	0	0	2	2
BARTOS ET AL 1994	0	0	2	2
BOCK 1988	1	0	1	2
BORCHERT 1989	0	0	1	1
BOYCE ET AL 1989	0	0	1	1
BOZEK ET AL 1994	1	0	0	1
BRAGG 1980	0	0	1	1
CALLISON ET AL 1985	1	0	0	1
CHAVEZ-RAMIREZ ET AL 1986	0	0	1	1
CLEMENTS ET AL 1996	0	0	2	2
COX ET AL 1988	1	0	0	1
DEBYLE 1984	0	0	2	2
DEES ET AL 2001	0	0	1	1
DELLASALA ET AL 1998	0	0	1	1
...	...	...	...	...

**VAR-DSS Demo Literature Pop-Up - Microsoft Int...**

**Demo 2 Literature Analysis:**  
 Let's find all publications citing an impact on wildlife or vegetation.

1. Choose "[+] Insert as Rows" from the Publications dropdown to make row headings
2. Choose "Wildlife" from the Values at Risk dropdown to filter our publication set.
3. Choose "Vegetation" from the Values at Risk dropdown to expand the filter.
4. Choose "[+] Insert as Columns" from the Values at Risk dropdown to expand the filter.

# VAR-DSS

Executing steps four and five produce the screen below:

**VAR-DSS Literature Analysis**

Design the Table Layout:

Values At Risk:  Fire Intensity:  Ecoregion:

Fire Type:  Literature Source:  Publication (by Author/Yr):

Publication	VEGETATION	WILDLIFE	TOTAL
	Average Impact <input type="text"/>		
<a href="#">AMARANTHUS ET AL 1988</a>	-1.0	--	-1.0
<a href="#">ANDERSON ET AL 1989</a>	--	0.0	0.0
<a href="#">APPELBAUM ET AL 1984</a>	1.0	--	1.0
<a href="#">AQUILANI ET AL 2000</a>	--	-1.0	-1.0
<a href="#">BACHELET ET AL 2000</a>	1.0	--	1.0
<a href="#">BAILEY ET AL 1978</a>	0.0	--	0.0
<a href="#">BAKER 1988</a>	-0.5	--	-0.5
<a href="#">BARNETT 1989</a>	1.0	1.0	1.0
<a href="#">BARTOS ET AL 1994</a>	1.0	--	1.0
<a href="#">BOCK 1988</a>	--	0.0	0.0
<a href="#">BORCHERT 1989</a>	1.0	--	1.0
<a href="#">BOYCE ET AL 1989</a>	--	1.0	1.0
<a href="#">BOZEK ET AL 1984</a>	--	-1.0	-1.0
<a href="#">BRAGG 1980</a>	1.0	--	1.0
<a href="#">CALLISON ET AL 1985</a>	-1.0	--	-1.0
<a href="#">CHAVEZ-RAMIREZ ET AL 1996</a>	--	1.0	1.0
<a href="#">CLEMENTS ET AL 1986</a>	--	1.0	1.0
<a href="#">COX ET AL 1988</a>	-1.0	--	-1.0
<a href="#">DEBYLE 1984</a>	--	1.0	1.0
<a href="#">DEES ET AL 2001</a>	--	1.0	1.0
<a href="#">DELLASALA ET AL 1998</a>	--	1.0	1.0
<a href="#">DODD ET AL 1988</a>	0.0	--	0.0

4 Choose "[+] Insert as Columns" from the Values at Risk dropdown to make these two filters into our column headings.

5 Choose "Average Impact" from the dropdown that appears inside the table.

Noste 1984 reports a positive impact on both wildlife and vegetation from wildfire. To read the publication's full citation and abstract, press the "NOSTE 1984" hyperlink in the table.

The Noste article refers to habitat very different from our Pacific Northwest ecosystem. Let's narrow the data set

The final screen will produce the following citation showing that the user can sort on analysis from broad summaries to specific citations.

VAR-DSS Demo Literature Analysis - Microsoft Internet Explorer

Address: http://www.var-dss.info/demo2k.asp

## VAR-DSS

Reset | Graph | Download | Help

Search: Literature Surveys About VAR-DSS

### Literature Analysis

Design the Table Layout

Values At Risk: Fire Intensity Ecoregion: Publication (by Author/Yr):  
 Fire Type: Literature Source

Publication	VEGETATION	WILDLIFE	TOTAL
AMARANTHUS ET AL 1988	-1.0	--	-1.0
DELLASALA ET AL 1998	--	1.0	1.0
GERSON ET AL 1997	--	-1.0	-1.0
HUFF ET AL 1984	--	0.0	0.0
SEIP ET AL 1984	1.0	0.0	0.5
TOTAL	0.0	0.0	0.0

Filtered by: Wildlife, Vegetation, M240 Marine Mtn  
 \*Impact is scaled [ +1 Positive, 0 Neutral, -1 Negative ]

AMARANTHUS ET AL 1988

Amaranthus, M; Jubas, H; Arthur, D. Stream Shading, Summer Streamflow and Maximum Water Temperature Following Intense Wildfire in Headwater Streams. Proceedings of the Symposium on Fire and Watershed Management. October 26-28, 1988, Sacramento, California. USDA Forest Service Gen Tech Rep PSW-108, pp 75-78

Abstract: "Adjacent headwater streams were monitored for post fire shade, summer streamflow, and maximum water temperature following the 40,000 ha Silver Complex fire in southern Oregon. Average post fire shade (30 percent) for the

VAR-DSS Demo Literature Pop-Up - Microsoft Internet Explorer

6. Choose "M240 Marine Mtn" from the Ecoregion dropdown

7. Press the "AMARANTHUS ET AL 1988" hyperlink in the table to read another citation and abstract

By quickly reading through the abstracts for the five identified articles, you find that none refer to meadowland ecosystems. It may be necessary to re-examine articles like Noste 1984 for conditions similar to our scenario

Assuming Noste 1984 is correct, and any intensity of fire management will greatly enhance our meadowland

The logic used in this second demonstration is more advanced than for demo #1 and illustrates more features of the VAR-DSS.

## CONCLUSIONS AND OUTLOOK

Phases I and II of the VAR-DSS project were highly successful. The prototype VAR-DSS fully operates beyond original specification and is significant in that it applies two software innovations: 1. it is a web-enabled computer program and 2. it uses dynamic table design. Web-enabled programs are becoming more common as software developers increase place programs on the web for users to operate. This allows full distribution of the software at minimal cost and enables wide-spread access and distribution. The dynamic table design is used by major corporations for managing large amounts of data in a relatively simple way. It is, as far as we know, new to fire and perhaps to public forestry.

The implications of this second innovation are potentially significant. While this design was used here to manage VAR, it could be vastly expanded to other fire management topics and problems. The dynamic table design would enable expansion of the system to incorporate VAR

into a broader fire management framework that would include other data sets of interest to managers as well as software that would aid in planning and budgeting fire management projects. Software such as Rx Cost used to estimate the cost of fuels treatments, could be linked into a web enabled and integrated suite of fire management programs. In addition the dynamic table design also would enable cross agency sharing of fire data and of integrated management programs.

It is crucial to understand the VAR-DSS and similar systems are not similar to providing a library card catalogue. The data in the system have been processed and analyzed to provide summary information that is more analytic in nature. Further, because the VAR-DSS system is analytic, as opposed to just descriptive, it requires a modest investment of time by the user to gain even basic proficiency. Recognizing this, we developed the two demonstration programs included in the prototype.

***In short, the project is completed and we think it was an outstanding success. It provides important insights into how a much broader and integrated interagency data system could be designed. Also recognize that this report does not do justice to the program.***

***Phases I and II have been complete since April 1, 2002, and because we have received no feedback from the JFS program, we can no longer promise to support the program as it has resided on the WEB.***

***We encourage the JFS leadership to consider the future of such a potentially powerful data analysis system including the implications that it might have for fire managers involved in VAR. Also, consider the implications for the design and operation of an integrated data analysis system that could facilitate interagency cooperation and common fire management efforts beyond analysis of values at risk.***