

## NWCG Fire Danger Working Team--June 2002

### NWCG Fire Danger Working Team June 2002

The June 2002 meeting of the Fire Danger Working Team (FWWT) was held in Washington D.C., June 10-12, 2002.

#### Members and Advisors Attending

Paul Schlobohm, Chair, BLM, pschlobo@dri.edu  
Larry Bradshaw, Vice-chair, USFS, Fire Behavior Research, lbradsha@fs.fed.us  
Gary Curcio, North Carolina Dept. of Forestry, gary.curcio@ncmail.net  
Patti Hiram, USFS, A&FM, WO, phiram@fs.fed.us  
Doug Bright, USFS, R6, dgbright@fs.fed.us  
Jeff Barnes, USFS, Fire Systems Support, Boise, ID, jlbarnes01@fs.fed.us  
John Swanson, USFS, R-5, Stanislaus NF, CA, jrswanson@fs.fed.us  
Russ Gripp, USFS, R-5, Northern Provinces, rgripp@fs.fed.us  
Francis Fujioka, USFS, Fire Meteorology Research, PSW, ffujioka@fs.fed.us  
Kolleen Shelley, USFS, National RAWS Program Coordinator, kshelley@fs.fed.us  
Tom McClelland, USFS, Weather Program, tmccllland@fs.fed.us

#### Guests Attending

Al Borup, BLM, IRM Working Team, aborup@blm.gov  
John Zachariassen, USFS, Rocky Mountain Research Station (doing RAWS review),  
[izachariassen@fs.fed.us](mailto:izachariassen@fs.fed.us)  
Ann Stegmaier, Minnesota DNR, Eastern Area Intelligence, astegmaier@fs.fed.us  
Tess Greaves (proxy for Joe Kennedy), State of Vermont, Dept of Forestry,  
tgreaves@fpr.anr.states.vt.us

Patti Hiram welcomed the group to Washington and gave logistical information on hotel and area.

Agenda items were reviewed and minutes from January were accepted.

1. **Membership.** John Swanson was welcomed as the new member in the line officer position. Doug Anderson, Northeastern States representative has accepted another position in the Minnesota DNR and has left the Team. Doug has been replaced with Joe Kennedy from New York State. Since Doug was a State representative next in line for the Chair it put the Chair transition in a quandary since Pete Guilbert, Western States representative (who recently replaced Steve Dunlap) felt he was not in a position to step into the vice-chair to be chair position. A compromise was developed prior to this meeting that would have Larry Bradshaw fill Doug's term as Vice-Chair and then Patti Hiram would be the next Chair when Paul's term is up. This arrangement was presented to the Team members present and approved.
2. **WT Reorganization.** Discussion on the proposal crafted by ad-hoc meeting of several of the group in Boise (17-May) was discussed. Discussed pros and cons of both. General feeling that we risk losing the effectiveness we've had. Concerns about where the GACC meteorologists will best fit? Also where does GIS technology fit? But reality is we serve at the pleasure of NWCG and they may well do what they want so we'd best give them a model that we can work with. Assigned to meeting work group. Result is proposal for possible Fire Science and Technology WT. (See attachment A1- *Proposal for a new NWCG Working Team.*)

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*Action Item: Paul is to coordinate with Fire Weather Working Team (Rich Ochoa) to bring a joint FDWT-FWWT proposal to NWCG by their October 8, 2002 meeting.*

3. **ASCADS-WIMS-WFAS.** Patti reviewed the progress of events involving BLM, USFS F&AM, and Missoula research in coordinating re-engineering of ASCADS, WIMS, and WFAS. At a 17-May meeting in Boise the principals agreed to forge ahead with an NWCG sponsored charter. Subsequent information from BLM indicated an urgent need to get on with emergency ASCADS operations in redesigning for 15 minute transmits. WT remains committed to business need analysis of the entire fire-weather program in support of fire and other resources.

**Action Items:** 1) Al Borup to find out how IQCS got Business Needs Analysis done.  
2) Patti to restart FS-BLM Memorandum of Understanding.  
3) Start business requirements analysis.

Also there was discussion of ASCADS outage on a Sunday without recovery until Monday morning. Proposed joint multi-Working Team letter stressing the importance of having on-call coverage during fire season.

**Action Item :** 1) Paul will work with other Working Teams to develop and submit to NWCG proposals to deal with funding.

4. **WIMS Status** (Barnes). WIMS web is at version 1.7 and more compatible with Netscape 6.2. Currently trying to secure a maintenance contract for one year to deal with bugs in the SPR (Software Problem Reporting Database) have additional resources for new tasks (i.e. implementation of solar radiation model). WIMS migration reduced the WIMS database from 43 GB to 20 GB. Initial Phase 2 work will re-organize the database, removing Fire Occurrence. Migration will start in fall and should result in greatly reduced user fees. Also working on getting away from the NWS Gateway and pulling data from ASCADS instead of ASCADS pushing to WIMS. Have also been working on channeling live data to hot back-up (redundant) site in Maryland. Test of Database on hot-site in Boulder (April 2002) went well. GACC's are getting AWIPS terminals and need NOAAPORT feeds. Eight of ten GACC's are FS net backbones. There is an issue of how much the FS networks can handle as NOAAPORT data feeds are very large. Seems to be working OK for now. Francis noted the FxNet product from the Forecast Systems Lab (NWS, Boulder) is very efficient with bandwidth with compression technologies (wavelets).

Gary Curcio noted reliability issues are starting to creep in. For 2 years it has been perfect and occasional downtimes get folks upset. WIMS always takes the hit even if it is not a WIMS problem. Jeff reminded him there is an alternate dial-up access via an ISP during times when networks or local ISP problems arise.

Lunch.

### 5. Updates From Research.

#### Larry Bradshaw (Missoula Fire Sciences Lab).

- Presented the state of the pocketcard work in conjunction with the Risk Mitigation Project and the FS policy response to the Thirtymile Fire.
- Color options in WIMS Fire Danger Maps

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- Current state of working with Computational Fluid Dynamic (CFD) software to work with high-resolution terrain.
- 19-year, 8-km fuel moisture (and ERC-G) climatology with University of Montana (using DAYMET and other sources) in support of 15-day AVN gridded forecasts (based on Missoula Fire Lab and Missoula NWS prototype) next year for NICC.
- FireFamily Plus will be released in July/August.
- WFAS reformat will be released in July/August.

**Francis Fujioka (Riverside Fire Lab).** Francis deferred the bulk his time to Al Reibau. Francis handed out a prototype business model of the NFDR used by the South Zone Coordinating Center for resource allocation decision. Francis reiterated our need to describe our research needs to NWCG in terms of data needs, not technology. Also reflected on Dave Cleaves perspective on the need to present in concert with other working teams, blending resource allocation and predictive services into the mix.

The Hawaii project is doing well and adding GIS into project to help them know what they are looking at. Hawaii State Division of forestry is adding ARC-Info suite of tools.

California Fire Agencies have committed funds for Riverside Modeling Center; \$300K for equipment, \$300K/year for support at DRI (Reno). Will need RAWs data and other networks for model initialization and verification.

Al Borup asked if Nelson dead fuel moisture model could be programmed on a weather station?

Russ had comments: ASOS vs WIMS wind measurement... Dew Point vs RH. WRCC does not tag data.

How about update on Haines work from Brian Potter? Gary Curcio will check. Kolleen suggested putting up Werth brothers work on Haines Index on the web somewhere...

**Al Riebau, WO Atmospheric Research Staff.** Dr. Reibau gave a presentation Thursday morning on the Fire Consortia for Atmospheric Mesoscale Modeling Systems (FCAMMS). These are regional mesoscale modeling centers funded by research dollars of the National Fire Plan. There is one in Seattle (Ferguson), Riverside (Fujioka), Fort Collins (Zeller), East Lansing (Heilman), and Athens GA (Achte-meier). There may also be one in Missoula (Hao). All these centers are getting the work done by contracts with University's or other institutions (e.g. DRI, FSL). They are generally running MM5 on computer clusters and cost about \$300K to get set-up and \$300K/year to run. Hopefully by fall of 2002 much of US will have 4-km coverage. New WARF model may approach 2-km resolution. Al views the FCAMMS as much more than a modeling effort—it really is a new Business model for Forest Service Research that is inclusive of many disciplines and broad ownership: Research, Fire Management, Air Quality, States, PM smoke, visibility, ozone, public health & smoke, and chemical weather & air quality. He encouraged other agencies to get involved as well. Chemical weather, the reactions & dissipation of chemicals in the air is a major concern since the events of September, 11, 2001. Program needs meaningful partnerships – people, intellect, time, and equipment.

Program will be pioneering in the integration of weather observations, remote sensing, emissions inventories, and mesoscale meteorology models.

**Action Item:** *Gary Curcio will initiate contact with Gary Achte-meier for SE interests and report back next meeting.*

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### *Wednesday Morning:*

#### 6. Eastern Area Issues/Challenges with fire danger, Ann Stegmaier and Tess Greaves.

Ann gave a run down on NFDRS from an Eastern Area perspective.

Eastern Area comprises 20 states that have 97% of the land base (federal land is 3%). Four compacts cover the area: Great Lakes, North Atlantic, Big Rivers, and Northeast. Any day may be affected by 2-3 different weather systems. Predictive Services is using compact groups to organize by and this is working OK. Bi-modal fire season is hard to model. Many use fuel model L, also E and R. G model gaining some ground, but does not have seasonal trends as western states do to high RH's. High RH also leads to lower IC's that prevent Very High/Extreme Adjective class ratings—especially for a G model. Northern tier states use the Canadian system, Minnesota has found 1000-hr fuels to be a good indicator. In terms of forecasting, they are lacking a good fire history database and weather (due to not using WIMS). Having trouble with people keeping catalogs and maintenance current. Many states using FTS or DOT weather stations so they are not getting corporate data.

PS: Is WIMS use going up or down?

AS: Up but needs more work and \$\$ to make WIMS a superior product.

KS: How can we help you with respect to WIMS?

AS: Need WIMS training. Not easy when you are starting from scratch.

Tess gave a run down of New England. Vermont is in WIMS because of White Mt NF. Lack of education is a big issue. The NE compact did inventory of stations & systems. Majority are manual and using the 1964 Nelson BUI. Confuses the public. New Hampshire and New York are getting FTS stations. Upper management does not make fire weather a priority due to perceived lack of cost/benefit of station costs. Fire is generally not a yearly problem in many NE states. Massachusetts has 1500/fires at 2000 acres/year.

Eastern states experience periodic firewall problems in accessing NWCG website this spring.

FireFamily Plus issue: Archival data is not going into WIMS (thus NIFMID) and not readily available for FFP. Fire climatology is relying on NWS 1<sup>st</sup> order station networks.

PS: How would an effort to gather data (weather and fire) for the region go over? Not sure what the answer was to this question; suggestions for the team at this time were 1) Increase education and awareness before 2005, and 2) Stay active with your Geographic Areas.

#### 7. New approach to developing industrial restrictions, Russ Gripp. Russ presented the work done by FS in California in modifying the Sale Activity Level (SAL). The old SAL was based on on-site weather using fuel moisture stick and an anemometer. There was not much quality control of the industrial applications or uniformity of instrument siting. The proposed Protection Activity Level (PAL) is based on analysis of fire weather and equipment fires. Presented in a matrix form (ERC by IC) showed some promising thresholds that accepts a high level of risk by the protection agencies. John Deeming reviewed the project and thought it a good and valid process. By having the process open for review it creates trust. Russ is currently working with WIMS change process to see about getting PAL values out of WIMS operationally.

FF: Comment on analysis process—not a good idea to lock into a specific variable. Want highest correlation. Indicators may vary from place to place and time of year. PSW has

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developed a statistical model for all fire environment variables. Considers false alarms and fire days. Also considers multiplicity of risks—all fire start sources.

LB: Will this process be available in a user package?

FF: We should work with Missoula to package as a FireFamily Plus Module.

RG: Need to sell concept of single fuel model across the state—working with industry and FS.

FF: Assume you want to regulate based on forecasts. WIMS only provides next-day. We need multiple-day mid-range forecasting in WIMS.

All: Agreed.

- 8. Future Program Direction: RAWS.** The final draft (04/08/2002) of the document by Phil Sielaff, Future Program Direction for the Wildland Fire Remote Automatic Weather Station (RAWS) Program was distributed and discussed.

KS: Maintenance issues—USFS & states cannot afford \$1800/year/station for NFDRS certification. Also issue of Red Card certification. Recommend not to make a 310 qualification entity. Could this group recommend that GACC meteorologists be certified as RAWS techs and be involved in readiness inspections. Training of RAWS techs in field locations is not working. They've put on a lot of training but only a small percentage of those trained stay current and are available. (It was duly noted this is not a problem limited to RAWS training.)

DB: R6 uses NFDRS station maintenance as part of readiness review.

The discussion eventually evolved to include other issues already discussed—the ASCADS/WIMS/WFAS coordination and ASCADS/WIMS support (24/7 or whatever) issues. The team identified the need for a more generic, longer time frame document that captures the business needs of the entire fire weather/danger program. As a need to respond immediately to Phil's request for feedback a subgroup was tasked to rough out a letter that responded to specific issues in the RAWS Futuring document and also raise the issue of the bigger picture.

The final draft that Paul sent to Phil is attached as *A2-fdwt\_response\_to\_raws\_future.doc*

- 9. Archiving 1998 version season codes and greenness factors.** Jeff Barnes requested formal action by the team to get these items moving forward on the WIMS fix list. There was discussion on whether the green-up date(s) were to be archived.

GC: Brought about discussion of green/freeze/cure cycles and dates. Gary offered to report back quantifying need to document need to archive green-up/cure/freeze dates for each fuel model.

JB: Are we going to have more discussion on Austin topic on removing 88 models from the system?

General feeling was there are enough people wanting 88 features to continue support.

**Action Item:** 88 Greenness factors, season code, and green-up dates will be 1<sup>st</sup> priority for database upgrades.

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Wednesday Afternoon: Broke into two working groups (see page 8 for details):

S491/Gaining a basic understanding (Schlobohm)

NFDRS Research needs/strategies (Hirami, Bradshaw)

Thursday Morning:

### 10. Future Meetings:

Fall, 2002. November 19-21, Scottsdale, AZ. Logistics TBA.

Spring, 2003. March 17<sup>th</sup> or 24<sup>th</sup>, Fairbanks, AK (with GACC Mets)

Fall, 2003. Week before Thanksgiving, 17<sup>th</sup>-23<sup>rd</sup>.

### 11. October NWCG and Working Team Chair Meeting:

The October meeting in Gettysburg VA will have a 1-day session with all Working Team chairs.

Concerns/Issues: Emphasis on communication between teams and parent group.

Consistency across the country requires consistency of weather network:

- Reliable
- Quality
- Applications (NFDRS, S491)
- Integration with predictive services, forecast models, and regional modeling centers.
- Air quality
- Prescribed fire programs

PH: Need to bring issues forward to NWCG and fire directors

FF: Predictive Services supports decisions about resource management.

### 12. FDWT Website: Bradshaw—no progress to report.

### 13. Recommendation for number of years for historical analysis.

Ten years is the planning increment for Fire Planning processes.

For Fire Danger: 30 years is best, 10 or more years is good. Be careful with less than 10 years; use other sources if available.

### 14. NFDRS Training Review, Schlobohm.

2002 Session in Marana was reviewed. S491 has had a number (~4) test courses and is getting last revisions. There is a clear need for "processor" (i.e., WIMS training). Is this S391? We should check with Sue Peterson to see if the WIMS processor training she developed for the legacy WIMS could be transferred easily to the web-based WIMS. The NFDRS Course Reference CD was well received and if nothing else saves hundreds of pounds of paper per course. Larry is taking final reviews of content and will work with Cindy Wolf of NWCG Publications Management to get CD into production.

### 15. Data Stewards and new Data Administration Working Group (DAWG), Schlobohm.

Brief discussion on charter of new working group. Judy Crosby is chair. Their first projects are updating the NWCG Glossary and standardizing unit identifiers. Need to be represented in glossary review was noted. Mike Barrowcliff (absent from this meeting) was representing FD team at initial DAWG meeting in Boise this week.

### 16. FDWT Operations Plan Update, Curcio.

No progress to report.

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17. **Task Status Updates from January, 2002.** Task sheets were quickly reviewed. Updated sheets are included as attachment "fdwt\_tasks\_jun\_2002.rtf"
18. **Adjourn.** The meeting was adjourned at 5:30 pm.

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### Results from Breakout Groups

Because of the smaller size of the group we broke into several smaller work groups.

The four objectives and our results were:

#### *Wednesday: Research*

Develop a marketing strategy for fire danger-related research in general.  
Develop a marketing strategy for specific fire danger research projects.  
Develop materials that can be employed to achieve the above objectives, so that the team leaves the meeting armed and dangerous.

##### NFDRS Research needs/strategies (Hirami, Bradshaw)

Team: Larry B., Francis F., John S., Al B.

Results: Team thrashed between the strategic and the weeds and did not successfully create a strategy. Came up with a couple of ideas though...

1. Identify stakeholders (FMO, NICC, GACC, State Foresters, Western Governors Assn...)
2. Charter task group to work with marketing consultant
3. Develop powerful presentation; target to each audience.
4. Explore wide variety of media
5. Contract with Deeming as a "road warrior."
6. Possible email campaign. Only interested parties need reply. Join in on optional mailing list.
7. Public press releases when opportunity presents itself.

#### *Wednesday and Thursday: PocketCards and applying NFDRS outputs*

Revisit intent of the PocketCard

Define the limits of NFDRS outputs as applied by the PocketCard. Or, is there more in the PocketCard for the firefighter than we have portrayed and if so, what? Or, bridge the gap between what the firefighter sees on the PocketCard when he relates today's fire danger to the historical trend and what actions the firefighter is supposed to take because of it. Address recommendation of Wordell's briefing paper.

##### Fire Danger PocketCards—Guidance, Web Content, Interpretation (Curcio)

Team: Gary C., Paul S., Doug B., Jeff B., John S., K. Shelly

Team re-convened Thursday morning to update first draft.

Results: (See updated website: <http://famweb.nwcg.gov/pocketcards>)

#### *Wednesday: S491/Gaining review*

Develop a FDWT response for both  
Recommend "fixes" to address any remaining issues

##### S491/Gaining a basic understanding (Schlobohm)

Team: Paul S., Russ G., Doug B., Gary C.

Results: Final edits on "Gaining" were accepted. Did not realistically have time and input on S491. Individuals will have to respond.

#### *Thursday: Decision points*

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Recommend appropriate applications for climatological breakpoints and fire business thresholds. Recommend functionality for both in future WIMS

Fire Business Thresholds and Climatological Breakpoints (Bradshaw)

Team: Larry B., Francis F., Russ G., John Z., Al B.

Results: (See attachment *A3-decision\_point\_breakout.doc*)

### **Results from Ad-hoc Workgroups**

Thursday:

Ad Hoc team met to draft initial response to Phil Sielaff on RAWS Futuring Document (Thursday afternoon while Pocketcard team was re-convened).

Team: Larry B., Francis F., Al B. , Jeff B. (others? )

Result: Draft is attached (*A3-fdwt\_response\_to\_raws\_future.doc*).

Thursday:

Ad Hoc team met to draft initial response to Working Team Merger.

Team: Paul S. and others.

Result: Draft is attached (*A1-Proposal for a new NWCG Working Team.doc*).

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Attachment A1: Proposal for a new NWCG Working Team.doc

Proposal for a reconfigured NWCG Working Team

- Name: Fire Science and Technology Working Team
- Scope: Fire Weather, Fire Danger, Fire Behavior, Predictive Services, Fire Climatology, and possibly Smoke Management
- Purpose: The WT is committed to advancing the application of fire-related science and technology.
- Objectives: Provide leadership and co-ordination in these fire-related prediction disciplines besides the ongoing areas of Fire Danger and Fire Weather.

Address Predictive Services, fire behavior, and possibly other emerging areas.  
Establish standards for the science common to these disciplines.

Technology transfer

Provide consistent strategy of direction (for its Task Groups)

A forum for sharing ideas across disciplines

Provide linkage for practitioner, management, systems, and research.

Task Groups: Existing teams to continue: Fire weather, fire danger

Opportunities as appropriate: fire behavior, predictive services, others

- Membership: Functional representation:
- Program managers
  - Scientist/Research
  - Practitioner/Applications
  - Represent each of the WT Scope disciplines

9 members

Task group chairs not necessarily members of the WT

Members have a passion for the discipline they represent

Normal NWCG representation

Initial Task List:

Big Picture Business Analysis

Complete re-engineering ASCADS/WIMS/WFAS

Develop live fuel moisture model for NFDRS

Help guide next-generation products for each discipline

Migration to a single set of fuel models for fire danger and fire behavior

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Attachment: A2-fdwt\_response\_to\_raws\_future.doc

June 28, 2002

Phil Sielaff  
Program Manager  
BLM, Remote Sensing Fire Weather Support Unit

Thank you for the opportunity to review your document titled "Future Program Direction for the Wildland Fire Remote Automatic Weather Station Program." (Revision date 3/12/02).

The document was discussed by the Fire Danger Working Team at their June 2002 meeting in Washington, D.C. This response was drafted by a small task group composed of Francis Fujioka, Larry Bradshaw, Jeff Barnes, and Al Borup and then amended and completed by the Team.

General comments. Would it help build a broader base of support by expanding the scope to address some current and future developments? For example how will the RAWs program interact with the new regional mesoscale modeling centers such as the Fire Consortia Advanced Mesoscale Modeling System (FCAMMS) as well as future fire related initiatives and their need (perhaps) of adding new sensors (i.e. air quality sensors).

The Working Team would like to ensure the near real-time fire weather data delivery system is robust and reliable. To that end the NFDRS station standards call for a 3-day response for key NFDRS stations and WIMS has a 2-hour call back for much of the year. We hope the future program will address and provide for similar support.

Specifics:

Page 2. ASCADS II. The Team of course agrees with the single point entry of NFDRS catalog information and shared databases with WIMS. We would also like to encourage the initiation of a wide-scoped, interagency sponsored, business requirements analysis for entire, end-to-end fire weather data system.

Page 2. Direct Readout Ground Stations. You might add strength to the last sentence to reflect not only data recovery but also guaranteed delivery of real-time data.

Page 3. Fire Behavior Models. The Team appreciates your thoughts on Fire Behavior Modeling applications of RAWs. We encourage you to continue working with the Fire Weather and Danger working teams to ensure the best utilization of the RAWs network.

Page 4. Qualifications. The Team suggested that qualifying technicians to certify RAWs stations not be made part of the 310-1 System due to the bureaucracy involved. We also discussed the idea of GACC Meteorologists having a role in certification and readiness reviews, but did not come to a consensus.

Page 4. Certification. Forest Service and States cannot afford \$1800/year/station for NFDRS Certification.

In conclusion:

As much as we liked your approach and content, the Team felt that a Team-sponsored proposal would need a more generic, longer time frame, strategic view. Through the course of the

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meeting, this idea evolved into the business analysis concept mentioned above, which the team will be championing in the coming months.

We appreciate the important role fire weather station programs play in the assessment of daily fire danger and other preparedness tools. The FDWT looks forward to working closely with the Remote Automatic Weather Station (RAWS) Program to advance the science, technology, and application of fire weather stations.

Paul Schlobohm  
Chair, FDWT  
775-674-7170

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Attachment: A3-decision\_point\_breakout.doc

Breakout Group – Fire Business Thresholds and Climatological Breakpoints.

Larry B., Francis F., Russ G., John Z., Al B.

What are appropriate applications for Climatological Breakpoints and Fire Business Thresholds.

How should the functionality be facilitated in WIMS.

Definitions:

Climatological Breakpoints are points on the cumulative distribution of one fire weather/fire danger index without regard to associated fire occurrence/business. There is folk lore history to the establishment of 90/97<sup>th</sup> and 80/95<sup>th</sup> level for different agencies and may be tied to the original 10AM policy of containing 90% of the fires at 10 acres or less by 10AM the day after discovery. (1972 Fire Planning Handbook—via Russ).

Fire Business Thresholds are values of one or more fire weather/fire danger indexes that have been statistically related to occurrence of fires (fire business). Generally the threshold is a value, or range of values where historical fire activity has significantly increased or decreased.

We listed applications where these decision points can be used:

Public Information	Forest Restrictions	Staffing Levels
Severity Requests	Situational Awareness	Predictive Services
Fire Planning	Pre-Positioning	Dispatch Levels
NFMAS	National Prep. Levels	Local Prep. Levels
Resource Allocation	Resource Prioritization	Rx Fire Complexity Analysis
Fire Org Restructuring with budget reallocation.		

Appropriate Applications: Generally if you have sufficient data (fire and weather) fire business breakpoints should be used over climatological breakpoints with possible exceptions of large area applications (National Preparedness Levels) and Public Adjective Classes.

What is sufficient data?

Climatological breakpoints: Minimum 10 years. 10 years would be 1/3 of the 30-year climate normals.

Fire Business Thresholds: Fuzzy area. Francis presented a statistical application of confidence intervals that we may use to define the minimum number of years to get a certain standard error. It was generally agreed that with strong weather/fire business relationships you may be able to have fewer years than needed for climatological breakpoints.

WIMS functionality: WIMS should accept a list of Index ranges to support fire business thresholds for computing staffing classes. For geographic consistency, IC ranges used to compute the Public Adjective Class should be tied to climatological thresholds instead of fixed levels. (Analysis/research required to establish these points.)