2025 Fire Environment Committee Annual Meeting

April 22, 2025 0830 MT - 1530 MT

Attendees:

Nick Nauslar
Tim Brown
Jim Wallman
Dave Shultz
Darren Clabo
Ben Hatchett
Cole Belongie
Billy Gardunio
Chris Moore
Dan Jimenez
Cheryl Bright
Pete Lahm
Travis Verdegan
Robert Clark
Robyn Heffernan
Wesley Hall

Agenda

1. FEMS and FENC's (and subcommittees') role in it
    - Cheryl's view: Problem is fire environment business/governance structure and situation (hasn't moved much), similar issue to fire danger, have no other way to get operational side of governance to come up with a way to govern outside of NWCG. Need someone to make decisions (SMEs, agency folks). Perennial challenge of this regarding NWCG vs agencies. Some pieces need to be sorted: example of standards, training, awareness. FEMS re-written with permanent wx stations, are permanent RAWS used on incidents? Yes. But standards may not fit in NWCG (incident vs long-term). Exec board says to deal with it, but no lanes/lines in the sand to say fits here. Need leadership!
    - Nick: NWCG role vs. day job role trying to fill gaps that need to be filled. A vacuum that stays a vacuum.
    - Dave: Time is limited, committees gather right folks for specific topics, mission creep happens. Gray line, hard to take a stand to know which direction to go. Re: FENC/FEMS in particular, memo draft to exec board was good thing to do. FENC has done its job, shared awareness.
    - Pre-incident planning. For fire environment to work at an incident level, lots of work has to happen before incident to make it happen and make it work. IMET example (hit the easy button). But years, training, software, equipment required 'behind the scenes' to make sure IMET shows up and is ready to do their job when they show up. To set standards, the ops side has to agree.
    - Figure it out and put sideboards on it OR make a different decision.

- No process in place to vet new models. Grassroots projects, self-vetting, undocumented standard becomes the way. Does this process work currently? For industry as a whole, this is desired (academia, private industry), need a path to get to utilization in wildland fire. Discussed at White House last year, how to get 'on board' and engaged. Need a process for this.
- Need some sort of 'body' to validate new science
- Model basics are the same, updates still happen (e.g., different ERCs used, gridded wind capability) and need to be checked/validated. New inputs change the outputs. Input differences, time alignment problems, different forecast inputs (hourly requirements vs other), not easy answers! This is why we need a research to operations process. Must be end-to-end process. Devil is in the details, and the details are eating our lunch right now. FEMS has turned into a R2O process (may pull back what pushed out because already using in ops, "available is (not!) operational". Many layers, data and periods of record. Logic but a change, hard to get agreement on a change. Who has capacity to facilitate this process? FENC role?
- RH forecasts are perennial issue! If we solved forecast issues, would be much further ahead in terms of how the models work/provide output.
- Fire has not prioritized capacity to do analysis/verification. Not enough SMEs who know how this process works to do thorough evaluation. Labs want more support to look at things. Need a better evaluation process to be set up. "Farmer to busser" workflow is not fair to devs.

2. R2O Process (e.g., agency, fire environment)
   - NWCG should be operations (training, standards), need a distinction between science-side of research and operational application. Many operational decisions need to be made. Single point of failure may get worse (not a good model to have). Leadership needs to invest in operationalizing, passing along to a group to continue. But will have to do more with less given loss of staff. Need more emphasis on operationalization if truly valuable.
   - How to define evaluation? So many pitfalls in process of R2O. Historically, the field does the testing, feedback loop does not happen. Don't want experimental tools as 'the' tool. Field testing is less than ideal.
   - Action item as FENC? Within mission/control, that is. **Update R2O SOPs for EB to include the need for upgrades to go through some sort of proces?** Who would do that? A work unit? SPC looking at gridded fire danger has been helpful as an example. **Caution: pause on new initiatives due to situation, so hold in pocket for now.** Documenting remains important if opportunities arise. But don't start something new at this point. Need to ensure things flow both ways (up and down from various levels between committees and EB).
3. Fire environment data management/integrity
   - How do we make sure the data we're using is the best possible data? Knowledge of how it came to be? Pros and cons, benefits, best uses, shortcomings
   - What has been Tim's experience in this? Easy win ideas? Need to inform fire business decisions (e.g., FEMS rollout), ripple effects of decisions can be

significant. Reliance on outside contractors (hard to know how it was cleaned up, why, can it have other uses), issues with scale of data/output used as input to models (GFS output as example, 25 km grid resolution winds). Can't have gaps in hourly system (could using daily but now hourly). Almost impossible explain to folks. Will it work? Maybe, depends on question, model used, etc. Many problems being faced. POR dataset (decision to not replace data). Precipitation grid severely lacks in ERA5, too much drizzle, rain duration is important in NFDRS so this is a problem. Need better precip grid, other things need to be fixed.

- Standards for obs/forecasts needed?
- Is there a document that consolidates the assumptions and limitations of the models and the data? Not really…would be a major undertaking to do this thoroughly. Do people care that data is good? Not really, they want their data in there if they use it. Setting up fire behavior model side of things: FSPro has one option to use NFDRSv4 because previous data/calcs deprecated. For other models, is FEMS wx data the standard? Allow users to look at gridded products? What is authoritative source?
- Entirety of convos so far: forming stage to solicit help to put plan/framework together for the entire fire environment ecosystem DSS world. Parallel effort. Objective statements to build in to ensure standards, data integrity.
- How to handle smoke? EPA has set standards for performance of monitors, evaluating sensor quality, value. Creating some controversy due to sensor quality but still has value for certain purposes. Reference and equivalence methods. Come back to question: Where is the value? People really want to know what is wrong (why can't use this?). E.g., 10% difference (due to error) in RH could have a huge impact on decision making.
- What data do you need to make a fire behavior run? What is the precision needed to make a forecast? Maybe some best practices to get down on paper would be helpful. Setting some basic standards/practices would be good start. What is necessary, what exists, what biases exist, is one better than another (why? What perspective?). Might be huge workload to sort all of this out, needs to be systematic and detailed. Assumptions, limitations need to be known. If want alignment between resolution and calculations, may be very limiting.
- Big difference between data we create and data we just use in fire.
- Maybe a decision tree as a start to get stuff down on paper? Nick proposed starting to sketch out a plan: **A Fire Environment Data Guide**
    i. **start working on process to develop best practices for subcommittee subject areas (NFDRS, spot forecasts, BEHAVE)**
    ii. **What data is needed?**
    iii. **Sources?**
    iv. **Pros/cons?**
    v. **Characteristics (e.g. resolution, precision)?**
    vi. **Intended use?**
- Maybe start with fire danger then go from there? Utilize decision tree(s)

- The “bridge” (ahem) between fire behavior and fire danger is fuels, but can get different results depending on inputs.
- Culture is ‘available is operational, if it is available it must be ok to use’. If shouldn’t use, shouldn’t be available, just don’t have the knowledge base at wide enough level for folks to take a bunch of options
    i. “Even if we provide assumptions and limitations or stamp experimental all over it. People will use the information as operational and authoritative”
    ii. “the thinking also is if it works well for me in my area, it must work well everywhere..."
    iii. If a broken tool in fire, it gets flagged and not used. That should be the same for fire environment data/products
    iv. FENC could become the gatekeeper of non-operational information/models as well as best practices (don’t use deterministic 14 day GFS)?
    v. Fire Behavior models are highly dependent on what the analyst uses for inputs. We do have examples of bad outcomes related to bad model outputs. But it is impossible to link the outcome to the model vs the analyst. All models based on Rothermal, so even with perfect data, model would still not behave better. Fuels remain an issue.
    vi. Back to verification…how do updates happen/model improved? How do you know it's better?
    vii. What is the problem? Trying to define it! But need to convey the assumptions/issues to the field (drawing nomograms with huge crayons), don’t rely completely on specific values. Characterize uncertainty and communicate to field. Handbook to talk about assumptions. “Assumption inbreeding” (error propagation/incorporation), but also are we looking at the right things? *What is the important variable that is driving your fire behavior today?* Large, active wildfire, must forecast instability differently. Cannot pull parts of fire behavior triangle apart.
    viii. How would this get run through an R2O process? Come back, ask some questions, work stuff out. AAR/FLA-style, something happened, what did we do, what could we do better next time? Maybe use a different (better) tool next time? Could get buy-in by using this style approach. A way to start the process (find the first thread to pull on, see where it goes)
    ix. R2O step: Take through tech transfer and training. Requires mastery to go through that process. Spaghetti chart of NFDRS as an example. See interactions between modules, input variables, parameters
    x. FDSC will tackle why we use SIGs
4. How to fund work/projects that include labor costs? What to do if there is no capacity to complete the work?
    - Proposals not funded by NWCG this year, but have docs that get updated ~annually
    - Things to finish: Darren’s Fire Weather, some others

- Chris, how do you deal with this? Started with Zeke when he retired from AFS? Once retired, things got passed on, taken more of a backseat role. Several guides/materials coming up to update, need to update on the semi-annual basis (e.g., w NFDRS4 coming out). Fire weather, fire danger as committee or other. Pocket guide coming, minimal changes to poster. Climatologies out of date for example, stale links. There is a workload that will be a solid lift.
- Nick: **Fire environment is highly comprehensive, proposal is FBSC identify other sections that another committee responsible to do specific updates to sections to keep this alive.** Annual feels like a fast pace. This is continuing education.
- Should we add a smoke section? Seems like yes…but 200 page guide is highly encompassing as is. Dave feels should be careful about duplicating information in another publication, just referencing is good. Generally folks agree.
- Change name to Fire Environment Reference Guide?
- **Annually updated document will come out of FENC now (no longer fire behavior subcommittee). No opposition. Aim to have ready by spring training season, need 2-3 months to get through publications (may be longer depending on staffing). 437 online, 437-1 printed to pdf version (to keep portal ability open, can't have both portal and pdf version). Ideas on how to do changes for updates seem cleaner with pdf version. Need to be 508 Compliant to be on the web.**
- Fire Weather Handbook: may have money to do graphics. Timeline should work out to have all text done by August. Will need to edit text to better reference figures (since they are not done yet). Some options for this are being explored. No extra projects given uncertainty. Hold and improve in the meantime!

5. New FENC Chair/Vice Chair
    - **Cheryl to transition with Robyn as vice chair this fall, become chair in January 2026 with Wes becoming vice chair in January. Would need new chair for fire environment continuing education subcommittee this fall.**
    - When used to have own charter, chair of FENC was non-voting chair.
    - FENC does not have all agency representation on it, not every committee needs every agency rep'd, but if some missing, Dave can help find reps. Fire Danger SC becoming more SME-focused, may want to push some agencies up to FENC level. If need to change structure, be nice to not have new chairs deal with this.
    - **Nick (late summer/fall) will get different agency representation on FENC, Dave will help**
    - Get current roster, identify gaps/holes that could be filled at various levels
    - Quarterly meetings with subcommittee members to keep agencies updated on activities. Info is super helpful to answer questions from leadership. Translates well.
6. S-491/591
    - 491 is being put on, but thought was in a paused state indefinitely. What's happening with these? 491 got moved out of spring and to fall, decision was made well before fire danger was getting into FEMS. Makes less sense to have

491 in fall; 491 is required of center managers in IFPM? Caused some angst about making 491 what it needs, teaching the right material, during the IPTM process (LTAN/FBAN require it), could become whole different course. No real convos about it yet. NWCG needs to draw firm line in the sand. 491 could become a true NWCG course that supports incident positions. Has a steering committee, may not be functioning fully at present. Taught through geographic area training centers. Course is a mess at present. Needs to be Fire Danger course, not NFDRS, and support incident positions. Nobody wants to listen to that, keeps being enabled. Who owns this class? Technically, FDSC owns it. CA looking at hosting locally. Fire Danger planning workshop, almost 20 people needed 491, can't support sending those folks to Naffrey(?). 491 is about FDOPs. 491 required for 590 (or 495 on LTAN side), so have to send people. Currently does not teach what is needed for these classes. There is a difference between day-job fire danger and incident-level fire danger. Seasonal trend charts, we don't make them anymore but need to be able to interpret them. How used to do it, now a new way. Same for Fire Family plus, also heading towards outdated.

7. Open Floor For Topics
    - How to make things more actionable to move forward? We make a decision, think are representing agencies, goes outside of FENC, and "No." Happened multiple times over the years. Back to agency vetting thing. Circular issue. Who gets a veto on what?
    - Conversations about CFFDRS unit, any contacts in Canada? Make CFFDRS-FWI unit under FDSC? Bring parity to NFDRS, base data in same place if going to utilize two systems.