

Fire Environment Committee Meeting

November 15-16, 2017

Crowder's Mountain State Park

Attending: Cabe Speary, John Cook, Thomas Crate, Matthew Harrell, Corey Davis, Caleb Jones, Corey Klamuth, John Mangus, John Mewborn, Pete Steponkus, David Greathouse, Margit Bucher, Matthew Barker.

Action items with follow up in red.

DAY 1

- Minutes from May 2017 meeting were approved without changes
 - Cabe informed FEC that Charter was Approved by NCFSS management team
- 1) Report from State Climate Office Update by Corey Davis
 - a) Wind sensor comparison
 - a. Four to five years ago, the State Climate Office's ECONet stations were updated to having 6 meter wind sensors (in addition to the 10 meter sensors) for display on the Fire Weather Portal and for data going into WIMS
 - b. Undergraduate student has been comparing the two to see whether patterns are similar or obstructions are an issue with the 6m wind data
 - c. Most stations show similar 6m and 10m direction patterns; speeds tend to be slightly weaker at 6m, but that is expected
 - d. One station (Lilesville) showed some skew in 6m winds from certain directions, likely due to obstructions. But other stations looked good.
 - b) Fire weather Portal launched for 13 SE US states
 - a. Same functionality for NC remains but faster loading, mobile friendly, view up to 3 meteograms at one time
 - i. **Feedback wanted: Any issues using the Portal on mobile devices? Are bookmarkable links showing the correct region? (Cabe may have an example)**
 - b. Coming soon: gridded values on-click and meteograms for some gridded datasets
 - c. Coming soon: meteogram enhancements for NFDRS parameters, like adding historical daily average, max, and min values for certain parameters
 - d. **Note: a change was requested and agreed on to show real-time fine dead fuel moisture since having only the daily 1-hour fuel moisture was confusing**
 - i. **The 1-hour FM will be kept but re-named**
 - e. Other planned updates:
 - i. Overlays with CPC and WPC outlooks, US Drought Monitor
 - ii. National and regional fire and smoke products (vent rate, BC, ADI)
 1. Getting these grids from other NWS offices has been delayed; Scott Krentz recommended contacting NWS Eastern Region
 2. The State Climate Office is working on generating these parameters using their WRF model (at 4 km resolution over the Carolinas; at 15 km CONUS)
 - iii. Adjective ratings from WIMS aggregated by FDRA.
 1. **Note: breakpoints for ratings need to be adjusted before data becomes public (John, Cabe, Corey)**
 - iv. NWS Fire Weather Forecasts by county for vent rate, BC, mixing height, ADI

- v. Calculated DENSCA index- this is currently under testing at Camp Lejeune. A multivariate analysis of fire danger indices developed by Denver Ingram and Kevin Scasny from SACC
- c) Organic soil moisture monitoring to inform Estimated Smoldering Potential
 - a. Funding from CISA (Carolinas Integrated Sciences and Assessments) received for 3 monitoring stations
 - b. Study goal: create a reliable network of stations, collect data for analysis, eventually compare soil moisture data to estimates based on satellite data
 - c. ML3 soil moisture probes will be placed in 3 columns at 5 depths at each station, eventually fewer depth readings may be needed?
 - i. Concern based on previous work by Curcio and Reardon: maintain contact between probes and organic soil as it dries out. Probes with longer sensors may be available – try contacting the Stevens company that makes the Hydra Probe
 - ii. Planned deployment of two stations at Pocosin Lakes early next year
 - 1. One station funded by CISA, one by US Fish & Wildlife
 - iii. Other two CISA-funded stations likely for Dismal Swamp and Green Swamp
 - 1. Putting these stations on higher/drier ground is best, and both locations have such sites available
 - d. Possibly a “RAWS-style” option available using FTS sensors
 - i. Overall equipment cost would likely be slightly cheaper than the currently planned State Climate Office option
 - ii. There is interest in having stations at DCBR (John Cook) and Camp Lejeune (Pete Steponkus)
- d) Climate outlook for winter: weak La Nina going into winter suggest a warm and dry winter, occasional cold shot is possible
 - a. Full winter outlook from the SCO available at: <http://climate.ncsu.edu/climateblog?id=247>

Our Winter Outlook

Overall, we expect this winter will be **drier than normal** with **near- to above-normal temperatures** in North Carolina due to the La Niña pattern that should remain weak but persistent throughout the season.

As a continuation of our warm fall, we predict **warm weather will dominate in December**. We expect the **best chances for cooler weather will be in January** if the polar vortex weakens and the polar jet stream sags southward.

Despite a couple of cold air outbreaks and significant snowfalls in the analog years we examined, we expect to see **fewer than normal wintry events**. Statewide snowfall events were also uncommon in similar past winters.

With the expected dry pattern, **drought is likely to remain and even intensify** this winter. Although impacts to agriculture are limited this time of the year, water supply could become a concern since above-normal rainfall is already needed to quench reservoirs across the Piedmont.

While our confidence is low in temperatures later in the winter, it's always worth remembering that even if we're in a warmer pattern in February or March, we can never rule out a damaging late-spring freeze event.

2) Smoke Management Plan Review

- b. Table for tonnage under open/closed conditions. Questions were raised at May meeting what open conditions mean: does this apply to marsh and grass burning?
- c. **Group decided to add a comment in SMP to clarify that “open burning” refers to site prep burn with 100 and 1,000 hr fuels likely to be smoldering over more than one burn period. (Cabe)**

- d. ADM certification should be 2 tiered and needs to include a Hysplit run for qualification as complex modeler. One Hysplit run needs to be outside of class. Low complexity certificate for VSmoke runs was discussed and accepted.
- e. Requirement for Retention of Hysplit metfiles for at least 5 years was discussed. Since state laws requires that emails are retained for 10 years, met files attached to emails will meet documentation needs
- f. BlueSky Model- currently SE grid is at 12k metfile resolution and too coarse for use under ADM. John will check with Bill Jackson when 4K resolution files are likely to be available in SE, at that point accepting BlueSky under ADM will be revisited. Concern: color coding of pm level in Hysplit run is not very useful for RX fire. Fuel consumption (shrubby and large fuels, duff) needs to be carefully assessed when using available fuel beds. Push AirFire to make 4 KM grids available for SE US (Cabe).
- g. Smoke database – NCID staff will have access to SM database as read only. Data will show all burns called in am by mid-day.
- h. Web based database allowing non NCFS burners to enter data – no progress made in development
- i. Should the current pm 2.5 standard (24 hr max EPA standard) in the NCSMP be lowered? Group decided to stick with the legal requirement. A burn boss should evaluate if a lower standard for SSA's is desirable. For example: USFS uses code orange for 1 hr EPA daily max as the max voluntary standard in their burns.

DAY 2

Agency Updates

- Fire staff in Raleigh
 - o Filled the volunteer fire department liaison position (Randy Kearney) about a month ago; works out of the Griffiths Forestry Center in Clayton
 - o Three other positions remain open; they will be made regional so can work remotely and travel to Raleigh occasionally
 - These positions are not federally funded; possible cuts based on the legislature's meeting in December if they're not filled
- Region 3
 - o Regional forester Greg Yates plans to retire in March
 - o Chris Sharpton moving to D9
 - o Beth Plummer now D12 district forester
 - o Lots of rainfall this fall beginning with Irma so below-normal fire season overall
- Region 2
 - o District 3
 - 31 site prep burns this year over ~1,000 acres, mostly in 3 counties
 - Enough periodic rain to keep Sandhills dryness in check
 - o District 6
 - Backlog of hazard reduction burns (some delayed by Matthew and residual wetness late last year)
 - Hope to take care of some of those this winter
 - Four type 4 engines at Fort Bragg that need to be converted
- Camp Lejeune

- Replacing old equipment
- Vacancies for a GS-9 position, GS-5 position
- Not many good prescribed burn days last year, but between fires and prescribed burns, ~7,500 acres burned total
- NC State Parks
 - Released after action review to their director for Party Rock and Chestnut Knob fires
 - Looking to double their fire capacity; hoping to get another full-time fire position and another burn crew online
 - Outfitting all engines across the state to type 6 to meet national standards
 - Cooperative burns on the books
 - Stone Mountain, Hanging Rock, South Mountains, Oconeechee Mountain, Merchants Millpond, Pilot Mountain
 - Around 6,000 acres total burned so far
- District 13
 - Quiet fall after tropical moisture came through
 - Anticipate drying by the spring
 - Some growing season burns this year, including on organics
 - Success using Estimated Smoldering Potential research to limit fire going into the ground
 - How to best encourage burning outside of traditional season?
 - Share new parameters?
 - TNC has a spreadsheet of seasonally available burn days
 - In D7, it helped to take a field tour and show the results of a winter burn vs. a May burn
 - Tie demonstrations with the data, especially to better inform new people
 - One unsuccessful burn, especially if done in narrow or non-existent windows, can discourage burning
 - Check with Fire Learning Network on the availability of information about growing season burns and their benefits?
- BRIDGE
 - Fully staffed now
 - Looking for training opportunities
- State Climate Office
 - New staff scientist (Darrian Bertrand) will be working on gridded fire and smoke parameter calculations
 - Technician hired over the summer, working on ECONet maintenance
 - Aaron Sims is still the interim director; no immediate plans to search for a permanent director
- Mecklenburg County
 - Hazard mitigation burn planned for 200 acres near Lake Wiley
 - Tough to get some permits due to an older air quality ordinance
 - PM2.5 sensors available for ~\$2,500 that can be outfitted on portable RAWS stations; could be useful to have on site for burns as a proof of impacts
- The Nature Conservancy
 - About to sign an MOU with Asheville Fire Department to do a burn in downtown; promoted through their Facebook page

- Last year, 55 burns for ~5,000 acres
- Boots on the ground over 47,000 acres
- Ready to burn again in the Mountains; have an on-call crew funded by USFS Region 8
- A 10-person module and a 4-person module in the Sandhills, shared with Wildlife
- 3 crew modules in Wilmington
- Historical analysis of vent rate, ADI data from Bill Jackson is still in progress
- Western fires
 - Active season out west despite wet weather and snow cover last winter/spring
 - 6 crews were sent out there

Fire Environment Project Updates

- Live fuel moisture program
 - Currently has 2 sites online: Rendezvous Mountain State Forest and Dupont State Forest
 - Have been collecting data since July/August; data being posted to the National Live Fuel Moisture Database
 - Goal was to determine at which fuel moisture the live fuels (mountain laurel, rhododendron, Virginia pine) might ignite
 - Both fresh growth and older growth are sampled
 - Once hardened off (in late August this year), just one sample is collected
 - Pilot Mountain State Park also wants to participate
 - Current plan to take this statewide next fall to sample Piedmont and coastal species
 - Takes 2 to 4 man hours every month (every 2 weeks during fire season) to collect samples, weigh, dry in oven, weigh again
- Fire Danger Operating Plan
 - Late summer, Cabe cleaned up some data for stations that will be used (removed 0 humidity days, negative wind days, etc.)
 - Currently, Cabe writing climate/topo/vegetation narratives for FDRAs
 - Cabe will then consult with regional NCFS reps to establish breakpoints using historical fire and weather data
 - Will help set daily readiness plans
 - Will also set Adjective Ratings as shown on the FWIP and promoted on public-facing fire danger page
 - FDOP could also be used to recommend burn bans and severity requests, especially for out-of-state resources
 - Cabe has been in contact with New FMO of NFs of NC, Steve Little. He will go with whatever we decide for FDRAs and SIGs.
- NFDRS2016
 - Coming alongside FFP 5.0 this fall? No.
- Smoke model verification
 - Little to no instrumentation-based field verification of smoke models
 - Research prize was available to develop a low-cost (<\$500) PM2.5 sensor
 - Work with NCSU to do some verification in prescribed burns?
 - Blue Sky testing has been done and published (Tara Strand did testing over the Sandhills)

- Quick-deploy RAWS
 - o Now have 6 stations available
 - o Training last Monday and Tuesday on how to set them up
 - o Anyone that has an MOU with NCFS can use them
 - o Eventual plan is to have 2 in each region
 - o Can check weather data at the station via radio
 - o Could also be used to test locations before establishing a permanent RAWS
- WeatherFlow sensors
 - o A cheaper option (\$65 to \$80) that measures basic weather parameters
 - o Must be paired with a smartphone

Training Needs and Opportunities

- Hope to have a training officer soon
- Conducted S-290 for NCFS partners at Haw River State Park in early November
 - o 26 total students from State Parks, NCWRC, TNC, Camp Lejeune
 - o Hope to do that course for partners every 2 years as long as there is interest
 - o State Parks: Recommend combining NCFS and partners in same training courses; allocate a certain number of slots to partners
- Current NCFS Burn Boss course not be meeting the needs
 - o **Recommend getting feedback about the current structure to evaluate its effectiveness**
 - o Could eventually replace the basic prescribed burn school with RX-301 (Prescribed Fire Implementation) and RX-341 (Prescribed Fire Plan Preparation), held within a one-week period
 - Combine with more localized training at the regional level.
- Ignition course went well at the coast
- Denver Ingram from SACC presented NFDRS2016, WIMS and FFP overview at Jordan Lake this summer
 - o Once NFDRS2016 rolls out, likely more training opportunities
 - Could be a train-the-trainer approach
- Just finished 2 days of RAWS training
 - o FTS representative was presenter
- Official NWCG RAWS maintenance course coming up on May 8-10 in Dry Branch, GA
- RX-410 smoke management course
 - o Last offered in NC in 2009?
 - o Could become part of requirements for RXB2 beginning in January.
 - o **Recommend offering it again in NC as soon as feasible.**
 - Likely interagency instructors, so interagency students as well
- Should be slots available for partners in S-390
- S-290 and S-390 from the fall were postponed; no updates on when they will be rescheduled

Fire Weather Updates from the National Weather Service

- NWS Morristown is now generating AGL mixing heights (in addition to MSL)
- NWS Raleigh has a new number for fire weather coordination: 919-326-1035
- NWS has a new Enhanced Data Display that allows selecting a location and viewing Fire Weather Forecasts, hourly graphs and tabular data

- It's linked from www.weather.gov/rah/fire
- Josh Weiss at NWS Wilmington has developed a new Stull-based mixing height tool
 - Possible first steps toward creating a national tool to get mixing heights without running the entire model
 - Background: Each WFO was using their own chosen methods for mixing height calculations, which created some major variations
 - Reached an agreement to use the Stull method for all offices
 - In first tests, the numbers aren't coming out exactly as expected
 - Stull method should produce some higher mixing heights, especially in the summer
- Red Flag Warning criteria are set by each state
 - Virginia has adopted a minimum temperature threshold (40°F) since few fires occur below that threshold
 - Jim Merrell asked if we want to consider a similar threshold for NC
 - Current NC Red Flag criteria:
 - Winds sustained at 20 mph, gusts to 30 mph
 - RH of 25% or less
 - Fire Danger of High or more
 - SC said that they will not add this criteria, and NWS Wilmington wants both NC and SC to be similar
 - Recommend not adding this criterium and continue to have NWS consult NCFS central office before issuing a Red Flag Warning
- Draft of new AOP for 2018 will be released soon

Updates from the NC Prescribed Fire Council

- Suggestions from PFC Technical Committee:
 - Ask NWS for uniform and consistent daily Fire Weather Forecasts (same 28 elements) and Spot Forecasts (same 17 elements) across all offices
 - Recommend yes for FWFs, no for Spot Forecasts (ask for variables you need per request)
 - Include year-round adverse wind profiles, like Brotak
 - Recommend including this year-round
 - All WFOs go to the uniform Stull method for mixing height
 - In development by NWS Wilmington
 - Get grids for ADI, LVORI, Vent Rate from all offices
 - Get higher-resolution model data for Blue Sky
 - 4 km NAM vs. 12 km
 - John Cook will pursue this
 - Change the threshold for Burning Category 1 from 33,499 to 14,760 mph*ft
 - Recommend making that change but keep the current asterisk
 - For ADM training, the requirement to be an NC Certified Burner should be a preference, not an absolute requirement
 - Yes, this might encourage air quality folks to take the training

Next Meeting

- May 2-3, 2018 fits in well with the training calendar
- Will be held in the Coastal Plain

- Possibly Hammocks Beach State Park in Swansboro?