

Fire Environment Committee Meeting

Pitt County Emergency Management Center

Greenville, NC

November 12-13, 2019

Tuesday, November 12

Welcome and Introductions

- New member: Nathan Gatlin from District 2, replacing Tim Howell
- Guests:
 - Kelly Cagle, FMO of Uwharrie Forest from USFS
 - Gary Curcio from NC Prescribed Fire Council
 - James Morrow from NWS Raleigh (new fire weather focal point)
 - Tomorrow: Melanie Pitrolo, air quality specialist with USFS

Review and Discussion of Minutes from May 2019 Meeting

- Smoke Management Plan: still addressing recommendations
 - Comment box has been added
- State Park Service had 3 workshops in the past week (Stone Mountain, Hanging Rock, Lake Norman) – one had 5,000 attendees
- Follow-up on workshops this summer and fall:
 - Held 2 duff workshops (one for private landowners, one for everybody)
 - Had a Fire Management in Organic Soils workshop in October, hosted by NC PFC and Southern Fire Exchange
- NCFS is still working to get VSMOKE web on their website. **Cabe will follow up with webmaster Amanda Hubbard about this.**

Smoke Management Program Status (Cabe Speary)

- NCFS website has a smoke management database for entering called-in burn information (as of last Thursday)
 - NC DAQ can also view this information
 - When entering pre-burn information, the final question is “has smoke been modeled?”
 - If yes, put who entered the information (usually the ops officer), the model used, and the certified ADM modeler who ran it
 - If no, need to input the Burning Category, check total allowable tonnage for the category, and check whether it meets requirements for protection under the NC Prescribed Burning Act

- Can use the Burning Category from a spot forecast
 - Currently usable only in-house at NCFS, but eventually may open up to all certified burners (based on agency guidelines) to enter their burn information
 - Concerns:
 - Region 3 county offices are getting complaints about smoke in communities
 - “Large scale burns that have been modeled to be acceptable have impacts that people don’t accept” (John Cook)
 - **Cabe and David Greathouse will meet with Region 3 in early December to talk about those concerns**
 - Could we work on some outreach/messaging that NCFS does not approve burns?
 - Discussion is between the burn boss and the modeler
 - DEQ has created comparisons showing particulate matter from wildfires vs. prescribed burns
 - Could we validate downwind smoke conditions to verify whether they’re in exceedance?
 - Make sure the word is getting out within NCFS (**Cabe will send out an email**)
 - Multiple burns in an area that may overlap
 - Duff consumption
- Changes to the Smoke Management Program discussed in the last 2 FEC meetings are still awaiting approval by the management team
 - Updated some statistics, semantics, and administrative codes
 - Added a Burning Category 0 (up to 14,760 vent rate: based on 1640 and 9 mph)
 - Updated maximum allowable tonnage table to include descriptions of open and understory burning
 - Updated requirements for ADM modeling
 - Certified ADMers may use VSMOKE for low-complexity smoke situations
 - Training will be done in certified burner training or burn boss school
 - Moderate to high complexity burns require a certified ADMer to run an ADM model
 - **Recommendation: Re-add the note about certified ADM training course being offered once per year**
 - **Recommendation: Clarify the requirement to note 3 high complexity burns (exclude VSMOKE/low complexity burns)**
 - Cabe keeps a list of current certified ADMers, available on request.
 - SMP notes that all models (regardless of complexity) should be run within 24 hours prior to the burn
 - Note that modelers should *retain a copy* of MET files for at least 3 years (don’t need to share them since files are so large)
 - Made changes to Air Quality Index based on Randy Strait’s suggestions
 - Added Code Orange to list of categories highly recommended not to burn (along with Red and Purple)

- **Recommendation: Coordinate again with Randy to see what the DAQ rule says regarding Code Orange (is there a waiver?)**
- Possibly include day/night ADI in the burn complexity worksheet?
- Do we need to update the definition of what a smoke-sensitive area is? (Current definition includes “occupied... homes” if smoke exceeds the NAAQ standard)
 - We were told not to make this more restrictive than necessary, and NC is already a very restrictive state

ADI Project Update (Margit Bucher)

- “How Available Burn Days Differ Using the Lavdas Dispersion Index Instead of Category Day”
 - In 2015, decided to look at ADI vs. vent rate to determine Burning Categories
 - Bill Jackson led a study of historical NWS Fire Weather Forecast data
 - For GSP, he looked at the distribution of days by ADI within each Burning Category
 - Found 1,846 missed opportunities (with forecasted ADI higher than the corresponding Burning Category) out of 6,704 forecast days, and only 160 overestimates
 - PFC has funded an internship to look at this more, possibly hosted by NWS
 - Idea 1: Compare acceptable burn days (Cat 2-5 based on vent rate vs. ADI categories) for each NWS office
 - Idea 2: Run VSMOKE or HYSPLIT model runs (with the same FEPS files) for days with the greatest departures between vent rate and ADI
 - Idea 3: Find other forecast parameters that may explain the departures between ADI and vent rate
 - Make sure to consider differences in the mixing height calculation steps for RAH and AKQ compared to the other offices (either exclude those offices or group offices by their method)
 - Could we do a new ORBS project to do some burns validating ADI? We may be able to do those burns under the SMP if supported by HYSPLIT.

State Climate Office Updates (Corey Davis)

- A new public-facing NC Daily Fire Danger page is now available at climate.ncsu.edu/fwip/nc_danger
 - Uses forecasted ERC and IC with updated breakpoints in the new FDOP
- For gridded datasets, can now click a point to see its value
- NWS Fire Weather Zone forecasts (for Burning Category, Mixing Height, ADI, and a few other parameters) will be available soon
 - Seeking feedback about whether they’re too slow/laggy, and other parameters in the forecasts that might be useful to see
- New forecast dataset: the National Blend of Models produced by NWS
 - Combines several different models into a high-resolution national grid
 - Mixing height currently available; other fire grids coming next year

- KBDI email alerts are in development by SCO and USDA SERCH
 - Seeking beta testers for this feature and future developments such as prescribed burning windows
- RAWS quality control routines and email alerts are also in development; will help identify sensor issues
- Organic soil moisture monitoring continues at 4 stations
 - Green Swamp site was installed this summer
 - ESP will be available in the Portal once all samples have been collected
 - For local instantaneous or short-term soil moisture monitoring, other sensors and readout meters are available ranging from \$1,000 to \$2,000

Seasonal Weather and Climate Review (Corey Davis)

- Recent weather pattern has shifted: hot and dry in early October, warm and wet and late October, cool and dry in early November
- Heading into the winter, ENSO is in a neutral pattern, which gives us little seasonal predictability
- Other patterns are likely to dictate our winter weather, which means we could have more variability similar to our fall weather patterns
- Model forecasts show a warmer than normal winter with no strong signal for precipitation

Wednesday, November 13

Atmospheric Dispersion Models – Estimating Downwind Concentrations of Pollution from Prescribed Fires (Melanie Pitrolo, USFS)

- To estimate smoke concentrations (in micrograms of PM2.5 per cubic meter of air), need to know fuel consumption, fuel loading, and emission factor (based on research)
 - Ambient PM2.5 concentrations in NC are 5 to 7 micrograms per cubic meter in the winter, 20 to 25 micrograms per cubic meter in the summer; levels above ~30 are cause for concern
 - To help estimate fuel loading/consumption, the new Fuel and Fire Tools (FFT) is available from USFS: www.fs.fed.us/pnw/fera/fft/
 - FCCS and Consume can provide consumption estimates for the proposed unit, or can get them from fuel plot data for the local unit
 - To determine emission factors, use FEPS (calculates hourly emissions and heat release profiles)
 - For burn planning, can use VSMOKE
 - Can estimate worst-case hourly downwind concentrations of PM2.5
 - For implementation, can use HYSPLIT, BlueSky, and PB Piedmont (for assessing the likelihood of nighttime smoke/superfog formation)
 - Estimate downwind concentrations based on forecast meteorology
- VSMOKE
 - 2 platforms: PC and online
 - Assumes a steady-state wind direction
- HYSPLIT
 - May show output as a trajectory model for *one* particle of pollution, without downwind estimates of pollution/concentrations
 - Dispersion models show hourly downwind estimates of pollution
 - 3 platforms:
 - PC, with hourly inputs from FEPS and outputs in AQI colors
 - A patch is now available to the get .arl file (in the hysplit4/guicode folder) that will fix met file tiles being downloadable – **Melanie will share this with Cabe**
 - Website (HYSPLIT Ready) with one set of inputs for the entirety of the burn
 - Less certainty in estimates of downwind pollution
 - Often far overestimates predicted concentrations
 - Fuel consumption is automatically selected by location, which can be very conservative
 - BlueSky
 - A web-based modeling playground on airfire.org that uses HYSPLIT
 - No longer requires a user login, but it also won't save your results (must manually save the run ID to view/share it in the future)
 - VSMOKE is currently grayed out in BlueSky

- Offers more specific options for fuel consumption than HYSPLIT Ready, but does not allow for prediction of aerial ignition or setting the rate of spread
 - Will automatically select common fuels for your location, but under Advanced options, can adjust those settings
- Outputs/results aren't in AQI colors, and it shows concentrations all the way down to 1 microgram per cubic meter of PM2.5, which are well below the ambient levels
 - Can be tough to interpret, especially for decision makers and the public
 - **Recommendation: Could we (or the PFC, or the Southern Group of State Foresters) write a letter with recommendations to AirFire?**
 - Include adjusting the palette/changes to AQI colors
 - A user guide would also be helpful to explain the options and results in BlueSky (it may be contracted out)
 - **Cabe will write a letter and send it to Jim Prevette by the end of January**
 - What is the vetting process to approve a new model for the state Smoke Management Program? **Gary volunteered PFC Technical Committee to work on this.**
- PB Piedmont
 - Available as an online version that takes a few minutes to run (piedmont.dri.edu)
 - Use this if you're seeing parameters in a spot weather forecast that indicate superfog formation is possible
 - Does not predict concentrations, but the likelihood of smoke and fog formation
 - Make sure to run it through 6-7 am to capture the early morning hours when superfog is most common
 - Results show hourly maps of areas at risk of smoke and smoke-induced fog formation
 - **Recommendation: Suggest adding another color (blue) to show areas of superfog? (Based on research work by Gary Curcio and Gary Ackmeier)**

Agency Updates

- NCFS
 - Christy Adams is the new Public Information Officer, formerly with NC DPS
 - All fire staff positions are filled
 - Burn boss moving to NWCG standards? Greg Hicks says no final word yet
 - NCSU did interviews for a fire science faculty position; an interim dean is in place for College of Natural Resources, but once a permanent dean is named, **Cabe and Kevin will send a letter advocating for that position**
 - Prescribed burning: 53 burns for 2,242 acres since last meeting
 - All but 174 were site prep

- Wildfires: 1,507 for 3,348 acres; acreage is at the 10-year average but about double the number of fires
- The Nature Conservancy
 - About 7,000 acres of burning by TNC, and assisted on about 35,000 acres
 - About 50 seasonal staff; 10 are available in the mountains, others coming online in January in the Sandhills and Coastal Plain
- State Climate Office
 - New director is Kathie Dello (was the assistant director of the Oregon climate office)
 - Rebecca Ward has been promoted to assistant state climatologist
 - Will be hiring a new associate director to help coordinate research efforts, and a new ECONet technician
- US Fish and Wildlife Service
 - A new type 6 engine is available at Pocosin Lakes
 - Sent one of their old type 6 engines to NCFCS
 - Could have a helicopter on an exclusive use contract for the Sandhills by the spring
 - Hired Caleb Jones as the FMO at Pocosin Lakes
 - Hope to burn more timber tracts
- Region 1
 - Haven't hired a regional forester yet
 - Andy Meadows from District 4 has retired
- Camp Lejeune
 - 24 burns for ~7,000 acres over the past year; fire danger increased in May and didn't end until Dorian
 - 80 wildfires for ~5,000 acres this summer (worst year since 2011)
 - Former Onslow and Pender county rangers have recently joined the staff
 - Got 3 highly modified John Deere 700s that have been working well
 - Finishing up a fourth type 6 engine
- Prescribed Fire Council
 - Next year's meeting likely in Morganton around the 3rd week of August
- Division of Air Quality
 - Charlotte area had many high ozone readings this summer
 - Another similar season next year would likely mean non-attainment status
 - Annual PM2.5 numbers are improving at the coast, steady in the Piedmont, getting slightly worse in the Mountains
 - Visibility continues to improve in all class-1 areas in NC over the past few years
- Region 2
 - Turnover in almost all classifications; rotating ~30% of assistant county rangers and FFEOs every year
 - 5 new dozers on order (4 in Region 2, 1 in District 8)
 - Ordering a store-bought type 4 engine (will be the first in NCFCS); hoping a vendor and purchase order will be done by early next year
 - From September through mid-October, were running above average on number of fires (most acreage was in the Sandhills)
 - Limited burning opportunities due to higher fire danger (97th percentile on ERCs at some sites) and inexperienced staff

- US Forest Service
 - Fire activity and acreage was low this year
 - A few FMOs have changed hands (one in Burnsville was just filled, Greg Phillips has changed positions within USFS)
- NC State Parks
 - Good prescribed burn year, and still burning into this fall
 - Cooperatively burned ~7,000 acres with NCFS so far this year
 - Lots of outreach events
 - Building 3 engines this year (had 4 last year)
 - New 4-person fire crew starting in January in Harnett County
- Region 3
 - Lots of inexperience and positions to be filled, especially in District 9
 - D9 district forester position has been open for a while
 - Bridge camp director position is open
 - Mike Kretschmar is acting camp director
- National Weather Service
 - Scott Sharp from RAH retired; James Morrow is the new fire weather focal point
 - 7-day NFDRS forecasts for RAWS are coming next spring?

Training Needs and Opportunities

- Preliminary training calendar to be released this week
- All NCFS personnel were pulled out of S-491 in October due to fire concerns
- Nov. 19-20: certified burner course in the Mountains (filled up within 10 days of registration opening)
- 3rd International Smoke Symposium: April 21-24, 2020, in Raleigh
 - Cabe is on the steering committee helping with logistics and promotions
 - Call for presentations is out (15 minute talks + 5 mins for questions) – closes on December 20
 - NC State is planning a few pre-conference workshops on April 20
 - NC PFC is hoping to arrange a plenary speaker and/or breakout session about southeast smoke management
 - Could we get other smoke management programs across the region to participate?
 - Deadline to submit special sessions is November 25; **Margit is drafting a proposal**
 - Cabe has secured 20 rooms at the Comfort Inn Midtown in Raleigh at state rates
 - Registration cost is typically \$500 to \$600; NCFS may be able to cover registrations for a few folks
 - Possible field tour? Carla has a few locations in mind (Jordan Lake, Occoneechee Mountain); would like to have multiple stations, including one with a prescribed burn going on
- L-380 at Stan Adams Center in late January; nominations were due in October
- S-290 on the calendar the week of February 10 in Browns Summit and the week of September 28 in Crossnore
- Certified burner course set for February 24-25 and April 28-29 (no location set yet)

- ADM class the first week of May (5-7) at Piedmont Research Station in Salisbury
 - Will continue to be offered every year
- S-390 planned for June 8-12 in Crossnore
 - To get the NWCG certificate, must be single resource boss before taking the class; otherwise will only get the NCFS certificate of completion
- Federal RAWS maintenance course is Oct 6-8 at Stan Adams Center
 - NCFS has 8 of the 16 slots; others spread among regional and federal partners that maintain RAWS stations
- RX-410 (smoke management)? Melanie Pitrolo has taught it before and is interested in helping with one in NC, but it probably won't be until next year since other national cadre are needed to teach it
- S-491? Will be held in the southeast again in 2 years in Florida
 - **Recommendation: David Greathouse is on the NFDRS steering committee and will suggest offering 491 again in the southeast sooner than this (mid to late 2020?)**
- S-200 rescheduled for May 27-29 in Crossnore; L-280 that same week
- S-230 (crew boss) and S339 (division supervisor) rescheduled for June 2-4 in Crossnore
- S-330 (strike team leader) will be the week of Feb. 24 at Stan Adams Center; may be full already?

NWS Annual Operating Plan Discussion (Scott Kennedy, James Morrow, Scott Krentz)

- Updated Annual Operating Plan
 - Set to be approved at the cooperators meeting on January 22-23 in Clemmons
 - **Scott K. will update the format and broken links**
 - Reorganize by NWS office (list the MIC, fire weather focal point, counties within each office instead of listing each of those separately)
 - Add a section on the fire grids going to the State Climate Office (ERH server, info on the upload scripts developed by Jake Wimberley/GSP)
- Proposed changes to the fire weather forecast-**NWS**
 - MHX: starting November 1, added requested parameters except for inversion burnoff time (can't get GSP's scripts working yet)
 - How consistent do we want to be? **Recommendations:**
 - Name all weather parameters the same? **(Yes)**
 - Put them all in the same order? **(Yes)**
 - Put days 3-7 at the bottom of the forecast, or per zone? **(Per zone, and include min humidity on each day)**
 - Provide Turner stability as a number or a letter? **(A letter)**
 - Guideline: Use FWF as a daily briefing, then go to the hourly graph (including in the Fire Poker tool) for more point-specific information, then submit a spot forecast for an individual burn
 - We may need some additional training on these products: **Scott K. and Margit will work on this early next year**
 - Tip: when submitting a spot forecast, include contact info. for the person on the ground at the fire if possible

- Tip: use the comment box for detailed requests or concerns (like minimum RH values or the presence of winds from a certain direction) that forecasters can help you with
- Tip: for ongoing burn sites/wildfires, NWS MHX can add that location to the point forecast matrix (need lat, lon, and elevation)
- Tip: send feedback to NWS about their forecasts! It's tough to track the accuracy of some parameters (e.g., mixing heights can only be verified at 12Z and 00Z based on balloon launches). NWS RAH only gets feedback on about 10% of spot forecasts now.
 - Spot forecast requests remain open to only subscribers of the AOP
 - On page 13 in the bottom paragraph, possibly remove "20-foot wind speed"? (since transport wind speed is directly listed) **NWS**
 - Update the PFW Guide (linked at the bottom of page 16) to reflect some of the new parameters listed in those? **NWS**
 - In the Dispersion Table on pages 50-51, update the Poor category to winds of 5-8 mph (instead of 6-8) **NWS**
- Fire Poker tool developed by NWS Duluth (weather.gov/dlh/firepoker)
 - Still experimental for now
 - Click a point and see the weather forecast based on the hourly grids, including hourly weather graphs for many parameters
- Can we get consistency in mixing height forecasts among all offices? It can create big differences on the edge of forecast areas.
 - Each office creates their grids subjectively, and as a rule they make sure mixing heights along the boundaries are within 1,500 feet

Next Meeting

- In the Piedmont: possibly in Raleigh including a visit to NWS Raleigh?
- Maybe the last week of May (the Thursday and Friday after Memorial Day)?