

NC Fire Environment Committee

In-person at the State Climate Office and virtual via Teams

May 11-12, 2022

Welcome and Introductions (Cabe Speary)

- Note: A ~600-acre fire is burning in the Green Swamp now, hoping to hold it within the containment lines
- Guests at this meeting:
 - Andrew Zimmerman, lead forecaster at NWS Wakefield, VA
 - Jonathan McGee, the former fire weather focal point, is transitioning into a hydrology position so Andrew will be taking over those duties (but Jonathan will still be an IMET)
 - Bob Mickler, forestry faculty at NC State (and puts on training courses for firefighters). **See if NCSU wants to become an official FEC Member?**
 - Elliot Tardiff and Heather Wylie, meteorologists at NC Division of Air Quality
 - Tammy Manning, attainment planning branch supervisor at NC DAQ
 - Mamie Colburn, air quality and outreach at the Asheville Regional Office
- New FEC representative for TNC NC: Carmella Stirrat, now TNC NC's fire manager

Review/Discussion of Minutes from November 2021 Meeting (Cabe Speary)

- Discussion at previous meeting included the SE Prescribed Fire Training Needs Survey; some state agencies across the Southeast are using it to reorganize their training
- Since last meeting, UNCW has almost wrapped up analysis of State Parks burn records for determining fire regimes
- Fire Danger Operating Plan has been signed by every agency except one
- Still investigating issues with NFDRSv4 (especially Growing Season Index) that is causing hazard levels not reflect on-the-ground conditions
- Minutes are approved

FEPS/FFT Training Module Update (Chris Jordan)

- Bill Jackson completed (in Feb/Mar) a new smoke tools interface including FEPS with output for HYSPLIT and V-Smoke
- Have now contracted with Bill to make some training videos for these tools:
 - How to complete (the new) FEPS
 - Importing the results into V-Smoke GIS
 - Importing the results into V-Smoke web
 - Building input files for PC-HYSPLIT
 - Getting meteorology for PC-HYSPLIT
 - Analysis in the mountains
 - Displaying results in Google Earth
- Expecting videos to be completed and shared by late July

ADM Training Updates (Cabe Speary)

- In the past, people have taken the ADM class but not actually gotten the certification, so hoping videos will help with training
- Once Bill Jackson's videos are finished, will need to update the Smoke Management Program to eliminate the requirement for taking the class; students could watch the videos, work with a certified ADM modeler to verify ability, then grant certification
- Want to make sure mentors are not overburdened but can also handle students from many different organizations
- Also concerns with maintaining currency, especially as technology changes: could have an ADM refresher course

Potential Inclusion of BlueSky Playground into the Smoke Management Program (John Cook, David Greathouse, Keith Money)

- BlueSky v3.5 does include V-Smoke, but output is grayscale (not AQI colors)
- Interface is fairly simple for entering fuels, consumption, fire information and it's pretty easy to get a result – and results can be shared via a URL
 - Note: met file is 3 km, compared to 2 km for HYSPLIT
- Should the SMP dictate using the most current version of BlueSky?
 - SMP currently just says new things need to be vetted
- Create a small group to look at changes to SMP for training and AQI colors, plus a more formal vetting to make sure it will fit within the Smoke Management Program
- Could we hold a virtual training for burn bosses to get more comfortable with using and requesting model runs, especially for smaller burns?
 - TNC has a burn boss refresher every year, USFS has RT-300 (Prescribed Fire Burn Boss Refresher course)
- Could we get the final analysis from Bill Jackson about ADI vs. Burning Category?

Training Needs and Opportunities (all)

- Certified burner course next week is full; will be two half-days of virtual training, then small group field tours spread across the state
 - Two more are on the schedule: Oct. 3-6 and Dec. 5-8
 - Course might be put online in a video format, along with the test; people who want the training without being certified could take that, while those who want the certification could then schedule a field tour
 - State law says NCFCS must charge for the course, and they're no way to pay online now (for past and current courses, had to pay at the door or mail in a check)
 - Could it be included in the Wildland Fire Learning Portal after the curriculum is revamped?
- NCFCS Prescribed Burn Boss school starts June 6 (and room is available if other agencies want to send people)
- Is RXB offered in the state? Or will NCFCS adopt it? (There's no need now since we don't send burn bosses out of state.)
 - Would it give any added liability protection for escaped burns or smoke?
 - If the FEC recommends teaching any of those courses in NC, then we could do it, but would need instructors or would need to send students somewhere

- NPS likely wouldn't use it, but would like to have already-qualified RXB2s get state-level burn boss certification
 - Would a legislative change be needed to grant this?
- S-390 in the Mountains is already full
 - State Parks has struggled to get people single-resource qualified, often because of limited space in courses like this
 - Could the Wildland Fire Learning Portal be used for any of these courses? Then hold field practicals over a weekend?
- NWCG updates:
 - For position task books, if courses are required, you have to take those before starting the task book
 - NWCG will not support classes that are not directly required for positions
 - The 2 most advanced fire danger classes (491 and 591) will not be required for any task position
 - Future of fire danger classes:
 - 191 will be basic, 3-4 hours online through Wildland Fire Learning Portal
 - 291 will be more advanced, required for single-resource bosses and a few other positions, also online (6-8 hours) and asynchronous
 - 391 would be mixed asynchronous online and instructor-led
 - 491 would be mixed online and in-person
 - 591 would be all in-person
 - Hope to have a preliminary outline of the lower-level courses out by the fall (A contractor at Uldaho is working on 191, 291, and 391)
 - Some 491 content will be pushed down to lower levels
 - Some 591 content will be pushed down to 491
 - A basic WIMS training course is online through the Wildland Fire Learning Portal that could be useful for new ops officers
 - Takes ~3 hours total
 - FEMS (Fire Environment Mapping System) should be online next summer and will replace WIMS plus adding some other features, such as an online version of FireFamily Plus
- [RT-300](#) in Chattanooga on June 13-16; registration is still open – 25 classes per day, over 3 days, open to all in the southern area
- Thomas is tentatively planning an engine academy with FL and VA, probably at Haw River State Park (dates TBD)

Agency Updates-Personnel, Organizational, Policy, Upcoming Projects, etc. (all)

- National Park Service (Chris Corrigan)
 - Made an offer on an FMO vacancy
 - Of 13 permanent funded positions, 8 vacancies now
 - A lot of FMP updates have stalled; NPS can't do burns at parks where there aren't current FMPs, including Great Smokeys and Chickamauga Battlefield
 - Supported a cooperative burn with Forest Service along Blue Ridge Parkway
 - Completed mechanical treatments at Bodie Island and Ocracoke

- Unusually high wildfire activity, including several wind events: 10 wildfire starts at GSM, 1 at Hatteras, 4 on the Parkway (a Type 2 team was called in for one of the GSM events)
- Great Smokey wildfire module continues to provide support to New Mexico
- State Parks (Thomas Crate)
 - About 100 vacancies now, with 30 supported by the legislature, including a permanent fire position; asking for 4 more permanent fire positions (would have 3 regional burn coordinators and 3 full-time crew managers, with 3 crews across the state)
 - Have funding to spend by July 1, including for new equipment (dozers) and UTVs for every park
 - Pilot Mountain wildfire reinforced the need to support prescribed fire within management and state government
 - Jon Blanchard retired; Jimmy Dodson took over as resource management program manager
 - Burning has been hit or miss this year
 - Several wildfires this year (including Grindstone, Huntsville Mountain, Cedar Creek, Chimney Rock)
 - Just took over Rendezvous Mountain educational forest; it's now a state park
 - Also Pisgah View State Park recently added
 - Updating a live GIS layer to show real-time property boundaries as land changes hands
- NC Division of Air Quality (Elliot Tardif)
 - [Air Quality Portal](#) is now online for viewing daily air quality and weather forecasts, and accessing other air quality and weather resources
 - Working on updating back-end modeling capabilities, anticipate new hardware coming online by June
 - DAQ recently submitted regional haze SIP (State Implementation Plan) to EPA
- NC Forest Service
 - Central Office (Cabe Speary)
 - Region 1 (Derrick Moore)
 - Have been sampling live fuel moisture (including gallberry, fetterbush and wax myrtle) to compare with and hopefully improve the live fuel moisture in NFDRSv4 (fuel model X)
 - Currently, live fuels south of the Albemarle Sound are showing maximum fuel moisture values, which should not be the case this early for pocosins, sweetgums, red maples, etc.
 - Recent soil samples from fire areas (including Jackson Road fire) showed soil moisture of 180%-200%, which helped validate the ESP numbers
 - District 4: Downeast Landowner Prescribed Burn Association is kicking off in the next few months with an in-person meeting; lots of interest so far
 - Region 2
 - Banner year for burning so far, even with the spring fire season in Robeson/Cumberland/Sampson counties
 - Robeson has had 212 fires for ~ 1,800 acres so far this year
 - 7,000 acres burned including site prep
 - 17 current vacancies, mostly assistant county rangers

- Pushing to increase growing season burning at Jordan Lake, then at Clemmons
 - Piedmont Training Academy will be held the week after Thanksgiving
 - NCFS is bringing on 5 interns (in each region, under forest protection, and under forest management) this summer who could potentially help with collecting data/oven drying and weighing for organics
 - Region 3
 - Still a lot of vacancies
 - Normal fire season so far this year, also did a lot of burning
 - Bridge program is short 4 positions
- Camp Lejeune (Pete Steponkus)
 - Last month, hired a new operator to fill a vacancy (Mitchell Harris from Pender County, formerly with NCFS)
 - High fire danger has limited prescribed burning
 - 32 wildfires for ~2,000 acres so far this calendar year
 - Hopeful for getting a soil moisture monitoring station installed this year
- State Climate Office (Corey Davis)
 - Jockeys Ridge State Park ECONet station installation
- NC Wildlife (Chris Jordan)
 - Good burn season this year, better than last year
- The Nature Conservancy (Carmella Stirrat)
 - 37 burns for 3,500 acres on TNC lands across the state
 - Supported 10 different partners in NC/SC/VA/TN on 95 burns for 36,000 acres
 - Waiting for some extra moisture and lighter winds to continue burning, especially in the Sandhills and Southeast
- NC State Forestry (Bob Mickler)
 - Continue to train students as type 2 firefighters
 - Back on track for forestry summer camp this year
 - Budgets and equipment have been an issue; NCSU gave \$3,000 this year for the fire program, which was enough for 2 radios
- National Weather Service (Scott Kennedy)
 - Andrew Zimmerman is new fire weather focal point in Wakefield
 - 5 qualified IMETs and 4 trainees within NWS offices that serve NC
 - Need 4 more signatures for the AOP

The NC ECONet System (Sean Heuser, ECONet Manager at the State Climate Office)

- ECONet is the State Climate Office's network of 43 weather stations across NC
- Data measured every minute and reported every 5 to 10 minutes
- Many stations on ag research farms, some at schools/colleges, others at parks, private lands, etc.
- Measures winds at 10m and 6m (for fire weather monitoring), air temperature at 2m and 9m (for inversion monitoring), solar radiation, relative humidity, pressure, black globe temperature (for human heat stress), precipitation, leaf wetness (for peanut disease monitoring), soil temperature, soil moisture
- All data is quality controlled using climatological, spatial, intersensor, and trend checks

- Routine maintenance at all stations three times per year, including cleaning and sensor calibration and replacement
- Emergency maintenance as needed, including when sensors fail (as informed by QC)
- Used for applications including fire danger calculations, peanut disease advisories, herbicide drift and spray recommendations

Future Prescribed Burning Opportunities in the SE (Adam Terando, USGS SE CASC)

- Based at USGS SE Climate Adaptation Science Center
- Increased CO₂ emissions since the industrial revolution have triggered climate changes, including heat waves and worse fire seasons
- In many areas, humans have suppressed fire during this same time period
- How could the background fire regime ‘state’ change if the climate warms?
 - Using the PC2FM model including future temperature and precipitation
 - Under lower emissions scenario, NC likely to see a 25-50% increase in fire probability by the end of the century
 - Under higher emissions scenario, NC likely to see a 50-75% increase in fire probability by the end of the century
 - Which areas (“pyromes”) today most closely match our future conditions?
 - By mid-century, the southern Blue Ridge is still likely to burn the same, but some models show it more similar to the northern coast of California, although probably not with the same sharp precipitation seasonality
- Projected prescribed burning opportunities in the southeast US
 - Used literature-based meteorological criteria for burning: temperature between 32 and 90.5F, RH > 30%, wind speeds 5-18 mph
 - Fire season shifting from warm to cool season months
 - Burn opportunities drop by 14% under lower emissions scenario and by 37% under higher emissions scenario
- Contact Adam at aterando@usgs.gov

NWS Fire Danger Messaging (Scott Kennedy)

- Last fall, there was some confusion about when NCFS’s burn ban was issued, and each office handled it differently: some mentioned it in Fire Weather Planning Forecasts
- Idea: in Fire Weather Watch or Red Flag Warning, mention that does *not* mean a burn ban is in place
- Current messaging in SPS (Special Weather Statements) generally recommends people check with local authorities, since some towns/municipalities may issue their own burn bans separate from any issued by NCFS
 - Note: SPS product will likely go away in 2024
- When a burn ban is lifted, NCFS should make sure to let all NWS offices know
- **Maybe add a section to AOP about which products to include and how to message it?**
- Social media has also become a major way for sharing the burn ban information
- Also, in FWFs, the Dispersion field should only apply through the evening hours – not overnight

Seasonal Climate/Weather Review (Corey Davis)

- Last November was one of the driest ever in NC, with just ~0.75" of rain on average statewide and less than 0.10" total in some northern Piedmont counties
 - That helped kick off wildfires, including the Grindstone Fire on Pilot Mountain
- La Niña developed last fall, so forecasts were for a drier-than-normal winter
- Winter in NC was the 15th-warmest and 33rd-driest on record, but January rain and snow events brought decent drought recovery, and entering the spring, drought had disappeared in most areas
- This spring, drought has redeveloped in eastern NC, and parts of the northern Mountains are starting to dry out as well
- Greenup is nearly complete across the Piedmont, still progressing at higher elevations in the Mountains, and a bit delayed in eastern NC due to the drought and the nature of local vegetation, such as pocosins and sweetgum
- Summer outlook favors above-normal temperatures (mostly since recent summers have been warmer than the 30-year average) with no strong indications of above- or below-normal precipitation
 - Expect a typical summer pattern with mostly pop-up showers and thunderstorms
- La Niña persists for now, and some forecasts show it fading this summer before re-emerging by late summer/fall
 - That could increase Atlantic tropical activity; NCSU's forecast team calls for 17-21 named storms this year
- Reminder: the SCO continues to create forestry-focused monthly short-range outlooks; contact him (cndavis@ncsu.edu) to be added to the email distribution list

DENSCA Updates (Corey Davis)

- Background: In early 2020, NWS offices began issuing 7-day forecasts for NFDRS parameters
- Another useful parameter is the DENSCA index, developed by Denver Ingram and Kevin Scasny, now retired from SACC
- DENSCA is calculated using the daily minimum relative humidity, 100-hour and 1000-hour dead fuel moisture, and the seasonal percentile component for BI and ERC
 - Values generally range from 0 to 100, and values less than 35 have been associated with increased fire activity
- After getting historical NFDRSv4 data calculated for stations in NC, 7-day DENSCA forecasts using new fuel models are now available in the Portal
- Case study looked at old vs. new DENSCA values for Pilot Mountain during last fall's fire season
 - New DENSCA had fewer "false positives" (days < 35 when there were no observed fires) so it may be an even better indicator now
 - Note that the 1000-hour fuels may be skewed toward lower diameters, which would change how quickly they dry out – and would also change the DENSCA
- As we continue working on adjustments to NFDRSv4, please review DENSCA data and forecasts in the [Fire Weather Portal](#) and share any feedback with Cabe and Corey

Fire Environment Project Updates (Cabe Speary)

- Live fuel moisture equipment in D9 is being used by USFS's advanced forestry program in Franklin to measure mountain laurel, rhododendron

- FEMS is also supposed to include a sampled live fuel moisture component; until it launches, Cabe will include that information in the weekly assessments
- Could SMP subcommittee look at nighttime burning?
- NCFE is trying to make our prescribed burn law more similar to FL's and GA's, which changes simple negligence to gross negligence, and would cover escaped fire (not just smoke)
 - The proposed language is basically copied from FL, including mentions of "authorized burns" – in NC, burn plans are never approved or denied (unless a burn ban is in place)

Review of Items Discussed and Action Items (Cabe Speary)

- Next meeting potentially in the Mountains? Probably November 2-3, 9-10, or 16-17?