A FUELSCAPE FOR ALL LANDS ACROSS THE SOUTHEASTERN U.S.

PREPARED FOR:
Texas A&M Forest Service
on behalf of the Southern Group of State Foresters

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A VIBRANT PLANET COMPANY

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1 FUELSCAPE METHODS

A fuelscape is a representation of the fuel, vegetation, and topography across a landscape. The fuelscape consists of geospatial datasets representing surface fuel model (FM40), canopy cover (CC), canopy height (CH), canopy bulk density (CBD), canopy base height (CBH), slope, elevation, and aspect. These datasets can be combined into a single landscape file (LCP) and used as a fuelscape input in fire behavior modeling programs. LANDFIRE 2.2.0[1] was the source for the fuel, vegetation, and topography data for the SWRA fuelscape.

Through the combined efforts of the Southern Group of State Foresters (SGSF), Texas A&M Forest Service (TAMFS), a variety of federal/state agency partners, and Pyrologix, an updated and calibrated fuelscape was produced as part of the Southern Wildfire Risk Assessment (SWRA). This fuelscape covers lands in 13 Southern States[2] (Figure 1) and can be used in the 2023 fire season and beyond to support fire operations in response to wildfire incidents. Pyrologix will also use the SWRA fuelscape to complete wildfire hazard assessment across all 13 states; the results of which can be used to aid in the planning, prioritization, and implementation of prevention and mitigation activities.

Figure 1. Overview of the fuelscape extent for the SWRA Wildfire Hazard Assessment.

[1] https://www.landfire.gov/data/comparison-table
[2] The 13 Southern States in US Forest Service Region 8 include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia

In the following sections (sections 1.1-1.3), we discuss the Pyrologix process of generating a fuelscape.

1.1 FUELSCAPE INPUTS OVERVIEW

The vegetation and disturbance inputs for SWRA were derived from the LF 2.2.0 30-m raster data. The LF release had significant changes from previous versions of LANDFIRE, including the use of new imagery, adjustments to agricultural areas, updated roads, and continuous vegetation cover and height classification[3]. Capitalizing on the new features of the LF Remap data, Pyrologix developed a custom fuelscape-generation method. In this approach, the generation of the surface fuels portion of the fuelscape (FM40) was handled differently than the generation of the canopy fuels (CC, CH, CBD, CBH). The two approaches are discussed in the following sections.

1.1.1 BASE VEGETATION DATA ADJUSTMENTS

Previous calibration feedback highlighted the need for adjustments to the LANDFIRE base vegetation data, particularly in the Developed Ruderal or Recently Disturbed Vegetation types and areas affected by recent disturbances.

Although relatively small in area (less than 5%), the developed ruderal vegetation types were found to be over-mapped in remote or rural at-risk communities. Due to the mapping process used in LF, these areas exhibited more benign fire behavior than expected, which misrepresented the associated wildfire hazard. This over-mapping necessitated a methodology to reduce the extent of these developed ruderal vegetation types and capture more of the natural vegetation types. In collaboration with the LANDFIRE Technical Lead, Pyrologix developed a process to revert these ruderal EVTs to their "Modeled EVT" assignments, adjusting the fire behavior results in these fuels. To avoid over-correcting, we used an additional classification of building cover (Scott et al. 2020) to prevent reverting truly developed areas. For areas with less than five percent building cover, we retained the original EVT assigned by LF Remap.

Similarly, the Modeled EVT was used as an override for the Recently Disturbed vegetation types. These are areas where disturbances made vegetation classification difficult, and the pixels were classified into a 'Recently Disturbed' vegetation class by lifeform. While this classification is not incorrect, it makes it difficult to differentiate vegetation types and make decisions on the associated fire behavior and risk. Backfilling to the Modeled EVT allows for more accurate vegetation stratification, fuels assignments, and hazard.

Finally, areas of recent (post-2016) disturbances in LF 2.2.0 were processed through the LANDFIRE disturbance transition models. These models adjust LANDFIRE Remap cover based on disturbance type, severity, and projected vegetation growth. While this approach is generally sound, the modeled adjustments have the potential to cause logical inconsistencies, such as disturbed areas having higher canopy cover than adjacent non-disturbed areas. To circumvent these potential issues and chronologically align the canopy characteristics, the LF 2.2.0 disturbed areas, covering

[3] Additional information can be found at https://www.landfire.gov/data/lf2020

roughly %5 of the fuelscape, were backfilled with the Modeled EVT and the remotely sensed canopy cover and height from LF. This ensured all canopy characteristics were represented by modeled outputs from the same imagery.

1.1.2 SURFACE FUELS

Pyrologix generated the surface fuels portion of the fuelscape (FM40) using the LANDFIRE Total Fuel Change Tool (LFTFCT, Smail et al. (2011)). LFTFCT requires *pre-disturbance* vegetation characteristics to assign a surface fuel model. Some of these pre-disturbance characteristics are represented as datasets known as the *fuel* vegetation datasets and include fuel vegetation type (FVT), cover (FVC), and height (FVH). The fuel vegetation datasets are used in conjunction with the biophysical settings (BpS) dataset and the fuel disturbance (FDIST) dataset as inputs to LFTFCT. Using these inputs, LFTFCT then queries a database of "fuel rules" to generate the surface fuel model (FM40) dataset, as well as a canopy guide (CG) dataset.

In general, LANDFIRE derives the fuel vegetation datasets above from the LANDFIRE *existing* vegetation datasets: existing vegetation type (EVT), cover (EVC), and height (EVH). Similarly, Pyrologix derived the SWRA fuel vegetation datasets from the LF EVT/EVC/EVH. However, we used a slightly modified approach.

LF is based on recent imagery that includes disturbances through 2016. If an area did *not* experience a disturbance from 2010 to 2016, the existing vegetation datasets were the same as the fuel vegetation datasets and therefore were considered pre-disturbance vegetation characteristics. However, if an area *did* experience a disturbance during that time frame, the imagery-based existing vegetation datasets reflect a *post-disturbance* condition, and the needed pre-disturbance vegetation information is unknown.

For unknown pre-disturbance information in LF Remap, LANDFIRE relied on previous vintages of LANDFIRE data to determine the needed LFTFCT inputs. In the Pyrologix method, we wished to retain as much information from the new imagery as possible and avoid relying on vintage LANDFIRE data for unknown inputs. Pyrologix, therefore, derived FVT directly from LF Remap EVT and derived FVC and FVH for disturbed areas by starting with the post-disturbance information on vegetation cover and height (EVC and EVH, in this instance) and using the disturbance severity to 'add back' the cover and height to a presumed pre-disturbance condition. For cover modifications, we used the inverse of standard severity reductions[4] to add back cover for disturbed tree and shrub FVTs. Maximum values of tree and shrub cover were calculated in the SWRA project area for each FVT to ensure values did not exceed the observed cover in the project area. The herbaceous cover was not adjusted, as the recovery time for herbaceous FVTs is relatively short. To determine the pre-disturbance height for FVTs that experienced a high-severity disturbance, we calculated the overall maximum post-disturbance height as well as the mean non-disturbed height in the SWRA project area. If the post-disturbance height was less than the mean non-disturbed height, the pre-

[4] Standard cover reductions include 20 percent for low severity, 50 percent for moderate severity, and 80 percent for high severity. The exception to these standard values is for insect and disease disturbances where 10 percent is used for low severity, 40 percent for moderate, and 80 percent for high severity.

disturbance height was set to the mean non-disturbance height. Otherwise, the pre-disturbance height was set to the overall maximum post-disturbance height.

Using the methods above, Pyrologix was able to derive fuel vegetation datasets from the recent imagery that represented pre-disturbance conditions for both disturbed and non-disturbed areas. It should be noted that while EVC and EVH are continuous data, LFTFCT requires inputs in standardized bins. Therefore, the FVC and FVH derived by Pyrologix for surface fuels were not continuous.

1.1.3 CANOPY FUELS

For LF Remap, canopy fuels datasets (CC, CH, CBH, and CBD) were created in conjunction with surface fuels through LFTFCT. In contrast, Pyrologix developed an independent process for generating canopy fuels. Although we developed the canopy fuels outside of LFTFCT, we generally mimicked the LFTFCT process and calculations, adjusting canopy fuels based on disturbance scenario and time since disturbance. A few differences in approach warrant highlighting below in sections 1.1.3.1 - 1.1.3.3. It should be noted that in both approaches, canopy characteristics are only calculated for pixels with a CG[5] other than zero. The inputs used to generate canopy datasets include FVT, EVC, EVH, CG, and LANDFIRE coefficients for each vegetation type/disturbance combination. The coefficients come from linear equations derived from Forest Vegetation Simulator (FVS) scenario outputs[3].

1.1.3.1 CANOPY COVER (CC) AND CANOPY HEIGHT (CH)

The LF Remap process groups the continuous values of pre-disturbance vegetation cover and height into classes when generating their FVC and FVH. Using the midpoint values of those classes, along with the coefficients mentioned above, LFTFCT calculates post-disturbance CC and CH and then groups the results into the same classes as the inputs. Final LF Remap CC and CH datasets only contain midpoint values. In the Pyrologix method we again wished to retain as much of the new information as possible, and by generating canopy grids outside of LFTFCT we were able to generate CC and CH using the continuous inputs for cover and height and kept the additional resolution of the continuous outputs in our final CC and CH.

For disturbances occurring in 2013-2016, we used the continuous values for existing vegetation cover (EVC) and height (EVH) as our CC, to reflect post-disturbance conditions. For post-2016 disturbances, we started from the continuous LF Remap cover (EVC, which was considered pre-disturbance cover in this case) and we adjusted CC using the LANDFIRE coefficients, setting a minimum cover limit of 5 percent. No additional adjustments were made to CH for post-2016 disturbances. CC and CH were set to zero for pixels where either CG was zero or CC or CH were zero.

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[5] Canopy Guide is a code used by LANDFIRE to flag whether tree canopy is available for crown fire activity. 0 = no tree canopy, 1 = CBH and CBD available for crown fire, 2 = tree canopy is present and will reduce windspeed accordingly, but CBH and CBD set to prevent crown fire activity, 3 = artificial reduction in CBD to prevent active and conditional crown fire.

1.1.3.2 CANOPY BULK DENSITY (CBD)

We calculated CBD using a generalized linear model (Reeves *et al.* 2009) employed by LANDFIRE but used our continuous CC for an input rather than the binned midpoints used in the default process. Consistencies with the LANDFIRE process include the maximum CBD value of 0.45 kg/m^3 and the default value of 0.01 kg/m^3 for CG 2. We changed the default for CG 3 from 0.05 kg/m^3 to 0.02 kg/m^3 to further reduce the potential for crown fire and only allow for ember lofting rather than possible low- to mid-grade passive crown fire.

1.1.3.3 CANOPY BASE HEIGHT (CBH)

Our method for CBH calculation was consistent with that used by LANDFIRE. However, we added a post-calculation check to ensure that the disturbed CBH was never lower than the corresponding non-disturbed CBH. This check did not include insect and disease disturbances, as we developed a separate process for calculating CBH in areas affected by these factors, detailed below.

Previous calibration efforts highlighted the need for adjustments to the LF Remap CBH calculations in areas disturbed by insects and disease. Both the CBH coefficients and the input cover value were adjusted to better align these areas with the expected increase in fire behavior and surface winds due to a reduction in canopy cover from insect mortality. This change ensured the fuelscape would produce fire behavior that was more active in moderate conditions and no worse than the non-disturbed fuel in more extreme conditions while maintaining fuelscape characteristics similar to the non-disturbed scenario.

Finally, while we retained the same minimum CBH value of 0.3 m and maximum CBH value of 10 m as LANDFIRE, we altered our handling of pixels in the case where the calculated CBH resulted in a value greater than the final CH. When that occurs, the standard LANDFIRE adjustment is to set CBH to be two-thirds of the CH. We chose to set the CBH to 90 percent of the CH, but no greater than 10 m to be consistent with the maximum CBH value noted above. This adjustment was made to prevent crown fire in shorter stands with more volatile fuel models where a CBH of two-thirds of the CH would still allow for some crown fire. These situations primarily occur with CG 2 or where the CBH value is raised after a disturbance. We also adjusted the default CBH for CG 2 to be 9.9 m rather than 10 m to make pixels with CG 2 easier to identify.

1.1.3.4 CANOPY OVERRIDES

During a fuelscape calibration, specialists may choose to override the calculated values of Canopy Cover (CC), Canopy Height (CH), Canopy Bulk Density (CBD), or Canopy Base Height (CBH) if these values do not accurately represent the expected fire behavior for a specific vegetation or disturbance combination. CBH is typically the canopy fuel adjusted during this calibration process. Using outputs from WildEST, such as fire type probability (surface, active, crown), specialists can compare expected fire behavior with modeled fire behavior. Based on these comparisons, CBH values can be adjusted to better reflect actual fire behavior. These adjustments are then incorporated into the final datasets.

1.2 SWRA FUELSCAPE CALIBRATION

Fuelscapes require calibration to ensure the derived fuels datasets accurately reflect the expected fire behavior in a given vegetation type. Typically, these datasets are derived from remotely sensed vegetation data and translated into surface and canopy fuels using specific fuel rules. Fuelscape calibration generally involves reviewing and adjusting these fuel rules based on feedback from local fire and fuels staff, as well as updating the fuelscape to account for recent disturbances.

LANDFIRE is the national, readily available source of fuelscape data and is sometimes used without modifications. Pyrologix fuel calibrations utilize many components of the LANDFIRE calibration process to provide an improved, updated fuelscape. Additional general information on customizing fuelscapes can be found in the LANDFIRE data modification guide (Helmbrecht and Blankenship, 2016).

1.2.1 CONSOLIDATING FUEL RULES

In the LANDFIRE fuel mapping process, fuel models and canopy characteristics are assigned using two primary input layers: Existing Vegetation Type (EVT) and LANDFIRE map zone. Using these inputs—along with information about fuel disturbances, vegetation height and cover, and biophysical settings—a rule is queried from the LANDFIRE rulesets to assign a surface fuel model and, if applicable, canopy characteristics for the given EVT and map zone.

When working on a large project extent, such as the Southeast U.S., many map zones are present. The challenge of fuelscape calibration is to produce output fuel rasters without artificial and often arbitrary seamlines across map zones. To achieve this, the rules from multiple zones must be reconciled and filtered to create one ruleset per EVT. As an unbiased method to reconcile rules from multiple map zones, we determined which zone holds the greatest share of each EVT on the landscape and applied those rules across the entire fuelscape.

After unifying rulesets to produce a preliminary fuelscape, we conducted fuelscape calibration workshops with local fire and fuels personnel to further customize and calibrate rulesets for the project area of interest.

1.2.2 FIRE BEHAVIOR SUMMARY

Before the fuel calibration workshops, we produced an initial set of fire behavior results with gNexus[6] and WildEST using the preliminary fuelscape. The fire behavior results include maps of Rate of Spread (ROS), Heat Per Unit Area (HPUA), Flame Length (FL), Fireline Intensity (FLI), Crown Fraction Burned (CFRB), Torching Index (TI), and Crowning Index (CI). These maps were then summarized by each rule in the LFTFCT database for landscape critique and evaluation by workshop participants.

[6] gNexus is a custom spatial implementation of the fire behavior calculator software, NEXUS 2.1 (available at http://pyrologix.com/downloads)

1.2.3 CALIBRATION WORKSHOP

Calibration efforts were focused on a prioritized list of EVTs. The set of EVTs reviewed in fuel calibration was identified as being among the most abundant EVTs, EVTs previously adjusted in LANDFIRE calibration efforts, EVTs with recent or historical fire behavior, and EVTs with inconsistencies in fire behavior across the range of vegetation cover and height values (i.e., passive crown fire is possible at all windspeeds for part of the rule while the remainder of the rule could only experience surface fire under all observable windspeeds). The prioritized list was reviewed with the TAMFS prior to the calibration workshops and geographically stratified into six regions for calibration (figure 2).

A series of six virtual SWRA fuel calibration workshops were held in February and March of 2023. At the workshops, we solicited feedback from local fire and fuels staff from as well as interagency partners across the region. The intent was to review the preliminary fire modeling results and refine the unified rulesets to produce fire behavior results consistent with the experience of workshop participants for the dominant EVTs. A list of the geographically stratified EVTs and rulesets for the calibrated EVTs are in the final 'Fuel Boxes' spreadsheet[7] and should be referenced to view final ruleset calibrations. Additionally, we discuss notable LFTFCT ruleset modifications below.

Figure 2. SWRA Fuelscape Calibration Zones

[7]SWRA Fuel Boxes: SWRA_FuelBoxes_20240729.xlsx

1.2.4 FUELSCAPE CALIBRATION WILDCARDS

During the calibration workshops, participants identified areas where the existing vegetation data layers were insufficient for accurate fire behavior modeling, suggesting the need to further stratify the vegetation types to capture the diverse ecological characteristics influencing fire dynamics. Historically, LANDFIRE has addressed these issues using its Biophysical Setting (Bps) data or a Wildcard dataset to make such adjustments.

This method involves the use of an ancillary dataset to sub-categorize vegetation types, allowing for a more nuanced understanding of how different vegetation characteristics influence fire dynamics. This stratification accounts for variations in fuel types, leading to more accurate modeling and estimates of fire behavior.

Wildcards (Figure 3) were developed based on feedback from six calibration workshops. Wildcards were used in SWRA to better capture areas of regeneration in ruderal vegetation types, aid in stratifying forest plantations, and identify waxy-leaf evergreen shrubs, especially where they intersect with pine/conifer regions. Within these pine/conifer regions, we delineated a mountainous zone to account for the presence of mountain laurel and rhododendrons, while the coastal zone was designated for palmetto, yaupon, titi, and wax myrtle. To enhance specificity, the coastal zone was further subdivided into areas of moderate and heavy vegetation coverage, with particular attention to the variability near Florida. EVT-specific, calibrated wildcard rulesets are included in the final 'Fuel Boxes' spreadsheet[7].

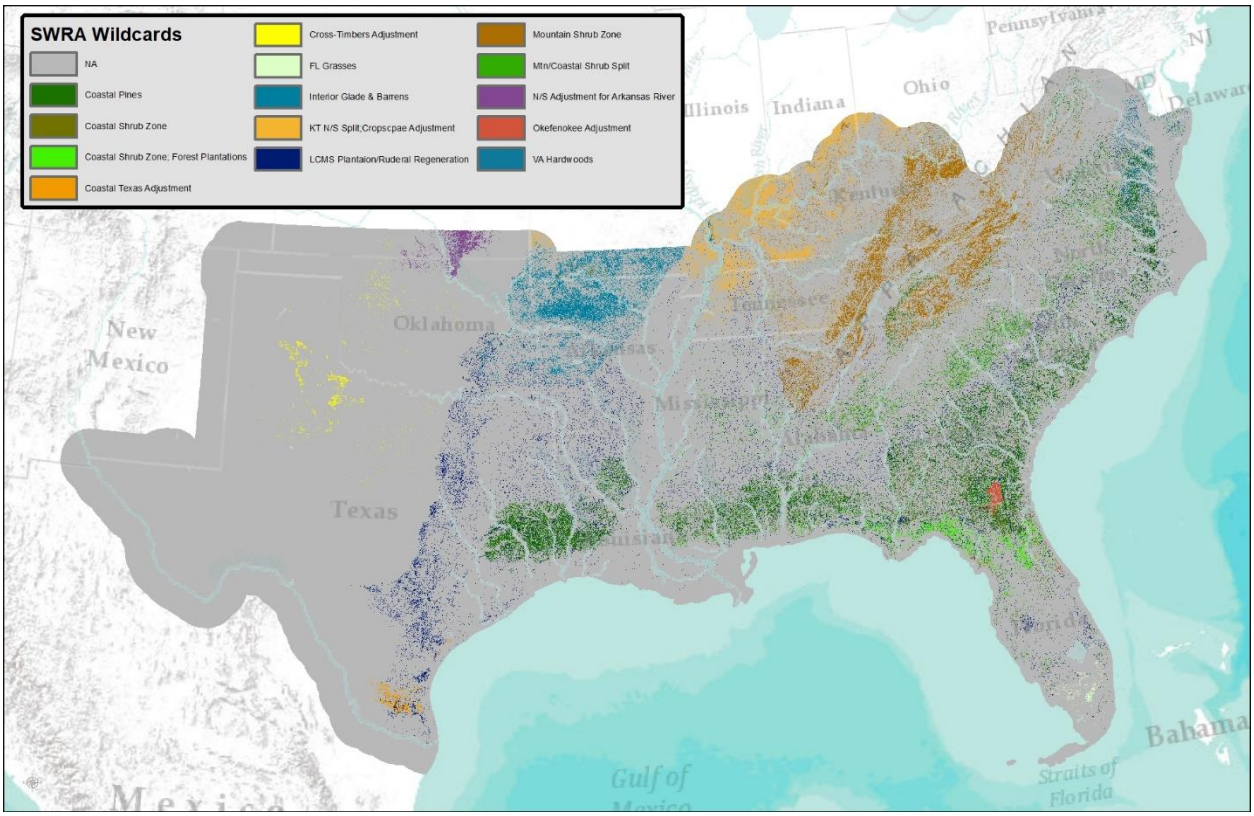

Figure 3. Map of wildcards across the SWRA LCP extent.

1.3 POST-WORKSHOP FUELSCAPE MODIFICATIONS

1.3.1 RECENT DISTURBANCES

In addition to calibrating fuel rulesets, both the surface and canopy inputs were updated to reflect recent fuel disturbances. The LF base data accounts for disturbances up to and including 2016. To update the SWRA fuelscape, we added disturbances occurring between 2017 and 2022, inclusively. Pyrologix gathered the LANDFIRE yearly disturbances data and assigned appropriate disturbance codes using similar logic developed by LANDFIRE.

1.4 CALIBRATED FUELSCAPE

After workshop edits and recent disturbances were incorporated into the fuelscape inputs, Pyrologix produced a fuelscape for SWRA using the calibration method and fuelscape development process discussed in section 1.1. This calibrated fuelscape was then further modified as described in section 1.5 for use in fire modeling.

1.5 CUSTOMIZATIONS FOR PYROLOGIX FIRE MODELING

Before using the fuelscape in the Pyrologix fire modeling and, ultimately, the Wildfire Hazard Assessment, Pyrologix made additional customizations, including custom fuel model assignments for identification of burnable agricultural lands, and burnable urban fuel models. These customizations are discussed in the following sections.

1.5.1 CUSTOM FUEL MODEL ASSIGNMENTS

The 40 Scott and Burgan Fire Behavior Fuel Models (FBFM40) represent distinct distributions of fuel loading found among surface fuel components, size classes, and fuel types. The spatial representation of fuel model assignments serves as input into wildfire simulation modeling systems like FARSITE, FlamMap, and FSim. Although the FBFM40 fuel model set covers a wide array of fuel bed scenarios, it is sometimes necessary to develop custom fuel model assignments for specific instances where one needs to simulate fire behavior not reflected in any standard fuel model.

Many spatial wildfire simulation systems associate certain simulation inputs with the fuel model raster. For example, FSim allows input of live and dead fuel moisture content to vary by fuel model. FSim further allows input of a rate of spread adjustment factor by fuel model. Therefore, it is sometimes necessary to use a “custom” fuel model only so that certain locations can be given different simulation inputs. For example, certain high-elevation locations may be characterized by a standard fuel model, but with different fuel moisture inputs. In that case, a custom fuel model can be made with the same parameters as the standard fuel model but with a different fuel model number. By mapping such areas using custom fuel models with a fuel model number different than the standard model on which they were based, we were able to control the weather scenarios during which simulated fire spread could take place.

1.5.1.1 BURNABLE AGRICULTURE LANDS

The SWRA fuelscape required a custom fuel model to account for burnable agriculture in Kentucky and Tennessee. Initially, SWRA row crops were mapped as non-burnable and assigned standard Scott and Burgan 40 fuel models. However, to accurately represent areas with burnable row crops, particularly those associated with corn, it was necessary to develop a wildcard and custom fuel model to specify the conditions under which these areas could burn.

The assignment of a custom fuel model to row crops involved using the Cropscape[8] dataset to identify regions where corn was planted at least five times between 2008 and 2022. By analyzing this data, areas within the LANDFIRE Row Crop EVTs (2963 - Crops/Row Crops: Row Crop - Close Grown Crop, 2964 - Row Crop, and 2965 - Close Grown Crop) with recurring corn cultivation were pinpointed. These areas were then assigned a burnable fuel model (116/GR3 fuel model, identical to 103/GR3) using a wildcard to better reflect their potential for fire.

1.5.1.2 CARIBBEAN SWAMP SYSTEMS

Assigning a custom fuel model to swamp/riparian vegetation types is often necessary due to the challenges inherent in accurately modeling fire behavior in these areas. These environments typically feature unique vegetation compositions and moisture conditions that complicate fire behavior prediction. Standard fuel models may not adequately account for these complexities, resulting in inaccurate predictions of fire behavior and spread dynamics. This was evident in the case of the Caribbean Swamp System (2478) EVT in SWRA. The FM13, Fuel Model 4 more accurately captured the fire behavior associated with the vegetation type and was assigned to a custom FM4/153; identical to FM4/4.

1.5.1.3 BURNABLE URBAN FUEL MODELS

The SWRA fuelscape also used custom fuel models to represent the potential for wildfire spread into burnable urban areas. The burnable-urban custom fuel models were spatially identified using the LANDFIRE EVTs designated as low and moderate-intensity developed: burnable developed areas are represented with 251/BU1, identical to TL9; and burnable roads are represented with 252/BU2, identical to TL3.

The addition of the custom fuel model for burnable urban and agriculture allows for the transmission of wildfire in simulation across these areas. To prevent overestimating the likelihood of wildfire in custom fuel models, FSim fuel moisture inputs were modified to allow for wildfire only under 97th percentile ERC conditions and above.

1.5.1.4 GREENNESS MASK

In the standard fuel mapping process, some vegetation can be mapped with a burnable fuel model even when the fuel is perpetually green (i.e. not available to burn). Examples of this include city parks, watered golf courses, and irrigated agricultural fields. These areas are often mapped with the

[8] Cropscape Data Layer - https://nassgeodata.gmu.edu/CropScape/

slowest-spreading, grass fuel model (101/GR1), but this is often still an overprediction of the fire behavior potential in these areas.

To identify these areas in the SWRA fuelscape, we applied Landsat satellite-based annual composites of median and maximum growing season NDVI, NBR, and tasseled cap indices, developed in Moran et al. (2020), along with training polygon data developed from areas of known golf courses, parks, and wildland vegetation to develop a Random Forest machine learning model. Composites and predictions were for 2016 to correspond with the satellite imagery utilized for Landfire data development. The model gave binary class predictions for whether the selected pixels match the spectral signals of landscaped and irrigated areas (e.g. golf courses) and therefore act as barriers to fire spread rather than propagate fire as a wildland fuel. The updates were constrained to grass and grass-shrub fuel models in urban EVTs. In the SWRA fuelscape, we converted pixels from a burnable fuel model to a non-burnable fuel model (91/NB1) in the following "urban" EVTs: Developed Herbaceous (2911), Developed Shrubland (2912), Urban Herbaceous (2916), Urban Shrubland (2917).

1.5.2 FINAL SWRA FUELSCAPE

Using the methods described above we generated the final version of the SWRA fuelscape for use in our wildfire hazard modeling. The fuel raster is displayed using fuel model groups in Figure 4. CC, CH, CBD, and CBH are shown in Figure 5 through Figure 8.

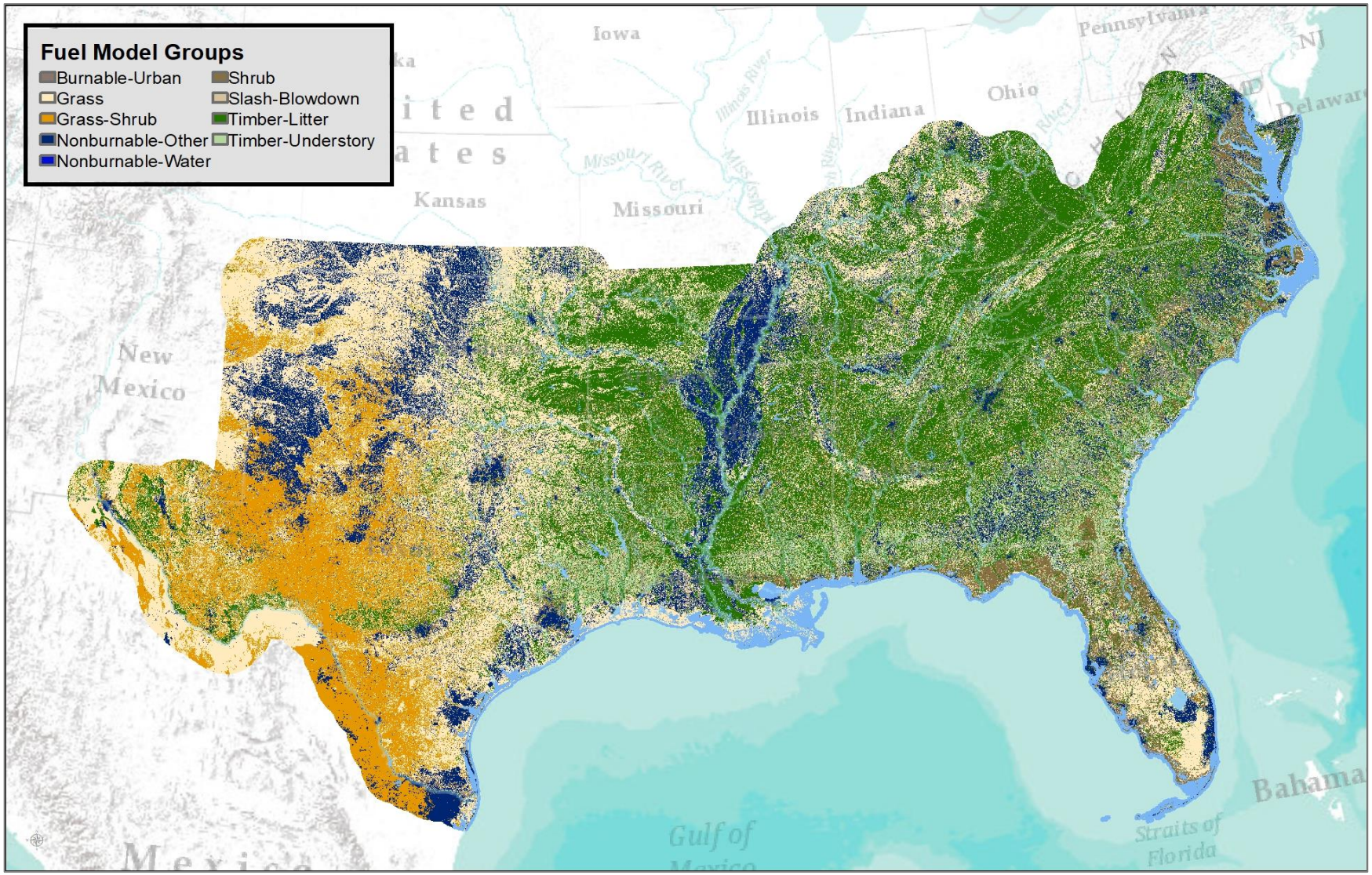

Figure 4. Map of fuel model groups across the SWRA LCP extent.

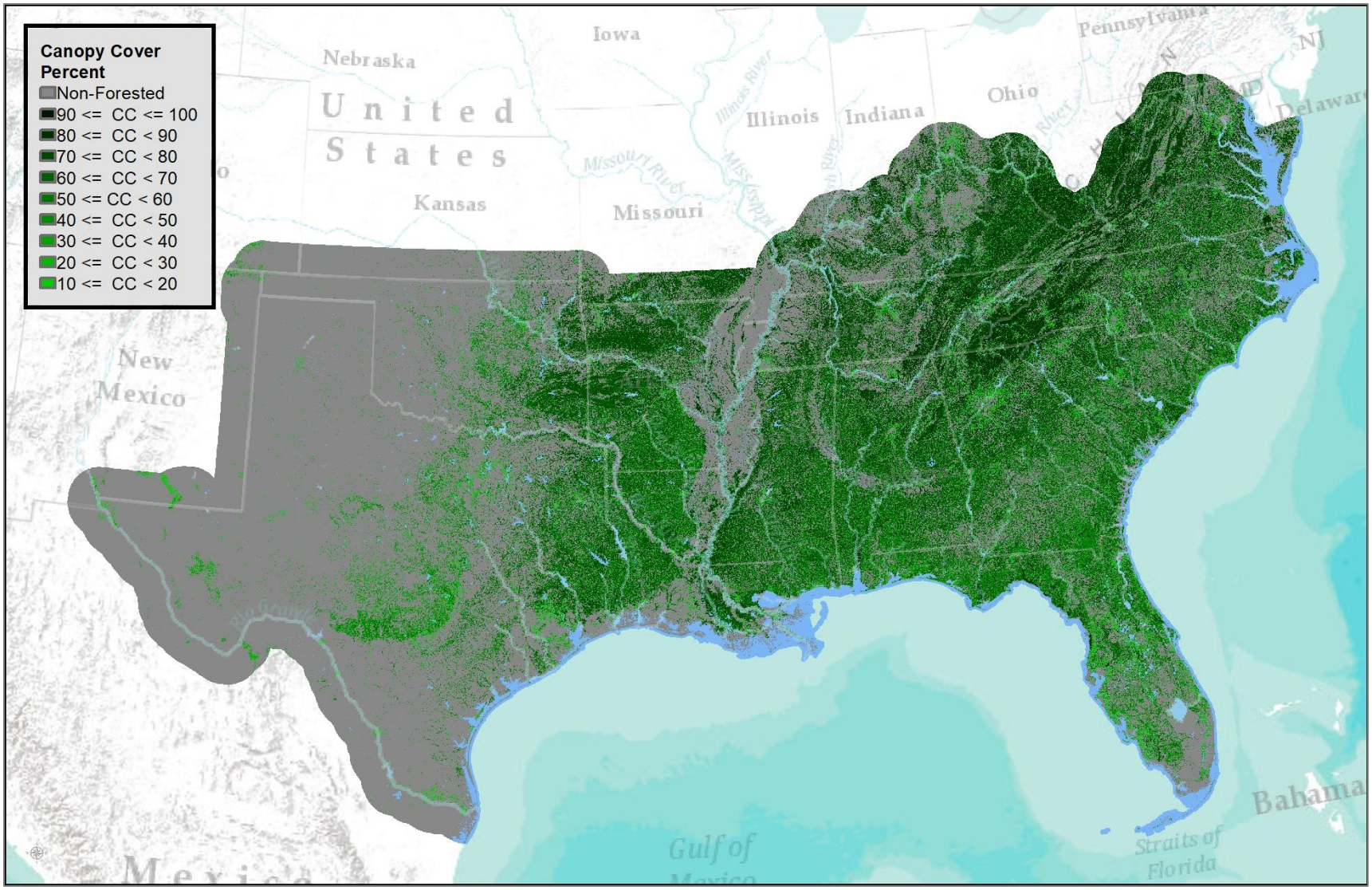

Figure 5. Map of canopy cover (CC) across the SWRA LCP extent. CC is continuous but is displayed in the standard LANDFIRE 10-percent classes for ease of viewing.

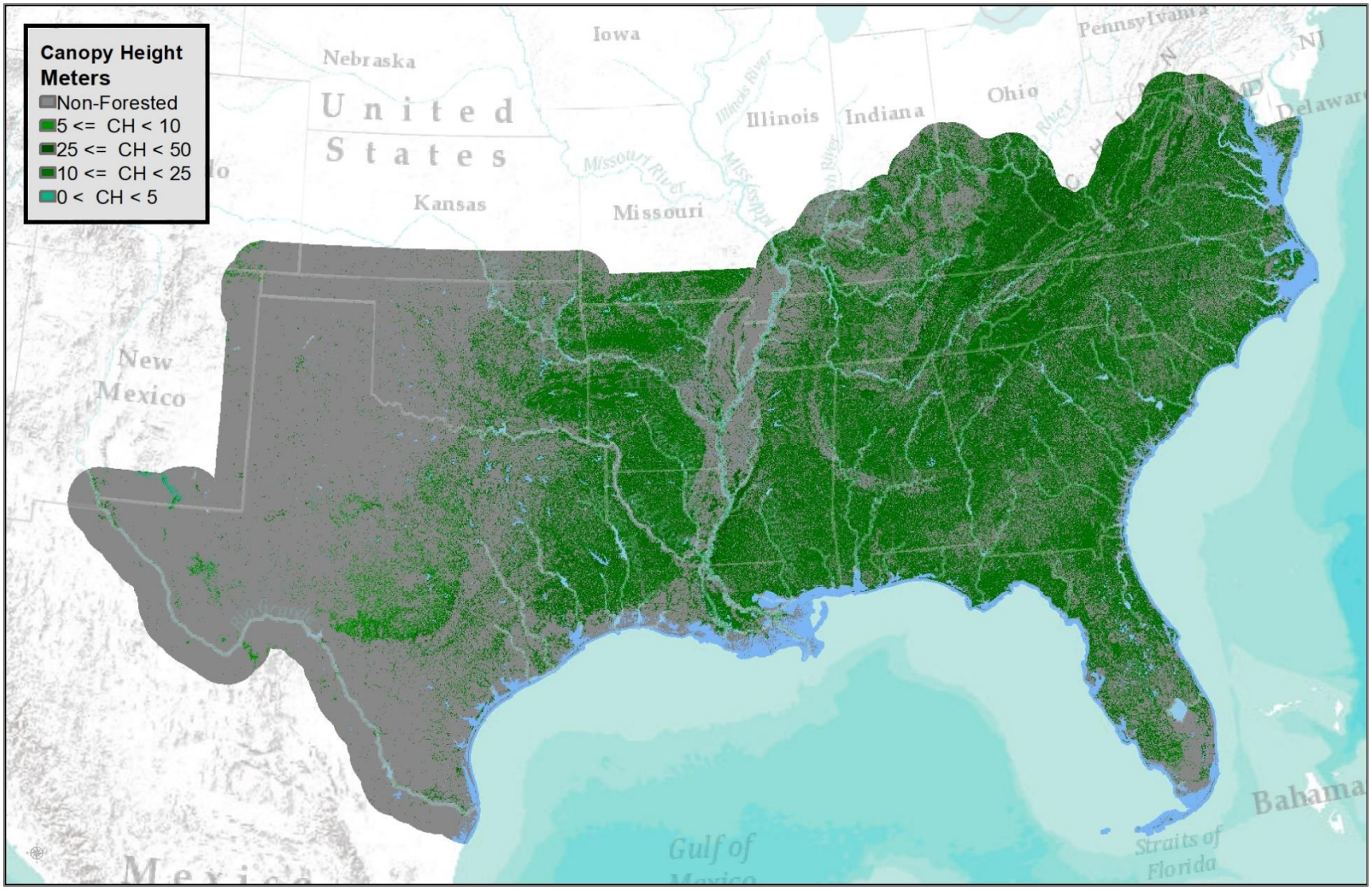

Figure 6. Map of canopy height (CH) across the SWRA LCP extent. CH is continuous but is displayed in the standard LANDFIRE height classes for ease of viewing.

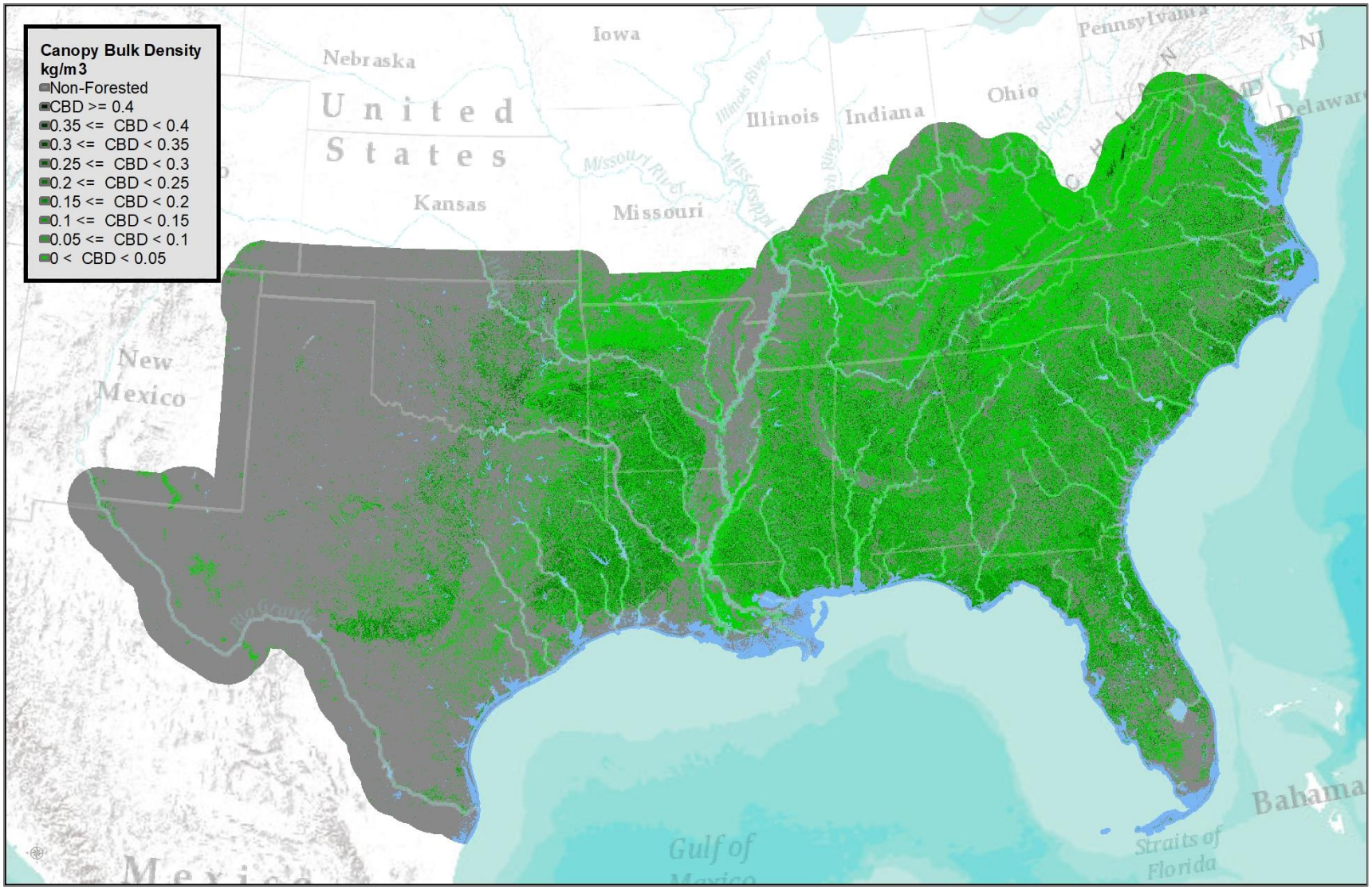

Figure 7. Map of canopy bulk density (CBD) across the SWRA LCP extent.

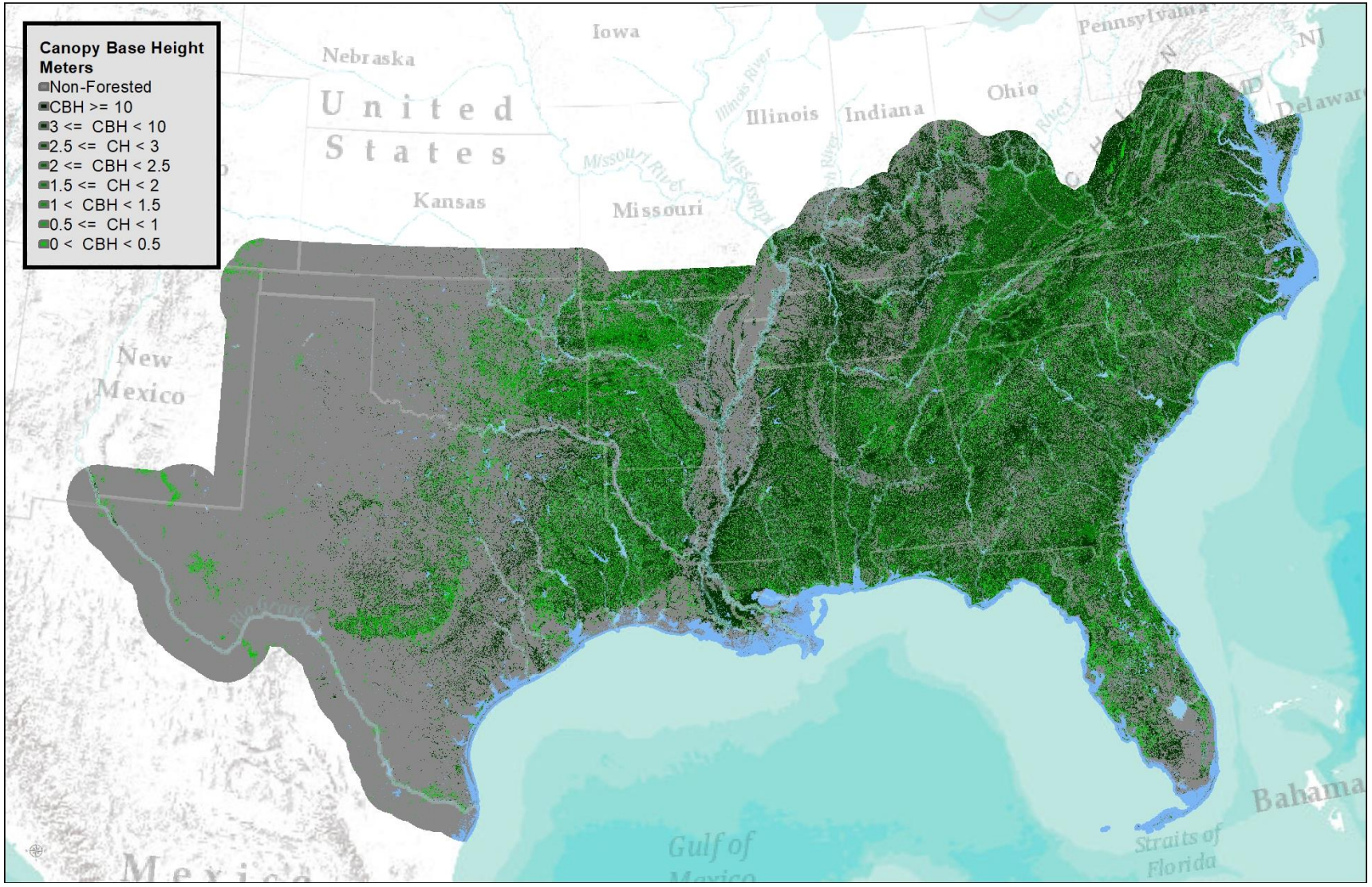

Figure 8. Map of canopy base height (CBH) across the SWRA LCP extent.

2 CONCLUSION

The process described in this document outlines the many steps necessary to produce a customized fuelscape using the Pyrologix methodology. The modifications to the LANDFIRE process were time-consuming and not without effort, but we hope that the results better reflect the vegetation conditions captured in the LF Remap imagery. The final SWRA fuelscape, for use in the 2023 fire season and beyond, is available with the final project deliverables.

Our calibration covered a large majority (75%) of the Southeast but was not inclusive of all EVTs within the fuelscape extent. A variety of EVTs cover the remaining burnable portion of the fuelscape. Further calibration of more EVTs, covering little ground, has diminishing returns for a region-wide assessment.

Finally, the SWRA fuelscape is current for the 2023 fire season and beyond. With frequent wildfires and other disturbances, a regular update interval is advised. We recommend an update interval of 2-5 years as programmatic budgets allow and fuel disturbances warrant. Please contact Pyrologix (www.pyrologix.com) for further questions on the customizations used in producing this fuelscape.

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The Southern Region Wildfire Risk Assessment was conducted by Pyrologix, a wildfire hazard and risk analytics firm based in Missoula, Montana. Pyrologix is a subsidiary of Vibrant Planet, a Public Benefit Corporation.

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