



Helene and Wildfire Risk in North Carolina

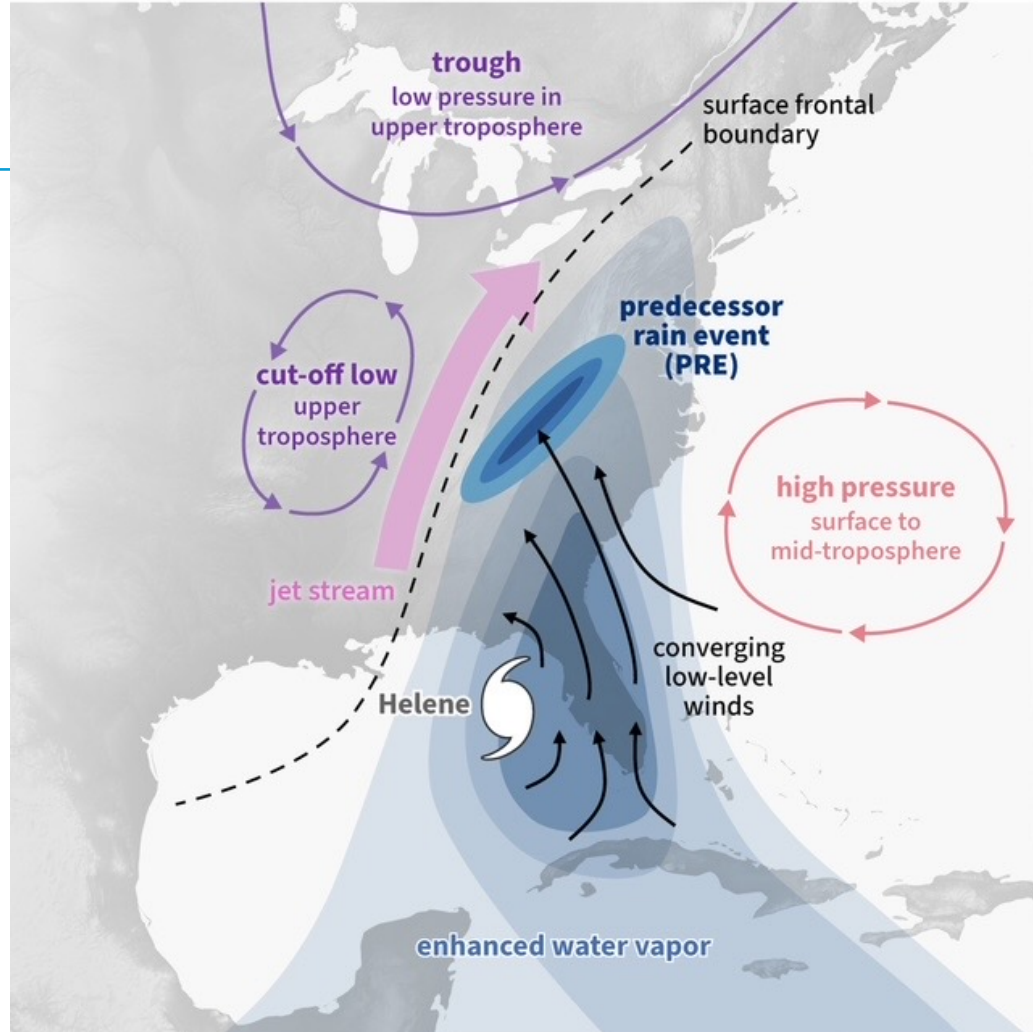
WNC Wildfire Summit

June 26th

The N.C. Forest Service is a division of the N.C. Depart. of Agriculture & Consumer Services
Steve Troxler, Commissioner

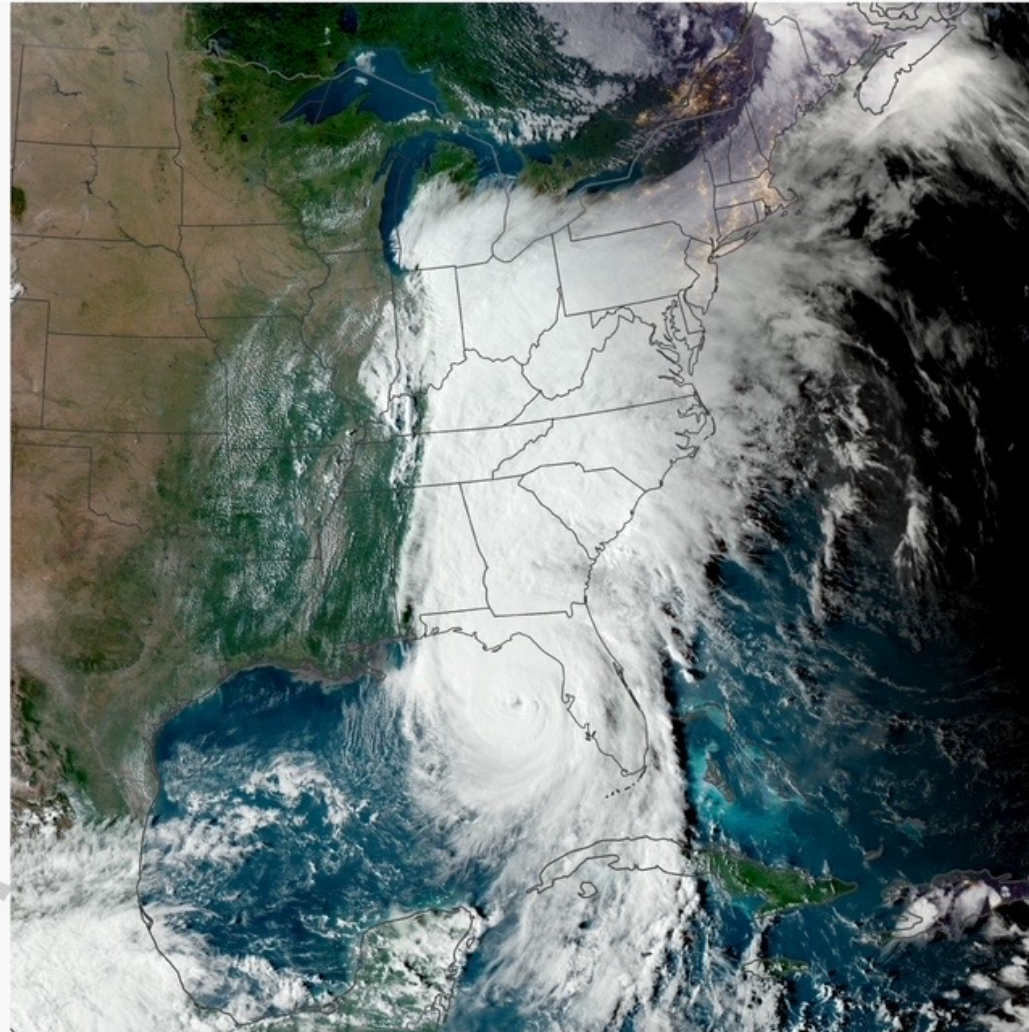


Weather patterns tapped Helene's moisture well before landfall



NOAA Climate.gov
Data: CW3E, adapted from
schematic by J. Cordeira

Clouds and rain stretched hundreds of miles north of Helene on September 26



NOAA Climate.gov
Data: NOAA GOES-16





NCFS Helene Response Overview

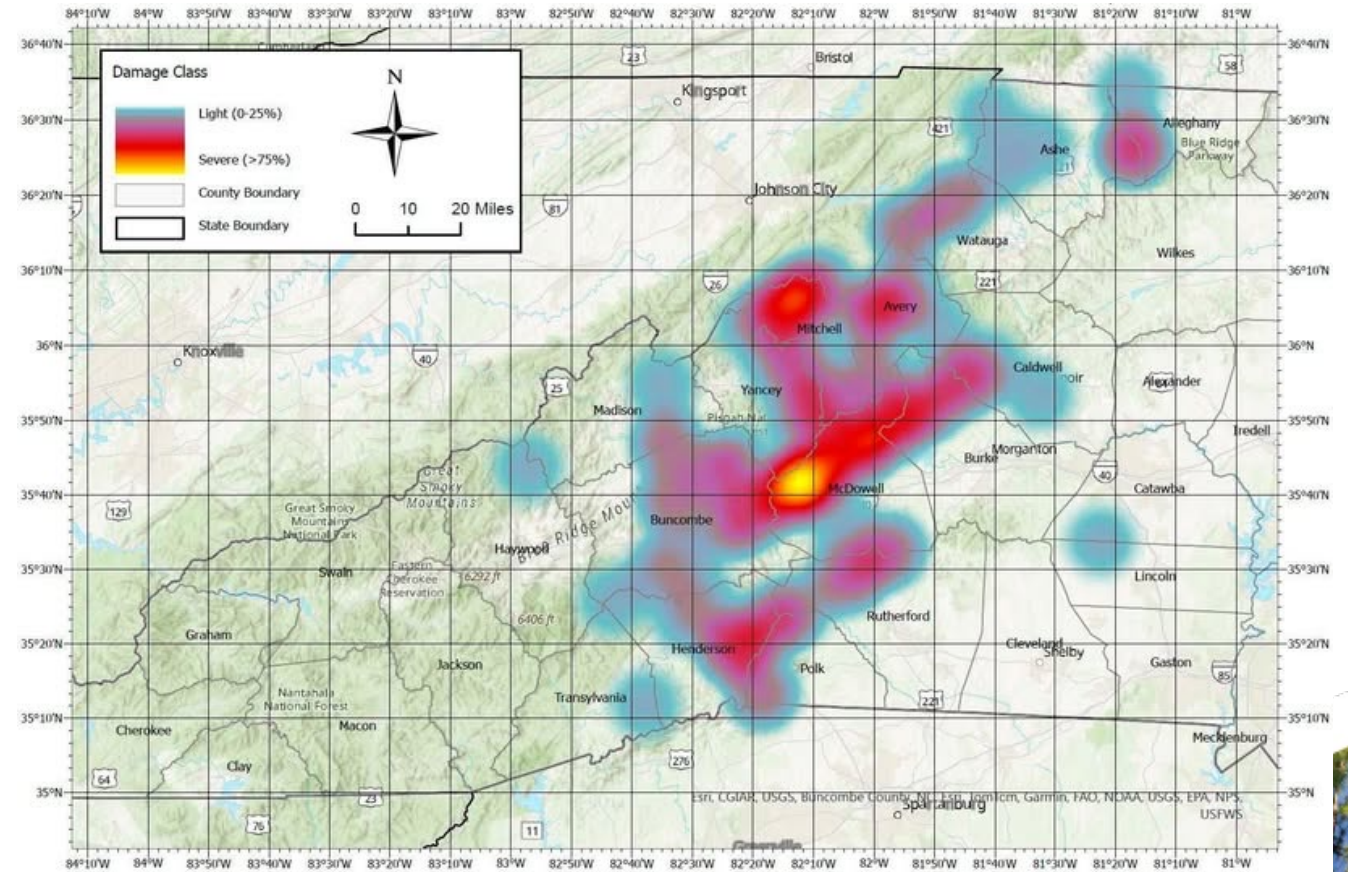
- Ag Emergency Operation Center (EOC) support
- 3 NCFS CIMT rotations (Sept. 30 to Nov. 20) to support NCEM
- 150+ Web EOC responses (12/31/24)
 - Search and rescue,
 - road clearing,
 - food and water,
 - generators
 - temporary medical treatment facilities
 - temporary bridge installation
 -and many others.
- More than 400 employees engaged in operations. NCFS recorded 67,983 hours of time worked on Helene response efforts.



Helene Response



Helene Response





NCFS Helene Recovery – Identifying the Problems

- Estimated 820,000+ acres of timber damage
- Fuel management & Wildfire preparedness
- Forest Management
 - Opportunities
 - Challenges
 - Utilization
 - Oak opportunities
 - Invasive species





NCFS Helene Recovery – Partnerships

- Started to discuss with Cooperators (we are all in this together)
- Identify new Partnerships to help frame the issues, work on solutions:
 - WNC Wildfire Risk Roundtable
 - NCFS, USFS, NOAA, NCICS, NCSU, Asheville Fire, NCGS, LOS, USFS SRS, UNC NEMAC, NCDEQ, Buncombe Co EM
 - Local EM, County Governments, Non-profits, FEMA, NCIDR



NCFS Helene Recovery – Framing the Issue

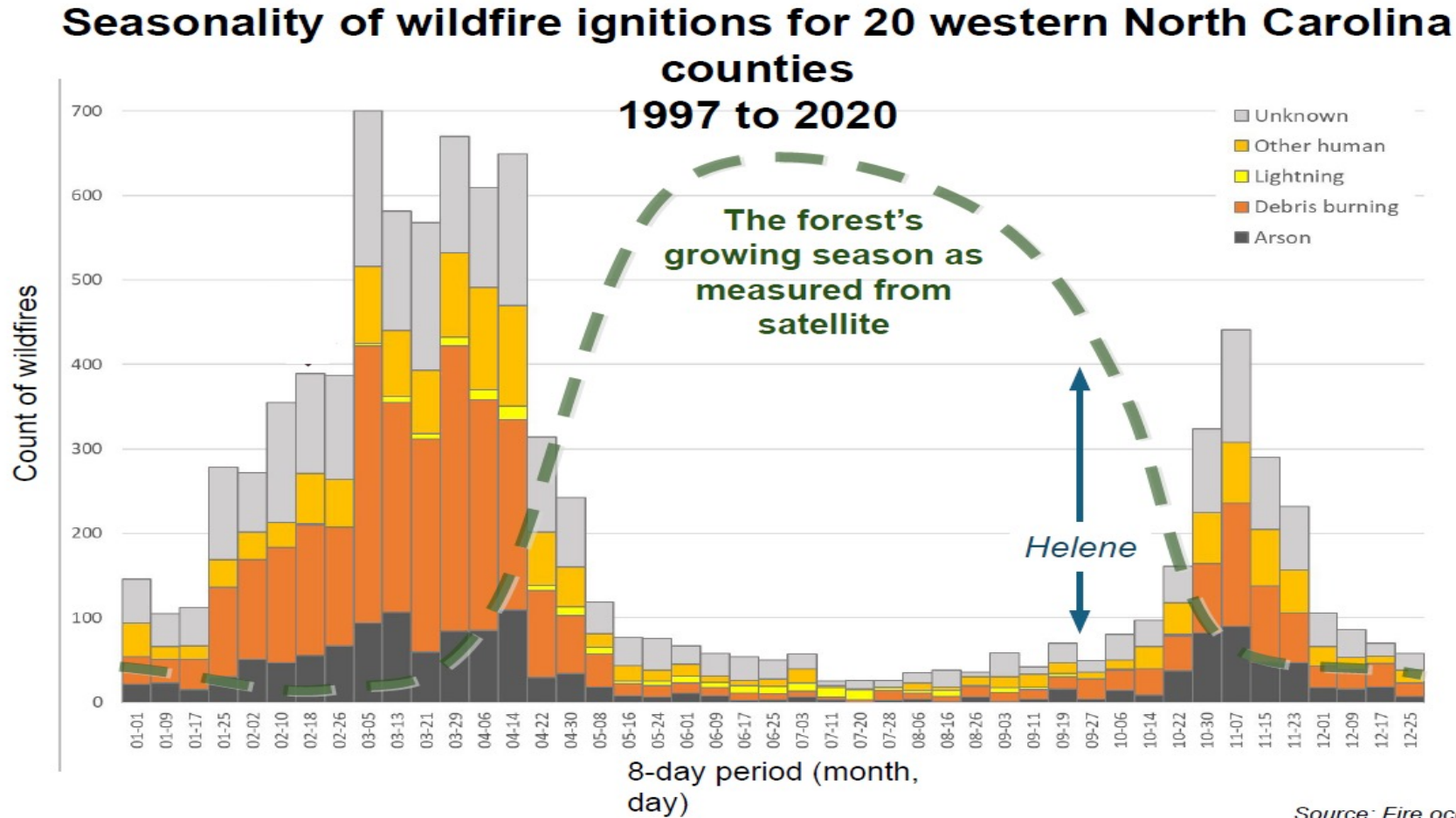
- Wildfire Preparedness and Fuel Management



- Access for Emergency Response
 - Wildfires will become larger
 - More Structures and critical infrastructure will be at Risk
- Severity of Wildfires
 - Increased fuel loading will hamper containment efforts by increasing the intensity of the wildfires
 - Large Timber will dry over time and contribute to wildfire intensity over a long period of time (15+ years).
- Wildland Urban Interface
 - Combining fast moving fires that are hard to access and contain with urban interface can have catastrophic impacts.



NCFS Helene Recovery – Wildfire Preparedness and Fuel Management



NCFS Helene Recovery



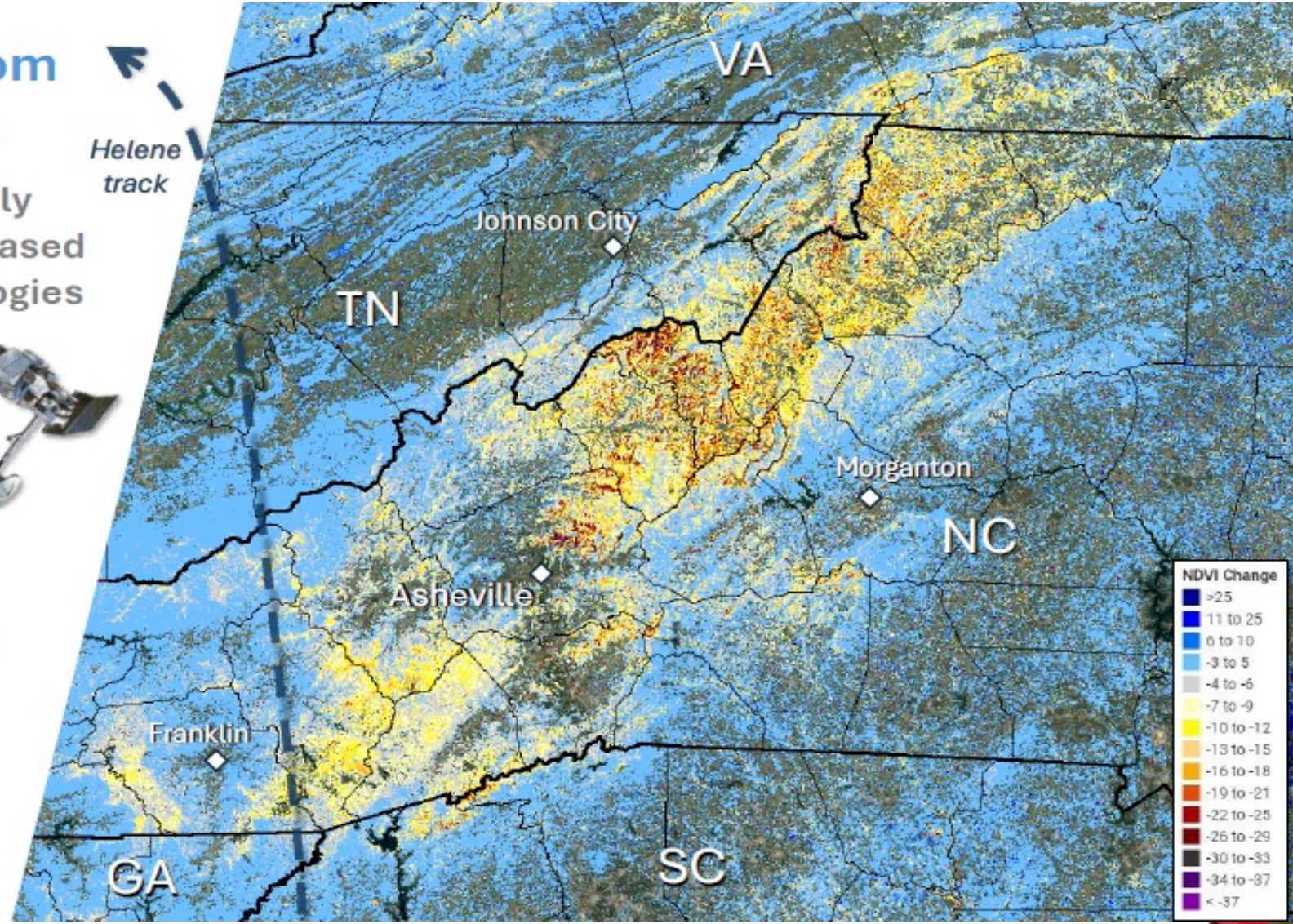
Forest impacts from Hurricane Helene

were rapidly and precisely mapped from satellite-based remote sensing technologies

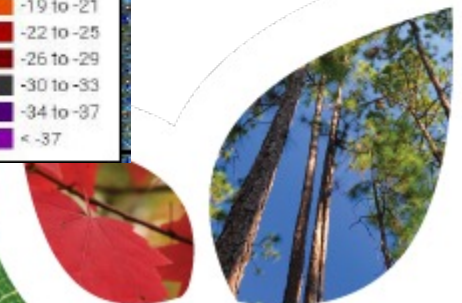
ESA's
Sentinel-2
(5-day; 10-m)



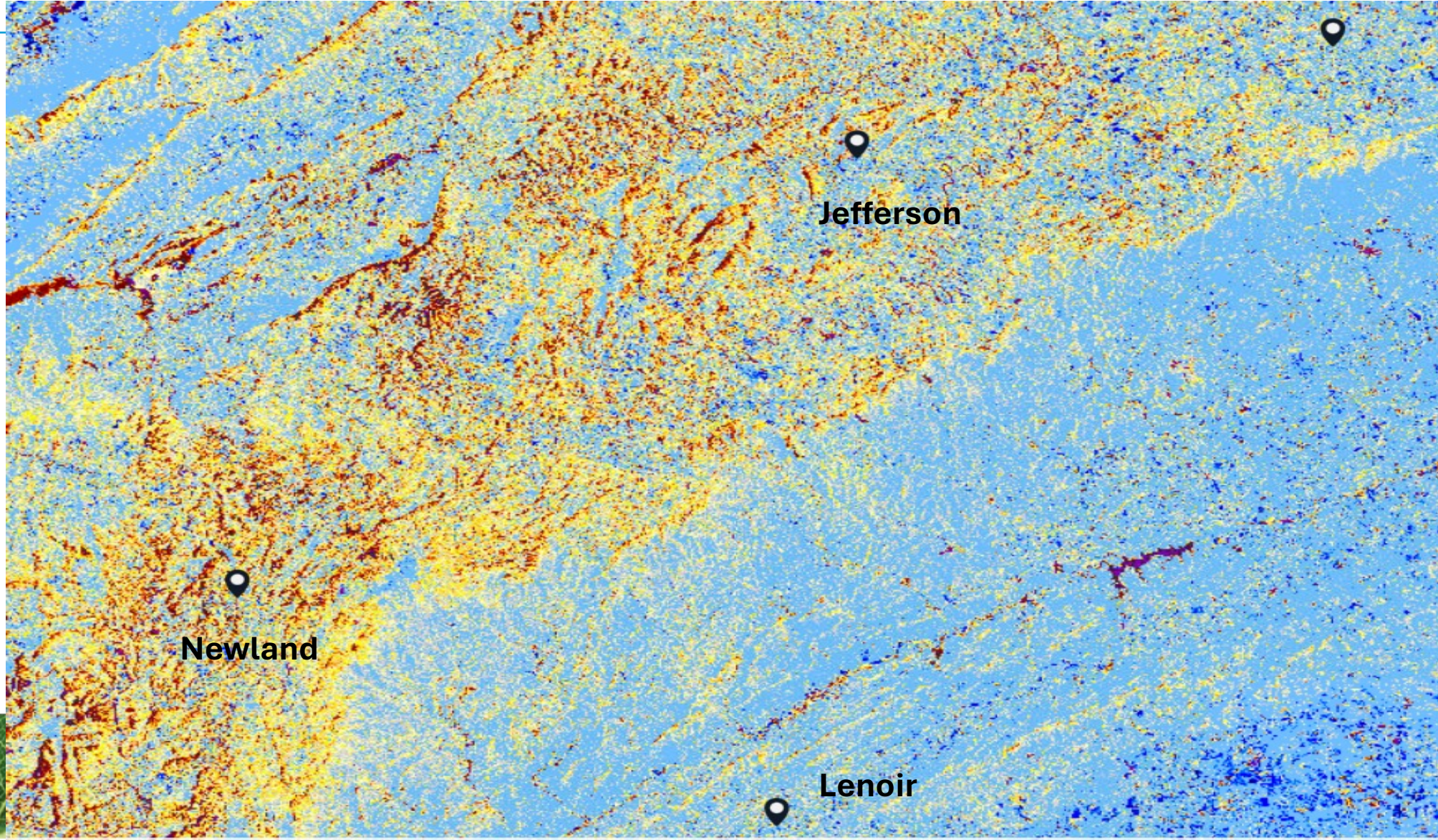
At right:
1-year change in early October
Normalized Difference
Vegetation Index (NDVI)



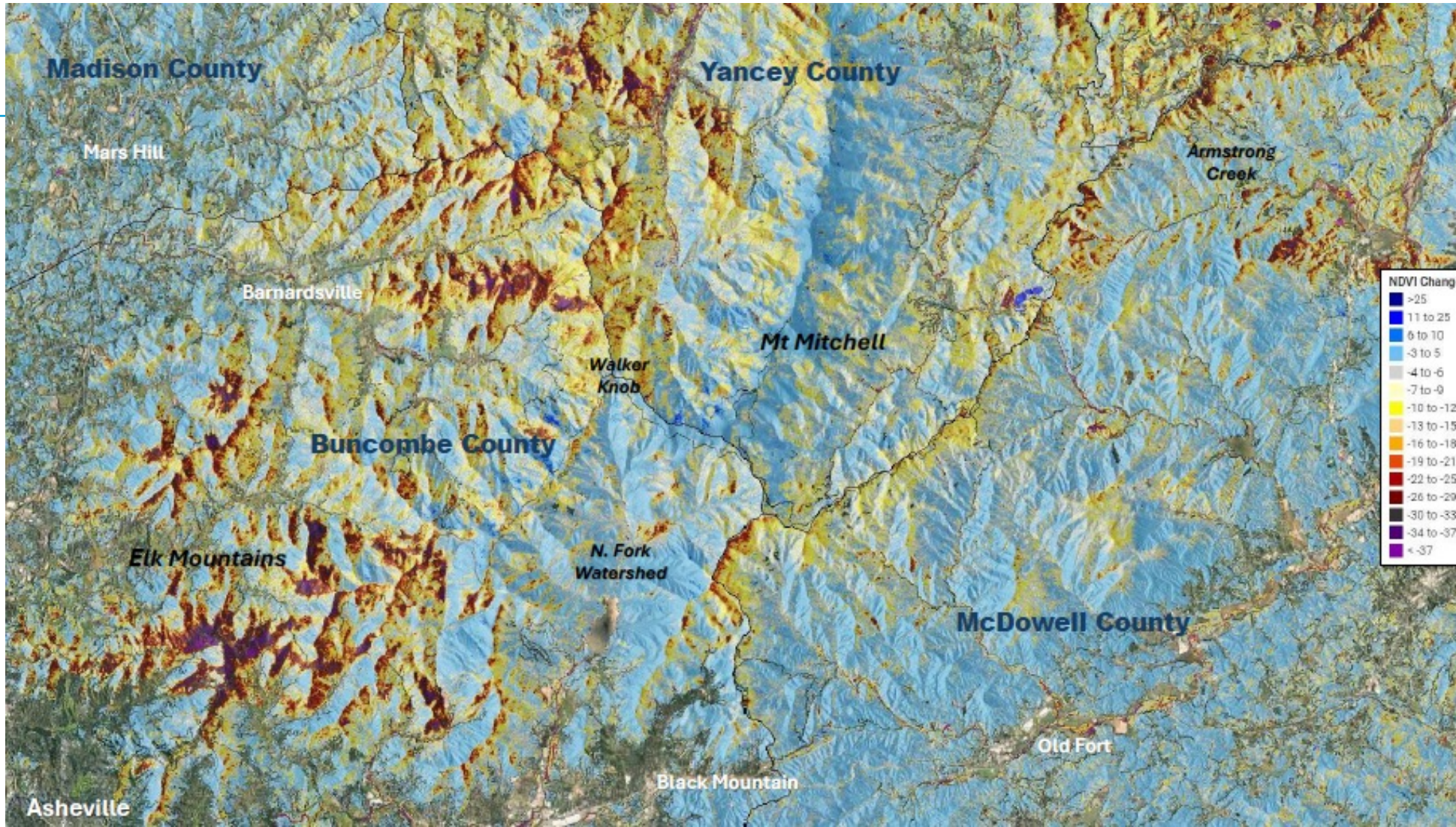
HiForm
High-resolution forest mapping



NCFS Helene Recovery



NCFS Helene Recovery



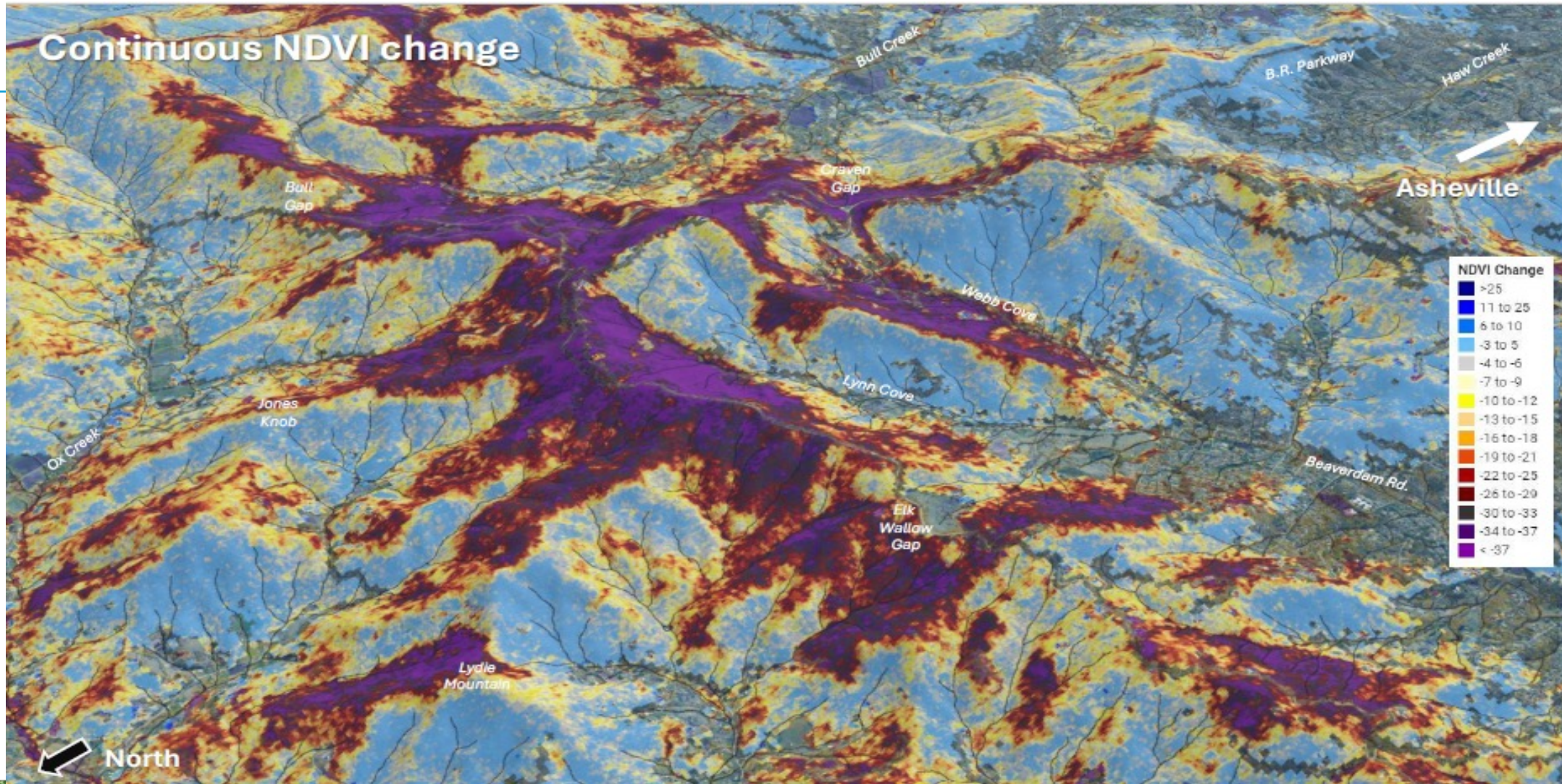
NCFS Helene Recovery



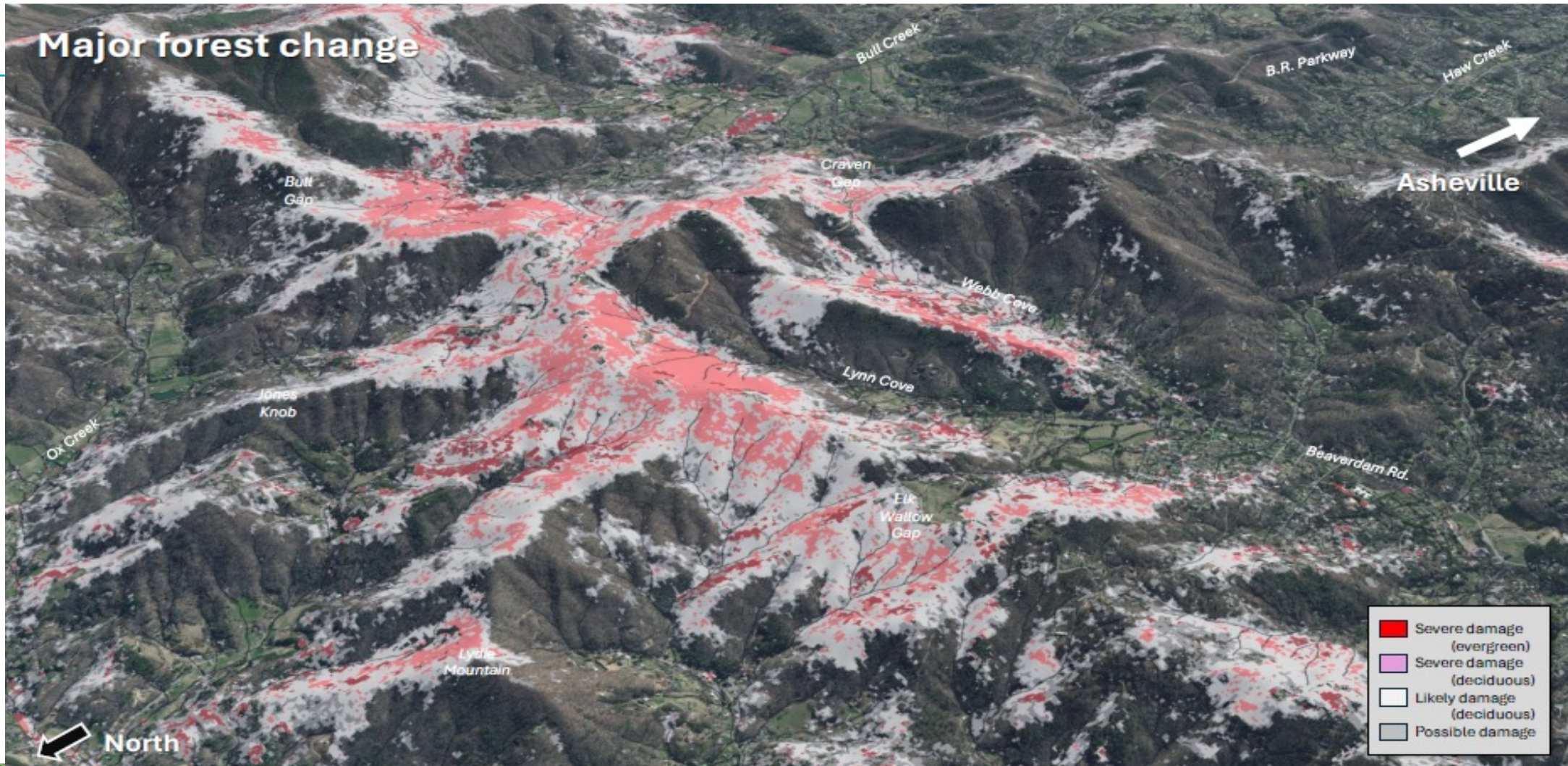
Blowdown was common on upper exposed slopes



NCFS Helene Recovery



NCFS Helene Recovery



NCFS Helene Recovery

Acres of major non-urban forest damage from Helene in western NC



County	Major severe conifer damage	Major severe deciduous damage	Likely major forest damage	Possible major forest damage	Overall acres with severe/major damage
Ashe	1,140	519	17,333	38,205	57,196 (29.9%)
Mitchell	3,029	4,517	22,457	26,386	56,390 (48.2%)
Watauga	1,004	663	13,806	30,809	46,282 (31.6%)
Buncombe	1,830	2,502	14,015	26,817	45,163 (16.9%)
Yancey	1,348	1,450	12,402	29,234	44,433 (26.5%)
Avery	1,175	933	14,341	27,900	44,348 (35.3%)
Jackson	360	49	2,730	22,892	26,031 (10.0%)
Haywood	501	163	3,160	22,037	23,862 (8.7%)
McDowell	1,205	1,100	6,552	14,954	23,810 (10.5%)
Transylvania	410	75	2,084	17,133	19,703 (9.8%)
Henderson	1,225	395	3,723	13,874	19,218 (13.3%)
Burke	1,316	238	2,068	8,793	12,414 (5.4%)
Madison	156	165	1,581	8,823	10,725 (4.6%)
Alleghany	272	58	1,756	8,424	10,509 (12.5%)
Caldwell	490	137	1,022	6,519	8,168 (3.7%)



NCFS Helene Recovery



Helene affected wildfire hazards near structures in different ways



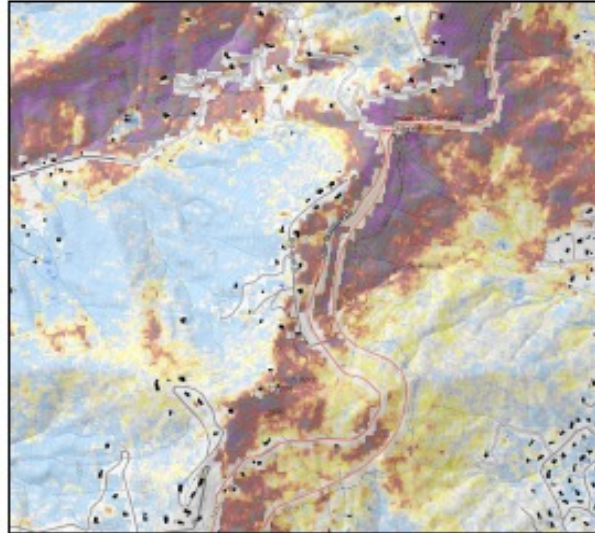
NCFS Helene Recovery



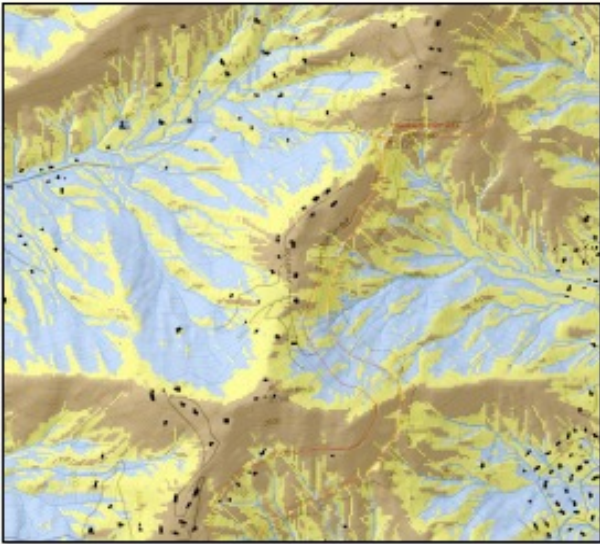
LANDFIRE fuels
(not used)



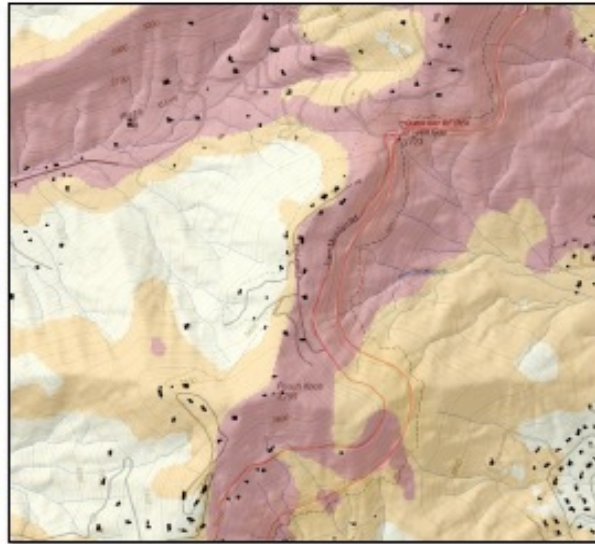
Helene canopy/fuels
impacts from 10m
HiForm



Relative site
dryness (TRMI)



Helene canopy/fuels
impacts for 5-acre
moving window area
analysis (a smoothed
version of the map
above)



NCFS Helene Recovery



Altered wildfire hazards near structures for 16-counties across western North Carolina

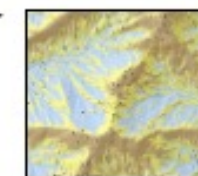


**Five-acre
near-structure
blowdown or
canopy damage**

Total structures
616,785
100%

	112,767 18.3%	429,530 69.6%	74,488 12.1%	
Severe	4,935 0.8%	8,589 1.4%	3,063 0.5%	16,587 2.7%
Possible	39,466 6.4%	106,394 17.2%	23,991 3.9%	169,851 27.5%
None/minor	68,366 11.1%	314,547 51.0%	47,434 7.7%	430,347 69.8%
	Wet (low)	Moderate	Dry (high)	
	Relative site moisture index- TRMI			

Background fire hazard

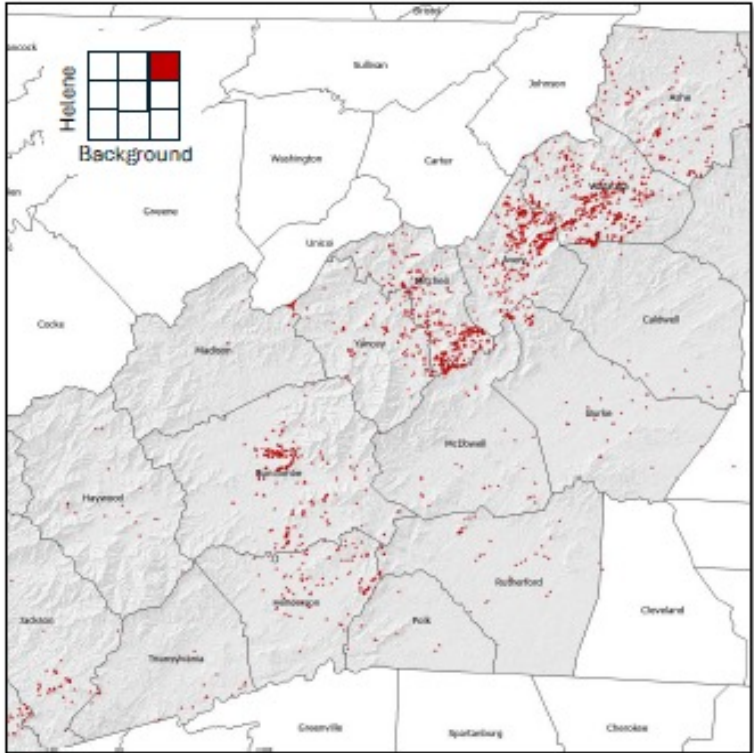


NCFS Helene Recovery



Structures near severe blowdown (only)
compared to the background fire hazard

Number of structures					% by background hazard				
County	Wet	Moderate	Dry	Grand Total	Wet	Moderate	Dry	Grand Total	
Ashe	492	589	195	1,276	10.0%	6.9%	6.4%	7.7%	
Avery	657	1,252	586	2,495	13.3%	14.6%	19.1%	15.0%	
Buncombe	616	1,149	357	2,122	12.5%	13.4%	11.7%	12.8%	
Burke	66	221	73	360	1.3%	2.6%	2.4%	2.2%	
Caldwell	51	104	39	194	1.0%	1.2%	1.3%	1.2%	
Haywood	178	224	20	422	3.6%	2.6%	0.7%	2.5%	
Henderson	285	723	135	1,143	5.8%	8.4%	4.4%	6.9%	
Madison	57	39	21	117	1.2%	0.5%	0.7%	0.7%	
McDowell	363	398	123	884	7.4%	4.6%	4.0%	5.3%	
Mitchell	727	1,480	473	2,680	14.7%	17.2%	15.4%	16.2%	
Polk	45	25	11	81	0.9%	0.3%	0.4%	0.5%	
Rutherford	141	128	58	327	2.9%	1.5%	1.9%	2.0%	
Transylvania	43	91	20	154	0.9%	1.1%	0.7%	0.9%	
Watauga	645	1,495	783	2,923	13.1%	17.4%	25.6%	17.6%	
Wilkes	18	68	16	102	0.4%	0.8%	0.5%	0.6%	
Yancey	551	603	153	1,307	11.2%	7.0%	5.0%	7.9%	
Grand Total	4,935	8,589	3,063	16,587	100.0%	100.0%	100.0%	100.0%	

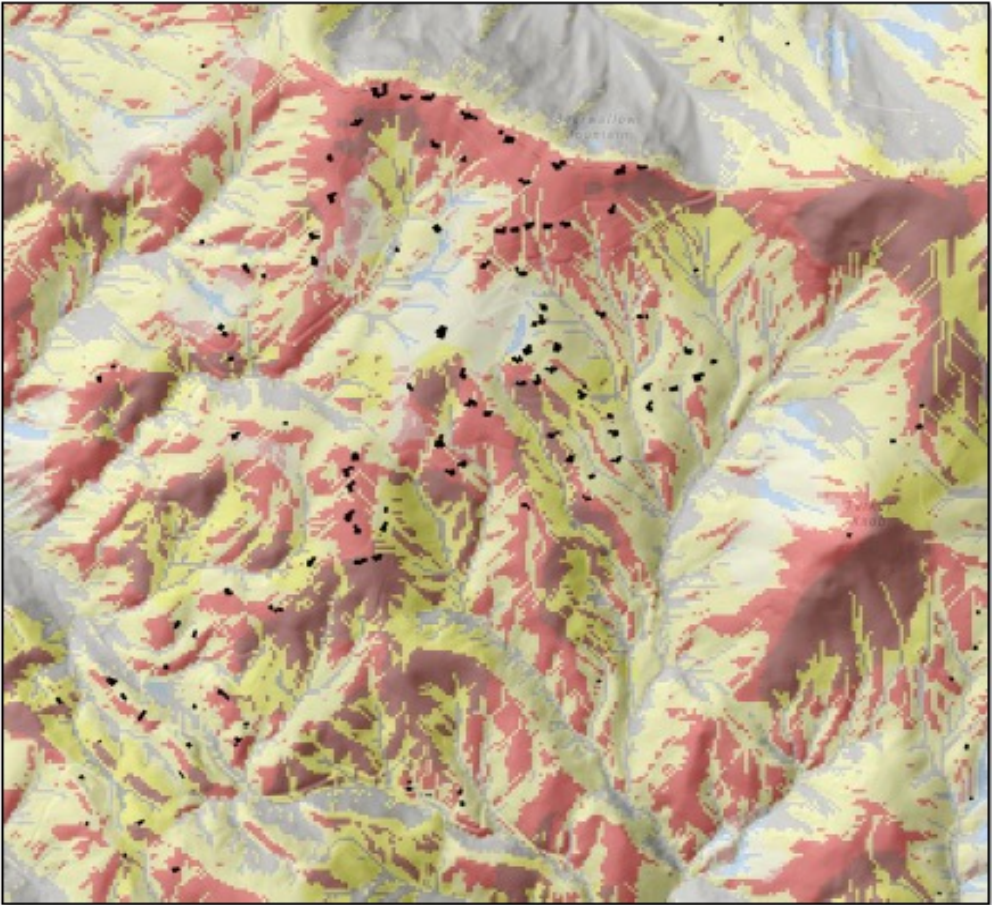


The 3,063 structures near severe
blowdown on dry fire-prone sites

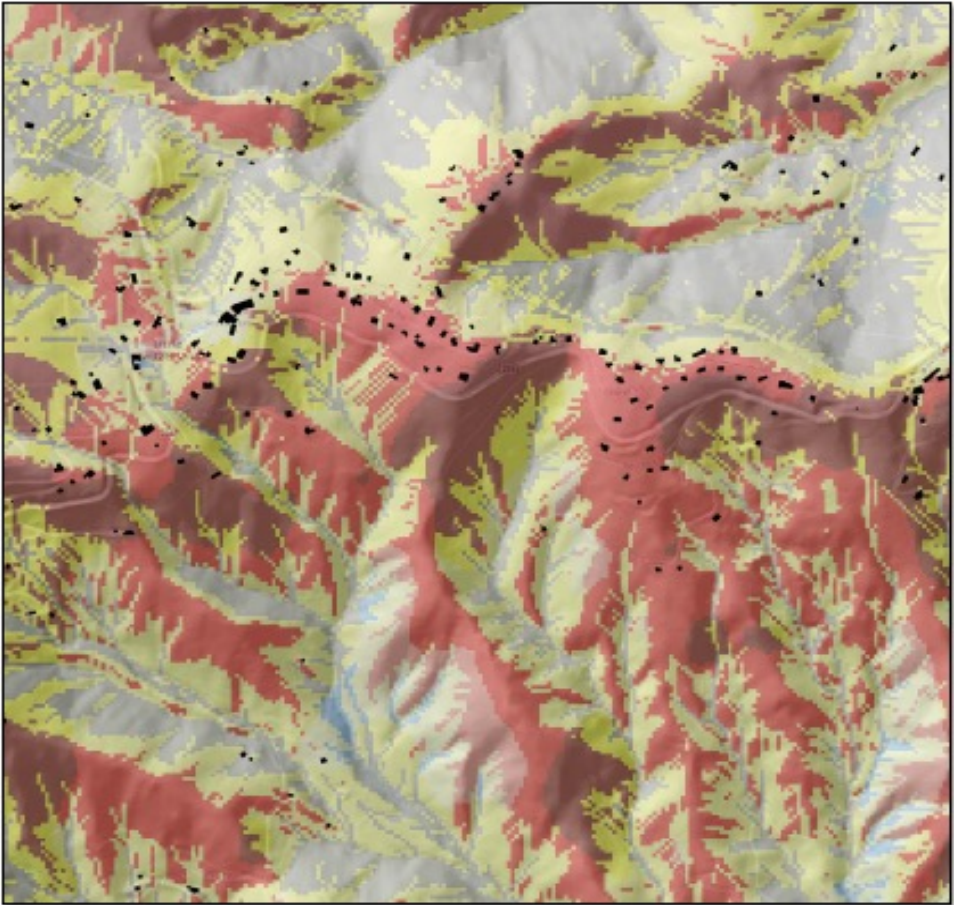


NCFS Helene Recovery

Structures compared to the combined background and Helene fire hazard



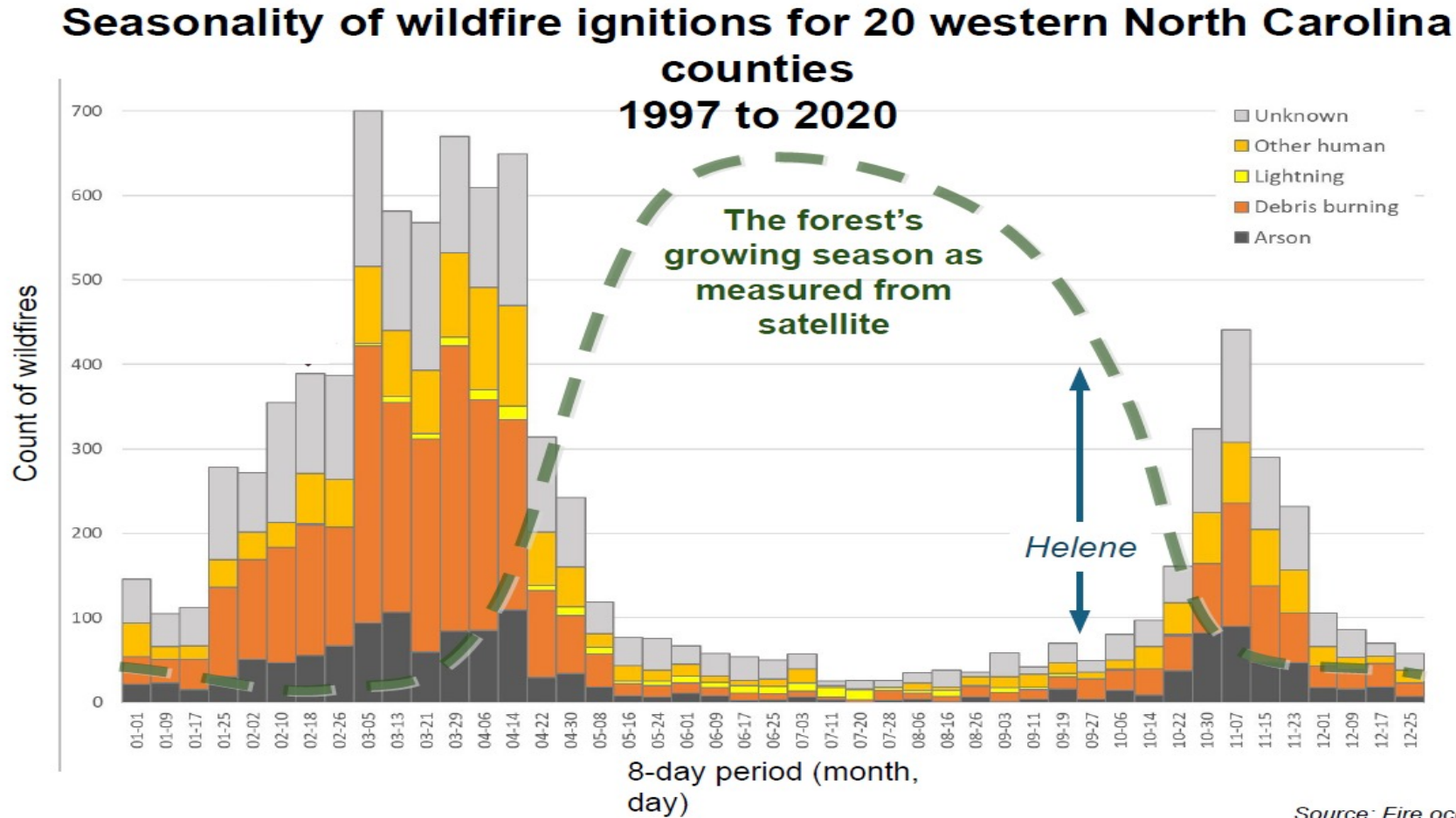
Bearwallow Mountain, Henderson, Buncombe Co.



Little Switzerland area, McDowell-Mitchell Co.



NCFS Helene Recovery – Wildfire Preparedness and Fuel Management



WNC Spring Wildfire Season 2025

Started Early – end of January



Crooked Creek Fire

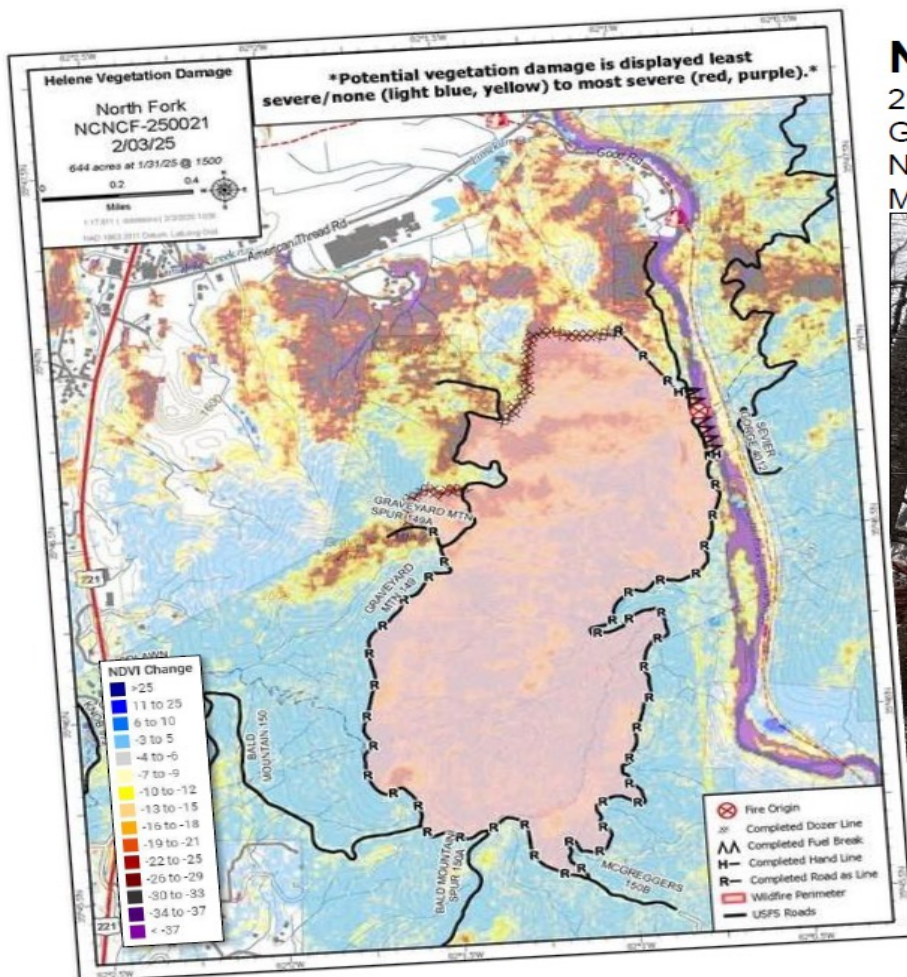
1-29-25: 220 acres
NCFS McDowell Co.
4 minor structures lost
1 residence damaged

North Fork Fire

29 Jan. 2025; 644 acres
Grandfather Ranger District, Pisgah NF.
McDowell Co., NC



Photo credit:
USFS



WNC Spring Wildfire Season 2025

Large Wildfires:



3910 Fire

3-1-25: 619 acres

NCFS Polk Co.

1 minor structures lost

136 Structures Threatened

Bailey Drive Fire

3-11-25: 133 acres

NCFS Mitchell Co.

1 minor structures lost

12 Structures Threatened



WNC Spring Wildfire Season 2025

Large Wildfires: Black Cove Complex



Black Cove Fire

3-19-25: 3502 acres
NCFS Polk Co.
7 residences lost
258 Structures Threatened

Deep Woods Fire

3-19-25: 3969 acres
NCFS Polk Co.
1 residence lost
210 Structures Threatened

Fish Hook Fire

3-20-25: 199 acres
NCFS Polk Co.
3 residence lost
49 Structures Threatened

Estimated total cost 4.2 Mil



WNC Spring Wildfire Season 2025

Large Wildfires:



Iron Circle Fire

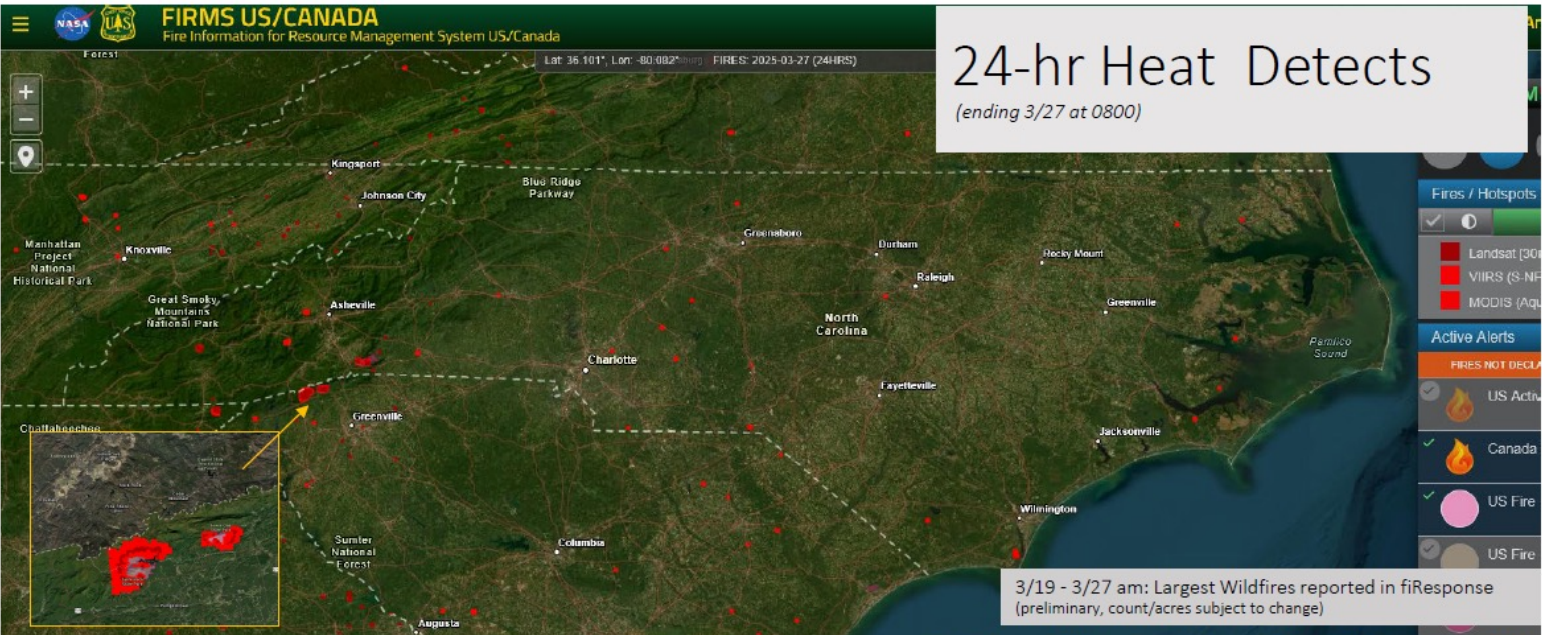
3-22-25: 160 acres
NCFS Burke Co.
37 Structures Threatened

Old Hwy. #1 Fire

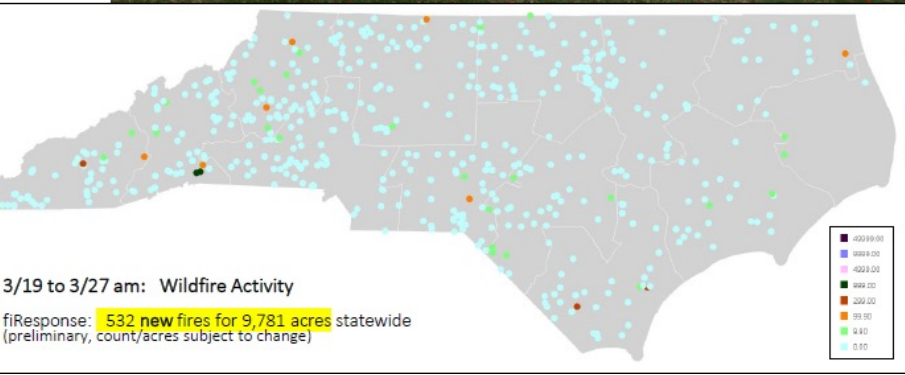
3-22-25: 250 acres
NCFS Wilkes Co.
2 minor structures lost
115 Structures Threatened

Alarka #5 Fire

3-25-25: 1575 acres
NCFS Swain Co.
1 residences lost
183 Structures Threatened



Incident Name	Discovery Date	Region	District	County	Acres
Black Cove	3/19/2025	Region 3	District 1	Polk County	2813.00
Deep Woods	3/19/2025	Region 3	District 1	Polk County	2742.00
Alarka Road #5	3/25/2025	Region 3	District 9	Swain County	750.00
Crusoe Island Rd	3/25/2025	Region 1	District 8	Columbus County	536.00
Holly Shelter Road 2	3/24/2025	Region 1	District 8	New Hanover County	340.00
Deaton Ln	3/19/2025	Region 2	District 3	Richmond County	279.00
Goinstown Road	3/22/2025	Region 2	District 10	Stokes County	276.60
Carolina Club	3/20/2025	Region 1	District 7	Currituck County	250.00
Old Hwy 16 #1	3/22/2025	Region 3	District 2	Wilkes County	250.00
Fish Hook Fire	3/20/2025	Region 3	District 1	Polk County	199.00
Rattlesnake Branch	3/26/2025	Region 3	District 9	Haywood County	175.00
Iron Circle	3/22/2025	Region 3	District 2	Burke County	147.00
Tomahawk Ridge	3/21/2025	Region 3	District 2	Caldwell County	65.00
Freedom Farm Road	3/26/2025	Region 3	District 1	Buncombe County	60.00
Kane Rx Burn Rekindle	3/20/2025	Region 2	District 11	Person County	51.55
Monteith Branch	3/26/2025	Region 3	District 9	Jackson County	50.00
Leechville Bridge Fire	3/19/2025	Region 1	District 13	Hyde County	45.00



WNC Spring Wildfire Season 2025

Large Wildfires:

Freedom Farm Fire

3-26-25: 130 acres
NCFS Buncombe Co.
50 Structures Threatened

NC Table Rock Fire

3-26-25: 635 acres
NCFS Transylvania Co.
100 Structures Threatened
Estimated costs: 650,000

Rattlesnake Branch Fire

3-26-25: 1843 acres
NCFS / USFS Haywood Co
estimated costs 2.6 Mil



WNC Spring Wildfire Season 2025

Large Wildfires:



Bee Rock Creek Fire

4-15-25: 2085 acres
NCFS / USFS McDowell Co.
15 Structures Threatened
Estimated costs 2.3Mil

Sam Davis Rd Fire

4-18-25: 559 acres
NCFS Swain Co.
65 Structures Threatened
Estimated costs .5 Mil

Bald Fork Fire

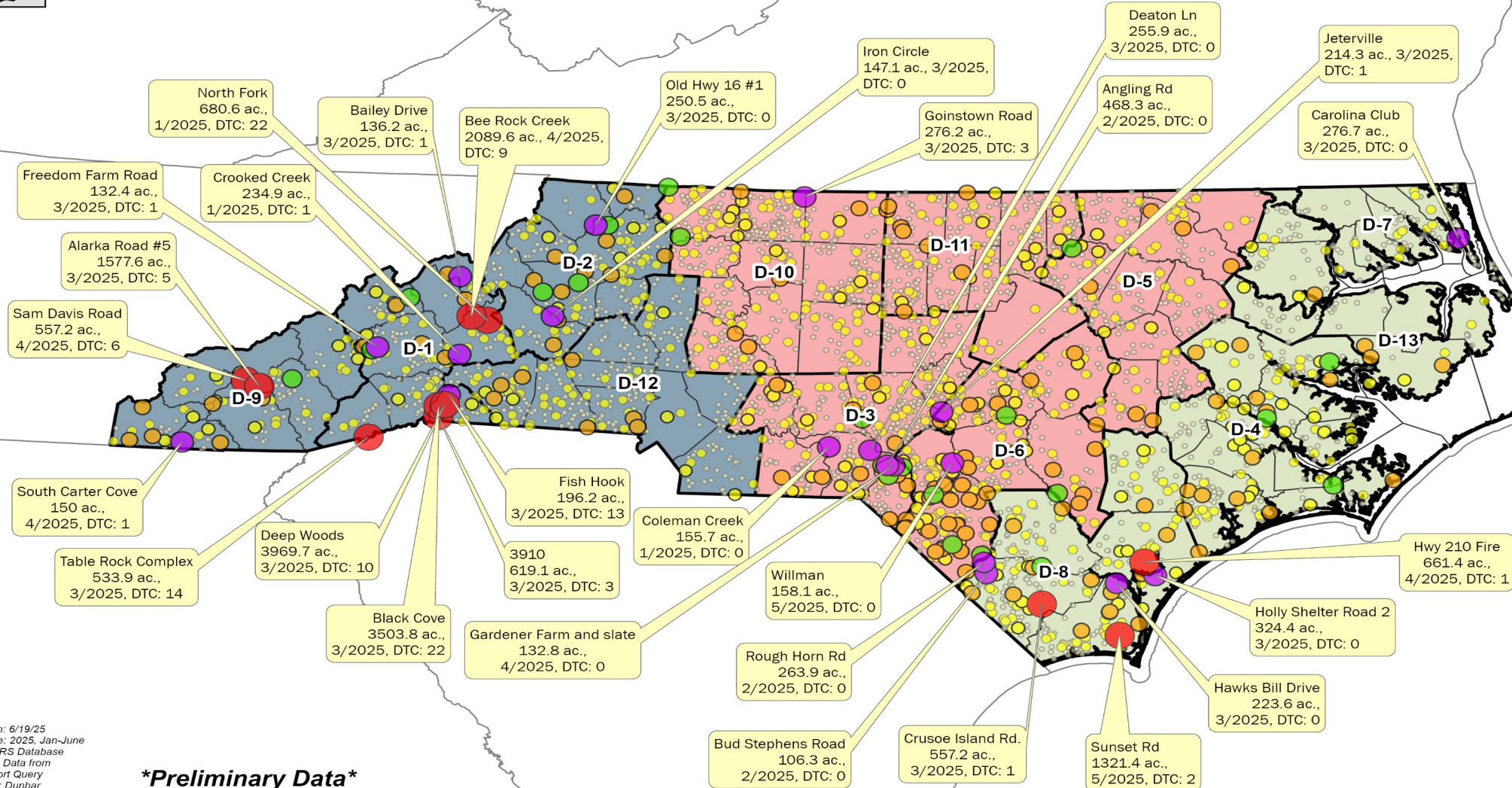
4-17-25: 105 acres
NCFS Ashe Co.





NC Forest Service Fire Locations - CY 2025 (YTD) Ending 6/18/25

Fires ≥ 100 acres are labeled, State recorded acres only
Fire Containment (Days to Containment, DTC) ≠ Controlled



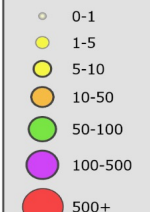
Date Drawn: 6/19/25
Date Range: 2025, Jan-June
Source: FARS Database
Preliminary Data from
NASF Report Query
Created by: Dunbar

Preliminary Data



NCFS Fires:
YTD - 2025

Fire Size (ac.)



NCFS Districts
NC Counties

NCFS Regions
Coastal Region (1)
Piedmont Region (2)
Mountain Region (3)
US States

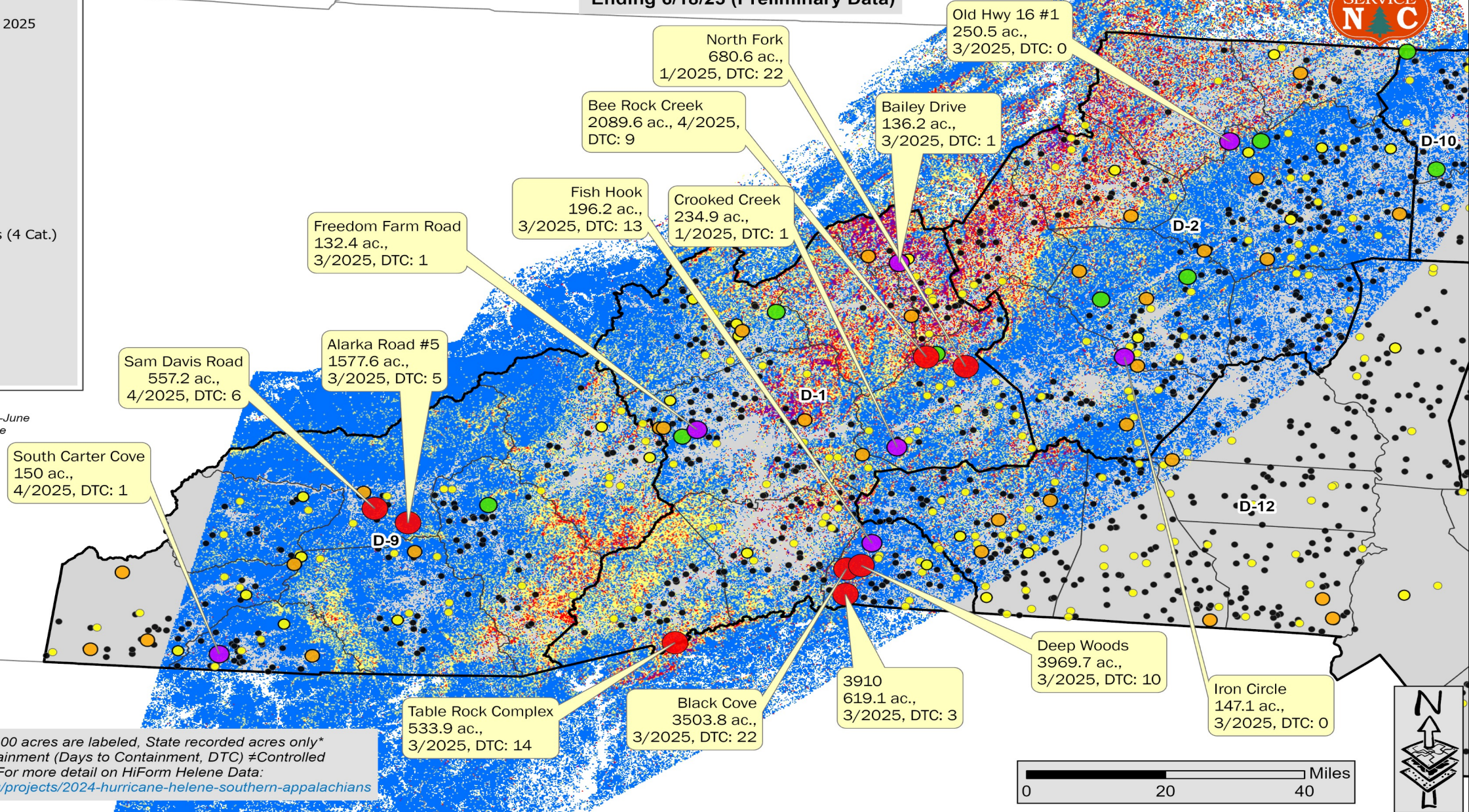
NC Forest Service Fire Locations - CY 2025 (YTD)

Ending 6/18/25 (Preliminary Data)

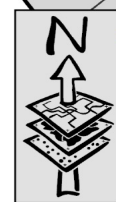
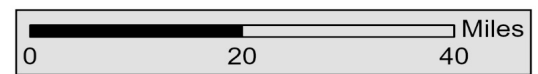


NCFS Districts
 NC Counties
 US States
 NCFS Fires: YTD - 2025
 Fire Size (ac.)
 • 0-1
 • 1-5
 • 5-10
 • 10-50
 • 50-100
 • 100-500
 • 500+
 Helene Impacts (4 Cat.)
 USFS SRS Data
 Damage Type
 1
 2
 3
 4

Date Drawn: 6/19/25
 Date Range: 2025, Jan-June
 Source: FARS Database
 Preliminary Data from
 NASF Report Query
 Created by: Dunbar



Fires ≥ 100 acres are labeled, State recorded acres only
 Fire Containment (Days to Containment, DTC) ≠ Controlled
 For more detail on HiForm Helene Data:
<https://hiform.org/projects/2024-hurricane-helene-southern-appalachians>



WNC Spring Wildfire Season Summary 2025



How did this Spring compare to past years?

Top 10 Years (from 1970-2025)

- FARS NASF Report Query – Region 3 Counties by Calendar Year, binned for Jan-May.

Preliminary Data!!

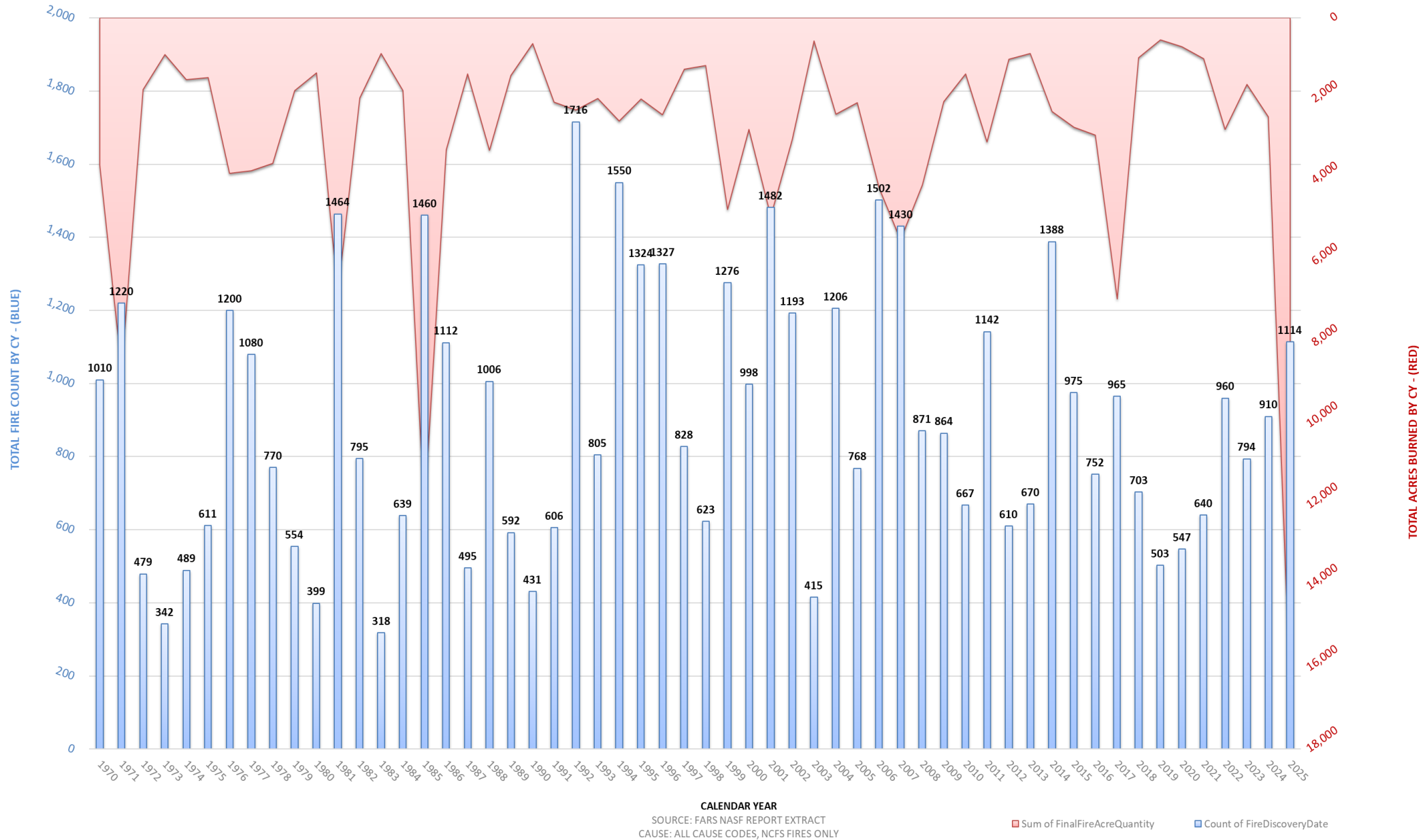
1st in Total acreage of Wildfires

Calendar Year (Jan-May)	Count of Fire Discovery Date (Jan - May)	Sum of Final Acreage by Discovery Date (Jan-May)
2025	1,114	16,584
1985	1,460	12,158
1971	1,220	8,650
2017	965	6,921
1981	1,464	6,779
2007	1,430	5,454
2001	1,482	4,885
1999	1,276	4,706
2006	1,502	4,185
2008	871	4,108



All Cause Codes - Region 3 Fires by CALENDAR YEAR (1970-2025)

(by discovery date)



WNC Spring Wildfire Season Summary 2025



What does the future hold for Wildfire in Western NC?

Questions?

