

Oregon and Climate Change

The Age of Megafires in the American West

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OREGON'S LABOR DAY WEEKEND wildfires of September 2020 dwarf my experiences as a crew foreman for the Eastern Lane Forest Protective Association in the 1960s. The fires we fought were small, five to twenty-five acres — our responsibility, respond quickly to contain the blazes. During the 1967 season, we fought a fire that started along the McKenzie River Highway 126, burning through steep cliffs on the north side of the road into the forest. Although it burned through difficult terrain, our crew held the fire to less than 100 acres. The 173,393-acre Holiday Farm fire that roared through the McKenzie Valley in September 2020 turned that 1967 incident into a mere flame. Those summer experiences, while working toward a doctorate in history at the University of Oregon, marked the beginnings of a career-long intellectual and scholarly journey, learning about fire history and policy. During the mid 1970s, I began teaching environmental history at Oregon State University (OSU), broadening my understanding of the importance of fire in sustaining healthy landscapes. With the publication of *Landscapes of Promise: The Oregon Story, 1800–1940* in 1997, I extended my knowledge of the history and politics of wildfire. The essay that follows foregrounds evidence about climate change, a theme that did not surface in my writing until the late 1990s.¹

The alerts — via radio, television, and cell phones — came with a rush on Labor Day, September 7, 2020. Red Flag warnings alerted citizens in Oregon, Washington, and northern California of hurricane-force east winds (blowing from the east) and the escalating danger of wildfire ignition and spread. On the Oregon Coast, the online *Tillamook County Pioneer* alerted residents of dangerous east winds and the closure of the nearby state forest. Public-use restrictions were moving to “Extreme,” the site announced, referring to a National Weather Service briefing that catastrophic winds were expected on Monday afternoon. Similar Red Flag alerts extended to fire-prone California’s



U.S. Forest Service, Oregon, InciWeb

A HAND CREW DIGS LINE through brush on September 21, 2020, while working to slow the Holiday Farm fire in the McKenzie Valley. The fire began on September 7 near Rainbow, Oregon, and burned over 173,000 acres.

Berkeley Hills and Nevada County, northwest of Lake Tahoe. The National Weather Service described the meteorological phenomenon:

Unseasonably cold and strong high pressure will push south-southeast from the Yukon, while strong, thermally-induced low pressure holds along the central and southern Oregon Coast. The pressure gradient between these two features will drive strong to potentially very strong east to northeast winds Monday night and Tuesday, bringing hot and dry conditions all the way to the coast. . . . This has the potential to see rapid fire spread rates develop for any lingering fires which occur prior and during the holiday weekend.²

The fifty to seventy mile-per-hour east winds blowing down the western slopes of the Cascades through Oregon’s river valleys turned small blazes into huge infernos and ignited new flames exploding into megafires on the night of September 7. That extraordinary, anomalous event became another



GUARDS WATCH FOR FIRE on the summit of Mount McLoughlin in August 1910, during the great fires that burned parts of Montana, northern Idaho, and Washington. The heroic experiences of U.S. Forest Service personnel on the 1910 fires shaped public approaches toward forest fires for most of the twentieth century.

chapter in the storied annals of the Pacific Northwest, where centuries of climate and cultural influences have shaped fire history. The human story begins with Indigenous people, who valued fire as an ecological tool to enhance their sustainable livelihoods. Euro-Americans, who viewed most wildfires as destructive, brought a different cultural focus to the practice. After the United States established dominion over the region and the lumber industry became the mainstay of the Northwest economy, efforts to protect timberlands from fire became critical.

Following the great fires that scorched parts of Montana, northern Idaho, and Washington in 1910, state and federal governments passed legislation to protect against such conflagrations. As Timothy Egan describes in *The Big Burn: Teddy Roosevelt and the Fire that Saved America*, the U.S. Forest Service became guardian of America's public timberlands, its rangers heroically protecting national forests from fire. The 1910 fires, historian Stephen Pyne

contended, shaped American attitudes toward fire for most of the twentieth century, succeeding to the point that by the late twentieth century "forests were diseased and dying and prone to catastrophic fire."³

Although unusual, the east winds powering the western Oregon conflagrations in September 2020 were not unprecedented. The state's twentieth-century fire history reveals numerous accounts of east-wind firestorms burning areas from the Cascade Range to the coast. The best known, the first of the Tillamook burns, started in a logging operation in August 1933, scorching 40,000 acres and then exploding after a few days, when strong east winds pushed the fire to 240,000 acres in twenty-four hours and to 355,000 acres before fall rains dampened the blaze. The Tillamook burns recurred at six-year intervals: 1939 (209,000 acres), 1945 (182,000 acres), and 1951 (32,700 acres), with strong east winds the catalyst behind each fire. The town of Bandon on Oregon's south coast caught fire in 1936 when powerful east winds blew embers from a blaze in the coastal mountains into town, igniting highly flammable gorse plants that grew throughout the community. When the embers cooled, the blaze had destroyed Bandon and torched 143,000 acres.⁴

Following those fires, Forest Service scientists observed that strong east winds blowing off the high arid lands east of the Cascade Range were responsible for turning the Tillamook fires into major conflagrations. Owen Cramer, an agency meteorologist, reported in 1957 that "small fires and severe east winds" caused the major historical fires that had taken place in western Oregon and Washington. Although scientists had been aware of the phenomenon for several decades, "east winds continue from time to time to tax fire-control agencies far beyond their usual capacities." Cramer provided an apt description of east-wind events:

An exceptionally dry wind from an easterly quadrant that may blow continuously for 24 to 48 hours or longer, sometimes at gale force, and often reaching maximum strength during night and early morning hours. It is accompanied by relative humidities that remain extremely low around the clock with relief only at night in some of the deeper ravines. Under these conditions fires run wild and fire-control men must be prepared for the worst.

He added that east winds affected weather in all three Pacific-coast states, an insight that fits firestorms of Labor Day 2020.⁵

The east winds that Cramer described were *foehn* type, downslope, very dry winds, the term originating from the German reference to "fohn," hot, dry winds in the central European Alps where the weather phenomenon was first analyzed. The winds, commonly referred to in the Pacific Northwest as east winds (in southern California, as Santa Ana winds), produce critical fire weather during summers, their speed stoking small fires and blowing them

into major conflagrations. According to the National Geographic Area Coordinating Center, the umbrella organization for websites related to fires and other emergencies, east winds in the Pacific Northwest exacerbate existing fires and can start new fires by blowing down power lines. The severity of east winds, one of the major patterns driving wildfire in the age of climate change, depends on the availability of fuel and weather.⁶

The National Weather Service published *Critical Fire Weather Patterns of the United States* in 1999, a report providing summaries of fire weather in districts across the nation. The Northwest districts included Olympia, Boise, Medford, Pendleton, Wenatchee, and Salem. For the Medford Fire Weather District, the brief reported that the experience of powerful east winds over the area “is one of the more frequent critical fire weather patterns that require red flag warnings.” For Olympia, Washington, the publication indicated that “strong, dry, east winds” powered most of the great wildfires west of the Cascades. When major fire incidents occurred, “winds in excess of 50 mph and humidities in the low teens are typical at lookouts along the lee slopes of the Cascades and Olympics.” The National Weather Service linked Salem’s fire weather directly to east winds tunneling down the canyons of the western Cascades, occasionally reaching speeds between thirty and sixty miles per hour. The entry added, “as important as the speeds are the low humidities, typically in the teens or low 20s during the day with little or no recovery at night.”⁷

Prompted by lessons from the Tillamook fire of 1933, the U.S. Forest Service, in cooperation with timberland owners, set the tone for fire policy in the Pacific Northwest and across the nation when it adopted the “10 a.m. policy” in 1935. The strategy proposed to control fires by 10 a.m. the day after they started or by that time each day until they were out. State forestry agencies in timbered states followed suit, establishing the 10 a.m. protocol for fighting forest fires everywhere. Pyne called the policy “an administrative *tour de force*,” establishing a national standard for fighting fires. When I attended one-day Oregon Department of Forestry workshops before fire seasons in the 1960s, instructors spoke from the 10 a.m. playbook. Although the National Park Service developed plans in the 1960s to let natural fires burn and to use prescribed burning, the Forest Service continued its practice of putting out all fires. When the Yellowstone fires of 1988 torched nearly half the park’s 2.2 million acres during the hottest and driest year in more than a century, the incident created political firestorms, with politicians and landowners accusing park managers of willfully allowing fires to burn.⁸

The Yellowstone event was a harbinger of the future, suggesting to climate and fire scientists to expect larger and more frequent wildfires in the coming years. It also figured into data that fire scientists were constructing to



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THE TILLAMOOK BURN of 1933 was the first of four Tillamook fires occurring at six-year intervals. In each instance, powerful east winds and plummeting humidity pushed small fires into major conflagrations.

illustrate the effects of warming temperatures in the Pacific Northwest. That information, also reflected in this essay, revealed that rising temperatures and extreme drought have increasingly influenced fire behavior since the mid 1980s. During the past several decades, climate change has contributed to rising global temperatures and increasing frequency and size of wildfires. Oregon’s September 2020 fires, environmental writer Ed Struzik contends, provide a cautionary tale for the western United States, where the country’s largest and most severe fires have occurred. He observed that fires had “burned more than 1 million acres . . . erupting in places where they rarely burn and overwhelming firefighters whose tools and strategies are no longer sufficient to deal with the new wildfire paradigm.”⁹

The Oregon wildfires unleashed on Labor Day weekend in 2020 overshadow but nevertheless are connected to the small Awbrey Hall fire of 1990, a fast-burning inferno that roared across 3,300 acres and destroyed 22 houses west of Bend. Originating in what was thought to be a campfire in Tumalo Creek Canyon on the hot afternoon of August 4, gusting winds pushed the firestorm out of the canyon, torching undergrowth and second-growth ponderosa pine

southwards toward Century Drive and luxury homes. Someone immediately reported the fire, and aircraft from the Redmond airfield dropped retardant on the fast-moving flames within an hour. It took 1,600 firefighters, 122 fire engines, 12 retardant-carrying airplanes, and 70 bulldozers to bring the fire under control. Fire-fighting costs amounted to more than \$2 million. Although no one cited a warming climate as a causal factor, Awbrey Hall proved to be a symbol of future fires.¹⁰ In an article published in this journal in 2001, for example, I wrote that a “warming climate” may have been partly to blame for recent fires such as Yellowstone but still attributed Awbrey Hall to “a century of logging and fire history” and the management of public forests.¹¹

Two years into the new century, high temperatures and thunderstorms in southwestern Oregon on the afternoon of July 13, 2002, triggered lightning fires burning inside the 180,000-acre Kalmiopsis Wilderness. Initially referred to as the Florence fire, when the blazes coalesced into a single conflagration, the Forest Service renamed it the Biscuit fire to assuage the mayor of the coastal tourist community, Florence. Although media made sport of the name change, the humor ended when the fuel-stoked Biscuit became the largest fire in the state’s recorded history at 500,000 acres. The Kalmiopsis was a fire-nurtured landscape — that is, a place that frequently experienced fire. Decades of fire suppression, however, had allowed an overgrowth of manzanita and tanoak and an accumulation of brush that caused the massive blaze to jump the Illinois River in the east, threatening commercial timberlands and the towns of Selma, Kerby, and Cave Junction. The interior of the Biscuit continued to burn until rain and snow in the rugged terrain dampened the embers.¹²

Fire-related expenses for the Biscuit amounted to an unprecedented \$150 million, and the political fallout lasted more than a decade. Critics derided the Forest Service for sending in only small ground crews following the lightning strikes, arguments that ignored strains on fire-fighting forces, with crews committed elsewhere. When the fire reached northern California in early August, the Forest Service brought in more than 7,000 fire fighters, their camps near Cave Junction in the Illinois Valley and Brookings and Gold Beach on the coast. They contained the fire, and property losses amounted to one historic fire lookout and a few cabins on mining claims.¹³

The Biscuit made national headlines because of the huge size of the fire, the costs to contain its spread, and its smoke plumes rising to 30,000 feet. Most notably, the fire was an unmistakable representation of future megafires.¹⁴ The Biscuit also became controversial when the Forest Service planned to sell fire-killed timber outside the boundaries of the Kalmiopsis. Heated arguments ensued when OSU graduate student Daniel Donato published portions of his master’s thesis in the prestigious journal *Science*, arguing that salvage logging slowed ecological recovery after fires. Ultimately,



U.S. Forest Service, Pacific Northwest Region

THE BISCUIT FIRE burned 500,000 acres in southwestern Oregon in 2002, the largest fire in the state’s recorded history, spewing smoke plumes rising to 30,000 feet. The giant blaze became a national story.

the timber salvaged was minuscule because the wood quickly deteriorated and had little value. As for Donato, he survived the protests of a few OSU forestry faculty, as well as the verbal assaults of Washington congressman Brian Baird, and completed his Ph.D.¹⁵

While the tempest over Biscuit continued, lightning ignited two fires near Mount Jefferson on August 19, 2003, that eventually merged, becoming the B&B Complex fire. Because of the proliferation of small lightning-strike fires in a common area, the Forest Service and the National Park Service began using the term “complex” to describe locales where fires were under one incident commander. With moisture levels in Oregon forests extremely low and temperatures in the nineties, a major windstorm on September 1 blew the fire into explosive growth, creating a smoke plume that could be seen from Portland. The flames burned both sides of Highway 20 at Santiam Pass and more than 90,000 acres in the Mount Jefferson Wilderness, national forest land, and a corner of the Warm Springs Indian Reservation.¹⁶

Unexpectedly, heavy precipitation dumped more than two inches of rain on the fire on September 7 and 8, bringing an end to its expansion. With

thirty-two years of experience fighting fires in central Oregon, Doug Johnson, fire boss on the B&B, thought rain prevented the fire from growing larger and driving the \$38 million costs even higher. When he began his career, Johnson thought a 2,000-acre fire was large, but “then along comes these fires like Biscuit and B&B that we just hadn’t seen before.” With the vantage of hindsight, he realized, “it’s more of the norm.” OSU forestry professor John Bailey thought B&B was “a wake-up call,” suggesting “that past management policies and climate change would make these types of fires more common.”¹⁷

Oregon’s big fires of 2002 and 2003 clearly reflected the influence of the warming climate on the increasing frequency and growing size of wildfires. *My Landscapes of Conflict: The Oregon Story, 1940–2000*, published in 2004, included a cautionary note in the preface: “As the prospect of global warming looms before us, it is obvious that the heavy hand of human agency is literally everywhere. We ignore such indicators at our peril.” It was apparent to me that rising temperatures, extended periods of severe drought, and lengthening fire seasons were accelerating the incidence and size of wildfires.

Anthony Westerling’s 2006 article in *Science* reported that fires on public forests represented increasing costs, expenses prompting state legislatures to adopt strategies to cope with climate change. Fire scientists were also striving to explain the meaning of larger and more frequent wildfires:

*If increased wildfire risks are driven primarily by land-use history, then ecological restoration and fuels management are potential solutions. However, if increased risks are largely due to changes in climate during recent decades, then restoration and fuels treatments may be relatively ineffective in reversing current wildfire trends.*¹⁸

Using “hydroclimatic data” to identify the location of major wildfires, Westerling examined wildfire history in the western United States since the 1970s. He described fire suppression during the twentieth century that promoted the accumulation of biomass, thereby increasing the size and areas burned. The warming climate and the growing frequency of drought and higher temperatures had increased the danger of wildfires. Excluding fire from pine forests that historically experienced low-frequency fires, Westerling charged, contributed to the accumulation of woody debris and created fuel for fires ignited by lightning strikes. Landscape practices, such as suppressing fires, enhanced the vulnerability of pine forests to the forces of global warming. Westerling believed, however, that climate “may still be the primary driver of forest wildfire risks.”¹⁹

The rugged pine country south and west of Sisters, Oregon, fit Westerling’s description of an environment where climate change has elevated risks from wildfire. The Black Crater fire, beginning as a lightning strike in the Three

Sisters Wilderness in August 2006, was one of several lightning-caused fires in Cascade wilderness areas that year. Burning through beetle-killed trees, most of the fire was within the Three Sisters Wilderness where the use of mechanized terrestrial equipment was prohibited. At the fire’s peak, nearly 700 fire fighters and support personnel were working Black Crater. When crews made significant progress in containing the blaze, the Sisters Ranger District reported that the low-burning event had been ecologically restorative, clearing underbrush and freeing ponderosa pine for faster growth.²⁰ With climate change accelerating, however, the future could show that no amount of fuel reduction would significantly reduce the incidence of fire.

The B&B Complex fires in 2003 referred to the Bear Butte and Booth fires merging into one large conflagration under the command of one official. It should be emphasized that the media paid more attention to fires burning in forests near population centers and major transportation corridors. Grassland and sagebrush fires burned more acreage but attracted less attention. A 2006 conflagration in eastern Oregon that torched more than 50,000 acres attracted little press, despite the *Hells Canyon Journal* calling the Foster Gulch Complex “Oregon’s largest wildfire.”²¹

The huge Long Draw fire in Oregon’s sparsely populated southeast in July 2012 was an exception, making headlines in major newspapers. The *Oregonian*’s Richard Cockle reported that the colossal burn was the largest “Oregon wildfire in 150 years,” turning the desert into a hellscape. Long Draw outpaced the Biscuit fire, charring 557,600 acres (871 square miles) between July 8 and 15. With early July temperatures above 100 degrees and ultra-low humidity, a lightning strike near Long Draw Canyon ignited the blaze in heavily parched grasses and brush. Strong winds pushed the flames across roads and fire lines, and unlike most sage-grassland fires, it did not slow when the sun set and temperatures cooled. “The hard-charging Long Draw fire,” Cockle remarked, “never paused, day after day.” Along with Miller Homestead (160,801 acres), another lightning-caused fire near Steens Mountain, those blazes took place in tinder-dry sage grasslands, low humidity, and high winds. Although Long Draw and Miller Homestead were huge fires, agencies spent more money in 2012 on the 26,795-acre Pole Creek fire southwest of Sisters (\$17,376,000, the most expensive in the state), which was putting up huge columns of smoke while hundreds of people were celebrating the Sisters Folk Festival.²²

Scientists are quick to point out that a single fire season can never be hard evidence of a changing climate, and data for several decades has shown that summers in the western states are becoming warmer, droughts are increasing, and wildfires are larger and occurring more frequently. Scientists at Harvard University released a study in 2013 demonstrating that



JUST NORTH OF McDERMITT, OREGON, a fire crew conducts a burnout near Blue Mountain Pass along highway 95, with the hope of keeping the main part of the Long Draw fire from interrupting the flow of traffic. The July 2012 Long Draw fire burned 557,600 acres and was reported as one of the largest wildfires in Oregon in 150 years.



mid-twenty-first-century fire seasons in the Northwest would be three weeks longer, be smokier, and burn larger areas than twentieth-century fires. The Harvard group used “internationally recognized climate scenarios” and historical fire records to reach its findings. The major factor influencing weather in the coming decades would be temperature, an item appearing “robust” in the models. According to Loretta Mickley, senior researcher of the Harvard study, “when you get a large temperature increase over time . . . and little change in rainfall, fires will increase in size.”²³

The findings in the Harvard study fit experiences with wildfire in central Oregon, where settlement patterns have worsened the problems and costs associated with wildfires. During the middle of the 2013 fire season, *Bend Bulletin* reporter Andrew Clevenger authored a three-part series, “Forward in the Forest,” providing information about communities in “the wildland urban interface.” The Forest Service estimated that the number of homes within a half-mile of a national forest grew from 484,000 in 1940 to 1.8 million in 2000. Forest Service chief Tom Tidwell told Congress in 2013 that megafires were placing an estimated 70,000 small communities at risk. Moreover, fires were consuming half the agency’s budget and reducing funds for prescribed burning. The grim influence of climate change was obvious; fires were burning an increasing number of acres of Oregon’s national forests every year.²⁴

Phil Chang, an administrator with the Central Oregon Intergovernmental Council, told Clevenger that under certain weather and wind conditions it was feasible for a firestorm to burn into the City of Bend. Central Oregon forests were “out of whack,” burdened with heavy fuel loads that would be reduced either “by us or through natural ignitions and wildfire.” With others, Chang feared that ladder fuels in eastside forests would feed cat-

astrophic fires burning in the upper story of trees. Tom Potiowsky, a former state economist, warned that because the prevalence of brush and dead wood in forests posed a serious fire threat, prescribed burning should be used to reduce the volatile biomass. Nature Conservancy’s Russ Hoeflich told Clevenger that public attitudes toward fires were changing because of threats they posed to homes. Chang left a parting thought with Clevenger: “In forest conservation, we’re in a constant race with wildfire.”²⁵

Climate scientists elsewhere confronted similar realities with landscapes carrying heavy fuel loads. The University of Idaho’s John Abatzoglou told a Salem *Statesman-Journal* reporter in 2013 that “large regional fire years are going to increase dramatically.” Idaho journalist Rocky Barker, author of *Scorched Earth: How the Fires of Yellowstone Changed America* (2005), recalled that when he began reporting on wildfires in the 1980s, there was little indication that he was witnessing the onset of ever-larger and longer fire seasons. Extreme fire behavior was uncommon when the Yellowstone fires occurred in 1988, but now, Barker observed, such fires are the norm. He added, “I don’t think people can even fathom yet how much change fire is going to continue to bring on us.”²⁶

Despite the trend toward large wildfires, Oregon experienced relatively mild seasons in 2013 and 2014. In contrast, Washington experienced its largest fire in recorded history, the Carlton Complex in the Methow Valley, lightning fires in July 2014 that quickly merged into a single inferno amid high winds and temperatures near 100 degrees. The fire burned 256,000 acres and destroyed 353 homes around the small towns of Pateros and Brewster. It burned mostly shrub-steppe grasslands, only 25 percent characterized as “dry forest.” The record-setting Washington blaze was confined to the

Methow Valley, an area prone to frequent fires. Its size and destructiveness, however, paralleled conflagrations elsewhere in the age of rapidly warming temperatures. The *Wenatchee World* characterized the event as “a catastrophe beyond measure . . . too great for an ordinary detached person to grasp.”²⁷

In the age of climate change, fire seasons varied dramatically from one year to the next. For the Pacific Northwest, the Forest Service declared the 2015 fire season “the most severe in modern history.” Fires in Alaska, California, the Northern Rockies, and the Great Basin placed a heavy burden on fire-fighting resources in the West. Oregon’s fires torched 631,000 acres, twice the ten-year average. The state’s largest and most destructive fires, at 110,261 acres, were lightning-ignited blazes in Canyon Creek Canyon south of John Day in August. The fires destroyed forty-three homes and numerous outbuildings — burning thirty-nine houses and 33,000 acres in one day. People who lost their homes, many of them elderly, expressed mixed feelings on whether they would rebuild or move on, some wondering if there was interest in a class-action suit against the Malheur National Forest for mismanagement.²⁸

The National Academy of Sciences published an important study in 2016 that assessed the extent to which human-caused climate change was responsible for western wildfires. John Abatzoglou of University of Idaho and A. Park Williams, a research professor at Columbia University, determined that 55 percent of the increased aridity in forest landscapes between 1979 and 2015 could be attributed to human disturbances — primarily through cutting moisture-retentive forests and draining wetlands. Although variations in climate regularly affected aridity, the report noted, human activities had become the primary influence in driving temperatures higher. The scientists determined that Pacific Ocean patterns oscillating between cooler and wetter periods and hotter and dryer seasons also affected the aridity of landscapes and prolonged fire seasons. That pattern, Williams told a *New York Times* reporter, meant “longer fire seasons, more burned acres of forests — [and] is likely to continue as long as there is enough fuel to burn.”²⁹

If the 2016 fire season was less active than the previous year, it was the proverbial lull before the storm. During the summer of 2017, Oregonians became familiar with the AQI (Air Quality Index), including this author in my regular forays to central Oregon, where smoke from wildfires prompted communities to cancel or postpone numerous events. The largest fires putting up smoke were the Milli fire (near Sisters), the Chetco Bar fire (in the Kalmiopsis Wilderness) burning toward Brookings, and the Eagle Creek fire (in the Columbia River Gorge).³⁰ The relatively small Milli fire that year (24,000 acres), like Black Crater (2006) and Pole Creek (2012), roared out of the Three Sisters Wilderness, threatening the town of Sisters and prompting



A DC10 TANKER drops fire retardant on the Milli fire near Sisters in September 2017. The relatively small Milli fire, at 24,000 acres, became the standard-bearer for wildfires near population centers, putting up huge volumes of smoke and raising the Air Quality Index to dangerous levels in central Oregon.

the evacuation of nearby communities. At 191,125 acres, the massive Chetco Bar fire, the largest in the Pacific Northwest in 2017, produced huge smoke plumes and captured national headlines. A lightning strike in the Kalmiopsis Wilderness ignited the blaze in mid July, when it burned slowly through debris from the Biscuit fire. A Forest Service helicopter dropped a small crew into the steep terrain to contain the blaze, but burning wood and rocks tumbling into Chetco Canyon prompted supervisors to remove the team. The fire remained small until August 12, when daytime temperatures in the nineties and strong east winds barreling down the canyon caused it to explode.³¹

Those fierce winds pushed the fire down the valley toward Brookings and smaller coastal settlements. Flaming embers spotted new fires far ahead, enabling the inferno to advance quickly down the canyon, and in just five days the fire grew from 6,000 to nearly 100,000 acres. When temperatures reached



ON SEPTEMBER 6, 2017, smoke from the Eagle Creek fire is visible from the Washington side of the Bridge of the Gods. The fire began on September 2, 2020, and spread quickly due to high temperatures and winds, threatening the historic Multnomah Lodge and periodically shutting down Interstate-84.

100 degrees on September 3, the flames intensified, producing a smoke column rising to 23,000 feet. The fire destroyed six houses on its westward rush, causing 5,000 people to evacuate. And then, blessedly, more than an inch of rain fell in early September, slowing the fire's advance and allowing crews to build containment lines. Citizens attending a meeting in Brookings accused the Forest Service of allowing the fire to burn in the Kalmiopsis as part of a liberal agenda, another example of the ongoing politics of fire. Agency personnel heatedly responded that their priorities had ensured no lives were lost, thanks to the early removal of the crew from dangerous Chetco Canyon.³²

The Eagle Creek fire in the scenic Columbia River

Gorge also became a national story. The fire started on Saturday afternoon, September 2, when a teenager, egged on by peers, threw a firecracker off the Eagle Creek Trail into the tinder-dry canyon below. By the time a helicopter flew over the blaze, it had burned fifty acres and was cresting a ridge to the west. On the afternoon of September 3, strong east winds pushed the fire west, embers spotting far in advance of the primary flames. The following night, wind gusts reached forty-five miles per hour, the temperature hovering at ninety-one degrees after midnight. An incident fire boss, with years of experience in the Gorge, reported on the spectacular view — "I've seen some impressive fire behavior, but I've never see anything like that in my career."³³

Fire officials ordered the evacuation of several communities along the Columbia River. The fire threatened historic Multnomah Lodge, and it jumped the Columbia River to the Washington side. In a mere sixteen hours on Sep-

tember 5, the fire advanced thirteen miles to the west and then expanded slowly, growing to 37,567 acres by September 13. During its most explosive phase, officials closed the Columbia River to travel, and Interstate-84 was periodically closed to clear debris from the highway. Crews were able to save Multnomah Lodge, and when rains arrived on September 17, the fire had burned 48,387 acres.³⁴ In a sense, Eagle Creek was Portland's fire, its smoke blanketing the city and evening television news showing brilliant scenes of night fires along the Columbia River. The fire closed the historic Columbia River Highway for several months and destroyed its Oneonta Tunnel thirty-six miles east of Portland.³⁵

Between 1992 and 2001, Oregon fires burned an average of 198,000 acres, a figure that increased to 433,541 acres between 2002 and 2017. The state's major fires in 2018 continued that trend when some 200 lightning strikes on July 15 started numerous fires across southern and southwestern Oregon, several becoming major conflagrations. With low precipitation that winter and spring, tinder-dry woody debris offered ready fuels to nourish ignition.³⁶ Responding to two rapidly expanding fires in mid July, Merv George, Jr., supervisor of the Rogue River-Siskiyou National Forest, ordered agency personnel to "put the fires out as quickly as possible," a forceful reminder that allowing fires to burn



THE EAGLE CREEK FIRE burns Shellrock Mountain near the Lindsey Creek area on September 17, 2020, having already burned 48,387 acres by this date.

naturally in the age of megafires was not an option. The Klondike and Taylor Creek fires, west and southwest of Grants Pass, were the largest. The Klondike, reburning a part of the Biscuit, flamed anew in mid September, prompting Gov. Kate Brown to declare it a major conflagration, freeing resources to contain the fire. By the time the Klondike was officially contained in November, it had burned 175,258 acres. Taylor Creek, a smaller blaze, scorched 52,839 acres, eventually reaching the Rogue River to the north.³⁷

The *Oregonian*'s Kale Williams captured the temper of the 2019 fire season in an intriguing October article: "Summer 2019: The Oregon wildfire season that wasn't." Williams offered an idiom to describe the past few months: "Sometimes the absence of something can make a bigger impact than its presence." With fresh memories of recent wildfires — evacuation orders, smoke blanketing cities and towns, and unhealthy air — "that absence came as a literal breath of fresh air." Oregon and Washington spent more than \$1 billion in 2017 and 2018 on wildfires, expenses that dropped to less than \$100 million in 2019. As federal and state administrators attributed the shortest fire season in two decades to cooler temperatures, fire officials acknowledged that 2019 was an anomaly, a reprieve from the new normal. Abatzoglou, now with the University of California, Merced, pointed out that climate variability would always occur, and a single quiet season would not reverse the trend toward severe wildfires.³⁸

Other scientists echoed Abatzoglou, citing evidence indicating longer and warmer fire seasons. Jessica Halofsky, a wildfire scientist with the Pacific Northwest Research Station in Olympia, observed that warmer and dryer years were contributing to ever-larger fires across the American West. Drought and insect outbreaks were increasing, stressing vegetation and adding to the severity of wildfires. Halofsky developed models projecting less precipitation during summers and increases during other seasons. To cope with anticipated wildfire threats, she advised that forestry officials should reduce fuels and use prescribed fire, especially in eastern and southwestern Oregon. Because the risk of fires in moist, coniferous forests was low, Halofsky believed the frequency of fire in those ecosystems would be minimal.³⁹

On the cusp of the new decade, a team of scientists, half from OSU, released a report showing that drought and larger fires would disrupt vulnerable landscapes throughout the Sierra Nevada Mountains, northern Rocky Mountains, and eastern Oregon, areas susceptible to disease, insect infections, and wildfire. Their models suggested that "Coastal Douglas-fir, hemlock/cedar, and redwood forest types" would be less vulnerable to drought and fire. Those "high carbon density" forests existed where there was more precipitation and fewer fires, and they possessed "the greatest potential to

ACRES BURNED IN OREGON BETWEEN 2002 AND 2019			
YEAR	TOTAL ACRES	YEAR	TOTAL ACRES
2002	1,010,952	2011	285,712
2003	160,191	2012	1,256,049
2004	30,018	2013	350,786
2005	155,331	2014	984,629
2006	545,870	2015	685,809
2007	648,046	2016	219,509
2008	136,572	2017	714,520
2009	100,668	2018	897,263
2010	93,731	2019	79,732

THIS TABLE, compiled by the author, documents the acres of land burned by wildfires between 2002 and 2019. The source for this information can be found in the National Interagency Fire Center's "Historical Year-End Fire Statistics By State, 2002-2019," https://www.nifc.gov/fireInfo/fireInfo_statistics.html.

sequester carbon of any forests in the western United States," an important factor in combating climate change. From the crest of the Cascade Range to the Pacific Coast, landscapes were less prone to "future drought and fire mortality." The frequency of fire in coastal forests, they noted, had been low. The great fires of record — Tillamook, Yaquina, Millicoma, and Nestucca — were rare and largely stand-replacement fires. With proper land-management strategies, the scientists saw opportunities to develop forest stewardship policies to counter climate change, because moisture-heavy coastal forests had historically burned less frequently than those farther inland.⁴⁰

A Place for Inquiry, A Place for Wonder: The Andrews Forest, my book released in September 2020, also regarded wildfire as a lesser threat to

forests on the western side of the Cascades. The region's extensive greenery, higher-than-average humidity, and natural-fire regimes of longer duration convinced many forest scientists that the western Cascades would escape the worst effects of climate change. Despite recent wildfires in the McKenzie River drainage, I was persuaded that the H.J. Andrews Experimental Forest, approximately four miles as the crow flies from the upper McKenzie River, would be relatively safe from the ravages of wildfire. The 15,800-acre forest had significant stands of old-growth Douglas-fir and enjoyed heavy seasonal precipitation. When OSU Press delivered the books to my doorstep in mid September, however, the 173,393-acre Holiday Farm Fire was burning in three experimental watersheds at the southwestern tip of the Andrews.⁴¹ This author obviously misjudged the potential for anomalous weather events in the age of climate change.

Jay Stockton, senior forecaster with Medford's National Weather Service, was another meteorologist involved with the Red Flag Warnings on the fated Labor Day weekend in 2020. Sitting in his office on Friday, September 4, he observed a major anomalous weather event taking shape on his monitors. Stockton noticed what southwestern Oregon meteorologists called "the Chetco effect," east winds developing and blowing down the Chetco Canyon, warming and accelerating as they funneled toward the coast, conditions that would affect all of western Oregon and cause humidity to plunge. The Medford office issued Red Flag Warnings, and the National Weather Service forecast "Extremely Critical Fire Weather" in the Salem area for Monday and Tuesday. After spending twenty-two years in Medford, Stockton told Oregon Public Broadcasting's Jes Burns, "I'd never seen this before." In the days following his forecast, small fires exploded and new fires developed into raging, uncontrollable infernos from the North Santiam Canyon south to the Rogue River Valley, events never witnessed in Oregon's recorded history.⁴²

When Oregon Public Broadcasting issued dire warnings about fierce windstorms expected on the night of September 7, I remarked aloud that the small, slow-burning Beachie Creek fire in the Opal Creek Wilderness was "going to blow up." It happened. Fifty to seventy-five mile-per-hour winds knocked down power lines, set off new blazes far ahead of the main fire, and exploded to 130,000 acres during the next several hours. By the time the firestorm moderated, it had burned 193,573 acres, destroyed 470 homes, and killed five people. The Lionshead fire, a small lightning blaze on the Warm Springs Reservation followed suit the same evening, crossing the Cascades into North Santiam Canyon and destroying 264 homes in the town of Detroit. By the time firefighters corralled the fire, it had torched 204,469 acres.⁴³

The Riverside fire in the Clackamas drainage started a short distance from Estacada on August 8 and burned 138,054 acres before it was con-

MAJOR FIRES IN WESTERN OREGON IN 2020		
FIRE	ACRES BURNED	ORIGIN
Lionshead	204,469	20 miles west of Warm Springs
Beachie Creek	193,573	15 miles north of Detroit
Holiday Farm	173,393	3 miles west of McKenzie Bridge
Riverside	138,054	2 miles southeast of Estacada
Archie Creek	131,542	20 miles east of Glide

THIS TABLE, compiled by the author, documents the five major wildfires that burned in western Oregon in 2020. Source information for the fires can be found on the InciWeb — Incident Information System site, <https://inciweb.nwccg.gov>.

tained. Farther south in the McKenzie River Valley, the Holiday Farm fire began on the evening of September 7 near the town of Rainbow and quickly spread westward, burning the small community of Blue River to the ground and destroying clusters of homes down the valley. By the time a rainstorm slowed the fire, it had burned 431 residences and consumed 173,393 acres. The Archie Creek fire began near the town of Glide, burning along the North Umpqua River and Highway 138, scorching 131,542 acres and destroying 109 homes. Like the other fires, Archie Creek burned thousands of acres of private and public timber, causing different levels of severity (burning through duff and root structures), depending on fuel and wind conditions.⁴⁴

The September fire that captured the most attention was also the smallest, and it was not a forest fire. The Almeda fire began on September 8 at the north end of the town of Ashland. High winds quickly blew flames west toward Medford, burning 3,200 acres through an eight-mile sliver along Bear Creek. The arson fire destroyed 2,000 homes, including mobile-home residences of people who worked in Ashland, home to the Oregon Shakespeare Festival. Two months after the fire, Juliet Grable of Jefferson Public Radio aired (and published on-line) the most moving account of the catastrophic Almeda fire. "For the Rogue Valley," she reported, "September 8, 2020 will be remembered as the day everything changed." High temperatures, drought, dry vegetation,

Photograph by Wes Dickinson, Attribution-NonCommercial 2.0 Generic (CC BY-NC 2.0)



THE ALMEDA FIRE began on September 8, 2020, and swept west from Ashland, destroying 2,000 homes. The aftermath of the fire is shown here with what little remained of residences in Talent, Oregon.

and “an unusually strong easterly wind” set conditions for the fire. The flames darkened the day in a “hellish glow,” Grable wrote, spreading “house to house, neighborhood to neighborhood, town to town, destroying entire sections of Talent and Phoenix.” The Almeda fire was another illustration of the effects of climate change on vulnerable communities such as those in northern California — Paradise (Camp fire) and Santa Rosa (Tubbs and Glass fires).⁴⁵

Associating climate change with Oregon’s Labor Day fires, I believe, is to anticipate more anomalous events in the future. The state’s most destructive of the September conflagrations, in terms of homes lost and people’s lives put in turmoil, the Almeda fire, was a wildfire without a forest, writes Sarah Golden, an environmental media writer in Oakland, California. Her father, Jeff Golden, an Oregon state senator from Ashland, representing Talent, Phoenix, and surrounding areas, remarked that “this gusty, sustained, chaotic wind, was an unusual episode . . . but it is part of the climate chaos that we’re experiencing.” Sarah added, “fires that were once a normal part of ecological cycles now rage out of control, with unnatural amounts of unnaturally dry fuels.” She urged states to develop strategies to cope with urban wildfire.⁴⁶

The same devastating September firestorms affected neighboring Washington and California, the latter experiencing its worst fire season on record. California wildfires burned 4,257,863 acres in 2020, damaged or destroyed more than 10,000 structures, and killed more than 30 people.⁴⁷ Five of California’s six biggest fires since 1932 occurred in 2020, clearly the influence of a warming climate. Oregon lost 1 million acres to fires in 2020, almost double the ten-year average, as well as more than 2,200 homes. There were eleven fire-related deaths. Colorado, another western state with an extraordinary fire season, witnessed 700,000 acres burned before the end of October, including the largest fire in state history, the 208,000-acre Cameron Peak blaze. During that fateful year, Colorado, Oregon, and California experienced their highest wildfire seasons on record.⁴⁸

The September 2020 wildfires poured blankets of smoke over cities from Seattle and Portland, south to Sacramento and San Francisco, north to Canada, and eastward to northern Europe. The fire blackened forests in the western Cascades that had not burned in decades. A *New York Times* article on September 24 attributed the cause of more frequent and larger fires to the lengthening fire season. Although the most destructive fires were in California, two were in Oregon — the Almeda and Beachie Creek fires. Because of Oregon’s longer, drier, hotter summers, the 2020 events did not surprise climate scientist Erica Fleishman, director of OSU’s Climate Change Research Institute. The September firestorms, she observed, followed a regional pattern — “More fires. More large fires, more destructive fires.”⁴⁹

Although directly linking the anomalous Labor Day windstorms to climate change was not fixed truth, Burns considered it reasonable to assume that extreme weather conditions and risks from wildfire would increase in the next decades. Scientists, environmentalists, and journalists who monitored the association between wildfire and global warming shared that view. Environmental writer Ed Struzik believes existing approaches to wildfire will be ineffective, because fires are now burning with greater ferocity and incinerating ever-larger landscapes. Writing for the *National Geographic* in September 2020, Alejandra Borunda observed that lengthening fire seasons in the West, combined with mountain snows melting earlier, had accelerated opportunities for more frequent big fires “than they would be, absent climate change.”⁵⁰ Tom Harbour, former director of the Forest Service fire and aviation unit, told Lauren Sommer of National Public Radio in September 2020, “as bad as it is, it’s going to get worse. And it’s going to get worse for another decade or two,” even if we develop climate-change mitigation strategies.⁵¹

Recent fires in the upper McKenzie River Basin mirror the assessments of wildfire professionals such as Harbour. Oregon’s fire season in 2017 fol-



THE AUTHOR'S MOSBY CREEK CREW is pictured here in 1964. Before the fire danger rose to dangerous levels during the summer, the crew cleared brush from fire roads on private forest land in the Mosby Creek and adjacent drainages.

lowed one of the most severe winters on record, with cold temperatures and heavy snows throughout the Cascades. Despite the ample precipitation, the summer of 2017 registered the highest temperatures on record in Portland and Salem. The large fires that year — Chetco Bar, Eagle Creek, and others — mirrored those soaring temperatures. After the upper McKenzie snows melted that spring, the lush-forested area also experienced two big fires in 2017 and another one in 2018. An area of historical fires of longer duration, some stand-replacing, others thirty-five to seventy-five years apart, was now experiencing frequent wildfires. The Horse Creek Complex of 2017 burned 33,780 acres in several lightning ignitions, including the large Separation fire (17,914 acres). The following summer, the Terwilliger fire scorched 11,500 acres around Cougar Reservoir.⁵² Nearly six decades after my first trek into the western Cascades, the effects of global warming provide powerful evidence that fires are now burning more often and in places where they seldom occurred before.

NOTES

As this issue goes to press, climate change and the huge Bootleg fire in south-central Oregon continue to provide new and alarming data about our collective future. Most troubling, in light of the United Nations Intergovernmental Panel on Climate Change's *Sixth Assessment Report*, is the accelerating rate of global warming and anomalous climate events that are becoming the new normal.

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