



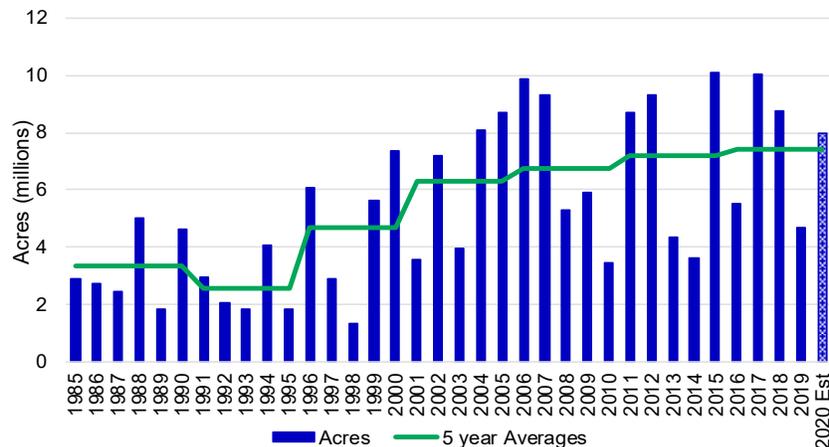
# Timberland Investor Report

## Catastrophic Natural Events Impacting Timberlands

Timberland investments are inherently exposed to natural elements - weather, pests, fires and other extreme natural events. This past year saw the concurrence of a number of headline worthy natural catastrophic events that included: fires in the U.S. West Coast that impacted an estimated four million acres and included five of the ten largest fires in California's history<sup>1</sup>; a fire season in Australia, with incidences of record-setting intensity; an insect infestation in Central Europe which may end up being of similar magnitude with the infestation British Columbia experienced in the 2000s<sup>2</sup>; and a hurricane season with a record number of named storms in the Atlantic affecting Central America, the Caribbean, and the U.S. South<sup>3</sup>.

The scale and number of natural disasters experienced in the timber sector in 2020 raises the question of whether we have arrived at some climate-change inflection point, or whether this is just another manifestation of 2020 randomly concentrating negative events. To try and put this year's series of occurrence into a historical context, our *Timberland Flash Report*, published in October, reviewed the incidence of fire in the U.S. and Australia based on publicly available data collected on a combination of private and public lands<sup>4</sup>. The historical data for the U.S. West showed that the number of large wildfires this year was unusual, but not unprecedented (see Figure 1). When viewing the U.S. western fire activity on an annual rate over five-year periods, a moderate upward trend does seem to emerge in the time-frame 1995-2020. Historical fire occurrence data in Australia for the states of New South Wales and Victoria show that the 2019/2020 fire season was clearly an outlier, but no trend is apparent (see Figure 2 on page 2)<sup>5</sup>.

**Figure 1. U.S. Acres Burned by Wildfires**  
(includes private, state, and federal lands)



Source: National Interagency Fire Center, September 30, 2020 HNRG Research October 20, 2020

<sup>1</sup><https://www.latimes.com/california/story/2020-10-04/california-fire-season-record-4-million-acres-burned>

<sup>2</sup>Forest Economic Advisors, Central Beetle & Windstorm Timber Disaster, May 2020

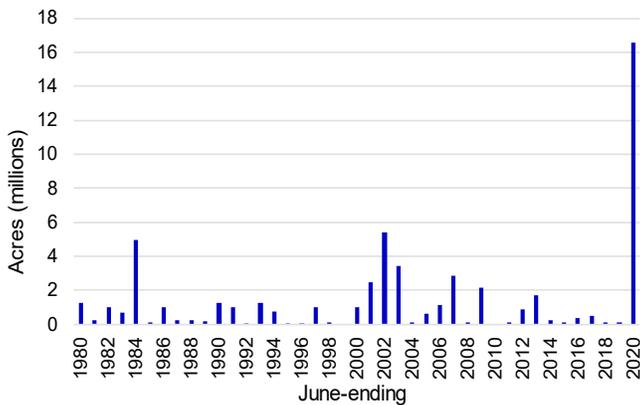
<sup>3</sup><https://weather.com/storms/hurricane/news/2020-09-21-atlantic-hurricane-season-2020-records>

<sup>4</sup>October 2020, Flash Report: Fire in the Forest Landscape: <https://htrg.com/research/>

<sup>5</sup>National Interagency Fire Center, as of September 2020, NSW Office for Environment and Heritage, NSW Rural Fire Service, Forest Fire Management Victoria, HNRG Research, as of September 30, 2020

**Figure 2: Forty-Years of History Highlight the Extreme 2019/2020 Australia Fire Season**

(Victoria and New South Wales)



Source: All Sources as of September 30, 2020. NSW Office for Environment and Heritage, NSW Rural Fire Service, Forest Fire Management Victoria, HNRG Research

Reliable, regional time series data on the value and volume loss from catastrophic events impacting timberland is not consistently available. Therefore, to evaluate the historical risk to timberland investments due to catastrophic physical loss, we use data from Hancock Natural Resource Group (HNRG) assets under management as a representative sample of timberland suitable for institutional investors. HNRG’s portfolio of timberland properties represents near 3% of the value of global investable timberland, by our estimate, and HNRG’s portfolio of properties roughly approximates the distribution of this universe of investable timberland<sup>6</sup>. We have also made preliminary estimates for 2020 from our managed properties, to provide an indication of the magnitude of 2020 events in relation to events of the past, and how the numerous events of the past year compare with the historical record.

Over the last twenty-five years, the average annual loss to catastrophic events (based on HNRG managed properties) has been 0.12% of total annual global asset value<sup>7</sup>. This year’s concurrent events of fires in Australia and the U.S. West combined with the back-to-back tropical storms and hurricanes affecting the U.S. Gulf states is estimated to be 0.44% loss of timberland value globally<sup>8</sup>. The fact that 2020 losses are larger than the long-term historical average by a factor of four underlines the number and scale of this past year’s natural events.

To gain a greater insight into whether an adjustment is needed to a forward-looking measure of the physical risk to commercial forestland, we break down the data on catastrophic loss by type of event and by geographic region to look for emerging trends. We categorize events into those most typical: storms, fire, and insect infestation. We also include a category of other losses which are due to events such as frost or drought damage to seedlings (see Figure 3).

This year’s large catastrophic losses were dominated by storm damage, which accounted for 60% of the estimated total 2020 damage and represents 0.26% of the total global portfolio’s asset value.

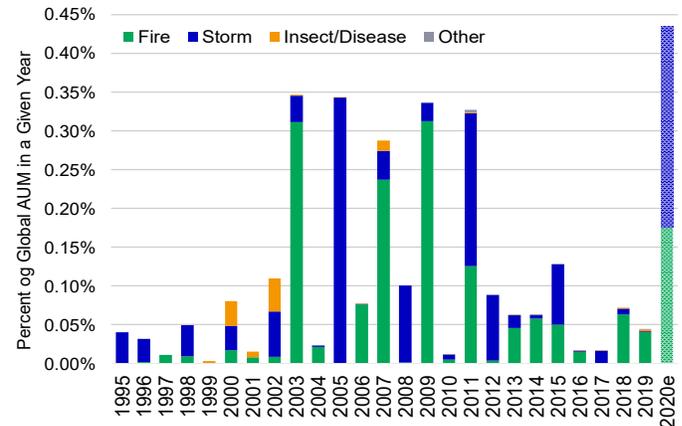
<sup>6</sup>HNRG Research as of September 2020

<sup>7</sup>HNRG Research as of December 14, 2020

<sup>8</sup>HNRG Research as of December 14, 2020

<sup>9</sup><https://www.nma.gov.au/defining-moments/resources/black-saturday-bushfires>

**Figure 3. Fires and Storms Cause Catastrophic Loss to Peak in 2020**



Source: Hancock Natural Resource Group, December 15, 2020

Fire loss was also significant, accounting for 40% of total losses, and 0.20% of asset value across HNRG’s global portfolio of timberland assets under management.

The combined total loss to asset value equates to the largest annual loss over the past twenty-five years, surpassing other years where historical events spiked catastrophic losses, such as Hurricane Katrina and Rita impacting timberland in the U.S. South (in 2005) or the Black Saturday fires in Australia (2009)<sup>9</sup>. Losses associated with the insect/disease category were inconsequential in 2020, reflecting the absence of Central European properties in HNRG’s portfolio.

The magnitude of financial loss resulting from catastrophic events is heavily influenced by the ability to harvest salvage material, with the dollar value of losses calculated net of revenue received from the sale of damaged timber. This year’s extremely high storm damage is magnified by the limited ability to capture value from salvage efforts in the wake of the storm damage in the U.S. South.

During the 2020 hurricane season, eight major storms occurred in the Gulf region of the U.S. South<sup>10</sup>. Hurricane Laura, a category 4 storm evoked the most damage. The Louisiana State University Extension Service estimates the storm damaged 758 thousand acres in Louisiana and another 210,000 acres damaged in Texas<sup>11</sup>. The volume of timber impacted by Laura is estimated to be the equivalent of one year’s typical harvest in Louisiana<sup>12</sup>. Generally, salvage after a storm or fire in the U.S. South can net back 50% of the value of the timber. With this year’s record number of storms in a concentrated area of the U.S. South where some areas were repeatedly hit, the ground remained saturated and the prolonged wet conditions promoted the growth of blue stain fungus which degrades sawtimber logs. Within 2-3 weeks in warm wet weather, blue stain fungus can cause sawlogs to be re-classified to lower-value pulpwood. Just prior to the storms, lumber mills in the impacted areas in the U.S. South were carrying full inventories, which further limited the demand for the additional salvage timber. Early estimates suggest that just

<sup>10</sup>[https://www.nola.com/news/hurricane/article\\_bbb1a810-0745-11eb-8d40-db2e3520acca.html](https://www.nola.com/news/hurricane/article_bbb1a810-0745-11eb-8d40-db2e3520acca.html)

<sup>11</sup>[https://www.nola.com/news/hurricane/article\\_bbb1a810-0745-11eb-8d40-db2e3520acca.html](https://www.nola.com/news/hurricane/article_bbb1a810-0745-11eb-8d40-db2e3520acca.html)

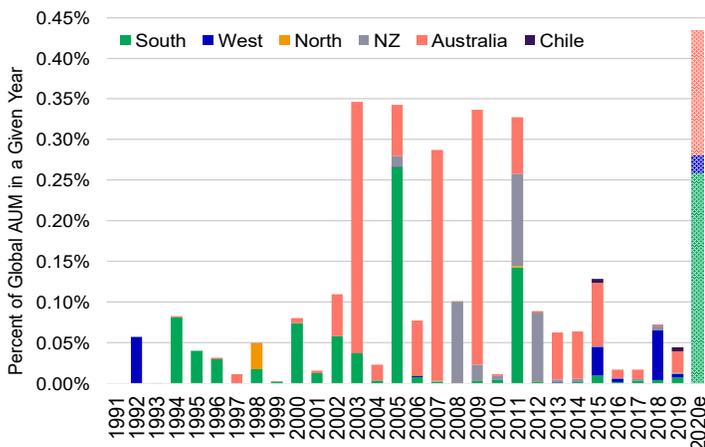
<sup>12</sup><https://www.laforestry.com/podcast/episode/4a981cfe/hurricanes-laura-and-delta-hits-la-timber-hard>

10% of the value of the timber damaged by the 2020 storms in Louisiana and East Texas will be recovered after all salvage efforts are complete.

The estimated value losses associated with this year's fire events were modified by the rate of salvage recovery. For fires in the U.S. West Coast, salvage operations are often expected to recover as much as 80% of the financial value of a mature timber stand, with typically a good recovery of sawtimber sized trees after a fire, as only the outside of the tree may be charred. In our current estimates for salvage recovery for this year's fires, we have assumed a lower salvage recovery rate (45%), given the extensive range of fire damage across counties and ownerships this season, and the slowed operating logistics due to the pandemic.

Viewing the 2020 physical timber losses through a geographical lens provides some additional insights (see Figure 4). In the case of Australia, the large-scale fires of 2020, although significant, did not match the peak value losses experienced in 2003, 2007 and 2009, a period which was characterized by successive hot and dry summers. These results highlight the potential for the HNRG data sample to differ from the general case—as Australia state data (Figure 2 on page 2) would suggest other timberland owners and managers in Australia suffered extraordinary losses in 2020.

**Figure 4. Catastrophic Loss Differs Across Geographies and Time**



Source: Hancock Natural Resource Group, December 15, 2020

Despite expansive fire activity throughout the U.S. West in 2020, the value losses across HNRG's regional portfolio of properties was contained by a combination of property location, management practices, and excellent opportunities for salvage. Estimates suggest 1.5 million acres across multiple ownerships in Oregon and Washington alone, were impacted by fire in 2020<sup>13</sup>. For perspective, roughly ten million acres are harvested annually across the entire U.S.<sup>14</sup>. The Oregon Forest Resources Institute is under-taking a study of the industry losses due to this year's fire season – due out in May of 2021. Our early calculations of losses, net salvage, for HNRG's western properties are just .022% of HNRG's total global asset value<sup>15</sup>.

The U.S. South dominated this year's timber damage, due to the highly unusual concentration of storm activity in the region that was exacerbated by very low rates of salvage recovery. The unusual number of storms experienced in the U.S. South in 2020 does not seem to reflect an emerging trend, since it followed eight successive years of very low storm damage, and the estimated damage for 2020 is not likely to exceed the previous peak set in 2005.

### Concluding Thoughts

Although 2020 will be a landmark year for catastrophic timber losses, the evidence does not compellingly show that we are on an upward curve leading to a higher probability of physical damage in the future. Historical data does suggest a moderate rising trend in U.S. western fire risk, this is not the case for either fire damage in Australia commercial forests or for storm damage in the U.S. South's pine plantations.

Going forward, efforts to mitigate these physical risks to forests will undoubtedly also come into play. Utilizing emerging technology and adaptive management techniques, will better prepare timberland assets for the occurrence of catastrophic events. New technologies such as monitoring forests for outbreaks of fires and insect infestation with drones could provide earlier identification and response. The historical patterns and timing of catastrophic events for timberland assets strongly suggests the risk-reducing advantages of building a geographically well diversified portfolio of properties.

<sup>13</sup>Forest Economic Advisors,  
<sup>14</sup>Forest Economic Advisors,  
<sup>15</sup>HNRG Research, December 15, 2020

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## About Hancock Natural Resource Group

Hancock Natural Resource Group, Inc. is a registered investment adviser and part of Manulife Investment Management's Private Markets platform. We specialize in global farmland and timberland portfolio development and management on behalf of our investors worldwide. Our timber division manages approximately 6 million acres of timberland across the United States and in Canada, New Zealand, Australia, and Chile. Our agricultural investment group oversees approximately 300,000 acres of prime farmland in major agricultural regions of the United States and in Canada and Australia.

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Manulife Investment Management is the global wealth and asset management segment of Manulife Financial Corporation. We draw on more than 150 years of financial stewardship to partner with clients across our institutional, retail, and retirement businesses globally. Our specialist approach to money management includes the highly differentiated strategies of our fixed-income, specialized equity, multi-asset solutions, and private markets teams—along with access to specialized, unaffiliated asset managers from around the world through our multimanager model.

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