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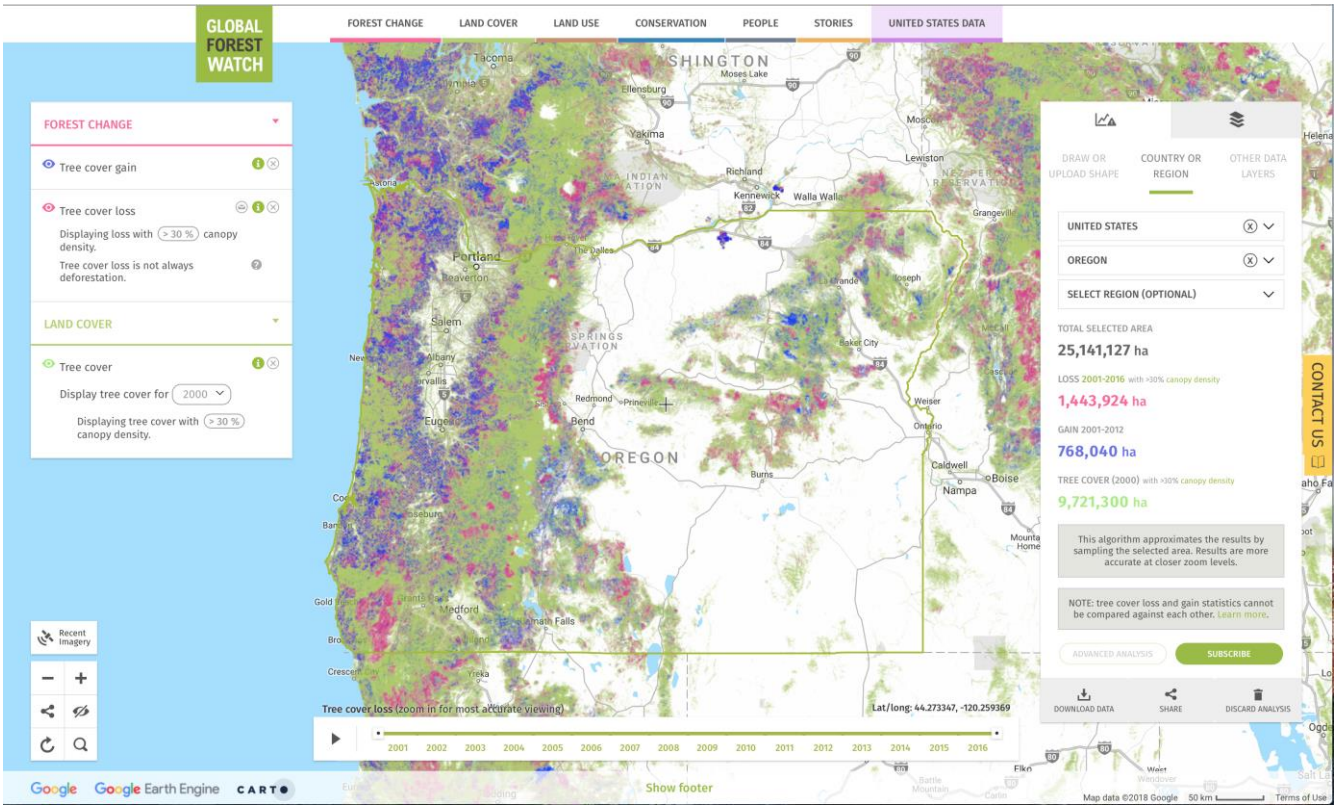
Section 19: Carbon offsets to reforest Oregon's damaged wildfire lands

My testimony will suggest additional language for Section 19 of HR 2020. During the past several years, wildfires in Oregon have become more punishing and costly. Federal and state governments spent $454 million and $514 million on wildfire suppression costs in 2017 and 2018 respectively, according to data from Northwest Interagency Coordination Center. In 2017, there were more than 2,000 total fires that burned 665,000 acres statewide. All totaled in 2018, Oregon had 1,880 fires that burned 846,411 acres or 1,322 square miles — an area larger than Rhode Island.

According to Global Forest Watch, the state of Oregon has lost approximately 1.7 million acres of forest cover from the period of 2001 to 2017. Much of this forest cover loss is due to wildfires. For example, the Biscuit Fire beginning in July 2002 burned 500,000 acres. Much of the Kalmiopsis Wilderness was burned and tree cover has not returned, as can be seen in the southwest corner of the state in this Global Forest Watch map.



The following forest fires table on the next page was provided by the Oregon Forest Resources Institute, based upon information from the Northwest Coordinating Center. While two bad fire years in a row does not necessarily mean a trend, climate scientists have been predicting for years that there will be an increase in the number of wildfire acreage burned throughout the West due to longer and

dryer wildfire seasons. Please note that this table shows actual forest acres burned which does not include the rangeland acreage burned that was cited in the opening paragraph.

Forest fires and acres burned in Oregon - 2014-2018

	ODF Protected			USFS Protected			Combined Total	
Year	**Fires**	**Size**	**Average**	**Fires**	**Size**	**Average**	**Fires**	**Size**
	(number)	(acres)	(acres/fire)	(number)	(acres)	(acres/fire)	(number)	(acres)
2018	964	90,704	94	667	349,123	523	1,631	439,827
2017	1,090	47,165	43	718	470,718	656	1,808	517,883
2016	396	4,529	11	561	45,663	81	957	50,192
2015	1,139	72,439	64	1,104	256,835	233	2,243	329,274
2014	1,184	114,089	96	1,410	119,280	85	2,594	233,369
Total	4,773	328,926	**69**	4,460	1,241,619	**278**	9,233	1,570,545

Forest Accounting Project

Produced by the state Oregon Global Warming Commission in 2018, the *Forest Accounting Project* assessed the amount of carbon sequestered in Oregon's public and private forests. According to the report,

> *Oregon's forests sequester very large quantities of carbon, presenting both risks (of release) and opportunities (for greater carbon withdrawal from the atmosphere and long-term forest storage). Oregon forests contain on the order of 3 billion (short) tons of carbon (or + 10.4 to 11.6 billion tons of CO2e5), variously in carbon pools that include standing live trees, standing and fallen dead trees, forest floor vegetation, and soils.*

The report states:

> *Since the early 1990s, Oregon's publicly- and privately-owned forests in aggregate appear to have been removing from the atmosphere and storing between 23 million (short) tons and 63 million tons of CO2e (Harmon 2018a) on average every year. . .*

A peer-reviewed 2018 report entitled *Land use strategies to mitigate climate change in carbon dense temperate forests* was prepared by a number of scientists including several from Oregon State University which found similar figures.

> *Oregon's net ecosystem carbon balance (NECB) was equivalent to 72% of total emissions in 2011–2015. By 2100, simulations show increased net carbon uptake with little change in wildfires. Reforestation, afforestation, lengthened harvest cycles on private lands, and restricting harvest on public lands increase NECB 56% by 2100, with the latter two actions contributing the most.*

To put the amounts of 23 to 63 million tons of CO2e into perspective, the Oregon Global Warming Commission's 2018 Biennial Report to the Legislature for the 2019 Legislative Sessions states,

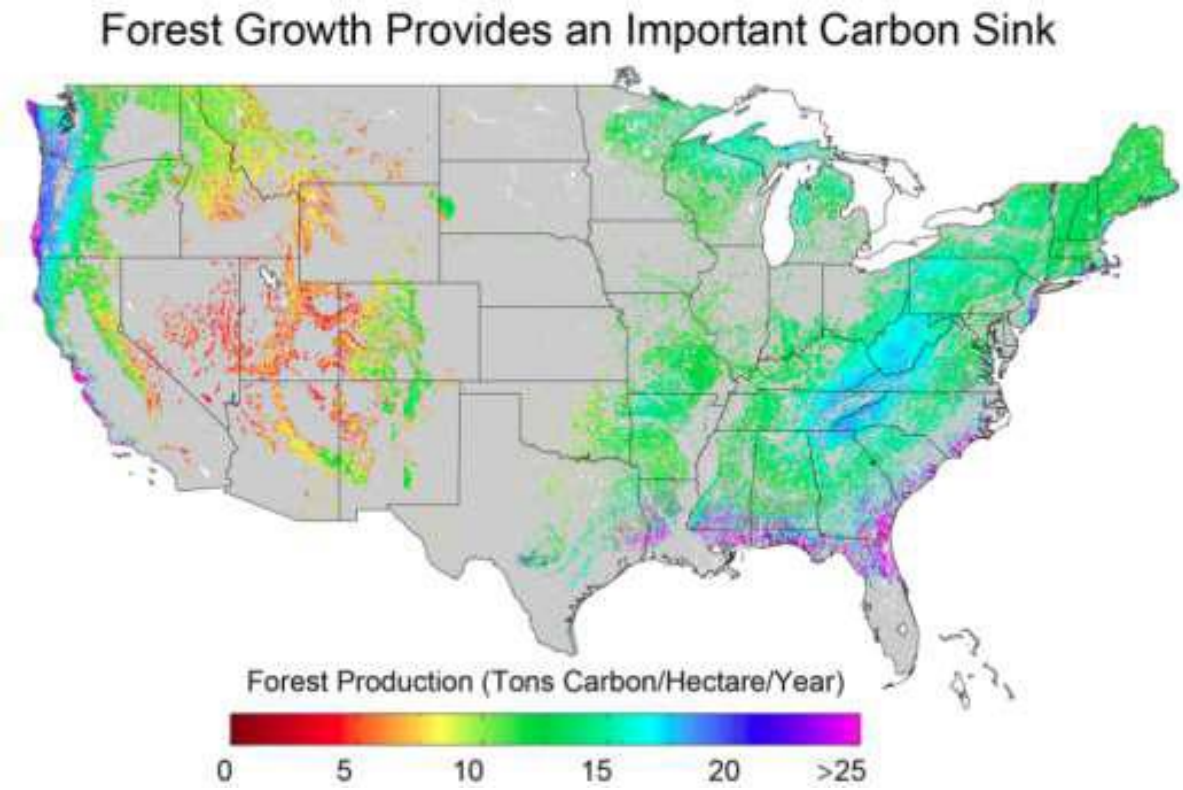
> *We are able to report a preliminary value of 64-65 million metric tons of carbon dioxide equivalent(MTCO2e) for the state's total GHG emissions in 2017. This reverses the slight decrease the state achieved in2016, returning to approximately the same level as in 2015. This level is well above the state's goal of 51 millionMTCO2e by 2020 and the Commission's adopted interim goal of 32.7 million MTCO2e by 2035, and it does not put Oregon on a path toward achieving its long-term goal of 14 million MTCO2e by 2050.*

In plain English, Oregon's forests sequester anywhere from 35% to essentially 100% of the anthropogenic greenhouse gases produced in Oregon. However, these is also a warning about the future of forest sequestration in Oregon. Forests in Montana no longer sequester carbon. Rather the forests have become a source of carbon, according to a Washington Post February 1, 2019 article.

National study says reforestation has significant potential to offset emissions

A scientific report entitled *Natural climate solutions for the United States* published in the November 14, 2018 edition of Science Magazine explored using Mother Nature to lessen the impacts of increasing amounts of carbon dioxide in the atmosphere which the report referred as "natural climate solutions." Examples included reforestation, changes in forest management, biochar, agricultural practices, etc.

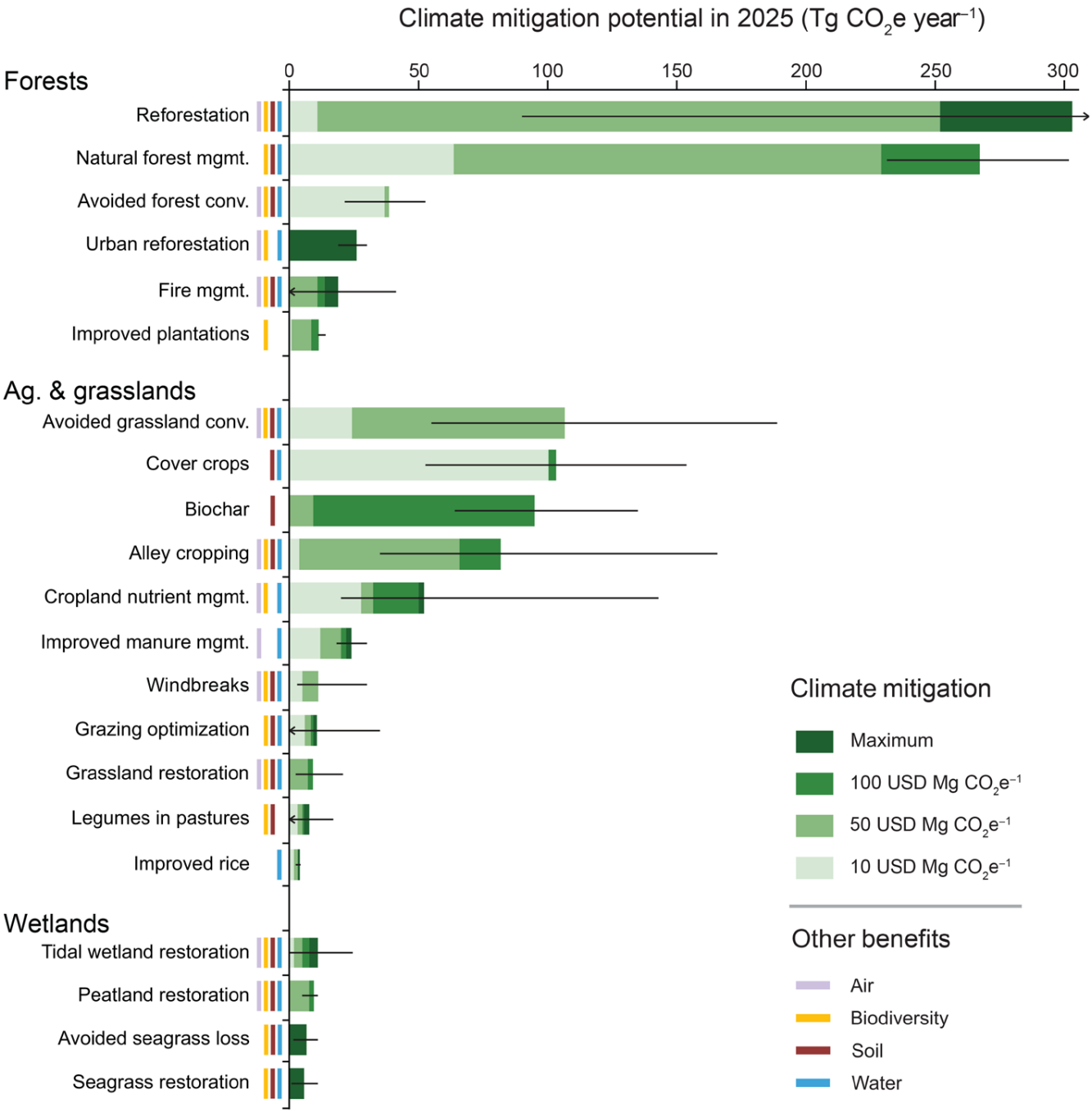
> *We found a maximum potential of 1.2 (0.9 to 1.6) Pg CO2e year−1, the equivalent of 21% of current net annual emissions of the United States. At current carbon market prices (USD 10 per Mg CO2e), 299 Tg CO2e year−1 could be achieved.*



For those willing to read dense scientific writing, the following paragraph from the report discusses how the increased carbon sequestration is achieved depending on the price of carbon. The report found that reforestation has the greatest potential of any of the natural climate solutions.

> *We find a maximum additional NCS mitigation potential of 1.2 Pg CO2e year−1 [95% confidence interval (CI), 0.9 to 1.6 Pg CO2e year−1] in the year 2025 (Fig. 1 and table S1). This is 21% of the 5794.5 Tg CO2e of net emissions in 2016 (15). The majority (63%) of this potential comes from increased carbon sequestration in plant biomass, with 29% coming from increased carbon sequestration in soil and 7% coming from avoided emissions of CH4 and N2O. At the USD 10, 50, and 100 price points, 25, 76, and 91%, respectively, of the maximum mitigation would be achieved. This means that 1.1 Pg CO2e year−1 are available at USD 100 per Mg CO2e, which equals the emission reductions needed to meet the U.S. NDC under the Paris Agreement*
>
> *Reforestation has the single largest maximum mitigation potential (307 Tg CO2e year−1). The majority of this potential occurs in the northeast (35%) and south central (31%) areas of the United States (fig. S1). This mitigation potential increases to 381 Tg CO2e year−1 if all pastures in historically forested areas are reforested. Previous estimates of reforestation potential range widely from 208 to 1290 Tg CO2e year−1 (7). Higher estimates than ours can be obtained by reforesting or afforesting areas that we excluded (e.g., productive crop and pasture lands and natural grasslands) and/or by using rates of carbon sequestration from plantations.*

The following bar graph is quite useful, but does need a bit of explaining. The chart also needs to be shown in full color. Otherwise, the reader will not be able to properly understand the bar chart. The chart is showing the amount of carbon sequestration from a variety of different types of natural climate solutions, such as reforestation, natural forest management, bio char, agricultural practices and wetlands restoration. Reforestation and natural forest management have by far the two biggest potentials. If you look at the reforestation bar, there are three colors. The light blue color shows what could be accomplished if the price of carbon is set at $10 per ton (which is not very much). The light green color shows how much reforestation could be accomplished at $50 per ton. The dark green shows what would be accomplished at $100 per ton. Please keep in mind that these are national figures and that the cost of reforestation in the south is much less than in the Pacific Northwest.



The key takeaway from the national report is that reforestation of lands has the greatest offset potential of any natural climate solution.

House Bill 2020 – carbon reduction proposed legislation

House Bill 2020 is currently under consideration by the 2019 Oregon State Legislature. The proposed bill includes sections for what are called "offset credits." As defined in the draft:

> *"Offset credit" means a tradable credit generated through an offset project that represents a greenhouse gas emissions reduction or removal of one metric ton of carbon dioxide equivalent.*

"Offset project" means a project that reduces or removes greenhouse gas emissions that are not regulated emissions.

The offset projects are defined as:

SECTION 19. Offset projects. (1) Offset projects:
(a) Must be located in the United States or in a jurisdiction with which the State of Oregon has entered into a linkage agreement pursuant to section 24 of this 2019 Act;
(b) Must not be otherwise required by law; and
(c) Must result in greenhouse gas emissions reductions or removals that:
(A) Are real, permanent, quantifiable, verifiable and enforceable; and
(B) Are in addition to greenhouse gas emissions reductions or removals otherwise required by law and any other greenhouse gas emissions reductions or removals that would otherwise occur.
(2)(a) A total of no more than eight percent of a covered entity's compliance obligation may be met by surrendering offset credits. A total of no more than four percent of a covered entity's compliance obligation may be met by surrendering offset credits that are sourced from offset projects that do not provide direct environmental benefits in this state.
(b) The Director of the Carbon Policy Office may by rule adopt additional restrictions on the number of offset credits that may be surrendered by a covered entity that is an air contamination source that is geographically located in an impacted community if:

There are both opportunities and challenges with using offset credits. The opportunity is that there is an increasing number of wildfire acreage that are not getting reforested due to a number of reasons which likely include lack of funding and lack of impetus and effort on the part of the public. The "offset credits" provide a funding mechanism to reforest scorched lands that are not able to regenerate naturally.

There are lots of challenges to using these offset credits. First, most of the wildfire acreage that needs to be reforested is located on US Forest Service lands as well as some Bureau of Land Management funds. There needs to be a mechanism in which a third party – either a for-profit entity or a non-profit entity – would be entitled to reforest the lands and receive offset credits. Second, reforesting many of the wildfire acres will be quite expensive. Many of the fires have burned in southwest Oregon which is both mountainous and increasingly dry. Many of these wildfire acres have likely had brush starting to grow on the acres which will need to be treated or removed. There needs to be a financial incentive for a third party – either non-profit or for profit – to make the effort to reforest these harsh sites.

Proposed language

A number of environmental organizations are understandably leery about the use of offset credits. There definitely needs to be a reduction in the greenhouse gas emissions for the state of Oregon to meet its target goal reductions. However, this particular reforestation effort will be a "genuine" offset projects that would not have occurred without the value of this offset credit.

The legislative draft says that the *"Carbon Policy Office within Oregon Department of Administrative*

Services and (will) direct(s) Director of Carbon Policy Office to adopt Oregon Climate Action Program by rule.

Section 3 of the legislative draft states that:

> *The Joint Committee on Climate Action shall:*
> *(a) Provide general legislative oversight of policy related to climate, including but not limited to the Oregon Climate Action Program established under sections 8 to 26 of this 2019 Act;*

Section 9 directs the Director of the Carbon Policy Office:

> *shall adopt an Oregon Climate Action Program by rule in accordance with the provisions of sections 8 to 26 of this 2019 Act.*

Since it appears that the State Legislature will develop a broad based carbon reduction legislative bill which will then be fleshed out in administrative rules, I would propose that there will be additional language in Section 19 that states:

> *The Director of the Carbon Policy Office may by rule adopt language to provide an incentive for persons to reforest wildfire lands that would otherwise not be reforested, either naturally or legally required.*

The above language is broad as there is much research that needs to be performed in the development of sound administrative rules to provide an incentive to reforest wildfire lands, particularly on US Forest Service and BLM lands. It is assumed that there will need to be some type of federal language that will allow both non-profits and for-profits to engage in offset projects on federal lands and to receive offset credits for that work. There needs to be research about the costs of reforesting which fires since there will be wide variations in reforestation costs on different types of forest lands, depending upon the topography, soil types, exposure, etc.

Similar to the Tillamook Burn reforestation effort in the 1930s, this effort will provide future benefits to future generations that are not yet calculable.