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December 11, 2017

Rep. Ken Helm, Chair, Work Group on Agriculture, Forests, Fisheries, Rural Communities, Tribes, members of the Work Group & Sen. Michael Dembrow (sent via email)

**Re:** Geos Institute comments on SB 1070

Thank you for your leadership on SB 1070. As a forest scientist and member of the Oregon Global Warming Commission's Task Force on Forest Carbon, I would like to comment on SB 1070 to bolster the scientific underpinnings of the bill that, if adopted, would make Oregon a leader in addressing climate change.

While the views herein are my own, the draft findings of the Task Force show that with improvements to forestry, Oregon can become a national leader in meeting emissions reduction targets as summarized:

- Using forest inventory data from the Pacific Northwest Research Station and forest carbon modeling, **annual emissions from industrial forestry represent ~38% of Oregon's total emissions (~24 million metric tonnes CO<sub>2</sub>e/year)**, the largest single emissions source of all reporting sectors in the state. This estimate builds on a 2015 report submitted to the governor by the Center for Sustainable Economy and Geos Institute<sup>1</sup>.
- Natural mortality and logging are the main emissions from forests with most mortality on a portion of federal lands (e.g., West Cascades).
- Although smoke plumes produced by large wildfires are impressive, wildfires overall are not a major long-lived (100 yr+ in the atmosphere vs. black carbon emissions with only 2 week shelf life) emissions source, representing ~5% of total emissions (some years <1%<sup>2</sup>). Fire-related emissions also decreased between 2001-05 vs. 2011-14 (two time periods for which we have data) but were highest on private lands. This is likely due to plantations that burn more intensely due to packing of small trees and accumulating logging slash over industrial landscapes<sup>3</sup>.
- Surviving and dead trees should not be logged after fire, as they

<sup>1</sup><http://www.forestlegacies.org/press-room/1265-oregon-forestry-is-clearcutting-our-climate-future>

<sup>2</sup>Hicke, J.A., et al. 2013. Carbon stocks of trees killed by bark beetles and wildfire in the western United States. *Environ. Res. Lett.* 8, 035032, [doi:10.1088/1748-9326/8/3/035032](https://doi.org/10.1088/1748-9326/8/3/035032).

<sup>3</sup>Odion, D.C., et al. 2004. Fire severity patterns and forest management in the Klamath National Forest, northwest California, USA. *Conservation Biology* 18:927-936. Bradley, C.M., et al. 2016. Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? *Ecosphere* 7:1-13.

continue to store carbon, emissions from logging would increase, and they serve critically important ecosystem functions. The largest percentage of long-lived emissions released into the atmosphere due to fire consistently comes from high fire severity hotspots in the forest litter and duff, not the standing dead or downed logs.

- Oregon's older coastal forests are among the most carbon dense ecosystems on the planet<sup>4</sup>. Older forests store 3-7 times more carbon than plantations<sup>5</sup>.
- Although sequestration is currently outpacing emissions from logging (due presumably to sustained yield forestry), gross forests carbon growth rates have been slowing down on private non-industrial forests, federal, and state forests.
- The Northwest Forest Plan shifted federal forests from an emissions source in the 1980s to a large carbon sink today<sup>6</sup>. Reduced logging levels on federal lands have accumulated carbon stored in mature forests and are now a climate asset for the state.

In closing, adding industrial forestry to the cap and invest framework of SB 1070 is essential. SB 1070 could be improved by encouraging landowners to adopt forestry practices that: (1) extend timber harvest rotations at least 50 years (net increase in carbon is ~15%<sup>7</sup>); and (2) protect older forests as sinks. Supporting forest conservation measures of the Northwest Forest Plan would optimize the federal lands sink. Current state logging practices emit forest carbon that took decades to centuries to accumulate (i.e., slow in). Logging returns carbon to the atmosphere quickly through slash, transport and manufacture of wood products, and soil carbon losses (i.e., fast out; Dr. Bev Law, Oregon State University). Allowing forests to accumulate carbon would have an immediate positive effect on carbon stored in vegetation and soils, atmospheric CO<sub>2</sub> absorption, clean water, and biodiversity that are increasingly important in a changing climate<sup>8</sup>. Thus, Oregon has a unique opportunity to adopt climate-saving practices that play a vital role in mitigating and preparing for climate change.

Sincerely,



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Chief Scientist

Member of Oregon's Global Warming Commissions Task Force on Carbon

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<sup>4</sup>Krankina, O., et al. 2014. High biomass forests of the Pacific Northwest: who manages them and how much is protected? *Environmental Management*. 54:112-121.

<sup>5</sup>Law, et al. 2001. Carbon storage and fluxes in ponderosa pine forests at different developmental stages. *Global Change Biology* 7:755-777. Hudiburg, T., et al. 2009. Carbon dynamics of Oregon and Northern California forests and potential land-based carbon storage. *Ecological Applications* 19:163-180.

<sup>6</sup>Krankina, O.N., et al. 2012. Carbon balance on federal forest lands of western Oregon and Washington. *Forest Ecology and Management* 286:171-182.

<sup>7</sup>Hudiburg, T., et al. 2009. *Ibid.*

<sup>8</sup>Brandt, P., et al. 2014. Multifunctionality and biodiversity: Ecosystem services in temperate rainforests of the Pacific Northwest, USA. *Biological Conservation* 169: 362-371.