

Appendix C — Approach for Providing Supporting Information for Goal Setting and Calculating Potential Net Sequestration Ranges for Oregon

As discussed in the body of the report, the Commission recommended goals in 2021 as required by Executive Order 20-04.

These goals are meant to be in addition to what the landscape is already sequestering. Per ODOE's Land-based Net Carbon Inventory (LCI), Oregon's natural and working lands removed approximately 48 MMTCO₂e/year in 2024, which is also equal to the rate of removals averaged over the past five years.

However, what do Oregon's net land-based removals mean in the context of national and global greenhouse gas data and related goals? What do these estimates mean given the mitigation potential of various land management strategies? ODOE staff worked to answer these questions to aid goal setting.

Staff researched state and national jurisdictions to understand how others have created greenhouse gas-related goals in general, or natural and working lands goals, specifically. ODOE reviewed a range of resources from international, national, and state bodies that have been involved with setting goals for land-based removals. These include the Intergovernmental Panel on Climate Change, U.S. White House, the U.S. Climate Alliance, and California, Maine, and New Jersey, among others.

Countries have relied upon global data and their own national greenhouse gas inventories to establish goals for land-based removals. Some countries, such as those in the European Union, have set explicit annual removals targets for different time horizons¹ but most have not.

Others have instead set economy-wide emissions targets that include removals from their land sector, or set activity targets like the planting of a certain number of trees with an implicit benefit to land-based removals.²

Approaches to Setting a Goal

- Use data from national or global GHG emissions datasets or atmospheric GHG concentrations
- Use data from Oregon's Land-based Net Carbon Inventory
- Use data from mitigation potentials of specific activities
- Use existing frameworks to arrive at goal (e.g. Net Zero or Real Zero Framework)

¹ European Commission (2023). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. [EUR-Lex - 52020DC0562 - EN - EUR-Lex](#)

² United Nations Climate Change (2025). *2025 NDC Synthesis Report*. [2025 NDC Synthesis Report | UNFCCC](#)

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Similarly, there are only a few states that have established explicit land-based sequestration and storage goals; most are relying on conservation targets and goals as a surrogate goal to mark progress. [See state progress on natural and working lands policies.](#)

Staff synthesized this information into approaches and frameworks that were either common or promising in their utility for Oregon and are listed in the callout box.

In January, ODOE conducted a workshop with the experts who have or currently are supporting the NCS work. Take-aways from the meeting included:

- The approaches ODOE presented are not necessarily exclusive of each other
- There are many ways to make a goal and much depends on the fundamental desire or aim that the goal will serve
- The goal will be achieved by land management activities and it is important that the goal is translatable to actions so that participants are empowered to act

Additionally, during the spring of 2026, ODOE discussed approaches to goal setting, their rationale, and preliminary calculations with the NCS Inter-agency Working Group, the Natural and Working Lands Advisory Committee, and held three meetings with Commissioners serving on an NCS Committee for the Commission. Committee members expressed a desire for additional information and discussion on land ownership and measures to address the declining trend in land-based removals in the LCI. This information is included in the report. [Appendix B](#) provides the underlying data used in the approaches that relied on data from federal and state sources.

Three Different Methods of Calculating Sequestration Ranges

The calculations were created based on the Sixth Assessment Report of the Intergovernmental Panel on Climate Change³ and the Long-Term Strategy of the United States,⁴ both of which were released in 2021. A recent report from the United Nations Environmental Program indicated that global annual emissions have increased every year since 2021 and emphasized that, given the increased likelihood of overshooting our global warming targets, greater and faster measures must be taken by countries to achieve net zero by 2050.⁵ Per the United Nations analysis, the U.S. is currently far off track from achieving net zero by 2050 and ambitious targets for land-based removals in the U.S. are likely necessary to meet global climate goals.

³ Intergovernmental Panel on Climate Change (2021). IPCC Sixth Assessment Report: Working Group 1: The Physical Science Basis. [Climate Change 2021: The Physical Science Basis | Climate Change 2021: The Physical Science Basis](#)

⁴ U.S. Department of State and United States Executive Office of the President (2021). *The Long-term Strategy of the United States: Pathways to Net-Zero Greenhouse Gas Emissions by 2050*. [The Long-Term Strategy of the United States, Pathways to Net-Zero Greenhouse Gas Emissions by 2050](#)

⁵ United Nations (2025). Emissions Gap Report 2025. [Emissions Gap Report 2025 | UNEP - UN Environment Programme](#)

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Each method answered slightly different questions:

- What could the goal be if it is based on global or national greenhouse gas information, and is consistent with previous international and national commitments?
- What could the goal be if it is based on Oregon land-based greenhouse gas information?
- What could the goal be if it is based on net removals related to potential NCS mitigation activities?

Calculations based on global and national information

The Intergovernmental Panel on Climate Change's 6th Assessment Report⁶ recommended that, globally, we must achieve net zero by 2050, and net negative thereafter, to limit warming to 1.5 degrees Celsius.

In keeping with the Intergovernmental Panel on Climate Change goal, the Long-term Strategy of the United States,⁴ proposed by the Biden Administration, stated that the U.S. should reach net zero by 2050. It proposed that the U.S. should increase land-based net sequestration by 200 MMTCO₂e per year by 2050. It did not establish by how much individual states should increase their land-based sequestration. This national goal was subsequently rejected by the current administration and no guidance for state contributions was ever produced.

However, using data from the U.S. National Greenhouse Gas Inventory,^{ix} and the recent data from Oregon's Land-based Net Carbon Inventory,^{Error! Bookmark not defined.} ODOE calculated that Oregon's land contributed on average 4.5 to 5.4 percent of national land-based removals over the last five years that data are available. Using these percentages, we can calculate the range of net sequestration by Oregon as its share of the total national net sequestration goal (200 MMTCO₂e/year).

Range: 9 to 10.8 MMTCO₂e/year

Calculations based on Oregon information

The recent Oregon Land-based Net Carbon Inventory calculated that over the last five years (2020 to 2024), total net land-based removals averaged 48 MMTCO₂e/year.

To develop a range of potential additional removals, ODOE used the historical record in Oregon. ODOE looked for the maximum rate of net removals in a given year within the Inventory data between 2001 and 2024. Oregon's landscape sequestered 64.9 MMTCO₂e/year in 2014, which represents a 36 percent increase in removals compared to the five-year average and offers a perspective on the range of feasible percent change.

⁶ Intergovernmental Panel on Climate Change (2021). IPCC Sixth Assessment Report: Working Group 1: The Physical Science Basis. [Climate Change 2021: The Physical Science Basis | Climate Change 2021: The Physical Science Basis](#)

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ODOE calculated the increase in net land-based annual removals based on incremental percent increases in removals:

- 10 percent equals 4.8 MMTCO₂e/year.
- 20 percent increase equals 9.6 MMTCO₂e/year.
- 30 percent increase equals 14.4 MMTCO₂e/year.

Range: 4.8 to 14.4 MMTCO₂e/year

Calculations based on potential NCS Activities

A 2020 study on natural climate solutions in Oregon, from Graves and others,⁷ estimated the additional removals from the potential implementation of 12 NCS activities. They found that by 2035, Oregon could sequester an additional 2.7 to 8.3 MMTCO₂e/year, and by 2050, and Oregon could sequester an additional 2.9 to 9.8 MMTCO₂e/year, depending on how aggressively each NCS activity was implemented. This information, along with a [study on tidal wetlands by the PNW Blue Carbon Working Group](#), and another on agricultural land (citation forthcoming) informed the current existing goal that was adopted in 2021 (5 MMTCO₂e/year by 2030 and 9.5 MMTCO₂e/year by 2050).

ODOE is currently working on an NCS and Metrics Analysis with RTI International to estimate the removal potential from approximately 15 NCS activities (of the 32 total NCS examined), which includes the 12 NCS activities examined in the publication by Graves and others. Additional in-depth future analyses (which would require additional funding) would be needed to refine NCS removal potential based on factors like zoning, land ownership, workforce, capital, and other considerations. Draft information from the current NCS and Metrics Analysis may be available by the time a new goal is established; however, additional analyses as described are needed to understand the actions Oregon can take to meet an established goal regardless of the method used to establish it.

Oregon's potential additional contribution

In the Commission's NCS Committee March 2026 meeting, Commissioners were interested in understanding Oregon's contribution to the U.S.'s overall land-based removals, and if Oregon could provide more than our share because our ecosystems may have more capacity than that of other states. ODOE therefore explored a larger role for Oregon based on historical precedent. Oregon's maximum contributions to land-based removals since 2000 occurred in 2014 at 65 MMTCO₂e/year, or about 7 percent (See Figure 6 and Table 9 in the [Land-based Net Carbon Inventory Report](#)). Using this percentage and relating it to the nationwide goal of increasing national removals by 200 MMTCO₂e/year, Oregon's potential contribution could

⁷ Graves et al. (2020). Potential greenhouse gas reductions from Natural Climate Solutions in Oregon, USA. *PLoS ONE*, 15(4), e0230424. <https://doi.org/10.1371/journal.pone.0230424>

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equal an additional 14 MMTCO₂e/year. This is within the science-based range of sequestration potential ODOE calculated in the “calculations based on Oregon information” section above.

Range: 14 MMTCO₂e/year

Total Range of Potential Net Sequestration Based on Data:

In summary, Figure A1 below illustrates the three ranges from the calculations described above. The dark vertical lines in the center of this figure represent the Commission’s current recommended goals for 2030 and 2050 (5 to 9.5 MMTCO₂e/year, respectively), while the horizontal, orange-colored bars represent the range of removals calculated above for each of the three methodologies. All three methodologies either span or cross the goals previously adopted by the Commission. The full range of science-based removals calculated ranges from a minimum of 2.9 and a maximum of 14.4 MMTCO₂e/year. [Appendix D](#) lists the preliminary mitigation potentials of some natural climate solutions that could be implemented in the state. In its calculations of potential net sequestration ranges, ODOE did not include uncertainty related to atmospheric GHG concentrations, national GHG inventory estimates, or state GHG inventory estimates. However, ODOE did make its recommendation within the range of removals.

Full Range: 2.9 to 14.4 MMTCO₂e/year

Figure C1. Summary graph of preliminary potential sequestration ranges from described methods

