

Oregon Roundtable on Sustainable Forests Preliminary Evaluation of Indicator of Sustainable Forest Management



G.a.: Carbon stocks on forestlands and in forest products

Current desired trend/target: Rates of storage of carbon in Oregon forests and Oregon forest products are stable or increasing.

The current data report for this indicator can be accessed at:
<http://www.oregon.gov/ODF/indicators/indicatorGa.shtml>

Evaluation Summary: ¹

Key Roundtable findings

- The indicator is not ready to assign ratings on condition and trend.
- The modeling approach used for the indicator raised some concerns and ideas for improvement.
- There was no consensus among meeting participants on what “sideboards” should be used for an analysis of Oregon forest carbon.
- Some participants believe model validation and enhancements are necessary if the model is to be credible.
- It is apparent there may not yet be consensus in the scientific community on how best to measure forest carbon storage and flux. Continued dialogue with OSU scientists and other experts is needed.
- Results are needed from substantially more regions than currently reported before some participants can be comfortable with a statewide approximation. Other participants believe the data may already be adequate to show management is not having much effect on total forest carbon storage as long as forested tracts remain in forestry uses.
- Some participants disagree with the existing desired trend statement.
- Some participants believe simulation results are not a good choice for characterizing current conditions.
- The Board of Forestry and the State of Oregon can encourage continued funding and commitment.

¹ This is a summary of the Oregon Roundtable on Sustainable Forests discussion and conclusions regarding the staff report on an Oregon Indicator of Sustainable Forests Management. The summary is organized around nine questions identified by the Roundtable as being central to evaluations of all 19 indicators. It reflects the input from Roundtable participants who attended the July 21, 2010 meeting where the indicator was discussed and from an electronic survey of those participants following the meeting. The summary is based on interpretation of the Roundtable discussions by the seven-person Roundtable Leadership Group, with the assistance of Oregon Department of Forestry staff.

Conclusions may not have been reached by the Roundtable for every evaluation question. The summary should not be considered as expressing a consensus of the meeting participants or the Roundtable in general. However, this information will be immediately useful to the technical staff working to implement and improve future indicator data collection and reporting and to the Board of Forestry and other Oregonians desiring to use the indicator as one tool in assessing Oregon’s progress towards sustainable forest management.

It is anticipated that the Roundtable will proceed with discussions on all the indicators and will then discuss the body of indicators as a whole – looking for common themes and synthesizing conclusions about the indicators project. Therefore, Roundtable conclusions for this indicator may be revisited and revised at a later date.

Additional Roundtable comments organized by indicator evaluation questions

1. Is the purpose and intent for the indicator clear?

For some participants, the indicator statement is clear and simple. The fourth paragraph in this section of the report is the most useful.

Others commented the report needs to speak to participation in the carbon economy and climate change adaptation and mitigation. The report could be written more positively – the indicator analyzes the role forests can play to mitigate climate change by enhancing carbon storage.

A non-technical editor for the report is recommended.

Does the indicator make sense given forests impact on carbon?

- Forest management has a very small (negligible) impact on carbon.
- Emphasize the carbon neutrality of forests and forest management.
- Forest growth and carbon sequestration should also be mentioned with carbon storage.

The report doesn't describe the tradeoffs of increased/decreased forest carbon on other indicators/resources.

Consider a trend statement that focuses on a "positive" achievement of management activities designed to meet goals.

The need to collect such data is clear enough but questions arise about the *Forestry Program for Oregon* Strategy G and whether it should be revised to something like "sustain the forest carbon cycle function" or, ala Montreal Process, "Maintain forest contribution to global carbon cycles"

Some participants are bothered by the lack of a qualitative direction in the indicators.

2. Is the protocol for indicator data collection clear and technically sound?

The modeling approach raised many concerns and ideas for improvement. Comments included:

- There is currently low validity in the model to use it as the sole source for a statewide indicator.
- The model is still rudimentary. It may be useful for historical/future projections, but not for quantifying current conditions.
- The model currently is just a starting point and may take years to mature.
- The model uses fire and timber harvest as the only drivers. What about the effects from fire suppression and other management activities?
- Given the major impacts of insects and diseases, their omission from the model is perceived as a major gap, especially in Eastern Oregon.
- If fire or insect and disease mortality is mistaken for harvest, does that then overstate resulting forest products storage?
- Fire history and data in the model needs to be updated/corrected.
- The model needs to include data on amounts of carbon released by burning and rapid (one year) decay of slash.

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- The model output for “Product Flux” doesn’t seem to appropriately reflect the harvest rates since 1990.
- Does the model reflect the high sequestration rates of new plantations?
- Carbon growth/sequestration is a critical factor in storage.

There was no consensus among meeting participants on what “sideboards” should be used for an analysis of Oregon forest carbon.

- Some believe subjective decisions have been made on what to include and not include in the model.
- Some were concerned that fossil fuels expended for wood product extraction and fossil fuels offset from wood product use are both outside the analysis.

There seems to be confusion between sequestration and storage. Do we want high levels of sequestration, storage, or both?

Some participants believe the protocol is still under development and not mature enough for use by decision-makers. It is also apparent there may not yet be consensus in the scientific community on how best to measure forest carbon storage and flux.

- The protocol lacks precision to track small and incremental changes.
- Look at other methods that can be interrelated with other indicators.
- Be clearer on what we know and don’t know.
- It appears the indicator is still in a development and testing mode, requiring some ground testing.
- Further examination is needed on why the Silver and Biscuit Fires made no impact on the Siskiyou (Klamath) region.
- The aggregate of the four test areas is a "for instance" approximation possibly of the state, but should be very qualified. It is not robust enough to support a statewide evaluation of Condition or Trend.
- Since this work will continue under NASA funding for another year, we should stay tuned and perhaps have a more finished product in six to nine months.

The ecosystem is very complex. Forests must be described as more than just a source or sink at a given point in time.

Without an agreed upon target as to what level of carbon stocks we want to manage to, how can we know what to measure?

3. Are indicator data being reported at the appropriate spatial and temporal scales?

The model seems capable of looking backward and forward and reporting at several different spatial scales. The temporal scale is good.

Results are needed from substantially more regions than currently reported before participants can be comfortable with a statewide approximation.

- Consider using ecoregions as the building blocks as statewide-only reporting may not that meaningful.
- To be used as an indicator we need statewide data and not an extrapolation from four areas. Oregon's forests in two to four other key regions may exhibit dramatic differences than for the four reported regions. The statewide picture could be completely different.
- Future efforts which model the whole state would be appropriate.

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4. From the indicator report can you draw a conclusion regarding the quality of the Indicator G.a information?

The indicator is not yet ready to assign a rating.

Some participants believe the indicator information squares with other analyses of carbon storage and release in forests and the trends by region appear plausible.

Some believe the Oregon-wide stores and flux extrapolations are grossly inaccurate and illogical.

It should be made very clear up front that this is at the proof-of-concept stage.

- The design and concepts seem admirable, but the failure to show the effect of the Biscuit fire and the admitted need for ground truthing, make it premature to draw conclusions.
- At least a basic summary of model validation results, assuming they were available, is needed. It appears the model has not been thoroughly validated, although some partial validation was apparently done.
- Without an agreed upon target as to what level of carbon stocks we want to manage to, we can't draw a conclusion from the current data.

5. From the indicator report can you draw a conclusion regarding the current conditions measured by Indicator G.a.?

The indicator is not yet ready to assign a rating.

Some participants believe the contention that Oregon-wide stores have been declining since 1950 is foolish. They believe the data may already be adequate to show management is not having much effect on total forest carbon storage as long as forested tracts remain in forestry uses.

If the effects of management are indeed minor, a conclusion could be made that forest management decisions should not be based on carbon storage consequences. Making forest management decisions solely on carbon could have unintended consequences for biological diversity and fuels.

Others believe the indicator is not yet ready to assign a rating. A more finished product is needed with more regions to aggregate.

Some believe the metrics and data used to draw conclusions are obviously in error.

6. From the indicator report can you draw a conclusion regarding the current trend measured by the indicator, when compared to the Desired Trend Statement?

The indicator is not yet ready to assign ratings.

Some believe the simulations present a useful historical trend. A conclusion can be drawn that even though we have changed our forest practices across Oregon in dramatic ways over the past 50 years, we haven't changed the amount of carbon stored in Oregon's forests very much.

Others believe the indicator is not yet ready to assign ratings because the data are not complete enough and do not do include projections.

Without an agreed upon target as to what level of carbon stocks we want to manage to, any comment on a trend would be personal opinion only.

Some participants disagree with the existing desired trend statement.

- In some forest types we may not want stable or increasing levels of carbon storage.
- The desired trend should be determined by the time scale looked at. Restoration work could reduce carbon storage in the short term but increase storage potential in the long term.
- The existing trend statement is not necessarily an indication of a healthy forest.
- The desired trend should probably vary by ecoregion.

7. Can a case be made that other technical information should be considered as a supplement or an alternative to the information already provided for the indicator?

Can stand level information be used to help estimate past carbon stores?

Staff should examine and evaluate suggestions made by participants. A very modest comparison in some region with any viable alternative might be useful, if not also very taxing in staff time.

Simulated carbon stocks are fine for looking at historical trends and necessary for making future projections. However, some participants believe simulation results are not a good choice for characterizing current conditions because in this approach carbon stocks are calculated independent of at least several other indicators, when in fact there are obvious dependencies. If the carbon stocks were calculated based on known dependencies and probably a few other statistical relations (e.g., above ground to below ground biomass), the indicator set would be much more useful for things such as trade-off analysis and policy formulation.

One participant was struck by how the other participants criticized the data because they couldn't correlate something they believed with the indicator. For example, the perception that insect epidemics in the Blue Mountains must have altered carbon storage dramatically. This phenomenon reflects the vast size of Oregon's forests compared to the neighborhood where we each reside.

Some believe the indicator should go back to drawing board and start over. Use the University of Washington *Consortium for Research on Renewable Industrial Materials* data models and equations is

recommended.

We should consider how much carbon is stored in wood products and for what period of time.

8. Do you believe there is an adequate level of institutional commitment and resources allocated for continued full implementation and reporting of this indicator into the future?

If and when NASA funding runs out and/or LSAT information becomes unavailable, there is certainly a problem. The Board of Forestry and the State of Oregon can encourage continued funding and commitment--apparently mostly federal.

Some believe this indicator and its measurement methods need complete revision.

9. What improvements would you like to see in future reporting for the indicator? Consider this indicator as an ongoing long-term effort. Other indicators are more ready for evaluation.

Tie to Indicator C.a.: *Area of non-federal forestland and development trends*. How much potential storage and sequestration is lost through conversion?

Analyze what mix of management is most beneficial for carbon policy.

Emphasize storage and sequestration.

Describe how ownership and other overlays interact and how different management approaches affect carbon. Identify the impacts of management activities on carbon.

Rather than a trend statement, consider identifying possible objectives for management activities to help meet the goal for the indicator. Encourage activities that enhance carbon storage and sequestration.

Analyze the carbon storage and sequestration interactions with other indicators: harvests levels, jobs, forest fuel conditions, ecosystem function, and economic values. Connected data sets are needed.

Some participants believe model validation and enhancements are necessary if the model is to be credible.

- The modeling is helpful however improvements and validation testing are necessary before attempting to use it in decision-making.
- The historic perspectives are the strongest point. The projections are also helpful but shouldn't be used to present carbon storage as absolute values today.
- The 2009 and 2010 data points should be deleted from the graphs.
- Check the name of the southwestern block of the Oregon forests that was modeled. In the report it is called the Klamath Region, however it appears as though it might be more appropriately called the Siskiyou Mountains. Given its location, the name Klamath seems misleading.
- Compare model predictions to inventories and other field data to improve model parameterization.
- Improve disturbance (fire history and others) and products use history.
- Improve the depiction of climate and the processes it controls.

- Examine how biofuels influence carbon stores in forest ecosystems & forest products.
- Project future possible changes in carbon stores due to natural disturbance and management.
- Continue development of the “carbon calculator.”
- Expand the modeling to other areas in Oregon.
- Why don't the Biscuit Fire in 2002 and the multitude of 1987 fires and other major disturbances show up in the modeled results?
- Clarify that data is spread out over five-year intervals.
- Validate the model against historical data and other growth, harvest, and mortality estimates. Broadly, the model should undergo adequate validation testing.
- Do comparative runs with different models, not just one.
- Could the model be used to estimate pre-European settlement conditions?
- Correct typo in website caption for Oregon-wide carbon stores chart. “(1012)” should be “(10¹² grams).”

The Roundtable should reexamine this model as it has been refined and expanded in the next 6 to 9 months, as well as any feasible alternatives that present themselves.

Replace simulated current condition with direct calculations.

The desired trend direction should be changed to neutral. Increased storage of carbon may or may not indicate a sustainable condition in a forest.

Make sure forest carbon growth, sequestration, and forest products –the full life-cycle of carbon -- are included.

Oregon indicators of sustainable forest management ratings explanations

Indicator Condition:



Good

Desired trend or target is being achieved



Mixed or Fair

Conflicting factors are affecting the status in both positive and negative ways



Poor

Desired trend or target is not being achieved

Indicator Trend:



Improving

Current status is an improvement compared to previous data



Mixed, Uncertain, or No Change

There are either conflicting (mixed) trends, trend direction is uncertain, or there is no significant change compared to previous data



Deteriorating

Current status is a deterioration compared to previous data

Quality of Indicator Information:



Adequate

Data coverage, frequency, currency, sources, and reliability are sufficient to draw conclusions with high confidence



Partial

Data coverage, frequency, currency, sources, and reliability are of mixed quality which affects the ability to draw conclusions



Inadequate

Data coverage, frequency, currency, sources, and reliability are of insufficient quality to draw conclusions