



### Air Pollutant

Any man-made and/or natural substance occurring in the atmosphere that are likely to directly result in adverse human health outcomes, or to the degradation of natural ecosystems. (CARB)

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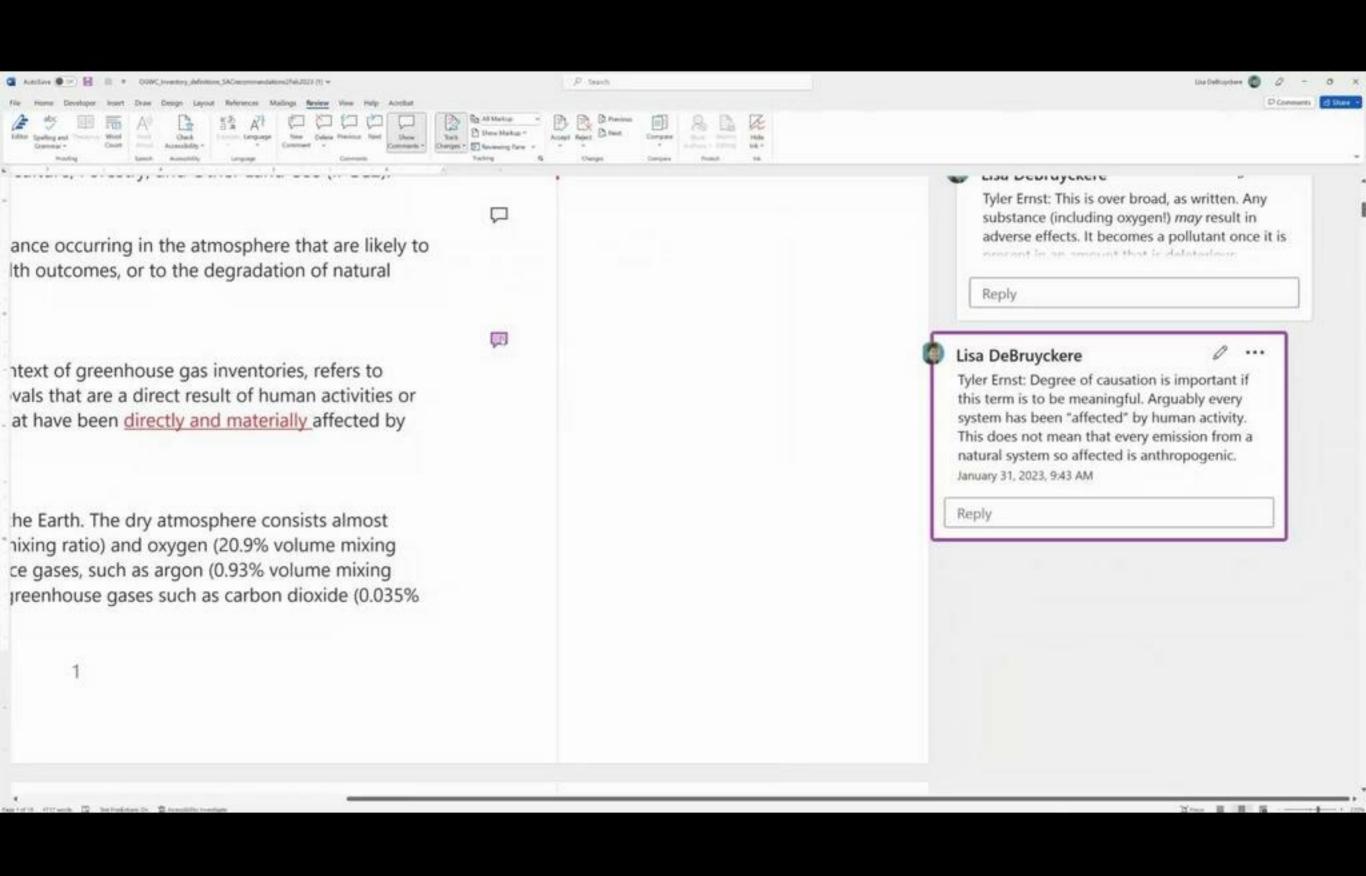
### Anthropogenic

The term "anthropogenic", in the context of greenhouse gas inventories, refers to greenhouse gas emissions and removals that are a direct result of human activities or are the result of natural processes that have been directly and materially affected by human activities. (USEPA2) 1

### Atmosphere

The gaseous envelope surrounding the Earth. The dry atmosphere consists almost entirely of nitrogen (78.1% volume mixing ratio) and oxygen (20.9% volume mixing ratio), together with a number of trace gases, such as argon (0.93% volume mixing ratio), helium and radiatively active greenhouse gases such as carbon dioxide (0.035%

<sup>1</sup> OWEB's climate resolution





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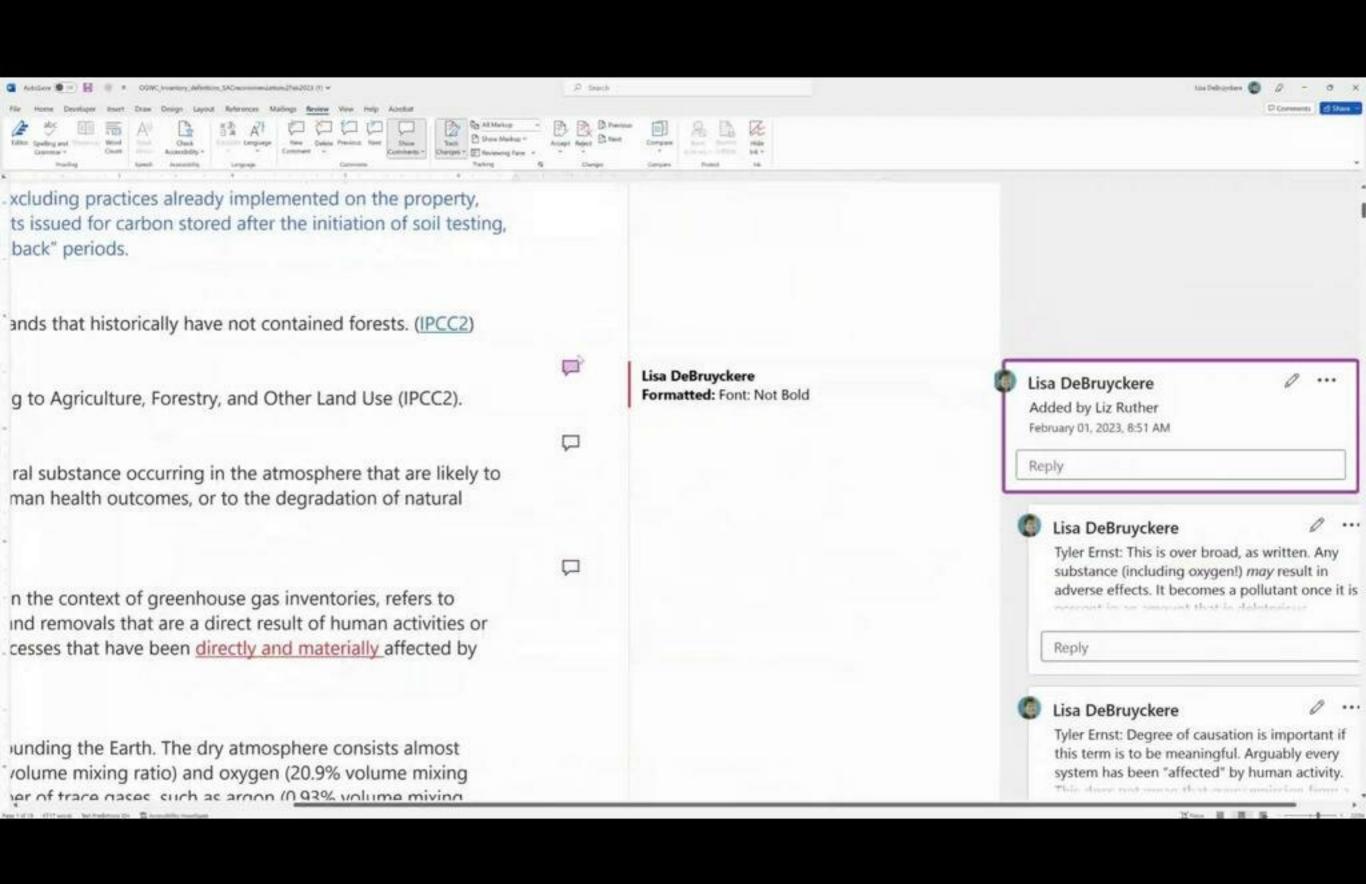
## Anthropogenic

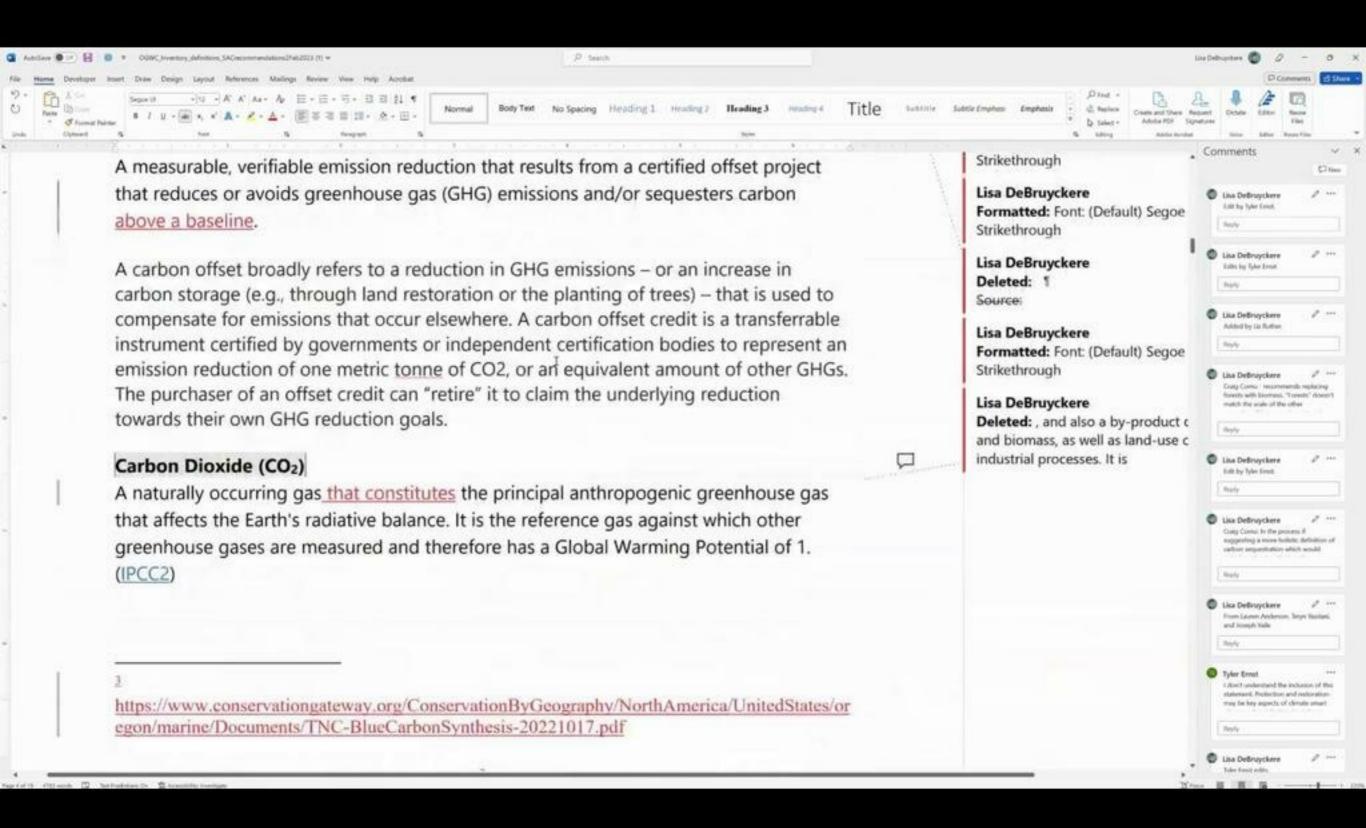
The term "anthropogenic", in the context of greenhouse gas inventories, refers to greenhouse gas emissions and removals that are a direct result of human activities or are the result of natural processes that have been <u>directly and materially</u> affected by human activities. (USEPA2)

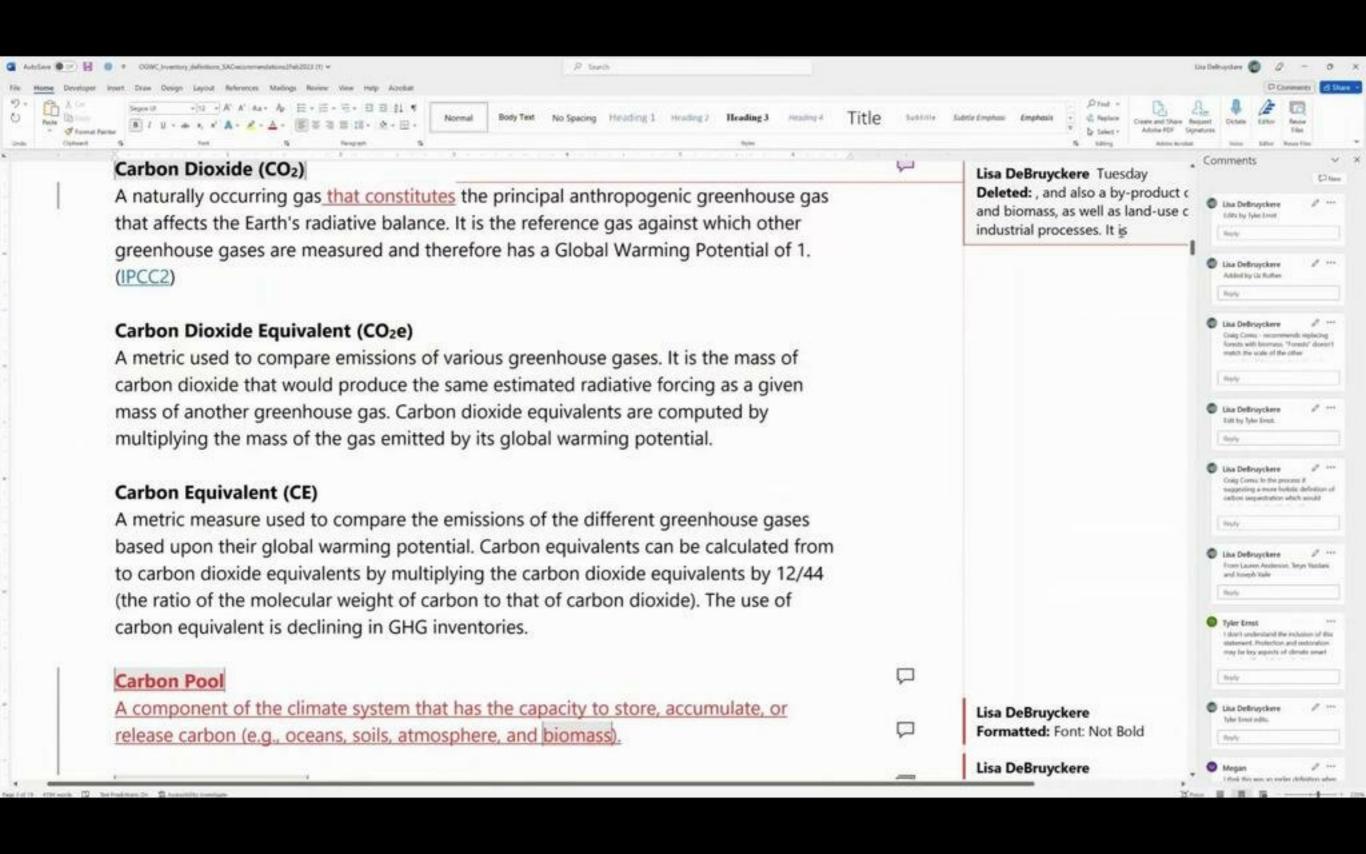
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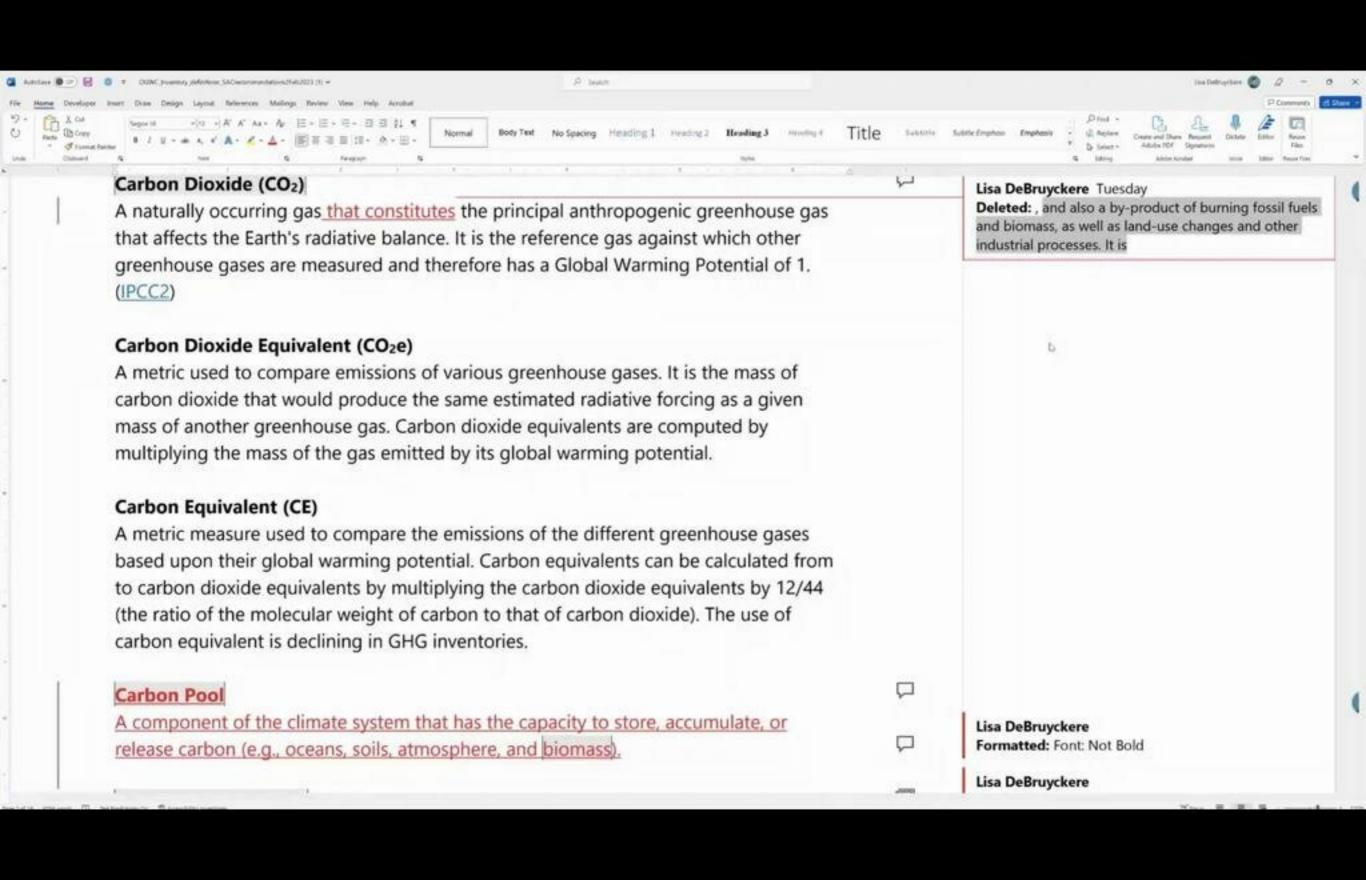
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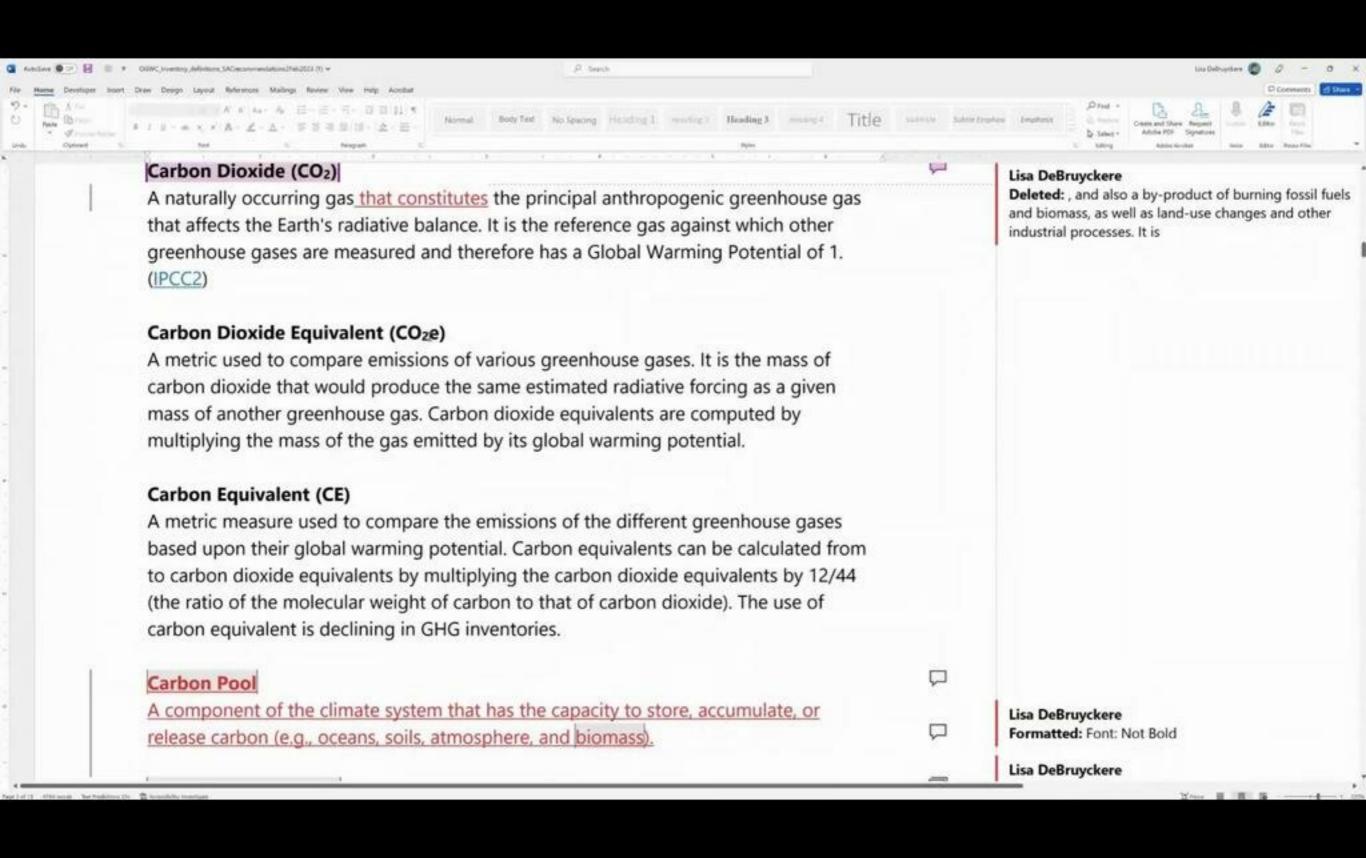
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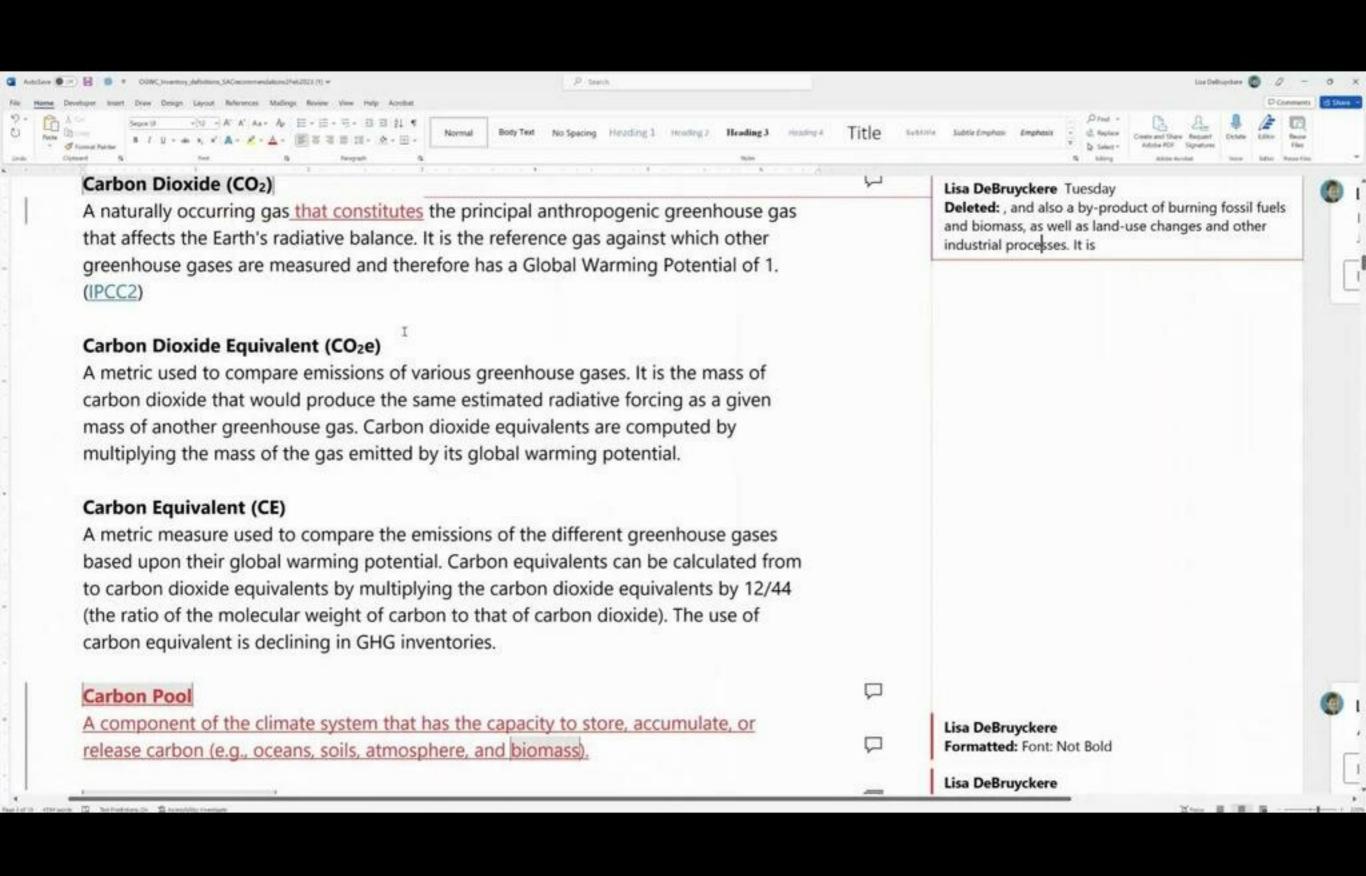


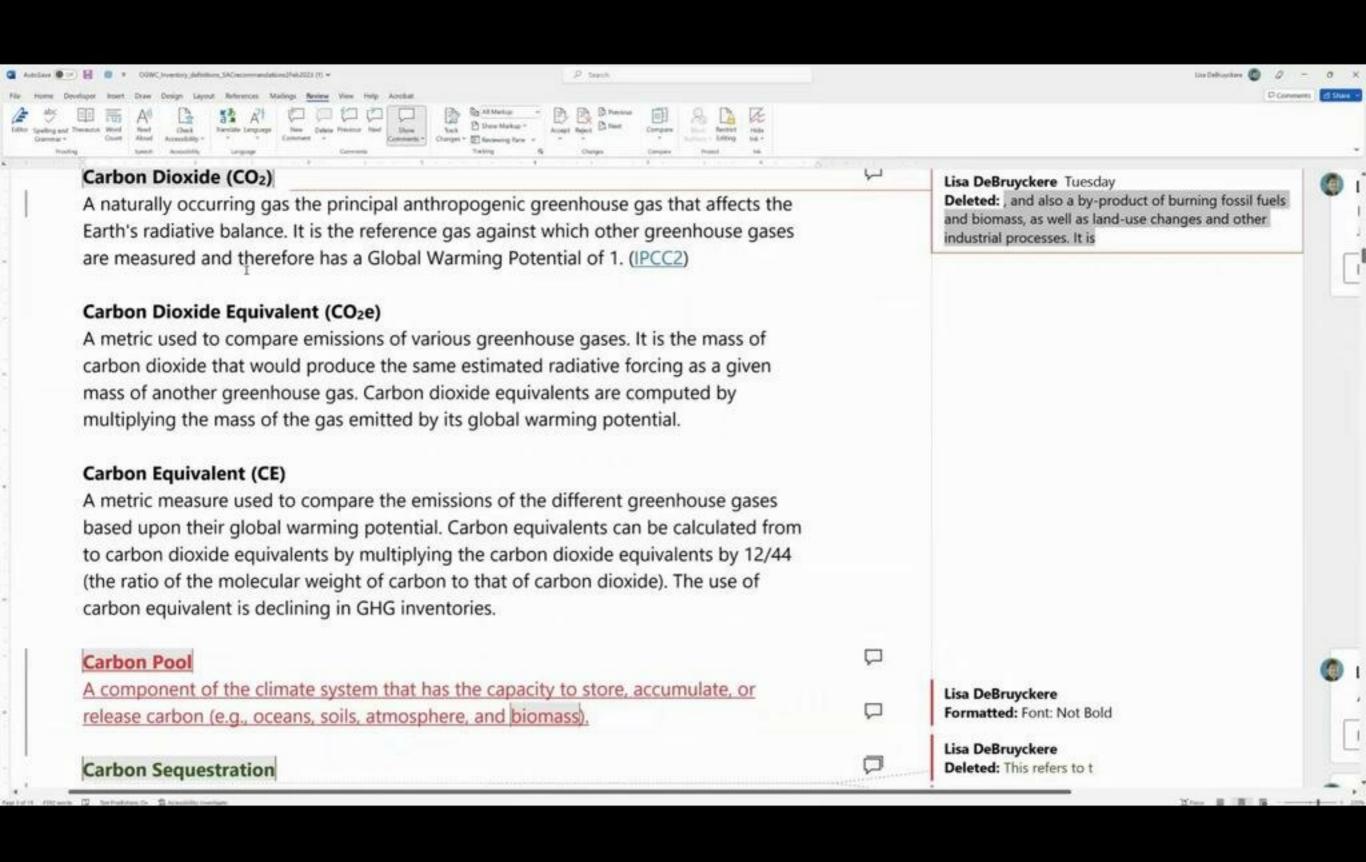


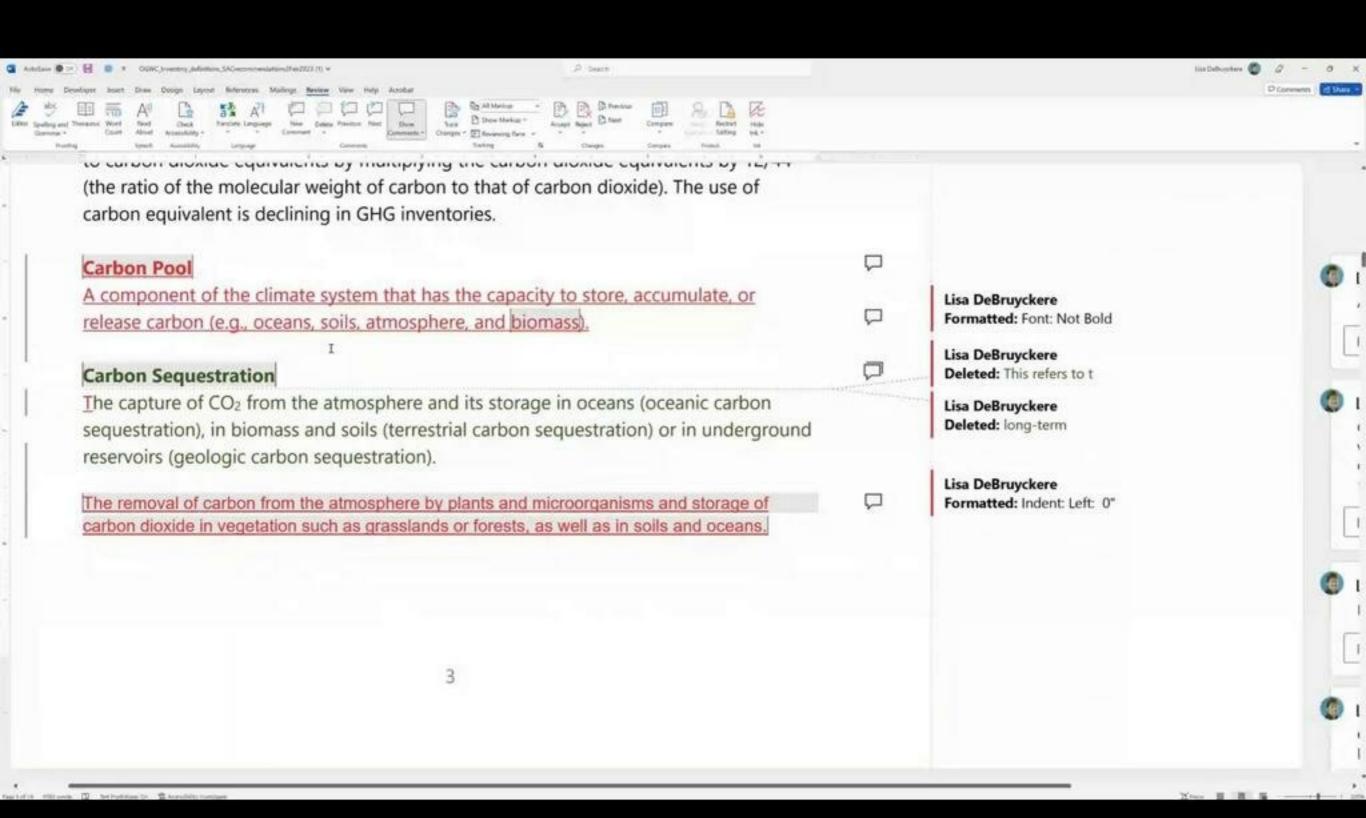


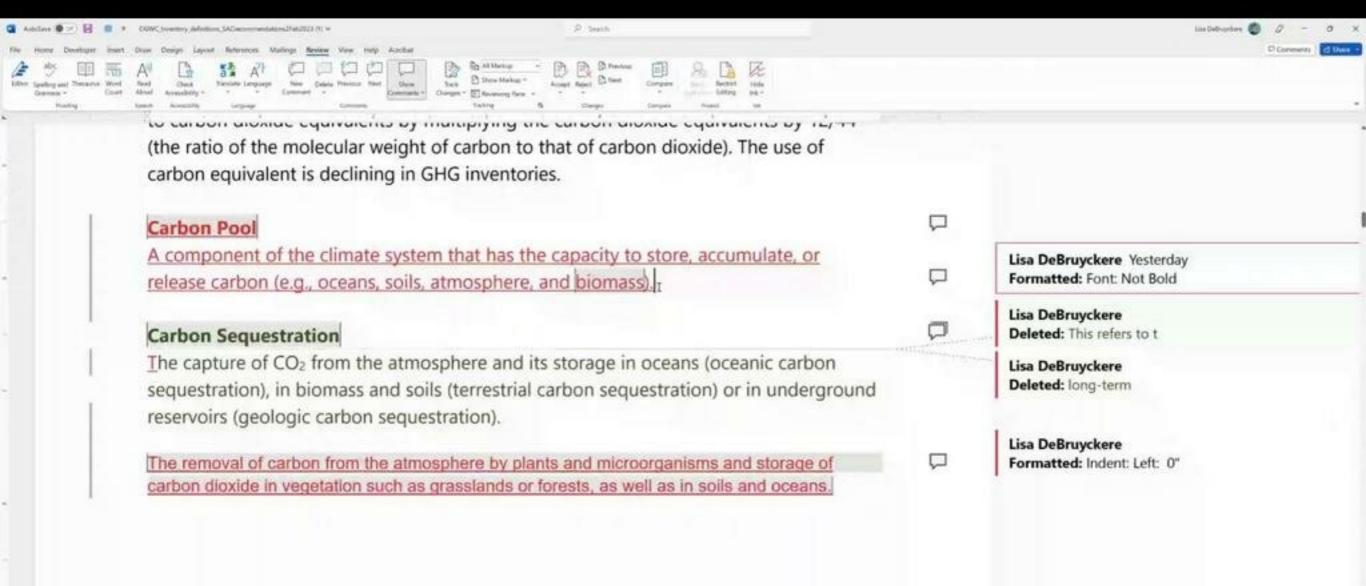


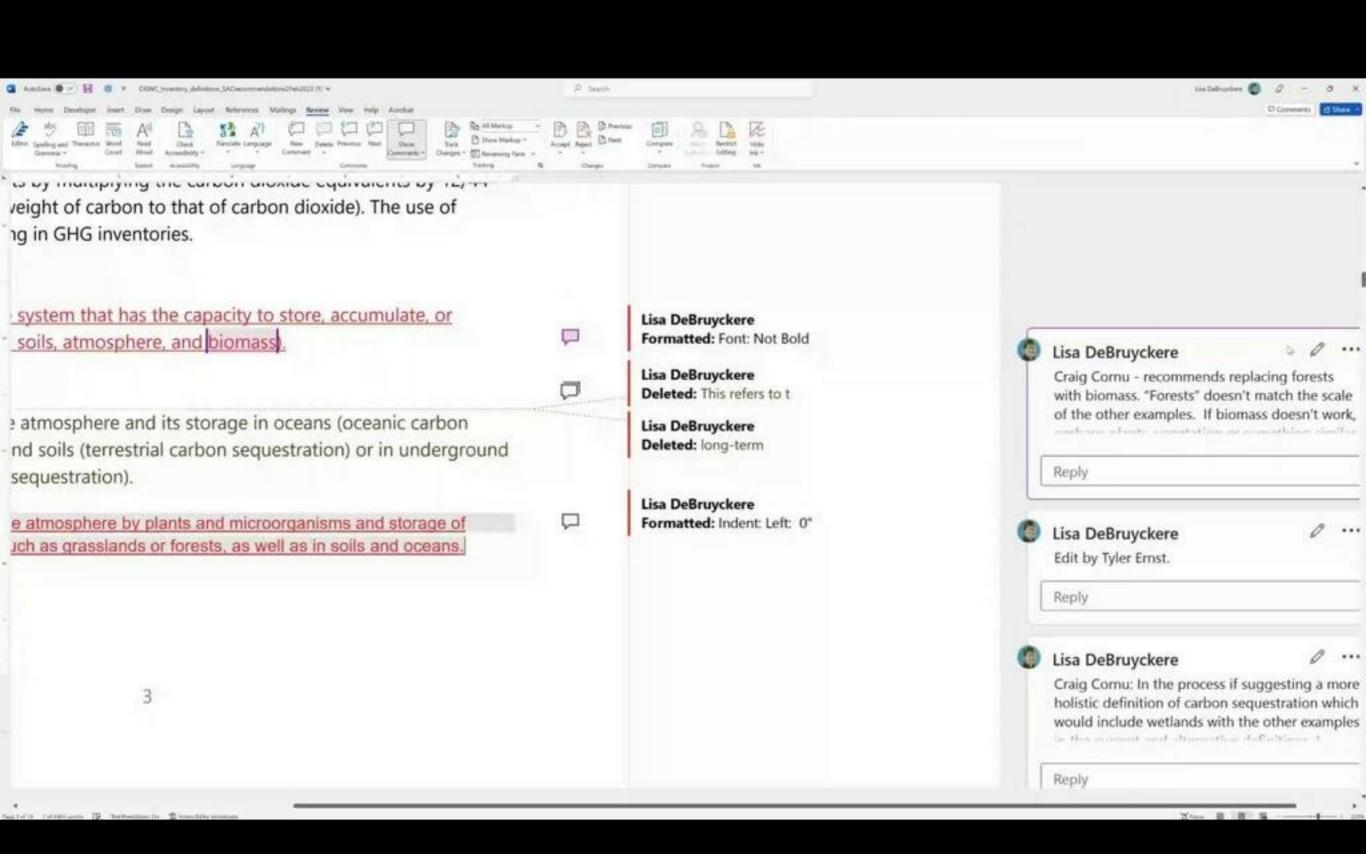


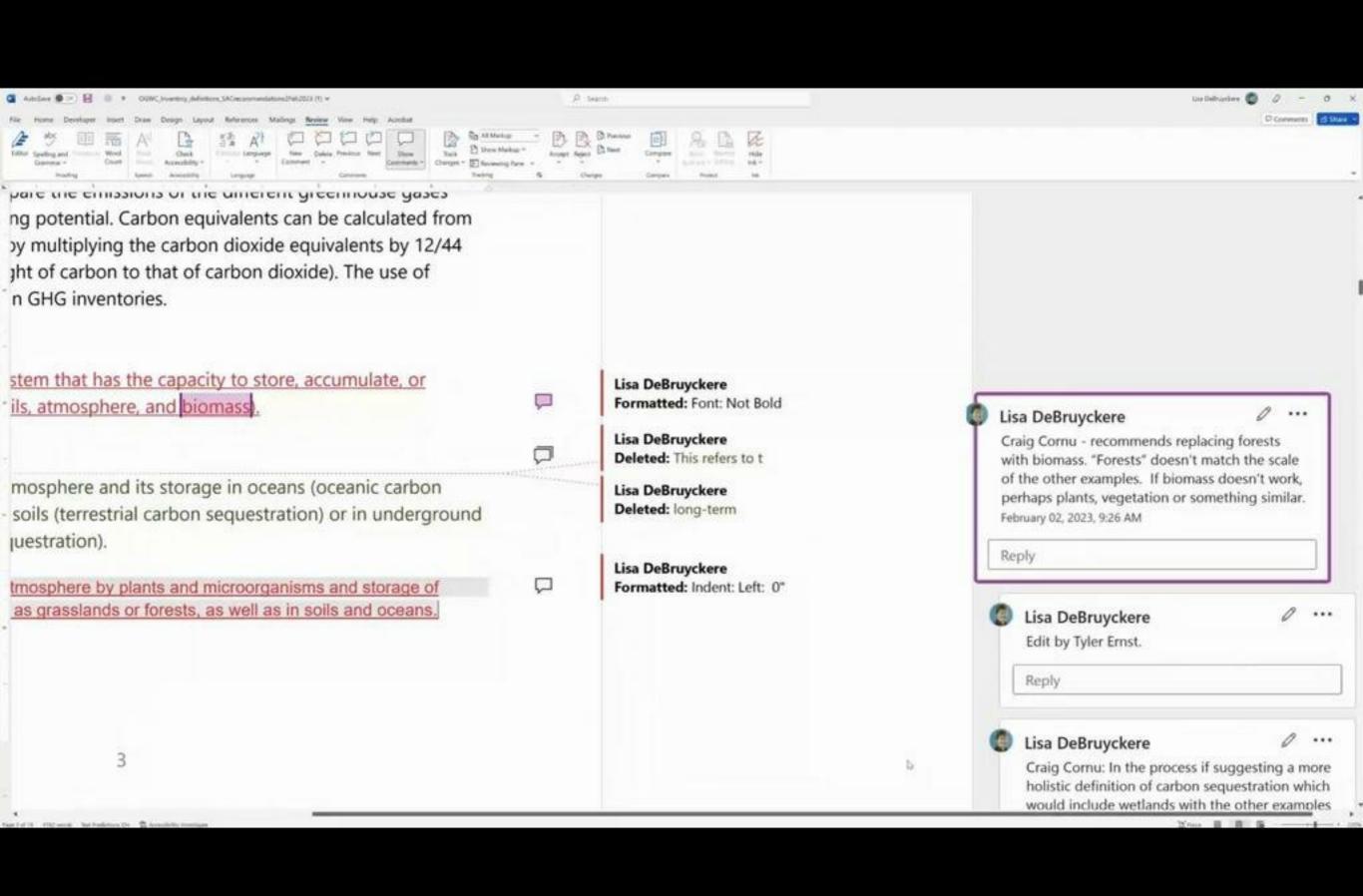


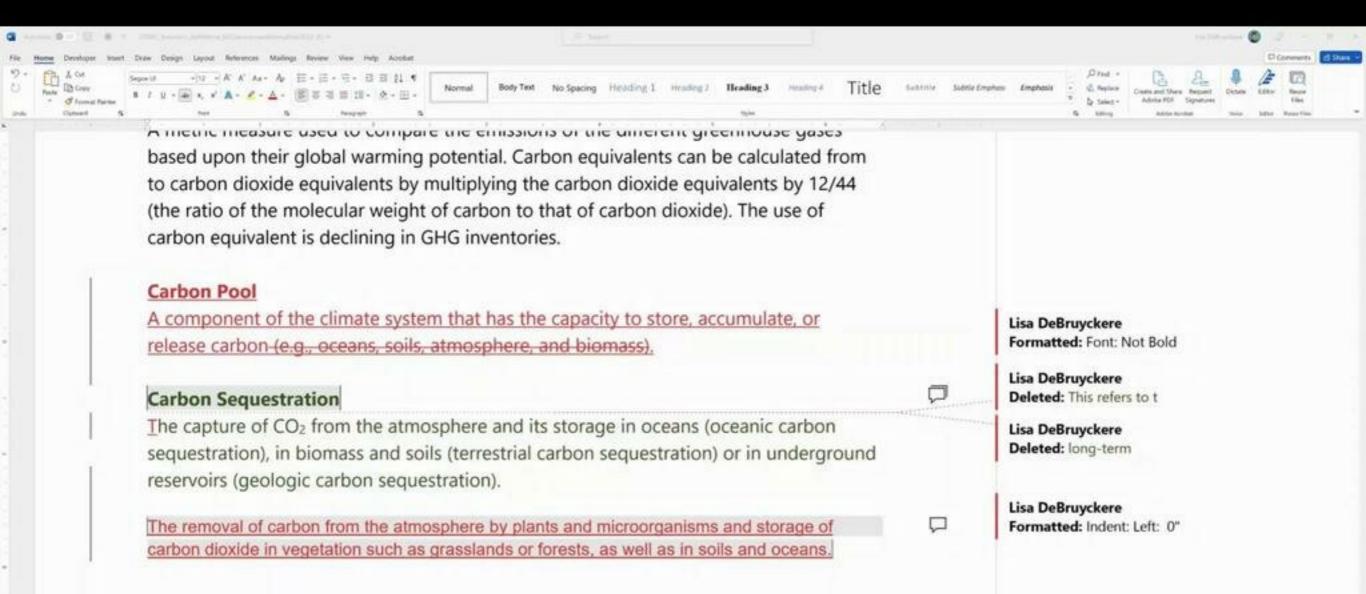


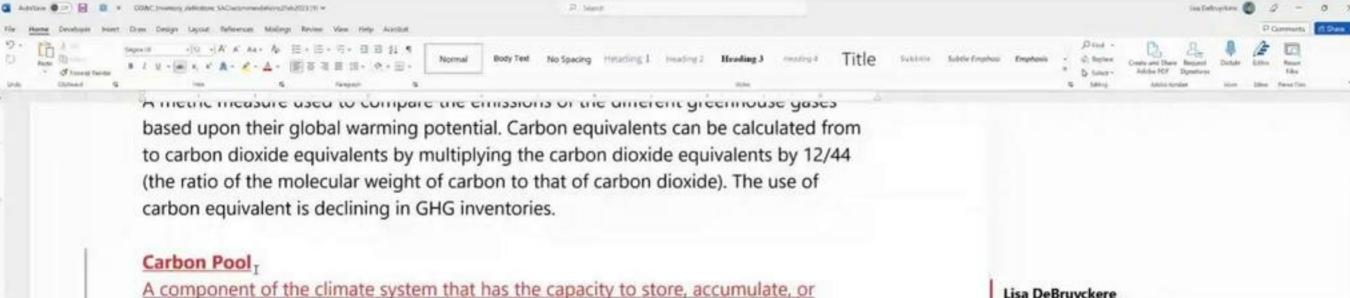












Carbon Sequestration

The capture of CO₂ from the atmosphere and its storage in oceans (oceanic carbon sequestration), in biomass and soils (terrestrial carbon sequestration) or in underground reservoirs (geologic carbon sequestration).

The removal of carbon from the atmosphere by plants and microorganisms and storage of carbon dioxide in vegetation such as grasslands or forests, as well as in soils and oceans.

release carbon (e.g., oceans, soils, atmosphere, and biomass),

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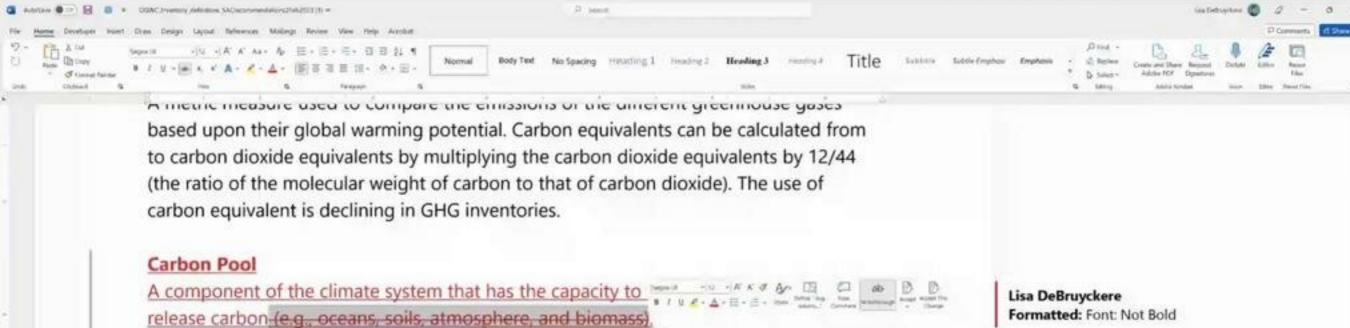
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## Carbon Sequestration

The capture of CO2 from the atmosphere and its storage in oceans (oceanic carbon sequestration), in biomass and soils (terrestrial carbon sequestration) or in underground reservoirs (geologic carbon sequestration).

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based upon their global warming potential. Carbon equivalents can be calculated from to carbon dioxide equivalents by multiplying the carbon dioxide equivalents by 12/44 (the ratio of the molecular weight of carbon to that of carbon dioxide). The use of carbon equivalent is declining in GHG inventories.

#### Carbon Pool

A component of the climate system that has the capacity to store, accumulate, or release carbon.

### Carbon Sequestration

The capture of CO<sub>2</sub> from the atmosphere and its storage in oceans (oceanic carbon sequestration), in biomass and soils (terrestrial carbon sequestration) or in underground reservoirs (geologic carbon sequestration).

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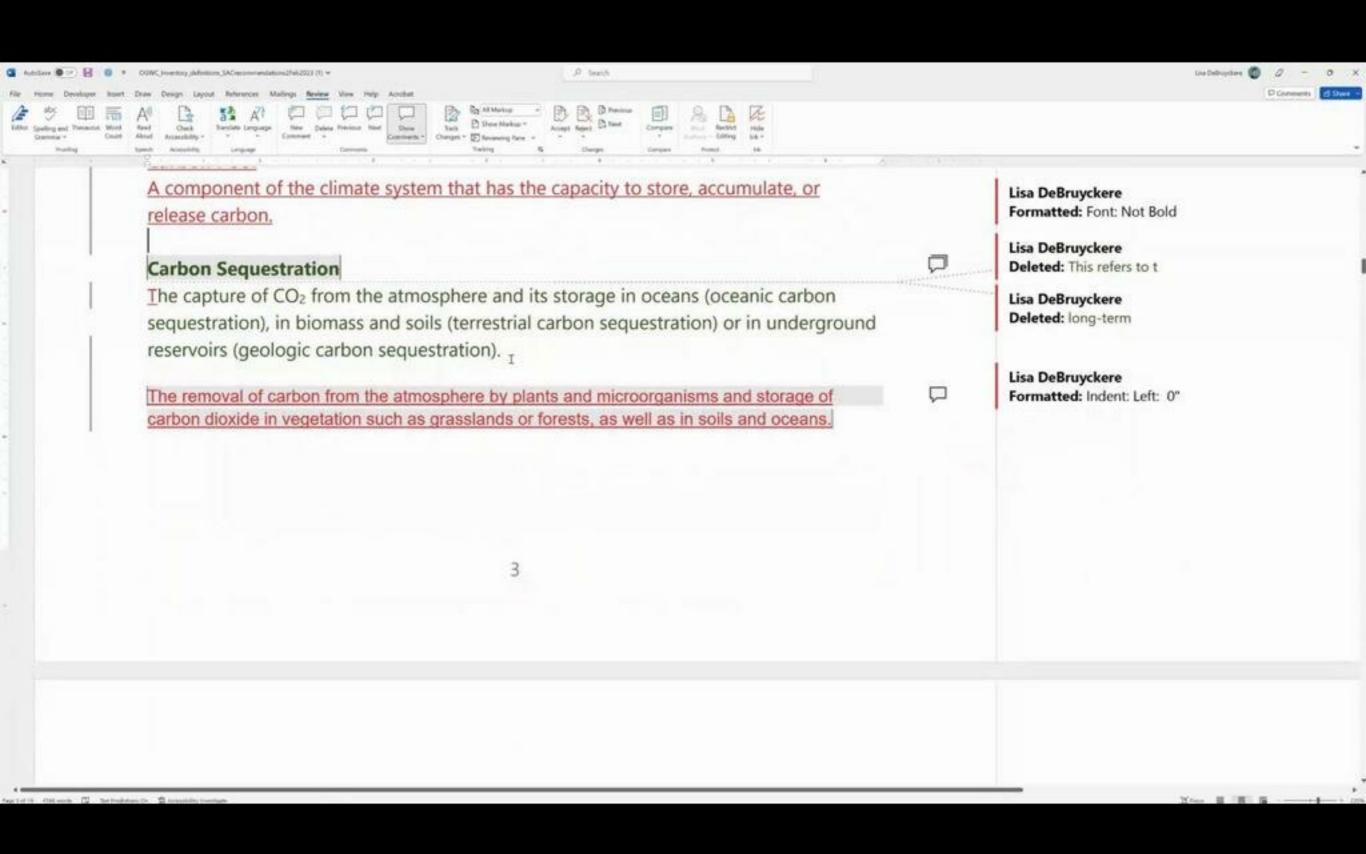
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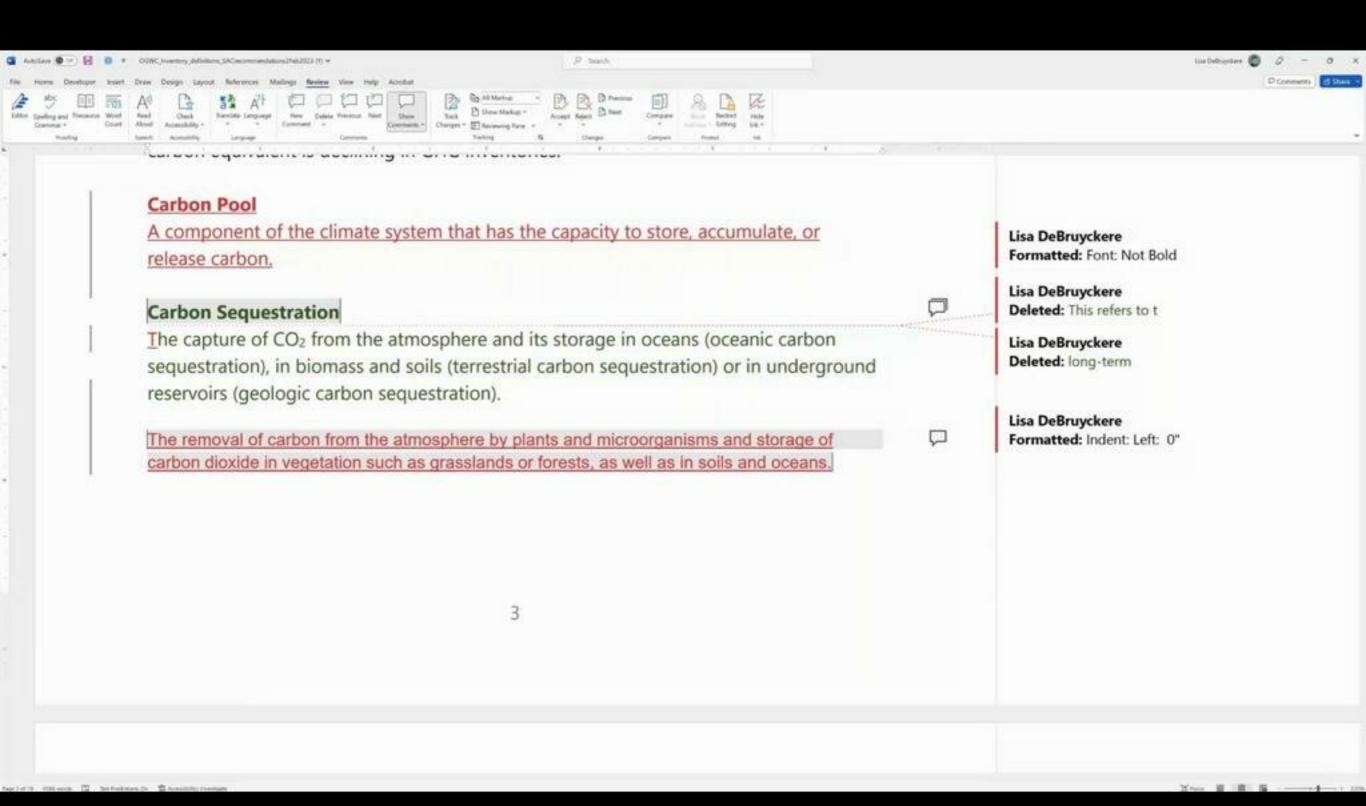
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### Carbon Pool

A component of the climate system that has the capacity to store, accumulate, or release carbon.

# Carbon Sequestration

The capture and storage of CO<sub>2</sub> from the atmosphere and its storage in oceans (oceanic carbon sequestration), in biomass and soils (terrestrial carbon sequestration) or in underground reservoirs (geologic carbon sequestration).

### **Biological Carbon Sequestration**

The removal of carbon from the atmosphere by plants and microorganisms and storage of carbon dioxide in vegetation such as grasslands or forests, as well as in soils and oceans.

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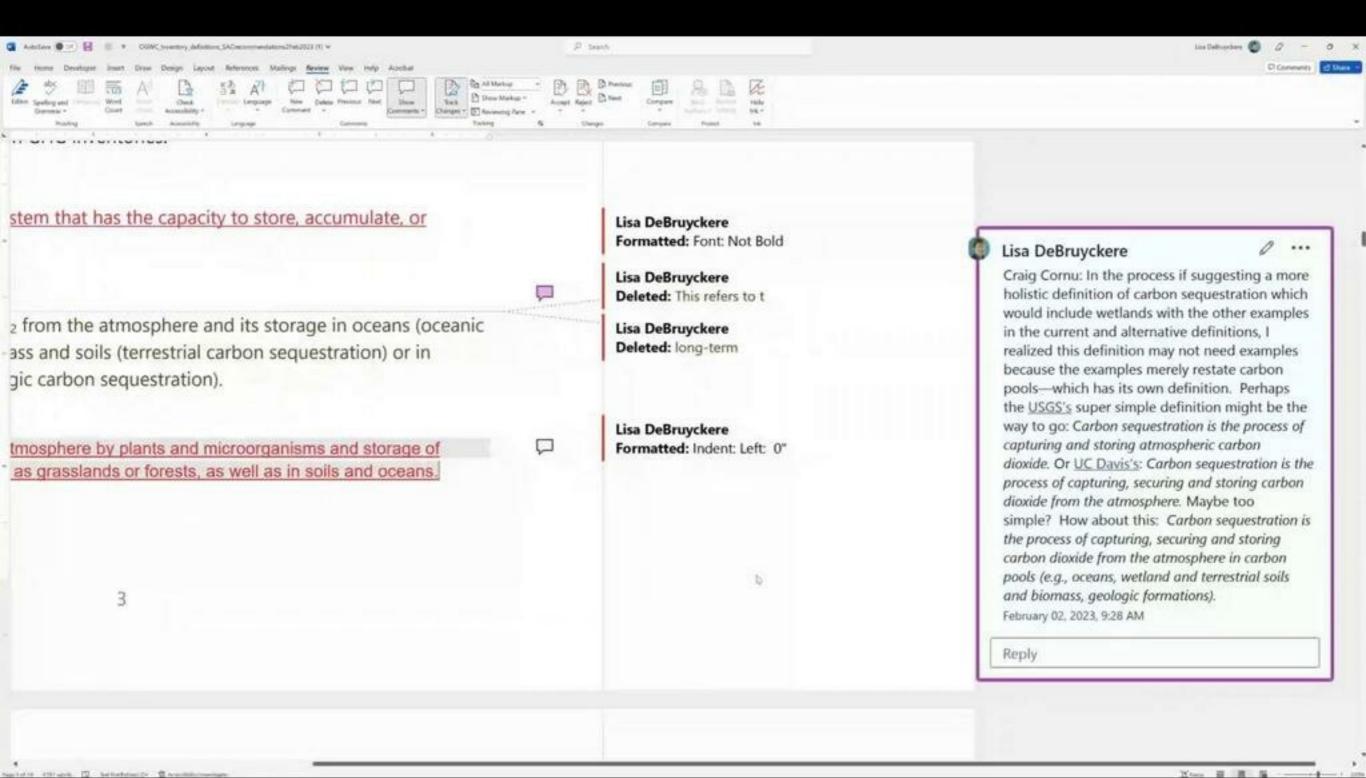
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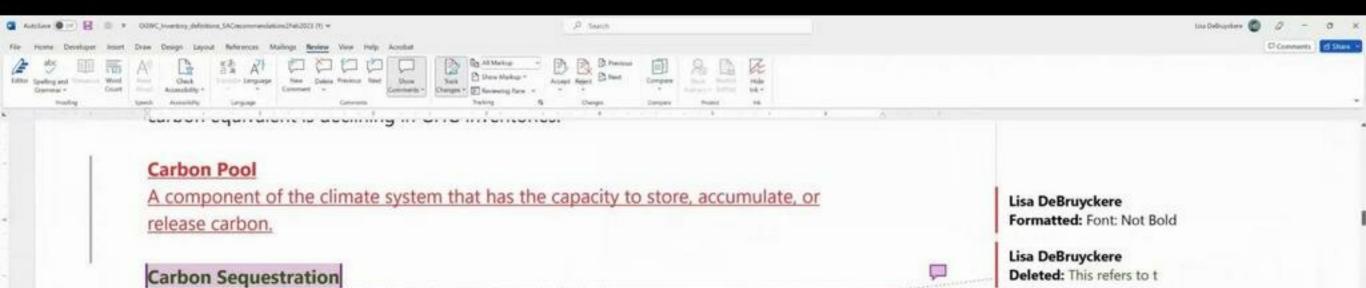
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Biological Carbon Sequestration

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underground reservoirs (geologic carbon sequestration).

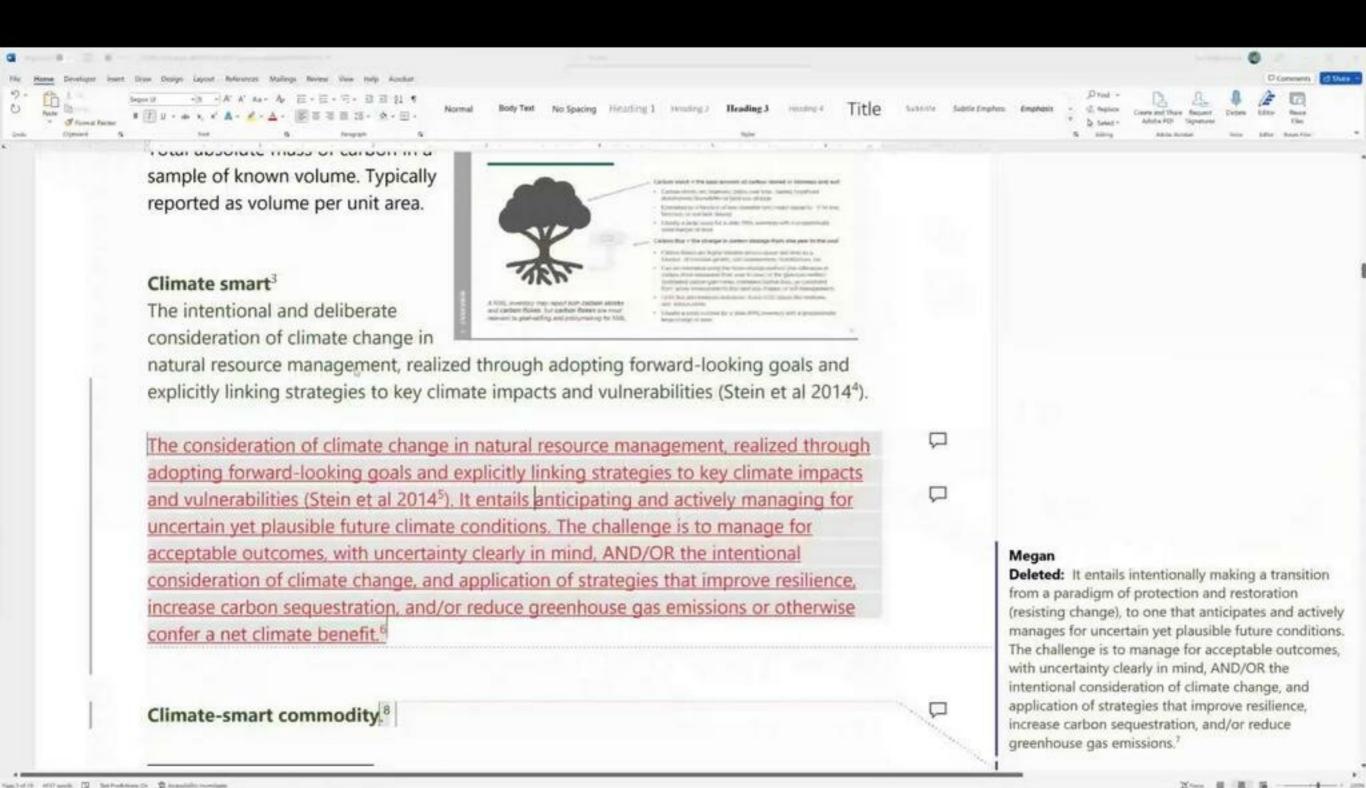
The capture and storage of CO2 from the atmosphere and its storage in oceans (oceanic

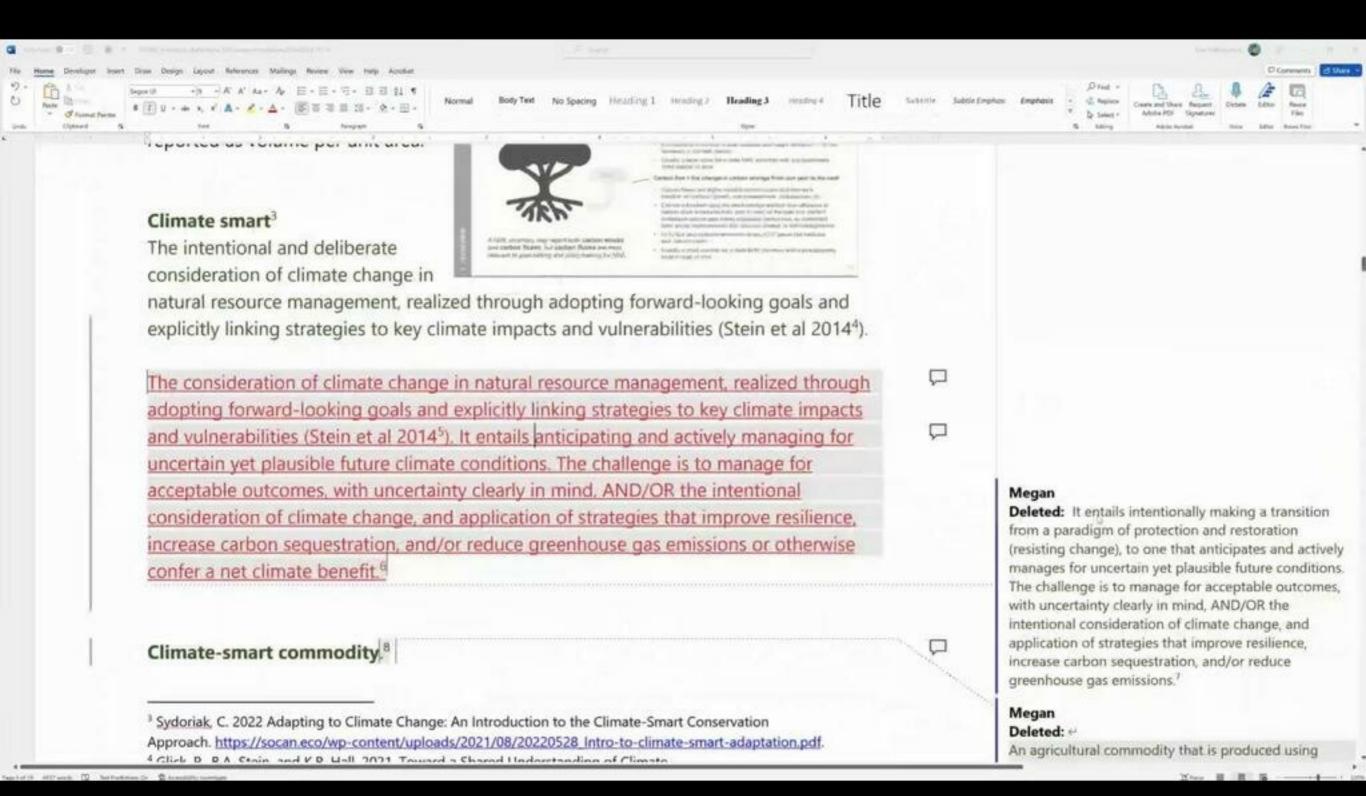
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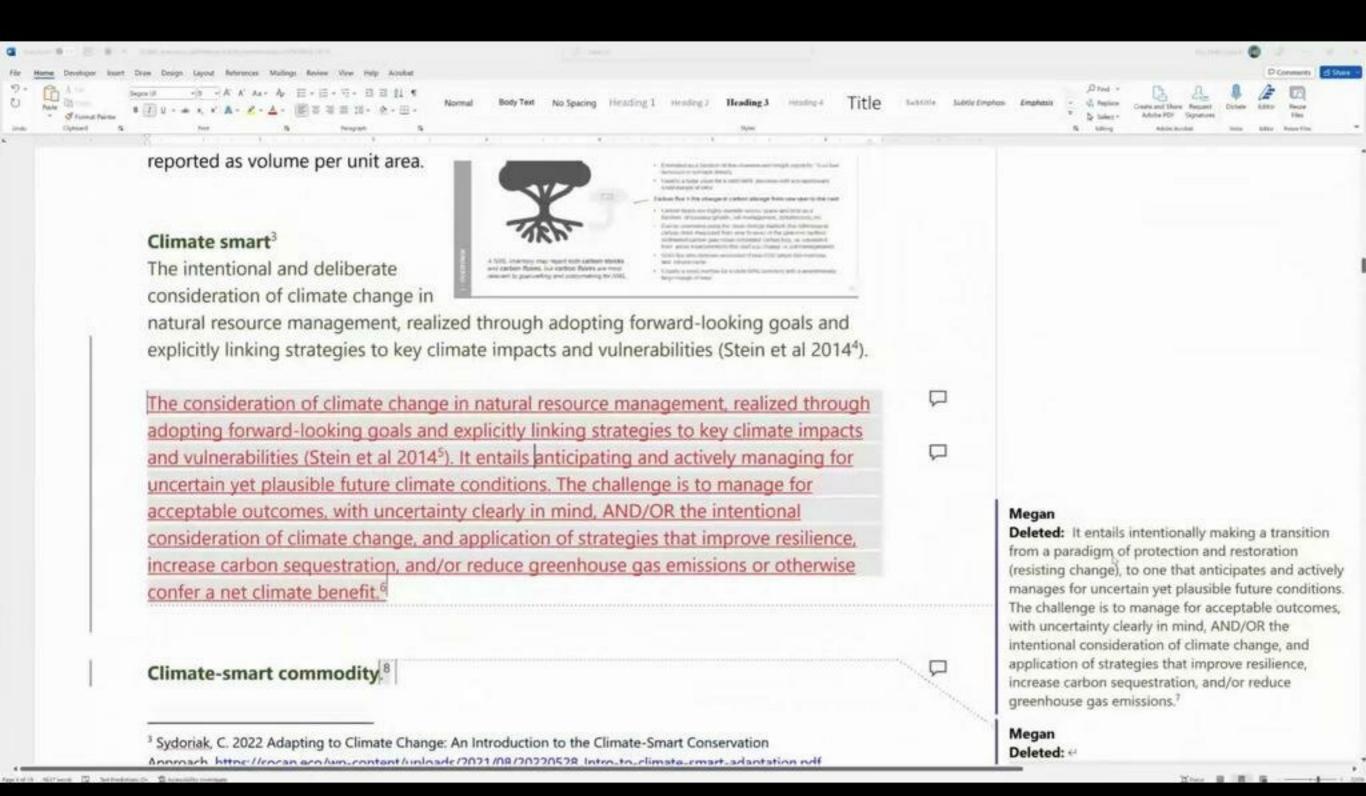
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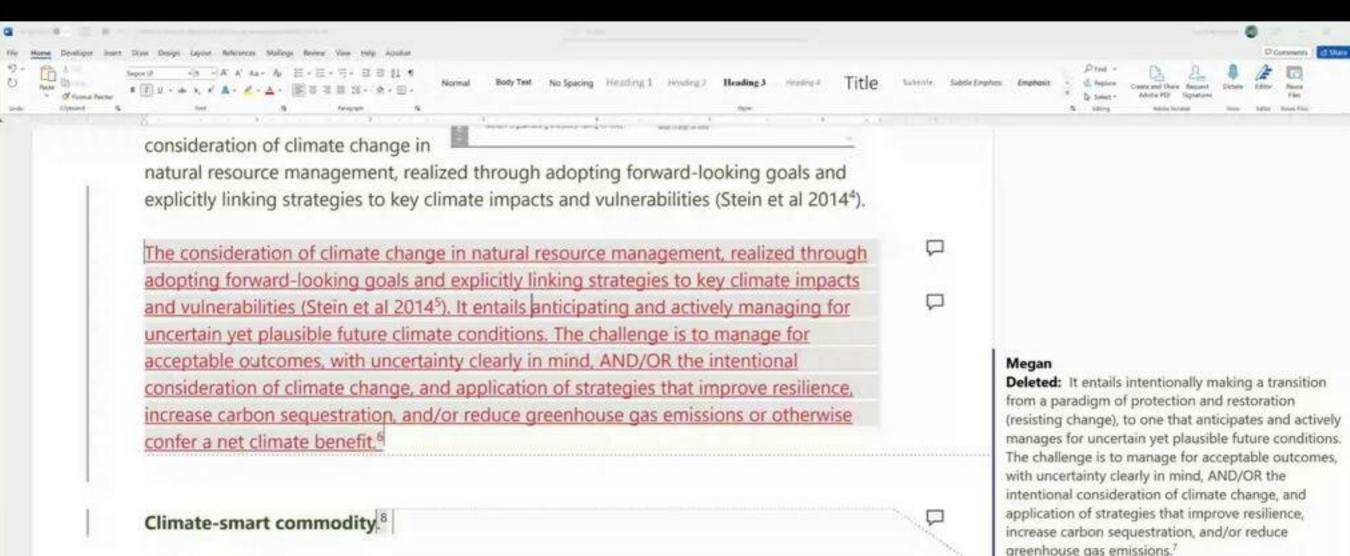
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<sup>&</sup>lt;sup>3</sup> Sydoriak, C. 2022 Adapting to Climate Change: An Introduction to the Climate-Smart Conservation

Approach. https://socan.eco/wp-content/uploads/2021/08/20220528\_Intro-to-climate-smart-adaptation.pdf.

Stein, B.A., P. Glick, N. Edelson, and A. Staudt (eds.) (2014). Climate-Smart Conservation: Putting Adaptation Principles into Practice. https://www.nwf.org/ClimateSmartGuide.

5 Glick, P., B.A. Stein, and K.R. Hall, 2021. Toward a Shared Understanding of Climate-Smart. https://www.nwf.org/ClimateSmartRestoration.

greenhouse gas emissions.7

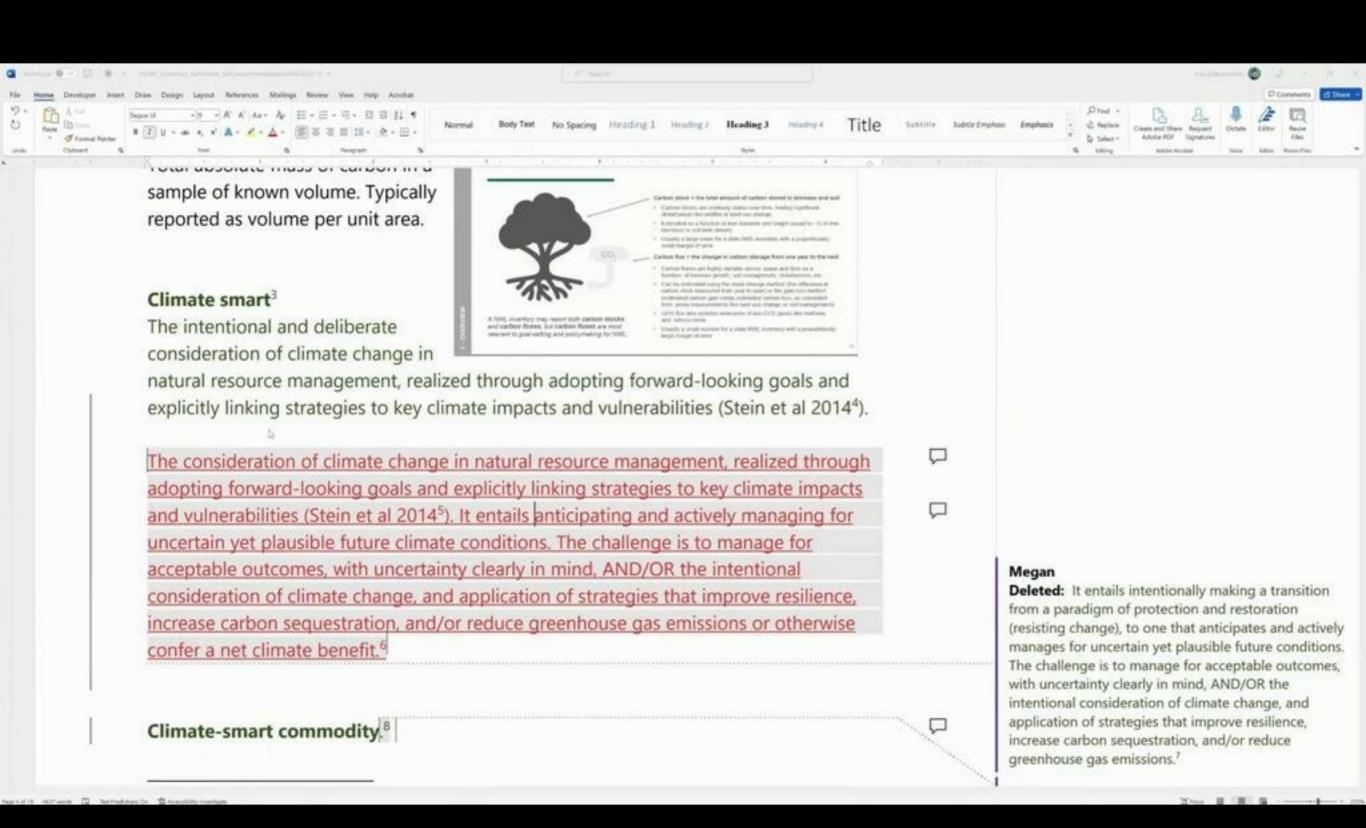
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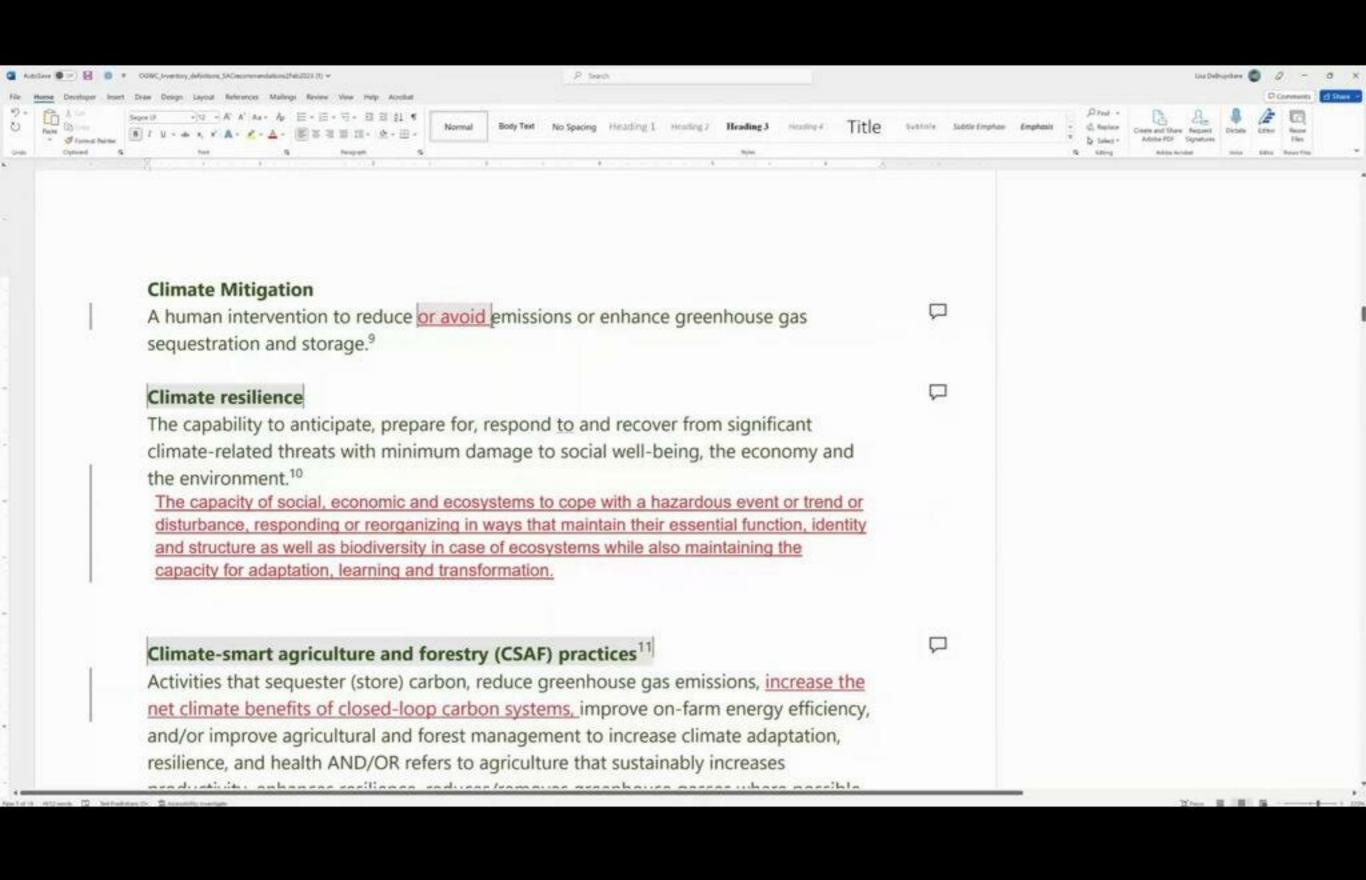
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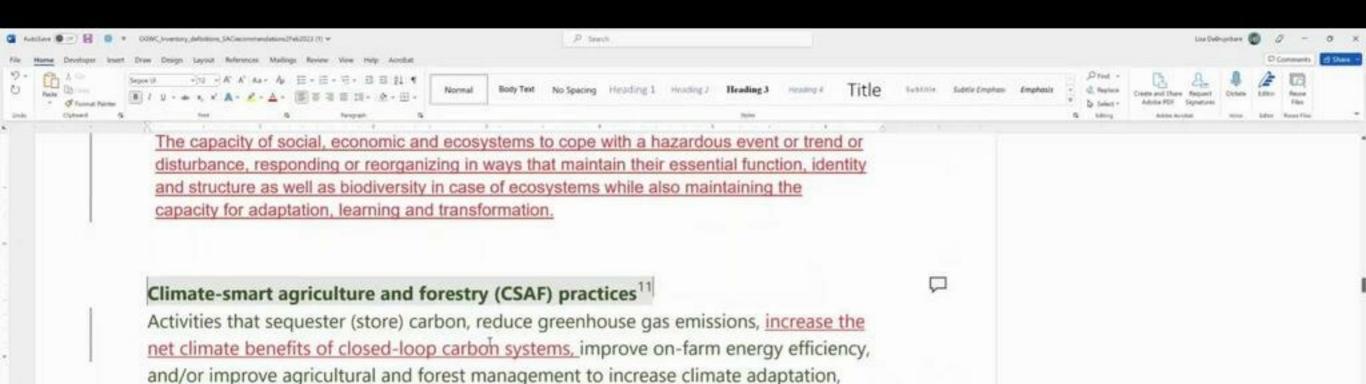
An agricultural commodity that is produced using farming practices that reduce greenhouse gas (GHG) emissions or sequester carbon

Glick, P., B.A. Stein, and K.R. Hall. 2021. Toward a Shared Understanding of Climate-

Smart. https://www.nwf.org/ClimateSmartRestoration.







Mitigation Categories:

 Soil Health – Reducing emissions and enhancing soil carbon sequestration.

productivity, enhances resilience, reduces/removes greenhouse gasses where possible,

resilience, and health AND/OR refers to agriculture that sustainably increases

and enhances achievement of national food security and development goals.12

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<sup>9</sup> Ibid

<sup>10</sup> Legislative concept for Natural and Working Lands Bill Oregon 2023 legislative session

Examples of practices from USDA NRCS

Full list of practices acknowledged by USDA as having GHG reduction benefit: <u>Climate-Smart Agriculture and Forestry</u> (CSAF) <u>Mitigation Activities List [1] FY2023</u> (usda.gov)



Activities that sequester (store) carbon, reduce greenhouse gas emissions, increase the net climate benefits of closed-loop carbon systems, improve on-farm energy efficiency, and/or improve agricultural and forest management to increase climate adaptation, resilience, and health AND/OR refers to agriculture that sustainably increases productivity, enhances resilience, reduces/removes greenhouse gasses where possible, and enhances achievement of national food security and development goals.<sup>12</sup>

### Mitigation Categories:

- Soil Health Reducing emissions and enhancing soil carbon sequestration,
- Nitrogen Management Implementing the 4Rs of nitrogen management and reducing nitrous oxide, a potent greenhouse gas. The 4Rs are Right Source, Right Rate, Right Time and Right Place.
- Livestock Waste Management Reducing potent methane emissions from manure.

Links to bodies that use the terms climate-smart agriculture:

<sup>9</sup> Ibid.

<sup>10</sup> Legislative concept for Natural and Working Lands Bill Oregon 2023 legislative session

Examples of practices from USDA NRCS

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Landing page shows the following categories of practices: NRCS Climate-Smart Mitigation Activities | Natural Resources
 Conservation Service (usda.gov)

United Nations: Climate.Smart Agriculture I Ened and Agriculture Organization of the United Nations (fan org).



The capability to anticipate, prepare for, respond to and recover from significant climate-related threats with minimum damage to social well-being, the economy and the environment.<sup>10</sup>

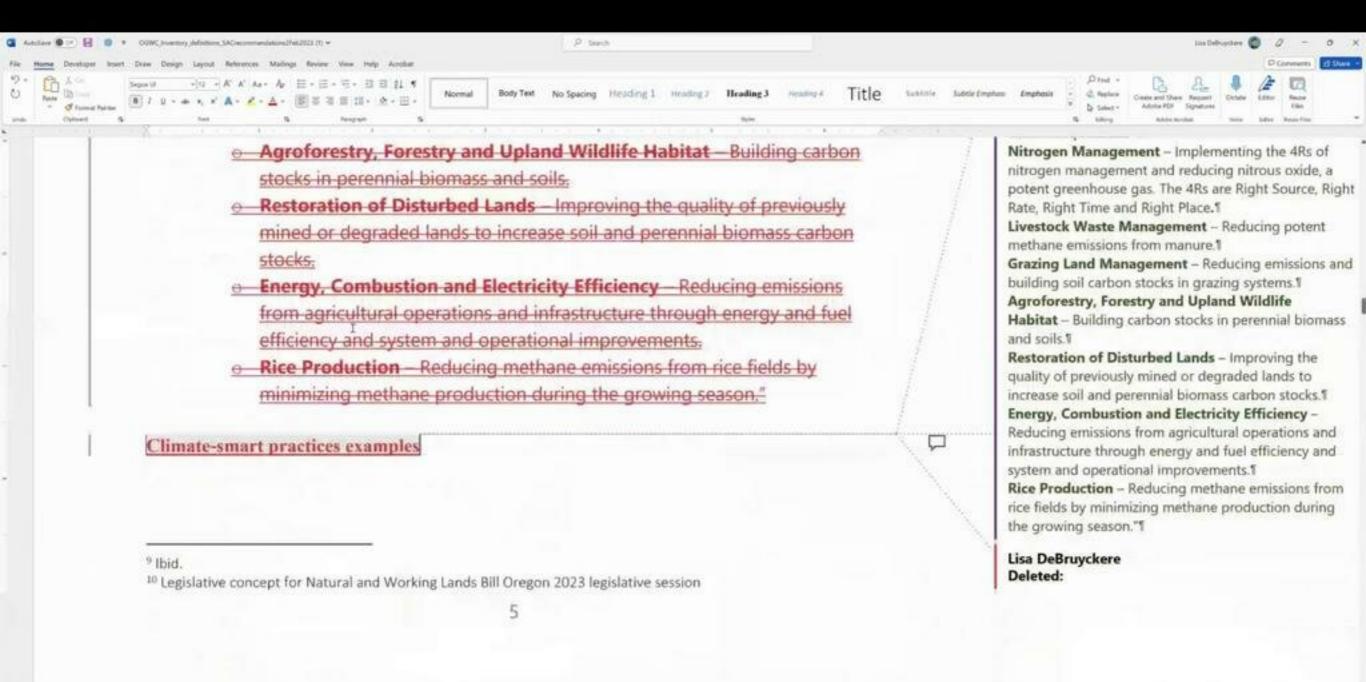
# Climate-smart agriculture and forestry (CSAF) practices 11

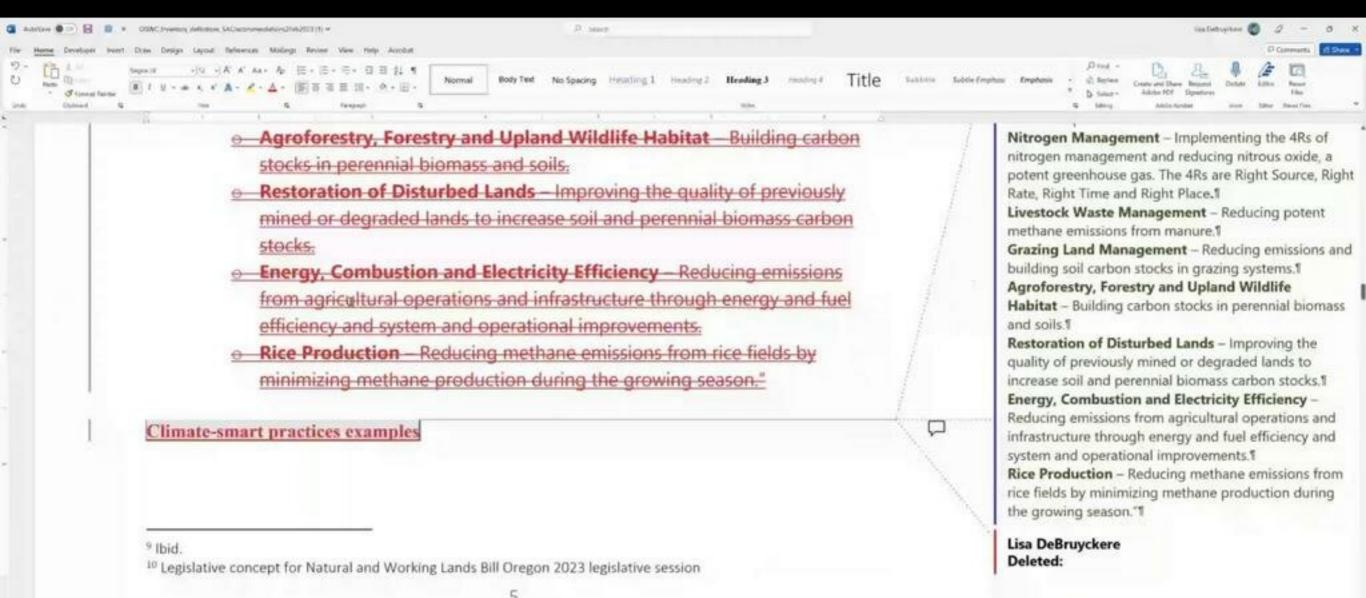
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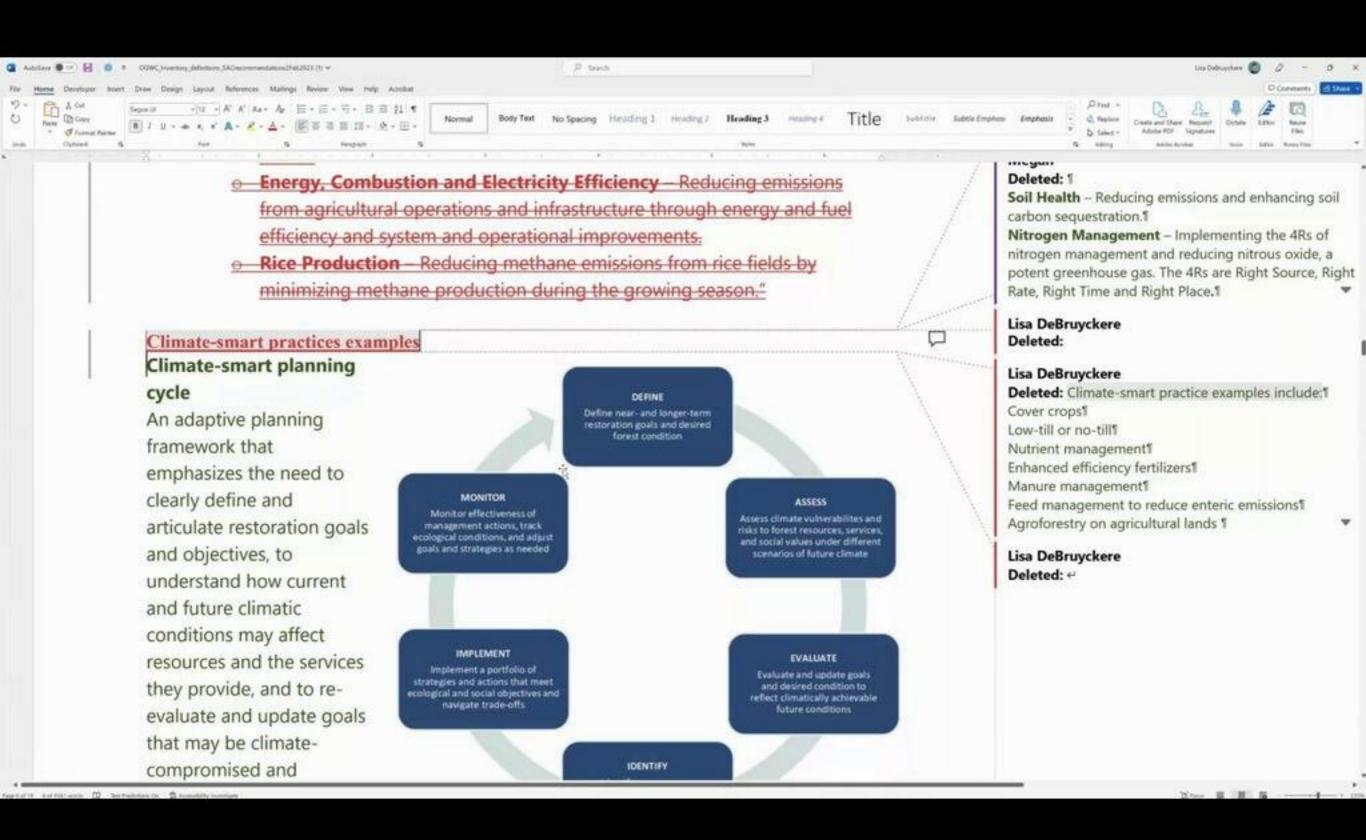
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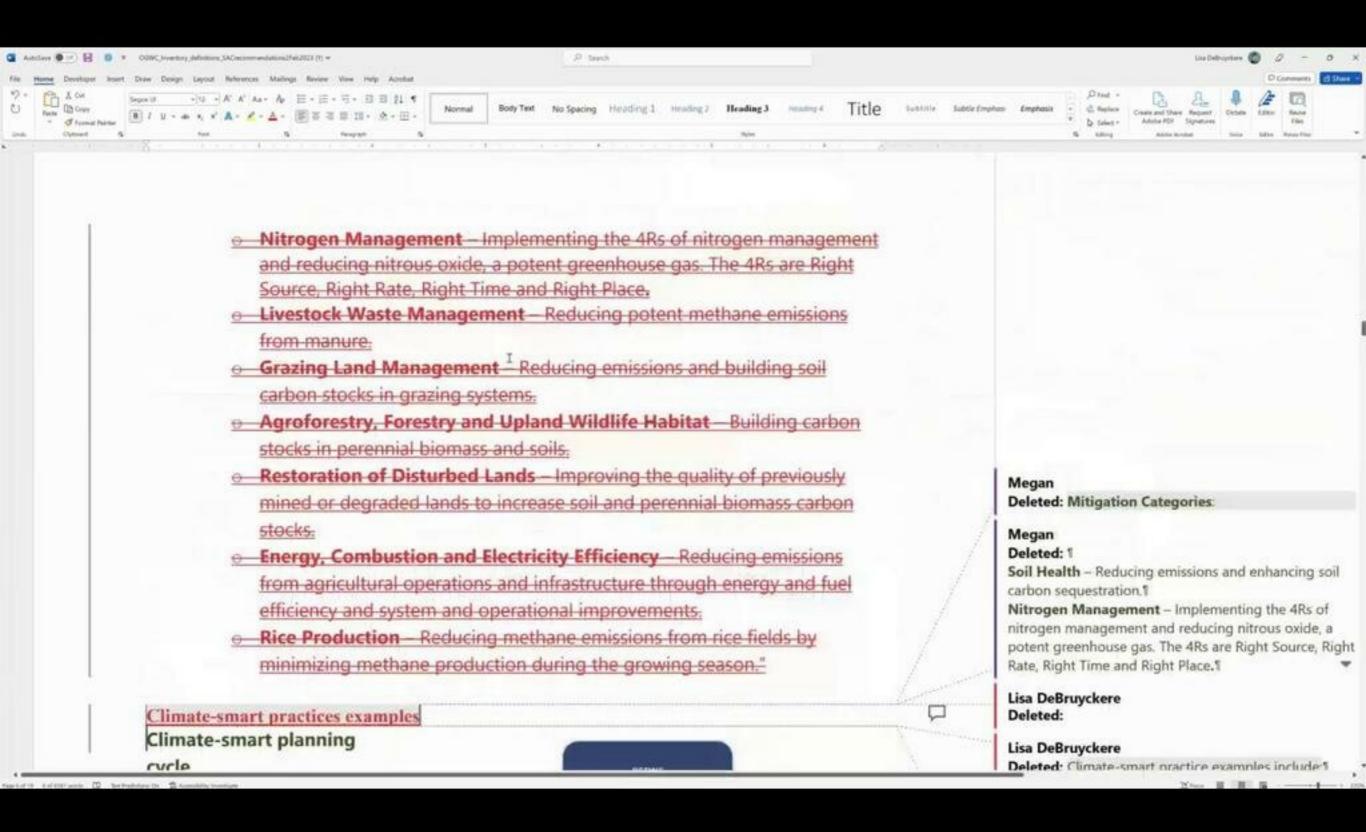
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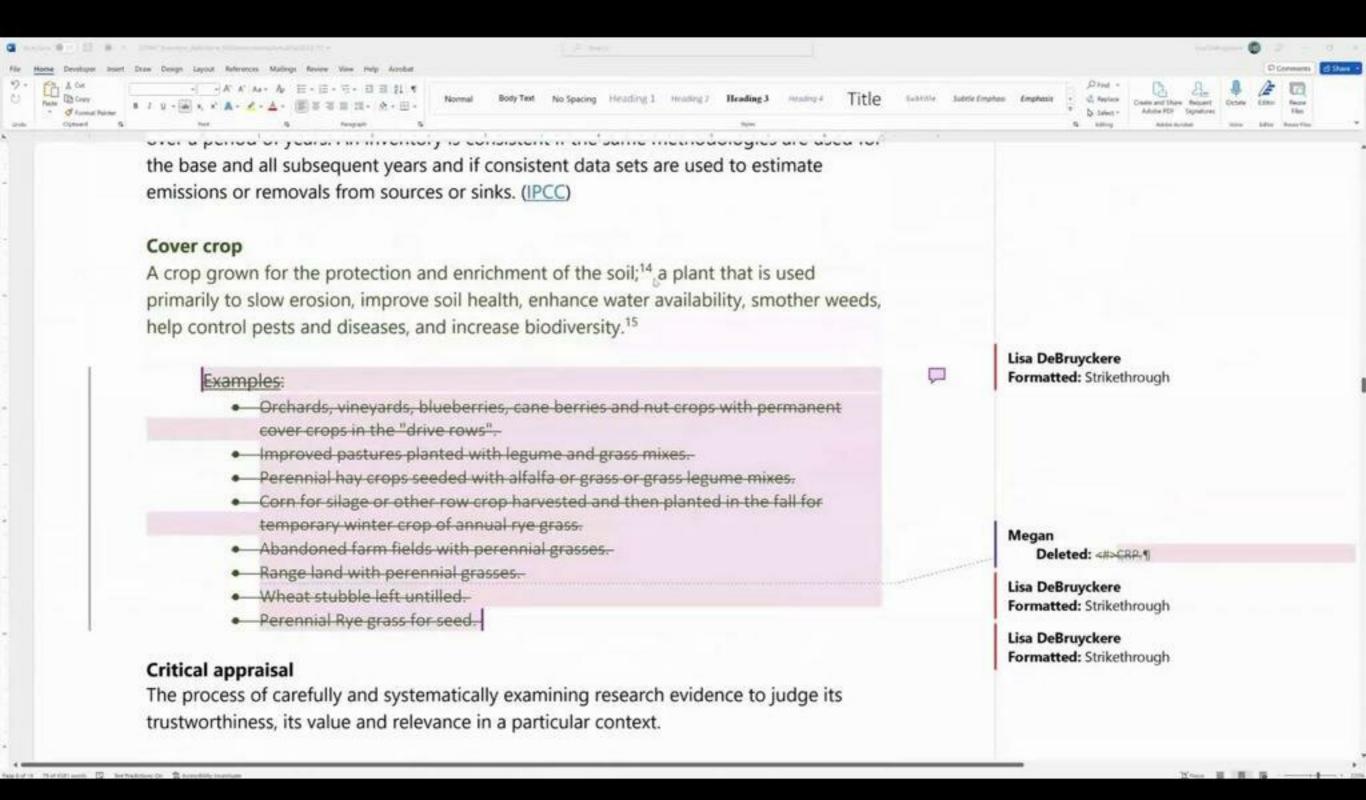
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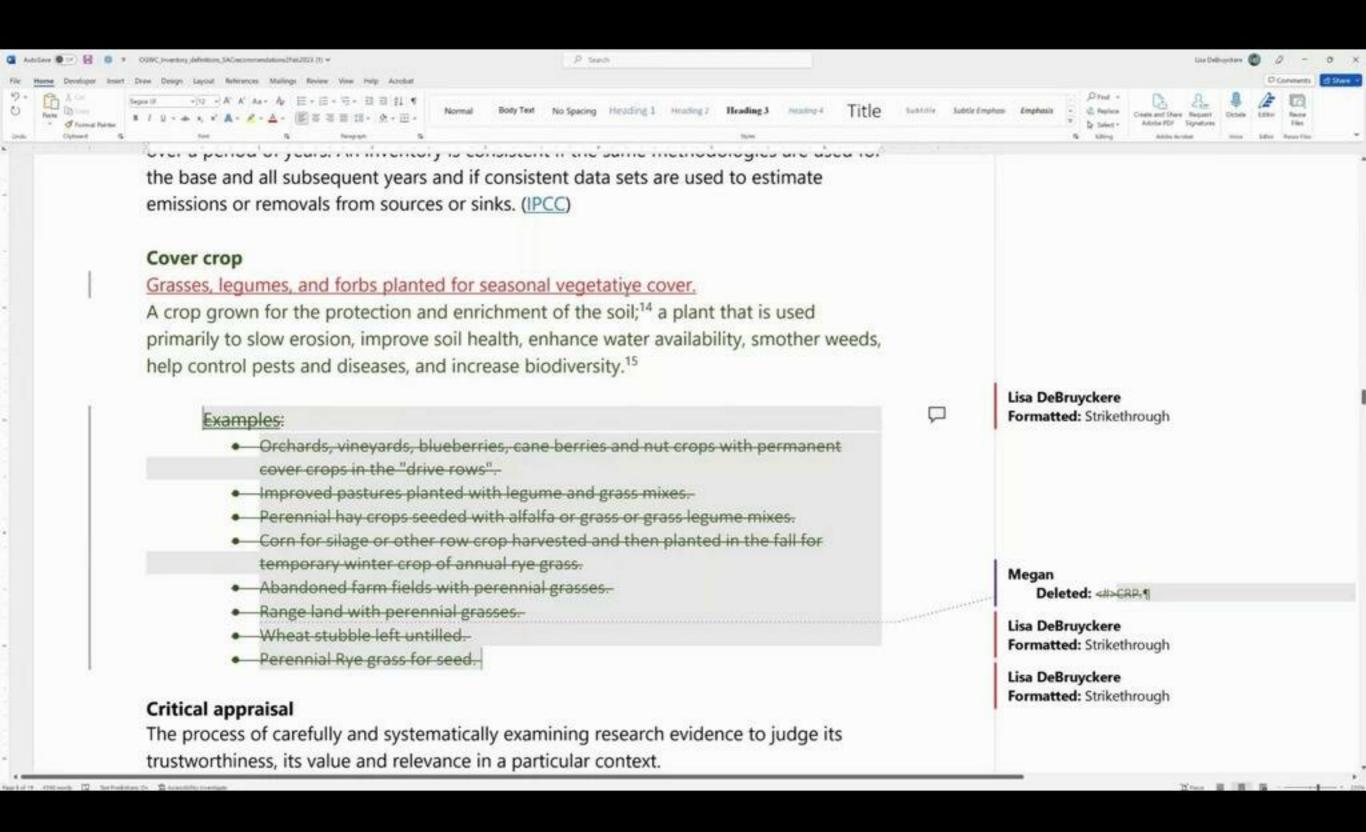


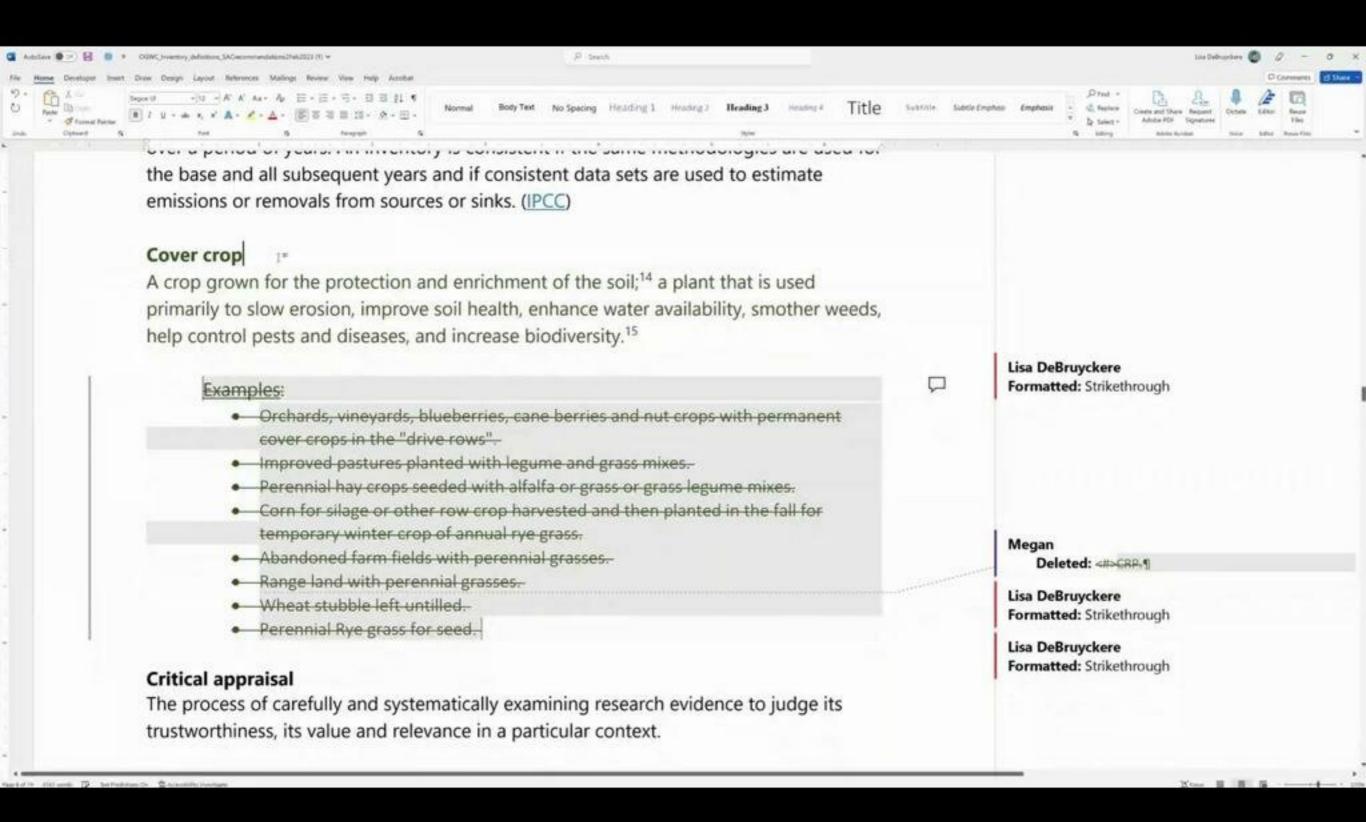


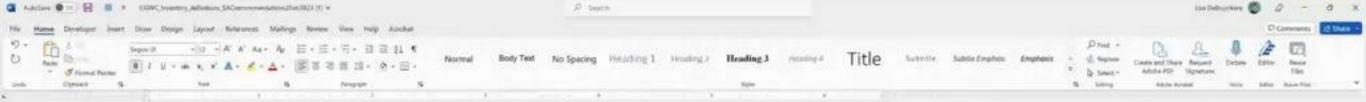












#### **Emission Factor**

A coefficient that quantifies the emissions or removals of a gas per unit activity. Emission factors are often based on a sample of measurement data, averaged to develop a representative rate of emission for a given activity level under a given set of operating conditions. (IPCC)

#### **Emission Inventory**

An estimate of the amount of pollutants emitted into the atmosphere from major mobile, stationary, area-wide, and natural source categories over a specific period of time such as a day or a year. (CARB)

#### **Emission Rate**

The weight of a pollutant emitted per unit of time (e.g., tons / year). (CARB)

#### **Environmental Justice**

Equal protection from environmental and health hazards and meaningful public participation in decisions that affect the environment in which people live, work, learn, practice spirituality and play (HB 2021, 81st Oregon Legislative Assembly, 2021 Regular Session).

#### **Environmental justice communities**

Communities of color, communities experiencing lower incomes, tribal communities, rural communities, coastal communities, communities with limited infrastructure and other communities traditionally underrepresented in public processes and adversely harmed by environmental and health hazards, including seniors, youth and persons with disabilities (HB 2021, 81st Oregon Legislative Assembly, 2021 Regular Session).

### Estimation

The assessment of the value of an unmeasurable quantity using available data and

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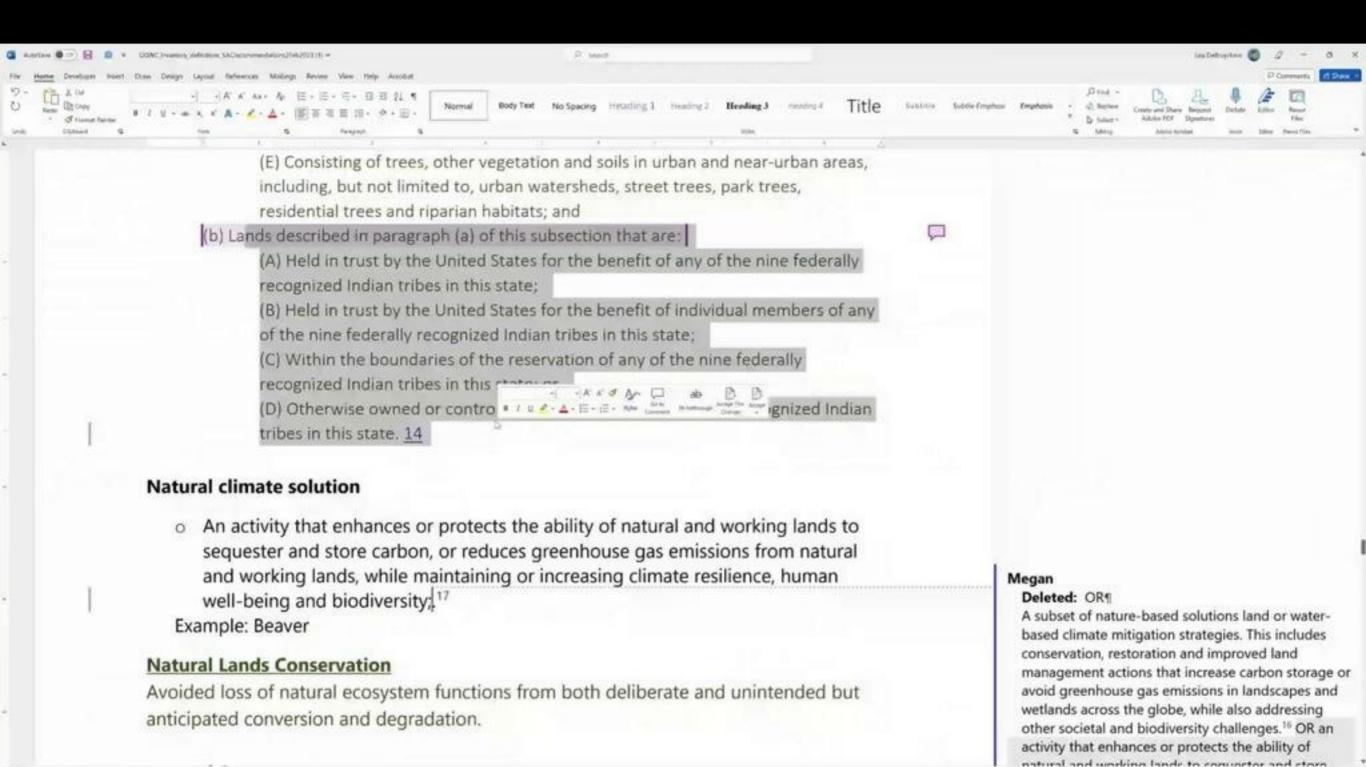
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### Natural and Working Lands (NWL)

- Natural and working lands means:
  - (a) Lands:
    - (A) Actively used by an agricultural owner or operator for an agricultural operation, including but not limited to active engagement in farming or ranching;

D. Seatte

- (B) Producing forest products;
- (C) Consisting of forests, woodlands, grasslands, sagebrush steppes, deserts, freshwater and riparian systems, wetlands, coastal and estuarine areas or the submerged and submersible lands within Oregon's territorial sea and marine habitats associated with those lands;
- (D) Used for recreational purposes, including, but not limited to, parks, trails, greenbelts and other similar open space lands; or

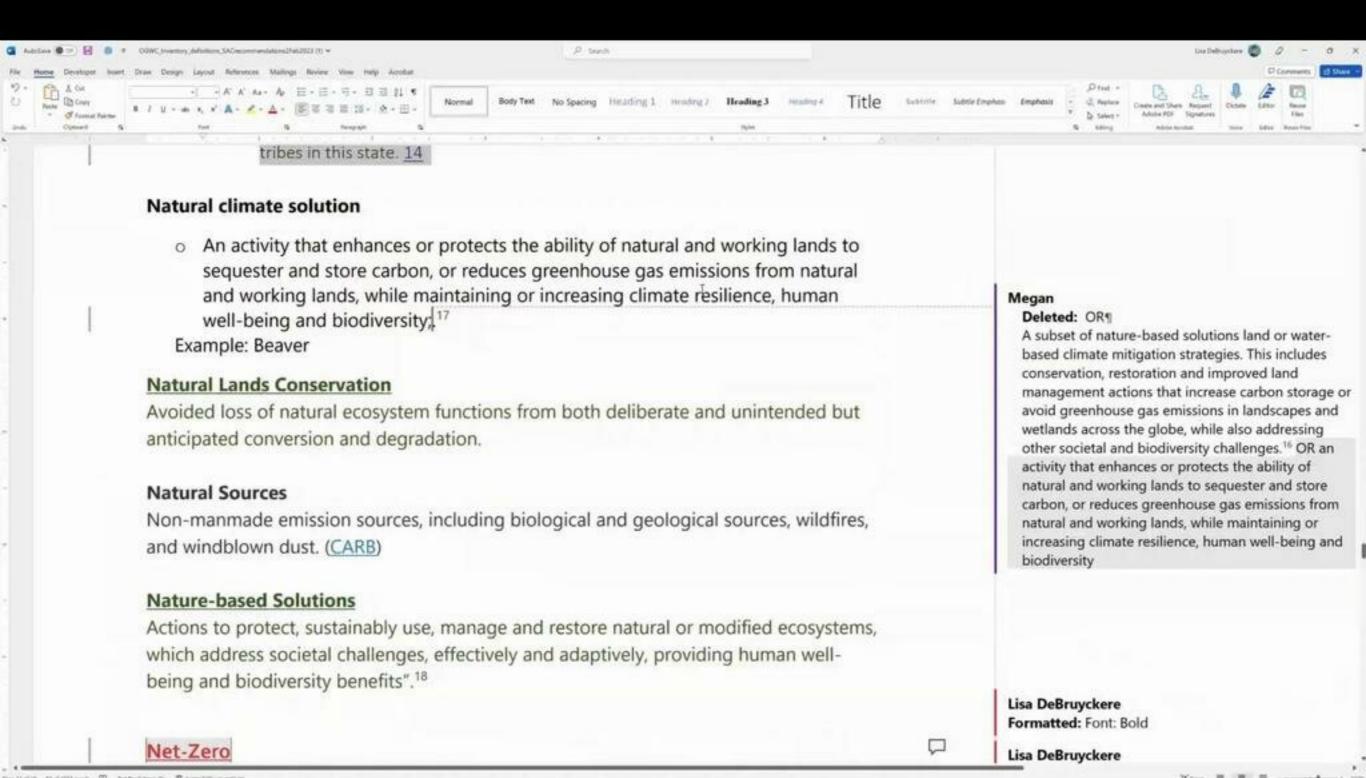
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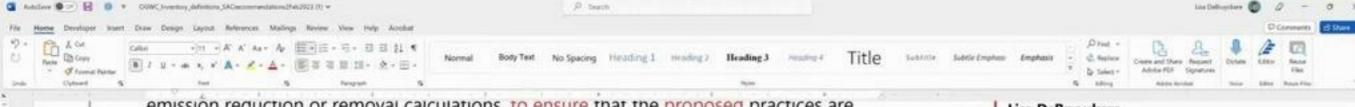
our natural environment: forests and woodlands, grassland and shrubland, cropland and rangeland, urban green spaces, wetlands and waters.1

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(E) Consisting of trees, other vegetation and soils in urban and near-urban areas, including, but not limited to, urban watersheds, street trees, park trees,





emission reduction or removal calculations, to ensure that the proposed practices are actually occurring at a specified location according to project specifications and that greenhouse gas stocks and fluxes are being properly accounted for.

Other sources for terms and definitions:

- https://usnature4climate.org/terms/
- https://usnature4climate.org/term-categories/general/
- We should distinguish between two key terms to clarify when we are talking about practices
  to meet sequestration goals and when we are talking about broader climate-smart
  practices; this is implied in the current definitions for the two terms below, but agreeing on the
  difference would help us talk about the questions above. For example, there may be many
  climate-smart practices which the state wants to incentivize or track, but may not be necessary
  or appropriate to include in the inventory, baseline, and activity-based metrics.
  - Natural climate solutions has an explicit focus on practices with quantifiable carbon sequestration benefits
  - Climate smart practices is a broader term which includes practices with climate adaptation and resilience benefits that may or may not have carbon benefits
- We should use the definitions for natural climate solutions and natural and working lands which align with SB 530
- We should avoid edits to previously defined technical terms wherever possible

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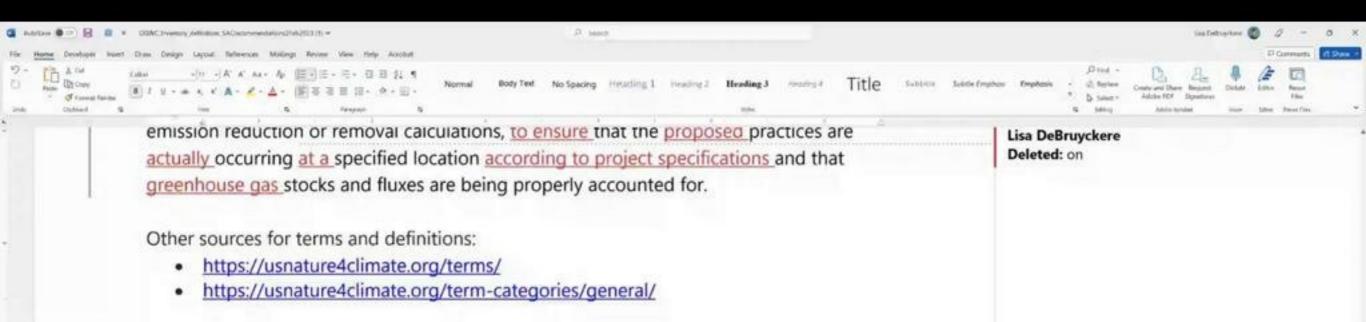
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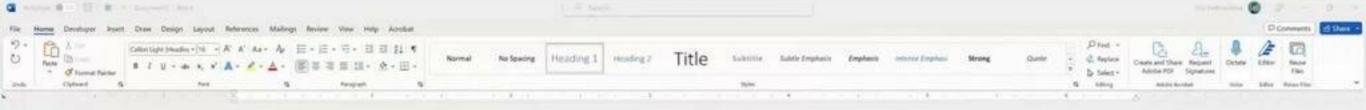
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# Purpose of Inventory Definitions (link)

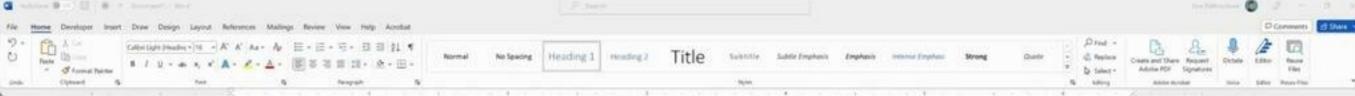
 A GHG emission inventory establishes historical emission trends and tracks progress in reducing GHG, demonstrating the state's progress in achieving statewide GHG targets.

# Our focus is on practices that advance Natural Climate Solutions

 Practices that sequester and store carbon and reduce emissions (on natural and working lands and not accounted for in the statewide GHG inventory). Excel spreadsheet

# What are the questions we are trying to answer?

- Activity-based metrics: Develop activity-based metrics and a baseline of these activities for Oregon's NWL.
  - O What are the recommended activities (i.e., practices) to capture and store more carbon and reduce GHGs in Oregon's NWL sector? Which should be included in this effort?
  - What method should be used to develop a baseline for these activities and track implementation through time? How much is occurring and how much has happened in the past? How much would occur following 'business-as-usual'?
  - How do we best measure or estimate the amount of carbon that is captured and stored by implementing the activities?



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  - How do we best measure or estimate the amount of carbon that is captured and stored by implementing the activities?
- Inventory: Create a tiered proposal for a greenhouse gas inventory for Oregon's NWL sector
  - What are the recommended methods to determine:
    - The current carbon stocks and net sequestration in Oregon's NWL?
    - How carbon stocks, emissions, and sequestration in Oregon's NWL change through time?
    - The causes of these changes?
    - How we track these differences?

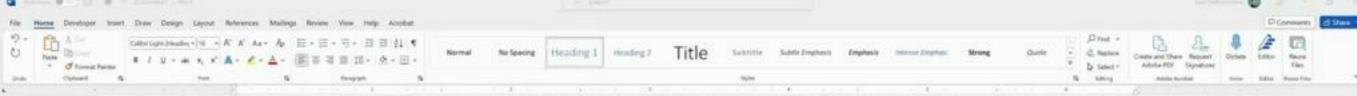


### Oregon's NWL.

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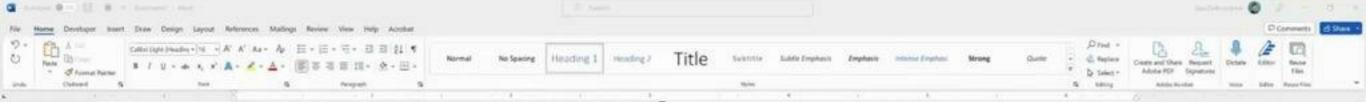
# Subcommittees

- Considering criteria for proposing practices (e.g., Ag carbon benefit, measurable, feasibility of implementation by agricultural community – developing a matrix that illustrates carbon benefit, co-benefits, etc.)
- Forestry Subcommittee considering articulating practices by land type (e.g., tribal, federal and



- How do we best measure or estimate the amount of carbon that is captured and stored by implementing the activities?
- . Inventory: Create a tiered proposal for a greenhouse gas inventory for Oregon's NWL sector
  - What are the recommended methods to determine:
    - The current carbon stocks and net sequestration in Oregon's NWL?
    - How carbon stocks, emissions, and sequestration in Oregon's NWL change through time?
    - The causes of these changes?
    - How we track these differences?

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- Ag Subcommittee Thinking about organizing practices into NRCS 4 Principals <u>buckets</u>
- Evaluating word choices
  - Example Forestry Reduce wildfire risks <u>versus</u> Restore ecologically appropriate fire regimes to maximize reduction of carbon releases from <u>wildfires</u>
  - o Example Agriculture Increase riparian areas beyond the edge of field versus Increase



How we track these differences?

## Subcommittees

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### Process

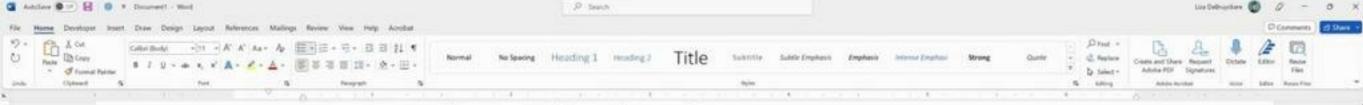
Why this project was designed the way it is – Roles and Responsibilities – and why it matters



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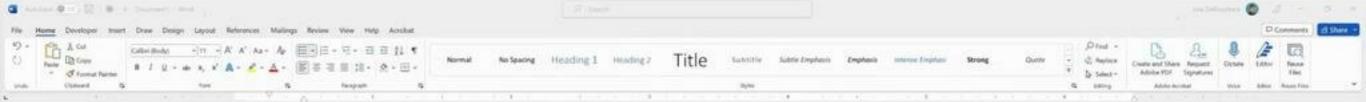


- The causes of these changes?
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