Carbon and Forest Management Work Group

Summary of Model Results

Neil Taberner / Forterra

June 11, 2025 | 9am – 3pm

Meeting #13

In this presentation

- We will conduct a high-level overview of the carbon study results.
- We will mention a couple of conclusions from the economic study for context.
- The rest of the economic study results will be summarized in the June 25, 2025 work group meeting.



Carbon Results

In support of:

- Increasing carbon sequestration and storage in forests and harvested wood products from DNR-managed forestlands

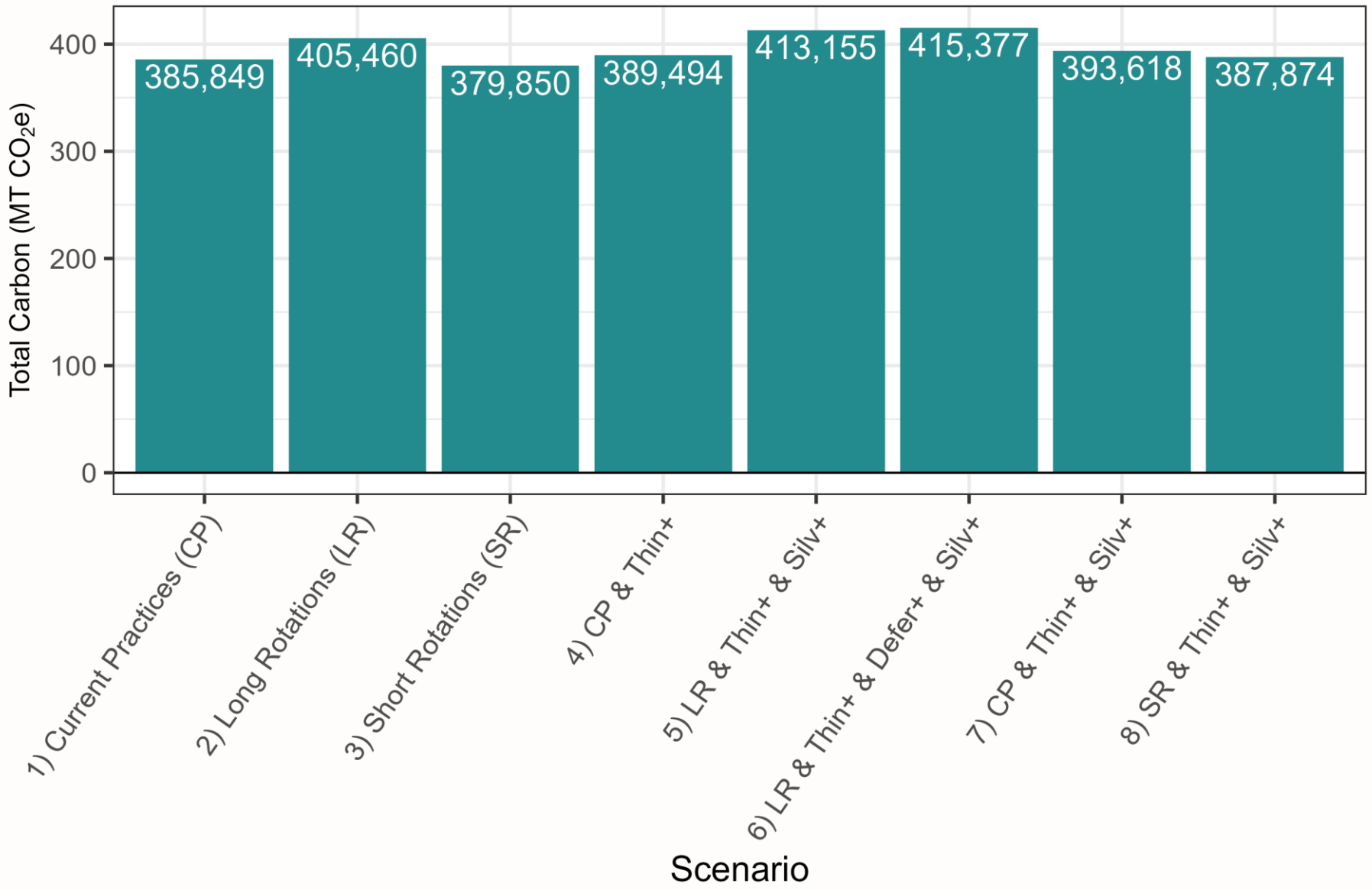


Mean Annual Total Carbon (MT CO_2e)

DNR-Managed Lands (GEM and Uplands)

Without climate change

Carbon Study



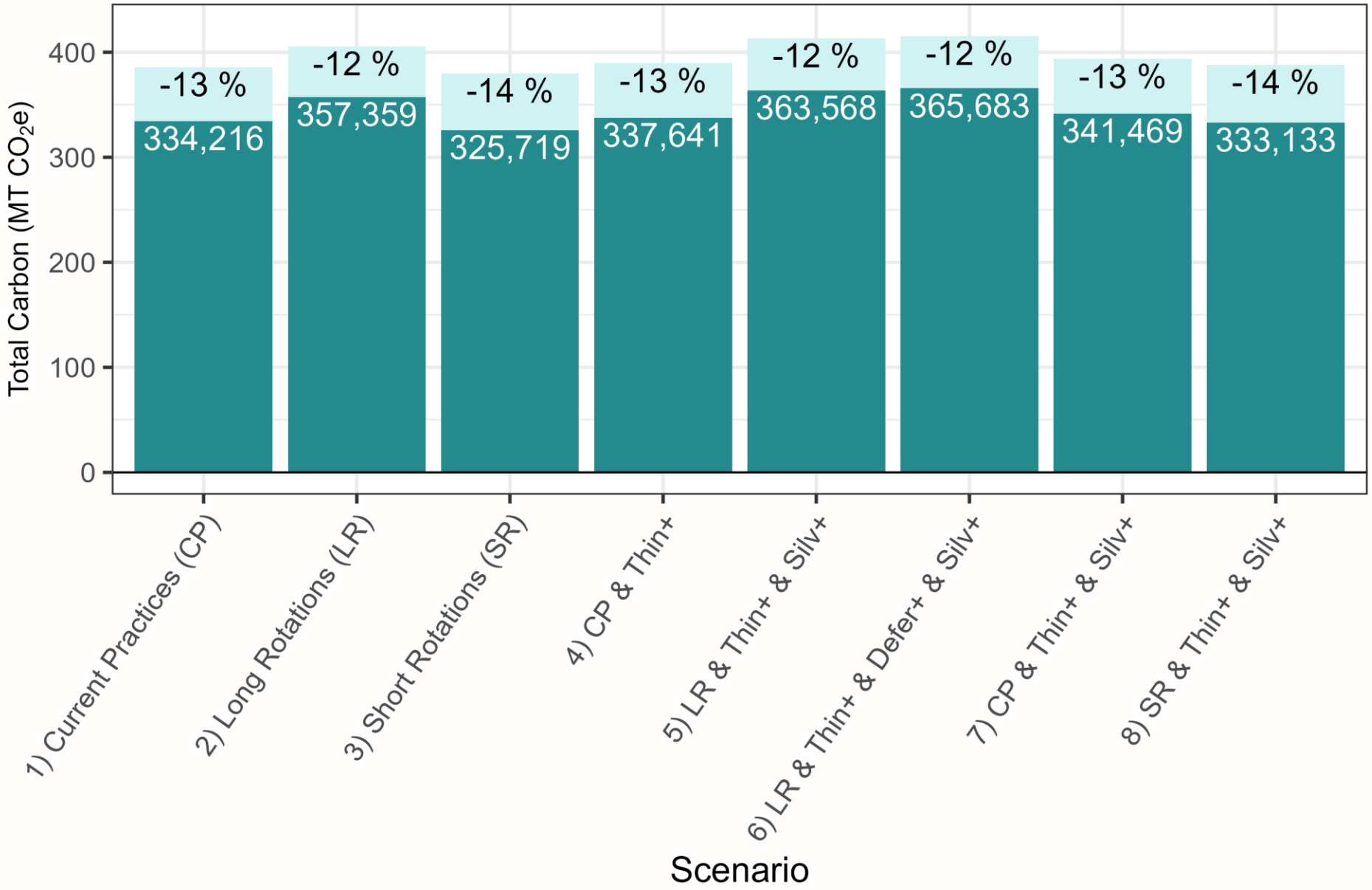


Mean Annual Total Carbon (MT CO_2e)

DNR-Managed Lands (GEM and Uplands)

With climate change

Carbon Study



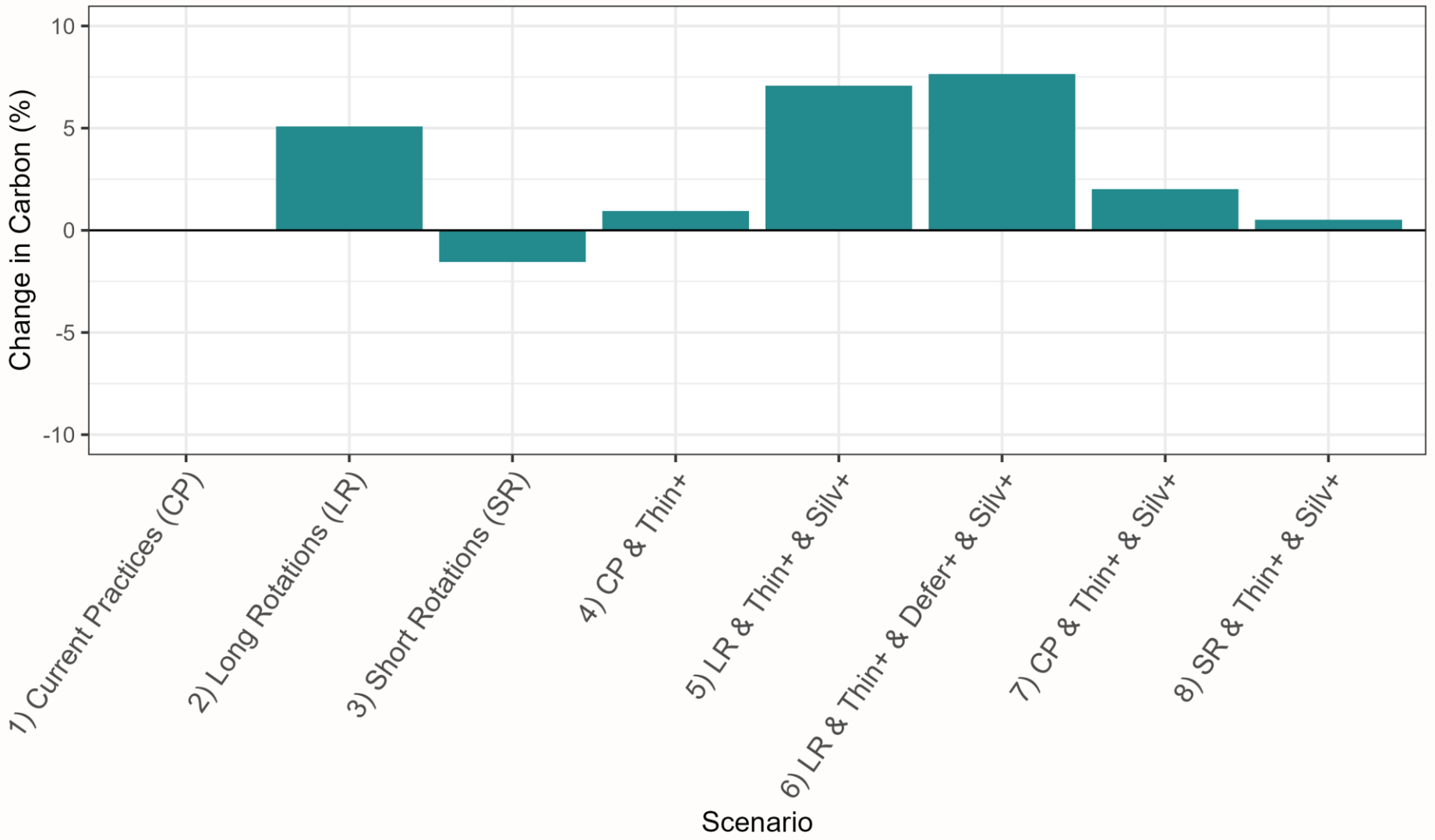
Mean Annual Total Carbon ($MTCO_2e$)

% Change in Carbon Compared to Scenario 1

DNR-managed Lands (GEM and Uplands)

Without **climate change**

Carbon Study



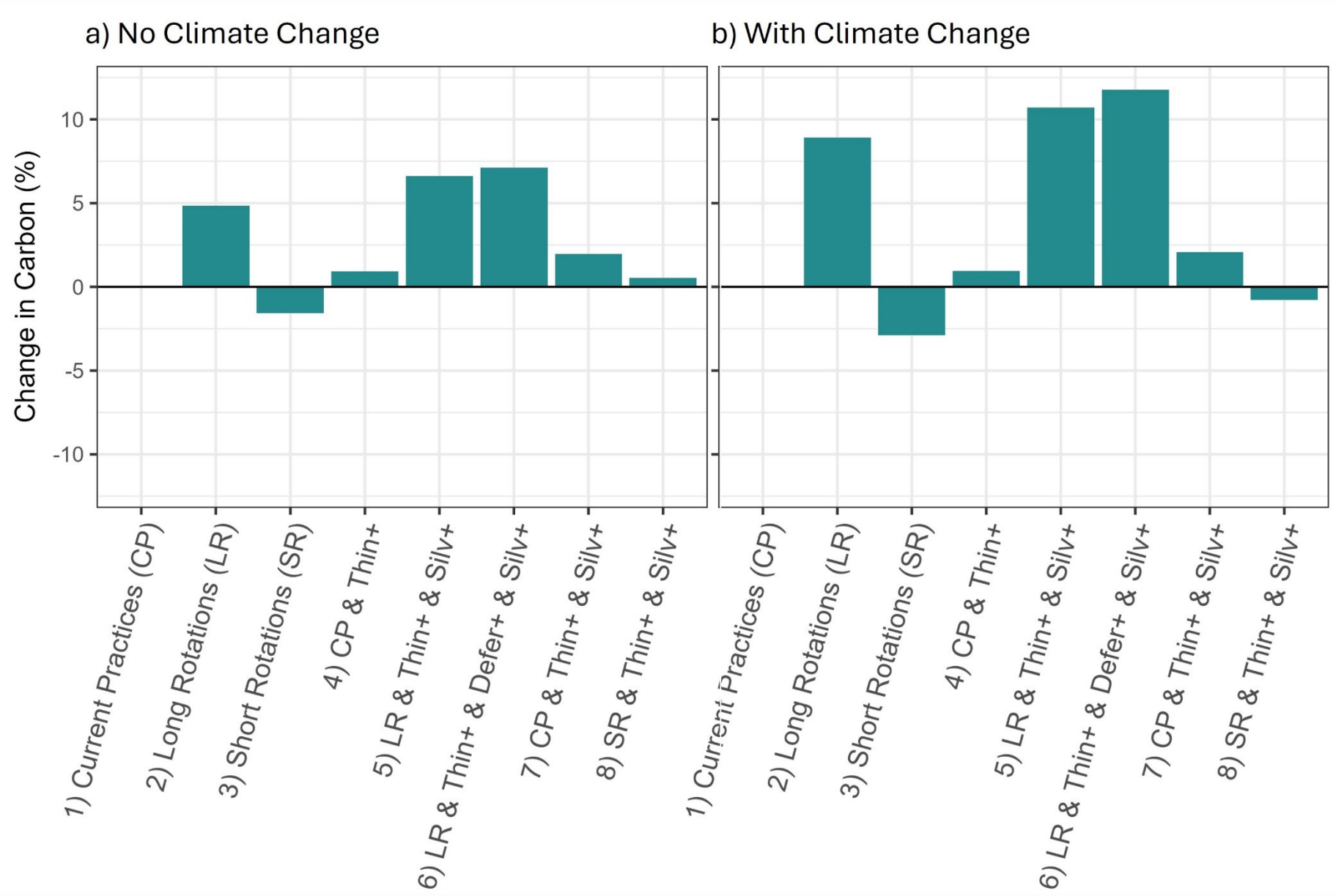
Mean Annual Total Carbon ($MTCO_2e$)

% Change in Carbon Compared to Scenario 1

DNR-managed Lands (GEM and Uplands)

With and without **climate change**

Carbon Study



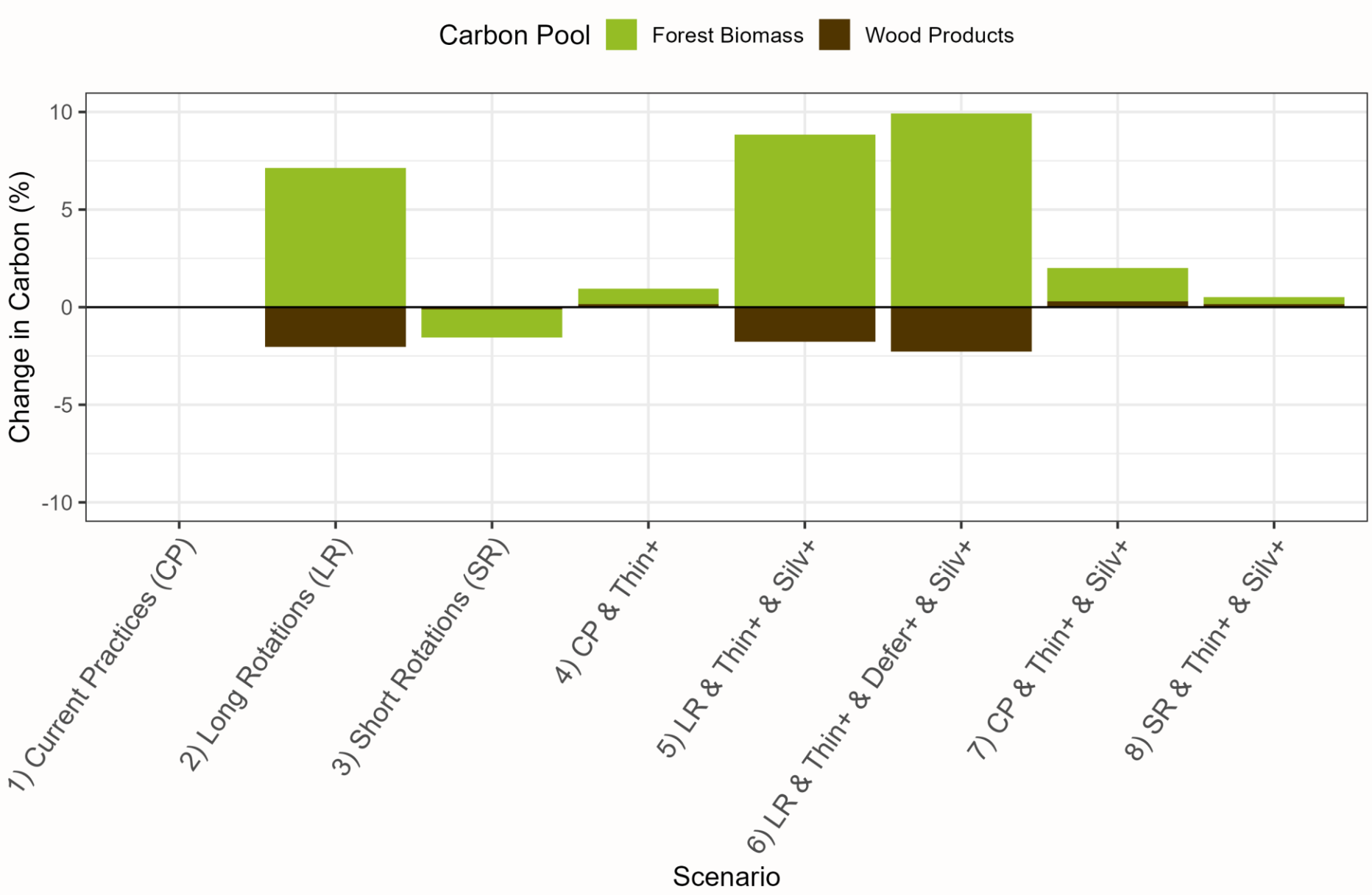
Mean Annual Total Carbon by Pool ($MTCO_2e$)

% Change in Carbon Compared to Scenario 1

DNR-managed Lands (GEM and Uplands)

Without **climate change**

Carbon Study



Carbon Storage Takeaways, Without Climate Change

- **Carbon study**: As compared to Scenario 1, carbon storage on DNR-managed lands is simulated to increase over time under all scenarios except Scenario 3. Gains are the highest under long rotation scenarios.
- **Economic study**: Leakage will occur on private lands, which will affect total carbon storage across all ownerships.

- **Scenario 1**: DNR Current Operations
- **Scenario 2**: Lengthen harvest rotation
- **Scenario 3**: Shorten harvest rotation
- **Scenario 4**: Significantly increase thinning
- **Scenario 5**: 2 + 4 + silviculture
- **Scenario 6**: 2 + 4 + silviculture + deferrals
- **Scenario 7**: 4 + silviculture
- **Scenario 8**: 3 + 4 + silviculture

Carbon Storage Takeaways, With Climate Change, Carbon Study

- The general pattern for carbon storage under the scenarios remains the same with climate change.
- Mean annual carbon storage in GEM and Upland areas is 12 to 14 percent less under climate change, depending on scenario.
- Climate change effects are minor initially (first 3 decades) but then flatten out carbon increases.

- **Scenario 1**: DNR Current Operations
- **Scenario 2**: Lengthen harvest rotation
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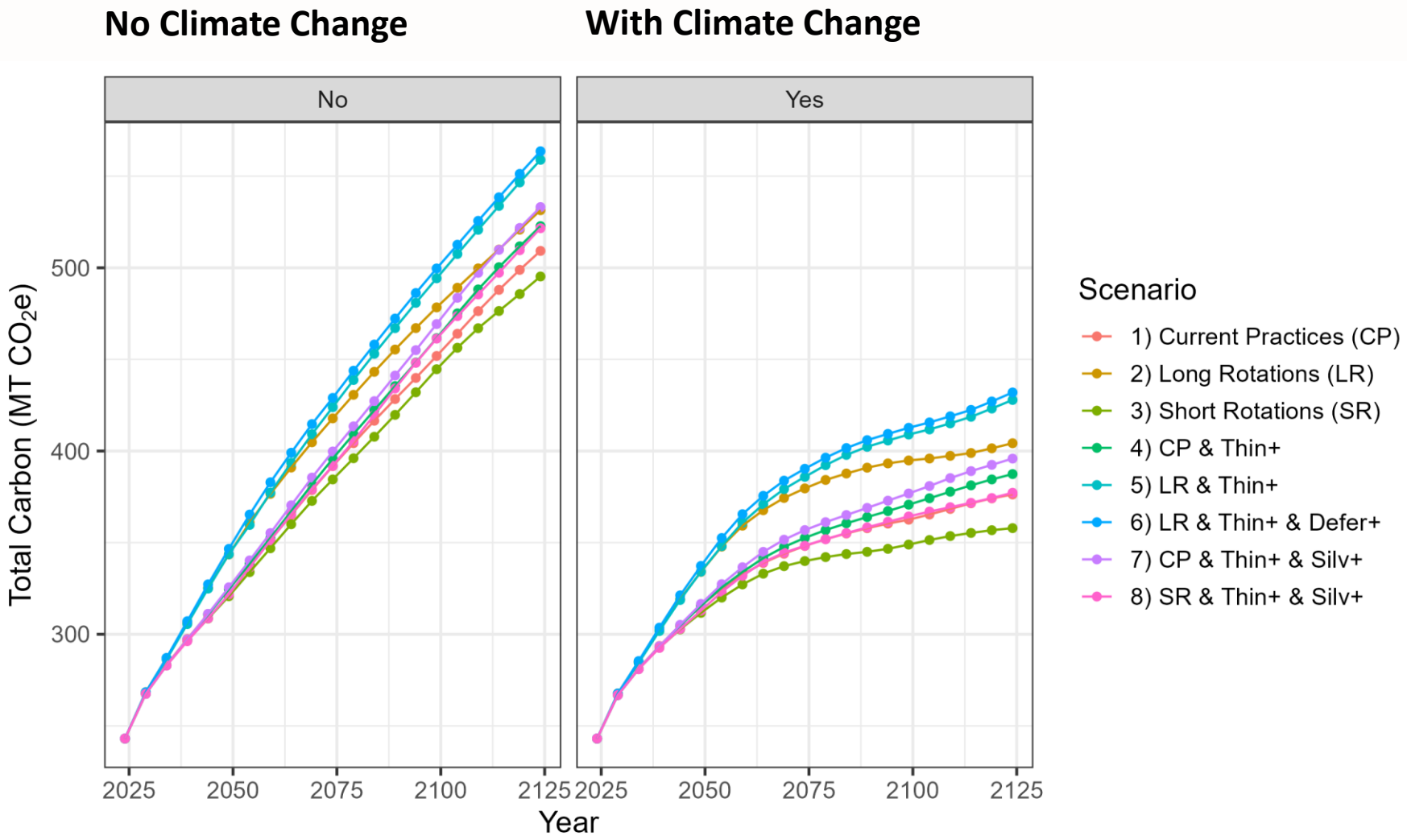
Total Carbon (MT CO_2e)

DNR-Managed Lands (GEM and Uplands)

With and without climate change

Carbon Study



Simulated Timber Yield Results

In support of:

- Generating predictable beneficiary revenue, and
- Maintaining timber supplies that support local industry

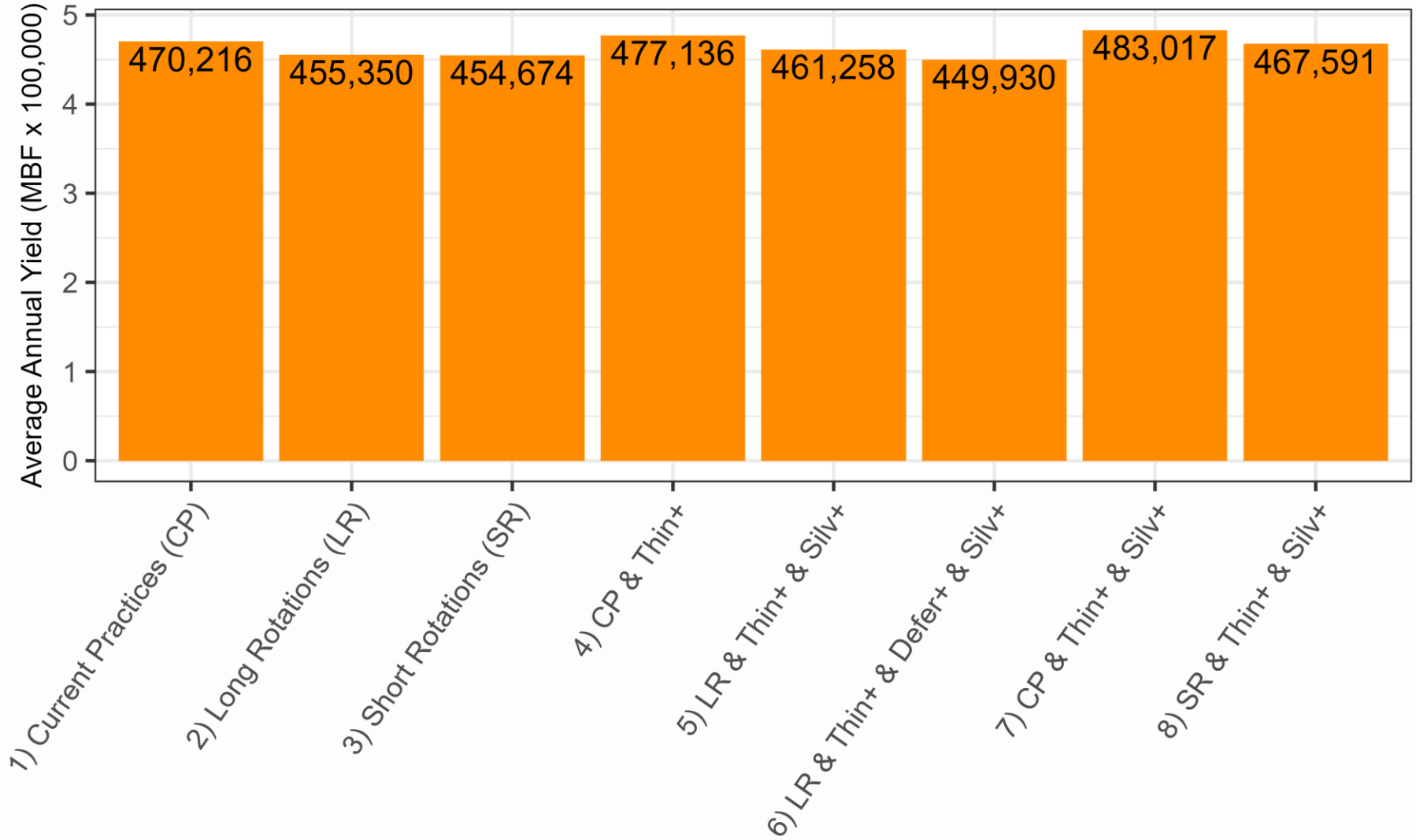


Average Annual Simulated Timber Yield (MBF)

DNR-Managed Lands (GEM and Uplands)

Without climate change

Carbon Study

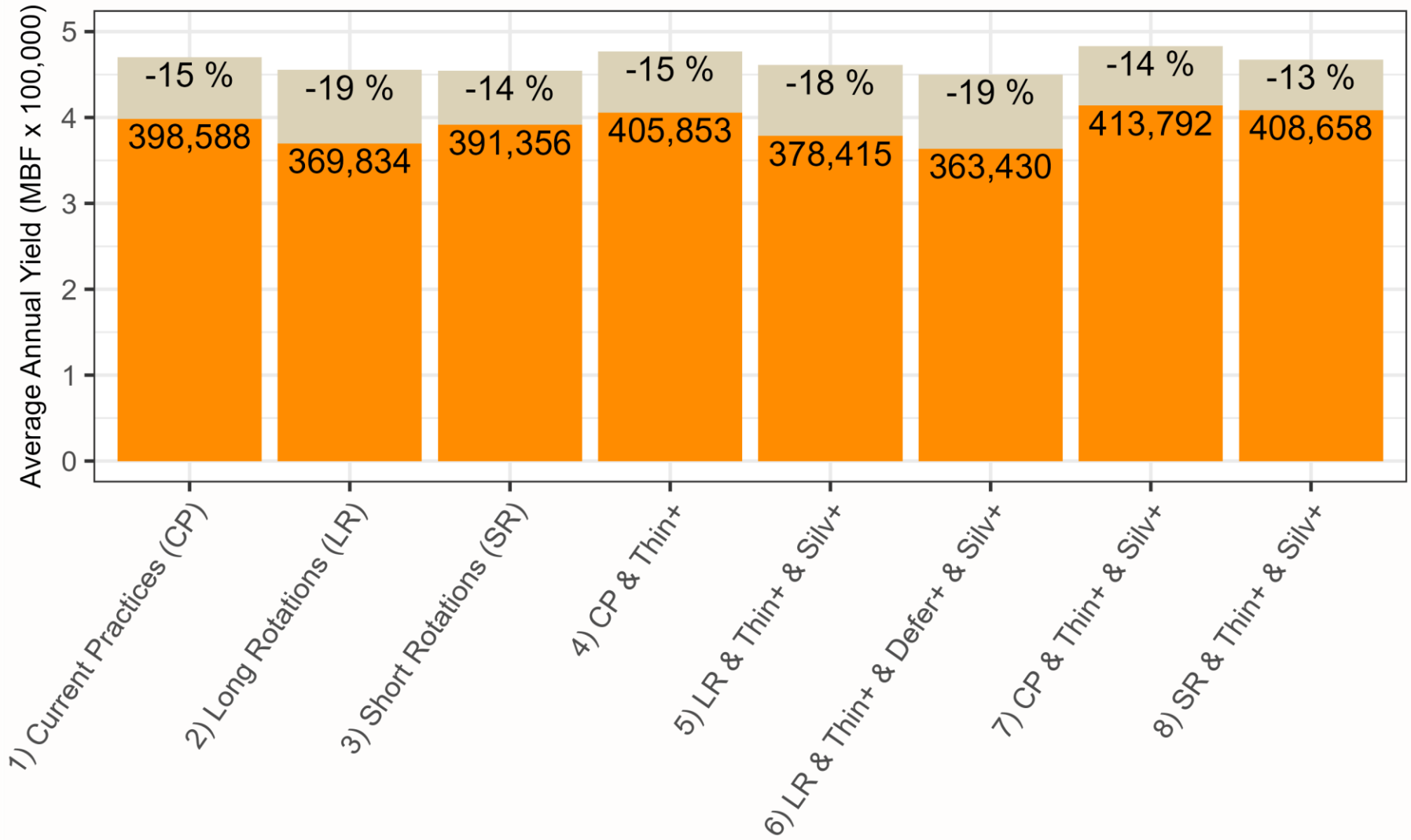


Average Annual Simulated Timber Yield (MBF)

DNR-Managed Lands (GEM and Uplands)

With climate change

Carbon Study

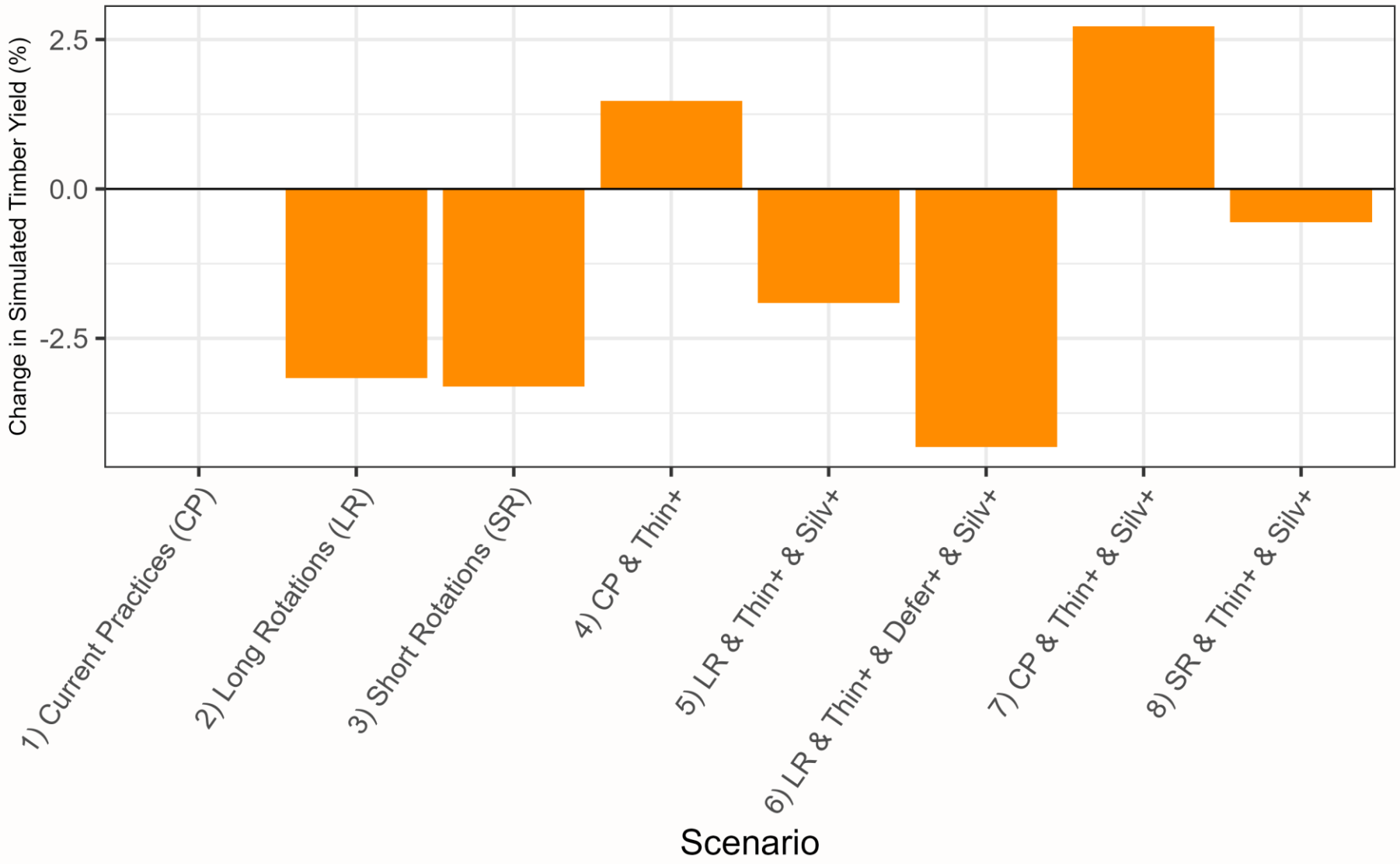


Percent Change in Simulated Timber Yield as Compared to Scenario 1

DNR-managed lands (GEM and Uplands)

Without Climate Change

Carbon Study

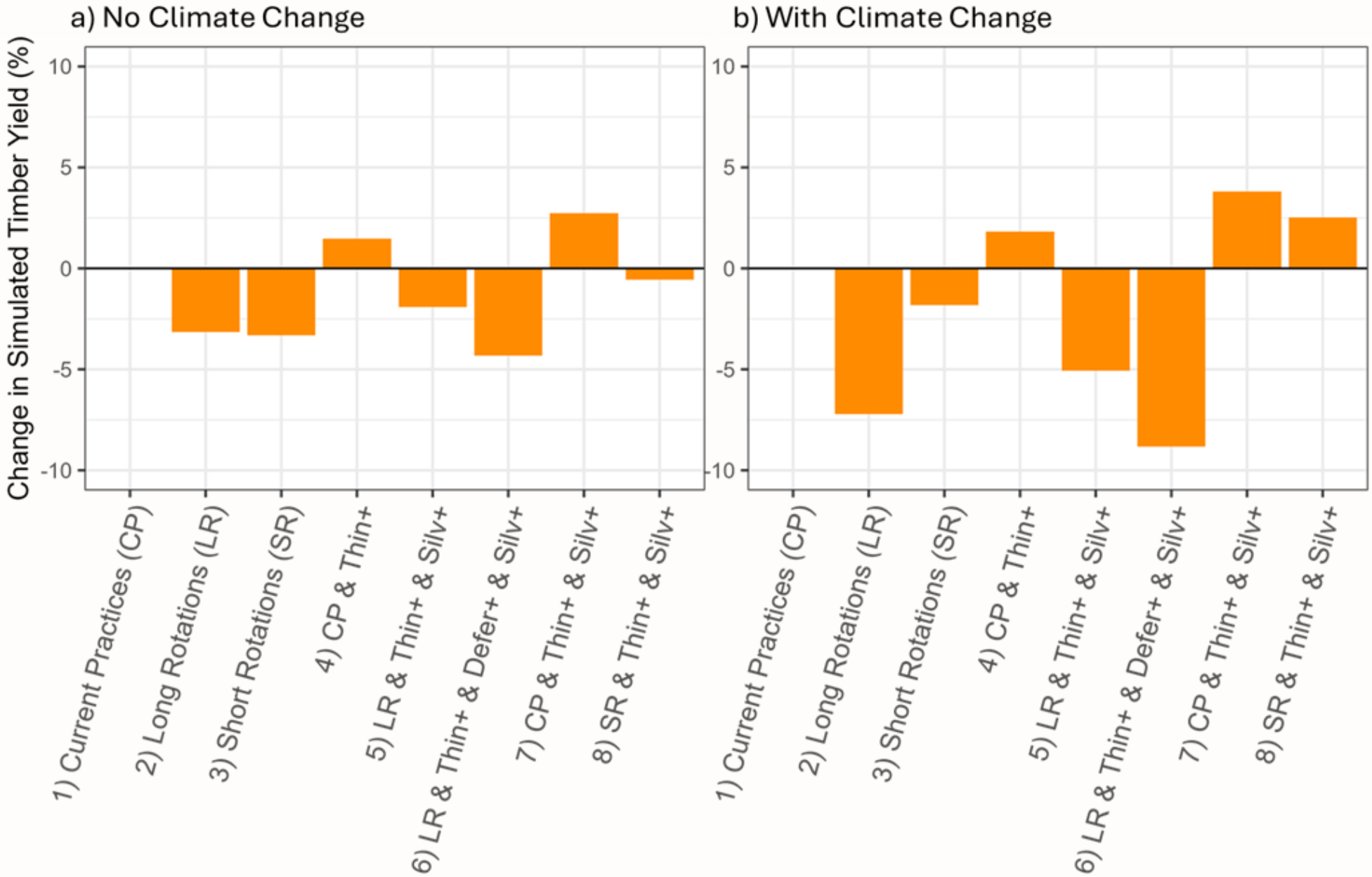


Percent Change in Simulated Timber Yield as Compared to Scenario 1

With and Without Climate Change

DNR-managed lands (GEM and Uplands)

Carbon Study

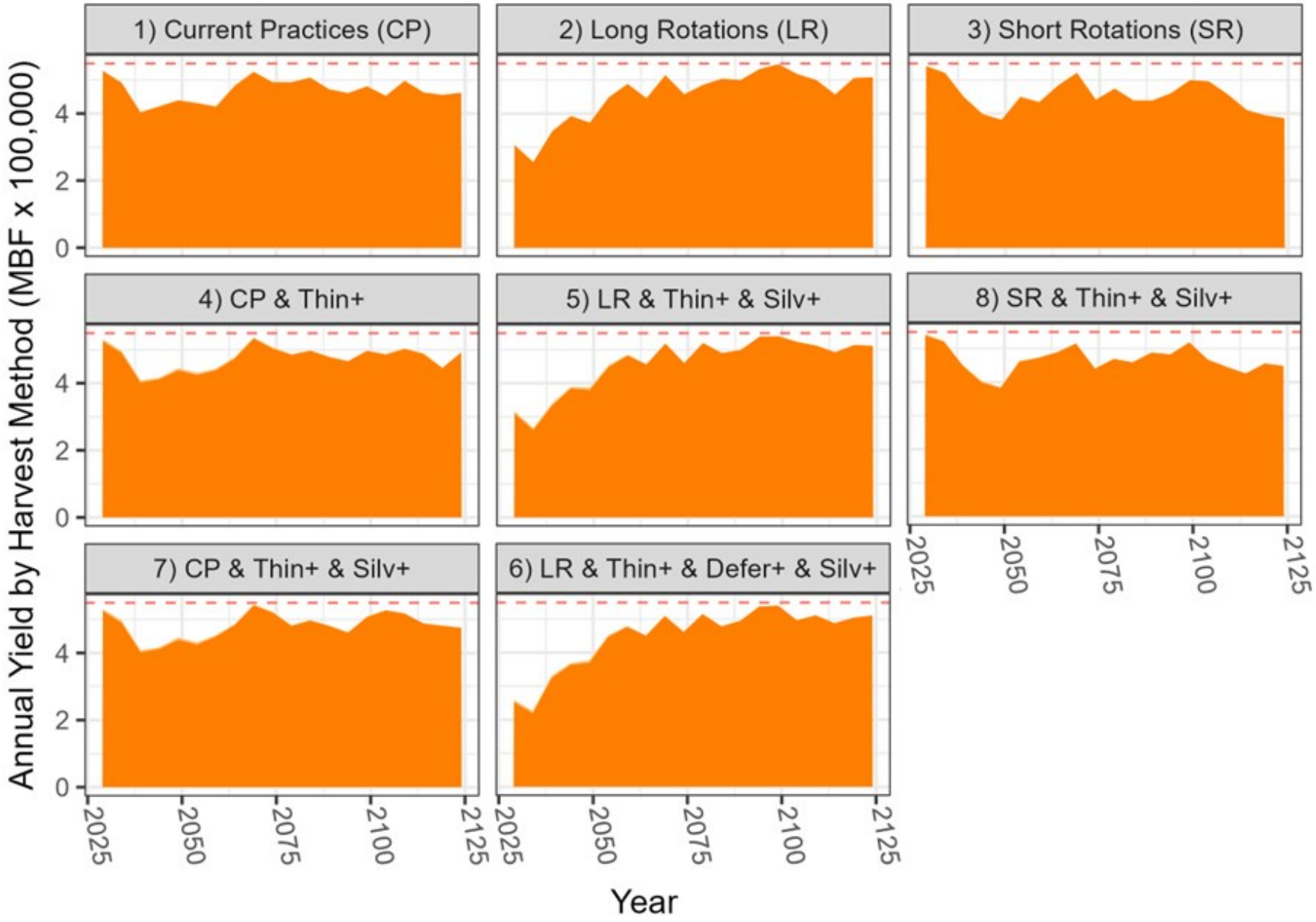


Annual Simulated Timber Yield (MBF): Fluctuations Over Time

DNR-Managed Lands (GEM and Uplands)

Without Climate Change

Carbon Study

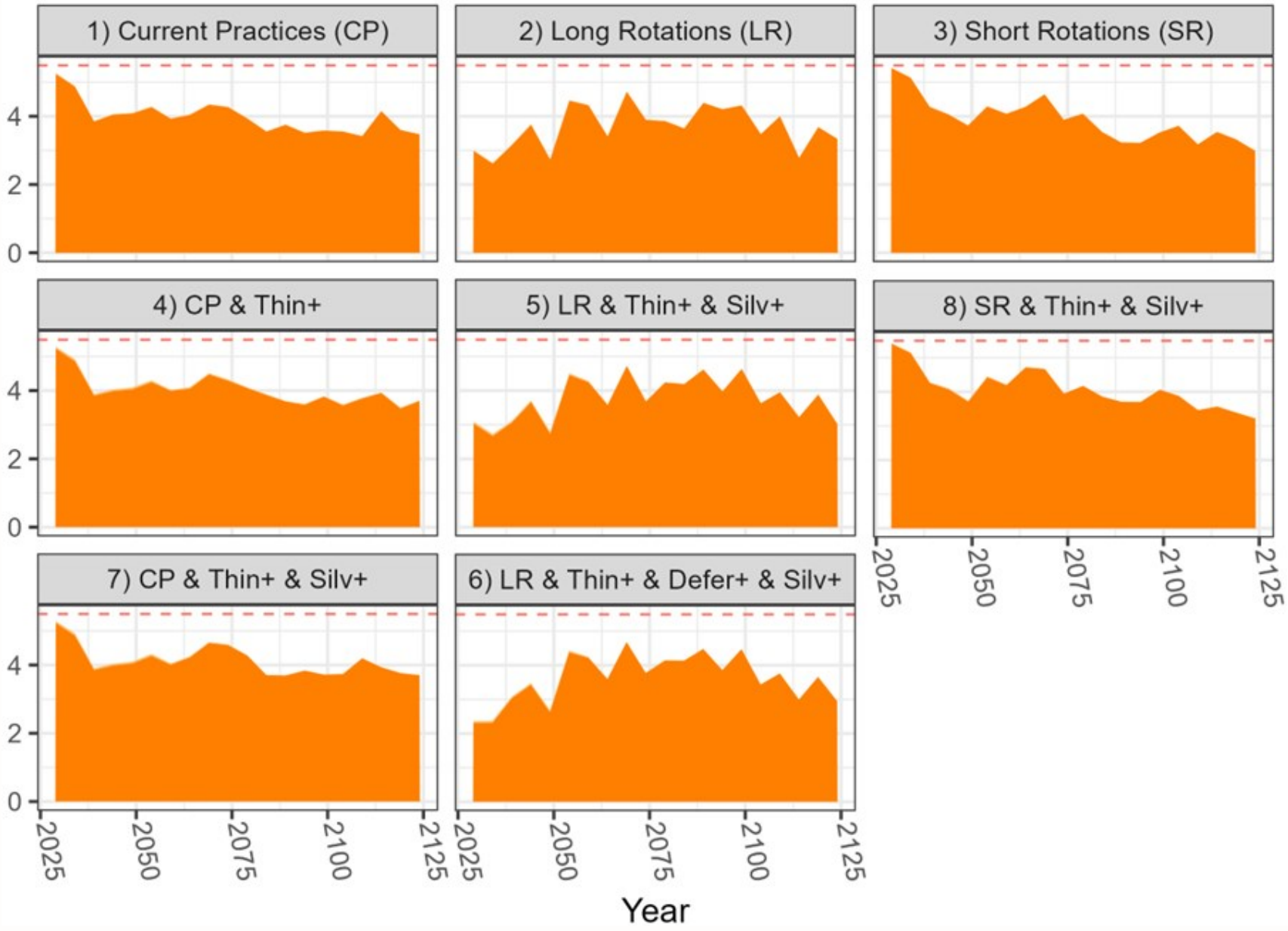


Annual Timber Yield (MBF): Fluctuations Over Time

DNR-Managed Lands (GEM and Uplands)

With Climate Change

Carbon Study



Timber Yield Takeaways, Without Climate Change

- **Carbon study:** Scenarios 4 and 7 increased harvest levels as compared to Scenario 1. The increase was highest for Scenario 7. All other scenarios had a lower harvest volume than Scenario 1. Of these, Scenario 6 had the largest decrease.
- **Economic study:** Because private forestland owners are expected to respond to changes in harvest on DNR-managed lands, impacts on overall harvest levels in western Washington should be minimal over the analysis period.

- **Scenario 1**: DNR Current Operations
- **Scenario 2**: Lengthen harvest rotation
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- **Scenario 7**: 4 + silviculture
- **Scenario 8**: 3 + 4 + silviculture

Timber Yield Takeaways, With Climate Change, Carbon Study

- The general pattern across scenarios holds for timber yield and carbon with or without climate change.
- Mean annual timber yields decreased 13 to 19 percent under climate change, depending on scenario.

- **Scenario 1**: DNR Current Operations
- **Scenario 2**: Lengthen harvest rotation
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Deferrals

In support of:

- Conserving and managing older, carbon-dense, structurally complex forest stands located on DNR-managed lands



Increase in Deferral of Older, Carbon-dense, Structurally Complex Forest Under Scenario 6

- Deferred 66,725 acres of forest age 80 years or older as of 2024.
- Used age as a surrogate for structure.
- No other scenarios included this component.



Other Proviso Goals

- **Addressing economic needs in rural communities:** These results were provided by Evergreen today and will be summarized at the start of the June 25 meeting.
- **Predictable beneficiary revenue:** If directed by the Board of Natural Resources, DNR will analyze the recommendations as alternatives in the Sustainable Harvest Calculation (SHC). As part of the SHC process, DNR will determine the potential revenue of each alternative by trust. The State Environmental Policy Act (SEPA) process for the SHC has several opportunities for public comment.

Putting it All Together: Carbon



Scenario	% difference mean annual stored carbon DNR only No climate change	% difference mean annual stored carbon DNR only Climate change	% difference mean annual simulated timber yield DNR only lands No climate change	% difference mean annual simulated timber yield DNR only lands Climate change
Scenario 1 stats	386 mean Mt CO2e/yr	386 mean Mt CO2e/yr	470,216 mean MBF/yr	470,216 mean MBF/yr
2: Lengthen Harvest Rotation	**5.1**	**6.9**	**(3.2)**	**(7.2)**
3: Shorten Harvest Rotation	**(1.6)**	**(2.5)**	**(3.3)**	**(1.8)**
4: Significantly Increase Thinning	**0.9**	**1.0**	**1.5**	**1.8**
5: 2+4+Silviculture	**7.1**	**8.8**	**(1.9)**	**(5.1)**
6: 2+4+Silviculture+ Deferrals	**7.7**	**9.4**	**(4.3)**	**(8.8)**
7: 4+ Silviculture	**2.0**	**2.2**	**2.7**	**3.8**
8: 3+4+Silviculture	**0.5**	**(0.3)**	**(0.6)**	**2.5**

Questions and Discussion