

# 2022 Scoping Plan Update

## Costs, Health, and Economics

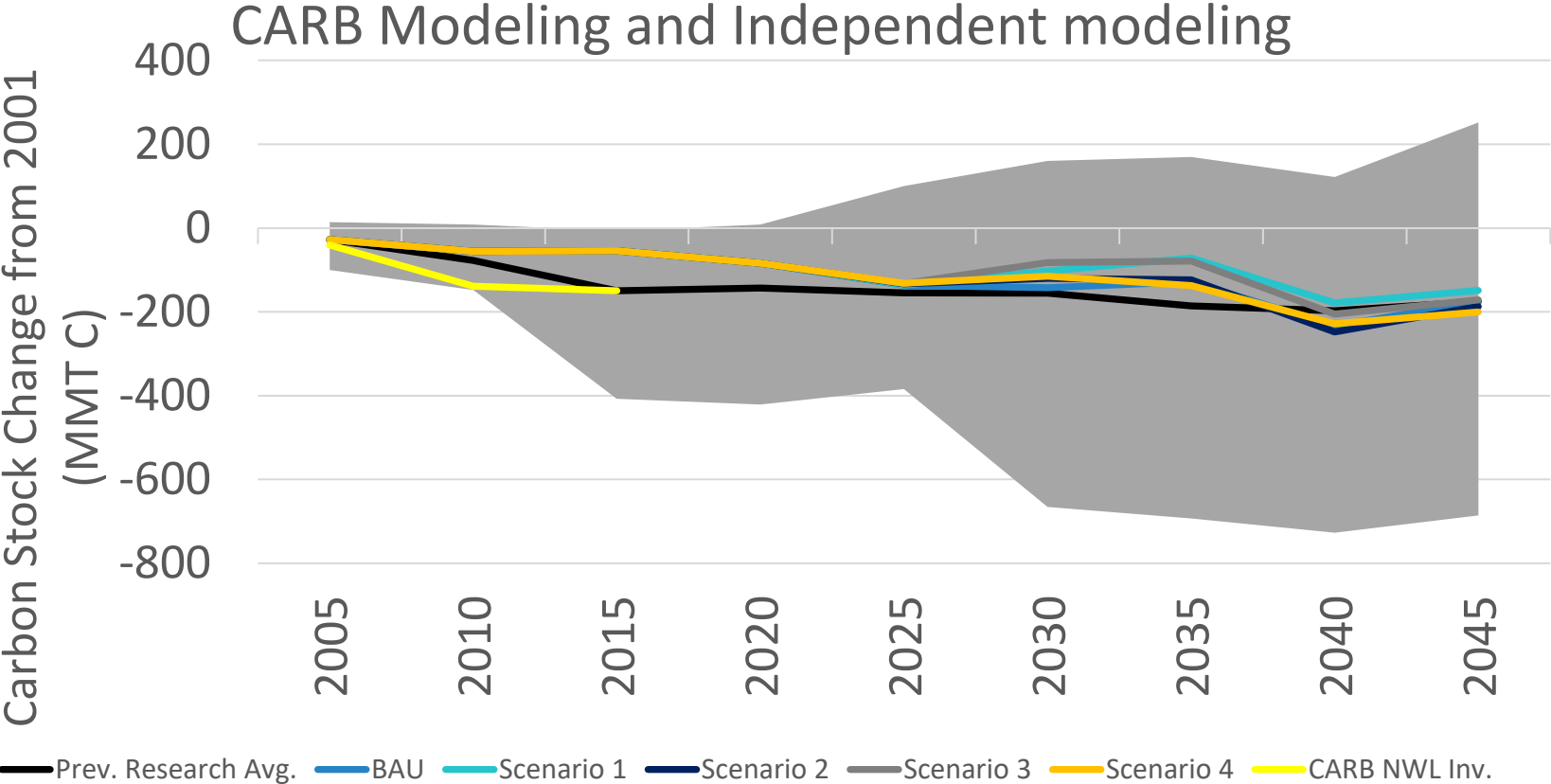
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NATURAL AND WORKING LANDS

APRIL 20, 2022

# Overall Results

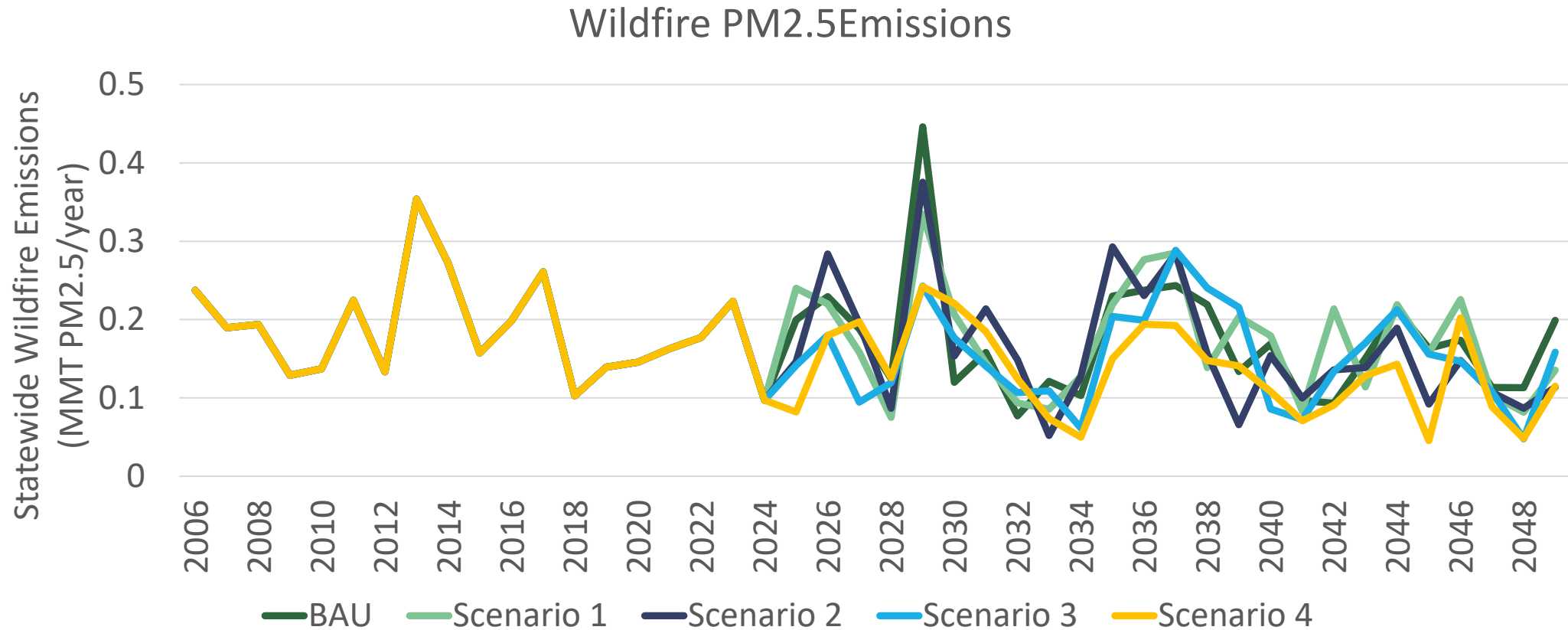


# Summary of GHG Modeling

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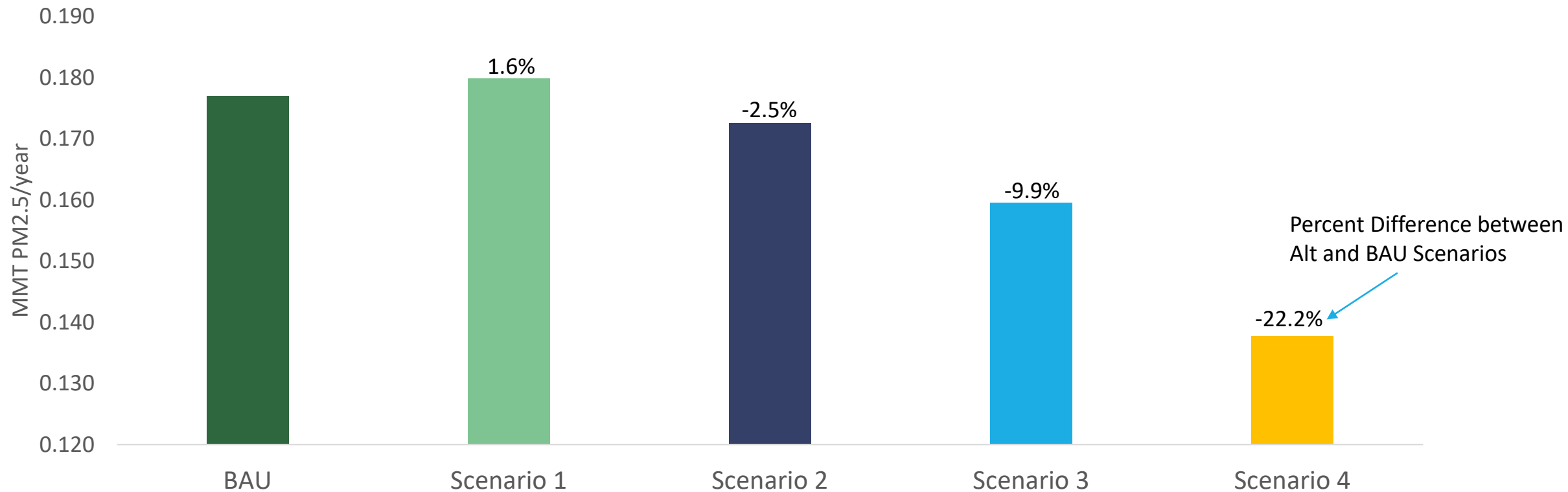
- Forests, shrublands, and grasslands dominate California's NWL contribution to carbon neutrality
- Our current forested biomass on the landscape is at historic highs
- The current trend from independent observations is that California's NWL are losing productivity
- Natural and Working Lands are projected to be a net source of emissions from 2025 to 2045
- Increasing actions on other lands can improve carbon storage and reduce emissions from this sector
- Expanding deployment of urban tree canopy, wetland restoration, healthy soils practices, and organic farming deliver carbon sequestration and reduced emissions.
- Natural variability exists - the ability for NWL to contribute to CN is dependent on future climate change and varies from year to year

# Annual Wildfire Emissions



# Annual Wildfire Emissions

Statewide Average Annual Wildfire PM2.5 Emissions from 2025-2045

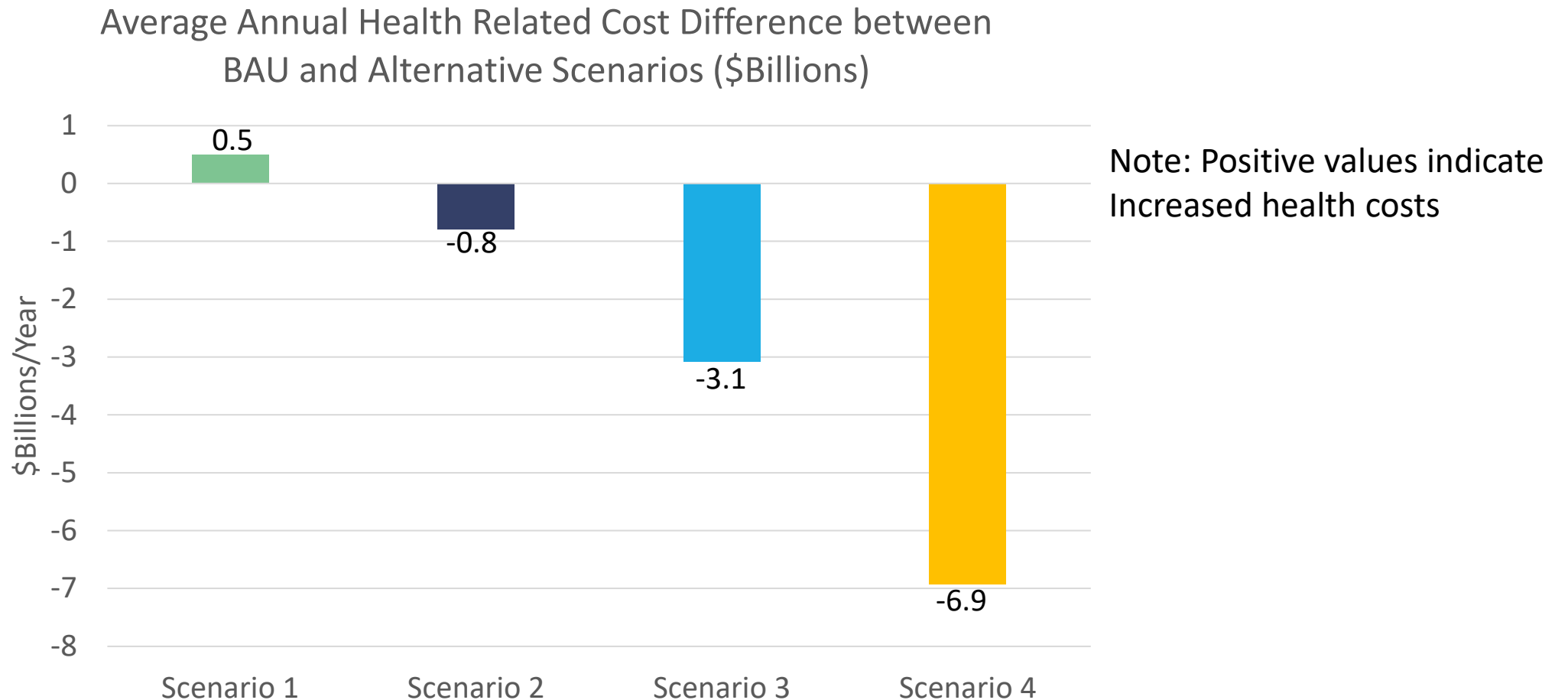


# Future Projected Health Impacts from Wildfire Emissions

Average annual difference in health effects in California from wildfire emissions compared to BAU from 2025-2045  
(positive numbers are increases in incidents)

Health Endpoint	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Hospital admissions from asthma	3	-9	-16	-27
Hospital admissions from chronic obstructive pulmonary disease without asthma	3	-8	-14	-24
Hospital admissions from all respiratory outcomes	10	-26	-47	-79
Emergency room visits from asthma	25	-65	-115	-193
Emergency room visits from all respiratory outcomes	67	-176	-311	-523
Emergency room visits from all cardiovascular outcomes	25	-65	-116	-195
All cause mortality	63	-165	-292	-492

# Annual Health Costs Associated with Wildfire Emissions



# Scientific agreement and knowledge gaps on the health benefits of organic/sustainable agriculture

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Literature has general agreement that converting to organic/sustainable ag:

- Decreases pesticide exposure (residues and environment)
- Increases the nutritional value of food
- Reduces soil erosion
- Increases soil quality
- Reduces antimicrobial resistant pathogens
- Increases air & water quality
- Improves the mental health and wages of workers.

Knowledge gaps:

- Health benefits of conventional vs sustainable farming for communities living near fields or the general population
- Sensitive populations (children, elderly, etc.) and vulnerable populations (low income, etc.) are rarely included
- Limited number of studies on non-organic sustainable farming
- Only a handful of studies are from California and US or similar countries



# Economic Analysis of Natural and Working Lands Actions

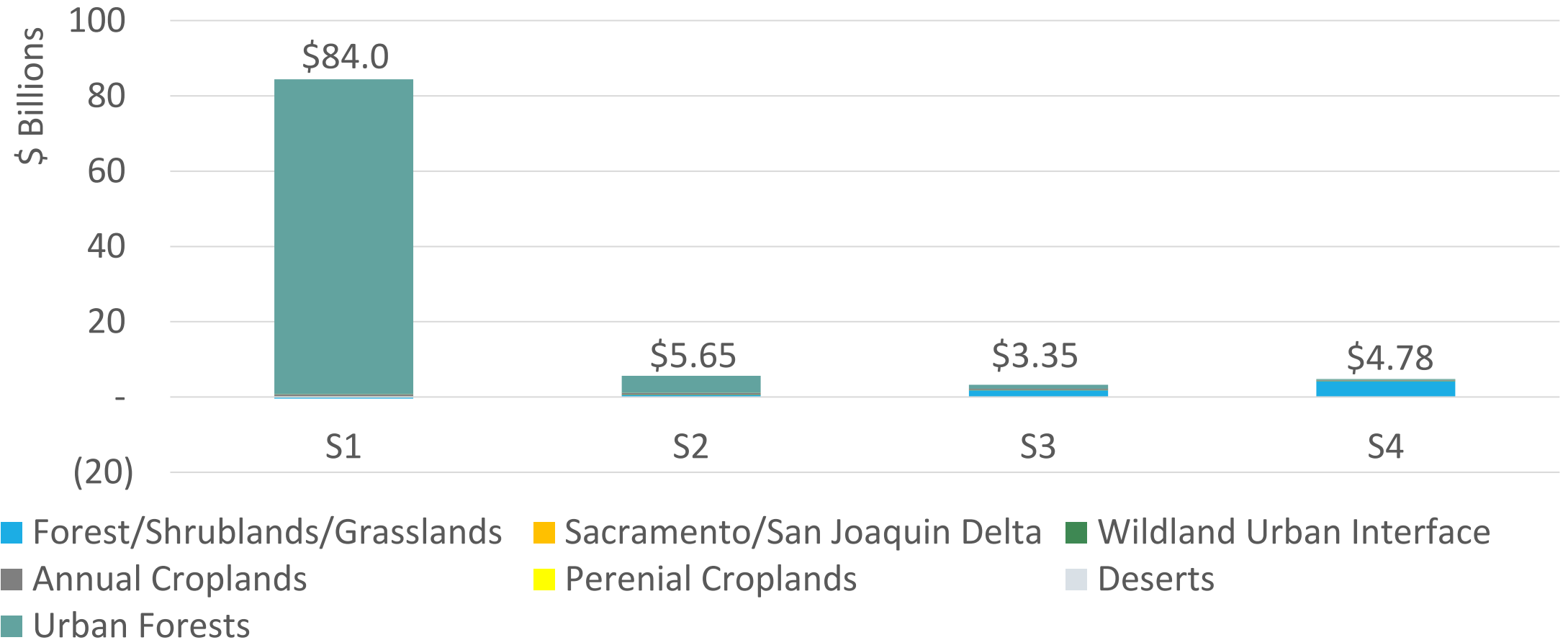
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- Direct costs of each action were estimated on a per acre basis
- Costs were estimated using a combination of survey data, academic literature, and existing subsidy programs
- Estimates of Direct costs were used as inputs into a macro economic model (REMI PI+) to assess effects of each scenario on employment, income, and GSP in the state

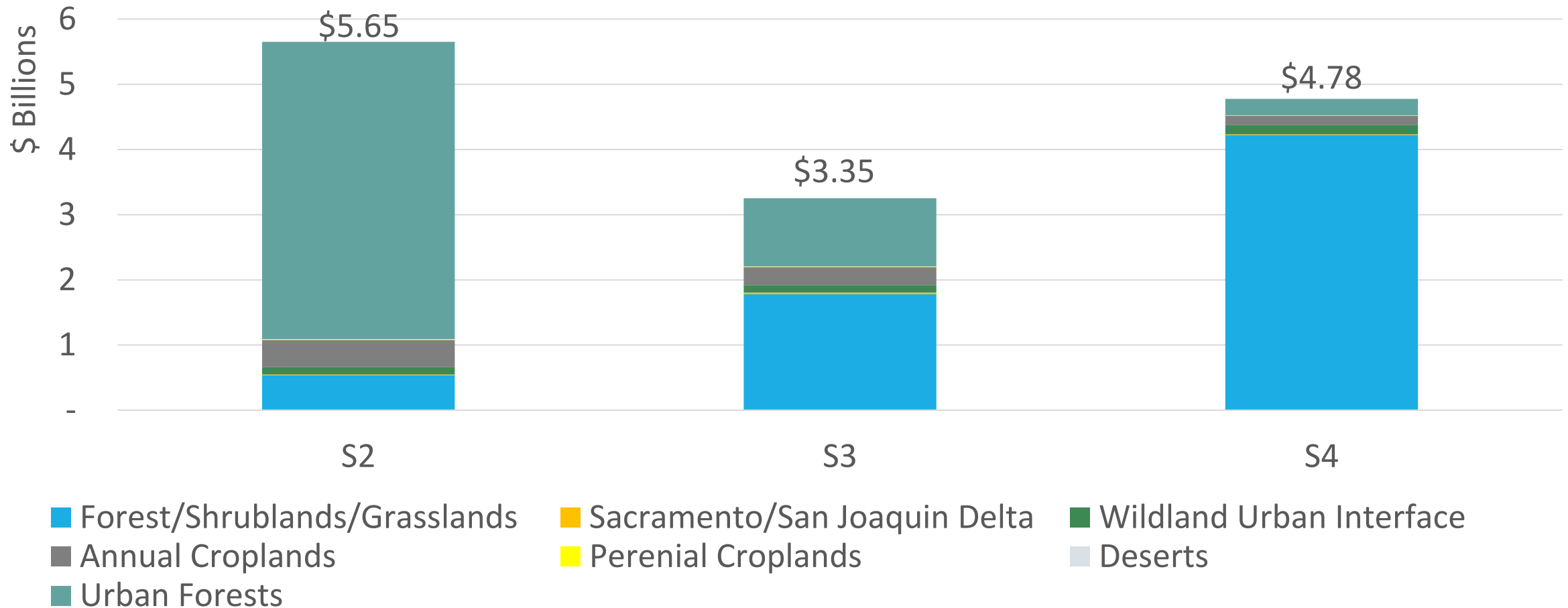


Photo courtesy of Adam Moreno

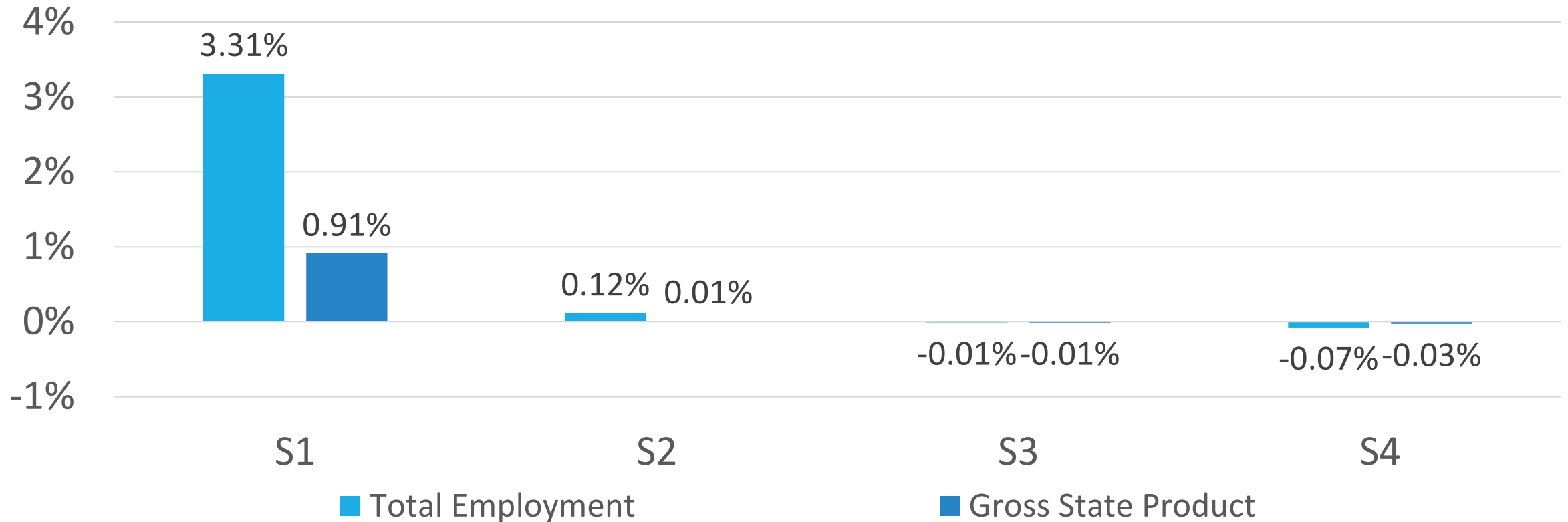
# Direct Annual Costs (All Scenarios)



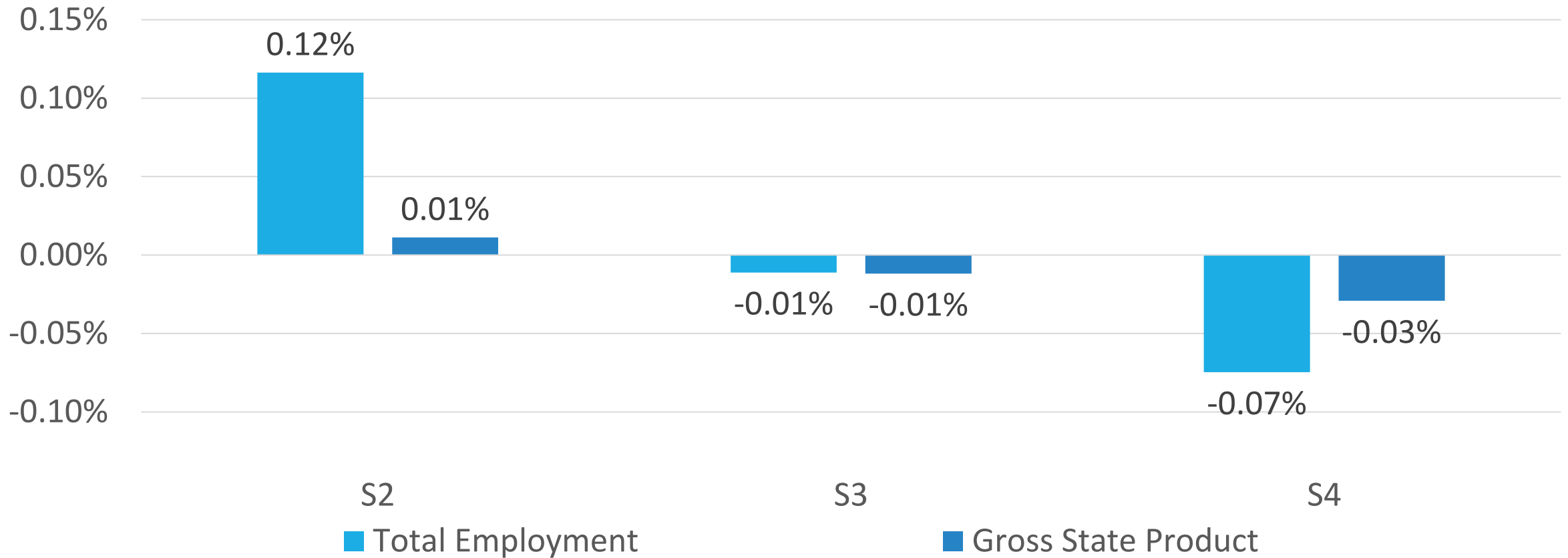
# Direct Annual Costs (Excl. Scenario 1)



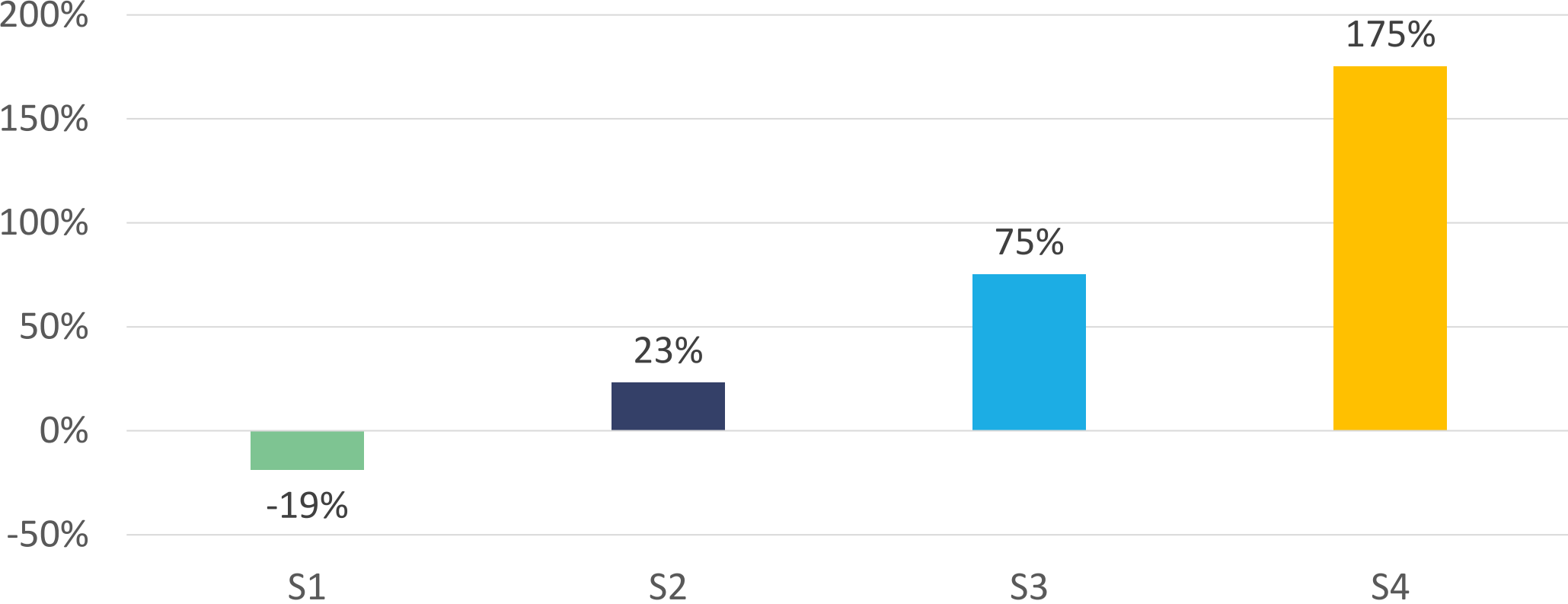
# GSP and Employment (2045, All Scenarios)



# GSP and Employment (2045, Excl. S1)



# Employment (Forestry Sector)



# Data Observations

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## ■ Costs

- Scenario 1 is an order of magnitude more expensive due to urban forestry; other scenarios range from \$3B to \$5.5B annually
- Forests and other natural land costs are the most expensive in scenarios 3 and 4

## ■ California Economy and Employment

- The California workforce is forecast to grow from today's levels through 2045 and the economy is forecasted to grow by 3.3% per year through 2045.
- All scenarios have a small impact on CA economy in 2045. For Scenarios 2, 3, and 4, the impact is less than a 0.03% change in GSP in 2045.
- Alternative 1 shows a positive impact in GSP and employment due to large reliance on urban forestry, which is labor intensive and also results in large declines in personal income.
- Scenario 3 has smallest total impact on direct costs, jobs, and GSP.
- To accomplish 1-5M acres annually in Scenarios 2, 3, and 4, the forestry sector employment needs to increase substantially

# Summary of NWL Scenarios

Scenario	Avg. Annual Wildfire Emissions	Annual Wildfire Emissions Health Cost/Benefits (2021\$)	Annual Cost (2021\$)	Employment Relative to BAU in 2045	Description
1: Maximizing short term carbon stock at 2045	53 MMTCO <sub>2</sub> e	~ -500 million (cost)	83 billion	+3%	Highest wildfire emissions Most health impacts Highest implementation cost Labor-intensive job increases
2: Balanced mix of strategies from current plans	51 MMTCO <sub>2</sub> e	~800 million (benefit)	5.6 billion	+0.1%	Second highest implementation cost Modest health benefits
3: Prioritize restoration and climate resilience	48 MMTCO <sub>2</sub> e	~ 3.1 billion (benefit)	3.2 billion	-.01%	Lowest implementation cost Second highest health benefits Moderate shift in jobs
4: Prioritize forest wildfire and other fuel reduction efforts	43 MMTCO <sub>2</sub> e	~6.9 billion (benefit)	4.7 billion	-0.1%	Lowest wildfire emissions Most health benefits Significant shift in jobs to meet forestry needs