
Tackling Climate Change through
Nature-Based Solutions

Who We Are


Cayla


Mira

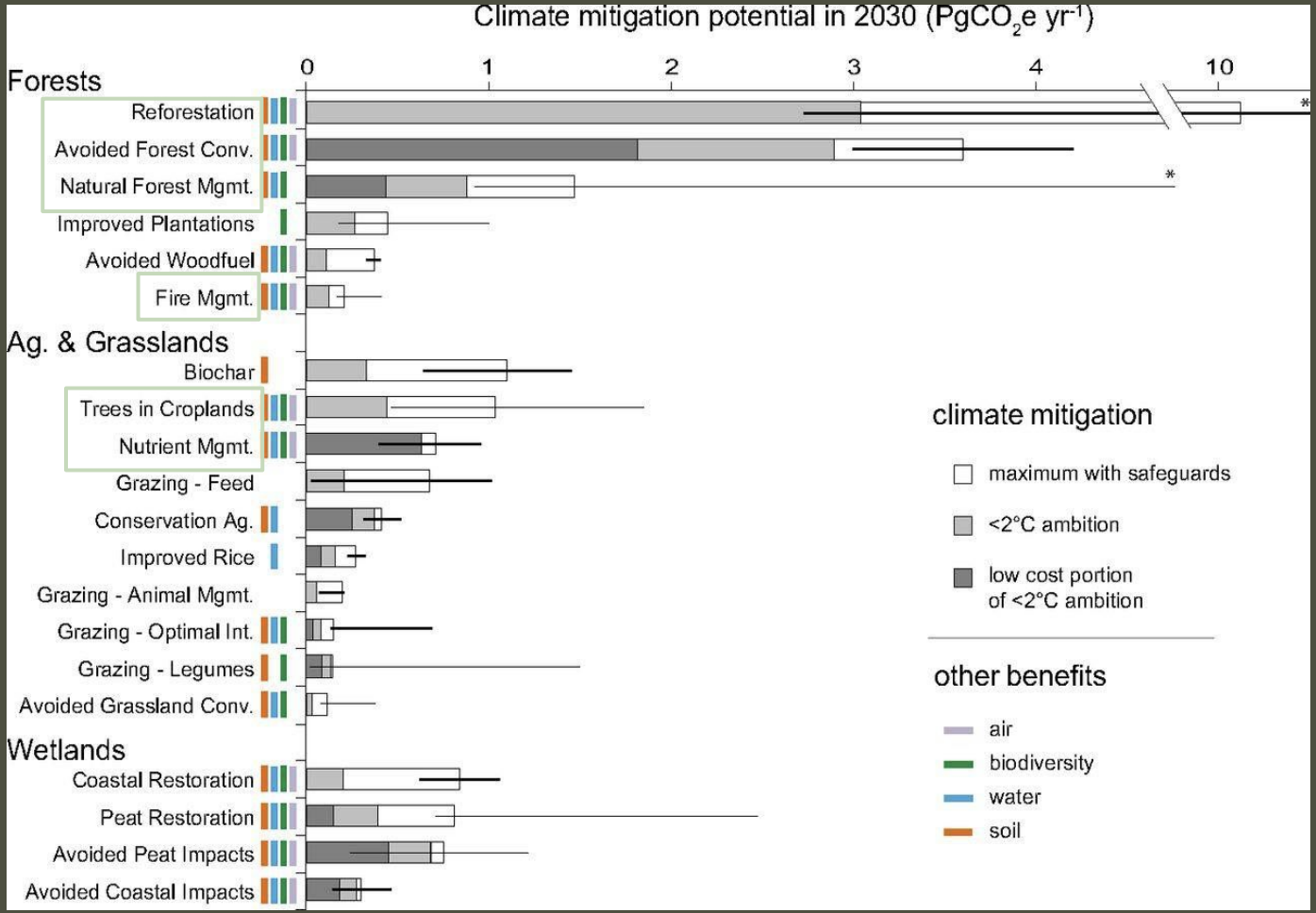

Jean

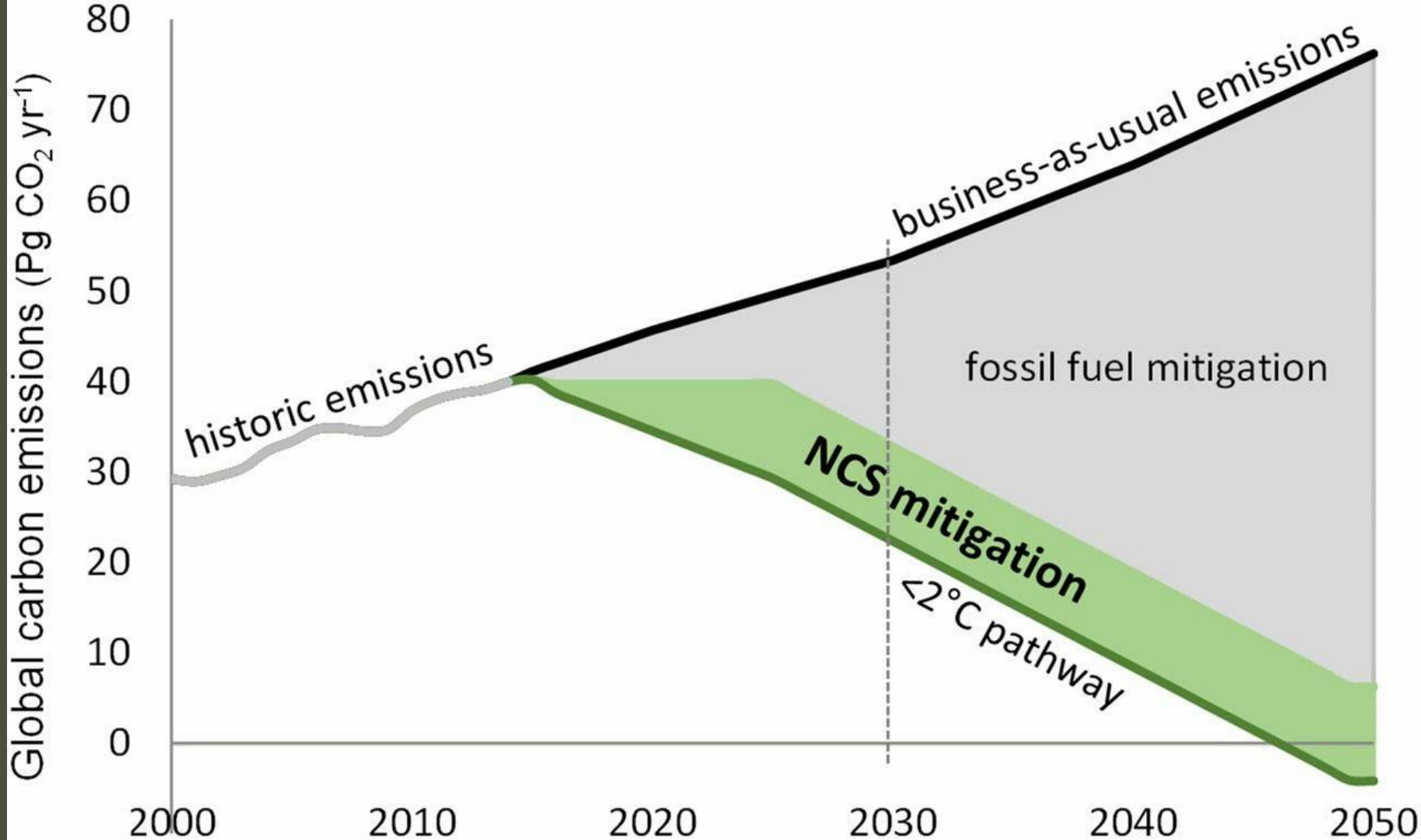

Davis


Angadpreet


"The climate crisis has already been solved. We already have the facts and solutions. All we have to do is to wake up and change."
-Greta Thunberg

What Are Nature-Based Solutions?




Global carbon emissions (Pg CO_2 yr^{-1})
80
70
60
50
40
30
20
10
0
2000
2010
2020
2030
2040
2050
historic emissions
business-as-usual emissions
fossil fuel mitigation
NCS mitigation
<2°C pathway

Our Mission Statement

To leverage nature-based strategies to decrease atmospheric greenhouse gas concentrations.

To utilize and enhance ecological systems that will assist in reversing climate change.

To develop these solutions with the aid of data analysis and visualization tools.

AGENDA

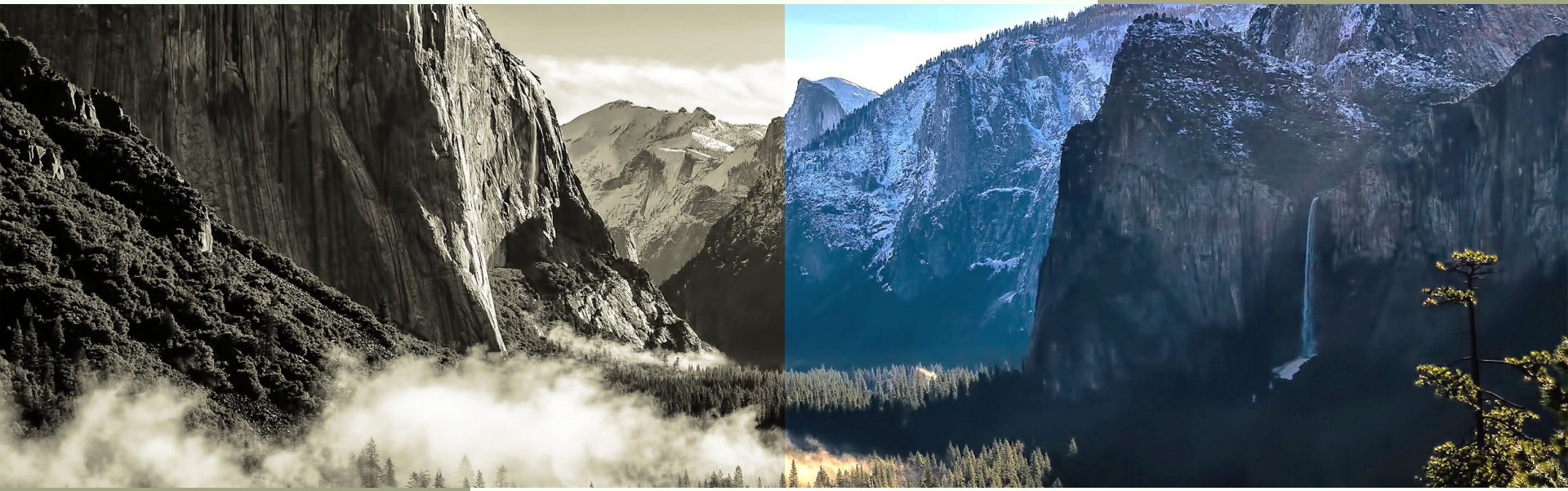
01 Present State

02 Preferred State

03 Strategies

04 California

Where We Are Now



and Where We Want To Be

Present State

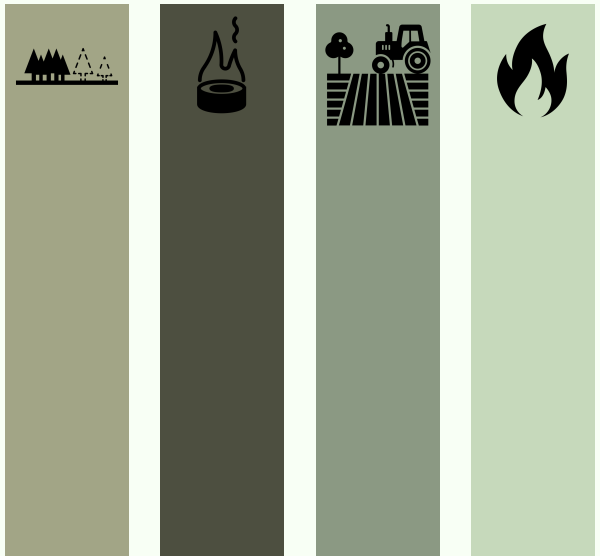
AGRICULTURAL EMISSIONS

13% Global GHG

N2O 300x more potent than CO2

DEFORESTATION

Tree cover loss now causing more emissions every year than 85 million cars would in their lifetime



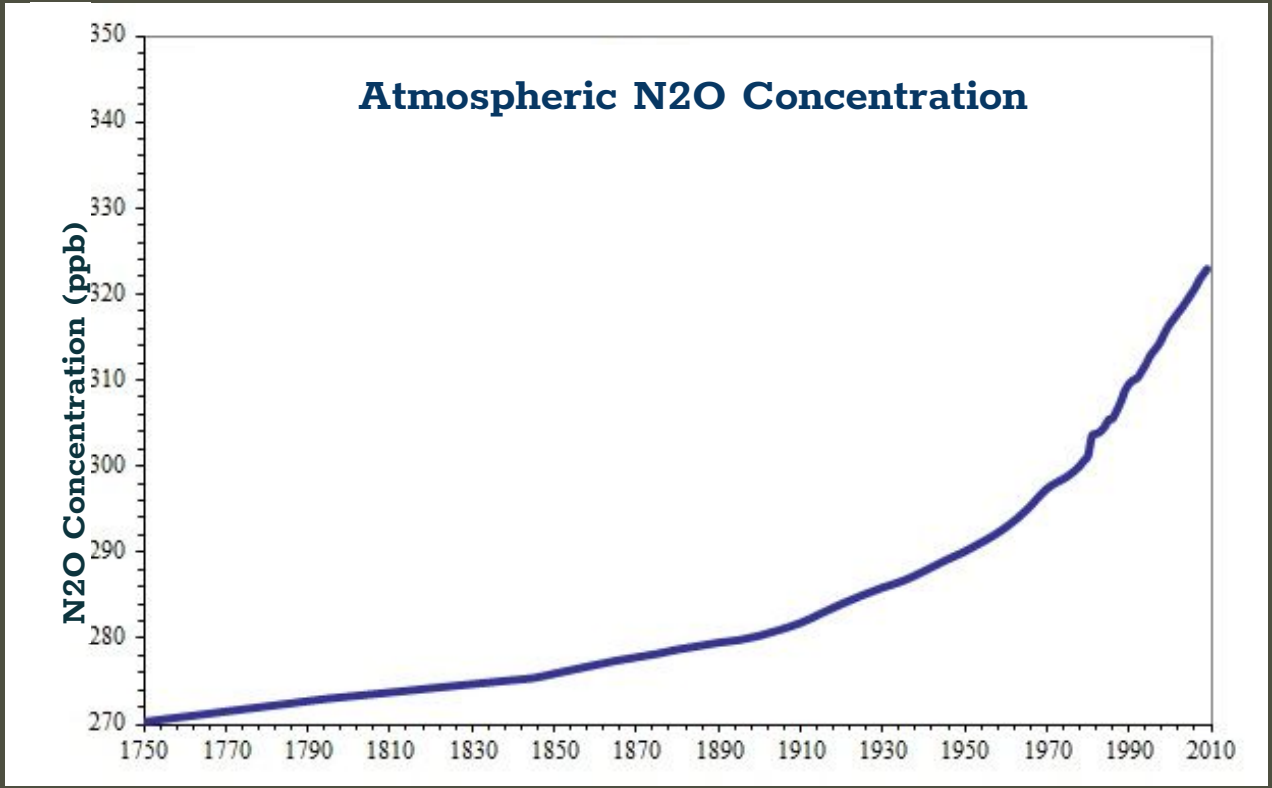
WOOD FUEL HARVEST

3 billion people

2% annual global CO2 emissions

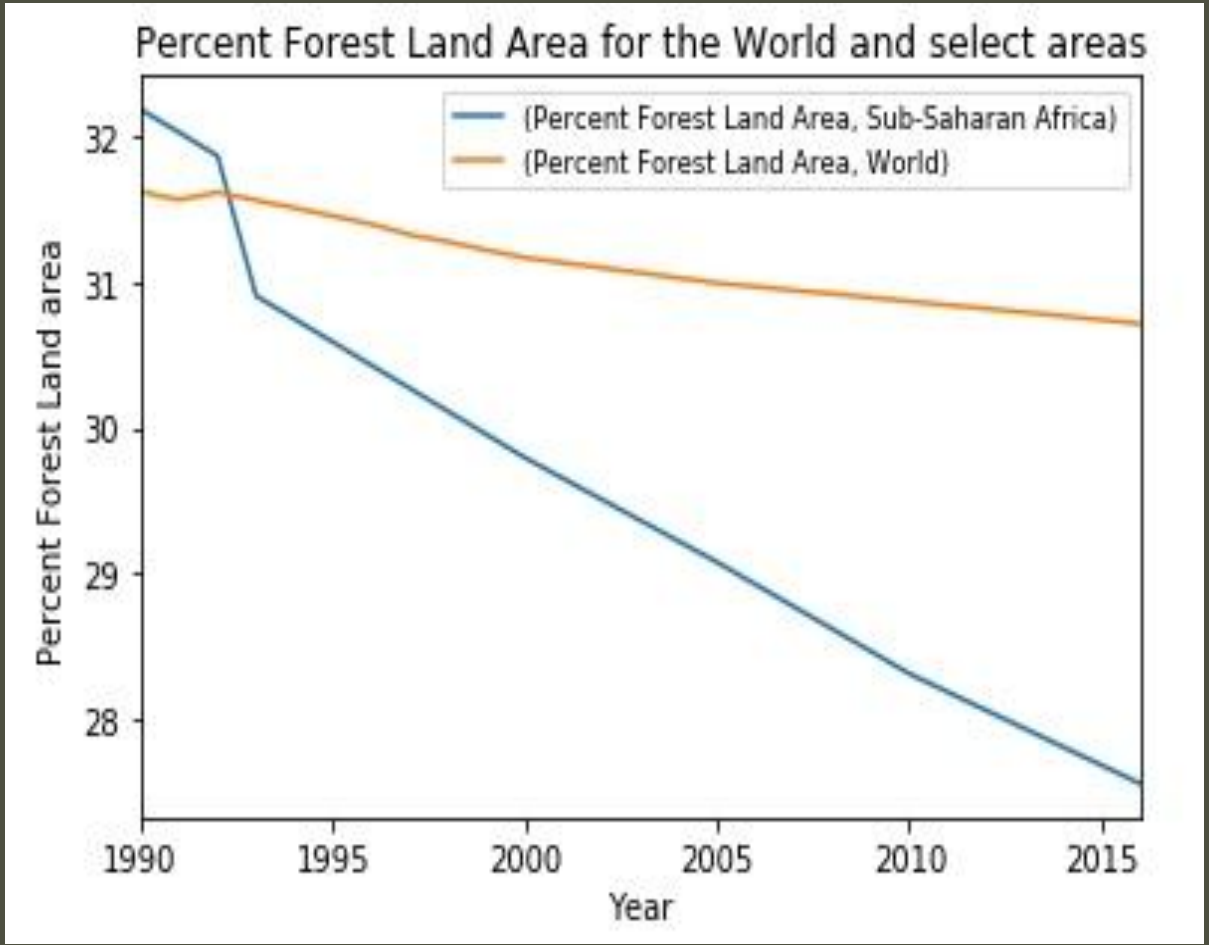
WILDFIRES

5-10% Global CO2 Emissions



Atmospheric Nitrous Oxide Concentrations have **increased** from **270 ppm** in 1750 to **325 ppm** in 2010

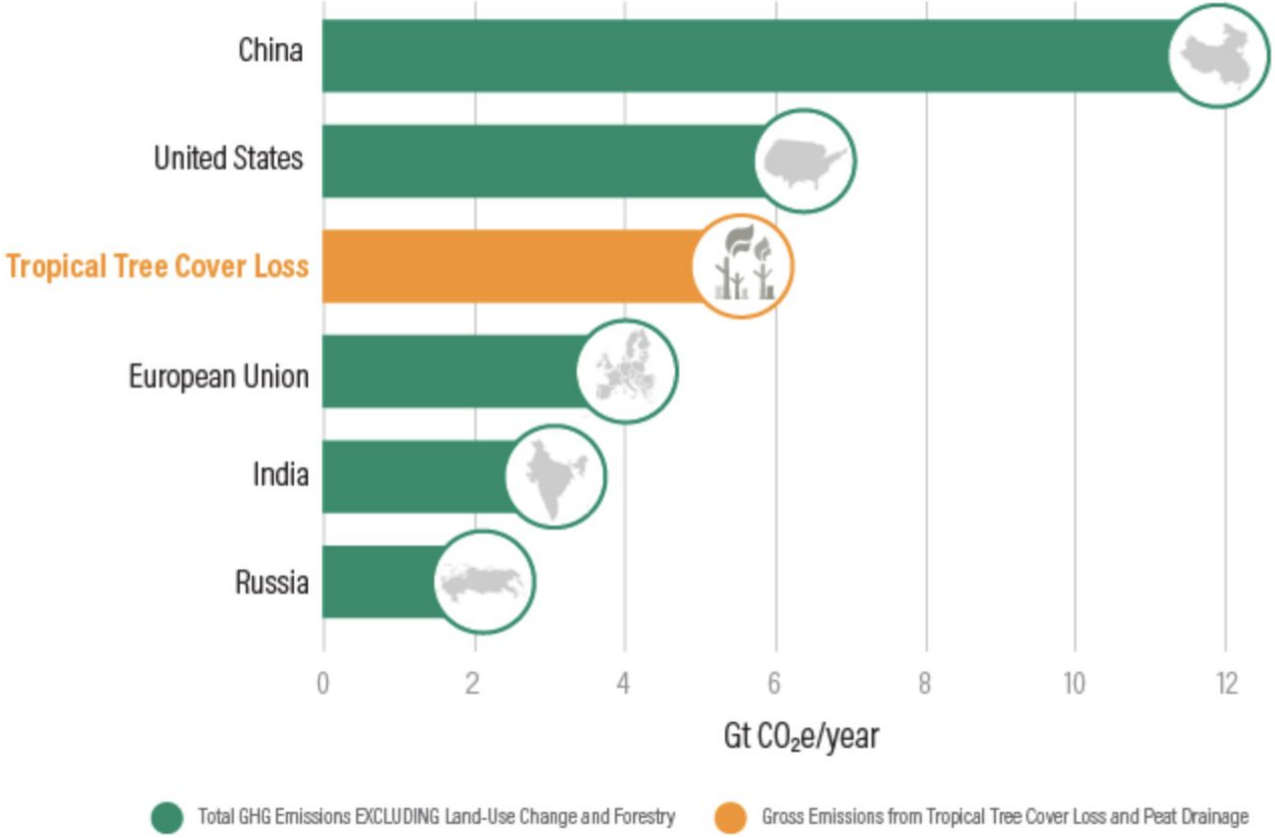
(Source: World Meteorological Organization)



The **percent of forested land** in Sub-Saharan Africa has **decreased** from 32% in 1990 to 28% in 2015.

(Source: World Bank)

If Tropical Deforestation were a Country, it Would Rank Third in CO_2e Emissions

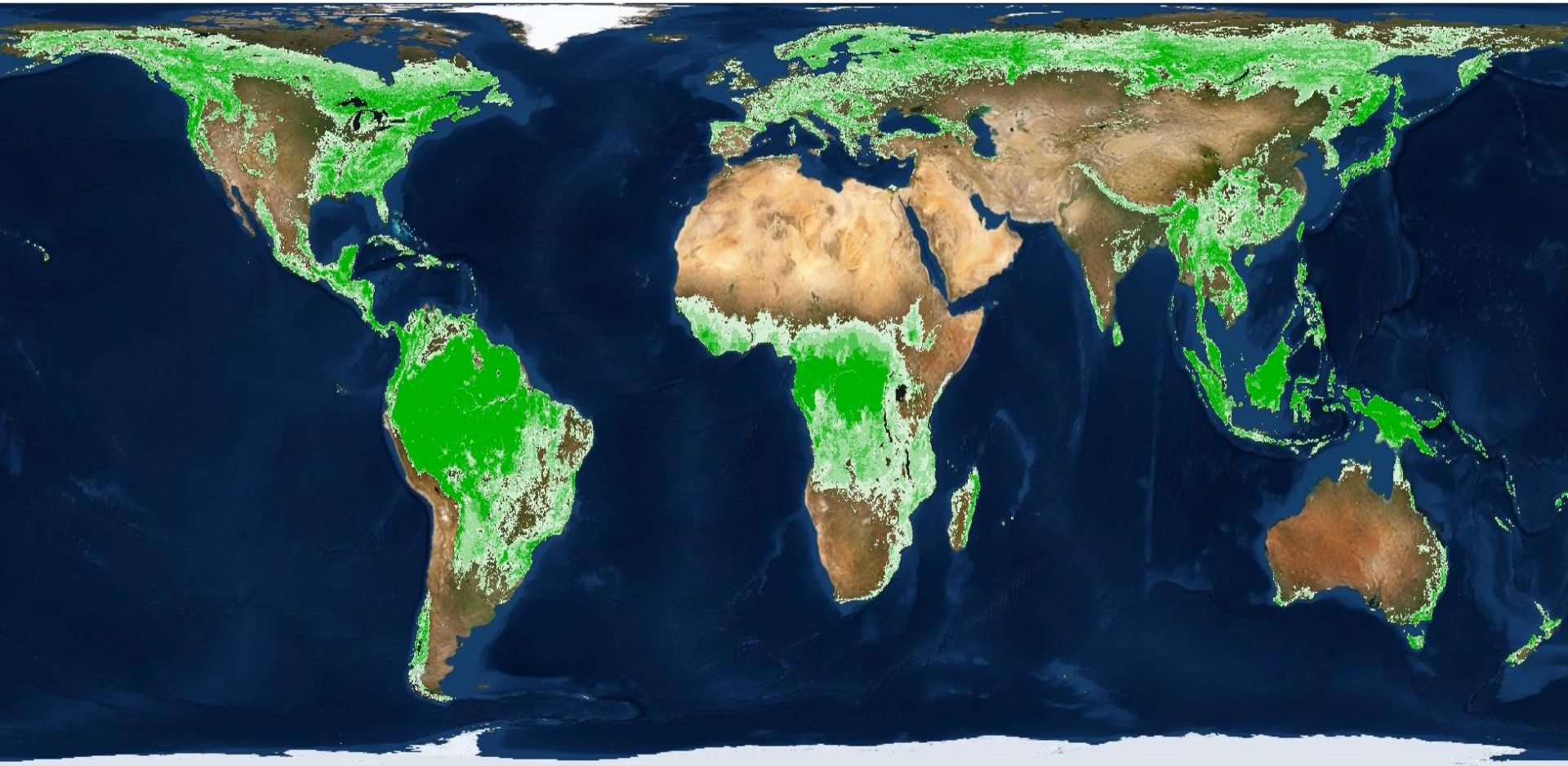


Source: Seymour & Busch, 2016.

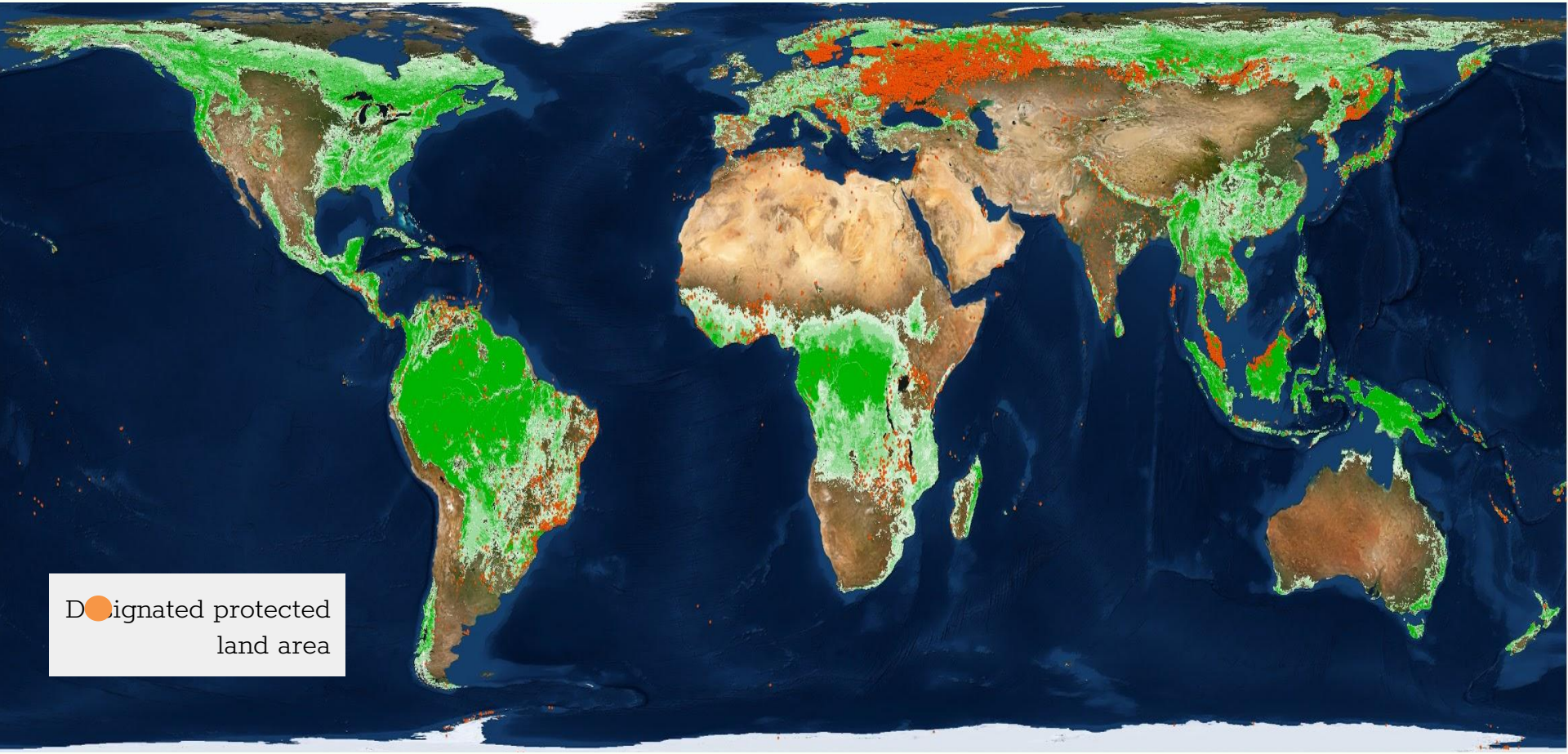
GLOBAL FOREST WATCH

WORLD RESOURCES INSTITUTE

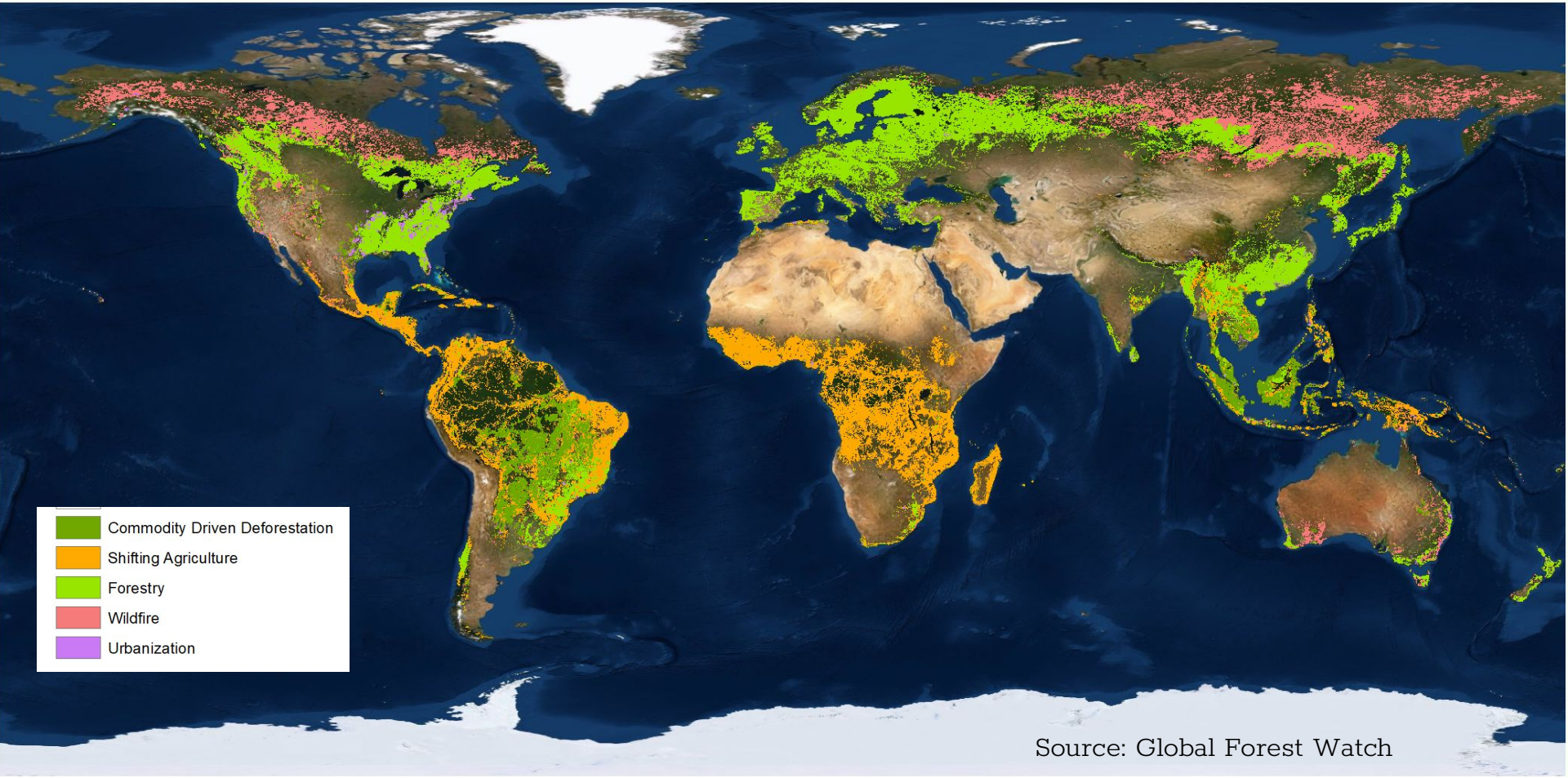
Current Forest Cover



Current Forest Cover and protected lands



Primary Drivers of Forest Cover Loss



Source: Global Forest Watch

Preferred State

SUSTAINABLE AGRICULTURE

Fertilizer emissions decrease 50%

AGROFORESTRY

Dominant global agricultural practice

REFORESTATION

Forests cover 40% of World land area

WILDFIRES

Decrease 80% → emissions decrease by 8.8Gt CO_{2eq}

How Do We Get There?

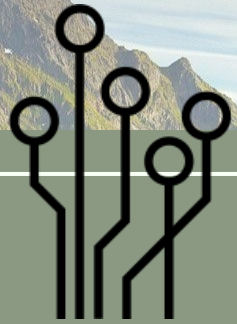
EVALUATION CRITERIA

Cost to Implement

#1

Equity

#2



Technological Feasibility

#3

Ease of Implementation

#4

CO_{2eq} Sequestration Potential

#5

GLOBAL IMPLEMENTATION STRATEGY

PHASE 1

2020-2022

Getting Started

PHASE 2

2023-2027

Implementing Solutions

PHASE 3

2028-2030 & Onward

Maintenance & Adaptation

TIMELINE TO PREFERRED STATE: MAIN POINTS

2021
1 trillion tree 2030 goal

2023
Nitrogen Fertilizer Cap and Trade System implemented

2024
Agroforestry enforced in large agricultural estates, Tillage of land prohibited

2025
Wood fuel regulations in place

2026
Removal of crop residue banned

2027
In most nations, microdosing (targeted application of fertilizers, water etc.) enforced by law

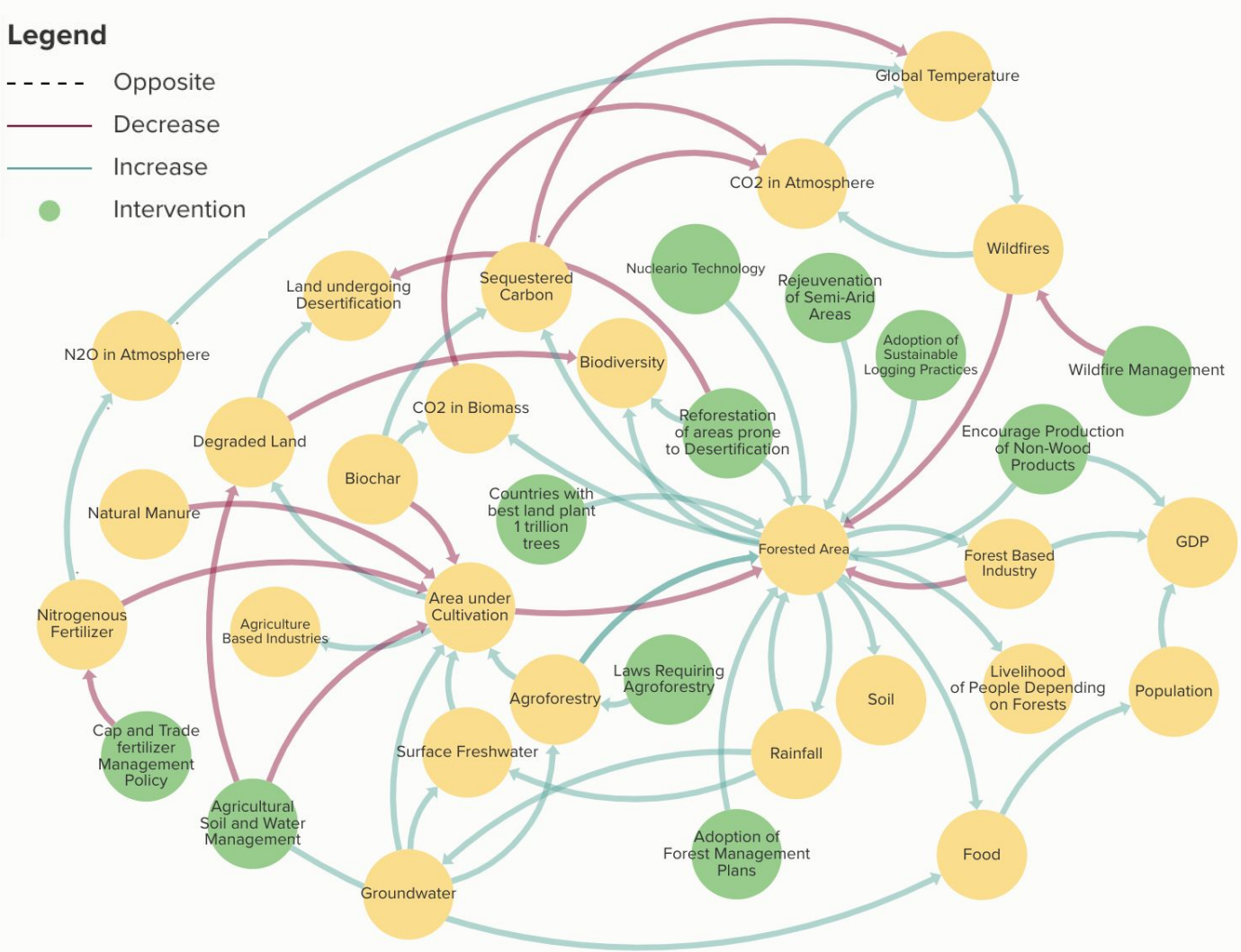
2028
Wildfires reduced 80%

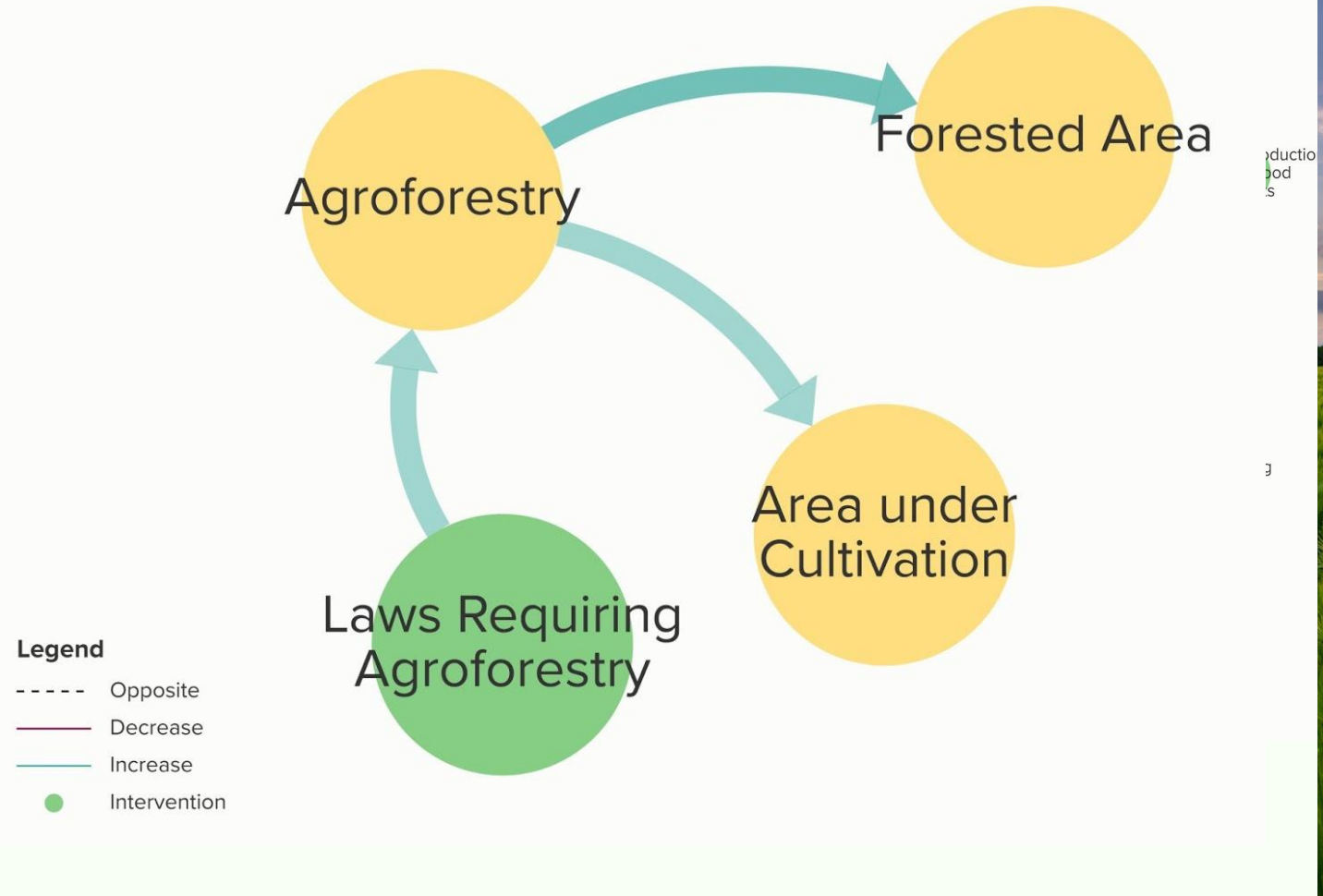
2029
Timber & paper based logging reduced by over 60%

2030
Fertilizer emissions decrease 50%, Forest cover is now 40% of world area.

Phase 1	Phase 2	Phase 3

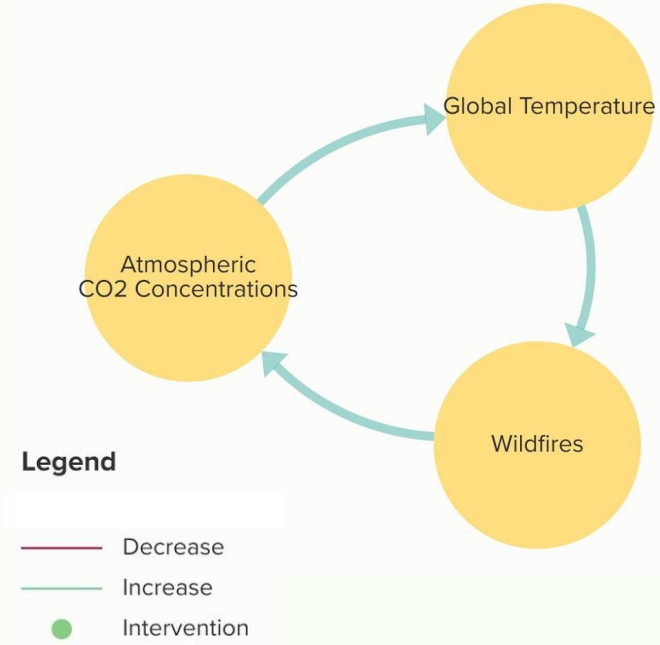
Preferred System Map

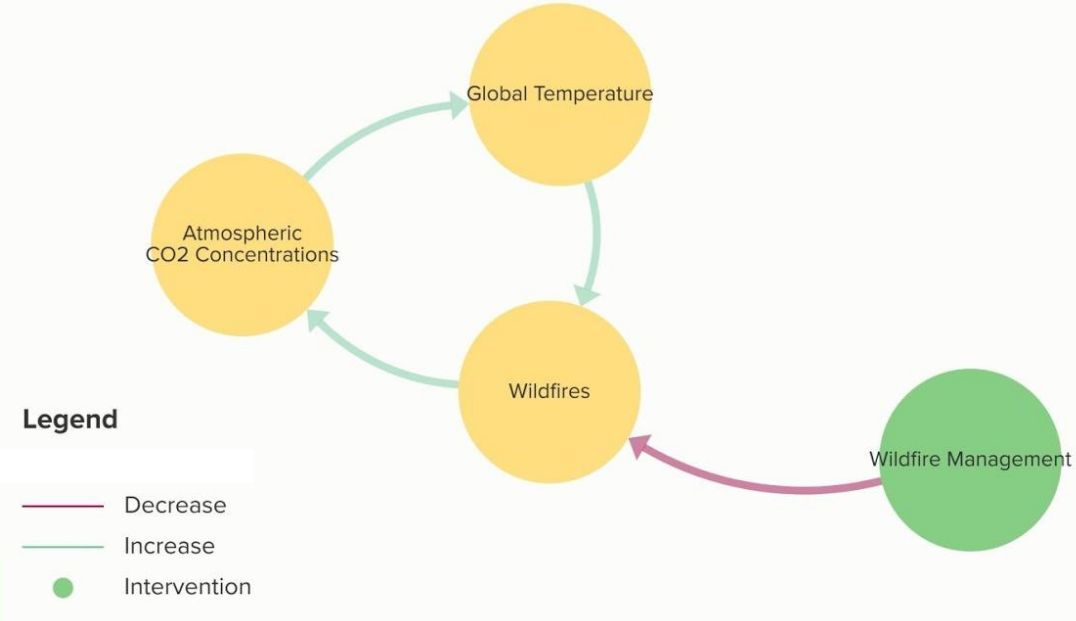



Agroforestry
Forested Area
Area under Cultivation
Laws Requiring Agroforestry
Legend
Opposite
Decrease
Increase
Intervention


Targeted Interventions

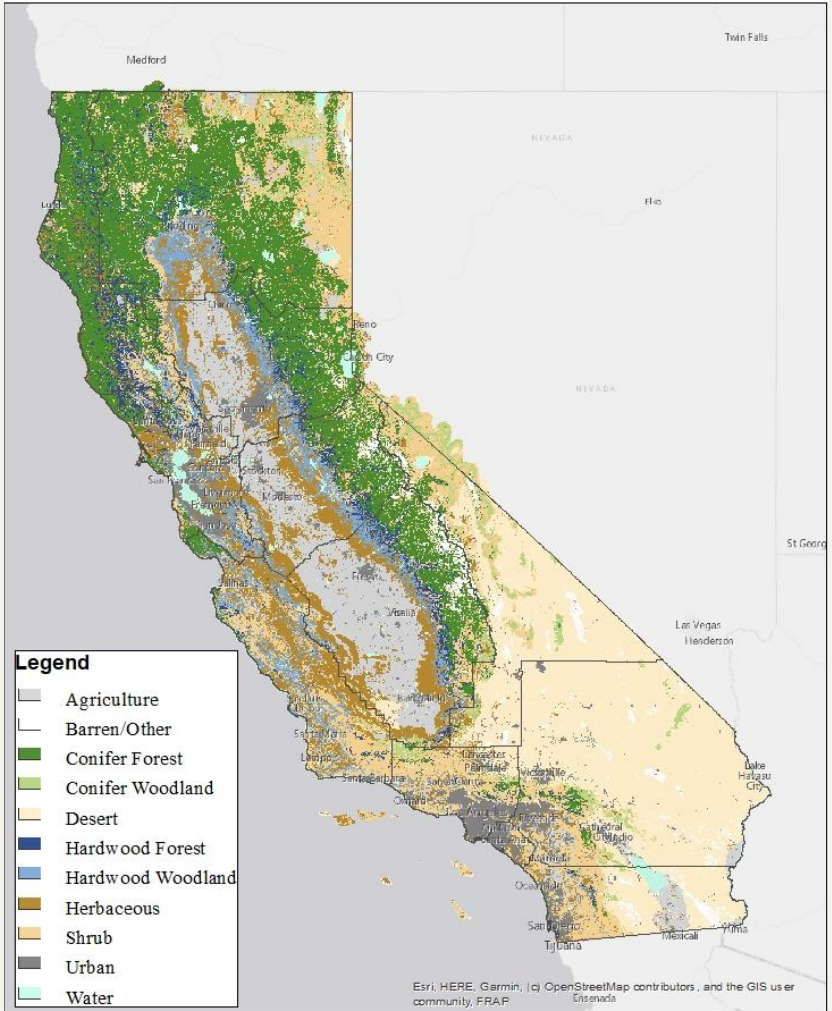
Intervening in a Dangerous Feedback Loop

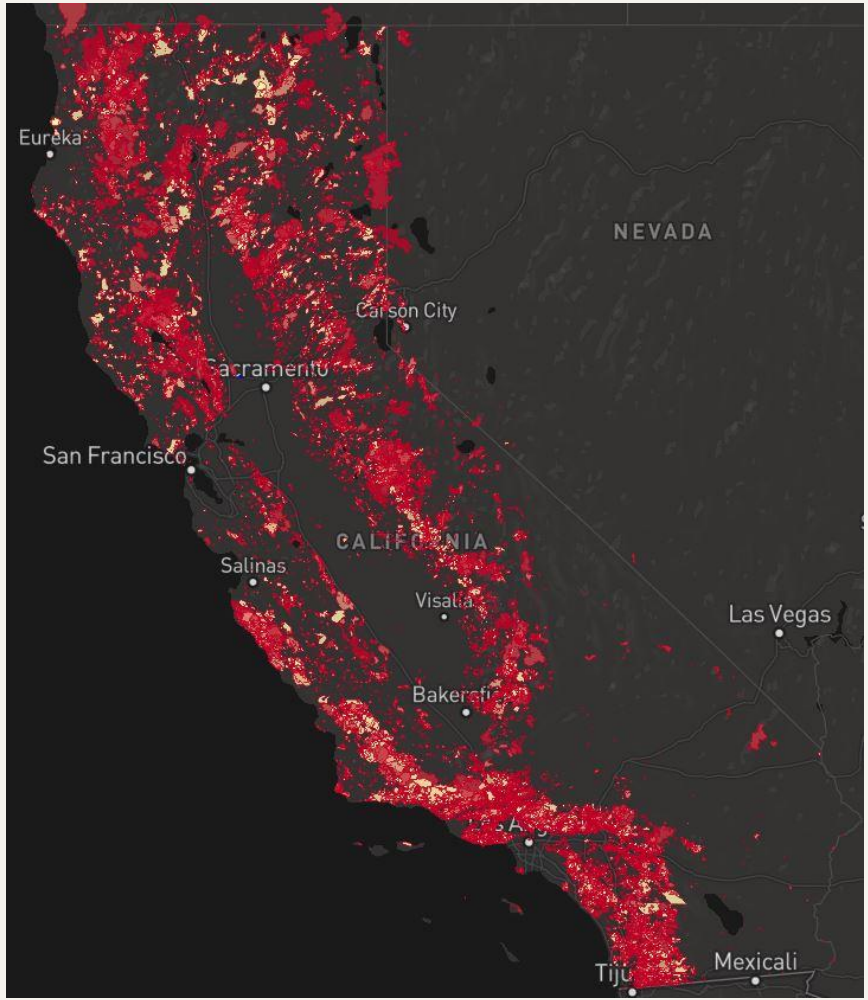




Implementation Example: California

Distribution of California Vegetation





California Wildfires - Last 50 years

CALIFORNIA IMPLEMENTATION: PHASE 1

Getting Started

#1

Funding

#2

Research

#3

Cap & Trade

#4

Identification

#5

Regulation

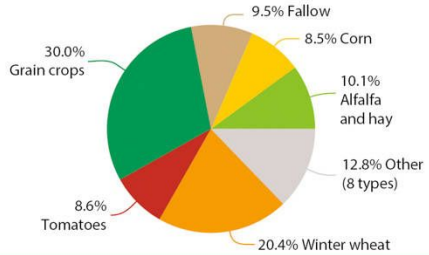
#6

Education

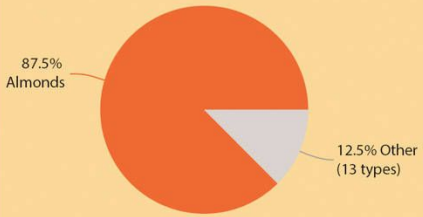
CALIFORNIA IMPLEMENTATION: PHASE 2

Transition and Execution - Agriculture

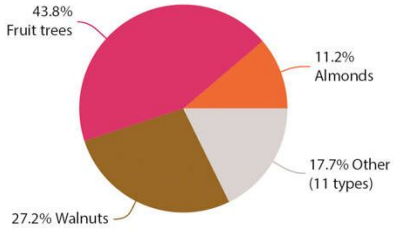
#2
12,018 (17.5%) properties
2,031,278 acres (24.5%) of total cropland acres



#5
7,272 (10.6%) properties
625,184 acres (7.5%) of total cropland acres



#3
11,882 (17.3%) properties
900,496 acres (10.9%) of total cropland acres

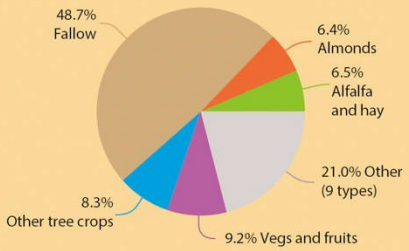


Agroforestry Potential

42.9%

24.9%

#4
17,107 (24.9%) properties
2,430,631 acres (29.3%) of total cropland acres



CALIFORNIA IMPLEMENTATION: PHASE 2

Transition and Execution - Forest Management

CAL FIRE

Strategically placed landscape fuel treatments decrease fire severity and promote recovery in the northern Sierra Nevada

Carmen L. Tubbesing [a], Danny L. Fry [a], Gary B. Roller [b], Brandon M. Collins [c], Varvara A. Fedorova [a], Scott L. Stephens [a], John J. Battles [a]

SFI chain-of-custody tracks fiber content from certified forest content, certified sourcing, and post consumer recycled content.

CALIFORNIA IMPLEMENTATION: PHASE 3

Maintenance and Adaptation

Agroforestry

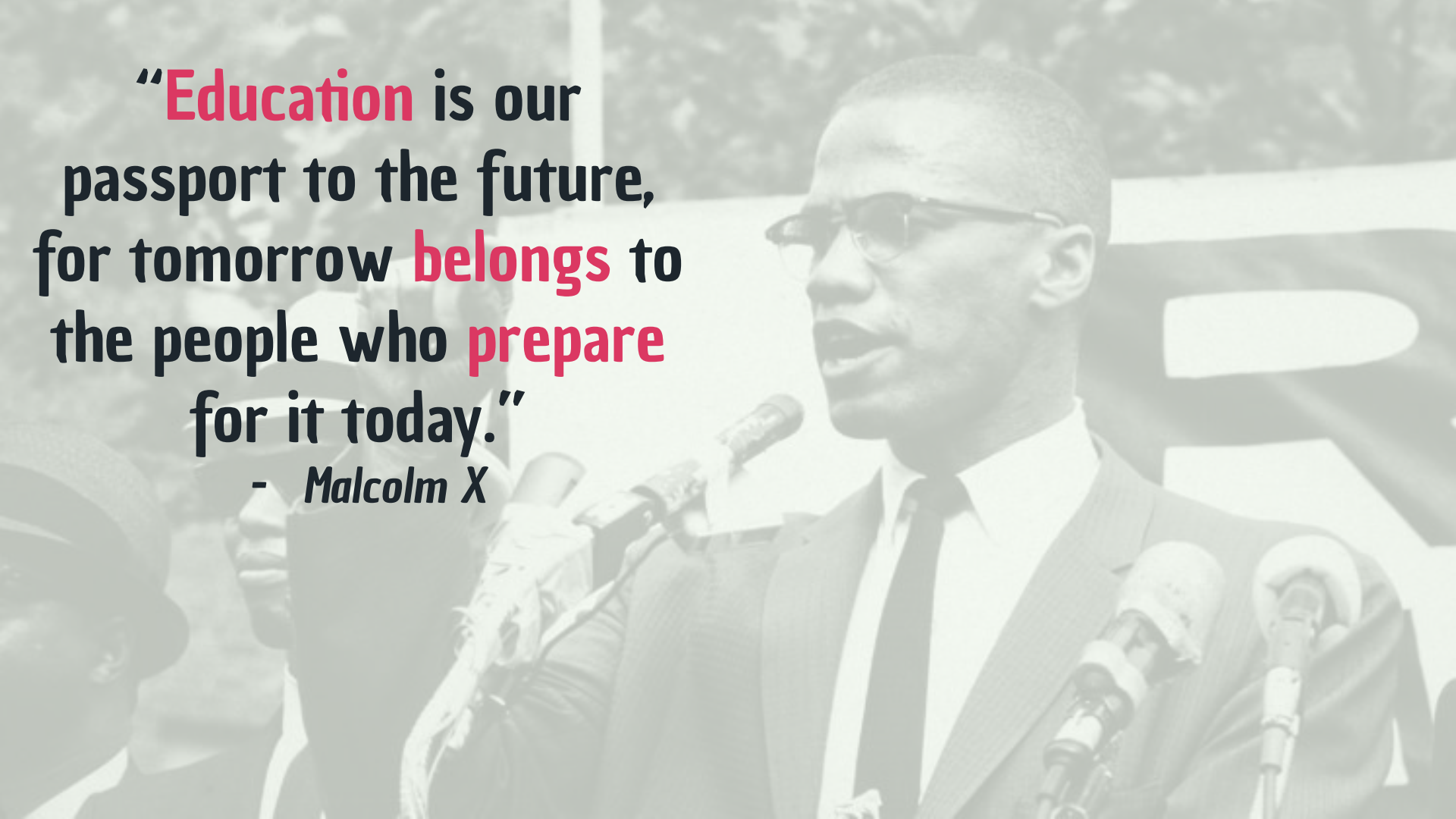
Farms see **improvement** in soil and water quality

Fertilizer Management

Fertilizer emissions **decrease 50%** from 2020 levels due to **cap and trade**

Forest Management

California forest maps continue to be **updated** and **inform** management and fire decisions


"Education is our passport to the future, for tomorrow belongs to the people who prepare for it today."
- Malcolm X

Thank you

Questions?