

Healthy Lands to Secure our Future



Point Blue
Conservation
Science

Ellie Cohen and Point Blue Staff
California and Climate Policy Panel
November 9, 2017' US Climate Action Center, COP 23
#wearestillin #UNFCCC

R. DiGaudio

Point Blue Conservation Science

Leaders in assessing changes in climate, land-use and the ocean, and in developing collaborative, nature-based solutions for wildlife and people

- 170 scientists & 20 grad students
- Manage >1 billion ecological observations across the Americas
- 2017 budget: \$14 million
- Founded in 1965 as Point Reyes Bird Observatory



Stay below 2°C limit?

Fire photo by peasap; Earth photo by NASA; composite by Phil Plait



We must remove
18% of CO₂
currently in the
atmosphere to get
back to a
safe climate
by 2100

(~550.5 Gt (billion metric tons) CO₂e or 150 Pg C)

With emissions staying at current levels & major reductions at 6% per year beginning by 2021

Improved Land-Use At Scale Required For carbon sequestration...& resilience, water, biodiversity, food security, health, other benefits



<http://eu.earthwatch.org/>

Natural Climate Solutions

can make up
~37% of emissions
reductions needed
to stay below 2C
by 2030



- Reforestation
- Avoided forest conversion
- Natural forest management
- Improved plantations
- Avoided woodfuel
- Fire management
- Biochar
- Trees in cropland
- Cropland nutrient management
- Grazing - improved feed
- Conservation agriculture
- Improved rice cultivation
- Grazing - animal management
- Grazing - optimal intensity
- Grazing - legumes
- Avoided grassland conversion
- Coastal restoration
- Peatland restoration
- Avoided peatland impacts
- Avoided coastal impacts

California Prioritizing Nature-based Solutions for Mitigation, Adaptation and Other Benefits

- **Governor Brown's Executive Order (B-30-15) April 29, 2015**
- **CA--SB 379 (Jackson) General Plan- Safety**
- **CA--AB 1482 (Gordon) Climate Resilience**
- **CA- SB 246 (Wieckowski) Adaptation**

CA Climate Law Extended

SB32 (Pavley; 2016)– 40% reduction in GHG emissions below 1990 levels by 2030

- Now at
~440 MMT/yr CO₂e
- With current policies
~310 MMT/yr CO₂e
- By 2030
260 MMT/yr CO₂e

**How reduce by at least another 50 MMT CO₂e per year?
Or cumulative gap of 221 MMT CO₂e?**



CA Climate-Smart Agriculture

Competitive Grants Programs:

>\$500 million since 2014



- Dairy Methane Reduction

(Anaerobic digesters and alternative manure management practices)

- Land conservation & avoided conversion

(Sustainable Ag Lands Conservation Program- SALC)

- On-farm water conservation & GHG reduction

(State Water Efficiency & Enhancement Program- SWEEP)

- Healthy Soils Initiative

(Compost, mulch, cover crops, no-till, hedgerows, riparian planting, and more)

New CA GHG Reduction Fund focus on natural & working lands to increase sequestration and avoid emissions



Point Blue Photo

One potential Healthy Lands scenario by 2030:

To sequester **~147 MMT (67%) CO₂e** of CA's 221 MMT gap



~ 70 MMT CO₂e
Prescribed Grazing- 10m acres



~42 MMT CO₂e
Compost Amendment- 1m acres



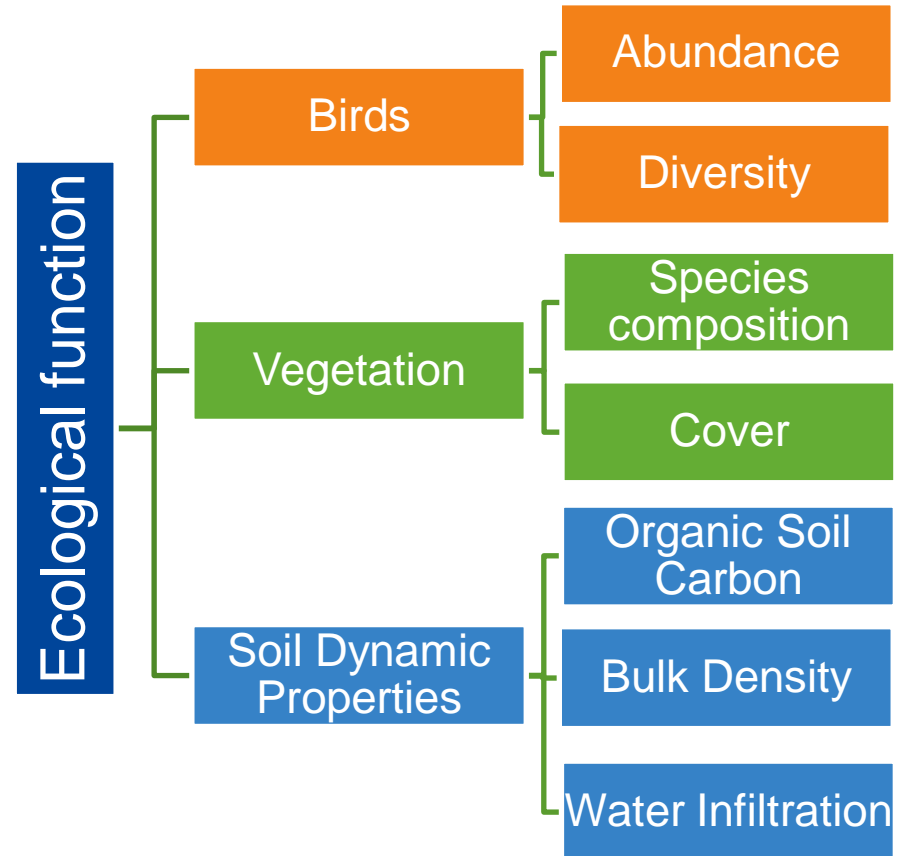
~35 MMT CO₂e
Riparian Restoration - .5m acres

ASSUMPTIONS:

- ramping up by 2023; then 7 years implemented at this scale
- Prescribed grazing: increase CO₂e -1 MT CO₂e /acre (NRCS)
- Compost amendment: ~.5 MT /acre or 18 MT /acre over 30 yrs (CCI)
- Riparian restoration- 40 MT/acre once forests mature (Point Blue)

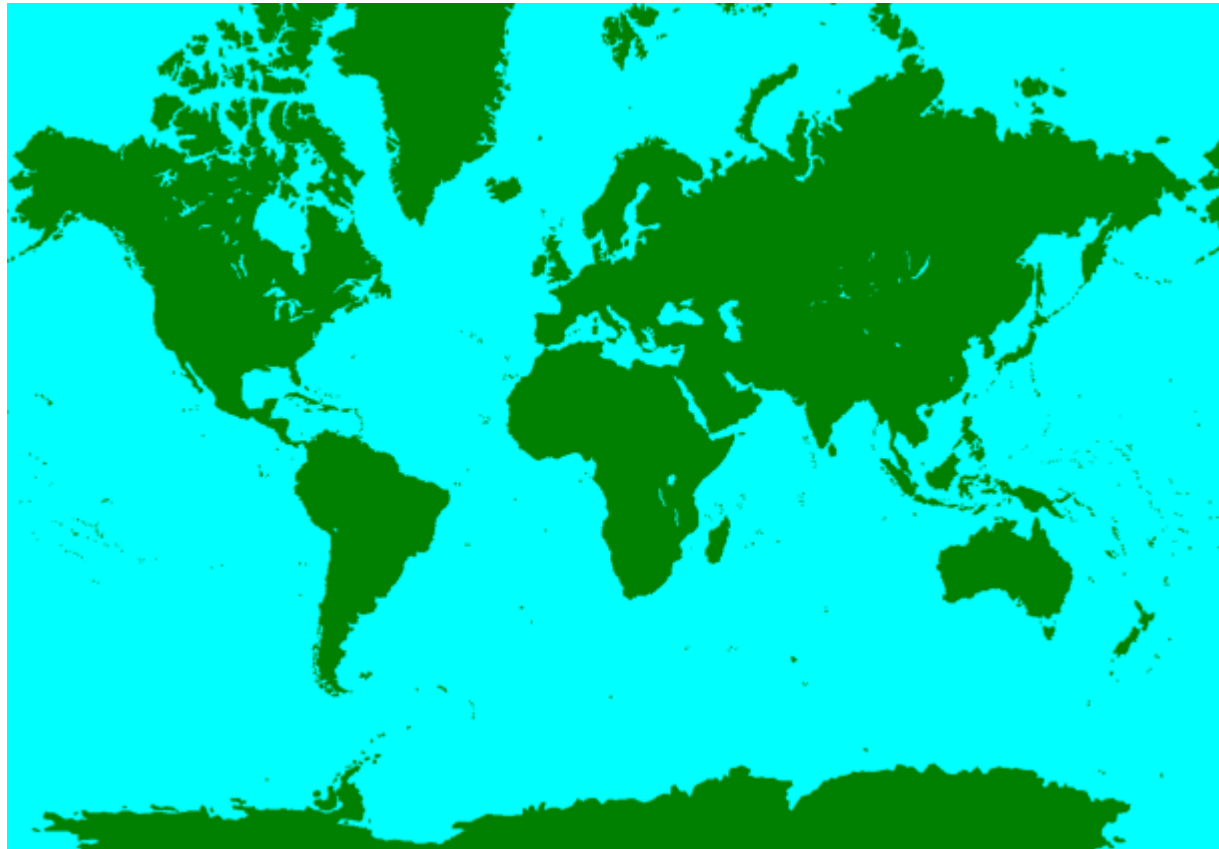
METRICS ARE KEY

Developing standardized metrics to assess, document, improve, replicate successes at scale



Global Healthy Lands Network Vision:

Scale up with standardized data & verification, open source, trainings, new communities of practice



The New York Times

Northern California: Coastal low clouds to start. San Jose afternoon. High in the mid-60s on the coast to the middle 50s in Central Valley. Weather map appears on Page 24.

Printed in California \$6.00

November 9, 2007

New Global Climate Union Report: On track for 350 PPM, <1C

HANGZHOU, China — President Obama and President Xi Jinping of China formally committed the world's two largest economies to the Paris climate agreement here on Saturday, cementing their partnership on climate change and offering a rare display of harmony in a relationship that has become increasingly discordant.

On multiple fronts, like competing for backing and maritime security, ties between China and the United States have frayed during the seven-and-a-half years of Mr. Obama's presidency. The friction has worsened since the accession of Mr. Xi as a powerful nationalist leader in 2013.

Yet the fact that he and Mr. Obama could not only agree to work together yet again on a joint plan to reduce greenhouse gases stands to the pragmatic personal rapport they have built, as well as to the complexity of the broader United States.

Though widely expected as the next step in the legal process, the deal could provide a boost in momentum for further climate talks by bringing the December accord into effect as soon as possible.

Countries accounting for 85 percent of the world's emissions must present formal ratification documents for that to happen, and together, China and the United States generate nearly 60 percent of the world's emissions.

"Despite our differences on other issues, we hope our willingness to work together on this issue will inspire further ambition and further action around the world," Mr. Obama declared.

Mr. Xi praised the Paris agreement as a milestone, adding, "I was told Chinese leadership had made such of this progress was made."

From the moment he stepped off Air Force One on his first visit to the United States, Mr. Obama



Climate Stabilizing, Health Benefits Up Thanks to Climate-Smart, Community-Based Land Management

By JUSTIN GILLES

NORFOLK, Va. — High vertical rulers are sprouting beside low spots in the streams here, so people can judge if the tidal floods that increasingly inundate their roads are too deep to drive through.

Five hundred miles down the Atlantic Coast, the only road to Tybee Island, Ga., is disappearing beneath the sea several times a year, cutting the town off from the mainland.

And another 300 miles on, in Fort Lauderdale, Fla., increased tidal flooding is forcing the city to spend millions fixing battered roads and drains — and on the way to sea level.

Now, those warnings are no longer theoretical. The inundation of the coast has begun. The sea has crept up to the point that a high tide and a brisk wind are all it takes to send water pouring into streets and homes.

Federal scientists have documented a sharp jump in the incidence of flooding — often called "sunny-day flooding" — along both the East Coast and the Gulf Coast in recent years. The sea is now so near the land in many places that they believe the problem is likely to worsen quickly. Still, in the Pacific Ocean mean that the 30

crises plaguing the country, like those that recently caused extensive flooding in Louisiana. Scientists say these rains are also a consequence of human greenhouse emissions.

"Once impacts become noticeable, they're going to be upon you quickly," said William V. Sweet, a scientist with the National Oceanic and Atmospheric Administration in Silver Spring, Md., who is among the leaders in research on coastal inundation. "It's not a hard-to-see





Thank you!

ecohen@pointblue.org



Point Blue

Conservation science
for a healthy planet.

ADDENDUM – References and other information

Some Considerations

- Current understanding- soil C accrual rates level off after ~20- 40 years (Paustian et al. 2016, TIMM Report, Sanderman et al 2017).
- Acting now on soils provides a bridge to a lower carbon future.
- Methane from cattle, rice and other sources not included in most (all?) of these scenarios.
- Regenerative ag lacks a common definition. (e.g., grazing mgmt., conservation ag (crops), habitat restoration).
- Scaling up implementation globally will require a massive “Marshall Plan” type investment.

6 Studies -- 6 Answers!

- 20% of annual emissions (Paustian et al 2016)
- >100% of annual emissions (Rodale- est from Paustian)
- 37% of emissions reduction needed for 2030 Paris goals (TNC; Bronson W. Griscom et al. 2017)
- up to 19% CO₂ in atmosphere sequestered (Sanderman PNAS 2017)
- 18% of CO₂ in atmosphere sequestered by 2050 (Drawdown 2017)
- 40% of CO₂ in atmosphere sequestered by 2100 (Positive Disruption, Rocky Mountain Institute 2017)

Regenerative agriculture could potentially sequester ~18-40%+ of CO₂ required to return to 350 PPM by 2100

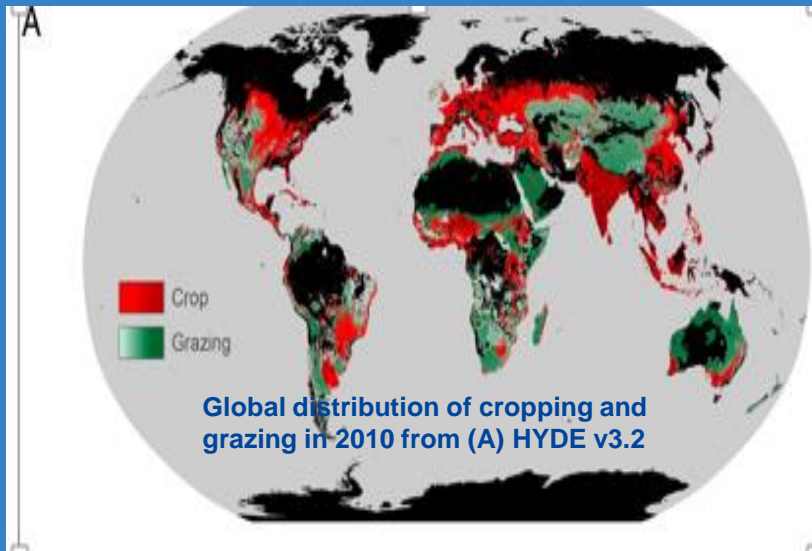
(if global program of major emissions reductions begins in 2021 @ 6% per year)

“1.5°C is the wrong goal...Must return to 350 PPM CO₂ & <1°C by 2100”

1.5C exceeds Eemian when seas were 20-30 ft higher ~120k yrs ago; need to return to 350 PPM to stay in Holocene range to sustain humanity

REQUIRES:

- Rapid phasedown of global emissions by at least 6%/yr starting in 2021
- Reforestation & improved agricultural (soil) and forestry practices
- Major CO₂ extraction technology

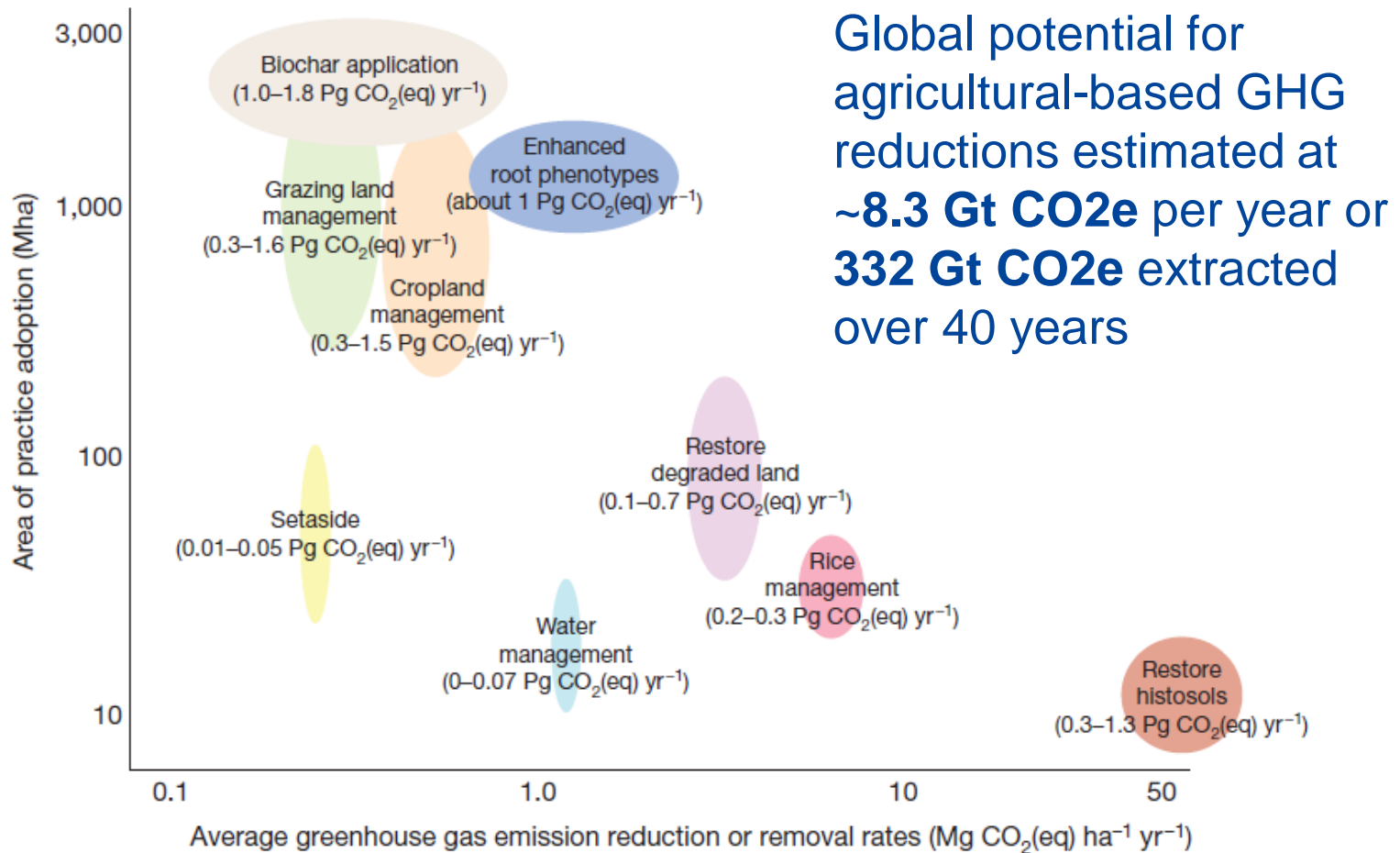


Up to 19% (of Hansen) or 103 Gt CO₂e can be recaptured

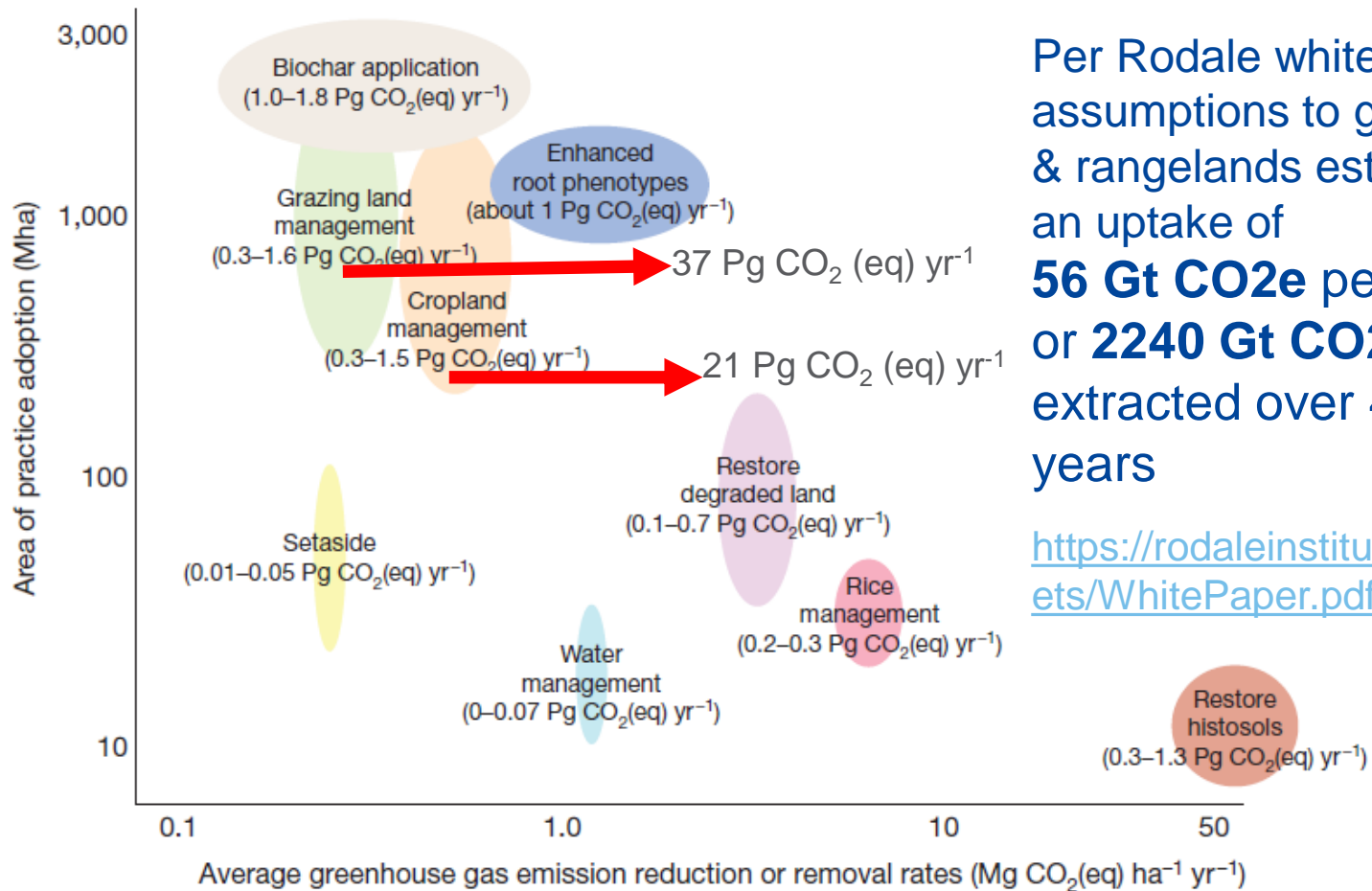
[8 Pg C to 28 Pg C or 28 Gt (billion metric tons of C)] ; -
 Assumes soil organic carbon (SOM) reaches a new steady state in 20 y

- These SOC losses are on par with estimates of carbon lost from living vegetation primarily due to deforestation (40) and are nearly 100 Pg C higher than earlier estimates
- assuming soil organic carbon (SOM) reaches a new steady state in 20 y ([35](#), [44](#)), this calculation suggests that 8 Pg C to 28 Pg C [up to 28 Gt (billion metric tons of C) or 103 Gt CO₂e] or can be recaptured
- There are identifiable regions which can be targeted for SOC (soil organic carbon) restoration efforts

One study: “~20%” of annual emissions or ~60% of total extraction needed *per Hansen*



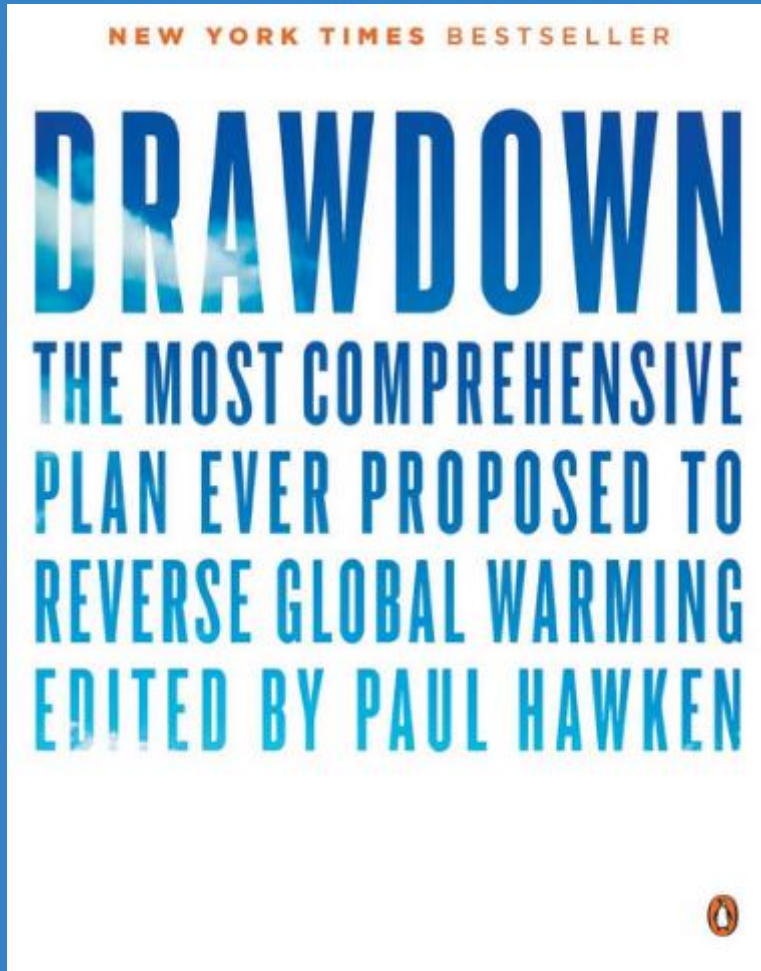
Another: “>100%” of annual emissions & total extraction needed *per Hansen et al*



Per Rodale whitepaper assumptions to global ag & rangelands estimates an uptake of **56 Gt CO₂e** per year or **2240 Gt CO₂e** extracted over 40 years

<https://rodaleinstitute.org/assets/WhitePaper.pdf>

~18% of total extraction needed *per Hansen et al*
by 2050 (~99 GT CO₂e)



Cattle: ~47 GT CO₂e

9- Silvopasture 31.19

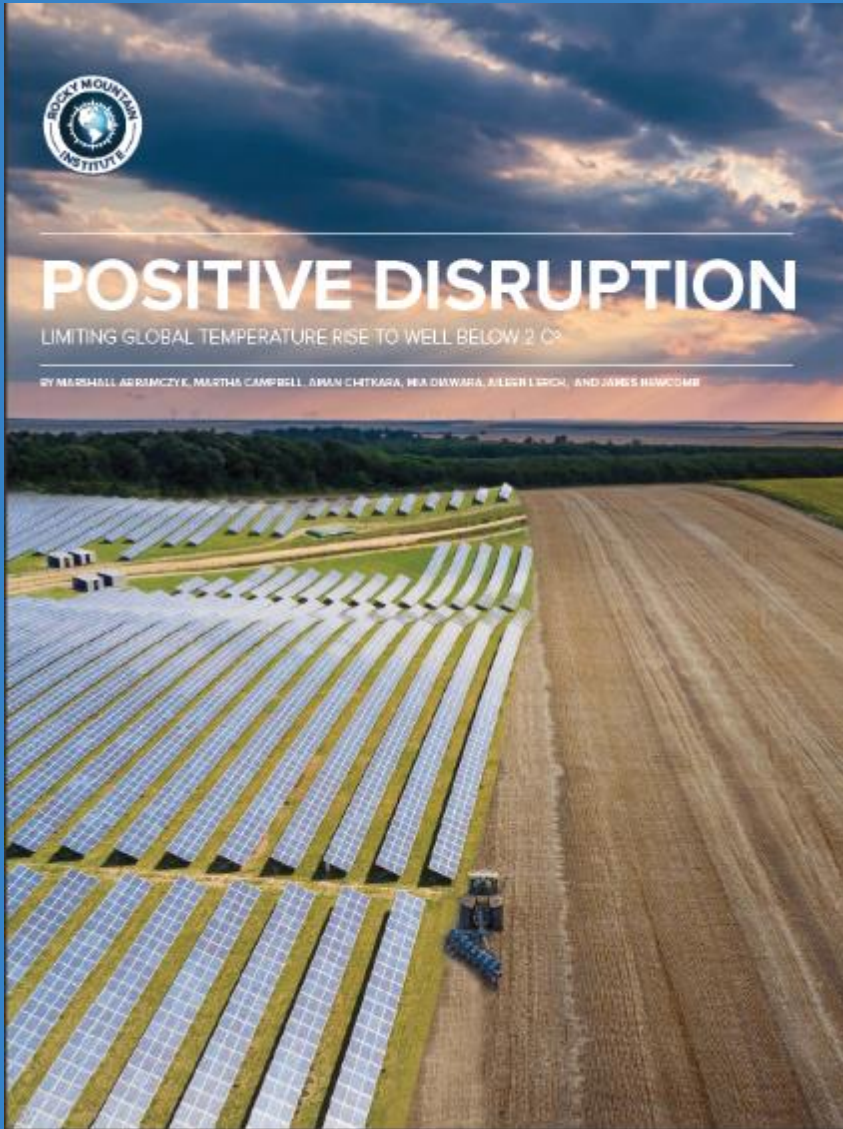
19- Managed grazing 16.34

Crops: ~52 GT CO₂e

11- Regenerative Ag 23.15

16- Conservation Ag 17.35

24- Improved Rice Cultivation 11.34



~40% of total
extraction needed

per Hansen et al

by 2100 (~221 GT CO₂e)

- Conservation agriculture
- Grazing management
- Habitat restoration

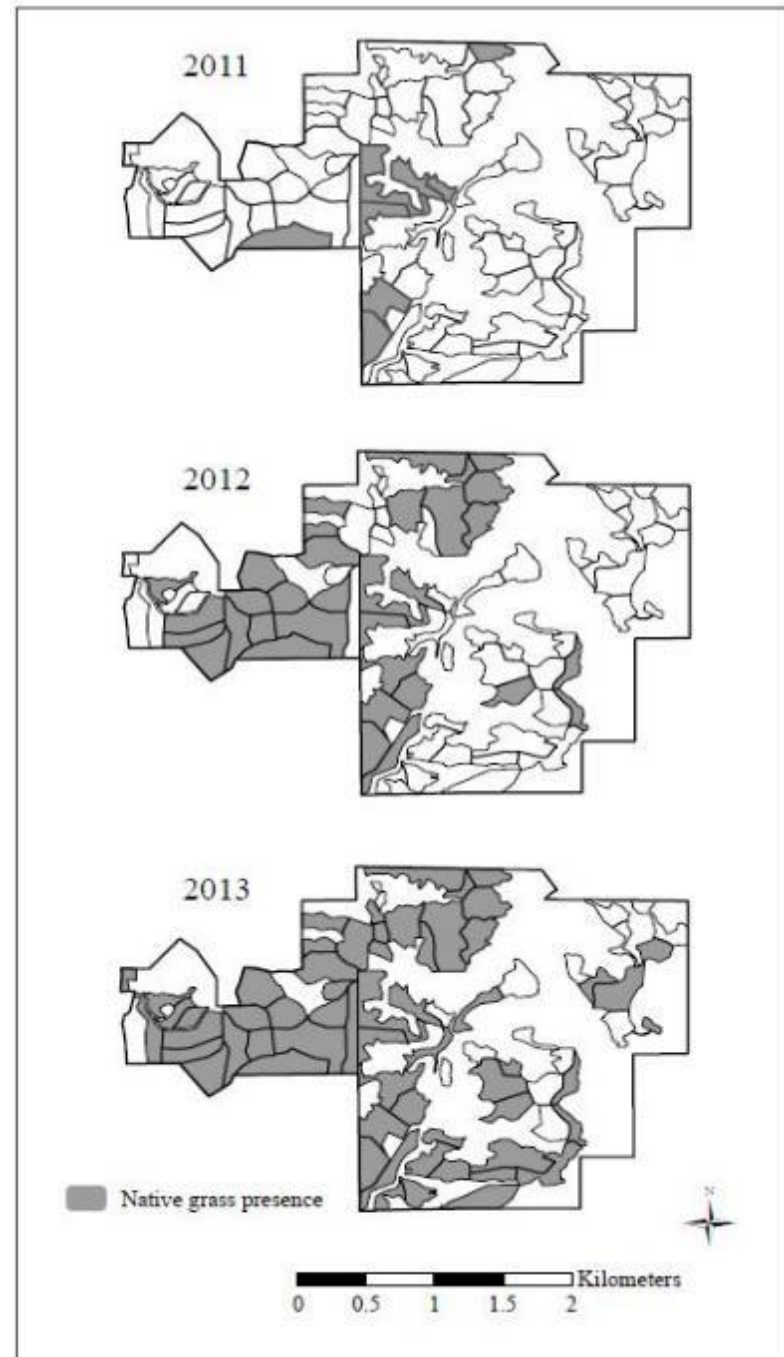
Point Blue: TomKat Ranch Study *(coastal; wetter)*

~72% increase in perennial grass cover following changes in grazing management:

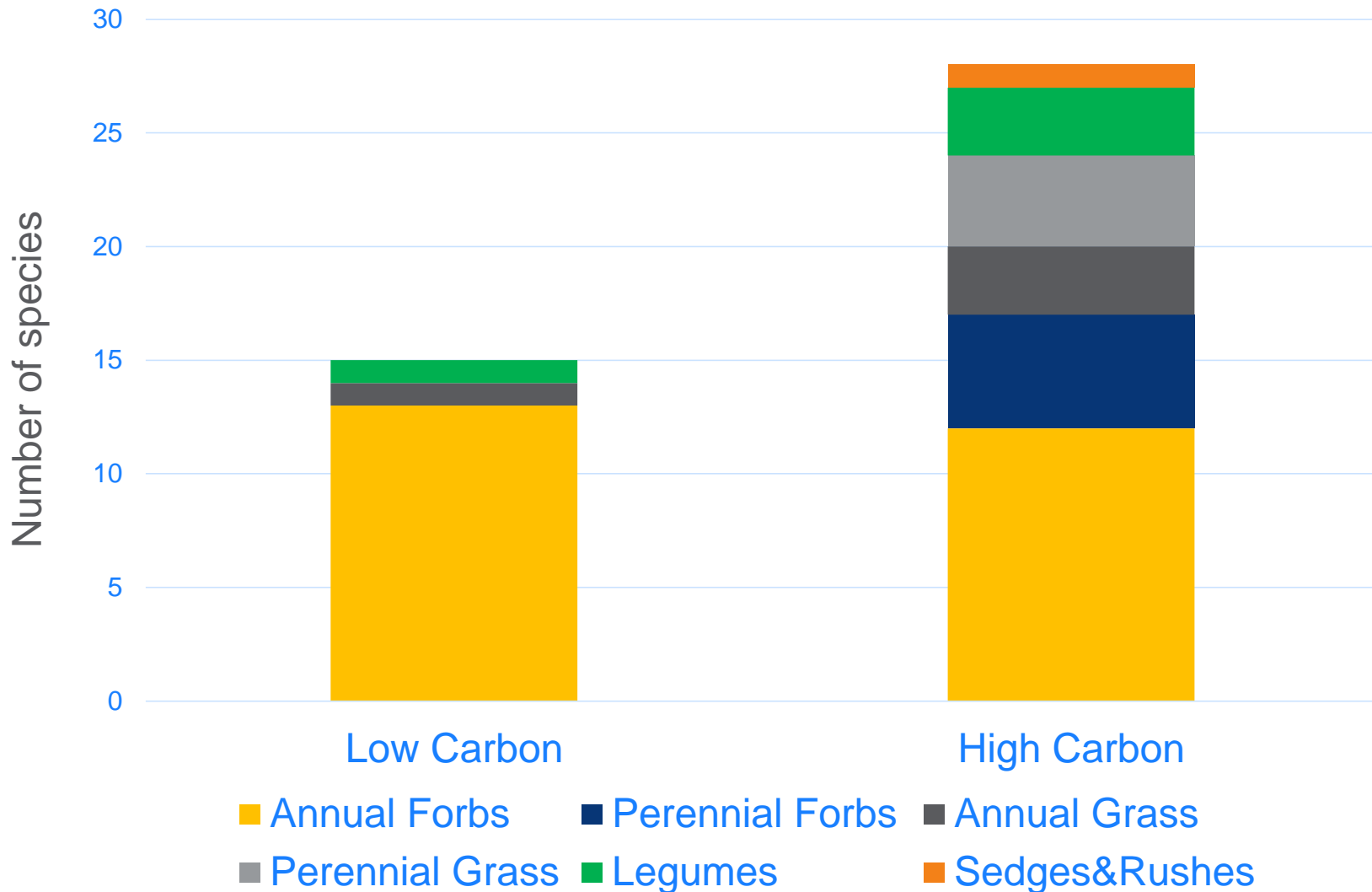
- more cattle rotation,
- more pasture rest,
- varying timing of rest

Henneman et al. 2014. Restoring Native Perennial Grasses by Changing Grazing Practices in Central Coastal California. *Ecological Restoration* 32(4): 352-354.

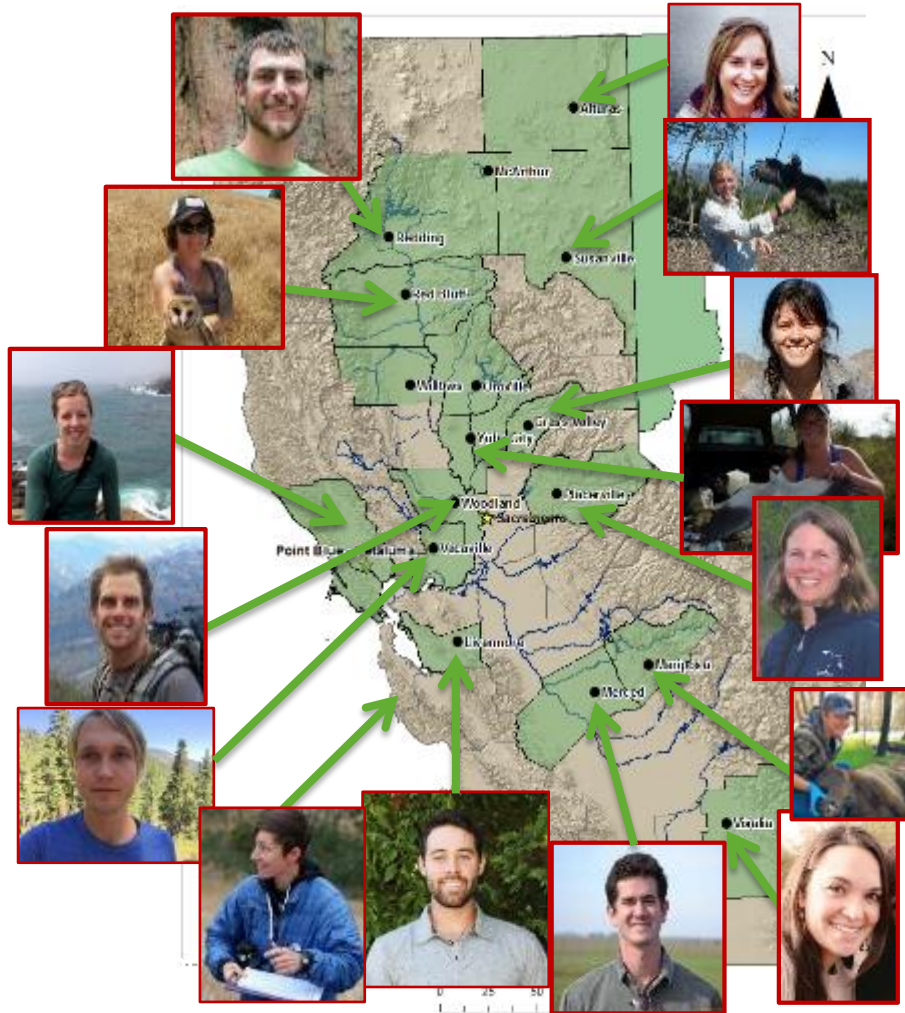
<http://phys.org/news/2014-12-rest-grazing-native-grasslands.html>



POINT BLUE: Rangeland plant diversity correlated with more soil carbon



Working Lands Achievements to Date:



- 35 Scientists: 14 “Partner Biologists” [w/ CA NRCS] + 1 TKR +10 f/t scientists + 10 p/t
- >1000 landowners engaged; 70+ Leopoldian Land Stewards
- ~800,000 acres-- 568,000 acres w/ conservation practices planned or implemented; ~200k+ acres rice/alfalfa
- \$19M in Farm Bill funds leveraged; total of \$38M in conservation w/landowner match
- in 11 counties where poverty rates exceed state, national avg.

