



SEEING THE FOREST

Nature's Solution To Climate Change



THE GREAT AMERICAN STAND SERIES

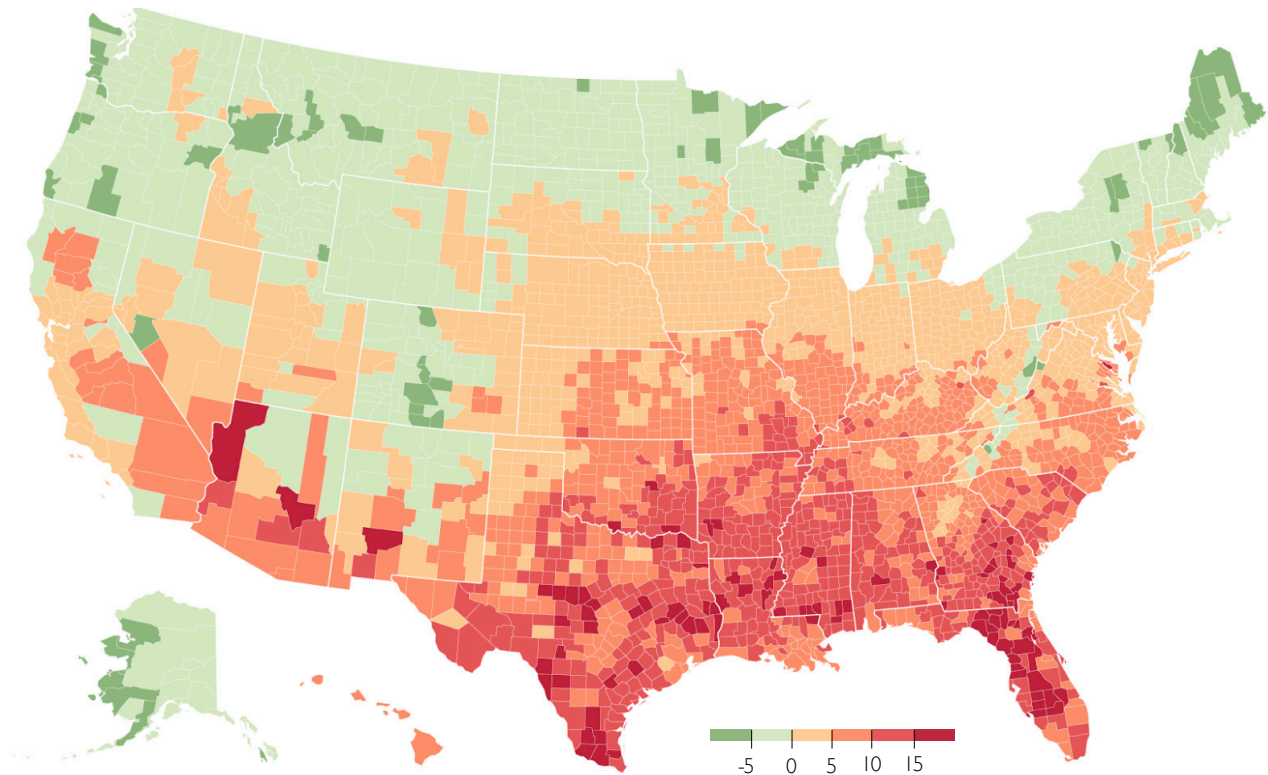
Sam L. Davis, Ph.D.

US FORESTS & THE CLIMATE EMERGENCY

Climate change is the number one threat facing the world today. To protect our communities and our livelihoods, we need to address the problem before it is too late. Scientists agree that we must reduce the amount of carbon dioxide being emitted into the atmosphere immediately.

PREDICTED DAMAGE, 2080-2099

PERCENT OF COUNTY G.D.P. PER YEAR



This map shows the predicted damage, 2080 to 2099, from climate change in the United States, as a percent of county GDP (economic productivity) per year. These impacts are already happening today.¹

If we stop deforestation, protect and restore degraded forests, and expand forests, we could reduce annual emissions by 75% in the next fifty years. If we also phase out fossil fuels, we could easily meet the goals of the Paris Agreement and avoid catastrophic climate change. These goals are lofty, but not unattainable, especially if the world unites for a common vision of keeping climate change at just 1.5 degrees Celsius.

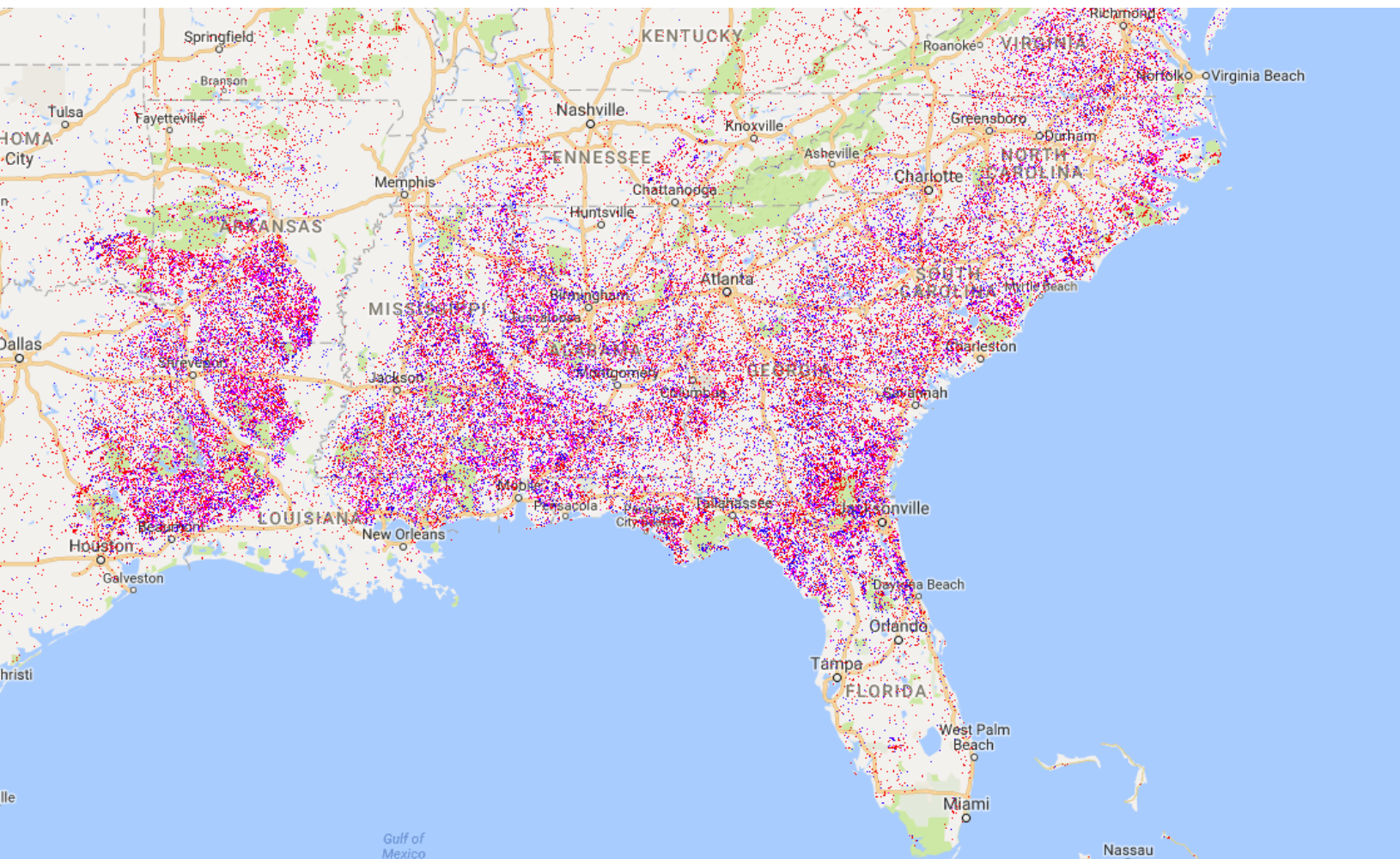
We cannot solve the climate crisis without our forests. Forests are one of the best ways we have to keep carbon out of the atmosphere, especially older trees, because each year they absorb carbon and store it in their roots, leaves, and wood. We need to improve, restore, and protect our forests across the planet.

DANGEROUS DEGRADATION

Many benefits that healthy, standing forests provide are invisible from day to day. Healthy forests give us clean air, clean water, and protection from storms. Forest degradation occurs across our landscape for development, agriculture, and logging for wood products . This landscape-wide phenomenon results in more carbon emitted into the atmosphere instead of being absorbed by our forests.

The US South is a hotspot for forest degradation. Although it has just two percent of the world's forest cover, the US South produces nearly 20% of the world's pulp and paper and 12% of its other wood products. The constant logging occurs at a rate four times higher than what occurs in South American rainforests.

In contrast, if we were able to halt deforestation and degradation in its tracks, we could prevent those carbon emissions from making their way into the atmosphere. By stopping forest degradation, we could put a significant dent in mitigating impacts of climate change and preventing the worst impacts from occurring in the next thirty years.

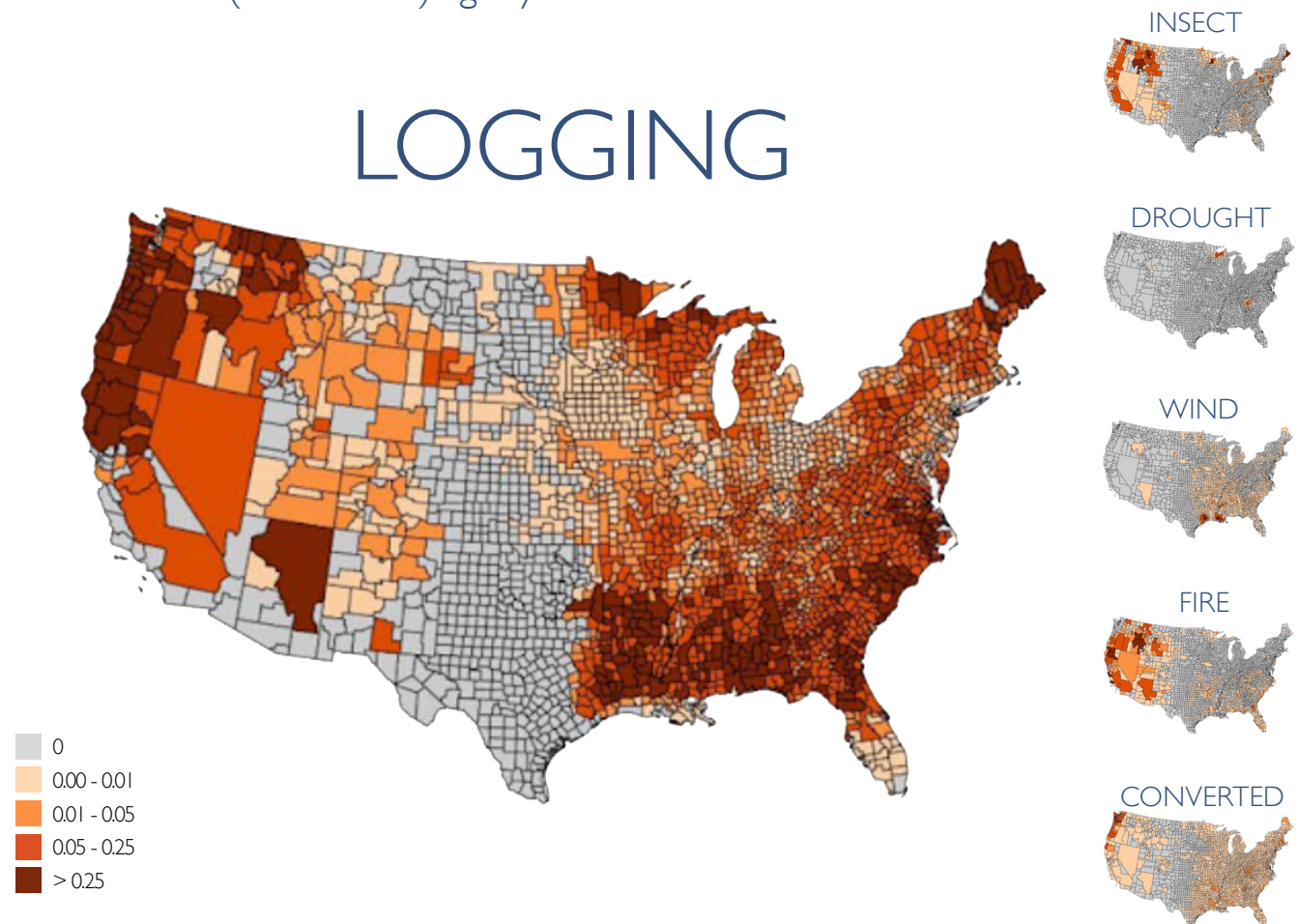


The US South is a hot spot for industrial logging (purple), shown here as forest disturbance.²

EMISSIONS FROM US FORESTS

When forests are logged, much of the carbon that was stored is released. The US government does not currently report emissions from logging. Scientists that have calculated these emissions have found these emissions to be significant.

Carbon Loss (2006-2010) Tg C yr^{-1}



When we look closely at the data, **logging accounts for 85% of emissions from US forests, more than five times the emissions from conversion, fire, wind, insects, and tree mortality combined.**³ Additionally, logging is diminishing the potential forest carbon sink by at least 35%.

Though the EPA does not report emissions from logging in its annual greenhouse gases inventory, carbon emissions from logging from 2006 to 2010 averaged 162 +/- 10 Tg/year , an amount greater than fossil fuel emissions from the residential and commercial sectors combined as reported in the latest EPA Greenhouse Gas Inventory Report: 1990-2014.

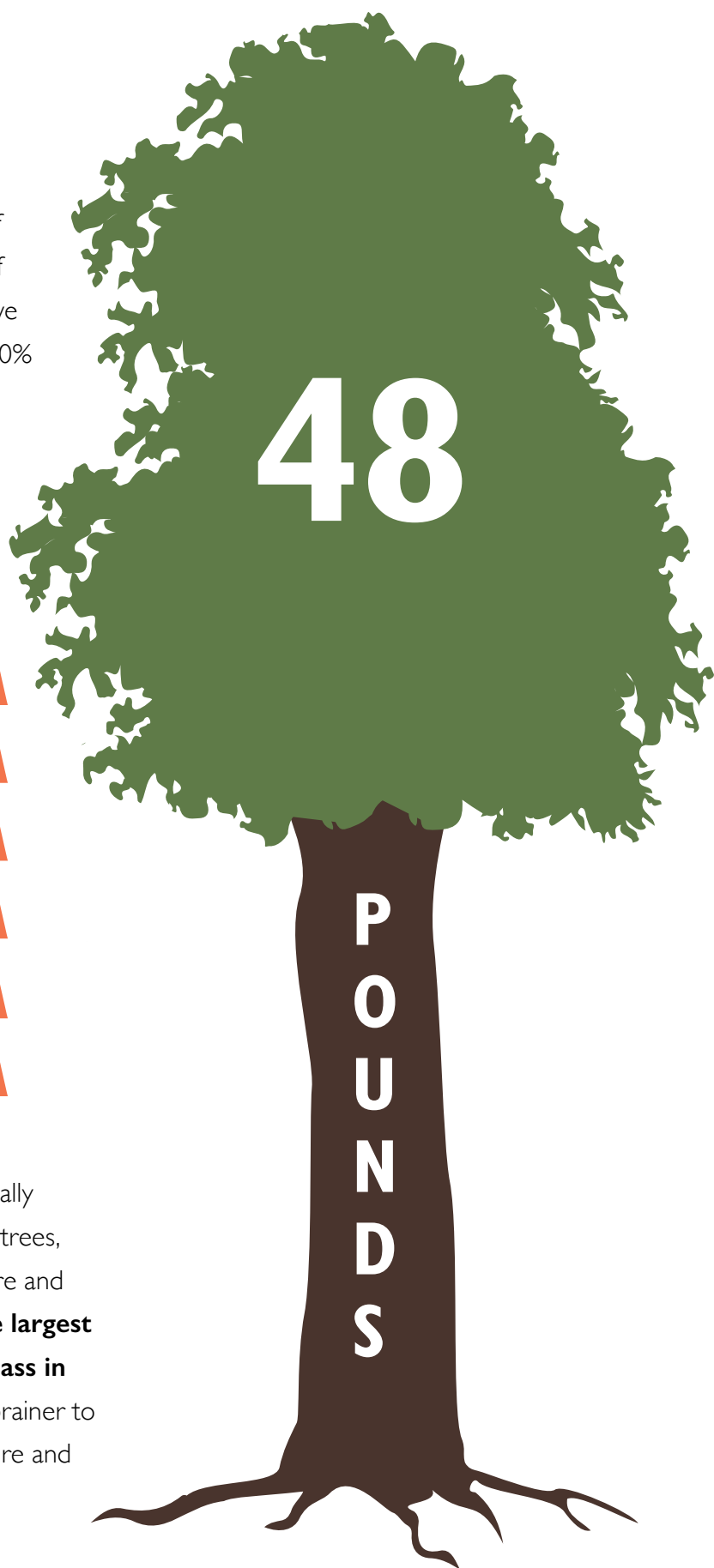
BIG TREES MATTER

Forests spend their entire lives absorbing carbon dioxide from the atmosphere and producing oxygen. As a result, old, natural forests are one of our best defenses against the damaging impacts of climate change. Unfortunately, though trees can live for hundreds, even thousands of years, less than 10% of trees in the US South are older than 80 years.

A SINGLE MATURE TREE CAN SEQUESTER UP TO 48 LBS OF CARBON PER YEAR.⁴



Recent studies show that old trees have an especially important role to play. When there are more big trees, more carbon is being pulled out of the atmosphere and stored safely in trunks, limbs, and soil. **In fact, the largest 1% of trees contribute half of the forest biomass in the world.** Given all of these benefits, it is a no-brainer to protect existing forests and allow forests to mature and soak up excess carbon from the atmosphere.



SOLVING THE CLIMATE CRISIS

The climate crisis is not insurmountable. We already have an accounting system that tells us how much extra carbon is entering the atmosphere. By current calculations, we are releasing about nine billion metric tons of carbon into the atmosphere each year, and our oceans and forests store about five billion metric tons of that carbon each year.

CURRENT YEARLY WORLD CARBON EMISSIONS

(by category, in billion metric tons)⁵



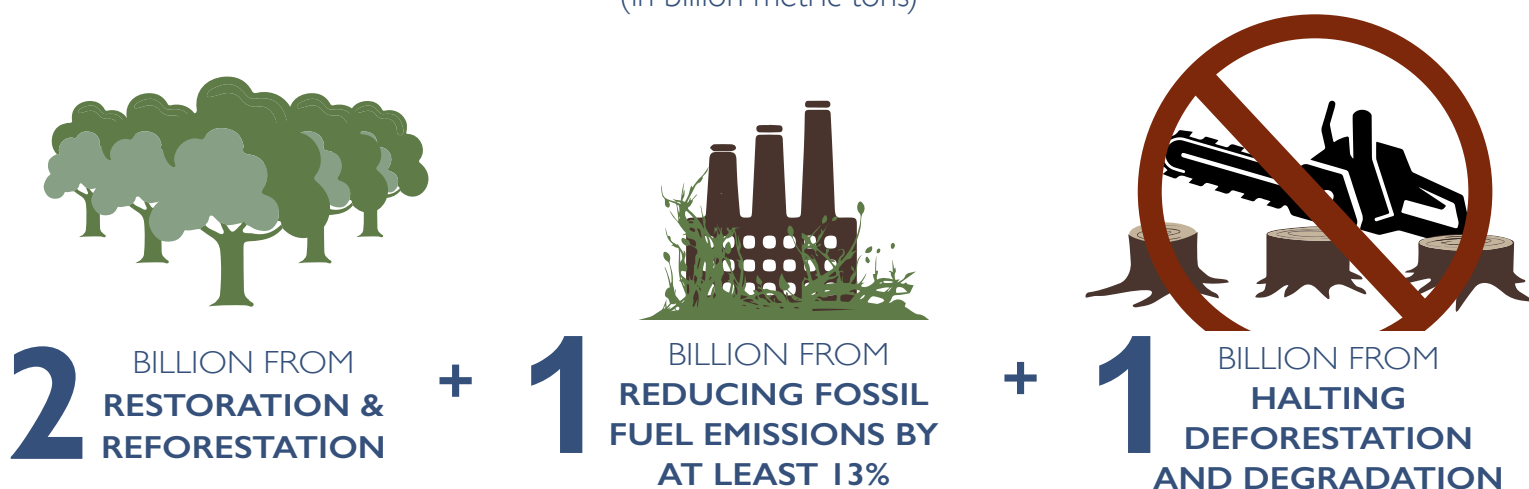
**WE HAVE 4 BILLION MT MORE IN THE ATMOSPHERE
THAN THE EARTH CAN CURRENTLY STORE**

GETTING THERE

There are a few global solutions to reduce our carbon emissions and stop the worst effects of climate change that are already happening. Although we must reduce the world's reliance on fossil fuels, that alone is not enough to stop climate change. We must also rely on our existing forests, wetlands, and other natural landscapes to combat the worst carbon emissions and perhaps even get them down to zero.

REDUCING CARBON EMISSIONS TO ZERO

(in billion metric tons)⁵



4 MT
CURRENT NET
CARBON

-

4 MT
ADDITIONAL
SEQUESTRATION

=

ZERO EMISSIONS

Here is how to get there. First, we stop degradation and deforestation. This is a worldwide effort, with a potential payoff of just over one billion metric tons of carbon being absorbed out of the atmosphere. Next, we look to the positive, and we restore and reforest our degraded natural areas. By this, of course, we mean natural reforestation -- not planting industrial pine plantations or non-native species such as eucalyptus. Any reforestation that occurs needs to be permanent and focused on replenishing natural, old-growth forests. Diverse, old natural forests also provide many times more value in ecosystem services like wildlife habitat, clean water, and clean air. These reasonable restoration and reforestation efforts could bring us nearly two billion metric tons of carbon closer to our net zero goal and need for “negative emissions” to halt climate change.

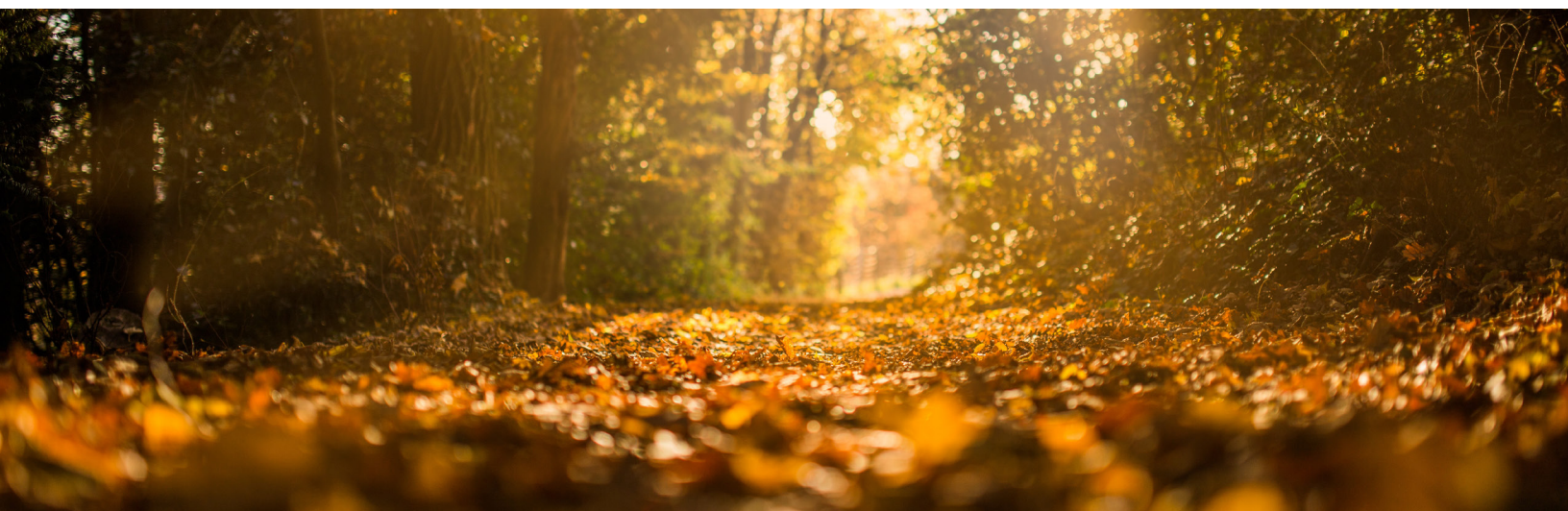
LOCAL SOLUTIONS TO A GLOBAL PROBLEM

Climate change is a worldwide problem in need of complex, multifaceted solutions. Large scale solutions have the potential to impact economies and livelihoods across the planet, but there are many problems with carbon offset markets like REDD+ and the California forest carbon offset program that have been identified by grassroots and indigenous leaders. **But local governments and grassroots groups can work together to advance forest protection in ways that help combat the global climate change problem and support local communities.**

Developing watershed-wide initiatives to create more public forested space in your community can provide immediate community benefits and also increase the carbon storage in forests. These new public spaces should be home to educational and recreational opportunities. Bird-watching, moth-lights, and fishing are all popular with young and old alike. Programs like these, in combination with preservation-minded management (leaving the trees alone to grow) can vastly increase the attractiveness of your area to outside visitors and promote a diverse, local economy rooted in the protection rather than destruction of forests.

Your community can also invest in solar or wind programs to lower reliance on fossil fuels and to ensure your energy isn't derived from biomass (burning trees) as a false solution. These truly renewable, low-carbon energy sources have remarkably little pollution associated compared to traditional coal or dirty biomass, and the cost of implementation is being lowered every year. Where renewable energy has been hampered by legislation, community members can organize to change policies, and make it easier for residents, businesses, and other institutions to tap into truly clean renewable energy like wind and solar.

Finally, local groups and governments can continually petition larger bodies of government (e.g., state and federal officials) to adopt solutions that are favorable for our climate and move us closer to a real climate change solution. Contributing to the public narrative through petitions, letters to the editor, and public speaking are additional ways in which individuals can feel empowered to make change in their communities.



WHERE TO GO FROM HERE

Want to grow your knowledge of forests?
READ ONE OF OUR REPORTS:

**THE GREAT AMERICAN STAND:
US FORESTS & THE CLIMATE EMERGENCY**

**TREASURES OF THE SOUTH:
THE TRUE VALUE OF WETLAND FORESTS**

A HISTORY OF FORESTS

INDUSTRY IMPACTS ON US FORESTS

**BE A LEADER FOR FOREST
PROTECTION IN YOUR STATE.**

SIGN THE PLEDGE



REFERENCES

1. Expected Damages From Climate Change (Page 2)

The map demonstrating expected damages from climate change comes from the New York Times Article, "[As Climate Changes, Southern States Will Suffer More Than Others](#)". The research comes from:

Hsiang, S. et al. Estimating economic damage from climate change in the United States. Science 356, 1362–1369 (2017). <http://science.sciencemag.org/content/356/6345/1362>

2. Hotspot For Industrial Logging (Page 3)

This map is recreated from data in this paper:

Hansen, M. C. et al. High-resolution global maps of 21st-century forest cover change. Science 342, 850–853 (2013). <http://science.sciencemag.org/content/342/6160/850>

The map generation code, written in Google's Earth Engine, is available upon request to: sam@dogwoodalliance.org.

3. Carbon Loss From US Forests (Page 4)

This map is pulled directly from the following paper:

Harris, N. L. et al. Attribution of net carbon change by disturbance type across forest lands of the conterminous United States. Carbon Balance Manag. 11, 24 (2016). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5108824/>

4. Tree Carbon Absorption Per Year (Page 5)

This is a commonly cited "fact", here's one of many sources declaring it: NCSU. Tree Facts. Available at: <https://projects.ncsu.edu/project/treesofstrength/treefact.htm>. (Accessed: 11th September 2018)

5. Getting To Zero Emissions Graphics (Pages 6 & 7)

Numbers for these graphics were taken directly from the Great American Stand, which this report is based on:

Moomaw, B. & Smith, D. The Great American Stand - US Forests and the Climate Emergency. (Dogwood Alliance, 2017). <https://www.dogwoodalliance.org/wp-content/uploads/2017/03/The-Great-American-Stand-Report.pdf>