



HAWAII DELEGATION

Natural and Working Lands Learning Lab Report

In July 2018 a delegation of State of Hawaii, non-governmental organization, and university representatives joined fellow US Climate Alliance states for a three-day intensive Natural and Working Lands Learning Lab hosted by American Foresters. Shortly before the delegation went to Washington DC, Governor David Ige signed a bill committing the State to be carbon neutral by 2045. This new legislation significantly shaped the conversation of the learning lab.

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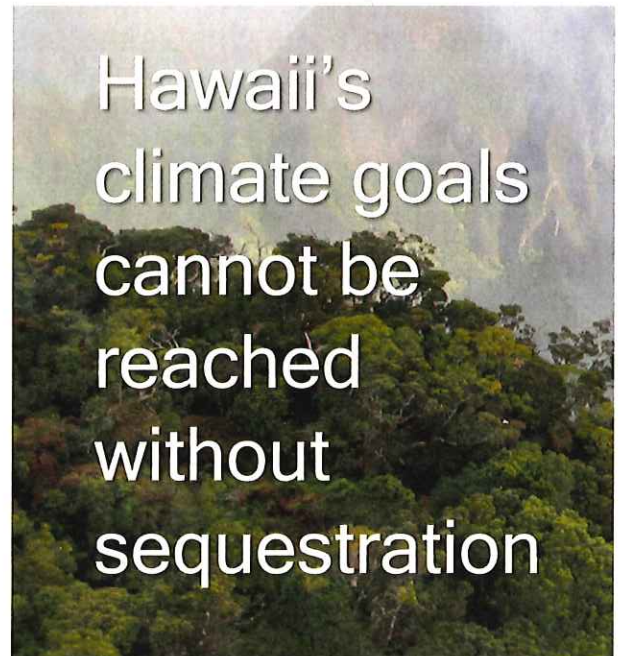
What role do natural and working lands play?

The EPA estimates that natural and working lands offset 9% of total US carbon emissions. In Hawaii natural and working lands are a net carbon sink. However, currently only 10% of emissions are offset by sequestration in natural and working lands. An analysis conducted by USGS shows that by reforesting Division of Forestry and Wildlife alien grasslands we could sequester an additional 4 MMT CO₂ Eq of carbon. Storing carbon in the biomass of trees is only one of a range of natural climate solutions or “greenhouse gas sequestration pathways” in natural and working lands. There appears to be great potential to store carbon in Hawaii’s soils through improved agricultural and soil conservation practices. Increasing sequestration of greenhouse gases in natural and working lands will be an indispensable component of the State’s effort in reaching its goal of being a net carbon sink by 2045. Due to limited time, the delegation had to focus on one sequestration pathway and selected reforestation.

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| Reforestation | Additional carbon sequestration in above and belowground biomass and soils gained by converting non-forest (<25% tree cover) to forest (>25% tree cover) (Hansen et al. 2013) |
| Agroforestry | Potential to produce double the rate of the reforestation carbon sequestration estimates over 20 years due to active management (e.g., planting, maintenance) and lower competition compared to the natural regeneration approach for reforestation |
| Forest carbon management | Extended rotations in softwoods and restocking understocked forests. |
| Fire management | Reduce the risk of high-intensity wildfire. |
| Urban reforestation | Additional carbon sequestration in aboveground and belowground biomass gained by increasing urban tree cover. |
| Avoided forest conversion | Emissions of CO ₂ avoided by avoiding anthropogenic forest conversion. |
| Cover crops | Additional soil carbon sequestration gained by growing a cover crop in the fallow season between main crops. |
| Tidal wetland restoration | Tidal wetlands (salt marshes and mangroves) play an outsized role in the carbon cycle because of their ability to store carbon long term in soils (Chmura et al., 2003 ; Holmquist et al., 2018), and their capacity to emit methane (Poffenbarger et al., 2011). |

Natural Lands

Hawaii's natural lands host some of the world's most unique forests and landscapes. These areas are both threatened by climate change and could play a key role in reducing the impacts of climate change. The multi-layered canopy system of native Hawaiian forests is excellent at maximizing carbon sequestration. Restoring alien grass and shrublands to native forest could put millions of tons of carbon into permanent storage. Forest restoration comes with substantial additional benefits such as run-off and flood prevention, reef protection, increased freshwater replenishment, and endangered species habitat restoration.



Working Lands

Climate-smart agriculture such as no or low-tillage practices, cover crops, silvopasture systems, and an increase in agroforestry and urban forestry can result in substantial amounts of additional carbon sequestered while ensuring and promoting local food production. UH Manoa soil scientists are in the process of mapping the carbon sequestration potential of agricultural lands and developing best management practices for increase sequestration in agriculture throughout the state.



Exploring carbon pricing mechanisms to incentivize and fund sequestration initiatives

Carbon market mechanisms can create powerful incentives for landowners and land managers by creating monetary rewards for increasing carbon sequestration. But what is the best carbon market mechanism from a natural and working lands perspective? The Hawaii team discussed three options:

- Voluntary Carbon Market
- Cap-and-Trade (Compliance Carbon Market)
- Carbon Tax

Voluntary Carbon Market

The voluntary carbon market enables those in unregulated sectors or countries that have not ratified Kyoto, such as the US, to offset their emissions¹. Voluntary markets do not guarantee greenhouse gas emission reductions or revenues from carbon offsets. However, voluntary markets offer individuals, companies and public entities the opportunity to offset their carbon footprint and fund climate action where there is no mandatory emission reduction in place.

Hawaii already hosts a private voluntary carbon offset project and the Hawaii Department of Land and Natural Resources is currently implementing two voluntary forest carbon offset projects on Hawaii Island and on Maui. These pilot projects will help to us to better understand the potential for a carbon market in Hawaii.

Cap and Trade

A cap-and-trade scheme is a compliance carbon market which sets greenhouse gas emission limits (caps) for defined geographies and time periods. A regulatory body allocates or sells a number of permits to emit certain amounts of greenhouse gases that accumulated do not exceed the cap. A limited percentage of emissions could be allowed to offset for example through reforestation projects.

The scheme requires upfront logistical and financial commitments to set up the necessary trading infrastructure and the regulatory body. The carbon prices are mostly determined by market mechanisms. California has had huge successes in reducing emissions with its cap and trade and carbon markets which have in turn have played a large role in funding sequestration projects such as the healthy

¹ <http://climatesolver.org/sites/default/files/pdf/making.pdf>

soils initiative and wildfire prevention efforts. But we often find what works on the continent doesn't always translate to the middle of the pacific.

Main Obstacle for Forest Carbon

The Hawaii delegation identified the high costs for verification and certification of forest carbon projects for both voluntary and compliance markets as a primary obstacle for incentivizing sequestration through reforestation. The fees for a forest carbon standard and for the third-party verification can accumulate to well over \$150,000 per project.

Carbon Tax

A carbon tax can be a simple mechanism for both reducing emissions and generating revenue for the State but it is likely to be tough to pass through legislation. While the actual emission reduction resulting from a carbon tax is uncertain, tax revenues provide steady funding with reduced need for regulatory agencies. Carbon tax also eliminates the need to worry about accounting systems and simplifies the inventory process.

Where does the money go?

Carbon taxes on corporations almost always are passed on to the consumer. There is concern that the implementation of a carbon tax might have disproportionate impacts on low-income households. To mitigate the impact on the individual areas that have instituted carbon taxes these areas may use revenues to provide tax credits for healthcare or other social services.

Also, the revenues generated from a carbon tax should be used to fund projects that will further mitigate impacts of climate change such as reforestation projects and state tax credits for solar panels or electric vehicles.

Ethics of the 2045 Carbon Goal

Act 15 enacts a “statewide target.....to sequester more atmospheric carbon and greenhouse gases than emitted within the State as quickly as practicable, but no later than 2045.” The 2045 carbon goal is a huge step in addressing climate change mitigation in Hawaii but does create an ethical question in accounting carbon emissions and sequestration. If the state’s goal is “to sequester more atmospheric carbon and greenhouse gases than emitted within the State” can Hawaii ethically sell carbon credits around the world to offset emissions elsewhere and still count that sequestration towards our carbon neutrality goal?

To answer this question Hawaii must decide if in calculating its carbon goal Hawaii is using an inventory or accounting system.

Inventory VS Accounting system

Inventory: Accounts for the simpler matrix of how much carbon Hawaii is emitting and how much carbon it is sequestering at any given time.

Accounting: Tracking system to identify where credits are produced and sold.



An accounting system is much more complex and requires more regulation as it is necessary to track offsets produced in Hawaii and where they're offset. The Learning Lab Team considered the possibility of restricting carbon credit producers to sell credits only to carbon producers located in Hawaii. There are several Hawaii based large carbon producers that could offset their emissions including Hawaiian Airlines, Chevron and Matson though there was consideration that restricting offsets could cause protectionist concerns. Additionally, restricting our carbon market to Hawaii based emitters could reduce the price of the credits if demand wasn't high enough.

Hawaii could sell credits to offset emissions outside of the state and still count the credits in the overall accounting of state sequestration, but it would put the credibility of Hawaii as a leader in climate change into question.