

Hawaii Cattlemen's Council, Inc.

PANIOLO STEWARDSHIP & CLIMATE CHANGE

Presented November 17, 2021
Greenhouse Gas Sequestration Taskforce

Nicole Galase, Hawai'i Cattlemen's Council
Nicholas Kreuger, UH Hilo CAFNRM

GREENHOUSE GAS SEQUESTRATION TASK FORCE



Agricultural and...land use practices that

- Promote increased greenhouse gas sequestration
- Build healthy soils
- Provide greenhouse gas benefits

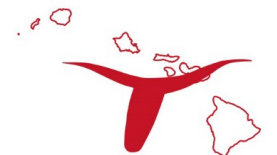


Hawaii Cattlemen's Council, Inc.

PANILO STEWARDSHIP



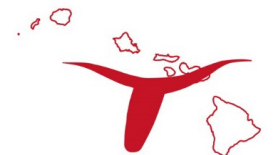
- More than 90% of farms and ranches in the US are family-owned
- In Hawai‘i, the paniolo culture represents hard work, and responsibility for the land and the community
- Ranchers must steward the land to ensure it produces for future generations



Hawaii Cattlemen's Council, Inc.



SUSTAINABILITY



Hawaii Cattlemen's Council, Inc.



SUSTAINABILITY

GOAL

CLIMATE
of U.S. d



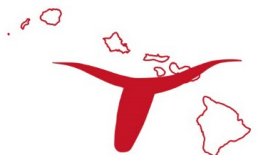
Environment
Sustainab

GOAL

NCBA will create & enhance opportunities that result in a
**QUANTIFIABLE INCREASE IN
PRODUCER PROFITABILITY &
ECONOMIC SUSTAINABILITY**

by 2025

*Economic
Sustainability*



Hawaii Cattlemen's Council, Inc.



SUSTAINABILITY

GOAL

CLIMATE
of U.S. d

*Environment
Sustainab*

A photograph of a black cow grazing in a green field. The cow is in the foreground, looking towards the camera. Other cows are visible in the background.

GOAL

NCBA
opportu
QUANTIFI
PRODUCE
ECONOM

*Economic
Sustainabil*

A close-up photograph of a cow's head, showing its eye and ear. The cow is brown and appears to be in a field.

*Social
Sustainability*

GOAL

ENHANCE TRUST IN CATTLE
PRODUCERS AS RESPONSIBLE
STEWARDS OF THEIR ANIMALS
& RESOURCES

by expanding educational opportunities
in animal care and handling programs to

*further improve
animal well-being*

A photograph of a brown cow standing in a field. The cow is looking towards the camera. There are trees in the background.

Hawaii Cattlemen's Council, Inc.



SUSTAINABILITY

GOAL

CLIMATE
of U.S. d

Environment
Sustainab

A photograph of a black cow grazing in a green field. The cow is in the foreground, looking towards the camera. The background shows more cows and a line of trees under a clear sky.

GOAL

NCBA
opportu
QUANTIFI
PRODUCE
ECONOM

Economic
Sustainabil

A photograph of a brown cow in a field. The cow is partially obscured by a green overlay on the left side of the image.

GOAL

Social
Sustainability

ENHANC
PRODUCER
STEWARDS

by expanding educ
in animal care and

anim

A photograph of a brown cow in a field. The cow is partially obscured by a green overlay on the left side of the image.

GOAL

Social
Sustainability

CONTINUOUSLY
IMPROVE
our industry's

workforce
safety and
well-being

A photograph of two men in a field. One man is wearing a cowboy hat and a blue shirt, and the other is wearing a blue plaid shirt and a grey cap. They are both looking at a map or a set of papers that are laid out on a white surface, possibly a table or a car hood.

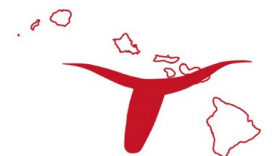


DEMONSTRATE CLIMATE NEUTRALITY of U.S. cattle production

by 2040

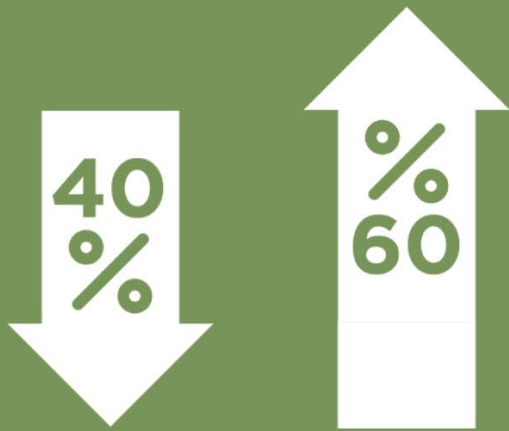


*Environmental
Sustainability*

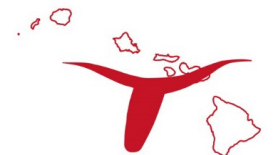


Hawaii Cattlemen's Council, Inc.

RECOGNITION OF LAND STEWARDSHIP

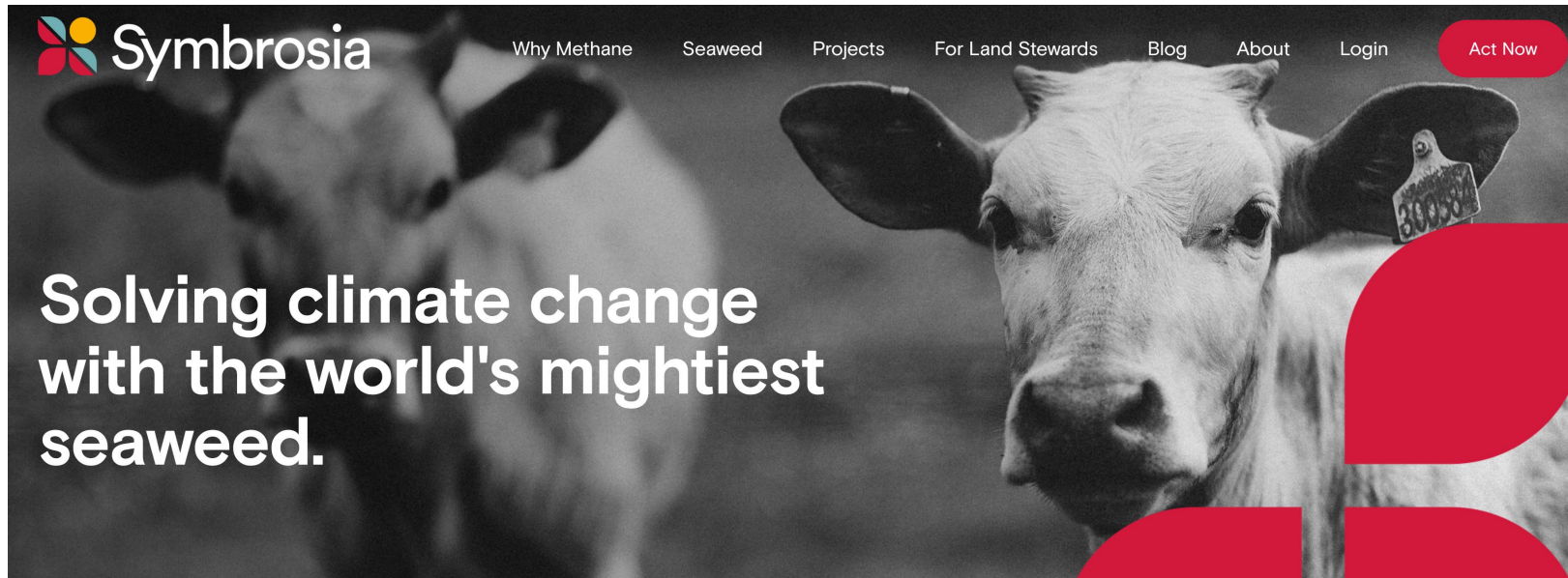



Between 1961 and 2018, the U.S. beef industry has reduced emissions per pound of beef by more than 40% while also producing more than 60% more beef per animal. This is a result of continued sustainability efforts and improved resource use.



Hawaii Cattlemen's Council, Inc.

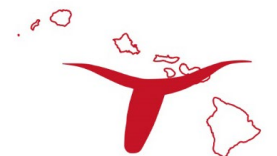
EMERGING RESEARCH



 **Symbrosia**

[Why Methane](#) [Seaweed](#) [Projects](#) [For Land Stewards](#) [Blog](#) [About](#) [Login](#) [Act Now](#)

**Solving climate change
with the world's mightiest
seaweed.**



Hawaii Cattlemen's Council, Inc.

EMERGING RESEARCH

2021 publication in the peer-reviewed, international journal *Land*'s special issue,
'Sustainable Rangeland Management to Protect Habitat and Livelihoods

Open Access

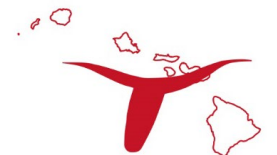
Review

Maintaining the Many Societal Benefits of Rangelands: The Case of Hawai'i

by  Leah L. Bremer^{1,2,*} ,  Neil Nathan³ ,  Clay Trauernicht⁴ ,  Pua'ala Pascua⁵ ,
 Nicholas Krueger⁶  ,  Jordan Jokiel⁷ , Jayme Barton⁸  and  Gretchen C. Daily³  

BENEFITS OF RANGELANDS

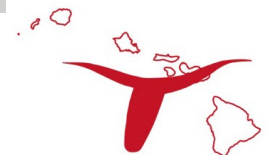
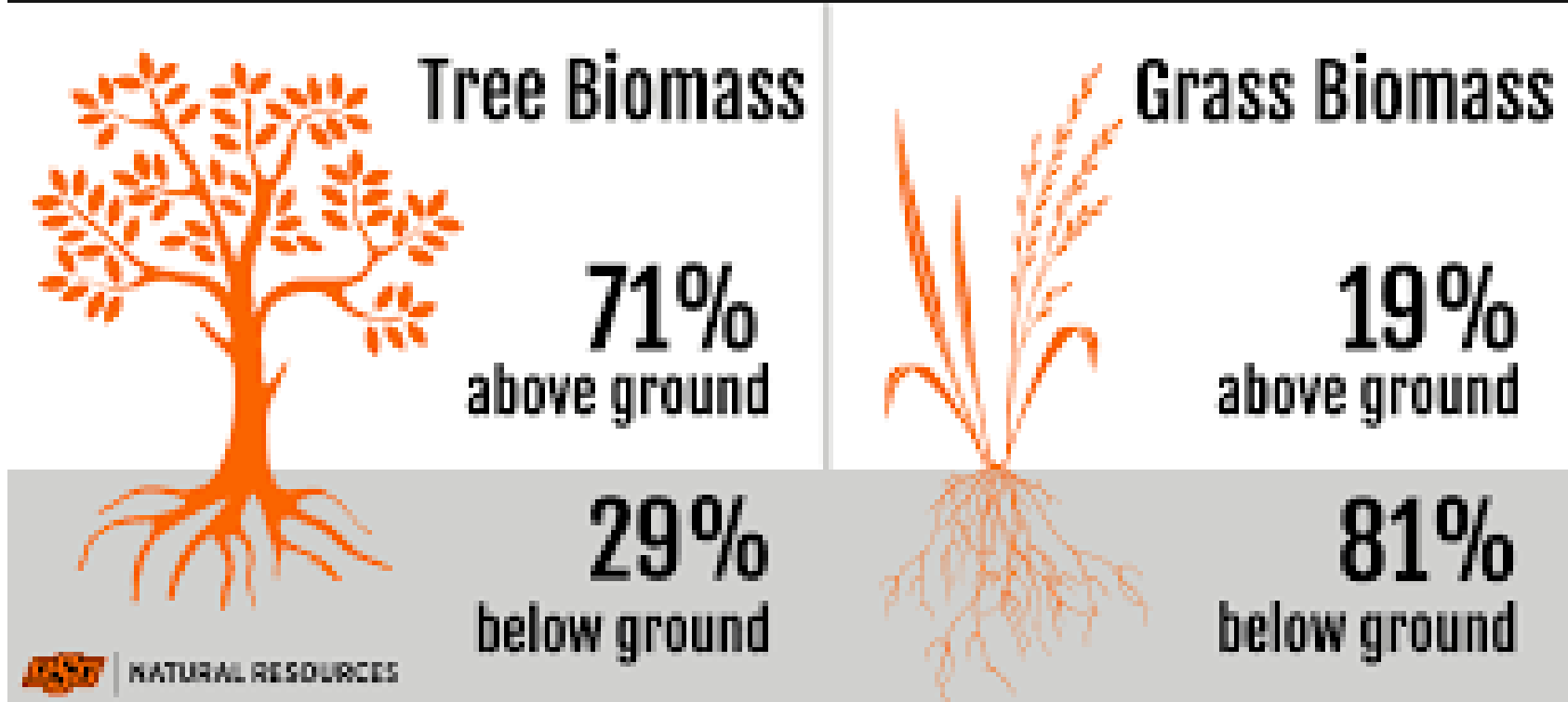
- Biodiversity
- Soil health
- Wildfire mitigation
- Water quality
- Carbon sequestration
- Cultural value and open space



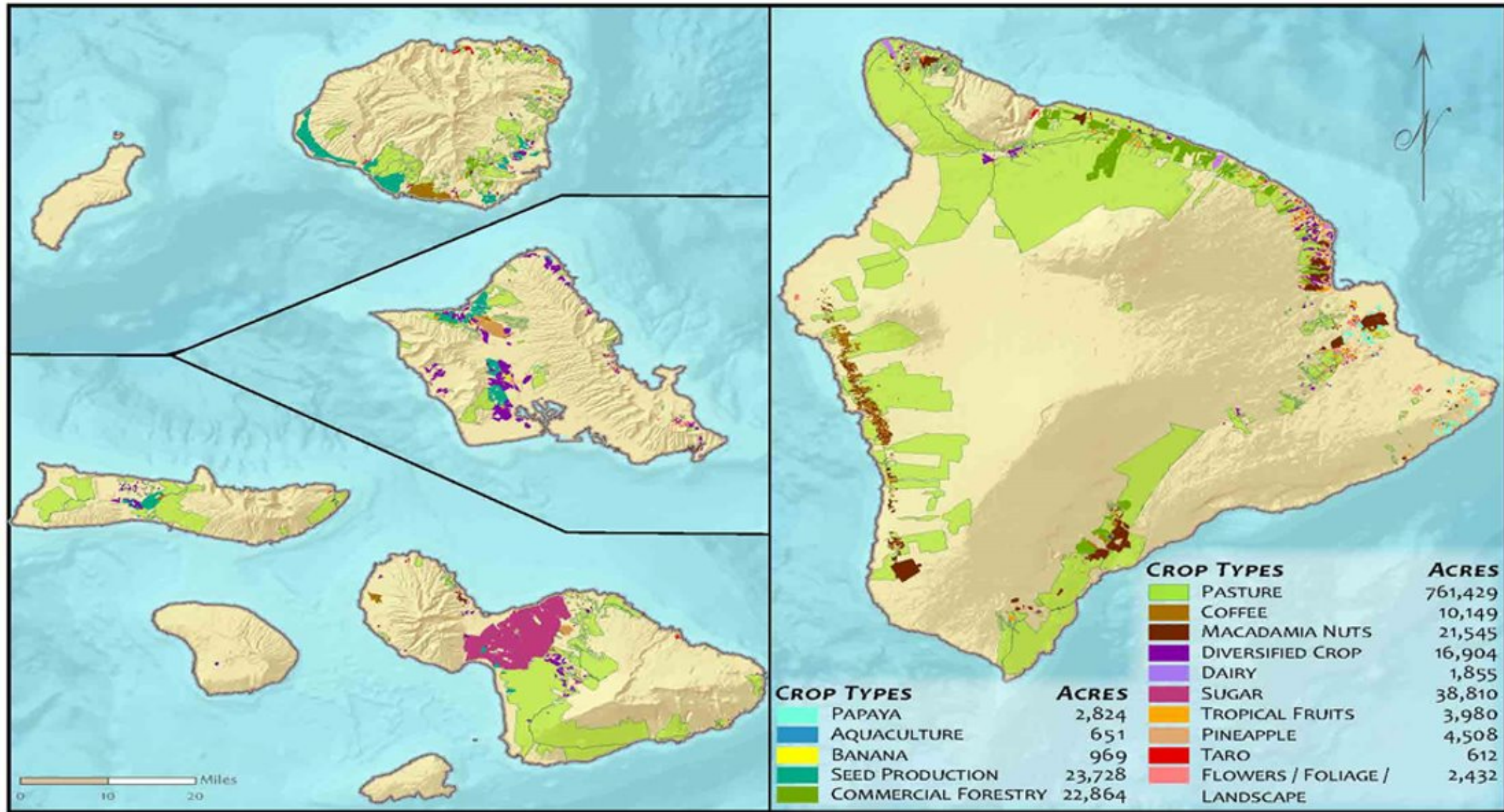
Hawaii Cattlemen's Council, Inc.

EMERGING RESEARCH

Grass roots are important for carbon storage



Hawaii Cattleman's Council, Inc.

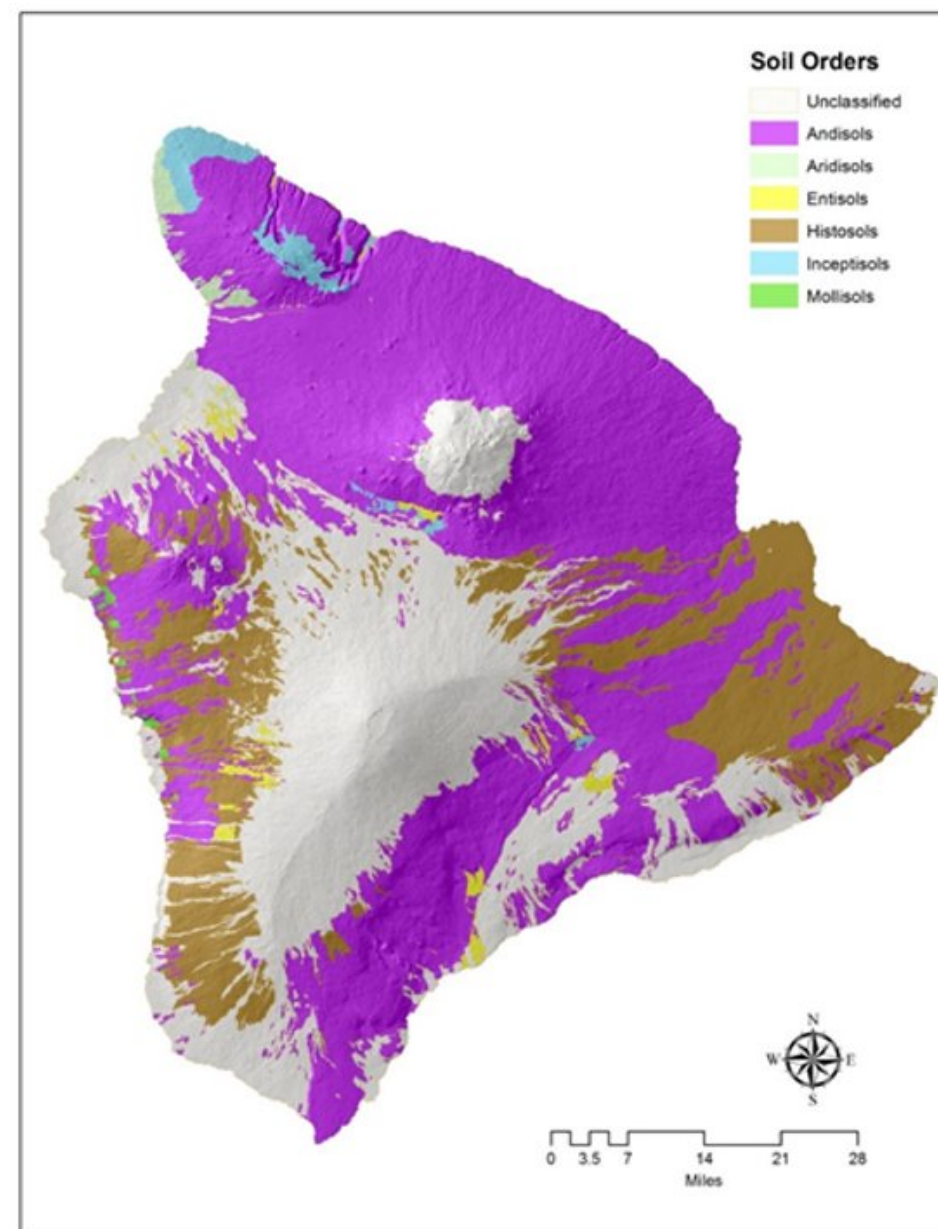
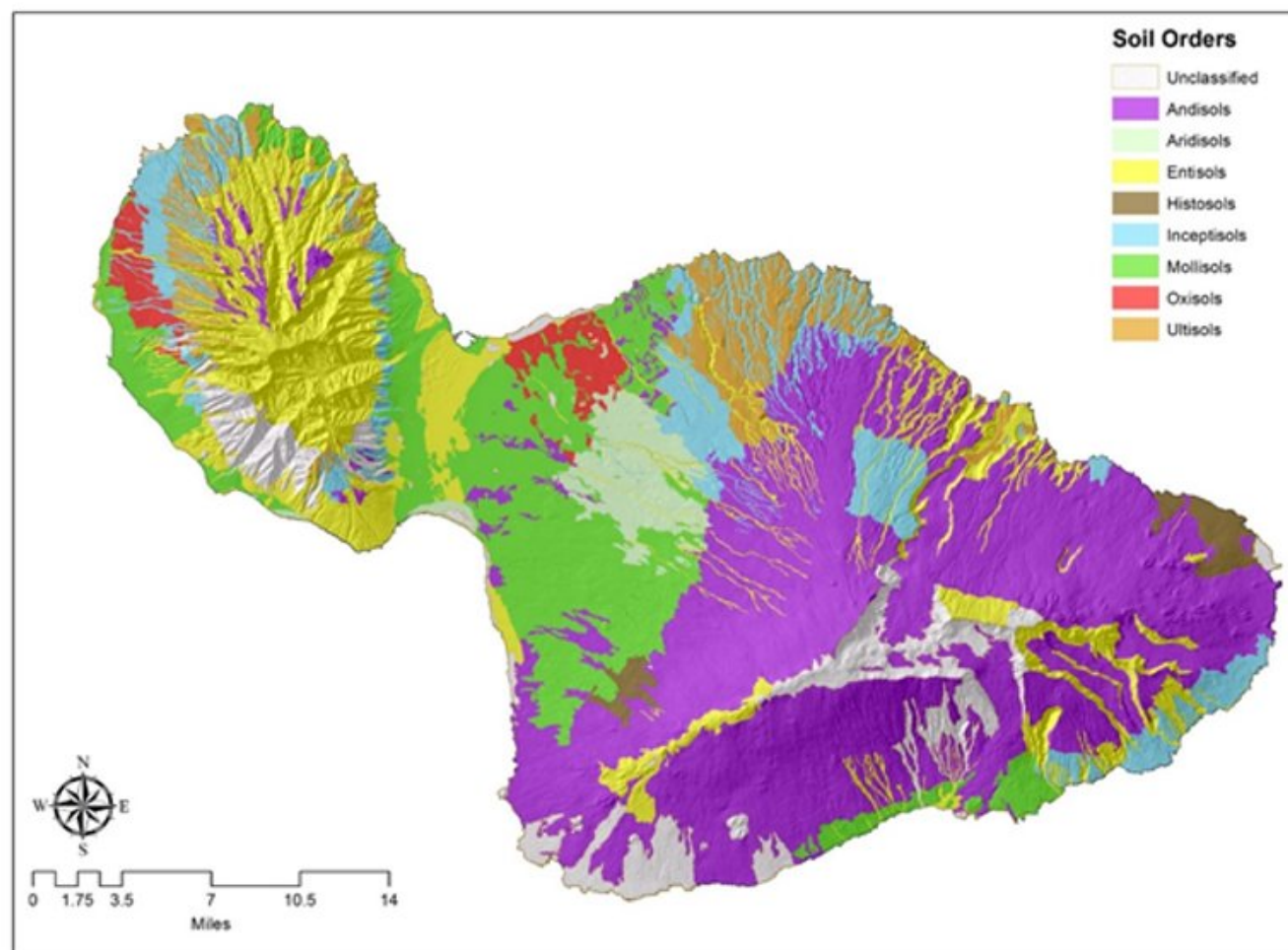


UNIVERSITY
of HAWAII
HILO



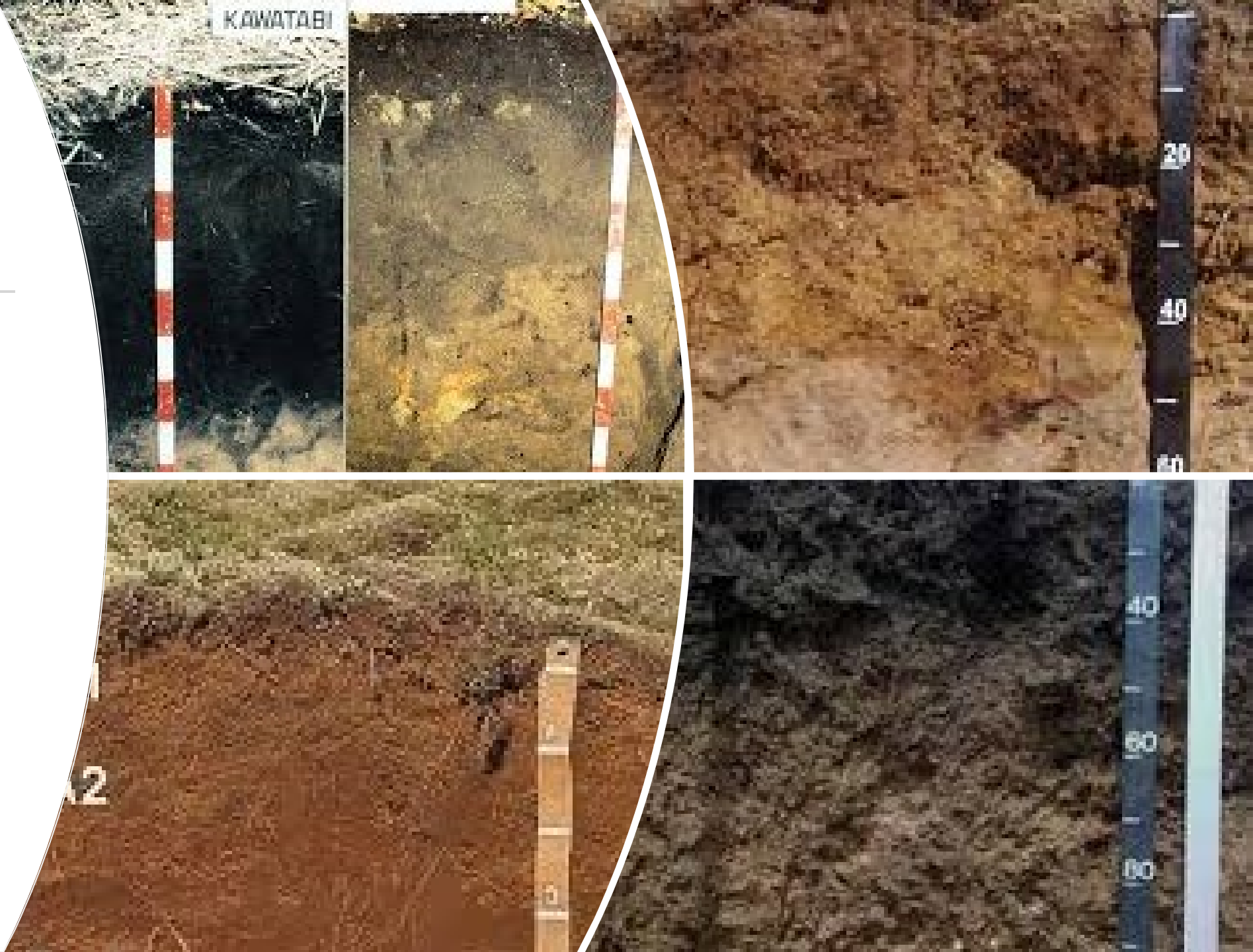
HAWAII AGRICULTURAL LAND UTILIZATION (2015)





Andisols

- <1% of the world's soils
- Store 1.8 – 5% of the world's soil organic carbon
- ≈39% of Hawai'i's land area (818,479 acres)
- Unique mineralogy = extremely high surface area
- Not all Andisols are weathered equally



Grazing and Carbon Sequestration

Grazing does not equal carbon sequestration

Responsible grazing encourages closed canopy and vigorous plant growth

Rangelands possess diverse value

Diverse ecosystem types increase resiliency and decrease impacts from natural disaster

SILVOPASTURE



- Integrating cattle and forest to harvest beef and timber from the land
- Rancher must be able to be profitable in order to maintain
- Consider that disturbing soil may release more carbon than captured

(Crow et al. 2017, Gross et al. 2017)

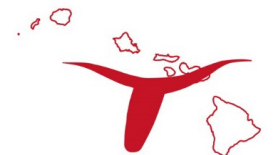


Hawaii Cattlemen's Council, Inc.

SHOWCASE AND IMPROVE



- Establish baseline carbon stocks in Hawai'i's rangelands
- Assess effects of grazing management on soil carbon stocks by comparing different grazing systems
- Measure soil carbon sequestration rates for grazing over different soil types.
- Support for ranchers to implement well-managed grazing



WORKS CITED

- Bremer, L. L., Nathan, N., Trauernicht, C., Pascua, P., Krueger, N., Jokiel, J., Barton, J., & Daily, G. C. (2021). Maintaining the Many Societal Benefits of Rangelands: The Case of Hawai'i. *Land*, 10(7), 764. <https://doi.org/10.3390/land10070764>
- Cambardella, C.A.; Moorman, T.B.; Novak, J.M.; Parkin, T.B.; Karlen, D.L.; Turco, R.F.; Konopka, A.E. Field-Scale Variability of Soil Properties in Central Iowa Soils. *Soil Sci. Soc. Am. J.* **1994**, 58, 1501–1511. [[Google Scholar](#)] [[CrossRef](#)]
- Crow, S.E.; Turn, M.; Taniguchi, S.; Schubert, S.; Koch, N. Carbon Balance Implications of Land Use Change from Pasture to Managed Eucalyptus Forest in Hawai'i. *Carbon Manag.* **2016**, 7, 3–4. [[Google Scholar](#)] [[CrossRef](#)]
- Gross, A.F.; Ray, R.; Gaskin, E. *Reversing Climate Change: A Study of Pathways through Hawai'i's Natural and Working Lands*; Conservation International: Washington, DC, USA, 2017. Available online: http://planning.Hawai'i.gov/wp-content/uploads/Conservation-International-FINAL-Report_GHG-4.30.2020.pdf (accessed on 20 March 2021).
- Project Drawdown: Silvopasture. Available online: <https://www.drawdown.org/solutions/silvopasture/technical-summary> (accessed on 23 May 2021).
- Torn, M.S.; Trumbore, S.E.; Chadwick, O.A.; Vitousek, P.; Hendricks, D.M. Mineral Control of Soil Organic Carbon Storage and Turnover. *Nature* **1997**, 389, 170–173. [[Google Scholar](#)] [[CrossRef](#)]

