

**LEGAL CONSIDERATIONS FOR COASTAL BLUE CARBON PROJECTS IN GEORGIA
AND LOUISIANA**

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I. INTRODUCTION

Restoration of coastal wetlands and natural carbon sequestration are global priorities. Yet, there are currently no carbon credits being generated by coastal wetlands blue carbon offset projects in the United States. The best available science increasingly indicates the potential for a financially viable blue carbon offset program for coastal wetlands. A financially viable blue carbon accreditation mechanism has the potential to partially fund valuable wetland restoration and maintenance critical to coastal regions in Louisiana, Georgia, and other states with extensive coastal wetlands. In addition to carbon sequestration, wetlands provide a plethora of ecosystem services, including providing wave attenuation, bird and wildlife habitat, fishery benefits, recreation, and improved water quality.

There are currently no federal or state laws related specifically to blue carbon markets. However, states like Georgia can serve as a model, based on its Carbon Sequestration Registry for forest-based carbon sequestration. Georgia has legislation that is not explicitly about coastal blue carbon but does lay the groundwork for it. Likewise, Louisiana has made legislative changes to use the funds generated by state-sponsored coastal blue carbon projects to finance coastal restoration activities. Louisiana has also produced the first climate action plan within the United States that specifically calls for action on blue carbon.

This article examines legal and policy considerations for voluntary blue carbon markets in Louisiana and Georgia and stems from Sea Grant's Blue

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Carbon Law Symposium, which included a Blue Carbon Network Meeting. The Blue Carbon National Working Group also held a workshop at State of the Coast 2023.⁴ Further, this article reviews the role of ecosystem services as co-benefits in coastal blue carbon verification and valuation.

A. Meeting International Climate Goals

Climate change is a global challenge that has led to unprecedented global attention on solutions. The Paris Agreement, originally adopted in 2015, calls on countries to reduce their emissions of greenhouse gases (GHGs), or nationally determined contributions (NDCs). The Biden Administration has set a target to reduce carbon emissions by 50-52% compared to 2005 levels by 2030.⁵ The United States and other developing countries have also pledged to mobilize a combined \$100 billion to finance climate sustainability efforts for developing countries under the United Nations Framework Convention on Climate Change (UNFCCC).⁶ The Oxford Principles for Net Zero Aligned Carbon Offsetting urged voluntary carbon markets to implement a higher standard for quality, nature-based carbon sequestration projects.⁷

Likewise, corporations are making bold net zero carbon pledges, motivated by consumer and shareholder demands. These corporations have created a demand for high-quality carbon offsets, which can often be of higher value.⁸

The conversation has grown from not just cutting emissions but also using the natural environment to sequester GHGs. The 2009 Manado Oceans

⁴ [Sea Grant Blue Carbon Law Symposium](#), SOUTH CAROLINA SEA GRANT CONSORTIUM (last visited Jan. 22, 2024). See also [Blue Carbon National Working Group](#), RESTORE AMERICA'S ESTUARIES (last visited Mar. 6, 2024).

⁵ THE WHITE HOUSE, [FACT SHEET: PRESIDENT BIDEN'S LEADERS' SUMMIT ON CLIMATE](#) (2021).

⁶ Julie Bos & Joe Thwaites, [Technical Note: A Breakdown of Developed Countries' Public Climate Finance Contributions Towards the \\$100 Billion](#), WORLD RES. INST. (Oct. 5, 2021).

⁷ M. ALLEN, K. AXELSSON, B. CALDECOTT, T. HALE, C. HEPBURN, C. HICKEY, E. MITCHELL-LARSON, Y. MALHI, F. OTTO, N. SEDDON. & S. SMITH, S., UNIVERSITY OF OXFORD, THE OXFORD PRINCIPLES FOR NET ZERO ALIGNED CARBON OFFSETTING 15 (2020).

⁸ [Carbon Offset Market Could Reach \\$1 Trillion With Right Rules](#), BLOOMBERG NEF (Jan. 23, 2023).

Declaration stressed the importance of nations to develop strategies for sustainable management of coastal ecosystems for both their benefits as buffer zones and “significant potential for addressing the adverse effects of climate change.”⁹

The Intergovernmental Panel on Climate Change (IPCC) assessed the potential of using coastal ecosystems as a tool to mitigate climate change and found that these coastal ecosystems can sequester an estimated 2% of current global emissions.¹⁰ The IPCC stressed the importance of protecting coastal ecosystems and the additional benefits that “blue carbon ecosystems” have on water quality, biodiversity, and fisheries.¹¹ Likewise, the United States has released the Ocean Climate Action Plan, which stressed the importance of blue carbon and the need to restore and protect coastal wetlands.¹²

B. Blue Carbon Overview

The term “blue carbon” describes the ability of marine ecosystems to capture and store carbon in a manner that is amenable to management.¹³ The component relevant for Louisiana and Georgia is carbon captured in coastal blue carbon ecosystems, the IPCC defines as tidal marshes, mangroves, and seagrasses. Managing coastal blue carbon presents an opportunity to generate revenue for and from coastal restoration by generating greenhouse gas offset credits from restoration or preserving these coastal habitats to incentivize private investment in coastal restoration. Coastal blue carbon ecosystems have potential to offset greenhouse gas emissions that industries cannot otherwise reduce.¹⁴

⁹ [Manado Oceans Declaration](#), ¶ 2 (May 14, 2009) (World Ocean Conference).

¹⁰ Nerilie Abram et al., [Summary for Policymakers](#), in IPCC SPECIAL REPORT ON THE OCEAN AND CRYOSPHERE IN A CHANGING CLIMATE 3, 30 (C.2.4.) (H.-O. Pörtner et al., eds., Cambridge University Press, 2019). See also Amro Abd-Elgawad et al., [Technical Summary](#), in IPCC SPECIAL REPORT ON THE OCEAN AND CRYOSPHERE IN A CHANGING CLIMATE 39 (H.-O. Pörtner et al., eds., Cambridge University Press, 2019).

¹¹ Abram et al., *supra* note 10.

¹² OCEAN POLICY COMM., THE WHITE HOUSE, [OCEAN CLIMATE ACTION PLAN](#) (2023).

¹³ [Annex I: Glossary](#), in IPCC SPECIAL REPORT ON THE OCEAN AND CRYOSPHERE IN A CHANGING CLIMATE (Nora M. Weyer ed., Cambridge University Press, 2019).

¹⁴ Daniel Friess, Jen Howard, Mark Huxham, Peter Macreadie & Finnley Ross, [Capitalizing on the Global Financial Interest in Blue Carbon](#), 1:8 PLOS CLIMATE e0000061 (2022).

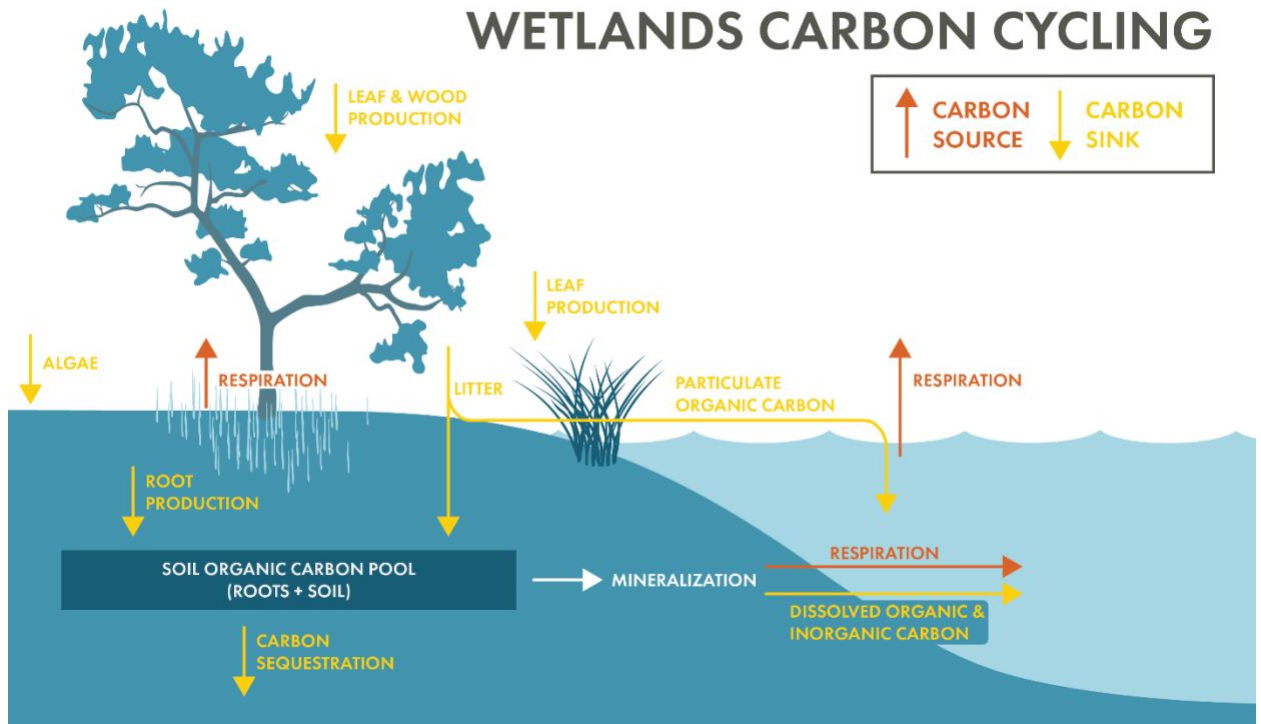


Figure 1. This illustration provides a high-level overview of how carbon is naturally sequestered in a coastal blue carbon environment.¹⁵

Until recently, most of the focus on natural carbon sequestration has been on forests and mangroves. However, the National Ocean Service has estimated that mangroves and coastal wetlands are ten times more efficient at sequestering carbon than certain forests.¹⁶ Forest conservation and its contribution to carbon sequestration is important. However, the potential coastal wetlands have for sequestering carbon and creating a funding mechanism for restoration should not be overlooked.

Voluntary carbon markets provide an opportunity for companies to buy different types of credit to offset their greenhouse gas emissions. The value of global voluntary carbon markets surpassed \$2 billion in 2021, with the average

¹⁵ Figure created by the Water Institute.

¹⁶ [Coastal Blue Carbon](#), NAT'L OCEAN SERV. (August 16, 2023).

price per ton for Forestry and Land Use being \$5.80.¹⁷ The types of carbon credit also showed natural carbon sequestration is growing in relevance, as 46% of the traded volume in 2021 was Forestry and Land Use.¹⁸ This shows there is a demand for nature-based carbon credits, and a voluntary blue carbon market has the potential to generate substantial funding.

The Biden Administration has pushed for climate action, and specifically, advancing nature-based restoration projects.¹⁹ However, the expansion of voluntary blue carbon markets could be accelerated with additional federal support by way of providing a tax credit or other incentive to keep naturally sequestered GHGs in the ground (i.e., protect existing wetlands) and an additional incentive for restoring wetlands.

The science surrounding blue carbon continues to advance due to the urgent need for climate solutions. If coastal blue carbon is to be capitalized on as a mitigation solution, there is an urgent need for the parallel advancement of blue carbon laws and policies.

II. ADDITIONAL BENEFITS OF BLUE CARBON ECOSYSTEM RESTORATION AND PROTECTION

As stated above, there is international interest in not just reducing carbon emissions, but also in protecting coastal ecosystems due to the community benefits gained from coastal ecosystems, such as reducing erosion and improving water quality, biodiversity, bird habitat, recreation, and fisheries.²⁰ The term often used to reference the economic and socio-cultural benefits natural ecosystems

¹⁷ FOREST TRENDS' ECOSYSTEM MARKETPLACE, THE ART OF INTEGRITY: STATE OF VOLUNTARY CARBON MARKETS, Q3 INSIGHTS BRIEFING (2022).

¹⁸ *Id.*

¹⁹ THE WHITE HOUSE, [NATURE BASED SOLUTIONS RESOURCE GUIDE](#) (2022). *See also* THE WHITE HOUSE, [A REPORT TO THE NATIONAL CLIMATE TASK FORCE: OPPORTUNITIES FOR ACCELERATING NATURE-BASED SOLUTIONS: A ROADMAP FOR CLIMATE PROGRESS, THRIVING NATURE, EQUITY, AND PROSPERITY](#) (2022).

²⁰ Abram et al., *supra* note 10, at C.2.4; MILLENNIUM ECOSYSTEM ASSESSMENT, [ECOSYSTEMS AND HUMAN WELL-BEING: CURRENT STATE AND TRENDS, VOLUME 1](#) (Rashid Hassan, Robert Scholes & Neville Ash, eds., 2005).

provide is “ecosystem services.”²¹ Coastal blue carbon ecosystems across the United States are critically important for conservation and resilience efforts. These ecosystems provide important nursery ground for fisheries, bird nesting habitat, protection for communities against coastal erosion and a range of ecological, economic, and cultural benefits.²²

The economic benefit of restoring and protecting coastal wetlands is also proving to be incredibly high. The cost of coastal land loss without restoration and resilience projects could increase in Louisiana alone by up to \$19 billion annually.²³ These benefits in and of themselves provide economic drivers for restoration; however, of growing interest is the capacity of wetlands to naturally sequester carbon. Blue carbon ecosystems play a critical role in helping the global community reach its carbon reduction goals.²⁴

The loss of coastal habitat has significant biodiversity, economic, and social consequences. For example, coastal wetland degradation and loss has reduced the size and diversity of fish populations, affecting the sustainability of commercial and recreational fisheries.²⁵ Estuaries, including tidal wetlands, generate approximately half of the commercially harvested seafood in the United States.²⁶ One 2019 study indicated that U.S. fisheries supported 1.8 million jobs and contributed \$255 billion to the economy.²⁷

²¹ JORDAN R. FISCHBACK, SOUPY DALYANDER, TIM CARRUTHERS, COLLEEN MCHUGH, ALLISON DEJONG, BRETT MCMANN, ABBY LITTMAN, ALLISON HAERTLING, PATRICK KANE & CRAIG A. BOND, WATER INST. OF THE GULF, [ENHANCING BENEFITS EVALUATION FOR WATER RESOURCES PROJECTS: CASE STUDY ANALYSIS RESULTS AND RECOMMENDATIONS](#) (2023).

²² INTERAGENCY COASTAL WETLANDS WORKGROUP, [RECOMMENDATIONS FOR REDUCING WETLAND LOSS IN COASTAL WATERSHEDS OF THE UNITED STATES](#) (2022); Betsy Von Holle et al., *Effects of Sea Level Rise on Coastal Species*, 83 J. WILDLIFE MGMT. 694 (2019).

²³ Xinyu Fu & Jie Song, *Assessing the Economic Costs of Sea Level Rise and Benefits of Coastal Protection: A Spatiotemporal Approach*, 9 SUSTAINABILITY 1495 (2017); LA. COASTAL PROT. & RESTORATION AUTH., [LOUISIANA’S COMPREHENSIVE MASTER PLAN FOR A SUSTAINABLE COAST](#) 39 (2023) (Without restoration and resilience projects “flood damages could increase by up to \$19 billion annually.”).

²⁴ PEW CHARITABLE TRUST, [COASTAL ‘BLUE CARBON’: AN IMPORTANT TOOL FOR COMBATING CLIMATE CHANGE](#) (2021).

²⁵ *Id.* at 21; *See also* Lindsay Wylie, Ariana E. Sutton-Grier & Amber Moore, *Keys to Successful Blue Carbon Projects: Lessons Learned from Global Case Studies*, 65 MARINE POL’Y 76 (2016).

²⁶ LA. COASTAL PROT. AND RESTORATION AUTH., *supra* note 23.

²⁷ NAT’L MARINE FISHERIES SERV., [FISHERIES ECONOMICS OF THE UNITED STATES 2019](#) (2022).

The nation is losing an average of 80,160 acres of coastal wetlands each year due to sea level rise, subsidence, erosion, drainage, and development.²⁸ Further, when wetlands are lost, not only are their ecosystem services lost, but GHGs are released.²⁹ It is estimated that up to 1.02 billion tons of carbon dioxide equivalent is released from degraded coastal wetlands on an annual basis.³⁰ Thus, while it is of global significance to restore coastal blue carbon ecosystems from a sequestration standpoint, it is also critical to protect intact blue carbon systems so as not to release GHGs.

Within the voluntary blue carbon market, projects vary in value, based on the amount of carbon sequestered. Projects that have co-benefits are considered high quality and usually have a higher value.³¹ For example, certain projects can be certified as a Verra Climate, Community & Biodiversity (CCB) Gold project. This qualification would require alignment with the CCB Standards.³² Projects that meet these higher standards due to verifiable co-benefits will be of higher value than if the same project did not verify the co-benefits.

²⁸ THOMAS E. DAHL & SUSAN-MARIE STEDMAN, U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., STATUS AND TRENDS OF WETLANDS IN THE COASTAL WATERSHEDS OF THE CONTERMINOUS UNITED STATES 2004 TO 2009 (2013) (on-file with author).

²⁹ Yongjiu Feng, Shurui Chen, Xiaohua Tong, Zhenkun Lei, Chen Gao & Jiafeng Wang, *Modeling Changes in China's 2000–2030 Carbon Stock Caused by Land Use Change*, 252 J. CLEANER PROD. 119659 (2020).

³⁰ Linwood Pendleton, Daniel C. Donato, Brian C. Murray, Stephen Crooks, W. Aaron Jenkins, Samantha Sifleet, Christopher Craft, James W. Fourqurean, J. Boone Kauffman, Nu'ria Marba', Patrick Megonigal, Emily Pidgeon, Dorothee Herr, David Gordon & Alexis Baldera, *Estimating Global "Blue Carbon" Emissions from Conversion and Degradation of Vegetated Coastal Ecosystems*, 7:9 PLoS ONE no. e43542 (2012).

³¹ CONSERVATION INTERNATIONAL ET AL., [HIGH-QUALITY BLUE CARBON PRINCIPLES AND GUIDANCE](#) (2022).

³² VERIFIED CARBON STANDARDS (VCS) PROGRAM, [THE CLIMATE, COMMUNITY & BIODIVERSITY STANDARDS](#) (3rd Ed. 2017).

III. BLUE CARBON PROJECTS IN THE UNITED STATES

As of 2020, roughly 2.15 billion people live within 100 kilometers (about 62.14 miles) of the coastline, in the near coastal zone.³³ More than 600 million people live in a coastal area less than ten meters above sea level.³⁴ In the United States, 127 million people live in coastal communities, accounting for a population density over five times greater in coastal shoreline communities than the U.S. average.³⁵ Because of dense coastal populations, it is imperative to protect the coasts. However, restoring and maintaining coastal environments requires funding. Blue carbon markets have the potential to raise capital to fund coastal restoration projects that in turn, provide a range of ecosystem services.

The United States does not have blue carbon standards in law or policy at this time. However, the Ocean Climate Action Plan outlines the need for more research, monitoring, and standards for blue carbon management.³⁶ An independent carbon credit entity, such as Verra, American Carbon Registry, or Gold Standard, verifies the project. The credits sold to buyers come with the understanding that the carbon credit certification has an accurate methodology to determine the credits being sold actually deliver the said carbon offsets.

The federal government is also looking holistically at project benefits. For example, studies have shown that focusing exclusively on project cost and a limited set of economic benefits from nature-based solutions fails to capture the full impacts of these projects.³⁷

There has also been an emergence of valuing the ecosystem services that blue carbon ecosystems provide. The federal agencies have been working with

³³ Lena Reimann, Athanasios T. Vafeidis & Lars E. Honsel, [Population development as a driver of coastal risk: Current trends and future pathways](#), 1 CAMBRIDGE PRISMS: COASTAL FUTURES e14, 1–12 (2023).

³⁴ Kytt MacManus, Deborah Balk, Hasim Engin, Gordon McGranahan & Rya Inman, [Estimating population and urban areas at risk of coastal hazards, 1990–2015: How data choices matter](#), 13 EARTH SYS. SCI. DATA 5747 (2021).

³⁵ [What percentage of the American population lives near the coast?](#), NAT. OCEANIC & ATMOSPHERIC ADMIN. (Jan. 18, 2024).

³⁶ OCEAN POLICY COMM., *supra* note 12.

³⁷ FISCHBACK ET AL., *supra* note 21.

partners to reevaluate their value metrics to include the value of ecosystem services.³⁸ These quantification studies and awareness of the ecosystem service values can and should be considered when valuing blue carbon credits.

When thoughtfully designed, these projects protect biodiversity, promote the sustainable economic development of communities, and can have a myriad of other positive impacts. Such projects can bring sustainable livelihoods to local people through sustainable fishing, soil and water protection, direct employment, and the use and sale of outdoor recreational activities.³⁹ During the planning process for these projects, communities can be involved to provide input on priority concerns that shapes and supports decision-making, as well as increasing their understanding of the effects of climate change and the community's capacity to adapt.⁴⁰

Certifiers of carbon credits also value the co-benefits of carbon-reduction projects. The co-benefits can be disclosed and valued within standard verification projects. Of relevance is the Blue Carbon Project Gulf of Morrosquillo, in Columbia, which is registered as a Verra Verified Carbon Standard (VCS) project and utilized the VM0007 methodology.⁴¹ The focus of the project is sequestering carbon; however, the project has co-benefits that include habitat restoration for endangered species and community participation in sustainable management practices.⁴² There are also some verification processes that highlight specific ecosystem services as part of the verification methodology. For example, many of the projects in the CCB Verra Registry are coupled with GHG reduction projects. As the name suggests, the projects tend to benefit the community, climate, and biodiversity. Several programs include training or educating local communities on sustainable practices and income opportunities. There is also an opportunity to

³⁸ *Id.*

³⁹ LASSE KRANTZ, SWEDISH INT'L DEV. COOP. AGENCY, [THE SUSTAINABLE LIVELIHOOD APPROACH TO POVERTY REDUCTION](#) (2001); Wylie, Sutton-Grier & Moore, *supra* note 25.

⁴⁰ Scott A. Hemmerling et al., [Elevating local knowledge through participatory modeling: active community engagement in restoration planning in coastal Louisiana](#), 22 J. GEOGRAPHICAL SYS. 241 (2019).

⁴¹ [The Blue Carbon Project Gulf of Morrosquillo: Protecting Mangroves and Marshes in Colombia](#), VERRA (last visited Mar. 6, 2024).

⁴² *Id.*

have projects that fall under the Sustainable Development Program (SD Vista Projects). Projects here often have a positive climate and community impact, with the objective of reaching SDGs. SD Vista project examples include electric bike projects, equipping and training households with cooktop stoves, water management and rice cultivation, and safe water access.

While these projects are often sited in undeveloped areas, there is the possibility to have certified projects in the United States. Not only has the impact of naturally sequestering carbon been gaining attention, but so has the cost of GHGs to communities. The Biden Administration has reinstated an Interagency Working Group, which determines the Social Cost of Greenhouse Gas Emissions.⁴³ The Administration has directed federal agencies to consider whether projects increase or reduce GHGs as part of their benefit-cost analysis.⁴⁴ Considering GHGs and their social costs will likely cause regulatory agencies to approve more nature-based projects and limit the approval of projects that degrade blue carbon environments. This change in policy may increase the value of projects in the voluntary blue carbon market. The guidance also supports the notion that there is value in reducing GHGs.⁴⁵ The methodology and standards for project certification in the voluntary carbon market are based on the environment (e.g. forest, boreal, wetland) and not the geographic location or jurisdiction. Thus, the methodology for a tidal wetland project in the United States would be similar to the methodology for a tidal wetland project in another country, with the most applicable methodology being VM0033.⁴⁶ There are not necessarily legal obstacles to a voluntary blue carbon market at the federal level, and the U.S. Securities and Exchange Commission (SEC) takes a neutral position on the use of carbon credits. However, the SEC may finalize a proposed rule that would require companies to disclose whether their net carbon emissions are being reduced through actual emissions reductions or through purchasing offsets.⁴⁷ Some

⁴³ THE WHITE HOUSE, [FACT SHEET: BIDEN-HARRIS ADMINISTRATION ANNOUNCES NEW ACTIONS TO REDUCE GREEN HOUSE GAS EMISSIONS AND COMBAT THE CLIMATE CRISIS](#) (2023).

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ VERRA, [METHODOLOGY FOR TIDAL WETLAND AND SEAGRASS RESTORATION \(VM0033\)](#), Version 2.1 (2023).

⁴⁷ [The Enhancement and Standardization of Climate Related Disclosures for Investors](#), 87 Fed. Reg. 21334 (April 11, 2022).

comments to the proposed rule support disclosure of which offsets were purchased for increased transparency and integrity.⁴⁸

At the time of this writing, Virginia is the only state to have a blue carbon project in the validation and verification process.⁴⁹ The Virginia Seagrass Restoration Project (VSRP) used a seed-dispersal technique that has led to 10,000 acres of eelgrass in the Virginia Coast Reserve.⁵⁰ The VSRP started as a conservation effort that has improved the water quality in the area and created a higher fish population.⁵¹ The VSRP and its partners also began to monitor the project's sequestration capacity and determine whether the VSRP successfully captured and stored carbon dioxide into the aquatic ecosystems' soil and plants.⁵² Over the course of twenty years, the project is estimated to capture 5,000 tons of carbon, which equates to the yearly carbon dioxide emissions of 3,500 cars.⁵³

Similar to other coastal states, neither Georgia nor Louisiana has a coastal blue carbon project submitted for accreditation in a voluntary blue carbon market. However, Georgia is the site for a remediation project in salt marsh habitat with environmental monitoring that focuses on carbon sequestration and other ecosystem services, including coastal resiliency, water quality, and biodiversity.⁵⁴

A. Blue Carbon Action in Louisiana

Louisiana is home to 37% of the estuarine wetlands in the United States, providing a plethora of ecosystem services.⁵⁵ In Louisiana the main drivers toward a blue carbon market are to provide the opportunity and resources to

⁴⁸ [Letter from The Integrity Council for the Voluntary Carbon Market to the Sec'y of the U.S. Sec. Exchange Comm'n](#) (June 17, 2022).

⁴⁹ Jill Bieri, [Virginia Seagrass Restoration Project Establishes a Model for Similar Action Worldwide](#), U.S. NATURE4CLIMATE (Nov. 6, 2022).

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² *Id.*

⁵³ *Id.*

⁵⁴ [Deepverge secures Blue Carbon Resilience project in Georgia and South Carolina worth £2.4m](#), MOD. WATER (Sept. 13, 2022).

⁵⁵ BRAD R. COUVILLION ET AL., U.S. GEOLOGICAL SURV., [LAND AREA CHANGE IN COASTAL LOUISIANA FROM 1932 TO 2010](#) (2011).

protect the state's coast while also providing incentives for industries and organizations to reduce their net carbon output.

Louisiana's Climate Action Plan aims to reduce carbon emission levels by 40-50% by 2030 and to net zero by 2050.⁵⁶ The plan lays out strategies to reduce carbon emissions, including Action 15.3 which details the need to develop a crediting mechanism and market for blue carbon.⁵⁷ Action 15.3 of Louisiana's Climate Action Plan, states in relevant part:

The natural carbon sequestration potential of Louisiana's coastal habitats is too valuable to be entirely precluded from market-based systems that can support the conservation and restoration of these important ecosystems. With the assistance of blue carbon experts, carbon verifiers, and coastal ecologists, Louisiana should evaluate the longevity of coastal carbon pools, the design and market interest for the creation of a specialized carbon credit, and the market specific to Louisiana's coastal wetland habitats. This potential Louisiana credit and market would more directly take into account the sequestration potential of coastal wetland habitats as well as the shorter time scales that conservation or restoration efforts would be expected to offer given the dynamic nature of deltaic systems. This credit and market would attempt to match the local and global demand for natural carbon credits with the urgent need to protect and restore Louisiana's wetland ecosystems for the preservation of the state's culture, communities, economy, and environment.

However, many of the coastal restoration projects carried out by the Coastal Protection and Restoration Authority (CPRA) are funded by settlement funds from the BP Deepwater Horizon Oil Spill. This funding source will be depleted by 2032, with certain coastal restoration projects incomplete and others in need of funding for maintenance.⁵⁸ Thus, Louisiana is particularly motivated to

⁵⁶ CLIMATE INITIATIVE TASK FORCE, [LOUISIANA CLIMATE ACTION PLAN](#) (2022).

⁵⁷ *Id.*

⁵⁸ LA. COASTAL PROT. & RESTORATION AUTH., *supra* note 23.

participate in a voluntary blue carbon market to fund restoration and maintenance projects necessary to reach its climate and resilience goals.

B. Co-Benefits of Blue Carbon in Louisiana

Louisiana has the potential to produce high quality and high impact blue carbon projects with SDG benefits. The IPCC reported climate change will cause adverse effects upon salt marshes, mangroves, and low-lying coastal systems.⁵⁹ These various systems are plentiful across the state of Louisiana. Participation in a voluntary blue carbon market in Louisiana will provide the opportunity to protect vulnerable coastal systems.⁶⁰ Since 1932, more than 5,196 square kilometers, or 25%, of Louisiana's coastal marsh has been submerged under water.⁶¹ As the barrier islands of Louisiana disappear, these coastal marshes no longer have the protection they once had.⁶² Funds generated from coastal blue carbon projects have the potential to increase the support for protecting, managing, and restoring the United States' coast.

Louisiana develops a master plan every five years, which contains comprehensive coastal restoration and risk reduction projects. The Louisiana Coastal Master Plan has several projects that have elements that do not sequester carbon. These projects include: building boat launches; Campground Improvements; Hydrological Restoration; Science & Education Complex; Land Bridges; Earthen Levees; and Other Programmatic Restoration Projects.⁶³ While these projects do not generate blue carbon credits they do compliment blue carbon projects, benefit the local community, and in some instances, may also have biodiversity benefits.⁶⁴ Thus, the opportunity exists for these projects to still generate credits under the Verra CCB Program or the SD Vista Program.

⁵⁹ Nathaniel L. Bindoff, William W.L. Cheung & James G. Kairo, [Changing Ocean, Marine Ecosystems, and Dependent Communities](#), in: IPCC SPECIAL REPORT ON THE OCEAN AND CRYOSPHERE IN A CHANGING CLIMATE 447 (H.-O. Pörtner, et al. 2019).

⁶⁰ Manado Ocean Declaration, *supra* note 9.

⁶¹ Paige Byerly, Bethann G. Merkle & Megan Hepner, [Renewed Hope for Coastal Marshes in Louisiana](#), 107:2 AM. SCIENTIST 98 (2019).

⁶² *Id.*

⁶³ LA. COASTAL PROT. & RESTORATION AUTH., *supra* note 23.

⁶⁴ *Id.*

Louisiana's coastal area supports extensive infrastructure associated with the energy and chemical industry, placing sensitive structures in an increasingly risky environment as the coastline faces degradation and erosion.⁶⁵ In Louisiana there are 388 chemical facilities that contain highly hazardous material within fifty miles of the coast and are at increased risk of flooding and hurricane damage.⁶⁶ Damage to the infrastructures would not only be economically harmful to the corporations, but also potentially devastating to neighboring communities.⁶⁷ Louisiana-based industries have the opportunity to mitigate weather-related risk by purchasing offset credits generated by coastal blue carbon projects based in Louisiana.

C. Louisiana's Legal Pathway to a Blue Carbon Market

Louisiana has a legal framework to participate in a voluntary blue carbon market. There is a statutory pathway for which projects would be undertaken by the state, and in that case, the state's CPRA would own the derived monetary benefits of the projects.⁶⁸ Likewise, a property owner may also enter the voluntary carbon market and either receive monetary compensation or contractually assign it to another party.⁶⁹

Despite the straightforward statutory language, Louisiana's coast is mostly tidal marshes which creates complex boundary issues and scientific gaps for optimal methodologies. Coastal property boundaries are ambulatory and whether land is submerged or not changes the legal ramifications of the property. This complex environment has spurred verification challenges and conservative

⁶⁵ HEMMERLING, S.A., CARRUTHERS, T.J.B., HIJUELOS, A.C., RILEY, S., BIENN, H.C., WATER INST. OF THE GULF, [TRENDS IN OIL AND GAS INFRASTRUCTURE, ECOSYSTEM FUNCTION, AND SOCIOECONOMIC WELLBEING IN COASTAL LOUISIANA](#) (2016).

⁶⁶ Susan C. Anenberg & Casey Kalman, [Extreme Weather, Chemical Facilities, and Vulnerable Communities in the U.S. Gulf Coast: A disastrous combination](#), 3:5 GEOHEALTH 122 (2019).

⁶⁷ Tristan Baurick & Jeff Adelson, [740 toxic sites in Louisiana are at risk from storms. Are they ready?](#), NOLA.COM (June, 16, 2023).

⁶⁸ LA. STAT. ANN. § 3:1221. *See also id.* §9:1103.

⁶⁹ *Id.* §9:1103.

assumptions that prevent Louisiana from having a lucrative voluntary blue carbon market.⁷⁰

Louisiana law establishes the monetary framework for natural carbon sequestration:

Any monetary compensation derived from the sequestration of carbon on the surface of land or water bottoms through biological processes, including but not limited to the growth of plants or animals or other natural or induced processes, is the property of the owner of the land or water bottom upon which such sequestration occurs, unless (a) contractually assigned to another party; or (b) the sequestration, uptake, or prevention of emission of greenhouse gases is directly related to the avoided conversion or avoided loss attributable to a project carried out or sponsored by the [CPRA] or the [CPRA] Board, including use of public resources as provided in R.S. 49:214.5.4. In such instance, the monetary compensation is the property of the state.⁷¹

The statute allows for circumstances in which landowners may benefit collectively or individually from natural carbon sequestration on privately owned lands. If the project is done by or on behalf of CPRA, the landowner would not directly receive the monetary compensation from the blue carbon market. However, the landowner would be the beneficiary of other benefits such as storm surge protection, reduced rate of land loss, hurricane protection, and reduced risk of infrastructure damage.

The Coastal Protection & Restoration Fund (CPRF) is an established trust fund in Louisiana's state treasury created to provide a dedicated, recurring source

⁷⁰ Tim Carruthers et al., *Filling critical knowledge gaps can reduce uncertainty to improve viability of blue carbon crediting mechanisms for tidal marshes*, FRONTIERS IN ENV'T SCI. (in review). See also Sarah K. Mack et al., *Chapter 23. Status and Challenges of Wetlands in Carbon Markets*, in WETLAND CARBON AND ENVIRONMENTAL MANAGEMENT (K. W. Krauss, Z. Zhu & C. L. Stagg eds., 2021).

⁷¹ LA. STAT. ANN. §9:1103.

of revenues for the Louisiana Coastal Master Plan through the CPRA. Louisiana law provides for the allocation of certain revenues dedicated to CPRA's Trust Fund:

Revenues derived from integrated coastal protection programs, projects, or activities shall be deposited in and credited to the fund.⁷²

This language was added to CPRA's enabling legislation in 2009 specifically to address the potential for the generation of carbon credits from CPRA projects and ensure that any revenues gained from such projects were dedicated back to CPRA's Trust Fund.⁷³ However, Section 9:1103 may need to be modified to include ecosystem services that are separate from the sequestration of carbon.

D. The Blue Carbon Potential in Georgia

The National Wetland Inventory has documented over 804,200 acres of wetlands in coastal Georgia. Fifty-four percent are freshwater, palustrine wetlands and 351,236 acres (44%) are saltwater, estuarine intertidal emergent.⁷⁴ The National Wetland Inventory conducted a preliminary assessment of wetland functions on the various wetland types.⁷⁵ The functions measured included surface water detention, coastal storm surge detention, provisions of flora and fauna, and carbon sequestration.⁷⁶ The assessment determined that nearly all of the wetlands were deemed important for carbon sequestration and wildlife habitat.⁷⁷ Georgia lost approximately 25% to 30% of its wetlands prior to protection efforts in the 1980s.⁷⁸ Of the remaining wetlands in Georgia the U.S. Environmental Protection Agency characterized 50% of the present wetlands to

⁷² *Id.* § 49:214.5.4(F).

⁷³ Act 523, 2009 Regular Session of the Louisiana Legislature.

⁷⁴ GA. DEP'T NAT. RES., WETLANDS OF COASTAL GEORGIA: RESULTS OF THE NATIONAL WETLANDS INVENTORY AND LANDSCAPE-LEVEL FUNCTIONAL ASSESSMENT (2012).

⁷⁵ *Id.*

⁷⁶ *Id.*

⁷⁷ *Id.*

⁷⁸ Elizabeth Kramer, *Wetland Value and Protection Strategies*, in ENCYCLOPEDIA OF WATER 1 (2019).

be in fair to poor condition.⁷⁹ Thus, there is ample opportunity to have coastal blue carbon projects in Georgia while restoring the state's wetlands.

Georgia, like other coastal states, face an existential crisis posed by climate change. Specifically, factors linked to our changing climate, such as coastal flooding, increased severe weather risk, sea level rise, land erosion, and temperature changes, are changing the established environmental and societal structures of coastal communities. Georgia does not have a climate action plan to date, however, the state has received funding through the Climate Pollution Reduction Grant and will be utilizing the funds to develop a climate action plan.⁸⁰ Once a plan is developed there will likely be accelerated motivation to utilize natural carbon sequestration programs, including a voluntary blue carbon market.

E. State Legal Framework and Barriers in Georgia

Georgia has a legal framework specifically designed for carbon projects, though it has primarily focused on forestry-based carbon sequestration.⁸¹ The Georgia Forestry Commission (GFC), in partnership with the Georgia Superior Court Clerk's Cooperative Authority (GSCCA), has established a voluntary carbon sequestration registry.⁸² The registry is a platform that facilitates buying carbon credits from forest landowners.⁸³ At the time of this writing, the registry does not have a process for coastal blue carbon projects and no blue carbon projects were found on the registry.⁸⁴ Still, Georgia is arguably further along in enabling Georgia landowners to participate in a voluntary blue carbon market than other states because Georgia has an established registry with government buy-in to support the buying and selling of carbon credits. Also, the majority of

⁷⁹ U.S. ENV'T PROT. AGENCY, [NATIONAL WETLAND CONDITION ASSESSMENT 2011: A COLLABORATIVE SURVEY OF THE NATION'S WETLANDS](#) (2016).

⁸⁰ Drew Kann, [Georgia is creating its first ever climate plan. Here's what to expect](#), ATLANTA J. CONSTITUTION (July 14, 2023).

⁸¹ GA. CODE ANN. § 12-6-223.

⁸² *Id.* § 12-6-229.

⁸³ [Georgia Carbon Sequestration Registry](#), GA. FORESTRY COMM'N (last visited Feb. 20, 2024).

⁸⁴ *Id.*

Georgia's coastal lands are state owned through Georgia's Protection of Tidewaters Act.⁸⁵

The Georgia Department of Natural Resources (GADNR) Coastal Resources Division manages and engages in wetland projects. Under the Georgia Coastal Marshlands Protection Act of 1970, the State recognizes that:

the coastal marshlands of Georgia comprise a vital natural resource system. The estuarine area ... is the habitat of many species of marine life and wildlife and, without the food supplied by the marshlands, such marine life and wildlife cannot survive. The estuarine marshlands of coastal Georgia are among the richest providers of nutrients in the world. Such marshlands provide a nursery for commercially and recreationally important species of shellfish and other wildlife, provide a great buffer against flooding and erosion, and help control and disseminate pollutants. The coastal marshlands provide a natural recreation resource which has become vitally linked to the economy of Georgia's coastal zone and to that of the entire state. This ... system is costly, if not impossible, to reconstruct or rehabilitate once adversely affected ...⁸⁶

The Georgia Coastal Management Program (GCMP) has a mission to balance economic development, preserve the natural environment, and promote sustainable development for the benefit of the public.⁸⁷ It is because of this legislative charge, that it is recommended here that the GCMP become involved in incorporating a coastal blue carbon credit pathway into Georgia's existing Carbon Sequestration Registry. The GCMP already serves as a liaison among various agencies and provides forums for local governments, developers, and citizens to discuss potential resource issues, environmental impacts, and permit requirements with the appropriate agencies.⁸⁸ The methodologies and certification

⁸⁵ GA. CODE ANN., § 52-1-1, *et. seq.*

⁸⁶ *Id.* §12-5-280 *et seq.*

⁸⁷ *Id.* § 12-5-321.

⁸⁸ *Id.* § 12-5-325.

procedures for the coastal blue carbon sequestration program could be incorporated with the body of laws for the forestry carbon sequestration program, in accordance with Ga. Code Ann. § 12-6-225. The path for state coordination of blue carbon projects in Georgia could begin with coordination efforts from the Coast Resource Division's GCMP, and the involvement of the GFC, Georgia Environmental Protection Division, and GSCCA. The GFC would need to update its regulations and procedures through its administrative process to include coastal blue carbon in its Carbon Sequestration Registry.

IV. CONCLUSION

While Georgia and Louisiana are on different coasts, they both have ecosystems that are naturally sequestering carbon and the potential to quantify and monetize the amount of carbon being naturally sequestered. Coastal states can learn and borrow from each other to help foster a voluntary blue carbon market. Louisiana has a state framework that overcomes many of the legal hurdles and property right conflicts other coastal states may encounter. Louisiana also has a monetary pathway that would allow blue carbon credits to fund coastal projects. Georgia has the mechanics and interagency cooperation of a market figured out through its forest program.

Georgia and Louisiana should consider folding in ecosystem services and co-benefits as part of their voluntary blue carbon market programs. Coupling the benefits of coastal blue carbon sequestration with other ecosystem services would increase the economic value of the blue carbon projects and also have tangible economic benefits for local communities and states.

Coastal states should also continue to invest in the science necessary to propel voluntary blue carbon markets forward on a solid scientific foundation. Lastly, it is necessary to build alignment between coastal communities, social and environmental needs, and coastal protection and restoration efforts. If there is thoughtful and meaningful engagement, blue carbon projects could be immensely beneficial to local communities, the nation, and globally.