BCarbon Stakeholder Meeting

January 11th, 2024

Agenda

- Thank you to our donors
- EPA methane rule overview from Dan Arthur, ALL Consulting
- Methane webinar updates
- Discussion of Updated Principles
- New research grant updates

Upcoming Meetings + Events

- Methane Webinar: January 25th, 1-3 PM CT
- Insurance subcommittee: February 1st, 10 AM CT
- SWG meetings on 2nd Thursday of the month for February (2/8), March (3/14)

All meetings via Zoom. Please email Sarah.Swackhamer@BCarbon.org to be added to any invitation list.

Thank you to our supporters

- Bia-Echo Foundation
- Formosa Plastics
- Valero Foundation
- TAMU Climate Smart
- Horizon Foundation
- Mitchell Foundation
- Lyda Hill Foundation (Rice University)
- Rice Management Corporation
- Carbon Royalty Corporation
- ExxonMobil
- Palacios Marine Agricultural Research

- Ann Hamilton
- Joe Swinbank
- Swinbank Family
- Lorraine Wulfe
- Ron and Lin Drees
- Beth Robertson
- Rod Sanders
- Garden Club of Houston

EPA Methane Rule & Beyond

Dan Arthur, ALL Consulting

Well Plugging Significance, Current & Ongoing Risks, New EPA Methane Rule, Additionality, & BCarbon

J. Daniel Arthur, P.E., SPEC, CPG, FGS, QMS
ALL Consulting, LLC
Tulsa, Oklahoma
January 11, 2024






Idle & Orphan Well Plugging

Idle & Orphan Well Plugging

- There are millions of Orphan & Idle/Non-Producing oil & gas wells throughout the United States and a significant percentage of these wells are venting and/or have the potential to emit considerable volumes of methane. Methane gas is 84 times more hazardous than carbon dioxide.
- Individual Idle, Orphan, & Marginal wells typically emit 10,000 to 500,000 Metric Tons of CO_2 equivalent over a 20-year period.
- Plugging these wells has an immediate impact by eliminating harmful & quantifiable emissions that would otherwise continue, supporting the case for "Additionality".

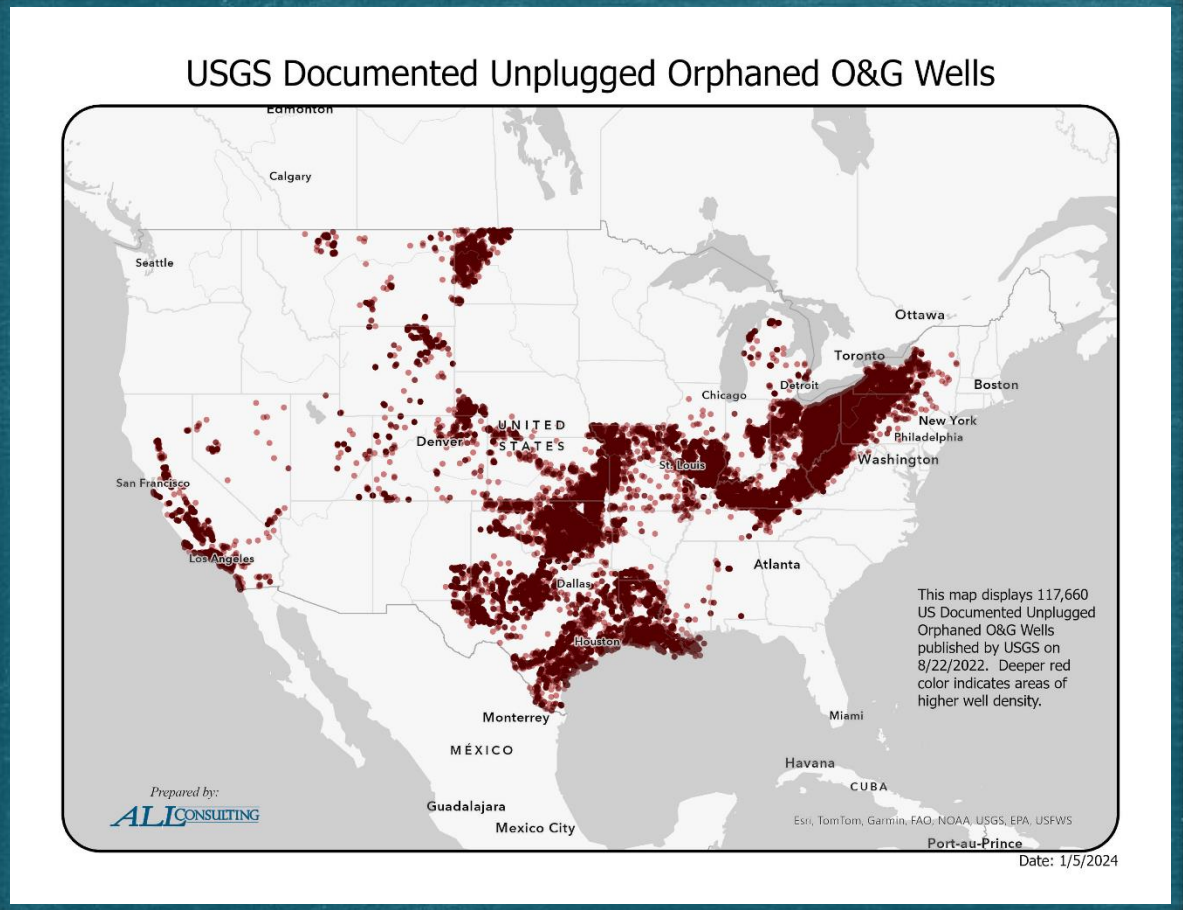
Idle & Orphan Wells:
A historic and ongoing problem!

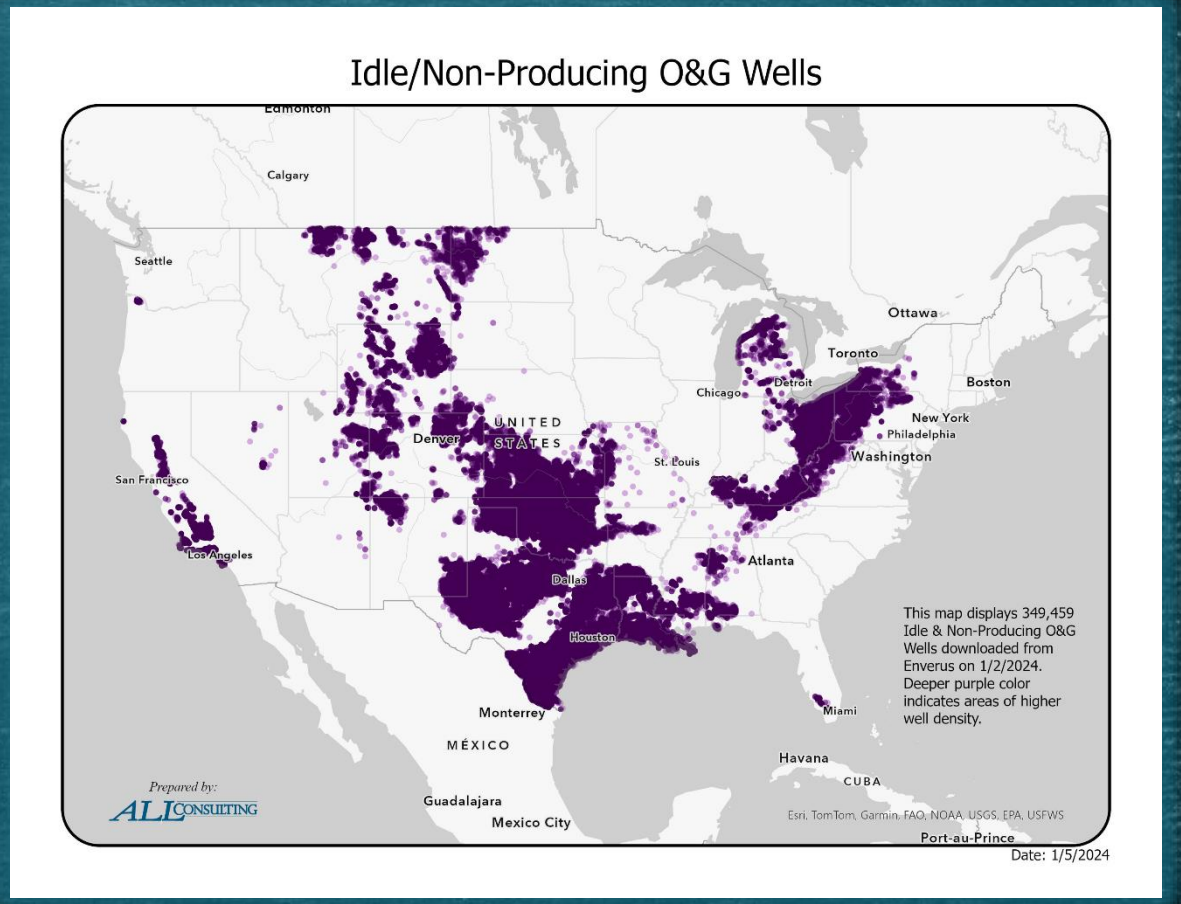






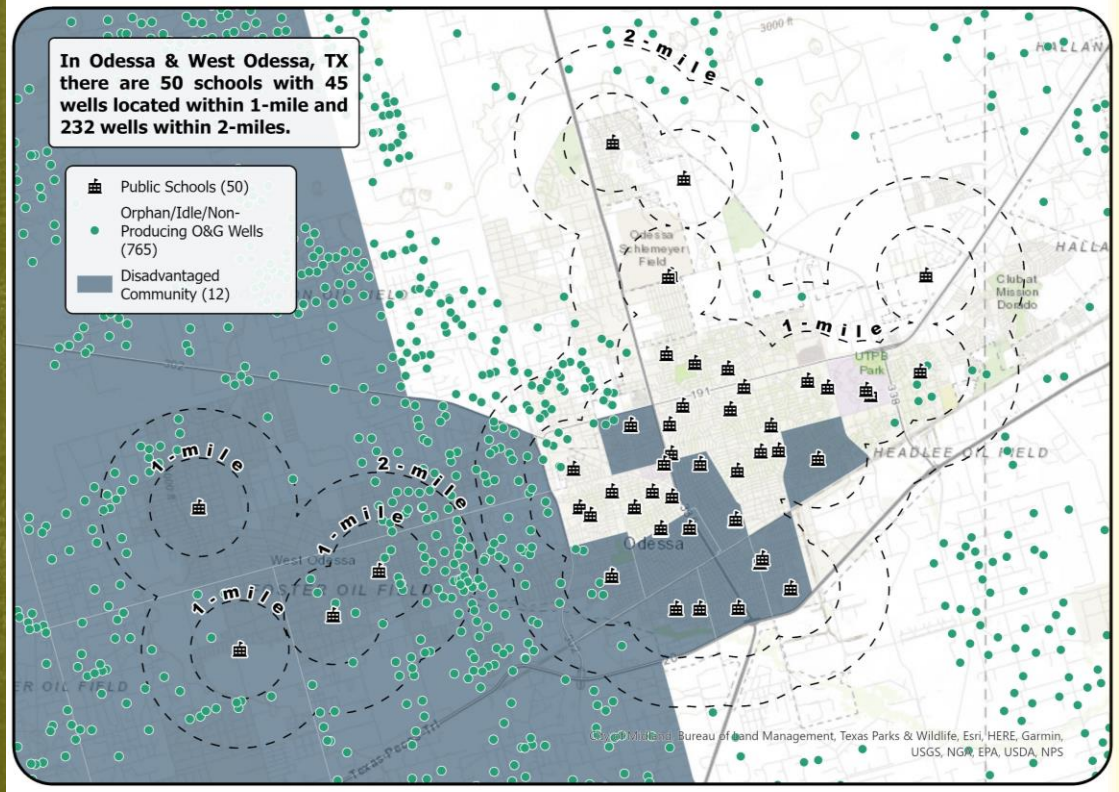
Over 3.5 Million Idle & Documented Orphan Wells in the United States



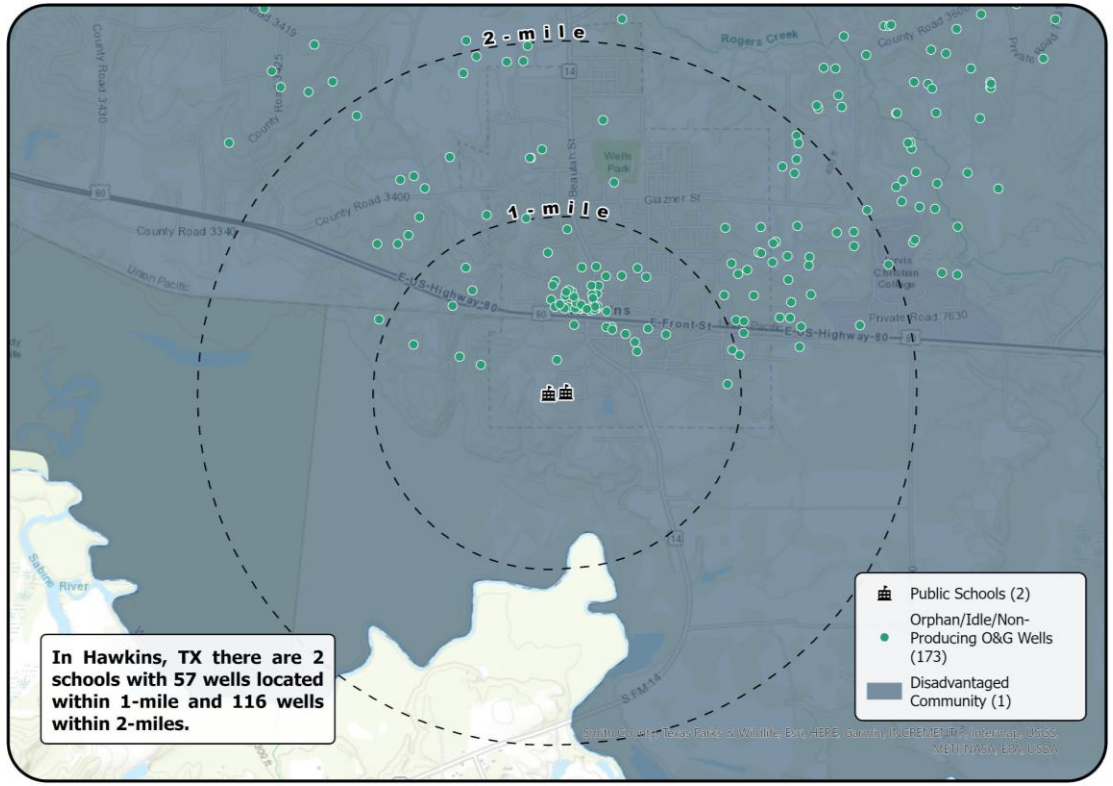


Prioritizing Well Plugging

Odessa & West Odessa, TX Schools & Orphan/Idle/Non-Producing O&G Wells Map

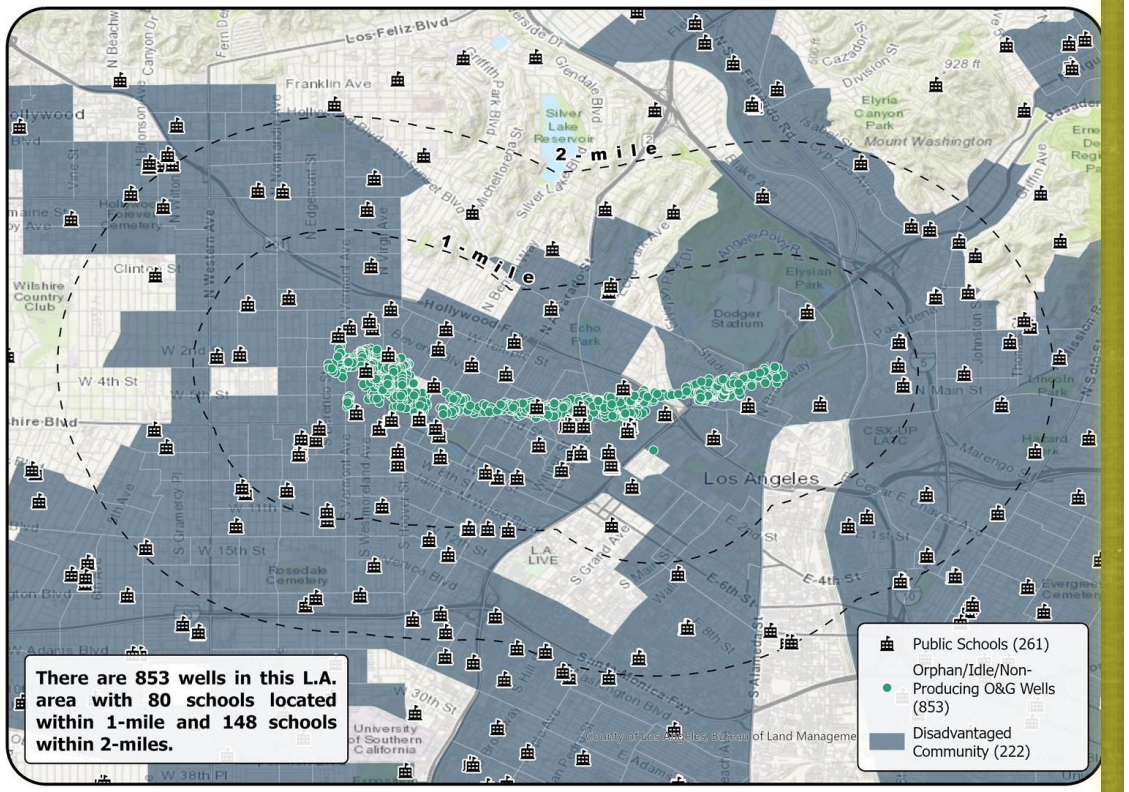


Hawkins, TX Schools & Orphan/Idle/Non-Producing O&G Wells Map

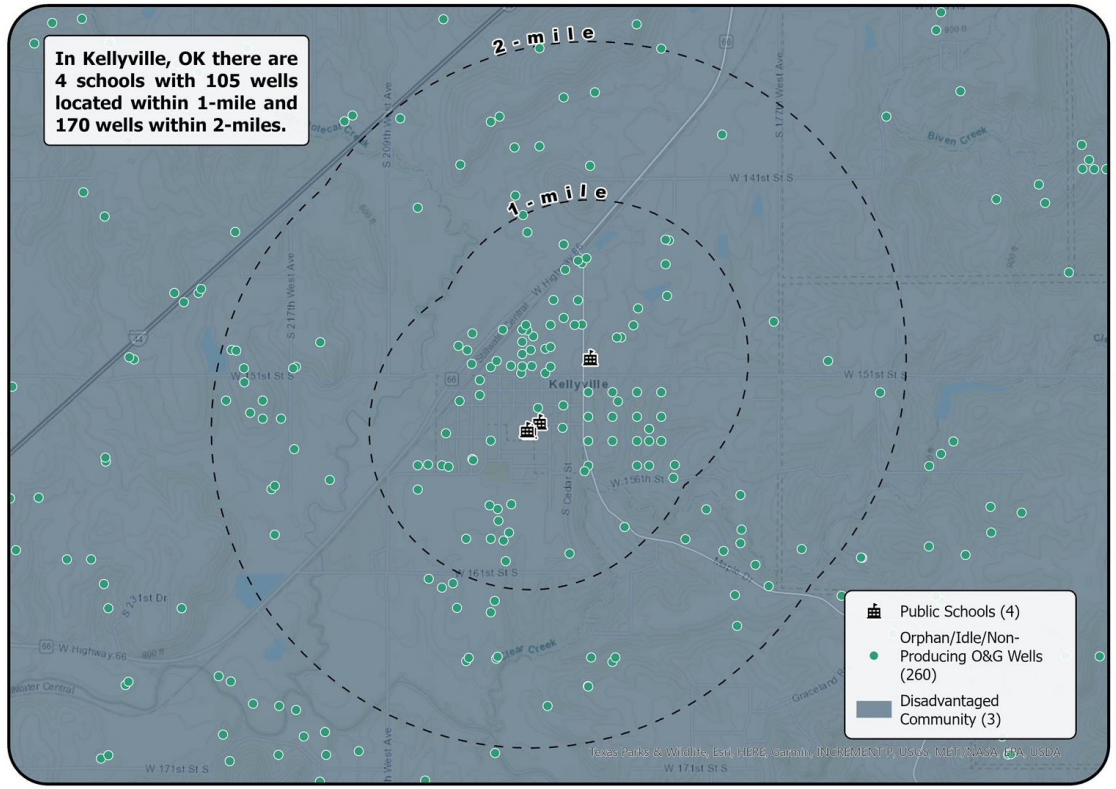


The Significance of Co-Benefits

Los Angeles Area Schools & Orphan/Idle/Non-Producing O&G Wells Map

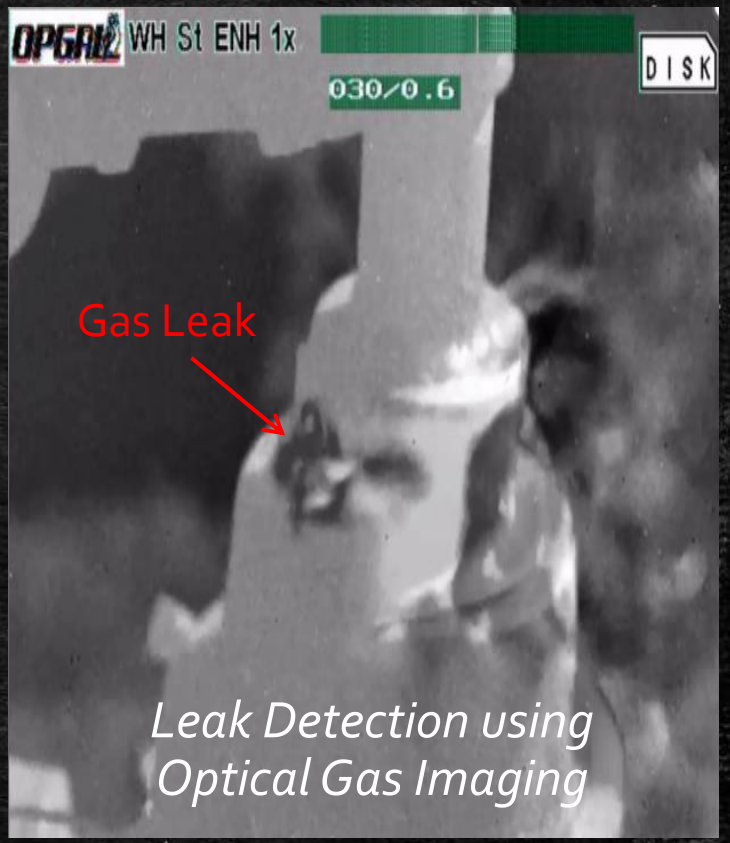


Kellyville, OK Schools & Orphan/Idle/Non-Producing O&G Wells Map



Do These Wells Leak Methane?

- Numerous sources confirm the emissions from idle, orphan, and also marginally productive wells are real and significant.
- On a personal basis, I've witnessed, detected, quantified, and characterized gas for thousands of wells across the United States and also internationally.
- This is REAL!



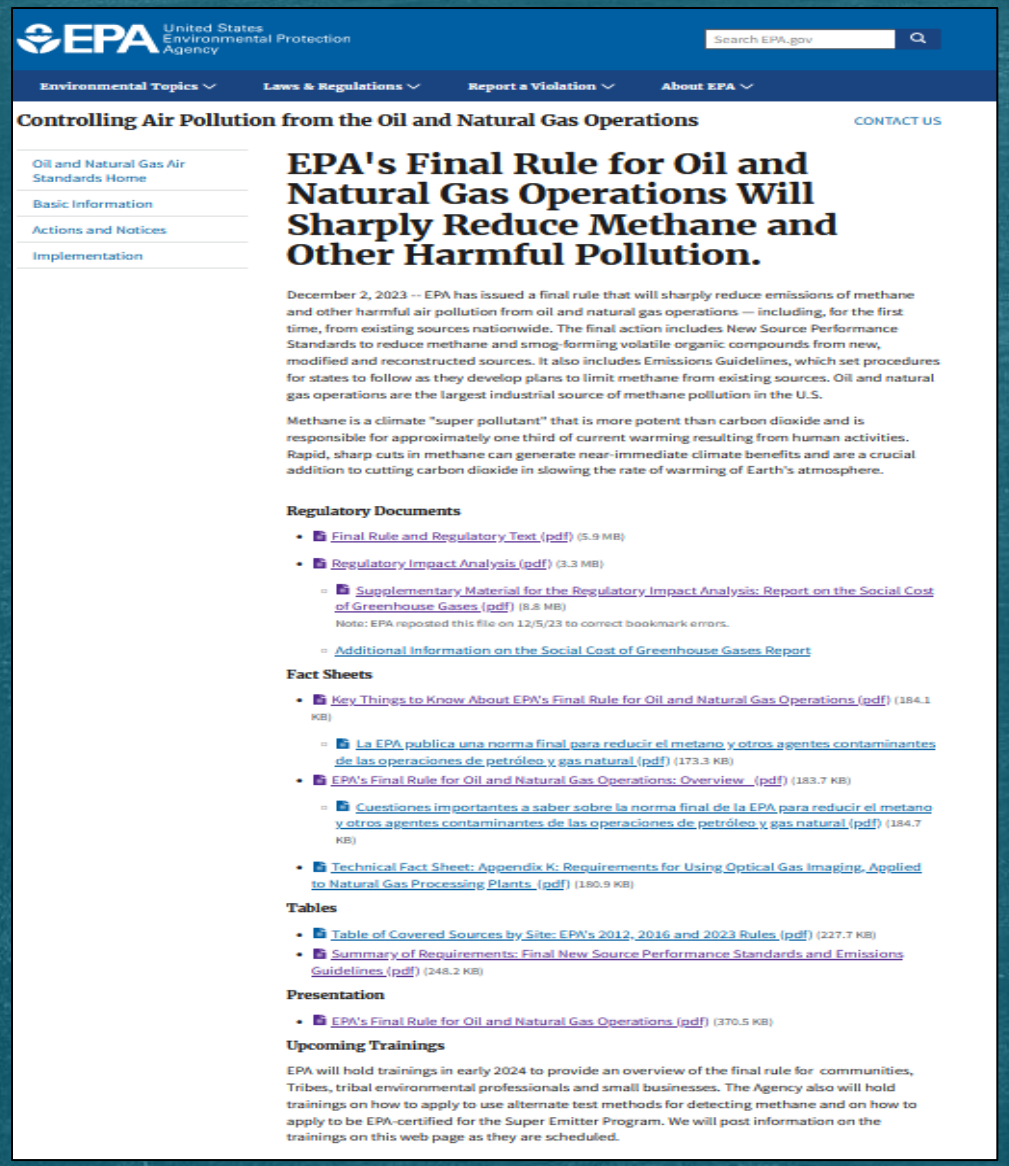
Source: ALL Consulting, LLC

MARGINAL CONVENTIONAL WELLS

- About 80% of all active onshore wells in the U.S.
- Defined as ≤ 15 BOED or ≤ 90 Mcf/d
- Production contributions:
  - Marginal conventional oil wells: about 10%.
  - Marginal conventional gas wells: about 11%.
- Estimates vary, but 10-14% of MCWs may contribute as much as 50% of all Methane emissions.
- Emissions from MCWs increase as production declines due to equipment failure or malfunction.
- Ultimately, these wells are shut-in due to economics or other constraints.

Source: ALL Consulting, LLC

New EPA Oil & Gas Methane Rule



EPA United States Environmental Protection Agency

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Controlling Air Pollution from the Oil and Natural Gas Operations

CONTACT US

- Oil and Natural Gas Air Standards Home
- Basic Information
- Actions and Notices
- Implementation

EPA's Final Rule for Oil and Natural Gas Operations Will Sharply Reduce Methane and Other Harmful Pollution.

December 2, 2023 -- EPA has issued a final rule that will sharply reduce emissions of methane and other harmful air pollution from oil and natural gas operations — including, for the first time, from existing sources nationwide. The final action includes New Source Performance Standards to reduce methane and smog-forming volatile organic compounds from new, modified and reconstructed sources. It also includes Emissions Guidelines, which set procedures for states to follow as they develop plans to limit methane from existing sources. Oil and natural gas operations are the largest industrial source of methane pollution in the U.S.

Methane is a climate "super pollutant" that is more potent than carbon dioxide and is responsible for approximately one third of current warming resulting from human activities. Rapid, sharp cuts in methane can generate near-immediate climate benefits and are a crucial addition to cutting carbon dioxide in slowing the rate of warming of Earth's atmosphere.

Regulatory Documents

- Final Rule and Regulatory Text (pdf) (5.9 MB)
- Regulatory Impact Analysis (pdf) (3.3 MB)
  - Supplementary Material for the Regulatory Impact Analysis: Report on the Social Cost of Greenhouse Gases (pdf) (8.8 MB)
    Note: EPA reposted this file on 12/5/23 to correct bookmark errors.
  - Additional Information on the Social Cost of Greenhouse Gases Report

Fact Sheets

- Key Things to Know About EPA's Final Rule for Oil and Natural Gas Operations (pdf) (184.1 KB)
  - La EPA publica una norma final para reducir el metano y otros agentes contaminantes de las operaciones de petróleo y gas natural (pdf) (173.3 KB)
- EPA's Final Rule for Oil and Natural Gas Operations: Overview (pdf) (183.7 KB)
  - Cuestiones importantes a saber sobre la norma final de la EPA para reducir el metano y otros agentes contaminantes de las operaciones de petróleo y gas natural (pdf) (184.7 KB)
- Technical Fact Sheet: Appendix K: Requirements for Using Optical Gas Imaging, Applied to Natural Gas Processing Plants (pdf) (180.9 KB)

Tables

- Table of Covered Sources by Site: EPA's 2012, 2016 and 2023 Rules (pdf) (227.7 KB)
- Summary of Requirements: Final New Source Performance Standards and Emissions Guidelines (pdf) (248.2 KB)

Presentation

- EPA's Final Rule for Oil and Natural Gas Operations (pdf) (370.5 KB)

Upcoming Trainings

EPA will hold trainings in early 2024 to provide an overview of the final rule for communities, Tribes, tribal environmental professionals and small businesses. The Agency also will hold trainings on how to apply to use alternate test methods for detecting methane and on how to apply to be EPA-certified for the Super Emitter Program. We will post information on the trainings on this web page as they are scheduled.

EPA's New Methane Oil & Gas Methane Rule

Implications?

Impacts to a Carbon Credit Program for Voluntarily Plugging???

Fundamentals of the Rule

- Directly applies to "NEW" wells (i.e., Wells/Well Facilities built after 12/6/22)
  - Requires wells to be monitoring and controlled until plugged.
  - Closure plan requires in the rule are vague and fairly onerous).
  - Includes language to outlaw orphaning going forward through requirement of closure plans.
  - **Effective Date: ~March or April 2024.**
- "Existing" wells to be addressed through "State Implementation Plans" from individual States.
  - It is unclear if "Orphaned" wells are even included.
  - Several States questioned EPA's authority for the rule and noted risks that the rule would likely increase the Orphan Well population.
  - **Effective Date: ~Late 2029.**

Conclusions

Conclusions

- With over 3.5 million Orphan, Idle, & MCWs, no amount of government funding will solve this problem.
- A plethora of lawsuits are anticipated with regard to EPA's methane rule.
- States have the option to include well plugging for carbon credits as an approved methodology in their State Implementation Programs.
- Even with the EPA Methane Rule, a solid argument for additionality can still be made. Left unaddressed for many more decades does NOT solve the problem.
- The BCarbon Methane Protocol critically focuses on these issues and offers Immediate, quantifiable, verifiable, and permanent results.

Rager Mountain (Pennsylvania)

Source: The Denver Gazette

Marina Del Rey

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Former Enforcement Officer & National Expert with the USEP
Registered Professional Engineer: 35 States
Registered Professional Petroleum Engineer
Certified Petroleum Geologist
Fellow of the Geological Society
Qualified Measurement Specialists
Consulting Expert to BCarbon
Consulting Expert to the USDOE/DOI (MERP)
Served as Expert to the Securities & Exchange Commission
Lead Research on Well Plugging for U.S. DOE Research
Expert Witness on multiple Cases involving Well Plugging/Well Is

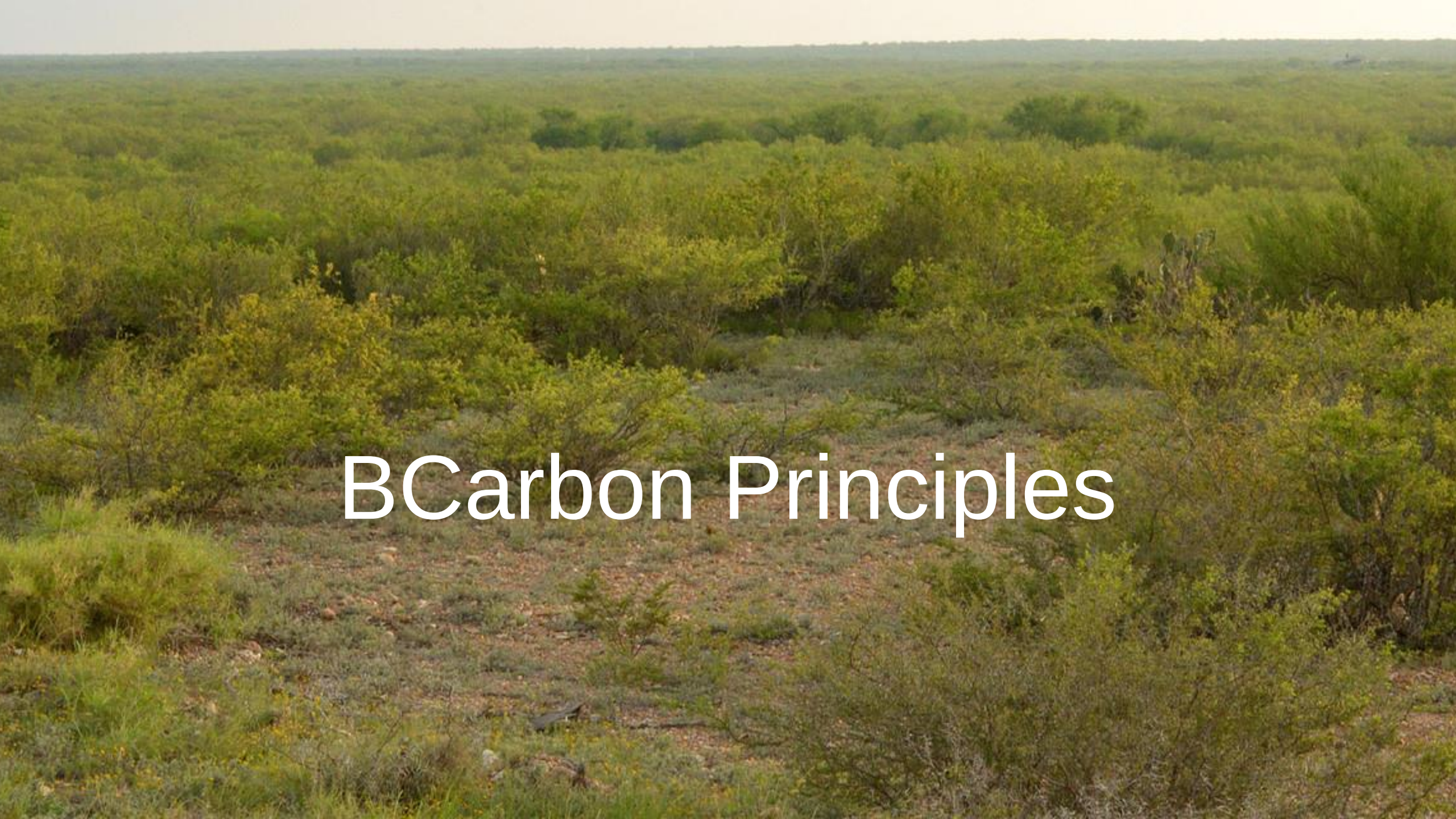

MCR Webinar Updates

Details + Agenda

January 25th from 1-3 PM CT, on Zoom

- Melanie Martin: Overview of BCarbon Protocol
- Jim Blackburn and Dan Arthur: EPA methane rule overview – legal and technical aspects
- Ryan Corbin: Presentation from ALL Consulting
- Q&A Session

Please let others in your network know!


BCarbon Principles

History and Evolution of the BCarbon Principles

- Original BCarbon Principles:
  - Focused on soil carbon program implementation
  - Published when BCarbon first became a nonprofit in 2021
- In 2024, BCarbon has grown:
  - Soil, forest, blue carbon, and well plugging protocols
  - Research projects in biodiversity, DEI and small landowner inclusion, commercial timber, and more
- Current need to update our Principles to reflect our broadened work and purpose

Discussion of Principles will be ongoing; feedback deadline: 1/25

1

A nonprofit organization formed to address climate change and aid in the global energy transition, BCarbon works as an agent of change in the voluntary carbon market by issuing carbon credits and generating solutions to the persistent problems of accessibility, quality, and scale.

2

BCarbon is both a registry and a research hub. We work with landowners, project developers, buyers, and industry leaders to develop Protocols that are rigorous and practical, and we collaborate with corporate, academic, and government partners to explore innovative solutions to market challenges.

3

Carbon emission reduction is only one aspect of a healthy climate. BCarbon adopts an inclusive, holistic view of ecosystem services, prioritizing the protection and improvement of ecological integrity as a central goal. Credit issuances under BCarbon protocols are dedicated to the removal and mitigation of greenhouse gas emissions and the enhancement of ecological health rather than the generation of income.

4

BCarbon aims to engage, support, and uplift diverse and marginalized communities, with particular attention to the rights of indigenous populations and communities disproportionately impacted by climate change. BCarbon also acknowledges barriers that prevent participation in projects by certain landowners and interested parties and is engaged in the exploration and implementation of new ideas to overcome these obstacles.

5

BCarbon is committed to transparency via open-access collaboration and hosts a monthly stakeholder group that bring together voices from across disparate disciplines and sectors to problem-solve, inform organizational direction, and share knowledge.

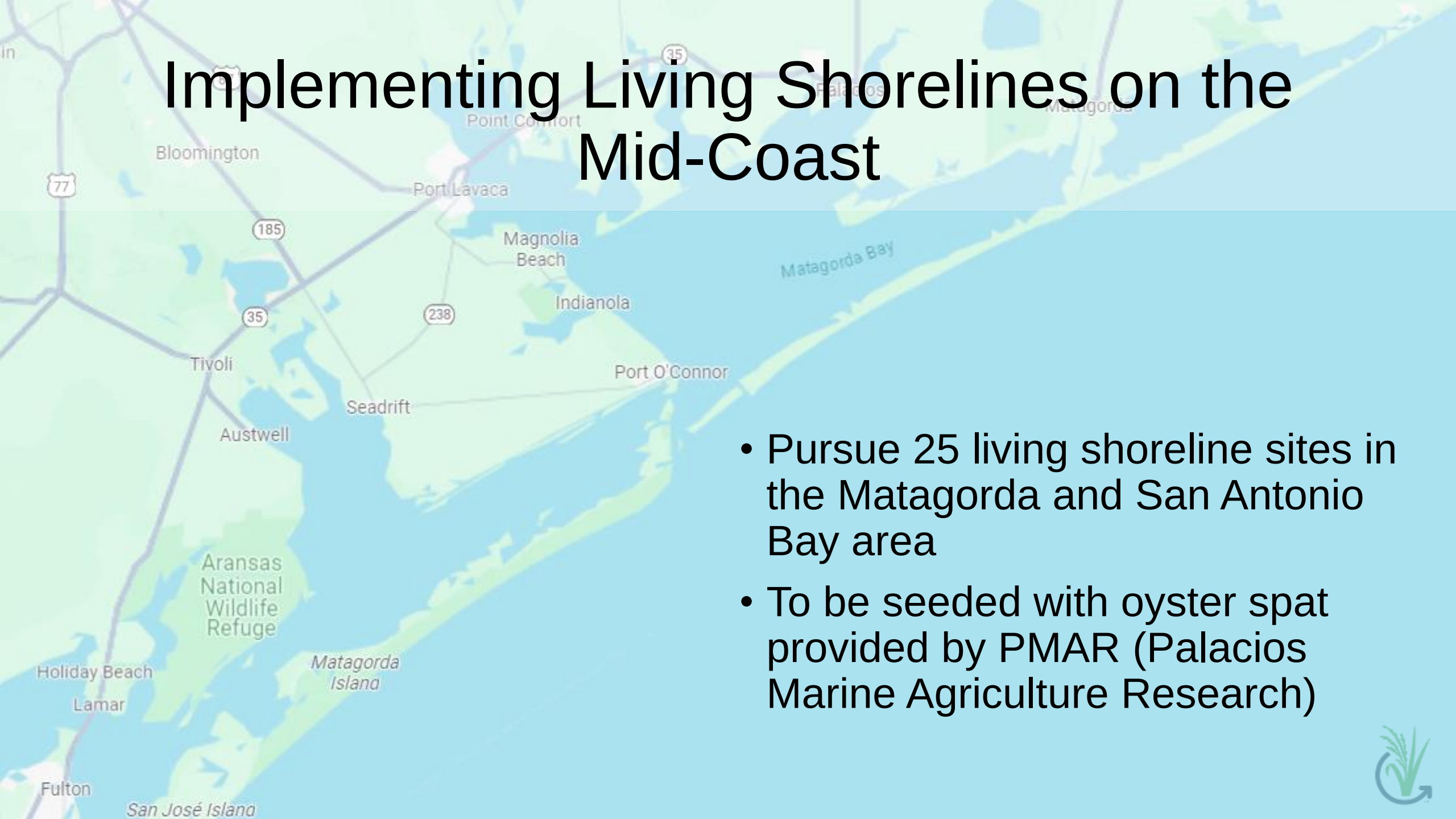
6

BCarbon treats accurate ecological accounting as a responsibility owed to both the end user of the product and the general public.


Discussion


Upcoming Grant Projects

Implementing Living Shorelines on the Mid-Coast



- Pursue 25 living shoreline sites in the Matagorda and San Antonio Bay area
- To be seeded with oyster spat provided by PMAR (Palacios Marine Agriculture Research)

For Immediate Release

Palacios Marine Agricultural Research (PMAR) and BCarbon Announce Joint Program to Construct Living Shorelines Around Matagorda and San Antonio Bays

For more information, please contact:
Dr. Joe Fox (jfox@pmartexas.org),
Dr. Larry McKinney (lmckinney@pmartexas.org),
Jim Blackburn (jim.blackburn@bcarbon.org), and
Lalise Mason (lalise.mason@bcarbon.org)

HOUSTON - January 11, 2024. The Palacios Marine Agricultural Research (PMAR) organization from Corpus Christi, Texas, and BCarbon, a Houston-based carbon registry, today announced a joint program to secure commitments to construct almost 70 miles of living shoreline to protect about 23,500 acres of coastal wetlands in the Matagorda and San Antonio Bay systems.

This project is based upon an earlier study by BCarbon that identified 25 sites in the Point Comfort Area, Texas mid-coast, where sea level rise is likely to cause significant loss of wetland acreage due to increased erosion and drowning of vegetation. By constructing living shorelines, wetlands can be protected from erosion: barriers trap sediment within the marsh, helping it keep up with the sea level rise that is predicted to essentially destroy Texas's coastal wetlands. An example of a living shoreline is shown in Figure 1.

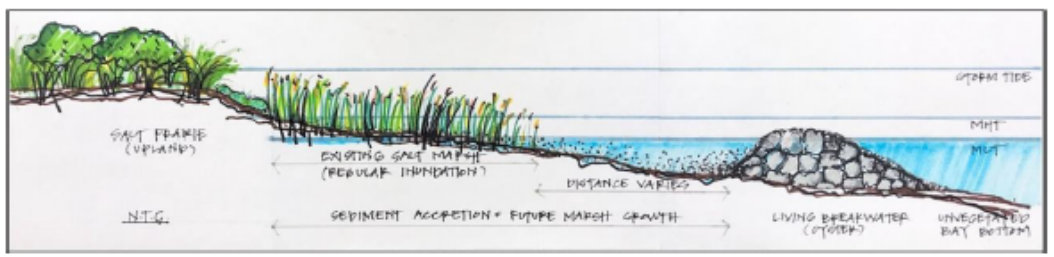
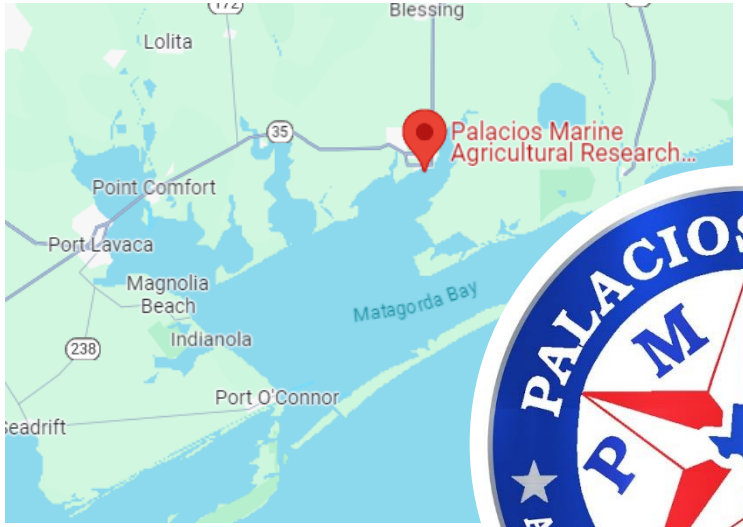


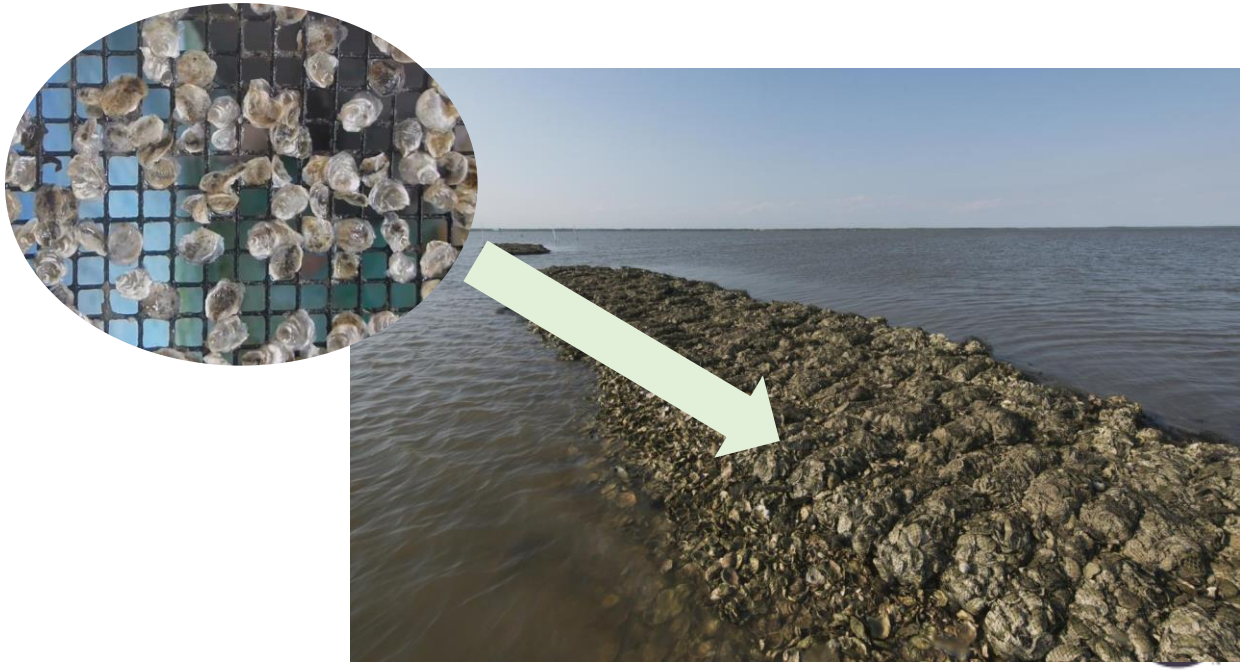
Figure 1. A living shoreline is constructed of rock or concrete about fifty to one hundred feet from the marsh edge, thereby offering protection from daily wave action that threatens the marsh with edge erosion, which can be significant once the wetland dies and the root structure loses its traction. Image by Lalise Mason for BCarbon.

The basic concept of this Protocol, developed by a stakeholder subcommittee at BCarbon, is that the cost to construct these shorelines can be recaptured, fully or partially, by claiming and selling carbon protection and removal credits to companies seeking to reduce their carbon footprint. These credits are based on the well-known ability of marshes to capture carbon dioxide from the air and store it in the soil. Carbon stored in the wetland soil is released by wetland destruction and erosion; however, it can be protected by the living shoreline, allowing the marsh to continue to function and permitting carbon credits to be issued.

Palacios Marine Agricultural Research (PMAR)

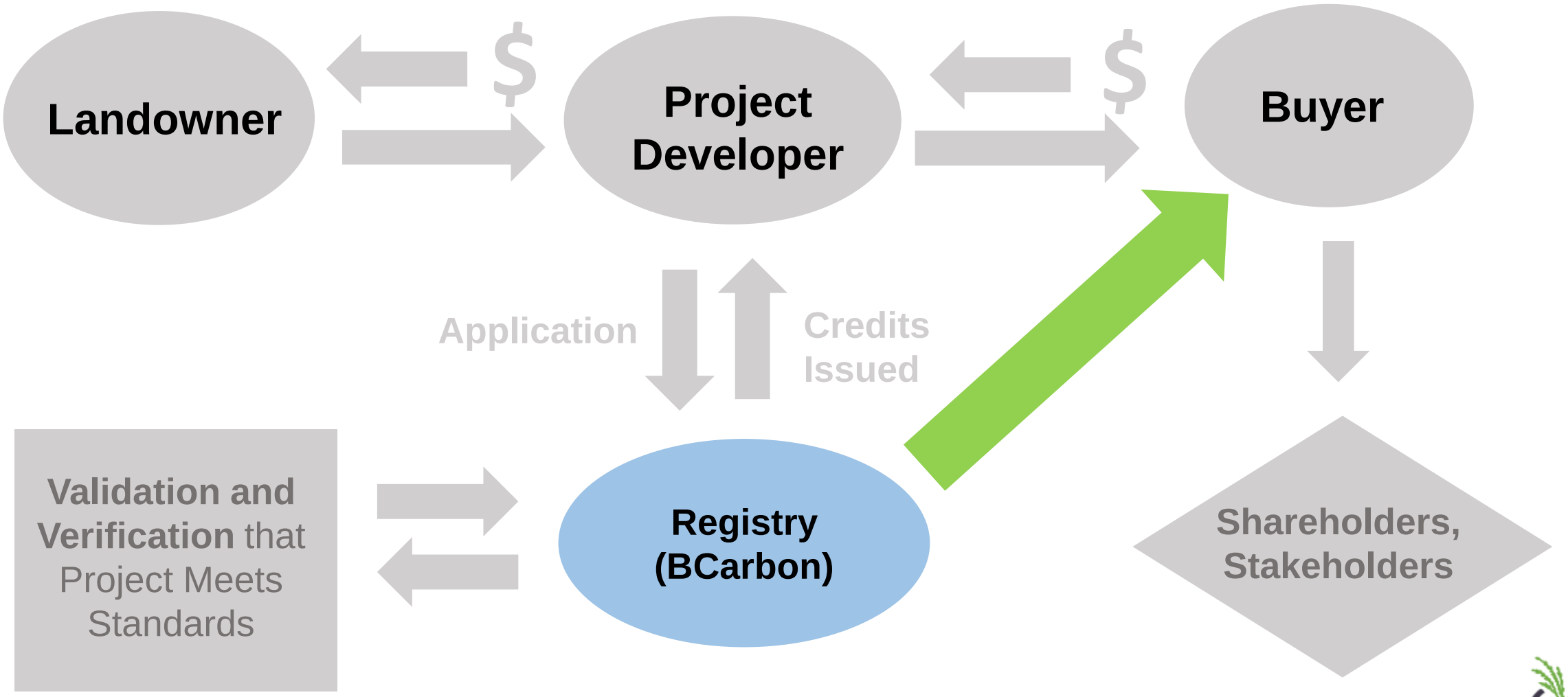
- Mission: restoring oysters on the Texas Coast
- ***Key role in BCarbon project:*** providing oyster spat for living shorelines





25 Prospective Projects developed by BCarbon

Bridging the Gaps



BCarbon Biodiversity Project Exploration funded by Joe Swinbank

- Fewer than ***60 ocelots remain in Texas;*** as few as 100 in the US overall
- Goal: ocelot protection and conservation
- Method: carbon credit? biodiversity credit? Combination?


Thank You