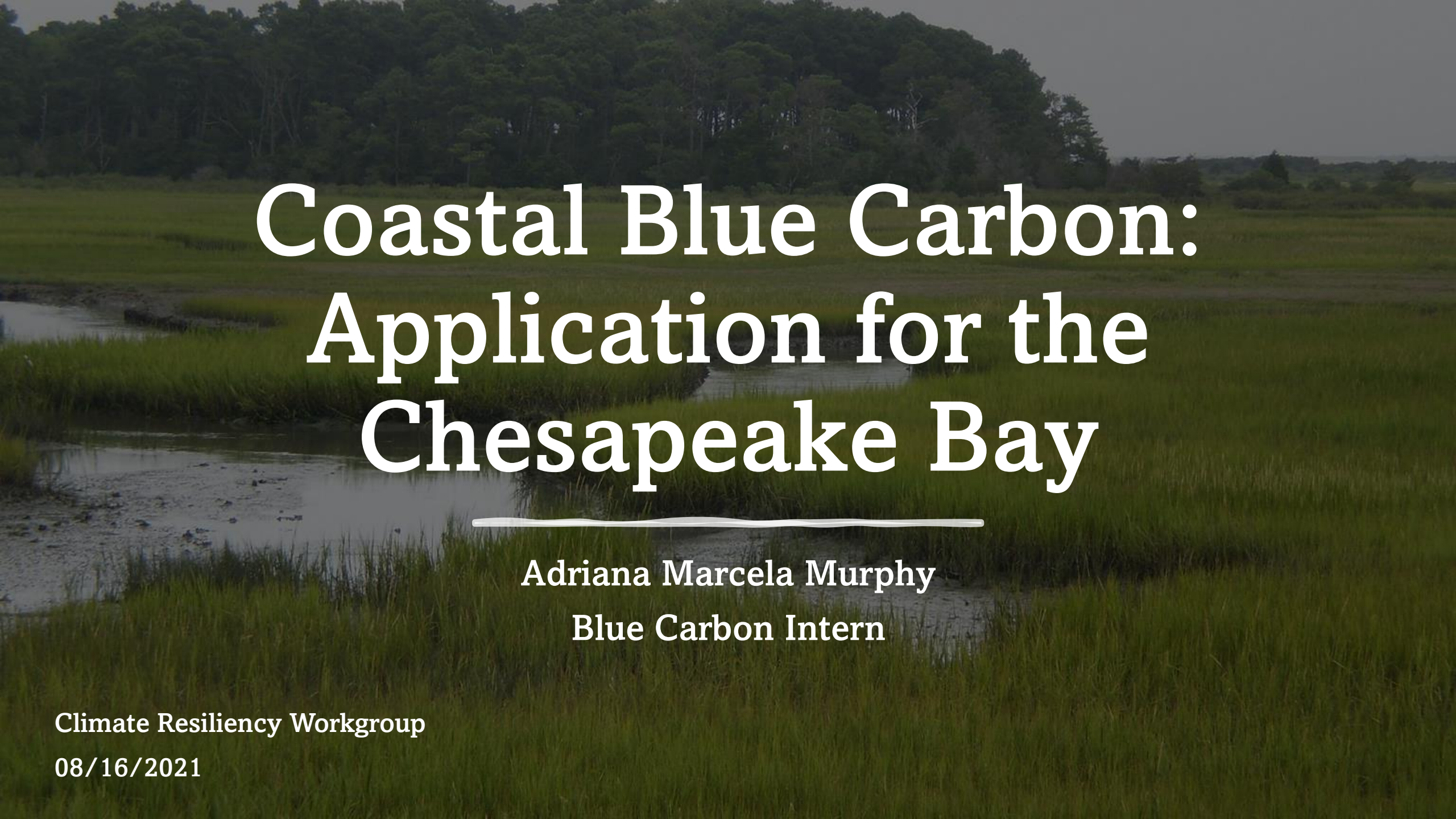


Coastal Blue Carbon: Application for the Chesapeake Bay

Adriana Marcela Murphy
Blue Carbon Intern

Climate Resiliency Workgroup

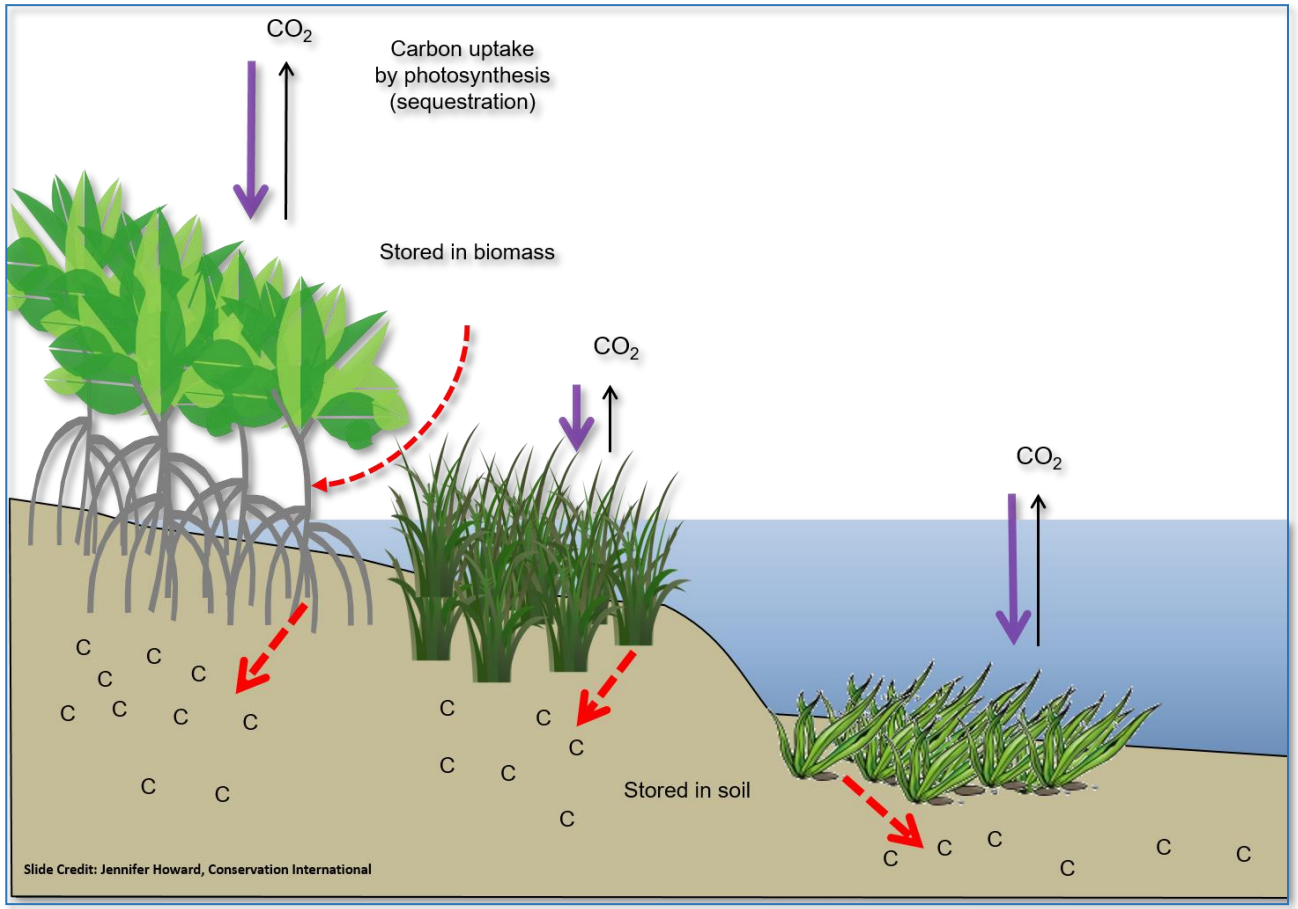
08/16/2021

About Myself

- I am from Colombia
- Student at George Mason University
  - Environmental Science
  - Marine, Estuarine and Freshwater Ecology
- Interested in learning benefits coastal habitats provide
- Blue Carbon Intern
  - Existing blue carbon research
  - Blue carbon crediting protocols

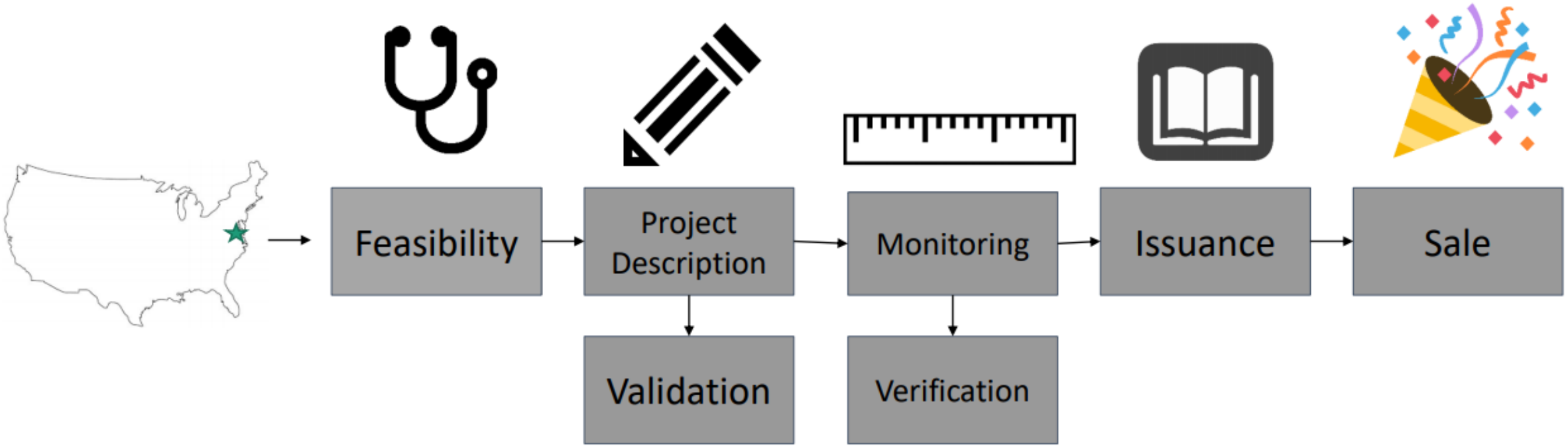
Coastal Blue Carbon

- What is coastal blue carbon?
- Address increasing levels of CO_2
  - Coastal wetlands store carbon in soils (Pidgeon, 2009)
    - 10 x temperate forest
    - 50x than tropical forest
- Prevent release of carbon back to atmosphere (Mcleod et al., 2011)
  - 50% seagrass loss since 1990s
  - 25% salt marshes loss since 1800s
  - 20% mangroves loss since 1980s
- Carbon markets as financial incentives



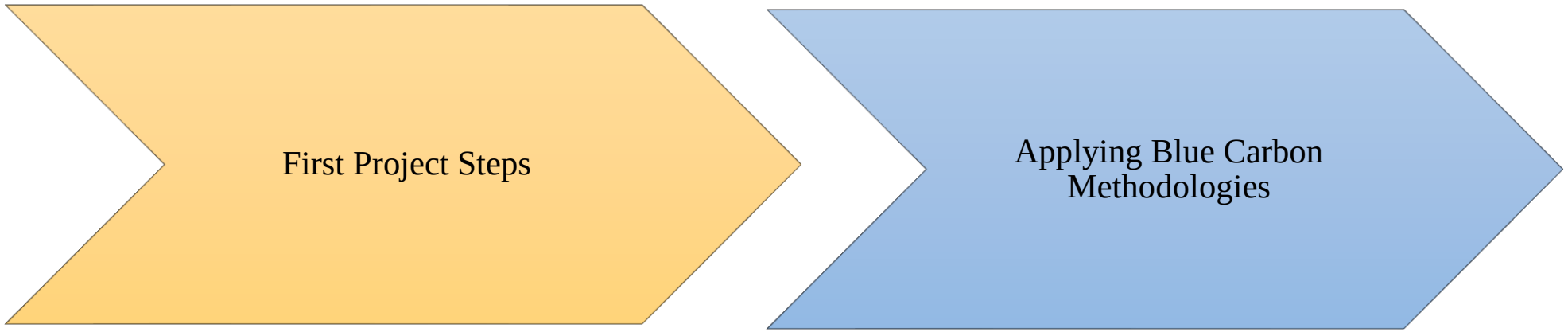
https://estuaries.org/bluecarbon/blue-carbon-science-projects/

Developing a Blue Carbon Crediting Project
State of blue carbon projects in USA



https://www.chesapeakebay.net/channel_files/42438/simpson_developingbcoffsets_lessons_learning_simpsonandrovner_dec2020v2.pdf

Coastal Blue Carbon Project



- Pre-feasibility Assessment
- Site Selection
- Prioritization

- Applicability conditions
- Project boundary
- Additionality
- Quantification
- Monitoring

Wetland Restoration and Conservation Eligible Projects

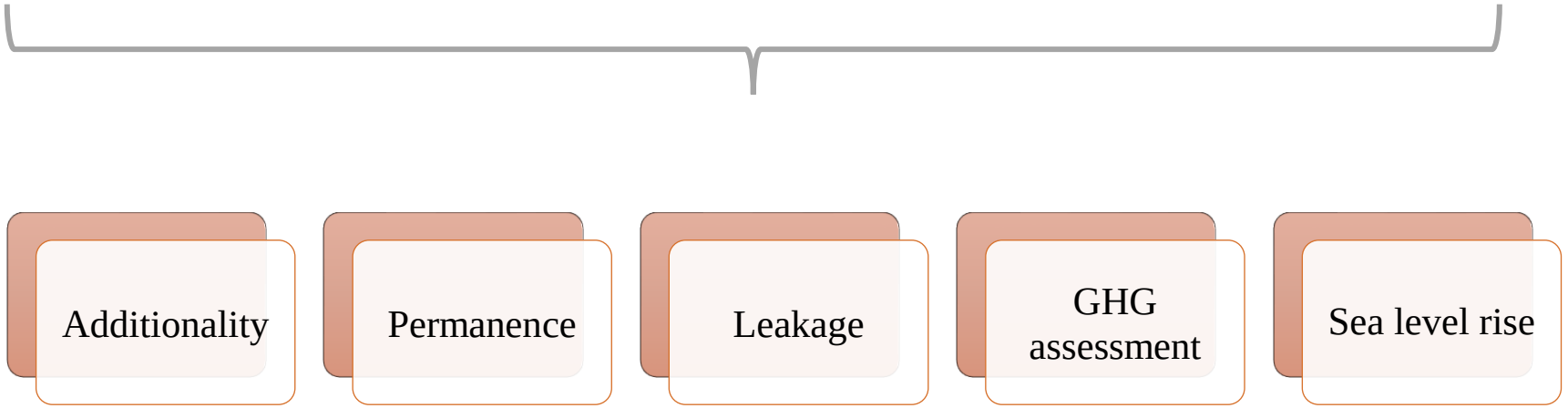
Eligible wetland restoration and conservation (WRC) activities increase net GHG removals by restoring wetland or reduce GHG emissions by rewetting or avoiding wetland degradation

- Restoring wetland ecosystems (RWE)
  - Restoration or management of water table depth
  - Sediment supply
  - Salinity characteristics
  - Water quality
  - Native plant communities

- Conservation of intact wetlands (CIW)
  - Avoiding planned wetland degradation (APWD)
  - Avoiding unplanned wetland degradation (AUWD)

Coastal Blue Carbon Methodologies

- VM0024 - Methodology for Coastal wetland Creation (2014) - RWE
- VM0033 - Methodology for Tidal Wetland and Seagrass Restoration (2015) - RWE
- VM0007 - Reducing Emissions from Deforestation and Forest Degradation (REDD+) Methodology Framework (2020) – RWE & CIW



Coastal Blue Carbon Methodologies: Key Eligibility Conditions

Additionality
- GHG emission reductions/removals are in excess of what would be achieved under a “business as usual” scenario
- Activity would not have occurred in the absence of carbon markets

Permanence
Assess risk of potential loss in C stock in the project area over a period of 100 years

Leakage
Project does not lead to an increase in emissions or decrease in removals of GHG outside project area
1. Market
2. Activity shifting
3. Ecological

GHG assessment
Avoiding release and/or increasing uptake

Sea level rise

Consider expected SLR and potential expanding areas landward – wetland migration, inundation, and erosion

Considering: topographical slope, land use and management, sediment supply, tidal range

Additionality

1. Regulatory Surplus: it is not required by law, statue, or any other regulatory framework
2. Positive list: meet methodology applicability condition

Applicability Conditions (examples):

- RWE activities
- Any or combinations of creating, restoring and/or managing hydrological conditions; altering sediment supply; changing salinity characteristics; improving water quality; (re-)introducing native plant communities; improving management practice(s)
- CIW Project Activities: Protecting at-risk wetlands, improving water management on drained wetlands, maintaining or improving water quality for seagrass meadows, recharging sediment to avoid drowning of coastal wetlands, creating accommodation space for wetlands migrating with sea-level rise

Permanence and Longevity

- Permanence of soil carbon stock will be maintained
- Potential losses in carbon stocks shall be assessed over a period of 100 years
- All methodologies require the use of the AFOLU non-permanence risk tool to determine a risk rating
  - ✓ Internal risk
    - Project longevity (30 years)
    - Project ownership can be maintained for entire project longevity
    - Entire project longevity shall be covered by management and financial plans
    - Legally enforceable agreement or requirement such as conservation easement or protected area law that would require the continuation of the management practice that sequesters carbon or avoids emissions for the entire project longevity
  - ✓ External risk
  - ✓ Natural risk

Leakage

- Activity shifting and Market leakage: displacement of economic activities to another area potentially causing increase in GHG emissions outside project area.
- Ecological leakage: hydrological connectivity with adjacent areas lead to increase in GHG emissions outside project area.

To avoid leakage → prior to the project start date:

- The project area is free of any land use that could be displaced outside the project area; or
- It is under a land use that could be displaced outside the project area; or
- It is under a land use that will continue at a similar level of service or production during the project crediting period

LEAKAGE TYPE	EXAMPLE	HOW TO OVERCOME
Ecological	The project may lead to changing water tables or a disruption of sediment supply, negatively affecting outside the project area.	Need a location-tailored technical response (e.g., establishing a buffer zone or avoiding water leakages by proper site selection and project design)
Activity-shifting	The disturbance (e.g., agriculture on drained wetlands) is taken up outside the project area.	Community benefits achieved through the project (e.g., jobs)
Market-effects	Market demand for products from the project area remains the same and supply shifts.	Goods replacement (e.g., sustainable shrimp farming)

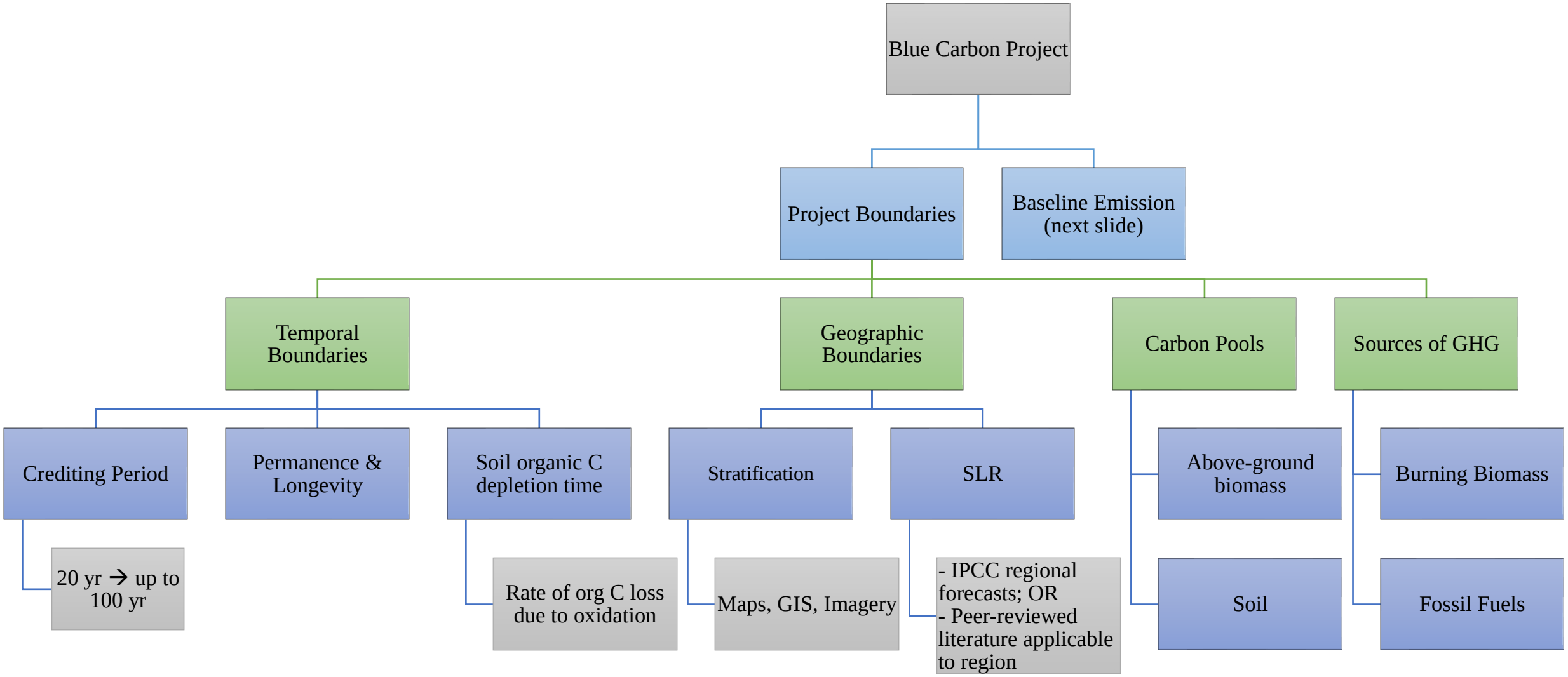
https://estuaries.org/wp-content/uploads/2019/02/rae_coastal_blue_carbon_methodology_web.pdf

Ineligible Wetlands

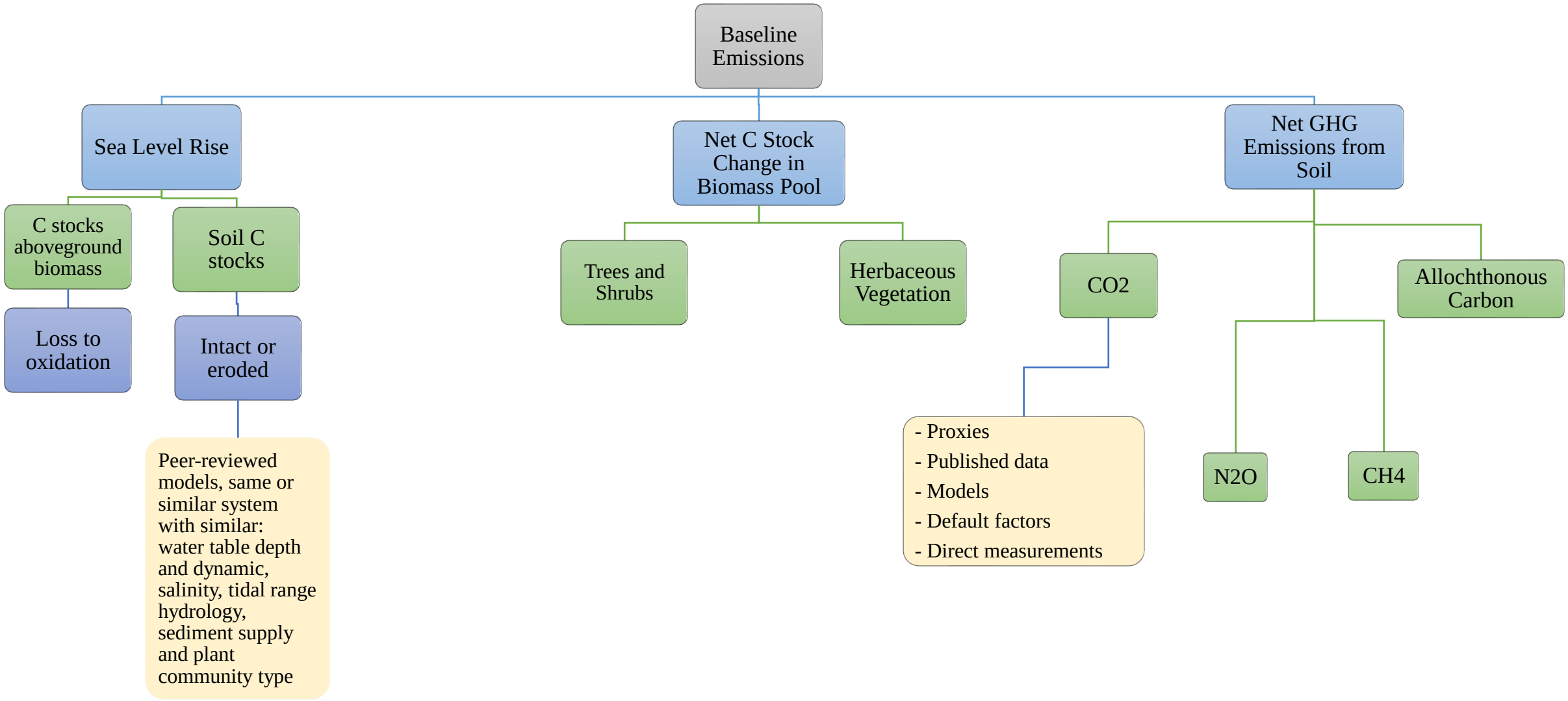
For projects quantifying CO_2 emission reductions, project areas which do not achieve a significant difference ($\geq$ 5 percent) in cumulative carbon loss over a period of 100 years beyond the project start date are not eligible for crediting based on the reduction of baseline emissions, and these areas must be mapped

- Baseline scenario: “business as usual” scenario
- With-project scenario: with project activities

GHG Assessment & Sea Level Rise



GHG Assessment & Sea Level Rise



Data Needs

- Sea Level Rise
    1. Assessment of potential wetland migration, inundation, and erosion
        a) IPCC regional forecasts
        b) Peer-reviewed literature applicable to the region
            i. Topographical slope
            ii. Land use
            iii. Sediment supply
            iv. Tidal range
    2. Soil carbon stocks
        a) Peer-reviewed models
            i. Water table depth and dynamics
            ii. Salinity
            iii. Tidal hydrology
            iv. Sediment supply
            v. Plant community type

Data Needs

- CO_2 emissions from the soil organic carbon pool
    1. Proxies → demonstrate strongly correlated with value of interest
    2. **Peer-reviewed published data** → from same or similar system (similar geomorphic, hydrologic, and biological properties, and are under similar management regimes unless differences do not affect GHG emissions).
    3. Default factors → The default factor provided only applies to areas with a crown cover of at least 50%.
    4. Peer-reviewed published models → from same or similar system (similar water table depth and dynamics, salinity, tidal hydrology, sediment supply and plant community type)
    5. Field-collected data → instructions provided by methodology
    6. Historical or chronosequence data
- Allochthonous carbon: for mineral soils
    1. Peer-reviewed published data
    2. Field-collected data
    3. Quantitative model verified with direct measurements

Available Data Sources

- Coastal Carbon Data Clearinghouse (SERC)
  - https://serc.si.edu/coastalcarbon/data
- Coastal National Greenhouse Gas Inventory
  - https://github.com/Smithsonian/Coastal-Wetland-NGGI-Data-Public/
- VIMS SAV Monitoring & Restoration website
  - https://www.vims.edu/research/units/programs/sav/reports/index.php
- Environmental Data Initiative Data Portal
  - https://portal.edirepository.org/nis/home.jsp

Grouped Projects

A VCS grouped project combines multiple project activities into a single, combined project that adds new instances over time.

Advantages

>> Grouping smaller projects can reduce transaction costs --- only requires a single validation process

>> It combines monitoring and verification procedures

>> Larger offset potential compared to small GHG reduction from smaller projects

>> Addition of new projects over time - BUT only one crediting protocol

Disadvantages

>> Challenges: land ownership split between government-held and private land

>> Legal implications

>> Monitoring - coastal wetlands can vary in habitat type, salinity, vegetation, soil type, etc.

>> System for allocating grouped results to individual projects in a fair and equitable manner will need to be agreed upon during project development

Summary

- Blue carbon methodologies - restore/conserve coastal habitats
- What is the best methodology?
- Set real expectation
- Enabling conditions

- Challenges → Additionality → Existing projects

- Next steps → Implementation Needs

Implementation Needs

Define target market

Set clear project goals and objectives

Select carbon methodology

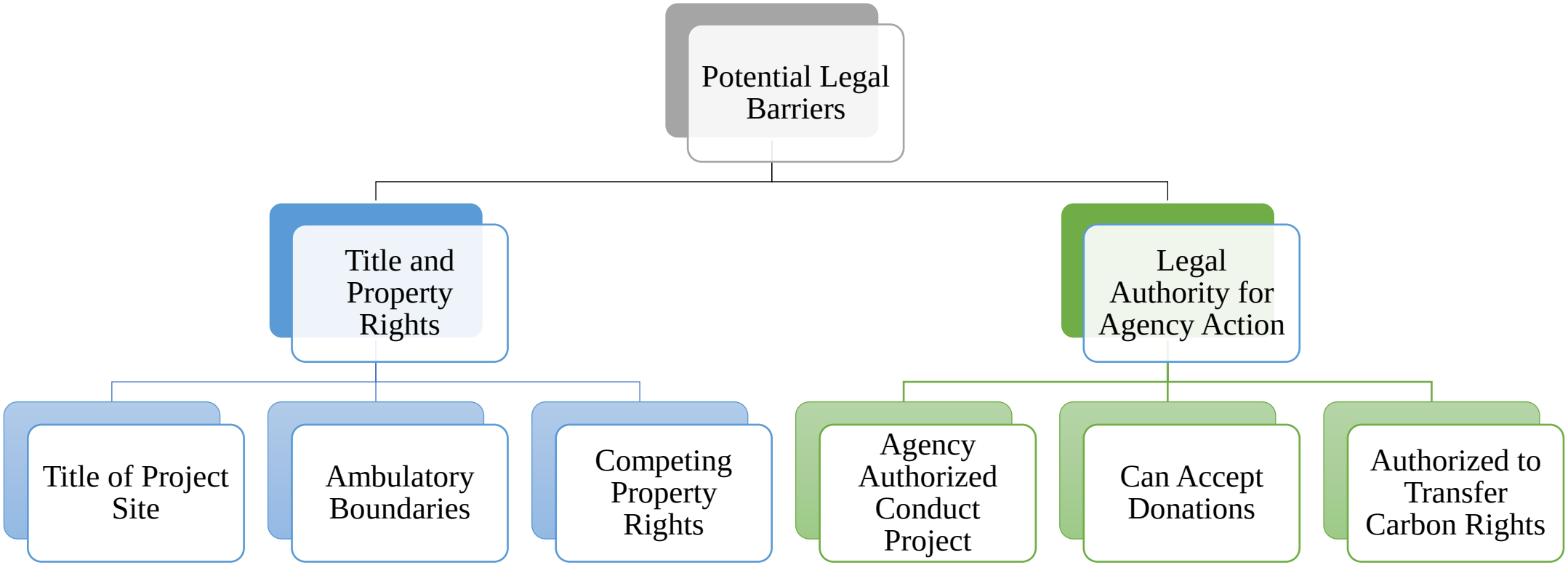
Project development finance

Team on site

Community engagement

Legal requirements

Legal Requirements



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Questions?

Grouped Projects