WR Methodological Module

Estimation of baseline carbon stock changes and greenhouse gas emissions from Wetland Restoration (WR) with hydrologic management including projected wetland loss in the baseline scenario (BL-WR-HM-WL)

I. SCOPE, APPLICABILITY AND PARAMETERS

Scope

This module provides guidance for estimating baseline carbon stock changes and GHG emissions when the baseline scenario includes projected wetland loss that would occur during the 40-year Crediting Period without the project activity (wetland restoration). This baseline module may be used for project activities that include hydrologic management that may require greenhouse gas (GHG) monitoring. Examples of eligible hydrologic management project activities include:

a. Diversion of river water (e.g., Mississippi River or other) into wetlands;

b. Introduction of nonpoint source runoff (e.g., agricultural, stormwater) into wetlands;

c. Introduction of treated municipal effluent (e.g., wetland assimilation) into wetlands.

d. Hydrologic management to maximize sheet flow, minimize impounded or stagnant conditions, or prevent saltwater intrusion.

As wetlands in the baseline scenario degrade and convert to open water the result of wetland loss is twofold:

1) As the amount of wetlands within the project boundary decrease in the baseline scenario the amount of carbon the wetland can sequester decreases (loss of sequestration capacity).

2) When vegetation death occurs within the project boundary in the baseline scenario part of the soil organic carbon pool is decomposed and released as either CO_2 or CH_4 (emissions due to wetland loss).

The 'loss of sequestration capacity' and 'emissions due to wetland loss' can be quantified in the baseline scenario if the restoration activity is successful in preventing the loss of wetlands and the associated loss of the wetland soil horizon.

Applicability

The module is applicable for estimating baseline carbon stock changes and GHG emissions related to wetland restoration (WR) through hydrologic management, or through the combination of hydrologic management with assisted natural regeneration, seeding, or planting of trees. The following conditions must be met to apply this module.

- Project activities meet the applicability conditions in the WR-MF listed under All Activity Types, and Wetland Restoration with Hydrologic Management.
- Project activities that increase emissions beyond the baseline scenario must be accounted for.

All WR activities involving hydrologic management shall occur in compliance with all applicable local, state and federal environmental regulations. The Project Proponent shall provide attestations and/or evidence (e.g., permits) of environmental compliance to ACR at the time of GHG Project Plan submission, and to the validation/verification body at the time of validation. Any changes to the project's environmental compliance status shall be reported to ACR.

Parameters

This module provides procedures to determine the following parameters:

Parameter	SI Unit	Description
$\Delta C_{bsl,WR\text{-}HM\text{-}WL}$	t CO_2-e	Cumulative total carbon stock changes and greenhouse gas emissions for the baseline scenario during projected wetland loss.
$\Delta C_{TREE\_BSL\_loss}$	t CO_2-e	Cumulative total carbon stock changes of living trees for the baseline scenario during projected wetland loss.
$\Delta C_{SOC\_BSL\_loss}$	t CO_2-e	Cumulative total carbon stock changes of soils for the baseline scenario during projected wetland loss.
$\Delta GHG_{E\_BSL\_loss}$	t CO_2-e	Rate of GHG emissions from the project area with BAU practices during projected wetland loss.

II. PROCEDURE

This module proceeds in five steps:

- Step 1: Identification of baseline scenario
- Step 2: Project boundary
- Step 3: Baseline stratification

- Step 4: Baseline net GHG removals for fixed baselines
- Step 5: Monitoring requirements for baseline renewal

Step 1. Identification of the baseline scenario

Baseline determination is defined as "existing or historical, as applicable, changes in carbon stocks in the carbon pools within the project boundary" where the land would remain degraded in the absence of the project activity. Project Proponent must demonstrate that the land would remain degraded in the absence of the project activity by applying the tool T-DEG. This may be accomplished by using multiple sources of data, such as from peer-reviewed literature, archives, maps or satellite images of the land use/cover prior to project activity, field surveys, governmental reports, expert judgment[1] and interviews with landowners or professionals affiliated with wetland management of the area. Project Proponent must demonstrate that the candidate baseline scenario is consistent with historical wetland patterns that have been documented with historical and existing wetland area over the most recent 10-year period prior to the project start date, or longer if necessary.

Step 2. Project boundary

The project boundary geographically delineates the WR project activity under the control of the Project Proponent (PP) as defined in the WR-MF. It shall be demonstrated that each discrete parcel of land to be included in the boundary is eligible for a WR ACR project activity.

The pools that will be included or excluded from accounting are provided in WR-MF. WR-MF shall be followed in determining the GHG assessment boundary, along with the guidance in the ACR *Forest Carbon Project Standard,* Chapter 2.

Hydrologic management has the potential to increase GHG emissions therefore baseline and project emissions must be accounted for. Emissions may be estimated based on site/project specific data, an acceptable proxy, reference sample plots or field monitoring of similar sites, peer-reviewed literature, approved local or national parameters, or the most recent default emission factors provided by IPCC (e.g. IPCC 1997, 2003, 2006). Project Proponent using extrapolated values must make conservative estimates to determine the baseline and proposed project activity GHG emissions. Sources deemed significant and selected for accounting in the baseline scenario shall also be accounted for in the project scenario.

Exclusion of carbon pools and emission sources is allowed subject to considerations of conservativeness and significance testing. This may be accomplished by using multiple sources of data, such as from peer-reviewed literature, field surveys, governmental reports, and expert judgment[2]. Pools or sources may always be excluded if conservative, i.e. exclusion will tend to

[1] Justification should be supplied for all values derived from expert judgment.
[2] Justification should be supplied for all values derived from expert judgment.

underestimate net GHG emission reductions/removal enhancements. Pools or sources can be neglected (i.e., counted as zero) if application of the tool T-SIG indicates that the source is insignificant, provided that all sources, sinks and pools determined to be insignificant and excluded from accounting represent less than 3% of the *ex ante* calculation of emission reductions/removal enhancements (per ACR *Forest Carbon Project Standard*). If monitoring of baseline and project emissions determines that an emission source(s) initially included in the GHG assessment boundary is insignificant using the tool T-SIG, monitoring may cease.

Step 3. Baseline stratification

Stratification is a standard statistical procedure to decrease overall variability of carbon stock estimates by grouping data taken from environments with similar characteristics. When estimating baseline carbon stocks, several strata can be assessed, including but not limited to:

a. Management regime
b. Vegetation type and species
c. Age class
d. Trend in land loss conversion
e. Water quality (e.g. salinity, nutrient inputs, distance from source, etc.)
f. Hydrology
g. Elevation and subsidence rates
h. Site index and anticipated growth rates
i. Areas prone towards wetland loss

If the project activity area is not homogeneous, stratification should be carried out to improve the accuracy and precision of carbon stock estimates. Different stratifications may be required for the baseline and project scenarios, especially if there will be a change in hydrology, in order to achieve optimal accuracy and precision of the estimates of net GHG removal by sinks. Strata should be defined based on parameters that affect GHG removals or emissions and/or that are key entry variables for the methods used to measure changes in carbon stocks.

- **For baseline net GHG removals by sinks** it will usually be sufficient to stratify according to major vegetation types since baseline removals for degraded (or degrading) wetlands can be expected to be small in comparison to project removals;

- **For actual net GHG removals by sinks**, the stratification for *ex-ante* estimations shall be based on the proposed project monitoring plan. The stratification for *ex-post* estimations shall be based on the actual implementation of the project monitoring plan. If natural or anthropogenic impacts (e.g., hurricanes) or other factors (e.g. altered hydrology) add variability to the growth pattern of the project area, then the *ex-post* stratification shall be revised accordingly.

Project Proponent may use remotely sensed data acquired close to the time of project commencement and/or the occurrence of natural or anthropogenic impacts for *ex-ante* and *ex-post* stratification.

Step 4. Baseline net removals for fixed baselines

The baseline scenario is the carbon stock present immediately prior to site preparation or the most likely carbon stock in the absence of project implementation. Therefore, the baseline net GHG removals by sinks is the sum of the changes in carbon stocks in the selected carbon pools within the project boundary just prior to site preparation, or what would have occurred in the absence of the project activity. If activities have already begun the baseline net GHG removals can be determined by using multiple sources of data, such as from peer-reviewed literature, archives, field surveys of reference sites, and governmental reports, combined with expert judgment[3]. The Project Proponents must retain a conservative approach in making these estimates.

Under the applicability conditions of this methodology:

- Changes in the carbon stock of aboveground non-tree vegetation may be conservatively assumed to be zero for all strata in the baseline scenario;
- Changes in the carbon stock of dead wood and litter/surface debris carbon pools are conservatively omitted. Therefore, the sum of the changes in the carbon stocks of dead wood and litter carbon pools is zero for all strata in the baseline scenario;
- For wetland GHG emissions, the sum of emissions will either be set as zero or quantified based on the conclusions of Step 2. Project Proponent using extrapolated values must use conservative estimates.

The baseline net GHG removals by sinks shall be estimated using the equations in this section. When applying these equations for the *ex-ante* calculation of baseline net GHG removals by sinks, Project Proponent shall provide estimates of the values of those parameters that are not available before the start of the Crediting Period and commencement of monitoring activities. Project Proponent should retain a conservative approach in making these estimates.

4.1 Baseline carbon stocks[4]

Net carbon stocks for the baseline scenario are equal to the carbon stocks of trees and soils minus greenhouse gas emissions. If wetland loss is expected to occur within the project boundary in the baseline scenario over the 40-year Crediting Period , the 'loss of sequestration capacity' and 'emissions due to wetland loss' can also be estimated and added to the net

[3] Justification should be supplied for all values derived from expert judgment.
[4] Stock estimates shall occur for the pools defined through the framework module WR-MF

carbon stocks. The baseline net GHG removals by sinks should be determined using the following equation:

$$\Delta C_{bsl,WR\text{-}HM\text{-}WL} = \Delta C_{TREE\_BSL\_loss} + \Delta C_{SOC\_BSL\_loss} - \Delta GHG_{E\_BSL\_loss} - \Delta GHG_{E\_BSL\_loss\_PE} \quad (1)$$

where:

$\Delta C_{bsl\text{-}WR\text{-}HM\text{-}WL}$ Net carbon stocks for the baseline scenario during wetland loss up to time *t*; t CO2-e

$\Delta C_{TREE\_BSL\_loss}$ Cumulative total carbon stock sequestered by living trees for the baseline scenario during wetland loss up to time *t*; t CO_2-e

$\Delta C_{SOC\_BSL\_loss}$ Cumulative total carbon stock sequestered by soils for the baseline scenario during wetland loss up to time *t*; t CO_2-e

$\Delta GHG_{E\_BSL\_loss}$ Cumulative total GHG's emitted from the project area for the baseline scenario during wetland loss up to time *t*; ton CO_2-e yr^{-1}

$\Delta GHG_{E\_BSL\_loss\_PE}$ Cumulative GHG emissions resulting from decomposition of organic matter during wetland loss (i.e., emissions due to wetland loss) up to time *t*; t CO_2-e

For calculation of carbon stock sequestered by living trees and soils, see the modules "Estimation of carbon stocks of living trees" (CP-TB) and "Estimation of carbon stocks of wetland soils" (CP-S). For the calculation of greenhouse gas emissions, see module "Estimation of emission sources" (E-E)

Rate of Wetland Loss

This module requires knowledge of the rate at which the wetlands within the project boundary would be lost over the Crediting Period (i.e., area of wetland loss per year) without the project activity. The baseline wetland loss rate in hectares per year in the project boundary must be determined before the start of the project activity, but can be modified during the course of the project if relevant data becomes available. There are several state and federal agencies that report wetland loss along the entire Louisiana coast, for example, the United States Geological Survey (USGS) publishes maps and analysis of land loss every few years. [5][6][7][8][9] Louisiana's

[5] Barras, J., S. Beville, D. Britsch, S. Hartley, S. Hawes, J. Johnston, P. Kemp, Q. Kinler, A. Martucci, J. Porthouse, D. Reed, K. Roy, S. Sapkota and J. Suhayda. 2003. Historical and projected coastal Louisiana land changes: 1978-2050: USGS Open File Report 03-334, 39 p. (Revised January 2004).

Comprehensive Master Plan for a Sustainable Coast[10] provides predictive models to evaluate a 'future without action' over a 50-year timeframe that will be updated for each five-year Master Plan. Ranges of high and low values for each environmental uncertainty (i.e., subsidence, sea level rise, rate of wetland loss) were chosen based on expert panel recommendations or by using best professional judgment, forming two scenarios described as 'moderate' and 'less optimistic' (Figure 1). It is the responsibility of the project proponents to justify the inclusion of wetland loss in the carbon analysis. Such justification could be derived from, for example, an analysis of surface elevations of wetlands in the project area in relation to projected sea level rise and regional subsidence estimates. Details of the analysis justifying the inclusion of wetland loss in the baseline scenario should be provided in the Greenhouse Gas Management Plan and be performed in a conservative manner.

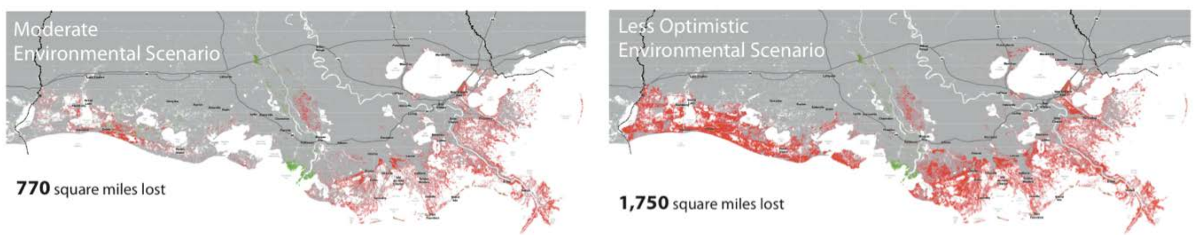

Figure 1. A comparison of modeled land change along the Louisiana coast at Year 50 under moderate and less optimistic scenarios of future coastal conditions. Red indicates wetland loss that is likely to occur with a BAU scenario (from CPRA 2012).

4.2 Baseline carbon stock changes of the living trees with wetland loss ($\Delta C_{TREE\_BSL\_loss}$)

Project Proponent may conservatively quantify carbon stock changes of living trees during projected wetland loss for the baseline scenario using module "Estimation of Carbon Stocks of Living Trees" (CP-TB). The estimation of carbon stock changes of living trees for the baseline

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[6] Barras, J.A. 2007. Land area changes in coastal Louisiana after Hurricanes Katrina and Rita. Pages 98-113 In G.S. Farris, G.J. Smith, M.P. Crane, C.R. Demas, L.L. Robbins, and D.L. Lavoie, editors. Science and the storms: The USGS response to the hurricanes of 2005. U.S. Geological Survey Circular 1306. Available from http://pubs.usgs.gov/circ/1306/.

[7] Barras, J.A., J.C. Bernier, and R.A. Morton. 2008. Land area change in coastal Louisiana - A multidecadal perspective (from 1956 to 2006). U.S. Geological Survey Scientific Investigations Map 3019, scale 1:250,000, 14 p. pamphlet.

[8] Couvillion, B.R., Barras, J.A., Steyer, G.D., Sleavin, William, Fischer, Michelle, Beck, Holly, Trahan, Nadine, Griffin, Brad, and Heckman, David, 2011, Land area change in coastal Louisiana from 1932 to 2010: U.S. Geological Survey Scientific Investigations Map 3164, scale 1:265,000, 12 p. pamphlet.

[9] Couvillion, B.R., Barras, J.A., Steyer, G.D., Sleavin, William, Fischer, Michelle, Beck, Holly, Trahan, Nadine, Griffin, Brad, and Heckman, David, 2011, Land area change in coastal Louisiana from 1932 to 2010: U.S. Geological Survey Scientific Investigations Map 3164, scale 1:265,000, 12 p. pamphlet.

[10] CPRA (Coastal Protection and Restoration Authority). 2007. Louisiana's Comprehensive Master Plan for a Sustainable Coast. Baton Rouge, Louisiana: Louisiana Coastal Protection and Restoration Authority.

scenario (ΔC_{TREE_BSL}) from CP-TB will be modified to ($\Delta C_{TREE\_BSL\_loss}$) using the equation below. If there is more than one stratum in the baseline scenario, the outcome should be summed over all the strata to obtain the value for the whole project.

$$\Delta C_{TREE\_BSL\_loss} = \sum_{y=1}^{t} (H_y/H_o) * \frac{\Delta C_{TREE\_BSL}}{t} \quad (2)$$

where:

$\Delta C_{TREE\_BSL\_loss}$	Cumulative total of the carbon stock changes of living trees for the baseline scenario during wetland loss up to time *t*; t CO_2-e
ΔC_{TREE_BSL}	Cumulative total of the carbon stock changes of living trees for the baseline scenario up to time *t*; t CO_2-e (CP-TB)
H_y	Wetland area within the project boundary at year y; ha
H_o	Wetland area within the project boundary at t=0; ha
y	1, 2, 3, 4…. time to monitoring event t; years
t	year of monitoring event; years

4.3 Baseline carbon stock changes of the soil pool during wetland loss ($\Delta C_{SOC\_BSL\_loss}$)

Project Proponents may conservatively quantify carbon stock changes of the soil pool during projected wetland loss for the baseline scenario. See the module “Estimation of Carbon Stocks of wetland soils” (CP-S) for calculation of carbon stock sequestered in soils. The estimation of carbon stock changes of the soil in the baseline scenario (ΔC_{SOC_BSL}) from CP-S will be modified to ($\Delta C_{SOC\_BSL\_loss}$) using the equation below. If there is more than one stratum in the baseline scenario, the outcome should be summed over all the strata to obtain the value for the whole project.

$$\Delta C_{SOC\_BSL\_loss} = \sum_{y=1}^{t} (H_y/H_o) * f\, C_{SOC\_BSL} \quad (3)$$

where:

$\Delta C_{SOC\_BSL\_loss}$	Cumulative total of the carbon stock changes of soils for the baseline scenario during wetland loss up to time *t*; t CO_2-e
$f\, C_{SOC\_BSL}$	Rate of increase in soil carbon stock for the baseline scenario; t CO2-e yr-1 (CP-S)
H_y	Wetland area within the project boundary at year y; ha

H_o Wetland area within the project boundary at t=0; ha

y 1, 2, 3, 4…. time to monitoring event t; years

t year of monitoring event; years

4.4.1 Baseline emissions during wetland loss ($\Delta GHG_{E\_BSL\_loss}$)

Project Proponents may conservatively quantify changes in GHGs emissions during wetland loss for the baseline scenario. See the Module "Estimation of emission sources" (E-E) for calculation of GHG emissions. The estimation of emissions in the baseline scenario (ΔGHG_{E_BSL}) from E-E will be modified to ($\Delta GHG_{E\_BSL\_loss}$) using the equation below. These equations provide for the calculations to be performed for each stratum. If there is more than one stratum in the baseline scenario, the outcome should be summed over all the strata to obtain the value for the whole project.

$$\Delta GHG_{E\_BSL\_loss} = \sum_{y=1}^{t} \left((H_y/H_o) * \Delta GHG_{E\_BSL} \right) \tag{4}$$

where:

$\Delta GHG_{E\_BSL\_loss}$ Cumulative total GHG emissions from within the project boundary for the baseline scenario during wetland loss up to time t; t CO_2-e

ΔGHG_{E_BSL} Annual total GHG emissions from within the project boundary for the baseline scenario (equation (1) of module E-E with T=1); t CO_2-e yr^{-1}

H_y Wetland area within the project boundary at year y; ha

H_o Wetland area within the project boundary at t=0; ha

y 1, 2, 3, 4…. time to monitoring event t; years

t year of monitoring event; years

4.4.2 Baseline emissions from the decomposition of organic matter during wetland loss ($\Delta GHG_{E\_BSL\_loss\_PE}$)

Currently insufficient knowledge exists regarding the fate and transport of carbon during wetland loss that can be applied to 'emissions due to wetland loss' carbon analysis. Critical research is needed to determine what proportion of the soil horizon, or at what rate, this material is decomposed and results in CO_2 and CH_4 emissions. If new data becomes available, however, Project Proponents can use the equations below in lieu of equation C3.5.1 in module E-E to quantify 'emissions due to wetland loss' that would occur if the project activity were not implemented. Project proponents are required to provide supporting evidence and arguments supporting the emission values used. Expert judgment and statements by professionals affiliated with wetland management may be provided as part of the supporting evidence.

If the annual proportion of soil organic carbon released as GHGs is known, the following equation can be used:

$$\Delta GHG_{E\_BSL\_loss\_PE} = \sum_{y=1}^{t} H_y * SOC_{50cm} * (\%_{CO2} + \%_{CH4} * GWP_{CH4}) \quad (5)$$

where:

$\Delta GHG_{E\_BSL\_loss\_PE}$	Cumulative total GHG emissions resulting from decomposition of organic matter during wetland loss within the project boundary up to time *t*; t CO_2-e
H_y	Wetland area within the project boundary at year y; ha
y	1, 2, 3, 4…. time to monitoring event t; years
t	year of monitoring event; years
SOC_{50cm}	Amount of carbon in top 50 cm of wetland soil profile; t CO2-e ha^{-1} (CP-S)
$\%_{CO2}$	Proportion of soil organic carbon released as CO_2 emissions per year (0-1); no units
$\%_{CH4}$	Proportion of soil organic carbon released as CH_4 emissions per year (0-1); no units
GWP_{CH4}	Global warming potential for CH_4 (= 25 for the first commitment period); t CO_2-e $(t\ CH_4)^{-1}$

Alternatively, the following equation can be used if the annual rates of emissions of GHGs during wetland loss are known:

$$\Delta GHG_{E\_BSL\_loss\_PE} = \sum_{y=1}^{t} H_y * (f\,GHG_{CO2\_loss} + f\,GHG_{CH4\_loss} * GWP_{CH4}) \quad (6)$$

where:

$\Delta GHG_{E\_BSL\_loss}$	Cumulative total GHG emissions resulting from decomposition of organic matter during wetland loss up to time *t*; t CO_2-e
H_y	Wetland area within the project boundary at year y; ha
y	1, 2, 3, 4…. time to monitoring event t; years
t	year of monitoring event; years
$f\,GHG_{CO2\_loss}$	Rate of CO_2 emissions during wetland loss; t C ha^{-1} yr^{-1}
$f\,GHG_{CH4\_loss}$	Rate of CH_4 emissions during wetland loss; t C ha^{-1} yr^{-1}

f GHG$_{N2O\_loss}$ Rate of N_2O emissions during wetland loss; t C ha^{-1} yr^{-1}

Global warming potentials for CH_4 and N_2O were derived from: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

Step 5. Monitoring requirements for baseline renewal

A Crediting Period for a project is a predetermined length of time for which the baseline scenario is applicable. This period of time is used for carbon quantification of offsets generated relative to its baseline.

In order to renew the Crediting Periods the Project Proponent must:

- Re-submit the GHG Project Plan in compliance with then-current GHG Program standards and criteria;
- Re-evaluate the project baseline;
- Demonstrate additionality against then-current regulations and performance standard data.
- Use GHG program-approved baseline methods, emission factors, tools, and methodologies in effect at the time of Crediting Period renewal;
- Undergo validation by an approved validation/verification body.

DATA AND PARAMETERS NOT MONITORED

Data /parameter:	H_o
Data unit:	ha
Used in equations:	2, 3
Description:	Wetland area within the project boundary at the start of the project (t=0)
Source of data:	Peer-reviewed literature, field surveys, governmental reports, archives, maps and satellite images of the land use/cover prior to project activity.
Measurement procedures (if any):	N/A
Any comment:	Determined at the start of project.

Data /parameter:	H_y

Data unit:	ha
Used in equations:	2, 3
Description:	Wetland area within the project boundary at monitoring event t
Source of data:	Peer-reviewed literature, field surveys, governmental reports, maps and satellite images of the land use/cover after start of project activity.
Measurement procedures (if any):	N/A
Any comment:	Shall be revisited at the time of baseline renewal. Since the equations using this parameter are integrated over yearly time steps, H_y for each year can be extrapolated from the project rate of wetland loss, which can be calculated as H_y /H_o when $y = t$.

Data /parameter:	$\%_{CO2}$
Data unit:	(0-1) no units
Used in equations:	4
Description:	Proportion of soil organic carbon released as CO_2 emissions per year
Source of data:	Peer-reviewed literature and/or independent field surveys
Measurement procedures (if any):	N/A
Any comment:	The use of this parameter must be scientifically justified by the Project Proponents and accepted by verifiers.

Data /parameter:	$\%_{CH4}$
Data unit:	(0-1) no units
Used in equations:	4
Description:	Proportion of soil organic carbon released as CH_4 emissions per year
Source of data:	Peer-reviewed literature and/or independent field surveys
Measurement procedures (if any):	N/A

Any comment:	The use of this parameter must be scientifically justified by the Project Proponents and accepted by verifiers.

Data /parameter:	$\%_{N2O}$
Data unit:	(0-1) no units
Used in equations:	4
Description:	Proportion of soil organic carbon released as N_2O emissions per year
Source of data:	Peer-reviewed literature and/or independent field surveys
Measurement procedures (if any):	N/A
Any comment:	The use of this parameter must be scientifically justified by the Project Proponents and accepted by verifiers.

Data /parameter:	$f\ GHG_{CO2\_loss}$
Data unit:	t C ha^{-1} yr^{-1}
Used in equations:	5
Description:	Rate of CO_2 emissions during wetland loss
Source of data:	Peer-reviewed literature and/or independent field surveys
Measurement procedures (if any):	N/A
Any comment:	The use of this parameter must be scientifically justified by the Project Proponents and accepted by verifiers.

Data /parameter:	$f\ GHG_{CH4\_loss}$
Data unit:	t C ha^{-1} yr^{-1}
Used in equations:	5
Description:	Rate of CH_4 emissions during wetland loss
Source of data:	Peer-reviewed literature and/or independent field surveys

Measurement procedures (if any):	N/A
Any comment:	The use of this parameter must be scientifically justified by the Project Proponents and accepted by verifiers.

Data /parameter:	$f\ GHG_{N2O\_loss}$
Data unit:	t C ha^{-1} yr^{-1}
Used in equations:	5
Description:	Rate of N_2O emissions during wetland loss
Source of data:	Peer-reviewed literature and/or independent field surveys
Measurement procedures (if any):	N/A
Any comment:	The use of this parameter must be scientifically justified by the Project Proponents and accepted by verifiers.

PARAMETERS ORIGINATING IN OTHER MODULES

Data /parameter:	ΔC_{TREE_BSL}
Data unit:	t CO_2-e
Used in equations:	2
Description:	Cumulative total of the carbon stock changes of living trees in the baseline scenario up to time *t*
Module parameter originates in:	CP-TB
Any comment:	

Data /parameter:	ΔGHG_{E_BSL}
Data unit:	t CO_2-e yr^{-1}
Used in equations:	1
Description:	Annual total GHG emissions from the project area for the baseline

	scenario
Module parameter originates in:	E-E
Any comment:	Use equation (1) of module E-E with *T* set to 1 (*T*=1)

Data /parameter:	$f\,C_{SOC\_BSL}$
Data unit:	t CO_2-e yr^{-1}
Used in equations:	3
Description:	Rate of increase in soil carbon stock for the baseline scenario
Module parameter originates in:	CP-S
Any comment:	

Data /parameter:	SOC_{50cm}
Data unit:	t CO2-e ha^{-1}
Used in equations:	4
Description:	Amount of carbon in top 50 cm of wetland soil profile
Module parameter originates in:	CP-S
Any comment:	