J Blue Credit®Certification Application Guide

- Utilizing blue carbon to combat climate change -

Ver.2.5

March 2025

ジャパンブルーエコノミー技術研究組合

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1.1 How to use this guide

This guide was compiled by the Japan Blue Economy Technology Research Association (Japan Blue Economy Association:J.B.E.) operated by J Blue Credit®This guide summarizes the application method for certification of J. Blue Credit (hereinafter referred to as "J. Blue Credit") and the approach to investigations related to the application. It summarizes points to note when applying and points to consider that are important during the review and certification, so please use this guide when considering investigation plans and applying.

1.2 What is J Blue Credit?

The Government:2050By 2020, carbon dioxide (CO_2In order to achieve carbon neutrality, local governments, companies, citizens, etc. must each do their best to reduce greenhouse gas emissions, including CO2 emissions, to virtually zero.CO_2However, for emissions that cannot be reduced to zero by oneself, it is necessary to make efforts to reduce them through the efforts of others.CO_2This can be adjusted by purchasing carbon offsets to offset the reduction or absorption of carbon dioxide.

Recent research has shown that carbon absorbed and stored in marine ecosystems (blue carbon) is just as important as carbon absorbed and stored on land (green carbon). As a result, there are high hopes for the use of blue carbon as an effective approach to achieving carbon neutrality in Japan, a country with rich marine ecosystems.

This blue carbon can be quantified and traded as credits§By utilizing J Blue Credit, applicants can raise funds for their activities by selling credits, and can expect to revitalize their activities by raising awareness of their activities. Credit purchasers can alsoCO_2In addition to reductions, it is also possible to disclose activities to combat global warming, which is beneficial for both parties.Win-winThis is a mechanism that creates a virtuous cycle between the environment and the economy.

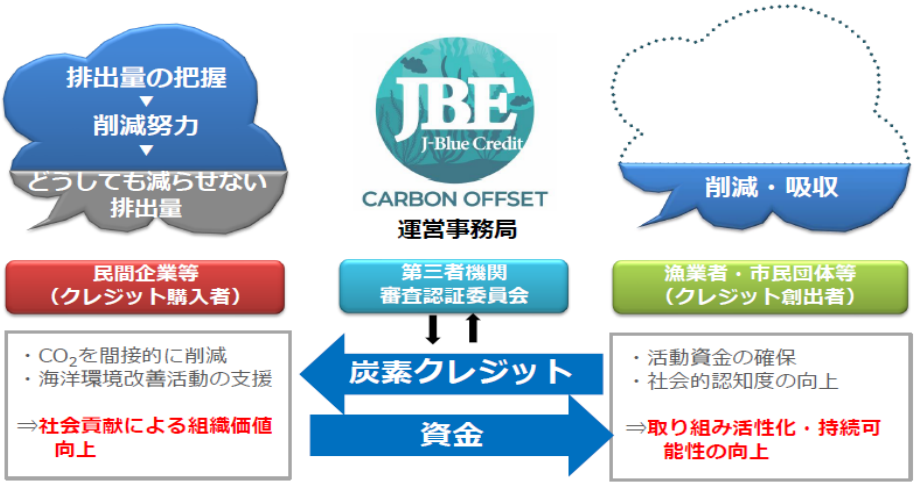


Figure 1-1 Overview of the J Blue Credit Scheme

§"5Refer to "Glossary" (p.58)

[Column] Blue Carbon and Green Carbon

Blue carbon is the carbon released into the atmosphere by marine organisms.$CO_2$is taken in, and seaweed and mangroves grow

Green carbon refers to carbon absorbed and stored in marine ecosystems such as lakes, ponds, and salt marshes.

(by forestCO_2As the opposite of absorption and storage,2009In 2013, the United Nations Environment Programme (UNEP)§By

It was named.

IPCC(Intergovernmental Panel on Climate Change)§According to information from the

As shown in the figure, land area (19hundred milliont-CO_2/Approximately one year)twenty fivehundred milliont-CO_2/10 years of carbon dioxide in the ocean

It can be seen that the water is being absorbed throughout the entire area. In addition, the water is also being absorbed throughout the entire area, including seaweed beds, tidal flats, coral reefs, and inner bay areas.

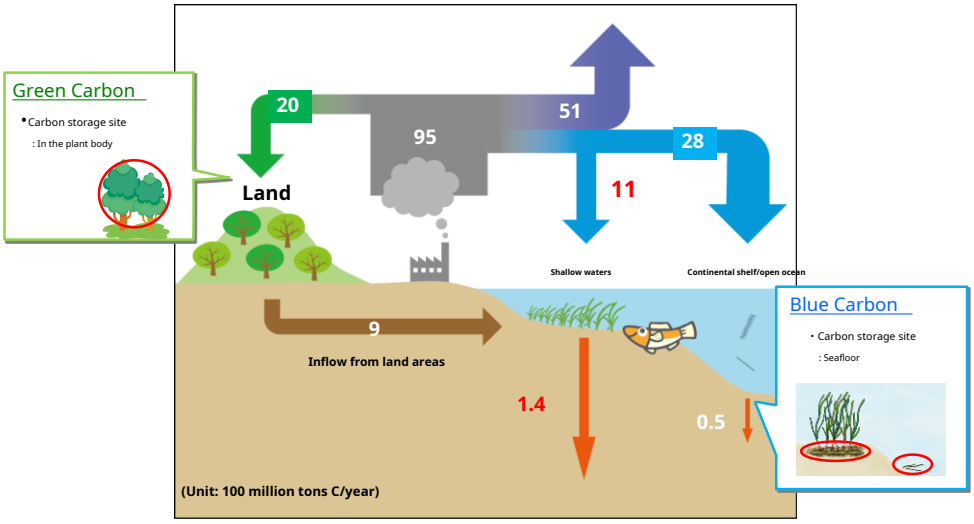
The entire "shallow waters"CO_2A recent study estimated the rate of absorption on a global scale, using knowledge and data.

Although there is a large variability and high uncertainty due to constraints, the "11hundred milliont-CO_2/year

It is estimated to be "approximately."

World No.6Japan, which has the longest coastline in the world, is an important step towards achieving carbon neutrality.CO_2Suck

There is a high possibility that it will become a source of income, and in recent years it has been attracting increasing attention from the national government, local governments, private companies, etc.



source:Kuwae and Crooks (2021)Created with reference to

Figure 1-2 Carbon cycle diagram of green carbon and blue carbon

§"5Refer to "Glossary" (p.58)

CO_2The absorption and storage mechanisms are as follows, and the locations where they are stored are different.

While green carbon is found mainly inside plants, blue carbon is found on the ocean floor.

It is stored "outside plants, such as in sediments," and is characterized by its highly sustainable carbon storage.

・Green carbon: absorbed by plants through photosynthesisCO_2but,

Accumulates in the soil as fallen leaves, roots, and fallen trees, in addition to "① within the body of the plant (trunk, branches, leaves, roots, etc.)"

Blue carbon: Absorbed by seaweed and other organisms through photosynthesisCO_2but,

It accumulates in the marine soil and deep sea as organic matter derived from the algae, and in the deep sea as organic matter derived from the algae.

It also accumulates in seawater as released, persistent dissolved organic matter.

The above absorption and storage mechanisms and life span (trees:50Years or more, seaweed/algae:1~Several years)

Due to differences in the type of credit, the characteristics of the credit issued will vary for each item, as shown in the table below.

Table 1-1 Characteristics of the credits issued

item	Green Carbon		Blue Carbon*1
Eligible schemes	J-Credit System§		J Blue Credit Scheme
Carbon storage site (CO absorbed from the atmosphere 2 where it is stored)	Tree biomass within the target area (Trunk, branches, leaves, roots, etc.)		Mainly difficult to decompose in soil and seawater As a sexual substance, or Deep sea and other areas outside the target area Retention
Sustainability of carbon storage (How many years has it been since the atmospheric $CO_2$is stored in the carbon pool Can it be done?)	**Decades** Until final harvest (~80 years) Recorded as emissions		**Hundreds to thousands of years** In soil, seawater, and the deep sea, Both are hundreds to thousands of years old Time scale
CO_2Regression risk (The stored carbon is Before the date CO_2(Return to	**expensive** Forest fires, landslides, land conversion, Appropriate felling, etc.		**low** Soil disturbance (if any) is the actual CO_2Regression is limited)
CO_2Insurance against regression risk ・Batteries on the credit register Buffer Management ・Measures to ensure permanence	Non-human Recurrence	**3% credit reserve** (Natural phenomena such as forest fires)	**Generally not required** (Evaluating annual performance) It is a system that can be sustained Long-lasting and low risk of regression (e.g.,
	Artificial Regression	・For 10 years**Improper felling** **Pick**(The amount of absorption is reduced. Lost),**Land Use Conversion** **Pledge not to** ・Expected CO_2Amount absorbed If there was no**Supplement** **Duty to fill**	
On the site Credit issuance limit years	As long as the trees grow**Unlimited** ・however,10 years since the start of activities is as mentioned above**Bound by security measures**Be do.		・As long as the ecosystem exists **Unlimited** ・Seaweed bed area and CO_2Amount absorbed butAssuming it decreased the following year However, the fact that it was discharged It won't happen.

*1: In principle, above-ground parts of mangroves are excluded.

§"5Refer to "Glossary" (p.58)

1.3 The concept of J Blue Credit certification

J-Blue Credit certification is a voluntary carbon market§As a global standard for high-quality carbon credits inICVCM(Integrity Council for the Voluntary Carbon Market)'s proposed Core Carbon Principles(p.5This is based on the concept of

J Blue Credits are absorbed and stored through the implementation of projects.CO_2The absorption amount is the target. CO_2The amount of absorption is100The target is materials that can be stably stored for more than a year (biomass contained in plants such as trees is not included).CO_2The absorption amount is J Blue Credit Assessment and Certification Committee§ (below, "Inspection and Certification Committee.") and is now known as J Blue Credit. You will be authenticated.

The certification is based on the creation, restoration, and maintenance of ecosystems targeted by the project.1Absorbed and stored over the yearCO_2 Based on the absorption amount, what would have happened if the project had not been implemented?CO_2This is the amount after subtracting the absorption amount (baseline), and the application is1This will be carried out on an annual basis.

From the viewpoint of whether records and memories of past activities remain clearly, the period covered by the certification may be extended.5The limit is one year.

Also,1The minimum certification unit per application is the total0.1t-CO_2That's all.

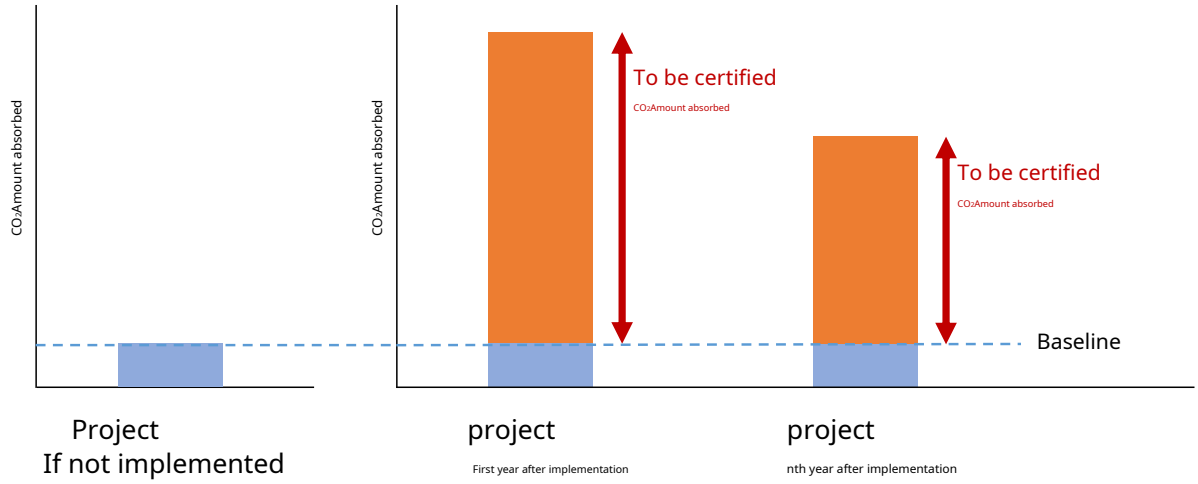


Figure 1-3 COs to be certified$_2$Amount absorbed

§"5Refer to "Glossary" (p.58)

As this system complies with the Core Carbon Principles as mentioned above, your application must also satisfy the items in the table below.

When applying, please enter the necessary information so that we can determine whether or not you qualify for the following items during the credit check.

Table 1-2 Core Carbon Principles and Judgment Methods

Core Carbon Principles Required items	Criteria	remarks
Additionality	Will the acquisition of credits result in emission reductions/removals?	p.8reference p.8(1)reference
Information Disclosure	Are information regarding credit activities disclosed comprehensively and transparently?	p.8reference
No double counting	Are there any duplicate applications, issuances, or sales?	p.9(3)reference
Sustainability	Are emission reductions/removals sustainable?	
system	Is there a system in place to ensure transparency, accountability, and credit quality?	
Quantifying reduction/absorption removal	Are the measurements of emission reductions/removals conservative and scientifically based?	p.9(2)reference
Sustainability	Does it have a positive impact on social and environmental sustainability?	
Net Zero Compatibility	Are you not engaging in activities or utilizing technologies that increase the use of fossil fuels, which are contrary to the Net Zero target, and are you continually working to reduce greenhouse gas emissions?	
Maintenance of the registry	Is there a registry that identifies, records and tracks credit activity and credits?	System administrator This is a requirement.
Third-party review and verification	Is there a requirement for an independent third party to review and verify credit activities?	The applicant is Not applicable。

※Online system "CO_2The content of the "Absorption Calculation Form" and attached documents will be reviewed by a third-party certification committee.

In order to identify, record and track credit activity and credits, "CO_2Contents of the "Absorption Calculation Form" and any attached documents will be registered and made public.

1.4 Application procedure

The process from application for J Blue Credit to credit certification and transfer is as follows. Applicants must complete the process via the J Blue Credit Operation System (hereinafter referred to as the "Online System") (https://credit.blueeconomy.jp/), confirmation of the target project, identification and coordination of related parties, investigation, application via the online system, on-site interviews, confirmation of application contents, and disclosure of activity reports (follow-up information). If activity reports are not submitted, certification will not be granted for the following fiscal year, so please submit them before applying for the following fiscal year.

The application details and activity reports of the certified projects areJ.B.E.ofHP(https://www.blueeconomy.jp/credit/follow-up/) to check.

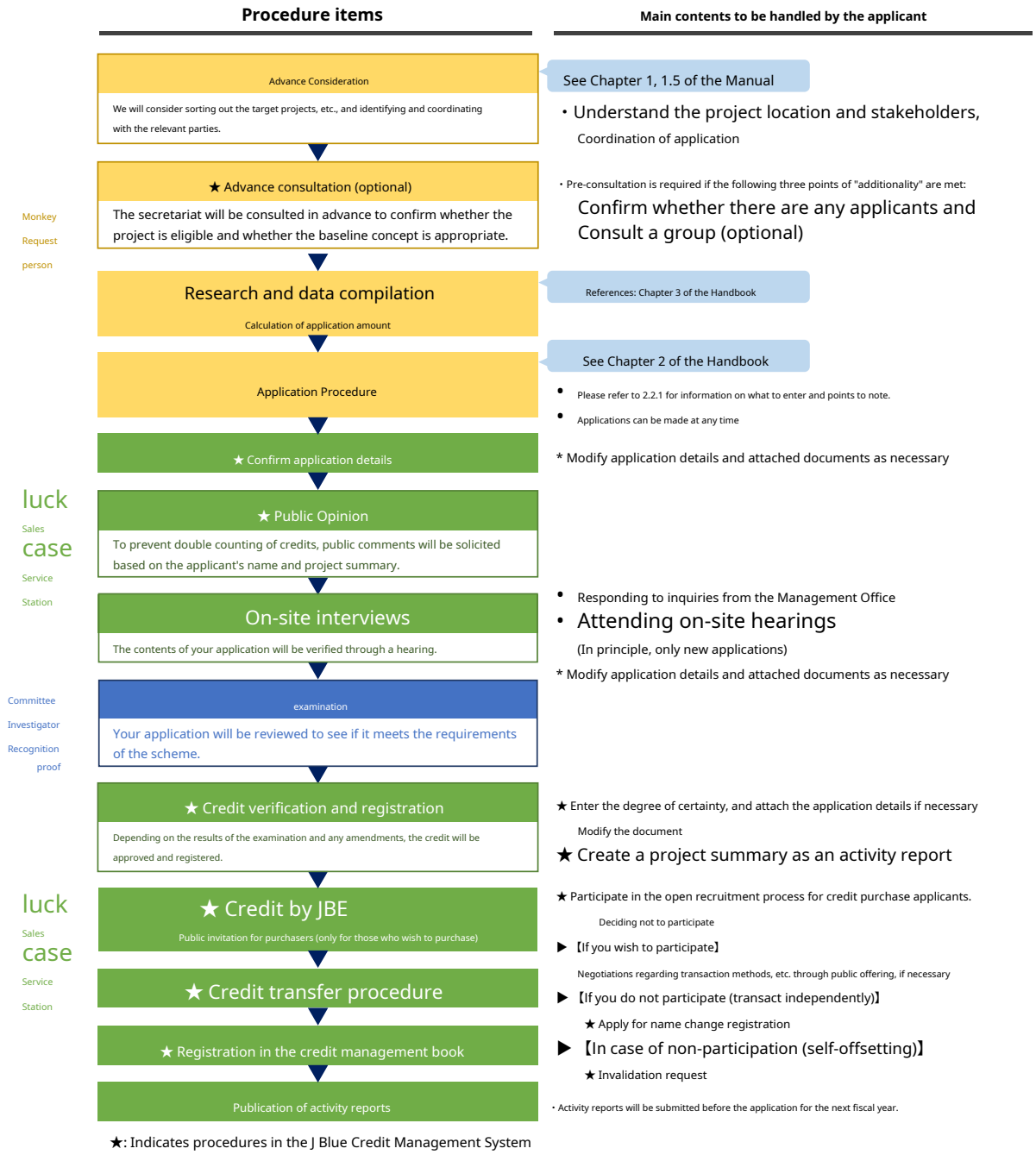


Figure 1-4 Procedural flow

The investigation and calculation procedures are shown below.

Advance review (project contents, etc.)

☐ **Consideration of project contents**(See Chapter 1 (p.10 onwards)) ・Projects related to natural infrastructure and artificial infrastructure (including aquaculture) are eligible. ・Consider whether the implementation content during the application period falls under the eligible projects.

☐ **Considering the baseline**(See Chapter 1 (p.9)) ・Consider the amount of absorption before the project is implemented (baseline)

☐ **Consideration of application scope**(See Chapter 1 (p.10)) ・The scope of the project includes the creation and conservation of the target ecosystem.

*Approximate area to apply for (when calculating based on production volume)

Target ecosystem	Eelgrass bed	Seaweed Bed	mangrove	Tidal flats
Approximate area*	Over 0.04ha	Over 0.07ha	Over 0.003ha	Over 0.07ha

* Based on Kuwae et al. (2019), CO_2The minimum certified unit of absorption is 0.1t-CO_2The area where the above is almost certain to be achieved is calculated. Calculation (assuming the area is 80% and the absorption coefficient is 70%)

☐ **Understanding the regional overview**

- Understanding the presence or absence of designated areas such as fishing rights and protected areas within the survey area, water depth, etc. [Reference database]

Umishiru (Ocean Conditions Display System): https://www.msil.go.jp/msil/htm/main.html?Lang=0 EADAS (Environmental Assessment Database): https://www2.env.go.jp/eiadb/webgis/index.html

☐ **Confirmation of stakeholders**(→Refer to Chapter 2 (p.9))

・To prevent double counting, confirm the parties involved in the project and implementation site, etc., and make the necessary adjustments and applications for the investigation and application. Request for payment etc.

Consult with the secretariat in advance regarding the content of the application, survey and calculation methods, etc. (optional)

* The three points ① to ③ in "(1) Additionality" shown on page 8 must be met, and the expected applicant group must be Please check in advance and consult with us.

Advance review (survey and calculation plan review)

☐ **Selection of calculation method**

・Select the calculation method based on the project content and important aspects of the calculation. (See Chapter 3 (p.17 onwards))

☐ **Consideration of research method**

- Consider the survey time, location, and method that best suits the type, size, and environmental conditions of the target ecosystem.

Tone **Survey, data compilation, and calculation of application amount**

☐ **Conducting the survey**

- Record information such as photographs that serve as the basis for determining distribution location and ecosystem type. - If a vessel was used for the survey, record the time, etc.

☐ **Absorption coefficient setting**

- Set the absorption coefficient to be used in the calculation (see Section 3.3)

☐ **Calculation of application amount**

・CO calculated from survey results$_2$Absorption to baseline CO_2Absorption volume and CO emissions from ships, etc.$_2$Subtract emissions, etc. (See Section 3.6 (p.46))

Apply for CO_2Amount absorbed
= (area of the target ecosystem×Evaluation) × (Absorption coefficient × Evaluation)
- Baseline CO_2Absorption - CO by ships etc.$_2$Emissions

Application Procedures (See Chapter 2)

Figure 1-5 Survey and calculation procedure

1.5 Eligible activity entities and projects

1.5.1 Requirements for the activity subject

The subject of an activity that is eligible for J Blue Credit application is required to meet both ① and ②.

1) Non-national organizations
② Those directly involved in the activities listed below (local governments,Nonprofit Organizations, Fisheries Cooperatives, Private Companies, and other various laws
Those who have contributed indirectly to the development (such as grant-givers and land managers)

1.5.2 Eligible Project Requirements

Projects that are eligible to apply for J Blue Credits can apply regardless of whether they are natural or artificial (including aquaculture) based. However, they are required to meet the "additionality" and "baseline" criteria shown below.

(1) Additionality

The purpose of the J Blue Credit Scheme is to: "Voluntary activities aimed at mitigating and adapting to climate change will continue to be

Based on this objective, the concept and requirements of additionality in the credit system are as follows:

"Acquiring credits will help sustain and develop our activities."

The presence or absence of additionality in each application is described below.3Based on points, etc.,*1The certification committee will determine whether the activity is appropriate, along with other requirements.*2 Please enter the following information in the "Project Overview" section of the online system:

① Voluntary activities were carried out with the aim of increasing absorption or suppressing a decrease.

② Why is it necessary to obtain credit?

3) Plans and prospects for sustaining and expanding climate change mitigation measures (including projects) through the acquisition of credits

*1In principle, a business can be determined to be an independent business if all or a major part of it is not conducted as a forced or compulsory undertaking based on laws, regulations, or national policies, and is not conducted as a profit-making transaction such as a contract, commission, or other outsourcing.

*2It has been pointed out that there is room for discussion at least regarding the necessity and content of additionality for carbon credits derived from carbon absorption and removal. In order to respond flexibly to the state of discussions both at home and abroad, the Review and Certification Committee will appropriately determine in a timely manner whether the additionality requirements of the J-Blue Credit Scheme are met.

(2) Baseline

As mentioned above, the baseline is the situation when the project is not implemented. The concept of the baseline in this credit system is as follows:

"As a result of voluntary activities, the amount of absorption increased.Before-After), and comparing project locations with non-project locations (Control-Impact) is shown from both sides.

BaselineCO_2The absorption amount after the project is implementedCO_2It is preferable to calculate the amount of CO2 removal using the same method as that for calculating removals, but if no survey has been conducted prior to the project implementation, please collect and understand as much information as possible about the site.

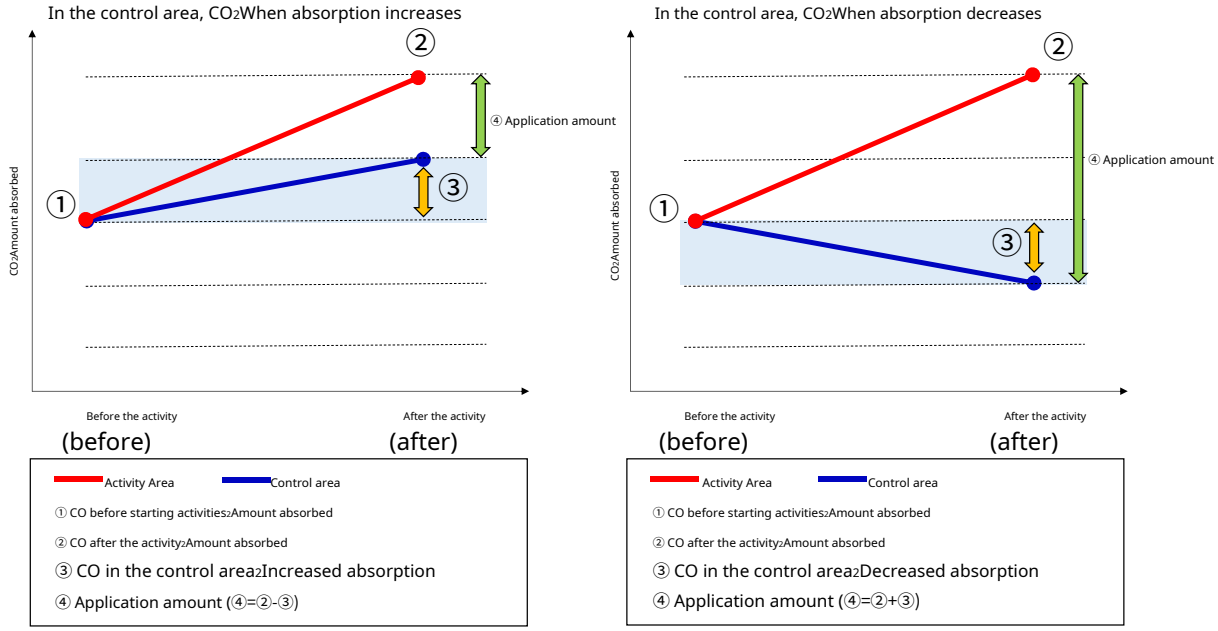


figure1-6 The baseline approach

(3) No double counting

Please coordinate with relevant parties in advance to avoid double counting.

In addition, please check the published application details to make sure there is no overlap with the area you are applying for. Examples of project stakeholders are as follows:

- Fishers (whether they have fishing rights, etc.)
- Port administrator
- Local government (administration)
- Universities (initiatives in the research field, etc.)
- Groups active in the same area

To ensure there is no double counting, the project overview is available online.2~3The project will be open to the public for about a week for public comment. During the public comment period, the applicant's name and project outline will be made public.

1.5.3 Eligible projects

"1.5.2As stated in "Requirements for Eligible Projects," eligible projects are as follows:3You need to fill in the points.

◆ It also aims to address climate change.

*The fact that in addition to fisheries, they are also working on decarbonization (activities aimed at decarbonization)

(e.g., establishing a joint system with other organizations)

◆ The increase in absorption is not a natural phenomenon but rather the result of activities. *Comparison between before and after the activity, and between the activity site and the non-activity site (see "Baseline")

◆ Acquiring credits will lead to maintaining and increasing absorption.(See "Additionality")

The target projects (activities) are as shown in Table 1-3.Either1Meet the above requirements The project is required to be carried out within Japan and to have no significant impact on the surrounding ecosystem.

The scope of the project should be set on the premise that the expansion of seaweed beds, tidal flats, etc. as a result of the activities can be explained chronologically and spatially (i.e., it can be confirmed that ecosystems such as seaweed beds and tidal flats have expanded to the surrounding areas after the direct activities have been carried out, and that the distribution area has expanded from the location of the direct activities).

Table 1-3 Target projects

Eligible Project Requirements		
1 From Naturally Base Board	Seaweed beds, mangroves, salt Marshes (tidal flats), etc. Natural coastlines of inland bays, etc. Activities in natural marine areas	1.1Creating an ecosystem
		Installation of foundations such as rocks and blocks, sand covering, adjustment of water depth, external forces (waves, currents, etc.) By adjusting the soil conditions, improving the bottom sediment, transplanting, sowing, and eradicating feeding organisms, So,Creating a new ecosystem If
		1.2Restoring, maintaining and preventing degradation of ecosystems
		The ecosystem in question was degraded or damaged prior to the implementation of the project. For the vanished field, Conducting the same activities as above,Restoring, maintaining and preventing degradation of the ecosystem If
2 people Engineering Base Board	Artificial infrastructure (structures, aquaculture) Activities at facilities, etc.	2.1Restoration, maintenance, expansion, and prevention of degradation of ecosystems
		The original artificial foundationClimate change mitigation measures other than the purpose of installation§(CO_2Absorption (or emission reductions)The purpose is also case In aquaculture projects, if the project requirements are met, existing Applications can be made including the aquaculture area.

§"5Refer to "Glossary" (p.58)

Table 1-4 Specific examples of target projects

item	Examples
① Installation of a substrate (algae reef) made of rocks or blocks	Natural stones, concrete blocks, aquaculture facilities, etc.
② Sand covering	Sea sand, dredged soil, land soil, modified soil (from the sea, waste), etc.
③ Adjusting the water depth	Making the walls of revetments and breakwaters more gently sloping, constructing berms on sloping revetments, raising the height with stone masonry, etc. (including ②sand-capping)
4. Adjustment of external forces (waves and currents)	Construction of canals (construction of waterways by digging the seabed), construction of structures
⑤ Improvement of water bottom sediment	Adding improvement materials, fertilizing, tilling, etc. (including ②sand covering)
⑥ Transplanting and sowing	Transplantation of eelgrass seeds, supply of mother algae, cultivation using seed threads, etc.
⑦ Eradication of predatory organisms	Removal of sea urchins, starfish, etc.
⑧ Infrastructure and vegetation management	Cleaning the rocks, thinning out, leaving behind
⑨ Restrictions on activities in the area	Preventing illegal fishing and reducing vegetation loss caused by fishing operations
⑩ Changes in activity structure	Establishment of a council for climate change mitigation measures, etc.

Important points to note when applying for credits for coastal barrenness prevention projects and seaweed farming

The following data is required when applying for credits for coastal erosion prevention projects or seaweed farming.J.B.E.Please refer to the website for similar certification project application details that are posted here.

◆ Measures against coastal erosion (Project to promote the multifaceted functions of fisheries, etc.) Data before and after activities in the project area, as well as data before and after around the project area

◆ Seaweed farming

Data on the location and amount of aquaculture (rope length) identified and grasped by aerial photography of the aquaculture area, or documents that can be used by a third party (other than the applicant) to certify the amount of aquaculture, such as insurance certificates for aquaculture facilities. *Data on landing (shipment) amount and implementation plans for aquaculture held by fishery cooperatives, etc. are objective evidence based on actual activities.

It is not accepted as documentation.

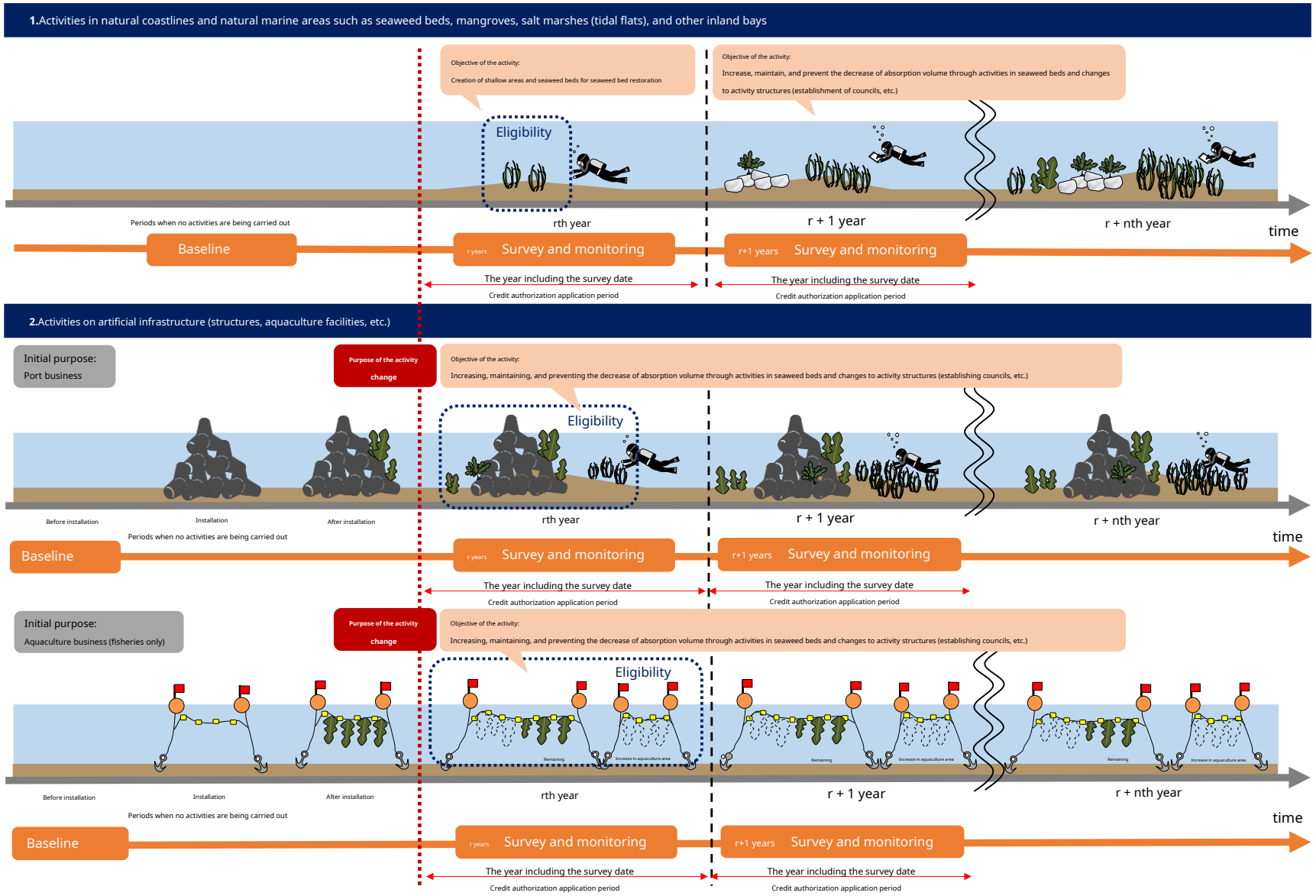


Figure 1-7 Image of the target project

2.1 Application period

The applicable period for J Blue Credit is1The application period is one year.1Please conduct this on an annual basis. Please note that the certification period may be extended from the perspective of whether records and memories of past activities remain clear.5The limit is one year.

2.2 JApplication via the Blue Credit Operation System

Points to note when reviewing the application details and the information to enter are as shown on the following pages. The information required for credit screening is summarized for each application item, so please use this as a reference when filling out the form.

- Transition to the J Blue Credit Management System -

2023year8month17From today , advance consultation, and application (new and renewal) are all handled through the J Blue Credit Management System.

This is a continuation.

For details on how to register and enter information, please refer to the "J Blue Credit Operation System"

(https://www.blueeconomy.jp/credit/) for more information.

For details on registration and input, please refer to the "2.2.1Please refer to "Points to Note and Input Information When Applying"

Please consider it.

In addition, with the introduction of the J Blue Credit operation system, applications will be**Accepted at any time** However, the examination and certification

Certificates and issuance times are not guaranteed.

Regarding the timing of the examination, certification and issuance,https://www.blueeconomy.jp/credit/Please check.

2.2.1 Important points to note and information to enter when applying

[User registration]

Application input items	Important points to note when applying and information to enter
Applicant	Project ImplementersPlease register as a user via our online system. This can be done individually or as a group. In the case of a joint application by multiple people, the representative should register and then add the co-applicants by clicking "Edit main applicant and co-applicants" which will be displayed after temporarily saving the project application.
Applicant information	If you are an individual, please enter your name. If you are an organization, please also enter the name of your organization, and then register your address, telephone number, email address, and password. When adding a joint applicant, enter the address and name. If it is an organization, enter the organization name, the applicant's position, name, address, and corporate number.

[Project Application]

Application input items	Important points to note when applying and information to enter
Project name	Please enter the project name (business name, initiative name, etc.). If it is a project that you have applied for in the past, please select the relevant project from "Project Handover". In addition, the project implementers§If there are any changes to the content of your plan or initiative, please enter this information during the advance consultation.
Project Class	Please check the applicable project category. (Multiple selections possible) p.10"Table1-3Please refer to "Target Projects".
Project Information (※8000(up to the characters)	Please enter the following information about the project: ・Reason for launching the project ・Explanation of activities after the project starts ・Application projectCO_2Explanation that the goal is also to restore and expand sinks *If you have any documents that provide an overview of the project, attach them by clicking "Add attachment." Please do.
Reason for obtaining credit (※1000(up to the characters)	Please explain why you would like to receive the credit.
Plans and prospects after obtaining credit Through (※2000(up to the characters)	Please describe any specific plans or prospects for continuing and expanding your climate change mitigation measures (including the project itself) through obtaining credits.
Activities carried out during the application period Overview	Please enter the activities carried out during the application period based on the project outline. Activities carried out outside the application period should be entered in the project information.
Project implementation start date	Enter the start date of the project.
Project Location	・Please create the project location on the map. ・Please refer to the system's general user manual for instructions on how to create it.

[Selection of target marine plants]

Application input items	Important points to note when applying and information to enter
Target marine plants choice	-[Ecosystem] [Seaweed bed] [Component species] Please input the target site (seaweed bed, tidal flat, mangrove forest). In the case of seaweed bed, please input the seaweed bed type (p.20Please also select (see below). -[Formula to be used] Please select the formula for the value actually used in the calculation (p.17 reference). -[Cultivation type] Please select whether or not you have cultivated the product. *Coefficients used to calculate the credit certification period, seaweed bed type, measured wet weight, etc. If it changes, you will need to enter it separately.

§"5Refer to "Glossary" (p.58)

【CO_2Absorption amount calculation form】

Application input items	Important points to note when applying and information to enter
Credit Authorization Application Elephant Period	Please enter the period for which you are applying for J Blue Credit, from the start date to the end date. However, the length of the period is1Please do so on an annual basis (1It is also possible to apply for several years in one lump sum for one year.) J Blue Credits are calculated based on the current stock at the time of the survey.1The annual absorption and storage volume is certified and issued, so the date of the survey is included.1Please make sure it is annual. The certification period can be retroactively5The retroactive period is limited to the past year. The conditions for retroactive period are as follows:2It's a point. ・Records of activities and investigations for each fiscal year must be kept. ・The results of each fiscal year's efforts must be able to be explained during interviews.
Target area (ha)	Area to be applied for (ha) for each ecosystem.
Basis for calculating area	Please enter the following information, keeping in mind that the scope of the project can be explained chronologically and spatially (that is, that it can be confirmed that the project spread to the surrounding area after the direct activity was carried out, and that the distribution area spread from the direct activity location). Also, please attach supporting documents. (Any format can be used.) - Survey date - Survey methods and results used to determine target location, area and coverage (diagrams and tables acceptable) - How to determine the target ecosystem (seaweed bed type, etc.) and how to classify the area and coverage - Reasons for determining the scope of activities (how the scope of activities was determined) -For areas where the water is deep and difficult to determine from aerial photographs, etc., it is preferable that you submit photographs as evidence of distribution. -Information such as water depth and ocean floor topography maps can also be used. *Certainty due to survey and determination methods§varies.
per unit area Amount absorbed	Please enter the absorption amount per unit area used to calculate the absorption amount.
per unit area Basis for calculating absorption amount	-Please enter the method for investigating the absorption coefficient. (Research method: using literature values or observational data, etc.) *Certainty depends on the contents§varies. *If you have documents related to the basis for calculation, please attach them by clicking "Add attachment."
Certainty assessment	-Please enter this information when resubmitting after the review and certification committee meeting.

[Vessels used during the survey]

Application input items	Important points to note when applying and information to enter
Ships used for the survey, etc.	-For the information on the vessels used in the survey, select the type of vessel used, and enter the number of vessels, operating hours, and vessel power (kW), and enter the fuel type. -During project implementationCO_2How is the emission amount calculated?p.45Please refer to the following. *If the ship information such as output is different, please enter it separately. 2When entering the number of vessels or more, select "Select the target marine plant"0" and then enter your vessel information.

[New uses for nets, ropes and buoys]

Application input items	Important points to note when applying and information to enter
New nets, ropes and buoys Shelf use	-When new nets, ropes, and buoys are used in the implementation of the project, the costs incurred in the production of these materials will be deducted only in the first year of application.CO_2Calculate emissions, CO_2This must be subtracted from the absorption amount. Enter the type and weight of material used. -During project implementationCO_2How is the emission amount calculated?p.45Please refer to.

§"5Refer to "Glossary" (p.58)

[Baseline setting, validity and amount]

Application input items	Important points to note when applying and information to enter
Baseline CO_2Amount absorbed	-If the project is not being implementedCO_2Please enter the absorption amount (baseline).
Baseline Setting Basis for calculation	-Please explain the state of the relevant ocean area if the project is not implemented, and enter the basis for how the amount of removals (baseline) was set if the project was not implemented. -The baseline concept is a guidelinep.9Please refer to. *If you have any documents related to the basis of calculation, please attach them by clicking "Add attachment". *"CO_2The baseline removal amount and the ship removal amount are calculated based on the values calculated using the "Removal Amount Calculation Form". By useCO_2The value minus the emissions will be calculated automatically (p.46reference).

[Input form for lead applicant and joint applicants (confidential information)]

Application input items	Important points to note when applying and information to enter
J Blue Credit Initially when issued Owner	The issued J Blue Credits will initially belong to the person designated by the applicant. Please enter the initial ownership percentage in parentheses after the name of each person (if the total is100 (Please make sure that the percentage is 100%). Please also include the degree of contribution of each person involved.p.16Please refer to the following. It is not necessary for the initial ownership rate and contribution rate to be the same, so please decide on the initial ownership rate and contribution rate through discussion between the parties involved. *Examples of each stakeholder - Fishers (whether they have fishing rights, etc.) ・Port administrator ・Local government (administration) ・Universities (initiatives in the research field, etc.) - Groups active in the same area

2.2.2 How we think about contribution

Regarding the ownership of credits, please hold prior discussions regarding the degree of contribution of each party, taking into account the implementation status of the project, etc.

Below is an example of how to think about the contributions of the credit acquirer and each party involved in implementing a infrastructure creation project.

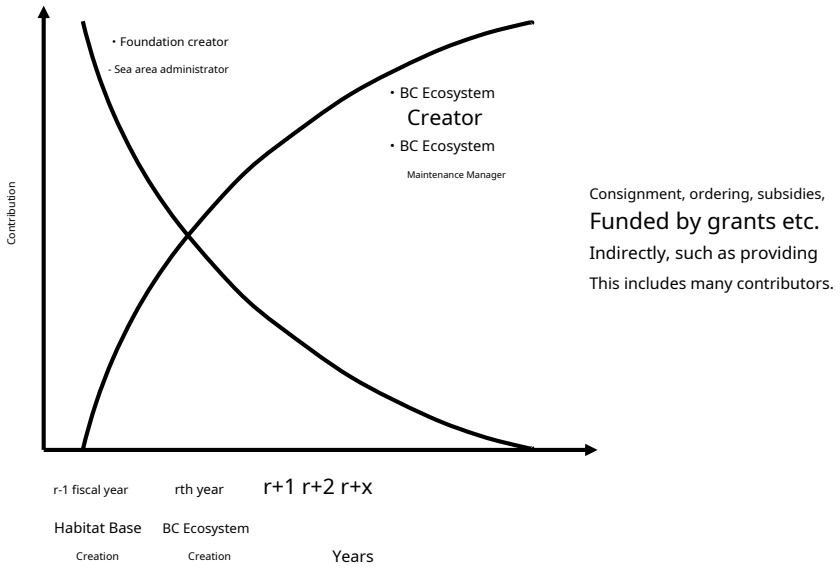


Figure 2-1 Project Implementer§Example of how to think about the contribution of (in the case of a foundation creation project)

§"5Refer to "Glossary" (p.58)

3.1 CO_2Planning for understanding absorption amount

3.1.1 CO_2Selection of method for calculating absorption amount

Coastal ecosystems, such as eelgrass beds, kelp beds, mangrove ecosystems, and tidal flats, absorb water from the atmosphere through photosynthesis and other processes.CO_2Absorbs and is absorbedCO_2Some of this remains in the soil, seawater and deep ocean.CO_2These ecosystems are important because they store carbon dioxide in the atmosphere for hundreds of years.CO_2The J Blue Credit Scheme will be a place where net absorbedCO_2(blue carbon).

CO_2The amount of absorption is calculated by multiplying the distribution area of the target ecosystem, which changes as a result of the project, by the amount of net primary production.§(hereinafter referred to as "production volume"), the absorption coefficient (per unit area) estimated from theCO_2The calculation method is shown below, and the formula is1is applicable to all target ecosystems, and the formula2can be used for seagrass bed ecosystems and seaweed bed ecosystems. In the case of seaweed cultivation, if the area is easy to measure, such as with rafts or nets, the area of the cultivation facility can be used for calculation, and if the area is difficult to measure, such as with rope cultivation, the length of the cultivation rope can be used for calculation. When the length of the cultivation rope is used, the formula2-2As shown in the figure, by multiplying the wet weight per unit rope length by the blue carbon residual coefficient,CO_2It is possible to calculate the amount of absorption.

Also, "Distribution area of the target ecosystem and area of aquaculture facilities" and "Wet weight per unit area" , "Unit The "wet weight per loop length" is based on measurements from on-site surveys, etc. "Absorption per unit area The "amount" and "blue carbon residual coefficient" are based on literature values.

Please refer to Figure 3-2 and select a feasible calculation method after considering the contents of your project, and then consider the necessary surveys, etc. Please refer to Section 3.2 for details on survey methods and Section 3.3 for details on absorption coefficients.

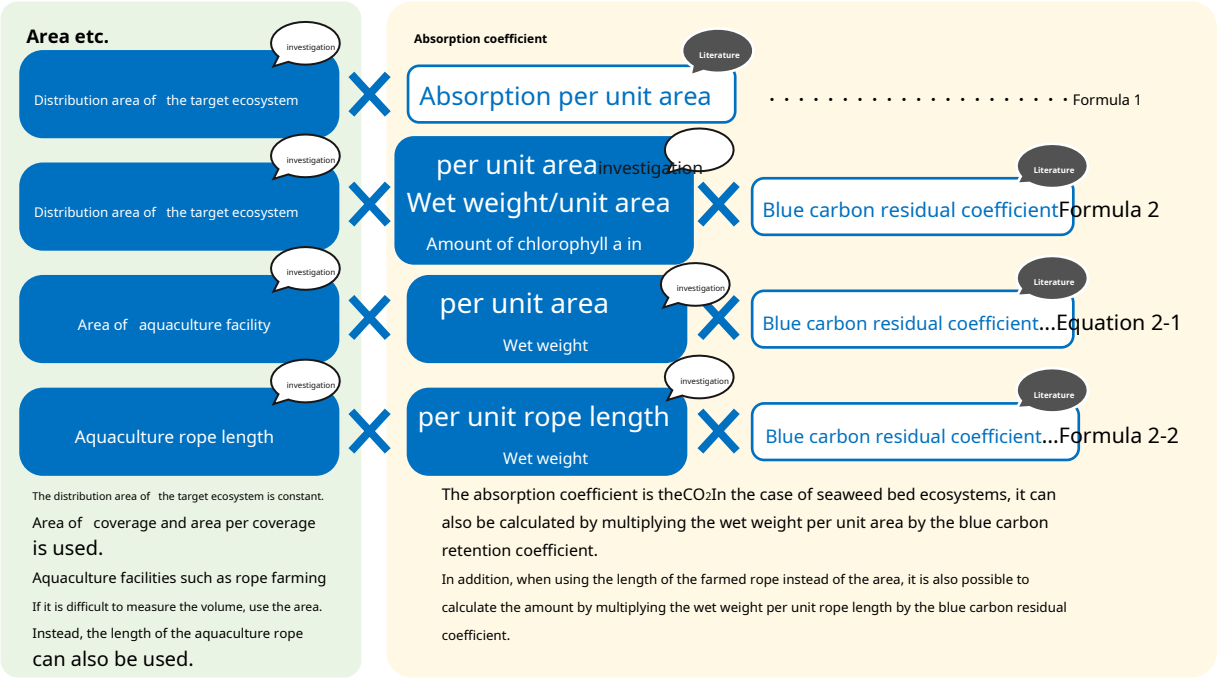


Figure 3-1 CO from production volume$_2$Calculation method for absorption amount

§"5Refer to "Glossary" (p.58)

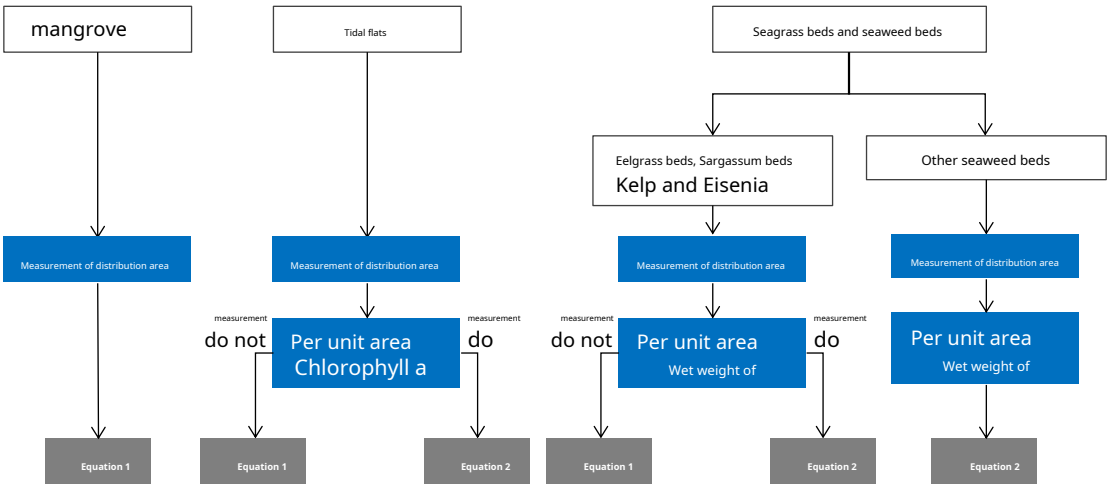


Figure 3-2（1） Calculation formula selection flow (other than seaweed farms)

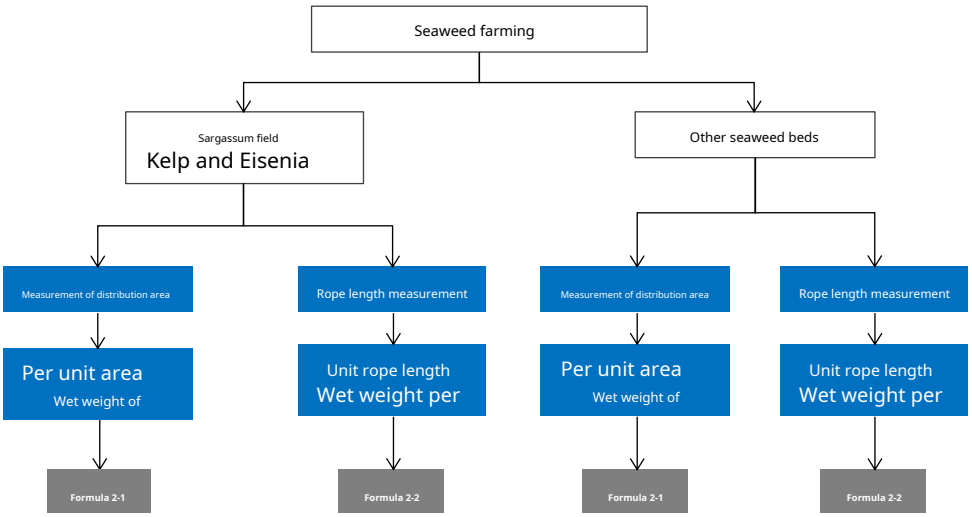


Figure 3-2（2） Calculation formula selection flow (seaweed farming beds)

3.1.2 CO_2Points to note when determining absorption amount

CO_2The accuracy of each element required for calculating removals varies depending on the method of assessment. In the J-Blue Credit Scheme, the accuracy of each element used in the calculation is reflected in the credit certified amount. Therefore, when conducting surveys and setting the removal coefficient for application, the accuracy of each element is ensured by taking the following points into consideration:CO_2Certainty of absorption§It is possible to increase the

Table 3-1 Important points to consider in the calculation

Elements required for calculation	Important Perspectives		Reference page
Appropriate area of the target ecosystem	Probability of distribution area of target ecosystem - Determining the boundaries of the target ecosystem - Consideration of exposure	Ecosystem type Certainty	3.6Term (p.41)
Uptake by ecosystem type coefficient	The accuracy of the absorption coefficient ・Consideration of regional characteristics: presence or absence of on-site observation, literature collection, seaweed bed Consideration of exposure		3.6Term (p.43)

As described in Chapter 1, the project you are applying for will be subject to an examination to see whether it is eligible for certification and whether the application scope and baseline have been set appropriately. Please confirm these points before carrying out the survey and calculation.

Reference information for selecting a survey method and setting absorption coefficients is summarized in Sections 3.2 and 3.3. However, since there are various optimal methods depending on the target ecosystem, characteristics of the survey area, budget, etc., we recommend that you consult with experts or the secretariat in advance and consider the survey and calculation plan.

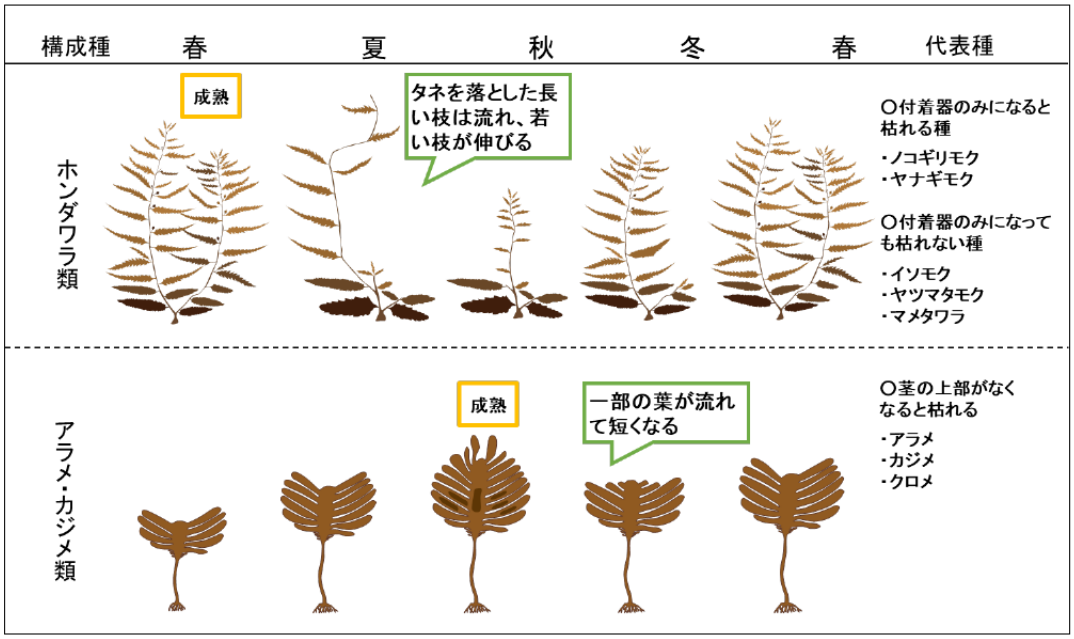
§"5Refer to "Glossary" (p.58)

3.2 Consideration of research method

3.2.1 Survey period

Of the seagrass ecosystems, seaweed ecosystems, mangrove ecosystems, and tidal flat ecosystems that are the subject of this system, the distribution range and biomass of seagrass ecosystems increase and decrease depending on the season. Therefore, it is desirable to conduct surveys during the peak season when the target seagrass and seaweed grow the largest and it is easier to confirm the distribution range and type.

In addition, the tidal flat ecosystem is affected by low tides during the daytime.4~6We recommend conducting a survey every month.



Source:3Guidelines for Countermeasures against Coastal Barrens, Fisheries Agency, Reiwa3year3month

Figure 3-3 Seasonal changes in perennial seaweeds

Table 3-2 Major ecosystems covered by J. Blue Credit and optimal timing for surveys

Ecosystem	Seaweed Bed Type	Main constituent species	investigation Right time*
Seagrass beds	Eelgrass bed	Eelgrass, Zostera marina, Sugamo, Ryukyu duck, etc.	Early summer
Seaweed Bed	Sargassum field	Akamoku, Sawtooth Algae, Sawtooth Algae, Hondawara, etc.	Spring
	Kelp field	Laminaria japonica, Narrow Laminaria japonica, Chigaiso, Nameme, Sujime, etc.	summer
	Arame field	Eisenia bicolor, Eisenia bicolor, Eisenia bicolor, Eisenia bicolor, Eisenia bicolor, etc.	Autumn
	Seaweed field	Wakame, Hirome, etc.	Spring-Early Summer
	Gelidium field	Japanese knotweed, giant knotweed, large knotweed, etc.	Spring-Summer
	others	Nori, coralline algae, green algae, small brown algae	-
mangrove	-	mangrove	All year round
Tidal flats	-	-	At low tide

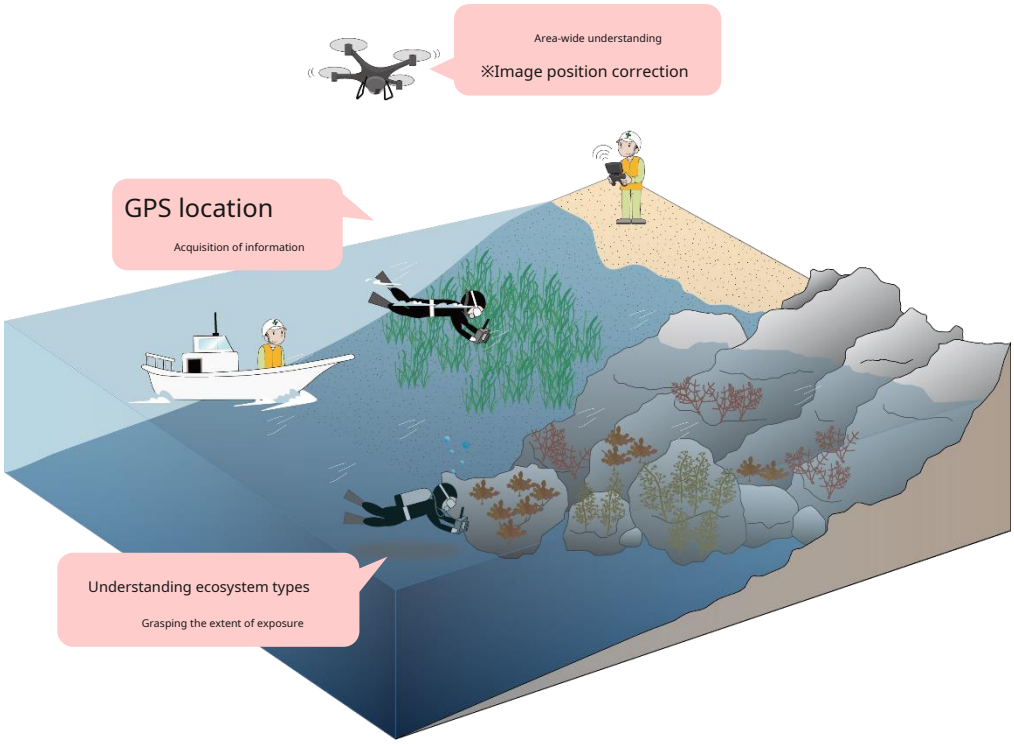
*The optimum time for surveys varies depending on the ocean area, so please check the optimum time for surveys, such as the peak season for seaweed beds in the target area.

3.2.2 How to determine distribution area

Here, we will introduce a general survey method to grasp the distribution area of the target ecosystem.CO_2In order to properly grasp the amount of absorption, it is necessary to understand the distribution area and type of the target ecosystem. There are various methods for the survey, such as grasping the distribution range using wide-area images such as aerial photographs, and grasping by visual observation on-site. When the target ecosystem is clearly visible, it is efficient to use aerial photographs or drone images that can grasp the wide-area distribution situation. When it is difficult to judge from the images or the ecosystem type cannot be determined, it can be grasped by methods such as visual inspection by diving. Similarly, in the case of aquaculture facilities, it is grasped by drone images so that the area of the aquaculture facility that is the subject of the application can be determined.

To grasp the area, it is important to obtain accurate location information, so it is necessary to correct the location of drone images, etc., and to carry out on-site surveys.GPSThe accuracy of the area is improved by obtaining location information from the sea. Furthermore, because the coverage of seagrass and algae varies even within the distribution range, the accuracy can be further improved by understanding the area by coverage class.

In addition, it is possible to improve the accuracy of the survey by using multiple methods based on the characteristics of each method. However, even if the same method is used, the information that can be obtained varies depending on the target ecosystem and the environmental conditions of the survey area, so please consider the survey plan according to the environmental conditions and the information you want to obtain.



Key points of the survey

① Determining the boundaries of the target ecosystem

・Select a method that can accurately determine the distribution range and boundaries. ・Understand location information (use position-corrected images, obtain location information using GPS, etc.).

② Consideration of coverage (e.g., grasping areas with a certain level of coverage or more, grasping areas by coverage class)

3) Select a method that can identify the type of ecosystem in question.

Figure 3-4 Key points of the field survey

[Method of determining area taking into account coverage]

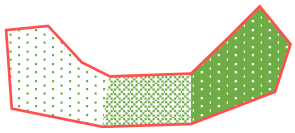
The density of seagrass and seaweed beds varies depending on the location.CO_2In calculating the amount of absorption

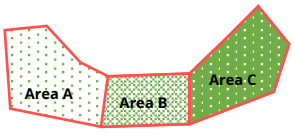
It is better to calculate the area from the actual area, taking into account the coverage, rather than using the area calculated from the edge of the seaweed bed.

The accuracy of the distribution area is improved.

Probability of distribution area

Calculating area from edge of seaweed bed < Calculate the actual area from the area of each coverage





Actual area = area x average coverage

district	area	Exposure	Actual area
A	14ha	twenty five%	3.5ha
B	10ha	50%	5.5ha
C	18ha	75%	13.5ha
total	42ha	-	22.5ha

Figure 3-5 Example of determining area taking coverage into account

■ How to assess exposure level

To understand the coverage of seaweed beds,

The ocean seen from above with a rectangular frame placed at the bottom

The proportion of the area covered by algae is called the landscape coverage.

The error is recorded as

Because there are5A step-by-step record is sufficient

If possible, please take a photo or other record.

The basis for the decision is the online system.

Please attach it to the system.

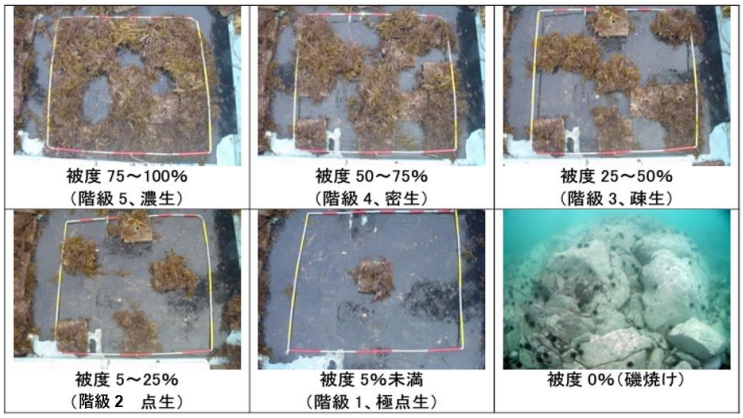
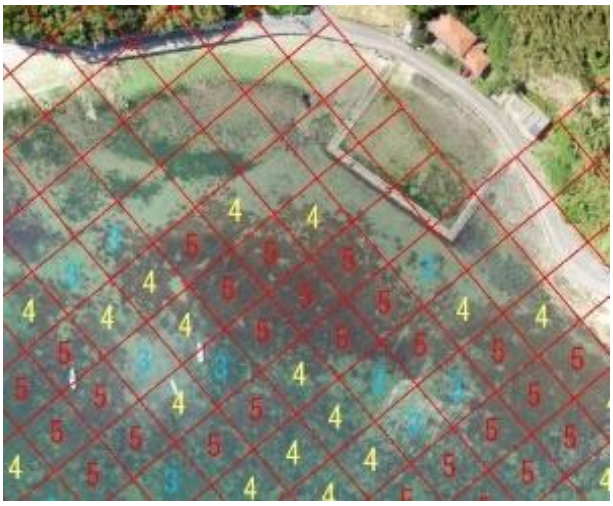


Figure 3-6 Examples of coverage classes

Source:3Edition Guidelines for Countermeasures against Rocky Coast Denudation, Fisheries Agency, Reiwa3year3month *Some corrections



Also, if the condition of the seaweed bed is clearly visible,

Aerial images of a loan, etc. are divided into meshes,

The coverage level for each shrub is interpreted, and

The actual area is calculated by aggregating the areas of the

This is also an effective method.

Figure 3-7 Example of coverage classification using drone imagery

Source: Yoshihisa Sugimura, Tomoko Kobayashi, Yugo Mito, Satoshi Yoshihara, Tomoya Okada, and Asahiro Kuwae: Blue Carbon Offset Scheme at Hakata Port Establishment and Future Prospects, Journal of the Japan Society of Civil EngineersG(environment),Vol.77,No.2,pp.31-48,2021.

[How to determine distribution area]

■ How to interpret images

Identifying seaweed beds from images taken by drones, etc.

The methods of distinguishing between them are visual inspection and image analysis.

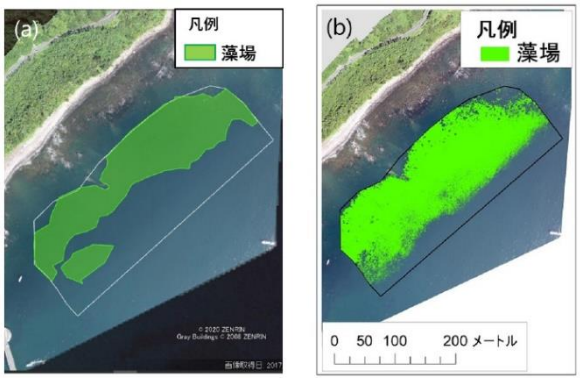
There is also a method for determining whether the

70~90It is said that the correct answer rate is about %.

When applying through the online system,

The basis for the determination and the method of analysis should be clearly stated.

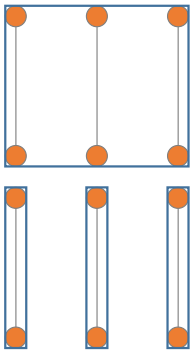
It is important to:



Source: Wide-area Seaweed Bed Monitoring Guide, Fisheries Agency, March 2021

[Method of determining the area and rope length of aquaculture facilities]

The area or rope length of the aquaculture facility or section to be applied for, and the aquaculture area within that measurement range



It is important to know exactly how much seaweed is being harvested.

To determine the area of aquaculture facilities and farm plots, aerial photographs taken by drones and

Google Earth,QGISConfirm the location of the facility from satellite images and calculate the area.

is possible*.

The data on landings (shipment volumes) held by fishery associations, etc. are recognized as objective information.

It is not possible to identify the location and amount of fish farmed (rope length) by taking aerial photographs of the farmed area, etc.

There must be clear evidence, such as a third party's proof of farm volume, based on a valid basis or an insurance certificate for the farm.

A fee will be required.

*For details on how to calculate the area using drones and satellite images, please refer to the Guide for Wide-area Seaweed Bed Monitoring (Fisheries Agency, March 2021).

So lame.

Table 3-3 Characteristics of survey methods (seagrass bed ecosystems and seaweed bed ecosystems)

perspective	Research methodology	Location information acquisition Points to note	local investigation	Area of seaweed bed		Seaweed bed type Judgment
				Borderline Judgment	Coverage Grasp	
Above	Satellite imagery	Image alignment correction (Geometric corrections, Orthorectifications) Need		○		
	Aerial photo			○		
	Aerial drone		○	○		
At sea	SurveySUP	GPSLocation by Information can be obtained Noh	○	○		
Sea level	Visual observation of the sea surface (box glasses, water drone, etc.)		○	○	○	○
	Acoustic Survey		○	○		
Undersea	Underwater camera	Precise location It takes ingenuity to obtain Need	○		○	○
	Underwater drone		○	○	○	○
	Visual diving (diver)		○	○	○	○
others	Existing survey reports (survey results, etc.)	Location confirmation	-	*	-	-

Note: "○" is attached to survey items for which relatively accurate information can be obtained. However, the type of target ecosystem, the environmental conditions of the survey site, and the The arrangement in the table may differ depending on the equipment, etc. Design drawings and survey results of the development

* site can also be used as reference materials for determining the area.

Table 3-4 Characteristics of survey methods (mangrove ecosystems and tidal flat ecosystems)

perspective	Research methodology	Location information acquisition Points to note	local investigation	Area of ecosystem Boundary determination	Ecosystem Type Judgment
Above	Satellite imagery	Image alignment correction (Geometric corrections, Ol Seo corrections) is required		○	○
	Aerial photo			○	○
	Aerial drone		○	○	○
At sea	Survey	GPSLocation information by Information can be obtained	○	○	○
others	Existing survey reports (survey results, etc.)	Location confirmation	-	*	-

Note: "○" is attached to survey items for which relatively accurate information can be obtained. However, the type of target ecosystem, the environmental conditions of the survey site, and the The arrangement in the table may differ depending on the equipment, etc. Design drawings and survey results of the development

* site can also be used as reference materials for determining the area.

■ Reference materials for the survey

・Guide to Wide-area Seaweed Bed Monitoring, Fisheries Agency, Reiwa3year3month

・No.3Guidelines for Countermeasures against Coastal Barrens, Fisheries Agency, Reiwa3year3month

・Monitoring site1000Manual for coastal surveys (shorelines, tidal flats, eelgrass beds, seaweed beds), Ministry of the Environment

§"5Refer to "Glossary" (p.58)

Satellite imagery

■ Survey Overview

・Understanding the target ecosystem through visual and machine interpretation of satellite images

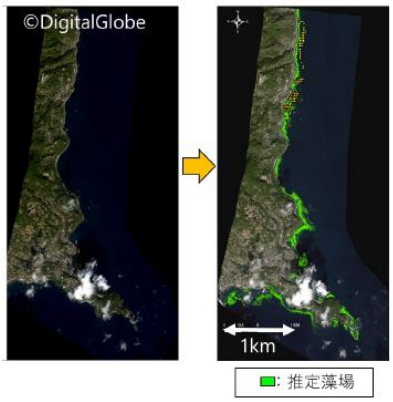


Figure source: Wide-area seaweed bed monitoring guide, Fisheries Agency, Reiwa3year3month

■ Accuracy of area

・A wide area (city, town, village, prefecture, region) can be grasped. ・The survey area is water depth.0~10m- It is difficult to grasp the vertical distribution (e.g., the growth status on vertical revetments, etc.) - The accuracy of determining the presence or absence of seaweed beds is60~85%degree*1

・Accurate location information can be obtained

・It is often difficult to grasp the density of coverage

■ Probability of ecosystem type

・Mangroves and tidal flats can be identified

- The presence or absence of seaweed beds can be determined, but it is often difficult to determine the type of seaweed bed.

■ Advantages and points to note

・Calculations are possible by utilizing open data and purchasing satellite images. ・Since it is not always possible to obtain images at times and periods suitable for surveys, the areas of seaweed beds and tidal flats may be underestimated.

There is a match

・It is possible to take new photos, but this is often expensive.

In seaweed bed ecosystems, it is difficult to determine coverage and seaweed bed type. If you want to obtain this information, you should combine it with other methods.

It is advisable to consider matching

*1: Guide for Wide-area Monitoring of Seaweed Beds, Fisheries Agency, Reiwa3year3month

Aerial photo

■ Survey Overview

・Understanding the target ecosystem through visual and machine interpretation of aerial photographs

■ Accuracy of area

・Enables comprehensive understanding of wide areas (cities, towns, villages, prefectures)

・Survey range is water depth0~10m- It is difficult to grasp the vertical distribution (e.g., the growth status on vertical revetments, etc.) - The accuracy of determining the presence or absence of seaweed beds is65~85%degree*1

・Highly accurate location information can be obtained (ortho-rectification is required)

・It is often difficult to grasp the density of coverage

■ Probability of ecosystem type

・Mangroves and tidal flats can be identified

- The presence or absence of seaweed beds can be determined, but it is often difficult to determine the type of seaweed bed.

■ Advantages and points to note

・Investigations are possible by purchasing aerial photographs

- As it is not always possible to obtain photographs at times and periods suitable for surveys, the area of seaweed beds and tidal flats may be underestimated.

There is a match

・It is possible to take new photos, but this is often expensive.

In seaweed bed ecosystems, it is difficult to determine coverage and seaweed bed type. If you want to obtain this information, you should combine it with other methods.

It is advisable to consider matching

*1: Guide for Wide-area Monitoring of Seaweed Beds, Fisheries Agency, Reiwa3year3month

Aerial drone

■ Survey Overview

・Visual and machine reading of photographs taken at low altitudes using drones, etc.
Understand the target ecosystem

■ Accuracy of area

・Enables surface understanding of a wide area (foreground)

・Survey range is water depth0~10m- It is difficult to grasp the vertical distribution (e.g., the growth status on vertical revetments, etc.) - The accuracy of determining the presence or absence of seaweed beds is70~90%degree*1

・Accurate location information can be obtained (ortho-correction is required). ・If the image clearly shows seaweed, the density of coverage can be understood.
There are also

Figure source: Wide-area seaweed bed monitoring guide, Fisheries Agency, Reiwa3year3month

■ Probability of ecosystem type

・Mangroves and tidal flats can be identified

・In some cases, it is possible to determine the type of seaweed bed.

■ Advantages and points to note

・Surveys can be conducted at the appropriate time

- When it is difficult to determine coverage or type of seaweed bed, it is advisable to consider combining it with other methods.

*1: Guide for Wide-area Monitoring of Seaweed Beds, Fisheries Agency, Reiwa3year3month

Survey/SUP

■ Survey Overview

・Research andSUPWe travel over the target ecosystem by stand-up paddle board and visually assess it.

■ Accuracy of area

・Because this is a line survey, the coverage is lower than that of aerial photographs, etc. ・The survey area is based on water depth.0~10m- It is difficult to grasp the vertical distribution (e.g., the growth status on vertical revetments, etc.)GPSBy carrying a smartphone, you can obtain accurate location information.
In some cases, you can grasp the density of the coverage of seaweed beds.

■ Probability of ecosystem type

・Mangroves and tidal flats can be identified

・In some cases, it is possible to determine the type of seaweed bed.

■ Advantages and points to note

・Surveys can be conducted at the appropriate time

・Surveys can be conducted even in shallow areas where boats cannot easily enter

- Not suitable for wide-area surveys due to manual labor
- When it is difficult to determine coverage or type of seaweed bed, it is advisable to consider combining it with other methods.

Visual observation of the sea surface (box glasses, water drone, snorkeling, etc.)

■ Survey Overview

・Understanding the seaweed bed ecosystem through visual inspection from the sea surface

Figure source: Wide-area seaweed bed monitoring guide, Fisheries Agency, Reiwa3year3month

■ Accuracy of area

・Because this is a line survey, the coverage is lower than that of aerial photographs, etc.

lower

・Survey range is water depth0~10m-Vertical distribution (e.g. growth status on vertical revetments, etc.) can be observed within the visual range.

However, the accuracy of determining vertical distance decreases when using only visual inspection.GPSEquipment withGPSAccurate location information by mobile phones

Available

・It is possible to grasp the density of seaweed bed coverage within visual range

■ Probability of ecosystem type

- The type of seaweed bed can be determined within visual range

■ Advantages and points to note

・Surveys can be conducted at the appropriate time

・Using surface drones and snorkeling allows surveys in shallow areas where boats cannot easily reach. ・Snorkeling is not suitable for wide-area surveys, but the Manta method (towing a diver by a boat) allows for wide-area surveys.

Inspection is also possible

- When it is difficult to determine coverage or type of seaweed bed, it is advisable to consider combining it with other methods.

Acoustic Survey

■ Survey Overview

・Using sonar to measure the difference in reflection between seaweed and the ground, we can identify the ecosystem of seaweed beds.

grasp

■ Accuracy of area

・Because this is a line survey, the coverage is less comprehensive than aerial photographs, etc.

Decreased

・Survey range is water depth3~100m- Vertical distribution (e.g. growth status on vertical revetments, etc.) is possible if it is deeper than the surface layer.

Graspable

・What is the accuracy of determining whether or not seaweed beds exist?74~92%degree*1

On boardGPSBy carrying a smartphone, accurate location information can be obtained. It is difficult to grasp the density of the coverage of seaweed beds.

■ Probability of ecosystem type

・The presence or absence of seaweed beds can be determined, but the type of seaweed bed is difficult to determine.

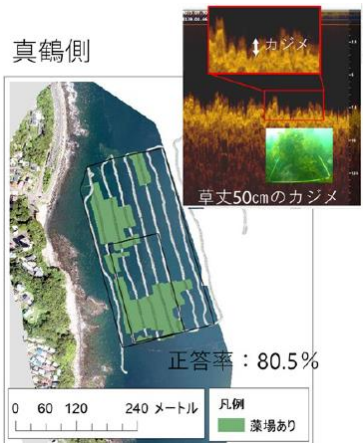


Figure source: Wide-area seaweed bed monitoring guide, Fisheries Agency, Reiwa3year3month

■ Advantages and points to note

・Surveys can be conducted at the appropriate time

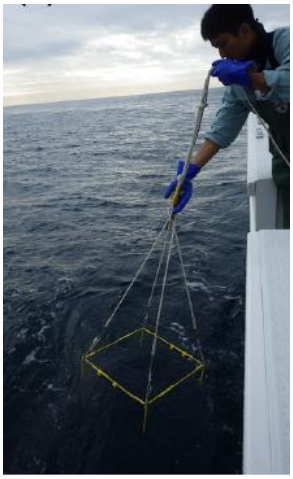
・Surveys can be conducted even when the water is murky or the seaweed beds cannot be seen from the sea surface. ・It is necessary to consider combining this method with other methods to determine the coverage and type of seaweed bed.

*1: Guide for Wide-area Monitoring of Seaweed Beds, Fisheries Agency, Reiwa3year3month

Underwater camera

■ Survey Overview

・Understanding the ecosystem of seaweed beds by visually interpreting underwater images taken with underwater cameras



Source of figure: Wide-area Seaweed Bed Monitor Ring Manual, Fisheries Agency, Reiwa3year3month

■ Accuracy of area

・Since this is a point survey, the coverage is low.

・The investigation range depends on the length of the cable.3~40mBy adjusting the shooting direction, it is possible to grasp the vertical distribution (e.g., growth status on vertical revetments, etc.) It is possible to determine whether or not there is a seaweed bed

On boardGPSIt is possible to carry a survey boat, but the location of the survey point may change due to currents, etc.

There is a possibility

・It is possible to grasp the density of coverage of seaweed beds

■ Probability of ecosystem type

・It is possible to determine the type of seaweed bed

■ Advantages and points to note

・Surveys can be conducted at the appropriate time

・Camera may be carried away by waves or tides, making surveys difficult. ・In places with high turbidity, it may be difficult to determine the type and coverage of seaweed beds. ・To determine the area, it is necessary to consider combining this with other methods.

Underwater drone

■ Survey Overview

・Visual interpretation of underwater images taken by underwater drones to identify seaweed beds

Understand the structure

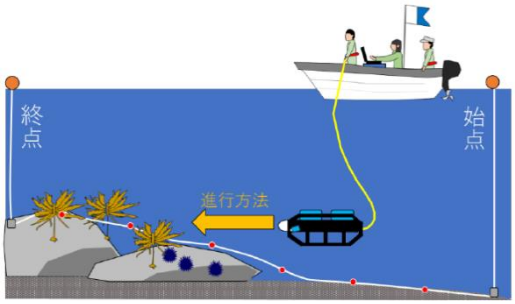


Figure source: Wide-area seaweed bed monitoring guide, Fisheries Agency, Reiwa3year3month

■ Accuracy of area

・Because it is a line survey, the coverage is less comprehensive than aerial photographs, etc.

Compared to

・The investigation range depends on the length of the cable.3~150mGrasp of the degree

Can be gripped

- It is possible to grasp the vertical distribution (e.g., growth status on vertical revetments, etc.) - It is possible to determine the presence or absence of seaweed beds

On boardGPSIt is possible to carry a diver and record the diving position.

However, it is difficult to obtain accurate position information for an aircraft underwater, and the accuracy of the position information decreases.

・GPSBy setting up a line with the start and end points measured by the GPS, and observing the line, the accuracy of the location information can be improved.

Is it possible?

・If a transponder (underwater acoustic signal receiver) is installed, accurate location information can be obtained. ・The density of coverage of seaweed beds can be grasped.

■ Probability of ecosystem type

・It is possible to determine the type of seaweed bed

■ Advantages and points to note

・Surveys can be conducted at the appropriate time

・The aircraft may be swept away by waves or tides, making investigations difficult. ・If it is difficult to obtain location information, it is advisable to consider combining it with other methods.

Diving Visual Observation

■ Survey Overview

-Understanding the ecosystem of seaweed beds through visual interpretation by divers

■ Accuracy of area

・Because this is a line survey, the surface coverage is not comparable to aerial photographs, etc.

Decreases when

・The scope of the survey0~30m- Vertical distribution (e.g. growth status on vertical revetments, etc.) can be grasped. - Presence or absence of seaweed beds can be determined.

On boardGPSIt is possible to carry a diver's watch and record his/her dive position.

However, it is difficult to obtain accurate location information for divers underwater, and the accuracy of the location information decreases.

・GPSA survey line was set up with the start and end points measured, and observations were made along the survey line.

By doing so, it is possible to improve the accuracy of location information. If a transponder (underwater acoustic signal receiver) is installed,

Highly accurate location information can be obtained

・The density of seaweed bed coverage can be accurately determined by using a square frame.

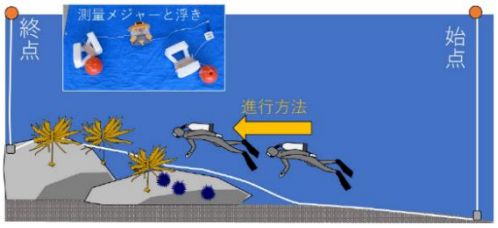
■ Probability of ecosystem type

・It is possible to determine the type of seaweed bed

■ Advantages and points to note

・Surveys can be conducted at the appropriate time

- Less susceptible to currents and turbidity



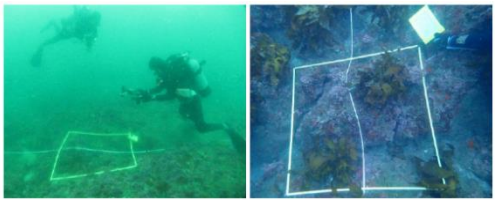


Figure source: Wide-area seaweed bed monitoring guide,

Fisheries Agency, Reiwa3year3month

3.2.3 How to determine wet weight per unit area

The method for determining the wet weight per unit area is based on on-site observation and literature values.2There are two ways:

(1) On-site observation

1) Natural and structural

To determine the wet weight per unit area

The representative location of the seaweed bed that is the subject of the application (with the coverage, etc.)

A quadrat is placed around the square (taking into consideration)

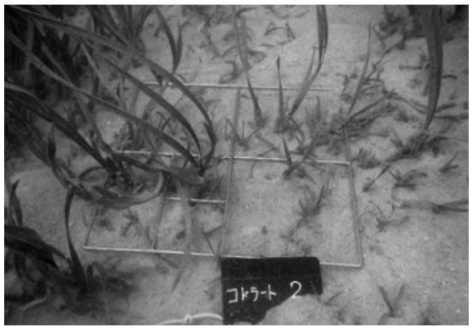
Seaweed and seaweed are collected and weighed, and the frame is

This can be calculated by dividing by the area.

Since there are variations depending on the representative location,

By collecting samples from multiple locations,

This will improve the performance.



Source: Blue Carbon in Ports (CO_2 Guide to measuring carbon capture and sequestration Drain, Port and Airport Technology Research Institute Fee,No.1309,2015.

Figure 3-8 Example of quadrat installation

2) Aquaculture facilities

In the case of aquaculture projects, the landing

When it is difficult to measure the total amount or remaining amount

In this case, the wet weight per unit area (unit length) can be calculated by harvesting the seaweed at a representative location, measuring its weight, and dividing it by the harvested area or the length of the rope. In this case, accuracy can be improved by sampling at multiple locations. It is also advisable to take photographs, etc., with an underwater drone or underwater camera, that allow the growth status to be confirmed.CO_2For details on how to calculate the absorption amount, see3.3Please refer to "Concepts for setting absorption coefficients".

Regarding the amount of landings, data on shipping volume held by fishing cooperatives and implementation plans for aquaculture are not accepted as objective evidence of actual activities. Data that identifies and captures the location and amount of aquaculture (rope length) by aerial photography of the aquaculture area, or documents that can certify the amount of aquaculture by a third party (other than the applicant), such as an insurance certificate for the aquaculture facility, are required.

The Inspection and Certification Committee will examine the reliability of the landing and remaining volumes based on the reported values of the farming area and wet weight per unit area.

■ Reference materials for on-site observation

・Monitoring site1000Manual for coastal surveys (shorelines, tidal flats, eelgrass beds, seaweed beds), Ministry of the Environment, Blue carbon in ports (CO_2 Guidelines for measuring CO2 absorption and carbon sequestration, Port and Airport Technology Research Institute Research materials,No.1309,2015.

・No.3Guidelines for Countermeasures against Coastal Barrens, Fisheries Agency, Reiwa3year3month

When conducting on-site observations, the following points must be considered. There is a trade-off between survey efficiency and representativeness of the site.§Therefore, it is important to develop a feasible survey plan based on the situation of the target area.

Table 3-5 Points to note for on-site observation

Points to keep in mind	Important Notice
By seaweed bed type Survey period	The best time to survey varies depending on the type of seaweed bed.CO_2To obtain a greater understanding of the amount of absorption, it is desirable to conduct the survey when the seaweed beds are in their prime whenever possible.
Representativeness of survey locations	It is important to set representative survey points that allow understanding of the type of seaweed bed and its growth status. Furthermore, the more survey points are set, the less variation in data will be obtained, and the more accurate the annual distribution of seaweed beds will be.CO_2This will improve the accuracy of understanding the amount of absorption. In addition, it is effective to record the coverage and take photos of the quadrat before harvesting in order to prove the representativeness of the survey site.
Permit application	Depending on the species and location, permission from the administrator may be required. When collecting, please check in advance with the prefectural fisheries department that has jurisdiction over the sea area to see if you need to apply for a special fishing permit, and with the environmental department to see if you need to apply for fishing permits under the Natural Parks Act, the Nature Conservation Act, or prefectural ordinances.

(2) Use of literature values

It is also possible to determine the wet weight per unit area from the coverage confirmed in field observations by using the relational expression between coverage and wet weight per unit area.kgWW/m_2The results of the relationship between the above and the survey period are shown in Table 3-6 and Figure 3-9. However, as there are large variations depending on the survey period and region, please use this as a reference only.

Table 3-6 Relationship between coverage class and wet weight

Seaweed Bed Type	Equation※ ( ) indicatesR^2: Coefficient of determination andn: Number of samples	Organized data*2	
Sargassum field	Wet weight (kgWW/m_2) =0.0279×e (1.2032× Coverage class*1) (R_2=0.684,n=42)	Sargassum field, Tamahahaki Sargassum, Sargassum family Spring Data	1) 2) 3)
Kelp field	Wet weight (kgWW/m_2) =0.9762×e (0.3855× Coverage class*1) (R_2=0.4339,n=28)	Mitsuishi kelp, stripes Early summer and summer data for	1)
Arame field	Wet weight (kgWW/m_2) =0.0311×e (0.9658× Coverage class*1) (R_2=0.4291,n=26)	Kurome, Arame, Tsurua Lame's early summer, summer day Ta	1) 2)
Seaweed field	Wet weight (kgWW/m_2) =0.0673×e (0.7658× Coverage class*1) (R_2=0.2758,n=20)	Wakame and Chigaiso spring Seasonal Data	1) 3)

*1The coverage level isp.22The classification shown in Figure 3-6 was used.2The data used for sorting is as shown below.

1) Port and Airport Technology Research Institute Unpublished material

2) Electric Power Development Co., Ltd. Unpublished material

3) Island City Development Project Survey results on the effectiveness of gently sloping revetments (seaweed bed survey), Reiwa2year8Moon, Fukuoka City Port and Airport Bureau

§"5Refer to "Glossary" (p.58)

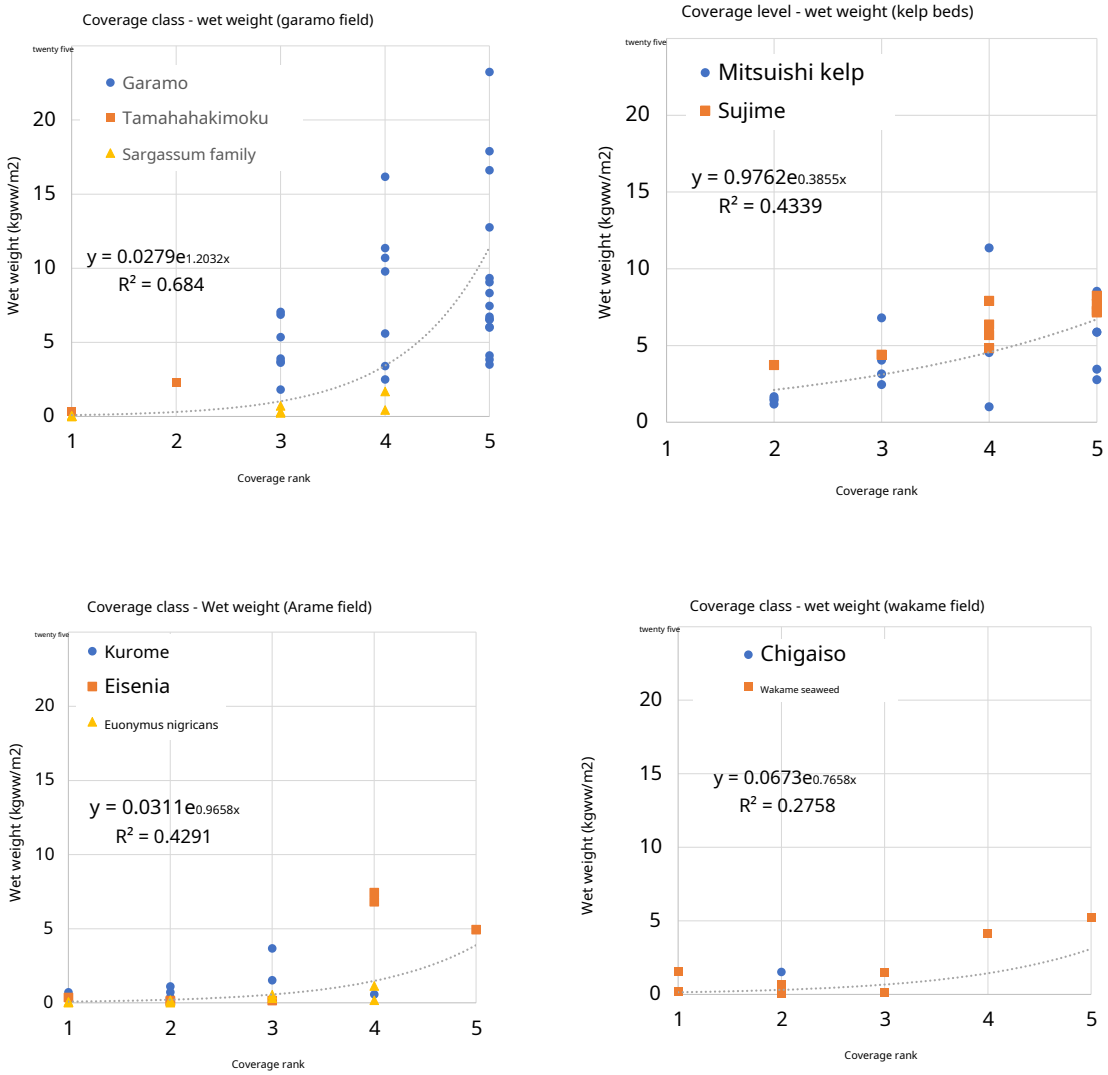


Figure 3-9 Relationship between coverage class and wet weight by seaweed bed type

3.3 Considerations in setting the absorption coefficient

CO_2The amount of absorption is as shown in Figure 3-1 above. "Distribution area of the target ecosystem" and "Wetness of the target ecosystem" Weight" "Ecosystem type per areaCO_2This is calculated by multiplying absorption coefficients such as the "absorption amount (absorption coefficient)" and "blue carbon residue coefficient." Here, we will explain the concept of setting this absorption coefficient and the method of collection.

The absorption coefficient is based on "on-site observation" and "reference value"2There are two ways to check this: either by using only pre-established literature values, or by setting values based on field observations and collected literature values.

When setting the absorption coefficient, it is important to consider the target ecosystem. In particular, when targeting a seaweed bed ecosystem, the accuracy of the absorption coefficient can be improved by using a coefficient that takes into account the regional characteristics.

For example, in the case of a seaweed bed ecosystem, if the national average absorption coefficient described in this manual is used (using literature values), it is easy to set the absorption coefficient, but since it does not take into account regional characteristics, it will have low consistency with the target ecosystem, resulting in over- or under-estimation and low reliability of the absorption coefficient. On the other hand, if an absorption coefficient can be set based on on-site observations and research and survey data on the constituent species of the target ecosystem in that region, it will have high consistency with the target ecosystem and high reliability of the absorption coefficient.

① On-site observation + literature collection (taking into account regional characteristics)	Ease of setup / Absorption coefficient Certainty
②Use of literature values (Regional characteristics are taken into consideration)	
③Use of literature values (Regionality is not taken into account)	

Figure 3-10 Absorption coefficient classification and accuracy

CO_2The amount of absorption can be calculated using the following formula:

■ When calculating for seaweed bed ecosystems

[Formula 1]

CO_2Absorption amount = A×B

A: Distribution area of the target ecosystem (ha) ⇒ See p.21
B: Absorption per unit area⇒ 3.3.1 (1) See p.36

[Formula 2]

CO_2Amount absorbed

$$= A \times W_a \times (1-Pw) \times P_c \times R_b \times 44/12 \times (P_{r1} + P_{r2}) \times C_e$$

A: Distribution area of the target ecosystem (ha) ⇒ See p.21
W_a: Wet weight per unit area (tons/ha) P_w: ⇒ See p.30
Water content⇒ See p.37
P_c: Carbon content ratio ⇒ See p.37
R_b: P/B ratio⇒ See p.37
P_{r1}: Residual coefficient ① ⇒See p.38 * Survival coefficient ① (algal survival coefficient)
P_{r2}: Residual coefficient ②⇒See p.38 ※Remaining coefficient ② (DOCs/Algal body ratio × RDOCs) C_e:
Conversion factor for the entire ecosystem⇒See p.38

■ Seaweed farming･When calculating based on [Formula 2-1] When

calculating based on the area of the aquaculture facility

CO_2Amount absorbed

$$= A_f \times (((W_y + W_r) / A_f) \times (1 - P_w) \times P_c \times R_b \times 44/12 \times (P_{r1} + P_{r2}) - (W_y/A_f) \times (1- P_w) \times P_c \times 44/12 \times P_{r1}) \times C_e$$

A_f: Aquaculture area (ha)
W_y: Landing volume (tons)
W_r: Remaining amount (tons)
P_w: Water content⇒ See p.37
P_c: Carbon content ratio ⇒ See p.37
R_b: P/B ratio⇒ See p.37
P_{r1}: Residual coefficient ① ⇒See p.38 ※Remaining coefficient ① (algal body remaining coefficient)
P_{r2}: Residual coefficient ②⇒See p.38 ※Remaining coefficient ② (DOCs/Algal body ratio × RDOCs) C_e:
Conversion factor for the entire ecosystem⇒See p.38

[Formula 2-2] When calculating based on the rope length of the rope farming facility

CO_2Amount absorbed

$$= L_f \times (((W_y + W_r) / L_f) \times (1 - P_w) \times P_c \times R_b \times 44/12 \times (P_{r1} + P_{r2}) - (W_y / L_f) \times (1-P_w) \times P_c \times 44/12 \times P_{r1}) \times C_e$$

L_f: Aquaculture rope length (m)
W_y: Landing volume (tons)
W_r: Remaining amount (tons)
P_w: Water content⇒ See p.37
P_c: Carbon content ratio ⇒ See p.37
R_b: P/B ratio⇒ See p.37
P_{r1}: Residual coefficient ① ⇒See p.38 ※Remaining coefficient ① (algal body remaining coefficient)
P_{r2}: Residual coefficient ②⇒See p.38 ※Remaining coefficient ② (DOCs/Algal body ratio × RDOCs) C_e:
Conversion factor for the entire ecosystem⇒See p.38

*Among the seaweed farms,p.10The scope of the target projects shown in is covered.

■ When calculating for mangrove ecosystems

[Formula 1]

CO_2Absorption amount = A×B

A: Distribution area of the target ecosystem (ha) ⇒ See p.21
B: Absorption per unit area⇒ 3.3.1 (1) See p.36

■ When calculating for tidal flat ecosystems

[Formula 1]

CO_2Absorption amount = A×B

A: Distribution area of the target ecosystem (ha) ⇒ See p.21
B: Absorption per unit area⇒ 3.3.1 (1) See p.36

[Formula 2]

CO_2Amount absorbed
= A × C × D

A: Distribution area of the target ecosystem (ha) ⇒ See p.21
C: Amount of chlorophyll a per unit area (mg/m_2)⇒ D: See p.30
Amount absorbed per amount of chlorophyll a ⇒ See p.40

■Calculation example (Sargassum bed (Sargassum type)10haInCO_2Calculation of absorption amount)

[Formula 1] Distribution area of the target ecosystem: 10 ha (Sargassum bed), seaweed bed area equivalent to coverage class 3

CO_2Absorption amount = Distribution area of the target ecosystem × Absorption amount per unit area

= 10 ha×2.7

= 27 t-CO_2/year

[Formula 2] Distribution area of target ecosystem: 10 ha (Sargassum field), wet weight per unit area: 10 t/ha (corresponding to coverage class 3)

CO_2Amount absorbed

=Distribution area of the target ecosystem × wet weight per unit area × seaweed bedCO_2Blue carbon residue conversion factor

=Distribution area of the target ecosystem × wet weight per unit area × (1-Water content) ×P/BRatio × Carbon content ratio

×44/12× (Remaining factor ① + remaining factor ②) × Conversion factor for the entire ecosystem

= 10ha×10t/ha*×1-(0.7~0.9）｝×(1.0~1.7)×(0.3~0.35)×44/12× (0.0472+0.0499) ×1.50

= 1.60~9.53 t-CO_2/year

*3.2.3 (2)Use of literature values (p.31) calculated based on the conversion formula

The maximum and minimum values of each absorption coefficient are shown in multiple references (p.36Since there are differences depending on the region, when collecting literature, please pay attention to the evaluation perspective regarding reliability and set the absorption coefficient.

3.3.1 Absorption coefficient setting

The absorption coefficient is determined based on the wet weight per unit area, water content,P/Bratiosit is necessary to set coefficients for each element, such as the carbon content ratio, etc. These can be set from on-site observation data, literature collection, and literature values, but the accuracy of the absorption coefficient will be improved by actually measuring each coefficient.

Equation (1)1in the case of

1) Absorption per unit area

The absorption per unit area is as shown below.

Table 3-7 Removal amount per unit area of blue carbon ecosystems (average across Japan)

formula	Ecosystem		Absorption per unit area ($t\text{-}CO_2/ha/year$)	source
formula1	Seagrass beds	Eelgrass bed	4.9	1
	Seaweed Bed	Sargassum field	2.7	1
		Kelp field	10.3	1
		Arame field	4.2	1
	mangrove*		4.76	2
	Tidal flats		2.6	1

※Figure 3-6 (p.22) Coverage rank3It is desirable to use it in seaweed beds of the above levels. * The amount of collection per unit area in mangrove ecosystems is based only on the amount absorbed by soil, excluding the biomass of plants. Source1: Nationwide estimate of annual carbon dioxide absorption in shallow marine ecosystems (Table 3-8No.2)

source2:IPCCWetlands Guidelines (Hiraishi, T., et al. (2014) 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands, IPCC, Switzerland)

Table 3-8 References for absorption per unit area

No	Literature title		Classification
1	IPCCWetlands Guidelines (2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands)	Hiraishi, T., Krug, T., Tanabe, K., Srivastava, N., Baasansuren, J., Fukuda, M. and Troxler, TG (eds). IPCC, Switzerland, 2014.	world average
2	Total annual carbon dioxide uptake in shallow marine ecosystems National estimate	Kuwae, A., Yoshida, G., Hori, M., Watanabe, K., Tanatani, T., Okada, T., Umezawa, Y., and Sasaki, J. (2019)Journal of the Japan Society of Civil EngineersB2 (Coastal Engineering), 75(1), 10-20.	Domestic average

Equation (2)2in the case of

1) Wet weight per unit area

For "wet weight per unit area," data can be obtained through on-site observations or literature values can be used.

Regarding the survey method,"3.2.3How to determine the wet weight per unit area (1) (p.30) for reference. Please change it to.

Regarding the use of literature values, "3.2.3How to determine the wet weight per unit area (2)" (p.31)For reference We have compiled a conversion formula that allows you to calculate the wet weight per unit area from the coverage data.

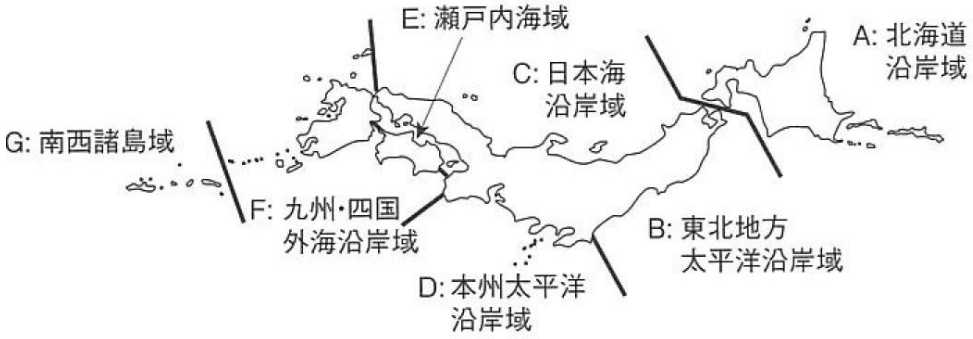
2) Water contentP/BRatio/carbon content ratio

"Moisture content""P/Bratio§" The "carbon content ratio" is based on surveys and research papers from various regions (3Edition Measures against coastal erosion It is possible to set it by collecting information (guidelines, etc.) and actual measurements.

When collecting literature, it is important to keep in mind the following points:

Table 3-9 Points to note when collecting literature

Points to keep in mind	Important Notice
The literature is collected in a range that takes into account regional characteristics. Is it collected?	Taking regional characteristics into consideration, it is recommended that the scope be the relevant ocean area to ocean area division.
Species that compose the target ecosystem or similar species Is the relevant literature collected?	Since absorption coefficients may vary depending on the species, it is recommended to use values for the major component species of the target ecosystem or similar species.
Are multiple documents collected?	1Since a single literature value has low accuracy, it is recommended to use an absorption coefficient collected and set from multiple literature sources. Please note that you are requested to consult with the secretariat or experts in advance regarding the method of collecting literature values, etc., to ensure their validity.



Source: Masakazu Hori, Tomohiro Kuwae: Blue carbon in shallow watersCO_2Sequestration, storage and its utilization,2017Year, Chijinshokan

Figure 3-11 Example of ocean area division

§"5Refer to "Glossary" (p.58)

3) Residual coefficient

Blue carbon refers to the carbon absorbed by seaweed bed ecosystems that accumulates as algae within seaweed beds and in the deep sea, as well as persistent organic carbon that is stored in the ocean.

Residual coefficient ① is1This is the ratio of carbon that accumulates inside and outside the seaweed bed to the amount of algae produced annually.

The residual coefficient ② is1This is the percentage of persistent dissolved organic carbon stored in the ocean per year. The residual coefficient can be based on literature values from surveys and research. The residual coefficient is automatically entered in the application system according to the target ecosystem and seaweed bed type.

Table 3-10 Residual coefficients from surveys and research①

formula	Ecosystem	Residual coefficient ①	source
formula2	Seagrass beds	0.1620	1
	Seaweed Bed	0.0493	2
	Seaweed farm	0.0472	3

※The calculation formula isp.37reference

source1: Nationwide estimate of annual carbon dioxide absorption in shallow marine ecosystems (Table 3-8No.2)
source2:Filbee-Dexter, Karen, et al, 2024, Carbon export from seaweed forests to deep ocean sinks
source3:Krause-Jensen&Duarte, 2016, Substantial role of macroalgae in marine carbon sequestration, Nature Geoscience

Table 3-11 Residual coefficients from surveys and research②

formula	Ecosystem	Seaweed Bed Type	Residual coefficient ②
Equation 2	Seagrass beds	Eelgrass bed (eelgrass type)	0.0181
	Seaweed Bed	Sargassum bed (Sargassum type)	0.0499
		Kelp bed (kelp type)	0.0285
		Arame field (Arame and Ecklonia type)	0.0528
		Wakame seaweed bed (Wakame seaweed, small brown algae type)	0.0279
		Gelidium bed (red algae type)	0.0484
		Coralline algae	0.0484
		Green algae	0.0699
	Seaweed farm	Kelp	0.0285
		Wakame and Mozuku	0.0279
		Susabinori	0.0206
		Human Exoskeleton	0.0699
		Sargassum (Sargassum type)	0.0499

※The calculation formula isp.37reference

Source: Port and Airport Research Institute, unpublished material

4) Conversion factor for the whole ecosystem

The conversion factors for the entire ecosystem are shown below.

Table 3-12 Conversion factors for the entire ecosystem based on surveys and research

formula	Ecosystem	Conversion factor for the whole ecosystem
Equation 2	Seagrass beds	2.12
	Seaweed Bed	1.50
Formula 2-1, Formula 2-2	Seaweed farm	1.00

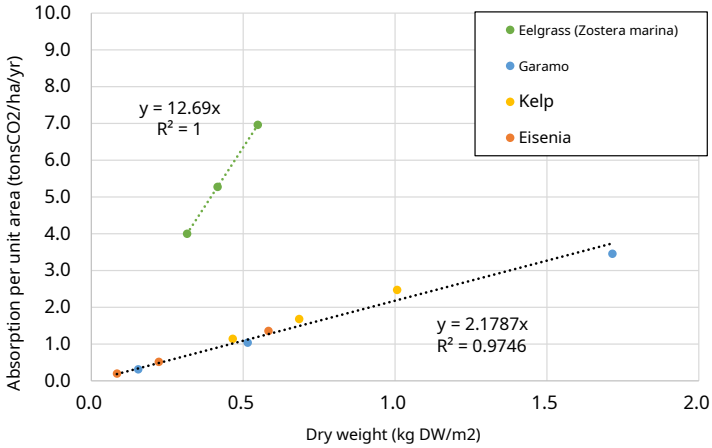
Source: Nationwide estimates of annual carbon dioxide absorption in shallow marine ecosystems
(Table 3-8No.2* Regarding seaweed farms, there is no scientific evidence, so1"

5) Relationship between wet weight, dry weight and absorption per unit area

formula2The relationship between weight and absorption per unit area when using the formula is shown in the figure below.2Now, let's consider the wet weight (1-The value converted to dry weight is then multiplied by the moisture content.CO_2The absorption amount is calculated, but the measured dry weight can also be used. Also, the relationship between the coverage class and the wet weight can be calculated based on the coverage observed on-site. (p.31) is converted using the relation However, since the relationship between the coverage class and the wet weight varies greatly depending on the survey period and region, the accuracy of the absorption coefficient changes in the following order:

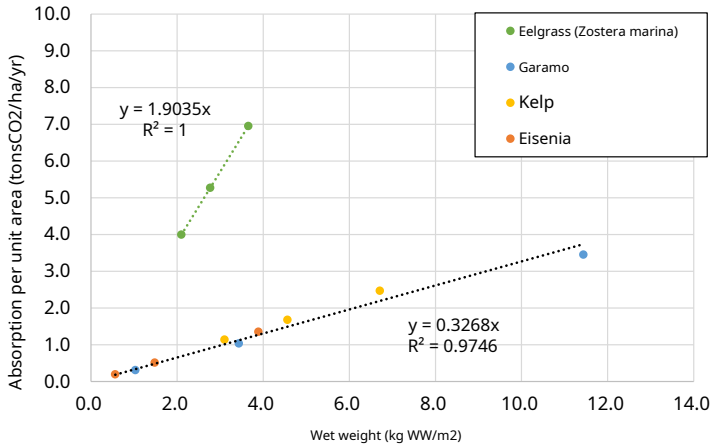
Table 3-13 Weight calculation methods and accuracy ranking

Ranking of likelihood	Calculation method
①: Dry weight	Calculated using dry weight (actual measurement)
②: Wet weight	Calculated using the dry weight converted from the wet weight (actual measurement) using the moisture content (literature value)
③: Exposure level	Calculated using wet weight converted from field observations



*P/BThe ratio and carbon content ratio are based on literature values for each type of seaweed bed.

Figure 3-12 Relationship between dry weight and absorption amount per unit area



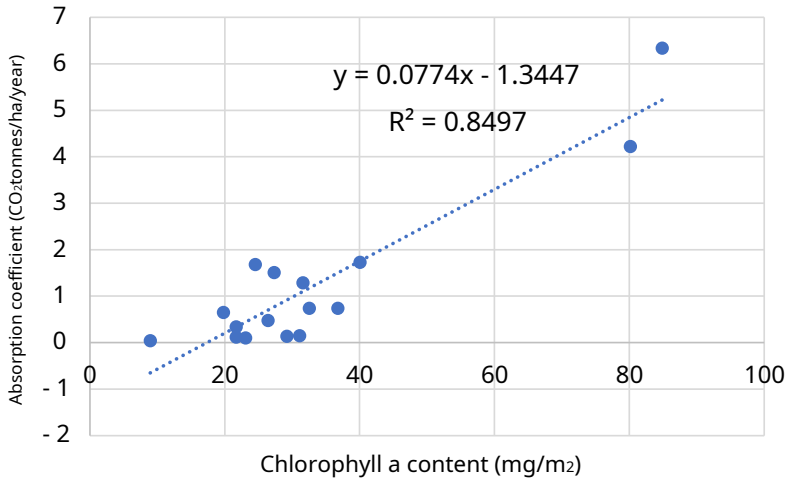
*Water content is0.85Assuming that,P/BThe ratio and carbon content ratio are based on literature values for each type of seaweed bed.

Figure 3-13 Relationship between wet weight and absorption amount per unit area

6) chlorophyllaRelationship between amount and absorption per unit area

In tidal flat ecosystems, the formula2Chlorophyll when usingaThe relationship between the amount and the absorption per unit area is shown in the figure below.

formula2So, the measured chlorophyllaIt is also possible to calculate the amount absorbed from the amount using a relational formula.



Source: Reiwa6year(2024Year)3timesJBlue Credit Certification and Issuance, Onomichi Sea Lilies Creating Satoumi through the restoration of tidal flats and seaweed beds,https://www.blueeconomy.jp/archives/2024-3-jbc-register/#38

Figure 3-14 Relationship between chlorophyll a amount and absorption per unit area

3.3.2 Assessing the likelihood

(1) Area

Certainty of distribution area of the target ecosystem§Represents the perspective of evaluation related to A model case is shown in 3-14.

Based on these viewpoints, the Examination and Certification Committee will judge the validity of the evaluation results for the contents of the application.§Please reflect this in your application.

For details of the application cases, please seeJ.B.E.ofHP(https://www.blueeconomy.jp/credit/) for your reference.

Table 3-14 Perspectives for evaluation of area certainty

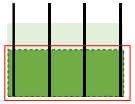
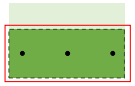
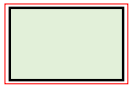
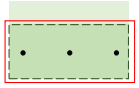
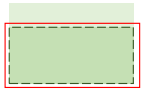
Classification	Probability of distribution area of target ecosystem		Ecosystem type Certainty
	Boundary determination	Consideration of coverage	
Review Price Base Semi	Overall evaluation based on the following criteria: ■ Area coverage ・The distribution range is accurately understood. (image clarity, line and In the survey, the amount of effort was taken into account, etc. (Use of bathymetric information, etc.) ■ Accuracy of the presence or absence of the target ecosystem - Accurately determine the boundaries of the target ecosystem Are you conducting a survey that can be used to ■ Location information accuracy - Location information of the boundary of the target ecosystem Is it accurate?GPSLocation information acquisition etc. acquisition, aerial photograph position correction, etc.)	■ Understanding the extent of exposure ・You can grasp the extent of coverage on a surface level. Dolphin - Actual area taking into account coverage Do you understand *Tidal flats and mangroves are excluded.	■ Ecosystem type accuracy - Determine ecosystem type You can get the information you need. Are you here?
Preparation Consideration	In order to obtain the information listed above, the survey will be carried out using one or a combination of methods, taking into account the conditions of the surveyed area.		

■ Important points to note when applying

・Enter the specific survey methods and results used to determine the target location map, area, and coverage. ・Enter the reasons for determining the target ecosystem and the results used for the determination (photos, etc.). ・Enter the method for obtaining location information and the method for determining the boundaries of the target ecosystem.

§"5Refer to "Glossary" (p.58)

Table 3-15 Model cases and certainty of determining the area of seagrass and seaweed beds

Certainty		Model Case		Evaluation perspective				
				Boundary determination			Consideration of coverage	Ecosystem Type
				Area coverage	Accuracy of boundary determination of target ecosystem	Location accuracy		
evaluation		Survey Contents	investigation image	Distribution range with precision I can understand it well mosquito	Accurately determine the boundaries of the target ecosystem Conduct a survey that will allow you to make good decisions Are you	Target ecosystem ranking Is the location information accurate?	Coverage can be grasped in a broad area. Are you ready?	Determine ecosystem type You can get the information you need. Are you here?
100~80%	High stomach	① Images showing seaweed beds clearly + ② Underwater visual observation (multiple shore-offshore lines) ①: Image interpretation from aerial photographs (position corrected) Area calculation using advanced image analysis ②: Survey line offshore (shallow to deep)GPSRecord the seaweed bed type and coverage. ① + ②: Area-wide organization of coverage and ecosystem type		・Clear images Reading and writing According to a survey The seaweed bed is the key I can understand it easily There are*. ◎	・Water that cannot be read from the image The boundary of the deep zone can be seen by visual inspection. Make more accurate decisions There are. ◎	・Location information accuracy High-resolution images I am using do. ◎	- Grasp the extent of coverage I can grasp it. ・Consideration of the degree of exposure Grasp the actual area Are you doing it? ◎	Ecosystem type Understanding the overall It is done. ◎
90~70%		① Images showing seaweed beds clearly + ② Underwater visual observation (multiple points) ①: Image interpretation from aerial photographs (position corrected) Area calculation based on manually set boundaries of seaweed beds ②: Record the seaweed bed type and coverage		・Clear images By reading The seaweed bed is the key I can understand it easily There are*. ◎	・The range that can be read from the image This is the basis for our judgment. ○	・Location information accuracy High-resolution images I am using do. ◎	- Grasp the extent of coverage I can't get a grip. -Actual area accuracy is low. △	Ecosystem type Understanding the overall Not possible stomach. △
80~60%		Underwater visual observation (outer edge of seaweed bed) - Record the boundaries of seaweed beds - Record the type and coverage of the seaweed bed at the boundary (GPSPosition in Record information)		- Only on the outer edge of the seaweed bed This is confirmation of Area coverage low. △	- Visually check the boundaries for accuracy He has good judgment. ◎	・Location information accuracy The degree is somewhat low stomach. ○	- Grasp the extent of coverage I can't get a grip. -Actual area accuracy is low. △	Ecosystem type Understanding the overall Not possible stomach. △
70~50%		① Images of seaweed beds are unclear + ② Underwater visual observation (multiple points) ① :Google EarthDetermine the area that is assumed to be a seaweed bed based on the above. ②: Record the seaweed bed type and coverage		・The seaweed bed is unclear So, judging the image Low accuracy*. △	・Image is unclear and borders are blurred The accuracy of judgment is low. △	・Location information accuracy High-resolution images I am using do. ◎	- Grasp the extent of coverage I can't get a grip. -Actual area accuracy is low. △	Ecosystem type A comprehensive understanding of I can't. △
60~20%	Low stomach	Blurred image of seaweed bed ・Google EarthThe area that is assumed to be a seaweed bed is determined from the Decline		・The seaweed bed is unclear So, judging the image Low accuracy* △	・Image is unclear and borders are blurred The accuracy of judgment is low. △	・Location information accuracy High-resolution images I am using do. ◎	・The degree of exposure can be understood It hasn't arrived yet. ・Understand the actual area Not yet. ×	Ecosystem type The information used to determine There is no news. ×

: Application scope : Range of seaweed beds : The range where growth was judged from clear images : The range where growth was judged from unclear images ▬: Line survey ●: Point survey

*≪Accuracy of determining the presence or absence of seaweed beds≫ Drone:70~90Approximately %, aerial photograph:65~85% Satellite image:60~85Approximately % (Source: Wide-area Seaweed Bed Monitoring Guide, Fisheries Agency, Reiwa3year3month)

(2) Absorption coefficient

Certainty of absorption coefficients§The evaluation viewpoints for the above are shown in Table 3-16, and model cases are shown in Table 3-17. Based on these viewpoints, the Examination and Certification Committee will judge the validity of the evaluation results for the contents of the application.§Please reflect this in your application. For details of the application example,J.B.E.ofHP(https://www.blueeconomy.jp/credit/) for your reference.

Table 3-16 Points of view for evaluation of the reliability of absorption coefficient

Classification	The accuracy of the absorption coefficient	
	Considering regional differences	
Review Price Base Semi	■Literature collection ・We were able to collect literature values in the vicinity of the target area. Ruka ■Consideration of seaweed bed type and coverage - Considering the type and coverage of seaweed beds in the target area Is the absorption coefficient set?	■Presence or absence of on-site observation ・Wet weight and moisture content etc. are measured by on-site observation. Which actual measurements are used? ・Survey points are set for each type of seaweed bed. It is set up at a representative location where the situation can be grasped. Is it possible to determine *The more survey points there are, the higher the accuracy.
Preparation Consideration	In order to obtain the information above, absorption coefficients will be collected and set based on the conditions of the survey area through on-site observations and literature values.	

■ Important points to note when applying

- For the absorption coefficient, enter whether to use the coefficient calculated using a field survey or the literature value.

- If an on-site survey is conducted, enter the survey method, reasons for selecting the survey location, and survey results in detail.

・Use of literature values (regional consideration) is based on the collected literature list and the concept of setting the absorption coefficient (maximum value, average

Enter the value used in the calculation (average value, etc.).

§"5Refer to "Glossary" (p.58)

Table 3-17 Model cases and certainty of setting absorption coefficients for seagrass and algae beds

Certainty evaluation		Model Case	Evaluation perspective: The accuracy of the absorption coefficient — Area basis (formula1Use of Regional characteristics (local seaweed bed type and The absorption coefficient considering the degree of radiation exposure is Is it set?	Weight, rope length basis (formula2Use of Conducting on-site observations and collecting literature Due to local characteristics (local algae) Considering the type of field and the degree of coverage The absorption coefficient was set correctly. Ruka
100 ~ 80 %	expensive ↑	① Measurement of wet weight per unit area + ② Setting the absorption coefficient based on literature collection (Regional characteristics are taken into consideration)	-	・Conduct on-site observations in the target areas It is. - Seaweed bed type of the target ecosystem Literature based on the regional characteristics of The absorption coefficient is set by collection. It is set forth. - Absorption coefficient taking into account the degree of coverage is used.
90 ~ 50 %		Use of literature values (Regional characteristics are taken into consideration)	- Seaweed bed type of the target ecosystem Document collection based on regional characteristics The absorption coefficient is set by is. - Absorption coefficient considering the degree of coverage It is being used.	-
50 ~ 30 %	↓ low	Use of literature values (Regionality is not taken into account)	・Using the national average literature value is. - Coverage is not taken into consideration.	-

(3) Baseline

The baseline is calculated using the same methodology as the blue carbon removals, so the evaluation of the ecosystem area and the removal coefficient of the target ecosystem will be carried out with the same degree of certainty. For more information on the baseline, please seep.9Please refer to.

3.4 By shipCO_2Calculation method for emissions

Fuel consumption by ships involved in marine surveysCO_2The calculation method for emissions and the coefficients used for the calculation are as follows:

For fuel consumption rate, use the coefficient for the power output closest to that of the vessel used.

CO_2Emissions (t-CO_2) = Operating time (h) × output (kW) x fuel consumption rate (liters/kWh) ×1/1000 × Emission factor (t-CO_2/kliters)

Table 3-18 CO from ship use$_2$Coefficients used in calculating emissions

coefficient				remarks	source
Fuel consumption rate	Outboard motor boat	11kW(15PS)degree	0.209Litres/kWh	Outboard motor boat figures	1
	Research vessel	51kW(70PS)degree	0.146Litres/kWh	Transportation ship (FRP,3t)Number of	1
		132kW(180PS)More than moderate	0.046Litres/kWh	Safety surveillance ship (FRP,10t) Number of	1
	Diver ship	206kW(280PS)degree	0.108Litres/kWh	Diver ship figures	1
	Patrol ship	254kW(180PS)degree	0.046Litres/kWh	Safety surveillance ship (FRP,10t)of	1
		423kW(180PS)degree	0.046Litres/kWh	Number	1
Emission Factor	Aheavy oil		2.75 t-CO_2/kLitres	-	2
	Volatile oil (gasoline)		2.29 t-CO_2/kLitres	-	2
	Light oil		2.62 t-CO_2/kLitres	-	2

source1: Port civil engineering contract work cost estimation standards Reiwa6Annual revised edition (Ministry of Land, Infrastructure, Transport and Tourism)

source2List of calculation methods and emission factors under the calculation, reporting and disclosure system (Ministry of the Environment, Reiwa5year12month12Daily update) (https://ghg-santeikohyo.env.go.jp/calc)

3.5 By using nets, ropes and buoysCO_2Calculation method for emissions

In conjunction with the production of new nets, ropes, and buoys for seaweed farmingCO_2The calculation method for emissions and the coefficients used in the calculation are as follows:

CO_2Emissions (t-CO_2) = Material weight (t) x Emissions factor (t-CO_2/t)

Table 3-19 CO from the use of nets, ropes and buoys$_2$Coefficients used in calculating emissions

coefficient			remarks	source
Emission Factor	Nets and Ropes	4.40 t-CO_2/t	-	1・2
	buoy	2.07 t-CO_2/t	-	1・2

source1: Heisei27Input-Output Table (Ministry of Internal Affairs and Communications)

source2: Data Book of Environmental Impact Units Based on Input-Output Tables (3EID) (Center for Global Environmental Research,2015year)

3.6 Calculation of application amount

The amount of carbon dioxide absorbed and stored after the project is implemented is the amount of carbon dioxide absorbed and stored that is eligible for J Blue Credit certification.CO_2From the absorption amount,CO_2Absorption amount and fuel consumption of vessels involved in marine surveysCO_2Emissions and use of nets, ropes and buoysCO_2Emissions minusCO_2This is the amount of absorption.

Also,CO_2The accuracy of the area and absorption coefficient used to calculate the absorption amount varies depending on the survey method, etc., as mentioned above.

■ Application amount

Apply for CO_2Amount absorbed

= (area of the target ecosystem×Evaluation) × (Absorption coefficient × Evaluation)

- Baseline CO_2Absorption - CO from shipping$_2$Emissions

- CO due to the use of nets, ropes and buoys$_2$Emissions

[Column] In the atmosphereCO_2Direct measurement of absorption

In this guide,CO_2The absorption amount is actually measured as shown in Figure 3-15.3The "carbon storage" shown in the red box

This means that the amount of carbon stored in the "carbon storage facility" each year is measured.

The residue is in the atmosphere.CO_2Indirectly, the net absorption is assumed to be equal to the annualCO_2Measure the amount of absorption

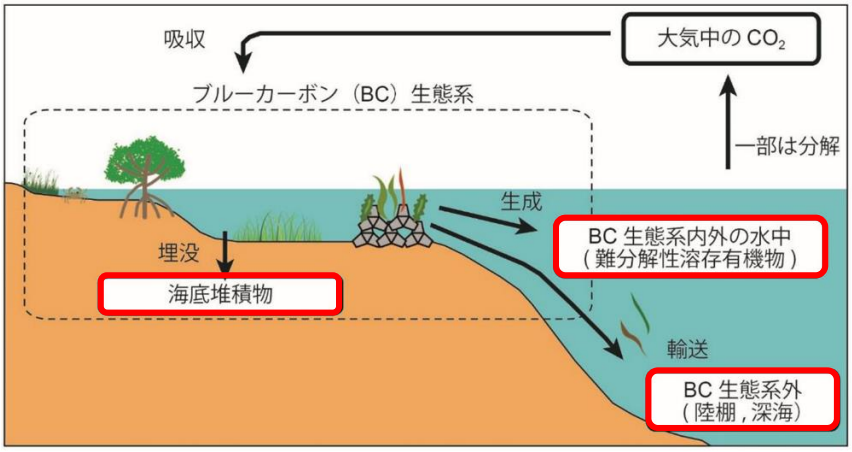
On the other hand, although the technology is more advanced,CO_2Net removals per year

There is also a method called the "gas flux method" that directly measures the

So lame.

■ References on the Gas Flux Method

・Blue carbon in ports (CO_2Guidelines for measuring carbon dioxide absorption and sequestration, Port and airport technology Research Institute Materials,No.1309,2015.



Source: Kuwae et al. (2019)Partially revised "National estimate of annual carbon dioxide absorption in shallow waters"

Figure 3-15 Blue carbon absorption and storage mechanism

The gas flux method isCO_2Partial pressure (pCO_{2water}) and in the atmosphereCO_2Partial pressure (pCO_{2air}) and in water

Between the atmosphereCO_2By calculating the gas exchange rate,CO_2The absorption coefficient of

It's a way to measure.

Below, we will introduce a method for measuring the amount of absorption using the gas flux method.

① On-site survey time and location requirements

1Survey period

pCO_{2water}The amount of algae varies daily due to the effects of photosynthesis and respiration in the algae bed.

Base production fluctuates seasonally.CO_2In the gas exchange method,pCO_{2water}Considering the change in

It is necessary to set a period. The years including the peak and decline periods of the seaweed beds.2More than one survey, taking into account daily fluctuations

To be able to1day2More frequent surveys (e.g. early morning and evening) are recommended.

This gives a more reliable estimate.

2Survey location

CO_2To measure the effect of seaweed beds on gas exchange rates, we performed measurements at sites inside and outside the seaweed beds.

It is necessary to measure the average value in the seaweed bed.

Decide the number of points (for example, to make sure that the points are evenly spaced from one end of the seaweed bed to the other).

In this case, the conditions such as salinity and water temperature should be as similar as possible to those in the seaweed bed, and the impact of the seaweed bed should be minimized.

Select a location.

② UnderwaterpCO_2How to measure

1. CO_2Measurement by concentration meter

pCO_{2water}As a method for automatically measuringNDIR) Sensor-based methods are common

That's correct.NDIRis calculated by exposing a gas sample to infrared light and calculating the absorption rate.pCO_2This is a method for determiningNDIRI

Since only the whole body can be measured, a gas-permeable membrane or seawater sprayer is used to measure the amount of seawater in the same way as seawater samples.pCO_2Willingness to have

The body temperature is extracted and measured on-site. The sensor can measure continuously, so it can be installed on-site to measure the daily cycle.

It is suitable for capturing

2. Estimation based on chemical analysis of water samples

The water samples were chemically analyzed.pCO_2Carbonate-based ingredients other than (DIC:Dissolved inorganic carbonate concentration,Talend:All Arca

Degree,pH) of2By calculating the equilibrium value from the water temperature and salinitypCO_{2water}Calculate the water sampling rate.

The sample was collected by overflowing into a thick glass bottle and saturated with mercuric chloride solution ($HgCl_2$) etc.

The samples are transported to the laboratory in a fixed state using a carbon dioxide analyzer.

Measure the minutes.$pCO_{2water}$is one of the carbonated components2Using the on-site measurements of water temperature and salinity,

The equilibrium calculation involvesCO_2SYS(Lewis and Wallace, 1998) or other software.

For each water sample,1Since only the data is available, complex measurements are required to capture the daily cycle.

Although it requires multiple samplings, it is a relatively easy technique to obtain samples at multiple locations.

3) In the atmospherepCO_2How to measure

As mentioned aboveNDIRSensor-equippedCO_2Directly using a densitometerpCO_{2air}will be measured.CO_2Prepare the concentration meter

If it is difficult to create a new database, you can use data from an existing database.

The database is provided by the National Institute for Environmental Studies (http://db.cger.nies.go.jp/gem/ja/ground/) and the Japan Meteorological Agency

(https://www.data.jma.go.jp/ghg/kanshi/obs/co2_monthave_ryo.html) and other sources have made the data publicly available.

I am.

④ CO_2How to Calculate Gas Exchange Rate

The daily average measured abovepCO_{2water},pCO_{2air}, water temperature, salinity, and the daily air-sea waterCO_2

Gas exchange rate (FCO_2) into the following formula (bulk formula§) can be calculated. Negative values are atmospheric

From underwaterCO_2It represents absorption.

$$FCO_2 = k \times S \times (pCO_{2water} - pCO_{2air}) \quad \text{(unit:} \times 10^{-8} \text{mol/m}^2\text{/h)}$$

$$= (k \times S \times (pCO_{2water} - pCO_{2air})) \times 44 \times 10^{-4} \times 24 \quad \text{(unit:gCO}_2\text{/ha/d)}$$

§"5Refer to "Glossary" (p.58)

CO_2The solubility of (S:mol/m^3/atm) can be calculated from water temperature and salinity using a function (Weiss, 1974[1]).

where$W.T.$is the water temperature (℃),SALindicates the salinity.

$$
\begin{aligned}
S = \mathrm{EXP}\ & (-60.2409 + 93.4517 \times (100 / (W.T. + 273.15) \\
& + 23.3558 \times \mathrm{LN}((W.T. + 273.15) / 100) \\
& + SAL \times (0.023517 - 0.023656 \times ((W.T. + 273.15) / 100) \\
& + 0.0047036 \times (((W.T. + 273.15) / 100)^2))) \\
& \times (999.842594 + 6.793952 \times 10^{-2} \times W.T. \\
& - 9.09529 \times 10^{-3} \times W.T.^2 + 1.001685 \times 10^{-4} \times W.T.^3 \\
& - 1.120083 \times 10^{-6} \times W.T.^4 + 6.536332 \times 10^{-9} \times W.T.^5 \\
& + SAL \times (8.24493 \times 10^{-1} - 4.0899 \times 10^{-3} \times W.T. + 7.6438 \times 10^{-5} \times W.T.^2 \\
& - 8.2467 \times 10^{-7} \times W.T.^3 + 5.3875 \times 10^{-9} \times W.T.^4) \\
& + SAL^{1.5} \times (-5.72466 \times 10^{-3} + 1.0227 \times 10^{-4} \times W.T. \\
& - 1.6546 \times 10^{-6} \times W.T.^2) + SAL^2 \times (4.8314 \times 10^{-4}))
\end{aligned}
$$

Gas exchange coefficient$k$(cm/h) can be calculated using the following formula:

$$K = 0.251 \times U_{10}{}^2 \times (660 / Sc)^{0.5}$$ (Wanninkhof, 2014[2])

U_{10}(m/s) is the altitude above sea level10 mIf you cannot measure it,$U_{10}$is the vicinity of the observation point

Meteorological AgencyAMeDASUsing the observation point data, the wind speed, altitude, and surface roughness are related by the following formula:

It can be estimated (Kondo,2000[3]).$V$is the average wind speed (m/s),$Z_A$is the anemometer installation height (m),Z_0teethAMeDAS

The surface roughness in each direction of the point (m) The information on the surface roughness is provided by Kondo (2000)[3]Please refer to

I will consider it.

$$U_{10} = (0.4 \times V / \mathrm{LN}(Z_A / Z_0)) / 0.4 \times \mathrm{LN}(10 / Z_0)$$

Schmidt number (Sc) is the surface water temperature$W.T.$and salt contentSALThe dynamic viscosity of the fluid is determined from[§]and the diffusion coefficient

It is a dimensionless number that represents the ratio (Jähne et al., 1987[4]).

$$
\begin{aligned}
Sc = & (2073.1 - 125.62 \times W.T. + 3.6276 \times W.T.^2 - 0.043219 \times W.T.^3) \\
& \times (0.06 / 35 \times SAL + 0.94)
\end{aligned}
$$

This is how it was calculatedFCO_2Using theCO_2Gas exchange rate (gCO_2/ha/d) using the following formula:

Calculate.

By seaweed bedsCO_2Gas exchange rate = within seaweed bedFCO_2–Outside the seaweed bedFCO_2

This value is calculated for each season and the annual average of seaweed bedsCO_2Gas exchange rate (t-CO_2/ha/Calculate the year.

§"5Refer to "Glossary" (p.58)

⑤ CO_2Gas exchange methodCO_2Calculation of absorption amount

CO_2Gas exchange methodCO_2The amount of absorption can be calculated using the following formula:

CO_2Absorption amount (t-CO_2/year)

=Seaweed bed area (ha) x footprint coefficient x seaweed bedCO_2Gas exchange rate (t-CO_2/ha/year)

Photosynthesis in seaweed bedspCO_{2water}Reduce the amount of bacteria on the surface of the seaweed beds.CO_2It promotes absorption.

The water inside the seaweed bed is constantly exchanged with the water outside the bed, and the water inside the bed is diluted and spreads outside the bed.

The term that corrects for the effects of dilution and diffusion is the footprint coefficient.

In a study conducted by the University of Tokyo, the number of fish in the seaweed beds in Lake Furen, Hokkaido,CO_2Gas exchange rate0.285t-CO_2/ha/year(Tokoro et al., 2014[5]), whereas the maximum abundance (wet weight: about2,300 g/m_2) to the formula2It is calculated using

RCO_2The absorption rate is approximately3.7t-CO_2/ha/The footprint is based on the flow (advection and diffusion) and stratification of the site.

Since it is governed by physical conditions such aspCO_2Multi-point observation and flow Actual measurement is required.

References

1)Weiss, RF (1974) Carbon dioxide in water and seawater: the solubility of a non-ideal gas. Marine Chemistry 2:203-215.

2)Wanninkhof, Rik, (2014), Relationship between wind speed and gas exchange over the ocean revisited, Limnol. Oceanogr. Methods, 12, doi:10.4319/lom.2014.12.351.

3)Kondo (2000) Near-surface Atmospheric Science: Understanding and Applications, University of Tokyo Press

4) Jähne, B., Heinz, G. and Dietrich, W. (1987)Measurement of the diffusion coefficients of sparingly soluble gases in water. Journal of Geophysical Research: Oceans 92:10767-10776.

5) Tokoro Tatsuki, Hosokawa Shinya, Miyoshi Eiichi, Tada Kazufumi, Watanabe Kenta, Montani Shigeru, Kayanne Hajime, and Kuwae Tomohiro. Net uptake of atmospheric $CO_2$by coastal submerged aquatic vegetation. Global Change Biology 20:1873-1884.

4.1 About Blue Carbon

Q1. What is blue carbon?

A 1.

- Carbon stored in the ocean through the actions of marine organisms is called "blue carbon."

・Plants growing in shallow waters produce food through photosynthesis.CO_2It absorbs carbon and stores it on the seafloor.

・Carbon stored on the ocean floor is stored over thousands of years, and the carbon stored on the ocean floor is1.9100 million~2.4Billion tons of carbon stored

It is said that this is the case.

Q 2. What are the major ecosystems that store blue carbon and their CO2 emissions?$_2$What is the absorption mechanism?

A2.

The main ecosystems in which blue carbon is stored include seagrass beds, algae beds, wetlands, tidal flats, and mangroves.

There is a forest.

-The carbon accumulation mechanisms are as follows:

① Seagrass beds

Eelgrass grows by photosynthesisCO_2The organic matter produced by absorbing water is transferred to the seabed soil as it dies or is washed away.

The plant accumulates in the soil and deep sea. In addition, persistent dissolved organic matter released from the plant accumulates in seawater.

② Seaweed beds

Seaweed such as akamoku, wakame, and kombu (including farmed kombu) grow by photosynthesis.CO_2It is produced by absorbing

The organic matter that has died or been washed away accumulates in the seabed soil and deep sea.

Decomposable dissolved organic matter accumulates in seawater.

3) Wetlands and tidal flats

Reeds and microalgae on the soil surface produceCO_2The organic matter produced by absorbing water dies and is washed away.

It accumulates in soil and deep oceans due to exposure to chemicals.

④ Mangrove forests

Mangrove trees grow by photosynthesisCO_2The organic matter produced by absorbing water is lost due to withering or runoff.

It accumulates in soil and deep oceans.

Q 3. How much CO2 is being produced by blue carbon in Japan?$_2$Is it assumed that the

A3.

・The latest survey results show that in Japan, seaweed and seagrass beds are the main habitat for130About 10,000 tons$CO_2$is correct

It is estimated that the taste is absorbed.

・Restoring seaweed beds, building bio-symbiotic port structures, and expanding aquaculture will help to improve the futureCO_2Increased absorption is expected

It is.

Q 4. What is the difference between seagrass beds and seaweed beds?

A4.

■ Seagrass beds

- This refers to a seaweed bed dominated by seaweed, mainly eelgrass, a type of seed plant.

・Many seaweeds have underground stems or root hairs that bury their roots in the seabed, and require the seabed to be sandy and muddy.

vinegar.

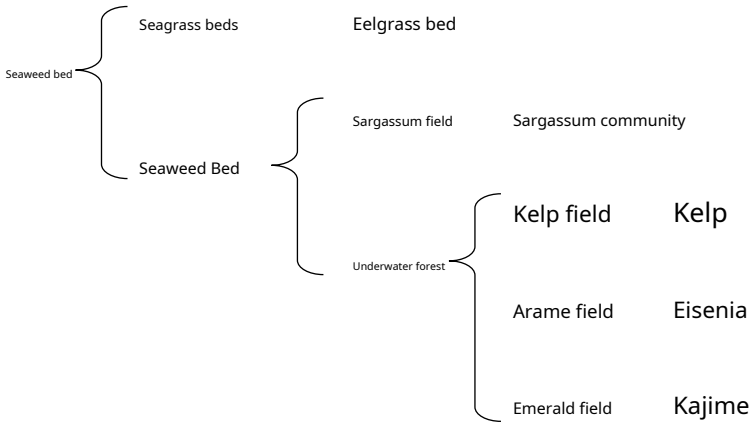
■ Seaweed beds

・A general term for seaweed beds made up of seaweed (spore-forming plants).

・Areas where branched seaweed such as akamoku grows abundantly are called saramo beds, and areas where large seaweeds such as kombu and arame grow in forests are called saramo beds.

Places where these seaweeds grow so lushly are called underwater forests, and are named after the species that make up the seaweed beds, such as kelp beds, Eisenia bicolor beds, and Ecklonia cava beds.

It is also sometimes referred to as the "uni."



Classification of seaweed beds (overview)

4.2 About J Blue Credit

Q 5. What is the overall concept of J Blue Credit? What is its purpose and what will it be possible to achieve in the future?

Or not?

A5.

・J Blue Credit is blue carbon that has been quantified and made tradable (credited).

・J Blue Credit isJ.B.E.*After being reviewed and verified by an independent third-party committee,J.B.E.Certified and issued

It is a unique credit that is run and managed by the company.

・J Blue Credit applies nationwide.

※JBEAboutA.11Please see.

Q6. Is this the first attempt at a credit system using blue carbon in Japan?

A 6.

・Preceding examples include the cities of Yokohama and Fukuoka which have issued their own credit certifications.

Q 7. What is the current status of international certification and credit creation around the world?

A 7.

·for exampleVerified Carbon Standard(VerraIt is certified and registered by the certification body (operated by ISO 9001).

Q 8. Who authenticated the credits and how?

A 8.

・J.B.E.The J Blue Credit Review and Certification Committee, an independent third-party organization (comprised of members from various fields of expertise)

A group of experts from the area of the target ecosystem wasCO_2Absorption coefficient etc. are examined and

Taking the results into accountJ.B.E.It has been authenticated.

Q9. How do you plan to differentiate yourself from J-Credit?

A9.

Each credit system has its advantages and disadvantages, so credit applicants and purchasers should choose the credit system that best suits their purpose.

We think it would be best for you to choose the credit system.

・At present, J-Credit does not include blue carbon methodology.

4.3 J.B.E.About

Q 10. What is JBE? When was it established? What are its objectives? Who are its members?

A 10.

■ Official name : Japan Blue Economy Technology Research Association

■ Establishment : 2020year7month

■ Members : National Institute of Maritime, Port and Aviation Technology, Sasakawa Peace Foundation, etc.

■ Details of the initiative : To stimulate blue economy projects, such as the conservation, restoration and utilization of oceans and coastal areas.

Research and development of the technologies (methodologies) required for

*A technology research association is established with ministerial approval under the Technology Research Association Act in order for multiple companies, universities, etc. to conduct joint testing and research. It is a corporation. It has the following features: 1) Equipment acquired through levies can be denominated in abbreviated form for tax purposes, 2) If certain conditions are met, patent fees and other fees can be reduced or exempted, and 3) A smooth organizational transition to a joint-stock company or similar can be made.

Q 11. What kind of organization is JBE (Japan Blue Economy Technology Research Association)?

A 11.

・Developing the technologies necessary to revitalize blue economy businesses, such as ocean conservation, restoration, and utilization.

As an organization responsible for system design and technical guidance,2year7Currently, Blue Carbon Cloud is

We are responsible for the certification, issuance, management and trading of J Blue Credits, which are the core of the credit system.

・J.B.E.The "Study Group on the Role of Blue Carbon in Contributing to the Prevention of Global Warming" was established by the Ministry of Land, Infrastructure, Transport and Tourism.

Based on the discussions at the meeting, we are working with the Ministry of Land, Infrastructure, Transport and Tourism to operate the J Blue Credit Scheme.

4.4 Domestic trends and others

Q 12. Will blue carbon be included in the national inventory? If so, when and to what extent? Will it fit in?

A 12.

・2023year4In May, the inventory was updated to reflect changes in carbon stocks in mangroves.

As for seaweed beds and seaweed beds,2024year4It was added to the inventory in the month.

Q 13. How do you calculate adjusted greenhouse gas emissions under the calculation, reporting and publication system of the Global Warming Countermeasures Promotion Act?

I understand that it is not possible to use it, but will it be possible to use it in the future?

A 13.

・We are currently in discussions with relevant ministries and agencies about the possibility of introducing this system.

・Note: Japanese versionCO_2Emissions trading scheme (GX-ETS)2024year10On the moonJ- Blue credits eligible

Registered as carbon creditsJTotal amount of Blue Credit certified54Project

T, about6,000t-$CO_2$was announced as "certified".

Q 14: Can anyone be a creator?

A 14.

・Any organization other than a national government institution may apply. Organizations that are engaged in the creation, restoration, maintenance, etc. of the target ecosystem

If so, you may be the applicant.

In the case of multiple applications, credits will be allocated at the time of application.*You need to decide.

* This will be decided through discussion between the parties involved, but if there is no actual management or activity, the property will not be eligible.

Q 15. Can credits be generated again at a location where an application and certification has already been made?

A 15.

・The existence of blue carbon generated during a period or through activities different from those previously certified may be recognized.

If certification for that activity is obtained again, credits can be generated in the same place.

・J Blue Credit1Applications are accepted on an annual basis, so you can apply every year.

Q 16. For example, do J-Blue credits generated from eelgrass exclude the carbon captured in the eelgrass? So is there no need to cut down the eelgrass?

A 16.

・Blue carbon in eelgrass beds under this system is mainly caused by the death and runoff of eelgrass, resulting in the seabed becoming covered in water.

Carbon that accumulates in soil and the deep sea, and persistent dissolved organic matter released from grasses accumulate in seawater.

Since the carbon that is harvested is the target, there is no need for subsequent harvesting.

However, the harvested eelgrass must be disposed of properly (by landfill or using as industrial raw material, etc.).

inCO_2If it is deemed to be equivalent to reduction or absorption, it will be treated as credit creation through a different activity.

may be accepted under the credit system.

Q 17: To what level must a credited site be maintained?

A 17.

・Credit certification is the result of rehabilitation activities and maintenance management, and is based on the certification period (project period).

Maintenance after the project implementation period is not directly related to the credits generated.

However, the purpose of the J Blue Credit Scheme is to "provide voluntary activities for mitigating and adapting to climate change."

The purpose of the project is to "continue or develop the activity," so "acquiring credits will lead to the maintenance or development of the activity."

Please note that the requirement states that "the

・In addition, through proper maintenance,Q15As stated in the previous article, this will lead to the creation of credits in the following fiscal year.

Q 18. What is proper maintenance?

How can seaweed beds be maintained and managed in order to apply for J Blue Credits?

A 18.

・Both seagrass beds and seaweed beds are communities of a certain size (currently0.1~0.2haIn order to maintain the above assumptions

If necessary activities such as transplanting, sowing, and pest control are continuously carried out, certification may be possible.

Masu.

However, since it would be counterproductive to increase the administrative burden on credit creators in the future,

It is not expected that you will be forced to do anything beyond your normal activities.

Specific examples of activities include transplanting additional eelgrass and protecting the habitat of eelgrass by creating rules for fishing grounds and marine areas.

In addition, the project involves monitoring bottom sediments and seaweed beds, providing a venue for environmental studies at local elementary schools, and carrying out public awareness activities.

is.

- To confirm that the requirement "acquiring credits will lead to the maintenance and development of activities"

After obtaining the credits, you will be required to submit periodic activity reports. The contents of those reports will be made public.

Q 19. Is there a way to apply so that maintenance costs can be covered by J Blue Credits every year?

A 19.

・J Blue Credit does not guarantee future maintenance costs.

On the other hand, for example, in the case of activities that allow for continuous credit generation, the transfer of those credits

It is anticipated that the funds obtained will be used to cover maintenance activity costs.

・Since you can apply for the same scope of activities every year, it is possible to plan your budget accordingly. However,

Proper maintenance must be carried out and records must be kept in order.

Q 20. What kind of organization would be ideal to be a credit creator (= applicant)?

A 20.

・From the buyer's point of view,1Rather than one person organizing a project,

RNonprofit OrganizationsThe project was supported by a wide range of organizations, including universities and schools.

It may be easier to obtain or more valuable.

This may be reflected in the amount of the payment.

Q 21: What types of companies are expected to be credit buyers?

A 21.

・Organizations that have greenhouse gas reduction targets and need to implement offsets to achieve them,

We envision organizations that have the meaning and motivation to contribute to society by supporting project implementers.

Masu.

·AlsoJ.B.E.In the public invitation for purchasers, we will require that they be domestic corporations, that they comply with the J Blue Credit System, andJ.B.E.

We require them to understand the scope of their responsibilities and to comply with the public tender procedure regulations.

Q 22. Can a company participating as a co-applicant use the credits issued by the project?

Can I purchase it?

A 22.

・Purchase is possible.

Q 23. Can I purchase J Blue Credits on a regular basis every year?

A 23.

・However, the timing and amount of J Blue Credits to be created varies from year to year.

So, regularlyJ.B.E.Please check the recruitment information on the website.

Q 24. How do I trade?

A 24.

・Depending on the content of the project, we will determine the optimal transaction method while taking into account the creator's wishes.J.B.E.But each time

We will determine.

Q 25: What is the application fee?

A 25.

For details on the various fees related to the application,HPPlease check the "List of Various Fees" on the website.

(https://www.blueeconomy.jp/credit/)

Q 26. If multiple activities with different content are carried out during the application period, can they be applied as separate projects?

Do I need to?

A 26.

If the applicant is the same,1It can be submitted as one project.

Q 27. If I want to be credit approved within the fiscal year, when should I apply?

A 27.

It depends on the number of applications received that year,J.B.E.ofHP(https://www.blueeconomy.jp/credit/)

Please check.

Please check in advance for more details.

term	Contents
Greenhouse gases	The Act on Promotion of Global Warming Countermeasures (Heisei10year10month9Japanese Law No.117No. 13 of the same Act, as amended.2Article3The following items are listed in7material. -carbon dioxide(CO_2) -methane(CH_4) - Nitrous oxide (N_2O) -Hydrofluorocarbons (HFC) as specified by government ordinance -Perfluorocarbon (PFC) as specified by government ordinance -Sulfur hexafluoride (science fiction$_6$) -Nitrogen trifluoride (NF_3)
credit	CO_2Reduction amount andCO_2The amount of absorption and removal is quantified and certified according to a predetermined method (methodology) and made available for trading.
J-Credit Scheme	The government-run credit system1(Blue carbon is not covered by this system.)
J Blue Credit	Of the greenhouse gas absorption achieved through projects to increase blue carbon implemented in Japan,J.B.E.The amount of greenhouse gas absorption certified by the government. Voluntary credits (not government-led,NGO(credits certified and traded under the initiative of the private sector or the11.
United Nations Environment Programme (UNEP:United Nations Environment Programme)	1972Established in 1995, the UN Environment Agency plays a leading role in and encourages partnerships to protect the environment so that governments and peoples can improve their own quality of life without compromising that of future generations. As the lead UN agency in the field of the environment, it sets the global environmental agenda, assists policymakers, advances environment-related activities within the UN system in the context of sustainable development efforts, and serves as the authoritative advocate for global environmental protection.
IPCC(Regarding climate change Intergovernmental Panel on Intergovernmental Panel on Climate Change)	World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP)1988 An intergovernmental organization established in 2000. Its purpose is to provide a scientific basis for national governments' climate change policies, and with the cooperation of scientists from around the world, it regularly prepares reports based on published literature (such as papers published in scientific journals) and provides an assessment of the latest scientific knowledge on climate change.
Voluntary Carbon Markets	A market in which many companies and organizations trade voluntary credits that will be necessary to achieve carbon neutrality in the future.
Climate change mitigation measures	It is one of the measures to deal with the problem of global warming, and refers to measures to reduce greenhouse gases, while measures to prepare for the adverse effects of global warming are called adaptation measures.
Project Implementer	A party that implements a project to increase greenhouse gas removals, including a party that jointly implements the project by providing technology, funds, services, etc.
Inspection and Certification Committee	In the J Blue Credit Scheme, project screening and approval, and project-based CO_2A third-party committee made up of experts that reviews and confirms absorption records.

term	Contents
Certainty	This refers to the reliability of numerical values such as the distribution area and absorption coefficient of blue carbon ecosystems.
Geometric correction and orthorectification	This involves removing distortions and misalignments from images such as aerial photographs, and correcting them to create data with accurate location information.
trade off	A contradictory relationship that cannot exist simultaneously.
Blue carbon ecosystems	Seagrass beds, wetlands, tidal flats, mangrove forests, etc.CO_2Ecosystems that consist of sinks
Net primary production	The total amount of organic matter produced by plants through photosynthesis minus the amount of respiration (carbon released through respiration).
P/Bratio	Current amount (B) relative to net primary production (P) ratio.
DOC(Dissolved Organic Carbon)	Organic carbon dissolved in water (carbon contained in organic matter).
RDOC(Hardly degradable dissolved Machine carbon)	Dissolved organic carbon that remains stable for a long period of time, from hundreds to thousands of years, without being decomposed.
Bulk Type	A method for indirectly estimating gas fluxes using theoretical models.
Kinematic Viscosity	Indicates the difficulty of a fluid to move or flow.

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