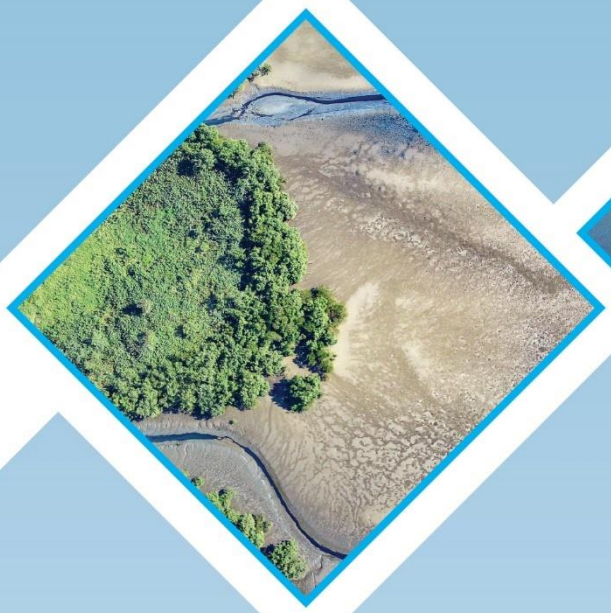
Port Environmental Review System - PERS Port of Paranaguá - 2025



PORTOS DO PARANÁ
LOGÍSTICA INTELIGENTE

PARANÁ
OVERNO DO ESTADO

Summary

1. Port profile

1.0 Port location

The port of Paranaguá is one of the world's most important maritime trade hubs, benefiting from a strategic location and one of the most advanced port infrastructures in Latin America (Figure 1). It is located in the city of Paranaguá, within a significant estuarine system, specifically in Paranaguá Bay. This bay is characterized by high environmental diversity and hosts important and protected ecosystems, such as mangroves, which serve as key breeding and nursery areas for numerous species. In addition, artisanal fishing plays a relevant role in the regional economy, as many local fishers depend on the natural resources found in the areas surrounding the port.

Figure 1. Port of Paranaguá location.

1.1. Legal status and port operation

The port of Paranaguá is a public port administered by the Government of the State of Paraná. Until 2013, the Port Authority was directly responsible for port operations. With the enactment of Federal Law No. 12,815/2013, which regulates the direct and indirect exploitation of ports and port facilities by the Federal Government and defines the activities carried out by port operators, port operations were transferred to private entities. As a result, private Port Operators became responsible for the loading and unloading of liquid and solid bulk cargo.

Port Operators are legal entities duly prequalified to perform passenger movement and/or the handling and storage of cargo destined for or originating from waterborne transport within the organized port area. In this institutional arrangement, the company Portos do Paraná performs the role of Port Authority, and the port of Paranaguá operates under the public landlord port model.

Under this model, Portos do Paraná is responsible for managing and supervising operational areas and for ensuring the availability, maintenance and adequacy of essential port infrastructure. This includes quays, berths, turning basins, road and rail access, as well as storage areas and facilities to support port users. The private sector, in turn, is responsible for the operation and maintenance of terminals, warehouses and operational equipment, contributing to efficiency, competitiveness and service quality. As Port Authority, the main responsibilities of Portos do Paraná include:

- Ensuring compliance with and enforcement of applicable laws, regulations and concession or lease agreements;
- Evaluating and prequalifying port operators;
- Supervising or executing the construction, renovation, expansion, improvement and conservation of port infrastructure;

- Supervising port operations to ensure regularity, efficiency, safety and environmental compliance;
- Authorizing vessel traffic, berthing and unberthing within the port area; and
- Suspending port operations when activities may compromise safety, efficiency or the regular functioning of the port.

The private sector is responsible for providing and maintaining port equipment, warehouses, labor and operational services. Leasing companies are accountable for the maintenance and operational management of their respective leased areas. In this context, the Port Authority is responsible for regulating, controlling and overseeing safety, security and environmental compliance measures applicable to lessees, port operators and other port agents operating within the port area, as summarized in Table 1.

Table 1. Definition of port agents related to the port of Paranaguá.

Port agents in the port of Paranaguá area
Tenants; authorizing agents; assignee; and port operators (including associations) of public port facilities
Other port operators operating in the common areas of the port
Stevedoring Management Group (OGMO) and professional unions
Railway operator (Rumo)
Vessel owners, ship owners or agents (shipping agencies)
Port support companies and port service providers

Portos do Paraná performs its role as Port Authority within a defined geographic area known as the Organized Port Area (polygon), as established by Federal Law No. 12,815/2013. This area encompasses port facilities, protective infrastructure, as well as maritime and land access routes.

The polygon of the port of Paranaguá defines the geographic boundaries within which the Port Authority exercises its administrative and management powers. This delimitation is established by an act of the Executive Branch and considers maritime and land access conditions, operational efficiency, competitiveness gains, and the existing port infrastructure. The current polygon of the port of Paranaguá is defined by Ordinance No. 65/2023 and is shown in Figure 2.

Figure 2. Portos do Paraná legal jurisdiction as a Port Authority.

1.2. Main commercial activities

The port of Paranaguá is the most productive Brazilian port in terms of quay length efficiency. Its infrastructure covers a total area of 4,129,801.3 m², with quays and piers extending over 5,347 meters. The port has 20 berths dedicated to cargo handling, including one dolphin berth for RO-RO vessels and 10 ship loaders. The main commercial activities at the port of Paranaguá are related to the export of agricultural commodities and the import of fertilizers and general bulk cargo. Among the most significant products handled at the port are soybeans, soybean meal, corn, salt, sugar, fertilizers, containerized cargo (including frozen poultry meat, wood,

paper, and chemical products), pulp, oil by-products, ethanol, and vehicles (Figure 3). The port of Paranaguá is the largest Brazilian port in terms of agricultural exports.

In 2024, total cargo throughput at the port of Paranaguá amounted to 66,769,001 tonnes, comprising approximately 40.0 million tonnes of exports and 26.7 million tonnes of imports. The main export commodities were soybeans (13,265,751 tonnes), containerized cargo (9,049,796 tonnes), and sugar (6,412,716 tonnes). On the import side, fertilizers (11,140,049 tonnes), containerized cargo (7,276,868 tonnes), and oil by-products (4,912,767 tonnes) represented the most significant cargo flows.

Grain exports in the State of Paraná operate under a pool shipping system, which is unique in Brazil and contributes to operational efficiency and logistics integration. Cargo can be loaded simultaneously at three dedicated bulk berths, and individual vessels may receive cargo from multiple producers, including small-scale suppliers. The system includes six ship loaders with a nominal capacity of 1,500 tonnes per hour, one vertical silo with a storage capacity of 100,000 tonnes, four horizontal silos with a combined capacity of 60,000 tonnes, and eight interconnected private and leased terminals, resulting in a total static storage capacity of approximately 1.025 million tonnes. Fertilizer handling is carried out at a public terminal with a storage capacity of up to 30,000 tonnes, connected to the quay through conveyor systems capable of handling up to 1,000 tonnes per hour. In addition, the port operates four terminals and four berths dedicated to liquid bulk cargo. The total liquid bulk storage capacity is 540,781 m^3, with export and import handling capacities of 3,450 m^3 per hour and 3,000 m^3 per hour, respectively.

Passenger shipping activities were initiated in 2023, when the port of Paranaguá began receiving cruise ships during the summer season. Since then, the port has recorded 15 cruise calls by MSC vessels, receiving more than 39,000 passengers, thereby diversifying port activities and contributing to regional tourism.

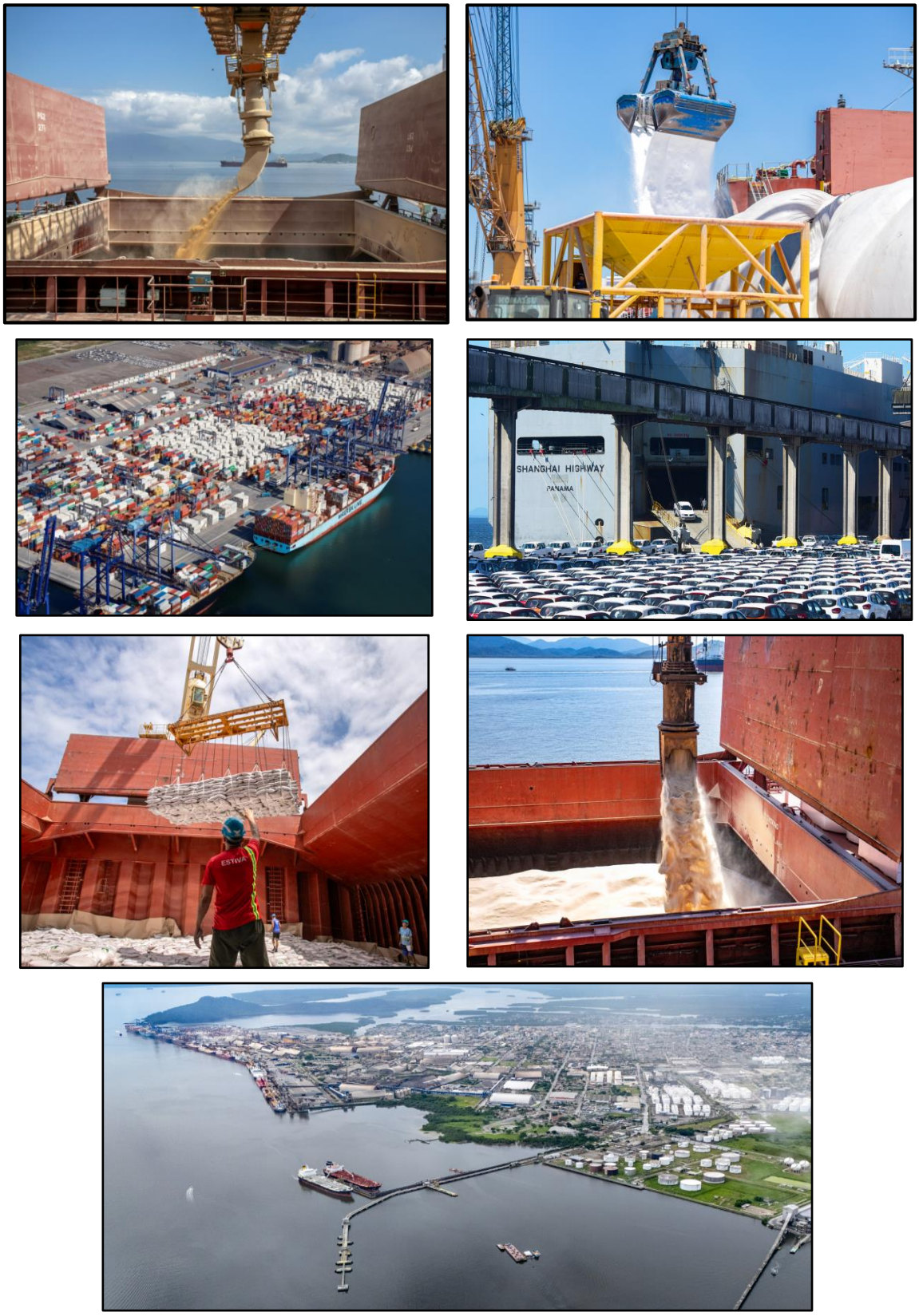


Figure 3. Main cargoes in the port of Paranaguá – soybean, fertilizers, containers, vehicles, sugar and liquid bulk.

1.2.1. Leases

Portos do Paraná, through its business model, offers areas of the Paranaguá and Antonina organized Port, through auctions held at B3 for exploitation by the private sector. In this context, the lease contracts signed for the areas affected by port operations play a crucial role in the development of the port complex, with new investments, revenue generation, employment and income for the entire community. Port areas are used for the movement and storage of goods and passengers, in accordance with the legislation in force for the port sector.

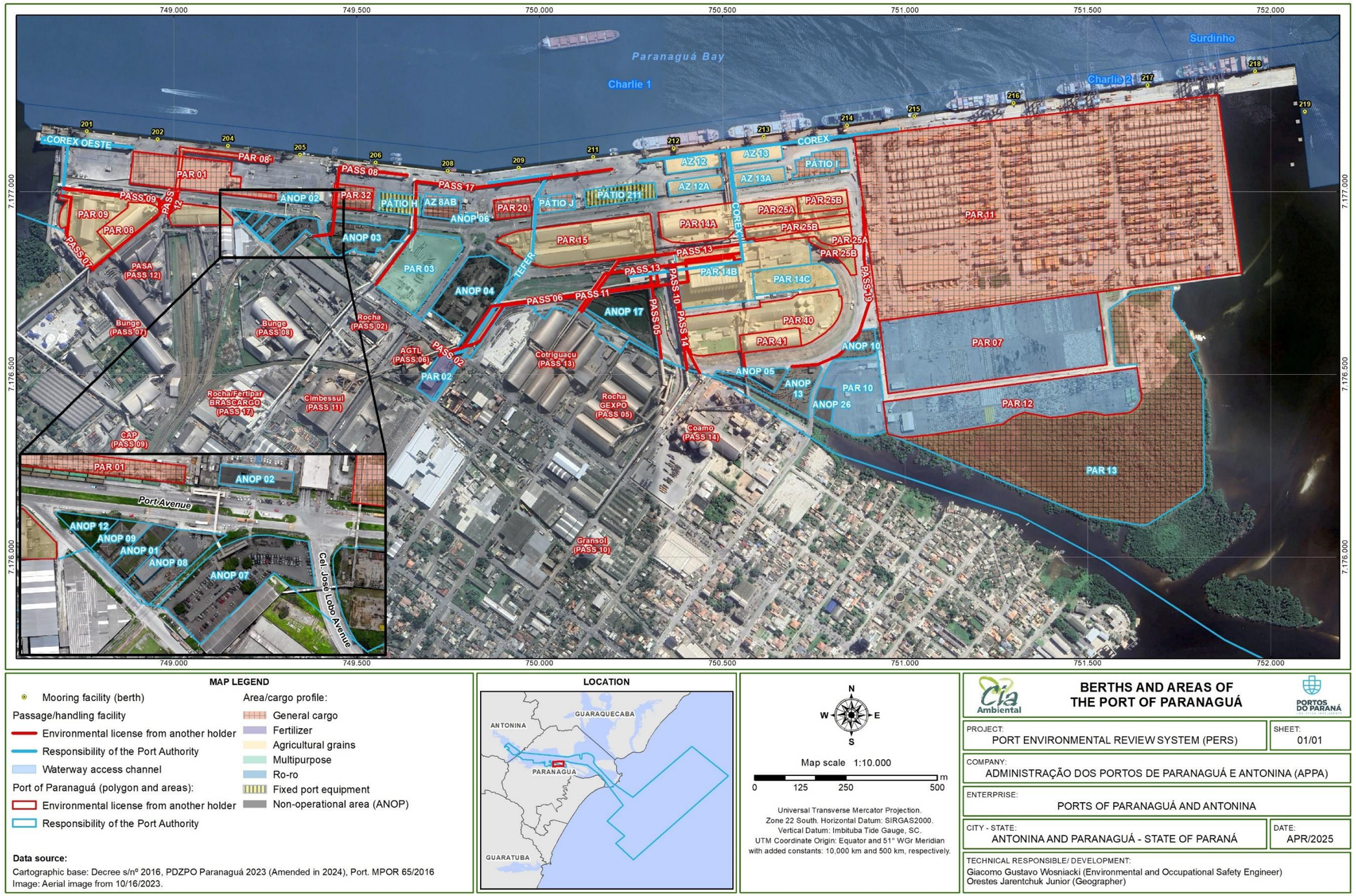
Areas not affected by port operations are used for any activities, as long as they comply with current regulations, and are not directly intended for passenger movement, movement or storage of goods, destined for or originating from water transport, authorized through use authorization contracts, use assignment with or without consideration. Portos do Paraná has seen a significant increase in its revenues in recent years with direct income from port exploitation contracts, rising from BRL128 million in 2021 to more than BRL183 million in 2024, that is, an increase of approximately 43% in revenues between 2021 and 2024.

In addition to direct revenue from these contracts, Portos do Paraná also raises funds related to bids placed by companies at auctions. In total, these revenues amount to almost BRL33 million in recent years (2021 to 2024), of which approximately BRL10 million are grants received in 2024. The lease contracts that regulate the exploitation of port areas are managed and monitored by Portos do Paraná Lease Management, and all procedures are carried out in accordance with current port legislation, in particular Law 12,815/2013, Decree 8,033/2013 and Ministry of Ports and Airports Ordinance 530/2019 and regulations issued by the Regulatory Agency Antaq.

Currently, Portos do Paraná manages 17 active lease contracts (Figure 4), as detailed in Table 2.

Table 2. Leasing contracts managed by Portos do Paraná and main cargo handled by each company.

Area number	Contract	Tenants	Main cargo	Area m²
PAR 01	002/2020	Klabin	General cargo	27.530,00
PAR 07	009/98	Volkswagen do Brasil Ltda.	General cargo	120.000,00
PAR 08	013/99	Pasa	Vegetal solid bulk	19.702,17
PAR 09	076/2021	Bunge	Vegetal solid bulk	21.577,34
PAR 11	020/98	TCP	General cargo	487.189,20
PAR 12	042/2021	Ascensus Gestão e Participações S/A	General cargo	74.149,00
PAR 14	087/025/00	Centro Sul	Vegetal solid bulk	20.025,67
PAR 15	068/2021	Cargill Agrícola	Vegetal solid bulk	37.431,00
PAR 16	001/94	Louis Dreyfus	Vegetal solid bulk	18.888,00
PAR 17	002/94	Interalli	Vegetal solid bulk	20.350,00
PAR 20	115/2002	Rocha Terminais Portuários e Logística S. A.	General cargo	5.000,00
PAR 32	093/2021	Teapar	General cargo	6.651,00
PAR 40	083/2021	COAMO	Vegetal solid bulk	42.203,25
PAR 41	067/98	COAMO	Vegetal solid bulk	8.724,60
PAR 45	016/98	Fospar	Mineral solid bulk	84.525,00
PAR 50	010/93	União Vopak	Liquid bulk	22.384,00
PAR 80	015/2006	Transpetro PGUA	Liquid bulk	182.841,46



MAP LEGEND

- Mooring facility (berth)

Passage/handling facility
- Environmental license from another holder
- Responsibility of the Port Authority
- Waterway access channel

Port of Paranaguá (polygon and areas):
- Environmental license from another holder
- Responsibility of the Port Authority

Area/cargo profile:
- General cargo
- Fertilizer
- Agricultural grains
- Multipurpose
- Ro-ro
- Fixed port equipment
- Non-operational area (ANOP)

Data source:
Cartographic base: Decree s/nº 2016, PDZPO Paranaguá 2023 (Amended in 2024), Port. MPOR 65/2016
Image: Aerial image from 10/16/2023.

LOCATION

N
W E
S

Map scale 1:10.000
0 125 250 500 m

Universal Transverse Mercator Projection.
Zone 22 South. Horizontal Datum: SIRGAS2000.
Vertical Datum: Imbituba Tide Gauge, SC.
UTM Coordinate Origin: Equator and 51° WGr Meridian
with added constants: 10,000 km and 500 km, respectively.

Cia Ambiental

BERTHS AND AREAS OF THE PORT OF PARANAGUÁ

PORTOS DO PARANÁ

PROJECT: PORT ENVIRONMENTAL REVIEW SYSTEM (PERS)	SHEET: 01/01
COMPANY: ADMINISTRAÇÃO DOS PORTOS DE PARANAGUÁ E ANTONINA (APPA)	
ENTERPRISE: PORTS OF PARANAGUÁ AND ANTONINA	
CITY - STATE: ANTONINA AND PARANAGUÁ - STATE OF PARANÁ	DATE: APR/2025
TECHNICAL RESPONSIBLE/ DEVELOPMENT: Giacomo Gustavo Wosniacki (Environmental and Occupational Safety Engineer) Orestes Jarentchuk Junior (Geographer)	

Figure 4. Port of Paranaguá area, including areas under leasing contracts.

1.3. Mission, vision and values

Portos do Paraná is continuously evolving to meet the demands of global trade, improving its infrastructure and management to ensure safer, more efficient and sustainable operations. Beyond seeking to lead the sector, our commitment is to consolidate a port operation model that balances competitiveness with social and environmental responsibility, contributing to the economic development and resilience of the logistics chain, thus, leading the port sector with efficiency and competitiveness, consolidating our position as a reference logistics hub in the Americas. The company's mission, vision and values, are presented in Figure 5.

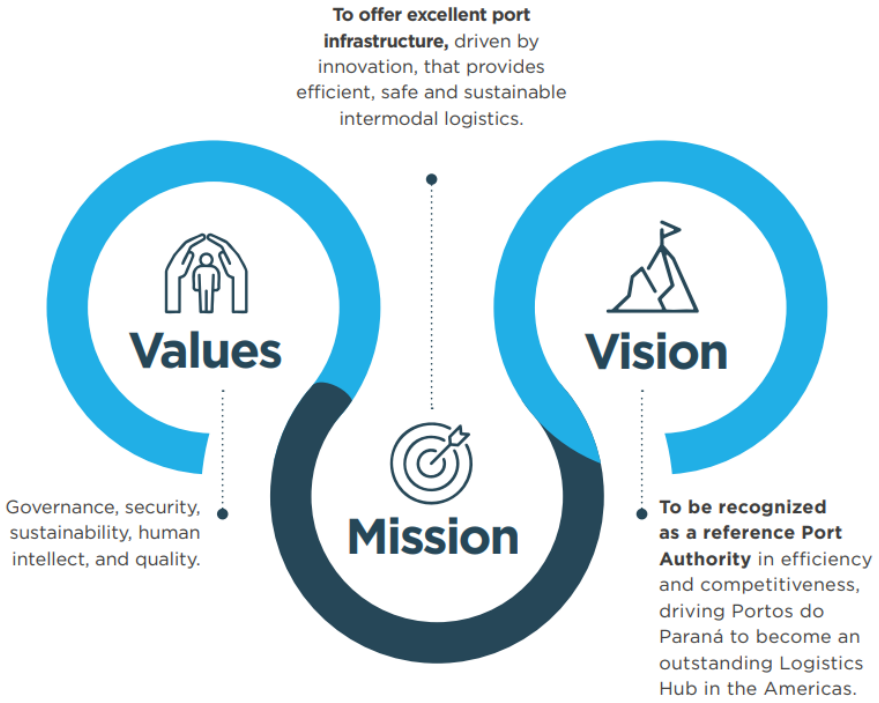


Figure 5. Port of Paranaguá's mission, vision and values.

1.4. Port of Paranaguá Process Mapping

The value chain is composed of three main categories:

- Governance Processes;
- Critical Success Processes; and
- Business Support Processes.

All categories are aligned to support Port Operations and Port Business, which constitute the core activities of the organization.

The Portos do Paraná value chain is structured to ensure the efficient execution of the company's strategic objectives, creating value both for the organization and the port community. Structuring the macroprocesses into Governance, Critical Success Processes, and Business Support Processes ensures the coherent implementation of initiatives and projects that drive sustainable growth. The framework is organized as follows:

1) Governance Processes

a) Governance, Risk, and Compliance: Directly related to the Internal Processes dimension, this process ensures the organization operates ethically and in compliance with regulations, generating and protecting value through risk management, internal controls, compliance, and Internal Audit.

b) Strategic Planning: Essential to align company actions with its mission, vision, and values, this process supports all strategic dimensions by providing guidance for sustainable growth, infrastructure modernization, and increased market competitiveness, while integrating information and monitoring organizational performance against established targets.

2) Critical Success Processes

a) Environment and Sustainability: Aligned with the Core Business dimension, this process promotes environmental sustainability in port operations, ensuring compliance with environmental legislation and minimizing impacts.

b) Technology and Innovation: Linked to the Learning and Growth dimension, this process drives process digitalization, infrastructure modernization, operational efficiency, and promotes technological innovation and digital transformation.

c) Occupational Health and Safety: Related to the People dimension, this process ensures safe working conditions, mitigates risks, and protects the physical and mental well-being of employees and stakeholders across all operations.

d) Engineering and Infrastructure: Directly tied to the Core Business dimension, this process ensures the expansion and maintenance of port infrastructure, which is essential for operational efficiency and competitiveness.

e) Port Security: Key to the Society and Stakeholders dimension, this process safeguards facilities, operations, and cargo, contributing to a safe and reliable port environment.

f) Port Operations: Directly linked to the Core Business dimension, this process encompasses essential cargo handling activities, ensuring efficiency and smooth flow of goods. It includes operational planning, berth management, coordination with port operators, and other stakeholders to optimize infrastructure utilization and service quality.

g) Port Business: Aligned with the Market and Investment dimension, this process covers commercial development, lease and concession management, and market analysis. It is critical for revenue growth, strengthening the port's competitive position, and ensuring long-term economic sustainability.

3) Business Support Processes

a) Administration and Contract Management: Related to Internal Processes, this process ensures that contracting and contract execution are conducted efficiently and transparently.

b) Finance and Accounting: Aligned with the Market and Investment dimension, this process provides financial stability, essential for investment and expansion of port infrastructure.

c) Procurement and Bidding: Critical to Internal Processes, this process ensures efficient acquisition of goods and services, compliance with regulations, and optimal resource allocation.

d) Legal: Linked to the Society and Stakeholders dimension, this process ensures corporate activities comply with legislation, mitigating legal risks and securing safe operations.

Adopting these macroprocesses as pillars of the port of Paranaguá value chain enables effective execution of strategic objectives, enhancing operational efficiency, sustainability, and security. This structure strengthens governance, operational reliability, and generates value for the entire port community.

The value chain is a fundamental tool for guiding organizational strategy and activities; understanding it is key for port of Paranaguá to achieve its strategic goals. Structuring the value chain around macroprocesses is a strategic and efficient approach, allowing the company to progress swiftly and in alignment with its business dynamics. Starting at the macro level provides a clear, integrated view of critical areas, identifying priorities and connections with corporate strategy.

Implementation and continuous improvement of this tool involve aligning with strategic objectives, documenting processes, subprocesses, and activities, enhancing process maturity and automation, and providing ongoing team training. For each defined process, a process mapping is performed, detailing inputs, sequence, criteria, methods, resources, and outputs.

1.5. Summary of layout, main activities and cargoes at the port of Paranaguá

General Characteristics of the Organized Port Area	
Item	**Description**
Legal framework	Organized Port Area defined by Ordinance No. 65/2023
Total area	869.7 km² (3.8 km² land / 865.9 km² water)
Port governance model	Landlord port
Number of port terminals	19
Available greenfield areas	5
Main Port Infrastructure	
Infrastructure	**Description**
Public commercial quay	3,451 m, 15 berths (general cargo and solid bulk)
RO-RO berth	1 berth (270 m)
Solid and liquid bulk piers	PPGL (2 berths), Fospar (2 berths), Cattalini (2 berths)
Storage facilities	Silos, warehouses and tanks (see Table 17)
Access channel and fairways	Maritime access routes (see Table 17)
Main Port Activities	
Activity Group	**Description**
Vessel traffic and navigation	Navigation in access channel; pilotage; berthing and unberthing
Cargo handling and storage	Loading, unloading and storage of bulk, liquid bulk, containerized and general cargo
Passenger operations	Cruise ship calls and passenger handling
Support port services	Tugboats, bunkering, ship supply, waste reception
Infrastructure management	Maintenance dredging and upkeep of public port infrastructure
Main Cargo Categories Handled	
Cargo Type	**Examples**
Solid vegetable bulk	Soybeans, soybean meal, corn, sugar, wheat, barley
Solid mineral bulk	Fertilizers (including ammonium nitrate), salt
Liquid bulk	Fuels, flammable products, corrosive products
Containerized cargo	General and hazardous cargo
General cargo	Pulp and paper, bagged sugar, vehicles, bagged fertilizers
Passengers	Cruise ship passengers
Activities under Direct Responsibility of the Port Authority	
Responsibility Area	**Description**
Infrastructure management	Public quays, access channel, dredging works
Environmental control	Waste management, hazardous cargo oversight, pest and vector control
Service coordination	Bunkering control, ship supply, operational safety
Contract management	Lease, right-of-way, transitional and use concession agreements

2. Policy statement - Port of Paranaguá Environmental Policy

Port of Paranaguá is committed to performing its operations in accordance with environmental legislation, minimizing its negative impacts on the environment and seeking excellence in port administration. The port priorities are to:

1. Preserve life, human health and safety, and the environment;
2. Contribute to the conservation of the natural, cultural and historical heritages of the region;
3. Ensure compliance with current environmental legislation;
4. Continuously improve its environmental performance by reviewing and updating its Environmental Management System;
5. Prevent, control, monitor and mitigate all forms of environmental pollution, with special attention to air quality, noise generation and waste management;
6. Assess the environmental quality of areas under the influence of port activities;
7. Rationalize natural resources use and reduce related costs;
8. Manage environmental aspects and impacts through programs and practical measures;
9. Continuously strengthen the relationship with the port community and the city;
10. Keep abreast of trends in technology to promote more efficiency, reduce environmental impacts and minimize risks and hazards to workers' health;
11. Assure the dissemination of this policy to all employees, to the port community and to all stakeholders, and promote their participation in the continuous improvement of the port environmental management system;
12. Establish, implement and periodically review environmental objectives and targets, with particular focus on air quality, waste generation, environmental quality and local community relationship;
13. Ensure transparency and stakeholder engagement by publishing an environmental report on a biennial basis, maintaining regular consultation with the local community and relevant organizations, and complying with all reporting obligations to Brazilian environmental authorities.

(The signed document is attached to PERS)

Luiz Fernando Garcia da Silva - CEO Ports of Paraná

2.1. Integrated Management System Policy (IMS)

The port of Paranaguá also comprises a policy related to the integrated management system, aligned with ISO 14001 and EcoPorts requirements. The IMS Policy statements are described below.

Through the IMS Policy, the port of Paranaguá seeks excellence in port administration, assuring the following principles:

1. *Human health and safety, promoting a safe and healthy environment, through dangers and risks mitigation;*
2. *The commitment to maintaining the environmental quality of port surroundings, to controlling environmental impacts, to preventing pollution and conserving natural resources, in alignment with the* Ecoports *Policy statements;*
3. *The quality, good performance and continuity of port operations, seeking to meet the expectations of customers and interested parties;*
4. *Legal compliance, through meeting applicable legal requirements in health, safety, environment and quality;*
5. *Promoting the participation of employees and port agents in the continuous improvement of processes, promoting engagement and dialogue;*
6. *Evaluating the IMS periodically and implementing continuous improvement actions to ensure efficiency in operations.*

(The signed document is attached to PERS)

Luiz Fernando Garcia da Silva

CEO Ports of Paraná

3. Register of Environmental Aspects, Legal Requirements and Performance Indicators

3.1. Environmental Aspects Register

The port of Paranaguá is one of Brazil's most important maritime gateways, playing a strategic role in national and international trade. Its port operations encompass a wide range of activities, including vessel berthing and unberthing, cargo handling, storage, and the loading and unloading of bulk, general, and containerized cargo. These processes are supported by specialized infrastructure, such as terminals, conveyor systems, warehouses, and access channels, ensuring operational efficiency and safety. Port activities are directly associated with several environmental aspects, such as the movement of vessels and cargo-handling equipment, fuel consumption, generation of solid waste, wastewater discharge, atmospheric emissions, and noise. Additionally, dredging and maintenance of navigation channels are essential processes that may interact with the marine and estuarine environment.

The main environmental impacts related to these operations include potential changes in water quality, air emissions from ships and equipment, noise affecting surrounding communities, and risks of soil or water contamination due to accidental spills. To mitigate these impacts, the port of Paranaguá adopts environmental management practices focused on legal compliance, pollution prevention, efficient use of natural resources, continuous monitoring, and the implementation of control and mitigation measures aimed at protecting ecosystems and promoting sustainable port operations.

In the process of identifying the Environmental Aspects and Impacts of Portos do Paraná, the elements of activities, products, and services specific to the company's operations are listed. Once these elements are identified, their respective environmental aspects and impacts are determined. Several criteria related to the characteristics of environmental aspects and impacts are considered in order to assess their significance, as shown in the table below:

Criteria	**Classification**	**Description**
Operational Condition	Normal, Abnormal, Risk	Related to routine operations.
Incidence	Direct or Indirect	The activity, product, or service is under the port full control.
Class	Beneficial or Adverse	Consequence of the impact on the environment.
Timeframe	Past, Current, or Future	Period of occurrence of the activity.
Severity	Low, Medium, or High	Magnitude or seriousness of the impact on the environment.
Frequency	Low, Medium, or High	Frequency of occurrence of the environmental aspect.

For the Severity and Frequency criteria, scores of 1, 2, or 3 are assigned, where a score of 1 corresponds to the "low" classification, 2 to "medium," and 3 to "high." The Severity and Frequency scores are added together to generate a value representing the Importance of the environmental aspect and impact. The Importance values, together with the Operational Condition, are used for the Significance Analysis of environmental aspects and impacts. Aspects and impacts are considered non-significant when the Importance value is 2 and the Operational Condition is normal, abnormal, or risk-related. Aspects and impacts with Importance values of 3, 4, 5, or 6, associated with any Operational Condition (normal, abnormal, or risk), are considered significant environmental impacts. In cases where Severity is low (S = 1)

and the Importance values are 3 or 4, the impact is considered non-significant. The Significance Analysis of environmental aspects and impacts serves to guide the establishment of the port environmental objectives and targets, aiming at the continuous improvement of environmental performance and operational processes, in order to prevent and/or mitigate potential impacts.

The environmental aspects and legal requirements related to the port of Paranaguá are presented in the table below. All the environmental aspects regarding Port Authority itself (e.g., the port of Paranaguá) and also tenants and operators over which Port Authority has an influence were compiled. The main impacts are described, as well as the legal requirements and control measures related to each environmental aspect.

Environmental Aspect Register - Port of Paranaguá							
Reference Number	General Environmental Aspect	Environmental Aspect	Impact on	Responsible person/Organisation	Applicable legislation	Legal requirements	Control measures
Port Operation Department							
O1	*Ship movement*	Waste removal	Water/soil	Port operator	Port Regulation - Integrated Management System (IMS)	Requirements described in the Item 3.1.4.2 of the Port Regulation - IMS, determining all aspects regarding ship waste removal.	Mitigation and control measures

O2		Oil spillage	Water/soil/Biota	Harbour master	National Law nº 9966/2000	The National Law nº 9966/2000 establishes basic principles that must be considered when operating oil and other harmful or dangerous substances in ports, piers, platforms and ships under Brazilian jurisdiction.	Emergency plan/Oil spill response
O3		Noise generation	Aquatic biota/Sorrounding community	Harbour master	Environmental organ requirement	Underwater noise must be under the established limits.	Monitoring
O4		Ballast water discharge	Biota/water	Harbour master	NORMAM nº 20 - Brazilian Navy	Ship must perform ballast water exchange at least 200 nautical miles away from the coast, with 200 depth, and register the coordinates.	Monitoring/Document control
Engineering Department							
E1	*Dredging*	Dredging operation	Water/biota/fishing activities	Port authority	Environmental organ requirement	Biotic and abiotic parameters to asses impacts of dredging activities.	Monitoring

E2		Dredging sediment disposal	Water/biota/fishing activities	Port authority	CONAMA Resolution nº 454/2012	The resolution establishes procedures that should be adopted to manage dredged material. Sediment evaluated parameters must be in accordance with the resolution to allow its disposal in oceanic areas.	Monitoring
E3		Underwater blasting	Biota/fishing activities	Port authority	Environmental organ requirement	Biotic and abiotic parameters to asses impacts of blasting in generating underwater noise generation, and impacting local fauna.	Monitoring
E4	*Infrastructure maintenance*	Noise	Sorrounding community	Port authority	Environmental organ requirement; CONAMA Resolution nº 1/1990; NBR Rules 10151 and 10152	Underwater noise monitoring/Noise limits must be in line with the resolution, regarding the city zones.	Monitoring

E5		Wastewater	Water/soil	Port authority	CONAMA Resolution nº 357/2005 and nº 430/2011	In order to discharge wastewater, parameters bust be in accordance to the limits established in the Chapter III of the CONAMA Resolution nº 357/2005 and in the Chapter II of the CONAMA Resolution nº 430/2011.	Monitoring
E6		Atmospheric emissions	Air quality	Port authority	CONAMA Resolution nº 491/2018	Atmospheric emissions must be in accordance with the limits established in the CONAMA Resolution.	Monitoring
E7		Waste generation	Soil/water	Port authority	Federal Law nº 12.305/2010 for solid waste; CONAMA Resolution nº 307/2002 for construction waste generation	Solid waste generation must be reduced; the solid waste must be properly destined or recycled; consctrucion waste destination must follow the classification presented in the Resolution.	Recycle and reuse; control waste segregation and destination
Environmental Department							
M1	*Use of natural resources*	Solid waste generation	Soil/water	Port authority	Federal Law nº 12.305/2010	Waste generation must be reduced; the waste must be properly recycled or allocated.	Control waste segregation and destination; train employees

M2		Waste water/sewage generation	Soil/water	Port authority	CONAMA Resolution nº 357/2005 and nº 430/2011	In order to discharge wastewater and sewage, parameters bust be in accordance to the limits established in the Chapter III of the CONAMA Resolution nº 357/2005 and in the Chapter II of the CONAMA Resolution nº 430/2011.	Monitoring and destination to sewage treatment station
M3		Eletric energy consumption	Total environment	Port authority	UNO Sustainable Development Goals	UNO Sustainable Development Goal nº 12 - Responsible consumption and production.	Monitoring and reducing
M4		Water consumption	Total environment	Port authority	UNO Sustainable Development Goals	UNO Sustainable Development Goal nº 12 - Responsible consumption and production.	Monitoring and reducing
M5		Fuel consumption	Total environment	Port authority	UNO Sustainable Development Goals	UNO Sustainable Development Goal nº 12 - Responsible consumption and production.	Monitoring and reducing
M6	*Oil spill emergency response*	Solid waste generation	Soil/water	Port authority	Federal Law nº 12.305/2010	Contamined waste must be properly treated and adequately allocated.	Reduce and allocate
M7		Wastewater generation	Soil/water	Port authority	CONAMA Resolution nº 357/2005 and nº 430/2011	Wastewater must be properly allocated.	Reduce, treat and allocate
Tenants and Organizations							

T1	*Ship operation*	Dry bulk operation	Air/water/biota/surrounding community	Port operator	Port Regulation - Integrated Management System (IMS) and related procedures.	Operators must keep the operational area clean by mechanical sweeping; conveyor belts must be enclosured.	Supervise and improve infrastructure
T2		Liquid bulk operation - spillage	Water/biota/surrounding community	Port operator	National Law nº 9966/2000; CONAMA Resolution nº 398/2008	Emergency and contingency plans establish the minimal procedures to be adopted in case of oil spill.	Supervise and keep the plans updated
T3		Cargo handling on land	Air/soil	Port operator	Port Regulation - Integrated Management System (IMS) and related procedures	Operators must keep the operational area clean by mechanical sweeping; cargo spillage must be reported to Port Authority.	Supervising
T4	*Cargo storage*	Dry bulk storage	Air/soil	Storage companies	Port Regulation - Integrated Management System (IMS) and related procedures	Companies must follow environmental and safety procedures to promote safe cargo storage.	Supervising
T5		Liquid bulk storage	Water/soil	Liquid bulk port tenants	Port Regulation - Integrated Management System (IMS) and related procedures	Companies must follow environmental and safety procedures to promote safe cargo storage.	Supervising
T6		Explosion risk	Total environment	Liquid bulk port tenants	Port Regulation - Integrated Management System (IMS) and related procedures	Companies must follow environmental and safety procedures to promote safe cargo storage.	Supervising

T7	*Container operation*	Container handling	Air/water/biota/surrounding community	Container terminal (private)	Port Regulation - Integrated Management System (IMS) and related procedures	Operational procedure nº 025 that establishes the minimum health and safety criteria for operating containers.	Supervising
T8		Environmental emergency	Total environment	Container terminal (private)	Terminal Emergency plan	In case of accident, terminal must be prepared to minimize environmental impacts.	Supervising and keeping the plan updated
T9	*Cargo handling*	Cargo spill	Air/soil/water/biota	Terminals	Terminal Emergency plan	In case of accident, terminal must be prepared to minimize environmental impacts.	Supervising and keeping the plan updated
T11	*Cargo transport*	Atmospheric emissions	Air quality	Transport companies	CONAMA Resolution nº 491/2018	Atmospheric emissions must be in accordance with the limits established in the CONAMA Resolution.	Monitoring
T12		Fuel consumption	Air/soil	Transport companies	UNO Sustainable Development Goals	UNO Sustainable Development Goal nº 12 - Responsible consumption and production.	Monitoring and reducing
T13		Cargo spill	Air/soil/water	Transport companies	Companies emergency and contingency plans	In case of cargo spillage, the company must be prepared to minimize environmental impacts.	Supervising and keeping the plan updated

3.2. Legal Requirements

The Port of Paranaguá seeks to ensure full compliance with applicable legal and other requirements related to environmental protection, occupational health, and workplace safety. The compliance with legal requirements is essential to ensure the quality and robustness of environmental licensing processes and occupational health and safety practices within areas under its responsibility, as well as to provide guidance to port operators.

To this end, the organization conducts the identification and registration of risks and opportunities, seeking continuous improvement in performance through the application of a dedicated risk assessment matrix. Guidance on the identification, evaluation, and registration of risks related to Portos do Paraná's activities, and applicable to the Integrated Management System, is established in the company's Risk Management Program (PGR).

Relevant legal and other requirements are continuously identified and updated with the support of specialized legal advisory services. This identification process is carried out on a monthly basis, during which regulatory updates, repealed legislation, amended standards, and newly issued regulations are systematically reviewed. All new or updated requirements are fully digitally archived in a shared public folder accessible to employees of the company's Environmental Board.

As highlighted in the PERS certification audit report conducted in 2022, one opportunity for improvement identified was the acquisition of a system to better organize and manage the port of Paranaguá's legal requirements. Since 2024, the control of legal requirements, as well as the assignment of responsibilities associated with each requirement, has been carried out using the CAL 4.0 software. Within this system, applicable legislation is selected according to the company's activities, and all associated legal requirements are compiled, monitored, and verified for compliance.

As access to the CAL system is restricted to authorized users via login and password, a summary spreadsheet of the legislation relevant to the operations of the port of Paranaguá is provided in the Annexes of this PERS. It is emphasized that each legal instrument generates a set of specific applicable requirements within the CAL system, which are individually assessed to demonstrate full, partial, or non-compliance, ensuring transparency and traceability in legal compliance management.

The dashboard below (Figure 6) presents the status of the legal requirements related to environmental management of the port of Paranaguá, with the total of 1.025:

- 783 requirements complied;
- 41 requirements not evaluated;
- 195 non-applicable;
- 6 non-complied.

The main legislation related to the port of Paranaguá can be viewed in the Annex 4.

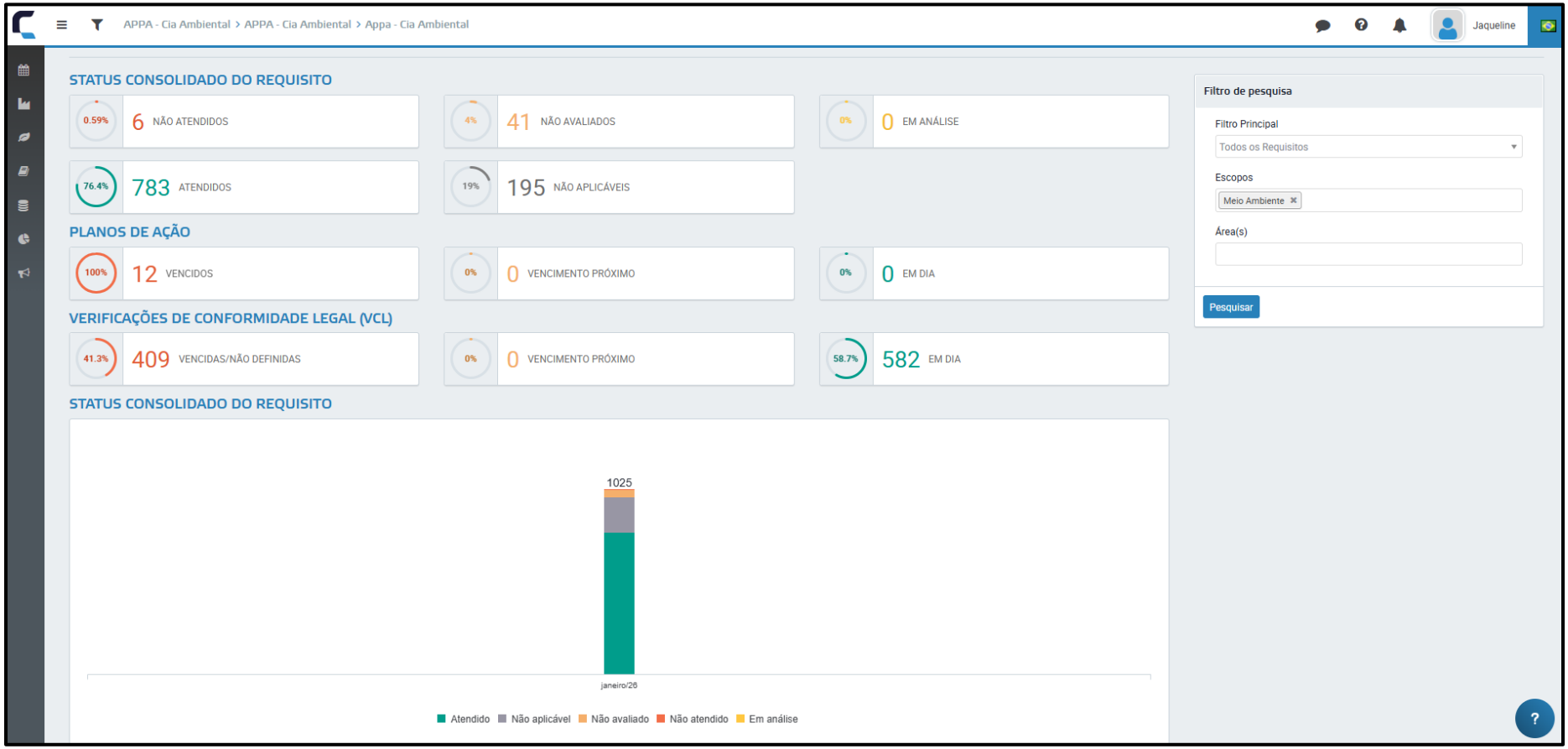


Figure 6. Dashboard of the software “CAL 4.0”, comprising legal requirements of the port of Paranaguá.

3.3. Signed declaration of Environmental Aspects and Legal Requirements

101 Lysimaco Ferreira da Costa St, Curitiba, PR, 80530-100, Brazil.

January 26, 2026

Environment Board
Port Administration of Paranaguá and Antonina (APPA)

Subject: ratification of the Register of Environmental Aspects of the Port of Paranaguá

As a specialized environmental consultant, our environmental management technical team declares, for all due purposes, that the register of legal and other environmental requirements in this PERS, is suitable and relevant for the main environmental aspects of the Port of Paranaguá. This declaration applies to the ECOSLC's EcoPorts Certification only.

Best regards,

gov.br Documento assinado digitalmente
CLARISSA OLIVEIRA DIAS
Data: 26/01/2026 11:15:08-0300
Verifique em https://validar.iti.gov.br

Clarissa Oliveira Dias
Environmental Engineer (CREA-PR No. 106422/D)
MSc in Civil Engineering

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GIACOMO GUSTAVO WOSNIACKI
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Giacomo Gustavo Wosniacki
Environmental Engineer and Occupational Safety Engineer (CREA-PR No. 113718/D)
MSc in Urban and Industrial Environment
Lead Auditor for Integrated Management Systems (ISO 9001, ISO 14001 and ISO 45001)

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DN: cn=HELIO ROBERTO LINHARES DE OLIVEIRA, o=BR, ou=ICP-Brasil, ou=ADVOGADO
Motivo: Eu estou aprovando este documento
Local: Curitiba
Data: 2026-01-26 11:01:03-03:00

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3.4. United Nations Sustainable Development Goals

The organization plans and executes its actions in line with the Sustainable Development Goals (SDGs), an action plan with global targets established by the UN, promoting initiatives aimed at sustainable development, environmental protection and the welfare of local communities.

The port of Paranaguá fulfills the following activities to contribute to the objective of 4 – Quality Education:

- The port promotes local students' internships, where they can complete the practical phase of their studies in our facilities;
- The port promotes weekly visits for the municipal students from the 5th grade (average of ten years old), to learn about port operations and the environmental activities related to the port.

The port of Paranaguá fulfills the following activities to contribute to the objective of 6 – Clean Water and Sanitation:

- The port established a partnership with the Federal University of Paraná (UFPR) to install ecological wastewater treatment systems in 60 households on Eufrasina Island (a traditional community, accessible only by boat and with no sewage treatment), covering 100% of the homes of the resident population.

The port of Paranaguá fulfills the following activities to contribute to the objective of 14 – Life below Water:

- To increase scientific knowledge of the Paranaguá Estuarine Complex and to prevent environmental impacts on the environment, the port monitors aquatic biota (phytoplankton, zooplankton, ichthyofauna, carcinofauna, cetaceans, chelonians, avifauna), mangroves and the physical environment (water quality, sediments) since 2014, in trimestral sampling efforts.

The port of Paranaguá fulfills the following activities to contribute to the objective of 15 – Life on Land:

- The port develops the Degraded Areas Recovery Program (PRAD). The initiative restored 400,000 m^2 of forested area in Antonina (equivalent to 40 hectares). A total of 55,719 seedlings of 121 native species were planted, including cedar, yellow ipê, and purple ipê, as well as native fruit trees (such as araçá, juçara, and pitanga) and exotic species (orange, lemon, avocado, and acerola).
- The port promotes frequent cleansing activities in mangroves and beaches in the surroundings of the port. Tons of residuals are removed every year from these environments.

The port of Paranaguá fulfills the following activities to contribute to the objective of 5 – Gender Equality:

- Since 2024, the port has been reserving 50% of the available slots in professional development courses for women employees. In the fourth edition of the course, Portos do Paraná offered eight available positions, exceeding the target for female participation, with five of the slots filled by female employees.

3.5. Environmental performance indicators

In this section, we present the five most important environmental aspects related to the port, as presented in the SDM, from 2023 to 2025 (Table 3). Additionally, the indicators and targets are included for each aspect, and the achieved improvements are presented.

Table 3. Environmental priorities established in PERS document (2023-2025)

Environmental Priority SDM 2023-2025	Indicator	Targets
Port development (water)	Development of projects (new piers and maintenance/capital dredging); number of leased areas with modern and sustainable designs	Complete the development of all planned projects and obtain the required environmental licenses; ensure environmentally responsible dredging operations through the implementation of environmental controls (overflow control, monitoring programs, fauna protection measures); promote the adoption of sustainable design criteria in new leasing areas
Port development (land)	Development of projects (new truck yards and logistics areas); number of leased areas with modern and efficient infrastructure	Complete project development and secure environmental licensing; incorporate measures to reduce noise, dust, and atmospheric emissions; promote efficient traffic management and stormwater control systems
Local community	Number of complaints related to port activities	Strengthen engagement with the local community through communication channels and environmental education initiatives; reduce the number of complaints related to noise, traffic, air quality, and other port-related impacts; improve response time and resolution of reported issues
Dredging (operation and disposal)	Compliance of dredging operations and disposal activities with environmental requirements	Maintain full compliance with environmental licenses and legal requirements; implement continuous monitoring of sediment quality, water quality, and disposal areas; apply best available techniques to minimize environmental impacts during dredging activities
Garbage / port waste	Total amount of waste generated; percentage of waste reused or recycled	Reduce total waste generation through prevention and efficiency measures; increase recycling and proper segregation rates; promote circular economy practices and environmentally sound disposal of non-recyclable waste

1. Port development (water)

The Port Authority advanced the development of strategic port infrastructure projects, including new piers and improvements in the access channel, ensuring that

all projects were prepared in accordance with applicable environmental regulations. Environmental licensing processes were conducted in close coordination with the competent authorities, supported by environmental studies, impact assessments, and mitigation plans, ensuring regulatory compliance and environmental feasibility.

The Port of Paranaguá has been developing an expansion project that comprises the implementation of Piers “T”, “F”, and “L” to increase port handling capacity and meet the growing demand for export cargo. This quay expansion includes the construction of three new piers, providing a total of ten additional berths. Environmental studies required for the environmental licensing of these new piers were duly prepared. In 2024, the studies were completed and formally submitted to the competent environmental authority for review and evaluation, as part of the process for the issuance of the respective environmental license. In parallel, the areas designated for the new piers were structured and made available for leasing, with the objective of enabling private investments in the construction and operation of the new port infrastructure.

With regard to dredging activities, the Port of Paranaguá has adopted strict environmental controls during both operation and disposal phases. These measures include overflow control systems, continuous monitoring of water quality and sediments, and the use of fauna protection devices, such as turtle deflectors, to minimize impacts on marine biodiversity. Dredging operations have been carried out under environmental supervision, ensuring compliance with license conditions and the application of best available techniques.

In parallel, the Port has been promoting the incorporation of sustainable design criteria in new leasing areas and infrastructure projects. This approach included the adoption of environmentally efficient layouts, stormwater management systems, and measures aimed at reducing emissions, noise, and waste generation during both construction and operation phases. Environmental requirements and

sustainability guidelines were integrated into leasing processes, encouraging tenants to adopt modern, efficient, and environmentally responsible solutions.

2. Port development (land)

Regarding port development in the terrestrial area, the environmental study prepared to support the implementation of Piers “T”, “F” and “L” also encompasses the onshore terminal facilities. This comprehensive study has been completed and is currently under evaluation by the competent environmental authority. Within the terrestrial area, several lease agreements were executed in 2024, in accordance with the layout presented in the approved development plan (Figure 7).

Figure 7. Lease areas under planning by the port of Paranaguá.

In recent years, the port of Paranaguá has also implemented significant improvements in its terrestrial infrastructure with a strong focus on environmental performance and operational efficiency. These initiatives include better land-use

planning, modernization of cargo handling areas, and the adoption of measures to mitigate noise, atmospheric emissions, and dust generation associated with port activities, as well as improvements in stormwater drainage and surface runoff control.

A major milestone in this process is the construction of the “Moegão”, the new centralized railway hopper system, designed to enhance logistics efficiency while substantially reducing environmental impacts. The project aims to triple the port’s capacity to receive grain exports by rail. Currently, approximately 550 railcars are unloaded daily at the export corridor; once the Moegão is fully operational, unloading operations will be centralized in a single facility capable of handling up to 900 railcars per day.

By eliminating the need for railcars to enter individual terminals, the project will significantly reduce internal shunting operations, contributing to lower fuel consumption, reduced atmospheric emissions, and decreased noise levels. Furthermore, the number of urban level crossings affected by rail operations will be reduced from 16 to five, leading to fewer traffic interruptions, improved urban mobility, and enhanced safety for the surrounding community. By the end of 2025, the Moegão project had reached approximately 75% completion, representing a key step toward more sustainable and integrated port operations.

3. Local Community

Portos do Paraná conducts its business based on the principles of ethics and integrity, using transparency of information as a pillar. The company has an ombudsman channel, which operates both internally and externally, serving stakeholders who have a relationship with Portos do Paraná, enabling employees, service providers, suppliers and communities to express opinions, whether through

compliments, complaints, reports, suggestions and requests for access to information.

The system used in the main channel is the integrated ombudsman management system SIGO, subordinate to the Office of the State Controller General (CGE), with access to all services provided from start to finish. The service triage process is unified and initially handled by the ombudsman sector. After that, complaints are directed to the highest superior of the responsible sector, who, in turn, is responsible for the response so that the request is dealt with in the shortest possible time.

In cases of "harassment" complaints, we work in parallel with the Portos do Paraná Ethics and Integrity Committee, established by Ordinance No. 194/2023 and created to comply with governance, integrity and transparency good practices. Requests can be made through three direct channels provided for citizens: the Ombudsman Channel on the Portos do Paraná website, our exclusive Ombudsman telephone number 0800 41 1133 and also our official email ouvidoria.appa@appa.pr.gov.br. This collegiate body has the primary responsibility to ensure compliance with the organization's Code of Ethics and Integrity, as well as the provisions of paragraph 2 of Article 24 of Federal Law 13,303/2016, which establishes guidelines for encouraging integrity and preventing irregularities within state-owned companies and government-controlled companies. Below, we can see statements documented in recent years:

Year	Access to Information Act	Praise	Suggestion	Request	Claim	Complaint	Total
2021	15	0	4	30	20	11	80
2022	16	0	0	23	16	26	81
2023	28	1	3	30	20	27	109
2024	88	0	1	111	13	28	241

There has been an increase in the number of requests for access to Information and Requests, due to the implementation in 2024 of the Portos do Paraná Information Access Manual, in conjunction with the organization's Compliance sector. Likewise, any and all requests for information were centralized through the official channel of the Portos do Paraná's Ombudsman Office.

Regarding the relationship with the external community, the port of Paranaguá develops a continuous Environmental Education Program, which has five structured lines of action, subdivided into thirteen projects with different objectives. The projects are in different stages of implementation, and they are continuously validated together with the attending communities. The activities include dialogues about the environment and specific training on a range of topics.

In 2024, Portos do Paraná invested BRL 35 million in environmental programs and socio-environmental initiatives. This amount represents an 18% increase compared to the investment made in 2023 (BRL 29.6 million). Of the total, approximately BRL 20 million was allocated directly to projects focused on communities along the coast of Paraná.

One of the main highlights of the year was the Degraded Areas Recovery Program (PRAD), completed in June 2024. The initiative restored 400,000 m^2 of forested area in Antonina—equivalent to 40 hectares or 40 soccer fields. A total of 55,719 seedlings of 121 native species were planted, including cedar, yellow ipê, and purple ipê, as well as native fruit trees (such as araçá, juçara, and pitanga) and exotic species (orange, lemon, avocado, and acerola).

Another highlight is the Environmental Education Program (PEA), which comprises 11 projects with a socio-environmental focus and incorporates permaculture practices, involving the planning and implementation of solutions aimed at making human settlements more sustainable. In 2023, more than 1,300 people benefited from over 230 activities carried out under the program.

The PEA also offers free vocational training courses. In 2024, the first Juçara Collection and Pulping Workshop was held for approximately 80 residents of the Amparo community in Paranaguá. The initiative aims to promote income generation combined with environmental conservation.

Also, within the scope of the PEA, Portos do Paraná established a partnership with the Federal University of Paraná (UFPR) to install ecological wastewater treatment systems in 60 households on Ilha de Eufrasina, covering 100% of the homes of the resident community.

4. Dredging (operation and disposal)

With the aim of maintaining the operational depths and drafts of the berths and waterway accesses to the ports of Paranaguá and Antonina, annual maintenance dredging campaigns are carried out to contribute to navigation safety. Since the beginning of environmental monitoring, the quality of the sediments dredged and discarded in ACE20 (licensed oceanic disposal area) has been

satisfactory, allowing regular maintenance dredging campaigns to be carried out on water access routes and berths.

Dredging volumes are variable and calculated before campaigns; however, they always aim to minimize environmental impact and ensure navigation safety. In 2024, the Port Authority completed the ongoing dredging work, with the partial demolition of the Palanganas Stones, within the scope of LI n21144/2016, which enabled the deepening of waterway access for vessels with a draft of up to 13.1 meters to date. Following federal environmental agency (IBAMA) guidelines and conditions, the work included impact mitigation measures and specific environmental monitoring.

The beneficial use of dredged material stands out, which constitutes good operational practice for improving the environmental management of port projects. After the rocks were removed from the seabed by mechanical dredgers, the high-value material was sent for crushing on land and donated to the city halls of the Paraná coast for use in the maintenance of public roads, mainly.

In addition, the access channel concession represents a major milestone, contributing to more efficient channel management, increased predictability of maintenance activities, and long-term improvements in navigation conditions, supporting the Port of Paranaguá's sustainable growth and competitiveness. The reception of larger vessels will only be possible as a result of the access channel concession, awarded on October 22 through an auction held at B3 in São Paulo. The winning consortium is required to increase the channel depth, enabling the maximum vessel draft—the distance between the vessel's deepest point and the water surface—to be increased from the current 13.3 meters to 15.5 meters within a period of up to five years.

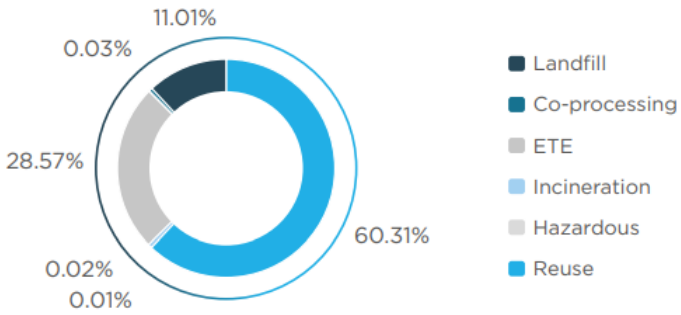
5. Garbage/port waste

The Solid Waste Management Plan is reviewed annually or whenever there are changes or expansions in the company's processes. There was also an update to the diagnosis and to quantities and technology of equipment for public cleaning, collection, transportation and final disposal of solid waste in the common areas of the Organized Ports of Paranaguá and Antonina. Opportunities for improvement are constantly monitored, seeking better waste segregation, including recycling, reducing the amount of waste sent to landfill and, consequently, the costs associated with its disposal.

Portos do Paraná's waste is managed by a third-party company, whose transport vehicles are tracked, allowing verification of the location of final disposal. Furthermore, all transportation and final disposal actions are managed through issuing Waste Transportation Manifests (WTMs) and Final Destination Certificates (FDCs).

In 2024, Portos do Paraná properly disposed of more than 2 thousand tons of solid waste under its direct responsibility, a reduction of approximately 16% compared to 2023. Furthermore, it monitored the removal of more than 14 thousand tons of waste from onboard vessels and almost 7 thousand tons of waste generated by port operators and the export corridor.

Generator	Types of Waste	2021	2022	2023	2024
Portos do Paraná	Recyclable	19	81	66.12	52.30
	Hazardous	1,776	546	731.62	22.47
	Non-hazardous	2,244	2,089	501.68	907.71
	Composting	-	-	1,525.77	1,367.44
	Total	4,040	2,717	2,825.19	2,349.92
On board the vessel	Solids	626	2,723	1,108.49	1,211.33
	Oily	6,150	10,320	14,836.07	13,038.99
	Total	6,776	13,043	15,944.56	14,250.32
Port operators	Hazardous	103	80	118.86	146.90
	Organic	50	27	349.78	262
	Recyclable	7	17	44.04	307.27
	Wood	2,04	-	-	-
	Civil construction	37	6,602	-	169.10
	Non-recyclable	712.09	679	591.43	88.33
	Total	874	803	1,104.11	973.61
Export corridor	Organic	4,193	5,094	6,966.65	5,823.53



3.6. Continuous Improvement System

Considering the port of Paranaguá's commitment to the continuous improvement of its environmental performance, significant progress has been achieved over the last two years, particularly since obtaining EcoPorts certification, as outlined in the sections below.

A key recent development is the initiation of the implementation of the ISO management system standards ISO 9001 (Quality Management), ISO 14001 (Environmental Management) and ISO 45001 (Occupational Health and Safety). In 2024, the port of Paranaguá entered into a contract with a specialized consulting firm to conduct a comprehensive diagnostic assessment, support the enhancement and integration of its management systems, and prepare the organization for future certification audits by an accredited certification body.

3.6.1. Environmental emergency response

The port of Paranaguá is the only public port in Brazil to operate a dedicated environmental emergency response base for chemical and oil spill incidents, in place since 2016, fully integrated with facilities for the rescue and care of petroleum-affected wildlife. The center is strategically located within the port of Paranaguá wharf area and comprises a two-storey structure totaling 1,129 m^2. It includes meeting rooms, risk management and crisis coordination facilities, training rooms, and dedicated areas for the storage and rapid deployment of emergency response equipment, ensuring prompt and effective action in the event of environmental incidents.

The facility was specifically designed to coordinate emergency response operations and enhance the efficiency of preparedness and response teams. It is equipped to support emergency situations both on land and in aquatic environments and provides permanent infrastructure for training and operational readiness. The center maintains a full inventory of response resources, including vessels, motor pumps, containment booms, skimmers and collectors, pumps for handling chemical products, storage tanks for solid and liquid waste, and comprehensive personal protective equipment, enabling response to a wide range of emergency scenarios.

In 2024, the port of Paranaguá further strengthened its emergency response capacity by expanding its resources to ensure rapid and effective action in incidents involving hazardous chemicals and fire events. These improvements included an increase in specialized personnel, notably the addition of civil firefighters, as well as the acquisition of a dedicated fire-fighting truck, reinforcing the port's commitment to environmental protection, safety, and operational resilience (Figure 8).

Figure 8. Port of Paranaguá environmental emergency response center and resources.

In 2024, the port of Paranaguá implemented a dedicated facility to provide assistance to wildlife in the event of environmental emergencies. The structure is operated by a contracted specialized company, which is responsible for both the installation and operation of the facility in full compliance with the guidelines established in the Port's Wildlife Protection Plan, as required by the competent environmental authority.

The wildlife assistance facility is located within the port area and benefits from direct access to Paranaguá Bay, enabling rapid response and safe transport of affected animals. The structure consists of three 12-meter-long containers, housing a fully equipped outpatient clinic, a necropsy room, a kitchen for the preparation of animal food, laundry and washing areas, and a multipurpose rehabilitation area designed to support the treatment, recovery, and stabilization of wildlife impacted by environmental incidents (Figure 9).

Figure 9. Port of Paranaguá fauna assistance structure and resources.

3.6.2. Carbon Footprint Assessment and Greenhouse Gases Emission

In October 2023, the port of Paranaguá entered into a contract with the Valenciaport Foundation for Research, Promotion and Commercial Studies of the Valencian Region to provide technical assistance for the assessment of carbon

dioxide (CO_2) emissions, including the calculation of the Port Authority's carbon footprint and the development of a Decarbonization Plan aimed at reducing greenhouse gas (GHG) emissions associated with port operations at the Organized Ports of Paranaguá and Antonina.

In addition to this initiative, Portos do Paraná is a signatory to the Brazilian Alliance for the Decarbonization of Ports and aligns its strategies with the United Nations Sustainable Development Goals (SDGs). The partnership between Portos do Paraná and the Valenciaport Foundation dates back to 2020, when a technical cooperation agreement was signed with the Spanish research and innovation center, internationally recognized as a reference in port sustainability and decarbonization.

In April 2025, the Valenciaport Foundation delivered the Carbon Footprint Report for Portos do Paraná, presenting the results of the carbon footprint calculation for the base year 2023 (Figure 10). The assessment was conducted in accordance with the GHG Protocol methodology and the "Methodological Guide for Calculating the Carbon Footprint in Ports" developed by Puertos del Estado. The calculation was based on Portos do Paraná's energy consumption data and encompassed both direct and indirect GHG emissions related to port activities. The main emission sources identified include the combustion of fossil fuels in port machinery and vehicles, electricity consumption, and other operational activities within the port system.

The results indicate that, in 2023, Portos do Paraná emitted a total of 678,519.84 tCO_2eq. Direct emissions (Scope 1) accounted for 2.7% of the total, while indirect emissions from purchased electricity (Scope 2) represented 0.1%, and other indirect emissions (Scope 3) accounted for 97.1%. While Scopes 1 and 2 are associated with activities under the direct control of the Port Authority, Scope 3 emissions include those generated by ships, technical-nautical services, port terminals, road transport, and rail operations. Within Scope 3, emissions from ships

were the most significant, representing 89.2% of the total carbon footprint of Portos do Paraná.

This study provides a robust technical basis for the implementation of the Port Authority's decarbonization strategy, supporting the definition of priorities and mitigation measures in alignment with its broader sustainability objectives and climate change commitments.

Figure 10. Valenciaport Foudantion partnership regarding greenhouse gases emission by the port and carbon footprint assessment.

3.6.3. Priority berthing for "Green Vessels"

In 2023, the port of Paranaguá implemented a priority berthing policy for environmentally efficient vessels through its Regulation on Vessel Scheduling, Operations and Berthing. This measure integrates environmental performance criteria into port operations, encouraging shipping companies to adopt cleaner technologies and practices.

Under the regulation, green vessels are defined as ships that demonstrate superior environmental performance according to internationally recognized benchmarks. Vessels are eligible for priority berthing when they achieve a score

above 60 points in the Environmental Ship Index (ESI) or hold an A+ rating on the RightShip platform. These indices serve as key environmental performance indicators, reflecting reduced emissions of atmospheric pollutants and greenhouse gases.

The effectiveness of this measure is monitored through operational and environmental indicators, including:

- Number and proportion of green vessels receiving priority berthing;
- Average ESI and RightShip scores of vessels calling at the port;
- Reduction in estimated atmospheric emissions (CO_2, NO_x, SO_x) associated with port calls;
- Improved turnaround times for environmentally efficient vessels, indirectly contributing to lower fuel consumption during waiting periods.

The expected environmental results of this policy include the progressive reduction of air emissions related to maritime traffic, the promotion of cleaner fleets in the port's vessel mix, and the strengthening of Portos do Paraná's role as a reference in sustainable port management. By linking operational priority to measurable environmental performance, the Port Authority aligns efficiency gains with its long-term environmental and decarbonization objectives.

3.6.4. Risk Management

The organization adopts a preventive approach based on Risk Management and Control, Strategic Planning, and Environmental Management. Within Environmental Management, the Risk Management Program (PGR) plays a central role and, since 2020, has been supported by a dedicated Working Group responsible for promoting preventive actions. This group focuses on the review and development

of internal standards, regulations, and preventive and emergency operational procedures, with the objective of ensuring safer operations and appropriate response in the event of incidents.

In 2024, the PGR projects and the Unified Emergency Plan for the Ports of Paranaguá and Antonina were reviewed, and their scheduled actions were implemented. During the same year, two new operational procedures were issued, and 15 regulations and procedures were revised. In total, 20,717 environmental inspections related to the monitoring and control of port operations and services were conducted in 2024, along with 13 simulated emergency response exercises.

Also in 2024, a Risk Management Workshop was held with members of the port community to discuss and define criteria for revising the procedure for the prevention and control of accidents caused by adverse weather conditions in port areas, which is annexed to the Emergency Control Plan. Following the workshop, Portos do Paraná established safety rules for port activities during extreme weather events—such as strong winds, lightning storms, and high tides—thereby defining a standardized safety and environmental procedure to be followed by companies operating at ports in Paraná. In addition, three workshops were conducted on the implementation of the Integrated Accreditation and Services System (SICS), including guidance on regulated hazardous activities subject to prior accreditation.

The organization is supported by a permanent multidisciplinary team provided by an outsourced company, consisting of six environmental technicians, one risk management technician, and one coordinator, who assist with operational activities and the management of the PGR. Environmental control is maintained on a 24-hour, seven-days-a-week basis through continuous inspections, ensuring compliance with applicable environmental standards and procedures across all port operations.

4. Responsibilities and resources

4.1. Organization structure

The Portos do Paraná administration is a state-owned company responsible for managing Paraná State port terminals (ports of Paranaguá and Antonina). An administrative council and an executive board run the public company. Seven boards and their own specialized staff compose the executive board. The Port CEO (Port President) is responsible for directing the company and establishing guidelines to manage the port and control the other boards.

The current managing model is the landlord port, in which port authority is responsible for port administration and for providing necessary structure to cargo handling and port operation. The public sector maintains waterways, turning basins, berths, and road and rail access, while the private sector handles the superstructure, including equipment, warehouses, and labor.

Portos do Paraná's key activities include:

- Supervising and regulating all port operations;
- Ensuring navigation safety through maintenance and monitoring;
- Protecting the environment, managing waste, and safeguarding flora and fauna in emergencies;
- Managing access via road and rail to port terminals;
- Regulating services provided by cargo operators, terminal operators, agents, towage, and mooring companies;
- Driving port development through the Paranaguá and Antonina Port Development and Zoning Plan;
- Facilitating new businesses, industries, services, and terminals through strategic initiatives;

- Managing tariffs for infrastructure use, berthing, operations, and other port services;
- Overseeing leased areas and regulating tenant activities;
- Developing and maintaining a qualified workforce.

Figure 11 shows the institutional organizational chart, highlighting the DMA's management and coordination units, which oversee the implementation of the Integrated Management System (IMS).

4.1.1. Environment Board

The port of Paranaguá has a dedicated Environmental Board composed of multidisciplinary professionals from several fields, including biology, environmental engineering, and oceanography, among others. The legal jurisdiction for environmental management covers the "organized port area," as described in Section 1.0.2.

Through its Environmental Management division, the Environmental Board is responsible for coordinating, monitoring, and inspecting environmentally related activities within the port area and its surroundings, as well as activities with potential pollution risks. Through the Occupational Health and Safety Management division, the Environmental Board is also responsible for managing and supervising matters related to occupational safety and employees' health. The organizational structure of the Port of Paranaguá's Environmental Board, in relation to other boards and key company personnel, is presented in Figure 11.

The Port Authority is responsible for implementing more than 20 environmental programs, all of which are linked to the environmental license that authorizes port operations. The Brazilian Institute for the Environment and Renewable Natural Resources (Ibama) oversees these activities and evaluates the annual environmental reports prepared by the port. Further information on the

port's environmental programs is provided in Section 6 of this document (Environmental Report). The legal framework governing port environmental management in Brazil includes national environmental legislation, such as the National Solid Waste Policy; specific decrees establishing water, sediment, and air quality standards; legislation related to vector control measures; and the National Environmental Education Policy, among others.

Environmental management at the Port of Paranaguá also includes the inspection and supervision of port operations in accordance with the Regulation on Environment, Health, and Occupational Safety (Integrated Management System – IMS Regulation). This regulation is a comprehensive management instrument that establishes requirements for environmental control and occupational safety in port activities that may cause environmental impacts and/or pose risks to workers' health and safety.

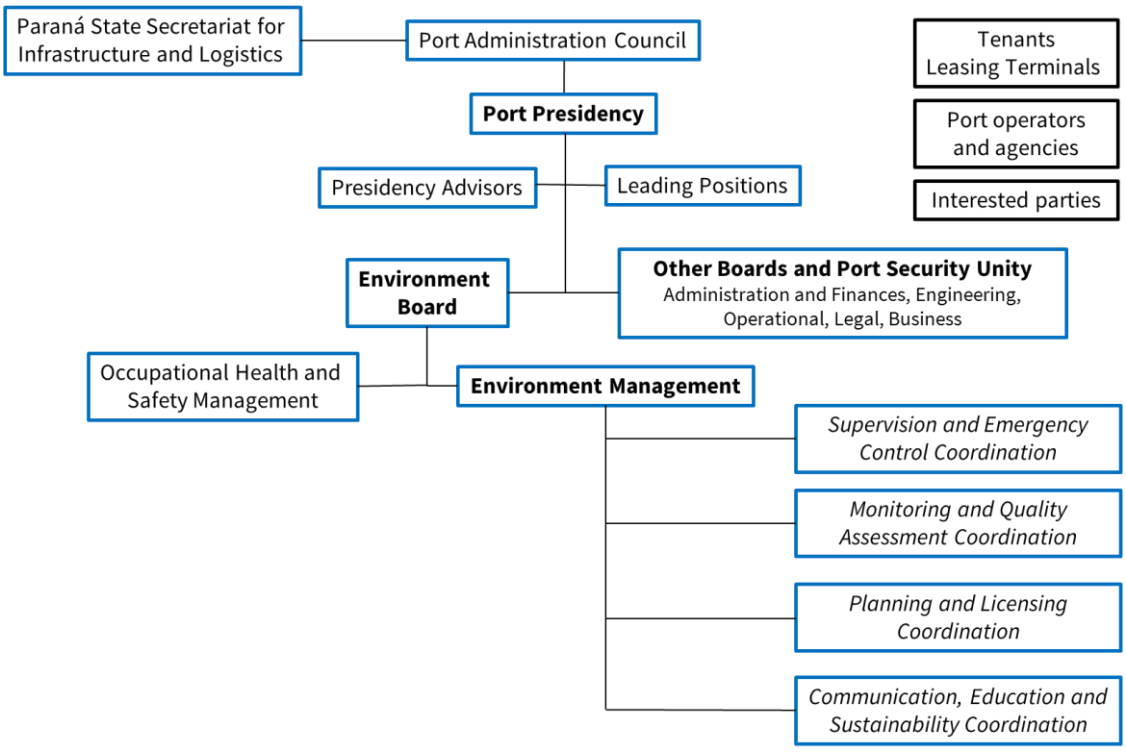


Figure 11. Chart representing the structure of the port and of the environmental organization.

4.1.2. Documented responsibilities of key personnel

The port of Paranaguá establishes, implements, and maintains the relevant responsibilities and authorities to ensure the effectiveness of the Quality, Environmental, and Occupational Health and Safety Management Systems. Responsibilities and authorities are formally defined and communicated through organizational documents such as organizational charts, job descriptions, operational procedures, specific plans, and Work Orders, ensuring that all employees understand their role, duties, and contribution to:

- Ensuring the conformity of processes, products, and services with customer requirements, legal and regulatory requirements, and other applicable requirements;
- Promoting the continuous improvement of the Quality, Environmental, and Occupational Health and Safety Management System;
- Ensuring compliance with legal requirements and other applicable requirements related to environmental aspects and occupational hazards and risks;
- Promoting environmental protection, including pollution prevention, and ensuring safe and healthy working conditions to prevent work-related injuries and illnesses;
- Ensuring that processes achieve their intended results, including the effectiveness of actions to address risks and opportunities;
- Supporting leadership in promoting a culture of quality, environmental sustainability, and the prevention of occupational accidents and diseases.

Leading positions are responsible for ensuring that these responsibilities and authorities are established, effectively communicated at all levels of the organization, and periodically assessed and reviewed to ensure their effectiveness and alignment with the strategic objectives of the integrated management system.

Port personnel comprise commission jobs, who are responsible for leading activities, and permanent employees. Port President nominates commission employees and permanent employees are hired by public tender. The functions and responsibilities of key personnel were established in the job plan, which was approved in a State Resolution authorized by the port Administration Council. The environmental responsibilities of port key personnel are presented in Table 4.

Table 4. Environmental responsibilities of key personnel of the port of Paranaguá.

Activities	Job Title or Name	Department
Port Operations (Dredging)	Bathymetry and Dredging Coordination	Engineering Board
Port Operations (Navigation)	Berthing Coordination and Marine Traffic Coordination	Port Operation Board
Port Operations (Terminals)	Supervision Management	Port Operation Board
Wharf management	Port Operation Management	Port Operation Board
Cargo handling operations	Supervision Management	Port Operation Board
Site Management	Institucional Programs Coordinator	Communication and Marketing Management
Strategic Planning	Strategic Planning Manager	Strategic Planning Management
Personnel Capacitation	Personal Development Coordination	Personal Management
Supplies acquisition	Supply Purchasing Coordination	Administrative Board
Bidding processes	Bidding Coordination	Administration Management
Licensing/Permits	Coordinator for Planning and Licensing	Environment Board
Quality Management	Compliance Coordinator	Compliance Superintendence
On site Contractor Management	Manpower Management Body (OGMO)	Manpower Management Body (OGMO)
Emergency Planning	Coordinator for Supervision and Emergency Control & Occupational Health and Safety Manager	Environment Board
Waste management	Coordinator for Monitoring and Quality Assessment	Environment Board
Environmental Document Management	Environment Manager	Environment Board
Environmental Data Management	Environment Manager	Environment Board
Air Quality monitoring	Outsourced company	Environment Board
Water Quality monitoring	Outsourced company	Environment Board
Sediment Quality monitoring	Outsourced company	Environment Board
Noise monitoring and management	Outsourced company	Environment Board
Wastewater monitoring and management	Outsourced company	Environment Board

Biota monitoring	Outsourced company	Environment Board
Mangrove structure monitoring	Outsourced company	Environment Board
Ballast water exchange monitoring	Outsourced company	Environment Board
Synanthropic Fauna Management	Outsourced company	Environment Board
Traffic Management	Engineer Manager	Engineering Board
Social Communication and Environmental Education activities	Outsourced company	Environment Board
Fishing Stock monitoring in the Paranaguá Bay	Outsourced company	Environment Board
Energy and Carbon Footprint Monitoring	Environment Manager	Environment Board

4.2. Port of Paranaguá Stakeholders

1. Identification of stakeholders

Stakeholders are identified based on their relationship with port activities and their potential to influence or be influenced by port operations, environmental aspects, and strategic decisions. The identification process considers, at a minimum, the following criteria:

- Legal and regulatory obligations (e.g., environmental authorities and government agencies);
- Operational interfaces (e.g., terminal operators, service providers, and contractors);
- Environmental and social influence (e.g., local communities, NGOs, and research institutions);
- Economic and strategic relevance (e.g., clients, investors, and port users);
- Internal stakeholders (e.g., employees and management).

Inputs for stakeholder identification include environmental licensing requirements, risk and impact assessments, legal registers, operational processes, and historical engagement records.

2. Stakeholder categorization

Identified stakeholders are categorized into groups according to their role and relationship with the port, such as:

- Regulatory and governmental bodies;
- Business partners and operators;
- Workforce and internal management;
- Local communities and civil society organizations;
- Academic and research institutions.

This categorization supports targeted engagement strategies and effective communication.

3. Assessment of expectations and influence

For each stakeholder group, expectations, concerns, and information needs are identified through formal and informal engagement mechanisms, including meetings, consultations, audits, complaints and suggestions channels, public hearings, and environmental reporting processes.

Stakeholders are also assessed according to their level of influence on port activities and the potential impacts of port operations on their interests, allowing prioritization where appropriate.

4. Periodic review and updating

The stakeholder register is reviewed annually or whenever significant changes occur in port operations, legal requirements, or the external context. This review ensures that new stakeholders are identified, existing ones remain relevant, and stakeholder expectations are adequately captured and addressed.

The results of this process are documented and consolidated in Table 4, which presents the identified stakeholders and their main expectations, serving as a reference for environmental management planning, communication, and decision-making.

Table 4. List of the port of Paranaguá stakeholders, their expectations and actions taken by the port.

STAKEHOLDERS	STAKEHOLDER DETAILS	EXPECTATIONS	MANAGEMENT ACTIONS
Academics and Researchers	Individuals and institutions that conduct research on port management, technological innovation, environmental impacts, and new operational approaches in the port sector.	Access to data and information for research, encouragement of innovation and technology projects related to the port sector.	Establish cooperation agreements, provide access to non-confidential data, support research projects, promote innovation hubs, and participate in academic forums.
Tenants	Companies that lease areas or facilities within the port to operate their commercial activities, such as cargo transportation, storage, and other port services.	Provision of areas by the Granting Authority that are suitable and in proper condition for carrying out the planned works and investments.	Ensure legal certainty, maintain infrastructure, support environmental licensing processes, and maintain continuous communication on operational requirements.
Associations and Trade Unions	Organizations representing groups of port workers that defend their members' interests regarding working conditions, wages, and safety.	Continuous dialogue, appreciation of workers, and compliance with labor and union rights.	Maintain structured social dialogue, comply with collective agreements, promote occupational health and safety programs, and engage unions in relevant decision-making.
Customers and Users	Companies or individuals that use port services, including importers, exporters, carriers, and other direct users of port infrastructure.	Efficiency in port operations and port tariffs compatible with market conditions.	Optimize operational processes, monitor service performance indicators, ensure transparent tariff policies, and maintain customer communication channels.
Employees of Portos do Paraná	Employees of the Port Authority responsible for the daily operation and management of the port, including administrative, operational, and support positions.	Workplace safety, adequate working conditions, recognition, and opportunities for training and professional development.	Implement H&S management systems, offer continuous training, promote career development, and encourage employee engagement in ESG initiatives.
Local Community	Residents and social groups living in areas influenced by the port, whose quality of life may be affected by port operations and expansion.	Job creation, socioeconomic development in the coastal region, mitigation of environmental impacts, and transparency in port actions.	Implement social responsibility programs, mitigate noise and air impacts, maintain community dialogue channels, and ensure transparency on projects and impacts.
Government of the State of Paraná	Authority that holds Portos do Paraná through a delegation agreement with the Federal Government.	An efficient public company that generates revenue independently from the State, serves as a benchmark for the national port sector, and strengthens the port–city relationship.	Ensure good governance, financial sustainability, regulatory compliance, and alignment with public policies and development strategies.
Media and	Press professionals and	Transparency and	Maintain an active press office,

Journalists	media outlets that disseminate information about the port and its impacts, influencing public perception and operational transparency.	access to up-to-date information on port operations, projects, and impacts.	provide timely and accurate information, organize press briefings, and manage crisis communication effectively.
Climate Change	Groups and entities that monitor and influence the port's adaptation to challenges posed by climate change, such as sea-level rise, storms, and extreme weather events.	Adoption of sustainable practices that contribute to climate change mitigation, compliance with existing environmental regulations, and assurance of the health and safety of workers exposed to these risks.	Develop climate adaptation and mitigation plans, monitor emissions, implement resilience measures, and integrate climate risks into strategic planning.
NGOs and Environmental Organizations	Entities engaged in environmental preservation and in influencing policies to minimize the environmental impacts of port operations, such as pollution and ecosystem degradation.	Compliance with environmental standards and reduction of impacts from port activities.	Promote environmental transparency, implement mitigation programs, engage NGOs in dialogue, and support biodiversity conservation initiatives.
Port/Logistics Operators	Companies responsible for cargo handling and operations within the port, including transportation, storage, and loading and unloading services.	Availability of adequate infrastructure and operational productivity compatible with the activity.	Maintain and expand infrastructure, ensure safe and efficient interfaces, provide clear operational rules, and enforce environmental and safety standards.
Regulatory and Inspection Bodies	Governmental or independent entities responsible for overseeing port activities, such as safety, environmental regulation, and compliance with standards.	Compliance with rules and regulations and cooperation during inspections and audits.	Ensure full legal compliance, provide accurate documentation, facilitate inspections, and implement corrective actions when required.
Port Authority Service Providers	Companies contracted by the Port Authority to provide essential services for port operations, such as environmental programs, occupational health and safety, asset security, administrative services, among others.	Clear contractual clauses and timely payments.	Manage contracts transparently, ensure timely payments, monitor performance, and enforce HSE and quality requirements.
Port Workers (excluding Portos do Paraná employees)	Workers operating in the port through contracted and registered companies, performing services such as cargo handling, cleaning, security, construction, and other general activities.	Safe working conditions, fair compensation, and efficient task allocation.	Enforce occupational safety standards, promote training, monitor labor conditions, and ensure compliance with labor regulations.
Visitors	Individuals and/or groups visiting the port, including tourists, delegations, and	Safety during visits, adequate infrastructure, and	Organize guided visits, ensure visitor safety procedures, provide educational materials,

	other visitors not directly involved in port operations but interested in learning about the organization.	information on port activities and history.	and maintain suitable visitor infrastructure

4.3. External regulatory bodies for the port of Paranaguá

The company is subject to a series of regulations and inspections that ensure the quality and efficiency of its services, in addition to protecting the environment, public health and workers' rights. In the Table 5 below we present the regulatory bodies for the port, according to the Environmental, Social and Governance areas.

Table 5. Regulatory bodies for the port of Paranaguá.

Environmental	Social	Governance
Bodies directly and indirectly related to environmental conditions focus primarily on technical regulation, safety, statistics and encouraging sustainable practices in their respective areas.	The bodies directly and indirectly related to social conditions are responsible for regulating public security, health and work.	Bodies directly and indirectly related to governance and infrastructure focus on technical regulation, supervision and control of port activities.
• Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) • State Secretariat for Sustainable Development and Tourism (SEDEST) • Institute of Water and Land (IAT) • National Institute of Metrology, Standardization and Industrial Quality (INMETRO) • Paraná Port Authority • Brazilian Institute of Geography and Statistics (IBGE) • National Petroleum, Natural Gas and Biofuels Agency (ANP) • National Land Transport Agency (ANTT) • Electricity Trading Chamber (CCEE) • National Electricity Regulatory Agency (ANEEL)	• National Commission for Public Security in Ports, Terminals and Waterways (Conportos) • National Health Surveillance Agency (ANVISA) • State Commissions for Public Security in Ports, Terminals and Waterways (Cesportos) • Federal Police (PF) • Brazilian Federal Revenue Service (RFB) • Ministry of Labor and Employment (MTE) • Paraná State Department of Health (SESA) • National Supplementary Health Agency (ANS) • Labor Prosecution Office (MPT)	• Ministry of Ports and Airports • National Secretariat of Ports • National Waterway Transport Agency (ANTAQ) • Government of the State of Paraná • State Secretariat for Infrastructure and Logistics (SEIL) • Federal Accounting Court (TCU) • Accounting Court of the State of Paraná (TCE-PR) • Office of the State Controller General (CGE) • Office of the Federal Controller General (CGU) • Treasury Department (SEFA) • Federal Prosecution Office (MPF) • State of Paraná Prosecution Office (MPPR) • Municipal Councils (Paranaguá and Antonina)

4.4. Resource allocation

The Environmental Manager, supported by the environmental management team, is responsible for preparing the annual budget plan for port environmental management activities. The Port President, together with the financial department, formally reviews and approves the allocation of financial resources for each operational area of the port.

The approved budget includes provisions for mandatory and voluntary environmental requirements, including biennial environmental certifications such as EcoPorts. The port's annual budget encompasses the environmental management items detailed in Table 6, ensuring the availability of financial resources necessary for the effective implementation and continuous improvement of the environmental management system.

Table 6. Resource allocation regarding the Environment Board.

Part of Organization	Item	Amount per year (approximate)
Human Resources	Staff costs Environment Management	R$ 1.992.000,00
Environmental Management	Environmental monitoring programs	R$ 7.822.579,32
Environmental Management	Waste management	R$ 2.595.738,11
Environmental Management	Mechanical road sweeping	R$ 3.183.085,77
Environmental Management	Environmental emergency response	R$ 3.457.449,15
Environmental Management	Oiled fauna response in case of emergency	R$ 1.161.053,60
Environmental Management	Environmental studies	R$ 250.247,88
Environmental Management	Environmental compensatory measures	R$ 1.572.912,54
Environmental Management	Maintenance services and vector control	R$ 2.511.893,09
Environmental Management	Innovation and research partnership with universities	R$ 1.029.832,63
Environmental Certification	Bi-annual certification by ESPO	R$ 17.554,02

(EcoPorts)		

Approximate budget for port environmental management comprising all items described above is R$ 31 million reais in 2025. Port fees charged for port operators and the leasing of port areas generate the resources allocated to the Environment Board.

4.5. Awareness

The organization ensures that all individuals performing work under its control are aware of fundamental aspects related to the policy and the effectiveness of the Integrated Management System (IMS). To this end, the following actions are implemented:

1. Awareness Aspects

- Knowledge of the Quality, Environmental, and Occupational Health and Safety (OHS) policy;
- Understanding of the organization's objectives related to each management system;
- Awareness of the consequences of noncompliance with IMS requirements, including legal, environmental, OHS, and quality impacts;
- Understanding of hazards, risks, and OHS-related control measures, where applicable.

2. Onboarding of New Employees

During the onboarding process, all new employees participate in an awareness program that addresses IMS principles and the environmental policy,

individual and collective responsibilities, and guidelines for compliance with legal and internal requirements.

3. Training Records

All training activities are documented and included in employees' records, enabling effective control and continuous assessment of awareness.

4. Communication and Engagement

Periodic meetings, Daily Safety Dialogues (DSD), and other communication channels are used to reinforce employee engagement and keep them informed about IMS policies, objectives, and results. These guidelines aim to establish an organizational culture aligned with the purposes of the IMS, promoting continuous improvement and compliance with legal, regulatory, and internal requirements.

As part of the implementation of ISO standards within our organization, we have structured an initiative focused on training through an online platform. This platform is a corporate communication and training tool designed to facilitate continuous employee development in a dynamic, accessible, and efficient manner. Its operation combines the distribution of strategic content with the promotion of active employee engagement, using modern learning methods, such as gamification. Initially, the Principles of our Integrated Management System (IMS) Policy were selected for dissemination through the platform. The objective is to ensure that all employees understand the principles that guide our IMS, aligning internal practices with the requirements of the standards and strengthening the culture of occupational health and safety, environmental management, and quality.

5. Conformity Review of Environmental Policy and Legal Requirements

The table below consolidates the main environmental aspects and impacts associated with the activities of the Port of Paranaguá, covering six environmental issues, identified as significant through the Self-Diagnosis Method in the last three years (2023-2025).

Significant Environmental Aspect	Environmental impact/issue	Port Policy	Actions taken	Responsible Actor	Key Perfomance Indicator	Concret Targets Last 2 years	Measured Results Last 2 years	Conclusions about Policy	Plans for 2025-2027
Port development (water)	Noise Wastewater Atmospheric emissions Waste generation Water quality	To keep abreast of trends in technology to promote more efficiency	Continuous monitoring Development of modern projects to reduce environmental impact	Port Authority and leased Terminals	Port structure modernization, including leased areas and port operators	Finish projects under development; Submit the project to environmental organ; Finish liquid bulk pier modernization	New conveyor belts are completely enclosed; Phase 1 of liquid bulk pier modernization started in 2022 and phase 2 was under planning	Efforts are been made to modernize port structures and ensure port development	Conclude Phase 2 of the liquid bulk pier modernization. Maintain and expand environmental monitoring programs associated with aquatic operations. Require new leased areas to implement best available technologies and robust environmental management plans. Promote continuous technological upgrades aimed at minimizing impacts on water quality and

									aquatic environments.
Port development (land)	Noise Wastewater Atmospheric emissions Waste generation Disturbance to community Traffic issues	To keep abreast of trends in technology to promote more efficiency	Continuous monitoring Development of modern projects to reduce environmental impact	Port Authority and leased Terminals	Port structure modernization, including leased areas and port operators; Improvement in traffic conditions in the port surroundings	Finish projects under development; Submit the project to environmental organ; Improve traffic management	Improvements in via horizontal and vertical signage; Construction of a railway hopper, reducing the number of intersections with city streets (75% concluded in 2025); Environmental studies for expansion of the triage yard were finished in 2025.	Efforts are been made to modernize port structures and ensure port development; Infrastructure works are under development; All studies were concluded; Actions have been taken to improve traffic management in the port surroundings	Conclude the railway hopper construction by 2026, further reducing urban traffic interference. Finalize the environmental licensing process for the expansion of the triage yard. Continue improving traffic management and logistics efficiency in the port surroundings. Maintain monitoring of noise, air emissions and community disturbance indicators.
Local community	Relationship and	To continuou	Continuous contact with	Port Authority and	Number of participants in	Increase the number of	Over 1.000 people have	The port maintains some	Expand educational and

	transparency with local community	sly strengthe n the relationsh ip with the port communi ty and the city	local community; Disclose port information with transparency	leased Terminals	the activities developed by the port in the communities of the port surroundings; Improve communication via Ombudsman channel	participants in the port activities; Promote disclosure of the Ombudsman channel; Respond to Ombudsman complaints	participated in the environmental actions promoted by the port in 2025 (50% increase); There has been an increase in the Ombudsman requests, which is positive, as it became an official communication channel with local population	efficient communication channels with the community, as the Ombudsman channel and promotes frequent and continuous activities in the port surroundings	environmental awareness programs in surrounding communities. Strengthen and promote the Ombudsman channel as a permanent dialogue tool. Increase community participation in port initiatives and public consultations. Monitor community perception indicators and continuously improve engagement practices.
Dredging (operation and disposal)	Disturbance to biota Water quality	To prevent, control, monitor and mitigate	Continuous monitoring	Port Authority	Environmental monitoring	Maintain continuous monitoring Improve dredge structure (implement	Established overflow limits in some areas Environmental restrictions of dredging in	New equipment promotes dredging with environmental security; Less impact on	Maintain environmental restrictions and continuous monitoring during dredging

		all forms of environmental pollution				measures to reduce impact on biota)	sensitive periods; Turtle deflector installed	biota and less sediment suspension during dredging	operations. Promote the concession of the access channel in 2026, ensuring high environmental performance standards. Further improve dredging equipment and operational procedures to reduce impacts on biota.
Garbage/port waste	Soil contamination Landfill saturation	To prevent, control, monitor and mitigate all forms of environmental pollution	Reduce waste generation and improve segregation	Port Authority and maritime agencies	Waste segregation and final destination	Reduce waste generation and improve segregation in 20%	Reduction of approximately 16% of waste generation 60% of port waste destined to reuse (recycling or composting)	Since 2022, waste generation has declined, and waste segregation has improved substantially, especially considering waste reuse (composting)	Maintain and enhance waste segregation and proper final disposal practices. Achieve a 20% reduction in waste generation compared to baseline levels. Continue employee training and

									awareness programs focused on waste reduction and segregation. Expand partnerships for recycling and composting initiatives.
Water quality	Non-attendance to legislation Impact on aquatic biota Oil leakage	Asses environmental quality of areas; To prevent, control, monitor and mitigate all forms of environmental pollution	Continuous monitoring; Reduction of oil leakage by prevention and leakage management system	Port Authority Port Operators	Full attendance to environmental legislation parameters; Prevention of oil leakage to water	Improve port infrastructure to respond to emergencies in general, including fire emergency	Implementation in 2024 of the new base for environmental response in case of emergencies, including fauna (see section 5.1.2.2); Maintain regular monitoring of water parameters	The port has substantially improved its infrastructure to ensure that environmental emergencies have non-significant impact in the water quality Water monitoring occurs continuously since 2014	Maintain continuous monitoring of water quality parameters. Conduct regular training for personnel involved in environmental emergency response. Continuously improve infrastructure and procedures for spill prevention and response.
Dust	Air quality Impact on	To prevent,	Continuous monitoring	Port Authority and	Accomplish to legislation	Total enclosure of conveyor belts	The new conveyor belts	Efforts are been made to	Replace outdated solid

	workers and port community	control, monitor and mitigate all forms of environmental pollution	Development of modern projects to reduce environmental impact	port operators	parameters Reduce dust generation	and towers for the transport of solid bulks Modernization of shiploaders; Improvement of solid bulk discharge equipment	of new projects are all enclosed with the aim of reducing the emission of particulate matter during operation; Ship loaders' loading chute that generate less particulate material during operation have been acquired in 2024, in order to replace the existing structures. At the end of 2023 and in early 2024, the first locally manufactured ecological funnel, developed by Centro Sul Serviços Marítimos, underwent the testing phase	modernize port structures and ensure port development; Port operators must attend port Authority requirements to replace operational equipment	bulk handling equipment with modern, low-emission alternatives. Install new shiploader chutes by 2026. Maintain coordination with port operators to ensure compliance with environmental requirements. Continue monitoring dust emissions and air quality indicators.
Air quality	Impact on	To	Continuous	Port	Accomplish to	Maintain month	Constant	Continuous	Quantify and

	workers and port community Greenhouse gases emission	prevent, control, monitor and mitigate all forms of environmental pollution	monitoring Development of modern projects to reduce environmental impact	Authority and port operators	legislation parameters	monitoring Total enclosure of conveyor belts and towers for the transport of solid bulks Modernization of shiploaders Improvement of solid bulk discharge equipment	monitoring indicates that air quality parameters are stable through the years; The decarbonization plan for the port of Paranaguá has been elaborated and is in the final phase of review.	monitor air quality parameters in the port and in Paranaguá urban area; Modernize and replace port equipment that generate particulate material.	monitor greenhouse gas emissions on a regular basis. Promote modernization and replacement of equipment to reduce emissions.
Climate change	Greenhouse gases emission Increase in global temperature Extreme climatic events	To preserve life, human health and safety, and the environment	Contract signed with Valeciaport Foudation to elaborate the decarbonization plan for the port of Paranaguá	Port Authority and leased terminals	Quantify the amount of GHG emissions of the port Reduce GHG emissions	Signed contract with the Valenciaport Foundation for technical assistance in the assessment of CO2 emissions (Carbon Footprint), including the preparation of a Decarbonization Plan to reduce GHG emissions	The decarbonization plan for the port of Paranaguá has been elaborated and is in the final phase of review.	Efforts are aligned with the Environmental Policy and substantial advances will be achieved with the implementation of the decarbonization plan for the port of Paranaguá	Implement the Decarbonization Plan for the port of Paranaguá. Develop additional strategies to improve air quality and enhance climate adaptation.

The Conformity Review demonstrates that the Environmental Policy of the Port of Paranaguá is effectively implemented and consistently integrated into the port's governance structure, operational processes, environmental management programs and decision-making mechanisms. The analysis of the interrelationships between the policy commitments (Chapter 2), the register of environmental aspects and legal requirements (Chapter 3), the allocation of responsibilities and resources (Chapter 4), and the measured environmental performance indicators and results (Chapters 3 and 6) provides documented evidence that the main policy objectives have been largely achieved during the review period.

Compliance with applicable environmental legislation and other requirements is systematically managed through structured processes, supported by continuous legal monitoring and the implementation of the CAL 4.0 system. The dashboard results indicate a high level of conformity, with the majority of identified legal requirements complied with and only a limited number under evaluation or identified as non-compliant, for which corrective actions are addressed through the Integrated Management System. This confirms the effectiveness of the port's approach to legal compliance and regulatory control, in line with its Environmental Policy and IMS Policy commitments.

The identification and management of significant environmental aspects are directly linked to the port's strategic priorities, particularly port development, dredging activities, waste management and interaction with the local community. Documented performance data show that port development projects in both aquatic and terrestrial areas have progressed in accordance with environmental licensing requirements, supported by environmental studies, monitoring programs and mitigation measures. Dredging operations and sediment disposal activities have been conducted under strict environmental controls, including continuous monitoring of water quality and sediments, the application of fauna protection

measures and the beneficial use of dredged material, demonstrating adherence to best available techniques and license conditions.

Environmental performance indicators provide measurable evidence of continuous improvement. Notable results include the reduction in solid waste generation under the Port Authority's responsibility, increased investment in environmental and socio-environmental programs, and the consolidation of structured monitoring programs for ecosystems, emissions, noise and resource consumption. Engagement with the local community is supported by documented actions such as the Environmental Education Program, the Ombudsman system, and significant investments in social and environmental initiatives, contributing to transparency, dialogue and impact mitigation.

The interrelationship between policy objectives, operational controls, monitoring programs and achieved results confirms that the Environmental Policy is not merely declarative but effectively implemented and monitored. The results also demonstrate alignment with international frameworks, such as the United Nations Sustainable Development Goals, reinforcing the port's commitment to sustainable development.

Lessons learned from this review highlight the importance of strengthening data integration, consolidating performance information in a clear and structured manner, and further enhancing digital tools for environmental and legal compliance management. The recommendation to consolidate key indicators and measured results into a single Conformity Review table is considered essential to improve traceability, facilitate internal evaluations and support external audits.

For the coming years, the Port of Paranaguá will build on these results by reinforcing its continuous improvement approach, expanding the integration of environmental requirements into new infrastructure projects and leasing processes, enhancing stakeholder engagement mechanisms, and advancing the

implementation of ISO management system standards. These actions will support higher levels of environmental performance, regulatory compliance and transparency, ensuring that the Environmental Policy continues to be effectively achieved and strengthened over time.

6. Environmental report

The port of Paranaguá, through the Integrated Management System Policy, aims to ensure a standard to be achieved and should be used as a reference for the continuous improvement of processes. Currently, the Port Authority has more than 20 permanent environmental programs for management, monitoring and social and environmental actions, in accordance with the conditions of the environmental Licenses issued by Ibama.

Port of Paranaguá activities, as in other ports, are directly linked to a range of environmental aspects, such as the movement of cargo, vessel traffic, and dredging works, among others. These activities can impact the region's biota, posing risks such as changes to environmental quality, introducing invasive species, and changes to aquatic communities, for example. Likewise, the port authority continuously carries out environmental monitoring in the Paranaguá Estuarine Complex, including monitoring of aquatic biota, which in particular includes species listed on the IUCN (International Union for Conservation of Nature) Red List and on national conservation lists. It is noteworthy that over 11 years of monitoring, the communities evaluated have maintained constant patterns of richness, abundance and diversity.

1. Ecosystems monitoring

- **Water Quality and Sediment**

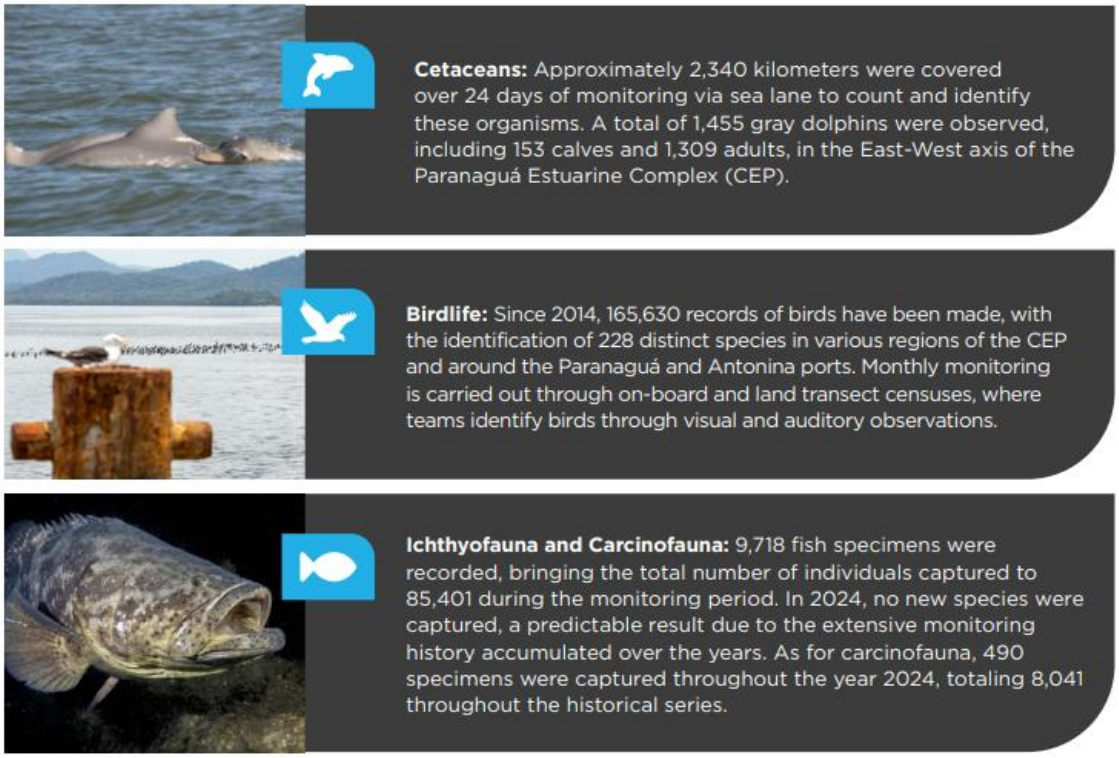
As required by IBAMA environmental licenses and CONAMA requirements, the port monitors seawater quality quarterly. During this monitoring, a range of environmental parameters are analyzed, with samples collected at different depths, including surface, mid-water and bottom. Such monitoring is essential to ensure that port operations do not affect the quality of the surrounding marine water (Figure 12).

In 2024, samples were collected at 32 points throughout the 6,873 water samples collected at 32 points 308,643 chemical parameter analyses estuarine complex. From these points, 6,873 water samples were obtained, resulting in 308,643 analyses of chemical parameters. In addition, 1,084 sediment samples were collected from the bottom of the Paranaguá and Antonina bays, culminating in more than 47,418 parameters analyzed. It is worth noting, within the scope of water resources monitoring, that, in 2024, 364 effluent samples were collected and analyzed, resulting in 6,780 parameter analyses performed.

Figure 12. Water and biota collection campaigns are performed every three months.

- **Aquatic Biota Monitoring Program**

In 2024, environmental monitoring on marine fauna in the area of influence of Portos do Paraná showed the following results:



- **Synanthropic Fauna**

Portos do Paraná carries out ongoing environmental control and management measures in the areas of the ports of Paranaguá and Antonina, with the aim of reducing and controlling the populations of organisms that transmit diseases, mainly zoonoses, that is, diseases that can be transmitted between animals and humans. Synanthropic fauna species found in port areas can be harmful to both local species and humans. Mainly species such as common pigeon, vermin, mice and rats are found. In order to control and reduce these populations, traps are installed to capture rodents, and pigeon eggs and nests are removed from different sectors in the Paranaguá and Antonina organized ports. In 2024, four campaigns were

conducted to assess the level of rodent infestation and 12 monthly campaigns to estimate the pigeon population, as well as the installation of 75 new traps (bait holders), removal of eggs and nests and the reduction in the supply of available food, through mechanized sweeping on 11,580 kilometers of roads in the organized port polygon.

- **Invasive Species**

In monitoring the planktonic community, two exotic taxa have been identified in phytoplankton, and two exotic species in zooplankton are also present in other estuarine systems in Brazil. Considering benthic organisms, 21 species with exotic/invasive status were recorded in the benthos of consolidated substrates and one species in the benthos of unconsolidated substrates, over the eleven years of continuous monitoring (2014-2024). It is worth noting that these same species have already been described in other locations in Brazil.

- **Mangrove Monitoring Program**

Intended for monitoring mangroves, carried out through the installation of permanent plots to evaluate phytosociological data from mangrove forests around the port region, evaluation of the fauna present in these areas and monitoring of shoreline advancement or retreat. In another area of focus, the program includes cleanup activities in areas subject to human interference, an initiative carried out in collaboration with the local population and community partners.

In 2024, three cleaning actions were held in mangroves and beaches in Paranaguá, removing almost 3 tons of waste from these locations. These actions had direct participation from more than 127 community members.

2. Socio-environmental actions

- **Environmental Education Program**

The port Environmental Education Program aims at creating effective conditions for building a critical sense of people under the influence of port activities, to promote the understanding of their role as agents in the process of improving individual and collective life quality. Besides, the program seeks to raise awareness for the prevention and minimization of socio-environmental impacts resulting from the operational activity of the port of Paranaguá.

This program comprises both internal and external audiences related to the port. The internal audience are port employees and third parties, port community (leasing companies), port workers (stevedoring), truck drivers, as well as any worker related to the port. Awareness campaigns, specific training efforts, and environmental dialogues are constantly performed with the internal audience (Figure 13).

Figure 13. Environmental education activities with the port internal audience.

The external audience are social groups located in the direct influence area of the port, such as artisanal fishing communities. The port develops 13 socio-environmental projects with the external audience, which are divided into 5 lines of action, comprising artisanal fishing strengthening, local association empowerment,

and support for young people, basic sanitation, tourism, culture and environmental awareness (Figure 14).

- Compost to Grow Project

The program is aimed at the development of Ilha do Mel, with the aim of teaching the basic concepts of the composting process and raising awareness about the correct segregation and reuse of solid waste. In 2024, 449 people participated in the activities, including students, which resulted in the composting of approximately one ton of organic waste generated locally, preventing this waste from being sent to the landfill.

- Our Fishing Project

The project seeks an alternative source of income for fishing communities located around Portos do Paraná. Throughout the year, three courses of “Cutting and Sewing” organized for women in the Piaçaguera region.

- Water for the Islands Project

The program is aimed at improving the water supply microsystems of communities in Paranaguá Bay. A spring recovery workshop using the “caxambu” method was held in the community of Europinha, and, in 2024, a joint action was organized to revitalize the water reservoir in the community of Eufrasina.

- Trails of Tomorrow Project

The project aims to train young people from communities in the area of influence of the Paranaguá and Antonina ports. In 2024, two courses aimed at young people were held.

- Ecological Sanitation Project

The program is designed to support improvements in selective collection and sewage treatment systems in communities in the Paranaguá Bay. Over 60 residences in the Eufrasina community have received ecological sewage treatment systems.

Figure 14. Activities developed with port external audience, involving local association empowerment, activities to encourage waste composting and young audience awareness actions.

- **Fishing Activity Management Program**

The Fishing Activity Monitoring Program regularly monitors artisanal fisheries in the Paranaguá Bay, supporting studies on the performance of fishing activity over time. Since 2014, this program has been evaluating the amount of arrived fishing resources, the species fished, as well as the equipment used and the type of vessel used by fishermen. Seven fishing landings are accompanied on a daily basis in the municipalities of Antonina, Paranaguá and Pontal do Sul, embracing the production of 33 fishing communities located throughout the Paranaguá bay (Figure 15).

Figure 15. Registers of the arrival of fishing resources to Paranaguá, accompanied by the personnel responsible for the program.

3. Environmental control actions

- **Solid Waste Management Plan**

The Solid Waste Management Plan is reviewed annually or whenever there are changes or expansions in the company's processes. In 2024, the organization updated these operational procedures, maintaining specific collectors for waste such as uncontaminated PPE, furniture and fabrics, in addition to selective collection points (Figure 16). There was also an update to the diagnosis and to quantities and technology of equipment for public cleaning, collection, transportation and final disposal of solid waste in the common areas of the Organized Ports of Paranaguá and Antonina.

Opportunities for improvement are constantly monitored, seeking better waste segregation, including recycling, reducing the amount of waste sent to landfill and, consequently, the costs associated with its disposal. Throughout 2024, there were approximately 2,300 audit actions with electronic systems on the different types of collectors that make up the waste management of Portos do Paraná, referring to the conditions of segregation and storage of waste in the collectors and waste islands. There were also more than 100 mechanized sweeping inspections regarding cleaning efficiency and equipment condition, as well as road cleaning. Furthermore, 24 training sessions related to the PGRS were held, with the participation of 231 employees directly involved in port activities.

Port of Paranaguá waste is managed by a third-party company, whose transport vehicles are tracked, allowing verification of the location of final disposal. Furthermore, all transportation and final disposal actions are managed through issuing Waste Transportation Manifests (WTMs) and Final Destination Certificates (FDCs). In 2024, Portos do Paraná properly disposed of more than 2 thousand tons of solid waste under its direct responsibility, a reduction of approximately 16% compared to 2023. Furthermore, it monitored the removal of more than 14 thousand

tons of waste from onboard vessels and almost 7 thousand tons of waste generated by port operators and the export corridor.

Figure 16. Collectors and buckets located in Selective Collection Points (PCS) along the port of Paranaguá legal jurisdiction.

- **Atmospheric Emission**

Based on the methodology established in the Paranaguá ports' Environmental Control Plan, approved by IBAMA, Portos do Paraná executes an air quality control program. This program is based on the premise of awareness and monitoring of atmospheric emissions generated by indirect port activities. During this monitoring, the levels of Total Suspended Particles (TSP), Inhalable Particles (IP), sulfur dioxide (SO2), nitrogen dioxide (NO2), smoke, ozone (O3) and carbon monoxide (CO) are measured (Figure 17). The results obtained generally comply with the standards established in the legislation, indicating that the local dispersion capacity is sufficient to maintain concentrations within limits that do not affect the health of the population, as established by CONAMA Resolution 03/90.

Figure 17. Equipment installed to monitor air quality in the port surrounding and black smoke monitoring with the methodology known as “Ringelmann scale”.

- **Noise Emissions Monitoring Program**

The Noise Emission Monitoring Program monitors every month, during the day and night periods, 21 points located in the port area and in the city of Paranaguá (Figure 18). In addition to verifying compliance with legal limits, this program also allows the creation of a database for strategic planning and management of this type of issue.

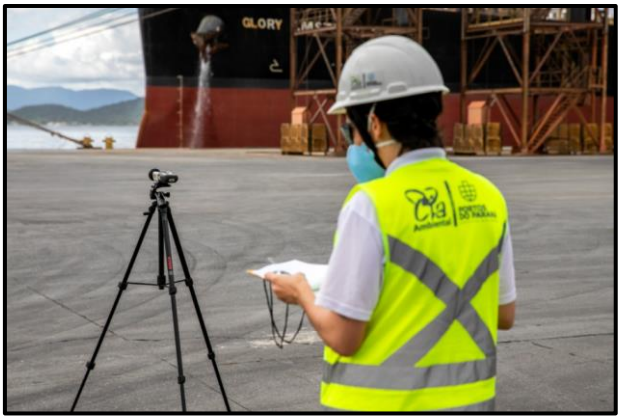


Figure 18. Evaluation of intermittent sources of noise pollution in the port area.

- **Energy consumption**

The port implements a range of initiatives to reduce energy consumption, which is in line with the ONS-UN program. Among the policies, environmental education campaigns stand out, encouraging employees to turn off lights and equipment when not in use. Furthermore, nautical signaling at the Port of Paranaguá uses buoys equipped with lanterns powered by solar batteries, which are essential for night navigation. Below we present the amount of energy used by the organization in 2024 (measured in MWh):

Month	Other	Renewables	Total
January	47.129	1,455.777	1,502.906
February	44.441	1,265.255	1,309.696
March	44.789	1,319.372	1,364.161
April	43.891	1,478.576	1,522.467
May	42.352	1,355.852	1,398.204
June	35.049	1,487.446	1,522.495
July	29.974	1,592.246	1,622.220
August	30.396	1,441.087	1,471.483
September	28.884	1,525.593	1,554.477
October	31.812	1,235.578	1,267.390
November	32.425	1,197.160	1,229.585
December	32.289	834.832	867.121
Total	443.431	16,188.774	16,632.205

- **Water consumption**

The port of Paranaguá values water as an essential resource and treats it with the utmost respect in its activities. All water consumed in the company's daily activities, such as cleaning and use in bathrooms, pantry and kitchen, is supplied by the company Paranaguá Saneamento (Iguá), which, after use, also treats the water through the sanitation system. We emphasize that one of the organization's specific objectives is to "Implement actions that encourage environmental quality, safety

and health at work, meeting legal requirements and applying good practices". Moreover, the organization has the goal of "Monitoring water and electricity consumption, aiming at reduction". This specific objective is detailed in Operating Procedure - PO - DIRAMB - 004, updated in 2024. Rainwater is directed to the region's drainage channels. Physical-chemical parameters are constantly monitored as part of environmental programs. Monitoring water consumption is essential for efficient management of water resources, and reaffirms our commitment to transparency and environmental responsibility. Below, we present the monthly water consumption for the year 2024:

Monthly consumption analysis - General APPA (m^3) - period 2020-2024

Year \ Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2020	6,979	11,324	10,094	10,692	11,739	12,201	12,121	12,239	11,374	9,447	5,169	5,424
2021	5,002	5,604	7,022	5,718	6,155	6,373	5,463	5,387	5,700	6,095	6,010	6,839
2022	6,620	7,754	8,906	7,101	6,456	6,057	8,755	7,696	7,798	7,730	6,413	6,972
2023	7,035	6,379	7,543	6,422	6,918	7,203	7,402	7,645	7,824	9,020	7,275	8,094
2024	9,313	7,218	7,944	8,046	8,872	8,048	7,340	6,741	7,670	8,265	7,633	6,840

7. Examples of Best Practices

Port of: Paranaguá Paraná

Country: Brazil

Contact person: Thales Schwanka Trevisan/Fernando Augusto Silveira Armani

Position: Environmental Manager/Professor at Federal University of Paraná

Email: thales.trevisan@appa.pr.gov.br/fernando.armani@ufpr.br

Environmental issue: 32 – Relationship with local community

Relevance to the 5Es framework: Exemplify/Encourage

Title: "Sustainable Communities" Project – a research, development and innovation project in partnership with the Federal University of Paraná

Description:

The Research, Development and Innovation project "Sustainable Communities" was signed in 2024 between Portos do Paraná and the Federal University of Paraná. It aims to improve sanitation conditions in coastal communities on the Paraná coast, through applied research, the development of decentralized sewage treatment technologies and the implementation of environmental education and promotion of sustainable practices.

The intervention is currently focused on the community of Eufrasina Island, in Paranaguá Bay, selected based on two strategic criteria: the existence of an active and regularized residents' association, and critical sanitation conditions, with multiple physical and logistical restrictions on the implementation of conventional systems, as it is a community with rugged topography, a significant presence of rocky outcrops and homes located on the water's edge, with no available areas for the implementation of traditional sewage treatment infrastructure.

The overall objective of the project is to improve sanitation conditions through the development and implementation of technical solutions adapted to the

local context, combined with community awareness and training strategies. The specific objectives are to:

- Design and implement individual sewage treatment systems in homes;
- Develop biodegradable cleaning products in conjunction with the community;
- Evaluate the efficiency of the installed systems;
- Produce enzymes and microorganisms to improve the performance of the systems;
- Monitor water quality in recreational areas;
- Promote the popularization of science through the scientific and technical dissemination of the project results.

Activities were also held in the community's state and municipal schools, with the aim of introducing the topic of environmental sanitation in the educational context, using the treatment systems implemented as pedagogical tools and teaching laboratories for students.

The project aims to consolidate a replicable technical and organizational model that integrates social technology, environmental innovation and community strengthening, promoting the improvement of sanitary conditions and environmental preservation in highly vulnerable areas of the Paraná coast.

Links:

https://www.portosdoparana.pr.gov.br/Noticia/Projeto-Comunidades-Sustentaveis-da-Portos-do-Parana-e-premiado-pela-ANTAQ

https://www.portosdoparana.pr.gov.br/Noticia/Iniciativa-socioambiental-da-Portos-do-Parana-e-finalista-em-concurso-nacional

https://www.portosdoparana.pr.gov.br/Noticia/Portos-do-Parana-e-UFPR-firmam-parceria-para-instalacao-de-sistema-de-esgoto-na-Ilha-de

Illustrations:

Figure 19. “Sustainable Communities” project team at the community of Eufrasina building ecological sewage treatment systems, monitoring effluents quality and performing environmental education.

Port of: Paranaguá Paraná

Country: Brazil

Contact person: Pedro Pisacco Pereira Cordeiro/Jaqueline Dittrich

Position: Sustainability Coordinator/Biologist

Email: pedro.pisacco@appa.pr.gov.br/jaqueline.dittrich@appa.pr.gov.br

Environmental issue: 5 – Climate change; 6 – Conservation Areas; 32 – Relationship with local community.

Relevance to the 5Es framework: Exemplify/Encourage/Enforce

Title: Degraded Areas Recovery Program

Description:

Portos do Paraná carried out a large-scale environmental restoration project in the municipality of Antonina, recovering 40 hectares of forest area by implementing agroforestry systems in small rural properties. The initiative included the planting of 55,719 seedlings from 121 native species such as ipê and cedar, as well as native and exotic fruit trees like juçara palm, araçá, pitanga, orange, acerola, and avocado.

This initiative is part of the Degraded Permanent Preservation Areas Recovery Program (PRAD) and its primary goal is to restore the local ecosystem while also helping reduce sedimentation in regional rivers, which may lower dredging costs in navigation channels in the future.

Beyond its environmental impact, the project fosters social inclusion and sustainable development. The local community was actively involved in activities such as family farming fairs and celebration events, promoting integration and strengthening ties between the port authority and nearby communities. This engagement underscores the organization's commitment to socio-environmental responsibility.

The restoration effort in Antonina marks a significant milestone for environmental conservation along the Paraná coast. In addition to its ecological benefits, it demonstrates how coordinated action between public institutions and local populations can generate lasting positive outcomes for both the environment and society. Through this project, Portos do Paraná reinforces its reputation as a reference in sustainable practices within the port sector.

Links:

https://www.portosdoparana.pr.gov.br/Noticia/Portos-do-Parana-recupera-area-florestal-equivalente-40-campos-de-futebol-em-Antonina

https://www.portosdoparana.pr.gov.br/Noticia/Portos-do-Parana-recupera-area-florestal-equivalente-19-campos-de-futebol-em-Antonina

https://www.portosdoparana.pr.gov.br/Noticia/Portos-do-Parana-inicia-programa-para-recuperar-areas-degradadas-e-conservar-mata-nativa-no

https://www.portosdoparana.pr.gov.br/Noticia/Agricultores-de-Antonina-conhecem-programa-ambiental-da-Portos-do-Parana

https://www.portosdoparana.pr.gov.br/Noticia/Portos-do-Parana-inaugura-oito-viveiros-comunitarios-para-recuperar-areas-degradadas

Illustration:

Figure 20. Degraded Areas Recovery Program developed by Portos do Paraná at rural communities in Antonina municipality.

8. Annexes

1. Signed ratification for the Environmental Aspects and Legal Requirements;
2. Signed Environmental Policy and IMS Policy statement;
3. Main legislation related to the port of Paranaguá.