



International Initiatives to Promote Port Sustainability: The Panama Canal Green Initiatives

Esteban G. Sáenz
Executive Vice-president
Environment, Water, and Energy
Panama Canal Authority



Agenda



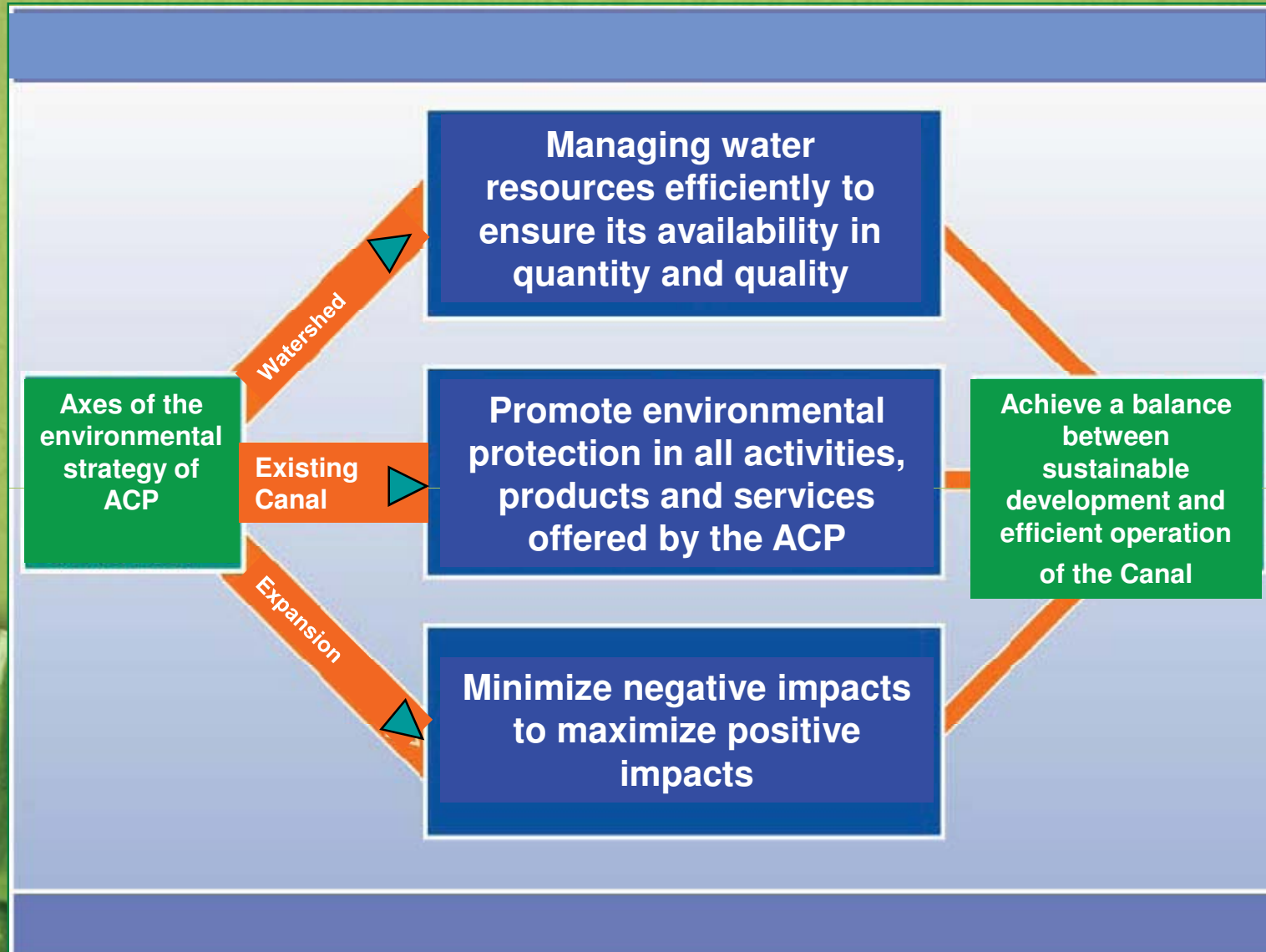
- **Environmental Strategy of ACP**
- **Environmental legislation and regulation**
- **Control and environmental management programs**
- **Inter-institutional Coordination**
- **Socio-environmental activities**
- **Environmental aspects of the Expansion Program**
- **The Green Route Concept**



Environmental Legislation and Regulations



Environmental Strategy of ACP



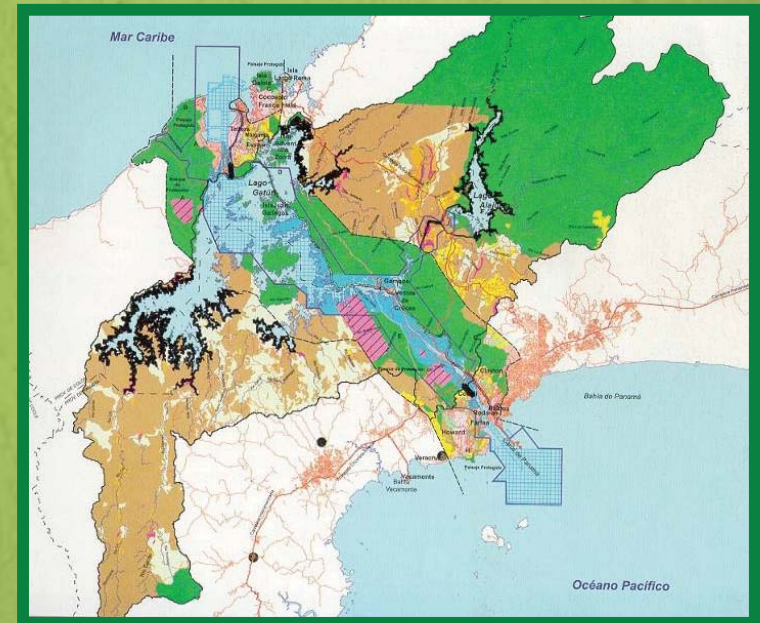
Legal Framework

1/2

Constitution of the
Republic of Panama
Nov. 1994

Law 19
June 1997

ACP Rules
June 1999



By Constitutional directive, the Panama Canal Authority is responsible for the administration, maintenance, use and conservation of the water resources of the Canal watershed

Legal Framework

2/2

Panama Canal Watershed

3,396 square kilometers

Article 316 of the Political Constitution of the Republic of Panama – Title XIV

“The Panama Canal Authority, in coordination with other government agencies, as established by the Law, shall be responsible for the administration, maintenance, use and conservation of the water resources of the Panama Canal watershed, which include the waters of the lakes and their tributary streams”

To accomplish this directive, ACP:

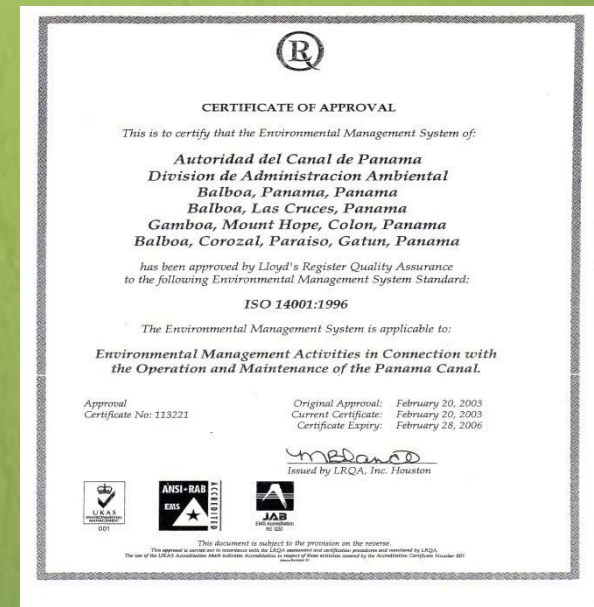


- Establishes actions to conserve the environment in the operational and compatibility areas of the Panama Canal
- Conducts inspections and environmental follow-up to identify and analyze pollution activities
- Develops and communicates legislation and environmental regulations to avoid contamination in areas under ACP responsibility
- Establishes pollution control, prevention and reduction measurements and identifies environmental aspects and impacts in the operations of the Panama Canal

Environmental Management System



Since June 2003 ACP (through the Environment Division) received ISO 14001 Certification , Environmental Management System



Control and Environmental Management Programs



Environmental Inspections Program

Objectives:

- **Operational Areas:** verify the fulfillment of the environmental measures established through the Environmental Adequacy Programs, Environmental Impact Studies and environmental legislation
- **Compatibility areas and watershed :** verify the fulfillment of the Environmental Management Plan and Environmental Management and Adequacy Plans



Energy Savings Program

Objectives:

- Accomplishment of energy savings measures in administrative and operational areas
- Implementation of an awareness campaign and strategy



Materials and Residues Management Program

Objectives:

- **Promote the efficient use of materials**
- **Reduce waste generation**
- **Seek alternatives of resources recuperation through processes like reutilization , recycling, residues commercialization and adequate final disposition**



Air Emissions Control Program

- **Fixed source measuring:
Miraflores Thermoelectric
Plant**
- **Mobile source measuring:
vehicles of ACP fleet**



Corporative Environmental Performance Index

Objective:

Measure the organization efforts in applying good practices, regulations and environmental improvements in order to operate under the concept of clean production (CDM), maintaining an efficient Canal operation and being friendly with the environment



Organization compliance with the environmental legislation (50%)



Investment in the improvement of environmental performance (20%)



Investment on human resources environmental training (30%)

Hydrocarbons Pollution Control and Management of oily water and used oil

- Investigation, response and mitigation of hydrocarbons spills
- Proactive prevention through labor training (annual exercises of hydrocarbons spills)
- Collection of used oil in floating equipment and ACP shops
- Oily water treatment



Sustainable Development and Integrated Watershed Management Plan (SD-IWMP)



Sustainable Development and Integrated Watershed Management Plan (SD-IWMP)

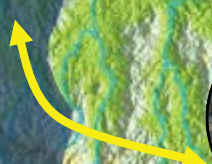


Economic

Environmental

Equilibrium

Social and cultural



Consultation process

Ministers; Congressmen; directors of public institutions;
international, church, community based organizations...



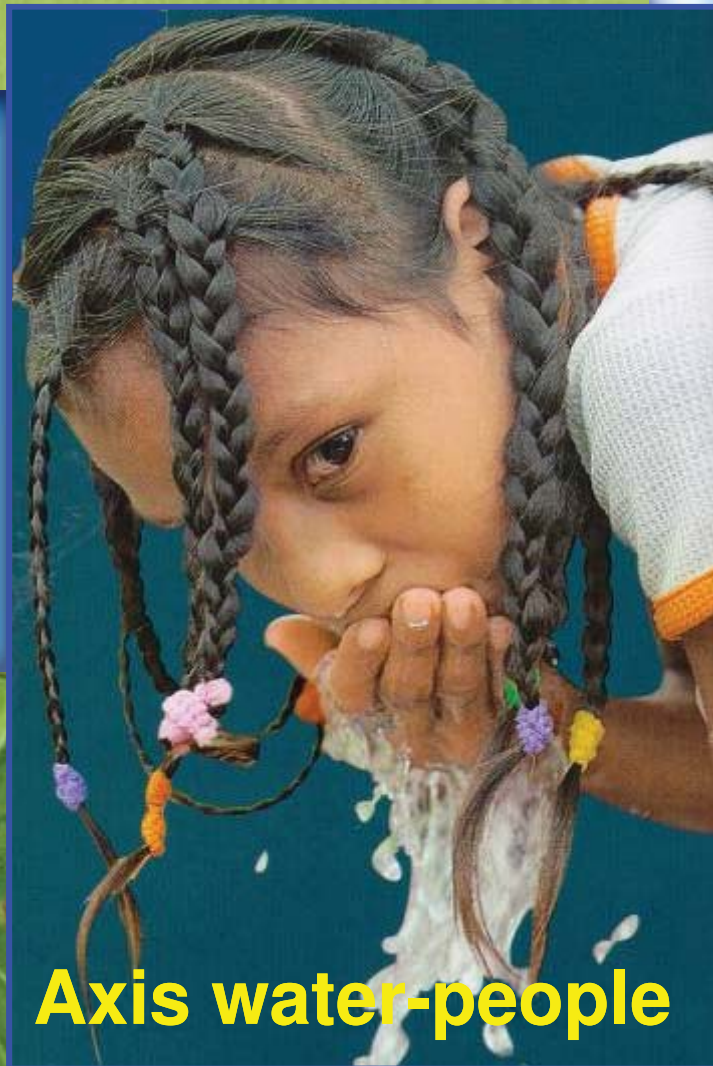
Socio-environmental Management Activities



Socio-environmental Management in the Panama Canal Watershed

Water

- Quantity
- Quality
- Forest coverage
- Land uses



Axis water-people

People

- Uses:
 - Consumption
 - Recreation
 - Economic activities
- Pressure:
 - Discharges
 - Solid waste
 - Deforestation
 - Inappropriate land use
- Effects on population:
 - Resources shortages
 - Diseases
 - Soil loss
 - Competition for use

Water uses

- Potable water
- Navigation
- Energy generation
- Other activities

Hydroelectric generation

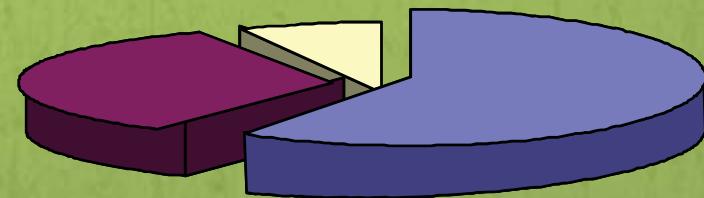
Human consumption

7%

34.7%

58.3%

Locks operations



Community relationships: Creation and strengthening of local committees and Environmental Conservation Work Training Program

Gatún – Gatuncillo
– Agua Sucia y Limón

Chagres - Alahuela

Chilibre - Chilibrillo

Los Hules Tinajones
y
Caño Quebrado

Pescado – Baila Mono
– Cañito y Paja

Cirí y Trinidad



Monitoring Water Quality and Quantity



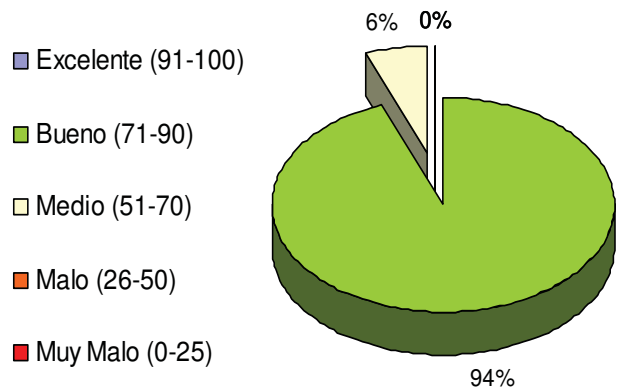
- Collect data on water quality on the watershed
- Ensuring the highest quality water supply for the population, human activities and operations of the Canal

Analysis conducted:

Conductivity, biochemical oxygen demand
 Temperature, Nitrates
 Dissolved oxygen Nitrites
 Total coliforms and fecal, pH
 Turbidity, Alkalinity
 Chlorides, Sulfates
 Total dissolved solids, Calcium
 Magnesium, total suspended solids
 Potassium, Sediments
 Sodium Phosphates

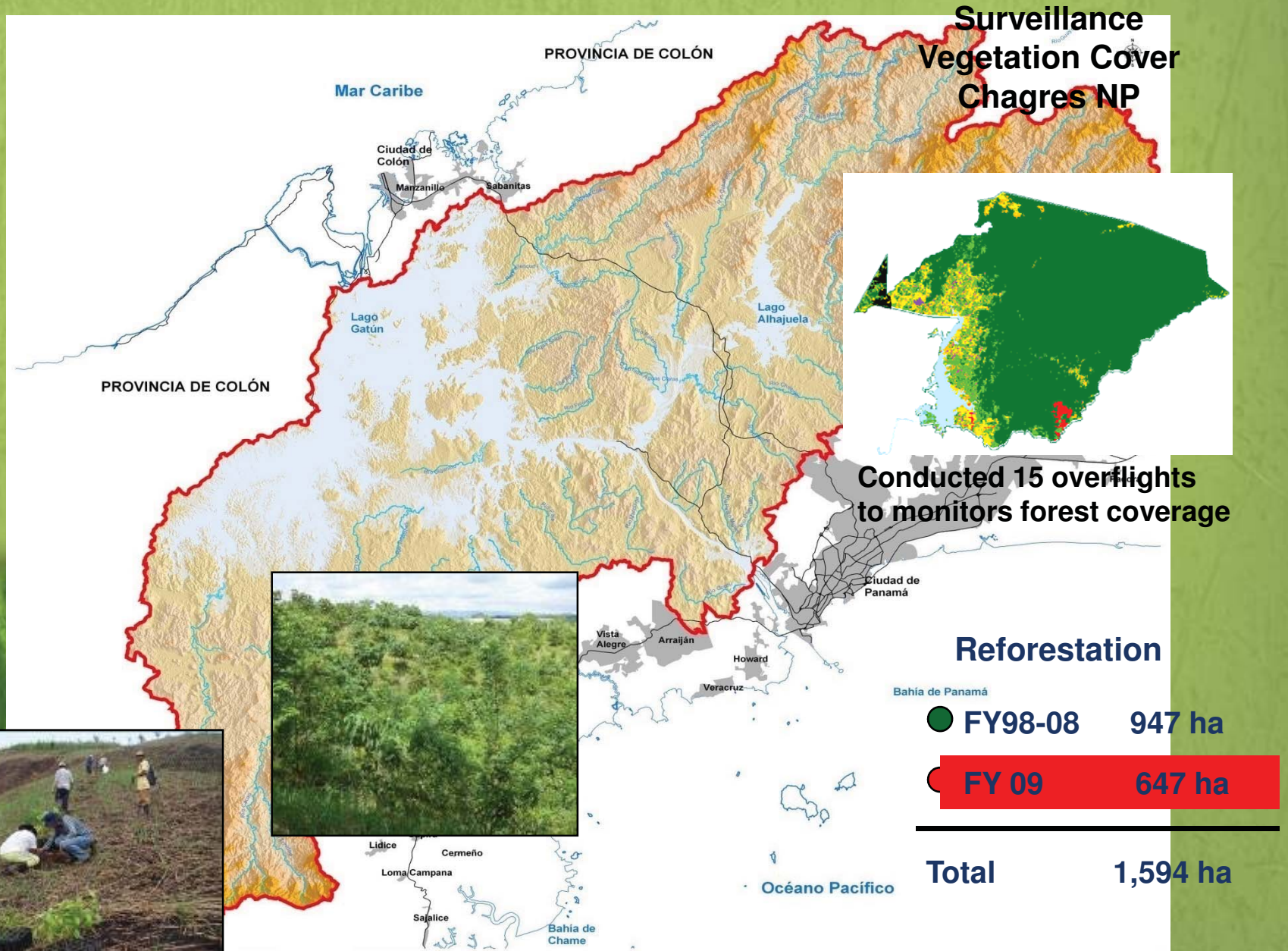


Índice de Calidad de Agua en la Subcuenca de Gatuncillo, 2008



62 sampling points for water quality

Remote Monitoring and GIS



Environmental Education



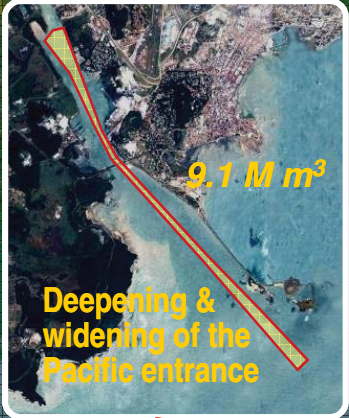
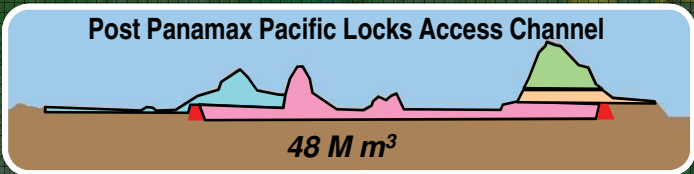
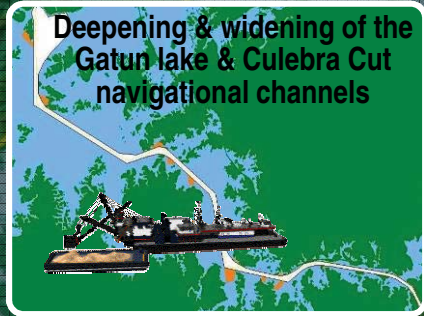
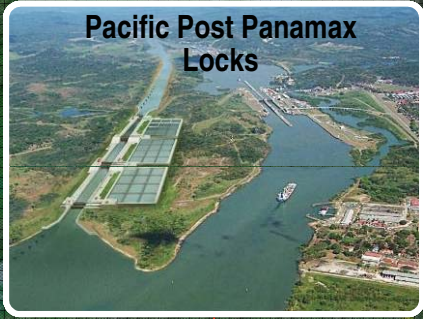
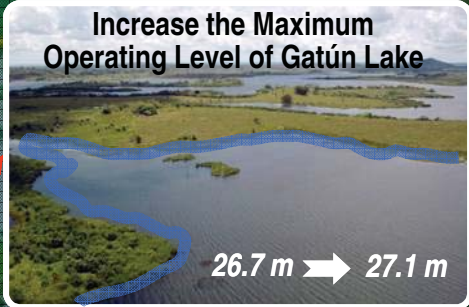
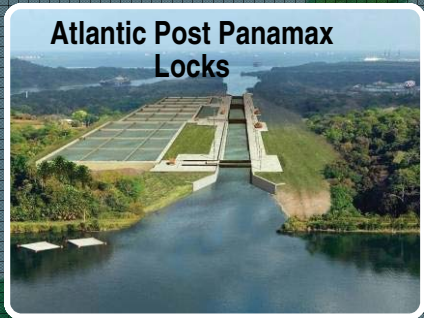
- Environmental Education Program in Public Schools in the Panama Canal Watershed
- Watershed Guardians - to sensitize teachers and students of the watershed for the conservation of water resources
- Our Canal and its watershed - Promotes a culture of entrepreneurship and responsible use of natural resources
- The 3R Campaign: Reduce, Reuse and Recycle, to encourage savings, optimal use, reuse and proper disposal of materials



Environmental Management of the Expansion Program

Expansion Program Components

Atlantic Ocean



Pacific Ocean

Environmental Assessment Process

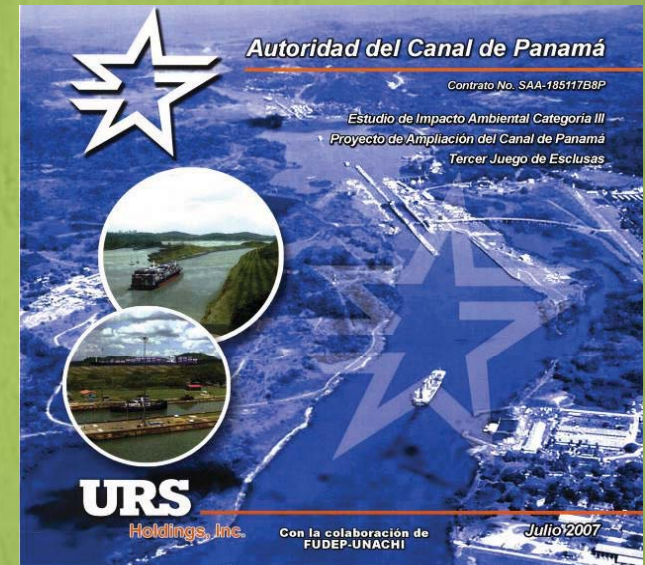
ENVIRONMENTAL STANDARDS

Environmental conditions:

- Environmental Impact Studies and Enforcing Resolutions
- Panamanian Laws and Regulations
- ACP Standards
- Multilateral Development Banks Requirements

Environmental and Health & Safety Aspects Addressed:

- Noise and Vibrations
- Air Quality
- Water Management
- Awareness Training
- Solid and Hazardous Waste Management
- Erosion and Sedimentation Control
- Wildlife Rescue
- Occupational Health and Industrial Hygiene
- Cultural Resources Protection
- Public Participation



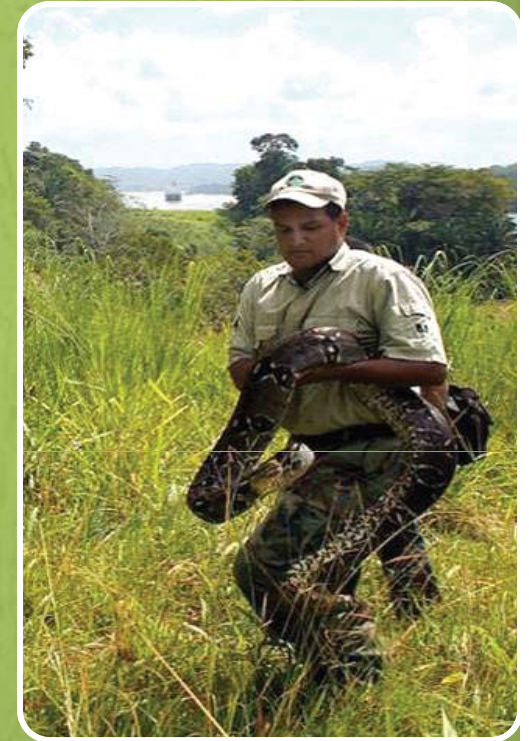
Wildlife Rescue and Ecological Compensation

Wildlife Rescue

- mammals
- reptiles
- amphibians

Reforestation Program 2008-2010:
665 Hectares

Ecological Compensation: a
total of 2,988,147.00 US \$
has been paid in concept
of ecological compensation



Cultural Resources

Contract with Smithsonian Tropical Research Institute for:

- Paleontological research and rescue
- Reconstruction of plant and animal diversity
- Oceanic and climatic model addressing variations due to the rise of the Isthmus
- Detailed Geological Map
- Stratigraphy and structural model of the Canal and tectonic evolution of the Isthmus
- Geological dating of units of interest



PAC-1

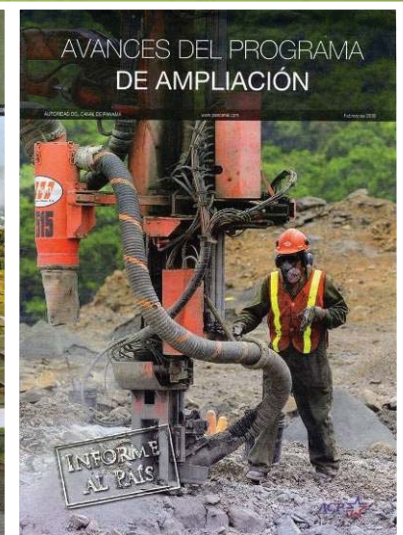
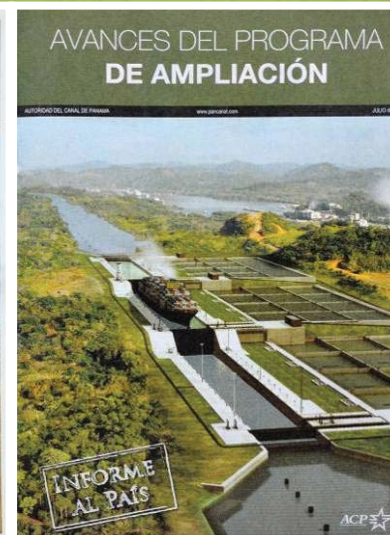
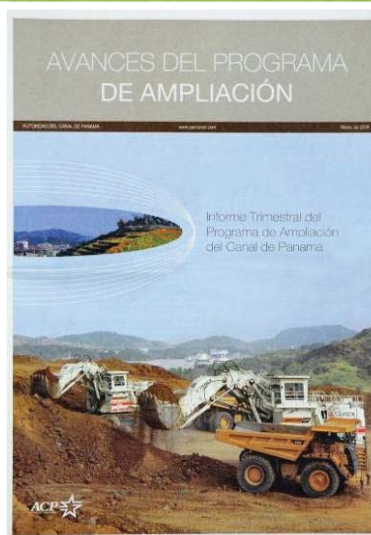
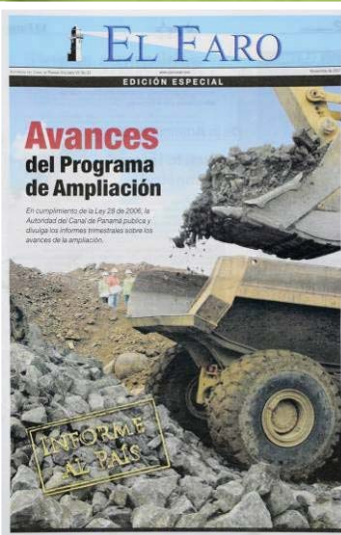


Progress Reports on the Expansion Program



**TU CANAL,
AL DÍA**

Vea la Programación por TV



*Works are carefully planned, evaluated and executed to **prevent, minimize, and mitigate** adverse impacts and improve environmental performance*



The “Green Route” Concept

Positioning the Panama Canal as the Maritime

“Green Route” of the World



Components of the Green Route Concept

The socio environmental commitment of ACP in the Panama Canal watershed



The reductions of CO₂ emissions in the planet, as a result of the Panama Canal route



Establish ACP as a carbon neutral organization



The socio environmental commitment

Objective:

Protect and conserve the water resources of the Panama Canal Watershed, both in quantity and quality, for the operation of the Panama Canal and to provide potable water to the population



Components:

- The protection of the existing forest cover and the promotion of sustainable land use
- The reconversion of degraded areas
- The inclusion of activities of commercial reforestation



Component	Scheme	Sub-scheme	Activity	Area (hectares)
Protection	Forest conservation		Conservation	11,000
	Regeneration		Conservation	2,000
Sub total				13,000
Reforestation and agroforestry	Agroforestry plantations	Agroforestry	Conservation	1,290
		Silvopastoral	Conservation	1,232
	Forest plantations		Commercial	1,500
		Continuous areas	Conservation	2,485
		Enrichment	Conservation	493
Sub total				7,000
Total				20,000

Land use management in farms Panama Canal Watershed

Regeneration

Crops

Live fences

Reforestation

Cattle raising

Live fences

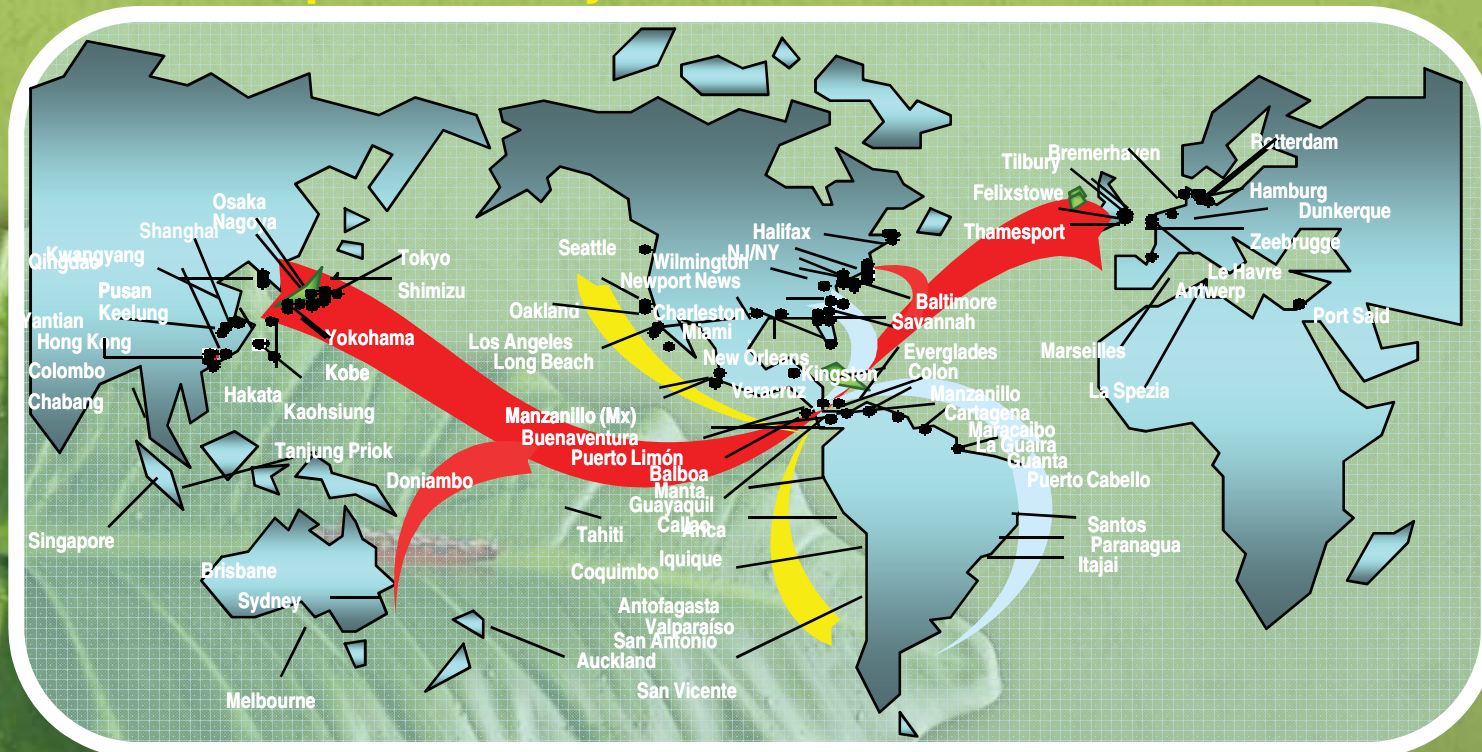
Live fences



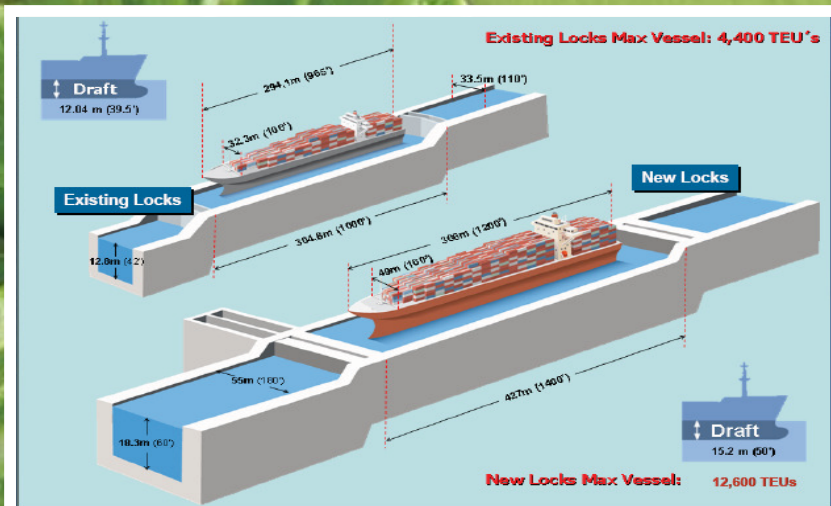
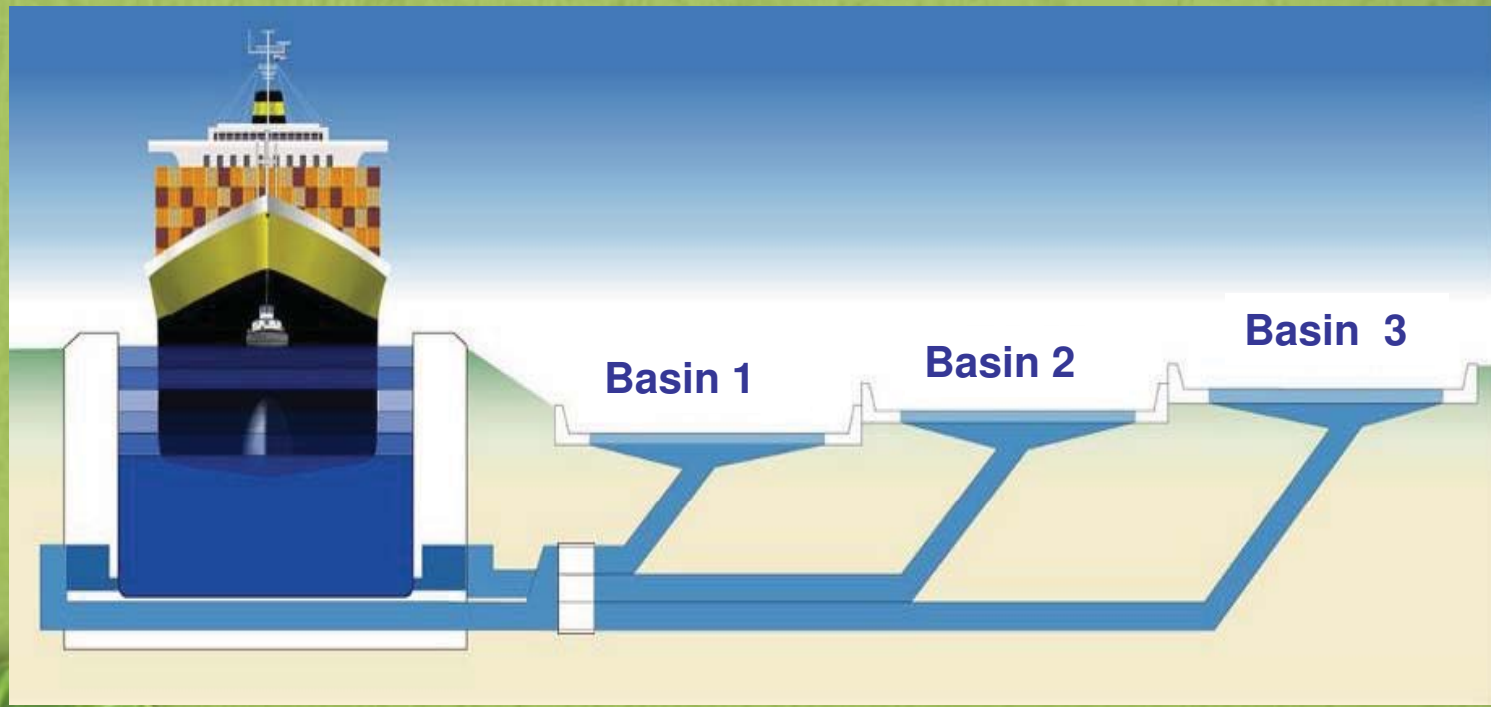
Mitigation of global CO₂ emissions by the Panama Canal route

The Panama route enhances environmental contribution by reducing GHG emissions on the planet:

- More efficient transport, reducing fuel consumption per cargo unit
- All-water route causes fewer emissions than other routes that combine transportation by land



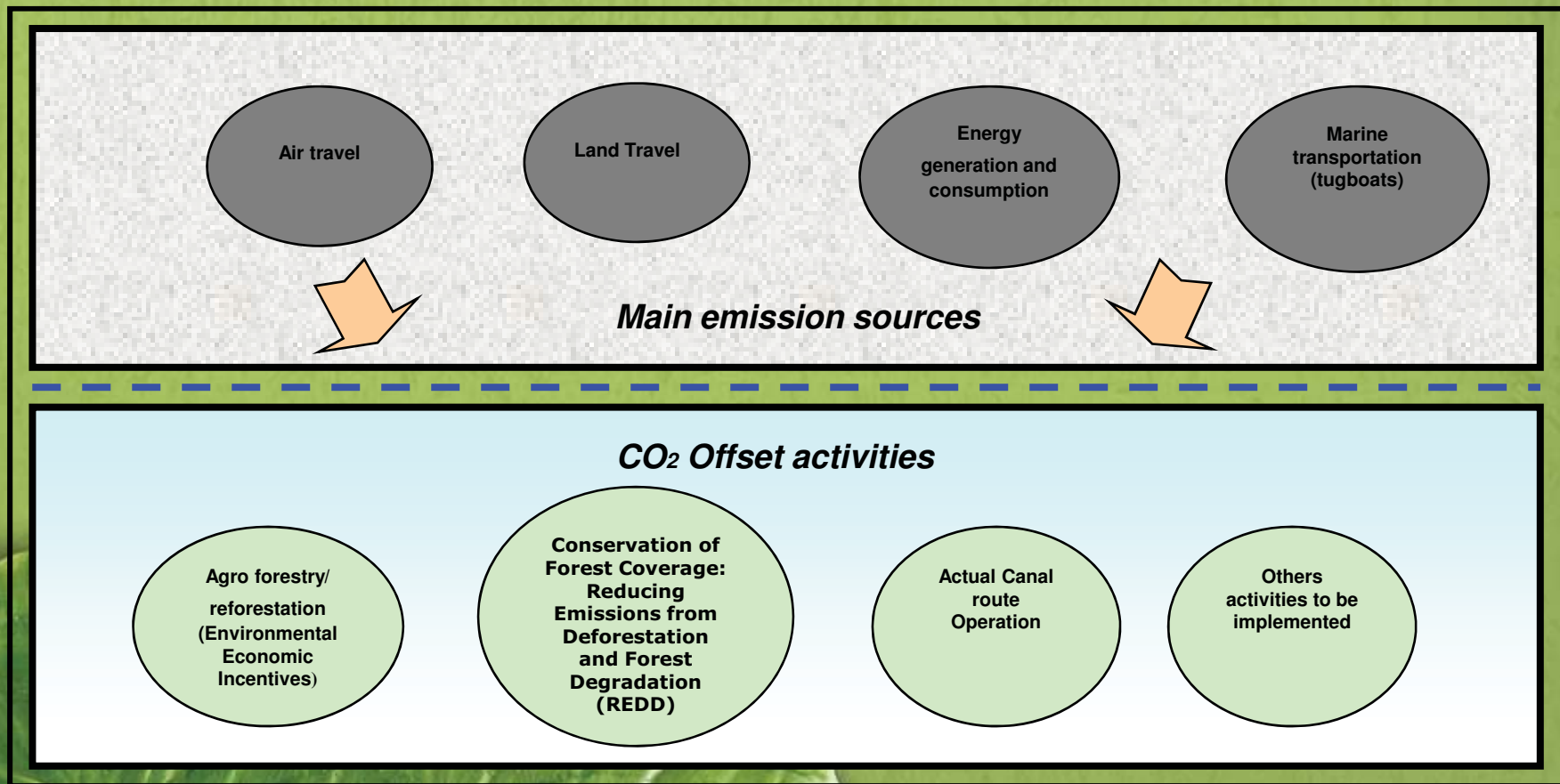
Adaptation to the Climate Change



The Panama Canal Expansion project is an adaptation model for the climate change

- With the new water saving basin system, the new locks will utilize 7% less water than the existing locks
- 60% of the water is reutilized in each transit
- It will not require new reservoirs for the operation of the new locks

Establish ACP as a carbon neutral organization



The ACP seeks to become a carbon neutral organization to fulfill its vision of being global leader in services for the maritime industry and sustainable development for the conservation of the Panama Canal Watershed

The Panama Canal in World Maritime Industry

- **A leader in the World Merchant Fleet: World's largest shipping registry**
- **One of ten Council IMO Members with the largest interest in providing international shipping services**
- **Maritime services to 6% of World Commerce**
- **Panama Canal offers high standards of efficiency, safety and reliability**
- **Panama is a Hub for global shipping and trade**



Panama Canal challenges

- Growth in transit demand and the maritime industry trend toward the deployment of larger vessels
- Prevent saturation point to be reached, avoiding diversion of traffic to potentially longer alternative routes
- To continue offering the safest and cost and time effective service for the World's commerce
- Remain a World leader in sustainable development and ensure its operations comply with highest environmental standards



The Green Route

- The ACP has developed an innovative strategy to face the environmental challenges associated with the Panama Canal Expansion, the promotion of sustainable development activities in the Panama Canal Watershed and the reduction of emissions in the worldwide shipping industry
- The Panama Canal Expansion Project will provide benefits to the international shipping industry, in terms of time and cost, as well as the CO₂ emissions reductions in the planet
- The all water route of the Panama Canal, with the sustainable management of its watershed, has been established as the Green Route of the world maritime commerce



Thanks for your attention

