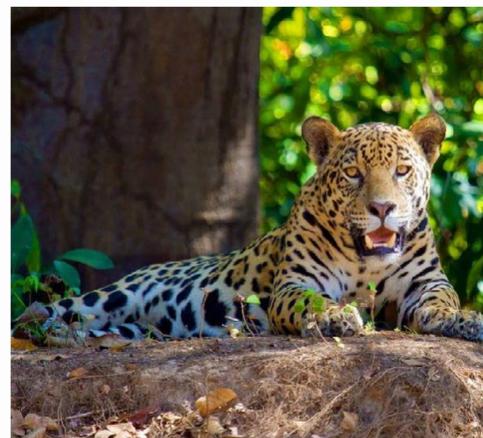
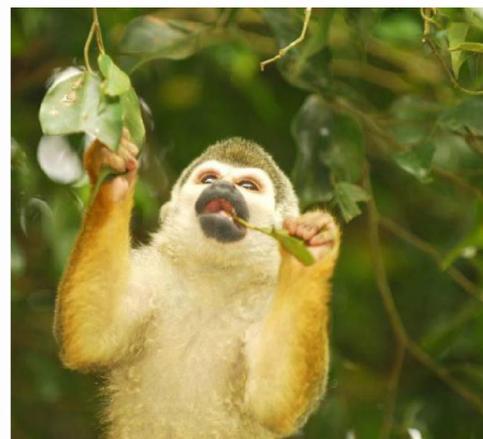


**WATER INFORMATION SYSTEMS
GOVERNANCE AND THE INTEREST OF
REMOTE SENSING**

**FOR AN INFORMED WATER RESOURCES
MANAGEMENT AT NATIONAL AND BASIN
LEVELS**

**MARIA ALEXANDRA MOREIRA
Secretary-General**

15th of September 2020





BOLIVIA



BRASIL



COLOMBIA



ECUADOR



GUYANA



PERÚ



SURINAM



VENEZUELA



"Considering the importance and multiplicity of functions that the Amazonian rivers perform in the process of economic and social development of the region, the Contracting Parties shall make efforts with a view to the rational use of water resources." (Art. V, ACT)

1978

The Amazon Cooperation Treaty (ACT) was signed on July 3, 1978

1998

The Amazon Cooperation Treaty Organization (ACTO) was born in 1998

2002

The Permanent Secretariat headquarters of ACTO was inaugurated in 2002 in Brasilia, Brazil

THE AMAZON REGION

WATER RESOURCES

Regional and global water reserves
Regulates the climate of the planet and of the region (carbon absorption and evapotranspiration processes)

POPULATION AND ECONOMY

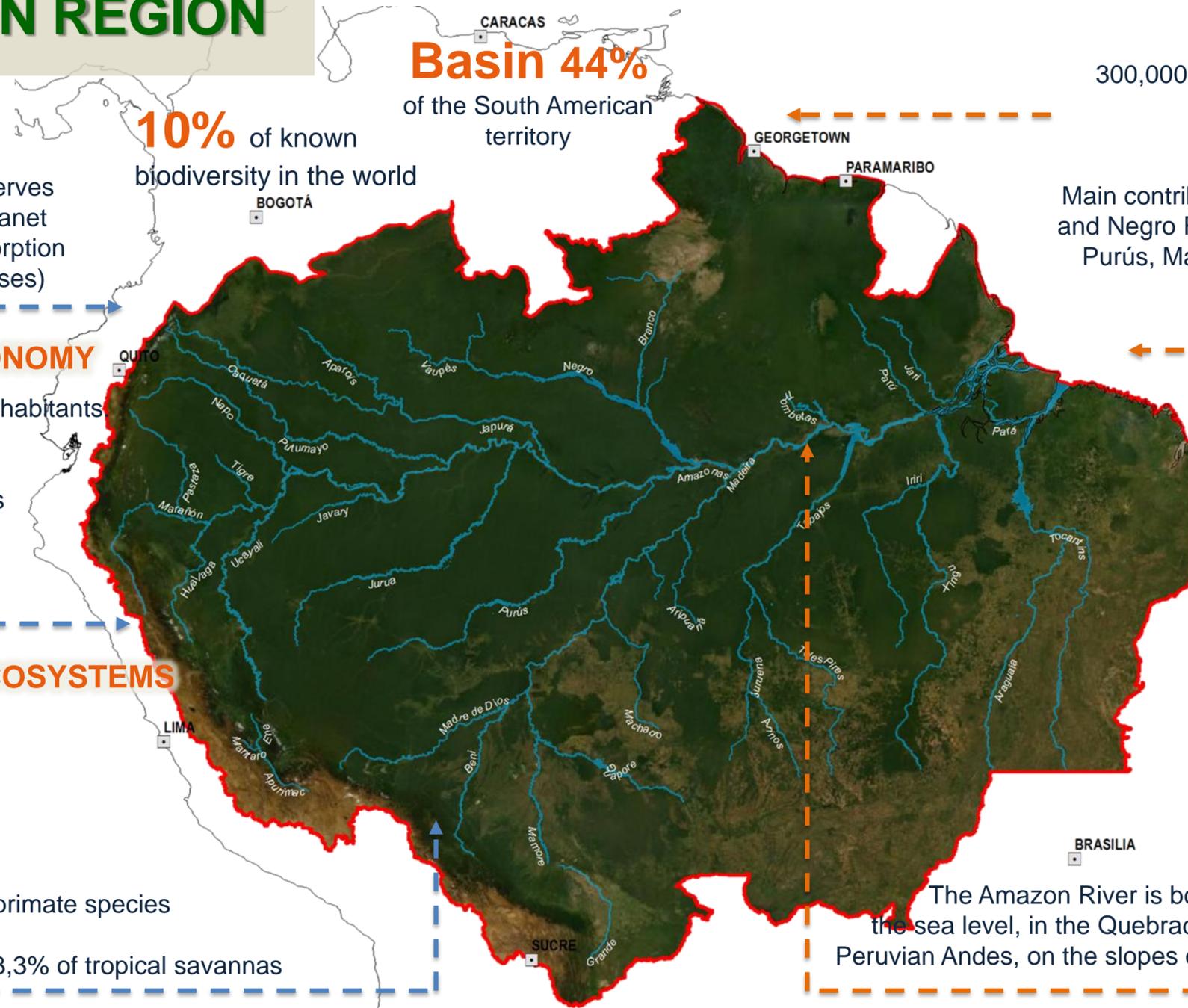
Amazon Basin: 40 million of inhabitants (approx)
420 indigenous peoples
86 languages and 650 dialects
53% of agricultural activities
31% of trade
16% of manufacture

BIODIVERSITY AND ECOSYSTEMS

Endemic species:
30.000 plant species
3.000 fish species
384 amphibian species
550 reptile species
950 bird species
350 mammal species and 57 primate species

Ecosystems

67,4% of tropical forest and 13,3% of tropical savannas



Basin 44%

of the South American territory

10% of known biodiversity in the world

HYDROGRAPHY

Output flow: 220,000 to 300,000 m³/s in the rainy season.

Length: 6,992 km

Hydrographic basin area: 6,118,000 km²

Main contributors: Putumayo, Japurá and Negro River (north slope), Juruá, Purús, Madeira, Tapajós and Xingú (south slope).

HYDROCLIMATIC THREATS

50% by floods
19% by drought
14% by landslides
11% by alluvium
4% by forest fires
2% by torrential flow of water
0,3% by water deficit and mud flows

It is the most voluminous and longest river on the planet.

The Amazon River is born at 5,597 meters above the sea level, in the Quebrada de Apacheta, Arequipa, Peruvian Andes, on the slopes of the Quehuisha volcano.

STRATEGIC ACTIONS FOR INTEGRATED WATER RESOURCES MANAGEMENT

Transboundary Diagnostic Analysis (TDA)

VISION

"Water resources are strategic for the equitable and sustainable development of the peoples of the Amazon River basin. These resources are subjects of protection and conservation for their multiple use in order to improve the quality of life of present and future generations, respecting the ethnic and cultural diversity and the sovereignty of the Member Countries. The integrated management of water resources is made feasible with participatory management, the exchange of information, research, the implementation of adaptation actions to variability and climate change, through regional cooperation and the support of an adequate institutional framework " .

TRANSBOUNDARY PROBLEMS

- Water pollution.
- Deforestation.
- Loss of biodiversity.
- Extreme hydroclimatic events.
- Erosion, sediment transport and sedimentation.
- Land use change.
- Loss of glaciers.
- Large infrastructure development.
- Weaknesses on integrated water resources management.

STRATEGIC ACTIONS

- Strengthening the capacities of key stakeholders in the Basin.
- Strengthening of water resources management.
- Legal framework of water resources management.
- Adaptation to extreme hydroclimatic events.
- Information and knowledge management of water resources.
- Public policies, communication, promotion and dissemination.

REGIONAL FRAMEWORK FOR THE MANAGEMENT OF HYDRIC RESOURCES

ECOSYSTEM KNOWLEDGE

GOVERNANCE STRUCTURE

REGIONAL MANAGEMENT

DEMONSTRATIVE ACTIONS

REGIONAL MONITORING

SUPERFICIAL WATER

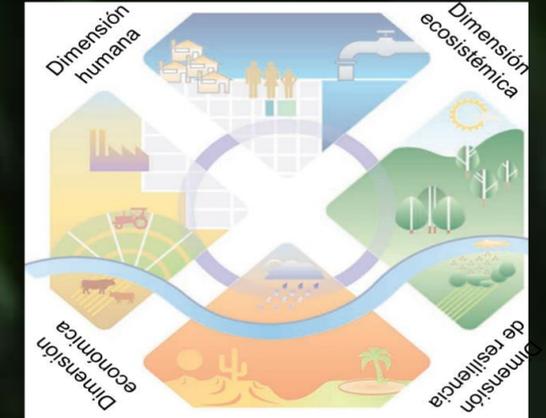
Multisector model Nexus for the Amazon Basin (ACTO and IDB)

Multisector systemic analysis of the Amazon Basin

Technical cooperation (ACTO and IDB)

Analysis of water availability for the provision of basic services

Strategic plan for the provision of drinking water, basic sanitation and solid waste



Second phase Amazon Project: Regional Action in the Area of Hydric Resources (ACTO and ANA-Brazil)

Regional following-up to the SDG 6 and 13. Study of the water quality in the Amazon Basin.

Formulation of protocols for the exchange of information on water quantity and quality

Constitution of the Amazon Hydrological Network (AHN) and the Regional Water Quality Monitoring Network (RWQMN)

Project for the Implementation of the Strategic Action Program – SAP (ACTO, UNEP, GEF)

Regional permanent mechanism for the coordination of IWRM
Coordination with countries' National Water agencies

Methodologies, standards and good practices.
Technical guidelines and norms for the water use

Nature based solutions, climate change adaptation, and early monitoring alerts

Strengthening of the AHN, RWQMN and development of the Erosion, Transport and Sediments Monitoring Network (ETSMN)

Project for the Environmental Protection of the Groundwater of the Sedimentary Aquifers of the Amazon Region (search of finance)

Estudios científicos y mapeo del acuífero

Directrices técnicas para la gestión de las aguas subterráneas y perforación de pozos

Proyectos piloto del ámbito municipal y transfronterizo

Red de monitoreo de aguas subterráneas

GROUNDWATER

DEVELOPMENT OF MONITORING NETWORKS OF THE AMAZON BASIN

1) AMAZON HYDROLOGICAL NETWORK - AHN

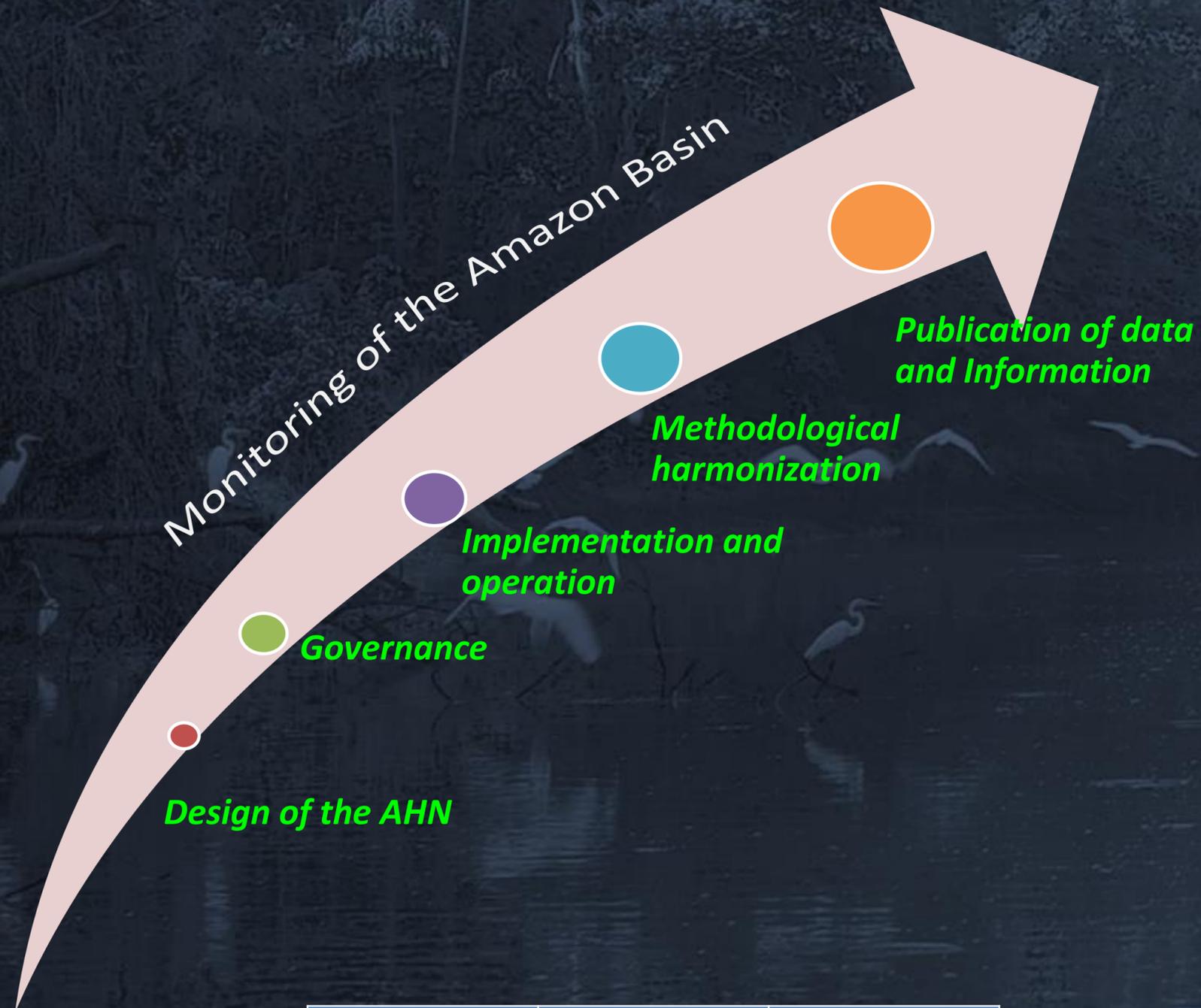
2) REGIONAL WATER QUALITY MONITORING NETWORK (RWQMN)

3) EROSION, TRANSPORT AND SEDIMENTATION MONITORING NETWORK (ETSMN)

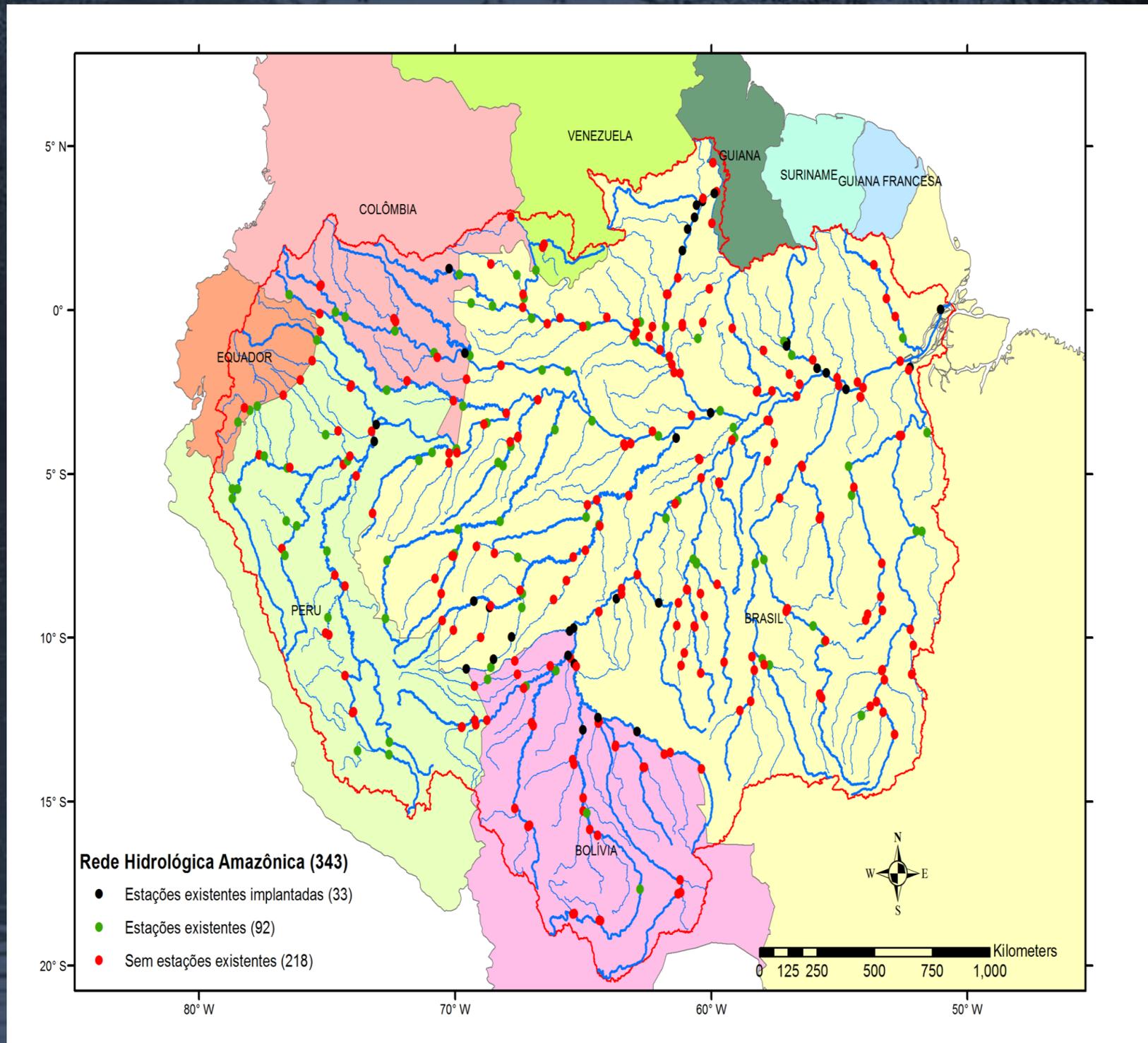
OUTCOMES

- **Integrated monitoring (hydrological network and water quality).**
- **Access to regional information.**
- **Strengthen the technical and technological capacity of the countries' institutions (e.g. inter-calibration of laboratories).**
- **Regional protocols for the exchange of information.**
- **Regional system with harmonized samples and analysis methods.**
- **Dissemination of knowledge about the Amazonian reality.**
- **Technical training actions in water resources.**
- **Pilot actions in some countries.**
- **Strengthen international cooperation among countries of the Basin.**
- **Supports compliance with international commitments.**

DESIGN OF THE AMAZON HYDROLOGICAL NETWORK - AHN



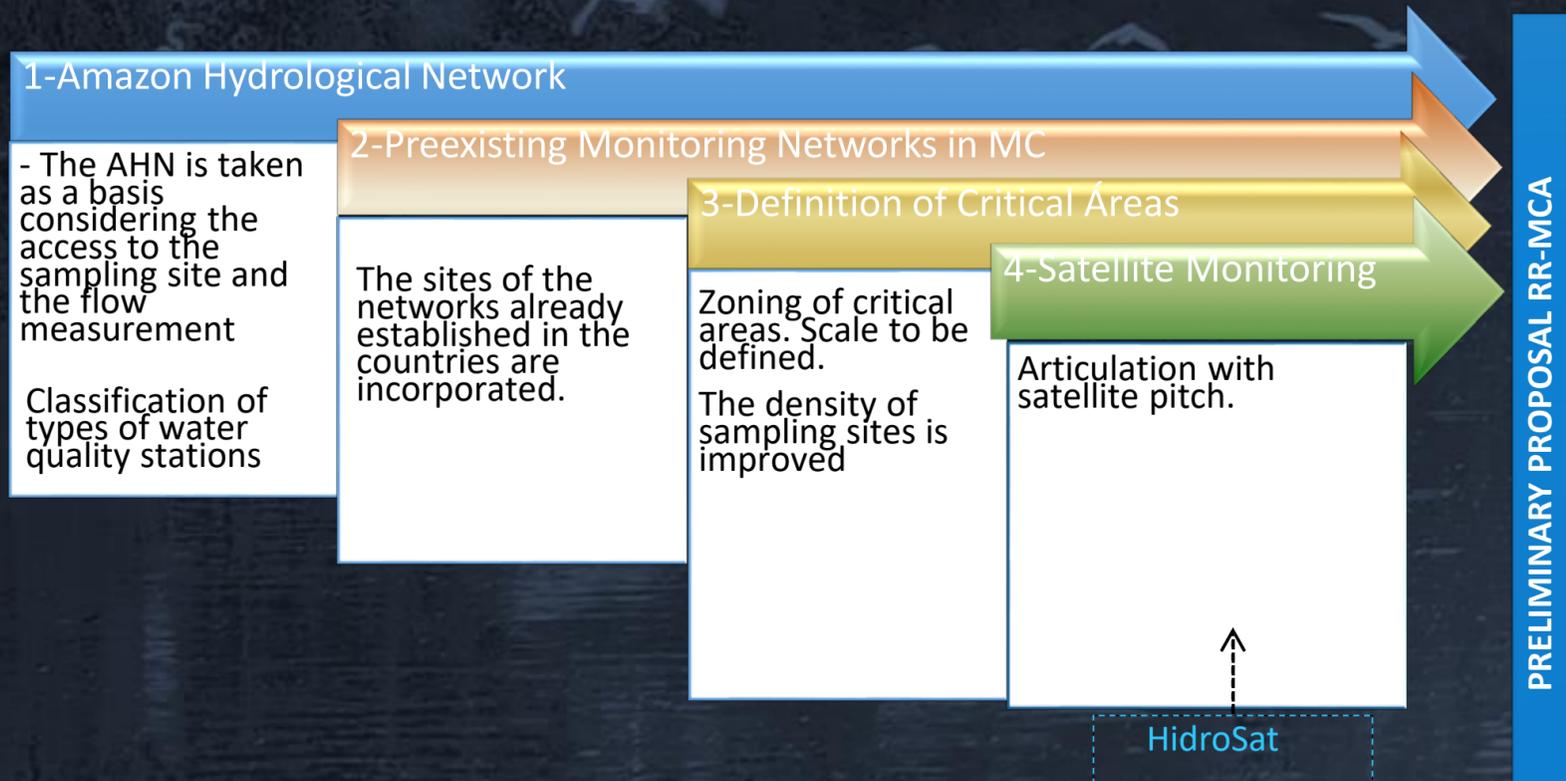
Phase 1	Phase 2	Total
125	218	343



REGIONAL WATER QUALITY MONITORING NETWORK (RWQMN)

GENERAL OBJECTIVE
 Generate standardized and comparable base information

Approach for the location of the Sampling Sites



➔ Use of different typologies of stations or sampling sites, namely:

Border: pollutant loads in areas of change of domain / country

Reference / Target/ Baseline: natural characteristic

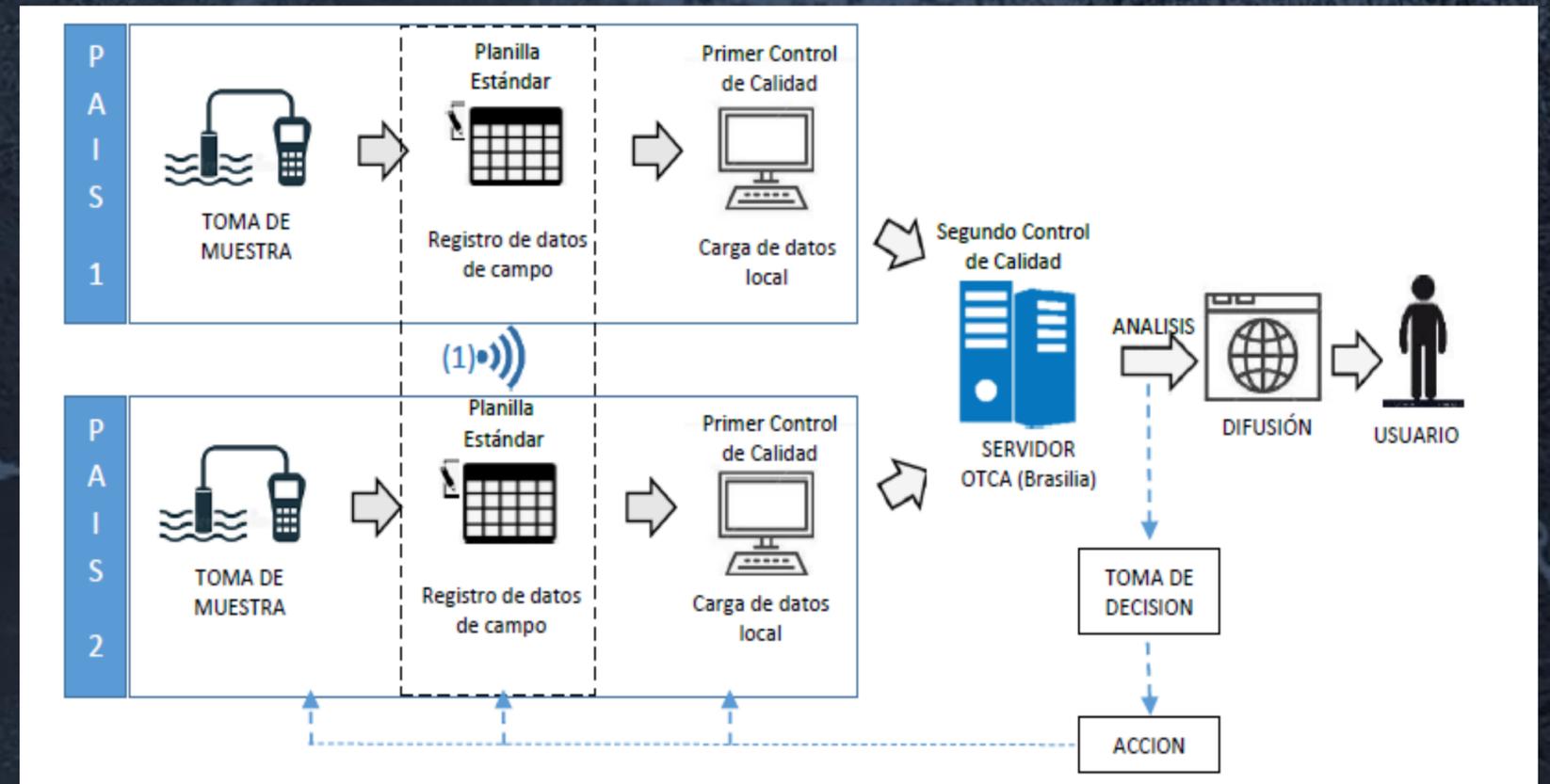
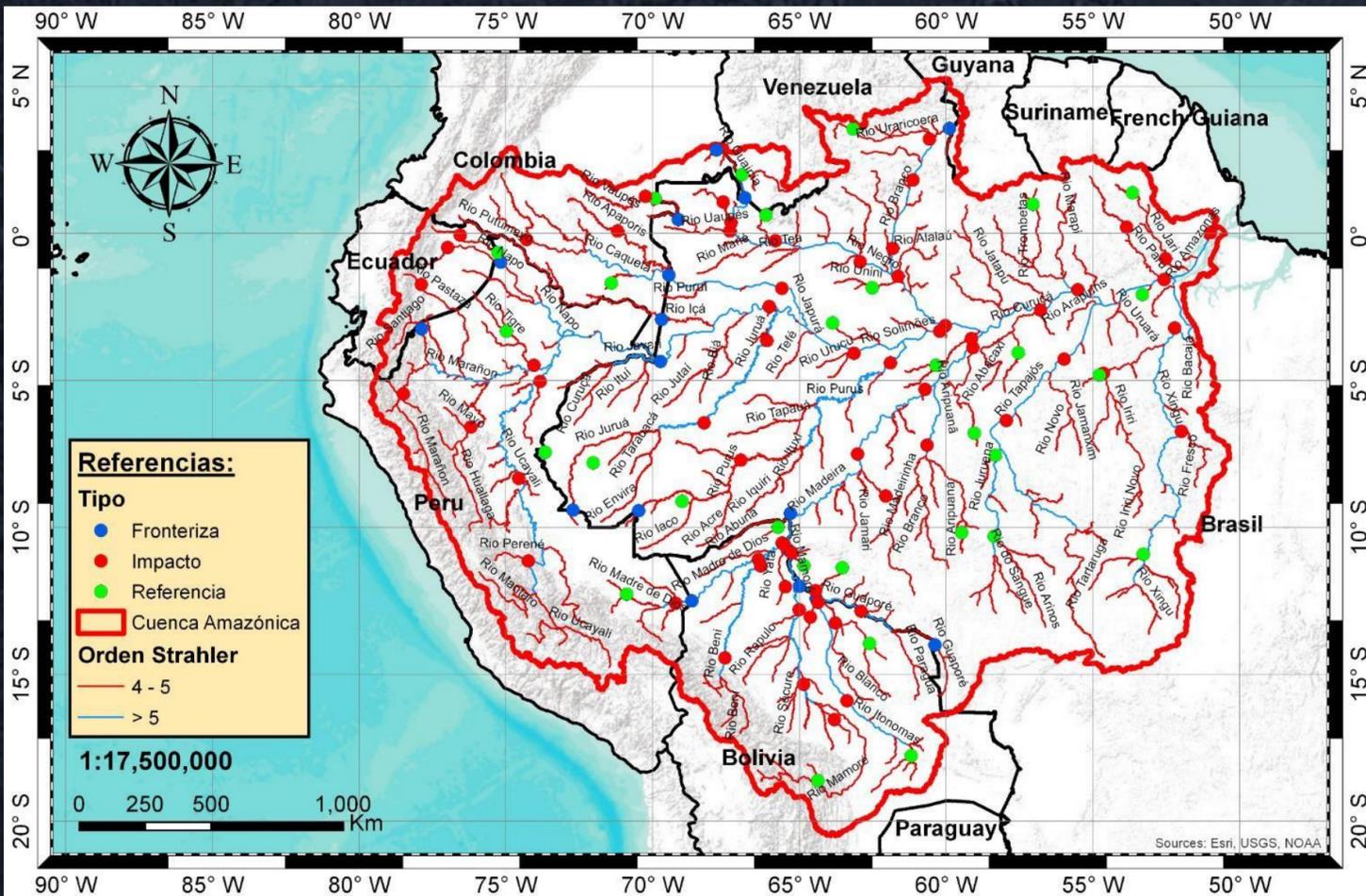
Impact: occurrence of failure to identify critical and priority regional pollution problems.

- ➔ Priority use of hydrometric stations of the Amazon Hydrological Network (AHN)
- ➔ Priority use of existing Water Quality stations in each country.
- ➔ Representativeness of monitoring sites based on the interests of the region.
- ➔ Possibility of access to the monitoring site.
- ➔ Measurement of basic field parameters (first phase).

PROPOSAL FOR A REGIONAL WATER QUALITY MONITORING NETWORK (RWQMN)

Monitoring stations proposal

GENERAL DIAGRAM OF THE DATA FLOW:



IMPLEMENTATION PROPOSAL

Reference	Impact	Border	Total
30	64	17	111

	Fase 0 DISEÑO	Fase 1 IMPLEMENTACION & ARMONIZACION	Fase 2 EXPANSION 1	EXPANSION 2
OBJETIVO	Definir Objetivo RR-MCA	Armonizar Actividades desde toma de muestra hasta información de resultados.	Extender Alcances de la RR-MCA.	Extender Alcances de la RR-MCA
ACTIVIDADES	<p>Consenso sobre:</p> <ul style="list-style-type: none"> • Sitios de Monitoreo: 111. • Parámetros: pH, CE, OD, Ta, SDT, Tur, NOT, PO4. • Frecuencia: semestral. • Logística: estandarización metodológica. • Financiamiento. • Acceso y Publicación de Datos. 	<ul style="list-style-type: none"> • Adquisición de equipamiento. • Identificación en campo de nuevos sitios de monitoreo. • Realización de Actividades de Capacitación • Estandarización protocolo de monitoreo y reporte de datos. 	<ul style="list-style-type: none"> • Incremento de parámetros de calidad medidos: Coliformes, DQO, DBOs, Clorofila-a, metales pesados, etc. • Incremento de sitios de monitoreo. • Incremento de frecuencia. 	<p>Evaluar la posibilidad de extender el análisis a diferentes compartimentos del cuerpo de agua:</p> <ul style="list-style-type: none"> • Sedimento • Biota • Uso de Indicadores biológicos

EROSION, SEDIMENT TRANSPORT AND SEDIMENTATION MONITORING NETWORK (ETSMN)

OUTCOMES:

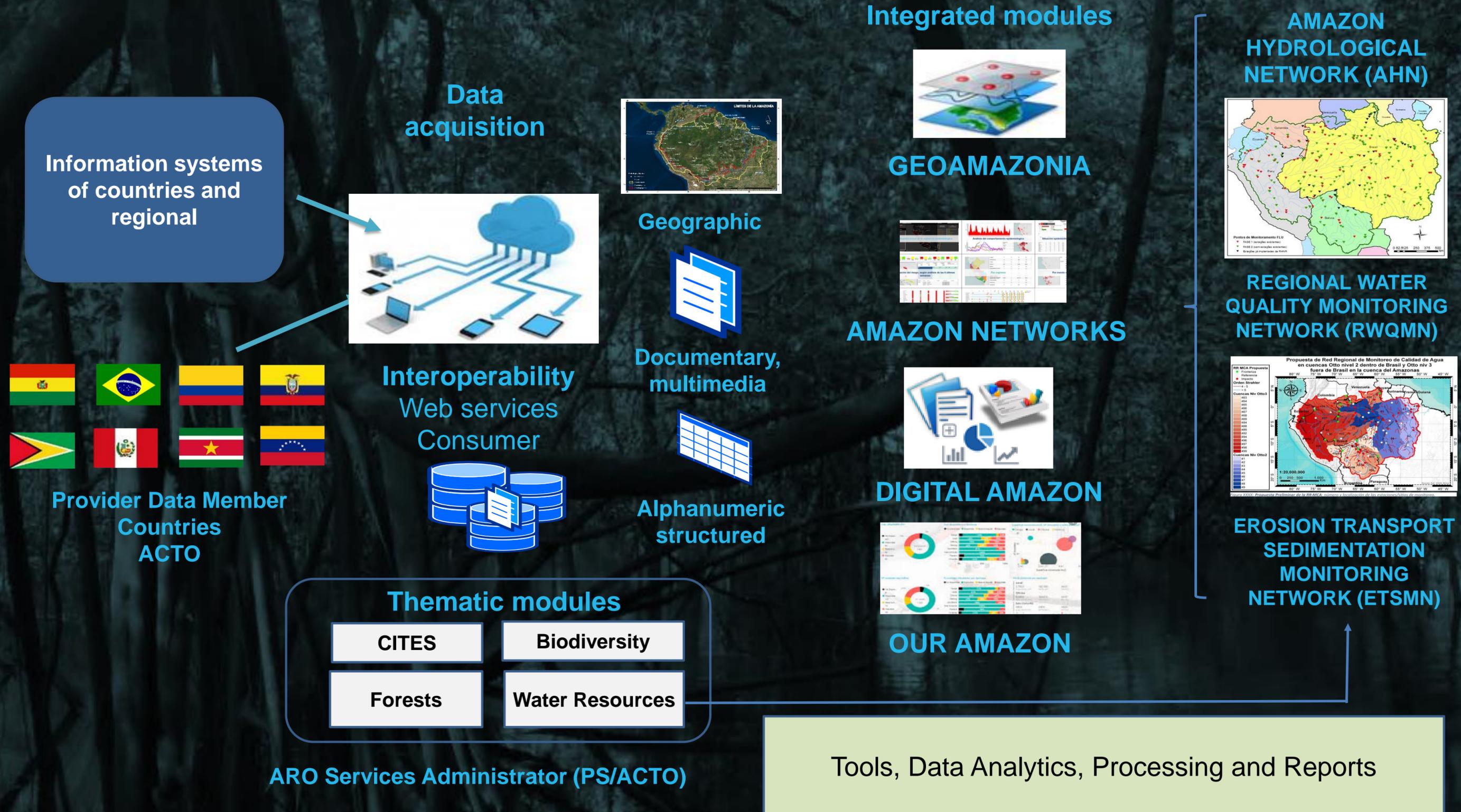
- 1) Baseline and monitoring of the current state of impacts of ETS in the Amazon Basin.
- 2) Identifying ETS hotspots.
- 3) Generation of an integrated satellite system with a coverage of approximately 800,000 km² of the Basin.

ACTIONS:

- Common protocol to implement and validate satellite data for access to a regional scale, available in the Amazon Regional Observatory-ARO (base - available methodologies - MC experiences - HidroSat - IRD)
- Definition and location of ground stations to generate and validate collected data.
- Technical training at the operational level in satellite monitoring.
- Agreed execution actions with priorities (short, medium and long term).



AMAZON REGIONAL OBSERVATORY - ARO





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