



Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin Considering Climate Variability and Change

Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela

GEF AMAZON PROJECT

ACTO/UNEP/GEF

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BACKGROUND

“CONVINCED that this Treaty represents the beginning of a process of cooperation which shall benefit their respective countries and the Amazon region as a whole...”

So ends the preamble of the Amazon Cooperation Treaty (ACT) signed on 3 July 1978 by representatives of Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela to begin the coordination and cooperation process that celebrated 35 years in force in 2013. Throughout its history, the ACT has been developing mechanisms to consolidate and institutionalize the common vision that motivates its Member Countries.

In 1998, the countries decided to take one more step in this joint process by establishing the Amazon Cooperation Treaty Organization (ACTO) and its Permanent Secretariat (PS). Within the framework of these efforts and challenges, on 13 December 2002 the ACTO Headquarters were inaugurated in Brasilia, Brazil, where its PS functions.

ACTO is an international organization that has the Meeting of Ministers of Foreign Affairs as its highest body, supported and assisted by the Amazon Cooperation Council (ACC) and by the Coordinating Commission of the Amazon Cooperation Council (CCOOR). At the national level, the Member Countries have Permanent National Commissions (PNC) responsible for applying the provisions of the Treaty, executing projects and programs and implementing the decisions adopted by the ACC and by the meetings of Foreign Ministers. Presided by the Ministries of Foreign Affairs, the PNCs bring together all the entities responsible for Amazonian cooperation and development in their respective territories.

In November 2009, the Heads of State of the Member Countries issued a Declaration on ACTO with the mandate to endow the Organization with “a new and modern role as a cooperation, exchange, knowledge and joint projection forum to face the new and complex international challenges that lie ahead”. In this context, they instructed the Ministers of Foreign Affairs to “... prepare a new Strategic Agenda for ACTO for the short, medium and long terms, including regional actions to support the national initiatives with a view to

strengthening the cooperation process.”

This mandate took into account the wealth of change taking place in the national and regional realities of the Member Countries. Profound transformations in the international, regional and local agenda led to the construction of a new vision, adapted to the challenges of the current context, to build unity while respecting diversity and preserving the common Amazonian heritage.

Consequently, and following extensive consultations, regional sectoral dialogue and information gathering processes in the Member Countries, in the framework of the 2004-2012 Strategic Plan review the Ministers of Foreign Affairs in their 10th meeting approved the new Amazonian Strategic Cooperation Agenda with an 8-year implementation horizon.

This agenda incorporates a crosscutting and multisectoral approach in all its programs, projects and activities to respond to the Member Countries’ concerns and requirements and to the mandates of the ACT. Thanks to the adjustment and revision mechanisms provided for its implementation, the Agenda is a guiding, flexible and adaptable tool capable of adequately reflecting all these common interests.

The New Strategic Agenda presents ACTO’s vision, mission and strategic objectives building upon two crosscutting axes (conservation and sustainable use of renewable natural resources and socioeconomic development). It establishes the Permanent Secretariat’s role and action guidelines, ACTO’s own project cycle, the institutional structure through which to manage the agenda and the various funding modalities considered.

The agenda adopts a thematic approach that reflects the different areas of the ACT: forests; water resources; management, monitoring and control of endangered wild fauna and flora species; protected areas; sustainable use of biodiversity and biotrade; indigenous affairs; knowledge management and information sharing; regional health management; infrastructure

and transport; and commercial navigation and tourism. It also includes emerging topics like regional development, climate change and energy.

The ACTO Member Countries made an important regional dialogue and concertation effort that includes a commitment to execute a series of programs, projects and activities. In this context, continuing to count with international cooperation from friendly governments and entities will be important for the Organization to achieve its goals in benefit of the Amazon region and its population.

GEF AMAZON PROJECT: Water Resources and Climate Change

Numerous research programs have focused on exceptional ecological, hydrological, anthropological, biological and geographical characteristics in specific areas of this large landscape. However, very few studies have considered the Amazon basin as a single hydrological system for which to propose sustainable and integrated water and land resources management.

The greatest watershed in the world crosses the national boundaries of eight South American countries and constitutes the most important element in the global water circulation. As such, achieving sustainable development in this globally important region of continental dimensions requires an intergovernmental strategy. One that is coordinated by the Amazon countries to face the environmental and socioeconomic impacts caused by extreme climate events as well as the human activities that impact on the ecosystem.

In response to the region's needs for socioeconomic development, sanitation, water supply and public health, and recognizing the unique characteristics of the Amazon basin, the Amazon Cooperation Treaty Organization (ACTO) sought support from the Global Environment Fund (GEF) to develop the project "Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin Considering Climate Variability and Change."

Objective - Building a Strategic Action Program

The project seeks to achieve a shared vision for the region's sustainable development based on the needs and interests of Amazonian society. To this end, it proposes a Strategic Action Program (SAP) agreed upon by the ACTO Member Countries that harmonizes their legitimate expectations for sustainable economic development in the context of increasingly numerous extreme climate events.

Its objective is to strengthen the institutional framework for the planning and execution of strategic activities to protect and manage water resources in face of the

climate variability and change experienced in the region.

Project Structure

The project is structured into five components, three thematic ones that generate scientific and technical information and provide direct support for the development of the Strategic Action Program (SAP), and two components to monitor and manage the project internally.

COMPONENT I: Understanding the Amazonian Society

The first component proposes creating a new vision for the Amazon basin; a vision agreed upon by the ACTO member country governments to provide a solid framework for integrated water resources management in the region.

In this sense, the project is surveying the needs, interests and goals of the main stakeholders of the Amazon basin, as well as the government structures and institutional and legal frameworks—national and regional—related to IWRM in the Amazon region.

Using quantitative and qualitative methods to study opinions and develop scenarios, the project is striving to understand the social and economic challenges related to water use and the social impacts caused by climate change in the region. These findings will be incorporated in strategic actions for the basin's integrated and sustainable management.

At the same time, based on an institutional mapping process and national inventories of relevant legislation, the project is analyzing the institutional and legal framework for water resources management in the eight Amazon countries, identifying existing legal differences, shared international commitments, and regional cooperation spaces for integrated and sustainable management of transboundary water resources in the Amazon basin. One of its priorities is strengthening institutional capacity in the eight countries as well as the regional institutional framework to foster cooperation in water resources management and implement common programs and projects.

In the end, this component will provide strategies to improve integration between the countries' legislation, regulations and institutional capacity, identifying institutional spaces and legal instruments to facilitate the implementation of the IWRM policies and programs defined in the SAP.

Component II: Understanding the Natural Resources Base

This component conducts a series of scientific studies geared to filling knowledge gaps and analyzing climate vulnerability, thereby providing the scientific and technical base to prepare the Transboundary Diagnostic Analysis (TDA) of the Amazon basin. Together, the outcomes of Components I and II will provide the basis for the Strategic Action Program (SAP) that associates human activities to natural resources in the Amazon basin.

Targeted research activities focus on improving knowledge about Amazonian aquatic ecosystem management by conducting studies in specific areas, mapping the extension of the Amazon aquifer system and determining its hydrogeological characteristics, and analyzing sediment load in two large transboundary rivers: the Madeira and the Solimoes.

At the same time, the project will generate knowledge about the risks associated to extreme hydrometeorological events and climate change in the Amazon basin by producing a Hydroclimatic Vulnerability Atlas (scale 1:1,000,000), identifying the areas and regions most vulnerable to extreme climate events and their socioeconomic impacts. This Atlas will be a fundamental element to design adaptation measures that increase the local population's resilience to climate variability and change, and strengthen the ability of local and regional governments, authorities and civil society to respond to extreme hydroclimatic events.

Based on scientific research findings and available information, analysis of institutional and legal frameworks, and a national consultation process held through national workshops and surveys, the Transboundary Diagnostic Analysis (TDA) will consolidate a synthesis of priority transboundary problems in the Amazon basin, quantifying the relative importance of their sources, causes and effects. This analysis will provide the scientific and technical grounds for the Strategic Action Program (SAP).

Component III: Strategic Action Program (SAP)

The main objective of this component consists of designing and validating a feasible and concerted SAP for the Amazon basin to guide the implementation of national and regional actions for basin-wide IWRM. As part of the process of building this strategic document, the project will develop pilot activities and projects for Priority Adaptation Measures (PAM). In addition, it will support the creation of an Integrated Information System (IIS), as well as communication, public participation and financial sustainability strategies.

Pilot projects and demonstration activities

Through pilot projects, strategic responses to mitigate the effects of unsustainable water use and management practices are experimented, testing the feasibility, costs and results of actions in practice. Three specific activities are being developed: i) Management of selected aquatic ecosystems geared to mitigating the impacts of human activities on aquatic ecosystems in critical areas; ii) Sustainable management in flooded forests, with the goal of demonstrating and implementing sustainable water resources management alternatives in three transboundary varzeas of the Amazon Basin; and iii) Sustainable use of groundwater in Amazonian urban hubs (case study: Manaus), showing the efficiency and sustainability of groundwater use in large Amazonian urban centers.

Simultaneously, and with the aim of developing specific adaptation and mitigation measures in response to climate change in selected areas of the Amazon basin, the project is executing four PAM activities.

The activity Ecosystem services and governance in the Purus transboundary river basin is assessing the experiences, feasibility and costs of specific interventions and actions developed by local governments to mitigate critical problems caused by climate change. The activity Adaptation to climate change in the MAP transboundary region is also working to strengthen governance in local institutions by implementing a trinational warning system (Bolivia, Brazil and Peru) for extreme climate events in the transboundary region of Madre de Dios-Acre-Pando.

Through the activity Adaptation to the sea level rise in the Amazon River delta adaptation measures are being developed for the rising sea level that is causing massive land loss in Marajo Island. Finally, the activity Joint use of groundwater and surface water in the region of the 3 frontiers (Brazil, Colombia, Peru) is studying the possibility of using these resources jointly to supply the population in the cities of Tabatinga and Leticia.

Integrated Information System

As part of the process of preparing an enabling environment for the future implementation of the SAP, the project is working to improve access to information for decision-making purposes by creating an Integrated Information System (IIS) for water resources and climate in the Amazon basin. This system will provide a tool for governments, research institutions, NGOs and other stakeholders in the basin to store, access and acquire the data they need to make decisions about IWRM, as well as to improve the ability of local and regional governments to prevent and adapt to hydroclimatic events in the Amazon basin.

At the same time, this activity will produce a database about water quality and possible sources of pollution in

the rivers of the Amazon as part of the IIS. Information generated by the other scientific research activities will also be incorporated, as will the Hydroclimatic Vulnerability Atlas.

Communication, Community Participation and Financial Strategy

Education and communication are essential elements to implement a sustainable water resources strategy for the Amazon Basin. In this sense, the project supports the creation of a receptive and favorable environment to implement the Strategic Action Program (SAP) through three strategies: Education Strategy; Communication, Community Outreach and Multi-Stakeholder Participation Plan; and Financial Strategy.

Designing the Strategic Action Program (SAP)

The Strategic Action Program for the Amazon basin will use the synthesized results of all the activities developed, in addition to any available hydrology and hydroclimatology data and information. It will address key issues identified in the Transboundary Diagnostic Analysis (TDA) thus contributing to the coordinated actions and interventions needed to implement common sustainable IWRM measures in the Amazon basin.

Building upon broad national discussions and consultations, and consolidated at the regional level, the SAP will be a strategic negotiated policy document that will establish clear priorities for national actions (e.g., political, institutional or regulatory reforms, investments, capacity-building, etc.) and regional cooperation initiatives to solve the priority transboundary problems identified in the TDA.

OUTCOMES AND OUTPUTS

To date, the project has produced concrete results in the following activities:

1. Institutional mapping and analysis: A preliminary analysis of the current institutional framework for water resources management in the Amazon basin was done at the national and regional levels. In addition, ACTO's current and potential role in coordinating regional IWRM actions was analyzed and national and regional coordination mechanisms for water resources were assessed, providing the grounds for discussing institutional capacity strengthening needs and identifying opportunities for sustainable regional cooperation in water management and conservation in the Amazon. These results will be validated in a regional workshop to be held in November 2013 in Lima whose recommendations will be incorporated in the SAP design.
2. Inventory of legislation and legal frameworks: Following a common methodological protocol, the group of national legal experts prepared an inventory of national legislation related to water resources management, biodiversity and climate change, identifying legal spaces and opportunities for regional cooperation.
3. Hydroclimatic Vulnerability Atlas (1:1,000,000): Using a common methodology and based on questionnaires, the Member Countries are currently collecting data and information that will be consolidated in a GIS environment. This includes: a biophysical and socioeconomic description of the Amazon basin; analysis of hydroclimatic hazards; analysis of social, economic and environmental susceptibility; analysis of social, economic and environmental adaptation capacity; and estimated hydroclimatic vulnerability.
4. Scientific knowledge: Progress in targeted research led to the first scientific findings that will inform the TDA by providing scientific and technical input for decision-making. Based on three field excursions to selected critical areas, the project finished analyzing environmental hazards and socioeconomic impacts associated to aquatic ecosystems in the Xingu, Tapajos and Negro rivers. In addition, sampling campaigns in the Madeira and Solimoes rivers indicate an important increase in sediment discharge in the past decade.
5. Knowledge of Amazon Aquifer: Initial data from the study "Assessment of the Sediment Basin Aquifers in the Amazon Hydrogeological Province in Brazil (1:1,000,000) and Pilot Cities (1:50,000)" was presented in the First Regional Technical Meeting on the Current State of Knowledge about Groundwater in Sedimentary Aquifers of the Amazon Region. Participants also discussed the latest knowledge about groundwater in the Amazon and Orinoco hydrogeological provinces and worked on defining the baseline for regional information on the matter.
6. Climate change adaptation measures: Significant results were achieved in demonstration activities and pilot projects in selected areas of the basin. In the Purus river basin, a management model that will allow local communities to direct their demands and needs for support to local governments in the case of extreme climate events is in the final stage of development. In the transboundary region of Madre de

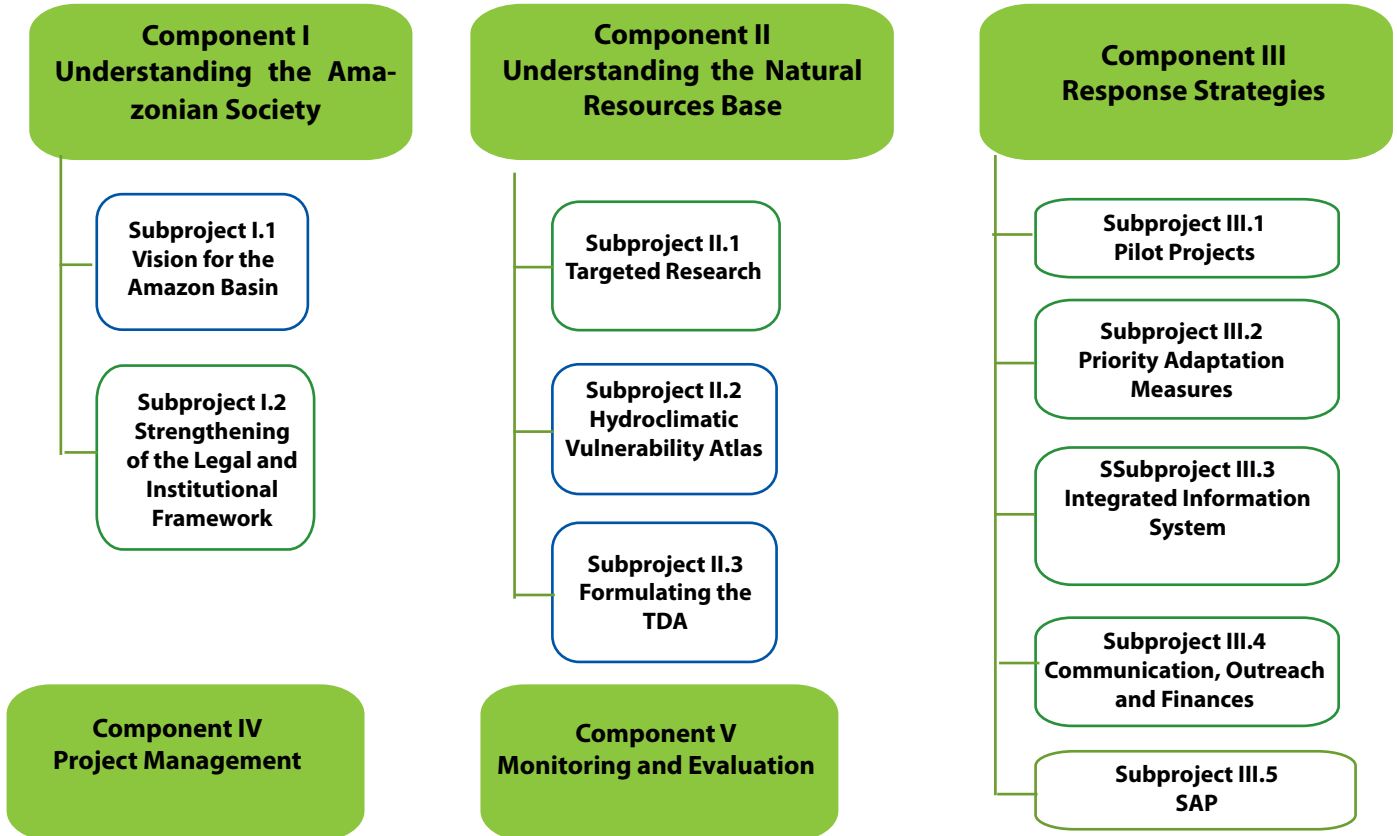
Dios-Acre-Pando (Bolivia, Brazil and Peru), the project is strengthening the ability of local governments and communities to respond to extreme events. The trinational team prepared and consolidated a database that will be validated in an excursion along the Acre river. Technicians are also being trained to implement an early warning system. Finally, as concerns adaptation to sea level rise in the Amazon delta, the geological, hydroclimatic and socioenvironmental study of Marajo Island is ready and concrete proposals to support local governments in their adaptation policies—including relocation of affected communities—are in the last stage of development.

7. Courses and technical meetings for experts of the eight Member Countries: As part of a South-South cooperation effort, six technical courses offered in conjunction with the Brazilian National Water Agency trained over 120 professionals from the eight countries in the areas of water resources management, hydrosedimentology, data collection platforms, pedagogical basins and extreme events.

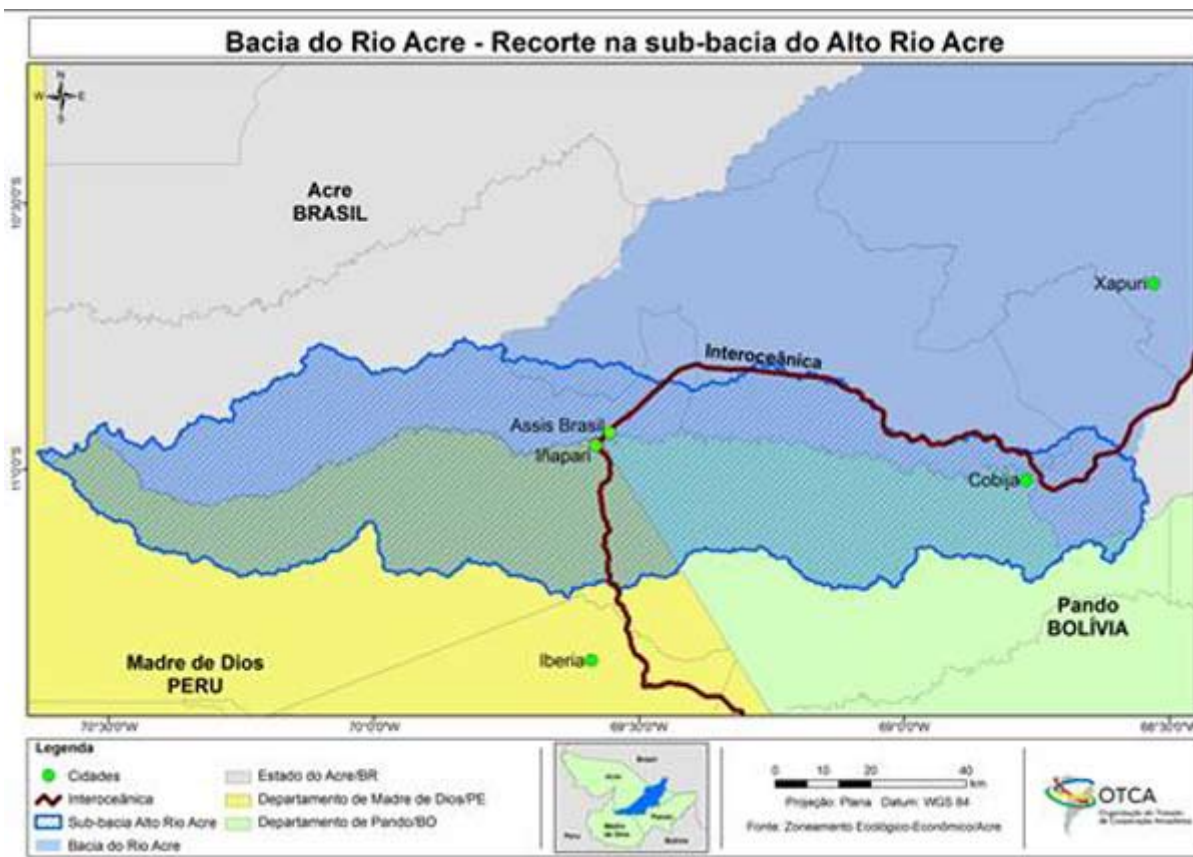
8. Strengthening regional dialogue on IWRM in the Amazon basin: The ACTO Member Countries established a regional dialogue about transboundary water resources management. Among the topics discussed are the project’s expected outputs and other aspects inherent to the region’s future institutionality, sustainability and coordination. This effort will generate a common vision for a strategy to face existing challenges and make use of existing opportunities.

FIGURES AND PHOTOS

Project Structure



Adaptation to climate change in the MAP transboundary region



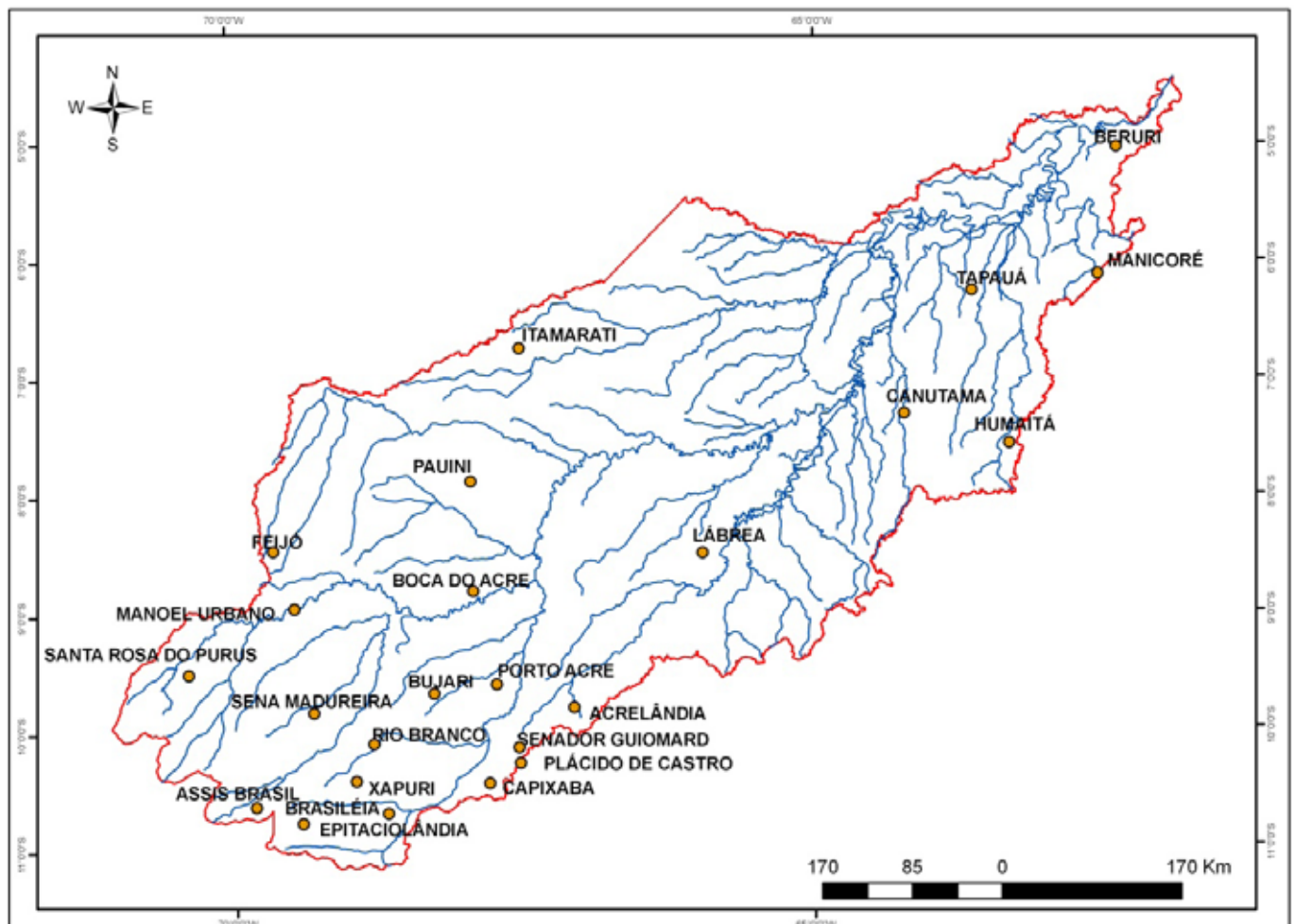
Adaptation to sea level rise in the Amazon river delta



Land loss processes in Marajo island



Ecosystem services and governance in the transboundary Purus river basin



Floods in the Purus river basin



Courses offered by the PS/ACTO in cooperation with ANA-Brazil

ANA-Brazil Courses

Hydrosedimentology 1: 9 - 23 November 2012

Operation and maintenance of data collection platforms: 26 - 30 November 2012

Hydrosedimentology 2: 05 - 09 August 2013

Operation and maintenance of data collection platforms: 30 September to 04 October 2013

Pedagogical Basins: 16 - 20 September 2013

TECHNICAL MEETINGS

Current State of Knowledge about Groundwater in Sedimentary Aquifers of the Amazon Region: 24 - 26 July 2013

Exchange of information on hydrometeorology, sediment gaging and water quality: 12 - 15 August 2013

Exchange of experience in managing extreme events: 18 - 20 November 2013