PROJECT ACTIVITIES

MISSION 1: IN-COUNTRY PLANNING MISSION

1 - KNOWLEDGE DEVELOPMENT OF INTEGRATED WATER RESOURCE MANAGEMENT (IWRM) AT RIVER BASIN LEVELS

- Environmental flows
- IWRM in Latin America and the Caribbean

MISSION 2: SELECTION OF A TOOL TO DEFINE EF IN PARAGUAY

2- APPLICATION OF A TOOL FOR DEFINING EF AT RIVER BASIN LEVELS

- Analysis of data availability
- Determination of a river basin-scaled tool to define EF in Paraguay
- Field campaigns of level and flow measurements in the Tebicuary River Basin
- Application of the tool to define EF in the Tebicuary River Basin

3- DEVELOPMENT OF A FRAMEWORK FOR AN IWRM PLAN

- Proposal of a general framework for the IWRM and Adaptation to Climate Change in Paraguay
- Guidelines for the development of an IWRM Plan for the Tebicuary River Basin (Paraguay)

MISSION 3: PRESENTATION OF THE TA RESULTS

4- TRAINING ACTIVITY OF LOCAL TECHINICIANS IN THE USE OF THE HYDRAULIC MODEL HEC-RAS AND ITS APPLICATION TO FLOOD MANAGEMENT

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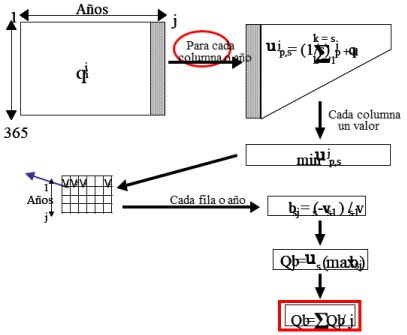
1 - KNOWLEDGE DEVELOPMENT OF INTEGRATED WATER RESOURCE MANAGEMENT (IWRM) AT RIVER BASIN LEVELS

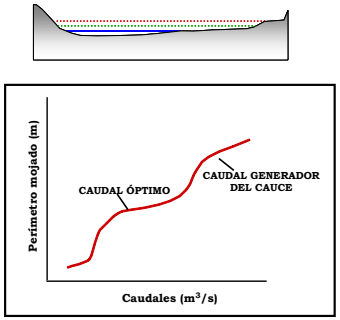
ENVIRONMENTAL FLOWS

HYDROLOGICAL METHODS



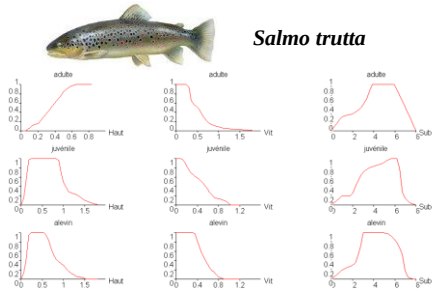
Based on the analysis of the historical series of natural flows

HYDRAULIC METHODS



Based on the relationship between simple hydraulic parameters and flow variations

HYDROBIOLOGICAL METHODS



Based on the quantification of fluvial habitat under different flow conditions, for different components of the ecosystem

HOLISTIC METHODS

The holistic approach is not a calculation method per se, it is more of a procedure or protocol with which to deduct the EF, seeking a consensus solution based on an independent analysis of the magnitude and distribution of the flow required by the different components of the system.

IWRM IN LATIN AMERICA AND THE CARIBBEAN

- What is the IWRM?
- Motivation for a IWRM
- Conceptual frameworks
- IWRM and climate change
- Existing models: world-wide paradigm
- The gender approach in IWRM
- Planning and management of water resources

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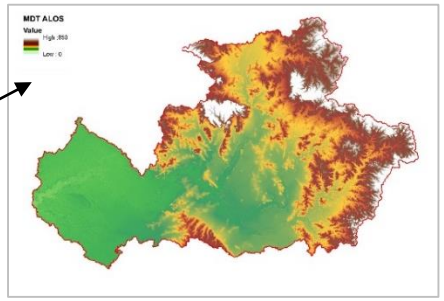
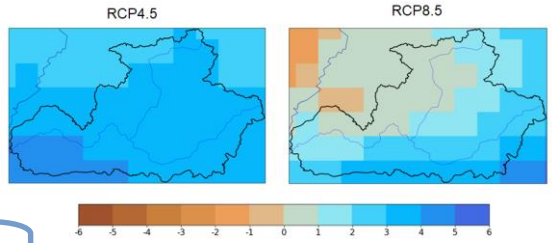
2- APPLICATION OF A TOOL FOR DEFINING EF AT RIVER BASIN LEVELS

ANALYSIS OF DATA AVAILABILITY

- Hydrographic and topographic information
- Precipitation and ETP data
- Flow data
- Soil type and land uses
- Fish fauna

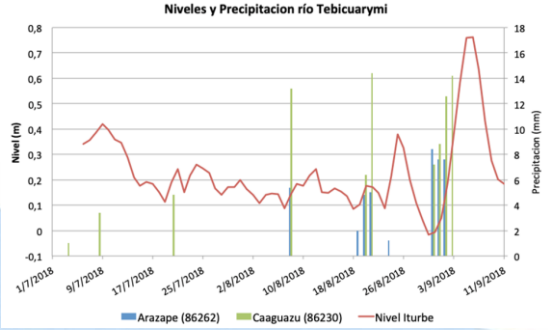




DETERMINATION OF A RIVER BASIN-SCALED TOOL TO DEFINE EF IN PARAGUAY

- Calibration of the precipitation data combining the information of the existing rain gauges with satellite data (TRMM project)
- Analysis of the climate change effect in the Tebicuary basin
- Selection and description of the hydrological model (Ad hoc model LEM-DW has been built)
- Description of the proposed methodology to obtain the EF in the Tebicuary River Basin

FIELD CAMPAIGNS OF LEVEL AND FLOW MEASUREMENTS IN THE TEBICUARY RIVER BASIN



APPLICATION OF THE TOOL TO DEFINE EF IN THE TEBICUARY RIVER BASIN

		Caudal ecológico	Porcentaje natural
Métodos hidrológicos	Qbas1	98.8	28.9%
	Qbas2	84.5	24.8%
	Qmm21	93.4	27.4%
	Qmm25	95.8	28.1%
	Q_AMB	93.1	27.3%
Métodos biológicos	*P. maculatus* (Bagre amarillo)	10.0	2.8%
	H. malabaricus (Tararira)	10.0	2.8%
	O. hepsetus (Dientudo)	230.0	63.9%
	A. bimaculatus (Sardina de dos puntos)	295.0	81.9%

- Characterization of the hydrological regime of the basin for the current situation and two climate change scenarios
- Definition of EF in the Tebicuary River Basin

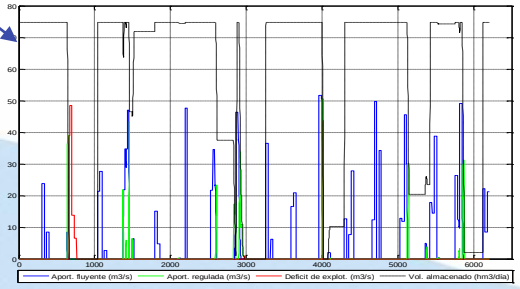
3- DEVELOPMENT OF A FRAMEWORK FOR AN IWRM PLAN

PROPOSAL OF A GENERAL FRAMEWORK FOR THE IWRM AND ADAPTATION TO CLIMATE CHANGE IN PARAGUAY

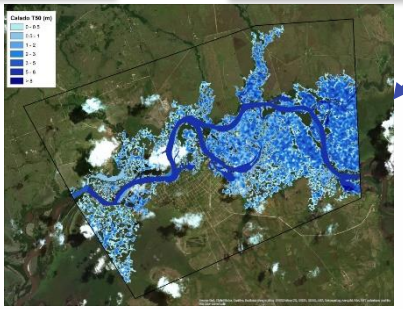
- General description of the country and state of the water resources
- Necessary framework for the implementation of IWRM in Paraguay
  - National policy
  - IWRM National Plan
  - National strategy
- Legal and institutional aspects
- Recommendations to enhance IWRM in Paraguay
  - Measures related to the institutional and legal framework
  - Instruments and scales of hydrological planning

GUIDELINES FOR THE DEVELOPMENT OF AN IWRM PLAN FOR THE TEBICUARY RIVER BASIN (PARAGUAY)

- Available information. Field campaigns
- Development of a water resources management model



- Water resources, hydrology and climate change
- Flood hazard assessment



- Recommendations for upcoming actions proposed in the basin

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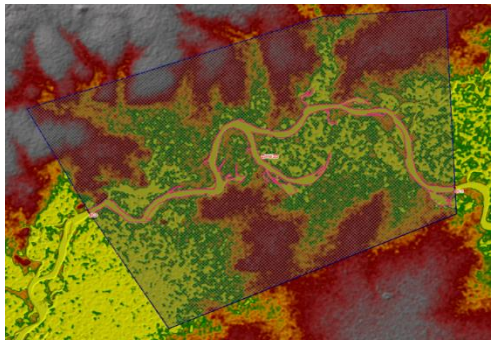
4- TRAINING ACTIVITY OF LOCAL TECHINICIANS IN THE USE OF THE HYDRAULIC MODEL HEC-RAS AND ITS APPLICATION TO FLOOD MANAGEMENT

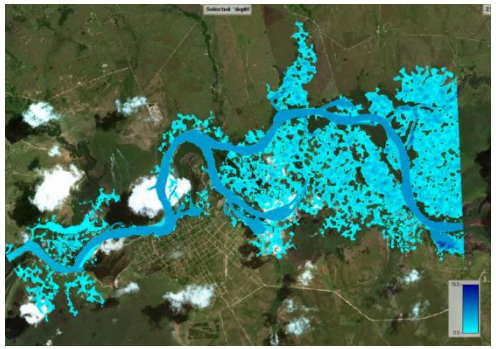
SESSION 1: INTRODUCTION TO THE FLOOD STUDY

SESSION 2: INTRODUCTION TO HEC-RAS HYDRAULIC MODEL

SESSION 3: CASE STUDY 2D: MODEL IMPLEMENTATION AND RESULTS ANALYSIS (PART I)

SESSION 4: CASE STUDY 2D: MODEL IMPLEMENTATION AND RESULTS ANALYSIS (PART II)





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