

## TC ABSTRACT

RG-T2659

### Development of Remote Sensing Data Sets and High-Resolution Modeling for Water Security and Climate Adaptation in Latin America

#### I. Basic project data

▪ Country/Region:	REGIONAL
▪ TC Name:	Development of Observational Data Sets and High-Resolution Modeling for Water Security and Climate Adaptation in Latin America
▪ TC number:	RG-T2659
▪ Team Leader/Team members:	Fernando Soares Bretas (INE/WSA), Team Leader; Pedro Coli and Liliana López (INE/WSA); Omar Garzonio (WSA/CBO); Javier Jiménez Mosquera (LEG/SGO); Alfred Grunwaldt (INE/CCS); and Raul Munoz (ESG)
▪ Taxonomy:	Knowledge generation and dissemination
▪ Date of the TC abstract:	August, 2015
▪ Reference to request:	N/A
▪ Beneficiary:	IDB member countries in Latin America
▪ Executing agency and contact name:	IDB Headquarters
▪ IDB funding requested:	US\$1,000,000
▪ Local counterpart funding, if any:	None
▪ Disbursement period:	36 months
▪ Execution period:	18 months
▪ Required start date:	October, 2015
▪ Types of consultants (firms or individual consultants):	Firm and individual consultants
▪ Prepared by Unit:	INE/WSA
▪ Unit of Disbursement Responsibility:	INE
▪ TC included in Country Strategy:	N/A
▪ TC included in CPD:	N/A
▪ GCI-9 Sector Priority:	Climate Change and Environmental Sustainability

#### II. Background and Justification

2.1 In developing countries, and most certainly in the case of the Latin America region, groundwater information, water quality data and even basic hydro-meteorological data may be scarce. In some areas Remote Sensing (RS) offers a solution to this data-scarcity problem by providing relevant data to decision makers from the Bank and its clients. In other areas however, in site observations remain key for water related operations since RS cannot extract all the required information or is simply too costly to apply. Only few practitioners understand all of the available remote sensing tools, their costs, limitations, and capabilities.

Bank staff and its client counterparts are in need of guidance and direction in order to incorporate RS tools for better decision making. This TC project therefore, targets to develop and disseminate a clear picture of the RS products available for water-related operations, how they are produced, to what water problems or situations they can be applied, what their potential and limitations are, how better results could be obtained by using them jointly with in-situ measurements, and how they can be validated and evaluated, to better inform the client and enhance Bank water-related operations.

- 2.2 This TC is intended to demonstrate what RS technology can do for water-related projects as such, and provide guidance to Bank teams with identifying the best RS option available based upon their project needs and constraints. This will lay the foundation for the actual application of RS instruments in pilot projects, case studies and also short-term remote sensing expert interventions on specific challenges in Bank operations as well as knowledge dissemination, advocacy and capacity building activities. The TC will also support the improvement of the of the Hydro-BID suite of models, developed under the sponsor of the IDB, by incorporating high resolution models to use RS data and refine predictions of river flows and water quality.

### III. Description of Activities

- 3.1 The project will support the development of methodologies and outputs consisting of the following activities. These activities are further detailed in the TC Document for this operation.
- 3.2 **Component 1:** Scoping Study: this activity will include a literature review, assessment of data availability and needs to implement RS methods, travel to the countries for data collection, interviews, data analysis, and the identification of pilot case studies for implementation (Activity 3).
- 3.3 **Component 2:** Development of high-resolution numerical models: this activity consists of the development of high-resolution (order of meters spatially and sub-hour temporally) models for assimilation and use of RS data in predictive mode. These models will be developed for integrated surface-groundwater flow and water quality, and incorporated into the Hydro-BID suite of models for analysis of water scarcity (droughts), inundation (floods) and pollution (water quality) problems. It is worth noting that such high resolution tools do not yet exist for the Latin America region, and these products will be a primary contribution of this TC.
- 3.4 **Component 3:** Case Study Applications: Water resources management data will be derived through the Bank's existing Hydro-BID system for water availability (water sources and quantities), water demand use and efficiency data available from INE/WSA clients through the region (e.g., *Empresa Pública Metropolitana de Agua Potable y Saneamiento* (EPMAPS) in Ecuador, *Autoridad Nacional del Agua* (ANA) in Peru, and *Agencia Pernambucana de Aguas y Clima* (APAC) in Brazil). We estimate that three case studies will be performed under this activity, each case study will be chosen to reflect a different problem: droughts, floods and pollution; and they will involve clients that have expressed interest in high resolution models for use of RS data. Furthermore, to promote the sustainability of the initiated actions, contacts with local universities in Quito (Ecuador), Recife (Brazil) and Lima (Peru) will be strengthened to introduce them to this new water resources modeling platform to further dissemination among students and future users.

- 3.5 **Component 4:** Seminar/workshop(s) to disseminate knowledge and generate policy dialogue. This activity will result in the drafting of three IDB Technical Notes documenting the case study applications, as well as an article for submission to a peer-reviewed journal.

#### IV. Budget

- 4.1 An indicative budget is presented below.

Activity	Total Funding (LAIF)
1. Scoping Study	50,000
2. Development of high-resolution numerical models	300,000
3. Case study applications	450,000
4. Knowledge dissemination and working/journal papers	200,000
<b>TOTAL</b>	<b>1,000,000</b>

#### V. Executing agency and execution structure

- 5.1 The TC will be executed by INE/WSA; which will be responsible for hiring the necessary consulting services (firms and individual) according to IDB procurement policies and procedures. INE/WSA will also be responsible for the technical quality of the products generated and the supervision of the hired consultants.

#### VI. Project Risks and Issues

- 6.1 The primary risk for implementation of this TC project is the lack of technical capacity of some of Bank's clients and the gap of information for model parameterization in particular areas. To mitigate this risk, the TC includes providing technical support and guidance to model users and building capacity with our client country counterparts (e.g., *Empresa Pública Metropolitana de Agua Potable y Saneamiento* (EPMAPS) in Ecuador, *Autoridad Nacional del Agua* (ANA) in Peru, and *Agencia Pernambucana de Aguas y Clima* (APAC) in Brazil), as well as with a local universities to sustain this effort beyond the duration of this TC. An additional risk stems from the pioneering nature of this TC; there isn't much operational experience with the kinds of products that this TC will yield. We have therefore included peer review of all outputs of this TC by at least 2 anonymous reviewers (one within the Bank and one outside the Bank) to insure quality of the TC deliverables.

#### VII. Environmental and Social Classification

- 7.1 Following ESG's project classification process (Safeguard Policy Filter and Safeguard Screening Form) requirements, it has been determined that this project falls under Category C. No environmental assessment studies or consultations are required for Category "C" operations.