Pilot projects for transferring knowledge and technology and strengthening international cooperation

http://www.prohimet.org

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PROHIMET

- Ibero-American Workshop on Hydrometeorological Information and Forecasting Systems
  - Valencia, Spain, 2004
    - Promoted by World Meteorological Organization (Weather, Climate and Water)
      - WMO Flood Forecasting Initiative
  - 128 experts from 22 countries of Ibero-America
    - One of the proposals: creation of a thematic network on hydrometeorological monitoring and forecasting.

- Description:
  - a thematic network, of ibero-american scope, which gathers specialists, of several disciplines, especially worried about the topics of floods and droughts, although they also cope with the problems related to climate change.
Objectives of PROHIMET

PROHIMET is a linkage and a cooperation framework for seeking the following specific objectives:

- To enlarge the **cooperation** between the scientific communities of **hydrologist** and **meteorologists**, and to stimulate their interaction with other institutions which have relation with both, as it is the case of the civil protection services.
- To establish a **multinational cooperation**, in the ibero-american region, for the use of new techniques of hydrometeorological forecasting.
- To encourage **staff training** and **capacity building** in the use of modern tools for hydrometeorological monitoring, forecast and dissemination, as well as all matters dealing with the concepts of risk, hazard and vulnerability.
- To analyze and to evaluate the **state of development and the lacks** and needs of the ibero-american countries in regards to the forecast and warning systems and hydrometeorological phenomena related measures.
- To promote the development of **pilot projects**, that would be used as demonstration cases.
- To contribute to the development, extension and improvement of the observation and measurement systems.
Actions

- Organization of workshops and training courses
- Preparation of dissemination material and provide free access to it
- Internet forums: the members constitute electronic discussion groups
- Development of pilot projects as demonstration cases
The pilot projects

- Since the creation of the network, its members expressed their conviction about the need and usefulness of pilot project as demonstration cases.

**PROHIMET COLOMBIA**
- Title: Hydrometeorological system of Nare and Guatapé river basins, located at Antioquia-Colombia (sistema hidrometeorológico en las cuencas de los ríos Nare y Guatapé, ubicados en Antioquia-Colombia)
- Country: Colombia
- Cities: El Retiro, Guarne, Rionegro, La Ceja, Carmen de Viboral, Marinilla, Santuario, San Vicente, El Peñol, Guatapé y San Rafael.
- River: Nare and Guatapé.

**PROHIMET-YÍ**
- Title: Pilot project for the early warning system of the Durazno city under Yi river floods (proyecto piloto de alerta temprana para la ciudad de Durazno ante las avedas del río Yí)
- Country: Uruguay
- City: Durazno
- River: Yí
Pilot projects.- main characteristics

- Short response time of the hydrological system
- Led by a hydropower production company
- Multipurpose goal
  - Improve reservoir operation
  - Civil protection
- Main problems to be solved
  - Weather forecast
  - Coupling NWP and hydrological forecasting models
  - Hydrometry
  - Rainfall estimation

- Long response time of the hydrological system
- Led by a university under the supervision of the central water administration
- Main goal
  - Reinforce local civil protection services emergency actions
- Main problems to be solved
  - Hydrometry
  - Hydraulics
  - Rainfall estimation
PILOT PROJECT
PROHIMET COLOMBIA
Hydrometeorological system of Nare and Guatapé river basins located at Antioquia-Colombia.

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Cities:
El Retiro, Guarne, Rionegro, La Ceja, Carmen de Viboral, Marinilla, Santuario, San Vicente, El Peñol, Guatapé y San Rafael.
PRIMARY OBJECTIVES

• To prevent flood disasters.
• To improve the reservoirs operation and to avoid possible failure of the dams
• To plan economical activities in function of the available water resources.
• To support emergency actions

SECONDARY OBJECTIVES

• To have an operational complete system including meteorological and Hydrological predictions capabilities

• To optimize the existing systems and to implement another tools in order to obtain new hydrometeorological information

• To be prepared for the migration process of the NESDIS NOAA satellite reception system.

• To share experiences and knowledge with other members of the PROHIMET Network and to put them in practice with the Pilot Project.
Pilot project supported by:

Red iberoamericana para el monitoreo y pronóstico de fenómenos hidrometeorológicos

PROGRAMA IBEROAMERICANO DE CIENCIA Y TECNOLOGÍA PARA EL DESARROLLO

World Meteorological Organization
Working together in weather, climate and water

EMPRESAS PÚBLICAS DE MEDELLÍN.E.S.P

CONSELHO NACIONAL DE DESENVOLVIMENTO CIENTIFICO E TECNOLÓGICO-Brasil
PILOT PROJECT
PROHIMET COLOMBIA

Hydrometry Measurement Networks

Incorporation of new technologies

Satellite System

Hydrological Forecasting

Automatic system for information validation

New Team of Meteorology Applied to Hydrology

SATELLITE IMAGES
HYDROESTIMATOR
ETA

Imágenes de satélite.
Fenómenos de Mesoescala
RESULTS UNTIL NOW

• Hydrological and meteorological studies: precalibration of Hydroestimator, calibration of ETA model and improvement of previous calibration of HBV model.

• Adding new capabilities to institutions, example: new team of meteorology applied to hydrology

• Capacity building

• Inter-institutional relationships: Agreement between National Institute of Meteorology and Hydrology (IDEAM) and EPM
**Pending Results**

- Implementation of the ETA calibrated model:
- New time interval of data and new forecast lead time HBV model.
- Linking hydrology and meteorology (ETA, Hydroestimator and HBV)
- New program for training of forecasters.
- Inter-institutional relationships: Protocols of communication and data interchanges between IDEAM, EPM and local authorities.
- Implementation of the software & tools for the satellite images and meteorological information from UNIDATA.
THANK YOU
PROHIMET PROJECT
WMO-IMFIA

PILOT PROJECT – EARLY WARNING SYSTEM FOR THE CITY OF DURAZNO – YI RIVER BASIN – URUGUAY

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Objectives

- Reinforcement of the actions performed by the civil protection service (CECOED)
- Development of an operational, early warning system
- Preparation of a geographical information system (GIS) to support the operation of the CECOED and for urban planning
- Institutional strengthening and inter-institutional coordination for the optimization of the available resources
- Advance towards linking meteorological information with hydrologic models
Importance of the project

- This pilot case will be an example for solving other flood plain problems in the region.

- It will be the first operational real-time flood alert system in Uruguay. More severe and more frequent flood events are occurring, causing floods of considerable magnitude. The civil protection services need the development of new tools.

- **Optimization of human and financial resources** at national and local level

- **Education, training and capacity building**

- **To give an additional use to the real-time hydrologic data system implemented for the management of the hydroelectric reservoirs** by UTE (hydropower company)

- **To comply with the new legal framework** (National Emergency System Law; Land Use Planning and Sustainable Development Law) through the development of flood risk mapping and its incorporation in the urban plan for the city of Durazno.

- **Expected ripple effect of benefits**: To contribute to the development of national policies with respect to water management, land use planning, risk management. To strengthen the scientific development at the university in the application of new technology in meteorology linked to hydrology and real-time observation networks. To support other local civil protection services in the country as well as other basins with similar characteristics in the region.
Sustainability of the project

- **Maintenance** of the hydrologic network by the hydropower company (UTE)
- **Legal framework** – National Emergency System Law
- **Commitment** of the institutions with responsibility in the matter

Approach

- **Interdisciplinary** approach
- **Integrated** Flood Management
Tasks

- **Inter-institutional coordination** (National Water Authority, Local Government, Hydropower Company, National Directorate of Meteorology, Civil Protection Service, University, PROHIMET and WMO)

- **Hydrologic and hydraulic studies**
  - Basic studies (characterization of precipitation, catchment areas and streamflows)
  - Topographic work for the hydraulic model
  - Stream gauge stations
  - Development and calibration of simulation models

- **Rainfall estimation based on satellite imagery**

- **GIS to support** emergency management and urban planning

- **Flood forecasting models**

- **Integration** of developed tools to the work done by the institutions

- **Definition of responsibilities and protocols** for action and for sharing data

- **Training and capacity building**

- **Dissemination** of results
Current Actions and Planned results for first semester (April 2010)

- Topographic work, hydrologic and hydraulic models and historical analysis
- Definition of IFD curves
- Inter-institutional coordination
THANK YOU