- The Use of Satellite Imagery and GIS for Disaster Reduction at Local Level -

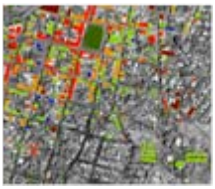
The case of Matagalpa Project 2002 – 2009
(from Hazard Mapping to an Integrated Disaster Risk Management)

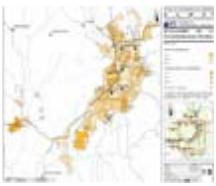
Goals

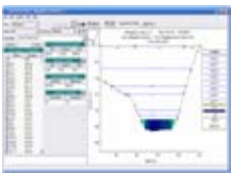
- Enhancing sustainable development of the Rio Grande de Matagalpa watershed
- Expanding integrated risk management from the local to the regional scale.
- Strengthening communication systems at different levels (local, regional and national)
- Building a "Flood Resilient Community": turning awareness into action.

Activities

- Methodological implementation of Risk Assessment and Spatial Decision Support System for Risk Management at Local Level.
- Development of GIS-based applications for Hazard Assessment, Element at Risk Mapping, Vulnerability and Risk Assessment.
- Capacity building to facilitate the integration of Risk Management into Urban and Rural Planning.







Matagalpa "Misión Agua" 2006-2008

The primary objective of UNOSAT **"Misión Agua"** Project (phase 2006-2008) is to support the Municipality of Matagalpa (ALMAT) in the development of an integrated watershed management and flood protection system.

UNOSAT in collaboration with ALMAT, CIGMAT and Canton of Geneva is currently developing a GIS-based methodology for:

- Hydrological modelling of Rio Grande de Matagalpa
- Hazard Mapping and Flood Scenario Simulations
- The assessment of variations in surface runoff due to land use changes

The results will provide insight into relative hydrologic impacts from changes in land cover and flood scenarios.

UNOSAT: Mission Statement

UNOSAT is an operational programme of the United Nations Institute for Training and Research (UNITAR) implemented by the United Nations Office for Project Services (UNOPS), dedicated to provide satellite imagery and GIS services to UN agencies, humanitarian organizations and local communities in developing countries.

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UNOSAT satellite imagery for all

UNOPS UNITAR

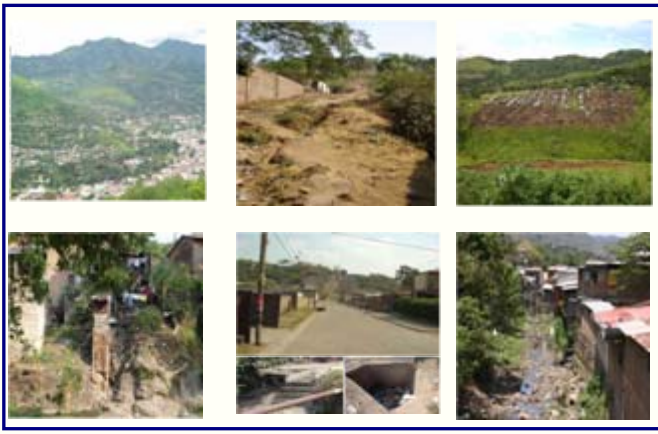
- The Use of Satellite Imagery and GIS for Disaster Reduction at Local Level -

The case of Matagalpa Project 2002 - 2009
(Integrated Watershed Management and Flood Protection System)

Hydrological Modelling of Rio Grande de Matagalpa

As floods are among the most severe threat on human lives and properties, knowledge of the flood, the occurrence and the magnitude is necessary to minimize the possible damage. Progress in hydrologic/hydraulic modelling has led to considerable improvements in the capability to simulate river flooding.
Widely used models for operational purposes are 1D and 2D models, which are used for the simulation of hydrodynamic system's behaviour. Geospatial Information represents an important instrument for Decision Makers in the process of:

- Improving people's perception of risk
- Building a "Flood Resilient Community":
  -turning Awareness into Actions-



Data Model

1.Geometry Data

- River center line, junctions and reaches
- River banks
- Flow path
- Cross sections
- Levees
- Bridges and culvert
- Manning coefficients
- Storage areas, etc..

2. Flow Data: boundary conditions

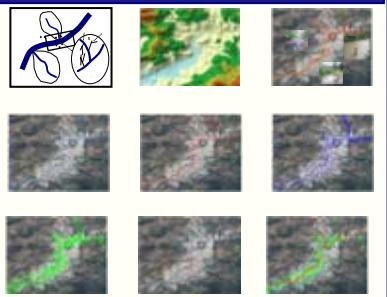
- Water surface
- Water discharge
- Critical or normal depth
- Rating curve

3. Perform Hydraulic Computations

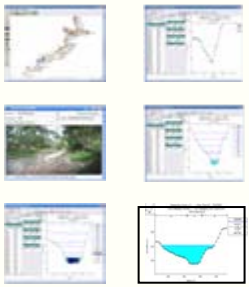
- Set flow regime, select geometry and/or flow files and start the computations

4. Analysis of results

GIS Data Integration



Hydro-Modeling



Results: Inundation Maps and Flood Scenario Simulations

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