

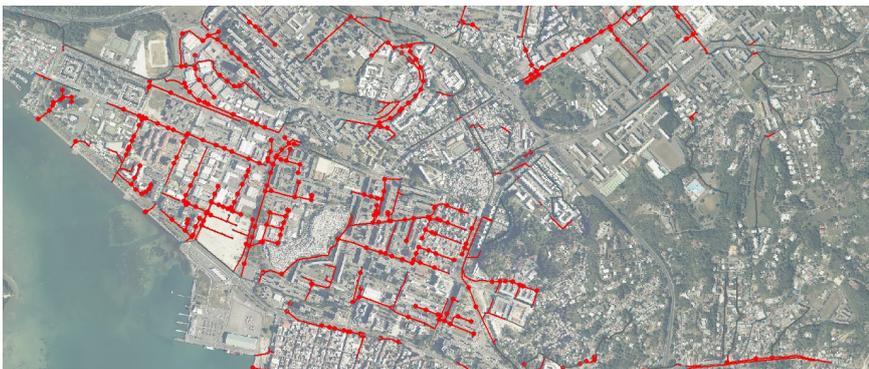
FORECASTING URBAN FLOODING IN GUADELOUPE

A local flood alert system for more efficient decision making of the Urban Community of Pointe à Pitre to mitigate flood impacts

The Communauté d'Agglomération de Pointe à Pitre (CAP) territory is very prone to flooding, particularly in urban areas. The flooding events can be sudden and extremely violent. DHI has developed a flood alert system that contributes to timely decision making that can mitigate flood impacts.

LOCALISED FLASH FLOODS

The CAP territory is subjected to different kinds of floods: coastal flooding, river flooding as well as overflowing of water networks. The sudden floods of May 2012 in several sections of Pointe à Pitre, more specifically in Les Abymes and in Gosier, were a reminder of the specific risks of floods in urban areas. Due to localised storms, the area suffered 313 mm of rainfall in only a few hours, equivalent to three months of rain at that time of year in the region. This sudden and high intensity rainfall caused a rapid rise of floodwaters in the city, with a water depth reaching 1.5m to 1.8 m.



Results showing overflows (red dots) and the insufficient capacities of the network during heavy rains (red lines) in a 10-year return period. ©DHI

Urban floods in the CAP territory have various origins: runoff and collection of rainwater at the lowest point on road networks which are not connected to the storm drainage system, saturation or overflow of the storm drainage system. The rainwater sanitation master plan has revealed a network congestion during frequent heavy rainfall events which cause overflows on sections of Pointe à Pitre and Les Abymes occurred.

Localisation of flooding points and resource mobilisation are strategic organisational issues for CAP Excellence. The alert system developed by DHI has helped resolve these issues and increased the community's efficiency in managing floods.

CLIENT

Urban Community of Pointe à Pitre (CAP Excellence)

CHALLENGE

Getting an effective alert system for urban flooding and thus providing better anticipation for future flood events

SOLUTION

Creating a self-contained flood alert system which can predict floods on a daily basis over a 24 hour period and issue alerts on expected overflows.

BENEFITS

- Real-time prediction of manhole overflowing over a 24 hour period
- Dissemination of information through e-mail alerts and a dedicated website.
- Full autonomy of MIKE OPERATIONS in recovering data, running simulations and sending alert emails if need be.
- Decision support system which increases the efficiency of CAP Excellence in flood management
- Dissemination of information through e-mail alerts and a dedicated website.

REGION/ COUNTRY

Guadeloupe, France

SOFTWARE

MIKE URBAN

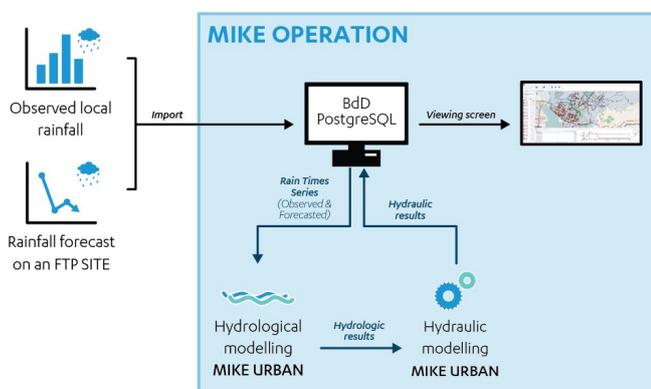
MIKE OPERATIONS

EARLY ALERT SYSTEM FOR REAL-TIME FLOOD FORECASTING

The forecasting and alert system set up by CAP Excellence covers the municipalities of Pointe à Pitre and Les Abymes in MIKE OPERATIONS.

The MIKE Powered by DHI's MIKE OPERATIONS forecasting platform integrates the MIKE URBAN modelling technology to model the storm drainage systems. The modelling of the hydrological response, which is the rainfall-runoff transformation on river catchments, and the flow propagation in the network are thus integrated into the operating system.

With the MIKE OPERATIONS software, rainfall information is automatically collected and a simulation launched each day. This system enables the user to predict the risks of overflowing of the storm drainage system, and consequently, the risks of floods over a 24-hour period. The information is then transmitted to operators.



MODELLING SYSTEM

Knowledge about hydraulic operations is provided by MIKE URBAN. Characteristics of the system include:

- 342 river catchments representing a total of 7,000 ha.
- 2513 manholes
- 2575 pipes
- 1 rainfall station
- 33 sea outfalls

FULL AUTONOMY OF THE SYSTEM

The real-time forecasting management system created by the MIKE OPERATIONS platform is completely autonomous. This cuts manpower cost by eliminating manpower required to operate and manage the system. The forecasting system runs on its own where tasks are scheduled to be performed daily.

Scheduled tasks include:

- observed rainfall data gathering

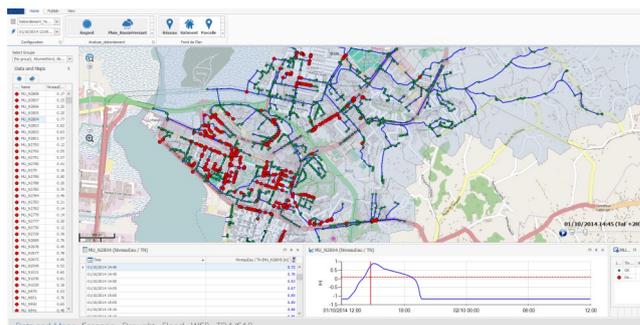
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For more information, visit: www.dhigroup.com

- retrieval of rainwater forecast after a 24-hour period
- data processing
- data verification and validation
- running simulations
- results analysis
- alert notifications

Tasks are executed and results are obtained at 8 am daily upon arrival of the CAP Excellence staff. The system uses weather forecast data provided daily by MeteoGroup, with hourly rainfall predictions over a 24-hour period.

PROJECT VALUE



Real-time forecasting and flood alert system interface simulating flood events at CAP territory © DHI

Flood management and employment of flood mitigation strategies is very important in dealing with extreme weather emergencies. Using our MIKE Powered by DHI's MIKE OPERATIONS software, we are able to provide CAP Excellence a real-time forecasting system to alert the Guadeloupe on potential flood events in the city. We are able to do this by simplifying technical processes and identifying potential flood location daily.

REAL-TIME OPERATION

The forecast management system created by the MIKE OPERATIONS platform automatically launches simulations daily with results available at 8 am. The system provides:

- data on flood risks
- prediction of potential flood events
- alert emails to managers in a flood event
- visualisation of flood sectors for easy identification of flood location