

**Abstract** The Paraná Delta in Argentina is considered a unique and vast mosaic of wetlands of international importance. To support decision-making for the sustainable spatial planning of the Paraná Delta, a planning kit and a two-dimensional hydrodynamic model are developed with a defined domain in the territory of the Delta. The model, implemented in Delft3D FM, is built from a flexible mesh, incorporating topography and rail and road structures. The link between INA and Deltares made possible the implementation and validation of the 2D model and the simulation of the hydrological and anthropological change scenarios in the short term. According to the results, the greatest effects on the water level growth are due to anthropological interventions associated with dikes.

## Introduction & Methods

A hydrodynamic model in DELFT 3D was implemented in order to evaluate the impact of different anthropic interventions (mainly infrastructure) in the Paraná Delta (17500 km<sup>2</sup>).

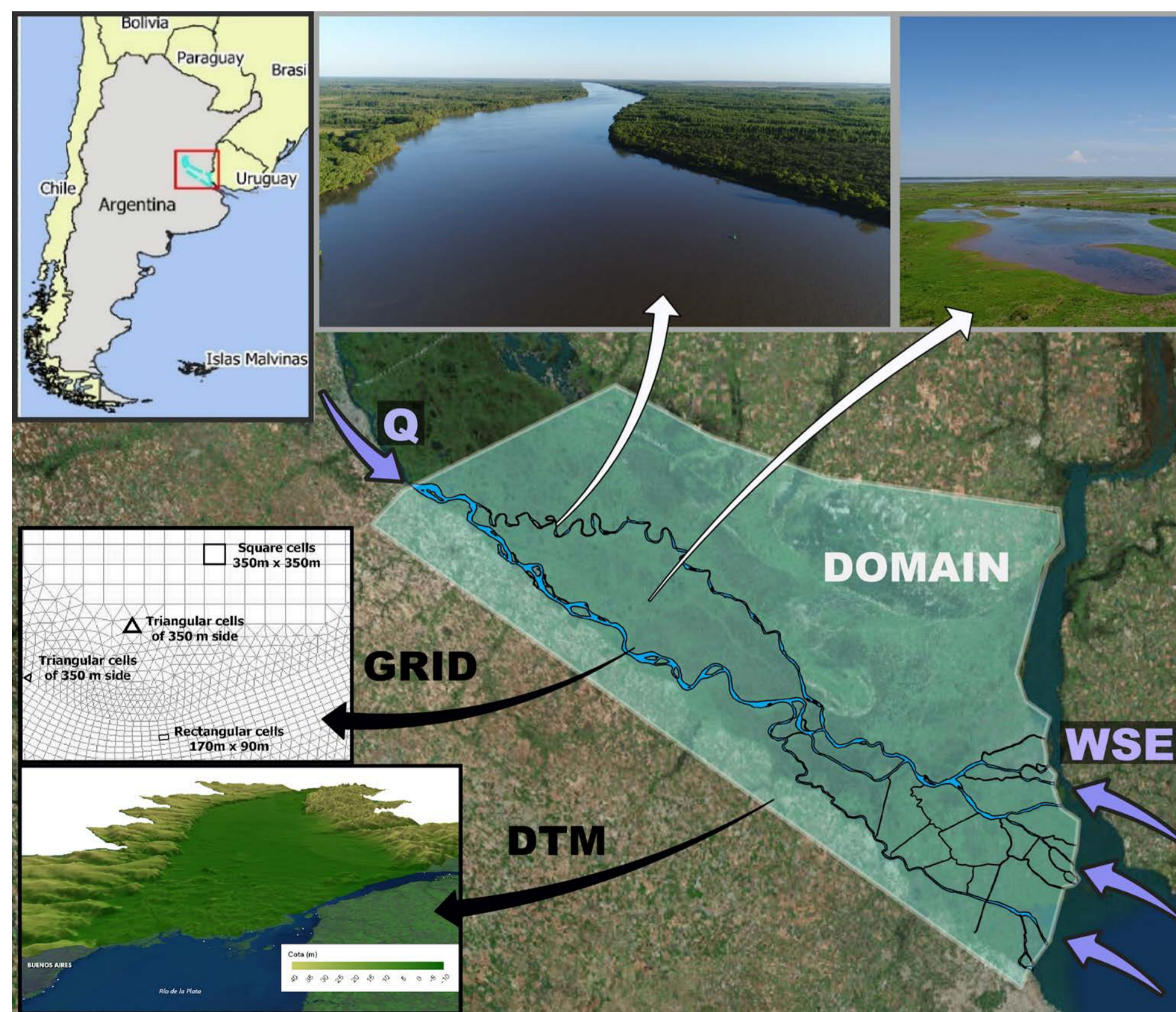


Figure 1: Implementation of 2D modeling

The Digital Terrain Model (DTM) and boundaries conditions indicated in Figure 1 were provided by INA. To validate the model, water surface elevations (WSE) observed along the Paraná River, under different hydrological conditions, were reproduced.

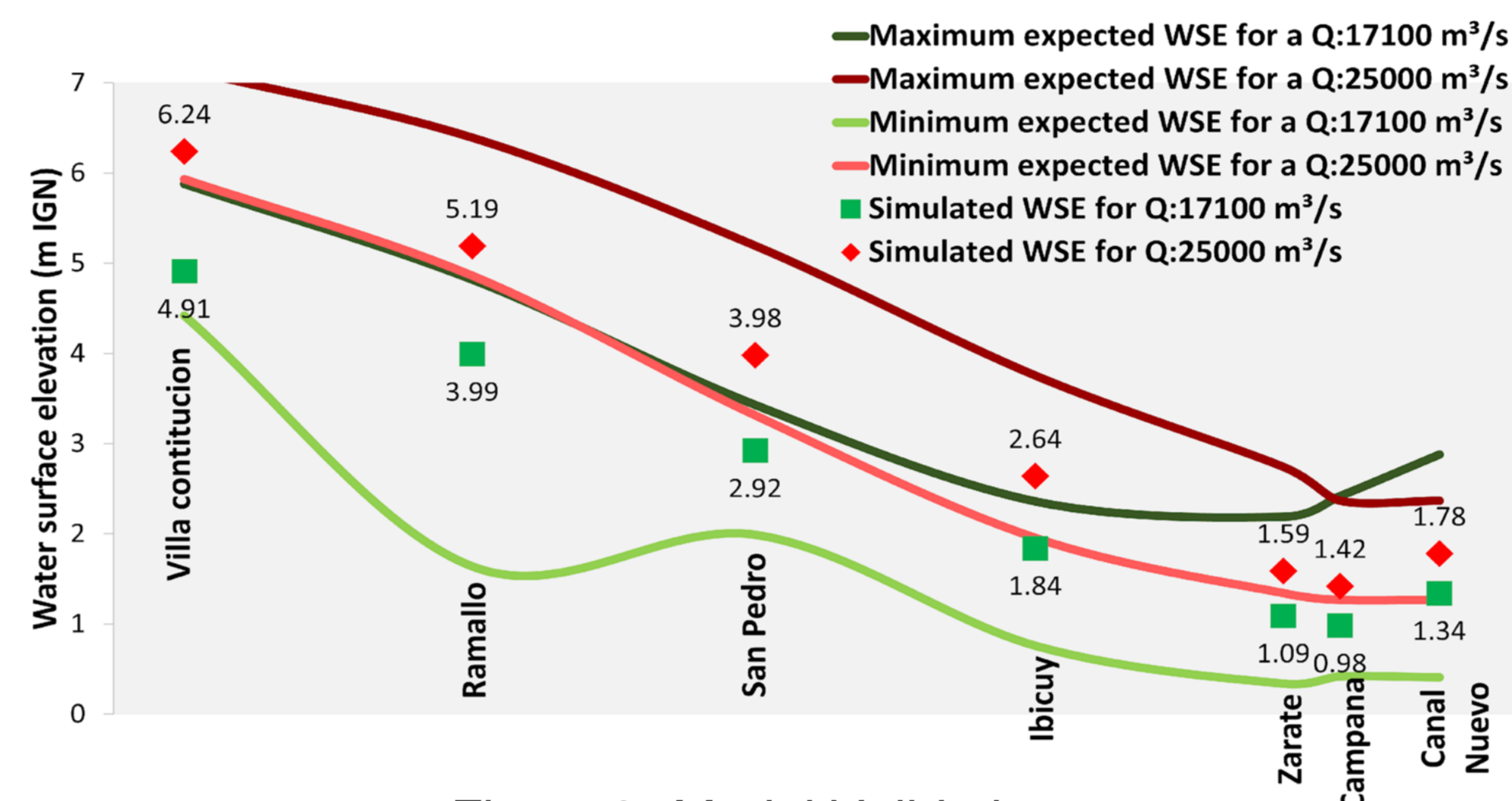


Figure 2: Model Validation

## Scenarios

To evaluate the most critical hydrological conditions, the historical flood of the Paraná River was defined as the base scenario. Four scenarios of anthropic interventions were proposed



Figure 3: Scenarios of anthropic interventions

## Result & Conclusions

The water levels in the observation station were obtained from the simulation. This level increase is verified for each of the anthropic interventions proposed. In the simulation the highest effects on the levels are visualized with dikes and a combination of interventions. As for the minimum impact, it occurred for the intervention of the Nueva Palmira International Connection (CINP). (Figure 4)

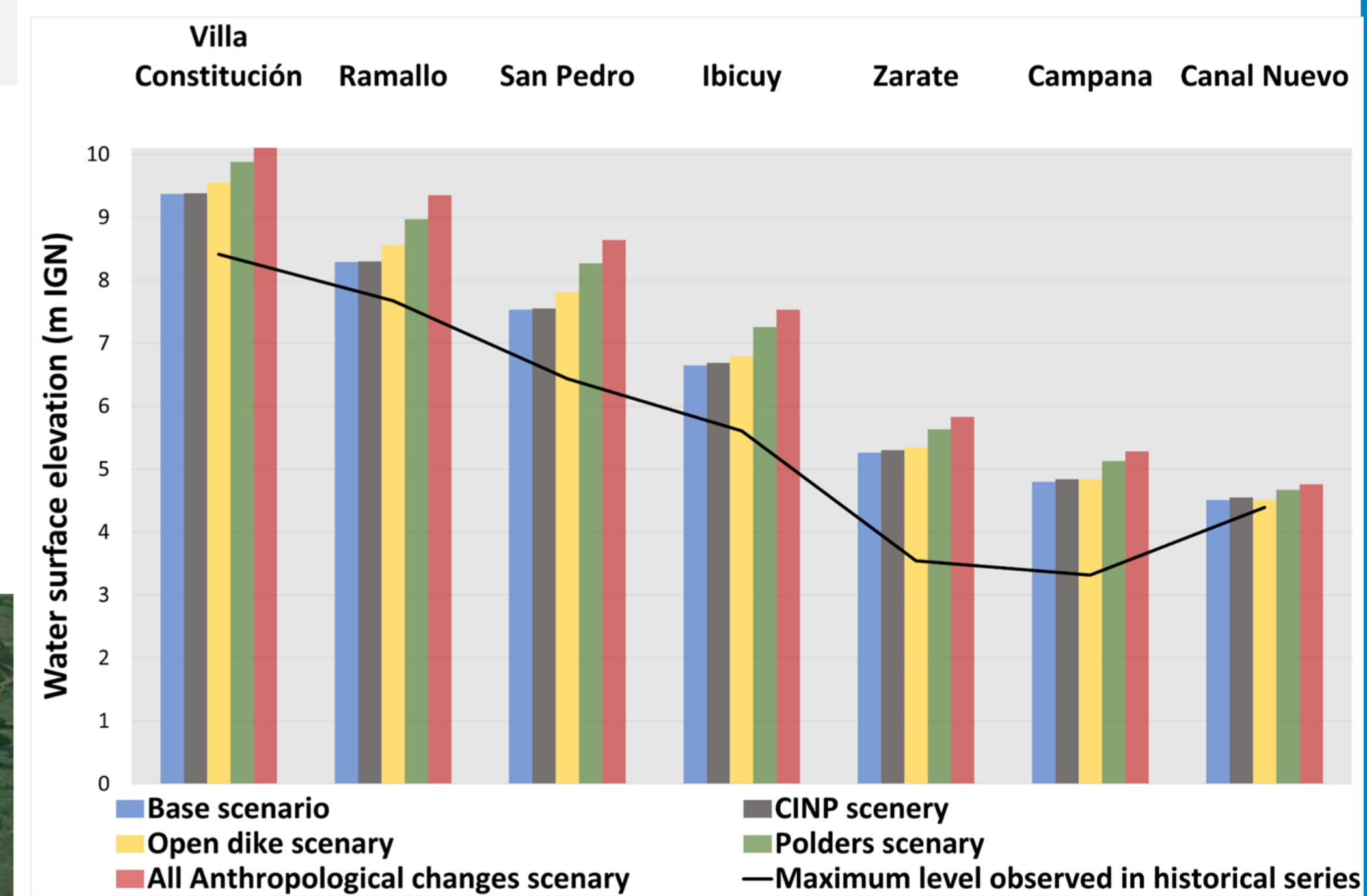


Figure 4: Impact on the levels in the observation stations.

The 2D hydrodynamic model on Delft 3D FM was an optimal tool to assess flood impacts of different anthropic interventions. The joint experience between INA and Deltares was, not only enriching both academically and professionally, but also enabled this work done in just seven weeks.