



Flood risk assessment and cultural heritage impact in the Instituto Superior de Arte (ISA) in Habana

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1. Some history about ISA



1. From american Country Club...

2. ... to the simbol of the Revolution.

3. Until its ruin

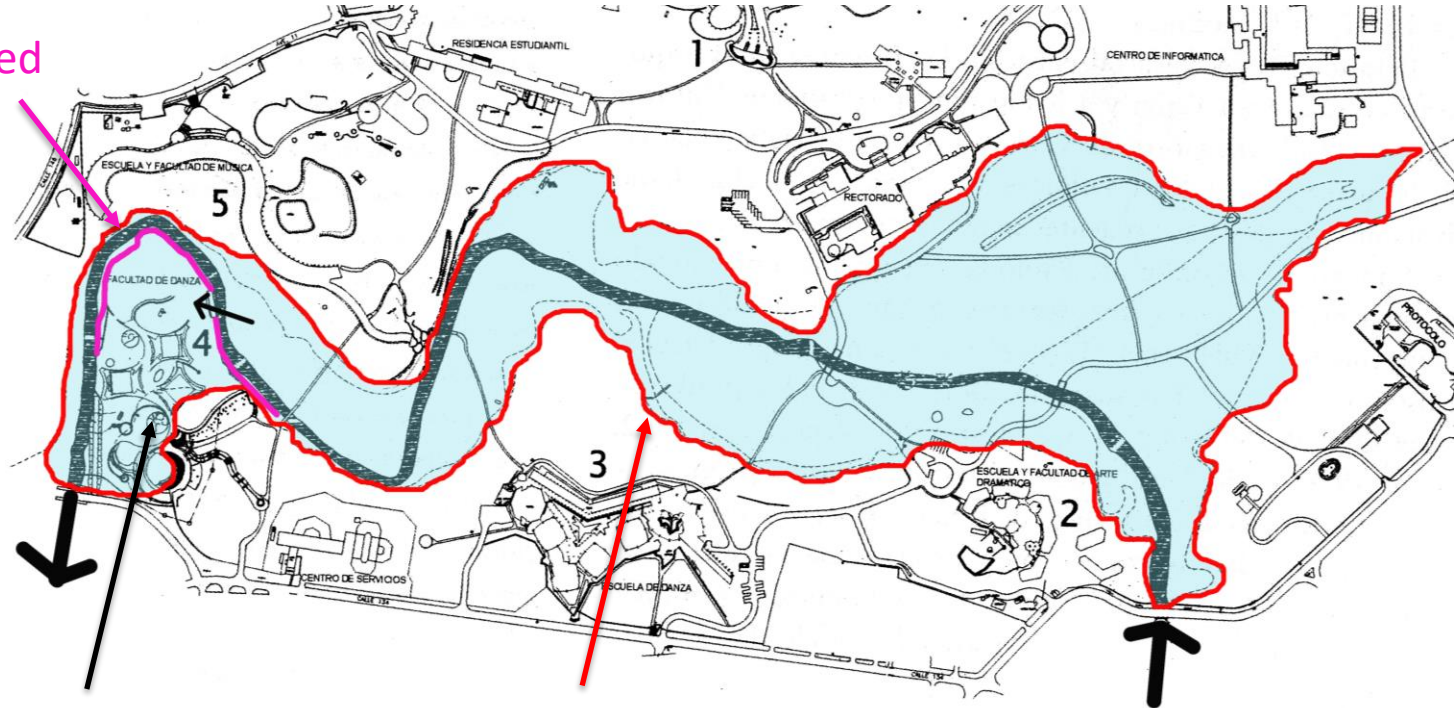
4. The restoration and flood proofing →



2. Case of study: park of ISA



Weir partially collapsed



Escuela de balletto

Flood of 2007

Rio Quibù



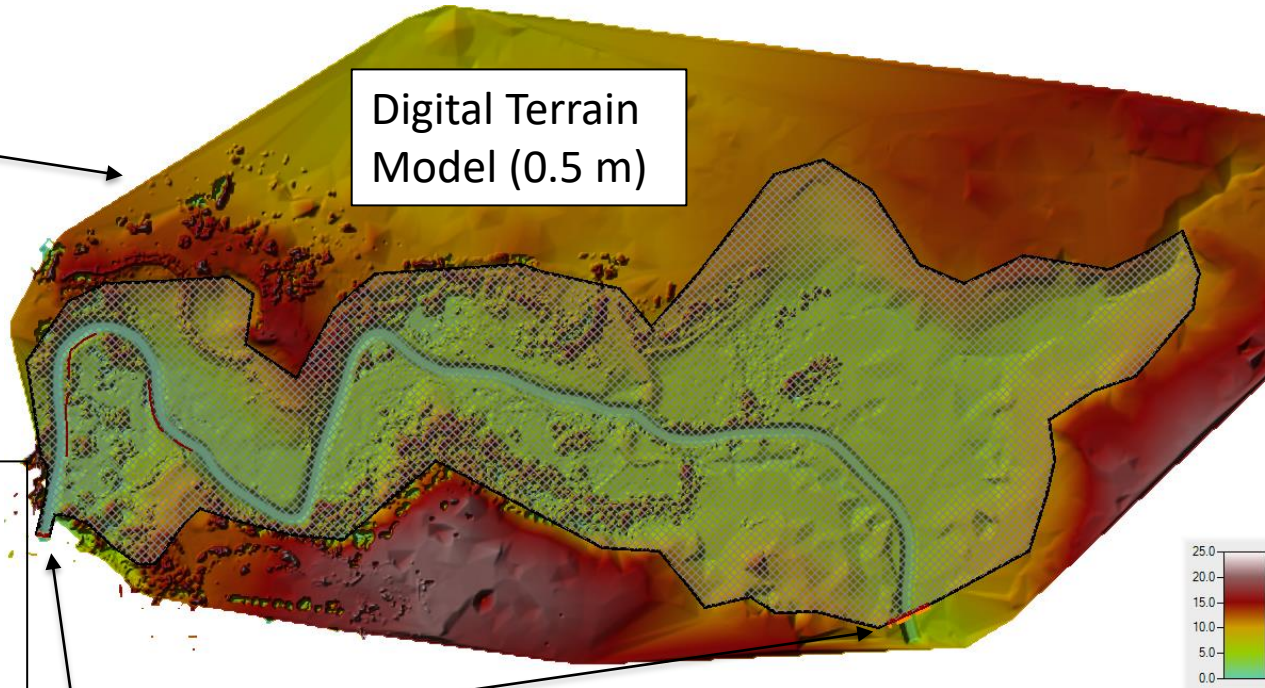
3. Dataset and method



- Laser scanner
- Hydraulic sections
- Spot elevation

Digital Terrain
Model (0.5 m)

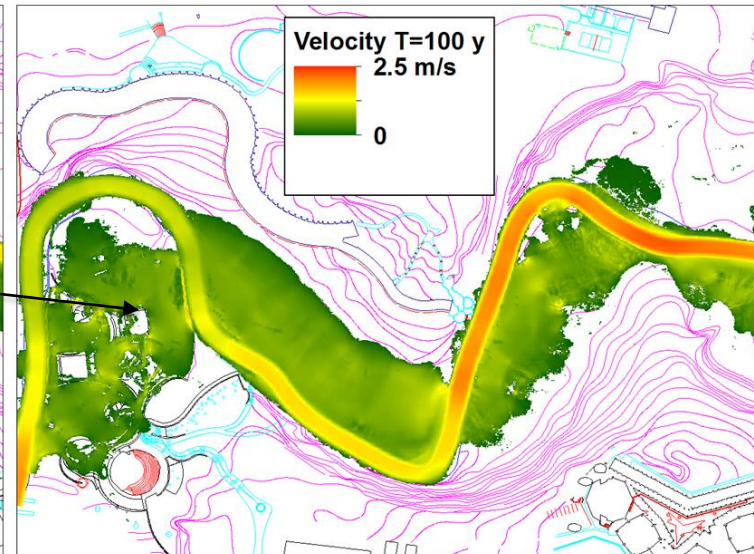
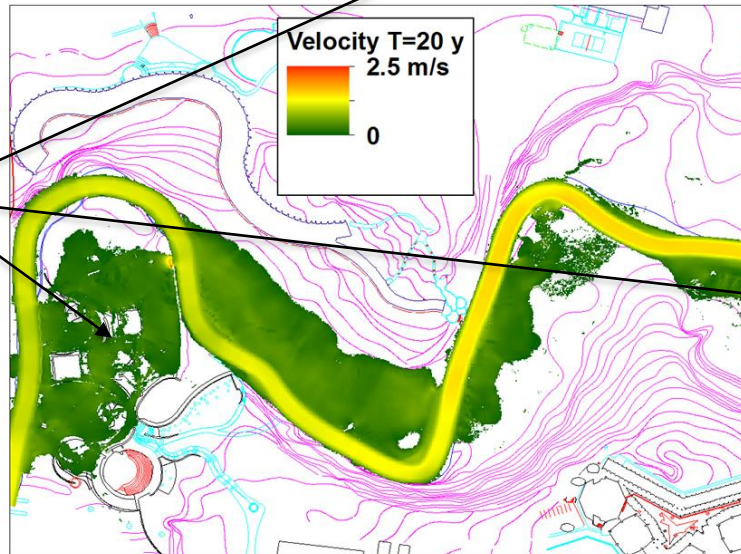
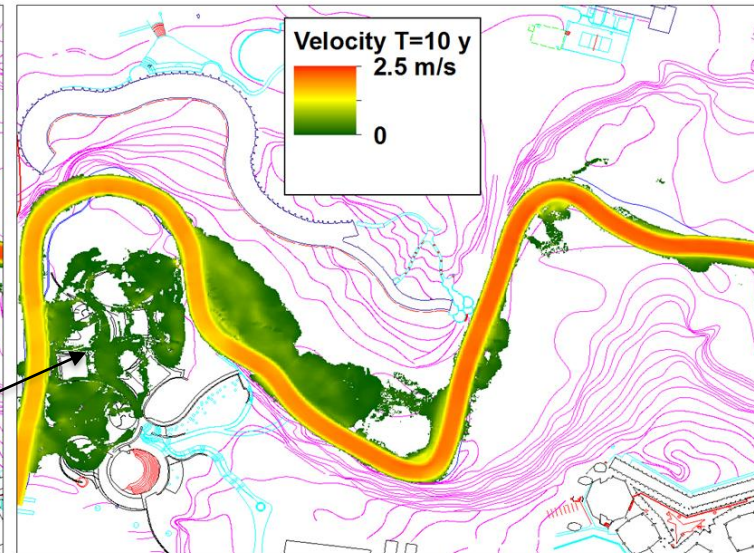
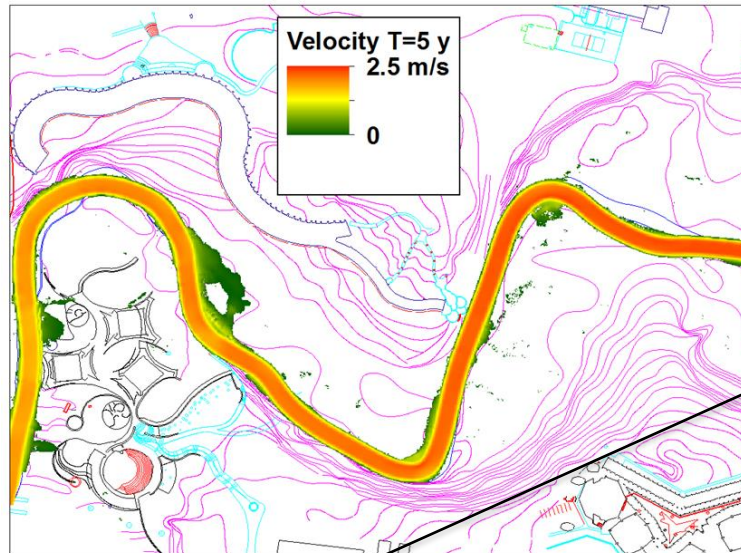
- Flood model:
- Finite volume De Saint Venant equation (HEC-RAS 2D)
- Boundary Conditions:
 - Upstream – discharge input from Cuban study
 - Downstream – Fixed water level at bridge 15 (immediately after escuela de balletto)



4. Flood area results

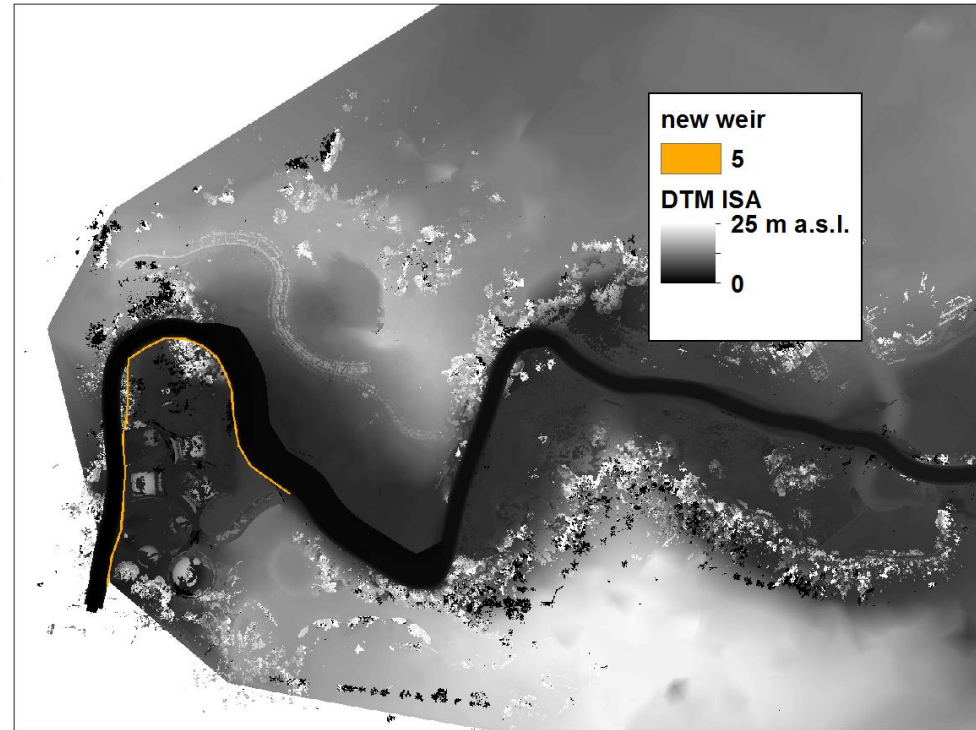
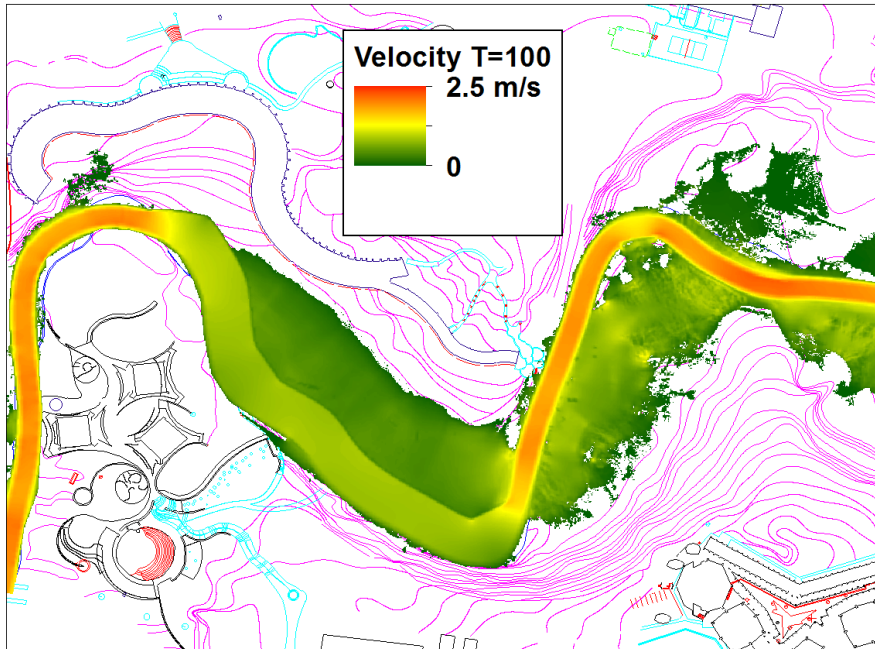
Using constant discharge as input we reach steady condition in a few hours

For return period larger than 5 years School of Ballet is the only building of ISA flooded



5. Flood proofing: river enlargement and new weir

Cuban project planned to build the wall surrounding School of Ballet and enlarge Quibù bed



Even for large return period School of Ballet is safe from flood