

Annex XI
Report on Storm Surge Estimations

Report on Storm Surge Estimations for False Caye (Latitude 16.4 North, longitude 88.3 West.)

Method:

- 1) Cyclones of different intensities were simulated to approach the site all at the same speed of approach but become stationary at different locations.
- 2) The cyclones were made to become stationary for at 24 hours to the southwest, southeast, and northeast of the site in order to simulate the effects of a constant southeasterly, northeasterly and northwesterly wind on the island.

Results:

- 1) Southeasterly wind effects (stationary cyclone to the southwest of the island)

Table 1. Cyclone wind strength and maximum surge

Cyclone Wind Strength (knots)	Maximum Surge (meters)
30	0.1
50	0.3
75	0.6 (Fig 1)
90	0.9
105	1.3 (Fig 2)

As shown in Figure 1 a Category 1 hurricane would generate up to 0.9 meters of surge on the caye. This would cover about of the island.

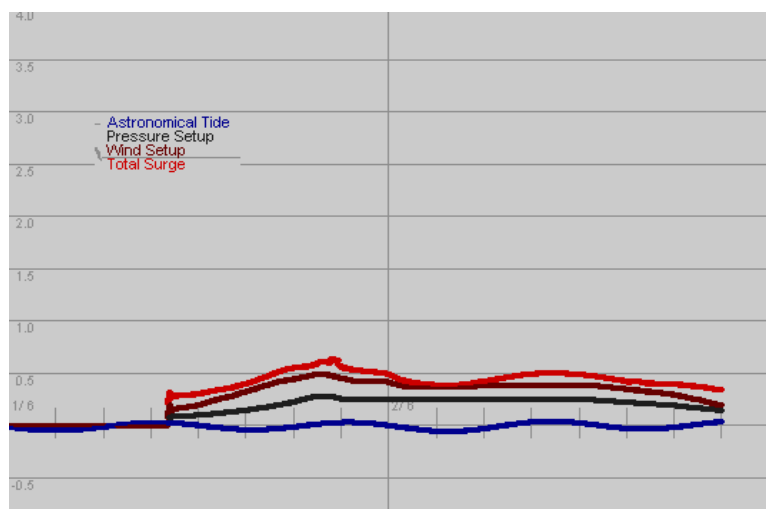


Figure 1. Storm surge generated by a category 1 hurricane (conditions stated under Results 1).

A category 3 hurricane produces a surge of 1.3 m (Figure 2) and all but the central point on the northeast quadrant of the island would be under water.

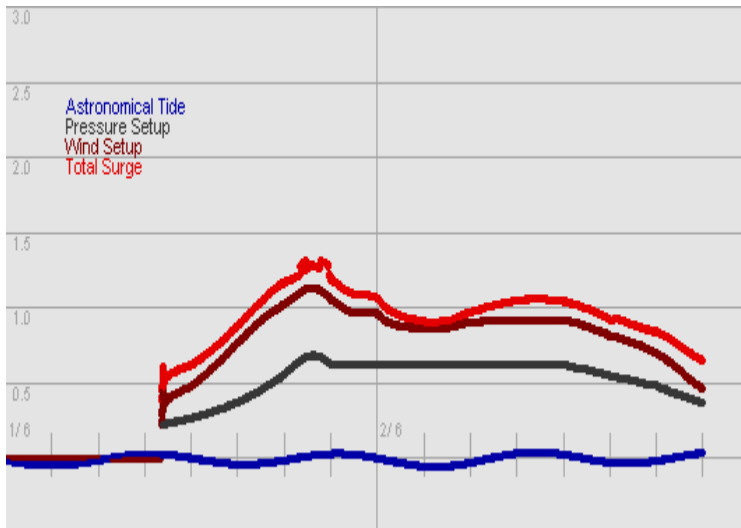


Figure 2. Storm surge generated by a category 3 hurricane. (Conditions stated under Results 1).

Results

2) Northeasterly wind effects (stationary cyclone to the southeast of the island)

Table 2. Cyclone wind strength and maximum surge

Cyclone Wind Strength (knots)	Maximum Surge (meters)
30	0.0
50	0.1
75	0.9 to 1.4 (Fig 3)
90	1.5 to 2.0 (Fig. 4)
105	2.0 to 2.8 (Fig 5)

As shown in Figure 3 this surge would cover about 80 to 90 % of the island

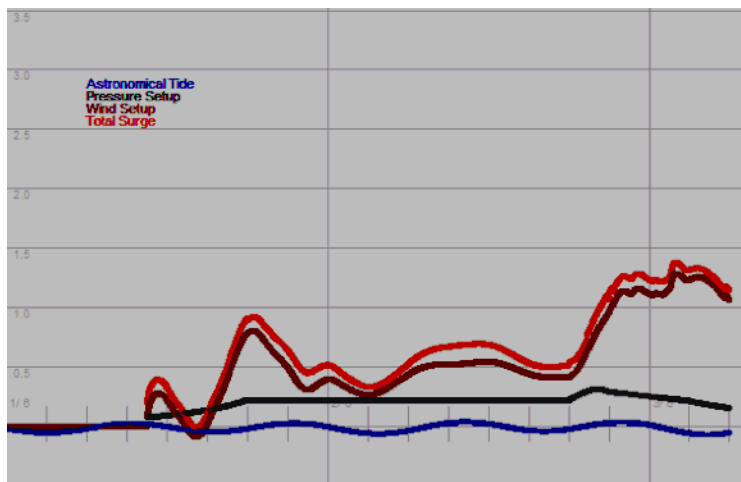


Figure 3. Storm surge generated by a category 1 hurricane (conditions stated under Results 2).

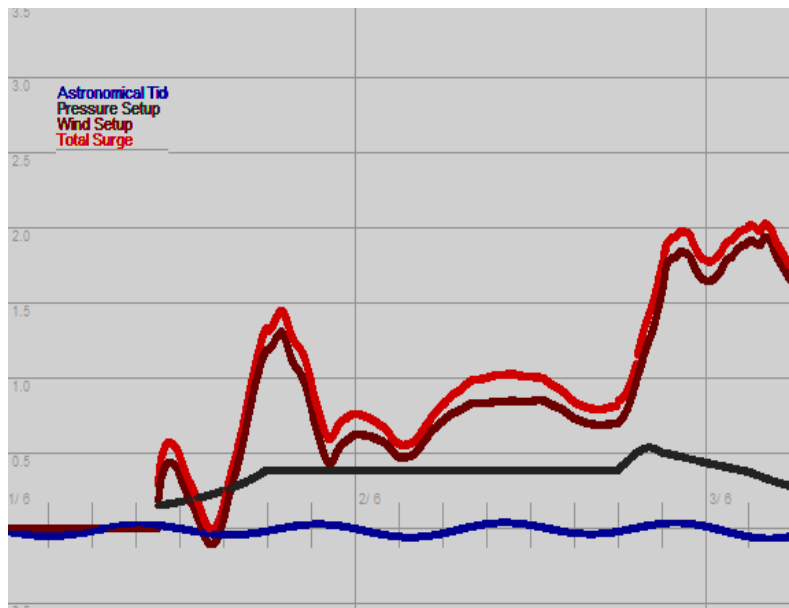


Figure 4. Storm surge generated by a category 2 hurricane (conditions stated under Results 2).

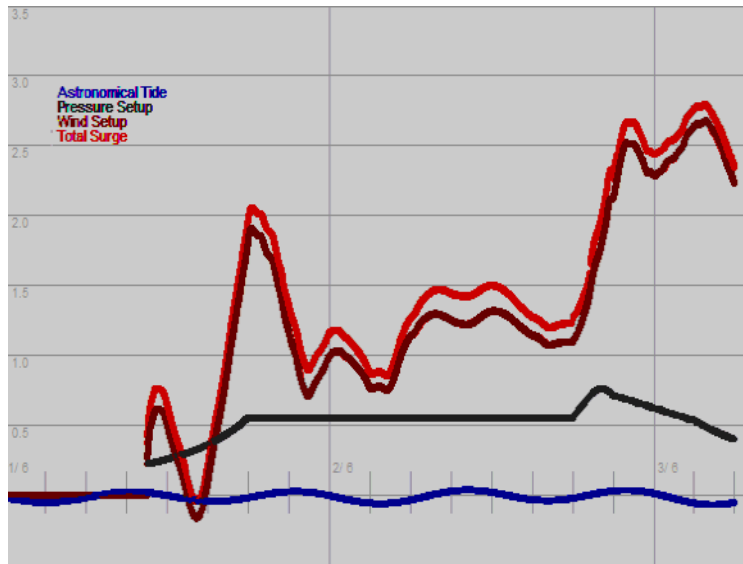


Figure 5. Storm surge generated by a category 3 hurricane (conditions stated under results 2)

Under conditions shown in Figure 5 the entire island will be under water.

Results

3. Northwesterly wind effects (stationary cyclone to the northeast of the island)

Table 3. Cyclone wind strength and maximum surge

Cyclone Wind Strength (knots)	Maximum Surge (meters)
30	0.1
50	0.2
75	† -0.8 to 0.5 (Fig 6)
90	† Greater than -1.0 (Fig 7)
105	† Greater than -1.0. (Fig. 8)

† Negative numbers indicate a surge moving away from the site and not up on the island itself. This would normally be the case for surges generated by northwesterly winds.

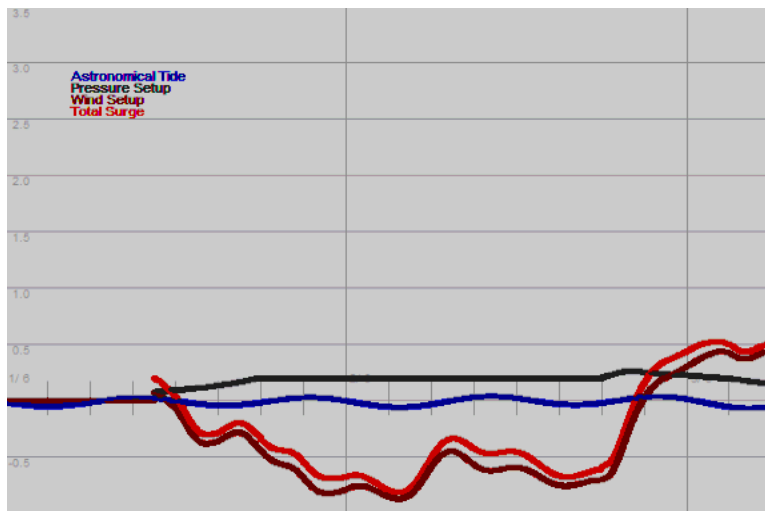


Figure 6. Storm surge generated by a category 1 hurricane.
(conditions stated under Results 3)

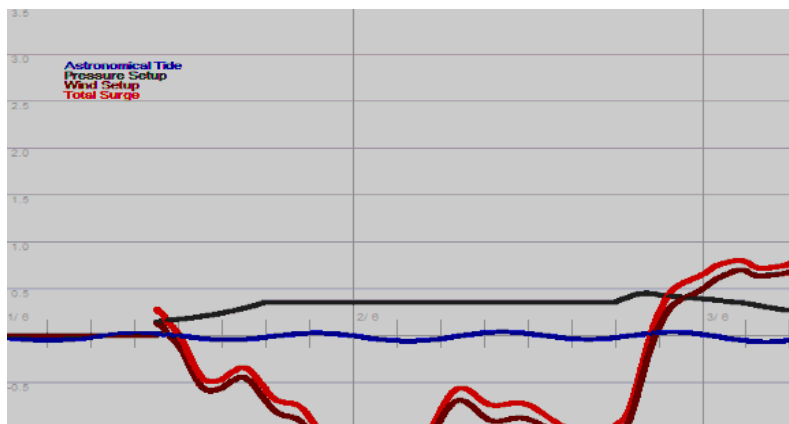


Figure 7. Storm surge generated by a category 2 hurricane
(conditions stated under Results 3)

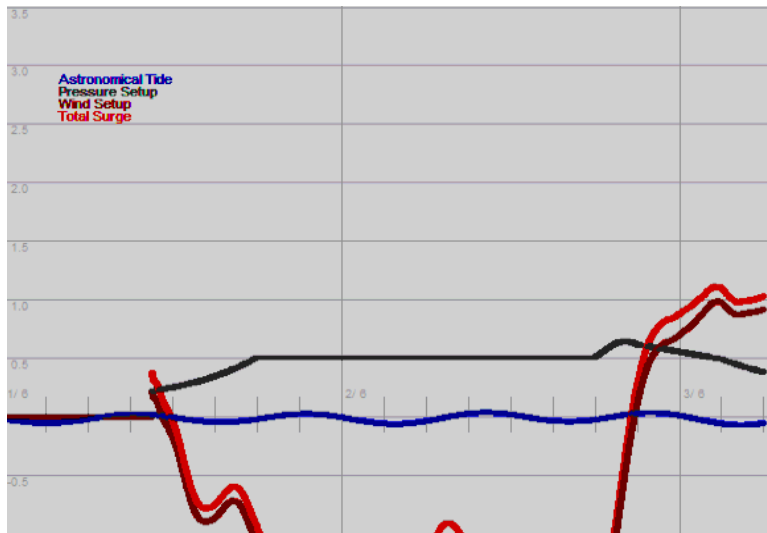


Figure 8. Storm surge generated by a category 3 hurricane (conditions stated under Results 3)

Surges simulated in Figures 6, 7 and 8 may lead to a reconfiguration or deformation of the island. This increases as would be expected with the increasing hurricane intensity.

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