

# Storm surges induced by hurricane Omar in Guadeloupe, October 2008



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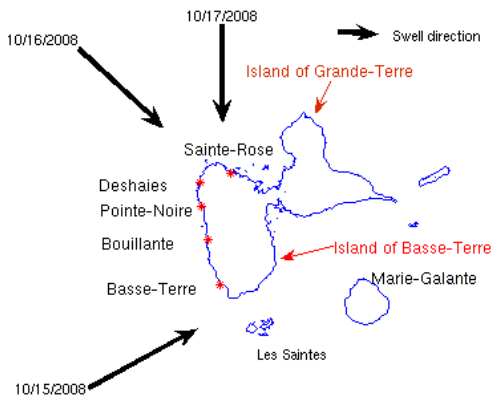
1<sup>st</sup> International Caribbean Waves Workshop, ICWW  
December 9-10th, 2008

# Plan

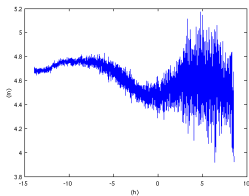
- Introduction
- Hurricane Omar
- Consequences of the sea elevation
- Conclusion and lessons to be learnt

# Description of this event

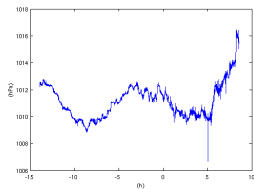
## Archipelago of Guadeloupe



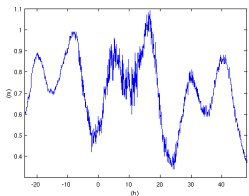
# Measure of this event



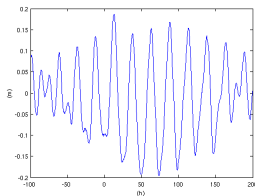
Tide recorder of Deshaies



Tide recorder of Deshaies



Tide recorder of Prêcheur

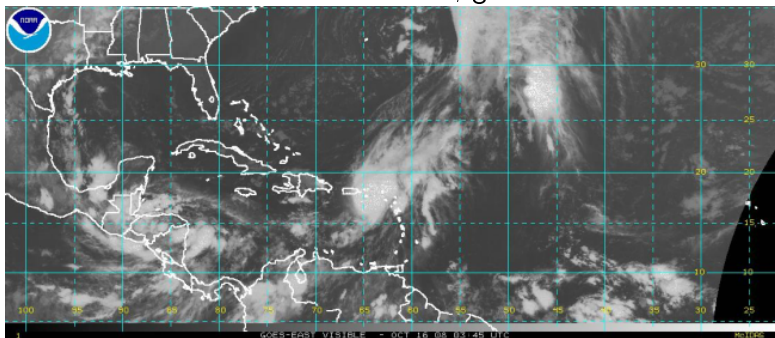


Tide recorder in Caribbean Sea

Data of BRGM, The General Council of Martinique, NOAA

# Omar, hurricane of category 4 (sshs)

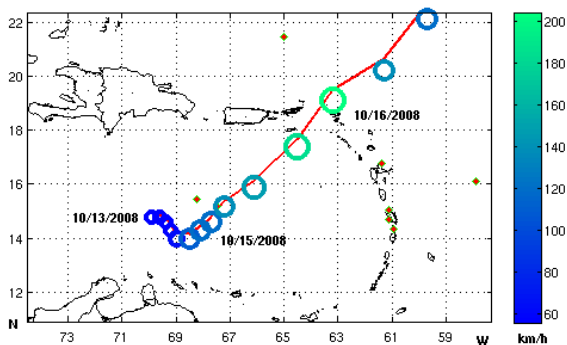
Wind estimation  $204 \text{ km.h}^{-1}$ , gusts  $250 \text{ km.h}^{-1}$



Satellite picture of Hurricane Omar, October 16th, 2008 at 0h15 UTC

Data of NOAA

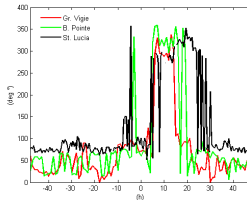
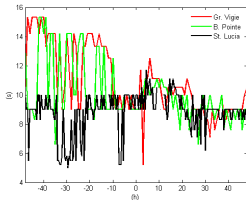
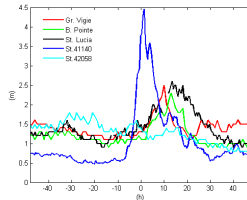
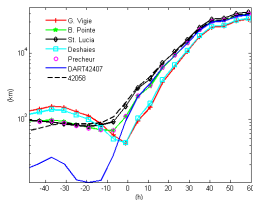
# Trajectory



Data of NOAA



# Swell Characteristics



(a) Distance to the buoys ; (b) Hs of the waves ; (c) Tp of the waves ; (d) Swell direction

# Waves effects on the beaches



(a)Center of Deshaies ; (b)Malendure, Bouillante ;(c)La Perle, Deshaies ;(d)Grande-Anse, Deshaies



# Waves effects on the shore



(a)Le Roux, Pointe-noire ; (b)Rivière-Sens, Basse-Terre ; (c)Ferry, Deshaies ; (d)Petite-Anse,  
Pointe-Noire

# Conclusion

- The cyclonic swell did come from the Omar Hurricane
- The effects started when Omar was closer to Guadeloupe coast
- The size of the waves ranged from about 2.5 m to 3 m, with periods lower than 12 s
- The effects were especially due to the presence of waves 6 to 8 times larger than the normal conditions
- No loss of human beings but large loss of material of several million euros

## Lessons to be learnt

- In the zone in spite of the presence of dams, the rise of the sea level still represents a real danger
- Dams useful for the protection of powerful waves, but slightly adapted in the case of flood
- Alerts must be systematically and more strictly respected
- Any swell higher than 2 m on the Caribbean coast of Guadeloupe, must be regarded as a major risk

# Thanks

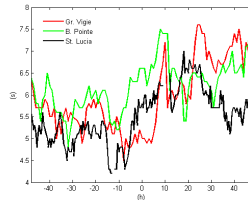
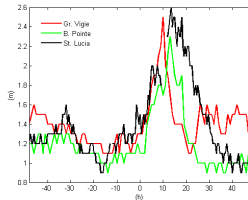
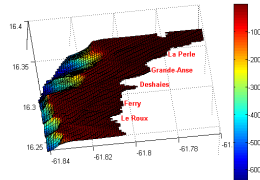
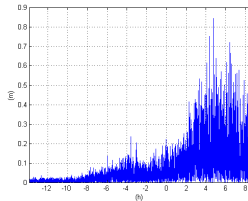
- Météo France (French Weather Agency)
  - Mr Roland MAZURIE
  - Mr Hugues BERTHELOT
- BRGM (Orléans)
  - Mr Rodrigo Predregos
- Dr. Jacque Moulinier, MC (LaRGe / UFR Sciences / UAG)

# Annex of pictures



(a)St-Rose(shore) ;(b)Grande-Anse,Deshaies ;(c)Malendure,Bouillante ;(d)Rivière Sens,Basse-Terre

# Annex of figures



(a) Absolute variation of the tide in the Port of Deshaies ; (b) Bathymetry of Deshaies ; (c) Maximal height of waves of Omar ; (d) Average period of the waves of Omar