

**KURSUS PEMODELAN HIDRAULIK 1
BAGI PROJEK PEMBANGUNAN
DI PANTAI DAN LUAR PANTAI**

COASTAL PROCESSES AND IMPACT ON SHORELINE

PROF. DATO' DR. SHARIFAH MASTURA SYED ABDULLAH
PENGARAH, INSTITUT PERUBAHAN IKLIM, UKM
PROFESOR KELESTARIAN ALAM SEKITAR WAN FATIMAH
PENYANDANG, KURSI PERUBAHAN IKLIM UKM-YSD

16 APRIL 2018

Storm Event at Tg. Tokong, Penang

VIDEO 1



VIDEO 2



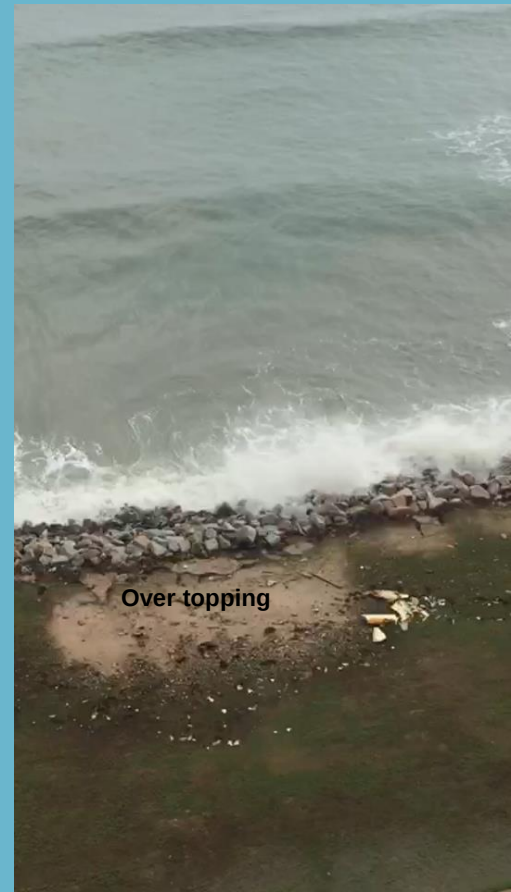
Storm Event at Tg. Tokong, Penang

PHOTO 1



PHOTO 2

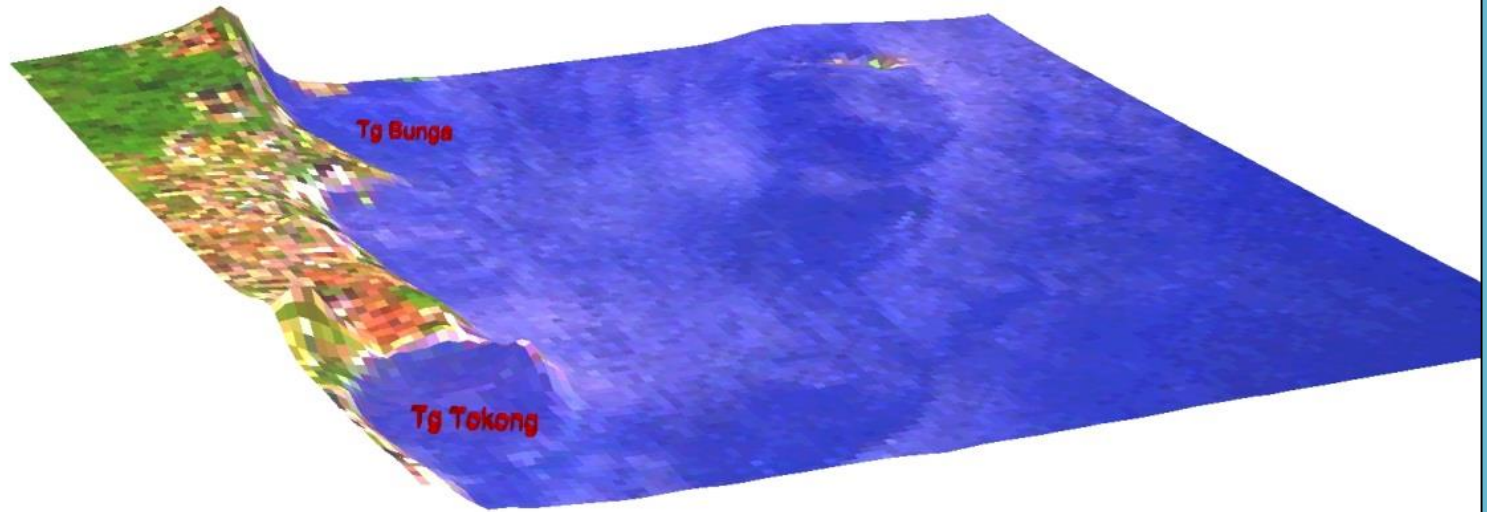




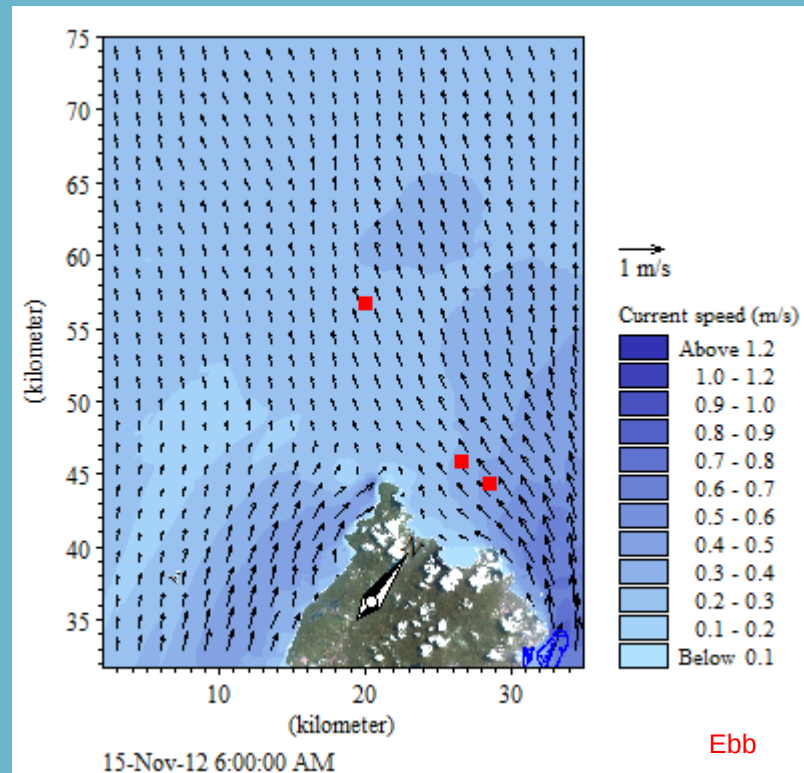
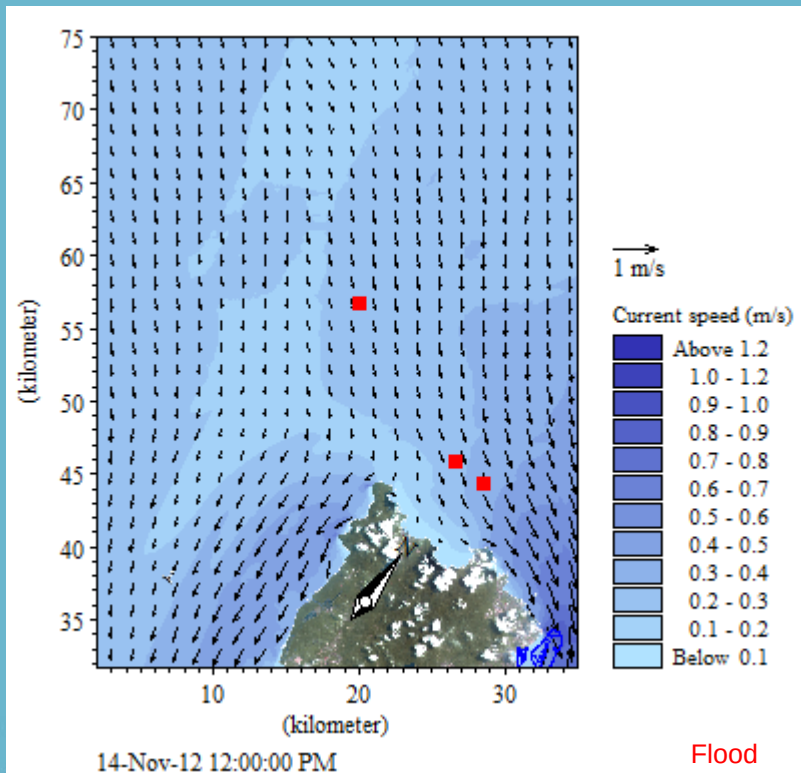
Satellite Imagery of Tg. Tokong (5/2/2018)



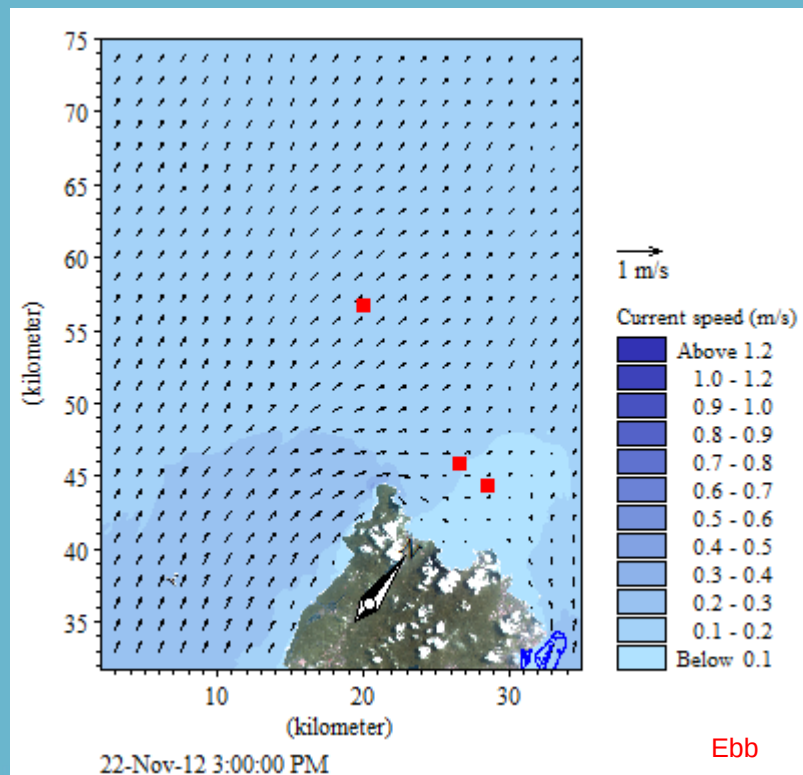
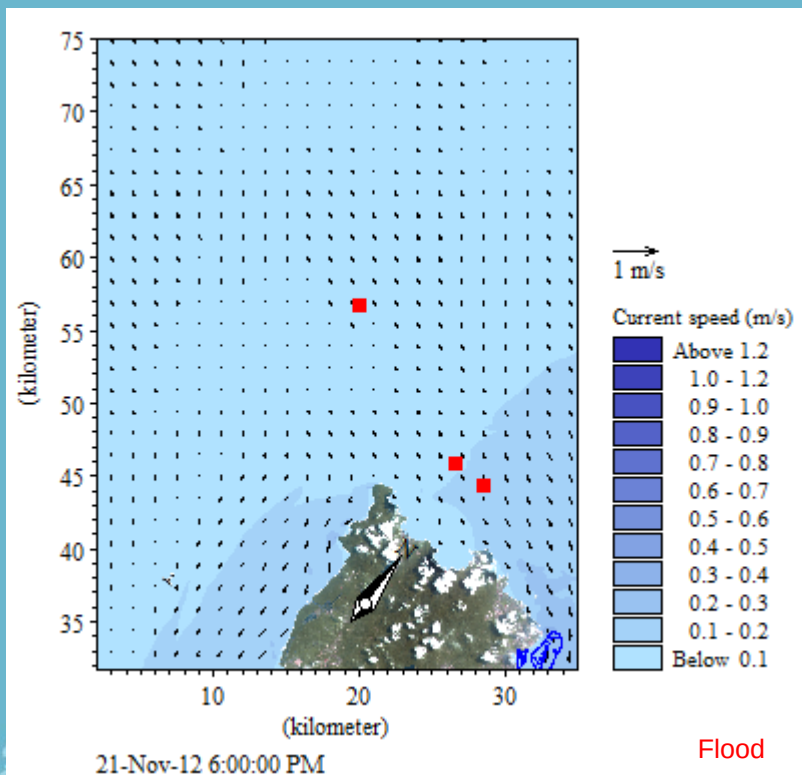
Bathymetry (3D) of Tg Tokong



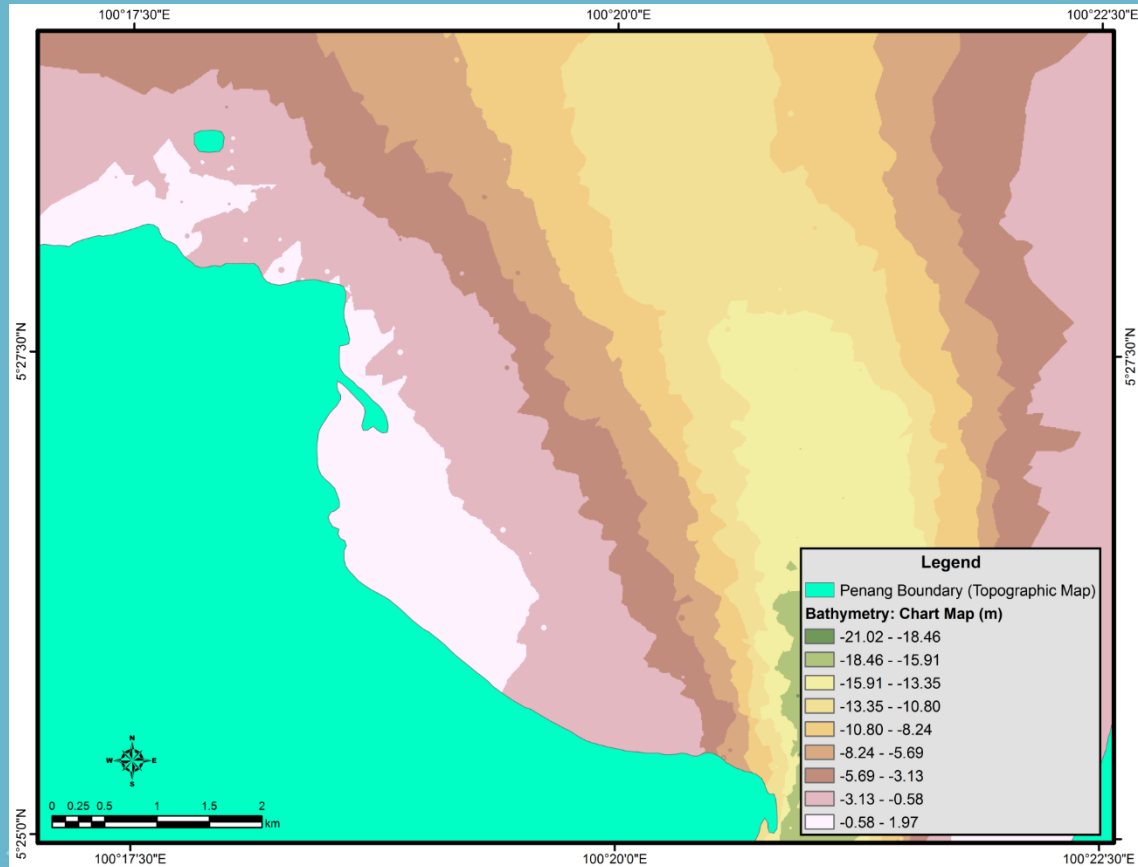
Current Flow Conditions (Spring)



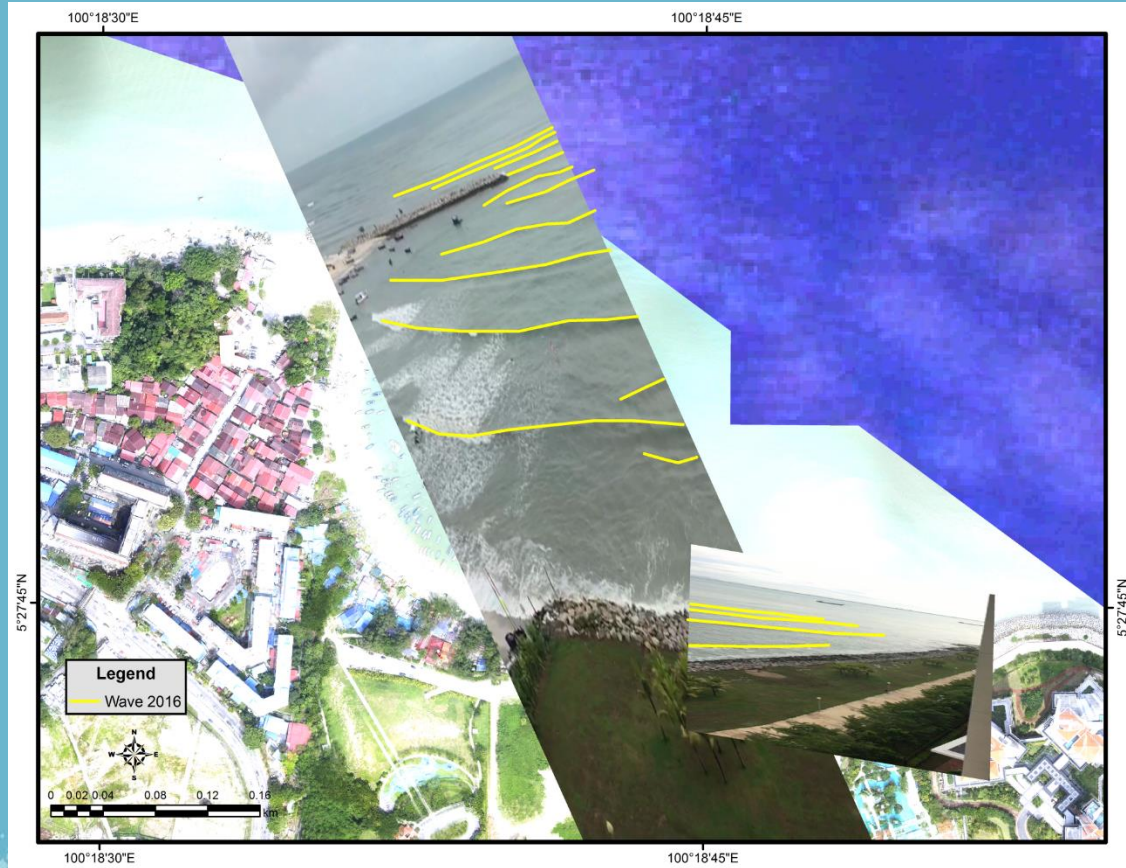
Current Flow Conditions (Neap)

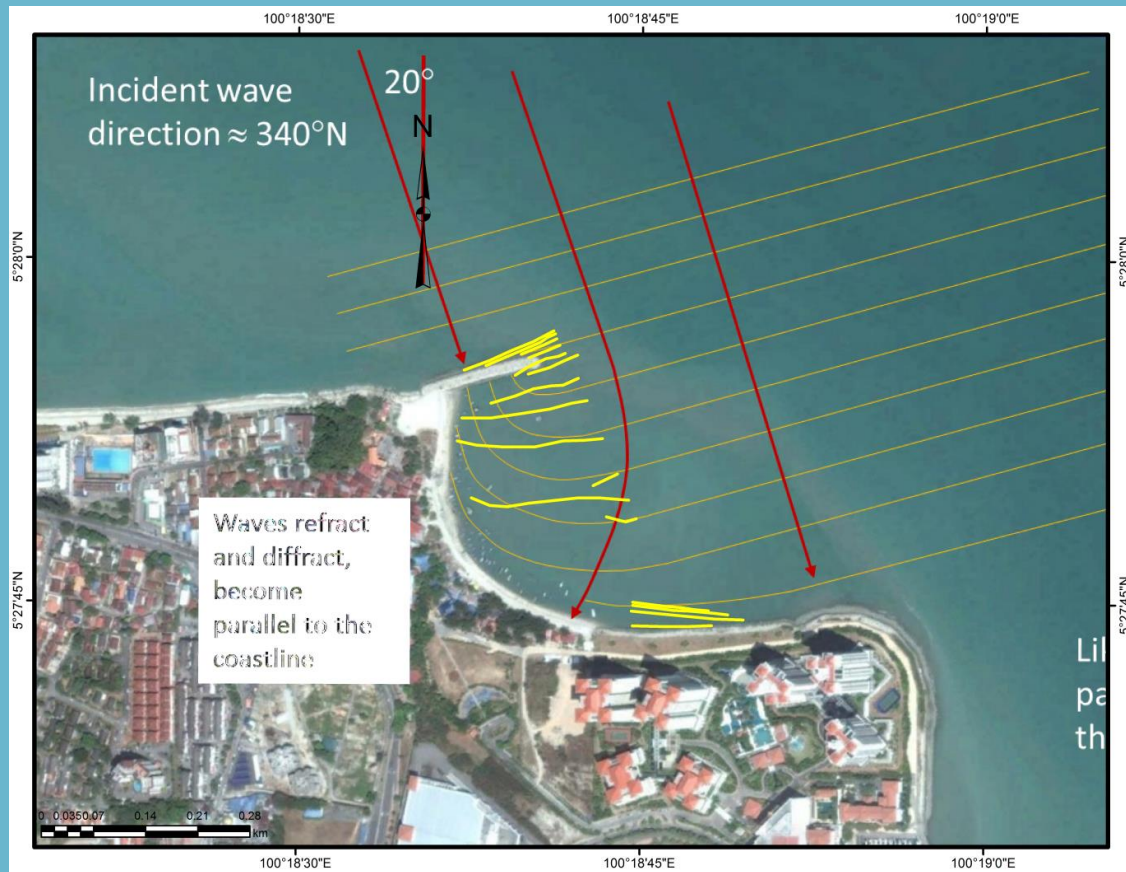


Bathymetry Map



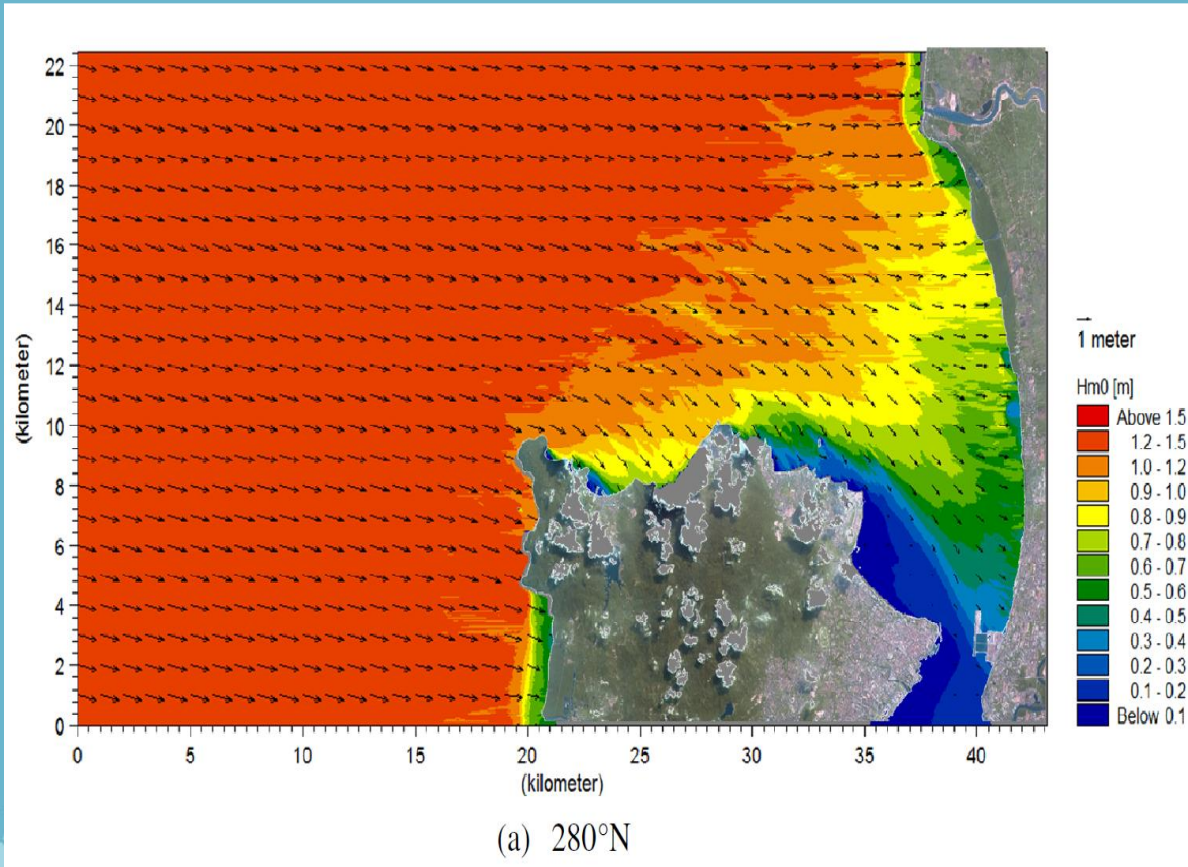
Combination Wave from Photo 1 & 2



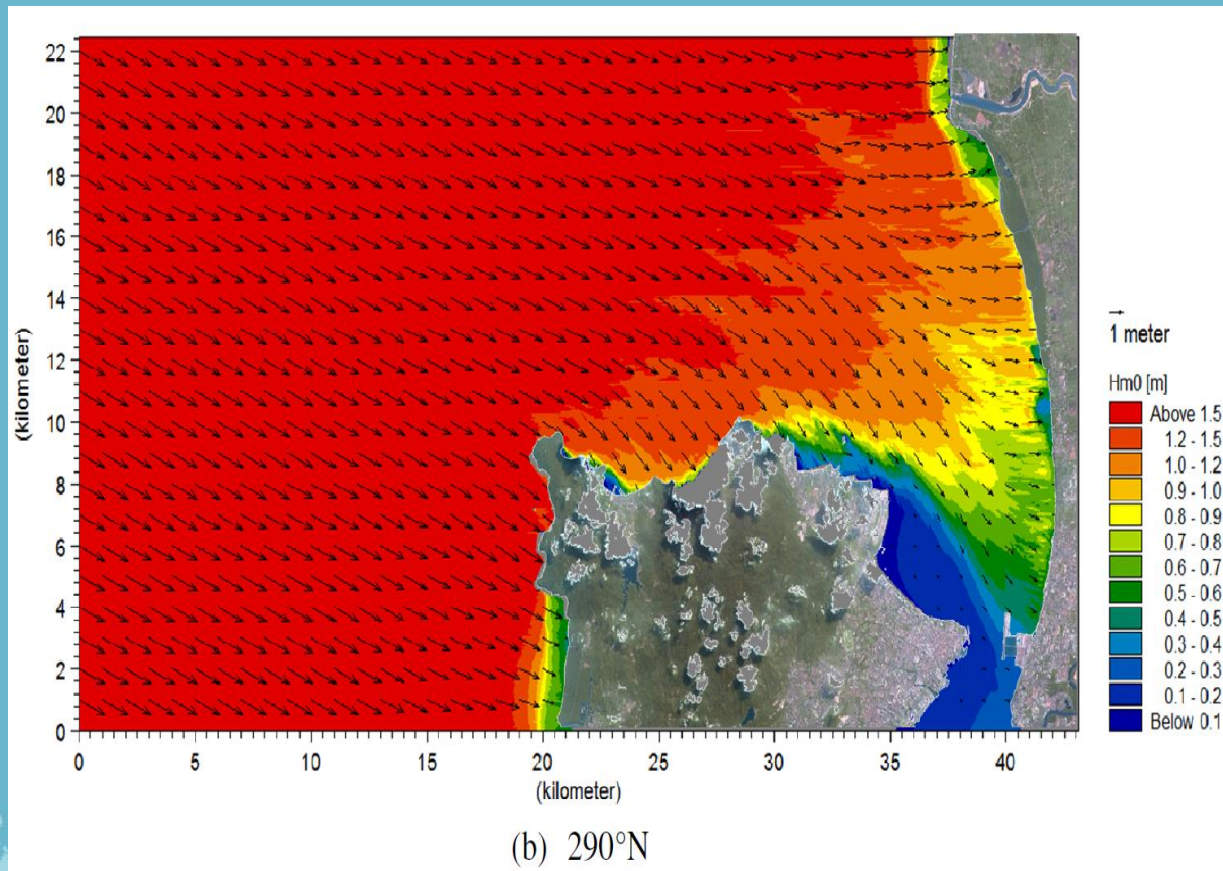


Wave Direction

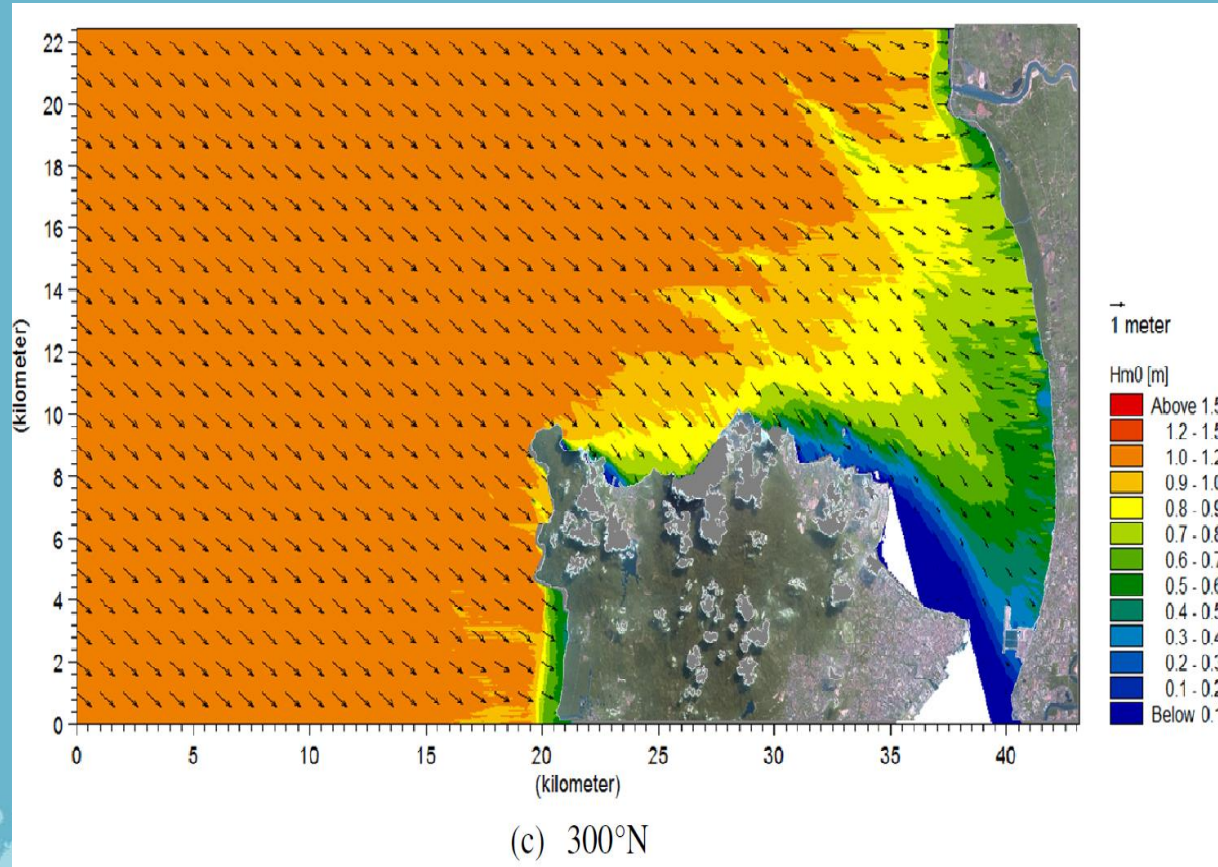
Wave 280° N



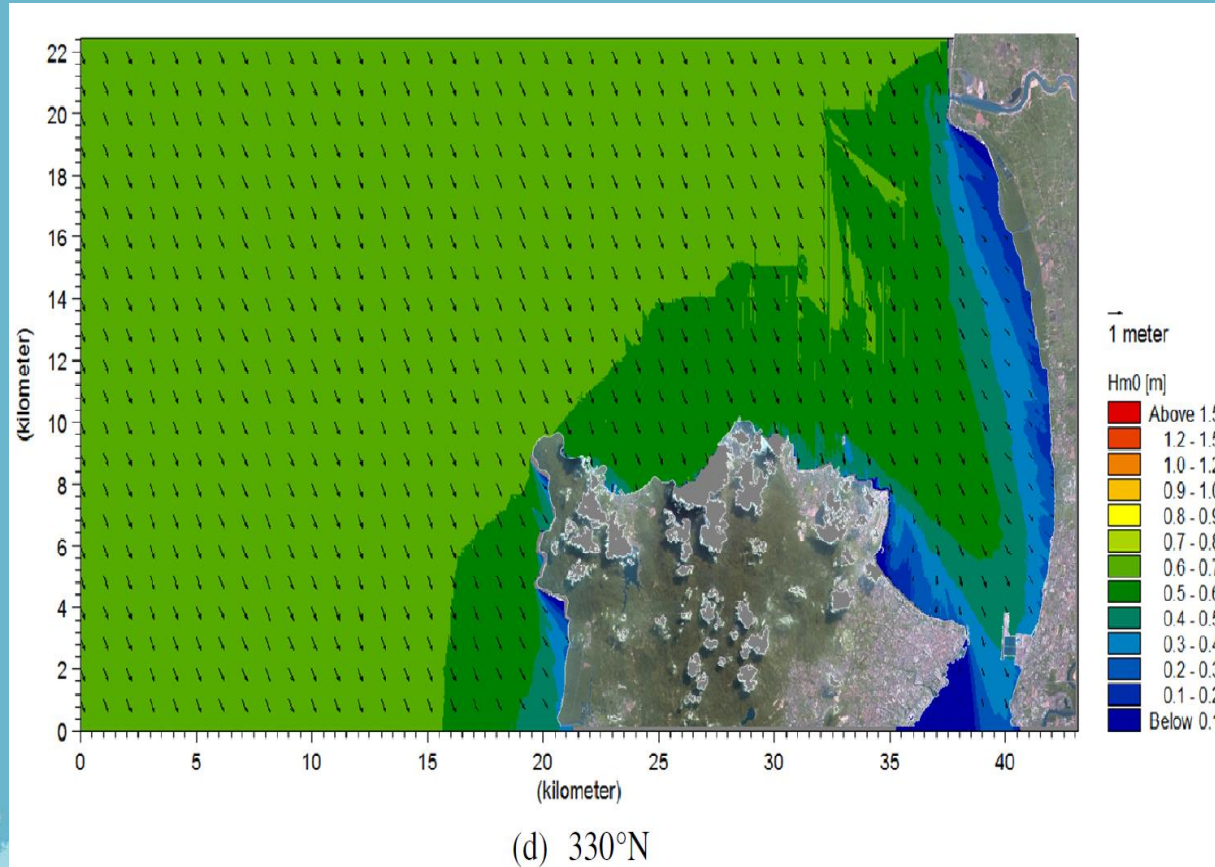
Wave 290° N



Wave 300° N



Wave 330° N





Incident wave direction $\approx$ 20°
 340°N

Waves refract and diffract,
become parallel to the coastline

Likely wave crest pattern
observed from the videos

Observation on the Video



The wave crests are almost parallel to the fisherman's breakwater and the coastline fronting the green area



The incident waves are from about 340N



Normal waves are from 280, 290, 300 and 330

On Wave Transformation

1 As wave approach to shore, the part of the wave in shallow water slows down

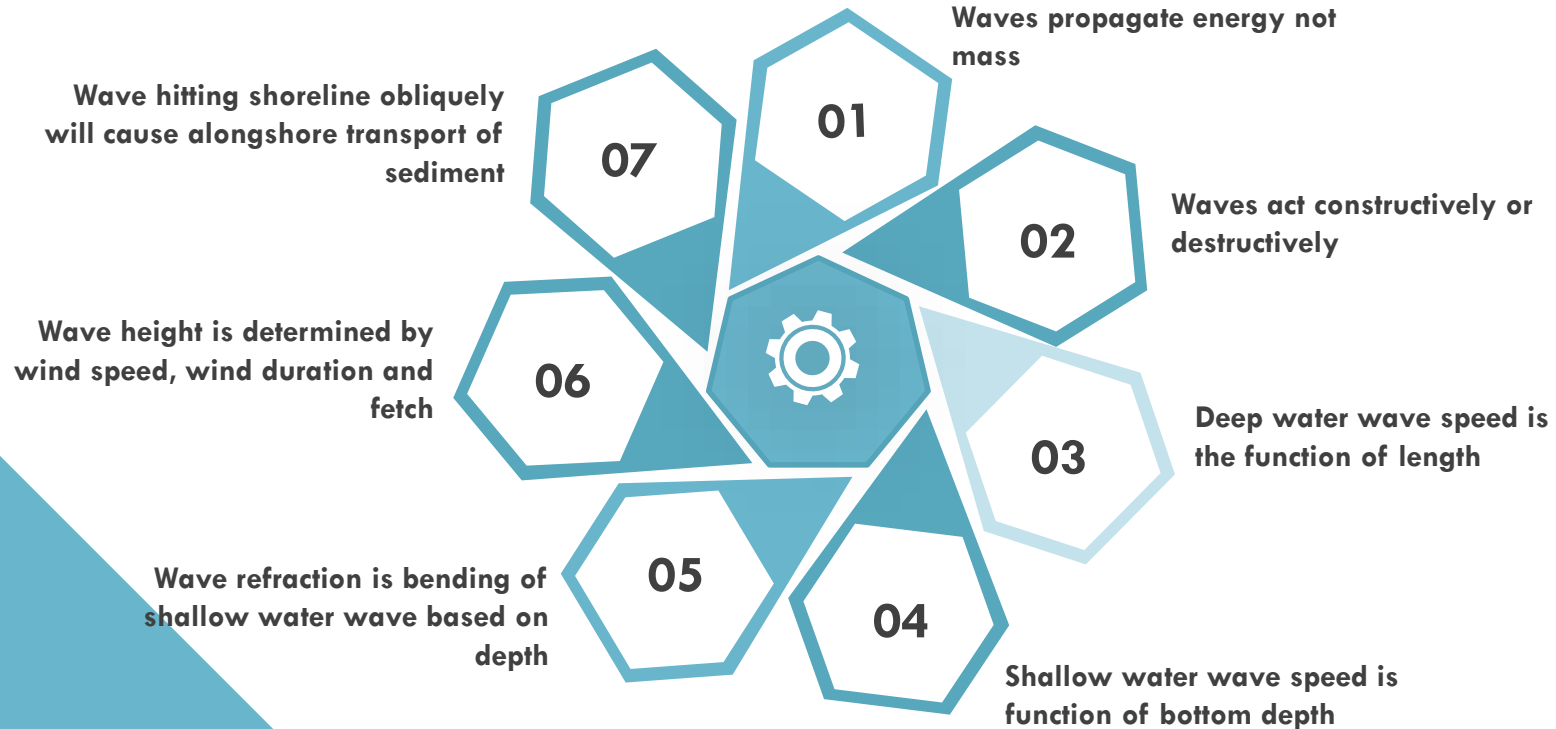
2 The part of the waves in deep water continue at its original speed

3 This cause wave crest to refract (bend) and result in wave lining up nearly parallel to shore

4 The photograph shows wave rays (orthogonal). This line is drawn perpendicular to the wave crest

5 The lines shows bending effects and area of energy concentration along the shore

On Wave Propagation





THANK YOU