Nile Delta Environment and Offshore Sediment Flux

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Abstract: The storm system which tracked across the eastern Mediterranean region on 2002 December,20 brought strong winds and heavy rainfall.Flooding was reported in Northern Lebanon and winds at the Beirut airport gusted to 60mph during the afternoon of the 20th(1),the Suez canal was closed on the 17th,waves had hit 3 meters at the beginning of the storm(2).

In a Intergovermental oceanographic Commission workshop report(3),Frihy(1988) analysis has previously revealed drastic shoreline change for the unstable offshore zone of the Nile delta with highest erosion rates of 114 meters per year in Rosetta (maximum value 120 meters)in a 28 years period study which is more than twice Bangladesh Damietta station(4)The major influencing agents affecting the Nile Delta region are winds and waves,though their dominants directions are northwesterly.Waves action along the coast is seasonal in nature,with storm waves in winter(period 7-8 second).These waves as high as 2.5 meters are generated with a predominant direction similar to that of wind.Storm surges in shallow water are combination of low barometric pressure and high onshore winds(5),they can rise sea level several meters.

The detection and calculation of coastal erosion and accretion data in the Nile Delta is still controversed at this time.Landsat thematic data taken between 1984 and 1998 in Nile Delta and presented in 2001(6)had used ERDAS Images processing software.The problem is significant.The difference in the volume of soils in-situ can be 243% for eroded area and 144% for the accreted area(6).Soft Bottom conditions are still not understand as well.A significant amount of research has been conducted to improve an understanding of these effects and to develop improved in situ methods in the Nile Delta. The Cone Penetrometer Test allow a very quick appraisal of subsurface conditions.For Soft alluvial layer at shallow depth,it is common to infer a value of undrained shear strengh from the qc values and the total overburden stress, po

The following expression is used(7): Cu=qc-p0/Nk

The appropriate value for the Cone Factor Nk varies between 5 and 75 ,with most common values between 10 and 30.

For the soft gaseous alluvial layer untill the shallow depth of 0.3meter,the Cone factor Nk was choosed equal to twelve in the empirical method used to derived the shear strenght from the resistancet (NGI:Norwegian Geotechnical Institute).For Nile offshore soft soils a empirical bearing capacity factor for cone Nk of 7 may be advanced to explain the bad performance obtained in underwater intervention.

ref:

(1) NOAA National Climatic Data Center.Extratropical cyclones. http://lwf.ncdc.noaa.gov/oa/climate/research/2002/dec/hazards.html

(2) Bad weather stops traffic on Suez canal Port Said 2002 December,17 http://www.spacedaily.com/2002/02121740203.2fo02yh.html\par

(3) Intergovernmental oceanographic Commission Workshop report N89 IOC-ICSEM OSNLR
Effect of River damming and deficit of sediment flux on the continental shelf.A case study of the Nile Delta http://www.io-warnemuende.de/homepages/schernewski/Littoral2000/docs/vol1/Littoral2002_36.pdf

(4) Coastal erosion on the Island of Bhola, bangladesh Goteborg University Magnus Kranz http://www.gvc.gu.se/BIBLIO/B-serin/absB178.htm

(5) Eurocoast Porthmouth 1996

(6) Coastal Erosion&Accretion Detection Covering Part of Northern Coast of Egypt using a landsat Thematic Mapper Data

(7) Unit CIV4249:Foundation Engineering:Site Investigation and Exploration.Department of Civil Engineering Monash University Australia