شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها

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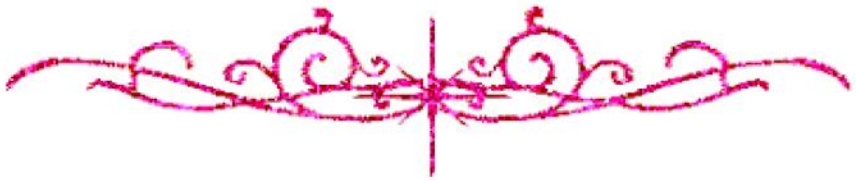

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بالرسالة صفحات

لم ترد بالأصل

HOSSAM MAGHRABY

ALEXANDRIA UNIVERSITY
FACULTY OF ENGINEERING

HYDRAULIC EFFECT OF WAVES ON THE NORTHERN COAST AND SUBMARINE SAND BARS CHARACTERISTICS

A Thesis Submitted in Partial
Fulfillment of the Requirements for the
Degree of M.Sc.

In

CIVIL ENGINEERING (HYDRAULICS AND IRRIGATION DEPT.)

BY

ENG. ESSAM EL DIN FOUAD ABD EL HALIM HELMY

B.Sc. Civil Engineering

Supervised By

Prof.Dr.
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ALEXANDRIA 1994

We certify that we have read this thesis and that, in our opinion, it is fully adequate, in scope quality, as a thesis for the degree of Master of Science.

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SYNOPSIS

A long term study of sand bars characteristics along the Nile Delta Coast between 1981 and 1990 was determined using a developed computer program.

The study aimed to obtain the relationship between bars crest height and depths of water over the bar crest, the relationship between bars height and onshore-offshore sediment quantity, and the distribution of equilibrium bars.

The bars migration rate, trend and the relationships between bars movement and the net cross-shore sediment patterns and volume were obtained. Also, the distribution of bars mean position and mean height along the Nile Delta Coast was presented.

The prevailing waves climate and offshore currents as well as, grain size distribution, bed slope changes and volumetric changes were also determined to relate them with the characteristics of bars.

Measured data at different stations along the Delta Coast is used. Also satellite photographs for the coast are obtained to show the position and type of the bars. Useful and definite conclusions are presented in the thesis.

NOMENCLATURE

a_i Incident wave amplitude near the point of breaking

B_t Galvin's breaker type index

C_B Bar crest speed.

D Water depth from still water level

D_b Breaking depth from still water level

D_{so} Mean grain size of beach material

f_p Centeral frequency of the frequency band containing maximum energy density

g Acceleration due to gravity

H Bar crest height (maximum bar height in each depth zone)

H_b Breaking wave height

H_c Bar crest depth from the still water level

H_o Unrefracted deep water wave height

H_s Significant wave height

H_t Bar trough depth from still water level

h^{th} Number of vortices

h_{vn} Water depth of the vortex

i Average beach slope shoreward of the breaker zone

k Dimensionless constant

L Wave length

L_b Breaking wave length

L_c Crescentic bar wave length

L_e Alongshore edge wave length

L_{vn} Average horizontal distance from break point to the location where h^{th} vortex reaches the bottom

$L^{`}$ Width of the surf zone

m^{i} The ordinal number (from the break point to the shore $m^{`} = 1,2,..$

m Node number of the edge wave (n = 0,1,2,..)

R_e Reynolds number of breaking waves

S Area of water mass in the surf zone.

T Wave period

T_e Edge wave period

T_p Peak wave period

t Time

X Constant 3.5 for deposition at node
6.5 for deposition at antinodes

X_B Bar crest horizontal location according to breaking theory of bars formation

x_c Distance offshore to the bar crest according to edge wave theory of bars formation

x_o Distance between the bar crest line and the shoreline (used in the computer program analysis)

x_1 Distance between the bar trough to the baseline

x_2 Distance between the bar beginning point to the baseline

x_{21} Distance between the beginning and trough points of the bar

Y Depth water over the bar crest

Y_1 Depth of water over the bar trough point

Y_2 Depth of water over the beginning point of the bar

Y_{21} Difference in depth of water over the beginning and trough points of the bar

Z_b Equilibrium bar height

β Beach face slope, inshore-foreshore slope

α Decay coefficient

α_o Deep water wave angle

ω Sediment fall speed

ω_t Wave frequency

δ Sea surface displacement

η Single similarity parameter

η_b Single similarity parameter for breaking waves

η_o Single similarity parameter for deep water waves

ν Kinematic viscosity of fluid

ϵ Surf-scaling parameter

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