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SEDIMENT TRANSPORT PROCESSES IN THE VICINITY OF A RIVER MOUTH

FINAL REPORT

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ABSTRACT

The dynamics of the development of a sandy beach through time are being studied. A river is used as an example of the effects of a source (or sink) supplying sediment to the beach, while wave-induced littoral transport distributes the sediment along the nearshore region.

An analytical solution of the continuity equation for sediment together with the Inman and Bagnold (1963) wave-induced littoral transport equation, as modified by Komar and Inman (1970), was developed under the assumptions that the nearshore depth, the wave energy flux, and the sediment source strength, are constant, and that the wave breaking angle is small. This solution indicates that the rate of growth of the shoreline increases linearly with the strength of the source. For a given source strength, as wave power increases the beach rate of growth in the vicinity of the source decreases, while the maximum longshore distance over which sediment is deposited increases. Thus higher incoming wave power results in flatter beach profiles in the longshore direction (smaller shoreline curvature).

A numerical solution of the above equations in finite difference form was developed and a computer program is presented. The computer program includes the effects of variable wave approach angle, arbitrary initial shoreline configuration, variable nearshore depth, and various sources or sinks. Comparison of the numerical solution results with those of the analytical solution, under the same conditions of nearshore topography, source strength and wave energy flux, reveals a most satisfactory agreement between the two solutions.

Examples of the program application including the effects of oblique wave angle of approach, as well as variable nearshore depth, are presented

Under an obligue wave attack angle the resulting shoreline is assymetrical with respect to the river mouth, the river acting as a littoral drift barrier causing increased deposition on the up drift bank. As expected, a linearly increasing nearshore depth results in lower rates of shoreline growth in the vicinity of the source.

The numerical solution includes the effects of wave refraction on shoreline development for the case where the nearshore depth contours remain straight and parallel. Under such conditions, ar a consequence of wave refraction the shoreline, in the neighborhood of the source, advances seaward at a slower rate since the longshore component of wave power increases with depth. Since more sediment is thus available for deposition further along the beach, the developing shoreline exhibit a flatter profile, or smaller curvature, in the longshore direction.

INTRODUCTION

The prediction of the changes in shoreline configuration, to be expected following man-made interferences with the existing sediment transport processes, is a matter of urgent and practical interest in Puerto Rico, owing to the intense development pressures on the coastal zone. This study presents a numerical model that may be used in analyzing the expected changes in the beach plan prior to the undertaking of any alterations of the nearshore environment.

The dynamics of the development through time of the plan shape of a sandy beach were studied. A river supplies sediment to the beach, while wave-induced littoral transport distributes this sediment along the nearshore region.

A computer program that predicts the expected changes in the beach plan, through a numerical solution of the pertinent equations describing the prevailing littoral transport processes, has been developed. An analytical solution of a special case is used to evaluate the accuracy of the numerical model.

The program can be used in analyzing the changes in the shoreline configuration that may result from proposed modifications in either the sediment supply or the local wave climate. Such modifications may involve reduction of the river sediment load due to construction of dams, interruption of the littoral transport by jetties or groynes, and fluctuations in the incoming wave power resulting from the refraction effects of offshore sand extraction or construction of breakwaters.

THEORETICAL CONSIDERATIONS

The development of a given beach in terms of erosion, accretion, or equilibrium conditions, may be studied by means of the principle of conservation of mass applied to the sediment transport processes affecting the beach. This principle is often stated as a balance equation for any convected properly moving through a specified region or control volume. The balance equation states that during any given time interval.

(inflow-outflow) + sources-sinks= change in storage

In the general case, the terms in the above continuity equation may contain the following sediment components:

<u>Inflow and Sources</u> { longshore transport into the region; river contribution; onshore transport; wind transport; carbonate production; cliff erosion.

<u>Outflow and Sinks</u> { longshore transport out of the region; sand extraction; offshore transport; wind transport.

<u>Change in Storage</u>: beach erosion or accretion.

The longshore and normal sediment transport through a beach segment are functions of the nearshore flow patterns controlled by waves and currents. The present study considers the effects of longshore transport but does not include the normal transport contribution since a satisfactory mathematical description of such transport is not available at present. In addition, Komar (1976) points out that the onshore-offshore sediment transport is of minor importance in comparison to the other terms in the sediment budget for a beach.

The remaining terms in the continuity equation, namely the river sediment transport, sand extraction, carbonate production, wind transport and beach sand mining, can be considered as sources or sinks of sediment. The effects of such sources or sinks on the beach sediment budget are independent of the prevailing wave climate. These effects are analyzed in this study through the incorporation of a river supplying sediment to the beach. The river may be viewed as an example of the manner in which any sediment source or sink can be taken into consideration in the analysis of the shoreline development.

With reference to Fig. 1, the net sediment flux through a beach element during a time interval dt may be expressed as

$$(\text{inflow-outflow}) = -dQdt$$

where Q represents the volume rate of longshore sediment transport. Should a river be contributing sediment to the beach element, at a volume rate of S_r, the net sediment volume accumulated in the element during dt would be

$$(\text{inflow-outflow}) + \text{source} = (-dQ+S_r)dt$$

This sediment volume would result in a change of the element volume, which as shown in Fig. 1, would be represented by

$$\text{Change in storage} = Ddydx$$

where D is the water depth at the toe of the beach face, or the maximum water depth at which deposition or erosion occurs at the beach element. The continuity equation may, thus, be expressed as

$$\frac{dy}{dt} = \frac{1}{D}\left[-dQ + S_r\delta(x-a)\right] \qquad (1)$$

where δ is the Dirac delta function defined by

$$\delta\ (x-a) = 0 \text{ for } x \neq a \quad (1a)$$

$$\delta\ (x-a) = 1 \text{ for } x=a \quad (1b)$$

$$\int_{-\infty}^{\infty} F(x)\ \delta(x-a)\ dx = F(a) \quad (1c)$$

Solution of Eq. (1) for the shoreline position at any time t requires an expression for the littoral transport, Q, in terms of known wave parameters. Such an expression was proposed by Inman and Bagnold (1963) who related I_l, the littoral transport rate in terms of immersed sediment weight, to the "P_l-factor" or the longshore component of wave power. This relationship is

$$I_l = K'P_l \quad (2)$$

with

$$P_l = (EC_g)_b \sin\alpha_b \cos\alpha_b \quad (3)$$

where

E = wave energy = $\gamma H^2/8$

H = wave height

Cg = wave group velocity

α = wave angle with shoreline

b = conditions at breaking

γ = specific weight of water

The proportionality factor K' was determined by Komar and Inman (1970) to be 0.77, on the basis of laboratory and field measurements.

The immersed-weight transport rate is related to the volume transport rate through

$$I_l = (\gamma_s - \gamma)\ a'\ Q \quad (4)$$

where γ_s is the sediment specific or unit weight, and a' is a sediment pore space factor, the common value of which is 0.6 according to CERC (1973) Combining Eq (2), (3), and (4) yields the relationship:

$$Q = K(ECg)_b \sin 2\alpha_b \tag{5}$$

Which may be used to calculate the longshore transport, Q, given the wave characteristics at breaking. Once Q is known, Eq. (1) can be solved for the shoreline configuration described by y (x,t).

ANALYTICAL SOLUTION

An analytical solution to the system of equations (1) and (5) can be obtained for the special case of small shoreline and breaking angles, and constant nearshore depth, D. The angle the waves make with the shoreline at breaking, α_b, may be expressed with reference to Fig. 2, as a function of the angle between the waves and the x-axis, α_w, and of the shoreline angle with the same axis

$$\alpha_b = \alpha_w - \arctan \frac{dy}{dx} \tag{6}$$

For constant wave angle, α_w, differentiating Eq (6) yields

$$\frac{d\alpha_b}{dx} = - \frac{d^2y}{dx^2} \Big/ \left[1 + \frac{dy}{dx}^2\right]$$

which, neglecting second order terms, reduces to

$$\frac{d\alpha_b}{dx} = - \frac{d^2y}{dx^2} \tag{7}$$

For small breaking angles, α_b

$$\sin\alpha_b \simeq \alpha_b$$

which in combination with equations (5) and (7) yields

$$\frac{dQ}{dx} = - K, (ECg)_b \frac{d^2y}{dx^2} \tag{8}$$

Substituting Eq (8) into continuity Eq (1) results in

$$\frac{dy}{dt} = \frac{1}{D}\left[K,(ECg)_b \frac{d^2y}{dx^2} + S_r\ \delta\ (x-a)\right] \tag{9}$$

which reduces to the Pelnard-Considere (1954) equation when the source term is excluded. Eq (9) may be rewritten in the form

$$\frac{d^2y}{dx^2} + \frac{S_r\ \delta(x-a)}{k} = \frac{1}{h}\frac{dy}{dt} \tag{10}$$

by defining the constants k and h as

$$k = K, (ECg)_b \tag{10a}$$

$$h = \frac{k}{D} \tag{10b}$$

Eq (10) describes the one-dimensional nonhomogeneous boundary-value problem of heat conduction, which may be solved in an infinite region with boundary conditions

$$\text{as} \qquad x \longrightarrow \pm\infty, \; y = \frac{dy}{dx} = 0 \tag{10a}$$

Following Necati (1968), the integral transform of the function y(x,t) with respect to x ($-\infty<x<\infty$) is defined by

$$\bar{y}\,(\beta,t) = \int_{x'=-\infty}^{\infty} e^{i\beta x'} y(x',t)\, dx' \tag{11a}$$

while the inversion formula is

$$y\,(x,t) = \frac{1}{2\pi}\int_{\beta=-\infty}^{\infty} e^{-i\beta x}\,\bar{y}\,(\beta,t)\,d\beta \tag{11b}$$

Taking the integral transform of Eq (10) by using the definition of Eq (11a) yields

$$\int_{\infty}^{\infty} \frac{\partial^2 y}{\partial x^2}\, e^{i\beta x}\, dx + \frac{1}{k}\,\bar{S}_r\,(\beta,t) = \frac{1}{h}\,\frac{d\bar{y}\,(\beta,t)}{dt} \tag{12}$$

Evaluating the first term in Eq (12) through integration by parts

$$\int_{\infty}^{\infty} \frac{\partial^2 y}{\partial t^2}\, e^{i\beta x}\, dx = \left[\frac{\partial y}{\partial x}\, e^{i\beta x} - i\beta y\, e^{i\beta x}\right]_{\infty}^{\infty} - \beta^2 \int_{\infty}^{\infty} y\, e^{i\beta x}\, dx$$

$$= -\beta^2\,\bar{y}\,(\beta,t)$$

and subsituting the result in (12) yields

$$\frac{d\bar{y}\,(\beta,t)}{dt} + h\beta^2\,\bar{y}\,(\beta,t) = \frac{h}{k}\,\bar{S}_r\,(\beta,t) \tag{13}$$

The solution of Eq (13) subject to the initial condition

$$\bar{y}\,(\beta,0)=\int_{x'=-\infty}^{\infty} e^{i\beta x'}\, y(x',0)\,dx'=0$$

may be written as

$$\bar{y}(\beta,t)= e^{-h\beta^2 t}\,\frac{h}{k}\int_{t'=0}^{t} \bar{S}_r\,(\beta,t')e^{h\beta^2 t'}\,dt' \qquad (14)$$

Subsituting Eq (14) into the inversion Eq (11b) yields

$$y(x,t)= \frac{1}{2\Pi}\,\frac{h}{k}\int_{\beta=-\infty}^{\infty} e^{-h\beta^2 t-i\beta x}\left[\int_{t'=0}^{t} \bar{S}_r(\beta,t')e^{h\beta^2 t'}dt'\right]d\beta \quad (15)$$

where

$$\bar{S}_r\,(\ \ ,t')=\int_{x'=-\infty}^{\infty} S_r\,(x',t')e^{i\beta x'}\,dx$$

Eq (15) may be rearranged as

$$y(x,t)= \frac{1}{2\Pi}\,\frac{h}{k}\int_{t'=0}^{t} dt' \int_{x'=-\infty}^{\infty} S_r\,(x',t')\,dx'\ \cdot$$

$$\int_{\beta=-\infty}^{\infty} e^{-h\beta^2(t-t')-i\beta(x-x')}d\beta$$

and the integration with respect to β performed using the relation

$$\frac{1}{2\Pi}\int_{\beta=-\infty}^{\infty} e^{-h\beta^2 t-i\beta x}\,d\beta= \frac{1}{(4\Pi h t)^{1/2}}\,e^{-\,x^2/dht}$$

The result is:

$$y(x,t)= \frac{h}{k} \int_{t'=0}^{t} \frac{dt'}{4\pi h(t-t')^{1/2}} \int_{x'=-\infty}^{\infty} S_r(x',t')e^{\frac{-(x-x')^2}{4h(t-t')}}\, dx' \qquad (16)$$

For the case of a river contributing sediment at a constant rate S_r, and located at $x'=a=0$, Eq (16) reduces to

$$y(x,t)= \frac{h\ S_r}{k} \int_{t'=0}^{t} \frac{e^{-x^2/4h(t-t')}}{4\pi h(t-t')^{1/2}}\, dt' \qquad (17)$$

Defining a new variable

$$\eta= \frac{x}{\left[4h(t-t')\right]^{1/2}}$$

then

$$dt'= \frac{1}{\eta^3} \frac{x^2}{2h}\, d\eta$$

and Eq (17) becomes

$$y(x,t)= \frac{S_r\ x}{2k\sqrt{\pi}} \int_{x/\sqrt{4ht}}^{\infty} \frac{e^{-\eta^2}}{\eta^2}\, d\eta \qquad (18)$$

Integrating by parts, and using the definition of the errorfunction, erf, and the complimentary error function, erfc,

$$\mathrm{erf}(x) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-\eta^2}\, d\eta \qquad (19a)$$

$$\mathrm{erfc}(x) = 1-\mathrm{erf}(x)=\frac{2}{\sqrt{\pi}} \int_x^{\infty} e^{-\eta^2}\, d\eta \qquad (19b)$$

yields the solution for the shoreline position at any time as

$$y(x,t)= \frac{S_r}{k}\left[\left(\frac{ht}{\pi}\right)^{1/2} \exp(-x^2/4ht)- \frac{x}{2} \operatorname{erfc}\left| \frac{x}{(4ht)^{1/2}} \right| \right] \quad (20)$$

with k and h given by Eq (10a,b) as

$$k= K,(ECg)_b$$

$$h= k/D$$

Substituting the expression for h into Eq (20), and rearranging, yields the equation for the time-varying shoreline position in the following form

$$y(x,t)= \frac{S_r}{(kD)^{1/2}} \left\{ \left(\frac{t}{\pi}\right)^{1/2} \exp\left(-x^2 \frac{D}{4kt}\right)- \frac{x}{2} \left(\frac{D}{k}\right)^{1/2} \operatorname{erfc}\left| x \left(\frac{D}{4kt}\right)^{1/2} \right| \right\} \quad (21)$$

This equation reveals that the rate of growth of the shoreline increases linearly with the volume of sediment supplied by the river, while the shoreline growth varies inversely with the wave power and the nearshore limit of littoral drift. In particular, for a given river sediment contribution, as wave power increases the beach growth rate at the river mouth, x=0, decreases, with the waves transporting larger portions of the river supply and distributing it along the beach away from the river mouth. The amount of sediment deposited along the beach decreases with increasing distances from the river mouth, so that at a distance $x=x_{max}$ there is no sediment deposition and $y(x_{max},t)=0$. This maximum distance may be estimated from the fact that for y(x,t) to be zero the complimentary error function, erfc, must also be zero. This function is essentially zero when its argument is approximately 3, thus

$$x_{max} \cong 3 \left(\frac{4kt}{D}\right)^{1/2}$$

Consequently, the effect of higher incoming wave power is to decrease the beach growth at the river mouth while increasing the maximum longshore distance over which river sediment is deposited. The resulting longshore beach profile is flatter, i.e. the shoreline curvature is reduced as wave power increases. This effect is exhibited in Fig. 3, which shows the development of the same initially straight shoreline, as obtained from Eq (21), after 30 days and after 180 days. The shoreline growth from 0 to 30 days was computed with wave power values of P and 10P, while the growth from 0 to 180 days with wave power P and 2P.

The development through time of an initially straight shoreline, obtained by means of the analytical solution, Eq (21), with a river sediment supply of 1,000 cu.m/day, wave energy flux of 3.2×10^7 ergs/cm-sec, and a constant nearshore depth of 1.0m, is shown in Table 1. The results of the analytical solution were used to evaluate the numerical model to be presented below.

NUMERICAL SOLUTION

The more general case might involve the following factors; variable wave angle of attack, α_w, an arbitrary initial shoreline configuration, variable nearshore depth, D, as well as various sources or sinks. Although an analytical solution involving all the above factors would be impossible, a numerical solution may easily be developed as follows.

Letting i and j represent x and t respectively, Eq (1) may be written in difference form which upon slight rearrangement takes the form

$$Y\left[i,j+1\right] = Y\left[i,j\right] + \frac{\Delta t}{D\left[i,j\right]}\left\{\frac{Q\ i-1,j - Q\left[i,j\right]}{\Delta x} + Sr\delta\left[i-m\right]\right\} \quad (22)$$

The new shoreline position at $(t + \Delta t)$, $Y\left[i,j+1\right]$, may be computed from Eq (22) once the sediment trasnport at time t, $Q\left[i,j\right]$, has been calculated for all x. This may be accomplished from Eq (5) in the form

$$Q\left[i,j\right] = K\left(EC_g\right)\left[i,j\right]\sin 2\alpha_b\left[i,j\right] \quad (23)$$

in which the breaking angle, α_b, is determined through the following difference form of Eq (6)

$$\alpha_b\left[i,j\right] = \alpha_w\left[i,j\right] - \text{Tan}^{-1}\frac{Y\left[i,j\right] - Y\left[i+1,j\right]}{\Delta x} \quad (24)$$

A computer program involving the solution of the system of equations (22) through (24) was developed, and is described below. A listing of the program appears in Appendix IV. The program was first used to predict the development of an initially straight shoreline progressing into water of constant depth, D=1.0 m, under the action of directly approaching waves, α_w=0, with power 3.2 x 10^7 ergs/cm-sec. The river is supplying sediment at a rate of 1,000 cu.m/day. These parameters are the same as those used in the analytical solution shown in Table 1. The results of the numerical solution are shown in Table 2. Inspection of these Tables reveals a most satisfactory agreement between the two solutions attesting to the reliability of the numerical solution and of the computer program.

The shoreline development during the first 15 days of growth, as obtained from the computer model, is shown in Fig. 4. In the vicinity of the river, the rate of advance of the shoreline is high initially, rapidly decreasing to a uniform rate as the shoreline approaches the equilibrium breaking angle necessary for the waves to transport the river sediment supply. Fig. 5 shows the rate of growth of the beach at various points along the shoreline, where it may be noted that as the distance from the river mouth increases the time necessary for littoral transport equilibrium also increases. This is also indicated in Fig. 6 which depicts the variation with time of the angle between breakers and shoreline for various points along the beach. The development of this beach after one year, in intervals of one month, is shown in Fig. 7.

The computer program is structured so that oblique angles of wave attack may be taken in consideration. The effect of such wave angles is shown in Fig. 8 for an angle of 50 and Fig. 9 where the wave angle with the x-axis is 10°. These figures indicate that under an oblique angle of wave approach the resulting shoreline is assymetrical with respect to the river mouth. The river acts in a manner analogous to a jetty or other littoral drift barrier causing more sediment to be deposited in the updrift side than in the downdrift side of the river mouth. Komar (1973) obtained similar results.

The effects of variable nearshore depth as well as of a sloping beach face may be analyzed by the computer program. Under these conditions the shoreline progresses seawards at a slower rate than in the comparable case of a constant nearshore depth. Fig. 10 shows the shoreline growth, with the sea bottom sloping at an angle of 0.5° and under a normal wave attack. After a year, the shoreline at the river mouth has grown by 179.4 m, while the depth increased from 1.0 of 2.67 m, as compared to the constant depth case, shown in Fig. 7, where the corresponding shoreline growth is 230.6 m. The same effect is observed under an oblique wave attack an example of which is shown in Fig. 11, which may be compared with the constant depth case of Fig. 9.

WAVE REFRACTION

In the cases presented up to this point the incoming wave energy flux has been kept constant, thus neglecting the effects of wave refraction on the beach development. Nevertheless, the computer program can accept different power flux values at each y(k,t) point, such as those forming the output of a wave refraction computer program over an arbitrary near-shore bottom topography.

In order to gain an insight into the effects of wave refraction of the shoreline development, the computer program includes wave refraction over a sloping bottom with contours straight and parallel. It is assumed that as the shoreline advances seaward, deposition of finer sediments maintain the bottom contours parallel to the shoreline. If no energy flows laterally along an incoming wave crest the power transmitted between two wave orthogonals should remain constant,

$$P_b = P_o \tag{25}$$

or

$$(EC_gS)_b = (EC_gS)_o \tag{25a}$$

where S is the spacing between the two orthogonals, b signifies conditions at breaking and o refers to deep water conditions.

The longshore component of wave power per unit length is

$$P_l = \frac{E_b \; Cg_b \; S_b}{S_b} \sin\alpha_b \; \text{Cos}\alpha_b = E_o Cg_o \frac{S_o}{S_b} \sin\alpha_b \cos\alpha_b \tag{26}$$

From simple geometric considerations shown in Fig. 12 the ratio of the orthogonal spacings is

$$\frac{S_o}{S_b} = \frac{\text{COS}\alpha_o}{\text{COS}\alpha_b} \tag{27}$$

which substituted in Eq (26) yields

$$P_l = E_o \, Cg_o \, COS\alpha_o \, \sin\alpha_b \tag{28}$$

Snell's law of refraction is expressed by the relation

$$\frac{\sin\alpha_b}{\sin\alpha_o} = \frac{C_b}{C_o} \tag{29}$$

while from linear wave theory-see for example Wiegel (1964) or CERC (1973) —the ratio of the wave phase velocities is

$$\frac{C_b}{C_o} = \text{Tanh} \, \frac{2\Pi d_b}{L_b} \tag{30}$$

Combining equations (28), (29) and (30) yields the "P_l-factors" in the following form

$$P_l = E_o \, Cg_o \, \frac{\sin 2\alpha_o}{2} \, \text{Tanh} \, \frac{2\Pi d_b}{L_b} \tag{31}$$

The wave refraction effects may, thus, be incorporated into the numerical solution by subsituting Eq (23) by the following expression for the longshore sediment transport

$$Q\left[i,j\right] = K(EC_g)_o \, \frac{\sin 2\alpha_o}{2}\left[i,j\right] \, \tanh \, \frac{2\Pi d_b\left[i,j\right]}{L_b\left[i,j\right]} \tag{32}$$

It should be noted that α_o is the angle between the wave in deep water and the shoreline. This angle changes as the shoreline configuration changes, and it may be computed according to Eq (24) with α_o=d_b. The hyperbolic tangent at any depth is computed by a Newton-Raphson iterative procedure, given the deep water wave parameters.

Fig. 13 shows the beach growth after one year, in intervals of one month, computed taking wave refraction into consideration. For purposes of comparison, the river, topography, and deep-water wave parameters were kept the same as those used in obtaining Fig. 10 which does not include refraction effects. It may be seen from these figures that wave refraction results in a much slower shoreline advance in the vicinity of the river mouth where, with refraction considered, the shoreline advanced 157.6 m/year, while the corresponding growth, neclecting refraction, was 179.4 m/year. This is a consequence of the fact that, in the case that wave refraction is taken into consideration, as the shoreline advances into deeper water the wave sediment transport capacity increases also, as shown by Eq (31) and (32). At the same time, a slower growth rate in the vicinity of the river there is more sediment available to be deposited further along the beach resulting in a flatter shoreline profile in the longshore direction. This is shown in Fig. 14.

In the case that, as the shoreline advances, the nearshore bottom contours remain parallel to the initial position of the shoreline, i.e. parallel to the x-axis, then Eq (28) would assume the form

$$P_1 = E_o C g_o \frac{\cos\alpha_o}{\cos\alpha_w} \frac{\sin\alpha_o}{2} \tag{33}$$

where α_w is the angle between the x-axis and the wave at breaking, while α_b is the angle between the advancing shoreline and the breaking wave. The angle α_b is computed by Eq (24) once α_w has been calculated. This is accomplished by rewriting Eq (29) and (30) as

$$\frac{\sin\alpha_w}{\sin\alpha_o} - \frac{C_w}{C_o} = \text{Tanh}\ \frac{2\Pi d}{L}$$

from which

$$\alpha_w = \arcsin\left[\sin\alpha_o\ \ \text{Tanh}\ \frac{2\Pi d}{L}\right] \tag{34}$$

Equ. (32) is subsequently replaced by

$$Q\left[i,j\right] = K(ECg)_o \quad \frac{\cos\alpha_o}{\cos\alpha_w\left[i,j\right]} \sin 2\alpha_b \left[i,j.\right] \tag{35}$$

USERS GUIDE TO THE COMPUTER PROGRAM

Brief Description of the Program

Given an initial shoreline plan and nearshore bathymetry, sediment source (or sink) contribution and location, and wave characteristics such as height, period, and direction, the program proceeds to calculate successive shoreline positions at predetermined time intervals.

Input/Output Parameters.

A list of the program input and output parameters, together with a description for each parameter, may be found in the first two pages of the program listing, Appendix IV of this report.

Unusual Conditions and Limitations.

The maximum permissible number of points used to describe any given shoreline position is 500. This condition in the program is expressed by requiring that XF/DX be less than five hundred. Should a bigger value be generated, by input, an error message is printed and execution is stopped. Similarly, DX, the calculation length increment, must be less than OUT, the length interval at which the results are printed, otherwise execution is deleted.

It should be noted that sediment transport normal to the shore is not included in the computations. The effects of wave refraction can be taken into consideration only in cases where nearshore bottom contours may be considered straight and parallel. In other cases, the refracted wave parameters need be calculated separately and then be provided as input to this program.

Function of Principal Program Modules.

1/Heading module: main section of the internal documentation.

2/Data input and data check module: the data is read and cases that violate the limitations mentioned above are rejected. The data input should have the following form:

CARD #	DATA
1	XF TF DX DT D NREAD NPRINT
2	OUT RIVER ALPHA BETA BKIMT
3-N	Array of initial shoreline configuration, Y.
N+1- M	DAY1 DAY2 HEIGHT WVANGL RSSU

Note:

The only integer values (carry no decimal point) are NREAD and NPRINT.

The other values are real, so they must have a decimal point.

1 is the initial value for NREAD and NPRINT.

Values are to be separated by a comma or by one or more spaces as long as the indicated values fit in their corresponding card.

The values for the array of initial shoreline configuration should have 10 values per card. Only the last card for this array or values can have less than 10 numbers.

Modifications will be necessary for reading in different formats.

3/Pre-operational module: calculation and output intervals are generated; headings and data values are printed.

4/Main program module:

(i) section of constants: all constants and unit conversion factors are set.

(ii) input/output control section: the variables that control the reading of data on wave parameters and sediment source contribution, as well as those that control the output interval, are set here. This is done while the simulation is proceeding, which permits varying the wave parameters and/or the sediment input during the same computer run. It also permits changes in the output interval as the program is executed.

(iii) wave refraction section: wave length is calculated as as a function of depth by a Newton-Raphson iteration method. The result of the iteration is used to compute the hyperbolic tangent of ($2\Pi d/L$).

(iv) shoreline development section: at each time increment the news position of all points along the shoreline, as well as the new depth at each point are computed. Results are printed at the output intervals previously set in the input/output control section.

5/Graphical output module: the coordinates are set and a graph of the successive shoreline positions for previously determined intervals is plotted.

6/Subroutines:

(i) WSANGL: calculates the angle between breaking wave and shoreline.

(ii) NEWTON: computes the littoral drift when I=0, and the breaking angle at I=XF+1.

(iii) WRITER: outputs the desired results.

(iv) SANDTR: calculates the littoral transport, SL, of sediment for all points along the shoreline where I 0.

(v) FUNCTION ATAND: returns the value of the arctan (dy/dx) in degrees.

APPENDIX I

REFERENCES

REFERENCES

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APPENDIX II

TABLES

TABLE 1

ANALYTICAL SOLUTION

Initially straight shoreline

P = 3.2 ergs/cm-sec

S_r= 1,000 cu.m/day

Constant nearshore depth, D= 1.0 m

Normal Wave Approach, α_w = o°

Position= distance from river mouth, meters

Time= days

Y = shoreline growth, meters

ERFC= complimentary error function = erfc (z)

Z = argument of erfc (z)

N = number of terms taken in computing erfc (z)

TABLE I: ANALYTICAL SOLUTION

POSITION	TIME	Y	N	Z	ERFC
0.	30.	66.0446			
100.	30.	43.7039	3	0.19510	0.78261
200.	30.	30.1752	5	0.39020	0.58106
300.	30.	18.9454	6	0.58530	0.40781
400.	30.	11.2779	7	0.78041	0.26974
500.	30.	6.3486	9	0.97551	0.16772
600.	30.	3.3717	10	1.17061	0.09782
700.	30.	1.6860	12	1.36571	0.05343
800.	30.	0.7923	13	1.56081	0.02729
900.	30.	0.3494	15	1.75591	0.01302
1000.	30.	0.1444	16	1.95102	0.00580
1100.	30.	0.0558	18	2.14612	0.00240
1200.	30.	0.0202	20	2.34122	0.00093
1300.	30.	0.0068	22	2.53632	0.00033
1400.	30.	0.0021	24	2.73142	0.00011
1500.	30.	0.0005	26	2.92652	0.00004
1600.	30.	0.0039	26	3.12162	0.00000
1700.	30.	0.0011	26	3.31673	0.00000
1800.	30.	0.0003	26	3.51183	0.00000
1900.	30.	0.0001	26	3.70693	0.00000
2000.	30.	0.0000	26	3.90203	0.00000
2100.	30.	0.0000	26	4.09713	0.00000
2200.	30.	0.0000	26	4.29223	0.00000
2300.	30.	0.0000	26	4.48734	0.00000
2400.	30.	0.0000	26	4.68244	0.00000
2500.	30.	0.0000	26	4.87754	0.00000
2600.	30.	0.0000	26	5.07264	0.00000
2700.	30.	0.0000	26	5.26774	0.00000
2800.	30.	0.0000	26	5.46284	0.00000
2900.	30.	0.0000	26	5.65794	0.00000
3000.	30.	0.0000	26	5.85305	0.00000
3100.	30.	0.0000	26	6.04815	0.00000
3200.	30.	0.0000	26	6.24325	0.00000
3300.	30.	0.0000	26	6.43835	0.00000
3400.	30.	0.0000	26	6.63345	0.00000
3500.	30.	0.0000	26	6.82855	0.00000
3600.	30.	0.0000	26	7.02366	0.00000
3700.	30.	0.0000	26	7.21876	0.00000
3800.	30.	0.0000	26	7.41386	0.00000
3900.	30.	0.0000	26	7.60896	0.00000
4000.	30.	0.0000	26	7.80406	0.00000
4100.	30.	0.0000	26	7.99916	0.00000
4200.	30.	0.0000	26	8.19426	0.00000
4300.	30.	0.0000	26	8.38937	0.00000
4400.	30.	0.0000	26	8.58447	0.00000
4500.	30.	0.0000	26	8.77957	0.00000
4600.	30.	0.0000	26	8.97467	0.00000
4700.	30.	0.0000	26	9.16977	0.00000
4800.	30.	0.0000	26	9.36487	0.00000
4900.	30.	0.0000	26	9.55998	0.00000
5000.	30.	0.0000	26	9.75508	0.00000

TABLE I (CONT'D)

POSITION	TIME	Y	N	Z	ERFC
0.	60.	93.4011			
100.	60.	72.3344	3	0.13796	0.84531
200.	60.	54.7453	4	0.27592	0.69639
300.	60.	40.4420	5	0.41387	0.55834
400.	60.	29.1281	6	0.55183	0.43515
500.	60.	20.4329	7	0.68979	0.32931
600.	60.	13.9465	8	0.82775	0.24176
700.	60.	9.2541	9	0.96570	0.17203
800.	60.	5.9646	10	1.10366	0.11857
900.	60.	3.7315	11	1.24162	0.07910
1000.	60.	2.2640	12	1.37958	0.05106
1100.	60.	1.3321	13	1.51753	0.03186
1200.	60.	0.7592	14	1.65549	0.01922
1300.	60.	0.4190	15	1.79345	0.01120
1400.	60.	0.2238	16	1.93141	0.00631
1500.	60.	0.1156	17	2.06936	0.00343
1600.	60.	0.0578	19	2.20732	0.00180
1700.	60.	0.0279	20	2.34528	0.00091
1800.	60.	0.0129	21	2.48324	0.00045
1900.	60.	0.0058	23	2.62119	0.00021
2000.	60.	0.0024	24	2.75915	0.00010
2100.	60.	0.0008	25	2.89711	0.00004
2200.	60.	0.0003	27	3.03507	0.00002
2300.	60.	0.0040	27	3.17303	0.00000
2400.	60.	0.0016	27	3.31098	0.00000
2500.	60.	0.0006	27	3.44894	0.00000
2600.	60.	0.0002	27	3.58690	0.00000
2700.	60.	0.0001	27	3.72486	0.00000
2800.	60.	0.0000	27	3.86281	0.00000
2900.	60.	0.0000	27	4.00077	0.00000
3000.	60.	0.0000	27	4.13873	0.00000
3100.	60.	0.0000	27	4.27669	0.00000
3200.	60.	0.0000	27	4.41464	0.00000
3300.	60.	0.0000	27	4.55260	0.00000
3400.	60.	0.0000	27	4.69056	0.00000
3500.	60.	0.0000	27	4.82852	0.00000
3600.	60.	0.0000	27	4.96647	0.00000
3700.	60.	0.0000	27	5.10443	0.00000
3800.	60.	0.0000	27	5.24239	0.00000
3900.	60.	0.0000	27	5.38035	0.00000
4000.	60.	0.0000	27	5.51831	0.00000
4100.	60.	0.0000	27	5.65626	0.00000
4200.	60.	0.0000	27	5.79422	0.00000
4300.	60.	0.0000	27	5.93218	0.00000
4400.	60.	0.0000	27	6.07014	0.00000
4500.	60.	0.0000	27	6.20809	0.00000
4600.	60.	0.0000	27	6.34605	0.00000
4700.	60.	0.0000	27	6.48401	0.00000
4800.	60.	0.0000	27	6.62197	0.00000
4900.	60.	0.0000	27	6.75992	0.00000
5000.	60.	0.0000	27	6.89788	0.00000

TABLE I (CONT'D)

POSITION	TIME	Y	N	Z	ERFC
0.	90.	114.3925			
100.	90.	93.0021	3	0.11264	0.87343
200.	90.	74.4721	4	0.22528	0.75003
300.	90.	58.6961	4	0.33793	0.63272
400.	90.	45.5055	5	0.45057	0.52400
500.	90.	34.6814	6	0.56321	0.42574
600.	90.	25.9695	7	0.67585	0.33917
700.	90.	19.0957	7	0.78849	0.26481
800.	90.	13.7816	8	0.90114	0.20252
900.	90.	9.7579	9	1.01378	0.15166
1000.	90.	6.7752	10	1.12642	0.11116
1100.	90.	4.6113	11	1.23906	0.07972
1200.	90.	3.0755	12	1.35170	0.05593
1300.	90.	2.0092	12	1.46435	0.03837
1400.	90.	1.2854	13	1.57699	0.02573
1500.	90.	0.8051	14	1.68963	0.01687
1600.	90.	0.4935	15	1.80227	0.01081
1700.	90.	0.2960	16	1.91491	0.00677
1800.	90.	0.1736	17	2.02755	0.00414
1900.	90.	0.0996	18	2.14020	0.00247
2000.	90.	0.0558	19	2.25284	0.00144
2100.	90.	0.0306	20	2.36548	0.00082
2200.	90.	0.0163	21	2.47812	0.00046
2300.	90.	0.0084	22	2.59076	0.00025
2400.	90.	0.0042	23	2.70341	0.00013
2500.	90.	0.0021	25	2.81605	0.00007
2600.	90.	0.0009	26	2.92869	0.00003
2700.	90.	0.0003	27	3.04133	0.00002
2800.	90.	0.0055	27	3.15397	0.00000
2900.	90.	0.0027	27	3.26662	0.00000
3000.	90.	0.0013	27	3.37926	0.00000
3100.	90.	0.0006	27	3.49190	0.00000
3200.	90.	0.0003	27	3.60454	0.00000
3300.	90.	0.0001	27	3.71718	0.00000
3400.	90.	0.0000	27	3.82983	0.00000
3500.	90.	0.0000	27	3.94247	0.00000
3600.	90.	0.0000	27	4.05511	0.00000
3700.	90.	0.0000	27	4.16775	0.00000
3800.	90.	0.0000	27	4.28039	0.00000
3900.	90.	0.0000	27	4.39304	0.00000
4000.	90.	0.0000	27	4.50568	0.00000
4100.	90.	0.0000	27	4.61832	0.00000
4200.	90.	0.0000	27	4.73096	0.00000
4300.	90.	0.0000	27	4.84360	0.00000
4400.	90.	0.0000	27	4.95624	0.00000
4500.	90.	0.0000	27	5.06889	0.00000
4600.	90.	0.0000	27	5.18153	0.00000
4700.	90.	0.0000	27	5.29417	0.00000
4800.	90.	0.0000	27	5.40681	0.00000
4900.	90.	0.0000	27	5.51945	0.00000
5000.	90.	0.0000	27	5.63210	0.00000

TABLE I (CONT'D)

POSITION	TIME	Y	N	Z	ERFC
0.	120.	132.0891			
100.	120.	110.5053	3	0.09755	0.89027
200.	120.	91.4078	3	0.19510	0.76261
300.	120.	74.7269	4	0.29265	0.67897
400.	120.	60.3505	5	0.39020	0.56106
500.	120.	48.1306	5	0.48775	0.49033
600.	120.	37.8908	6	0.58530	0.40781
700.	120.	29.4349	7	0.68286	0.33419
800.	120.	22.5558	7	0.78041	0.26974
900.	120.	17.0445	8	0.87796	0.21438
1000.	120.	12.6973	9	0.97551	0.16772
1100.	120.	9.3221	9	1.07306	0.12913
1200.	120.	6.7434	10	1.17061	0.09782
1300.	120.	4.8051	11	1.26816	0.07290
1400.	120.	3.3720	12	1.36571	0.05343
1500.	120.	2.3298	12	1.46326	0.03851
1600.	120.	1.5846	13	1.56081	0.02729
1700.	120.	1.0608	14	1.65836	0.01901
1800.	120.	0.6988	15	1.75591	0.01302
1900.	120.	0.4529	16	1.85346	0.00876
2000.	120.	0.2887	16	1.95102	0.00580
2100.	120.	0.1810	17	2.04857	0.00377
2200.	120.	0.1116	18	2.14612	0.00240
2300.	120.	0.0677	19	2.24367	0.00151
2400.	120.	0.0403	20	2.34122	0.00093
2500.	120.	0.0236	21	2.43877	0.00056
2600.	120.	0.0136	22	2.53632	0.00033
2700.	120.	0.0076	23	2.63387	0.00020
2800.	120.	0.0042	24	2.73142	0.00011
2900.	120.	0.0022	25	2.82897	0.00006
3000.	120.	0.0011	26	2.92652	0.00004
3100.	120.	0.0005	27	3.02407	0.00002
3200.	120.	0.0077	27	3.12162	0.00000
3300.	120.	0.0042	27	3.21918	0.00000
3400.	120.	0.0022	27	3.31673	0.00000
3500.	120.	3.0011	27	3.41428	0.00000
3600.	120.	0.0006	27	3.51183	0.00000
3700.	120.	0.0003	27	3.60938	0.00000
3800.	120.	0.0001	27	3.70693	0.00000
3900.	120.	0.0001	27	3.80448	0.00000
4000.	120.	0.0000	27	3.90203	0.00000
4100.	120.	0.0000	27	3.99958	0.00000
4200.	120.	0.0000	27	4.09713	0.00000
4300.	120.	0.0000	27	4.19468	0.00000
4400.	120.	0.0000	27	4.29223	0.00000
4500.	120.	0.0000	27	4.38978	0.00000
4600.	120.	0.0000	27	4.48734	0.00000
4720.	120.	0.0000	27	4.58489	0.00000
4800.	120.	0.0000	27	4.68244	0.00000
4900.	120.	0.0000	27	4.77999	0.00000
5000.	120.	0.0000	27	4.87754	0.00000

TABLE I (CONT'D)

POSITION	TIME	Y	N	Z	ERFC
0.	150.	147.6801			
100.	150.	125.9642	3	0.08725	0.90160
200.	150.	106.4770	3	0.17450	0.80507
300.	150.	89.1683	4	0.26176	0.71125
400.	150.	73.9570	5	0.34901	0.62161
500.	150.	60.7345	5	0.43626	0.53726
600.	150.	49.3693	6	0.52351	0.45908
700.	150.	39.7127	6	0.61076	0.38772
800.	150.	31.6041	7	0.69802	0.32357
900.	150.	24.8768	7	0.78527	0.26677
1000.	150.	19.3635	8	0.87252	0.21723
1100.	150.	14.9011	9	0.95977	0.17468
1200.	150.	11.3346	9	1.04702	0.13868
1300.	150.	8.5207	10	1.13428	0.10869
1400.	150.	6.3290	11	1.22153	0.08408
1500.	150.	4.6443	11	1.30878	0.06418
1600.	150.	3.3663	12	1.39603	0.04835
1700.	150.	2.4098	13	1.48329	0.03593
1800.	150.	1.7034	13	1.57054	0.02635
1900.	150.	1.1889	14	1.65779	0.01905
2000.	150.	0.8192	15	1.74504	0.01359
2100.	150.	0.5571	15	1.83229	0.00956
2200.	150.	0.3740	16	1.91955	0.00663
2300.	150.	0.2477	17	2.00680	0.00454
2400.	150.	0.1619	18	2.09405	0.00306
2500.	150.	0.1043	18	2.18130	0.00204
2600.	150.	0.0664	19	2.26855	0.00134
2700.	150.	0.0416	20	2.35581	0.00086
2800.	150.	0.0258	21	2.44306	0.00055
2900.	150.	0.0157	22	2.53031	0.00035
3000.	150.	0.0094	23	2.61756	0.00021
3100.	150.	0.0053	23	2.70481	0.00013
3200.	150.	0.0030	24	2.79207	0.00008
3300.	150.	0.0016	25	2.87932	0.00005
3400.	150.	0.0008	26	2.96657	0.00003
3500.	150.	0.0132	26	3.05382	0.00000
3600.	150.	0.0077	26	3.14107	0.00000
3700.	150.	0.0044	26	3.22833	0.00000
3800.	150.	0.0025	26	3.31558	0.00000
3900.	150.	0.0014	26	3.40283	0.00000
4000.	150.	0.0008	26	3.49008	0.00000
4100.	150.	0.0004	26	3.57733	0.00000
4200.	150.	0.0002	26	3.66459	0.00000
4300.	150.	0.0001	26	3.75184	0.00000
4400.	150.	0.0001	26	3.83909	0.00000
4500.	150.	0.0000	26	3.92634	0.00000
4600.	150.	0.0000	26	4.01359	0.00000
4700.	150.	0.0000	26	4.10085	0.00000
4800.	150.	0.0000	26	4.18810	0.00000
4900.	150.	0.0000	26	4.27535	0.00000
5000.	150.	0.0000	26	4.36260	0.00000

TABLE II (CONT'D)

POSITION	TIME	Y	N	Z	ERFC
0.	180.	161.7755			
100.	180.	139.9619	2	0.07965	0.91031
200.	180.	120.1859	3	0.15930	0.82176
300.	180.	102.4091	4	0.23895	0.73542
400.	180.	86.5692	4	0.31860	0.65230
500.	180.	72.5823	5	0.39825	0.57329
600.	180.	60.3457	5	0.47790	0.49913
700.	180.	49.7417	6	0.55755	0.43041
800.	180.	40.6412	6	0.63720	0.36752
900.	180.	32.9082	7	0.71685	0.31069
1000.	180.	26.4031	8	0.79650	0.25999
1100.	180.	20.9866	8	0.87615	0.21532
1200.	180.	16.5234	9	0.95580	0.17647
1300.	180.	12.8841	9	1.03545	0.14310
1400.	180.	9.9483	10	1.11510	0.11480
1500.	180.	7.6054	10	1.19475	0.09110
1600.	180.	5.7559	11	1.27440	0.07150
1700.	180.	4.3119	12	1.35405	0.05550
1800.	180.	3.1970	12	1.43370	0.04261
1900.	180.	2.3458	13	1.51335	0.03234
2000.	180.	1.7031	13	1.59300	0.02427
2100.	180.	1.2234	14	1.67265	0.01801
2200.	180.	0.8695	15	1.75230	0.01321
2300.	180.	0.6112	15	1.83195	0.00958
2400.	180.	0.4250	16	1.91160	0.00686
2500.	180.	0.2923	17	1.99125	0.00486
2600.	180.	0.1987	17	2.07090	0.00340
2700.	180.	0.1337	18	2.15055	0.00236
2800.	180.	0.0889	19	2.23020	0.00161
2900.	180.	0.0585	20	2.30985	0.00109
3000.	180.	0.0379	20	2.38950	0.00073
3100.	180.	0.0243	21	2.46915	0.00048
3200.	180.	0.0154	22	2.54880	0.00031
3300.	180.	0.0097	23	2.62845	0.00020
3400.	180.	0.0057	23	2.70810	0.00013
3500.	180.	0.0034	24	2.78775	0.00008
3600.	180.	0.0020	25	2.86740	0.00005
3700.	180.	0.0011	26	2.94705	0.00003
3800.	180.	0.0006	27	3.02670	0.00002
3900.	180.	0.0104	27	3.10635	0.00000
4000.	180.	0.0063	27	3.18599	0.00000
4100.	180.	0.0038	27	3.26564	0.00000
4200.	180.	0.0022	27	3.34529	0.00000
4300.	180.	0.0013	27	3.42494	0.00000
4400.	180.	0.0007	27	3.50459	0.00000
4500.	180.	0.0004	27	3.58424	0.00000
4600.	180.	0.0002	27	3.66389	0.00000
4700.	180.	0.0001	27	3.74354	0.00000
4800.	180.	0.0001	27	3.82319	0.00000
4900.	180.	0.0000	27	3.90284	0.00000
5000.	180.	0.0000	27	3.98249	0.00000

TABLE I (CONT'D)

POSITION	TIME	Y	N	Z	ERFC
0.	210.	174.7375			
100.	210.	152.8480	2	0.07374	0.91694
200.	210.	132.8470	3	0.14748	0.83478
300.	210.	114.7038	4	0.22122	0.75439
400.	210.	98.3687	4	0.29497	0.67657
500.	210.	83.7744	5	0.36871	0.60207
600.	210.	70.8378	5	0.44245	0.53150
700.	210.	59.4628	6	0.51619	0.46539
800.	210.	49.5431	6	0.58993	0.40412
900.	210.	40.9648	7	0.66367	0.34795
1000.	210.	33.6098	7	0.73741	0.29701
1100.	210.	27.3581	8	0.81116	0.25132
1200.	210.	22.0909	8	0.88490	0.21078
1300.	210.	17.6926	9	0.95864	0.17519
1400.	210.	14.0530	9	1.03238	0.14429
1500.	210.	11.0687	10	1.10612	0.11775
1600.	210.	8.6441	10	1.17986	0.09520
1700.	210.	6.6927	11	1.25360	0.07625
1800.	210.	5.1368	11	1.32735	0.06050
1900.	210.	3.9080	12	1.40109	0.04754
2000.	210.	2.9467	12	1.47483	0.03700
2100.	210.	2.2021	13	1.54857	0.02852
2200.	210.	1.6308	14	1.62231	0.02177
2300.	210.	1.1966	14	1.69605	0.01646
2400.	210.	0.8700	15	1.76979	0.01232
2500.	210.	0.6266	15	1.64354	0.00913
2600.	210.	0.4471	16	1.91728	0.00670
2700.	210.	0.3161	17	1.99102	0.00487
2800.	210.	0.2212	17	2.06476	0.00350
2900.	210.	0.1535	18	2.13850	0.00249
3000.	210.	0.1054	19	2.21224	0.00176
3100.	210.	0.0716	19	2.28599	0.00123
3200.	210.	0.0482	20	2.35973	0.00085
3300.	210.	0.0322	21	2.43347	0.00058
3400.	210.	0.0212	22	2.50721	0.00039
3500.	210.	0.0137	22	2.58095	0.00026
3600.	210.	0.0089	23	2.65469	0.00017
3700.	210.	0.0056	24	2.72843	0.00011
3800.	210.	0.0033	24	2.80218	0.00007
3900.	210.	0.0020	25	2.87592	0.00005
4000.	210.	0.0012	26	2.94966	0.00003
4100.	210.	0.0007	27	3.02340	0.00002
4200.	210.	0.0119	27	3.09714	0.00000
4300.	210.	0.0075	27	3.17088	0.00000
4400.	210.	0.0047	27	3.24462	0.00000
4500.	210.	0.0029	27	3.31837	0.00000
4600.	210.	0.0018	27	3.39211	0.00000
4700.	210.	0.0011	27	3.46585	0.00000
4800.	210.	0.0006	27	3.53959	0.00000
4900.	210.	0.0004	27	3.61333	0.00000
5000.	210.	0.0002	27	3.68707	0.00000

TABLE I (CONT'D)

POSITION	TIME	Y	N	Z	ERFC
0.	240.	186.6022			
100.	240.	164.6516	2	0.06898	0.92229
200.	240.	144.6687	3	0.13796	0.84531
300.	240.	126.2287	4	0.20694	0.76979
400.	240.	109.4905	4	0.27592	0.69639
500.	240.	94.3986	5	0.34489	0.62572
600.	240.	80.6840	5	0.41387	0.55834
700.	240.	68.8664	5	0.48285	0.49470
800.	240.	58.2562	6	0.55183	0.43515
900.	240.	48.9565	6	0.62081	0.37997
1000.	240.	40.8657	7	0.68979	0.32931
1100.	240.	33.8795	7	0.75877	0.28324
1200.	240.	27.6929	8	0.82775	0.24176
1300.	240.	22.8026	8	0.89672	0.20474
1400.	240.	18.5081	9	0.96570	0.17203
1500.	240.	14.9136	9	1.03468	0.14340
1600.	240.	11.9292	10	1.10366	0.11857
1700.	240.	9.4711	10	1.17264	0.09724
1800.	240.	7.4630	11	1.24162	0.07910
1900.	240.	5.8361	11	1.31060	0.06382
2000.	240.	4.5289	12	1.37958	0.05106
2100.	240.	3.4872	12	1.44856	0.04050
2200.	240.	2.6642	13	1.51753	0.03186
2300.	240.	2.0193	13	1.58651	0.02485
2400.	240.	1.5184	14	1.65549	0.01922
2500.	240.	1.1325	14	1.72447	0.01474
2600.	240.	0.8380	15	1.79345	0.01120
2700.	240.	0.6150	16	1.86243	0.00844
2800.	240.	0.4476	16	1.93141	0.00631
2900.	240.	0.3231	17	2.00039	0.00467
3000.	240.	0.2312	17	2.06936	0.00343
3100.	240.	0.1642	18	2.13834	0.00249
3200.	240.	0.1156	19	2.20732	0.00180
3300.	240.	0.0806	19	2.27630	0.00129
3400.	240.	0.0558	20	2.34528	0.00091
3500.	240.	0.0383	21	2.41426	0.00064
3600.	240.	0.0259	21	2.48324	0.00045
3700.	240.	0.0175	22	2.55222	0.00031
3800.	240.	0.0116	23	2.62119	0.00021
3900.	240.	0.0075	23	2.69017	0.00014
4000.	240.	0.0049	24	2.75915	0.00010
4100.	240.	0.0032	25	2.82813	0.00006
4200.	240.	0.0017	25	2.89711	0.00004
4300.	240.	0.0010	26	2.96609	0.00003
4400.	240.	0.0006	27	3.03507	0.00002
4500.	240.	0.0122	27	3.10405	0.00000
4600.	240.	0.0079	27	3.17303	0.00000
4700.	240.	0.0051	27	3.24200	0.00000
4800.	240.	0.0032	27	3.31098	0.00000
4900.	240.	0.0020	27	3.37996	0.00000
5000.	240.	0.0013	27	3.44894	0.00000

TABLE I (CONT'D)

POSITION	TIME	Y	N	Z	ERFC
0.	270.	196.1337			
100.	270.	176.1323	2	0.06503	0.92672
200.	270.	155.7987	3	0.13007	0.85406
300.	270.	137.1118	3	0.19510	0.78261
400.	270.	120.0372	4	0.26014	0.71296
500.	270.	104.5280	4	0.32517	0.64562
600.	270.	90.5257	5	0.39020	0.58106
700.	270.	77.9621	5	0.45524	0.51970
800.	270.	66.7601	6	0.52027	0.46187
900.	270.	56.8362	6	0.58530	0.40781
1000.	270.	48.1020	7	0.65034	0.35772
1100.	270.	40.4855	7	0.71537	0.31169
1200.	270.	33.8337	7	0.78041	0.26974
1300.	270.	28.1136	8	0.84544	0.23184
1400.	270.	23.2138	8	0.91047	0.19788
1500.	270.	19.0459	9	0.97551	0.16772
1600.	270.	15.5256	9	1.04054	0.14114
1700.	270.	12.5733	10	1.10558	0.11793
1800.	270.	10.1151	10	1.17061	0.09782
1900.	270.	8.0833	11	1.23564	0.08056
2000.	270.	6.4160	11	1.30068	0.06585
2100.	270.	5.0579	12	1.36571	0.05343
2200.	270.	3.9599	12	1.43074	0.04303
2300.	270.	3.0788	13	1.49578	0.03440
2400.	270.	2.3770	13	1.56081	0.02729
2500.	270.	1.8222	14	1.62585	0.02149
2600.	270.	1.3870	14	1.69088	0.01679
2700.	270.	1.0483	15	1.75591	0.01302
2800.	270.	0.7864	15	1.82095	0.01002
2900.	270.	0.5858	16	1.88598	0.00765
3000.	270.	0.4330	16	1.95102	0.00580
3100.	270.	0.3179	17	2.01605	0.00436
3200.	270.	0.2317	18	2.08108	0.00325
3300.	270.	0.1675	18	2.14612	0.00240
3400.	270.	0.1202	19	2.21115	0.00177
3500.	270.	0.0855	19	2.27618	0.00129
3600.	270.	0.0605	20	2.34122	0.00093
3700.	270.	0.0424	21	2.40625	0.00067
3800.	270.	0.0294	21	2.47129	0.00047
3900.	270.	0.0203	22	2.53632	0.00033
4000.	270.	0.0137	22	2.60135	0.00023
4100.	270.	0.0093	23	2.66639	0.00016
4200.	270.	0.0063	24	2.73142	0.00011
4300.	270.	0.0039	24	2.79646	0.00008
4400.	270.	0.0025	25	2.86149	0.00005
4500.	270.	0.0016	26	2.92652	0.00004
4600.	270.	0.0007	26	2.99156	0.00002
4700.	270.	0.0174	26	3.05659	0.00000
4800.	270.	0.0116	26	3.12162	0.00000
4900.	270.	0.0077	26	3.18666	0.00000
5000.	270.	0.0051	26	3.25169	0.00000

TABLE I (CONT'D)

POSITION	TIME	Y	N	Z	ERFC
0.	300.	206.8512			
100.	300.	186.8069	2	0.06170	0.93047
200.	300.	166.3456	3	0.12339	0.86147
300.	300.	147.4492	3	0.18509	0.79351
400.	300.	130.0883	4	0.24679	0.72708
500.	300.	114.2227	4	0.30848	0.66265
600.	300.	99.8019	5	0.37018	0.60062
700.	300.	86.7668	5	0.43188	0.54136
800.	300.	75.0507	6	0.49357	0.48517
900.	300.	64.5803	6	0.55527	0.43230
1000.	300.	55.2778	6	0;61697	0.38292
1100.	300.	47.0617	7	0.67866	0.33717
1200.	300.	39.8488	7	0.74036	0.29509
1300.	300.	33.5549	8	0.80205	0.25668
1400.	300.	28.0968	8	0.86375	0.22169
1500.	300.	23.3929	8	0.92545	0.19061
1600.	300.	19.3645	9	0.98714	0.16270
1700.	300.	15.9366	9	1.04884	0.13800
1800.	300.	13.0383	10	1.11054	0.11629
1900.	300.	10.6036	10	1.17223	0.09736
2000.	300.	8.5717	11	1.23393	0.08098
2100.	300.	6.8871	11	1.29563	0.06691
2200.	300.	5.4997	12	1.35732	0.05492
2300.	300.	4.3646	12	1.41902	0.04477
2400.	300.	3.4423	13	1.48072	0.03626
2500.	300.	2.6978	13	1.54241	0.02916
2600.	300.	2.1009	14	1.60411	0.02330
2700.	300.	1.6256	14	1.66581	0.01848
2800.	300.	1.2499	15	1.72750	0.01456
2900.	300.	0.9547	15	1.78920	0.01140
3000.	300.	0.7245	16	1.85090	0.00886
3100.	300.	0.5462	16	1.91259	0.00683
3200.	300.	0.4091	17	1.97429	0.00524
3300.	300.	0.3043	17	2.03599	0.00399
3400.	300.	0.2250	18	2.09768	0.00301
3500.	300.	0.1650	18	2.15938	0.00226
3600.	300.	0.1204	19	2.22107	0.00168
3700.	300.	0.0870	19	2.28277	0.00125
3800.	300.	0.0626	20	2.34447	0.00091
3900.	300.	0.0447	21	2.40616	0.00067
4000.	300.	0.0316	21	2.46786	0.00048
4100.	300.	0.0223	22	2.52956	0.00035
4200.	300.	0.0154	22	2.59125	0.00025
4300.	300.	0.0107	23	2.65295	0.00018
4400.	300.	0.0074	24	2.71465	0.00012
4500.	300.	0.0048	24	2.77634	0.00009
4600.	300.	0.0033	25	2.83804	0.00006
4700.	300.	0.0018	25	2.89974	0.00004
4800.	300.	0.0012	26	2.96143	0.00003
4900.	300.	0.0008	27	3.02313	0.00002
5000.	300.	0.0154	27	3.08483	0.00000

TABLE I (CONT'D)

POSITION	TIME	T	N	Z	ERFC
0.	330.	219.0450			
100.	330.	196.9638	2	0.05883	0.93370
200.	330.	176.3925	3	0.11765	0.86786
300.	330.	157.3154	3	0.17648	0.80292
400.	330.	139.7071	4	0.23530	0.73931
500.	330.	123.5323	4	0.29413	0.67744
600.	330.	108.7472	5	0.35295	0.61767
700.	330.	95.3000	5	0.41178	0.56034
800.	330.	83.1318	5	0.47060	0.50571
900.	330.	72.1780	6	0.52943	0.45402
1000.	330.	62.3693	6	0.58825	0.40546
1100.	330.	53.6330	7	0.64708	0.36014
1200.	330.	45.8939	7	0.70590	0.31813
1300.	330.	39.0759	7	0.76473	0.27948
1400.	330.	33.1027	8	0.82355	0.24415
1500.	330.	27.6990	8	0.88238	0.21206
1600.	330.	23.3915	9	0.94121	0.18317
1700.	330.	19.5093	9	1.00003	0.15729
1800.	330.	16.1851	9	1.05886	0.13428
1900.	330.	13.3554	10	1.11768	0.11396
2000.	330.	10.9606	10	1.17651	0.09615
2100.	330.	6.9461	11	1.23533	0.08063
2200.	330.	7.2615	11	1.29416	0.06722
2300.	330.	5.0614	12	1.35298	0.05570
2400.	330.	4.7046	12	1.41181	0.04587
2500.	330.	3.7547	12	1.47063	0.03755
2600.	330.	2.9795	13	1.52946	0.03054
2700.	330.	2.3508	13	1.58826	0.02469
2800.	330.	1.8441	14	1.64711	0.01984
2900.	330.	1.4380	14	1.70593	0.01584
3000.	330.	1.1149	15	1.76476	0.01257
3100.	330.	0.8592	15	1.82359	0.00991
3200.	330.	0.6583	16	1.88241	0.00776
3300.	330.	0.5013	16	1.94124	0.00605
3400.	330.	0.3795	17	2.00006	0.00468
3500.	330.	0.2854	17	2.05889	0.00359
3600.	330.	0.2135	18	2.11771	0.00275
3700.	330.	0.1586	18	2.17654	0.00208
3800.	330.	0.1172	19	2.23536	0.00157
3900.	330.	0.0858	19	2.29419	0.00118
4000.	330.	0.0627	20	2.35301	0.00088
4100.	330.	0.0455	21	2.41184	0.00065
4200.	330.	0.0326	21	2.47066	0.00048
4300.	330.	0.0234	22	2.52949	0.00035
4400.	330.	0.0164	22	2.58831	0.00025
4500.	330.	0.0116	23	2.64714	0.00018
4600.	330.	0.0078	23	2.70597	0.00013
4700.	330.	0.0055	24	2.76479	0.00009
4800.	330.	0.0038	25	2.82362	0.00007
4900.	330.	0.0023	25	2.88244	0.00005
5000.	330.	0.0016	26	2.94127	0.00003

TABLE I (CONT'D)

POSITION	TIME	Y	N	Z	ERFC
0.	360.	228.7851			
100.	360.	206.6716	2	0.05632	0.93652
200.	360.	186.0043	3	0.11264	0.87343
300.	360.	166.7693	3	0.16896	0.81114
400.	360.	148.9442	4	0.22528	0.75003
500.	360.	132.4981	4	0.28160	0.69045
600.	360.	117.3922	4	0.33793	0.63272
700.	360.	103.5805	5	0.39425	0.57715
800.	360.	91.0109	5	0.45057	0.52400
900.	360.	79.6257	6	0.50689	0.47347
1000.	360.	69.3627	6	0.56321	0.42574
1100.	360.	60.1565	6	0.61953	0.38095
1200.	360.	51.9389	7	0.67585	0.33917
1300.	360.	44.6405	7	0.73217	0.30046
1400.	360.	38.1913	7	0.78849	0.26481
1500.	360.	32.5217	8	0.84481	0.23219
1600.	360.	27.5631	8	0.90114	0.20252
1700.	360.	23.2492	9	0.95746	0.17572
1800.	360.	19.5158	9	1.01378	0.15166
1900.	360.	16.3020	9	1.07010	0.13019
2000.	360.	13.5504	10	1.12642	0.11116
2100.	360.	11.2072	10	1.18274	0.09440
2200.	360.	9.2227	11	1.23906	0.07972
2300.	360.	7.5511	11	1.29538	0.06696
2400.	360.	6.1510	12	1.35170	0.05593
2500.	360.	4.9846	12	1.40802	0.04645
2600.	360.	4.0184	12	1.46435	0.03837
2700.	360.	3.2227	13	1.52067	0.03151
2800.	360.	2.5708	13	1.57699	0.02573
2900.	360.	2.0400	14	1.63331	0.02090
3000.	360.	1.6101	14	1.68963	0.01687
3100.	360.	1.2641	15	1.74595	0.01354
3200.	360.	0.9869	15	1.80227	0.01081
3300.	360.	0.7665	16	1.85859	0.00858
3400.	360.	0.5919	16	1.91491	0.00677
3500.	360.	0.4547	17	1.97123	0.00531
3600.	360.	0.3473	17	2.02755	0.00414
3700.	360.	0.2638	18	2.08388	0.00321
3800.	360.	0.1992	18	2.14020	0.00247
3900.	360.	0.1497	19	2.19652	0.00189
4000.	360.	0.1117	19	2.25284	0.00144
4100.	360.	0.0830	20	2.30916	0.00109
4200.	360.	0.0612	20	2.36548	0.00082
4300.	360.	0.0450	21	2.42180	0.00062
4400.	360.	0.0326	21	2.47812	0.00046
4500.	360.	0.0237	22	2.53444	0.00034
4600.	360.	0.0169	22	2.59076	0.00025
4700.	360.	0.0122	23	2.64709	0.00018
4800.	360.	0.0083	23	2.70341	0.00013
4900.	360.	0.0060	24	2.75973	0.00010
5000.	360.	0.0042	25	2.81605	0.00007

TABLE 2

NUMERICAL SOLUTION

Initially straight shoreline

P = 3.2 ergs/cm-sec

S_r= 1,000 cu.m/day

Constant nearshore depth, D= 1.0 m

Normal wave approach, α_W = 0°

POS= distance along x-axis, (m)

River POSITION = 5,400 m

DAY= time, days

Y POSITION = shoreline growth, m

TABLE 2 NUMERICAL SOLUTION

POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT	CHANGE IN LIT TRANS	CHANGE IN Y POSITON	WATER DEPTH
0.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
400.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
600.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
800.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
1000.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
1200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
1400.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
1600.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
1800.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
2000.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
2200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
2400.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
2600.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
2800.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
3000.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
3200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
3400.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
3600.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
3800.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
4000.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
4200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
4400.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
4600.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
4800.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
5000.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
5200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
5400.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	1000.000	1.000E+00	1.000E+00
5600.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
5800.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
6000.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
6200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
6400.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
6600.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
6800.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
7000.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
7200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
7400.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
7600.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
7800.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
8000.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
8200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
8400.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
8600.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
8800.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
9000.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
9200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
9400.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
9600.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
9800.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
10000.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00
10200.	0.1	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	0.000E-01	1.000E+00

TABLE 2 (CONT'D)

POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT	CHANGE IN LIT TRANS.	CHANGE IN Y POSITON	WATER DEPTH
0,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.646E-34	1.000E+00
200,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.481E-32	1.000E+00
400,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.221E-30	1.000E+00
600,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	9.171E-29	1.000E+00
800,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	6.264E-27	1.000E+00
1000,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	3.878E-25	1.000E+00
1200,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	2.169E-23	1.000E+00
1400,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.092E-21	1.000E+00
1600,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	4.929E-20	1.000E+00
1800,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.987E-18	1.000E+00
2000,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	7.119E-17	1.000E+00
2200,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	2.255E-15	1.000E+00
2400,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	6.284E-14	1.000E+00
2600,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.530E-12	1.000E+00
2800,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	3.235E-11	1.000E+00
3000,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	5.891E-10	1.000E+00
3200,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	9.167E-09	1.000E+00
3400,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.207E-07	1.000E+00
3600,	30.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.001	1.331E-06	1.000E+00
3800,	30.0	0.0004	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.012	1.215E-05	1.000E+00
4000,	30.0	0.0036	-0.00	0.00	0.00	3.196E+07 (-)	0.1	0.091	9.066E-05	1.000E+00
4200,	30.0	0.0268	-0.02	0.00	0.02	3.196E+07 (-)	0.9	0.545	5.447E-04	1.000E+00
4400,	30.0	0.1646	-0.12	0.00	0.12	3.196E+07 (-)	4.7	2.594	2.594E-03	1.000E+00
4600,	30.0	0.8241	-0.50	0.00	0.50	3.196E+07 (-)	19.5	9.630	9.630E-03	1.000E+00
4800,	30.0	3.3427	-1.65	0.00	1.65	3.196E+07 (-)	63.7	27.397	2.740E-02	1.000E+00
5000,	30.0	10.9778	-4.26	0.00	4.26	3.196E+07 (-)	164.2	58.876	5.888E-02	1.000E+00
5200,	30.0	29.4493	-8.83	0.00	8.83	3.196E+07 (-)	336.4	94.724	9.472E-02	1.000E+00
5400,	30.0	65.8587	11.79	0.00	11.79	3.196E+07 (+)	443.8	112.322	1.123E-01	1.000E+00
5600,	30.0	29.4493	6.29	0.00	6.29	3.196E+07 (+)	241.7	94.724	9.472E-02	1.000E+00
5800,	30.0	10.9778	2.73	0.00	2.73	3.196E+07 (+)	105.4	58.876	5.888E-02	1.000E+00
6000,	30.0	3.3427	0.94	0.00	0.94	3.196E+07 (+)	36.3	27.397	2.740E-02	1.000E+00
6200,	30.0	0.8241	0.26	0.00	0.26	3.196E+07 (+)	9.9	9.630	9.630E-03	1.000E+00
6400,	30.0	0.1646	0.06	0.00	0.06	3.196E+07 (+)	2.1	2.594	2.594E-03	1.000E+00
6600,	30.0	0.0268	0.01	0.00	0.01	3.196E+07 (+)	0.4	0.545	5.447E-04	1.000E+00
6800,	30.0	0.0036	0.00	0.00	0.00	3.196E+07 (+)	0.1	0.091	9.066E-05	1.000E+00
7000,	30.0	0.0004	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.012	1.215E-05	1.000E+00
7200,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.001	1.331E-06	1.000E+00
7400,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.207E-07	1.000E+00
7600,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	9.167E-09	1.000E+00
7800,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	5.891E-10	1.000E+00
8000,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	3.235E-11	1.000E+00
8200,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.530E-12	1.000E+00
8400,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	6.284E-14	1.000E+00
8600,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	2.255E-15	1.000E+00
8800,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	7.119E-17	1.000E+00
9000,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.987E-18	1.000E+00
9200,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	4.929E-20	1.000E+00
9400,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.092E-21	1.000E+00
9600,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	2.169E-23	1.000E+00
9800,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	3.878E-25	1.000E+00
10000,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	6.264E-27	1.000E+00
10200,	30.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	9.171E-29	1.000E+00

TABLE 2 (CONT'D)

POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT	CHANGE IN LIT TRANS.	CHANGE IN Y POSITION	WATER DEPTH
0,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	5.714E-22	1.000E+00
200,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.024E-20	1.000E+00
400,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.905E-19	1.000E+00
600,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	3.283E-18	1.000E+00
800,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	5.228E-17	1.000E+00
1000,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	7.676E-16	1.000E+00
1200,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.037E-14	1.000E+00
1400,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.284E-13	1.000E+00
1600,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.455E-12	1.000E+00
1800,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.505E-11	1.000E+00
2000,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.415E-10	1.000E+00
2200,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.207E-09	1.000E+00
2400,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	9.304E-09	1.000E+00
2600,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	6.459E-08	1.000E+00
2800,	60.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	4.024E-07	1.000E+00
3000,	60.0	0.0001	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.002	2.241E-06	1.000E+00
3200,	60.0	0.0007	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.011	1.112E-05	1.000E+00
3400,	60.0	0.0036	-0.00	0.00	0.00	3.196E+07 (-)	0.1	0.049	4.891E-05	1.000E+00
3600,	60.0	0.0163	-0.01	0.00	0.01	3.196E+07 (-)	0.4	0.190	1.901E-04	1.000E+00
3800,	60.0	0.0668	-0.04	0.00	0.04	3.196E+07 (-)	1.4	0.650	6.499E-04	1.000E+00
4000,	60.0	0.2434	-0.12	0.00	0.12	3.196E+07 (-)	4.5	1.946	1.946E-03	1.000E+00
4200,	60.0	0.7914	-0.33	0.00	0.33	3.196E+07 (-)	12.8	5.086	5.086E-03	1.000E+00
4400,	60.0	2.2941	-0.83	0.00	0.83	3.196E+07 (-)	32.1	11.555	1.156E-02	1.000E+00
4600,	60.0	5.9357	-1.84	0.00	1.84	3.196E+07 (-)	71.4	22.749	2.275E-02	1.000E+00
4800,	60.0	13.7466	-3.63	0.00	3.63	3.196E+07 (-)	140.3	36.737	3.874E-02	1.000E+00
5000,	60.0	28.6145	-6.39	0.00	6.39	3.196E+07 (-)	245.2	57.029	5.703E-02	1.000E+00
5200,	60.0	54.1314	-10.11	0.00	10.11	3.196E+07 (-)	383.3	72.518	7.252E-02	1.000E+00
5400,	60.0	93.0964	12.26	0.00	12.26	3.196E+07 (+)	460.5	78.969	7.897E-02	1.000E+00
5600,	60.0	54.1314	8.13	0.00	8.13	3.196E+07 (+)	310.8	72.518	7.252E-02	1.000E+00
5800,	60.0	28.6445	4.98	0.00	4.98	3.196E+07 (+)	188.2	57.029	5.703E-02	1.000E+00
6000,	60.0	13.7466	2.63	0.00	2.63	3.196E+07 (+)	101.6	36.737	3.874E-02	1.000E+00
6200,	60.0	5.9357	1.26	0.00	1.26	3.196E+07 (+)	48.6	22.749	2.275E-02	1.000E+00
6400,	60.0	2.2941	0.53	0.00	0.53	3.196E+07 (+)	20.6	11.555	1.156E-02	1.000E+00
6600,	60.0	0.7914	0.20	0.00	0.20	3.196E+07 (+)	7.7	5.086	5.086E-03	1.000E+00
6800,	60.0	0.2434	0.07	0.00	0.07	3.196E+07 (+)	2.5	1.946	1.946E-03	1.000E+00
7000,	60.0	0.0668	0.02	0.00	0.02	3.196E+07 (+)	0.7	0.650	6.499E-04	1.000E+00
7200,	60.0	0.0163	0.00	0.00	0.00	3.196E+07 (+)	0.2	0.190	1.901E-04	1.000E+00
7400,	60.0	0.0036	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.049	4.891E-05	1.000E+00
7600,	60.0	0.0007	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.011	1.112E-05	1.000E+00
7800,	60.0	0.0001	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.002	2.241E-06	1.000E+00
8000,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	4.024E-07	1.000E+00
8200,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	6.459E-08	1.000E+00
8400,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	9.304E-09	1.000E+00
8600,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.207E-09	1.000E+00
8800,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.415E-10	1.000E+00
9000,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.505E-11	1.000E+00
9200,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.455E-12	1.000E+00
9400,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.284E-13	1.000E+00
9600,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.037E-14	1.000E+00
9800,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	7.676E-16	1.000E+00
10000,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	5.228E-17	1.000E+00
10200,	60.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	3.283E-18	1.000E+00

TABLE 2 (CONT'D)

POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT	CHANGE IN LIT TRANS.	CHANGE IN Y POSITION	WATER DEPTH
0,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	2.403E-16	1.000E+00
200,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	1.869E-15	1.000E+00
400,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	1.661E-14	1.000E+00
600,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	1.384E-13	1.000E+00
800,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	1.079E-12	1.000E+00
1000,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	7.844E-12	1.000E+00
1200,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	5.316E-11	1.000E+00
1400,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	3.351E-10	1.000E+00
1600,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	1.963E-09	1.000E+00
1800,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	1.066E-08	1.000E+00
2000,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	5.358E-08	1.000E+00
2200,	90.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	2.489E-07	1.000E+00
2400,	90.0	0.0001	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.001	1.066E-06	1.000E+00
2600,	90.0	0.0004	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.004	4.206E-06	1.000E+00
2800,	90.0	0.0015	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.015	1.525E-05	1.000E+00
3000,	90.0	0.0056	-0.00	0.00	0.00	3.196E+07	(-)	0.1	0.051	5.073E-05	1.000E+00
3200,	90.0	0.0196	-0.01	0.00	0.01	3.196E+07	(-)	0.4	0.155	1.545E-04	1.000E+00
3400,	90.0	0.0633	-0.03	0.00	0.03	3.196E+07	(-)	1.0	0.430	4.302E-04	1.000E+00
3600,	90.0	0.1889	-0.07	0.00	0.07	3.196E+07	(-)	2.8	1.093	1.093E-03	1.000E+00
3800,	90.0	0.5201	-0.18	0.00	0.18	3.196E+07	(-)	7.0	2.531	2.531E-03	1.000E+00
4000,	90.0	1.3231	-0.42	0.00	0.42	3.196E+07	(-)	16.1	5.332	5.332E-03	1.000E+00
4200,	90.0	3.1109	-0.87	0.00	0.87	3.196E+07	(-)	33.8	10.202	1.020E-02	1.000E+00
4400,	90.0	6.7695	-1.68	0.00	1.68	3.196E+07	(-)	65.1	17.716	1.772E-02	1.000E+00
4600,	90.0	13.6607	-2.99	0.00	2.99	3.196E+07	(-)	115.5	27.906	2.791E-02	1.000E+00
4800,	90.0	25.6404	-4.91	0.00	4.91	3.196E+07	(-)	189.1	39.878	3.988E-02	1.000E+00
5000,	90.0	41.9492	-7.19	0.00	7.19	3.196E+07	(-)	286.8	51.717	5.172E-02	1.000E+00
5200,	90.0	73.9814	-10.69	0.00	10.69	3.196E+07	(-)	404.4	60.793	6.079E-02	1.000E+00
5400,	90.0	114.9795	12.47	0.00	12.47	3.196E+07	(+)	467.8	64.359	6.436E-02	1.000E+00
5600,	90.0	73.9814	9.02	0.00	9.02	3.196E+07	(+)	343.6	60.793	6.079E-02	1.000E+00
5800,	90.0	41.9492	6.12	0.00	6.12	3.196E+07	(+)	235.1	51.717	5.172E-02	1.000E+00
6000,	90.0	25.6404	3.87	0.00	3.87	3.196E+07	(+)	149.3	39.878	3.988E-02	1.000E+00
6200,	90.0	13.6607	2.26	0.00	2.26	3.196E+07	(+1	87.6	27.906	2.791E-02	1.000E+00
6400,	90.0	6.7695	1.22	0.00	1.22	3.196E+07	(+)	47.4	17.716	1.772E-02	1.000E+00
6600,	90.0	3.1109	0.61	0.00	0.61	3.196E+07	(+)	23.6	10.202	1.020E-02	1.000E+00
6800,	90.0	1.3231	0.28	0.00	0.28	3.196E+07	(+)	10.8	5.332	5.332E-03	1.000E+00
7000,	90.0	0.5201	0.12	0.00	0.12	3.196E+07	(+)	4.5	2.531	2.531E-03	1.000E+00
7200,	90.0	0.1889	0.04	0.00	0.04	3.196E+07	(+)	1.7	1.093	1.093E-03	1.000E+00
7400,	90.0	0.0633	0.02	0.00	0.02	3.196E+07	(+)	0.6	0.430	4.302E-04	1.000E+00
7600,	90.0	0.0196	0.01	0.00	0.01	3.196E+07	(+)	0.2	0.155	1.545E-04	1.000E+00
7800,	90.0	0.0056	0.00	0.00	0.00	3.196E+07	(+)	0.1	0.051	5.073E-05	1.000E+00
8000,	90.0	0.0015	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.015	1.525E-05	1.000E+00
8200,	90.0	0.0004	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.004	4.206E-06	1.000E+00
8400,	90.0	0.0001	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.001	1.066E-06	1.000E+00
8600,	90.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	2.489E-07	1.000E+00
8800,	90.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	5.358E-08	1.000E+00
9000,	90.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	1.066E-08	1.000E+00
9200,	90.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	1.963E-09	1.000E+00
9400,	90.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	3.351E-10	1.000E+00
9600,	90.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	5.316E-11	1.000E+00
9800,	90.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	7.844E-12	1.000E+00
10000,	90.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	1.079E-12	1.000E+00
10200,	90.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	1.384E-13	1.000E+00

TABLE 2 (CONT'D)

POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT	CHANGE IN LIT TRANS.	CHANGE IN Y POSITION	WATER DEPTH
0,	120.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	3.861E-13	1.000E+00
200,	120.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.781E-12	1.000E+00
400,	120.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.003E-11	1.000E+00
600,	120.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	5.377E-11	1.000E+00
800,	120.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	2.721E-10	1.000E+00
1000,	120.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.298E-09	1.000E+00
1200,	120.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	5.832E-09	1.000E+00
1400,	120.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	2.466E-08	1.000E+00
1600,	120.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	9.800E-08	1.000E+00
1800,	120.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	3.658E-07	1.000E+00
2000,	120.0	0.0001	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.001	1.281E-06	1.000E+00
2200,	120.0	0.0005	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.004	4.201E-06	1.000E+00
2400,	120.0	0.0017	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.013	1.291E-05	1.000E+00
2600,	120.0	0.0053	-0.00	0.00	0.00	3.196E+07 (-)	0.1	0.037	3.708E-05	1.000E+00
2800,	120.0	0.0161	-0.01	0.00	0.01	3.196E+07 (-)	0.2	0.100	9.953E-05	1.000E+00
3000,	120.0	0.0457	-0.02	0.00	0.02	3.196E+07 (-)	0.7	0.249	2.494E-04	1.000E+00
3200,	120.0	0.1224	-0.04	0.00	0.04	3.196E+07 (-)	1.6	0.583	5.830E-04	1.000E+00
3400,	120.0	0.3081	-0.10	0.00	0.10	3.196E+07 (-)	3.8	1.270	1.270E-03	1.000E+00
3600,	120.0	0.7296	-0.21	0.00	0.21	3.196E+07 (-)	8.2	2.575	2.575E-03	1.000E+00
3800,	120.0	1.6263	-0.43	0.00	0.43	3.196E+07 (-)	16.6	4.858	4.858E-03	1.000E+00
4000,	120.0	3.4148	-0.82	0.00	0.82	3.196E+07 (-)	31.6	8.523	8.523E-03	1.000E+00
4200,	120.0	6.7604	-1.46	0.00	1.46	3.196E+07 (-)	56.5	13.897	1.390E-02	1.000E+00
4400,	120.0	12.6364	-2.45	0.00	2.45	3.196E+07 (-)	94.8	21.052	2.105E-02	1.000E+00
4600,	120.0	22.3431	-3.88	0.00	3.88	3.196E+07 (-)	149.6	29.639	2.964E-02	1.000E+00
4800,	120.0	37.4657	-5.79	0.00	5.79	3.196E+07 (-)	222.7	38.795	3.880E-02	1.000E+00
5000,	120.0	59.7668	-8.20	0.00	8.20	3.196E+07 (-)	313.1	47.214	4.721E-02	1.000E+00
5200,	120.0	91.0337	-11.04	0.00	11.04	3.196E+07 (-)	417.1	53.348	5.335E-02	1.000E+00
5400,	120.0	132.8954	12.60	0.00	12.60	3.196E+07 (+)	472.2	55.685	5.569E-02	1.000E+00
5600,	120.0	91.0337	9.57	0.00	9.57	3.196E+07 (+)	363.7	53.348	5.335E-02	1.000E+00
5800,	120.0	59.7668	6.93	0.00	6.93	3.196E+07 (+)	265.9	47.214	4.721E-02	1.000E+00
6000,	120.0	37.4657	4.77	0.00	4.77	3.196E+07 (+)	183.9	38.795	3.880E-02	1.000E+00
6200,	120.0	22.3431	3.11	0.00	3.11	3.196E+07 (+)	120.0	29.639	2.964E-02	1.000E+00
6400,	120.0	12.6364	1.91	0.00	1.91	3.196E+07 (+)	73.7	21.052	2.105E-02	1.000E+00
6600,	120.0	6.7604	1.10	0.00	1.10	3.196E+07 (+)	42.6	13.697	1.390E-02	1.000E+00
6800,	120.0	3.4148	0.60	0.00	0.60	3.196E+07 (+)	23.1	8.523	8.523E-03	1.000E+00
7000,	120.0	1.6263	0.30	0.00	0.30	3.196E+07 (+)	11.7	4.858	4.858E-03	1.000E+00
7200,	120.0	0.7296	0.14	0.00	0.14	3.196E+07 (+)	5.6	2.575	2.575E-03	1.000E+00
7400,	120.0	0.3081	0.06	0.00	0.06	3.196E+07 (+)	2.5	1.270	1.270E-03	1.000E+00
7600,	120.0	0.1224	0.03	0.00	0.03	3.196E+07 (+)	1.0	0.583	5.830E-04	1.000E+00
7800,	120.0	0.0457	0.01	0.00	0.01	3.196E+07 (+)	0.4	0.249	2.494E-04	1.000E+00
8000,	120.0	0.0161	0.00	0.00	0.00	3.196E+07 (+)	0.1	0.100	9.953E-05	1.000E+00
8200,	120.0	0.0053	0.00	0.00	0.00	3.196E+07 (+)	0.1	0.037	3.708E-05	1.000E+00
8400,	120.0	0.0017	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.013	1.291E-05	1.000E+00
8600,	120.0	0.0005	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.004	4.201E-06	1.000E+00
8800,	120.0	0.0001	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.001	1.281E-06	1.000E+00
9000,	120.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	3.658E-07	1.000E+00
9200,	120.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	9.800E-08	1.000E+00
9400,	120.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	2.466E-08	1.000E+00
9600,	120.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	5.832E-09	1.000E+00
9800,	120.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	1.298E-09	1.000E+00
10000,	120.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	2.721E-10	1.000E+00
10200,	120.0	0.0000	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.000	5.377E-11	1.000E+00

TABLE 2 (CONT'D)

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POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER		LITTORAL TRANSPORT	CHANGE IN LIT TRANS	CHANGE IN Y POSITION	WATER DEPTH
0,	150.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	4.418E-11	1.000E+00
200,	150.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	1.430E-10	1.000E+00
400,	150.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	5.896E-10	1.000E+00
600,	150.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	2.352E-09	1.000E+00
800,	150.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	8.929E-09	1.000E+00
1000,	150.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	3.222E-08	1.000E+00
1200,	150.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	1.105E-07	1.000E+00
1400,	150.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	3.594E-07	1.000E+00
1600,	150.0	0.0001	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.001	1.110E-06	1.000E+00
1800,	150.0	0.0005	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.003	3.248E-06	1.000E+00
2000,	150.0	0.0014	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.009	9.006E-06	1.000E+00
2200,	150.0	0.0041	-0.00	0.00	0.00	3.196E+07	(-)	0.1	0.024	2.365E-05	1.000E+00
2400,	150.0	0.0112	-0.00	0.00	0.00	3.196E+07	(-)	0.2	0.059	5.878E-05	1.000E+00
2600,	150.0	0.0294	-0.01	0.00	0.01	3.196E+07	(-)	0.4	0.138	1.382E-04	1.000E+00
2800,	150.0	0.0736	-0.02	0.00	0.02	3.196E+07	(-)	0.9	0.307	3.070E-04	1.000E+00
3000,	150.0	0.1749	-0.05	0.00	0.05	3.196E+07	(-)	2.0	0.644	6.444E-04	1.000E+00
3200,	150.0	0.3957	-0.11	0.00	0.11	3.196E+07	(-)	4.2	1.278	1.278E-03	1.000E+00
3400,	150.0	0.8523	-0.22	0.00	0.22	3.196E+07	(-)	8.3	2.390	2.390E-03	1.000E+00
3600,	150.0	1.7479	-0.41	0.00	0.41	3.196E+07	(-)	15.8	4.220	4.220E-03	1.000E+00
3800,	150.0	3.4156	-0.73	0.00	0.73	3.196E+07	(-)	28.3	7.026	7.026E-03	1.000E+00
4000,	150.0	6.3642	-1.24	0.00	1.24	3.196E+07	(-)	48.2	11.029	1.103E-02	1.000E+00
4200,	150.0	11.3186	-2.02	0.00	2.02	3.196E+07	(-)	78.0	16.322	1.632E-02	1.000E+00
4400,	150.0	19.2390	-3.11	0.00	3.11	3.196E+07	(-)	120.2	22.776	2.278E-02	1.000E+00
4600,	150.0	31.3070	-4.58	0.00	4.58	3.196E+07	(-)	176.5	29.975	2.997E-02	1.000E+00
4800,	150.0	48.8727	-6.44	0.00	6.44	3.196E+07	(-)	247.4	37.219	3.722E-02	1.000E+00
5000,	150.0	73.3703	-8.70	0.00	8.70	3.196E+07	(-)	331.5	43.594	4.359E-02	1.000E+00
5200,	150.0	106.2124	-11.29	0.00	11.29	3.196E+07	(-)	425.8	48.097	4.810E-02	1.000E+00
5400,	150.0	148.6695	12.68	0.00	12.68	3.196E+07	(+)	475.1	39.779	4.978E-02	1.000E+00
5600,	150.0	106.2124	9.95	0.00	9.95	3.196E+07	(+)	377.7	48.097	4.810E-02	1.000E+00
5800,	150.0	73.3703	7.52	0.00	7.52	3.196E+07	(+)	287.9	43.594	4.359E-02	1.000E+00
6000,	150.0	48.8727	5.46	0.00	5.46	3.196E+07	(+)	210.1	37.219	3.722E-02	1.000E+00
6200,	150.0	31.3070	3.80	0.00	3.80	3.196E+07	(+)	146.5	29.975	2.997E-02	1.000E+00
6400,	150.0	19.2390	2.52	0.00	2.52	3.196E+07	(+)	97.4	22.776	2.278E-02	1.000E+00
6600,	150.0	11.3186	1.59	0.00	1.59	3.196E+07	(+)	61.7	16.322	1.632E-02	1.000E+00
6800,	150.0	6.3642	0.96	0.00	0.96	3.196E+07	(+)	37.1	11.029	1.103E-02	1.000E+00
7000,	150.0	3.4156	0.55	0.00	0.55	3.196E+07	(+)	21.2	7.026	7.026E-03	1.000E+00
7200,	150.0	1.7479	0.30	0.00	0.30	3.196E+07	(+)	11.5	4.220	4.220E-03	1.000E+00
7400,	150.0	0.8523	0.15	0.00	0.15	3.196E+07	(+)	5.9	2.390	2.390E-03	1.000E+00
7600,	150.0	0.3957	0.08	0.00	0.08	3.196E+07	(+)	2.9	1.278	1.278E-03	1.000E+00
7800,	150.0	0.1749	0.03	0.00	0.03	3.196E+07	(+)	1.3	0.644	6.444E-04	1.000E+00
8000,	150.0	0.0736	0.02	0.00	0.02	3.196E+07	(+)	0.6	0.307	3.070E-04	1.000E+00
8200,	150.0	0.0294	0.01	0.00	0.01	3.196E+07	(+)	0.2	0.138	1.382E-04	1.000E+00
8400,	150.0	0.0112	0.00	0.00	0.00	3.196E+07	(+)	0.1	0.059	5.878E-05	1.000E+00
8600,	150.0	0.0041	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.024	2.365E-05	1.000E+00
8800,	150.0	0.0014	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.009	9.006E-06	1.000E+00
9000,	150.0	0.0005	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.003	3.248E-06	1.000E+00
9200,	150.0	0.0001	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.001	1.110E-06	1.000E+00
9400,	150.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	3.594E-07	1.000E+00
9600,	150.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	1.105E-07	1.000E+00
9800,	150.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	3.222E-08	1.000E+00
10000,	150.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	8.929E-09	1.000E+00
10200,	150.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	2.352E-09	1.000E+00

TABLE 2 (CONT'D)

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POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT	CHANGE IN LIT TRANS.	CHANGE IN Y POSITON	WATER DEPTH
0,	180.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	1.177E-09	1.000E+00
200,	180.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	2.965E-09	1.000E+00
400,	180.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	9.723E-09	1.000E+00
600,	180.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	3.139E-08	1.000E+00
800,	180.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	9.722E-08	1.000E+00
1000,	180.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	2.881E-07	1.000E+00
1200,	180.0	0.0001	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.001	8.163E-07	1.000E+00
1400,	180.0	0.0004	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.002	2.211E-06	1.000E+00
1600,	180.0	0.0010	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.006	5.721E-06	1.000E+00
1800,	180.0	0.0028	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.014	1.414E-05	1.000E+00
2000,	180.0	0.0072	-0.00	0.00	0.00	3.196E+07	(-)	0.1	0.033	3.336E-05	1.000E+00
2200,	180.0	0.0179	-0.01	0.00	0.01	3.196E+07	(-)	0.2	0.075	7.511E-05	1.000E+00
2400,	180.0	0.0426	-0.01	0.00	0.01	3.196E+07	(-)	0.5	0.161	1.613E-04	1.000E+00
2600,	180.0	0.0973	-0.03	0.00	0.03	3.196E+07	(-)	1.1	0.330	3.304E-04	1.000E+00
2800,	180.0	0.2132	-0.06	0.00	0.06	3.196E+07	(-)	2.2	0.645	6.452E-04	1.000E+00
3000,	180.0	0.4481	-0.11	0.00	0.11	3.196E+07	(-)	4.2	1.201	1.201E-03	1.000E+00
3200,	180.0	0.9037	-0.21	0.00	0.21	3.196E+07	(-)	8.0	2.128	2.128E-03	1.000E+00
3400,	180.0	1.7431	-0.37	0.00	0.37	3.196E+07	(-)	14.4	3.594	3.594E-03	1.000E+00
3600,	180.0	3.2507	-0.64	0.00	0.64	3.196E+07	(-)	24.7	5.778	5.778E-03	1.000E+00
3800,	180.0	5.8043	-1.05	0.00	1.05	3.196E+07	(-)	40.8	8.843	8.843E-03	1.000E+00
4000,	180.0	9.9650	-1.66	0.00	1.66	3.196E+07	(-)	64.4	12.885	1.289E-02	1.000E+00
4200,	180.0	16.4649	-2.52	0.00	2.52	3.196E+07	(-)	97.5	17.874	1.787E-02	1.000E+00
4400,	180.0	26.2128	-3.67	0.00	3.67	3.196E+07	(-)	141.8	23.610	2.361E-02	1.000E+00
4600,	180.0	40.2689	-5.15	0.00	5.15	3.196E+07	(-)	198.2	29.706	2.971E-02	1.000E+00
4800,	180.0	59.7960	-6.95	0.00	6.95	3.196E+07	(-)	266.5	35.608	3.561E-02	1.000E+00
5000,	180.0	85.9942	-9.07	0.00	9.07	3.196E+07	(-)	345.4	40.652	4.065E-02	1.000E+00
5200,	180.0	120.0244	-11.47	0.00	11.47	3.196E+07	(-)	432.2	44.140	4.414E-02	1.000E+00
5400,	180.0	162.9225	12.74	0.00	12.74	3.196E+07	(+)	477.3	45.425	4.543E-02	1.000E+00
5600,	180.0	120.0244	10.24	0.00	10.24	3.196E+07	(+)	388.1	44.140	4.414E-02	1.000E+00
5800,	180.0	85.9942	7.97	0.00	7.97	3.196E+07	(+)	304.8	40.652	4.065E-02	1.000E+00
6000,	180.0	59.7960	6.01	0.00	6.01	3.196E+07	(+)	230.9	35.608	3.561E-02	1.000E+00
6200,	180.0	40.2689	4.37	0.00	4.37	3.196E+07	(+)	168.5	29.706	2.971E-02	1.000E+00
6400,	180.0	26.2128	3.06	0.00	3.06	3.196E+07	(+)	118.2	23.610	2.361E-02	1.000E+00
6600,	180.0	16.4649	2.06	0.00	2.06	3.196E+07	(+)	79.7	17.874	1.787E-02	1.000E+00
6800,	180.0	9.9650	1.33	0.00	1.33	3.196E+07	(+)	51.5	12.885	1.289E-02	1.000E+00
7000,	180.0	5.8043	0.82	0.00	0.82	3.196E+07	(+)	31.9	8.843	8.843E-03	1.000E+00
7200,	180.0	3.2507	0.49	0.00	0.49	3.196E+07	(+)	18.9	5.778	5.778E-03	1.000E+00
7400,	180.0	1.7491	0.28	0.00	0.28	3.196E+07	(+)	10.8	3.594	3.594E-03	1.000E+00
7600,	180.0	0.9037	0.15	0.00	0.15	3.196E+07	(+)	5.9	2.128	2.128E-03	1.000E+00
7800,	180.0	0.4481	0.08	0.00	0.08	3.196E+07	(+)	3.0	1.201	1.201E-03	1.000E+00
8000,	180.0	0.2132	0.04	0.00	0.04	3.196E+07	(+)	1.5	0.645	6.452E-04	1.000E+00
8200,	180.0	0.0973	0.02	0.00	0.02	3.196E+07	(+)	0.7	0.330	3.304E-04	1.000E+00
8400,	180.0	0.0426	0.01	0.00	0.01	3.196E+07	(+)	0.3	0.161	1.613E-04	1.000E+00
8600,	180.0	0.0179	0.00	0.00	0.00	3.196E+07	(+)	0.1	0.075	7.511E-05	1.000E+00
8800,	180.0	0.0072	0.00	0.00	0.00	3.196E+07	(+)	0.1	0.033	3.336E-05	1.000E+00
9000,	180.0	0.0028	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.014	1.414E-05	1.000E+00
9200,	180.0	0.0010	[illegible]	0.00	0.00	3.196E+07	(+)	0.0	0.006	5.721E-06	1.000E+00
9400,	180.0	0.0004	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.002	2.211E-06	1.000E+00
9600,	180.0	0.0001	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.001	8.163E-07	1.000E+00
9800,	180.0	[illegible]	0.00	[illegible]	[illegible]	3.196E+07	(+)	0.0	0.000	2.881E-07	1.000E+00
10000,	180.0	[illegible]	0.00	0.00	[illegible]	3.196E+07	(+)	0.0	0.000	9.722E-08	1.000E+00
10200,	180.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	3.139E-08	1.000E+00

TABLE 2 (CONT'D)

POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT		CHANGE IN LIT TRANS	CHANGE IN Y POSITON	WATER DEPTH
0,	210.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	1.293E-08	1.000E+00
200,	210.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	2.715E-08	1.000E+00
400,	210.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	7.464E-08	1.000E+00
600,	210.0	0.0000	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	2.056E-07	1.000E+00
800,	210.0	0.0001	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.001	5.473E-07	1.000E+00
1000,	210.0	0.0003	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.001	1.401E-06	1.000E+00
1200,	210.0	0.0007	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.003	3.449E-06	1.000E+00
1400,	210.0	0.0018	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.008	8.160E-06	1.000E+00
1600,	210.0	0.0044	-0.00	0.00	0.00	3.196E+07	(-)	0.1	0.019	1.855E-05	1.000E+00
1800,	210.0	0.0105	-0.00	0.00	0.00	3.196E+07	(-)	0.1	0.040	4.049E-05	1.000E+00
2000,	210.0	0.0241	-0.01	0.00	0.01	3.196E+07	(-)	0.3	0.085	8.469E-05	1.000E+00
2200,	210.0	0.0535	-0.01	0.00	0.01	3.196E+07	(-)	0.6	0.171	1.708E-04	1.000E+00
2400,	210.0	0.1145	-0.03	0.00	0.03	3.196E+07	(-)	1.1	0.330	3.300E-04	1.000E+00
2600,	210.0	0.2364	-0.06	0.00	0.06	3.196E+07	(-)	2.2	0.612	6.116E-04	1.000E+00
2800,	210.0	0.4707	-0.11	0.00	0.11	3.196E+07	(-)	4.1	1.088	1.088E-03	1.000E+00
3000,	210.0	0.9044	-0.19	0.00	0.19	3.196E+07	(-)	7.4	1.855	1.855E-03	1.000E+00
3200,	210.0	1.6772	-0.33	0.00	0.33	3.196E+07	(-)	12.8	3.033	3.033E-03	1.000E+00
3400,	210.0	3.0030	-0.55	0.00	0.55	3.196E+07	(-)	21.4	4.756	4.756E-03	1.000E+00
3600,	210.0	5.1942	-0.89	0.00	0.89	3.196E+07	(-)	34.4	7.149	7.149E-03	1.000E+00
3800,	210.0	8.6839	-1.38	0.00	1.38	3.196E+07	(-)	53.3	10.302	1.030E-02	1.000E+00
4000,	210.0	14.0428	-2.06	0.00	2.06	3.196E+07	(-)	79.7	14.231	1.423E-02	1.000E+00
4200,	210.0	21.9844	-2.98	0.00	2.98	3.196E+07	(-)	115.0	18.849	1.885E-02	1.000E+00
4400,	210.0	33.3547	-4.16	0.00	4.16	3.196E+07	(-)	160.3	23.941	2.394E-02	1.000E+00
4600,	210.0	49.1047	-5.62	0.00	5.62	3.196E+07	(-)	216.1	29.170	2.917E-02	1.000E+00
4800,	210.0	70.2492	-7.36	0.00	7.36	3.196E+07	(-)	281.9	34.095	3.410E-02	1.000E+00
5000,	210.0	97.8149	-9.37	0.00	9.37	3.196E+07	(-)	356.4	38.216	3.822E-02	1.000E+00
5200,	210.0	132.7830	-11.61	0.00	11.61	3.196E+07	(-)	437.2	41.021	4.102E-02	1.000E+00
5400,	210.0	176.0252	12.79	0.00	12.79	3.196E+07	(+)	479.0	42.045	4.204E-02	1.000E+00
5600,	210.0	132.7830	10.46	0.00	10.46	3.196E+07	(+)	396.2	41.021	4.102E-02	1.000E+00
5800,	210.0	97.8149	8.33	0.00	8.33	3.196E+07	(+)	318.1	38.216	3.822E-02	1.000E+00
6000,	210.0	70.2492	6.45	0.00	6.45	3.196E+07	(+)	247.8	34.095	3.410E-02	1.000E+00
6200,	210.0	49.1047	4.85	0.00	4.85	3.196E+07	(+)	186.9	29.170	2.917E-02	1.000E+00
6400,	210.0	33.3547	3.53	0.00	3.53	3.196E+07	(+)	136.4	23.941	2.394E-02	1.000E+00
6600,	210.0	21.9844	2.49	0.00	2.49	3.196E+07	(+)	96.2	18.849	1.885E-02	1.000E+00
6800,	210.0	14.0428	1.69	0.00	1.69	3.196E+07	(+)	65.5	14.231	1.423E-02	1.000E+00
7000,	210.0	8.6839	1.11	0.00	1.11	3.196E+07	(+)	43.0	10.302	1.030E-02	1.000E+00
7200,	210.0	5.1942	0.70	0.00	0.70	3.196E+07	(+)	27.2	7.149	7.149E-03	1.000E+00
7400,	210.0	3.0030	0.43	0.00	0.43	3.196E+07	(+)	16.6	4.756	4.756E-03	1.000E+00
7600,	210.0	1.6772	0.25	0.00	0.25	3.196E+07	(+)	9.8	3.033	3.033E-03	1.000E+00
7800,	210.0	0.9044	0.14	0.00	0.14	3.196E+07	(+)	5.5	1.855	1.855E-03	1.000E+00
8000,	210.0	0.4707	0.08	0.00	0.08	3.196E+07	(+)	3.0	1.088	1.088E-03	1.000E+00
8200,	210.0	0.2364	0.04	0.00	0.04	3.196E+07	(+)	1.6	0.612	6.116E-04	1.000E+00
8400,	210.0	0.1145	0.02	0.00	0.02	3.196E+07	(+)	0.8	0.330	3.300E-04	1.000E+00
8600,	210.0	0.0535	0.01	0.00	0.01	3.196E+07	(+)	0.4	0.171	1.708E-04	1.000E+00
8800,	210.0	0.0241	0.00	0.00	0.00	3.196E+07	(+)	0.2	0.085	8.469E-05	1.000E+00
9000,	210.0	0.0105	0.00	0.00	0.00	3.196E+07	(+)	0.1	0.040	4.049E-05	1.000E+00
9200,	210.0	0.0044	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.019	1.855E-05	1.000E+00
9400,	210.0	0.0018	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.008	8.160E-06	1.000E+00
9600,	210.0	0.0007	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.003	3.449E-06	1.000E+00
9800,	210.0	0.0003	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.001	1.401E-06	1.000E+00
10000,	210.0	0.0001	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.001	5.473E-07	1.000E+00
10200,	210.0	0.0000	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.000	2.056E-07	1.000E+00

TABLE 2 (CONT'D)

POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT	CHANGE IN LIT TRANS.	CHANGE IN Y POSITION	WATER DEPTH
0,	240.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	7.996E-08	1.000E+00
200,	240.0	0.0000	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	1.465E-07	1.000E+00
400,	240.0	0.0001	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.000	3.500E-07	1.000E+00
600,	240.0	0.0002	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.001	8.515E-07	1.000E+00
800,	240.0	0.0004	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.002	2.016E-06	1.000E+00
1000,	240.0	0.0011	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.005	4.614E-06	1.000E+00
1200,	240.0	0.0026	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.010	1.020E-05	1.000E+00
1400,	240.0	0.0060	-0.00	0.00	0.00	3.196E+07 (-)	0.1	0.022	2.175E-05	1.000E+00
1600,	240.0	0.0135	-0.00	0.00	0.00	3.196E+07 (-)	0.1	0.045	4.477E-05	1.000E+00
1800,	240.0	0.0292	-0.01	0.00	0.01	3.196E+07 (-)	0.3	0.089	8.892E-05	1.000E+00
2000,	240.0	0.0615	-0.02	0.00	0.02	3.196E+07 (-)	0.6	0.170	1.704E-04	1.000E+00
2200,	240.0	0.1251	-0.03	0.00	0.03	3.196E+07 (-)	1.1	0.315	3.148E-04	1.000E+00
2400,	240.0	0.2466	-0.05	0.00	0.05	3.196E+07 (-)	2.1	0.561	5.611E-04	1.000E+00
2600,	240.0	0.4711	-0.10	0.00	0.10	3.196E+07 (-)	3.8	0.964	9.640E-04	1.000E+00
2800,	240.0	0.8719	-0.17	0.00	0.17	3.196E+07 (-)	6.7	1.597	1.597E-03	1.000E+00
3000,	240.0	1.5643	-0.29	0.00	0.29	3.196E+07 (-)	11.2	2.550	2.550E-03	1.000E+00
3200,	240.0	2.7212	-0.47	0.00	0.47	3.196E+07 (-)	18.3	3.924	3.924E-03	1.000E+00
3400,	240.0	4.5916	-0.75	0.00	0.75	3.196E+07 (-)	29.0	5.819	5.819E-03	1.000E+00
3600,	240.0	7.5184	-1.14	0.00	1.14	3.196E+07 (-)	44.3	8.315	8.315E-03	1.000E+00
3800,	240.0	11.9533	-1.69	0.00	1.69	3.196E+07 (-)	65.5	11.451	1.145E-02	1.000E+00
4000,	240.0	18.4649	-2.43	0.00	2.43	3.196E+07 (-)	94.0	15.198	1.520E-02	1.000E+00
4200,	240.0	27.7357	-3.38	0.00	3.38	3.196E+07 (-)	130.7	19.443	1.944E-02	1.000E+00
4400,	240.0	40.5485	-4.57	0.00	4.57	3.196E+07 (-)	176.4	23.981	2.398E-02	1.000E+00
4600,	240.0	57.7605	-6.01	0.00	6.01	3.196E+07 (-)	231.2	28.522	2.852E-02	1.000E+00
4800,	240.0	80.2677	-7.70	0.00	7.70	3.196E+07 (-)	294.6	32.712	3.271E-02	1.000E+00
5000,	240.0	108.9643	-9.61	0.00	9.61	3.196E+07 (-)	365.3	36.161	3.616E-02	1.000E+00
5200,	240.0	144.6975	-11.72	0.00	11.72	3.196E+07 (-)	441.2	38.482	3.848E-02	1.000E+00
5400,	240.0	188.2179	-12.83	0.00	12.83	3.196E+07 (+)	480.3	39.322	3.932E-02	1.000E+00
5600,	240.0	144.6975	10.65	0.00	10.65	3.196E+07 (+)	402.8	38.482	3.848E-02	1.000E+00
5800,	240.0	108.9643	8.63	0.00	8.63	3.196E+07 (+)	329.1	36.161	3.616E-02	1.000E+00
6000,	240.0	80.2677	6.83	0.00	6.83	3.196E+07 (+)	261.8	32.712	3.271E-02	1.000E+00
6200,	240.0	57.7605	5.26	0.00	5.26	3.196E+07 (+)	202.6	28.522	2.852E-02	1.000E+00
6400,	240.0	40.5485	3.95	0.00	3.95	3.196E+07 (+)	152.4	23.981	2.398E-02	1.000E+00
6600,	240.0	27.7357	2.88	0.00	2.88	3.196E+07 (+)	111.2	19.443	1.944E-02	1.000E+00
6800,	240.0	18.4649	2.04	0.00	2.04	3.196E+07 (+)	78.8	15.198	1.520E-02	1.000E+00
7000,	240.0	11.9533	1.40	0.00	1.40	3.196E+07 (+)	54.1	11.451	1.145E-02	1.000E+00
7200,	240.0	7.5184	0.93	0.00	0.93	3.196E+07 (+)	36.0	8.315	8.315E-03	1.000E+00
7400,	240.0	4.5916	0.60	0.00	0.60	3.196E+07 (+)	23.1	5.819	5.819E-03	1.000E+00
7600,	240.0	2.7212	0.37	0.00	0.37	3.196E+07 (+)	14.4	3.924	3.924E-03	1.000E+00
7800,	240.0	1.5643	0.22	0.00	0.22	3.196E+07 (+)	8.7	2.550	2.550E-03	1.000E+00
8000,	240.0	0.8719	0.13	0.00	0.13	3.196E+07 (+)	5.1	1.597	1.597E-03	1.000E+00
8200,	240.0	0.4711	0.07	0.00	0.07	3.196E+07 (+)	2.9	0.964	9.640E-04	1.000E+00
8400,	240.0	0.2466	0.04	0.00	0.04	3.196E+07 (+)	1.6	0.561	5.611E-04	1.000E+00
8600,	240.0	0.1251	0.02	0.00	0.02	3.196E+07 (+)	0.8	0.315	3.148E-04	1.000E+00
8800,	240.0	0.0615	0.01	0.00	0.01	3.196E+07 (+)	0.4	0.170	1.704E-04	1.000E+00
9000,	240.0	0.0292	0.01	0.00	0.01	3.196E+07 (+)	0.2	0.089	8.892E-05	1.000E+00
9200,	240.0	0.0135	0.00	0.00	0.00	3.196E+07 (+)	0.1	0.045	4.477E-05	1.000E+00
9400,	240.0	0.0060	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.022	2.175E-05	1.000E+00
9600,	240.0	0.0026	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.010	1.020E-05	1.000E+00
9800,	240.0	0.0011	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.005	4.614E-06	1.000E+00
10000,	240.0	0.0004	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.002	2.016E-06	1.000E+00
10200,	240.0	0.0002	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.001	8.515E-07	1.000E+00

TABLE 2 (CONT'D)

POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER		LITTORAL TRANSPORT	CHANGE IN LIT TRANS.	CHANGE IN Y POSITION	WATER DEPTH
0,	270.0	0.0001	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.000	3.334E-07	1.000E+00
200,	270.0	0.0001	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.001	5.505E-07	1.000E+00
400,	270.0	0.0003	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.001	1.173E-06	1.000E+00
600,	270.0	0.0007	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.003	2.583E-06	1.000E+00
800,	270.0	0.0015	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.006	5.570E-06	1.000E+00
1000,	270.0	0.0034	-0.00	0.00	0.00	3.196E+07	(-)	0.0	0.012	1.166E-05	1.000E+00
1200,	270.0	0.0075	-0.00	0.00	0.00	3.196E+07	(-)	0.1	0.024	2.367E-05	1.000E+00
1400,	270.0	0.0159	-0.00	0.00	0.00	3.196E+07	(-)	0.2	0.047	4.653E-05	1.000E+00
1600,	270.0	0.0330	-0.01	0.00	0.01	3.196E+07	(-)	0.3	0.089	8.859E-05	1.000E+00
1800,	270.0	0.0664	-0.02	0.00	0.02	3.196E+07	(-)	0.6	0.163	1.633E-04	1.000E+00
2000,	270.0	0.1298	-0.03	0.00	0.03	3.196E+07	(-)	1.1	0.292	2.916E-04	1.000E+00
2200,	270.0	0.2466	-0.05	0.00	0.05	3.196E+07	(-)	2.0	0.504	5.040E-04	1.000E+00
2400,	270.0	0.4560	-0.09	0.00	0.09	3.196E+07	(-)	3.5	0.843	8.431E-04	1.000E+00
2600,	270.0	0.8193	-0.15	0.00	0.15	3.196E+07	(-)	5.9	1.365	1.365E-03	1.000E+00
2800,	270.0	1.4317	-0.25	0.00	0.25	3.196E+07	(-)	9.8	2.140	2.140E-03	1.000E+00
3000,	270.0	2.4335	-0.40	0.00	0.40	3.196E+07	(-)	15.7	3.245	3.245E-03	1.000E+00
3200,	270.0	4.0252	-0.63	0.00	0.63	3.196E+07	(-)	24.4	4.762	4.762E-03	1.000E+00
3400,	270.0	6.4811	-0.95	0.00	0.95	3.196E+07	(-)	36.8	6.761	6.761E-03	1.000E+00
3600,	270.0	10.1631	-1.40	0.00	1.40	3.196E+07	(-)	54.1	9.289	9.289E-03	1.000E+00
3800,	270.0	15.5285	-2.00	0.00	2.00	3.196E+07	(-)	77.2	12.349	1.235E-02	1.000E+00
4000,	270.0	23.1332	-2.77	0.00	2.77	3.196E+07	(-)	107.1	15.687	1.569E-02	1.000E+00
4200,	270.0	33.6246	-3.75	0.00	3.75	3.196E+07	(-)	144.7	19.783	1.978E-02	1.000E+00
4400,	270.0	47.7263	-4.94	0.00	4.94	3.196E+07	(-)	190.4	23.848	2.385E-02	1.000E+00
4600,	270.0	66.2150	-6.36	0.00	6.36	3.196E+07	(-)	244.1	27.836	2.784E-02	1.000E+00
4800,	270.0	89.6906	-7.99	0.00	7.99	3.196E+07	(-)	305.3	31.457	3.146E-02	1.000E+00
5000,	270.0	119.5430	-9.82	0.00	9.82	3.196E+07	(-)	372.7	34.401	3.440E-02	1.000E+00
5200,	270.0	155.9161	-11.81	0.00	11.81	3.196E+07	(-)	444.6	36.362	3.636E-02	1.000E+00
5400,	270.0	199.6674	12.86	0.00	12.86	3.196E+07	(+)	481.5	37.067	3.707E-02	1.000E+00
5600,	270.0	155.9161	10.80	0.00	10.80	3.196E+07	(+)	408.2	36.362	3.636E-02	1.000E+00
5800,	270.0	119.5430	8.88	0.00	8.88	3.196E+07	(+)	338.3	34.401	3.440E-02	1.000E+00
6000,	270.0	89.6906	7.15	0.00	7.15	3.196E+07	(+)	273.8	31.457	3.146E-02	1.000E+00
6200,	270.0	66.2150	5.62	0.00	5.62	3.196E+07	(+)	216.3	27.836	2.784E-02	1.000E+00
6400,	270.0	47.7263	4.32	0.00	4.32	3.196E+07	(+)	166.5	23.848	2.385E-02	1.000E+00
6600,	270.0	33.6246	3.23	0.00	3.23	3.196E+07	(+)	124.9	19.783	1.978E-02	1.000E+00
6800,	270.0	23.1332	2.36	0.00	2.36	3.196E+07	(+)	91.3	15.867	1.589E-02	1.000E+00
7000,	270.0	15.5285	1.68	0.00	1.68	3.196E+07	(+)	64.8	12.349	1.235E-02	1.000E+00
7200,	270.0	10.1631	1.16	0.00	1.16	3.196E+07	(+)	44.8	9.289	9.289E-03	1.000E+00
7400,	270.0	6.4811	0.78	0.00	0.78	3.196E+07	(+)	30.1	6.761	6.761E-03	1.000E+00
7600,	270.0	4.0252	0.51	0.00	0.51	3.196E+07	(+)	19.6	4.762	4.762E-03	1.000E+00
7800,	270.0	2.4335	0.32	0.00	0.32	3.196E+07	(+)	12.4	3.245	3.245E-03	1.000E+00
8000,	270.0	1.4317	0.20	0.00	0.20	3.196E+07	(+)	7.7	2.140	2.140E-03	1.000E+00
8200,	270.0	0.8193	0.12	0.00	0.12	3.196E+07	(+)	4.6	1.365	1.365E-03	1.000E+00
048406,000E+00		0.4560	0.07	0.00	0.07	3.196E+07	(+)	2.6	0.843	8.431E-	
8600,	270.0	0.2466	0.04	0.00	0.04	3.196E+07	(+)	1.5	0.504	5.040E-04	1.000E+00
8800,	270.0	0.1298	0.02	0.00	0.02	3.196E+07	(+)	0.8	0.292	2.916E-04	1.000E+00
9000,	270.0	0.0664	0.01	0.00	0.01	3.196E+07	(+)	0.4	0.163	1.633E-04	1.000E+00
9200,	270.0	0.0330	0.01	0.00	0.01	3.196E+07	(+)	0.2	0.089	8.859E-05	1.000E+00
9400,	270.0	0.0159	0.00	0.00	0.00	3.196E+07	(+)	0.1	0.047	4.653E-05	1.000E+00
9600,	270.0	0.0075	0.00	0.00	0.00	3.196E+07	(+)	0.1	0.024	2.367E-05	1.000E+00
9800,	270.0	0.0034	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.012	1.166E-05	1.000E+00
10000,	270.0	0.0015	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.006	5.570E-06	1.000E+00
10200,	270.0	0.0007	0.00	0.00	0.00	3.196E+07	(+)	0.0	0.003	2.583E-06	1.000E+00

TABLE 2 (CONT'D)

POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT	CHANGE IN LIT TRANS	CHANGE IN Y POSITION	WATER DEPTH
0,	300.0	0.0003	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.001	1.050E-06	1.000E+00
200,	300.0	0.0004	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.002	1.600E-06	1.000E+00
400,	300.0	0.0009	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.003	3.102E-06	1.000E+00
600,	300.0	0.0019	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.006	6.283E-06	1.000E+00
800,	300.0	0.0041	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.013	1.256E-05	1.000E+00
1000,	300.0	0.0087	-0.00	0.00	0.00	3.196E+07 (-)	0.1	0.024	2.446E-05	1.000E+00
1200,	300.0	0.0177	-0.00	0.00	0.00	3.196E+07 (-)	0.2	0.046	4.634E-05	1.000E+00
1400,	300.0	0.0353	-0.01	0.00	0.01	3.196E+07 (-)	0.3	0.085	8.527E-05	1.000E+00
1600,	300.0	0.0686	-0.01	0.00	0.01	3.196E+07 (-)	0.6	0.152	1.524E-04	1.000E+00
1800,	300.0	0.1299	-0.03	0.00	0.03	3.196E+07 (-)	1.0	0.265	2.647E-04	1.000E+00
2000,	300.0	0.2396	-0.05	0.00	0.05	3.196E+07 (-)	1.8	0.446	4.464E-04	1.000E+00
2200,	300.0	0.4311	-0.08	0.00	0.08	3.196E+07 (-)	3.1	0.731	7.310E-04	1.000E+00
2400,	300.0	0.7559	-0.14	0.00	0.14	3.196E+07 (-)	5.2	1.162	1.162E-03	1.000E+00
2600,	300.0	1.2926	-0.22	0.00	0.22	3.196E+07 (-)	8.5	1.795	1.795E-03	1.000E+00
2800,	300.0	2.1559	-0.35	0.00	0.35	3.196E+07 (-)	13.4	2.690	2.690E-03	1.000E+00
3000,	300.0	3.5079	-0.53	0.00	0.53	3.196E+07 (-)	20.5	3.914	3.914E-03	1.000E+00
3200,	300.0	5.5703	-0.79	0.00	0.79	3.196E+07 (-)	30.7	5.529	5.529E-03	1.000E+00
3400,	300.0	8.6352	-1.16	0.00	1.16	3.196E+07 (-)	44.6	7.582	7.582E-03	1.000E+00
3600,	300.0	13.0740	-1.65	0.00	1.65	3.196E+07 (-)	63.7	10.094	1.009E-02	1.000E+00
3800,	300.0	19.3417	-2.28	0.00	2.28	3.196E+07 (-)	88.3	13.045	1.305E-02	1.000E+00
4000,	300.0	27.9759	-3.09	0.00	3.09	3.196E+07 (-)	119.3	16.370	1.637E-02	1.000E+00
4200,	300.0	39.5878	-4.08	0.00	4.08	3.196E+07 (-)	157.4	19.949	1.995E-02	1.000E+00
4400,	300.0	54.8477	-5.27	0.00	5.27	3.196E+07 (-)	202.8	23.614	2.361E-02	1.000E+00
4600,	300.0	74.4631	-6.65	0.00	6.65	3.196E+07 (-)	255.3	27.151	2.715E-02	1.000E+00
4800,	300.0	99.1550	-8.23	0.00	8.23	3.196E+07 (-)	314.5	30.320	3.032E-02	1.000E+00
5000,	300.0	129.6294	-9.99	0.00	9.99	3.196E+07 (-)	379.0	32.871	3.287E-02	1.000E+00
5200,	300.0	166.5479	-11.89	0.00	11.89	3.196E+07 (-)	447.4	34.557	3.456E-02	1.000E+00
5400,	300.0	210.4951	12.89	0.00	12.89	3.196E+07 (+)	482.4	35.161	3.516E-02	1.000E+00
5600,	300.0	166.5479	10.93	0.00	10.93	3.196E+07 (+)	412.9	34.557	3.456E-02	1.000E+00
5800,	300.0	129.6294	9.09	0.00	9.09	3.196E+07 (+)	346.1	32.871	3.287E-02	1.000E+00
6000,	300.0	99.1550	7.42	0.00	7.42	3.196E+07 (+)	284.1	30.320	3.032E-02	1.000E+00
6200,	300.0	74.4631	5.94	0.00	5.94	3.196E+07 (+)	228.2	27.151	2.715E-02	1.000E+00
6400,	300.0	54.8477	4.65	0.00	4.65	3.196E+07 (+)	179.2	23.614	2.361E-02	1.000E+00
6600,	300.0	39.5878	3.56	0.00	3.56	3.196E+07 (+)	137.4	19.949	1.995E-02	1.000E+00
6800,	300.0	27.9759	2.66	0.00	2.66	3.196E+07 (+)	102.9	16.370	1.637E-02	1.000E+00
7000,	300.0	19.3417	1.94	0.00	1.94	3.196E+07 (+)	75.2	13.045	1.305E-02	1.000E+00
7200,	300.0	13.0740	1.38	0.00	1.38	3.196E+07 (+)	53.6	10.094	1.009E-02	1.000E+00
7400,	300.0	8.6352	0.96	0.00	0.96	3.196E+07 (+)	37.2	7.582	7.582E-03	1.000E+00
7600,	300.0	5.5703	0.65	0.00	0.65	3.196E+07 (+)	25.2	5.529	5.529E-03	1.000E+00
7800,	300.0	3.5079	0.43	0.00	0.43	3.196E+07 (+)	16.6	3.914	3.914E-03	1.000E+00
8000,	300.0	2.1559	0.28	0.00	0.28	3.196E+07 (+)	10.7	2.690	2.690E-03	1.000E+00
8200,	300.0	1.2926	0.17	0.00	0.17	3.196E+07 (+)	6.7	1.795	1.795E-03	1.000E+00
8400,	300.0	0.7559	0.11	0.00	0.11	3.196E+07 (+)	4.1	1.162	1.162E-03	1.000E+00
8600,	300.0	0.4311	0.06	0.00	0.06	3.196E+07 (+)	2.4	0.731	7.310E-04	1.000E+00
8800,	300.0	0.2396	0.04	0.00	0.04	3.196E+07 (+)	1.4	0.446	4.464E-04	1.000E+00
9000,	300.0	0.1299	0.02	0.00	0.02	3.196E+07 (+)	0.8	0.265	2.647E-04	1.000E+00
9200,	300.0	0.0686	0.01	0.00	0.01	3.196E+07 (+)	0.4	0.152	1.524E-04	1.000E+00
9400,	300.0	0.0353	0.01	0.00	0.01	3.196E+07 (+)	0.2	0.085	8.527E-05	1.000E+00
9600,	300.0	0.0177	0.00	0.00	0.00	3.196E+07 (+)	0.1	0.046	4.634E-05	1.000E+00
9800,	300.0	0.0087	0.00	0.00	0.00	3.196E+07 (+)	0.1	0.024	2.446E-05	1.000E+00
10000,	300.0	0.0041	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.013	1.256E-05	1.000E+00
10200,	300.0	0.0019	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.006	6.283E-06	1.000E+00

TABLE 2 (CONT'D)

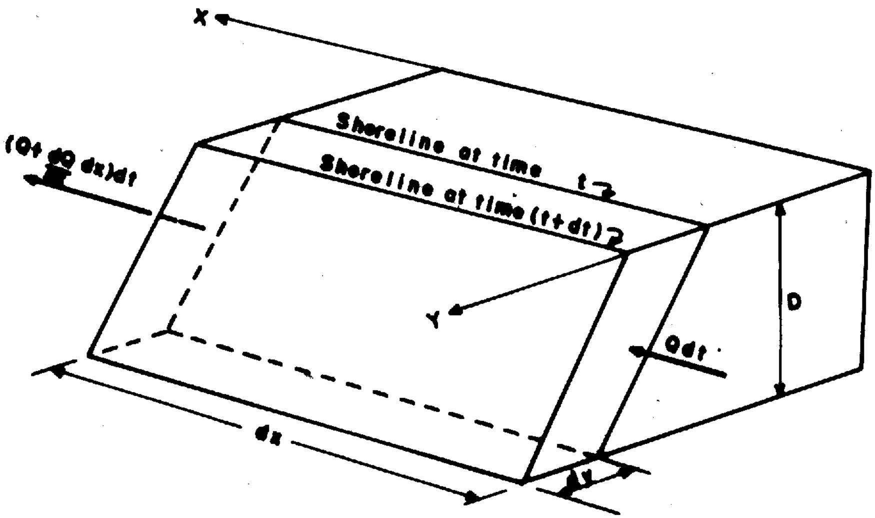
POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT	CHANGE IN LIT TRANS.	CHANGE IN Y POSITION	WATER DEPTH
0,	330.0	0.0008	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.003	2.690E-06	1.000E+00
200,	330.0	0.0012	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.004	3.845E-06	1.000E+00
400,	330.0	0.0023	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.007	6.690E-06	1.000E+00
600,	330.0	0.0047	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.013	1.301E-05	1.000E+00
800,	330.0	0.0095	-0.00	0.00	0.00	3.196E+07 (-)	0.1	0.024	2.439E-05	1.000E+00
1000,	330.0	0.0188	-0.00	0.00	0.00	3.196E+07 (-)	0.2	0.045	4.476E-05	1.000E+00
1200,	330.0	0.0364	-0.01	0.00	0.01	3.196E+07 (-)	0.3	0.080	8.009E-05	1.000E+00
1400,	330.0	0.0686	-0.01	0.00	0.01	3.196E+07 (-)	0.6	0.140	1.396E-04	1.000E+00
1600,	330.0	0.1264	-0.03	0.00	0.03	3.196E+07 (-)	1.0	0.237	2.369E-04	1.000E+00
1800,	330.0	0.2276	-0.04	0.00	0.04	3.196E+07 (-)	1.7	0.392	3.915E-04	1.000E+00
2000,	330.0	0.4004	-0.07	0.00	0.07	3.196E+07 (-)	2.8	0.630	6.301E-04	1.000E+00
2200,	330.0	0.6880	-0.12	0.00	0.12	3.196E+07 (-)	4.6	0.987	9.871E-04	1.000E+00
2400,	330.0	1.1555	-0.19	0.00	0.19	3.196E+07 (-)	7.3	1.505	1.505E-03	1.000E+00
2600,	330.0	1.8968	-0.29	0.00	0.29	3.196E+07 (-)	11.4	2.235	2.235E-03	1.000E+00
2800,	330.0	3.0441	-0.45	0.00	0.45	3.196E+07 (-)	17.3	3.230	3.230E-03	1.000E+00
3000,	330.0	4.7775	-0.66	0.00	0.66	3.196E+07 (-)	25.7	4.544	4.544E-03	1.000E+00
3200,	330.0	7.3345	-0.96	0.00	0.96	3.196E+07 (-)	37.2	6.221	6.221E-03	1.000E+00
3400,	330.0	11.0186	-1.36	0.00	1.36	3.196E+07 (-)	52.7	8.291	8.291E-03	1.000E+00
3600,	330.0	16.2043	-1.89	0.00	1.89	3.196E+07 (-)	73.0	10.756	1.076E-02	1.000E+00
3800,	330.0	23.3392	-2.55	0.00	2.55	3.196E+07 (-)	98.7	13.583	1.358E-02	1.000E+00
4000,	330.0	32.9397	-3.38	0.00	3.38	3.196E+07 (-)	130.5	16.702	1.670E-02	1.000E+00
4200,	330.0	45.5823	-4.38	0.00	4.38	3.196E+07 (-)	168.8	19.997	2.000E-02	1.000E+00
4400,	330.0	61.8887	-5.56	0.00	5.56	3.196E+07 (-)	213.8	23.319	2.332E-02	1.000E+00
4600,	330.0	82.5079	-6.92	0.00	6.92	3.196E+07 (-)	265.2	26.483	2.648E-02	1.000E+00
4800,	330.0	108.0944	-8.45	0.00	8.45	3.196E+07 (-)	322.5	29.289	2.929E-02	1.000E+00
5000,	330.0	139.2855	-10.14	0.00	10.14	3.196E+07 (-)	384.5	31.527	3.153E-02	1.000E+00
5200,	330.0	176.6765	-11.96	0.00	11.96	3.196E+07 (-)	449.9	32.997	3.300E-02	1.000E+00
5400,	330.0	220.7924	12.91	0.00	12.91	3.196E+07 (+)	483.2	33.521	3.352E-02	1.000E+00
5600,	330.0	176.6765	11.04	0.00	11.04	3.196E+07 (+)	416.9	32.997	3.300E-02	1.000E+00
5800,	330.0	139.2855	9.28	0.00	9.28	3.196E+07 (+)	353.0	31.527	3.153E-02	1.000E+00
6000,	330.0	108.0944	7.66	0.00	7.66	3.196E+07 (+)	293.2	29.289	2.929E-02	1.000E+00
6200,	330.0	82.5079	6.21	0.00	6.21	3.196E+07 (+)	238.8	26.483	2.648E-02	1.000E+00
6400,	330.0	61.8887	4.94	0.00	4.94	3.196E+07 (+)	190.5	23.319	2.332E-02	1.000E+00
6600,	330.0	45.5823	3.86	0.00	3.86	3.196E+07 (+)	148.8	19.997	2.000E-02	1.000E+00
6800,	330.0	32.9397	2.94	0.00	2.94	3.196E+07 (+)	113.8	16.702	1.670E-02	1.000E+00
7000,	330.0	23.3392	2.20	0.00	2.20	3.196E+07 (+)	85.1	13.583	1.358E-02	1.000E+00
7200,	330.0	16.2043	1.61	0.00	1.61	3.196E+07 (+)	62.2	10.756	1.076E-02	1.000E+00
7400,	330.0	11.0186	1.15	0.00	1.15	3.196E+07 (+)	44.5	8.291	8.291E-03	1.000E+00
7600,	330.0	7.3345	0.80	0.00	0.80	3.196E+07 (+)	31.0	6.221	6.221E-03	1.000E+00
7800,	330.0	4.7775	0.55	0.00	0.55	3.196E+07 (+)	21.1	4.544	4.544E-03	1.000E+00
8000,	330.0	3.0441	0.36	0.00	0.36	3.196E+07 (+)	14.1	3.230	3.230E-03	1.000E+00
8200,	330.0	1.8968	0.24	0.00	0.24	3.196E+07 (+)	9.1	2.235	2.235E-03	1.000E+00
8400,	330.0	1.1555	0.15	0.00	0.15	3.196E+07 (+)	5.8	1.505	1.505E-03	1.000E+00
8600,	330.0	0.6880	0.09	0.00	0.09	3.196E+07 (+)	3.6	0.987	9.871E-04	1.000E+00
8800,	330.0	0.4004	0.06	0.00	0.06	3.196E+07 (+)	2.2	0.630	6.301E-04	1.000E+00
9000,	330.0	0.2276	0.03	0.00	0.03	3.196E+07 (+)	1.3	0.392	3.915E-04	1.000E+00
9200,	330.0	0.1264	0.02	0.00	0.02	3.196E+07 (+)	0.7	0.237	2.369E-04	1.000E+00
9400,	330.0	0.0686	0.01	0.00	0.01	3.196E+07 (+)	0.4	0.140	1.396E-04	1.000E+00
9600,	330.0	0.0364	0.01	0.00	0.01	3.196E+07 (+)	0.2	0.080	8.009E-05	1.000E+00
9800,	330.0	0.0188	0.00	0.00	0.00	3.196E+07 (+)	0.1	0.045	4.476E-05	1.000E+00
10000,	330.0	0.0095	0.00	0.00	0.00	3.196E+07 (+)	0.1	0.024	2.439E-05	1.000E+00
10200,	330.0	0.0047	0.00	0.00	0.00	3.196E+07 (+)	0.0	0.013	1.301E-05	1.000E+00

TABLE 2 (CONT'D)

POS	DAY	Y POSITION	SHORELINE ANGLE	WAVE ANGLE	BREAKING ANGLE	POWER	LITTORAL TRANSPORT	CHANGE IN LIT TRANS	CHANGE IN Y POSITION	WATER DEPTH
0,	360.0	0.0020	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.006	5.693E-06	1.000E+00
200,	360.0	0.0029	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.008	8.004E-06	1.000E+00
400,	360.0	0.0053	-0.00	0.00	0.00	3.196E+07 (-)	0.0	0.013	1.342E-05	1.000E+00
600,	360.0	0.0101	-0.00	0.00	0.00	3.196E+07 (-)	0.1	0.024	2.365E-05	1.000E+00
800,	360.0	0.0194	-0.00	0.00	0.00	3.196E+07 (-)	0.2	0.042	4.236E-05	1.000E+00
1000,	360.0	0.0364	-0.01	0.00	0.01	3.196E+07 (-)	0.3	0.074	7.390E-05	1.000E+00
1200,	360.0	0.0669	-0.01	0.00	0.01	3.196E+07 (-)	0.5	0.126	1.260E-04	1.000E+00
1400,	360.0	0.1206	-0.02	0.00	0.02	3.196E+07 (-)	0.9	0.210	2.099E-04	1.000E+00
1600,	360.0	0.2126	-0.04	0.00	0.04	3.196E+07 (-)	1.5	0.341	3.411E-04	1.000E+00
1800,	360.0	0.3669	-0.06	0.00	0.06	3.196E+07 (-)	2.5	0.541	5.409E-04	1.000E+00
2000,	360.0	0.6198	-0.10	0.00	0.10	3.196E+07 (-)	4.0	0.837	8.369E-04	1.000E+00
2200,	360.0	1.0251	-0.16	0.00	0.16	3.196E+07 (-)	6.3	1.263	1.263E-03	1.000E+00
2400,	360.0	1.6601	-0.25	0.00	0.25	3.196E+07 (-)	9.7	1.861	1.861E-03	1.000E+00
2600,	360.0	2.6331	-0.38	0.00	0.38	3.196E+07 (-)	14.6	2.674	2.674E-03	1.000E+00
2800,	360.0	4.0912	-0.56	0.00	0.56	3.196E+07 (-)	21.5	3.748	3.748E-03	1.000E+00
3000,	360.0	6.2288	-0.80	0.00	0.80	3.196E+07 (-)	31.0	5.126	5.126E-03	1.000E+00
3200,	360.0	9.2949	-1.13	0.00	1.13	3.196E+07 (-)	43.8	6.838	6.838E-03	1.000E+00
3400,	360.0	13.5991	-1.56	0.00	1.56	3.196E+07 (-)	60.5	8.899	8.899E-03	1.000E+00
3600,	360.0	19.5149	-2.12	0.00	2.12	3.196E+07 (-)	81.9	11.298	1.130E-02	1.000E+00
3800,	360.0	27.4788	-2.81	0.00	2.81	3.196E+07 (-)	108.5	13.997	1.400E-02	1.000E+00
4000,	360.0	37.9854	-3.65	0.00	3.65	3.196E+07 (-)	140.9	16.920	1.692E-02	1.000E+00
4200,	360.0	51.5781	-4.65	0.00	4.65	3.196E+07 (-)	179.3	19.963	1.996E-02	1.000E+00
4400,	360.0	68.8358	-5.82	0.00	5.82	3.196E+07 (-)	223.7	22.990	2.299E-02	1.000E+00
4600,	360.0	90.3562	-7.15	0.00	7.15	3.196E+07 (-)	274.0	25.842	2.584E-02	1.000E+00
4800,	360.0	116.7383	-8.64	0.00	8.64	3.196E+07 (-)	329.5	28.348	2.835E-02	1.000E+00
5000,	360.0	148.5618	-10.27	0.00	10.27	3.196E+07 (-)	389.3	30.334	3.033E-02	1.000E+00
5200,	360.0	186.3671	-12.02	0.00	12.02	3.196E+07 (-)	452.0	31.631	3.163E-02	1.000E+00
5400,	360.0	230.6304	12.93	0.00	12.93	3.196E+07 (+)	484.0	32.092	3.209E-02	1.000E+00
5600,	360.0	186.3671	11.13	0.00	11.13	3.196E+07 (+)	420.3	31.631	3.163E-02	1.000E+00
5800,	360.0	148.5618	9.44	0.00	9.44	3.196E+07 (+)	358.9	30.334	3.033E-02	1.000E+00
6000,	360.0	116.7383	7.88	0.00	7.88	3.196E+07 (+)	301.2	28.348	2.835E-02	1.000E+00
6200,	360.0	90.3562	6.46	0.00	6.46	3.196E+07 (+)	248.2	25.842	2.584E-02	1.000E+00
6400,	360.0	68.8358	5.21	0.00	5.21	3.196E+07 (+)	200.7	22.990	2.299E-02	1.000E+00
6600,	360.0	51.5781	4.13	0.00	4.13	3.196E+07 (+)	159.3	19.963	1.996E-02	1.000E+00
6800,	360.0	37.9854	3.21	0.00	3.21	3.196E+07 (+)	123.9	16.920	1.692E-02	1.000E+00
7000,	360.0	27.4788	2.44	0.00	2.44	3.196E+07 (+)	94.5	13.997	1.400E-02	1.000E+00
7200,	360.0	19.5149	1.82	0.00	1.82	3.196E+07 (+)	70.6	11.298	1.130E-02	1.000E+00
7400,	360.0	13.5991	1.33	0.00	1.33	3.196E+07 (+)	51.6	8.899	8.899E-03	1.000E+00
7600,	360.0	9.2949	0.96	0.00	0.96	3.196E+07 (+)	37.0	6.838	6.838E-03	1.000E+00
7800,	360.0	6.2288	0.67	0.00	0.67	3.196E+07 (+)	25.9	5.126	5.126E-03	1.000E+00
8000,	360.0	4.0912	0.46	0.00	0.46	3.196E+07 (+)	17.8	3.748	3.748E-03	1.000E+00
8200,	360.0	2.6331	0.31	0.00	0.31	3.196E+07 (+)	11.9	2.674	2.674E-03	1.000E+00
8400,	360.0	1.6601	0.20	0.00	0.20	3.196E+07 (+)	7.8	1.861	1.861E-03	1.000E+00
8600,	360.0	1.0251	0.13	0.00	0.13	3.196E+07 (+)	5.0	1.263	1.263E-03	1.000E+00
8800,	360.0	0.6198	0.08	0.00	0.08	3.196E+07 (+)	3.1	0.837	8.369E-04	1.000E+00
9000,	360.0	0.3669	0.05	0.00	0.05	3.196E+07 (+)	1.9	0.541	5.409E-04	1.000E+00
9200,	360.0	0.2126	0.03	0.00	0.03	3.196E+07 (+)	1.2	0.341	3.411E-04	1.000E+00
9400,	360.0	0.1206	0.02	0.00	0.02	3.196E+07 (+)	0.7	0.210	2.099E-04	1.000E+00
9600,	360.0	0.0669	0.01	0.00	0.01	3.196E+07 (+)	0.4	0.126	1.260E-04	1.000E+00
9800,	360.0	0.0364	0.01	0.00	0.01	3.196E+07 (+)	0.2	0.074	7.390E-05	1.000E+00
10000,	360.0	0.0194	0.00	0.00	0.00	3.196E+07 (+)	0.1	0.042	4.236E-05	1.000E+00
10200,	360.0	0.0101	0.00	0.00	0.00	3.196E+07 (+)	0.1	0.024	2.365E-05	1.000E+00

APPENDIX III

FIGURES



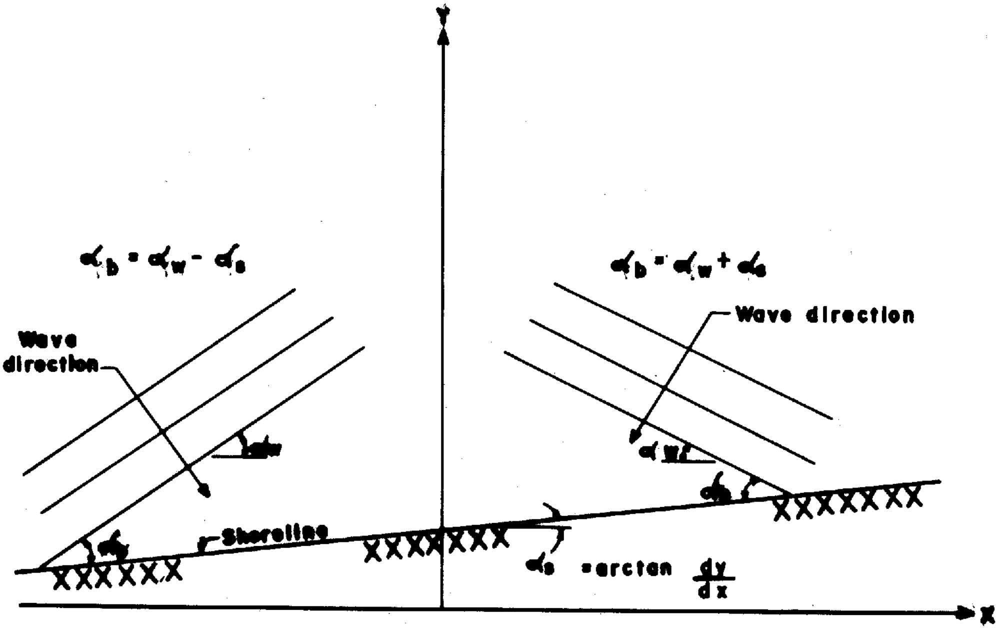
SEDIMENT TRANSPORT AND SHORELINE DEVELOPMENT

INFLOW−OUTFLOW=−dQdt

INFLOW−OUTFLOW+SOURCE=(−dQ +Sr)dt

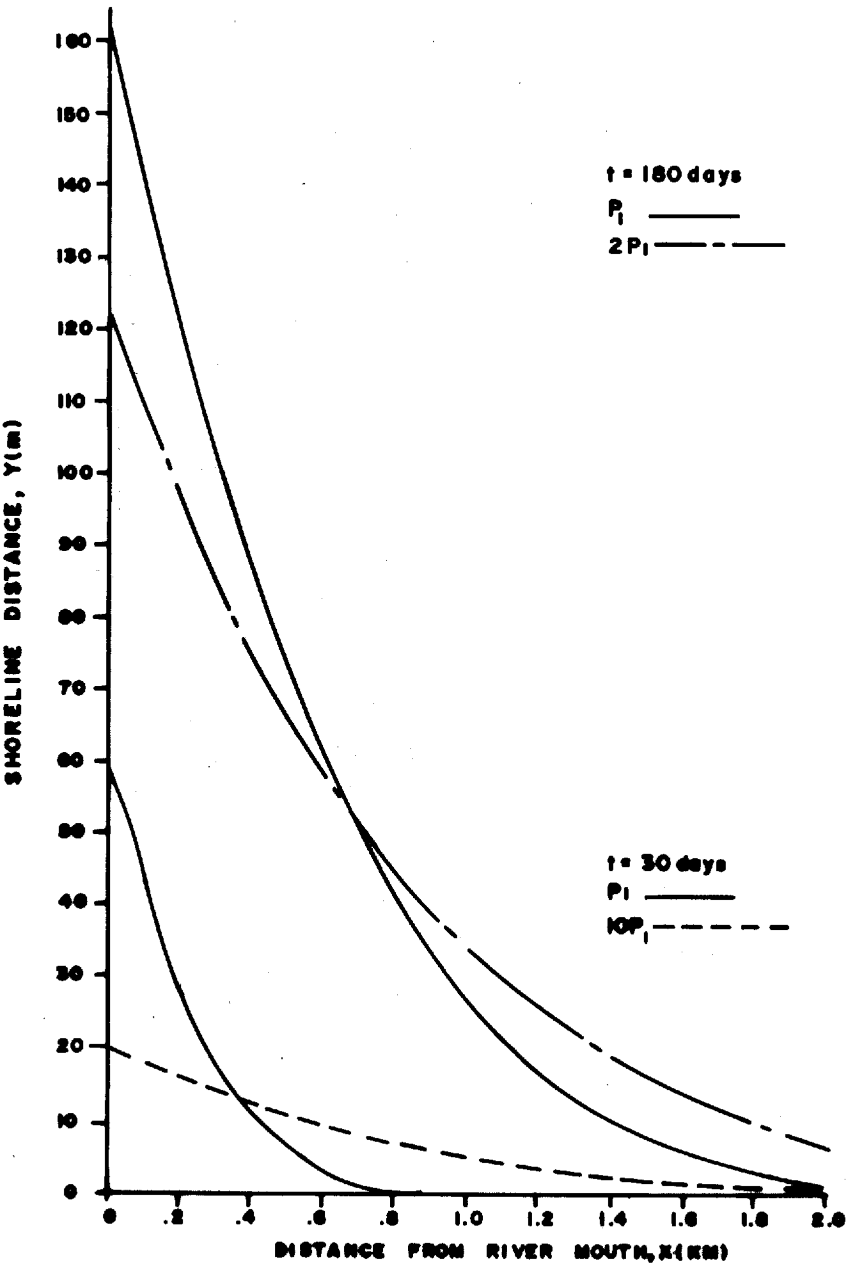
CHANGE IN STORAGE=Ddydx

FIGURE 1



ANGLE BETWEEN SHORELINE AND WAVES

FIGURE 2



EFFECT OF WAVE POWER ON SHORELINE DEVELOPMENT AND CURVATURE

FIGURE 3

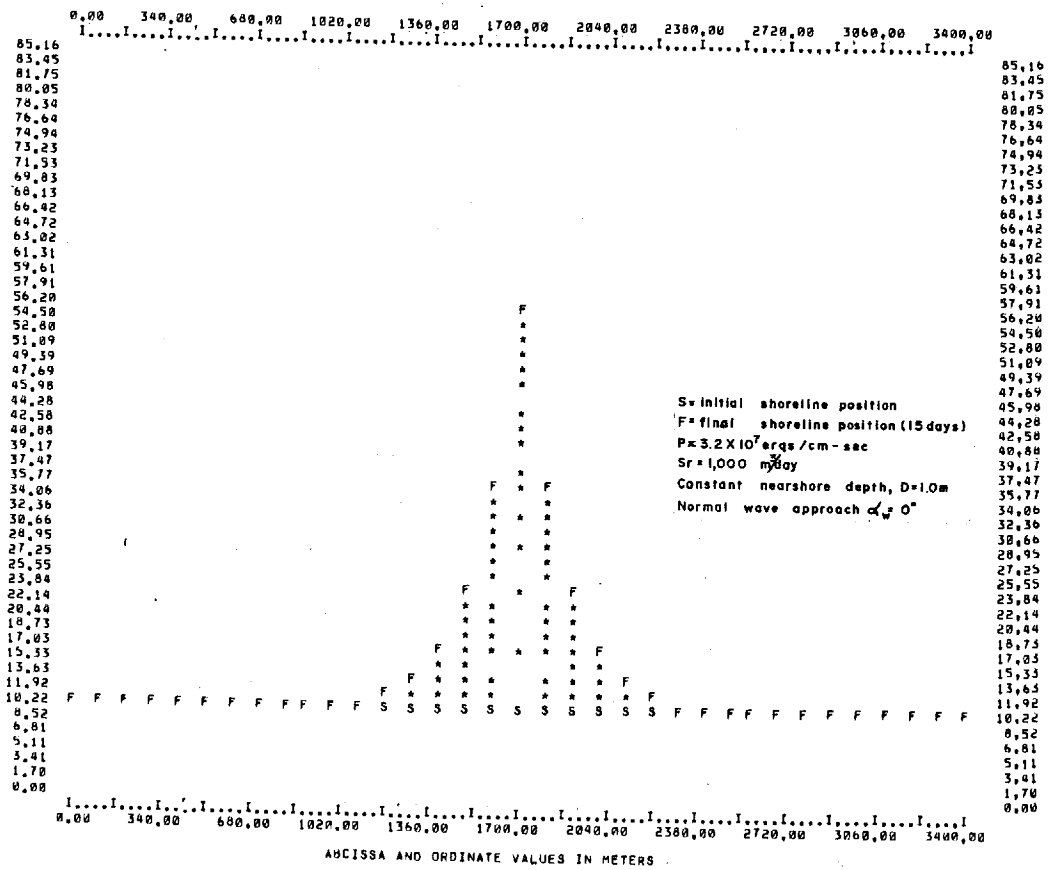
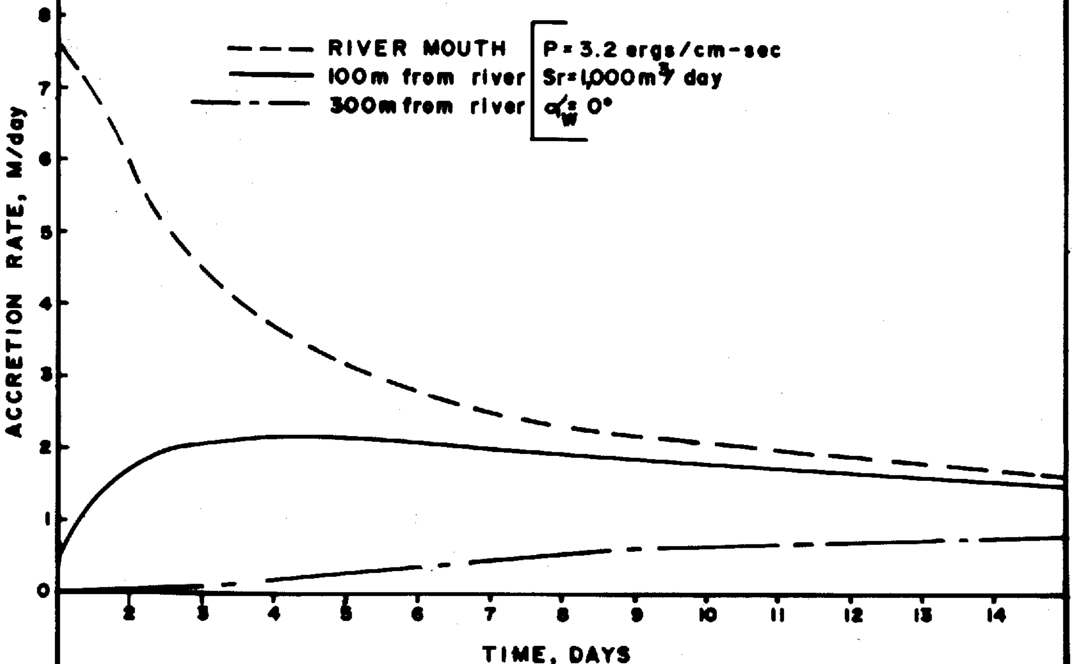
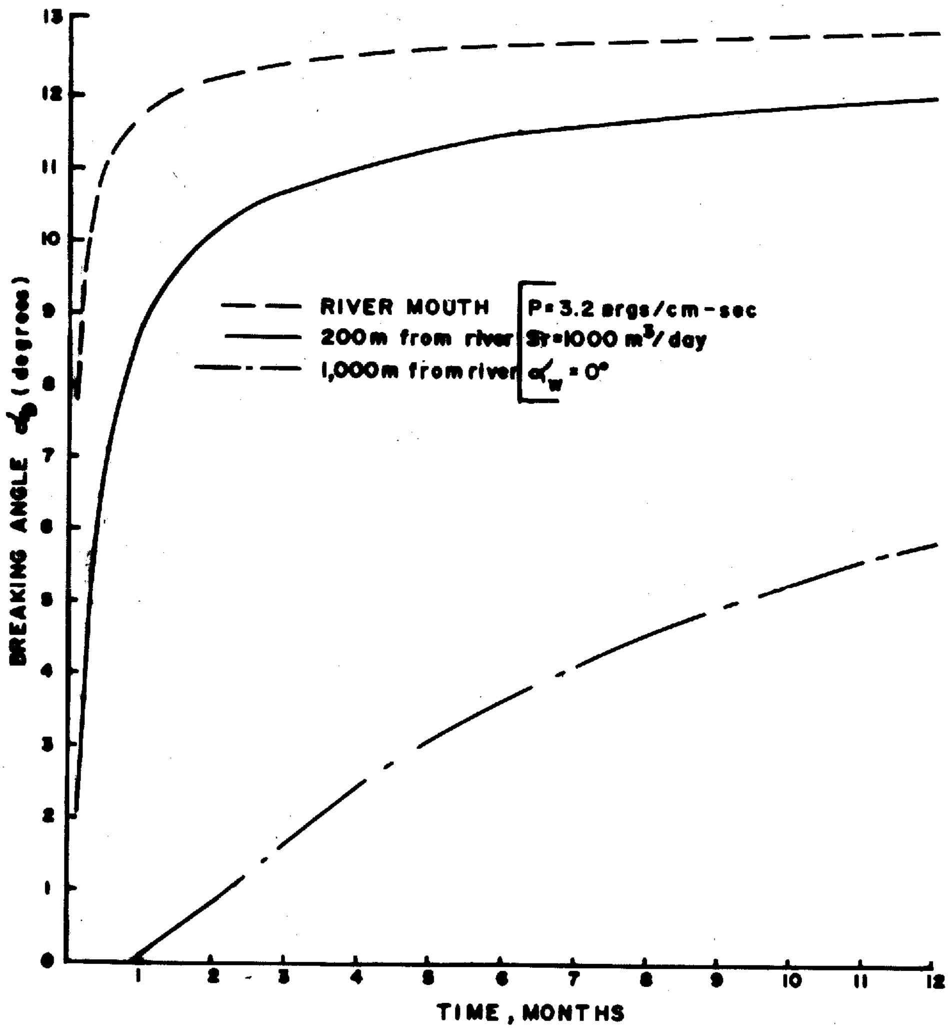


FIG. 4 DAILY SHORELINE ADVANCE



SHORELINE RATE OF ADVANCE

FIGURE 5



BREAKING ANGLE VARIATION

FIGURE 6

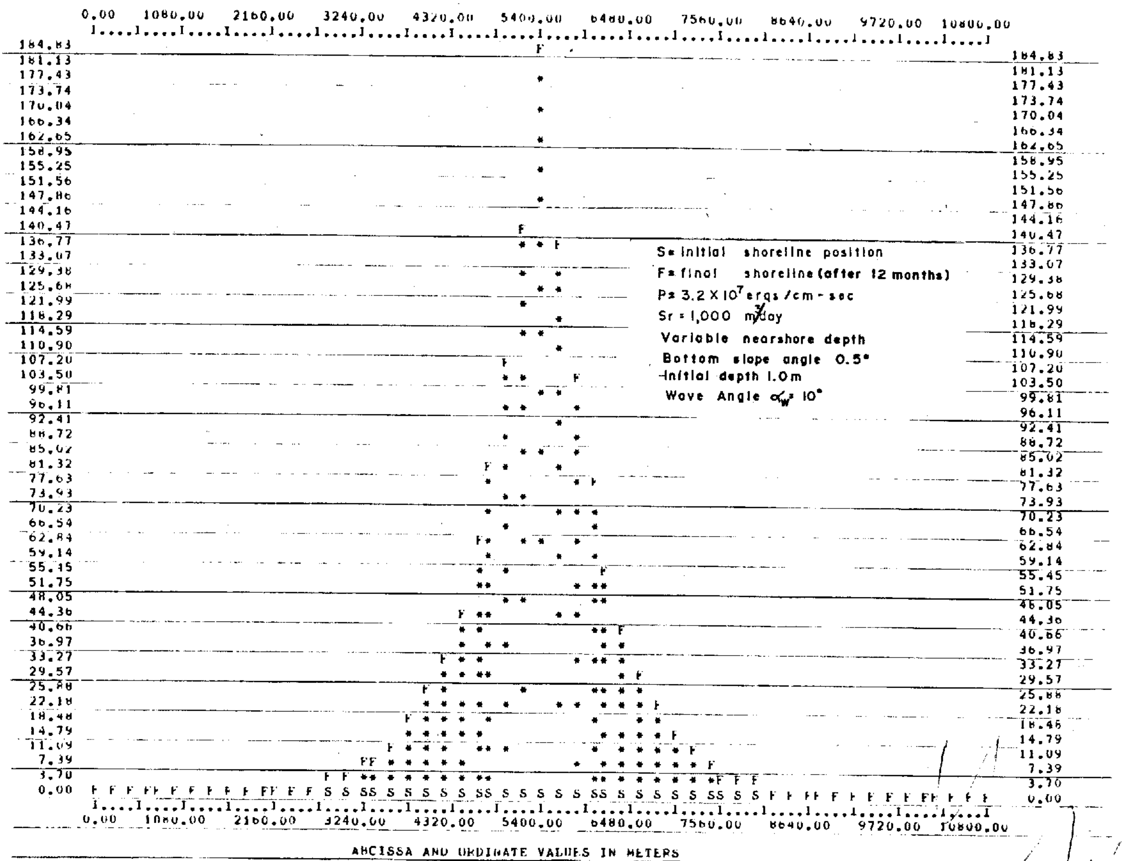
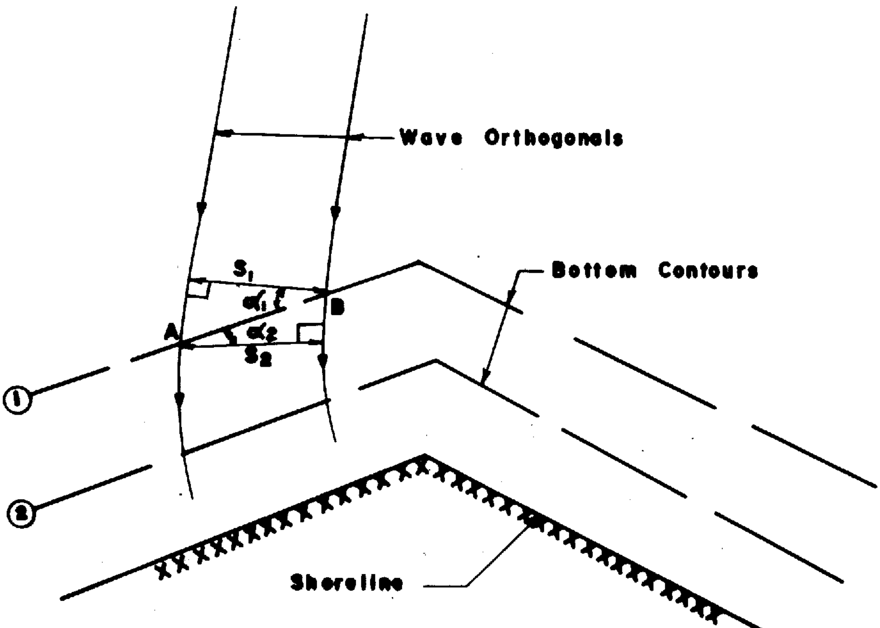


FIG. II SHORELINE ADVANCE IN LINEARLY INCREASING DEPTH OBLIQUE WAVE ATTACK



$$\text{Hypotenuse } AB = \frac{S_1}{\cos \alpha_1} = \frac{S_2}{\cos \alpha_2}$$

WAVE REFRACTION OVER PARALLEL CONTOURS

FIGURE 12

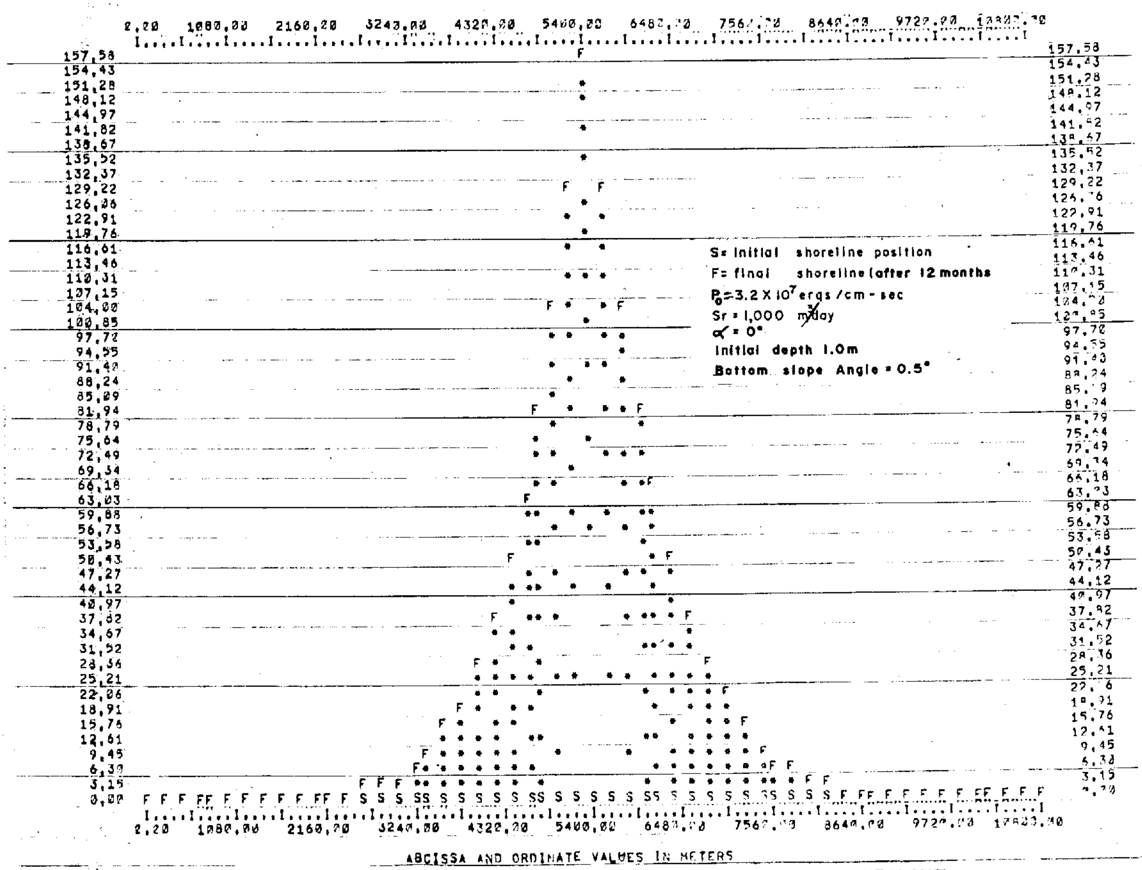
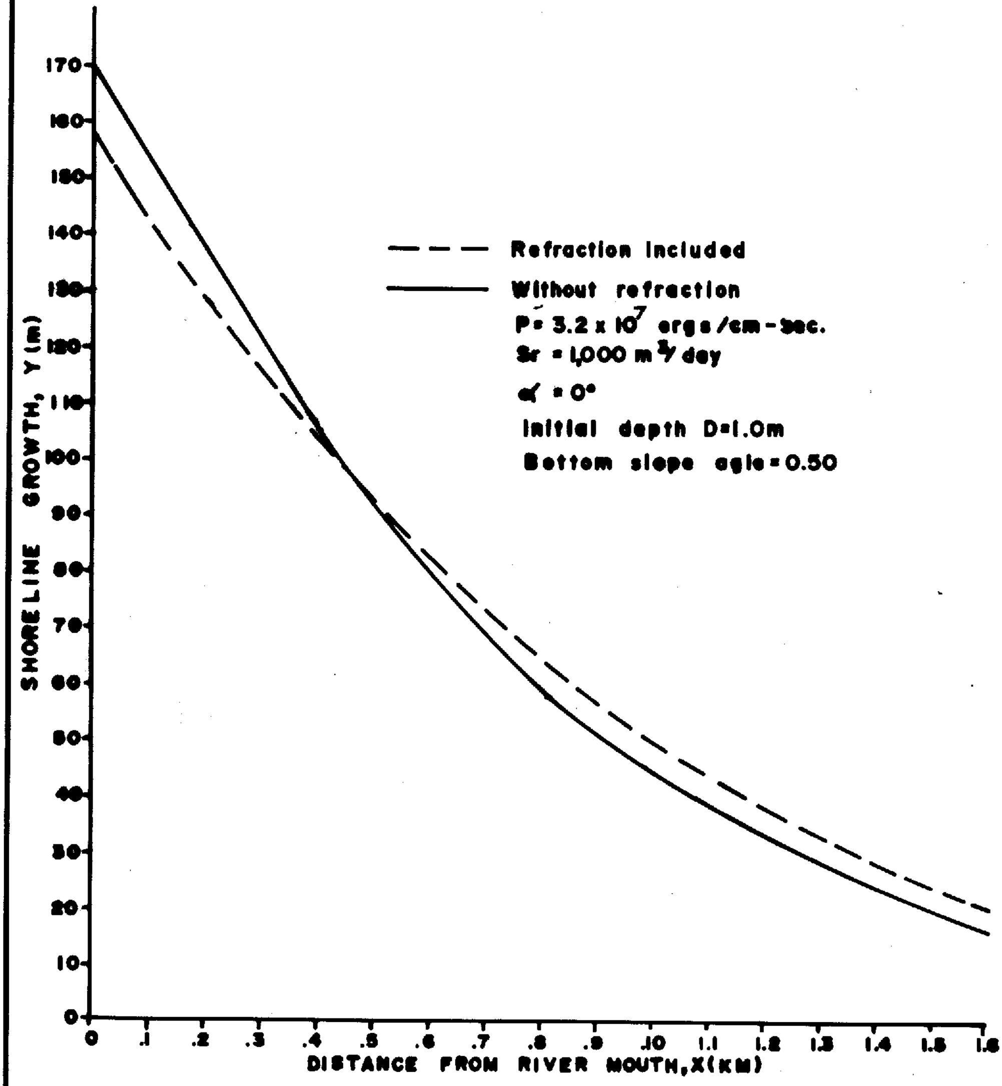


FIG. 13 REFRACTION EFFECTS ON SHORELINE DEVELOPMENT



REFRACTION EFFECTS ON LONGSHORE BEACH PROFILE

FIGURE 14

APPENDIX IV

COMPUTER PROGRAM LISTING

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C       COMPUTER MODEL OF DELTA GROWTH DUE TO SEDIMENT
C       INPUT FROM RIVERS AND LONGSHORE TRANSPORT
C       DEVELOPED BY DR. CHRISTOS HADJITHEODOROU.
C
C       PROGRAMMED BY LUIS F. RICO  .... FEBRUARY 20, 1979
C       MODIFICATIONS BY FELIPE GARCIA ....1979
C       AND BY JUAN E. SANTIAGO-RIVERA ....1980
C
C
C       WAVE REFRACTION IS INCLUDED.
C
C       DESCRIPTION OF VARIBLES:
C       DESCRIPCION DE VARIABLES:
C
C       INPUT VARIABLES:
C       VARIABLES DE ENTRADA:
C      ALPHA---- BEACH FACE ANGLE.
C      ALPHA---- ANGULO QUE HACE LA CARA DE LA PLAYA.
C
C      BETA----- NEARSHORE BOTTOM ANGLE
C      BETA----- ANGULO QUE HACE EL FONDO DE LA PLAYA.
C
C      BKLMT---- BREAKING ANGLE LIMIT.
C      BKLMT---- LIMITE PARA EL ANGULO A QUE ROMPE LA OLA.
C
C      D-------- MAXIMIM INITIAL DEPTH.
C      D-------- PROFUNDIDAD MAXIMA INICIAL.
C
C      DAY1----- FOLLOWING DAY IN WHICH DATA WILL BE READ.
C      DAY1----- PROXIMO DIA A LEER DATOS.
C
C      DAY2----- FOLLOWING DAY WHEN THE RESULTS WILL BE WRITTEN.
C      DAY2----- PROXIMO DIA A QUE SE VA A ESCRIBIR RESULTADOS.
C
C      DT------- TIME INCREMENT.
C      DT------- INCREMENTO EN EL TIEMPO.
C
C      DX------- LENGTH INCREMENT.
C      DX------- INCREMENTO EN EL LARGO.
C
C      HEIGTH--- WAVE HEIGTH.
C      HEIGHT--- ALTURA DE LA OLA.
C
C      OUT------ LENGTH INTERVAL AT WHICH THE RESULTS ARE DESIRED.
C      OUT------ A QUE INTERVALO DE LARGO DESEA LOS RESULTADOS.
C
C      P-------- ENERGY FLUX.
C      P-------- FLUJO DE ENERGIA.
C
C      RIVER---- RIVER POSITION.
C      RIVER---- POSICION DEL RIO.
C
C      RSSU----- SEDIMENT SUPPLIED BY THE RIVER.
C      RSSU----- SEDIMENTO SUMINISTRADO POR EL RIO.
C
C      TF------- TIME LENGTH(DURATION).
C      TF------- TIEMPO DE DURACION.
C
C      XF------- BEACH LENGTH.
C      XF------- LARGO DE LA PLAYA.
```

```
C
C       WVANGL--- DEEP WATER WAVE ANGLE.
C       WVANGL--- ANGULO DE LA OLA EN AGUAS PROFUNDAS.
C
C       OUTPUT VARIABLE:
C       VARIABLES DE SALIDA:
C       BKANGL--- BREAKING WAVE ANGLE.
C       BKANGL--- ANGULO A QUE ROMPE LA OLA EN LA PLAYA.
C
C       DIA------ DAY ON WHICH RESULTS ARE GIVEN.
C       DIA------ DIA A QUE SE DAN LOS RESULTADOS.
C
C       DSL------ CHANGE IN THE SEDIMENT TRANSPORT.
C       DSL------ CAMBIO EN EL TRANSPORTE DE SEDIMENTO.
C
C       DY------- CHANGE IN THE SHORELINE POSITION.
C       DY------- CAMBIO EN LA POSICION DE LA PLAYA.
C
C       P-------- ENERGY FLUX.
C       P-------- FLUJO DE ENERGIA.
C
C       POS------ POINTS OF THE BEACH IN THE X-AXIS.
C       POS------ PUNTOS DE LA PLAYA EN EL EJE DE X.
C
C       SANGLE--- ANGLE OF THE BEACH WITH RESPECT TO MAGNETIC NORTH.
C       SANGLE--- ANGULO QUE HACE LA PLAYA CON RESPECTO AL NORTE MAGNETICO.
C
C       SHORE---- ANGLE OF THE BEACH WITH RESPECT TO THE X-AXIS.
C       SHORE---- ANGULO QUE HACE LA PLAYA CON RESPECTO A EJE DE X.
C
C       SL------- SEDIMENT TRANSPORT.
C       SL------- TRANSPORTE DE SEDIMENTO.
C
C       WAVE----- WAVE ANGLE WITH RESPECT TO THE X-AXIS.
C       WAVE----- ANGULO DE LA OLA CON RESPECTO AL EJE DE X.
C
C       WDEPTH--- MAXIMIM DEPTH THAT IS CACULATED.
C       WDEPTH--- PROFUNDIDAD MAXIMA QUE SE VA COMPUTANDO.
C
C       WVANGL--- DEEP WATER WAVE ANGLE.
C       WVANGL--- IGUAL QUE  WVANGL DE ENTRADA.
C
      DIMENSION LETTER(16),YI(100),IDA(2)
        DIMENSION Y(0/500),BKANGL(0/500),SL(0/500),WDEPTH(0/500),X(500),
       2XOUT(500),YY(100,200),XXX(100),YYY(100)
      LOGICAL CALLED,ABSOLT
C
C
1     FORMAT (8G)
3     FORMAT(6G)
4     FORMAT(10G)
5     FORMAT(10G)
6      FORMAT(5G)
2-0   FORMAT(1H1,20X,'PROGRAM STOPPED, EITHER XF IS TOO BIG OR DX IS
     *TOO SMALL',/,20X,'THE PROGRAM IS SET TO A MAXIMUM OF 500 POINTS',/
     *,20X,'DX = ',F8.2,/,20X,'DT = ',F8.0,/,'IXF=XF/DX= ',I6,/)
2-1   FORMAT(1H1,20X,'PROGRAM STOPPED,  OUTPUT INTERVAL IS LESS THAN
     *DELTA X "DX"',/,20X,'CONDITIONS MUST BE    DX<=OUTPUT INTERVAL.'/)
2'1   FORMAT(/41X,'ABCISSA AND ORDINATE VALUES IN METERS'/)
2-8   FORMAT(6(/),18X,'MODEL7',5X,'DATE',2X,2A5,5X,A5,' END')
```

```
299   FORMAT(6(/),18X,'MODEL7',5X,'DATE',2X,2A5,5X,A5,' START')
300   FORMAT (2(/),18X,'COMPUTER MODEL OF DELTA GROWTH DUE TO SEDIMENT',
     ,/18X,'INPUT FROM RIVERS AND LONGSHORE TRANSPORT.',//18X,'WAVE RE
     .FRACTION IS INCLUDED.')
301   FORMAT (2(/),28X, 'DATA VALUES',2(/))
302   FORMAT(/,1X,'RIVER SEDIMENT SUPPLY, IN CUBIC METERS PER DAY ',
     *4X,F8.0,/)
304   FORMAT(1H1,46X,'MODEL7 OUTPUT RESULTS',2(/))
305   FORMAT(/,1X,'WAVE HEIGTH, IN CENTIMETERS',24X,F8.2)
306   FORMAT(1X,'BEACH LENGTH , IN METERS IS :',22X,F8.2,2(/),1X,'LENGTH
     * INCREMENT, IN METERS IS',21X,F8.2,/)
307   FORMAT(1X,'TIME PERIOD , IN DAYS',30X,F8.2,2(/),1X,'TIME STEP , IN
     * DAYS',32X,F8.2)
312   FORMAT(/,1X,'BEACH FACE ANGLE, IN DEGREES',23X,F8.2,/)
313   FORMAT(1X,'BOTTOM SLOPE ANGLE, IN DEGRRES',21X,F8.2,/)
314   FORMAT('0ANGULO DE LA OLA EN AGUAS PROFUNDAS = ',F7.2,' GRADOS.')
315   FORMAT(4X,'POS'4X,'DAY',3X,'Y POSITION',3X,'SHORELINE',6X,'WAVE',
     .7X,'BREAKING',4X,'POWER',5X,'LITTORAL',2(3X,'CHANGE IN'),6X,
     .'WATER'/1H ,25X,3(7X,'ANGLE'),15X,'TRANSPORT',3X,'LIT TRANS.',2X,
     .'Y POSITION',5X,'DEPTH')
320   FORMAT(1X,I4,',',I2,7E11.3)
500   FORMAT(1X,'THE BREAKING ANGLE LIMIT IN DEGREES IS: ',13X,F6.0/)
C
C
C     INPUT DATA SECTION:
C     SECCION DE ENTRADA DE DATA:
C
C
      CALL DATE(IDA)
      CALL TIME(IT)
      WRITE(3,299)IDA,IT
      READ(21,1) XF,TF,DX,DT,D,NREAD,NPRINT,CALLED
      READ(21,3)OUT,RIVER,ALPHA,BETA,BKLMT,ABSOLT
      NUMPOS = XF/OUT+1
      IXF=XF/DX+1
      IF(IXF.GE.500) WRITE(3,240)DX,XF,IXF
      IF(IXF.GE.500) STOP
      IF(DX.GT.OUT) WRITE(3,241)
      IF(DX.GT.OUT) STOP
      READ(21,4) (Y(II),II=1,IXF)
      DO 12 I = 1,IXF,IFIX(OUT/DX)
   12 YI(I) = Y(I)
      KTF = TF/DT
      IXF = XF/DX+1
      LCENT=RIVER/DX+1
      Y(0) = Y(1)
      Y(IXF+1) = Y(IXF)
      LXF=XF
C
C     GENERATES INTERVALS ALONG THE BEACH.
C     GENERA INTERVALOS ATRAVEZ DE LA PLAYA.
C
      DO 14 I = 1,IXF
      X(I)=(I-1)*DX
   14 CONTINUE
C
C     GENERATES INTERVALS AT WHICH OUTPUT IS DESIRED.
C     GENERA INTEVALOS DE LARGO QUE SE DESEA LOS RESULTADOS.
C
      DO 15 I=1,IXF,IFIX(OUT/DX)
```

```
      XOUT(I)=(I-1)*DX
   15 CONTINUE
      WRITE(3,300)
      WRITE(3,301)
      WRITE(3,306)XF,DX
      WRITE(3,307)TF,DT
C
C
C     MAIN PROGRAM BEGIN!
C     COMIENZA EL PROGRAMA PRINCIPAL!
C
      GR = 980.
      RK = 0.77
      A = 0.6
      RHO = 1.02
      RHOS = 2.65
      Q = RK/((RHOS - RHO)*GR*A)
      Q = Q*8.64E-02
      XMIN = 0.0
      YMIN = 0.0
      XMAX = XF
      YMAX = 0.0
      WRITE(3,312)ALPHA
      WRITE(3,313)BETA
      WRITE(3,500)BKLMT
      WRITE(3,304)
C
      A=1/(2*((COSD(BETA)/SIND(BETA))-(COSD(ALPHA)/SIND(ALPHA))))
      DAY2=NPRINT*DT
      M=1
      DO 20 K=1,KTF
      IF(NREAD.NE.K)  GO TO 80
      NOW=NPRINT
      DAY=DAY2
      READ(21,6)DAY1,DAY2,HEIGHT,WVANGL,RSSU
      NREAD=DAY1/DT
      NPRINT=DAY2/DT
   80 J=1
      DO 10  I=1,IXF
      IF(K.EQ.1)  WDEPTH(I)=D
      B=WDEPTH(I)
       T=5
       PI=3.141592654
       NUMXIT=20
       G=9.81
       AL0=(G*(T**2))/(2.*PI)
       EPS=1E-6
       AL=AL0
       DO 22  ICONT=1,NUMXIT
       FL=AL-AL0*TANH(2.*PI*B/AL)
       FPL=1+(2.*PI*B*AL0)/((AL**2)*(COSH(2.*PI*B/AL)**2))
       DELTA=FL/FPL
       AL=AL-DELTA
       IF (ABS(DELTA/AL).GT.EPS) GO TO 22
       GO TO 111
   22   CONTINUE
  111   FX=TANH(2.*PI*B/AL)
     IF(I .EQ. 1) CALL NEWTON(I,BANGLE,IXF,Y,SANGLE,WVANGL,
      2BKANGL,SL,P,HEIGHT,RHO,Q,GR,DX,BKLMT,LDRIFT,FX)
```

```
      DDY = Y(I) - Y(I+1)
      SANGLE = ATAND(DDY,DX)
      IF(I .EQ. IXF)  SANGLE = BANGLE
        CALL WSANGL(I,LDRIFT,SANGLE,WVANGL,BKANGL,BKLMT)
      CALL SANDTR(I,LDRIFT,FX,BKANGL,SL,P,HEIGHT,RHO,Q,GR)
      DSL= SL(I+1)-SL(I)
      IF(X(I).EQ.RIVER)   DSL = DSL +RSSU
      C = DSL*DT/DX
      DY = (-B+(B**2+4*A*C)**.5)/(2*A)
        IF(K.EQ.NOW) CALL WRITER(I,M,J,DAY,LDRIFT,Y,SANGLE,WVANGL,
        2BKANGL,SL,DSL,P,DY,WDEPTH,RSSU,HEIGHT,X,NUMPOS,XOUT,YY,FX)
      Y(I)=Y(I)+DY
      WDEPTH(I)=2*A*DY +B
      YMAX = AMAX1(Y(I),YMAX)
      YMIN = AMIN1(Y(I),YMIN)
   10 CONTINUE
   *0 CONTINUE
C
      DO 30 I = 1,NUMPOS
      YMAX = AMAX1(YI(I),YMAX)
      YMIN = AMIN1(YI(I),YMIN)
   3  CONTINUE
C
C     OUTPUT DATA SECTION:
C     SECCION DE SALIDA DE RESULTADOS:
C
C
C     THIS SECTION PRODUCES THE GRAPH
C     AND LATER WRITES THE RESULTS.
C
C     ESTA SECCION PRODUCE LA GRAFICA
C     Y LUEGO ESCRIBE LOS RESULTADOS.
C
C
      DATA ICARAS,ICARA/'S','*'/
      ICODI=1
        WRITE(3,256)
 25     FORMAT(1H1)
      DO 270 K=1,M-1
      DO 260 I=1,NUMPOS
      XXX(I)=(I-1)*DUT
      YYY(I)=YY(I,K)
  260 CONTINUE
      CALL LPLOT(XMIN,XMAX,XXX,YMIN,YMAX,YYY,NUMPOS,1,ICARA,ICODI)
      ICODI=4
  2,0 CONTINUE
      CALL LPLOT(XMIN,XMAX,XXX,YMIN,YMAX,YI,NUMPOS,1,'S',4)
      CALL LPLOT(XMIN,XMAX,XXX,YMIN,YMAX,YYY,NUMPOS,1,'F',5)
      WRITE(3,271)
      CALL DATE(IDA)
      CALL TIME(IT)
      WRITE(3,298) IDA,IT
      STOP
      END
C
C
C     SUBROUTINE SECTION:
C     SECCION DEL LAS SUBRUTINAS:
C
```

```
        SUBROUTINE WSANGL(I,LDRIFT,SANGLE,WVANGL,BKANGL,BKLMT)
        DIMENSION BKANGL(0/500)
C
C
C      THIS SUBROUTINE CALCULATES THE MINOR ANGLE BETWEEN
C      THE WAVE AND THE SHORELINE.
C       ESTA SUBRUTINA CALCULA EL ANGULO MENOR ENTRE LA OLA Y LA PLAYA.
C
C
       LDRIFT=+1
       BKANGL(I) = SANGLE - WVANGL
       IF ( BKANGL(I) .LT. 0.0)  LDRIFT = -1
       BKANGL(I) = ABS( BKANGL(I))
       IF ( BKANGL(I) .GT. BKLMT )  BKANGL(I) = BKLMT
       IF( BKANGL(I).GT.  90.0)  BKANGL(I) = +180.0 - BKANGL(I)
       IF( BKANGL(I).LT.(-90.))  BKANGL(I) = -180.0 - BKANGL(I)
       RETURN
       END
C
C
C
C     SUBROUTINE NEWTON
        SUBROUTINE NEWTON(I,BANGLE,IXF,Y,SANGLE,WVANGL,BKANGL,SL,P,
        2HEIGHT,RHO,Q,GR,DX,BKLMT,LDRIFT,FX)
        DIMENSION Y(0/500),BKANGL(0/500),SL(0/500)
C
       SANGLE = ATAND( Y(1) - Y(2),10*DX)
       CALL WSANGL(0,LDRIFT,SANGLE,WVANGL,BKANGL,BKLMT)
       CALL SANDTR(0,LDRIFT,FX,BKANGL,SL,P,HEIGHT,RHO,Q,GR)
       BANGLE = ATAND(Y(IXF-1)-Y(IXF),10*DX)
       RETURN
       END
C
C
       SUBROUTINE WRITER(I,M,J,DAY,LDRIFT,Y,SANGLE,WVANGL,BKANGL,
         2SL,DSL,P,DY,WDEPTH,RSSU,HEIGHT,X,NUMPOS,XOUT,YY,FX)
         DIMENSION Y(0/500),BKANGL(0/500),SL(0/500),WDEPTH(0/500),X(500),
         2XOUT(500),YY(100,200)
C
C
C      THIS SUBROUTINE WRITES OUT(LENGTH INTERVAL AT WHICE THE RESULTS ARE DESIRED).
C      ESTA SUBRUTINA MANDA ESCRIR OUT(A QUE INTERVALO DE LARGO SE DESEAN LOS RESULTADOS).
C
C
C      OUTPUT HEADINGS ARE SPECIFIED.
C      EL ENCABEZADO ES ESPECIFICADO.
C
C
502    FORMAT(31X,'WAVE HEIGHT, IN CENTIMETERS',24X,F8.2)
504    FORMAT(//,31X,'RIVER SEDIMENT SUPPLY, IN CUBIC METERS PER DAY ',
      *2X,F10.2,/)
506    FORMAT(4X,'POS'4X,'DAY',3X,'Y POSITION',3X,'SHORELINE',6X,'WAVE',
      .7X,'BREAKING',4X,'POWER',5X,'LITTORAL',2(3X,'CHANGE IN'),6X,
      .'WATER'/1H ,25X,3(7X,'ANGLE'),15X,'TRANSPORT',3X,'LIT TRANS.',2X,
      .'Y POSITION',5X,'DEPTH')
510    FORMAT(1X,I6,',',F6.1,F12.4,2(F10.2,3X),F10.2,1PE12.3,1X,A3,
      *0PF12.1,0PF12.3,1PE12.3,1PE12.3)
       IF(X(I).NE.XOUT(I))  RETURN
       IF ( I .GT. 1) GO TO 100
       WRITE(3,504) RSSU
```

```
      XOUT(I)=(I-1)*DX
   15 CONTINUE
      WRITE(3,300)
      WRITE(3,301)
      WRITE(3,306)XF,DX
      WRITE(3,307)TF,DT
C
C
C      MAIN PROGRAM BEGIN!
C     COMIENZA EL PROGRAMA PRINCIPAL!
C
      GR = 980.
      RK = 0.77
      A = 0.6
      RHO = 1.02
      RHOS = 2.65
      Q = RK/((RHOS - RHO)*GR*A)
      Q = Q*8.64E-02
      XMIN = 0.0
      YMIN = 0.0
      XMAX = XF
      YMAX = 0.0
      WRITE(3,312)ALPHA
      WRITE(3,313)BETA
      WRITE(3,500)BKLMT
      WRITE(3,304)
C
      A=1/(2*((COSD(BETA)/SIND(BETA))-(COSD(ALPHA)/SIND(ALPHA))))
      DAY2=NPRINT*DT
      M=1
      DO 20 K=1,KTF
      IF(NREAD.NE.K)  GO TO 80
      NOW=NPRINT
      DAY=DAY2
      READ(21,6)DAY1,DAY2,HEIGHT,WVANGL,RSSU
      NREAD=DAY1/DT
      NPRINT=DAY2/DT
   80 J=1
      DO 10  I=1,IXF
      IF(K.EQ.1)  WDEPTH(I)=D
      B=WDEPTH(I)
        T=5
        PI=3.141592654
        NUMXIT=20
        G=9.81
        AL0=(G*(T**2))/(2.*PI)
        EPS=1E-6
        AL=AL0
        DO 22  ICONT=1,NUMXIT
        FL=AL-AL0*TANH(2.*PI*B/AL)
        FPL=1+(2.*PI*B*AL0)/((AL**2)*(COSH(2.*PI*B/AL)**2))
        DELTA=FL/FPL
        AL=AL-DELTA
        IF (ABS(DELTA/AL).GT.EPS) GO TO 22
        GO TO 111
  22      CONTINUE
  111   FX=TANH(2.*PI*B/AL)
      IF(I .EQ. 1) CALL NEWTON(I,BANGLE,IXF,Y,SANGLE,WVANGL,
        2BKANGL,SL,P,HEIGHT,RHO,Q,GR,DX,BKLMT,LDRIFT,FX)
```

```
299   FORMAT(6(/),18X,'MODEL7',5X,'DATE',2X,2A5,5X,A5,' START')
300   FORMAT (2(/),18X,'COMPUTER MODEL OF DELTA GROWTH DUE TO SEDIMENT',
     ./18X,'INPUT FROM RIVERS AND LONGSHORE TRANSPORT.',//18X,'WAVE RE
     .FRACTION IS INCLUDED.')
301   FORMAT (2(/),28X, 'DATA VALUES',2(/))
302   FORMAT(/,1X,'RIVER SEDIMENT SUPPLY, IN CUBIC METERS PER DAY ',
     #4X,F8.0,/)
304   FORMAT(1H1,46X,'MODEL7 OUTPUT RESULTS',2(/))
305   FORMAT(/,1X,'WAVE HEIGTH, IN CENTIMETERS',24X,F8.2)
306   FORMAT(1X,'BEACH LENGTH , IN METERS IS :',22X,F8.2,2(/),1X,'LENGTH
     # INCREMENT, IN METERS IS',21X,F8.2,/)
307   FORMAT(1X,'TIME PERIOD , IN DAYS',30X,F8.2,2(/),1X,'TIME STEP , IN
     # DAYS',32X,F8.2)
312   FORMAT(/,1X,'BEACH FACE ANGLE, IN DEGREES',23X,F8.2,/)
313   FORMAT(1X,'BOTTOM SLOPE ANGLE, IN DEGRRES',21X,F8.2,/)
314   FORMAT('0ANGULO DE LA OLA EN AGUAS PROFUNDAS = ',F7.2,' GRADOS.')
315   FORMAT(4X,'POS'4X,'DAY',3X,'Y POSITION',3X,'SHORELINE',6X,'WAVE',
     .7X,'BREAKING',4X,'POWER',5X,'LITTORAL',2(3X,'CHANGE IN'),6X,
     .'WATER'/1H ,25X,3(7X,'ANGLE'),15X,'TRANSPORT',3X,'LIT TRANS.',2X,
     .'Y POSITION',5X,'DEPTH')
320   FORMAT(1X,I4,',',I2,7E11.3)
500   FORMAT(1X,'THE BREAKING ANGLE LIMIT IN DEGREES IS: ',13X,F6.0/)
C
C
C     INPUT DATA SECTION:
C     SECCION DE ENTRADA DE DATA:
C
C
      CALL DATE(IDA)
      CALL TIME(IT)
      WRITE(3,299)IDA,IT
      READ(21,1) XF,TF,DX,DT,D,NREAD,NPRINT,CALLED
      READ(21,3)OUT,RIVER,ALPHA,BETA,BKLMT,ABSOLT
      NUMPOS = XF/OUT+1
      IXF=XF/DX+1
      IF(IXF.GE.500) WRITE(3,240)DX,XF,IXF
      IF(IXF.GE.500) STOP
      IF(DX.GT.OUT) WRITE(3,241)
      IF(DX.GT.OUT) STOP
      READ(21,4) (Y(II),II=1,IXF)
      DO 12 I = 1,IXF,IFIX(OUT/DX)
   12 YI(I) = Y(I)
      KTF = TF/DT
      IXF = XF/DX+1
      LCENT=RIVER/DX+1
      Y(0) = Y(1)
      Y(IXF+1) = Y(IXF)
      LXF=XF
C
C     GENERATES INTERVALS ALONG THE BEACH.
C     GENERA INTERVALOS ATRAVEZ DE LA PLAYA.
C
      DO 14 I = 1,IXF
      X(I)=(I-1)*DX
   14 CONTINUE
C
C     GENERATES INTERVALS AT WHICH OUTPUT IS DESIRED.
C     GENERA INTEVALOS DE LARGO QUE SE DESEA LOS RESULTADOS.
C
      DO 15 I=1,IXF,IFIX(OUT/DX)
```

```
C
C       WVANGL--- DEEP WATER WAVE ANGLE.
C       WVANGL--- ANGULO DE LA OLA EN AGUAS PROFUNDAS.
C
C       OUTPUT VARIABLE:
C       VARIABLES DE SALIDA:
C       BKANGL--- BREAKING WAVE ANGLE.
C       BKANGL--- ANGULO A QUE ROMPE LA OLA EN LA PLAYA.
C
C       DIA------ DAY ON WHICH RESULTS ARE GIVEN.
C       DIA------ DIA A QUE SE DAN LOS RESULTADOS.
C
C       DSL------ CHANGE IN THE SEDIMENT TRANSPORT.
C       DSL------ CAMBIO EN EL TRANSPORTE DE SEDIMENTO.
C
C       DY------- CHANGE IN THE SHORELINE POSITION.
C       DY------- CAMBIO EN LA POSICION DE LA PLAYA.
C
C       P-------- ENERGY FLUX.
C       P-------- FLUJO DE ENERGIA.
C
C       POS------ POINTS OF THE BEACH IN THE X-AXIS.
C       POS------ PUNTOS DE LA PLAYA EN EL EJE DE X.
C
C       SANGLE--- ANGLE OF THE BEACH WITH RESPECT TO MAGNETIC NORTH.
C       SANGLE--- ANGULO QUE HACE LA PLAYA CON RESPECTO AL NORTE MAGNETICO.
C
C       SHORE---- ANGLE OF THE BEACH WITH RESPECT TO THE X-AXIS.
C       SHORE---- ANGULO QUE HACE LA PLAYA CON RESPECTO A EJE DE X.
C
C       SL------- SEDIMENT TRANSPORT.
C       SL------- TRANSPORTE DE SEDIMENTO.
C
C       WAVE----- WAVE ANGLE WITH RESPECT TO THE X-AXIS.
C       WAVE----- ANGULO DE LA OLA CON RESPECTO AL EJE DE X.
C
C       WDEPTH--- MAXIMIM DEPTH THAT IS CACULATED.
C       WDEPTH--- PROFUNDIDAD MAXIMA QUE SE VA COMPUTANDO.
C
C       WVANGL--- DEEP WATER WAVE ANGLE.
C       WVANGL--- IGUAL QUE  WVANGL DE ENTRADA.
C
      DIMENSION LETTER(16),YI(100),IDA(2)
        DIMENSION Y(0/500),BKANGL(0/500),SL(0/500),WDEPTH(0/500),X(500),
       2XOUT(500),YY(100,200),XXX(100),YYY(100)
      LOGICAL CALLED,ABSOLT
C
C
 1    FORMAT (8G)
3     FORMAT(6G)
4     FORMAT(10G)
5     FORMAT(10G)
6      FORMAT(5G)
2-0   FORMAT(1H1,20X,'PROGRAM STOPPED, EITHER XF IS TOO BIG OR DX IS
     #TOO SMALL',/,20X,'THE PROGRAM IS SET TO A MAXIMUM OF 500 POINTS',/
     #,20X,'DX = ',F8.2,/,20X,'DT = ',F8.0,/,'IXF=XF/DX= ',I6,/)
2-1   FORMAT(1H1,20X,'PROGRAM STOPPED,  OUTPUT INTERVAL IS LESS THAN
     #DELTA X "DX"',/,20X,'CONDITIONS MUST BE    DX<=OUTPUT INTERVAL.'/)
2'1   FORMAT(/41X,'ABCISSA AND ORDINATE VALUES IN METERS'/)
2-8   FORMAT(6(/),18X,'MODEL7',5X,'DATE',2X,2A5,5X,A5,' END')
```

```
C        COMPUTER MODEL OF DELTA GROWTH DUE TO SEDIMENT
C        INPUT FROM RIVERS AND LONGSHORE TRANSPORT
C        DEVELOPED BY DR. CHRISTOS HADJITHEDOROU.
C
C        PROGRAMMED BY LUIS F. RICO  .... FEBRUARY 20, 1979
C        MODIFICATIONS BY FELIPE GARCIA ....1979
C        AND BY JUAN E. SANTIAGO-RIVERA ....1980
C
C
C        WAVE REFRACTION IS INCLUDED.
C
C        DESCRIPTION OF VARIBLES:
C        DESCRIPCION DE VARIABLES:
C
C        INPUT VARIABLES:
C        VARIABLES DE ENTRADA:
C       ALPHA---- BEACH FACE ANGLE.
C       ALPHA---- ANGULO QUE HACE LA CARA DE LA PLAYA.
C
C       BETA----- NEARSHORE BOTTOM ANGLE
C       BETA----- ANGULO QUE HACE EL FONDO DE LA PLAYA.
C
C       BKLMT---- BREAKING ANGLE LIMIT.
C       BKLMT---- LIMITE PARA EL ANGULO A QUE ROMPE LA OLA.
C
C       D-------- MAXIMIM INITIAL DEPTH.
C       D-------- PROFUNDIDAD MAXIMA INICIAL.
C
C       DAY1----- FOLLOWING DAY IN WHICH DATA WILL BE READ.
C       DAY1----- PROXIMO DIA A LEER DATOS.
C
C       DAY2----- FOLLOWING DAY WHEN THE RESULTS WILL BE WRITTEN.
C       DAY2----- PROXIMO DIA A QUE SE VA A ESCRIBIR RESULTADOS.
C
C       DT------- TIME INCREMENT.
C       DT------- INCREMENTO EN EL TIEMPO.
C
C       DX------- LENGTH INCREMENT.
C       DX------- INCREMENTO EN EL LARGO.
C
C       HEIGTH--- WAVE HEIGTH.
C       HEIGHT--- ALTURA DE LA OLA.
C
C       OUT------ LENGTH INTERVAL AT WHICH THE RESULTS ARE DESIRED.
C       OUT------ A QUE INTERVALO DE LARGO DESEA LOS RESULTADOS.
C
C       P-------- ENERGY FLUX.
C       P-------- FLUJO DE ENERGIA.
C
C       RIVER---- RIVER POSITION.
C       RIVER---- POSICION DEL RIO.
C
C       RSSU----- SEDIMENT SUPPLIED BY THE RIVER.
C       RSSU----- SEDIMENTO SUMINISTRADO POR EL RIO.
C
C       TF------- TIME LENGTH(DURATION).
C       TF------- TIEMPO DE DURACION.
C
C       XF------- BEACH LENGTH.
C       XF------- LARGO DE LA PLAYA.
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