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PART 5: RUNUP2

for transect: YK-75

Station locations shifted by: -3.27 feet from their  
original location to set the shoreline to  
elevation 0 for RUNUP2 input

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RUNUP2 INPUT CONVERSIONS

for transect: YK-75

Incident significant wave height: 14.78 feet

Peak wave period: 13.63 seconds

Mean wave height: 9.25 feet

Local Depth below SWEL: 27.20 feet

Mean wave height deshoaled using Hunt approximation for  
celerity assuming constant wave energy flux.

References: R.G. Dean and R.A. Dalrymple. 2000. Water

Wave Mechanics for Engineers and Scientists. World  
Scientific Publishing Company, River Edge New Jersey

USACE (1985), Direct Methods for Calculating Wavelength, CETN-1-17  
US Army Engineer Waterways Experiment Station Coastal Engineering  
Research Center, Vicksburg, MS

also see Coastal Engineering Manual Part II-3  
for discussion of shoaling coefficient

Depth,  $D = 27.20$

Period,  $T = 11.58$

Waveheight,  $H = 9.25$

Deep water wavelength,  $L_0$  (ft)

$L_0 = g \cdot T^2 / 2\pi$

$L_0 = 32.17 \cdot 11.58^2 / 6.28 = 686.88$

Deep water wave celerity,  $C_0$  (ft/s)

$C_0 = L_0 / T$

$C_0 = 686.88 / 11.58 = 59.31$

Angular frequency,  $\sigma$  (rad/s)

$\sigma = 2\pi / T$

$\sigma = 6.28 / 11.58 = 0.54$

Hunts (1979) approximation for Celerity  $C_{1H}$  (ft/s) at Depth  $D$  (ft)

$y = \sigma \cdot \sigma \cdot D / g$

$y = 0.54 \cdot 0.54 \cdot 27.20 / 32.17 = 0.25$

$C_{1H} = \sqrt{g \cdot D / (y + 1 / (1 + 0.6522 \cdot y + 0.4622 \cdot y^2 + 0.0864 \cdot y^4 + 0.0675 \cdot y^5))}$

$C_{1H} = 28.36$

Shoaling Coefficient  $K_{sH}$

$K_{sH} = \sqrt{C_0 / C_{1H}}$

$K_{sH} = \sqrt{59.31 / 28.36} = 1.45$

Deepwater Wave Height  $H_{0\_H}$  (ft)

$H_{0\_H} = H / K_{sH}$

$H_{0\_H} = 9.25 / 1.45 = 6.40$

Deepwater mean wave height: 6.40 feet

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END RUNUP2 CONVERSIONS

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RUNUP2 RESULTS

for transect: YK-75

RUNUP2 SWEL:

8.96

RUNUP2 deepwater mean wave heights:

-9999.00

RUNUP2 mean wave periods:  
-9999.00

RUNUP2 runup above SWEL:  
-9999.00

RUNUP2 Mean runup height above SWEL: -9999.00 feet

RUNUP2 2-percent runup height above SWEL: -9999.00 feet

RUNUP2 2-percent runup elevation: -9999.00 feet-NAVD88

RUNUP2 Messages:  
RUNUP2 Failed

\_\_\_\_\_END RUNUP2 RESULTS\_\_\_\_\_

\_\_\_\_\_ACES BEACH RUNUP\_\_\_\_\_

Incident significant wave height: 14.78 feet

Significant wave height deshoaled using Hunt equation

Deepwater significant wave height: 8.96 feet

Peak wave period: 13.63 seconds

Average beach Slope: 1:55.35 (H:V)

ACES RUNUP CALCULATED USING 'Aces\_Beach\_Runup.m'

ACES Beach 2-percent runup height above SWEL: 5.05 feet

ACES Beach 2-percent runup elevation: 14.01 feet-NAVD88

ACES BEACH RUNUP is valid

\_\_\_\_\_END ACES BEACH RESULTS\_\_\_\_\_

PART 5 COMPLETE\_\_\_\_\_