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PART 5: RUNUP2

for transect: YK-15

Station locations shifted by: -0.43 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-15

Incident significant wave height: 8.18 feet

Peak wave period: 13.06 seconds

Mean wave height: 5.12 feet

Local Depth below SWEL: 13.70 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

Deep water wavelength,  $L_0$  (m)

$$L_0 = gT^2/\pi$$

$$L_0 = 32.17 \times 11.10^2 / 6.28 = 631.24$$

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

$$C_0 = L_0/T$$

$$C_0 = 631.24 / 11.10 = 56.85$$

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

$$\sigma = \pi/T$$

$$\sigma = 6.28 / 11.10 = 0.57$$

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

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

$$y = 0.57 \times 0.57 \times 13.70 / 32.17 = 0.14$$

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

$$C_{1H} = 20.51$$

Shoaling Coefficient  $K_{sH}$

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

$$K_{sH} = \sqrt{56.85 / 20.51} = 1.66$$

Deepwater Wave Height  $H_{0H}$  (ft)

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

$$H_{0H} = 5.12 / 1.66 = 3.08$$

Deepwater mean wave height: 3.08 feet

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END RUNUP2 CONVERSIONS

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RUNUP2 RESULTS

for transect: YK-15

RUNUP2 SWEL:

9.30  
9.30  
9.30  
9.30  
9.30  
9.30  
9.30  
9.30  
9.30

RUNUP2 deepwater mean wave heights:

2.92

2.92  
2.92  
3.08  
3.08  
3.08  
3.23  
3.23  
3.23

RUNUP2 mean wave periods:

10.55  
11.10  
11.66  
10.55  
11.10  
11.66  
10.55  
11.10  
11.66

RUNUP2 runup above SWEL:

5.41  
5.87  
6.24  
5.77  
6.10  
6.47  
5.98  
6.35  
6.70

RUNUP2 Mean runup height above SWEL: 6.10 feet

RUNUP2 2-percent runup height above SWEL: 13.42 feet

RUNUP2 2-percent runup elevation: 22.72 feet-NAVD88

RUNUP2 Messages:

No Messages

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

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

Incident significant wave height: 8.18 feet

Significant wave height deshoaled using Hunt equation

Deepwater significant wave height: 4.31 feet

Peak wave period: 13.06 seconds

Average beach Slope: 1:15.80 (H:V)

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

ACES Beach 2-percent runup height above SWEL: 7.44 feet

ACES Beach 2-percent runup elevation: 16.74 feet-NAVD88

ACES BEACH RUNUP is valid

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

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