

Important Breaker Index Formulas PDF



**Formulas
Examples
with Units**

**List of 16
Important Breaker Index Formulas**

1) Breaker Depth Index Formula

Formula

$$\gamma_b = \frac{H_b}{d_b}$$

Example with Units

$$0.3273 = \frac{18 \text{ m}}{55 \text{ m}}$$

Evaluate Formula 

2) Breaker Depth Index given Wave Period Formula

Formula

$$\gamma_b = b - a \cdot \left(\frac{H_b}{[g] \cdot T_b^2} \right)$$

Example with Units

$$0.3038 = 1.56 - 43.8 \cdot \left(\frac{18 \text{ m}}{9.8066 \text{ m/s}^2 \cdot 8 \text{ s}^2} \right)$$

Evaluate Formula 

3) Breaker Height Index Formula

Formula

$$\Omega_b = \frac{H_b}{\lambda_o}$$

Example with Units

$$2.5714 = \frac{18 \text{ m}}{7 \text{ m}}$$

Evaluate Formula 

4) Deepwater Wave Height given Breaker Height Index Formula

Formula

$$\lambda_o = \frac{H_b}{\Omega_b}$$

Example with Units

$$7.0588 \text{ m} = \frac{18 \text{ m}}{2.55}$$

Evaluate Formula 

5) Deepwater Wavelength given Breaker Height Index from Linear Wave Theory Formula

Formula

$$\lambda_o = \frac{H'_o}{\left(\frac{\Omega_b}{0.56} \right)^{-5}}$$

Example with Units

$$7.1263 \text{ m} = \frac{0.00364 \text{ m}}{\left(\frac{2.55}{0.56} \right)^{-5}}$$

Evaluate Formula 



6) Equivalent Unrefracted Deepwater Wave Height given Breaker Height Index from Linear Wave Theory Formula

Formula

$$H'_o = \lambda_o \cdot \left(\frac{\Omega_b}{0.56} \right)^{-5}$$

Example with Units

$$0.0036 \text{ m} = 7 \text{ m} \cdot \left(\frac{2.55}{0.56} \right)^{-5}$$

Evaluate Formula 

7) Local Depth given Root Mean Square Wave Height Formula

Formula

$$d_l = \frac{H_{\text{rms}}}{0.42}$$

Example with Units

$$20 \text{ m} = \frac{8.4 \text{ m}}{0.42}$$

Evaluate Formula 

8) Local Depth given Zero Moment Wave Height Formula

Formula

$$d_l = \frac{H_{m0,b}}{0.6}$$

Example with Units

$$20 \text{ m} = \frac{12.00 \text{ m}}{0.6}$$

Evaluate Formula 

9) Root Mean Square Wave Height at Breaking Formula

Formula

$$H_{\text{rms}} = 0.42 \cdot d_l$$

Example with Units

$$8.4 \text{ m} = 0.42 \cdot 20.0 \text{ m}$$

Evaluate Formula 

10) Semi-Empirical Relationship for Breaker Height Index from Linear Wave Theory Formula

Formula

$$\Omega_b = 0.56 \cdot \left(\frac{H'_o}{\lambda_o} \right)^{-\frac{1}{5}}$$

Example with Units

$$2.5409 = 0.56 \cdot \left(\frac{0.00364 \text{ m}}{7 \text{ m}} \right)^{-\frac{1}{5}}$$

Evaluate Formula 

11) Water Depth at Breaking given Breaker Depth Index Formula

Formula

$$d_b = \left(\frac{H_b}{\gamma_b} \right)$$

Example with Units

$$56.25 \text{ m} = \left(\frac{18 \text{ m}}{0.32} \right)$$

Evaluate Formula 

12) Wave Height at Incipient Breaking given Breaker Depth Index Formula

Formula

$$H_b = \gamma_b \cdot d_b$$

Example with Units

$$17.6 \text{ m} = 0.32 \cdot 55 \text{ m}$$

Evaluate Formula 



13) Wave Height at Incipient Breaking given Breaker Height Index Formula

Formula

$$H_b = \Omega_b \cdot \lambda_o$$

Example with Units

$$17.85 \text{ m} = 2.55 \cdot 7 \text{ m}$$

Evaluate Formula 

14) Wave Height at Incipient Breaking using Beach Slope Formula

Formula

$$H_b = [g] \cdot T_b^2 \cdot \frac{b - \gamma_b}{a}$$

Example with Units

$$17.7684 \text{ m} = 9.8066 \text{ m/s}^2 \cdot 8 \text{ s}^2 \cdot \frac{1.56 - 0.32}{43.8}$$

Evaluate Formula 

15) Wave Period given Breaker Depth Index Formula

Formula

$$T_b = \sqrt{\frac{a \cdot H_b}{[g] \cdot (b - \gamma_b)}}$$

Example with Units

$$8.052 \text{ s} = \sqrt{\frac{43.8 \cdot 18 \text{ m}}{9.8066 \text{ m/s}^2 \cdot (1.56 - 0.32)}}$$

Evaluate Formula 

16) Zero-Moment Wave Height at Breaking Formula

Formula

$$H_{m0,b} = 0.6 \cdot d_l$$

Example with Units

$$12 \text{ m} = 0.6 \cdot 20.0 \text{ m}$$



Evaluate Formula 



Variables used in list of Breaker Index Formulas above

- **a** Functions of Beach Slope A
- **b** Functions of Beach Slope B
- **d_b** Water Depth at Breaking (Meter)
- **d_l** Local Depth (Meter)
- **H_b** Wave Height at Incipient Breaking (Meter)
- **$H_{m0,b}$** Zero-Moment Wave Height (Meter)
- **H'_o** Equivalent Unrefracted Deepwater Wave Height (Meter)
- **H_{rms}** Root Mean Square Wave Height (Meter)
- **T_b** Wave Period for Breaker Index (Second)
- **Y_b** Breaker Depth Index
- **λ_o** Deep-Water Wavelength (Meter)
- **Ω_b** Breaker Height Index

Constants, Functions, Measurements used in list of Breaker Index Formulas above

- **constant(s):** [**g**], 9.80665
Gravitational acceleration on Earth
- **Functions:** **sqrt**, sqrt(Number)
A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- **Measurement:** **Length** in Meter (m)
Length Unit Conversion 
- **Measurement:** **Time** in Second (s)
Time Unit Conversion 



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