

Underwater Noise

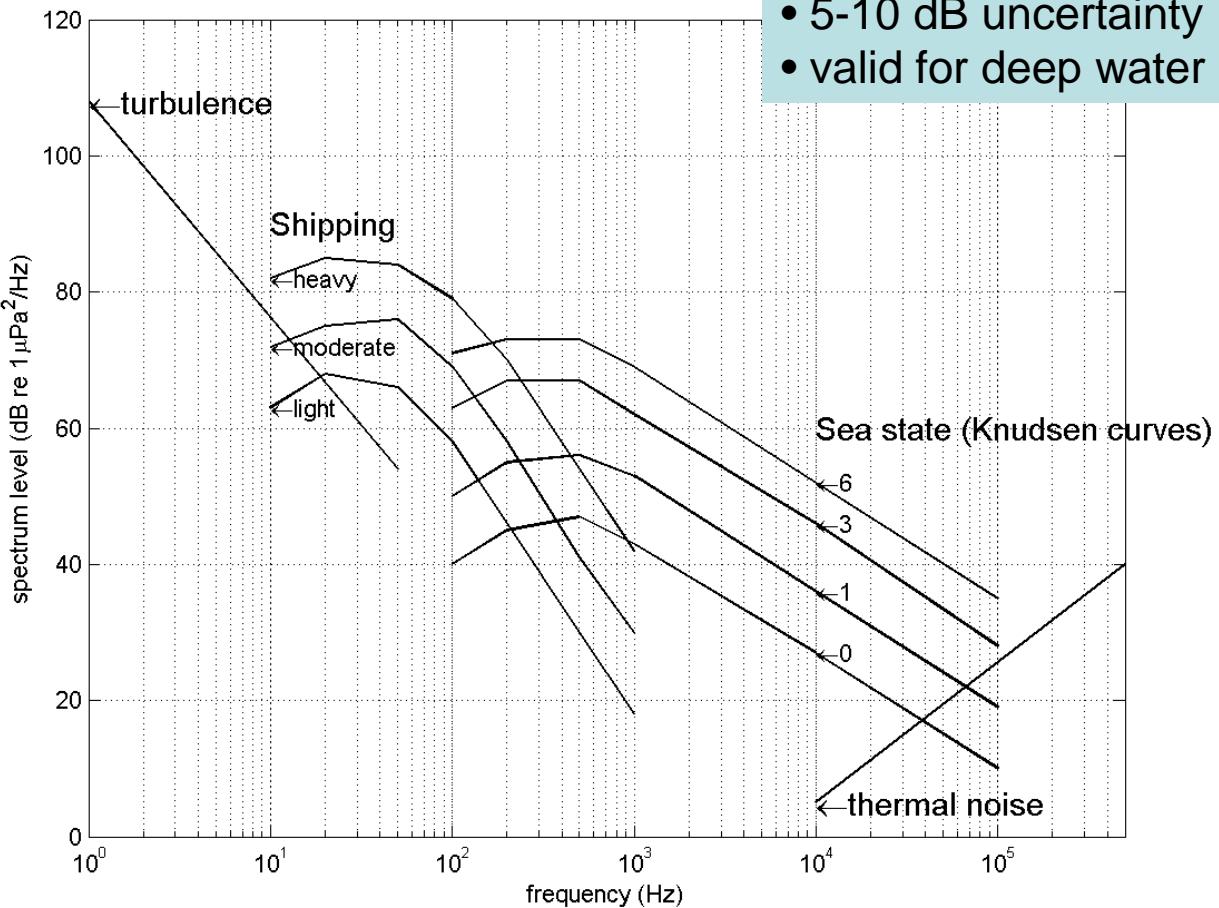
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1

Ambient noise

- < 10 Hz: turbulence
- 50 - 500 Hz: distant shipping
- 500 Hz - 25 kHz: wind noise (Knudsen)
- > 100 kHz: thermal noise
- expressed in dB re $1 \mu\text{Pa}^2/\text{Hz}$

Deep water spectral ambient noise levels



Sonar self noise

- Noise generated by the receiving platform
 - **machinery noise**
 - **propeller noise**
 - **hydrodynamic noise**
- hull-mounted systems (empirical relation):

$$NL_{self} = 33 + 1.8v - 20^{10} \log\left(\frac{f}{12}\right) \text{ dB re } 1 \mu\text{Pa}^2/\text{Hz}$$