

Assessing Noise from Wind Farms



**Dr Bob Thorne, The Society for Wind Vigilance,
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Wind farm noise assessment

Three distinct 'measures' apply

- Environmental risk assessment
- Noise numbers
- Adverse health effects



Environmental Risk Assessment

Three distinct processes apply

- Best practice
- Precautionary principle
- Uncertainty



Noise Numbers

- Apply an acoustical standard or guideline
- Numbers assume “acceptable levels”
- Unproven
- Difficult to predict
- Difficult to measure for compliance
- Little relevance to people affected by noise



Adverse Health Effects ARE identifiable

- Annoyance and Sleep Disturbance
- Anxiety, stress and harmful health effects (e.g. headaches, nausea, sleep deprivation)
- Psychoacoustic and Sensitivity measures

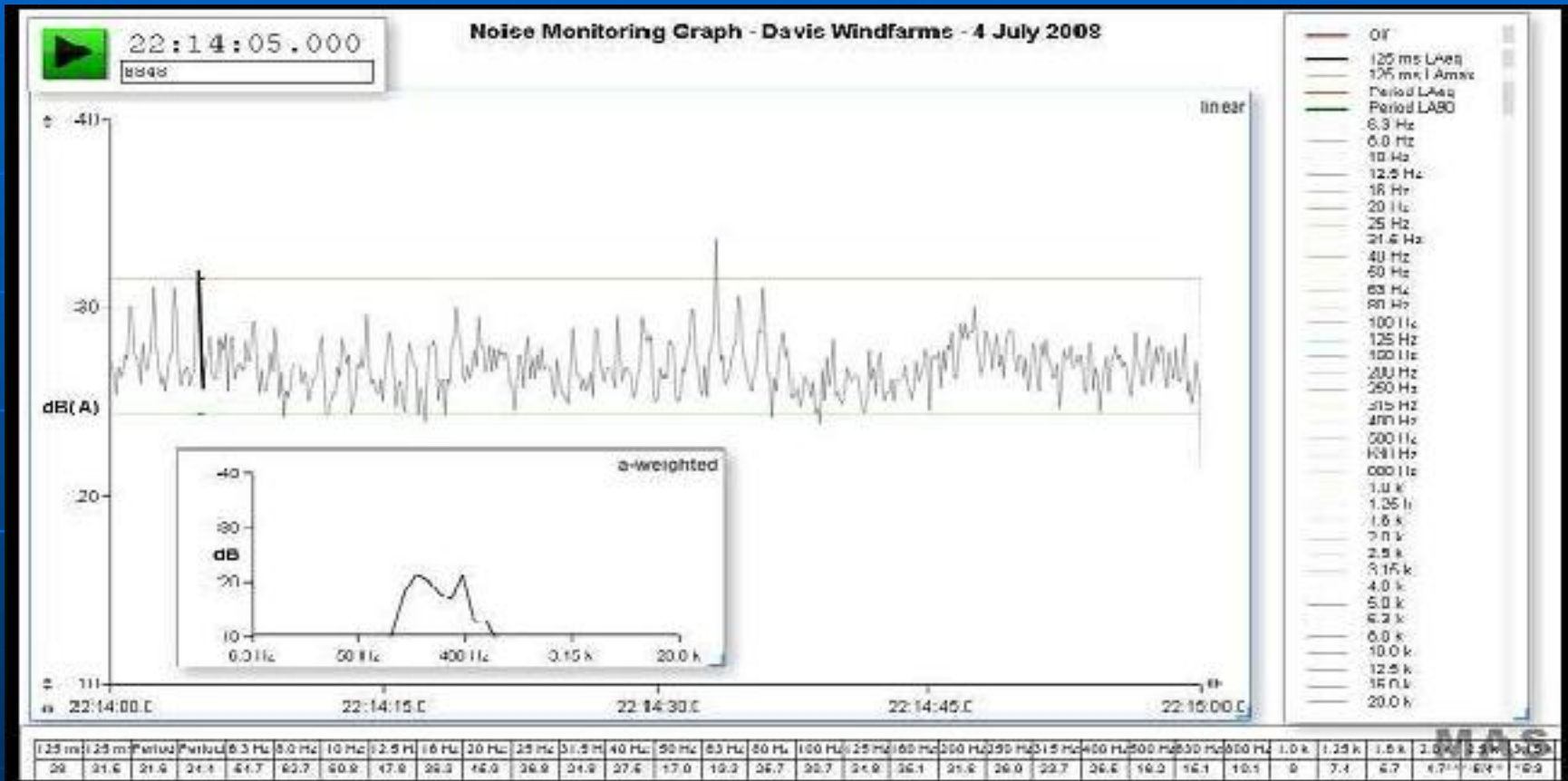


Low Amplitude Sound

- Difficult to measure wind farm 'sound-in-sound'
- Sounds below 35-40dBA can be intrusive and annoying
- The CHARACTER of the sound becomes important rather than sound 'level' or 'volume'

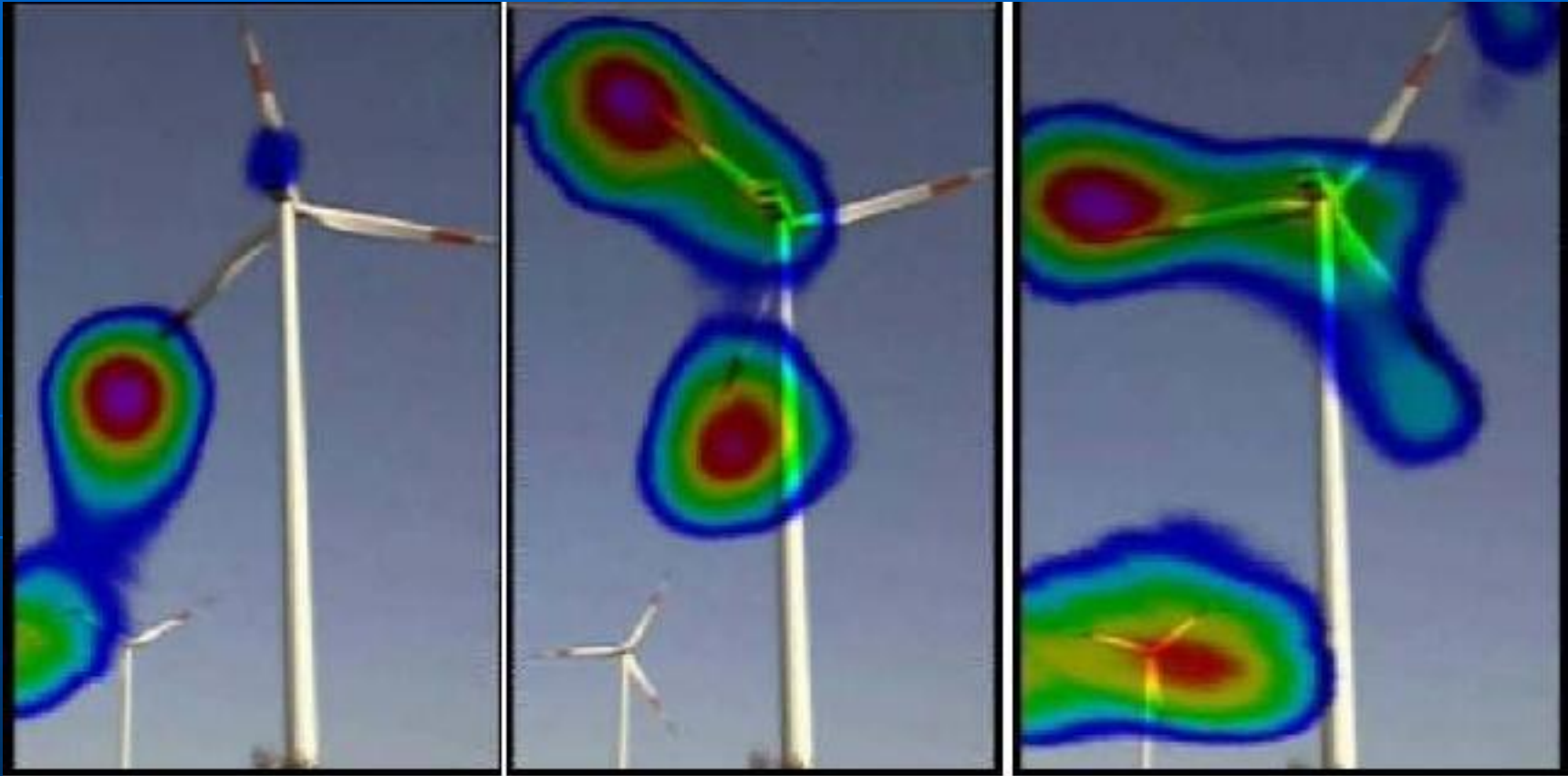


Wind turbine levels indoors



Turbine 'thump' and beats clearly audible below 30 dB(A)

Turbine sound patterns



Source: Acoustic Camera, "Multiple noise sources wind turbines 300Hz-7kHz.avi"



Modulation or beating from turbines measured

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Intrusive Sound and Noise

- Unreasonable interference with the comfort or repose of a person
- Noise defined as
A sound that is perceptible to a human observer and has definable characteristics that modify the observer's emotional and informational responses to that sound from pleasurable or neutral to adverse.



Infrasound

- Often inaudible but perceptible
- Readily measured
- Wind IS characterised by infrasound
- Turbines change infrasound 'flow' from laminar wind to heightened noise (pressure) zones with cumulative effect from multiple turbines



Personal Sensitivity Analysis

- Personal affinity to local environment (personal space assessment)
- Personal perception and sensitivity to sound and noise
- Exposed / non-exposed health effects analysis



Model for Measuring and Assessing Intrusive Sound and Noise from Wind Farms

