

I'm writing to ask you to consider a moratorium on the installation of industrial scale wind turbines in your rural areas due to their destructive health impacts on persons living nearby.

I'm a Licensed Clinical Psychologist. Ph.D. Degree from Purdue University in America (known for excellence in statistics, research design and interpretation). My doctoral dissertation was on PTSD (Post-Traumatic Stress Disorder). I'm a past Clinical Supervisory Faculty member at the University of Virginia Medical School, with a 6th year degree in Psychometry from Purdue, double Masters Degree in Special Education, past Director of Purdue's Achievement Center for Children - a groundbreaking institution in the field of sensory perception and learning disabilities which draws patients from around the world.

My experience and training allow me to appreciate the subtle connections between Big Wind, low frequency sound waves, and the Wind Turbine Syndrome (WTS) - a set of symptoms severe enough to have caused people to abandon their homes when Big Wind arrives. Consider for a moment a report in *The Toronto Star* (Canada), "The Cutting Edge: Military Use of Sound," 6 June 2005:

Military weaponry exists that relies on low-frequency sound to disperse crowds or control crowd behaviour. The effect of low-frequency noise at high intensities creates discrepancies in the brain, producing disorientation in the body: *'The knees buckle, the brain aches, the stomach turns. And suddenly, nobody feels like protesting anymore. The latest weapon in the Israeli army's high-tech tool kit.'* *'The intention is to disperse crowds with sound pulses that create nausea and dizziness. It has no adverse effects, unless someone is exposed to the sound for hours and hours.'*

Consider also:

1 - Wind Turbine Syndrome meets Hollywood:

"[Movie] sound engineers deliberately include loud noises well below the lowest frequencies that can be detected by our hearing system (20 Hertz) because, although we cannot hear such sounds directly, our body actually feels them.... This type of sound is called 'infrasound,' and the weight of evidence suggests that humans instinctively react to major infrasound with feelings of awe, discomfort, even panic" (*Psychology Today*).

"How sound skews the Academy Awards"

by George Michelsen Foy, [Psychology Today](#) 3/6/10

...I suspect one reason Avatar and Hurt Locker are such strong contenders has to do with the fact that both are full of loud explosions....

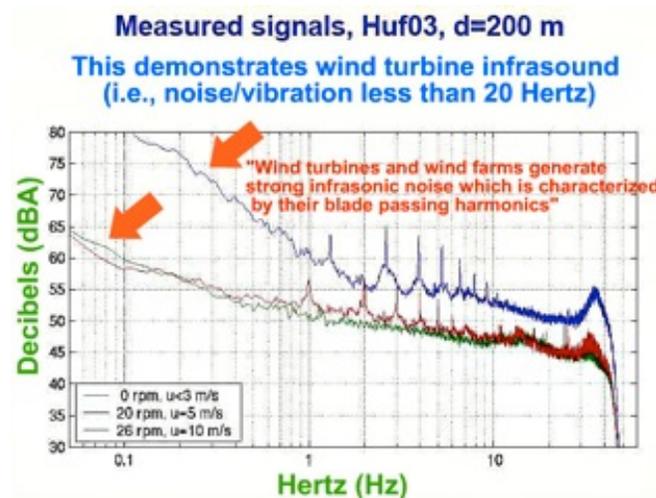
I remember sitting in the theater wearing silly glasses as the massive explosions swept from the sound system, so deep and loud that they shook my body, slightly but literally...

Likely I was the only person wearing silly glasses in the Harvard Square Loews that day to suspect both the high volume and low frequency of those explosions were geared to jack up our emotional response to the film.

Sources I cannot name, because they work in the Industry, have told me that producers and big sound outfits like Dolby know well that very loud, low-frequency sounds trigger an out of proportion fear response in viewers.

Those same sources claim sound engineers deliberately include loud noises well below the lowest frequencies that can be detected by our hearing system (20 Hertz) because, although we cannot hear such sounds directly, our body actually feels them. Studios apparently insist that theaters playing big-bang films be equipped with Dolby-type sub-woofers that can generate frequencies well below 20 Hz.

This type of sound is called “infrasound,” and the weight of evidence suggests that humans instinctively react to major infrasound with feelings of awe, discomfort, even panic. Precisely what I’m supposed to feel as despite Jeremy Renner’s heroic efforts, the suicide bomber is blown to kingdom come.



From [Ceranna et al., “The Inaudible Noise of Wind Turbines” \(2005\), p. 14](#), with overlaid explanatory text by [KS.com](#).

Why do we react this way to low-frequency noise? Well, consider the natural sources of infrasound: they include lightning, avalanches, earthquakes, stampeding buffalo, tsunamis, tornadoes. Over two million years of evolution those primates who could detect, and flee from, such dangers had an evolutionary edge over those who couldn’t. Since artillery and bombs are another source of infrasound, it may be that humans who react quickly to low frequency will be even more favored in the future.

Other animals are more sensitive to infrasound than we are; the first hint many people in Thailand had that the 2004 tsunami was on its way was their dogs and cats high-tailing it for high ground. The apocryphal story of rats quitting doomed ships might

have a glint of truth, in that animals would be more sensitive to infrasound noise generated by a hull's structural defects.

Chronic low-frequency noise is known to be harmful over the long term—in the long run, fear and discomfort produce stress, which corrodes our health. In a movie theater, however, we are not exposed long enough to suffer physical harm. Watching a film, we want to experience powerful, even unpleasant emotions, the better to empathize with the characters; the better to escape our daily grind. So infrasound, to my mind, is a legitimate tool to use.

We might also want to remember, however, as James Cameron or Kathryn Bigelow thank the academy (and their fashion advisers and grade-school teachers), that part of the package that brought them to the podium was most likely crafted by sound engineers to trigger some of the most primal, unconscious reflexes known to man."

2 - [KS.com](#) explains the Ceranna study further: "Wind turbines produce major infrasound. Period. No question about it. For years, Big Wind has denied that turbines produce infrasound & low frequency noise (ILFN). [Either denied it exists or dismissed its significance as so trivial, it's not worth considering.](#) The (convenient) rule of thumb among Big Wind acousticians being, "If you can't hear it, it can't hurt you." This is wrong on two counts.

(1) ...the vestibular organs of the inner ear, along with other bodily organs of balance, motion, and position sense, are profoundly affected ("dis-regulated") by sub-audible ILFN. ... the frequency range of the normal human vestibular system (semi-circular canals, utricle, and saccule) is 0 (DC) to 20 Hz. This is infrasound.

(2) Industrial wind turbines produce strong infrasound and low frequency noise, precisely in the range (0 to 20 Hz) "listened to" by the vestibular organs—the body's principal organs of balance, motion, and position sense. There are, now, numerous noise/vibration studies unequivocally demonstrating turbine ILFN.

See "The Inaudible Noise of Wind Turbines," by Lars Ceranna, Gernot Hartmann, and Manfred Henger. Presented at the Infrasound Workshop, November 28 – December 02, 2005, Tahiti. Federal Institute for Geosciences and Natural Resources (BGR), Section B3.11. Stilleweg 2, 30655 Hannover, Germany. [Click here for the full report](#) (PDF).

Internationally acclaimed noise engineer George Kamperman calls it "the best documentation I have seen on wind turbine infrasound. This is a careful study on a single wind turbine utilizing instrumentation appropriate for measuring very low frequency infrasound."

Turn to the final page of the report, p. 23, for the authors' conclusions: "Wind turbines and wind farms generate strong infrasonic noise which is characterized by their blade passing harmonics (monochromatic signals)." You can't get any more explicit than that. Next time you hear a wind salesman dismiss infrasound and low frequency noise as

moonshine, whip out this article and start reading aloud, so the entire roomful of people hears the truth. "



Conclusions

- number of wind turbines and their size is constantly growing
- wind turbines and wind farms generate strong infrasonic noise which is characterized by their blade passing harmonics (monochromatic signals)
- generated noise of wind turbines can theoretically be estimated
 - geometrical spreading $\sim R^{-1}$
 - SPL $\sim \text{rpm}^4$
- recordings from field measurements near a single wind turbine show that the theoretical model is also valid for frequencies below a few Hz
- minimum distance between an infrasound array and a wind farm can be estimated to avoid reduction of the array's detection capability (e.g. 600MW wind turbine: $d > 15$ km, 11-element wind farm: $d > 30$ km)

BGR Bundesanstalt für Geowissenschaften und Rohstoffe
GEZENTRUM MANNHEIM

Tabelle, Nov/Dec 2003 1/10

(I took the liberty to add emphasis, hoping to make your reading more efficient) -
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