The Falmouth Experience: Life Under The Blades

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Encouraged by the Patrick Administration's goal to expand wind power, communities across the commonwealth are considering or constructing wind turbines. In the town of Falmouth, some residents say a turbine installed last year has changed their lives — and not for the better. This week, WGBH's ***Sean Corcoran*** *takes us to Falmouth to explore all sides of the issue in a special series,* ***The Falmouth Experience: The Trouble with One Town's Turbine.***

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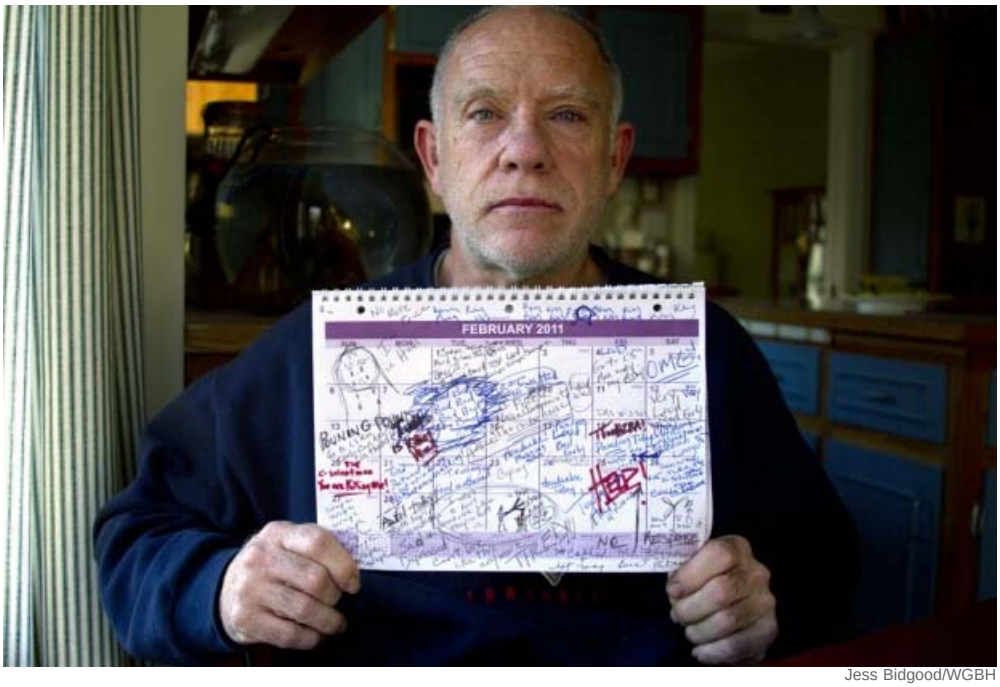
The Falmouth Experience, Part 1: Life Under The Blades

Reported by Sean Corcoran



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The ocean is a life-support system for the planet and the lifeblood of coastal communities, like Cape Cod. But human actions - from fishing to climate change - are altering the ocean in fundamental ways. Climatide is an exploration of what that means for life on Cape Cod and how we can begin to build a more sustainable relationship with the sea around us. Heather Goldstone holds a Ph.D. in ocean science and has spent several years reporting on the Cape's unique environment and research community for the Cape and Islands NPR stations.

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In his kitchen table at his Falmouth home, Neil Anderson holds the calendar where he and his wife record their daily reactions to the wind turbine located nearby.

FALMOUTH, Mass. — Standing on his home's porch, Neil Anderson points through the thicket of trees in his front yard and across Blacksmith Shop Road towards one of his closest neighbors: A wind turbine.

"Right now we are 1,320 feet, which is one-quarter mile south of Wind One, which is Falmouth's first wind turbine. It's been online since April. And we've been trying to get it stopped since April," Anderson says.

Wind One, as the turbine is officially called, is owned by the town of Falmouth and is located at the town's wastewater treatment plant, where it stands 262 feet tall to the turbine's hub. That's about 10 feet taller than the Pilgrim Monument in Provincetown. The blades extend just shy of 400 feet, which is about half the height of the John Hancock Building in Boston.

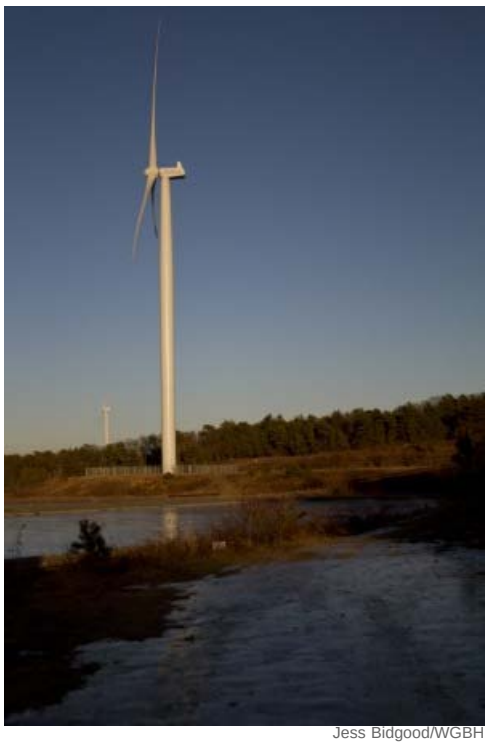
When it was installed last spring, Anderson didn't think Wind One would cause a problem. For 35 years, he's owned and operated a passive solar company on Cape Cod.

The energy conservationist in Anderson considered wind power a good principle. He wasn't alone — before the turbine switched on, Falmouth residents almost universally welcomed Wind One as a symbol of renewable energy and a way to keep taxes down.

"I was proud looking at it from this viewpoint — until it started turning," Anderson said.

But now, as many as 50 people are complaining about the turbine and the noise it makes at different speeds. A dozen families are retaining a lawyer for that reason.

"It is dangerous. Headaches. Loss of sleep. And the ringing in my ears never goes away. I could look at it all day, and it does not bother me. It's quite majestic — but it's way too close," Anderson said.



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Wind 1 stands 262 feet tall in Falmouth. As many as 50 residents of the town have complained of the health effects the turbine's noise and shadows have had on their lives.

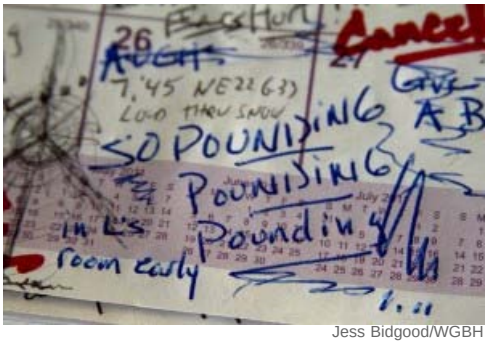
Neighbors say this isn't a debate about a turbine ruining their view, and their goal is not compensation. Some just want it turned off at night.

But Anderson can't compromise. "This house has been my hobby, my investment, and we love it out here. We will move if we have to. Because we cannot live with (the turbine). No, we cannot," Anderson said.

Wind One is expected to save the town about $375,000 a year in electricity. Heather Harper, Falmouth's acting town manager, says Falmouth owes about $5 million on the 1.65-megawatt turbine.

Harper said one of the challenges of running the turbine is that the type of sound some neighbors complain about — that low-level pulse — isn't regulated by the state. "The times I have been there I do not experience the impact of the effect that the neighbors have expressed that they've experienced. But I do believe that they are experiencing something that is very real to them," Harper said.

David McGlinchey is with the non-partisan Manomet Center for Conservation Sciences in Plymouth, which provides science-based



Jess Bidgood/WGBH

Neil Anderson and his wife keep a log of how the turbine affects them. It shows nights of disrupted sleeping, headaches, and even mood-swings.

information to policy makers. McGlinchey says that while Wind One has generated complaints, other turbines of similar size, including a 1.8-megawatt turbine in Hull, have been mostly well-received.

"The existing peer-reviewed studies suggest that there are no health effects associated with the sound and noise from wind turbines," McGlinchey said. "That being said, people clearly experience symptoms. People have headaches, people have their sleep disturbed, people are not living well next to them in some situations. In some situations they are. So, both sides are right."

Wind advocates say Falmouth's experience has made it nearly impossible to get other turbines approved on Cape Cod, and potentially across the state. Last week, Falmouth's selectmen acknowledged the issue and agreed to turn off the turbine when wind speeds exceed 23 miles per hour.

It's unclear how much relief this will bring or how long it will last, since selectmen said more permanent mitigation efforts still must be negotiated.

One looming concern of neighbors is a second turbine, one of the same size and make that has gone up not far from the first. Falmouth's Wind Two is scheduled to be turned on sometime this spring.

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State faults Falmouth wind turbine study

Photo 1 of 1 | View Enlarged Photo

A state agency has criticized a town-commissioned noise study for a municipal wind turbine at Falmouth's waste water treatment facility.

Cape Cod Times File/Steve Heaslip

By Aaron Gouveia
agouveia@capecodonline.com
February 16, 2011

FALMOUTH — In September, a town-commissioned noise study reported the 1.65-megawatt turbine off Blacksmith Shop Road did not exceed state noise limits.

But that claim is now in dispute, according to a Jan. 24 letter from the state Department of Environmental Protection.

The noise study, conducted by Harris Miller Miller & Hanson Inc., failed to properly present the sound data collected near Wind I last summer in a way that allowed state officials to determine whether the turbine is too loud, according to the letter.

"Our initial review indicates that the Falmouth Wind Turbine Noise Study does not present and aggregate the results in a manner that would allow MassDEP to draw a conclusion regarding compliance with the MassDEP Noise Policy," writes Laurel Carlson, acting deputy regional director for the DEP.

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Sound data should have been broken down into one-hour average periods as opposed to three-hour averages, and pure tone data should have been provided in decibels, not statistical form, Carlson said.

Representatives from the consulting company did not return a phone message seeking comment.

Heather Harper, Falmouth's acting town manager, said she is reviewing the matter with the company and hopes to resubmit the data in approximately a week so DEP can make a ruling.

But for dozens of residents who claim the turbine negatively impacts their health, the DEP letter is further proof town officials rushed the erection of the turbine without due diligence.

"We've become the poster child for how not to do this process," said Todd Drummey, who lives near the turbine.

Drummey and other residents are upset because town officials were told about the flaws in the study months ago but did nothing.

After the town's consultant study came out in September, neighbors directed their own consultants, Noise Control Engineering Inc., to review it. Noise Control Engineering last month pointed out the same flaws in the study as the DEP did, but the town took no action.

"The town said the (HMMH) study gave them a clean bill of health, but it doesn't," said Christopher Senie, the lawyer representing more than a dozen Falmouth residents who live near the turbine.

Multiple neighbors are also troubled that Falmouth officials received the DEP letter on Jan. 24 but did not make it public for nearly three weeks.

Meanwhile, the Falmouth Zoning Board of Appeals has been involved in a contentious hearing regarding the turbine and the decision by Building Commissioner Eladio Gore not to require a special permit for Wind I.

A final vote is expected at Thursday's board of appeals meeting, but the hearing was officially closed last week and no new information can be considered, Senie said.

The delay in notifying residents and their attorneys about the DEP letter was unintentional, Harper said Tuesday. She said she didn't receive it until Thursday because it was e-mailed to former Town Manager Robert Whritenour's address.

The letter was addressed to David Carignan, Falmouth health agent, who did not return a phone message seeking comment Tuesday.

"I can't explain why it wasn't forwarded to me by other staff," Harper said. "I had been away for several days. Perhaps it was a misunderstanding of whether I was around or not."

But that isn't sitting well with residents who have already complained about a lack of communication regarding the turbine.

"I am extremely disturbed by the fact that the town did not share this letter with the abutters, attorneys for the abutters, or the abutter's noise consultant," Drummey wrote in an e-mail to town officials Tuesday. "As the letter is dated three weeks ago, I can only assume that the town did not intend to release this information."

Malcolm Donald, another neighbor, said he is "sickened" by the lack of consideration shown to the residents who live near Wind I.

Many homeowners say they are considering selling their houses due to stress caused by the turbine. An identical turbine on the same lot will likely be operational in the next few months.

"Our independent sound engineers made comments on the town study and where the weaknesses were, but the town doesn't care," Donald said. "This is having an adverse health impact on people's lives."

But Harper cited a plethora of collaboration between the town and Noise Control Engineering during the sound study and said town officials have always been "concerned" about the neighbors' complaints.

Although there will be some minor modifications as to how the second turbine operates, Harper does not anticipate any delays in getting it online.

"The contract is under way for Wind II and we're moving forward," she said.

HOME

Reader Reaction

Echo 1 Items Admin

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From the Danish Energy Agency

Loss of value to real property due the erection of wind turbines
An erector of a wind turbine has a duty to pay compensation for loss of value of real property following the erection of the wind turbine. The size of the loss of value is determined by an appraisal authority.
If a property loses more than 1 per cent in value due to the erection of new wind turbines, the owner is ensured full compensation for his loss. The owner of the property must notify his claim for compensation for loss of value to Energinet.dk. As owner of the property you can choose to enter into a voluntary agreement for compensation for the loss of value with the erector of the wind turbine, or you can ask an impartial appraisal authority to make a specific appraisal of the property and determine the scope of your loss.

The claim from the owner of a property affected must be notified before the wind turbine has been erected. The erector of the wind turbine is therefore obligated to visualise the project and prepare other material as well as provide information to the citizens affected at a public meeting no later than four weeks before the municipal planning process ends. Any claims raised at a later stage will only be assessed as an exception to the rule.

Energinet.dk, which is responsible for operating the electricity grid in Denmark, is managing the scheme.
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Wind Turbine Noise: A Real Headache, But Not Why You Think

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By: Michael C. Bailey
Published: 07/25/10

By MICHAEL C. BAILEY

Sleep deprivation, elevated stress levels, headaches, feelings of nausea – symptoms described by a number of Falmouth residents living near the town-owned wind turbine off Blacksmith Shop Road. What they want to know: is noise from the turbine causing these problems, or is it all in their heads?

The answer, according to Dr. Robert J. McCunney, may lie somewhere in-between.

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Region community

Dr. McCunney spoke before more than 70 people last week at a forum co-sponsored by the Cape and Islands Renewable Energy Collaborative (CIRenew) and the New England Wind Energy Education Project (NEWEEP) entitled “Wind Turbines – Noise & Health: Fact Vs. Fiction.”

Dr. McCunney is a staff physician at Massachusetts General Hospital, a clinical faculty member at Harvard Medical School, and a research scientist at Massachusetts Institute of Technology, and served on a joint American Wind Energy Association/Canadian Wind Energy Association panel to study the health effects on wind turbine noise.

The information Dr. McCunney presented at the forum, held at Upper Cape Cod Regional Technical School, was drawn from two peer-reviewed studies of the effects of wind turbine noise on human health, conducted in Europe in 2007 and 2009.

The reports focused on three aspects of wind turbine operations: the audible “swish swish” sound of a turbine’s blades, and the low-frequency sound and ultra low-frequency “infrasound” generated by the turbine’s motor.

Infrasound is defined as a sound with a frequency of 20 hertz (Hz), which is below the range of normal human hearing; human speech ranges from 500 and 20,000 Hz. According to Dr. McCunney, infrasound can become audible at higher decibel (dB) levels; wind turbines generate infrasound at 50 to 70 dB, which is below audible levels.

The sound of the turbines cutting the air falls in the 500 to 1,000 Hz, which qualifies as neither infrasound or low-frequency sound, Dr. McCunney added.

The studies cited by Dr. McCunney indicated that there is no clear connection between low-frequency noise or infrasound and adverse health effects. Several other studies mirror those findings, and the World Health Organization (WHO) in 1999 declared that inaudible low-frequency noise was not a health concern.

“There’s no reliable evidence that infrasounds below the hearing threshold produce physiological or psychological effects,” he said, referring to the WHO report.

Moreover, Dr. McCunney said the federal Food and Drug Administration (FDA) has approved the use of infrasound at 70 dB for therapeutic massage purposes. “The FDA is not an easy organization to get something through,” he noted.

One of the arguments in support of what has been dubbed “wind turbine syndrome” comes from the person who coined the phrase: pediatrician Dr. Nina Pierpont, author of “Wind Turbine Syndrome – A Report on a Natural

Experiment."

The book is a study of 10 families (38 individuals total) showing, according to Dr. Pierpont's official website, a "seemingly incongruous constellation of symptoms" that comprise wind turbine syndrome, including irregular heartbeat, nausea, tinnitus (a persistent ringing in the ears), headaches, vision problems, and sleep disturbance.

Dr. Pierpont maintains in her book that the low-frequency noise generated by wind turbines is the root cause for this condition, which is currently not recognized by any medical organization in the US as a legitimate diagnosis. Dr. McCunney said his research turned up no scientific studies of or research on wind turbine syndrome.

He pointed out that Dr. Pierpont's book was not peer-reviewed, the strongest level of scientific research. He further noted that most of the 36 references he found to "vibroacoustic disease" – ailments caused by low-frequency vibrations, such as wind turbine syndrome – came from a group of Portuguese scientists conducting case studies, the weakest level of scientific research.

Sound Equals Fury

Then there is the audible sound of the blades cutting the wind, which Dr. McCunney said is, in his experience, most often what disturbs people living near turbines and is the likely cause for their reported health issues.

The noise generated by the blades moving through the air generally falls within the 35 to 45 decibel range as measured from 984 feet from the source (as per the National Research Council). An Ontario Public Health Agency study indicated that a wind farm (a facility comprising multiple turbines) generates between 30 and 50 dB as measured at a distance of just over 1,100 feet.

The NRC said the noise of a single turbine is 90 to 105 dB as measured at the source.

In comparison, the human voice during at a whisper is about 20 dB, normal conversation ranges from 50 to 70 dB, and a jet engine registers 140 dB. The medical community considers prolonged exposure to sound registering 85 dB – the noise level generated by busy city traffic – to pose a risk to human hearing, while sound on the high end such as a jet engine or shotgun blast (155 dB) can cause instant damage.

In its 2009 report the Santa Fe, New Mexico-based Acoustic Ecology Institute (AEI) stated that the ambient noise levels for a typical rural neighborhood at night is 30 dB, "so, it is not that hard for wind farms to become a new and dominant acoustic presence."

In some communities in the US, the AEI reported, a setback standard is adopted for onshore wind turbines based on the turbine's height: the distance between the turbine and a home should be at least five times the height of the turbine.

Although the sound of the blades moving through the air is undeniably audible over significant distances, Dr. McCunney said the evidence indicates that any health problems are linked less to the sound quality itself and more to whether the listener regards the sound as "annoying" – the definition of which is highly subjective.

Referring back to Dr. Pierpont's book, Dr. McCunney said the symptoms that allegedly come with wind turbine syndrome "seem to be what's been described about 30 or 40 years ago in the context of annoyance from noise" rather than low-frequency vibrations.

"The similarity between symptoms of noise annoyance and those of wind turbines indicates that this diagnosis is not, at least according to many, a pathological effect but an example of the stress effects of exposure to noise of virtually any type," Dr. McCunney said.

However, that conclusion did not sit well with several members of the audience, who said they lived near the Falmouth turbine, located at the town's wastewater treatment facility. During a question-and-answer sessions, people challenged Dr. McCunney's conclusions, presenting their own symptoms as evidence that the turbine was causing health problems.

Dr. McCunney did not dispute their claims that they were dealing with health issues ranging from sleep deprivation to chronic headaches, but reiterated that the root cause was the turbine's audible noise and their individual and subjective reactions to it.

Those reactions, he said, may be influenced by an individual's pre-existing opinion of wind turbines.

The European studies drew the conclusion that a small percentage of people reported being annoyed by sound levels of up to 35 dB, but as shown in a 2009 cross-sectional study conducted in the Netherlands, among 2,000 people living within a mile and a half of wind turbines, people who reported being annoyed by the sound of the turbines also reported disliking the turbines for other reasons: aesthetics, lack of economic benefits such as lower utility rates, et cetera.

"This has been a recurring theme I've seen in the research on wind turbines," Dr. McCunney said. The Swedish study in 2007 interviewed 750 people living at least 1,968 feet from wind turbines, and that study found that "those who had an unfavorable attitude toward wind turbines were over 13 times more likely to report being annoyed by [the

noise].”

He did not have a firm explanation as to why very young children, who ostensibly do not have opinions on wind turbines, also experience these symptoms, but said the concept of annoyance is very relative.

“Annoyance means different things to different people,” Dr. McCunney said. “Annoyance could be standing too long in a line at the post office or being stuck in traffic…it’s hard to get an objective definition of what annoyance means in terms of the health implications.”

A few members of the audience challenged Dr. McCunney’s objectivity, pointing out his work on the American Wind Energy Association/Canadian Wind Energy Association panel. “I approached this topic honestly, with no axe to grind,” he said. “I approached this thinking that I’m balanced, but I understand because of my conclusions people might think otherwise, but that’s the way it goes.

“My goal here is that if you’re going to be making public policy based on science, to try to make it on the best available interpretation of the science as you can,” Dr. McCunney said. “My bias is, make sure that you interpret the science in a proper way for public policy.”

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