

# Hearing Earth

## Geophysicist Probes Sounds of Living Planet

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STEBEN — Artist John Bullitt listens closely to sounds most never even think about — such as the subterranean reverberations of a distant earthquake or of a remote volcanic eruption.

He first became aware of these sounds when he built a seismometer as an undergraduate majoring in physics at Grinnell College in Iowa.

### Rumblings

Steben geophysicist John Bullitt has collected many earthy — and unearthy — sounds from the planet. Sample some at [www.fenceviewer.com](http://www.fenceviewer.com). Tune in and hear the tides, peepers, creaking boards and other intriguing audio clips at [www.jtbullitt.com](http://www.jtbullitt.com).

The seismometer, Bullitt realized, provided a continuous record of ground motion not only nearby but on the other side of the world.

"I thought, 'Here I am in the cornfields of Iowa and I can be listening to earthquakes in the South Pacific,'" he said.

Bullitt went on to earn a master's degree in geophysics at the University of California at Berkeley.

Eventually he entered a doctoral program in geophysics at the Massachusetts Institute of Technology.

It was about that time he began taking the "wiggles" recorded by seismometers, fed them into his computer and, using software he designed, turned the waves into sound.

Bullitt said he was fascinated that one can be standing on the ground, which to all appearances is stable, yet beneath the surface the Earth is slowly rising and falling 1 foot each day.

"All of this is going on and we're unaware of it most of the

time," he said.

Bullitt said the ambient terrestrial vibration is far too low in pitch for human ears to hear, but the movement of the Earth's solid crust and mantle obey the same physical laws as audible sound in air.

"They rise, spread, reverberate, and die away within the vast interior of the Earth, just as a hymn echoes beneath the soaring dome of a gothic cathedral," he said in his description of a CD he recorded in 2007, "Earth Sound."

Bullitt abandoned the Ph.D. program and became deeply interested in Buddhism. By the early 1990s he had created a website — [www.accesstoin-sight.org](http://www.accesstoin-sight.org) — that became a major source of information about Theravāda Buddhism.

He returned to his sound work about 15 years later. He rented a studio space in Somerville, Mass., alongside other artists and developed a sound installation room with several speakers that played subterranean sounds around the world simultaneously.

This is also the period when he recorded "Earth Sound."

"The reaction some people had when they walked into the room was to be confused and walk out," Bullitt said. "Others actually listened to the sound. Some had an epiphany."

Surprisingly, he said, some children would lie down, their ear pressed to the floor, saying they felt "safe."

"Yet the sounds were of the violence and upheaval and restlessness of the planet," Bullitt said.

The raw data for "Earth Sound" came from the International Deployment of Accelerometers (IDA) network

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operated by IRIS, an international consortium of research institutions that collect, archive and distribute digital seismic data.

IDA's sensitive instruments are located around the world in boreholes 100 meters underground. The instruments continuously monitor the three-dimensional motion of the ground — up and down, north and south, east and west — 20 times per second.

Bullitt then used custom software to assemble the patchwork of raw seismic data into continuous time-synchronized files.

Although he cleaned up distracting background noise, Bullitt said he did not add any echo or reverberation.

"The recordings place you, the listener, deep within the Earth, your ears in tune with the planet's

**"Whatever our fate,  
there is an ancient  
underlying order and  
beauty to this world  
that will endure.  
The music of Earth  
will play on."**

— John Bullitt

own deep vibrations," Bullitt said of the CD.

He relocated to Maine two years ago. Bullitt said his fondness for the shore took him along the coast and eventually to shoreline Washington County.

"There's the wildness," he said. "And it's just so beautiful. And I love being close to the tides."

His current interests are recording sound in the moment, what is going on beneath his feet at any one point in time.

Bullitt also is intrigued by the scratches on bedrock left by glacial movement. The grooves, he said, remind him of the grooves on a record.

He's now trying to find a way to "play" the grooves in order to hear the Earth's "oldest phonograph."

The Buddhism and the geophysics have meshed into a deep appreciation for the Earth on a multitude of levels and one he hopes to awaken in other people.

"If we all really appreciate the beauty and wonder and rare gift we have living on this planet, we'd all be at peace with each other," Bullitt said.

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