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Geologist: NYC on Shaky Ground

The ground underneath New Yorkers' feet may not be as solid as previously believed, according to a study released yesterday at Hofstra University.

In fact, according to Charles Merguerian, a geology professor at Hofstra, the very bedrock of Manhattan has fault lines previously unknown and may be more susceptible to earthquakes than believed.

"Everyone has thought that we are not in danger in the metropolitan area because we are not near a plate boundary, like California," Merguerian said in an interview after presenting his findings at a conference called "The Geology of Southern New York."

"But there are still stresses in our crust," he said. "Even though they may date to collisions that took place as far back as 450 million years ago, they are still locked in rocks."

Merguerian, whose presentation on the geology of New York City was the highlight of the conference, studied core drillings, newly excavated water

tunnels and outcroppings of rock wherever he could find them. The result is a new geologic mapping of New York that turned up younger "brittle" faults beneath both Dyckman Avenue and 155th Street in the Bronx, 96th Street in Manhattan and one just to the east of Roosevelt Island. He also confirmed the existence of a fault beneath 125th Street.

Long Island, which sits atop sand, is not affected by the faults. "If you're built on rock and it moves, there can be a problem," said Lee Koppelman, executive director of the Long Island Regional Planning Commission. "But if you're built on sand like Long Island, which has no fault lines running through it, there is no problem. Even if there was a strong enough tremor in Westchester, we might feel it, but sand is a good absorber of shock."

While there is a consensus that there is seismic activity in the metropolitan area, geologists emphasize that they have yet to decide whether a major earthquake is at all possible, let alone when it might occur.

"There is enough evidence to say there is something to think about," said Michael Greenman, a geologist who does subsurface investigations of new construction for the city's Department of General Services.

Merguerian said construction of the 63rd Street water tunnel has provided crucial evidence of movement in the deeper, so-called "ductile" faults, which are reactivated when the brittle faults, which measure no more than 2 inches in width and extend through Manhattan, move.

"You can see the fresh-looking greenish activity in the ductile fault here," he said, referring to a photograph of the tunnel's bare rock. "It indicates a recent northwest trending." The direction of movement, or trending, is especially significant because it reflects the movement of last October's earthquake in Westchester, which measured 4.0 — considered moderate — on the Richter scale.

"The northwest trending of the brittle

faults appears to be the same as the quake in Westchester," Merguerian said. "This demonstrates the possibility of activity in an area previously thought to be free of it."

Other geologists see some validity in Merguerian's study.

"There seems to be a correlation between the geometry of his brittle faults and our own earthquake studies," said Leonardo Seeber of Columbia University's Lamont-Doherty Geological Observatory.

Several engineers of some of the city's tall buildings are taking note of the new discussion, but thus far do not consider it necessary to alter their standards.

"Despite what geologists are saying," said Irwin Cantor, chief executive officer of the Office of Irwin Cantor, engineer for Trump Tower and other buildings, "the engineering community has not had to think about upgrading the structure of high-rise buildings. By designing for wind, we have prospective earthquakes covered."