

双语：地球深处发现“大洋”面积相当于北冰洋 PDF转换可能丢失图片或格式，建议阅读原文

https://www.100test.com/kao_ti2020/177/2021_2022__E5_8F_8C_E8_AF_AD_EF_BC_9A_E5_c84_177909.htm Scientists scanning

the deep interior of Earth have found evidence of a vast water reservoir beneath eastern Asia that is at least the volume of the Arctic Ocean. The discovery marks the first time such a large body of water has found in the planet's deep mantle. The finding, made by Michael Wyession, a seismologist at Washington University in St. Louis, and his former graduate student Jesse Lawrence, now at the University of California, San Diego, will be detailed in a forthcoming monograph to be published by the American Geophysical

Union. Looking down deep The pair analyzed more than 600,000 seismograms records of waves generated by earthquakes traveling through the Earth collected from instruments scattered around the planet. They noticed a region beneath Asia where seismic waves appeared to dampen, or “attenuate,” and also slow down slightly.

“Water slows the speed of waves a little,” Wyession explained.

“Lots of damping and a little slowing match the predictions for water very well.” Previous predictions calculated that if a cold slab of the ocean floor were to sink thousands of miles into the Earth's mantle, the hot temperatures would cause water stored inside the rock to evaporate out. “That is exactly what we show here,” Wyession said. “Water inside the rock goes down with the sinking slab and it's quite cold, but it heats up the deeper it goes, and the rock eventually becomes unstable and loses its water.” The water

then rises up into the overlying region, which becomes saturated with water. “ It would still look like solid rock to you, ” Wyssession told LiveScience. “ You would have to put it in the lab to find the water in it. ” Although they appear solid, the composition of some ocean floor rocks is up to 15 percent water. “ The water molecules are actually stuck in the mineral structure of the rock, ” Wyssession explained. “ As you heat this up, it eventually dehydrates. It ’ s like taking clay and firing it to get all the water out. ” The researchers estimate that up to 0.1 percent of the rock sinking down into the Earth ’ s mantle in that part of the world is water, which works out to about an Arctic Ocean ’ s worth of water. “ That ’ s a real back of the envelope type calculation, ” Wyssession said. “ That ’ s the best that we can do at this point. ” The Beijing anomaly Wyssession has dubbed the new underground feature the “ Beijing anomaly, ” because seismic wave attenuation was found to be highest beneath the Chinese capital city. Wyssession first used the moniker during a presentation of his work at the University of Beijing. “ They thought it was very, very interesting, ” Wyssession said. “ China is under greater seismic risk than just about any country in the world, so they are very interested in seismology. ” Water covers 70 percent of Earth ’ s surface and one of its many functions is to act like a lubricant for the movement of continental plates. “ Look at our sister planet, Venus, ” Wyssession said. “ It is very hot and dry inside Venus, and Venus has no plate tectonics. All the water probably boiled off, and without water, there are no plates. The system is locked up, like a rusty Tin Man with no oil. ” [中文链接](#)（并非全文翻译）：本报

综合消息近日，美国科学家报告说，他们在地球深处发现一个巨大的，面积与北冰洋一般大小的“大洋”。这是科学家第一次在地表下发现如此多的水。华盛顿州立大学的地质学家迈克尔维瑟逊和校友加州大学的耶西劳伦斯合作完成的论文已发表在美国地球物理协会的杂志上。更为有意思的是，这一巨大水体的位置主要是在东亚及北京的地下深处。因此科学家把这种新的地底特征称为“北京异常”。然而，如此面积巨大的水体不可能有一个人会打算利用潜艇对这一区域进行探测，原因在于，所发现的这些水体均被禁闭在位于地表以下700公里到1400公里的岩石之中。地表以下700公里到1400公里位置本应该是属于地幔层。地幔有可能存在如此大面积的地下水吗？中国地质科学院地质所研究员韩同林告诉记者，东亚地区地下是否真正含有美国专家所推测的含水岩石区还需要进一步研究。维瑟逊提到，新发现的地下水以0.1%的比例存在于距地表700公里到1400公里的岩石中，虽然它的比例很小，但是总量估计的数字却非常巨大。如果进一步的勘测证明了维瑟逊的推测，那么相当于北冰洋水量的这些结晶水是否能加以开发利用呢？韩同林说，虽然理论上我们通过开采这些岩石经过高温融化蒸发收集和过滤是可以获得水的，但是目前这项工作的成本将是人们负担不起的。岩石中为何会有水呢？韩同林解释，前苏联有科学家就曾提出，现在地球表面的水仅仅占地球总水量中的13%，还剩87%的水量保存在地幔里，成为不断补充地表水分的后备来源。

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