

The Ocean's Impact on Slow Slip Events

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The ocean waters may impart stresses that change how shallow submarine and near-coastal faults start or stop slipping, particularly when they slip slowly over days to months (in episodes called slow slip events, or SSEs). We can now assess this possibility using new simulated seafloor pressures and a catalog of SSEs in the Hikurangi subduction zone, encompassing the onshore and offshore region of northeastern New Zealand. We only ask how probable this causal connection is because SSEs are difficult to measure precisely and many physical processes may change their behaviors. Our statistical analyses do not reveal any impact of ocean pressure changes on how or when SSEs start, but do indicate they may affect when SSEs end. One explanation of this result is that the slow slippage actually causes the fault to become weaker, making it more sensitive to the small stress changes imparted by the ocean.