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Mixed deformation styles on a shallow subduction thrust, Hikurangi margin, New Zealand

Fagereng, A., Savage, H.M., Morgan, J.K., Wang, M., Meneghini, F., Barnes, P.M., Bell, R., Kitajima, H., McNamea, D.D., Saffer, D.M., Wallace, L.M., Petronotis, K., LeVay, L., and IODP Expedition 372/375 Scientists.

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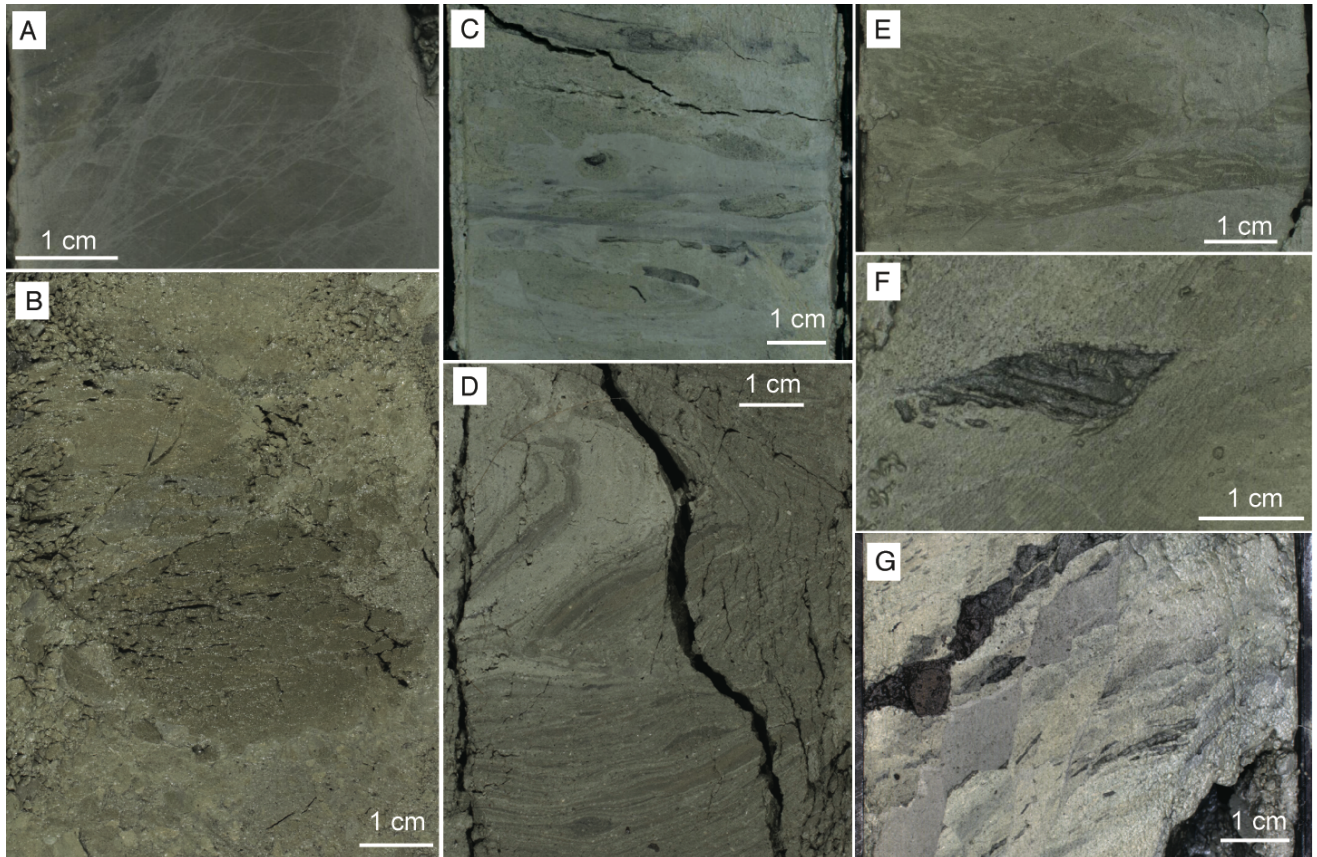


Figure DR1: Clean core images used to describe key structures in the text and Figure 3

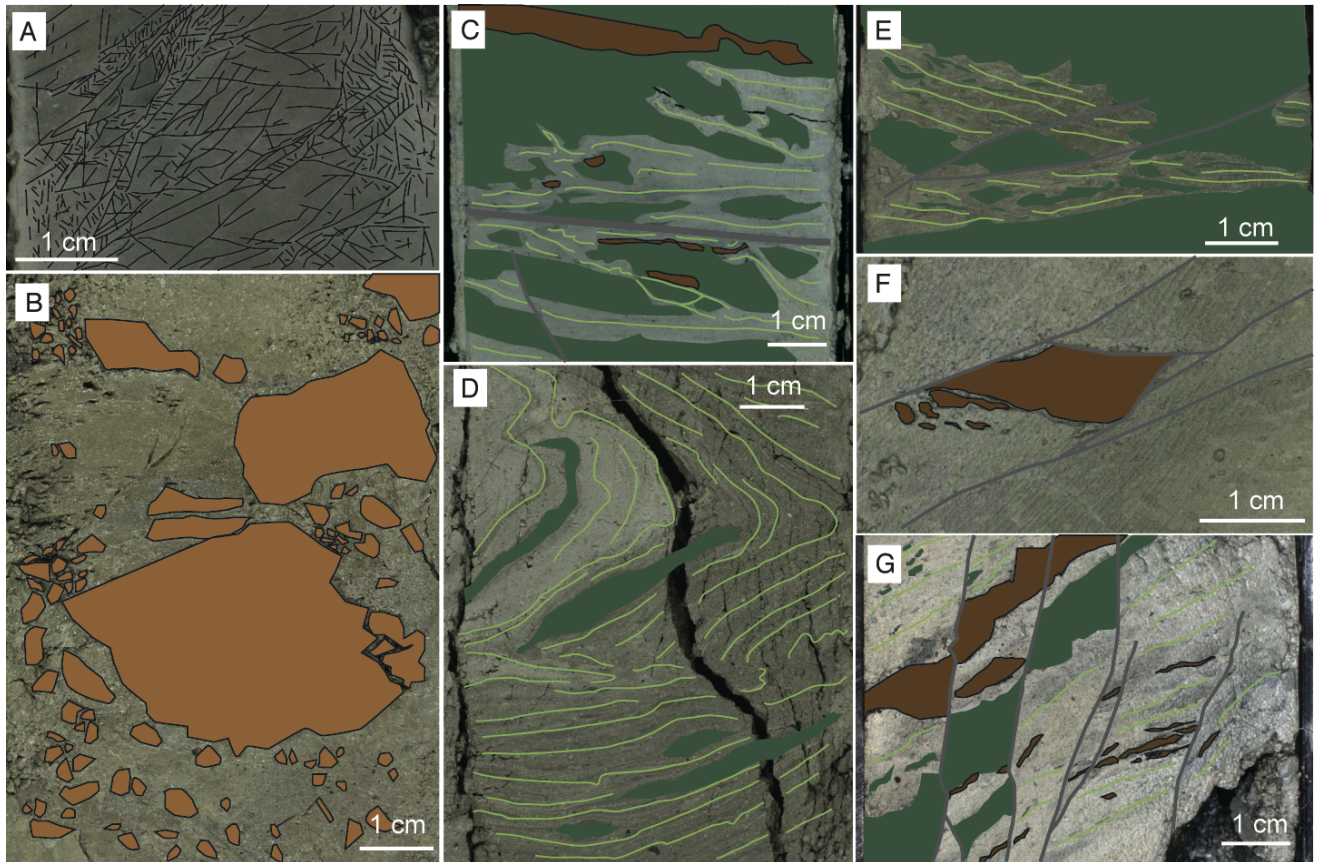


Figure DR2: Interpreted core images (see Figure 2 for legend).

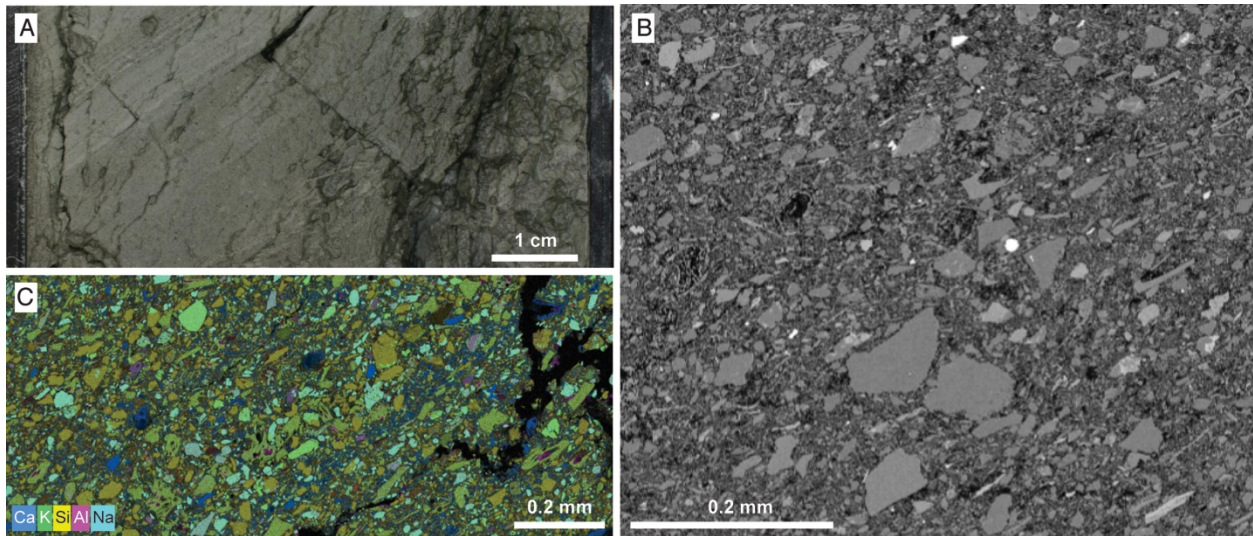


Figure DR3: General microstructure of sample IODP375-U1528F-13R2 18-21 cm. A: Core photograph of sampled interval, working section, showing planar laminations dipping gently to the left. This lamination is defined by grain size and clay content, with a general shape-preferred orientation parallel to layering. Back scatter electron (BSE) image in panel B illustrates this moderate shape-preferred orientation. An Energy Dispersive Spectroscopy (EDS) map shown in panel C was acquired on a Zeiss Sigma HD Scanning Electron Microscope in the School of Earth and Ocean Sciences at Cardiff University, with a beam voltage of 15kV, 120 μ m aperture, and 500 ms dwell time. The resultant pixels are approximately 2 μ m. The element map highlights coarser, silica-rich layers, and finer, relatively pelitic layers, as well as a moderate shape preferred orientation.

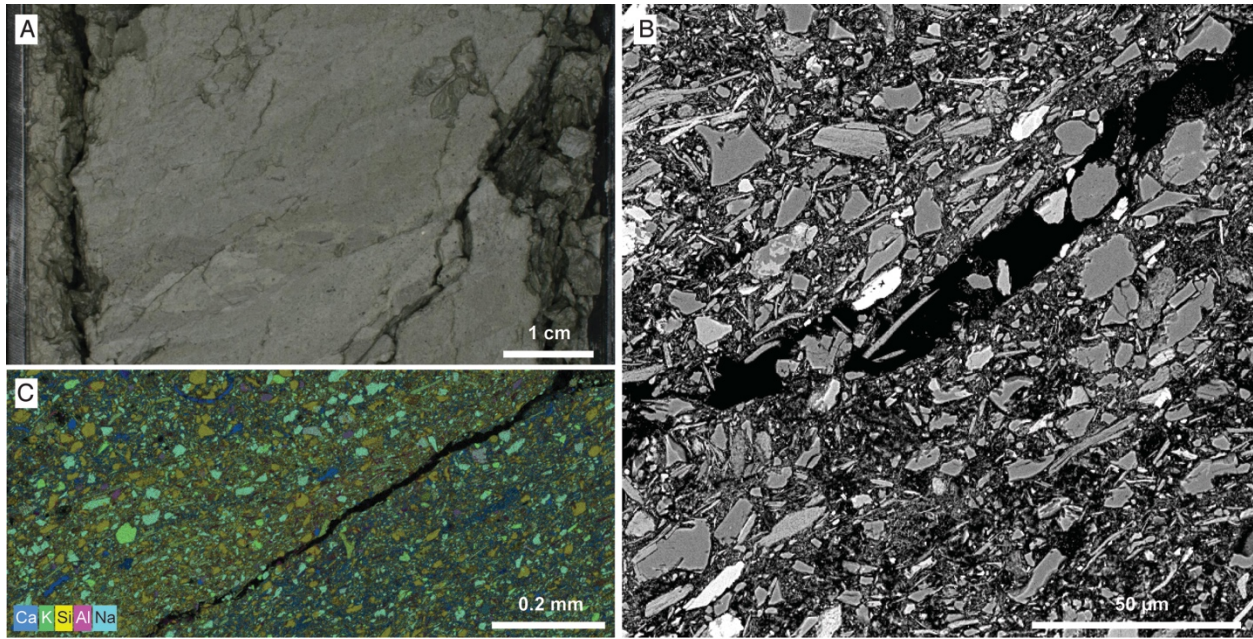


Figure DR4: General microstructure of sample IODP375-U1528F-13R2 56-60 cm. A: Core photograph of sampled interval, working section, showing locally disrupted layering dipping gently to the left. Back scatter electron (BSE) image in panel B illustrates a qualitatively better developed shape-preferred orientation than in the less disrupted sediments shown in Figure DR3. An Energy Dispersive Spectroscopy (EDS) map shown in panel C was acquired on a Zeiss Sigma HD Scanning Electron Microscope in the School of Earth and Ocean Sciences at Cardiff University, with a beam voltage of 15kV, 120 μm aperture, and 500 ms dwell time. The resultant pixels are approximately 2 μm . The element map highlights a general fine grain size, weak layering defined by more and less pelitic sediments, and a layer-parallel preferred orientation of elongate grains.

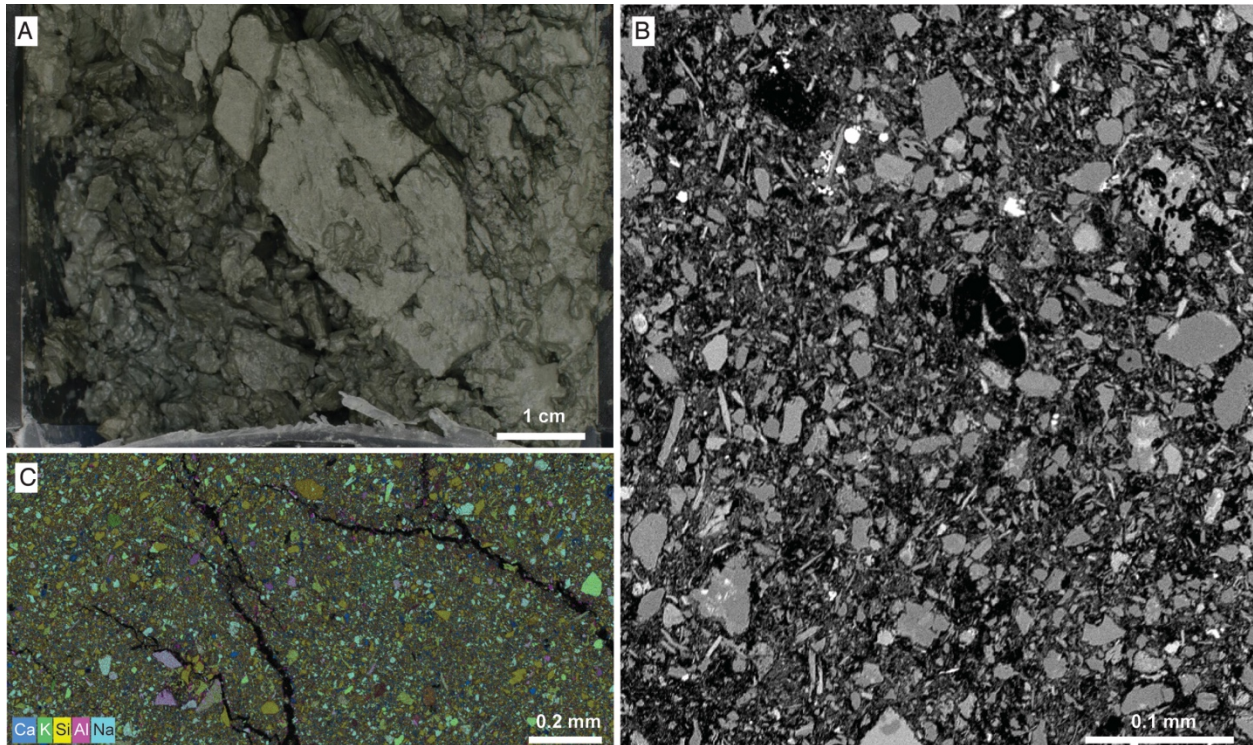


Figure DR5: General microstructure of sample IODP375-U1528F-13R2 139-144 cm. A: Core photograph of sampled interval, working section, showing brecciated mudstone. Back scatter electron (BSE) image in panel B illustrates a lack of shape-preferred orientations in comparison to samples in Figures DR3 and DR4; note also a lack of fractures in individual grains. An Energy Dispersive Spectroscopy (EDS) map shown in panel C was acquired on a Zeiss Sigma HD Scanning Electron Microscope in the School of Earth and Ocean Sciences at Cardiff University, with a beam voltage of 15kV, 120 μm aperture, and 500 ms dwell time. The resultant pixels are approximately 2 μm . The element map highlights a lack of grain alignment and a lack of compositional layering. Although elongate brecciated clasts can be seen to have long axes plunging to the right in panels A and C, these are not defined by any macroscopic, microscopic, or chemically defined boundaries other than open fractures.