

Faults are primary focuses of both fluid migration and deformation in the upper crust. The recognition that faults are typically heterogeneous zones of deformed material, not simple discrete fractures, has fundamental implications for the way geoscientists predict fluid migration in fault zones, as well as leading to new concepts in understanding seismic/aseismic strain accommodation. This book captures current research into understanding the complexities of fault-zone internal structure, and their control on mechanical and fluid-flow properties of the upper crust. A wide variety of approaches are presented, from geological field studies and laboratory analyses of fault-zone and fault-rock properties to numerical fluid-flow modelling, and from seismological data analyses to coupled hydraulic and rheological modelling. The publication aims to illustrate the importance of understanding fault-zone complexity by integrating such diverse approaches, and its impact on the rheological and fluid-flow behaviour of fault zones in different contexts.