A retrospective of the work of Patience Cowie: the interaction of faults in space and time and their influences on subsurface fluid flow, surface processes and earthquakes

Zoe Shipton
Department of Civil and Environmental Engineering, University of Strathclyde, Glasgow, G11XJ (zoe.shipton@strath.ac.uk)

Patience Cowie was a truly outstanding scientist whose research spanned several disciplines of structural geology and tectonics. She made a lasting contribution to every discipline she published in and as well as academic advances, produced significant impacts in the hydrocarbon industry and earthquake hazard assessment. Her research in fault mechanics and fault population was a genuine game-changer. The implications of her work for predicting fault patterns and linkage have been crucial for the interpretation of 3D seismic data, and for examining the interplay between faults and the basins they bound and sediments they host. More recently she explored relationships between fault geometry, slip rate and recurrence intervals along seismically active faults, with important implications for earthquake hazard assessment.

Patience’s drive to constrain physical explanations of the underlying dynamics of Earth processes meant her numerical modelling was always firmly grounded in field observations. Her models incorporated the effects of stress in time and space as fault system evolved, but always underpinned by geometric and kinematic observations in the field. She loved fieldwork and her joy at the beauty of geological structures was infectious and inspiring.