

Coastal Tectonics

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Coastal Tectonics

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Preface

At first glance, coastal tectonics is as redundant a category as inland tectonics, for the shoreline does not necessarily coincide with a distinctive geodynamic environment. What prompted the international conference on the subject that led to this book was the Editors' conviction that coasts favour the study of active tectonics (a) by providing a reference datum – namely sea level – against which deformation can be measured and (b) by supplying datable material and environmental clues with which the progress of deformation can be traced.

As a bonus we have coasts which temporarily coincide with a tectonic boundary or major structure and wash it clean for our inspection. Consider plate boundaries such as those of the western Americas where subduction and transform displacement are now operating, or the extensional coasts of the Gulf of Corinth where normal faulting will perpetuate tectonic conditions on the coast for some time to come. There are also countless locations, notably oceanic islands, which are tectonic at one remove, as their uplift or subsidence reflects the dynamic behaviour of the lithosphere elsewhere.

There was a further question to be resolved. The original plan had been to focus on Late Quaternary coastal tectonics, but this soon emerged as unnecessarily restricting: why 'late', and why Quaternary, when many active coasts began to deform in the Tertiary or even earlier, and when much illuminating work depends on the evidence of seismology and geodesy?

We have an excellent precedent for our title: that of the survey by Ken Lajoie (1986) that did much to define the scope and procedures of tectonic investigations on coasts. Lajoie opened his discussion by observing that between one third and one half of the Earth's marine coastlines lie along or near tectonically active plate boundaries. By implication he was emphasizing mechanism rather than narrative, and that was our intention when we organized a conference around the application of high-resolution coastal chronologies to the testing and refining of crustal models at local, regional and global scales.

The papers that follow (which include seven that were solicited after the meeting) have accordingly been grouped into sections which deal in turn with the extraction of tectonic data from the many kinds of noise in the coastal record and with their bearing on the analysis of interplate and intraplate tectonics and the construction of earthquake sequences. Lack of space meant that some themes, such as salt tectonics, receive little mention; conversely, areas which have attracted investigation from various viewpoints, notably coastal California, are discussed in more than one paper. Of the many possible dating methods, the emphasis is on radiocarbon and U-series techniques, but one of the papers reviews the potential value of stable isotopes in the correlation of marine terraces, two are primarily concerned with archaeological indicators of tectonic displacement, and another exploits historical records which have long lain unread in the archives; *Strombus bubonius* emerges reinvigorated in its new tectonic role. Some persistent geodynamic problems are at best highlighted by the work reported in this book, notably the distinction between seismic and aseismic contributions to net tectonic strain; the distinction between stable and unstable coastlines, however, emerges as unhelpful.

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Iain Stewart & Claudio Vita-Finzi