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The Tectonic and Climatic Evolution of the Arabian Sea Region

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Over long periods of time the tectonic evolution of the solid Earth has been recognized as the major control on the development of the global climate system. Tectonic activity acts in one of two different ways to influence regional and global climate: (i) through the opening and closing of oceanic gateways and its effect on the circulation patterns in the global ocean; (ii) through the growth and erosion of orogenic belts, resulting in changes in oceanic chemistry and disruption of atmospheric circulation. The Arabian Sea region has several features that make it the best area globally to examine solid Earth–climatic interactions. Indeed, it can be regarded as the global type area for studies of climate and palaeoceanographic responses to tectonic activity, most notably in the context of the South Asian monsoon and its relationship to the growth of high topography in the adjacent Himalayas and Tibet.

The Tectonic and Climatic Evolution of the Arabian Sea Region brings together a collection of recent studies on the area from a wide group of international contributors. The papers range from high resolution, Holocene palaeoceanographic studies of the Pakistan margin to regional tectonic reconstructions of the ocean basin and surrounding margins throughout the Cenozoic. Marine geophysics, stratigraphy, isotope chemistry and neotectonics come together in a multidisciplinary approach to the study of interactions of land and sea. While much work remains to be done to understand fully the tectonic and climatic evolution of the Arabian Sea, a great deal has been achieved since the last major review, as detailed in the 26 contributions. This volume is essential reading for palaeoceanographers, sedimentologists and geophysicists. It will also be of interest to structural geologists and those working in the petroleum industry.

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Cover illustration: NASA satellite image of the Gulf of Oman and Persian Gulf looking westward. The image shows the coast parallel ridges of the Makran Accretionary Complex on the right central (north) side of the image. The Oman (Semail) Ophiolite is clearly seen as a dark crescent on the central left (south) of the image. Clouds of dust from the deserts of central Arabia can be seen moving northeastwards across the Gulf of Oman. These particles are picked up by the strong summer monsoon winds, driven by low atmospheric pressure over the Tibetan Plateau. The winds drive seasonal coastal upwelling and high biogenic productivity along the Oman margin, whose record is preserved in the sediments of the Arabian Sea.

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