

Global hotspot maps

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ABSTRACT

This chapter provides a catalog and maps of those volcanic, tectonic, and geochemical features that have become known as “hotspots,” including those that may have a shallow plate tectonic or asthenospheric origin. Many proposed hotspots, including isolated structures and the active portions, or inferred ends, of seamount chains, do not have significant swells, substantial magmatic output, or tomographic anomalies. A hotspot catalog, as opposed to a volcano catalog, is therefore subjective. Recent lists of those purported to be underlain by deep mantle plumes disagree strongly. A melting anomaly, or hotspot, may result from localized high absolute mantle temperature or from a localized fertile or fusible patch of the asthenosphere. Some have been called “wetspots,” and some have been called “hotlines.” The localization may be due to lithospheric stress or architecture. The common characteristics of features designated as hotspots suggest an underlying common cause. This chapter provides references and brief evaluations of individual features and mechanisms that can be used to evaluate the origins of hotspots. Discussions of individual hotspots, volcanic chains, and tomographic results are given in three appendixes.