

Plate Tectonics ... To Be Continued

Since its inception by Alfred Wegener nearly 100 years ago, plate tectonics has been supported by a wealth of scientific evidence (some of which has been presented in this chapter). Although there are still details to be worked out (such as the exact driving mechanism), it has been universally accepted by Earth scientists today because it helps explain so many observations about our planet. Further, it has led to predictive models that have been used to successfully understand Earth behavior. One such example is the **Wilson cycle** (Figure 3-41), named in

honor of *John Tuzo Wilson* for his contribution to the early ideas of plate tectonics. The Wilson cycle uses plate tectonic processes to show the distinctive life cycle of ocean basins during their formation, growth, and destruction.

Not only is plate tectonic activity primarily responsible for the creation of landforms, it also plays a prominent role in the development of ocean floor features—which is the topic of the next chapter. Armed with the knowledge of plate tectonic processes you've gained from this chapter, understanding the history and development of ocean floor features in various marine provinces will be a much simpler task.

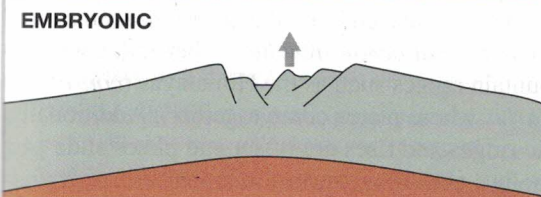
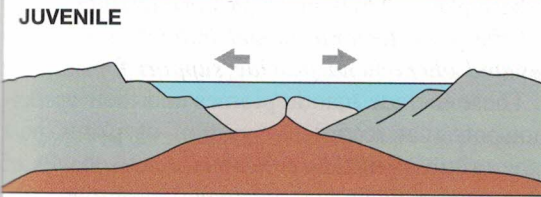
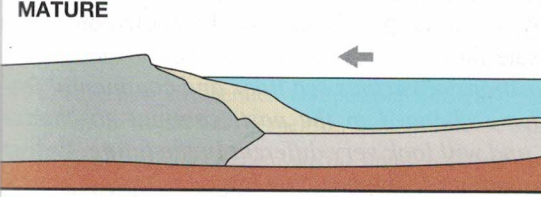
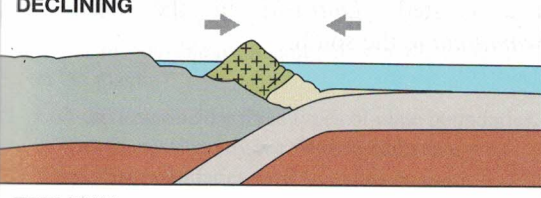
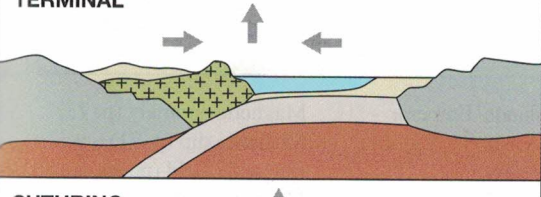
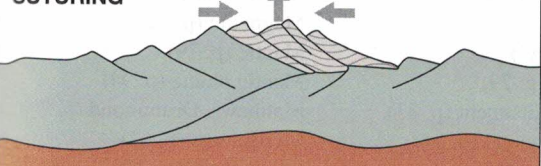
STAGE	MOTION	PHYSIOGRAPHY	EXAMPLE
EMBRYONIC 	Uplift	Complex system of linear rift valleys on continent	East African rift valleys
JUVENILE 	Divergence (spreading)	Narrow seas with matching coasts	Red Sea
MATURE 	Divergence (spreading)	Ocean basin with continental margins	Atlantic and Arctic Oceans
DECLINING 	Convergence (subduction)	Island arcs and trenches around basin edge	Pacific Ocean
TERMINAL 	Convergence (collision) and uplift	Narrow, irregular seas with young mountains	Mediterranean Sea
SUTURING 	Convergence and uplift	Young to mature mountain belts	Himalaya Mountains

Figure 3-41 The Wilson cycle of ocean basin evolution.

The Wilson cycle depicts the stages of ocean basin development, from the initial embryonic stage of formation to the destruction of the basin as continental masses collide and undergo suturing.