Module B. Colour from the Cosmos

Lesson 15: Beryl Geology and Geography

Where is it Found Globally?

Beryl is found basically wherever there are pegmatites and pegmatites can be found in most places of the world. So in a very general sense, the potential for gem beryl is very widespread. Unlike emeralds, which require mixing of Be- and Cr-rich rocks, aquamarine can get its chromophore, Fe, from ingredients commonly found with pegmatites. Consequently, aquamarine is the most common of the gem beryl varieties, but typically the "least" valued.

Of course, exceptional specimens of beryl come from only a handful of global locations. Notable are the pegmatites of Colorado, California, and Idaho (USA), the pegmatite fields of Minas Gerais (Brazil), the Ural Mountains (Russia), high alpine pegmatites of Gilgit (Pakistan), and the many deeply weathered eluvial pegmatite fields of Madagascar. All of these localities also produce other gem beryl varieties, such as morganite, goshenite, and heliodor.

The geologic environment for emerald formation is much more restricted because the ingredients required (Be + Cr/V) need to be sourced from independant reservoirs. Given this restriction, there are a surprisingly large number of occurrences worldwide but like aquamarines, only a few notable locations stand out. Zambia, Zimbabwe, Madagascar, Afghanistan, Brazil, and Austria all have classical emerald deposits where pegmatite intrudes Cr-bearing schist. The premier locality for emeralds, however, is Colombia. The stones mined in Colombia are by far the nicest stones in the world, achieve good sizes, and have been mined through antiquity.

Geographic distribution of main emerald deposits (green circles and italicized text) and major physiographic features of Colombia.

**Optional Readings**

If you are keenly interested in the emeralds of Colombia, these two "historical" articles by Keller and Ringsrud address the geology and general setting from a gemological perspective.

[Keller, P. C. (1981). Emeralds of Colombia. *Gems and Gemology*, *17*, 80-92.](https://connect.ubc.ca/bbcswebdav/pid-2559935-dt-content-rid-10494320_1/courses/SIS.UBC.EOSC.118.99C.2014WC.44220/Course_Files/moduleB/lesson15/download/ColombianEmerald_Keller1981.pdf)

[Ringsrud, R. (1986). The Coscuez mine: A major source of Colombian emeralds. *Gems & Gemology*, *22*, 67-79.](https://connect.ubc.ca/bbcswebdav/pid-2559935-dt-content-rid-10494320_1/courses/SIS.UBC.EOSC.118.99C.2014WC.44220/Course_Files/moduleB/lesson15/download/ColombianEmerald_Ringsrud1986.pdf)