Module B. Colour from the Cosmos

Lesson 15: Beryl Geology and Geography

What Current Science is Being Conducted?

A review article published by faculty and research personnel at [UBC Earth and Ocean Sciences](http://www.eos.ubc.ca/), Groat et al. (2008), contains much of the current information available on emerald occurrences worldwide. Groat and colleagues also contributed to an edited volume "Geology of Gem Deposits" published by the Mineralogical Association of Canada in 2007. Their sections focused on emeralds and non-emerald gem beryls (Groat et al., 2007, Turner et al., 2007). (Citations for these papers are listed below.)

An interesting research focus worth mention is on the use of oxygen isotopes and trace elements in gem-quality emerald to characterize global deposits and facilitate tracking of valuable stones. This technique has helped unravel some of the complex histories of important historical stones, such as those found in royal collections. This ability to determine a stone's origin is particularly significant because the origin can greatly influence the price of an emerald. For example, it could be determined whether a specimen is from Colombia or perhaps an area where illicit gem smuggling is common.

**Questions for thought**

What is emerald? How does it differ from aquamarine? How are they similar? How does a green beryl differ from an emerald?

What are some common geological environments for beryl to form?

Globally, where are these found?

Specifically, where are most commercial emeralds sourced?

Why is beryl a good mineral for jewelry?

Are there ways to determine an emerald's origin?

What are some famous examples of emerald through history?

Citations for recent research papers on emeralds and other gem beryls authored by UBC Earth and Ocean Sciences research staff:

* Groat, L.A., Giuliani, G., Marshall, D.D., and Turner, D.J. (2008). "Emerald deposits and occurrences: A review". *Ore Geology Reviews*, Vol. 34, p87-112.
* Groat, L.A., Giuliani,G., Marshall, D.D., and Turner, D.J. (2007). "Emerald". **In** *Geology of Gem Deposits*. L.A. Groat, Ed. Mineralogical Association of Canada Short Course Series, Vol. 37, p79-110.
* Turner, D.J. and Groat, L.A. (2007). "Non-emerald gem beryl". **In** *Geology of Gem Deposits*. L.A. Groat, Ed. Mineralogical Association of Canada Short Course Series, Vol. 37, p111-144.