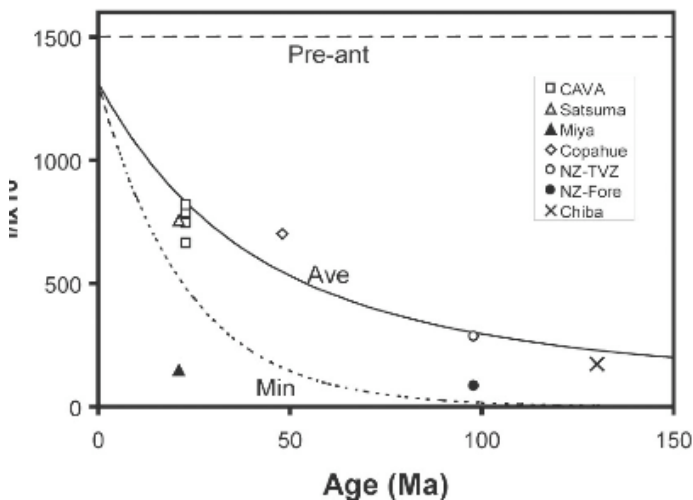


<b>SF</b> (MARGINS-related)	Tracing Volatiles Across Volcanic Arcs: $^{129}\text{I}$ , He, $\text{N}_2$ , $\text{CH}_4$ and $\text{CO}_2$ in Fluids from New Zealand and Japan	
	U. Fehn, U. of Rochester; R. J. Poreda; G. T. Snyder	
	2/1/2003 – 1/31/2006	EAR 02-29100

- Application of  $^{129}\text{I}$  for the characterization of geothermal and volcanic fluids.
- Combination of  $^{129}\text{I}$  results with gas systematics in subduction related volcanic systems in main arc and fore arc areas of New Zealand and Japan.
- Ages of subducting slabs in research areas vary between 20 and 130 My.
- Iodine ages for fluids from several subduction zones indicate derivation from subducting marine sediments.
- Initial results for fluids from the fore arc in New Zealand give substantially older ages than from main arc  $\rightarrow$  difference in dewatering systematics between fore arc and main arc.
- Continuation of work in Central America and of pilot projects in Japan and New Zealand.
- Involvement of post-doctoral, graduate and undergraduate students.
- International collaboration with researchers from New Zealand (B. Christenson, GNS) and Japan (H. Shinohara and K. Kazahaya, JGS; Y. Muramatsu, NIRS).

### Figures and Captions



**Figure 1:**  $^{129}\text{I}/\text{I}$  ratios versus age of subducting plate for five subduction zones: Central America (CAVA); Southern Japan (Satsuma and Miyazaki); Andes (Copahue); New Zealand and Northern Japan (Chiba). Open symbols: main volcanic zones; closed symbols and x: fore arc areas. Expected ratios for oldest (min) and time-averaged (ave) subducted sediments are indicated.

Ratios for main volcanic zones fall close to time-averaged values and show dependence on age of subducting crust, ratios for fore arc areas are considerably lower and do not show age dependence. The results indicate the presence of recycled marine sediments under the main volcanic zones, but derivation of fluids in fore arcs from older sources is not directly related to current subduction processes.

## Publications and Presentations

### Publication:

U. Fehn and G. T. Snyder (2003): Origin of iodine and  $^{129}\text{I}$  in volcanic and geothermal fluids from the North Island of New Zealand: Implications for subduction zone processes. *Econ. Geol.*, Spec. Publ.10, 159-170.

### Presentations:

U. Fehn and G. Snyder (invited, 2003): Origin of iodine and  $^{129}\text{I}$  in volcanic and geothermal fluids from the North Island of New Zealand. Thirteenth Goldschmidt Conference, Kurashiki, Japan, Sept. 2003. *Geochim. Cosmochim. Acta*, 67, A92, 2003.

U. Fehn (2003): Dewatering in main and fore arcs:  $^{129}\text{I}$  results, 11<sup>th</sup> Annual Hubbert Quorum, Menlo Park, Dec. 2003.

A. M. Stewart (2004): Tracing fluids in a subduction zone:  $^{129}\text{I}$  and halogens in geothermal waters from New Zealand. National Conference for Undergraduate Research, Indianapolis, IN, April 2004.