

Mercury fluxes from the abandoned Monte Amiata mining district in the Paglia and Tiber river catchments, Central Italy: preliminary estimates

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Mt. Amiata



**Quaternary (300 ka) volcano, 1738 m asl
Southern Tuscany (between Siena and Grosseto)**

**3rd largest Hg district in the world (100 kt Hg produced,
1850s-1980s)**

Enormous amounts ($\approx 30\text{-}40$ kt) of Hg dispersed into the environment during exploitation, affecting stream sediments in the drainage basin, particularly the Paglia-Tiber river system



- Most Hg transport in the fluvial system occurs in particulate form
- Load estimates from analysis of unfiltered water
- Flow determined
 - a) by tracer injection (NaCl)
 - b) by physical measurements (gauging stations)

Early estimates (Rimondi et al., ESPR 2014)

Q=discharge (L/s), HgF = Hg flux (g/day)

	March 2011		Sept 2011		March 2012	
	Q	HgF	Q	HgF	Q	HgF
PM (creek before mine inflow)	420	0.6	<<1	-	20	0.005
PV (creek just after mine inflow)	1380	34	170	24	190	1.3
PC (Paglia river 4 km from mine)	1820	18	170	3.4	220	0.9
PA (Paglia 20 km from mine)	9570	12	410	0.5	820	1.1

The September 2014 campaign



Discharge (Q, L/s) and Hg fluxes (HgF, g/day)

	Q	HgF	Previous estimates, HgF
PC	190	5	1-18
PA	1530	1	1-12
Alviano dam	57,000	223	-
Porta Portese	87,000	91	-

- **Alviano load unexpectedly high**
- **Release of Hg-contaminated sediments during dam maintenance?**
- **Need a full understanding of sediment budget in this facility**