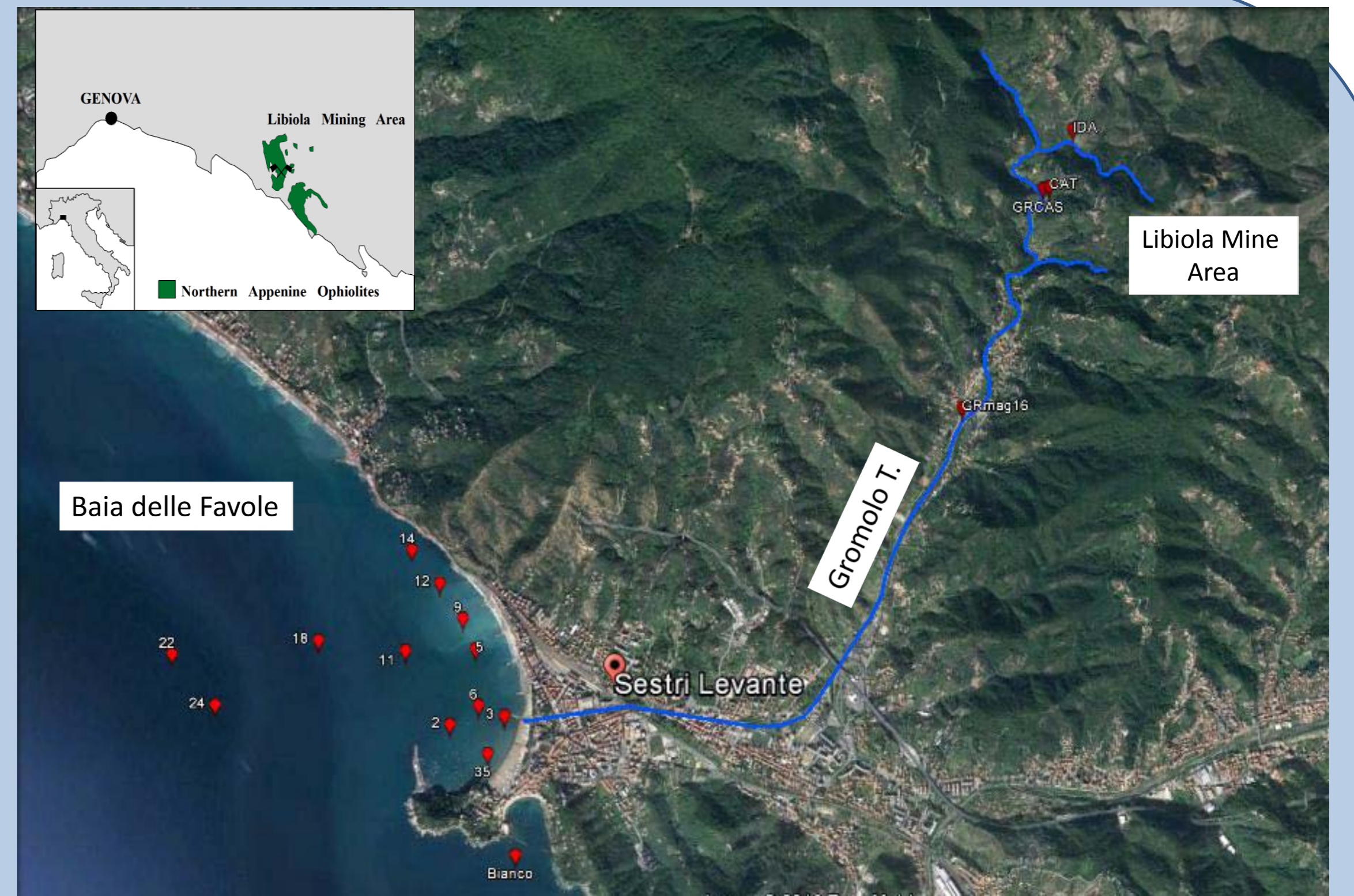


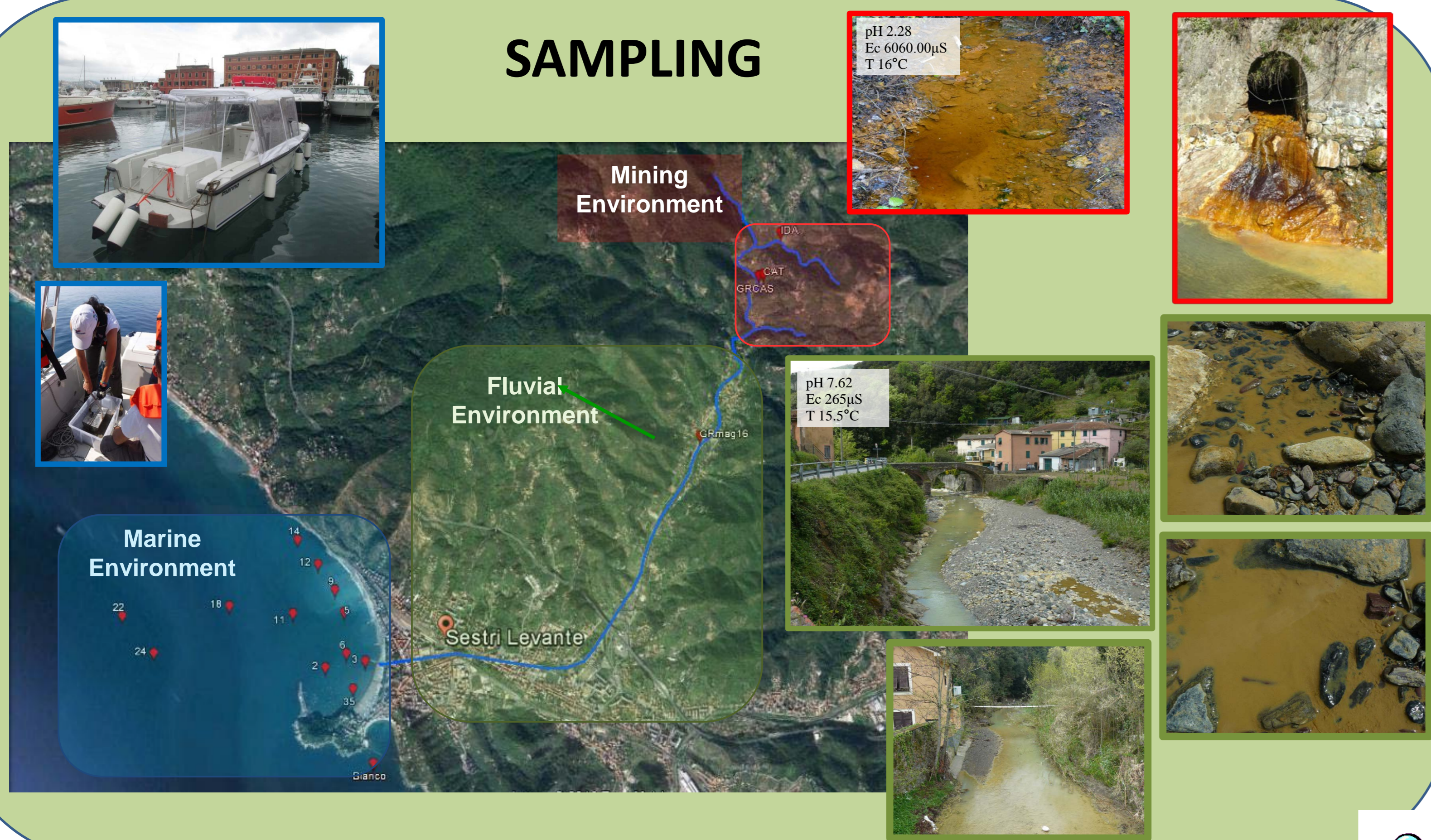
AIM OF WORK

The Gromolo Torrent is an Apennine watercourse located near the town of Sestri Levante (Eastern Liguria, Italy). Inside its basin, the abandoned Libiola Cu mine is located. This mining site was the most important sulphide (chalcopyrite + pyrite + sphalerite + pyrrhotite) deposit of the Ligurian ophiolites and was exploited until 1962. Intense Acid Mine Drainage (AMD) processes are active, leading to the generation of solutions characterised by low pH values and high amounts of dissolved SO_4^{2-} , Fe, and other chemical elements such as Cu, Zn, Pb, Al, Co, and Ni. An extensive precipitation of Fe and Cu-rich secondary minerals from AMD occurs, controlling the dispersion of elements of environmental concern outside the mine area. Moreover, AMD flows in the uncontaminated Gromolo Torrent in two points, causing the formation of amorphous Fe^{3+} oxy-hydroxides. These amorphous precipitates constitute a blanket which covers the torrent bed for several km.

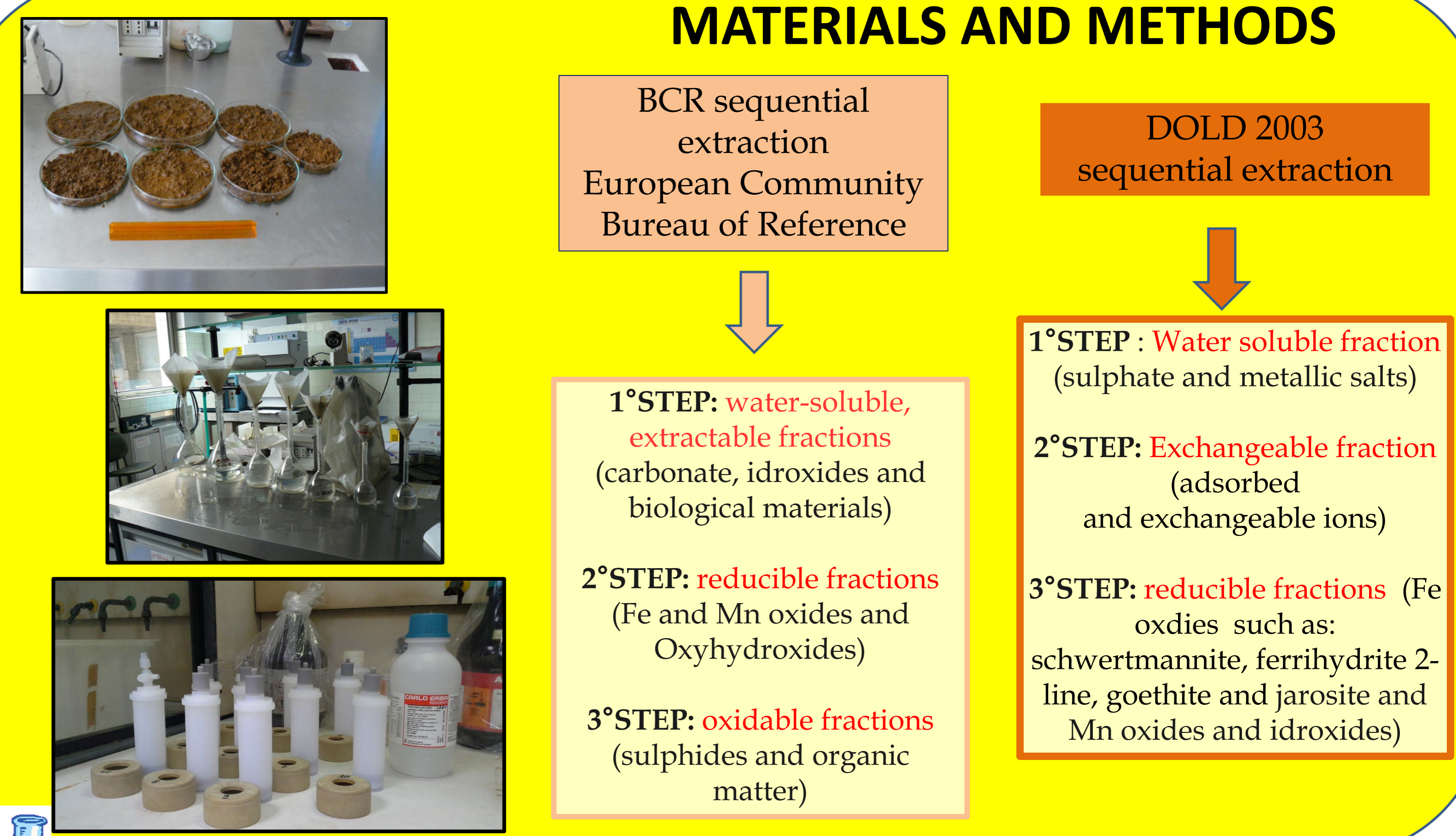


The aims of the work were: a) to characterise metal dispersion in the Gromolo Torrent bed and in the marine sediments of the "Baia delle Favole", where the torrent mouth is located; b) to evaluate the potential remobilisation of selected elements (Cd, Cr, Co, Cu, Mn, Ni, Pb, V, and Zn) from the amorphous precipitates using Bulk Leaching Tests (BLT); c) to assess the fraction of easily exchangeable metals using modified BCR Sequential Extraction (SE) on the amorphous precipitates and on marine sediments.

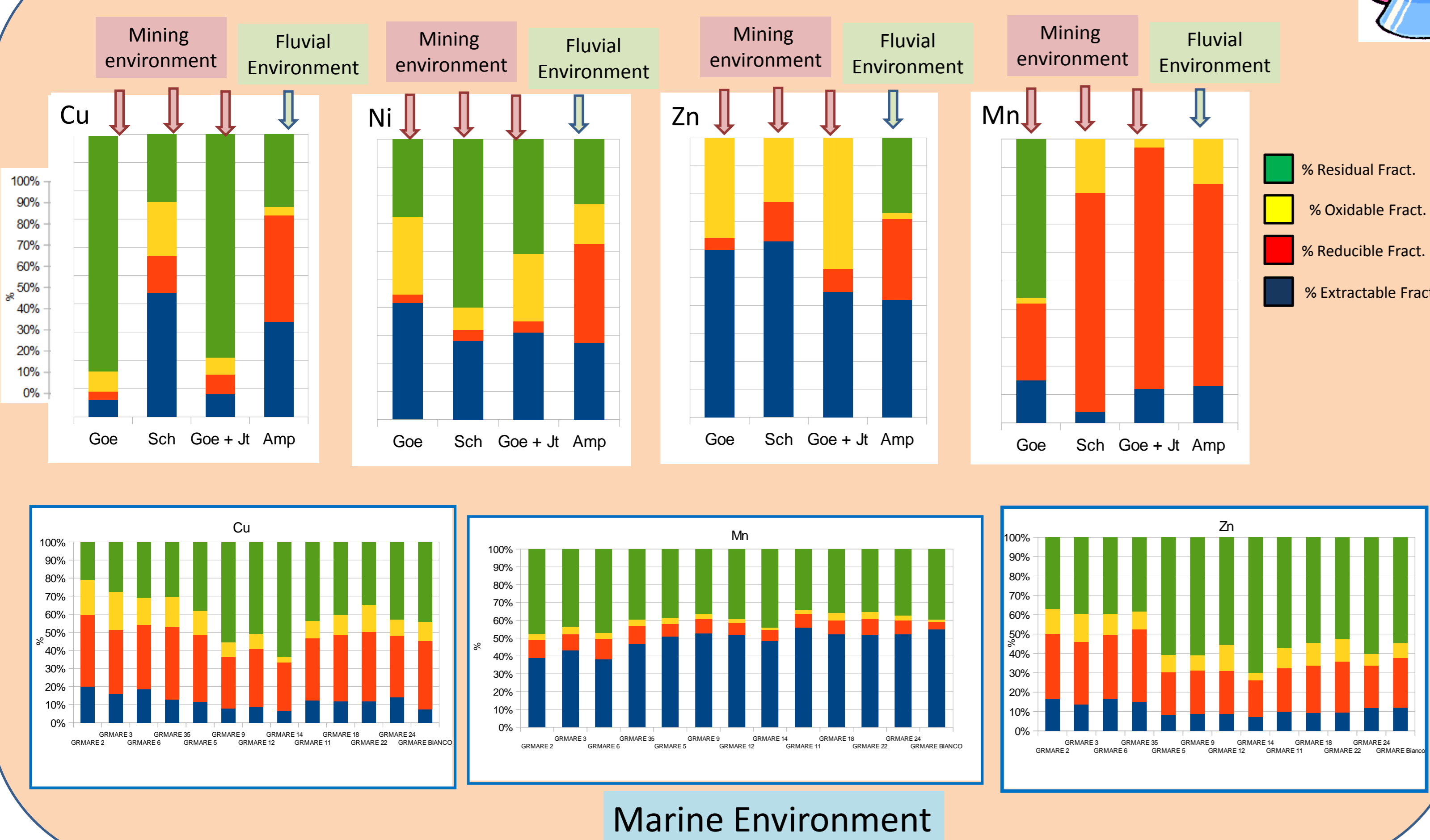
SAMPLING



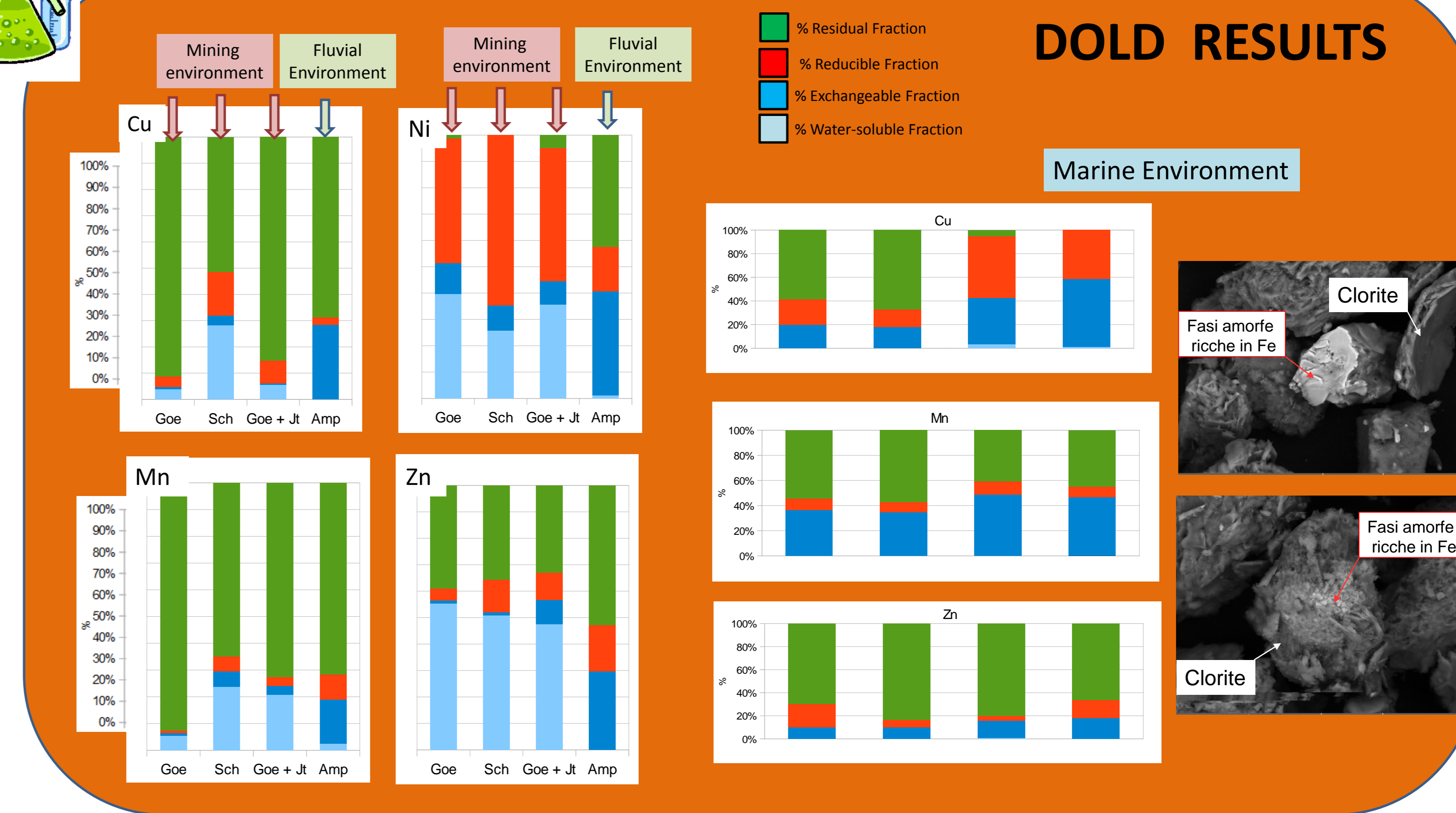
MATERIALS AND METHODS



BCR RESULTS



DOLD RESULTS



CONCLUSIONS

Mining Environment

- > Ni, Zn e Cu are correlated to water-soluble, extractable fractions and in minor amount at organic matter
- > Cu is incorporated in goethite structure Mn is present as Mn idroxides
- > No adsorption mechanism

Fluvial Environment

- > Adsorption and incorporation of Cu, Mn, Ni e Zn on Fe amorphous phases

Marine Environment

- > Cr and V associated to residual fractions
- > Co and Pb incorporated into goethite structure
- > Mn is present in carbonates
- > Cu and Zn are correlated to water-soluble, extractable fractions and to Fe-rich minerals