We studied 14 sites from apparently undeformed sedimentary rocks, and 2 from rhyolitic rocks. Magnetic fabrics were determined applying anisotropy magnetic susceptibility (AMS) and anisotropy of anhysteretic remanence magnetization (AARM). Three AMS fabric types were found in the sedimentary rocks. The first type shows $K_{\text{min}}$ perpendicular to the bedding plane while $K_{\text{max}}$ and $K_{\text{int}}$ are scattered within the bedding plane itself, so that no $K_{\text{max}}$ can be observed. The second fabric type (majority) is represented by a triaxial ellipsoid. The axes are well clustered and distinct; the $K_{\text{min}}$ axis is still perpendicular to the bedding plane, and a $K_{\text{max}}$ with two different orientations, appears in the bedding plane. The third fabric type is characterized by well-clustered $K_{\text{max}}$ in the bedding plane with $K_{\text{min}}$ and $K_{\text{int}}$ distributed along a girdle, so that no magnetic foliation can be defined. The $K_{\text{max}}$ orientation in the volcanic rocks is different, in one of them it is vertical whereas in the other is horizontal. The magnetic lineations (AMS and/or AARM) are around N30-40E and N-S. These orientations are similar to those of the two deformation phases indicated by the dispersion of the bedding poles throughout the basin. The volcanic rock with vertical $K_{\text{max}}$ has a N-S AARM lineation with horizontal plunge indicating that this rock was emplaced after the first deformation phase, but was affected by the second deformation. Results from the bedding correction show that the data before and after correction are almost the same indicating that magnetic fabrics were acquired during syn-tectonic sedimentation.