Interferometric processing of series of data acquired over time by synthetic aperture radar (SAR) satellites makes it possible to measure millimetric ground motions (typically induced by landslides, subsidence and earthquake or volcanic phenomena), and to monitor the stability of buildings and infrastructures. In this work, we present the first application of the interferometric SAR (InSAR) technology to high-resolution monitoring of ground deformations over an entire continent, based on full-resolution processing of the whole archive of past and future Sentinel-1 (S1) satellite acquisitions over most parts of Europe. The European Ground Motion Service (EGMS) is funded by the European Commission and forms an essential element of the Copernicus Land Monitoring Service (CLMS) managed by the European Environment Agency. Upscaling from existing national precursor services to pan-European scale will be challenging. Although low-resolution datasets have been recently produced at this scale, full-resolution processing is more complex, potentially revealing errors that would be disguised or suppressed otherwise at coarser scale. The project will utilise the most advanced persistent scatterer (PS) and distributed scatterer (DS) InSAR processing techniques, and a high-quality GNSS model, required to calibrate the InSAR products. To foster acceptance and a maximum/optimum use of the service by the growing Copernicus user community and the public at large, the EGMS will provide tools for visualization, exploration, analysis and download of the ground deformation measurements, as well as elements to promote best practice and user uptake.