

## Abstract

Salminen R.<sup>1</sup> (Chief-editor), Batista M.J.<sup>2</sup>, Bidovec M.<sup>3</sup>, Demetriades A.<sup>4</sup>, De Vivo B.<sup>5</sup>, De Vos W.<sup>6</sup>, Duris M.<sup>7</sup>, Gilucis A.<sup>8</sup>, Gregorauskiene V.<sup>9</sup>, Halamic J.<sup>10</sup>, Heitzmann P.<sup>11</sup>, Lima A.<sup>5</sup>, Jordan G.<sup>12</sup>, Klaver G.<sup>13</sup>, Klein P.<sup>14</sup>, Lis J.<sup>15</sup>, Locutura J.<sup>16</sup>, Marsina K.<sup>17</sup>, Mazreku A.<sup>18</sup>, O'Connor P.J.<sup>19</sup>, Olsson S.<sup>20</sup>, Ottesen R.-T.<sup>21</sup>, Petersell V.<sup>22</sup>, Plant J.A.<sup>23</sup>, Reeder S.<sup>23</sup>, Salpeteur I.<sup>24</sup>, Sandström H.<sup>1</sup>, Siewers U.<sup>25</sup>, Steenfelt A.<sup>26</sup>, Tervainen T.<sup>1</sup> 2005. *Geochemical Atlas of Europe. Part 1 – Background Information, Methodology and Maps.*

The IUGS/IAGC Global Geochemical Baselines Programme aims to establish a global geochemical reference baseline for more than 60 determinants in a range of media for environmental and other applications. The European contribution to the programme has been carried out by government institutions from 26 countries under the auspices of the Forum of European Geological Surveys (FOREGS). The main objectives of this European survey were: 1) to apply standardised methods of sampling, chemical analysis and data management to prepare a geochemical baseline across Europe; and 2) to use this reference network to level national baseline datasets.

Samples of stream water, stream sediment and three types of soil (organic top layer, minerogenic top and sub soil) have been collected at nearly 900 stations, each representing a catchment area of 100 km<sup>2</sup>, corresponding to a sampling density of about one sample per 4700 km<sup>2</sup>. In addition, the uppermost 25 cm of floodplain sediment was sampled from 750 sites each representing a catchment area of 1000 km<sup>2</sup>.

All soil and sediment samples were prepared at the same laboratory, and all samples of particular sample types were analysed by the same method at the same laboratory. More than 50 elements, both total and *aqua regia* extractable concentrations, and other parameters (such as pH and grain size) were determined on the <2 mm grain size fraction of soil and floodplain sediment samples and on the <0.15 mm grain size fraction of stream sediment samples, and total concentrations of organic soil samples were measured after using a strong acid digestion. Nine laboratories of European geological surveys carried out the analytical work.

Altogether, 360 geochemical maps showing the distribution of elements across Europe have been prepared. All the results and field observations are organised in a common database and the maps are published as a Geochemical Atlas of Europe. All the sampling sites were photographed and this photo archive is also available. Samples have been archived in the Slovak Republic for possible future use.

Initial results show that the distribution patterns of both water and solid samples are related to such factors as large-scale tectonic provinces, geochemical variation of large lithological units, extension of the Weichselian glaciation, and contamination reflecting industrialized areas and regions of intensive agriculture.

Key words (GeoRef Thesaurus, AGI): geochemical surveys, baseline studies, soils, sediments, stream water, sampling, sample preparation, chemical analysis, geochemical maps, atlas, areal geology, Europe

<sup>1</sup>Geological Survey of Finland, P.O.Box 96, FI-02151 Espoo, Finland;

<sup>2</sup>Geological Survey of Portugal, Estrada da Portela – Zambujal, Apartado 7586, 2720 Alfragide, Portugal;

<sup>3</sup>Geological Survey of Slovenia, 1001 Ljubljana, Slovenia;

<sup>4</sup>Institute of Geology and Mineral Exploration, 70 Messoghion Street, GR-11527 Athens, Greece;

<sup>5</sup>Departimento Geofisica e Vulcanologia, Universita' di Napoli "Federico II", Via Mezzocannone 8, 80138 Napoli, Italy;

<sup>6</sup>Geological Survey of Belgium, Jennerstraat 13 B-1000 Brussels, Belgium;

<sup>7</sup>Czech Geological Survey, Klárov 131/3, CS-11821 Praha 1, Czech Republic;

<sup>8</sup>State Geological Survey of Latvia, Eksporta iela 5, Riga, LV-1010, Latvia;

<sup>9</sup>Geological Survey of Lithuania, Konarskio 35, Vilnius, LT-03123, Lithuania;

<sup>10</sup>Institute of Geology, Croatia, Sachsova 2, HR-10000, Zagreb, Croatia;

<sup>11</sup>Swiss National Hydrological and Geological Survey, CH-3003 Berne, Switzerland;

<sup>12</sup>Hungarian Geological Institute, P.O. Box 106, H-1442 Budapest, Hungary;

<sup>13</sup>TNO-NITG, The Netherlands, P.O. Box 80015, 8508 TA Utrecht, The Netherlands;

<sup>14</sup>Geological Survey of Austria, Rasumofskygasse 23 Postfach 127 A-1031 Wien, Austria;

<sup>15</sup>Polish Geological Institute, PL-00 975 Warszawa, Poland;

<sup>16</sup>Geological Survey of Spain, 23 Rios Rosas, ITGE-E 28003 Madrid, Spain;

<sup>17</sup>Geological Survey of Slovak Republic, Mlynská dol. 1, SK-81704 Bratislava, Slovak Republic;

<sup>18</sup>Center of Civil Geology, Rs. S. Frasheri, Nr. 31 Tirana Albania;

<sup>19</sup>Geological Survey of Ireland, Beggars Bush, Haddington Road, Dublin 4, Ireland;

<sup>20</sup>Geological Survey of Sweden, P.O.Box 670, S-751 28 Uppsala, Sweden;

<sup>21</sup>Geological Survey of Norway, 7491 Trondheim, Norway;

<sup>22</sup>Geological Survey of Estonia, Kadaka tee 80/82, Tallinn, EE-0026, Estonia;

<sup>23</sup>British Geological Survey, Kingsley Dunham Center, Keyworth, Nottingham NG12 5GG, United Kingdom;

<sup>24</sup>Geological Survey of France, BP 6009, 45060 Orléans Cedex, France;

<sup>25</sup>Bundesanstalt für Geowissenschaften und Rohstoffe, Postfach 510153, D-30631 Hannover, Germany;

<sup>26</sup>Geological Survey of Denmark and Greenland (GEUS), Øster Voldgade 10, DK-1350 Copenhagen K, Denmark

Reijo Salminen  
Geological Survey of Finland  
P.O.Box 96  
FI-02151 ESPOO, FINLAND

E-mail: Reijo.Salminen@gtk.fi