INTERNATIONAL UNION OF GEOLOGICAL SCIENCES (IUGS)

INITIATIVE ON FORENSIC GEOLOGY (IFG)

ANNUAL REPORT FOR 2015

DR LAURANCE DONNELLY, CHAIR IUGS-IFG
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INTERNATIONAL UNION OF GEOLOGICAL SCIENCES (IUGS)
INITIATIVE ON FORENSIC GEOLOGY (IFG)

Annual Report 2015

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1  TITLE OF CONSTITUENT BODY

The International Union of Geological Sciences (IUGS), Initiative on Forensic Geology (IFG) was officially launched during the 62nd Executive Committee Meeting of the IUGS, which was held at UNESCO headquarters, in Paris, France, on 22nd February 2011.

2  AIM

2.1  Mission Statement

IUGS-IFG seeks to; ‘to develop forensic geology internationally and promote its applications’.

2.2  Objectives

The objectives of the IUGS-IFG are to:

1. Collate and disseminate data and information on forensic geology applied to policing and law enforcement, criminal, environmental and civil investigations;
2. Promote international meetings, seminars, conferences and training;
3. Develop a ‘Committee’ to act as principal advisers, collaborators and active participants;
4. Develop an international network whereby each ‘member’ will act as a principal contact in their respective country for the collation and dissemination of information on forensic geology;
5. Collate, make available and where appropriate review any existing documentation and publications in forensic geology; and
6. Produce a document endorsed by the Committee to be called; ‘A Guide to Forensic Geology’.

3  ROLE WITHIN IUGS SCIENCE POLICY

3.1  Background

Although the documented history of forensic geology can be traced to the latter half of the 19th Century, in recent years there have been significant interests and developments in the multidisciplinary fields of forensic geology throughout the world. Since the millennium there have been numerous international meetings, conferences, seminars and training on different aspects of forensic geology. Furthermore, several text books have been published and there are numerous technical papers in peer reviewed scientific journals, conference proceedings, magazines, police and law enforcement literature. IFG represents IUGS interests in forensic geology and provides the opportunities for capacity building, knowledge transfer and outreach events, promoting our mission, ‘to develop forensic geology internationally and promote its applications’. The members of the IFG committee are senior representatives of their respected organisations and include geologists, geoscientists, police officers, forensic scientists and law enforcement agencies.

3.2  Main Approach

IUGS-IFG aims to raise the global awareness of forensic geology by holding meetings and conferences, promoting research, teaching, training and the operational deployment of forensic geologists. This will be consistent with the broad objectives of IUGS, and includes the following:

- Capacity building: By raising levels of awareness, knowledge and providing information about forensic geology;
- Technology transfer: Through improvement in skill sets; and
- Outreach: Educating and informing police, law enforcement organisations, geologists, geoscientists and the ‘general public’ about forensic geology.
4 ORGANIZATION

The IUGS-IFG Committee comprises representatives from major geographical regions of the world and includes specialists from academia, industry, consultancy, operationally based forensic geologists, the police, law enforcement agencies and forensic organisations, as shown in Figure 4.1 and Table 4.1.

![Diagram of IUGS-IFG Committee structure]

**Figure 4.1 Structure of the IUGS-IFG Committee in 2015**

4.1 IFG Committee Changes

In 2015, three new members were assigned to the IUGS-IFG Committee as follows:

- Dr Duncan Pirrie, Special Publications Adviser;
- Dr Ruth Morgan, Forensic Science Adviser; and
- Mr Fabio Augusto Da Silva Salvador, joint Co-officer for Latin America.

In 2016, the IUGS-IFG committee aim to consider adding two serving police officers from the Abu Dhabi Police, Forensic Geology Group, to facilitate and assist with the establishment of a Forensic Geology training event, in Abu Dhabi, in 2017.
<table>
<thead>
<tr>
<th>POSITION</th>
<th>NAME</th>
<th>COUNTRY</th>
<th>AFFILIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td>1Dr Laurance Donnelly</td>
<td>England</td>
<td>IUGS-IFG</td>
</tr>
<tr>
<td>Vice Chair</td>
<td>2Prof Rob Fitzpatrick</td>
<td>Australia</td>
<td>Commonwealth Scientific and Industrial Research Organisation (CSIRO)</td>
</tr>
<tr>
<td>Treasurer</td>
<td>3Prof Lorna Dawson</td>
<td>Scotland</td>
<td>The James Hutton Institute</td>
</tr>
<tr>
<td>Secretary</td>
<td>4Ms Marianne Stam</td>
<td>USA</td>
<td>California Department of Justice</td>
</tr>
<tr>
<td>Geoforensic Law Enforcement Adviser</td>
<td>5Commander Mark Harrison, MBE</td>
<td>Australia</td>
<td>Australia Federal Police (AFP) (formerly, UK Police National Search Adviser)</td>
</tr>
<tr>
<td>FBI Adviser</td>
<td>6Ms Jodi Webb</td>
<td>USA</td>
<td>Federal Bureau of Investigation (FBI)</td>
</tr>
<tr>
<td>Webmaster/Information Officer</td>
<td>7Dr Elisa Bergslien</td>
<td>USA</td>
<td>SUNY Buffalo State</td>
</tr>
<tr>
<td>Communications</td>
<td>8Dr Jennifer McKinley</td>
<td>N. Ireland</td>
<td>Queens University Belfast</td>
</tr>
<tr>
<td>Geological (Trace) Evidence Advisers</td>
<td>9Dr Skip Palenik</td>
<td>USA</td>
<td>Microtrace LLC</td>
</tr>
<tr>
<td></td>
<td>10Dr Chris Palenik</td>
<td>USA</td>
<td>Microtrace LLC</td>
</tr>
<tr>
<td>Training and Publications</td>
<td>11Dr Alastair Ruffell</td>
<td>N. Ireland</td>
<td>Queens University Belfast</td>
</tr>
<tr>
<td>Special Publications Adviser</td>
<td>12Dr Duncan Pirrie</td>
<td>England</td>
<td>Helford Geoscience LLP</td>
</tr>
<tr>
<td>Forensic Science Adviser</td>
<td>13Prof Ruth Morgan</td>
<td>England</td>
<td>University College London, JDI Centre for the Forensic Sciences</td>
</tr>
<tr>
<td>Honorary Committee Member</td>
<td>14Dr Raymond Murray</td>
<td>USA</td>
<td>Forensic Geologist, Montana</td>
</tr>
<tr>
<td>Officer, USA</td>
<td>15Dr Bill Schneck</td>
<td>USA</td>
<td>Washington State Patrol Crime Laboratory</td>
</tr>
<tr>
<td>Officer, Latin America</td>
<td>16Mr Carlos Molina Gallego</td>
<td>Colombia</td>
<td>Instituto Nacional de Medicina Legal y Ciencias Forense, Bogota</td>
</tr>
<tr>
<td></td>
<td>17Mr Fabio Augusto Da Silva Salvador</td>
<td>Brazil</td>
<td>Brazilian Federal Police (BFP)</td>
</tr>
<tr>
<td>Officer, Europe</td>
<td>18Ms Rosa Maria Di Maggio</td>
<td>Italy</td>
<td>Geoscienze Forensi Italia (formerly, Servizio Polizia Scientifica)</td>
</tr>
<tr>
<td>Officer, Russia &amp; CIS</td>
<td>19Dr Olga Gradusva</td>
<td>Russia</td>
<td>Russian Federal Centre of Forensic Science, Ministry of Justice, Moscow</td>
</tr>
<tr>
<td></td>
<td>20Dr Ekaterina Nesterina</td>
<td>Russia</td>
<td>Russian Federal Centre of Forensic Science, Ministry of Justice, Moscow</td>
</tr>
<tr>
<td>Officer, Middle East</td>
<td>21Captain Ahmed Saeed Al Kaabi</td>
<td>UAE</td>
<td>Abu Dhabi Police, Forensic Geology Group, United Arab Emirates</td>
</tr>
<tr>
<td></td>
<td>22Captain Khudooom Saied Al Naimi</td>
<td>UAE</td>
<td>Abu Dhabi Police, Forensic Geology Group, United Arab Emirates</td>
</tr>
<tr>
<td></td>
<td>23Lieutenant Saleh Ali Al Katheeri</td>
<td>UAE</td>
<td>Abu Dhabi Police, Forensic Geology Group, United Arab Emirates</td>
</tr>
<tr>
<td>Officer, Japan and Asia</td>
<td>24Dr Ritsuko Sugita</td>
<td>Japan</td>
<td>National Research Institute of Police Science, Japan</td>
</tr>
<tr>
<td>Officer, Australia</td>
<td>25Prof James Robertson</td>
<td>Australia</td>
<td>University of Canberra</td>
</tr>
<tr>
<td>Officer, Pacific</td>
<td>26Prof Shari Forbes</td>
<td>Australia</td>
<td>University of Technology, Sydney</td>
</tr>
<tr>
<td>Officer, Canada</td>
<td>27Prof Grant Wach</td>
<td>Canada</td>
<td>Dalhousie University, Nova Scotia</td>
</tr>
<tr>
<td>Officer, Africa</td>
<td>28Dr Roger Dixon</td>
<td>South Africa</td>
<td>University of Pretoria (formerly, Forensic Science Lab, South African Police Service)</td>
</tr>
</tbody>
</table>

Note: The superscript number assigned to each member of the IUGS-IFG Committee, refers to those involved in the events and activities during 2015, as summarised in section 7 of this report.

Table 4.1 IUGS-IFG committee members in 2015 and their professional affiliations
5 EXTENT OF NATIONAL/REGIONAL/GLOBAL SUPPORT FROM SOURCES OTHER THAN IUGS

During 2015 support for IUGS-IFG was provided by individual committee members and their respective employers/organisations. The in-kind value of this support is considerable. IUGS-IFG has estimated that the Committee Officers have provided at least 194 person days in the last year attending IUGS-IFG conferences and providing training courses, the provision of outreach events and the management of the Initiative. The value of this in-kind support is difficult to quantify, however a commercial value to the time spent on the IUGS-IFG in 2015 would be in excess of approximately USD($)155,000. In addition, participation in the various IUGS-IFG events during the year has also been supported directly by committee members employers and via research funding of approximately USD($)54,500. We therefore estimate the value of this indirect funding and in kind funding support to be in excess of approximately USD($)210,000.

5.1 Acknowledgements

Throughout 2015, IUGS-IFG received support from numerous organisations, which include the following:

- **IUGS Executive Committee.**
- **Prof Peter Bobrowsky, Prof Colin Simpson, Dr Brian Marker MBE, Dr Kevin Telmer**
- **Commercial companies:** Helford Geoscience LLP (UK), Microtrace LLC (USA), James Hutton Limited and Geosciente Forensi Italia (Italy)
- **Police, Law Enforcement and Federal Agencies:** California Department of Justice, Federal Bureau of Investigation (USA), Australian Federal Police (Australia), Washington State Patrol Crime Lab (USA), Abu Dhabi Police (UAE), Russian Federal Centre of Forensic Science (RFCFS) of the Ministry of Justice of Russia (Russia), National Research Institute of Police Science of Japan (Japan), Servizio Polizia Scientifica (Italy), Carabinieri (Italy), Brazilian Federal Police (Brazil), National Crime Agency (NCA) (UK), Police National Search Centre, The College of Policing (UK), Home Office Centre for Applied and Scientific Research (CAST) (UK), Greater Manchester Police (GMP) (UK), West Yorkshire Police (UK), South Yorkshire Police (UK), Police Scotland, Inspector Graham Peffers (GMP and NCA), Inspector Colin Hope (NCA) Mike Ferguson (CAST), Inspector Jon Feather (UK).
- **Universities and Research Institutes:** University of Messina (Sicily), The American University of Rome (Italy), Institute of Forensic Science in China, University of Pretoria (South Africa), Dalhousie University (Canada), National Research Institute of Police Science (Japan), CSIRO (Australia), Centre for Australian Forensic Soil Science (CAFSS) (Australia), Buffalo State College (USA), Queens University Belfast (Northern Ireland), the James Hutton Institute (Scotland, UK), University of Canberra (Australia), University of Technology, Sydney (Australia), University of Keele Department of Earth Sciences (UK), University College London (UK), University of Staffordshire, (UK), University of Pretoria (South Africa), Nacional Institute of Criminalistics (INC) (Brazil), Instituto Nacional de Medicina Legal y Ciencias Forense (Colombia), The Geological Society of London (Forensic Geosciences Group, Near Surface Geophysics Group, Western Regional Group, North West Regional Group), University College London, JDI Centre for the Forensic Sciences.
6  INTERACTION WITH OTHER INTERNATIONAL PROJECTS & ORGANISATIONS

Throughout 2015, IUGS-IFG interacted and collaborated with the organisations and projects listed in Table 6.1.

<table>
<thead>
<tr>
<th>ORGANISATION</th>
<th>TYPE OF INTERACTION</th>
<th>PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>IUGS Executive Committee</td>
<td>Committee meeting</td>
<td>IUGS Executive Committee meeting, Vancouver</td>
</tr>
<tr>
<td>The Institution of Civil Engineers (ICE), Wales and Chartered Institution of</td>
<td>Outreach</td>
<td>Annual dinner and guest speaker</td>
</tr>
<tr>
<td>Water and Environmental Management (CIWEM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science Festival, Ulster Museum in Belfast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GB Police Force 1</td>
<td>Operational support</td>
<td>Search for a shallow, unmarked, homicide grave</td>
</tr>
<tr>
<td>GB Police Force 2</td>
<td>Operational support</td>
<td>Search for a missing person</td>
</tr>
<tr>
<td>GB Police Force 3</td>
<td>Operational support</td>
<td>Search for a missing person</td>
</tr>
<tr>
<td>GB Police Force 4</td>
<td>Operational support</td>
<td>Rape case in Northern Europe</td>
</tr>
<tr>
<td>GB Police Force 5</td>
<td>Operational support</td>
<td>Search for missing person in a lake</td>
</tr>
<tr>
<td>GB Police Force 6</td>
<td>Operational support</td>
<td>Double homicide search for graves</td>
</tr>
<tr>
<td>Tellus and Tellus Border Project</td>
<td>Knowledge transfer</td>
<td>Spatially referenced, baseline geochemical data for soils</td>
</tr>
<tr>
<td>North West Police Underwater Search and Marine Unit, and Centre for</td>
<td>Knowledge transfer and outreach</td>
<td>Imaging and search in underwater environments and the development of</td>
</tr>
<tr>
<td>Advanced Science and Technology (CAST)</td>
<td></td>
<td>search strategies.</td>
</tr>
<tr>
<td>China Institute of Forensic Science</td>
<td>Outreach</td>
<td>Affiliation with IUGS-IFG &amp; GIN</td>
</tr>
<tr>
<td>Gendarmerie National Facility, Paris, France</td>
<td>Outreach and knowledge transfer</td>
<td>Conference</td>
</tr>
<tr>
<td>7th European Academy of Forensic Science, Prague, Czech Republic</td>
<td>Outreach</td>
<td>Conference</td>
</tr>
<tr>
<td>Wildlife Crime Scene and Field Investigation Seminar</td>
<td>Outreach</td>
<td>Conference</td>
</tr>
<tr>
<td>Hertfordshire Geological Society</td>
<td>Outreach</td>
<td>Invited speaker</td>
</tr>
<tr>
<td>Colombia’s National Institute of Medical, Legal and Forensic Sciences.</td>
<td>Knowledge transfer and operational support</td>
<td>PhD research</td>
</tr>
<tr>
<td>Australian Facility for Taphonomic Experimental Research (AFTER)</td>
<td>Knowledge transfer</td>
<td>Research facility</td>
</tr>
<tr>
<td>Polizia di Stato, Carabinieri, Geoscienze Forense Italia, Alfate, Malvern,</td>
<td>Training</td>
<td>MSc in Forensic Geology, University of Messina, Sicily.</td>
</tr>
<tr>
<td>the James Hutton Institute, Queens University Belfast, Ambregeo, Consiglio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nazionale Dei Geologi and the Geological Society of London, Forensic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geoscience Group, The American University of Rome</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Association of Mathematical Geoscience (IAMG)</td>
<td>Outreach and knowledge transfer</td>
<td>Compositional Data (CoDA) Analysis in Forensic Science, in Girona, Spain.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Also, the 17th annual IAMG conference, in Freiberg, Germany.</td>
</tr>
<tr>
<td>Organization</td>
<td>Type</td>
<td>Event</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Colombian Observatory on Medical and Forensic Geology, and IUGS Geoscience Professionalism and Geoethics.</td>
<td>Outreach</td>
<td>Planning for the 35th International Geological Congress, in UK, Australia Cape Town, 2016</td>
</tr>
<tr>
<td>National Research Institute of Police Science in Japan, Japan Coast Guard Academy, Research Institute of Environmental Geology of Chiba Prefecture, Kagoshima University, and Oxford Instruments.</td>
<td>Outreach and knowledge transfer</td>
<td>International Symposium on the Development of Forensic Geology, 122nd Annual Meeting of the Geological Society of Japan</td>
</tr>
<tr>
<td>Tellus' and ‘TellusBorder’</td>
<td>Knowledge transfer</td>
<td>Northern Ireland</td>
</tr>
<tr>
<td>Geology and Environment for Manchester Students (GEMS)</td>
<td>Outreach</td>
<td>Guest speaker</td>
</tr>
<tr>
<td>Animal, Soil, Plant Trace (ASPT) working group of the ENFSI network</td>
<td>Training</td>
<td>Belgium</td>
</tr>
<tr>
<td>EMFA a joint venture between the Forensic Science Institute of the French Gendarmerie (IRCGN) and the ENFSI project group Forensic Archaeology.</td>
<td>Outreach and knowledge transfer</td>
<td>France</td>
</tr>
<tr>
<td>Hong Kong Regional Group of the Geological Society and Geological Society of London</td>
<td>Outreach</td>
<td>Hong Kong</td>
</tr>
<tr>
<td>University of Dundee, Scotland</td>
<td>On line course</td>
<td>Massive On line Open Learning (MOOC)</td>
</tr>
<tr>
<td>3rd International Conference on Engineering Geophysics, Al Ain, UAE</td>
<td>Conference</td>
<td>United Arab Emirates University, Al Ain, UAE and Society for Exploration Geophysicists (SEG)</td>
</tr>
<tr>
<td>Abu Dhabi Police, Forensic Geology Group</td>
<td>Training</td>
<td>Planning for land and water search training in 2017</td>
</tr>
<tr>
<td>Police National Search Centre, The College of Policing, UK</td>
<td>Training</td>
<td>Police Search Advisor (PoISA), CPD course</td>
</tr>
</tbody>
</table>

Table 6.1 Selected examples of IUGS-IFG collaboration in 2015
7 CHIEF ACCOMPLISHMENTS

7.1 JANUARY

7.1.1 68th IUGS Executive Committee Meeting, Vancouver, Canada

On 27th January 2015, IUGS-IFG attended the 68th IUGS Executive Committee meeting in Vancouver and provided an overview of IUGS-IFG activities throughout 2014. The global advancement of forensic geology was acknowledged and positive feedback was provided the Secretary General of IUGS.

7.1.2 Search for a Grave, Northern Europe

A covert search for the grave of a child who went missing several years ago continued throughout 2015, in a remote part of Northern Europe. This included the use of geophysical surveys, Red-Amber-Green (RAG) prioritisation maps, Conceptual Geological Models (CGM), interpretation of historical and recent aerial imagery, behavioural profiling of the offender, victimology assessments, geological review of intelligence, the development of soil sampling and Volatile Organic Compound (VOC) analysis. This search will continue into 2016 and beyond or until the target is found.

7.2 FEBRUARY

7.2.1 The Royal Society, London, England

On 2nd to 3rd February 2015, IUGS-IFG attended, ‘The Paradigm Shift in Forensic Science’, which was held at The Royal Society, in London. IUGS-IFG also attended part of a follow on meeting at Chichley Hall, in London, with a group of lawyers, judges and forensic scientists.

7.2.2 Forensic Geology at the ICE & CIWEM Annual Dinner, Cardiff, Wales

On 5th February 2015, IUGS-IFG was invited as guest speaker at the Annual Dinner of the Institution of Civil Engineers (ICE) and Chartered Institution of Water and Environmental Management (CIWEM), at the Trevithick Lecture Theatre, Cardiff School of Engineering, in Cardiff, South Wales. The presentation given was entitled, ‘Forensic Geology: The Applications of Geology to Policing and Law Enforcement’. The event was attended by civil and structural engineers, geologists and students. There was particular interest in the applications of forensic geology to civil engineering failures and geohazards.

7.2.3 Forensic Science Seminar, University College London (UCL), London, England

On 5th February 2015, a representative for the UK Home Office, Centre for Advanced Science and Technology (CAST) gave a presentation at UCL, in London. This presentation included the applications of geophysics to assist with ground and water searches.

7.2.4 The Year of Mud, How Volcanoes Solve Crime, Belfast, Northern Ireland

On 19th February 2015, IUGS-IFG took part in the Geological Society of London themed event, ‘The Year of Mud’. Two sessions were held entitled, ‘How can Volcanoes Help Solve Crime? The venue was the Ulster Museum in Belfast. This attracted 75 attendees with 75% of being under the age of 15, who participated in soil examination and footwear treads.

7.2.5 Tellus Soil and Sediment Geochemistry, Belfast, Northern Ireland

The ‘Tellus’ and ‘TellusBorder’ projects includes data on soil and stream sediment properties that are spatially-referenced for Northern Ireland. This potentially provides invaluable intelligence when used in conjunction with information relating to the context of a particular crime to determine the provenance of a displaced sample. Such material may be have adhered to a suspect’s footwear, clothing, vehicle, weapon or contraband. A case study used a spade to allegedly excavate an area for the concealment of a mortar and mortar rounds.
7.3 MARCH

7.3.1 Operational Support, Rape Case, Northern Europe
In March 2015, information was provided on the geology of a rock sample used during the brutal rape of a woman to assist with identifying the type, source and location of the rock.

7.3.2 Northern Ireland Science Festival, Belfast, Northern Ireland
A Forensic Geology session was held at the Northern Ireland Science Festival. This event was organised by the Ulster Museum in collaboration with Queen’s University Belfast (QUB), Geological Survey Northern Ireland (GSNI), Northern Ireland Regional Group of the Geological Society of London. This included an overview of, ‘What is forensic geology and how has geology helped to solve several high profile criminal cases in the UK and internationally?’ For example, how can soil found on a shoe help to solve a crime? The story of an ancient volcanic landscape is revealed and how volcanoes can help to solve crime. A series of interactive talks followed by a treasure hunt for forensic geological clues using exhibition material in the Ulster Museum, which revealed how a forensic geologist thinks and show how an understanding of geological processes and environments can assist in unravelling the crime. This formed part of a Northern Ireland Science Festival, the first of its kind in Northern Ireland and attracted thousands of people to an amazing diversity of science events across the country.

7.3.3 Search for Missing British Person, Europe
IUGS-IFG assisted the Police during the search for a missing British person in Europe.

7.4 APRIL

7.4.1 Deployment of GPR to search for a Missing Person’s Grave, Northern Europe
Ground Penetrating Radar (GPR) surveys were deployed across control sites in connection with the search for a missing person’s grave in Northern Europe and. The preliminary results were conclusive in detecting the buried control items, which were undetected by GPR at the time of their initial burial. The change in the physical properties of the reinstated peaty soils over a period of approximately 8 years was envisaged to be significant for the deployment of GPR in the geological conditions encountered. The results were subsequently presented in France and Japan in August and September 2015, respectively.

7.4.2 Search for Missing Persons, Colombia, South America
In 2009, IUGS-IFG committee members (1,11,14,15,16) delivered the, ‘First IberoLatin American Conference on Forensic Geology, in Bogota, Colombia.’ This was carried out in collaboration with the; University of National University of Colombia, Department of Geology; Colombia’s National Institute of Medical, Legal and Forensic Sciences; Instituto National De Medicina y Ciencias Forense (National Forensic Crime Laboratories) and the Federal Police. Since this course, IUGS-IFG has continued to support the development of forensic geology in Colombia and throughout Latin America. In April 2015, an interview was given to the media on the applications of geology during searches for missing persons in Colombia. The number of people in Colombia who are missing is 85,000 (according to the National Register of Missing People, although some in Colombia suggest this figure is around 96,000). Of these, a significant proportion are estimated to be involuntary disappearances (c19,000 in 2014). As part of PhD research and operation support to the Authorities, geological methodologies and search strategies developed by IUGS-IFG and others are applied during the search for missing person’s graves. Further details can be found at http://www.vice.com/read/the-grave-hunter-0000622-v22n4

7.4.3 Police and Forensic Water Searches, Northern Europe
In collaboration with the UK Home Office, Centre for Advanced Science and Technology (CAST) and the a UK Police Underwater Search and Marine Unit, IUGS-IFG arranged for the experimental deployment of sonar and water penetrating radar searches of a canal in Europe. The experimental techniques worked well and were able to locate items in the canal.
7.4.4 European Network of Forensic Science Institute (ENFSI), Riga, Latvia\textsuperscript{3,19}

The 4th ENFSI annual meeting was held on 16th to 17th April 2015, at Riga, in Latvia. There were three sessions on, ‘Wildlife and Non-human DNA’, ‘Soil’ and ‘Morphology’. In addition, there was a ‘bring an unsolved case to the group’ session, which was useful for sharing innovative ideas and best practice.

7.4.5 Geology and Environment for Manchester Students, (GEMS), Manchester, England\textsuperscript{1}

On 20th April 2015, a presentation was given to GEMS entitled, ‘Forensic Geology: The Applications of Geology to Policing and Law Enforcement.’ The event was held in the Williamson Building, University of Manchester, Department of Geology. There was particular interest and discussions on the applications of geology to environmental crimes.

7.4.6 Forensic Geology, Hyderabad, India\textsuperscript{13}

In Hyderabad, India, a series of presentations were given to outline the applications of forensic geology and forensic science to police and criminal investigations.

7.5 MAY

7.5.1 Wildlife Crime Scene and Field Investigation Seminar, Montana, USA\textsuperscript{1,4}

On 13\textsuperscript{th} May 2015, a program was developed and presented, which attracted wildlife enforcement officers from around the world. A presentation lasting two hours was given on; ‘Forensic Geology and its Application in Wildlife Investigations.’

7.5.2 ASPT, ENFSI, Training in Soil Forensic Microscopy Techniques, Namur, Belgium\textsuperscript{3,9,19}

On 22nd to 27th May 2015, a week long training course was delivered in Namur, Belgium. This was organised from the Animal, Soil and Plant Trace (ASPT) working group of the ENFSI network. The course included pollen and mineral extraction and characterisation, focussing on microscopy when samples are minute in size. A range of participants from across Europe attended and enjoyed a very well run course.

7.6 JUNE

7.6.1 MSc in Forensic Geology, Messina, Sicily, Italy\textsuperscript{3,8,11,18}

In 2014-2015, IUGS-IGS supported the Università degli Studi di Messina, Dipartimento di Scienze dell'Ambiente, Messina, Sicily to establish a new MSc course in forensic geology, the first of its kind in Italy. The first part of the course took place in June 2015, followed by a second stage in September 2015. The course was attended by approximately 150 delegates and it was supported in collaboration with the Polizia di Stato, Carabinieri, Geoscienze Forense Italia, The American University in Rome, Alfatest, Malvern, the James Hutton Institute, Queens University Belfast, Ambregoo, Consiglio Nazionale Dei Geologi and the Geological Society of London, Forensic Geoscience Group. The course was heavily publicised and gained much media attention, including national TV coverage through Italy and Sicily. The course contents included a series of formal lectures followed by knowledge transfer events and field training in the following:

- Background, history and global developments of forensic geology;
- Design and implementation of ground searches for buried and concealed items including graves, human remains, drugs, explosives and firearms;
- Crime scene examinations;
- Soil sampling and laboratory analysis;
- Working with the police and law enforcement; and
- Selected operation cases from around the world.

7.6.2 Compositional Data Analysis in Forensic Science, L'Escala, Girona, Spain\textsuperscript{8}

IUGS-IFG has links with the International Association of Mathematical Geoscience (IAMG). This included a representation at an event on 1\textsuperscript{st} to 5\textsuperscript{th} June 2015, to discuss on Compositional Data (CoDA) Analysis in forensic science, which was held at L’Escala, in Girona, Spain.
7.7 JULY

7.7.1 Search for a Suspected Missing Person, Northern Europe\textsuperscript{1,3,11}
IUGS-IFG assisted Police in a search for a missing person in Northern Europe. This included the provision of a search strategy and the deployment of geophysical search assets at a remote location over a wide area.

7.7.2 3rd IberoLatin American Course on Forensic Geology, Argentina\textsuperscript{1,16,17}
IUGS-IFG committee plans to be involved with the organisation and planning for the 3rd IberoLatin American Course on Forensic Geology. IUGS-IFG committee members were involved in the management of the 1st course (in Bogota, Colombia, 2009) the 2nd course (in Brazil, 2013). The 3rd course was originally proposed to take place in Argentina in 2016, but this was changed to 2017, to avoid possible clashes with the 35th IGC, to be held in Cape Town in 2016.

7.8 AUGUST

7.8.1 European Meeting on Forensic Archaeology, Pontoise, France\textsuperscript{3,11}
The 4th European Meeting on Forensic Archaeology (EMFA) was held on 28th to 29th August, in Pontoise, France. EMFA is a joint venture between the Forensic Science Institute of the French Gendarmerie (IRCGN) and the ENFSI project group on Forensic Archaeology. The theme of the conference was, ‘Crime Scene: Role of the Forensic Archaeologist in a Multidisciplinary Team’ and has a stated purpose of discussing the present and future state of forensic archaeology in European countries, to present relevant case studies, research and development. IUGS-IFG was represented at this event to discuss the applications of forensic geology and collaboration with forensic archaeologists.

7.8.2 Search for Missing Person in a Lake, Northern Europe\textsuperscript{1,11}
IUGS-IFG assisted the Police with a search for a missing person in a lake in Northern Europe.

7.8.3 Crime Writers Festival, Harrogate, England\textsuperscript{3}
IUGS-IFG was represented at the Harrogate Crime Writers Festival. Forensic geoscientists are features in the new books, ‘The Moth Catcher’ and ‘Time of Death’.

7.8.4 Crime, Fact or Fiction, Royal Society Summer Science Exhibition, London, UK\textsuperscript{3}
IUGS-IFG and others attended a Royal Society panel debate on, ‘Crime Fact or Fiction’, in London, as part of the Royal Society Summer Science Exhibition. All tickets were sold and over 200 attended.

7.8.5 Crime Novel, London, UK\textsuperscript{1}
IUGS-IFG was contacted to provide advice and guidance to a crime writer on geological accuracy for a possible crime novel.

7.9 SEPTEMBER

7.9.1 Location of Graves Using Victim Detector Dogs, Europe\textsuperscript{1,5,11}
IUGS-IFG provided a former British police dog handler and FBI canine trainer, with advice aimed at better understanding the influence of geology during the deployment of victim detector dogs to locate homicide graves and to explain the generation of false-positive indications.

7.9.2 The Development of Forensic Geology, Nagano, Japan\textsuperscript{1,8,11,14,24}
Throughout 2014 and 2015, IUGS-IFG planned and organised a forensic geology event in Japan. This was held on 9th to 13th September, at the International Symposium on the Development of Forensic Geology, 122nd Annual Meeting of the Geological Society of Japan, at Nagano, in Japan, in collaboration with the Japan National Research Institute of Police. This symposium was the first of its kind in Japan and focussed on the application of geology and its applications to criminal investigations in Japan. It was attended by the Japan Coast Guard Academy, Research Institute of Environmental Geology of Chiba Prefecture, Kagoshima University and Oxford Instruments. The program was a great success and it included four IUGS-IFG committee members in attendance and
others who assisted with the management of the event from USA, UK and Japan. It was attended by invited delegates that were mostly Japanese with some from Southeast Asia and Africa.

7.9.3 Forensic Geology and the Institute of Forensic Science in China\(^1,14\)
Since 2011, IUGS-IFG has been seeking to develop forensic geology in China. In 2015, three members of the China Institute of Forensic Science were identified to become affiliated to IUGS-IFG, via the Geoforensic International Network (GIN). IUGS-IFG is pleased to welcome the Institute of Forensic Science in China.

7.9.4 Forensic Geology in Hong Kong\(^8,11\)
On 13th to 20th September 2015, IUGS-IFG was represented in Hong Kong in association with the Hong Kong Regional Group of the Geological Society and with support from the Geological Society of London. A presentation was given on forensic geology followed by discussions on the future development of forensic geology throughout China.

7.9.5 35th International Geological Congress (IGC), Cape Town, South Africa\(^1,2,3,5,11,26,28\)
In September 2015, an IUGS-IFG committee member visited South Africa to continue with the planning for the forensic geology session at the 35th IGC and joint meeting with the 5th International Meeting on Criminal and Environmental Forensics, on 27 August to 4th September, in Cape Town. Throughout 2015, IUGS-IFG has been discussing the possibility for joint meetings at the 35th IGC with the Medical Geologists (Colombian Observatory on Medical and Forensic Geology) and on Geoethics in association with the IUGS Task Group Global Geoscience Professionalism and Geoethics.

7.9.6 7th European Academy of Forensic Science, Prague, Czech Republic\(^1,3,13,26\)
IUGS-IFG was represented at the 7th European Academy of Forensic Science Conference, Prague, Czech Republic, on 6th to 11th September 2015. The conference was focussed on, ‘Pushing Boundaries and Working Beyond Borders.’ A keynote presentation was given on results from a European inter laboratory soil case work trial. Other presentations included the detection of Volatile Organic Compounds (VOCs) from body decomposition and its application to training cadaver-detection and blood-detection dogs, following on from case work and research conducted in the UK.

7.9.7 Location, Excavation and Examination of Clandestine Graves, Scotland\(^3\)
On 14th to 20th September, as part of a Massive On line Open Learning (MOOC) course, with the University of Dundee and Future Learn, over 20,000 students signed up for a course entitled, ‘Identifying the Dead’. This included the properties of soil and their role in human decomposition. You tube interviews, video clips, activities and questions were included. One comment (out of over 800 direct responses) after learning about soil evidence was a student who commented; ‘It’s a fascinating subject!! I never knew how important soil would be.’ (https://www.futurelearn.com/courses/identifying-the-dead)

7.10 OCTOBER

7.10.1 Hertfordshire Geological Society, St Albans, England\(^1\)
On 1st October 2015, IUGS-IFG was invited by Hertfordshire Geological Society to give a presentation on the history, developments and cases in forensic geology. In the past, two members of Hertfordshire Geological Society provided micro-palaeontological analysis to assist the UK Police for a missing person and murder case. This was attended by approximately 50 to 60 delegates and included an extended question and answer session.

7.10.2 Double Homicide, Northern Europe\(^1,11\)
In October guidance was provided by IUGS-IFG on the search for the graves for two missing persons in Northern Europe. This case involved the management of psychics.

7.10.3 Australian Facility for Taphonomic Experimental Research (AFTER)\(^1,3,5,26\)
The University of Technology Sydney (UTS) announced the opening of a new forensic research facility in 2016, called the, ‘Australian Facility for Taphonomic Experimental Research (AFTER).’ IUGS-
IFG have provided geological and geophysical advice for AFTER. This facility is the first of its kind in Australia, and the only facility outside of the USA, that allows the donation of cadavers to study the process of human decomposition in a natural environment. Such facilities, often colloquially are referred to as ‘body farms’. These allow geologists, researchers, police and forensic scientists to better understand the physical, chemical, and biological processes of soft and hard tissue degradation. The facility is being led by UTS in collaboration with the following partners: University of Wollongong, University of Sydney, Australian National University, University of Canberra, University of New England, Australian Federal Police, NSW Police, Victoria Police, Victorian Institute of Forensic Medicine, NSW Forensic and Analytical Sciences Services, and the Australian Nuclear Science and Technology Organisation. The aim of the research carried out by these collaborative partners is to assist with the search for, recovery and identification of victims remains including missing persons, and victims of homicide, genocide or mass disasters.

7.10.4 Analysis of Soil, VOCs and Leachate from a Homicide Grave, Northern Europe\textsuperscript{1,11,12}

In 2014, soil samples were taken by IUGS-IFG from the grave of a homicide victim who lay undiscovered for 15 years. These were subsequently analysed by IUGS-IFG, Helford Geoscience LLP, The James Hutton Institute and University of Staffordshire. The objective was to determine the chemistry, VOCs and mineralogy of the soils at, and in the immediate vicinity of the grave and whether organic compounds were present and detectable. This research is ongoing and is aimed at reducing open area ground searches so that a cost-effective and practicable ground search for burials can be deployed.

7.10.5 17th annual IAMG conference\textsuperscript{8}

IUGS-IFG was represented at the 17th annual IAMG conference, held on 5th to 13th September 2015, in Freiberg, Germany. Over 300 participants attended from across the world, which also included a special, ‘Day of Surveys’ to acknowledge William Smith and 200 years of science and methodologies to construct maps.

7.10.6 Knaresborough Rotary Club, England\textsuperscript{1}

IUGS-IFG was invited to the Knaresborough Rotary Club Annual Dinner as guest speaker. A presentation on forensic geology was postponed and a new date will be considered in 2016.

7.11 NOVEMBER

7.11.1 Forensic Geology and the Brazilian Federal Police, Curitiba, Paraná, Brazil \textsuperscript{1,11,16,17}

On 19th to 20th November, the Brazilian Federal Police, along with the University of São Paulo, Federal University of Paraná and the Federal Technological University of Paraná promote the First South Brazilian Symposium on Research in Forensic Sciences, held at Curitiba, Paraná, Brazil. At this event, the initial first results of a project were discussed called, ‘Microtraces and Traces of Forensic Interest.’ This was supported by cUSD$2,000 from the Ministry of Education, in Brazil (https://sulforense.wix.com/sulforense). In Brazil, steps are being taken for the provision over the next four years of numerous PhD and post-doctoral research in criminalistics, including forensic geology.

7.11.2 Lord Advocates Conference on Cold Cases, Scotland\textsuperscript{3}

IUGS-IFG presented a keynote at the Lord Advocates conference on cold cases. This included the work carried out by IUGS-IFG and the wider skills the group brings to cold case investigations. This event drew attention to the use of miniaturised techniques allowing these to then apply an organic approach previously not possible.

7.11.3 IUGS-IFG Sub-Committee Meeting, Northern Europe\textsuperscript{3,11,12}

On 6th November 2015, a sub-committee meeting was held by teleconference to discuss the progress and publication of, ‘A Guide to Forensic Geology’, the 35th IGC in Cape Town, operational case work, the future development of IUGS-IFG, finance and funding.
7.11.4 International Conference on Engineering Geophysics, Al Ain, UAE

The 3rd International Conference on Engineering Geophysics was held in Al Ain, UAE, on 15th to 18th November 2015. IUGS-IFG was involved in the Technical Committee, provided a keynote speaker and a speaker for the session entitled, ‘Women in Geoscience’. IUGS-IFG also organise a session on forensic geology in collaboration with the UK National Search Adviser (National Crime Agency), to build upon the advancements and training that took place in Abu Dhabi, in 2012, organised with the Abu Dhabi Police.

7.11.5 Abu Dhabi Police, Forensic Geology Group

IUGS-IFG began to collaborate with the Abu Dhabi Police, in Rome, in 2011. This led to the establishment of a knowledge transfer and training event in UAE, in 2013. The General Directorate of the Abu Dhabi Police has initiated a project to concentrate on geosciences and its applications to forensic investigations including the establishment of a Forensic Geology Group. On 17th November 2015, a meeting was held in Al Ain, UAE, attended by IUGS-IFG, Abu Dhabi Police and the UK Police National Search Adviser (UK National Crime Agency). A training programme was requested by Abu Dhabi Police Forensic Geology Group in 2017, to include land and water searches, crime scene examination and geological trace evidence collection and analysis. Abu Dhabi Police continue to remain on the IUGS-IFG committee, two additional serving officers are being considered to join the IUGS-IFG committee in 2016, to assist with the planning for training in 2017.

7.11.6 International Journal of Geosciences, Cultural Heritage and Forensics

An Adjunct Professor of Archaeology and Classics, at The American University, in Rome, invited members of the IUGS-IFG to act as Editorial Board members for a new, peer-review journal called the, ‘International Journal of Geosciences Applied to Cultural Heritage and Forensics’, by Science Publishing Group.

7.12 DECEMBER 2015

7.12.1 St Christopher’s High School, Accrington, Lancashire, UK

On 1st December 2015, IUGS-IFG gave a presentation to St Christopher’s High School, in Lancashire, England, years 7 to 13 pupils as part of the ‘Aspirations Programme’. This included forensic geology and examples of how geologists may assist the Police investigate some crimes such as; ground searches for burials, water searches, crime scene examinations, geological trace evidence and environmental crimes.

7.12.2 Police National Search Centre, The College of Policing, NCA, Coventry, UK

On 17th to 18th December 2015, IUGS-IFG took part in a Continuation of Professional Development (CPD) event for PolSAs (Police Search Advisors), for the Police National Search Centre, The College of Policing. This included the provision of new search strategies and techniques to locate burials relate to homicide, terrorism and organized crime.

8 MAIN PRODUCTS IN 2015

8.1 Confidential Documents and Operations

Some of the IUGS-IFG committee members were contacted by the Police to provide advice, guidance and assistance with operational cases. As such, confidential documents and some events and activities remain restricted and are not included in this report.

8.2 Training Documents

As part of forensic geology training courses held in the UK, UAE, Sicily and Japan, IUGS-IFG produced and issued documents to accompany course work.

8.3 Website

IUGS-IFG web site was expanded and provides information on the IUGS-IFG committee, history, past, recent and future global events, contacts, papers, publications and popular press articles.
8.4 **Flyer**
IUGS-IFG flyer provides information on recent and selected future events in forensic geology and was issued on the web site and provided at global events throughout 2015.

8.5 **Geoforesnic International Network (GIN)**
The Geoforesnic International Network (GIN) brings together forensic geologists, geoscientists and invited police/law enforcement officers from around the world, who have a desire and interest in the development of forensic geology. IUGS-IFG is pleased to welcome representatives from China.

Those countries now represented in GIN include; Australia, Argentina, Belgium, Brasil, Canada, China, Colombia, England, France, Germany, Hungary, India, Iran, Ireland, Italy, Japan, Malta, Mexico, Namibia, New Zealand, Nigeria, Northern Ireland, Portugal, Russia, Scotland, South Africa, Spain, Sweden, Switzerland, Netherlands, United Arab Emirates, United States of America, Wales and the West Indies (Caribbean).

8.6 **Certificates**
IUGS-IFG certificates were issued to delegates who attended forensic geology training in UK, Japan and Sicily.

8.7 **Newsletter**
IUGS-IFG published the second newsletter in June 2015, which was subsequently issued and circulated globally.

8.8 **Publications**
A list of publications by IUGS-IFG and/or including IUGS-IFG committee members are presented in Appendix I.

9 **Main Problems Encountered in 2015**

9.1 **Funding: A Principal Leadership Challenge**
The provision of core funding from IUGS is crucial for the progression of IFG. This enables additional funding or funding in kind to be subsequently provided by stakeholders to enable global events and activities to take place.

9.2 **Time Demands**
The success of IUGS-IFG in the past five years has resulted in significant increased requests for collaboration and the setting up of forensic geology events. IUGS-IFG members also have significant demand for follow-on support and advice after project completion. IUGS-IFG has managed this by expanding the core committee and by delegation to fellow committee members, in particular encouragement of deployment of local teams.

9.3 **Publications**
IUGS-IFG continues to receive on a regular basis request for books and papers to be published on the subject of forensic geology. IUGS-IFG has been approached for the publication of books and a ‘Journal of Forensic Geology’. However, IUGS-IFGs focus remains the writing and publication of, ‘A Guide to Forensic Geology’. Other books and opportunities will be considered following its publication.

9.4 **Competence, Accreditation, Regulation and Code of Conduct**
There is no international organisation with the authority to regulate and accredit the work and practices of forensic geologists. This is being considered and addressed by IUGS-IFG. Currently those working operationally obtain accreditation through their own professional body and as chartered scientists.

9.5 **Alignment with Forensic Science**
IUGS-IFG has recruited a committee member to investigate the alignment of forensic geology with forensic science, which may differ in each country.
9.6 Effective Communication & Training
There is the need for training on techniques to facilitate communication between Forensic Geologists and the Police/Law Enforcement. For example, training in, ‘Geology for Police Officers’ and the basic principles of ‘Policing, Search and Crime Scene Examinations for Geologists’, are required.

9.7 Security and Geopolitics
In some parts of the world increased security risks have prevented the advancement of forensic geology. As such, IUGS-IFG has not sent any members to localities where security risks remain high.
10 SUMMARY OF EXPENDITURES IN 2015

10.1 Bank Account & Management
The IUGS-IFG bank account remains in Aberdeen, Scotland, and is managed by Prof Lorna Dawson (IUGS-IFG Treasurer).

10.2 Summary of Accounts
The income and expenditure on the account for 2014 is summarised in Table 10.1. As the IUGS-IFG bank account is held in the UK, the income and expenditure is shown in £ sterling and $USD equivalent. In 2015, IFG was successful in attracting additional funding for international events.

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<th>DETAILS</th>
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Note: exchange rate, www.xe.cm on 5th November 2011, 1 GBP = 1.52399 USD, 1 USD = 0.656173 GBP

Table 10.1 IUGS Treasurers Accounts 2015 Transaction

11 WORK PLAN FOR NEXT YEAR (2016)

In 2016, the objectives of IUGS-IFG are as follows:

- Progress the publication of, ‘A Guide to Forensic Geology’;
- Attendance at the 35th International Geological Congress, in Cape Town, South Africa. This may include the provision and organisation of a session on forensic geology and the 5th "International Conference on Criminal and Environmental Soil Forensics";
- Establishment of a joint meeting in Cape Town with the Medical Geologists (Proyecto Colombiano de Geología Médica y Forense) and the 5th International Professional Geology Conference (5IPGC) and the IUGS Task Group Global Geoscience Professionalism;
- Provision of training for the UK Police in ground searches for burials associated with crime and terrorism (tbc);
- Focus on developing Forensic Geology in Africa and Asia;
- Provision of ongoing in kind support for the MSc in Forensic Geology, University of Messina, Sicily, Italy;
- Consideration of the establishment, and encouragement of local contributions, for a course on forensic geology in Barcelona, Spain;
- Development and enhancement of ground search strategies and deployment of analysis of Volatile Organic Compounds (VOCs) and Leachate Plumes;
- Collaboration with Australian Taphonomy Experimental Research (AFTER);
- Engagement with schools and the general public to raise awareness of the applications of geology to police and law enforcement investigations;
- Presentation on the applications of forensic geology to ground searches and geological (trace) evidence, Yorkshire Group of the Geological Society of London, February 2016;
- Planning for the 3rd IberoLatin American Course of Forensic Geology, in Argentina, in 2017;
- Presentation on the applications of Forensic Geology to Crime Associated with Homicide, Terrorism and Organised Crime for the Western Institute of Mining and Metallurgy, Institute
of Materials Minerals and Mining, University of Keele, Department of Geology, UK, March 2017;
• Planning for forensic geology training with the Abu Dhabi Police, Forensic Geology Group, in 2017; and
• Further development and growth of the IUGS-IFG web site as a focal point for the availability and global distribution of information on Forensic Geology.

12 Critical Milestones

Critical milestones for 2015 included the following:

• Development of the draft of, ‘A Guide to Forensic Geology’;
• Implementation of a new MSc course in Forensic Geology, at University of Messina, Sicily, Italy;
• Establishment of the Abu Dhabi Police, Forensic Geology Group;
• Representation of forensic geology in Japan, at the International Symposium on the Development of Forensic Geology, 122nd Annual Meeting of the Geological Society of Japan
• Provision of geological support to the Police for some high profile crimes in the UK and Internationally; and
• Establishment of forensic geology in China, including a visit to Hong Kong and the assignment of three geologists from China to the Geoforensic International Network (GIN).

13 Anticipated Outputs to Be Achieved for 2016

The main outputs expected for 2015 include the following:

• Completion of the final draft of, ‘A Guide to Forensic Geology’;
• IUGS-IFG representation at the Forensic Geology session, at the 35th International Geological Congress, in Cape Town, South Africa;
• Delivery of further training, knowledge transfer and outreach events; and
• Publications and marketing of IUGS-IFG.

14 Budget for 2016

In 2016, IUGS-IFG aims to finalise the draft of, ‘A Guide to Forensic Geology’ and, depending on the publisher’s timeframes, work toward publication.

In 2015, IUGS-IFG was successful in obtaining funding in-kind for its global events. This enabled IUGS-IFG to therefore conserve some of core funding received from IUGS. IFG aims to utilise its funding to hold a committee meeting at the 35th IGC in Cape Town and to collaborate with; the 5th International Conference on Criminal and Environmental Soil Forensics, the 5th International Professional Geology Conference (5IPGC) and the IUGS Task Group Global Geoscience Professionalism and Geoethics, and the Proyecto Colombiano de Geología Médica y Forense.

In 2016, IUGS-IFG plans to break even or generate a small surplus funding, which can be carried forward to be reinvested in the development of forensic geology. IUGS-IFG will also continue to request and obtain contributory funding and funding services in-kind in addition to the core funding that is provided by IUGS. This approach is expected to provide a basis and for the continued global development and advancement of Forensic Geology.

In 2011-2015 IUGS-IFG has been successful in attracting additional financial support to assist with international events. IUGS-IFG would request that we can ‘roll forward’ the current balance of GBP £9,613.55 USD$14,650.95 to assist with the proposed meetings and events in 2016 especially the 35th IGC in Cape Town and the launch of, ‘A Guide to Forensic Geology’.

IUGS-IFG kindly requests the maximum available budget of USD$15,000 funding from the IUGS Executive Committee for 2016 to help the group continue to pursue the global development of forensic geology throughout 2016 and beyond.
APPENDIX I: SELECTED PUBLICATIONS IN 2015
Books, Book Chapters and Monographs


Refereed Journal Articles


Conference Papers


**Popular Press & Media Articles**


**TV, Media and Radio Interviews**

42. Radio interviews. e.g. http://www.bbc.co.uk/programmes/b06gwmc#play
43. Inspecting Detectives, The Long Shadow of the World's End, Episode 3
   https://t.co/4LD3loHxbybbc.co.uk

44. Interview with German TV programme Odysso will be aired on Thursday 19 November 2015 and it will be available to view at http://bit.ly/1PwJp02 after broadcast (to be aired in 2016)

45. Approximately 30 TV/media related interviews and discussion in Australia and UK during 2016.

**Web Sites**

47. http://www.vice.com/read/the-grave-hunter-0000622-v22n4
52. https://www.futurelearn.com/courses/identifying-the-dead
55. http://www.cngeologi.it/
63. http://article.wn.com/view/2015/06/05/Workshop_e_Field_Training_di_Geologia_Forense_della_IUGSIFG_/1

71. https://sulforense.wix.com/sulforense
APPENDIX II: SELECTED PHOTOGRAPHS AND ASSOCIATED INFORMATION
Carlos Molina searching for mass graves in Colombia.

Pier Matteo Barone, The American University of Rome, talked about forensic geology, geophysics and archaeology, Prague, Czech Republic.

Demonstrating forensic soil science and forensic archaeology, University of Dundee, Scotland.

Skip Palenik teaching the identification of minerals using optical microscopy, Namur, Belgium.

Bog search for a Missing Person using Ground Penetrating Radar, Northern Europe.

Laurance Donnelly and Lorna Dawson working with the Police in Europe.

Lorna Dawson and Ekaterina Nesterina, in Latvia.

Laurance Donnelly, searching for a suspected, shallow, homicide grave, Northern Europe.
Lorna Dawson and crime writers Mark Billingham (left) and BBC TV Crime Writer, Ann Cleeves (right) at the launch of ‘Time of Death’ and ‘The Moth Catcher’, at the Harrogate Crime Festival, Harrogate, UK

IUGS-IFG committee members speak about Forensic Geology on national TV, in Messina, Sicily, Italy

Rob Fitzpatrick, in South Africa planning ahead for the 35th International Geological Congress

Geological investigations, Australian Taphonomy Experimental Research (AFTER)

Laurance Donnelly and Alastair Ruffell conducted experimental GPR over a suspect homicide grave in Northern Europe

Mike Ferguson (CAST & GIN), at University College London, giving a presentation which included the application of geophysics to ground at water searches in collaboration with IUGS-IFG

Skip Palenik geological trace evidence training, USA

Laurance Donnelly and Alastair Ruffell conduct experimental deployment of dogs and geophysics to locate buried items related to unmarked graves, in Northern Europe
IUGS-IFG with staff and delegates from the MSc in Forensic Geology, University of Messina, Sicily, Italy

IUGS-IFG with Carabinieri and Polizia and Staff from the University of Messina, Sicily, Italy

IUGS-IFG and Prof Roberta Somma, University of Messina, Sicily, Italy
MSc Forensic Geology, Sicily: Training in Ground Search for Burials
The International Union of Geological Sciences (IUGS), Initiative on Forensic Geology (IFG), was officially launched during the 62nd Executive Committee Meeting of the IUGS, which was held at UNESCO headquarters, in Paris, France, on 22nd February 2011. The objectives of the IUGS-IFG are to:

- Collate and disseminate data and information on forensic geology applied to policing and law enforcement, criminal, environmental and civil investigations;
- Promote international meetings, seminars, conferences and training;
- Develop a ‘Committee’ to act as principal advisers, collaborators and active participants;
- Develop an international network whereby each ‘member’ will act as a principal contact in their respective country for the collation and dissemination of information on forensic geology;
- Collate, make available and where appropriate review any existing documentation and publications in forensic geology; and
- Produce a document endorsed by the Committee to be called; ‘A Guide to Forensic Geology’.


The IUGS-IFG Committee comprises representatives from major geographical regions of the world and includes specialists from: academia, industry, consultancy, operationally based forensic geologists, the police, law enforcement agencies and forensic organisations.

Both IUGS-IFG and the GeoForensic International Network (GIN) brings together forensic geologists, geoscientists and invited police/law enforcement officers from around the world, who have a desire and interest in the development of forensic geology. Countries now represented in include: Australia, Argentina, Belgium, Brasil, Canada, Colombia, China, England, France, Germany, Hungary, India, Iran, Ireland, Italy, Japan, Latvia, Malta, Mexico, Namibia, New Zealand, Nigeria, Northern Ireland, Portugal, Russia, Scotland, South Africa, Spain, Sweden, Switzerland, Netherlands, United Arab Emirates, United States of America, Wales and the West Indies (Caribbean).
Flyer and Press Release for MSc in Forensic Geology and Field Training, University of Messina, Sicily, Italy

Example of IUGS-IFG certificate for delegates attending training in Forensic Geology

We hereby certify that

Prof Roberta Somma

Participated in the workshop: Knowledge transfer and training for the

MSc in Forensic Geology and MSc in Forensic Sciences

held at the

Università degli Studi di Messina, Sicily, Italy, 10th-11th June 2015

Dr Laurence Donnelly
IUGS-IFG, Chair

Rose Marie Di Maggio
IUGS-IFG, Officer for Europe

Prof Lorne Dawson
IUGS-IFG, Treasurer

Dr Alastair Ruffell
IUGS-IFG, Training

Dr Jennifer Mackley
IUGS-IFG, Communications
IUGS-IFG & MSc in Forensic Geology, University of Messina, Sicily, Italy

Università degli Studi di Messina

Giornate sulla Geologia Forense
17 Settembre 2015, Palazzo Biscari, Ali (Messina)

RAG MAP OF THE CAPPUCINI AREA (ALI, MESSINA): THE MURDER OF JASMINE

Robert Somma(1), Massimiliano Silvestro(2), Maria Cascio(2)
& Laurance Donnelly(3)

1 Dipartimento SATAS, Universitàdi Messina, 2 Dipartimento di Scienze della Terra, 3 The International Union of Geological Sciences (IUGS) Initiative on Forensic Geology (IFG)

DIPARTIMENTO DI SCIENZE DELLA TERRA, DELLA SICUREZZA DEL TERRITORIO, DELLI ALUMNI E DELLA VALUTAZIONE NATURALE DEIisuoli

Master in Geologia forense: esperienza sul campo per gli studenti

Continua...

Field training exercises on the Italian Forensic Training Camp (IUGS-IFG) at Ali (Messina) in the Capuccini area (Ali, Messina). The training was organized by the Italian Geological Society (SASMA) and the Italian Society of Geochemistry and Forensic Geology (SGC). The training included a visit to the Capuccini area, where the remains of Jasmine were found. The training was attended by approximately 30 participants. The training was organized by the SASMA and the SGC. The training was supported by the IUGS-IFG and the Italian Ministry of Education, University, and Research.
IUGS-IFG & the International Symposium on Development of Forensic Geology, 122nd Annual Meeting of the Geological Society of Japan
IUGS-IFG & Collaboration with the Abu Dhabi Police, Forensic Geology Group
Abu Dhabi Police, Forensic Geology Branch

(Left) Flyer for a Forensic Geology Presentation to School Children, Years 7 to 13, St. Christopher’s School, Accrington, Lancashire. (Right) UK Marketing of Forensic Geology used by IUGS-IFG and Geological Society of London (GSL) Forensic Geoscience Group (FGG)
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