The 2004 General Assembly of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

IAVCEI intra-meeting field trip to Lanin volcano, guided by Dr. Jose Antonio Naranjo of SERNAGEOMIN.

The IAVCEI General Assembly was hosted by the Chilean geological community, primarily SERNAGEOMIN, at the Gran Hotel Pucon, November 15–19, 2004. Pucon is a beautiful lakeside town at the foot of the active Villarrica volcano, with good food, friendly people, and an abundance of recreational activities. Better attended than all previous IAVCEI gatherings, it provided a venue for the presentation of recent research in the field of volcanology, as well as a meeting of experts working in hazards and the emergency management of specific volcanoes from all around the world. Field trips took place before, during, and after the meeting, allowing all of the approximately 850 attendees the opportunity to see some of Chile's volcanoes.

MAP:GAC was represented by Dr. Patricia Sruoga, Ms. Silvia Castro, Ms. Iris Galarza, Mr. Andres Cazas, Ms. Malaika Ulmi, Mr. Otto Krauth, Dr. Marta Calvache, Mr. Hector Cepeda, Mr. Bernardo Pulgarin, Dr. Pablo Samaniego, Mr. Marco Rivera, and a number of Chileans hosting the event. Krauth introduced GeoSemantica to the community of volcanologists, and it was met with interest by representatives of the World Organization of Volcano Observatories, who are working on their own database.

The conference was very successful—SERNAGEOMIN and the entire organizing committee are to be congratulated for a memorable week!

Ms. Malaika Ulmi

GeoSemantica Update

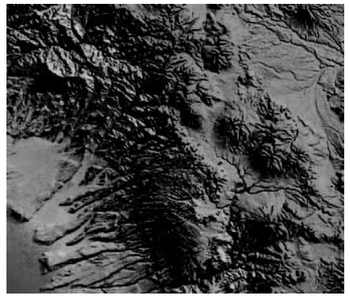

Figure 1. Shuttle Radar Topography Mission (SRTM) data.

November has been another busy month for the GeoSemantica team. Mr. Otto Krauth presented GeoSemantica at the IAVCEI General Assembly (http://www2.sernageomin.cl/iavcei/) in Pucon, Chile on November 16, 2004. The presentation was well received and several agencies expressed interest in connecting to and using GeoSemantica, including the World Organization of Volcano Observatories (http://www.wovo.org/).

The development team has been very busy over the past three months building GeoSemantica v1.0. This first release will be available in a Beta version for review and comment in the next month or two, while version 1.0 has a target delivery date of May 1, 2005.

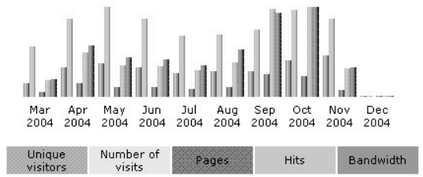

Figure 2. GeoSemantica Usage Statistics.

Usage of the GeoSemantica prototype has continued to exceed expectations. Unique user visitation has increased over October's record and could reach 800 unique users by month's end.

Krauth has uploaded Shuttle Radar Topography Mission (SRTM) data for all of South America into GeoSemantica. This dataset provides 30 metre resolution digital elevation (DEM) data, and brings the total number of spatial data layers available in the system to 707.

Mr. Joost van Ulden

Cities on Volcanoes 4, Quito, Ecuador, *January 23-27, 2006*

Ever since Pompeii, humans living near volcanoes have periodically risked their lives and livelihood due to volcanic hazards. "Cities on Volcanoes" is an international conference for those who help urbanites coexist with active volcanoes. From volcanologists to seismologists, to city planners and the medical community, experts meet to share their understanding of the necessary interdisciplinary coordination of disaster management and all aspects of living with volcanoes. The fourth meeting of "Cities on Volcanoes" (it has convened every 2 or 3 years since 1998) is scheduled for January 23 to 27, 2006, in Quito, Ecuador, a city certainly experienced in its own share of hazards from the six active volcanoes within sight of the city, four of which have erupted historically. Field trips during the meeting will visit some of the active Ecuadorian volcanoes near Quito, which include Guagua Pinincha, Cotopaxi, Cayambe, El Reventador, Pululahua, Chacana Caldera / Papallacta Hot Springs / Antisana Volcano, Quilotoa, Tungurahua, and the Galapagos Islands. More at http://www.igepn.edu.ec/citiesonvolcanoes/index.htm.

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From the Manager's Desk

December 2004

In Canada, snow is falling in most parts of the country, and we are all looking forward to Christmas and the holidays to brighten up what is often a dark and cold period. We hope all our South American colleagues are enjoying summer and everyone on both sides of the equator enjoys a peaceful holiday season.

November has been a busy period for MAP:GAC collaboration. For national work in landslides, Dr. Lionel Jackson and Ms. Monica Jaramillo were in Venezuela to assist in studies in the Merida Case Study area, and Dr. Reginald Hermanns visited Chile to review their work in landslides and plans for future study. Dr. Mark Stasiuk and Mr. Oscar Cerritos are in Peru giving a dGPS course and helping INGEMMET create DEMs of the Matucana Case Study area. An airphoto course (similar to that given in Bolivia) by BGC Engineering Inc. of Vancouver was completed in Ecuador. In December, Hermanns will be off to Argentina for additional work in landslides, and two Venezuelan FUNVISIS seismologists will visit the GSC seismology office in Ottawa. On a more regional note, professionals from MAP:GAC countries were well represented at the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) meeting in Pucon, Chile (November 14 – 19), including Mr. Otto Krauth and Ms. Malaika Ulmi. MAP:GAC's booth, the presentation on the project, and GeoSemantica were all well received. Mr. Mike Ellerbeck is in Venezuela attending an international meeting of Emergency Preparedness managers, where he presented to the group an overview of MAP:GAC, including discussions on the importance of including geoscience in planning.

Though short, the teleconference Executive Council meeting held November 10 went very well. Several important pieces of information were dealt with. Everyone is looking forward to the face-to-face meetings in Caracas to be held from February 20 to March 2, 2005. Specific meeting dates are:

GeoSemantica: Sunday, February 20 – Friday, February 25
Individual country meetings (1.5 hrs each): Wednesday, February 23
Geoscience Working Group (GWG) meeting:
Thursday, February 24 – Saturday, February 26
Joint GWG and Executive Council field trip (Vargas area):
Sunday, February 27
MAP:GAC Executive Council meeting:
Monday, February 28 – Tuesday, March 1
Special session of the Executive Council (RimSim simulation exercise):
Wednesday, March 2.

It has yet to be decided whether it is necessary to have a GEMMA meeting during this period. Look for more information on the meetings in the January MAP:GAC newsletter. Project Leaders and Coordinators are reminded that the country work plans must be updated on the web by January 30.

One issue that has come up over the past month is the dissemination of information to other members of the institute after staff have attended conferences, workshops (such as GEMMA), or other training activities or initiatives such as the Geoscience Working Group meetings. I feel that it is extremely important that as many staff as possible in each institution are aware of activities in which their colleagues have participated, and can gain some benefit from a better understanding of project activities. I strongly encourage all participants in these various activities to give a presentation to their colleagues to let them know what they have participated in, and some of the lessons they may have learned. In addition, we encourage all to submit brief activity reports and other items of interest to the MAP:GAC newsletter.

Dr. Catherine Hickson

Landslide Hazard Update:

Elderly residents help scientists understand natural hazards near Mérida, Venezuela

Scientists with the Caracas and Mérida offices of INGEOMIN and the Geological Survey of Canada (GSC) conducted joint fieldwork November 8 – 16, 2004, as a part of the MAP:GAC Case Study of the Montalbán River basin near Mérida in the Venezuelan Andes. The area was struck by a flood disaster on October 28, 1947, when a surge of mud and boulders descended the course of the Montalbán River and blocked the Chama River so suddenly that it ceased to flow below its confluence with the Montalbán River. The dam created by the debris also created a small lake that persisted for days. As a part of the fieldwork, scientists were able to locate and interview several people, now in their eighties, who were eyewitnesses to the disaster. From these interviews, it became clear that the disaster was consistent with several large debris flow surges that descended the course of the Montalbán River rather than a water flood that transported a large amount of sediment as bed load. This is because only a debris flow is consistent with the almost instantaneous damming of the Chama River.

Figure 1. Left to right: Ms. Riguey Valladares, Mr. Oscar Rosso (INGEOMIN), and Ms. Monica Jaramillo (Geological Survey of Canada) interview long time resident Mr. Juvenal Uribe in his sugar cane field near the Las Vegas fan, the site of the 1947 disaster that killed at least 20 people.

Continued on the next page.

Figure 2. Field samplers pose for a photograph with one of the large boulders sampled for cosmogenic dating. Left to right: Ms. Monica Jaramillo and Dr. Lionel Jackson (GSC), Mr. Jesus Guerrero, Ms. Riguey Valladares, Mr. Wilmer Lozada, Mr. Oscar Rosso, and Mr. Pedro Dufflart (INGEOMIN).

Figure 3. Field geologists descend one of the prehistoric rock avalanches, now sparsely populated, in the upper basin of the Montalbán River.

Colleagues from the University of the Andes in Mérida, Mr. Jaime Lafaille (FUNDAPRIS) and Mr. Carlos Ferrer, have already concluded that a rock avalanche high in the Montalbán River basin was the ultimate cause of the 1947 disaster. The November field investigations in the upper part of the basin revealed evidence of at least three additional prehistoric rock avalanches. The two youngest had their source within the crystalline Precambrian rocks, whereas the apparently oldest rock avalanche of the three had a source within younger Mesozoic sandstone. These avalanches likely transformed directly into debris flows that covered large areas of the Montalbán River fan system. Furthermore, all three would have dammed the course of the Montalbán River and formed landslide lakes. Landslide dams are usually unstable and commonly fail catastrophically and cause massive debris flows similar to but likely larger than the one that caused the 1947 disaster.

In order to determine the hazard that rock-avalanche-caused debris flows pose to the Montalbán River fan system, the frequency of such events must be determined. Material for radiocarbon dating has not been found in rock avalanche or fan sediments. Consequently, cosmogenic exposure dating will likely be used to directly date the rock avalanches. This technique uses the accumulation of minute amounts of isotopes such as beryllium-10 and chlorine-36 within the upper few centimetres of a rock surface. These isotopes are created by the interaction of cosmic rays with elements within the rock. The longer that the rock is exposed to the Earth's surface, the greater the concentration of cosmogenic isotopes found immediately beneath the surface of a rock. Ten samples were obtained for analysis from the rock avalanches during fieldwork. The detection of these isotopes is accomplished through the use of accelerator mass spectrometers. These are among the most sophisticated and sensitive analytic machines presently available to scientists. As sophisticated as these methods are, they could not be applied without the understanding of past disasters in the area provided by elderly residents who generously helped the scientists with their work.

Dr. Lionel Jackson

XII Latin American Geological Congress
Quito, Ecuador, May 4–6, 2005

The organizing committee of the XII Latin American Geological Congress, which includes MAP:GAC participating agency DINAGE, invites everyone in the field of earth sciences to participate in the three-day event rescheduled for May 4 - 6, 2005. Proposed activities include a strong technical and scientific program, involving research and development presentations from all branches and applications of geology. The congress theme, "Geology: a fundamental base for sustainable development and integration", fits well with the work of MAP:GAC. In addition to presentations, short courses, poster sessions, and meetings, field trips will also provide an opportunity to enjoy the geology and beauty of Ecuador. Abstracts must be submitted by February 15, 2005. For more information, see www.cigmyp.org/congreso/index.htm.

Ms. Malaika Ulmi

Community Communications:
Second International Conference on Civil Protection in Venezuela

The Second International Conference on Civil Protection in Venezuela, hosted by Civil Protection of Venezuela in Caracas November 17–19, 2004, was attended by representatives from emergency management organizations of Mexico, Nicaragua, Cuba, Bolivia, Ecuador, Brazil, Portugal, Spain, France, and Germany. As well, civil protection representatives came from all over Venezuela. MAP:GAC Project Administrator Mr. Mike Ellerbeck represented the project with a presentation on MAP:GAC and the role of geoscience in emergency management. The conference provided attendees the opportunity to learn about issues facing emergency management organizations in different countries, and how they dealt with similar challenges. Attendees also learned how emergency management organizations and scientific organizations were working together in Venezuela and around the world to integrate scientific information for better identification of different kinds of risk.

Mr. Mike Ellerbeck

Centennial of the Argentinean Geological Suvey, SEGEMAR

To celebrate its centenary, the Argentinean Geological Survey – SEGEMAR – organized an extensive program of commemorative activities. On Monday October 25, 2004, the official ceremony of the anniversary was celebrated commemorating the date in 1904 when the Decree was signed that created the Mines, Geology, and Hydrology Division, which was the first antecedent of the Geologic Service. For this occasion, the books "History of the Argentinean Geological Survey" and "History of Argentinean Mining" were presented; and tribute plates to the institution, donated by the Argentinean Center of Cartography, were on display at the Service of Naval Hydrography and the Secretariat of Mining. In addition, the exhibition "100 years of Applied Investigation for the Knowledge and Development of Natural Resources" was inaugurated. The President of SEGEMAR, Mr. Jorge Mayoral, and the Executive Secretary, Dr. Pedro Alcántara, highlighted the achievements and the institutional work in the first 100 years of the body. After the speeches, wine was served to honour the 350 attendees.

Next, on October 26–27, four seminars, summarized below, took place in which the goals, current activities, and future of SEGEMAR were analyzed and debated.

SEGEMAR and Industry: Oriented to representatives of mining, hydrocarbons, and other economic activities related to SEGEMAR. Representatives of the industry presentated and discussed mutual necessities in order to define common goals, and held a round-table discussion on the revision of strategic targets.

SEGEMAR, Science and Technology: The contributions of the body to scientific and technical knowledge in Argentina were emphasized through several presentations. The historical relations with other science and technological institutions, both domestically and abroad, were analyzed looking forward to fortify agreements that would allow greater effectiveness in the management of the institution.

SEGEMAR and Society: Representatives of various provincial and national agencies and other institutions related to natural disaster management, territorial planning, and improving in the quality of life of the population, participated in this meeting. They discussed subjects such as the geological hazards, land-use planning, environmental base lines, etc. A presentation by Dr. Catherine Hickson, GSC, Project Manager of MAP:GAC, explained the work of MAP:GAC.

Creation and Transference of Scientific Knowledge in SEGEMAR: This seminar was oriented to media and journalists specializing in scientific subjects related to the work of SEGEMAR. Its objective was to describe the activities of SEGEMAR for the benefit of the community and to analyze difficulties that the scientific community has in communicating its achievements. In the last conference of the seminar, Mr. Otto Krauth (GSC, MAP:GAC) presented the progress of the GeoSemantica sub-project and explained the importance and potential of the tools already available on the Web and those already incorporated into GeoSemantica to develop more effective scientific communication.

On October 29 an awards dinner was held, where the longest-serving personnel of SEGEMAR received medals, and retired officers, who significantly contributed to the growth of the institution and its scientific scope, were recognized. Various activities were planned through the month of November, including conferences, videos, and round tables, all of them highlighting the work of SEGEMAR in its first 100 years, and the importance of geologic and mining knowledge to national development in Argentina.

Mr. Eduardo Zappettini

Alpacoma Landslide Dam

In the September 2004 issue of the MAP:GAC newsletter we reported on a landslide that occurred in Alpacoma, La Paz (Bolivia) on July 18, 2004. The landslide debris formed various basins expected to fill up with rainwater. During the early rainy season the largest basin was nearly filled (basin size maximum is 350 m long by 50 m wide by 20 m deep). During the last few days of November, the rain has stopped and the lake level has lowered a few metres by infiltration into landslide debris and by evaporation. However, it is expected that the water level will rise rapidly again when rainfall resumes, most likely causing overtopping of the dam and possible catastrophic failure. About 50,000 cubic metres of water would be released in such an event, surging through the La Paz suburb of Mecacapaca and flowing further downriver. Due to lack of precise topographic data, and because it is difficult to assess the exact velocity of breach formation, it is not possible to calculate exactly the maximum height of the outburst flood. Hydrologic models, however, indicate that the maximum discharge could be as high as 150 cubic metres per second if the breach reaches a depth of 15 m within 20 minutes, and about 50 cubic metres per second if the breach reaches that depth within 60 minutes. It is estimated that the wave could be significantly higher than 5 m (and locally could reach 20 m high). All responsible authorities of La Paz, including the local municipality, the mayor's office, and the civil defence and emergency teams, were informed of the situation. Due to complicated access to the dam site (only possible by crossing over the landslide debris), the dam could not be opened before the rainy season, as recommended in early August by researchers from SERGEOTECMIN and the Geological Survey of Canada. Now a further warning has been given to the authorities to be prepared for an outburst flood event, so that the impact of potential flooding can be reduced and loss of life prevented.

Photo by Mr. Gonzalo Quenta.

Dr. Reginald Hermanns